

ARTISAN®
TECHNOLOGY GROUP

Your **definitive** source for quality pre-owned equipment.

Artisan Technology Group
(217) 352-9330 | sales@artisantg.com | artisantg.com

Full-service, independent repair center
with experienced engineers and technicians on staff.

We buy your excess, underutilized, and idle equipment
along with credit for buybacks and trade-ins.

Custom engineering
so your equipment works exactly as you specify.

- Critical and expedited services
- In stock / Ready-to-ship
- Leasing / Rentals / Demos
- ITAR-certified secure asset solutions

Expert team | Trust guarantee | 100% satisfaction

All trademarks, brand names, and brands appearing herein are the property of their respective owners.

Find the *Avantek AM-4060M* at our website: ***Click HERE***

HIGH POWER, SOLID STATE, TWT REPLACEMENT AMPLIFIER RETROFIT KITS FOR TERRESTRIAL POINT-TO-POINT MICROWAVE RADIO

Avantek manufactures solid state retrofit kits including the amplifier and installation accessories and instructions to replace TWTs and their associated radio power supplies in terrestrial point-to-point microwave radio transmitters. Full band kits with 10 watts output power are available as shown below. These kits include all parts including transitions, hardware and complete installation instructions.

The standard unit is one piece with an internal power supply which operates from -24 or -48 VDC. A two piece unit is also available with a separate power supply. This unit's RF section is mechanically similar to a high efficiency TWT and is identified with a "5" in the last field of the model number.

All amplifier units are interchangeable between radio types within a frequency band minimizing the required spare parts. Only the installation kit is unique.

If you desire more information on any of these products, or have similar needs not covered here, please contact TMA sales at (913) 677-1602 or contact the factory at 180 Blue Ravine Road, Folsom, CA 95630 (916) 985-1201.

PC5

THE AVANTEK RETROFIT FAMILY

	COLLINS												LENKURT						NORTHERN TELECOM			WESTERN ELECTRIC									RAYTHEON					RCA	
	MS109	MS109E	MS109ES	MW109E	MW109E1	MDR6	MW109A3	MW109B3	MW609E	MW609E1	MDR11		CTR108	775G	775A	775C	775D		RA3T4	RA3T6	RD3		TD-2	TD-3D	TH-1	TH-3	TMA1	TM2A	TN1	TL2	TN1A		KTR3A/E	KTR3TS	RDS6200	KTR3A/E11		MM600
AWP-42100	X	X	X										X	X					X				X	X									X	X	X			
AWP-64100				X	X		X	X							X					X					X	X	X	X								X	
AWP-64105						X																															
AWP-71100															X																						
AWP-77100																X																					
AWP-83100																					X																
AWP-85100																																					
AWP-117100									X	X							X																		X		
AWP-117105											X																			X	X	X					

AWP SERIES, HIGH POWER TWT REPLACEMENT AMPLIFIERS

Guaranteed Specifications @ 25° C Case Temperature

PC5

Model	Frequency Range (GHz)	R.F. Input Power (dBm)	Gain (dB)	Output Power[12] (Watts/dBm)	Noise Figure (dB) Max.	AM/PM Conver (°/dB)@ Max. Output Typ./Max.	Output Power Variation 0° to +55° C (dB), Max.	Output Power Flatness (dB), P-P	Envelope Delay Distortion (nsec), P-P	Harmonics (dBc), Max.	Spurious (dBc), Max.	Return Loss (dB), Min. Input	Return Loss (dB), Min. Output	Input Power[13] Watts[9]
AWP-42100	3.7-4.2	Note 1	Note 2	10/+40	10[3]	1.5/3	±2.5	±.25[4]	±1[6]	-53	-60	20	20	76
AWP-64100	5.925-6.425	Note 1	Note 2	10/+40	10[3]	1.5/2	±2.5	±.25[5]	±1[7]	-53	-60	20	20	76
ACU-64100	5.925-6.425	Note 1	42-53	10/+40[8]	10[3]	1.5/3	±2.5	±.25	±1[11]	-53	-60	20	20	110
AWP-71100	6.4-7.1	Note 1	Note 2	10/+40	10[3]	1.5/3	±2.5	±.25[10]	±1[11]	-53	-60	20	20	76
AWP-77100	7.1-7.7	Note 1	Note 2	10/+40	10[3]	1.5/3	±2.5	±.25[10]	±1[11]	-53	-60	20	20	76
AWP-83100	7.7-8.3	Note 1	Note 2	10/+40	10[3]	1.5/3	±2.5	±.25[10]	±1[11]	-53	-60	20	20	76
AWP-85100	7.7-8.5	Note 1	Note 2	10/+40	10[3]	1.5/3	±2.5	±.25[10]	±1[11]	-53	-60	20	20	76
AWP-117100	10.7-11.7	Note 1	Note 2	10/+40	10[3]	1.5/3[9]	±2.5	±.25[10]	±1[11]	-53	-60	20	20	120

Notes 1: Accepts any input level from -1 to +10 dBm for rated output power.
2: Gain adjustable from 30 to 41 dB for an output power level of +40 dBm.
3: At maximum gain.
4: Peak-to-peak across any 20 MHz band at +40 dBm output power.
5: Peak-to-peak across any 30 MHz band at +40 dBm output power.
6: Peak-to-peak across any 20 MHz band.
7: Peak-to-peak across any 30 MHz band.
8: Designed for linear operation (multi-carrier SAT uplink).
9: At -24 or -48 VDC.
10: Peak-to-peak cross any 40 MHz band at rated output power.
11: Peak-to-peak across any 40 MHz band.
12: At nominal input.
13: 1 dB compressed.

The above amplifiers are only representative of our complete Retrofit product line. Please contact the factory at (916) 985-1201 for additional information.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

MODULAR CONNECTORLESS AMPLIFIERS

MODAMP™ MONOLITHIC MICROWAVE INTEGRATED CIRCUITS (MMICs)

The MSA series of monolithic silicon amplifiers is a family of silicon bipolar Monolithic Microwave Integrated Circuits (MMICs) using nitride self-alignment, ion-implantation for precise control of doping and nitride passivation for high reliability. They use series and shunt feedback and exhibit very high uniformity from amplifier to amplifier. Typical applications include narrow and broadband IF and RF amplifiers in commercial, industrial and military mobile, airborne and land based systems.

MSA SERIES

Typical Specifications at 25° C Case Temperature

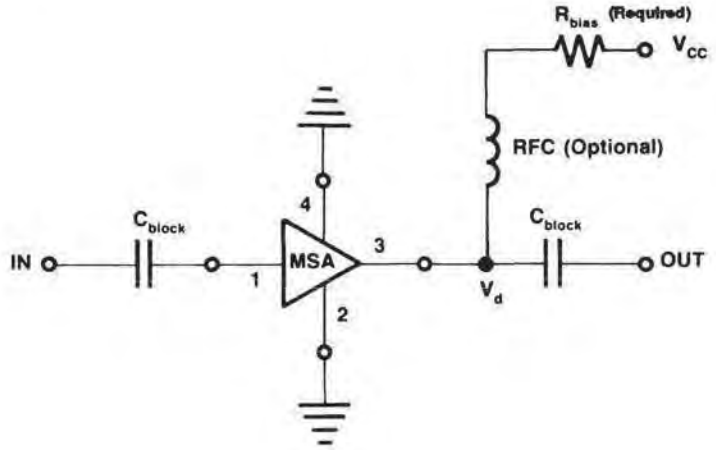
PC1

Part Number	Maximum Usable Frequency[1] (GHz)	$\|S_{21}\|^2$ Gain @ 0.1 GHz (dB)	$\|S_{21}\|^2$ Gain @ 1.0 GHz (dB)	Noise Figure @ 1.0 GHz (dB)	P_{1dB} @ 1.0 GHz (dBm)	Minimum Power Supply Voltage[3] (V_{CC})	Device Voltage[3] (V_d)	Device Current[3] (mA)	Case Type
MSA-0104	3.5	18.5	15.0	6.0	1.5	7	5	17	4-pac plastic
MSA-0204	4.0	12.5	11.0	6.5	4.5	7	5	25	4-pac plastic
MSA-0304	3.5	12.5	11.0	6.0	10.0	7	5	35	4-pac plastic
MSA-0404	2.5	8.3	7.7	7.0	11.5	7	5.3	50	4-pac plastic
MSA-0420	4.0	8.5	8.5	6.5	16.0	10	6.3	90	200 mil BeO
MSA-0520	2.5	9.0	8.5	6.5	23.0	15	12	165	200 mil BeO
MSA-1023	2.5	8.5	8.5	7.0	27.0	20	15	325	230 mil flange
MSA-1120[2]	3.0	12.5	11.0	4.0	15.0	8	5.5	60	200 mil BeO
MSA-0135	4.5	19.0	16.5	6.0	1.5	7	5	17	micro-X
MSA-0235	4.5	12.5	12.0	6.5	4.5	7	5	25	micro-X
MSA-0335	4.5	12.5	12.0	6.0	10.0	7	5	35	micro-X
MSA-0435	3.8	8.5	8.3	6.5	12.5	7	5.3	50	micro-X
MSA-0635	4.0	20.5	16.5	3.0	1.5	5	3.5	16	micro-X
MSA-0735	4.0	13.5	13.0	4.5	5.5	5	4	22	micro-X
MSA-0835	6.5	32.5	23.0	3.0	12.5	10	7.8	36	micro-X
MSA-0170	4.5	19.0	16.5	6.0	1.5	7	5	17	70 mil hermetic
MSA-0270	4.5	12.5	12.0	6.5	4.5	7	5	25	70 mil hermetic
MSA-0370	4.5	12.5	12.0	6.0	10.0	7	5	35	70 mil hermetic
MSA-0470	4.0	8.5	8.3	6.5	12.5	7	5.3	50	70 mil hermetic
MSA-0670	4.0	20.5	17.5	3.0	1.5	5	3.5	16	70 mil hermetic
MSA-0770	4.0	13.5	13.0	4.5	5.5	5	4	22	70 mil hermetic
MSA-0870	6.0	32.5	23.5	3.0	12.5	10	7.8	36	70 mil hermetic
MSA-0910[2]	6.0	8.0	8.0	6.0	12.0	12	7.7	35	100 mil hermetic
MSA-0185	4.5	18.5	15.5	6.0	1.5	7	5	17	85 mil plastic
MSA-0285	4.5	12.5	12.0	6.5	4.5	7	5	25	85 mil plastic
MSA-0385	4.0	12.5	12.0	6.0	10.0	7	5	35	85 mil plastic
MSA-0485	3.6	8.3	8.0	7.0	12.5	7	5.3	50	85 mil plastic
MSA-0685	4.0	20.0	17.0	3.2	1.5	5	3.5	16	85 mil plastic
MSA-0785	3.8	13.5	12.5	5.0	5.5	5	4	22	85 mil plastic
MSA-0885	6.0	32.5	22.5	3.3	12.5	10	7.8	36	85 mil plastic
MSA-0186	4.5	18.5	15.5	6.0	1.5	7	5	17	surface mount plastic
MSA-0286	4.5	12.5	12.0	6.5	4.5	7	5	25	surface mount plastic
MSA-0386	4.0	12.5	12.0	6.0	10.0	7	5	35	surface mount plastic
MSA-0486	3.6	8.3	8.0	7.0	12.5	7	5.3	50	surface mount plastic
MSA-0686	4.0	20.0	17.0	3.2	1.5	5	3.5	16	surface mount plastic
MSA-0786	3.8	13.5	12.5	5.0	5.5	5	4	22	surface mount plastic
MSA-0886	6.0	32.5	22.5	3.3	12.5	10	7.8	36	surface mount plastic

Notes 1: Frequency at which $|S_{21}|^2$ gain equals 6 dB.
2. Recent product addition.
3. Refer to biasing configuration on next page.

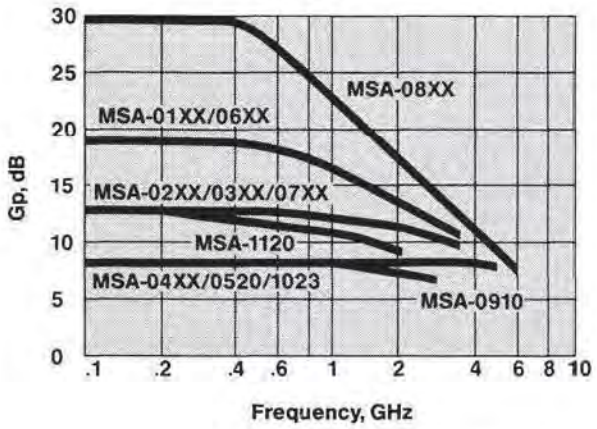
Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

TYPICAL BIASING CONFIGURATION

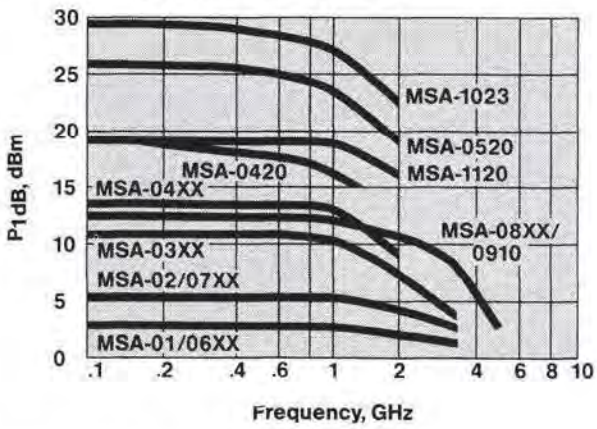


TYPICAL PERFORMANCE: Si MMIC AMPLIFIERS

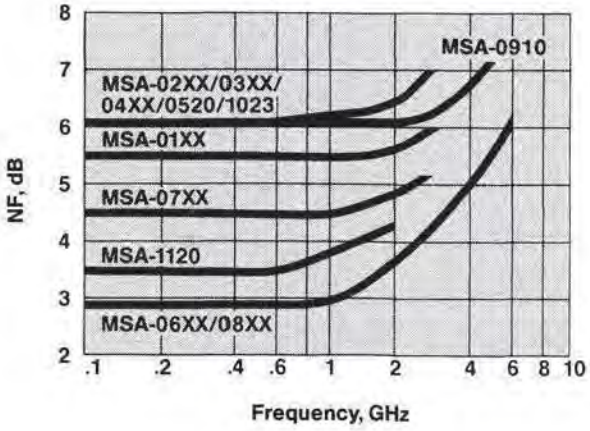
TYPICAL POWER GAIN vs. FREQUENCY
$T_A = 25°C$



TYPICAL OUTPUT POWER @ 1 dB GAIN COMPRESSION
vs. FREQUENCY, $T_A = 25°C$



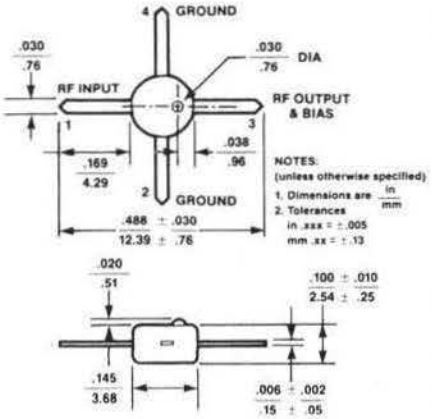
TYPICAL NOISE FIGURE vs. FREQUENCY
$T_A = 25°C$



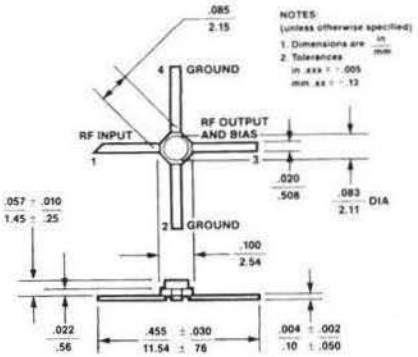
Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

CASE DRAWINGS

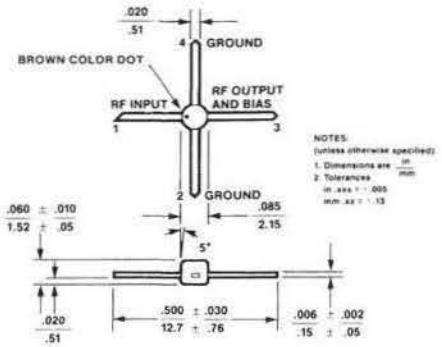
AVANTEK 04 PLASTIC PACKAGE



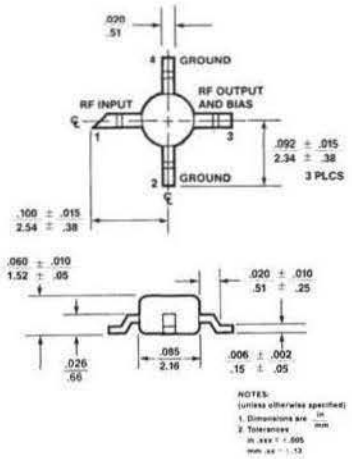
AVANTEK micro-X PACKAGE



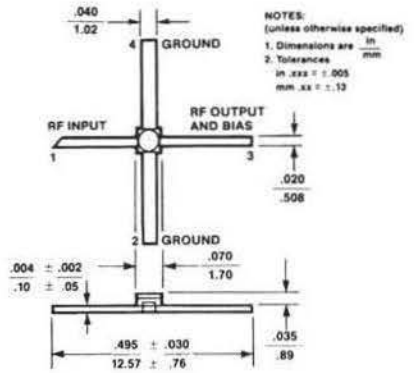
AVANTEK 85 PLASTIC PACKAGE



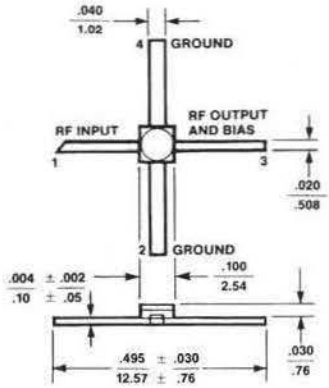
AVANTEK SURFACE MOUNT



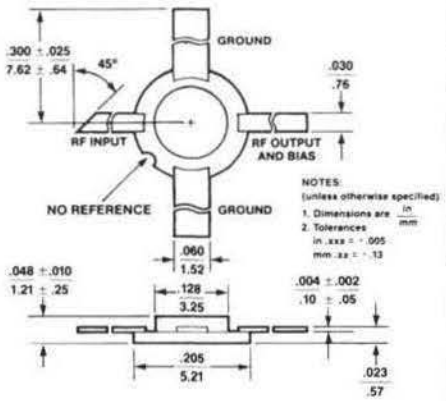
AVANTEK 70 mil PACKAGE



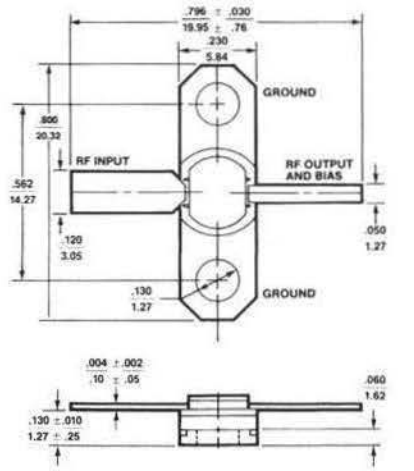
AVANTEK 100 mil STRIPLINE



AVANTEK 200 mil BeO PACKAGE



AVANTEK 230 mil BeO FLANGE PACKAGE



NOTES:

Artisan Technology Group - Quality Instrumentation ...Guaranteed | (888) 88-SOURCE | www.artisantg.com

PLANARPAK™ SERIES SURFACE-MOUNTED COMPONENTS

Avantek PlanarPak™ surface-mounted components bring a new dimension to the design of microwave systems. The new surface-mount package allows the use of simpler microstrip installations at higher densities and with improved performance over previously available packages.

PLANARPAK™ SERIES SURFACE MOUNTED AMPLIFIERS

Guaranteed Specifications @ 0° to 50° C Case Temperature

PC2

Model	Frequency Range (MHz) Minimum	Gain (dB) Minimum	Noise Figure (dB) Maximum	Power Output at 1 dB Gain Compression (dBm) Minimum	Power Requirements Voltage (VDC)	Power Requirements Current (mA) Nominal	Case Type
PPA-210	10-200	8.0	2.0	+11	+15	15	PP-38
PPA-211	10-200	7.5	2.7	+17	+15	30	PP-38
PPA-253	5-200	29.0	4.0	0	+5	30	PP-25
PPA-543	10-500	10.0	2.7	+6	+15	25	PP-38
PPA-544[1]	10-500	10.0	3.0	+12	+15	35	PP-38
PPA-519	5-500	13.0	5.5	+18	+15	70	PP-38
PPA-509	5-500	13.0	5.5	+20	+15	90	PP-38
PPA-520	5-500	14.0	4.5	+12	+5	33	PP-38
PPA-1043[1]	10-1000	10.0	4.0	+6	+15	25	PP-38
PPA-1005	5-1000	11.0	6.0	+19.5	+15	90	PP-38
PPA-1006	5-1000	11.0	6.0	+17	+15	70	PP-38
PPA-1007	5-1000	12.5	5.0	+11	+5	33	PP-38
PPA-2012[2]	500-2000	9.0	4.0	+12	+15	50	PP-38
PPA-2013[2]	500-2000	9.0	5.5	+19	+15	100	PP-38
PPA-4132	1000-4000	20.0	6.0	+17	+8	150	PP-38
PPA-6232	2-6 GHz	17.0	6.0	+17	+8	150	PP-38
PPA-18232	2-18 GHz	9.0	9.5	+11	+8	155	PP-25
PPA-18632	6-18 GHz	12.0	6.5	+13	+9	50	PP-25

(P) Preliminary

Notes 1: Both RF input & RF output pins are at DC ground—No blocking capacitor.
2: RF Input pin is at DC ground—No input blocking capacitor.

PPF-030, PLANARPAK™ SURFACE MOUNTED ATTENUATOR

Guaranteed Specifications at 0 to +50° C Case Temperature

PC2

Model	Frequency Range (MHz)	Insertion Loss (dB) Maximum	Attenuation (dB) Minimum	VSWR (50Ω) Maximum	Switching Speed (μsec) Maximum	Control Voltage (V)	Case Type
PPF-030	100-500	2.5	40	2.0	1.0	0 to +15	PP-25F
	500-1000	3.0	35	2.0	1.0		
	1000-2000	3.5	25	2.0	1.0		

PPS-010, PLANARPAK™ SURFACE MOUNTED, NON-REFLECTIVE, SPDT SWITCH

Guaranteed Specifications at 0° to 50° C. Case Temperature

PC2

Model	Frequency Range (MHz)	Insertion Loss (dB) Maximum	Isolation (dB) Minimum	VSWR (50Ω) Maximum	Switching Speed (μsec) Maximum	Control Voltage (VDC)	Case Type
PPS-010	10-200	1.5	40	1.7	5.0	±15	PP-25S
	200-500	1.5	30				
	500-2000	2.5	20				

PLANARPAK™ SURFACE MOUNTED DETECTORS

Guaranteed Specifications at 0° to 50° C Case Temperature

PC2

Model	Frequency Range (MHz)	VSWR (50Ω) Maximum	Sensitivity Typical	Flatness (@ input) (dB) Maximum	Video B/W Typical	Power (VDC) Nominal	Case Type
PPD-2001[1]	20-2000	1.8	.9V/mW	±0.3	150 kHz	+15	PP-25DA
PPD-6002[2]	100-6000	2.0	-10 to +10 dBm	±1.0	1000 nsec	+15	PP-25DD

Notes 1: Level detector.
2: Threshold detector.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

PPL-504, PLANARPAK™, SURFACE MOUNTED LIMITING AMPLIFIER

Guaranteed Specifications @ 0° to 50°C Case Temperature

PC2

Model	Frequency Range (MHz)	Input Power Limiting Range (dBm) Minimum	Saturated Output Power (dBm) Minimum	Output Power Flatness (dB) Maximum	Noise Figure (dB) Maximum	Operating Bias (Vdc)	Case Type
PPL-504	10-1000	-25 to +10	-2.0	±1.0	10.0	+15	PP-48

PPM-2515M, PLANARPAK™ SURFACE MOUNTED TRIPLE BALANCED MIXER

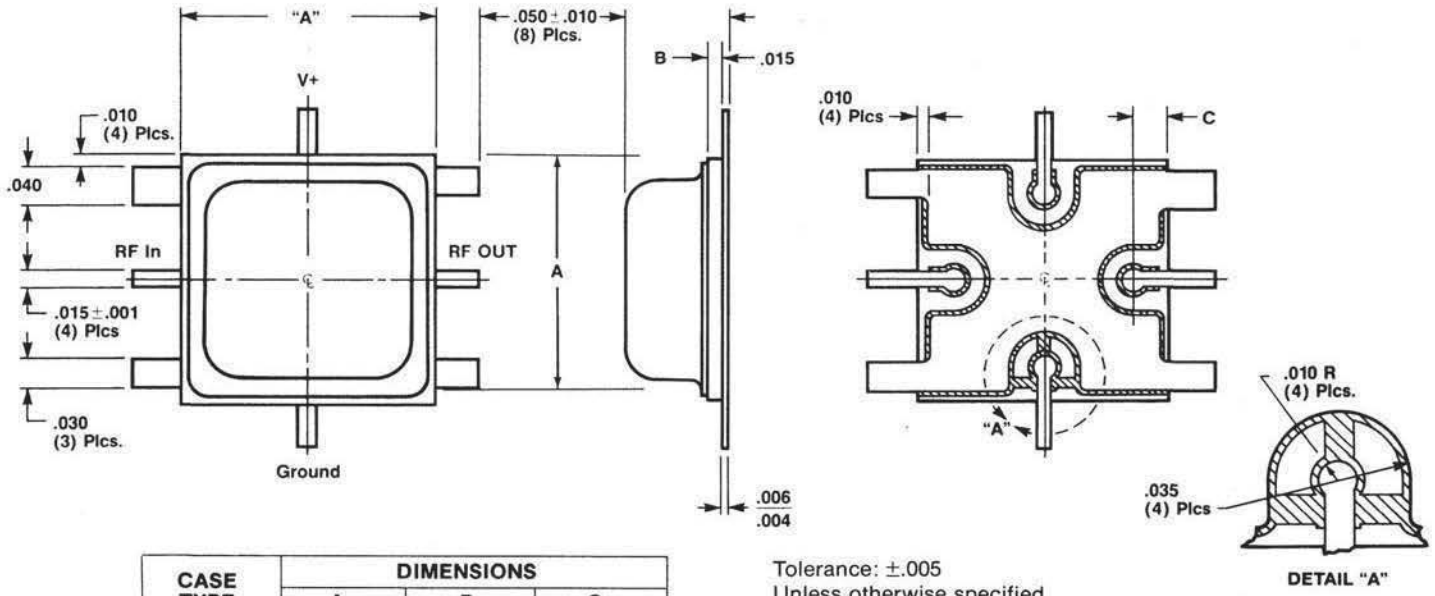
Typical Specifications @ 25°C Case Temperature

PC2

Model	Frequency Range (GHz) RF/LO	Frequency Range (GHz) IF	Conv. Loss (dB) Typical	ISOL. LO/RF (dB) Typical	ISOL. LO/IF (dB) Typical	VSWR RF/IF	VSWR LO	Case Type
PPM-2515M	.05-2.5	.001-1.5	7.6	35	35	1.5	2.5	PP-38M

CASE DRAWINGS

PP-25/38

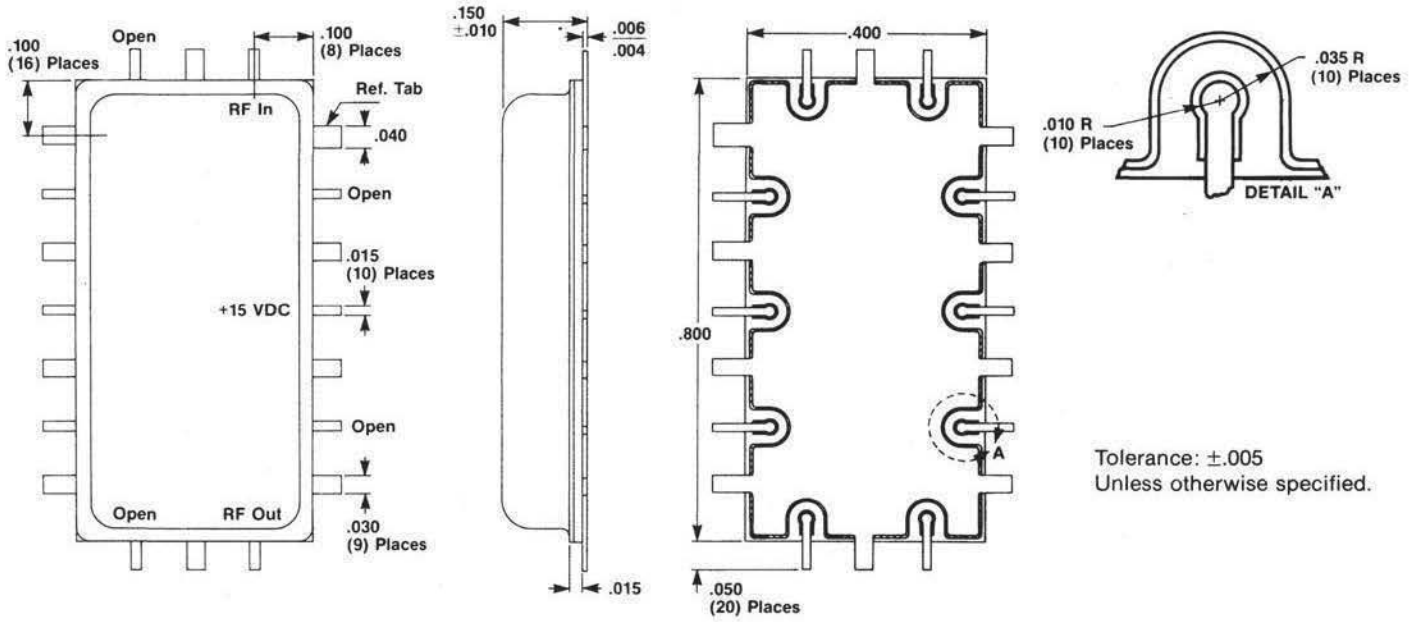


CASE TYPE	DIMENSIONS		
	A	B	C
PP-25	.250	.110	.035
PP-38	.375	.150	.040

Tolerance: ±.005
Unless otherwise specified.

Note: The above pin designations are for amplifiers only. For details and pin designations on other PP-25/38 products see specific drawings with product type listings elsewhere in this catalog.

PP-48



Tolerance: ±.005
Unless otherwise specified.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

AMPLIFIER MODULES

Avantek's broad selection of GPD and UTO series of products provides the design engineer with an immediate solution for RF and IF gain requirements. Proven reliability, guaranteed performance, reduced size and reduced part count—add up to significant savings in cost and time with Avantek Modular Amplifiers.

The factory guarantees operation of most UTO and GPD Series amplifier modules over -54° C to +105° C. Consult specific data sheets or the Avantek Modular Products Data book for complete specifications.

GPD SERIES LOW COST AMPLIFIERS, TO-39 PACKAGE[1]

Guaranteed Specifications at 0° to 50° C Case Temperature

PC2

Model	Frequency Response (MHz) Minimum	Gain (dB) Minimum	Noise Figure (dB) Typical	Power Output for 1 dB Gain Compression (dBm) Typical	Gain Flatness (±dB) Typical	3rd Order Intercept Point (dBm) Typical	Input Power (±1% Reg.) Voltage (VDC)	Input Power (±1% Reg.) Current (mA) Typical
GPD-110	0.1-400	12	4.0	-2.0	1.0	+12	2.5	10
GPD-120	0.1-400	13	5.5	+8.0	1.0	+24	5.5	25
GPD-130	0.1-400	12	7.0	+17.0	1.0	+27	6.0	60
GPD-310	0.1-1000	7	5.0	-1.0	1.0	+11	2.3	10
GPD-320	0.1-1000	7	5.0	+8.0	1.0	+18	3.0	25
GPD-330	0.1-1000	6	6.5	+16.0	1.0	+26	4.5	60
GPD-311	0.1-1000	11	4.5	+3.0	1.0	+15	2.7	15
GPD-321	0.1-1000	11	4.7	+8.0	1.0	+20	3.5	25
GPD-331	0.1-1000	9	6.0	+16.0	1.0	+28	5.5	60
GPD-410	0.1-1500	11	4.2	+2.5	1.0	+15	2.5	15
GPD-420	0.1-1500	10	4.7	+8.0	1.0	+20	2.8	25
GPD-430	0.1-1500	9	6.3	+16.0	1.0	+28	5.0	60

GPD SERIES LOW COST AMPLIFIERS, TO-12 PACKAGE

Guaranteed Specifications at 0° to 50° C Case Temperature

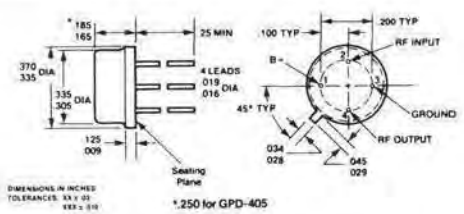
GPD-201	5-200	30	3.5	+5	1.0	+13	+15	30
GPD-202	5-200	25	5.5	+9	1.0	+18	+15	60
GPM-552	5-500	33	4.5	0	0.2	+14	+15	34
GPM-1052	5-1000	20	7.0	+8	0.3	+20	+15	60
GPD-251	5-200	25	4.0	+1	1.0	+10	+5	30
GPD-252	5-200	15	4.0	0	1.0	+12	+5	11
GPD-401/461[2]	5-400	13	4.5	-2	1.0	+9	+15	10
GPD-411	5-400	12	3.2	-6	1.0	+4	+15	7
GPD-402/462[2]	5-400	13	6.0	+6	1.0	+18	+15	24
GPD-403/463[2]	5-400	9	7.5	+15	1.0	+25	+24	65
GPD-404/464[2]	5-400	9	7.5	+15	1.0	+26	+15	70
GPD-405	10-400	13	6.5	+20	1.0	+29	+15	90
GPD-1001/1061[2]	5-1000	12	6.0	0	1.0	+12	+15	15
GPD-1002/1062[2]	5-1000	12	7.0	+6	1.0	+16	+15	27
GPD-1003/1063[2]	5-1000	10	8.0	+14	1.0	+24	+15	55

Notes 1: Three external capacitors (input, output coupling and RF bypass) are required to establish low frequency roll-off. An external bias resistor, with a value determined by the available bias voltage, ($R_D = [V_{CC} - V_D] \div I_D$), where R_D is the value of the bias resistor (Ohms), V_{CC} is the available source voltage, V_D is the required device bias voltage (per specification) and I_D is the device current (per specification), is also required.

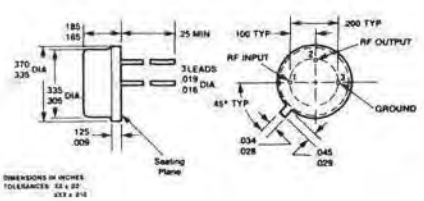
2: The 60 Series is the same as the standard series except that three external capacitors are required to establish low frequency roll-off.

CASE DRAWINGS

TO-12



TO-39



Artisan Technology Group - Quality Instrumentation... Guaranteed | (888) 88-SOURCE | www.artisantg.com

HIGH PERFORMANCE AMPLIFIERS

The premium UTO/UTC Series of amplifiers offers the best possible performance and high reliability under the most difficult operating conditions. They provide very stable and repeatable performance over a wide range of frequencies, temperatures and supply voltages.

UTO/UTC SERIES

Guaranteed Specifications at 0° to 50° C Case Temperature

PC2

Model UTO/UTC	Frequency Range (MHz) Minimum	Gain (dB) Minimum	Noise Figure (dB) Maximum	Power Output at 1 dB Gain Compression (dBm) Minimum	Gain Flatness (±dB) Maximum	Third Order Intercept Point (dBm) Typical	Input Power (±1% Reg.) Voltage (VDC)	Input Power (±1% Reg.) Current (mA), Typ.	Case Type
10 to 150 MHz		(Listed in order of Increasing Noise Figure, Increasing Power Output)							
103	10-100	25.5	2.1	+9.5	1.0	+22	**+5**	15	TO-8T
101	10-100	26.5	2.2	+14.5	1.0	+26	+15	20	TO-8T
104	10-150	24.0	2.3	+9	1.0	+22	**+5**	20	TO-8T
102	20-150	23.5	3.2	+18	1.0	+32	+15	31	TO-8T
10 to 200 MHz		(Listed in order of Increasing Noise Figure, Increasing Power Output)							
514	30-200	15	2.0	-3	0.75	+7	+15	8	TO-8U
210	10-200	8.0	2.0	+11	1.0	+29	+15	8	TO-8T
221	10-200	27	2.5	+13.5	0.7	+27	+15	29	TO-8T
211	10-200	7.5	2.7	+17	1.0	+28	+15	30	TO-8T
222	20-200	28	3.5	+19	0.7	+32	+15	47	TO-8T
250	10-200	30	4.0	-3	1.0	+9	**+5**	13	TO-8U
5 to 400 MHz		(Listed in order of Increasing Noise Figure, Increasing Power Output)							
443[3]	10-400	12.5	4.5	+4.5	0.7	+19	**+5**	10	TO-8T
440[3]	10-400	12.5	4.5	+8	0.7	+23	+15	15	TO-8T
441[3]	20-400	13.5	4.5	+15	0.7	+32	+15	32	TO-8T
444[3]	10-400	12.5	5.0	+8.0	0.7	+22	**+5**	15	TO-8T
421	5-400	27	5.5	+6	1.0	+18	+15	38	TO-8U
416	5-400	14	5.5	+10	1.0	+23	+15	35	TO-8U
442[3]	10-400	13	5.5	+20	0.7	+33	+15	62	TO-8T
2 to 500 MHz		(Listed in order of Increasing Noise Figure, Increasing Power Output)							
511	5-500	15	2.5	-2	1.0	+8	+15	10	TO-8U
517	5-500	22	2.5	+5	1.0	+15	+15	22	TO-8U
543[1]	10-500	10	2.5	+6	1.0	+22	+15	25	TO-8U
510	5-500	15	3.0	-2	1.0	+8	+15	10	TO-8U
512	5-500	20	3.0	+7	1.0	+20	+15	23	TO-8U
554	5-500	28.0	3.0	9.0	0.7	21.0	**+5**	40	TO-8T
544[1]	10-500	10	3.0	+12	1.0	+28	+15	35	TO-8T
558	5-500	28.0	3.2	13.5	0.7	23.0	**+5**	73	TO-8T
572[4]	50-500	18	3.5	+11	0.5	+24	+15	32	TO-8T
501	5-500	14	4.0	-2	1.0	+11	+15	10	TO-8U
521	5-500	27	4.0	+6	1.0	+18	+15	38	TO-8U
552	5-500	13.5	4.0	+6.5	0.7	+21	**+5**	18	TO-8T
502	5-500	14	4.0	+7	1.0	+21	+15	23	TO-8U
571[4]	50-500	14.5	4.0	+10	0.5	+27	+15	32	TO-8T
524	5-500	30	4.0	+14	1.0	+27	+15	70	TO-8T
516	5-500	14	4.5	+10	1.0	+23	+15	35	TO-8T
520	5-500	14	4.5	+12	0.7	+22	**+5**	33	TO-8T
533	5-500	16	5.0	+14	0.7	+30	+15	53	TO-8T
545	10-500	10	5.0	+17	0.5	+36	+15	60	TO-8T
519	5-500	13	5.5	+18	0.7	+33	+15	70	TO-8T
509	5-500	13	5.5	+20	1.0	+35	+15	90	TO-8T
513	5-500	16	6.0	+14	1.0	+31	+24	50	TO-8U
518	5-500	13	6.0	+23	0.7	+38	+15	130	TO-8T
523	5-500	23	7.0	+12	1.0	+25	+15	80	TO-8U
503	5-500	9	7.0	+13	1.0	+33	+24	50	TO-8U
515	2-500	12	7.0	+14	0.5	+28	+15	65	TO-8U
505	10-500	9	7.0	+18	1.0	+33	+15	95	TO-8T
546[3]	10-500	10	8.0	+23	0.5	+38	+15	110	TO-8T
561[2]	10-500	11	9.0	+26	0.7	+39	+15	190	TO-8T
504	5-500	6	11.0	+17	1.0	+34	+24	100	TO-8U

Notes: See notes on following page.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

HIGH PERFORMANCE AMPLIFIERS, Continued

Model UTO/UTC	Frequency Range (MHz) Minimum	Gain (dB) Minimum	Noise Figure (dB) Maximum	Power Output at 1 dB Gain Compression (dBm) Minimum	Gain Flatness (±dB) Maximum	Third Order Intercept Point (dBm) Typical	Input Power (±1% Reg.) Voltage (VDC)	Input Power (±1% Reg.) Current (mA), Typ.	Case Type
2 to 1000 MHz	**(Listed in order of Increasing Noise Figure, Increasing Power Output)**								
1011	2-1000	14	3.5	-5	0.7	+10	+15	8	TO-8U
1012	5-1000	15	4.0	+4	1.0	+17	+15	18	TO-8U
1043[1]	10-1000	10	4.0	+6	1.0	+22	+15	25	TO-8T
1054	5-1000	23.5	4.0	+9.5	0.7	+21	**+5**	40	TO-8T
1058	5-1000	23.5	4.2	+13	0.7	+22	**+5**	70	TO-8T
1013	5-1000	15	4.5	+9	1.0	+20	+15	29	TO-8U
1044[1]	10-1000	10	4.5	+12	1.0	+28	+15	35	TO-8T
1021	5-1000	22	4.5	+12	1.0	+27	+15	85	TO-8U
1001	5-1000	14	5.0	-2	1.0	+11	+15	10	TO-8U
1052	5-1000	13	5.0	+7	0.7	+18	**+5**	18	TO-8T
1007	5-1000	12.5	5.0	+11	0.7	+21	**+5**	33	TO-8T
1006	5-1000	11	6.0	+17	1.0	+30	+15	70	TO-8T
1005	5-1000	11	6.0	+20	1.0	+33	+15	90	TO-8T
1002	5-1000	14	6.5	+7	1.0	+21	+15	23	TO-8T
UTM-1056	10-1000	25.6	6.5	+12	0.7	+26	+15	135	TO-8T
UTM-1057	10-1000	26	6.5	+14	0.7	+29	+15	170	TO-8T
1033	5-1000	10	6.5	+14	1.0	+28	+15	48	TO-8T
1024	10-1000	12	6.5	+22[5]	1.0	+35	+15	155	TO-8T
1055	10-1000	15.5	7.5	+15	0.7	+29	+15	135	TO-8T
1023	10-1000	12	8.5	+24.5[6]	1.0	+36	+15	205	TO-8T
UTM-1053	5-1000	27	9.0	+5	2.0	+21	+15	90	TO-8T
1004	10-1000	6	12.0	+20	0.7	+40	+15	110	TO-8T
1 to 1500 MHz	**(Listed in order of Increasing Noise Figure, Increasing Power Output)**								
1524	10-1500	21	4.5	+7	1.5	+19	+15	60	TO-8U
1511	5-1500	10	4.5	-9	0.5	+1	+15	7	TO-8U
1522	5-1500	18	5.5	+11	1.5	+23	+15	85	TO-8U
1501	5-1500	9	5.5	-3	0.5	+10	+15	10	TO-8U
1502	5-1500	9	7.5	+6	0.5	+19	+15	23	TO-8U
1 to 2000 MHz	**(Listed in order of Increasing Noise Figure, Increasing Power Output)**								
2031	1-2000	9	5.5	+2	1.0	+14	+15	16	TO-8U
2032	1-2000	9	6.0	+7	1.0	+17	+15	25	TO-8U
2033	1-2000	8	8.5	+14	1.0	+30	+15	50	TO-8T
5 to 2000 MHz	**(Listed in order of Increasing Noise Figure, Increasing Power Output)**								
2021	10-2000	9	4.0	+2	1.0	+14	+15	16	TO-8U
2012[2]	500-2000	9	4.0	+12	1.0	+23	+15	50	TO-8U
2052	5-2000	9	5.0	+5.5	0.7	+16	**+5**	18	TO-8T
2024	5-2000	15	5.5	+5	1.0	+18	+15	38	TO-8T
2013[2]	500-2000	9	5.5	+19	1.0	+33	+15	100	TO-8U
2022	10-2000	9	6.0	+7	1.0	+17	+15	25	TO-8U
2055	5-2000	8.5	6.0	+10	0.7	+22	**+5**	32	TO-8T
2026	10-2000	13.5	7.0	+19	1.0	+31	+15	155	TO-8T
2027	10-2000	13.5	7.0	+16	1.0	+30	+15	108	TO-8T
2023	10-2000	8	8.5	+14	1.0	+29	+15	50	TO-8T
2025	100-2000	9.5	4.5	+25	1.0	+37	+15	175	TO-8T
1700 to 2300 MHz	**(Listed in order of Increasing Noise Figure, Increasing Power Output)**								
2311	1700-2300	8	5.0	-3	0.5	+10	+15	15	TO-8U
2302	1700-2300	8	6.5	+3	0.5	+13	+15	18	TO-8U
2303	1700-2300	8	8.0	+10	0.5	+20	+15	30	TO-8U
2321	1700-2300	14	8.0	+10	1.0	+23	+15	70	TO-8U

(P) Preliminary

Notes 1: Both RF input and RF output pins are at DC ground—no blocking capacitor.

2: RF input pin is at DC ground—no input blocking capacitor.

3: A portion of any DC voltage applied to the RF input pin will appear at the RF output pin (i.e., a resistive DC path exists between pins). There is no input or output blocking capacitor.

4: High reverse isolation.. Typ S_{12} = -48 dB at 500 MHz.

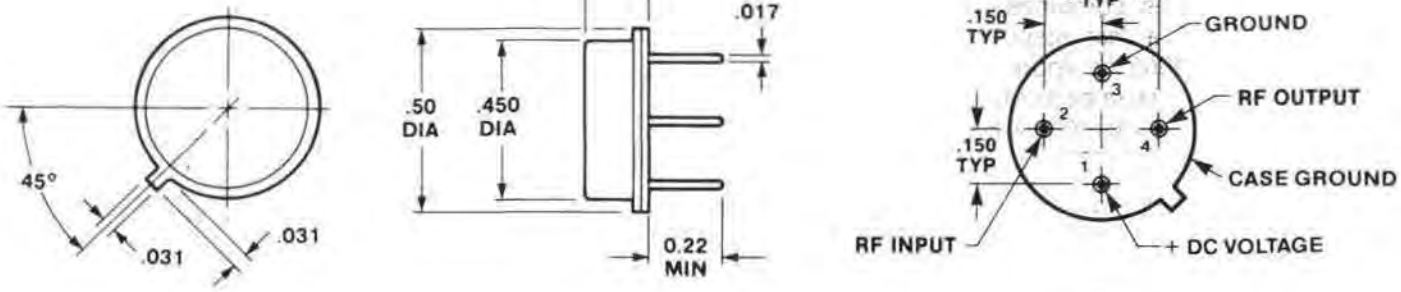
5: From 10-500 MHz, Power Output for 1 dB Comp = +24.5 dBm.

6: From 10-500 MHz, Power Output for 1 dB Comp = +26 dBm.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

CASE DRAWINGS

TO-8T/U (UTO MODELS)

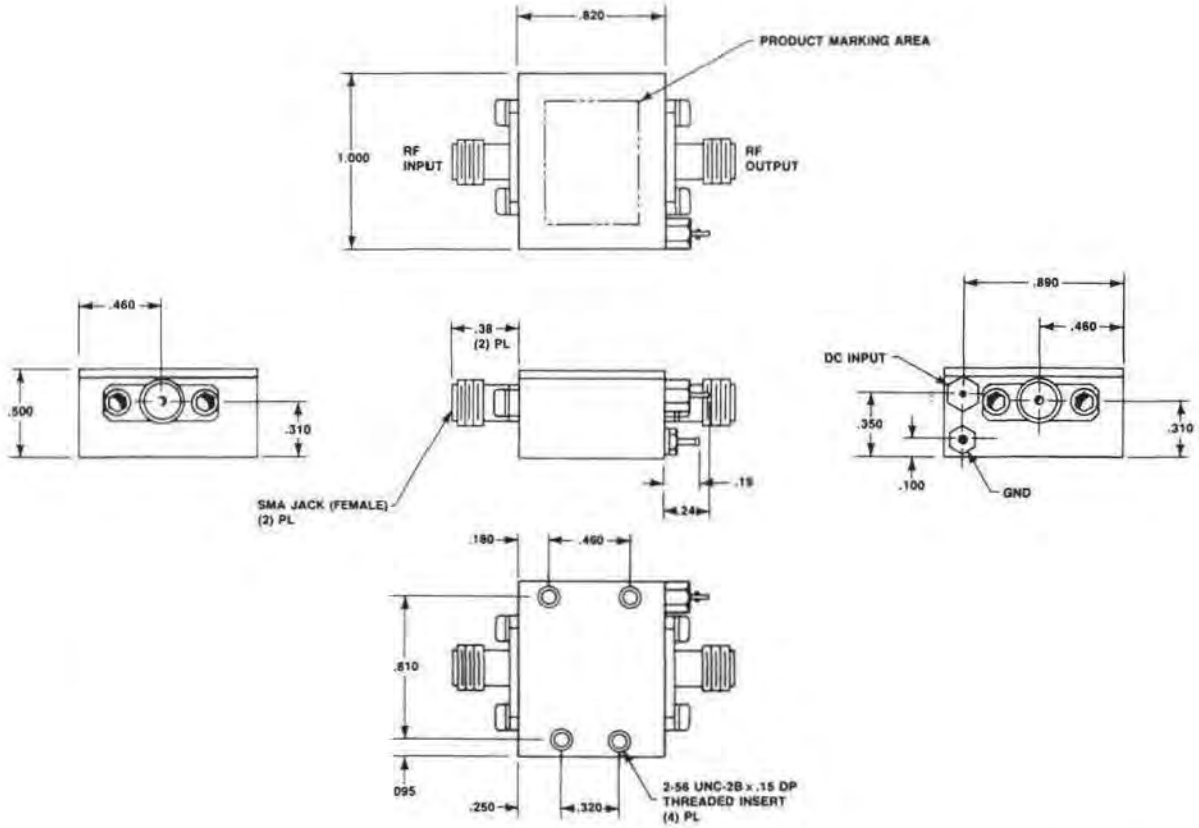


APPROXIMATE WEIGHT 0.06 OZ

DIMENSIONS IN INCHES
TOLERANCES: XX ± .02
XXX ± .010

CASE TYPE	DIM A
TO-8T TO-8U	.210 .175

TC-1 (UTC MODELS)



TYPICAL WEIGHT WITH CONNECTORS = 21.5 GRAMS

DIMENSIONS IN INCHES
TOLERANCES: XX ± .02
XXX ± .010

Artisan Technology Group - Quality Instrumentation ...Guaranteed | (888) 88-SOURCE | www.artisantg.com

THIN-FILM VOLTAGE-CONTROLLED AMPLIFIERS

The AGC series combines a thin-film cascadable amplifier with a fast response attenuator. Models AGC-553 and 1053 incorporate monolithic gain stages. Used alone, they can be a complete AGC controlled IF amplifier in the 5 to 1000 MHz range. They may be combined with other wideband amplifier modules such as the GPD, GPM, UTM or UTO series to produce a voltage controlled amplifier with any reasonable amount of gain and power output without degrading the frequency response of the cascade.

AGC SERIES

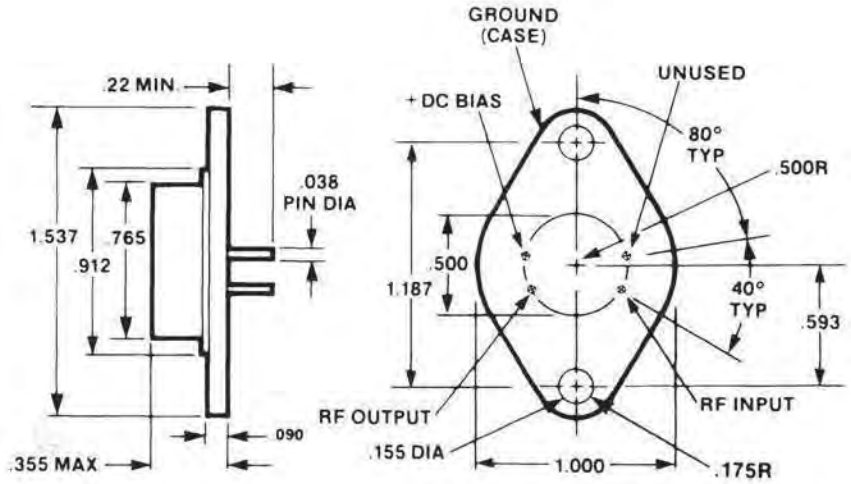
Guaranteed Specifications at 0° to 50° C Case Temperature PC2

Model	Frequency Response (MHz)	Gain (dB) Typ./Min.	AGC Range (dB) Typ.	AGC Voltage Range (Volts)	AGC Current Range (mA)	Maximum[1] Noise Figure (dB) Typ./Max.	Power Output at 1 dB Gain Compression (dBm) Minimum	Typical Response Time (μsec)	Bias Voltage (VDC)	Bias Current (mA)	Typical VSWR	Case Type
AGC-330	5-300	22/20	36	0 to 5	0 to 30	4.0/5.0	0	1.5	+15	25	<2.0	TO-3
AGC-553	10-500	44/40	45	0 to 5	0 to 12	6.0/8.0	-4	25	+15	50	<2.0	TO-8F
AGC-1053	10-1000	22/18	35	0 to 5	0 to 12	11.0/12.0	+5	25	+15	90	<2.0	TO-8F

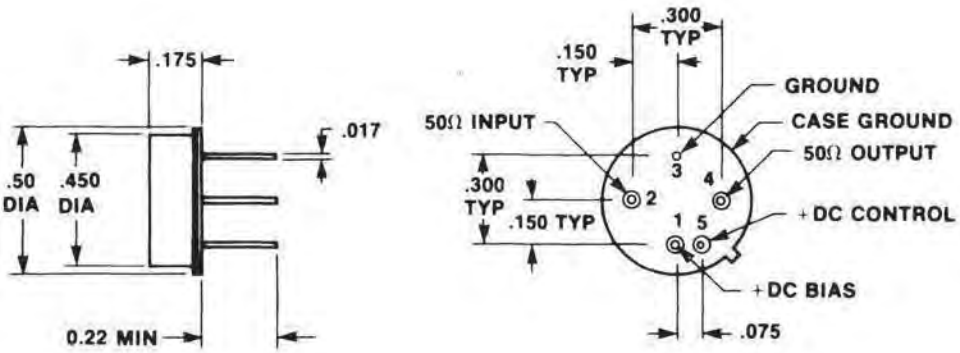
Note 1: At 0 AGC.

CASE DRAWINGS

TO-3



TO-8F



Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

THIN-FILM LIMITING AMPLIFIERS

These devices amplify a wide range of weak input signals to the same, relatively constant (limited) output power level.

UTL SERIES THIN-FILM LIMITING AMPLIFIERS

Guaranteed Specifications @ 0° to 50° C Case Temperature PC2

Model	Frequency Range (MHz)	Input Power Limiting Range (dBm) Minimum	Saturated Output Power (dBm) Minimum	Output Power Flatness (dB) Maximum	Noise Figure (dB) Maximum	Operating Bias (Vdc)	Case Type
UTL-502	5-500	-10 to +7	-4.0	±0.5	11.0	+15, -15	TO-8F
UTL-503	5-500	-11 to +7	-4.0	±1.0	10.0	+15	TO-8F
UDL-502	5-500	-33 to +7	-4.0	±0.5	11.0	+15, -15	DIP
UDL-503	5-500	-33 to +10	-2.0	±1.0	10.0	+15	DIP

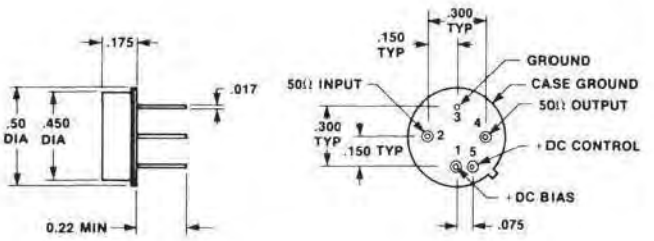
PPL-504, PLANARPAK™, SURFACE MOUNTED LIMITING AMPLIFIER

Guaranteed Specifications @ 0° to 50° C Case Temperature PC2

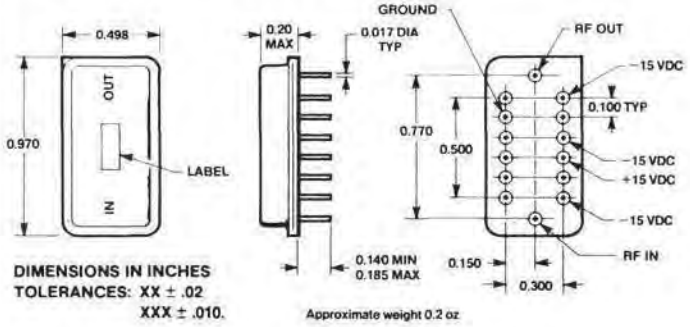
Model	Frequency Range (MHz)	Input Power Limiting Range (dBm) Minimum	Saturated Output Power (dBm) Minimum	Output Power Flatness (dB) Maximum	Noise Figure (dB) Maximum	Operating Bias (Vdc)	Case Type
PPL-504	10-1000	-25 to +10	-4.0	±0.8	10.0	+15	PP-48

CASE DRAWINGS

TO-8F



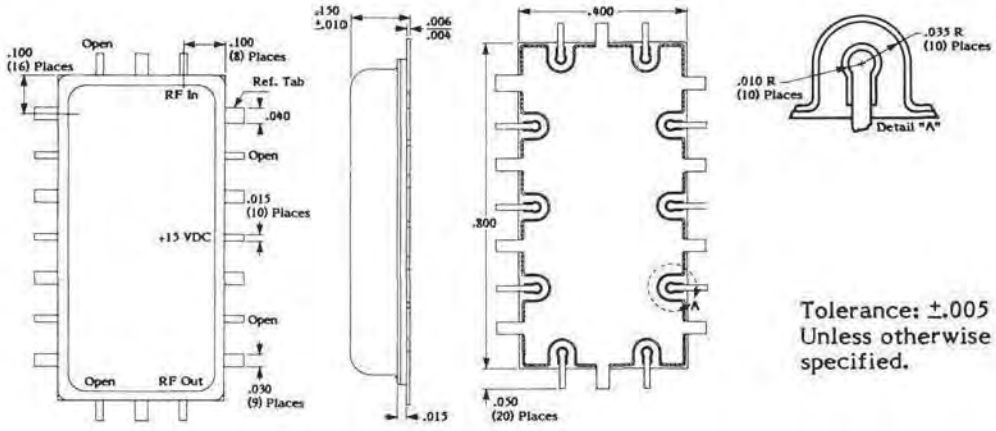
DIP



DIMENSIONS IN INCHES
TOLERANCES: XX ± .02
XXX ± .010.

Approximate weight 0.2 oz

PP-48



Tolerance: ±.005
Unless otherwise specified.

Note: Leads are for testing only and may be trimmed flush at time of installation.

Artisan Technology Group - Quality Instrumentation Guaranteed | (888) 88-SOURCE | www.artisantg.com

WIDE FREQUENCY RANGE OSCILLATORS

COMMERCIAL YIG-TUNED OSCILLATORS

Avantek AV Series of YIG-tuned fundamental transistor oscillators are designed for wideband applications in receivers and instruments where tuning linearity, phase noise and spectral purity are crucial. They make ideal local oscillators for frequency-agile receivers and spectrum analyzers, and are excellent as signal sources for microwave sweep generators and synthesizers.

AV-7000 SERIES COMMERCIAL YIG-TUNED OSCILLATORS

Guaranteed Specifications @ 0 to +65°C Case Temperature

PC6

Model Number	Frequency Range (GHz)	Power Output @ 25°C (dBm) Minimum	Power Variation (dB) Maximum	Frequency Drift over Temperature (MHz) Maximum	Second Harmonic Below Carrier @ 25°C (dBc), Min.	Case Type
NARROW BAND OSCILLATORS						
AV-7224-2	3.7-4.2	+20	2	10	20	C-45
AV-7443-2	5.4-5.9	+20	2	20	20	C-45
AV-7443-3	5.9-6.5	+20	2	20	20	C-45
AV-7443-4	7.2-7.8	+20	2	20	20	C-45
AV-74010-2	7.9-8.4	+16	2	20	20	C-45
AV-74010-3	8.5-9.6	+16	2	20	20	C-45
AV-74010-4	9.5-10.5	+16	2	20	20	C-45
AV-7872-3	10.7-11.7	+20	2	25	20	M4-45
AV-71261-2	11.7-12.7	+19	2	40	20	M3-60
AV-71261-3	12.7-13.2	+19	2	40	20	M3-60
AV-71261-4	14.0-14.5	+19	2	40	20	M3-60
OCTAVE BAND OSCILLATORS						
AV-7104	1.0-2.2	+16	3	10	15	A-45
AV-7203	2-4	+14	3	10	12	A-45
AV-7204	2-4	+16	3	10	20	B-45
AV-7224	2-4	+20	3	10	12	C-45
AV-7238-2	2.6-5.2	+17	6	20	20	C-45
AV-7403	4-8	+13	6	20	12	C-38
AV-7453	4-8	+17	6	20	12	C-38
AV-7443	4-8	+20	6	20	12	C-45
AV-77011	7-11	+17.8	6	25	12	M4-45
AV-7871	8-12.4	+14.8	6	25	12	M4-45
AV-7872	8-12.4	+17.8	6	25	12	M4-45
AV-7873	8-12.4	+20	6	25	12	M4-45
AV-71241	12-18	+13	6	40	12	M3-45
AV-71251	12-18	+16	6	40	12	M3-60
AV-71261	12-18	+19	6	40	12	M3-60
MULTI-OCTAVE BAND OSCILLATORS						
AV-70502	0.5-2	+14.8	6	10	12	M1-45
AV-7124	1-4	+14.8	6	10	12	C-45
AV-7236	2-6	+13	6	15	12	A-45
AV-7238	2-8	+14.8	6	20	12	C-45
AV-7288	2-8	+20	6	20	8	C-45
AV-72010	2-10	+14	6	20	8	C-45
AV-74010	4-10	+16	6	20	12	C-45
AV-76018	6-18	+14.8	8	40	10	M3-60
AV-77016	7-16	+17	6	40	12	M4-45
AV-78318	8-18	+10	6	40	12	M3-45
AV-78218	8-18	+14.8	6	40	12	M3-45
AV-78518	8-18	+17	6	40	12	M3-60
AV-78020	8-20	+13	8	40	12	M3-60
AV-71220	12-20	+16	6	40	15	M3-60
WIDEBAND OSCILLATOR						
AV-74018	4-18	+17	6	40	10	M3-60

Avantek, Inc. • 3175 Bowers Ave., Santa Clara, Ca 95054 • Phone: (408) 727-0700 • FAX: (408) 727-0539 • TWX: 310-371-8717 or 310-371-8478 • TELEX: 34-6337

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

AV-7000 COMMERCIAL YIG-TUNED OSCILLATORS, Continued

Model Number	Frequency Range (GHz)	Power Output @ 25°C (dBm) Minimum	Power Variation (dB) Maximum	Frequency Drift over Temperature (MHz) Maximum	Second Harmonic Below Carrier @ 25°C (dBc), Min.	Case Type
MILLIMETER BAND OSCILLATORS						PC6
AV-71826	18-26.5	+13	6	60	—	M5-60
AV-718226	18-26.5	+16	6	60	—	M5-60
AV-26040M	26.5-40	+10	6	60	—	M5-45
AV-26040W	26.5-40	+10	6	60	—	M5-45WR28
AV-26240M	26.5-40	+13	4	60	—	M5-60
AV-26240W	26.5-40	+13	4	60	—	M5-60WR28
AV-33050W	33-50	+7	6	60	—	M5-45WR22

Model Number	Frequency Range (GHz)	Power Output @ 25°C (dBm) Min.	Power Variation (dB) Max.	Frequency Drift over Temperature (MHz) Max.	Second Harmonic @ 25°C Below Carrier (dBc), Min.	Phase Noise dBc/Hz @ 20 kHz	Case Type
OCTAVE BAND OSCILLATORS WITH GUARANTEED PHASE NOISE							
AV-7443-8	4-8	+20	6	20	12	-95	C-45
AV-7872-8	8-12.4	+17.8	6	25	12	-80	M4-45
AV-71261-8	12-18	+19	6	40	12	-80	M3-60
MULTI-OCTAVE BAND OSCILLATORS WITH GUARANTEED PHASE NOISE							
AV-7236-8	2-6	+13	6	15	12	-105	A-45
AV-7238-8	2-8	+14.8	6	20	12	-95	C-45
AV-76018-8	6-18	+14.8	8	40	10	-75	M3-60
AV-78518-8	8-18	+17	6	40	12	-80	M3-60
LOW NOISE BIPOLAR OSCILLATORS							
AV-7298	2-8	+14.8	6	20	12	108	C-45
AV-12018	12-18	+16	6	40	20	100	M3-60
AV-76318	6-18	+16	6	40	10	100	M3-60
AV-78012	8-12.4	+17.8	6	25	12	105	M4-45
AV-78718	8-18	+16	6	40	15	100	M3-60

Model Number	Frequency Range (GHz)	Power Output @ 25°C (dBm) Min.	Power Variation (dB) Max.	Frequency Drift over Temperature (MHz) Max.	Second Harmonic @ 25°C Below Carrier (dBc), Min.	Case Type
OCTAVE BAND LOW HARMONIC OSCILLATORS						
AV-7104-9	1.0-2.2	+16	3	10	20	A-45
AV-7224-9	2-4	+20	3	10	20	C-45
AV-7403-9	4-8	+13	6	20	20	C-38
AV-7453-9	4-8	+16	6	20	20	C-38
AV-7443-9	4-8	+17.8	6	20	20	C-45
AV-7871-9	8-12.4	+14.8	6	25	20	M4-45
AV-7872-9	8-12.4	+17.8	6	20	20	M4-45
AV-7873-9	8-12.4	+20	6	25	20	M4-45
AV-71241-9	12-18	+13	6	40	20	M3-45
AV-71251-9	12-18	+14.8	6	40	20	M3-60
AV-71261-9	12-18	+17	6	40	20	M3-60
MULTI-OCTAVE BAND LOW HARMONIC OSCILLATORS						
AV-7238-9	2-8	+14.8	6	20	20	C-45
AV-78020-9	8-20	+13	8	40	20	M3-60

YIG-TUNED OSCILLATOR WITH TRACKING YIG FILTER, AV-7248

Guaranteed Specifications @ 0 to +65°C Case Temperature

PC6

Model	Frequency Range (GHz)	Power Output @ 25°C (dBm) Minimum	Power Output Variation (dB) Maximum	Frequency Drift over Temperature (MHz) Maximum	Second Harmonic @ 25°C Below Carrier (dBc), Min.	Case Type
AV-7248	2-8	+14.8	6	20	40	F1

Artisan Technology Group - Quality Instrumentation Guaranteed | (888) 88-SOURCE | www.artisantg.com

YIG TUNED OSCILLATORS, EXTENDED TEMPERATURE RANGE

Avantek AV Series YIG-tuned transistor fundamental oscillators (with extended temperature ranges) are extremely compact and lightweight, yet are designed and manufactured to offer excellent performance and high MTBF's over the -54° to +85°C temperature range. They meet the environmental conditions of MIL-E-5400 and MIL-E-16400.

This family of YTO's offers complete 1 to 18 GHz frequency coverage and they are ideal for systems requiring signal sources with moderate power levels, excellent tuning linearity, low spurious outputs and a flat power out vs. frequency characteristic

AV-7000 SERIES EXTENDED TEMPERATURE RANGE OSCILLATORS

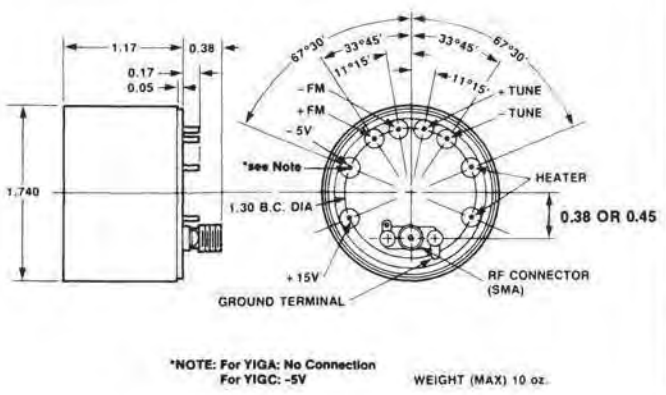
Guaranteed Specifications -54° to +85°C Case Temperature

PC6

Model	Frequency Range (GHz)	Power Output Over Temp. & Freq. (dBm) Minimum	Maximum	Frequency Drift over Temperature (MHz) Maximum	Second Harmonic Below Carrier (dBc), Min.	Case Type
NARROW BAND OSCILLATORS						
AV-7278-5	5.4-5.9	+16	+23	30	12	M4-45
AV-7278-6	5.9-6.5	+16	+23	30	12	M4-45
AV-77116-3	7.9-8.4	+17.8	+24	30	12	M4-45
AV-77116-4	8.5-9.6	+17.8	+24	30	12	M4-45
AV-77116-5	9.5-10.5	+17.8	+24	30	12	M4-45
AV-77116-6	14.0-14.5	+16	+23	40	20	M4-45
OCTAVE BAND OSCILLATORS						
AV-7214	2-4	+17	+23	20	12	M4-45
AV-7278-4	2.6-5.2	+16	+23	30	10	M4-45
AV-7413	4-8	+8	+20	40	12	M2-38
AV-7418	4-8	+14.8	+23	40	12	M4-45
AV-77111	7-11	+17	+24	40	12	M4-45
AV-7814	8-12.4	+13	+24	50	10	M3-60
AV-78112	8-12.4	+19	+24	40	12	M3-60
AV-72118	12-18	+16	+23	60	15	M3-60
MULTI-OCTAVE BAND OSCILLATORS						
AV-7114	1-4	+13	+21	20	12	M1-45
AV-7246	2-6	+16	+23	30	8	M4-45
AV-7218	2-8	+5	+17	40	5	M2-38
AV-7278	2-8	+14.8	+23	40	8	M4-45
AV-76118	6-18	+13	+23	60	8	M3-60
AV-77116	7-16	+16	+24	50	12	M4-45
AV-78418	8-18	+13	+24	70	10	M3-45
AV-78618	8-18	+16	+24	60	10	M3-60

CASE DRAWINGS

A, B and C

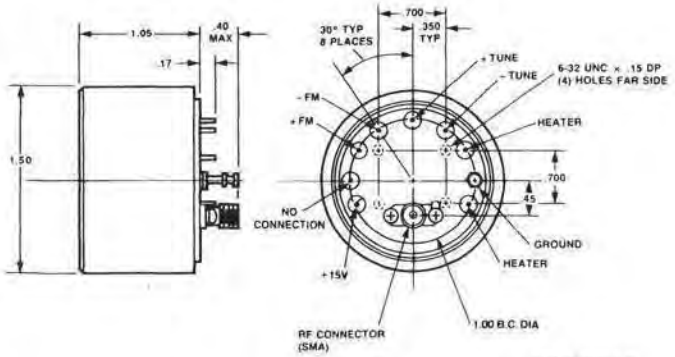


*NOTE: For YIGA: No Connection
For YIGC: -5V

WEIGHT (MAX) 10 oz.

Note: Electrical connections vary between models. See data sheet or Signal Sources Data Book for details.

M1-45

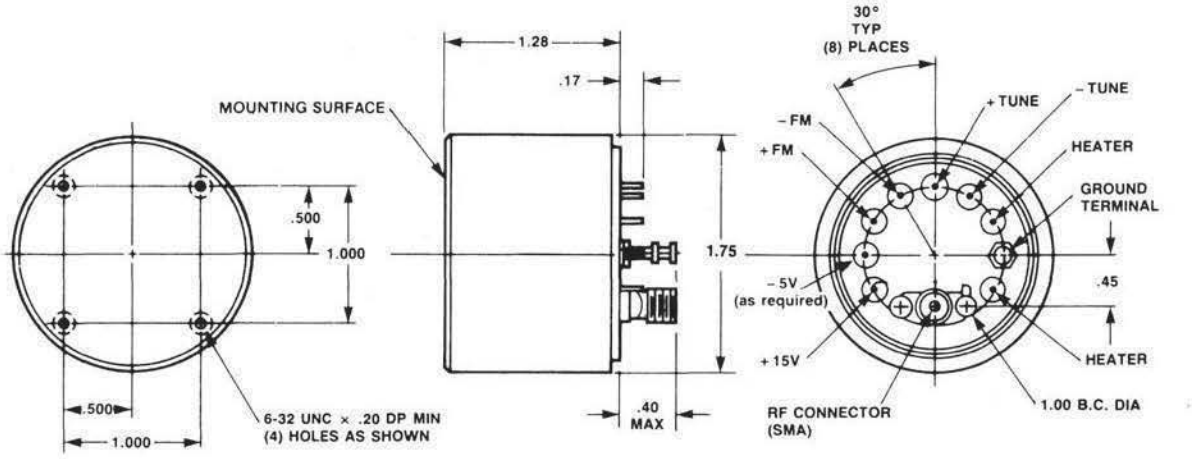


WEIGHT (MAX) 8 oz.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

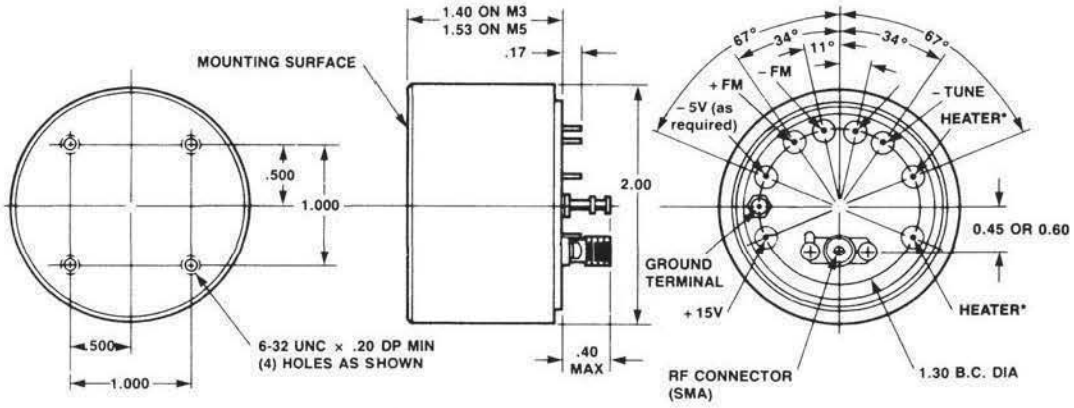
CASE DRAWINGS, continued

M4-45



WEIGHT (MAX) 12 oz.

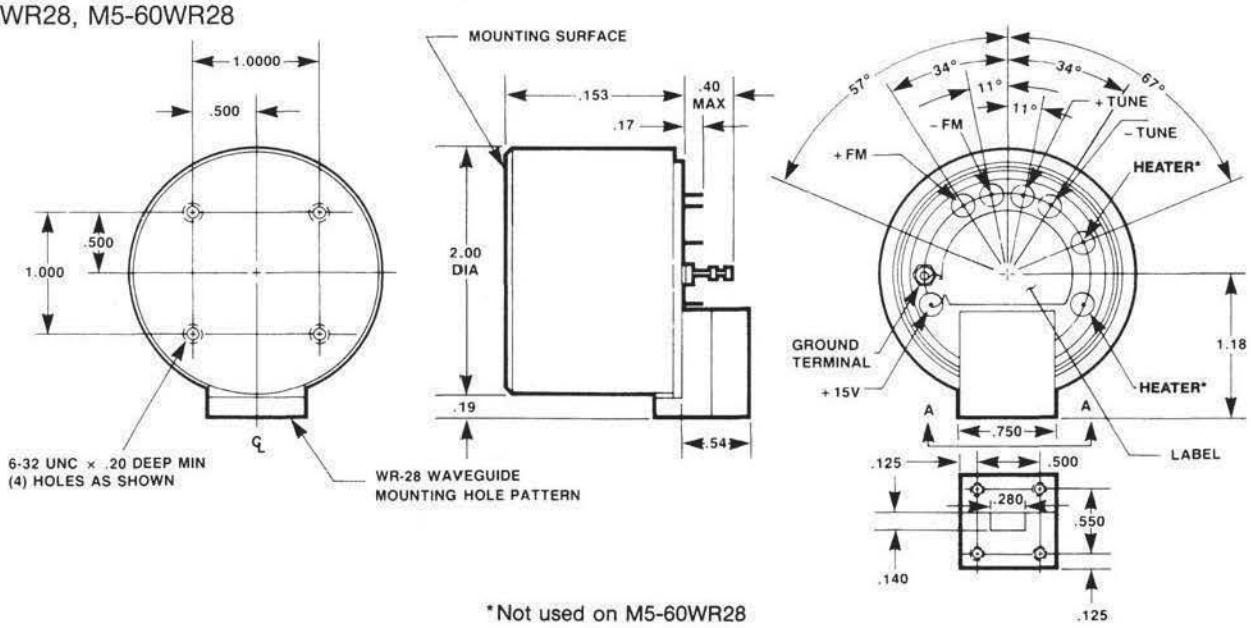
M3-45, M3-60, M5-45, M5-60



WEIGHT (MAX) 17 oz. (M3)
19 oz. (M5)

*Not used on M5-60

M5-45WR28, M5-60WR28

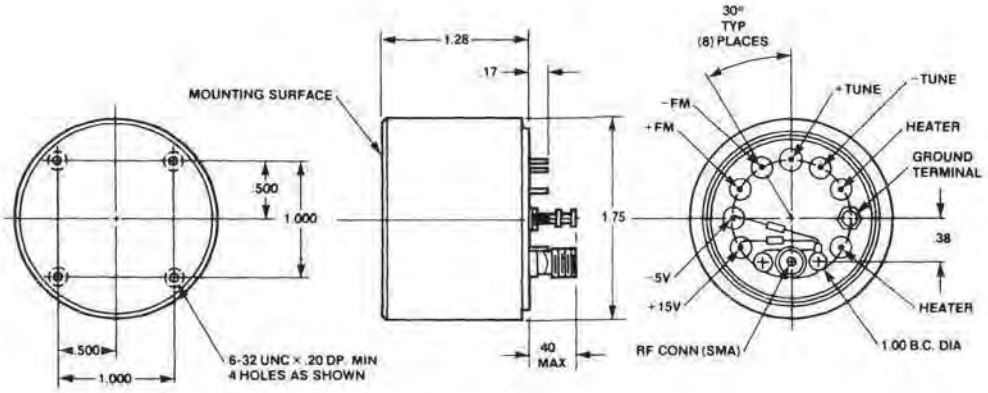


*Not used on M5-60WR28

Artisan Technology Group - Quality Instrumentation ..Guaranteed | (888) 88-SOURCE | www.artisantg.com

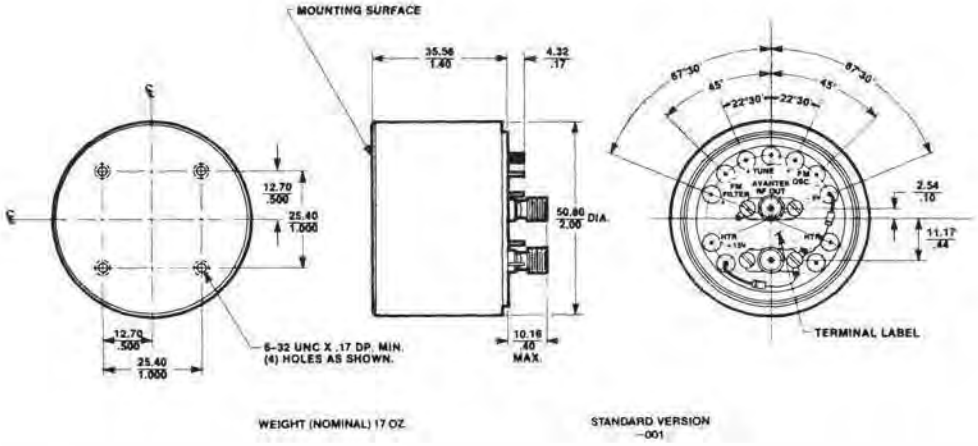
CASE DRAWINGS

M2



WEIGHT (NOMINAL) 12 OZ

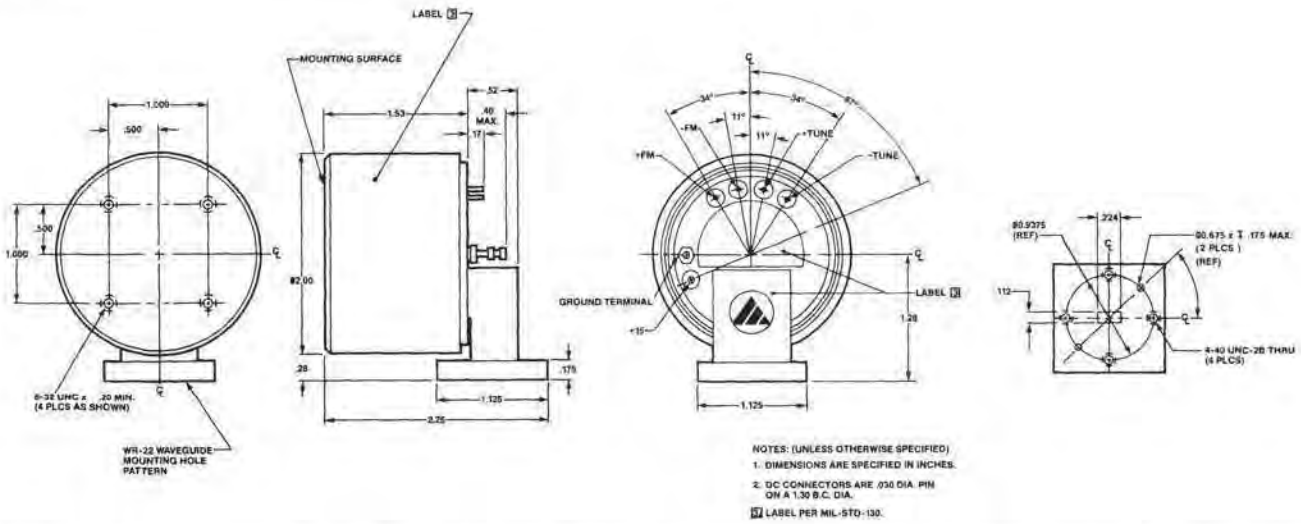
F1



WEIGHT (NOMINAL) 17 OZ

STANDARD VERSION
-001

M5-45WR22



NOTES: (UNLESS OTHERWISE SPECIFIED)
1. DIMENSIONS ARE SPECIFIED IN INCHES.
2. DC CONNECTORS ARE .030 DIA. PIN ON A 1.30 B.C. DIA.
[3] LABEL PER MIL-STD-130.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

HYPERABRUPT VARACTOR TUNED OSCILLATORS, EXTENDED TEMPERATURE RANGE

Avantek HTO Series hyperabrupt varactor-tuned fundamental oscillators combine a negative-resistance transistor oscillator with a buffer amplifier in a compact, hermetically-welded TO-8 or AvanPak package. The frequency of oscillation is determined by a hyperabrupt varactor diode acting as a voltage-variable capacitor in a thin-film microstripline resonant circuit. As with conventional (or abrupt) varactor-tuned oscillators, this design provides extremely high tuning rates, limited primarily by the internal impedance of the user-supplied tuning voltage source.

An integral buffer amplifier stage isolates the oscillator from variations in load impedance, minimizing frequency pulling while producing a full +10 dBm minimum output power level. This permits the HTO Series oscillator to be used without external amplifiers or isolators.

HTO SERIES

Guaranteed Specifications, -54° to +85° C Case Temperature

PC6

Model	Frequency Range (GHz)	Power Output Into 50 Ohms, Min. (dBm)	Power Output Variation Maximum (dB)	Tuning Voltage Limits +VDC Low Freq.	Tuning Voltage Limits +VDC High Freq.	Input Bias Power (1% Reg.) Voltage (VDC)	Input Bias Power (1% Reg.) Current (mA) Maximum	Harmonics Typical (dBc)	Case Type
HTO-0900	0.9-1.6	+10	±2.5	3+2; -1	16±2	+15	50	-8	TO-8V
HTO-1000	1.0-2.0	+10	±2.5	2±1	15+5; -2	+15	55	-7	TO-8V
HTO-2000	2.0-4.0	+10	±2.5	1+2; -0.7	14±4	+15	100	-12	TO-8V
HTO-2600	2.6-5.2	+10	±2.5	1+2; -0.7	14±4	+15	100	-12	TO-8V
HTO-4000	4.0-8.0	+10	±2.5	1+2; -0.5	14±4	+15	100	-12	TO-8V
HTO-7500	7.5-11.0	+10	±2.5	1+2; -0.5	14±4	+15	100	-15	TO-8V
HTO-8000	8.0-12.4	+10	±2.5	2.5±1.5	17±3	+10-+15	150	-20	OX-2
HTO-12000	12.4-18.0	+10	±2.5	2.5±1.5	17±3	+10-+15	150	-20	OX-2

CASE DRAWINGS—See page 86 for TO-8V

DTO 2500, DIGITALLY TUNED VARACTOR TUNED OSCILLATOR ASSEMBLY

Guaranteed Specifications @ -54° to +85° C Case Temperature

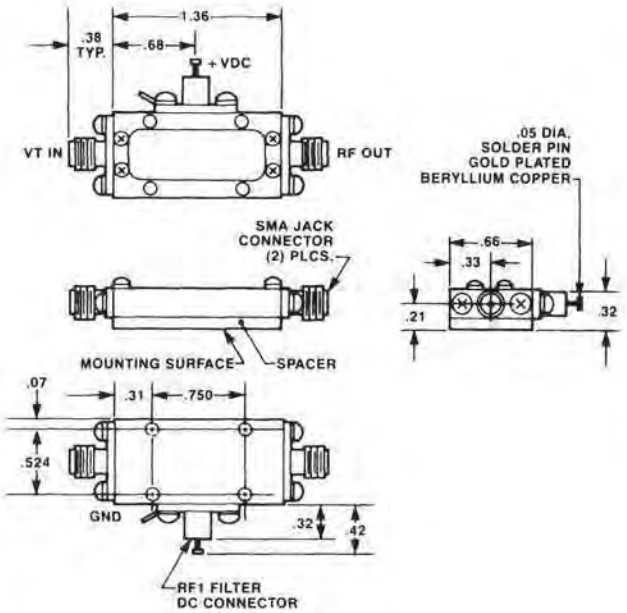
PC6

Model	Frequency Range[1] (GHz)	Frequency Crossover (MHz) Min.	Frequency Crossover (MHz) Max.	Power Output[2] (dBm) Min.	Power Output[2] (dBm) Max.	Linearity (MHz) Maximum	Harmonics (dBc) Minimum	Phase Noise 100 kHz from Carrier (dBc/Hz), Max.	Residual FM (kHz) Maximum	Settling Time[3] @ 2 μseconds (MHz)	Post Tuning Drift[4] (MHz) Max.	Case Type
DTO-2500	2.5-6.5	0	160	+7	+15	±80	15	-73	100	2	2	IN-800469

Notes 1: Unit utilizes three oscillators to cover the frequency range.
2: Unit provides dual output ports.
3: Measured at 1.0 millisecond from an input tuning command for a step from any inband frequency to any other inband frequency.
4: From 1.0 millisecond to 10 seconds.

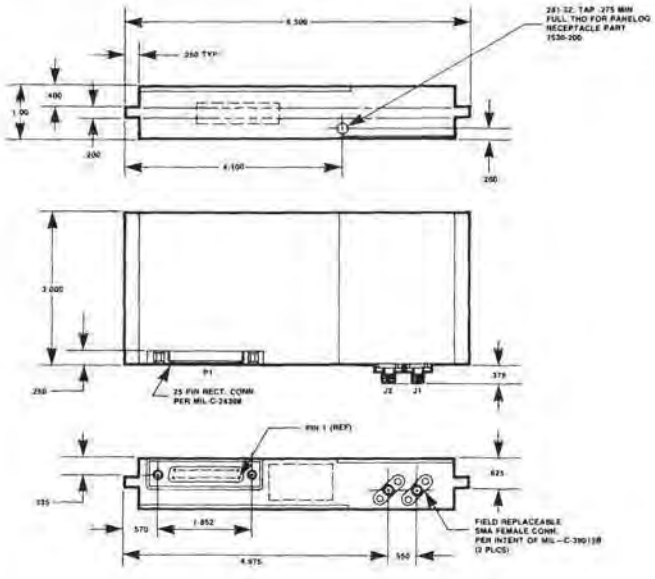
CASE DRAWINGS

OX 2



Note: Connectors are user removable for 50 ohm stripline use.

IN-800469



Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

LINEARIZED VCO ASSEMBLIES

The Avantek® VCA Series of assemblies are ideal for wideband applications requiring extended temperature ranges. The units incorporate hyperabrupt voltage controlled oscillators with linearization circuits, voltage regulators, amplifiers and heaters in one rugged package. Careful attention is paid in the integration process which yields excellent linearity, power flatness and residual FM characteristics under severe environments.

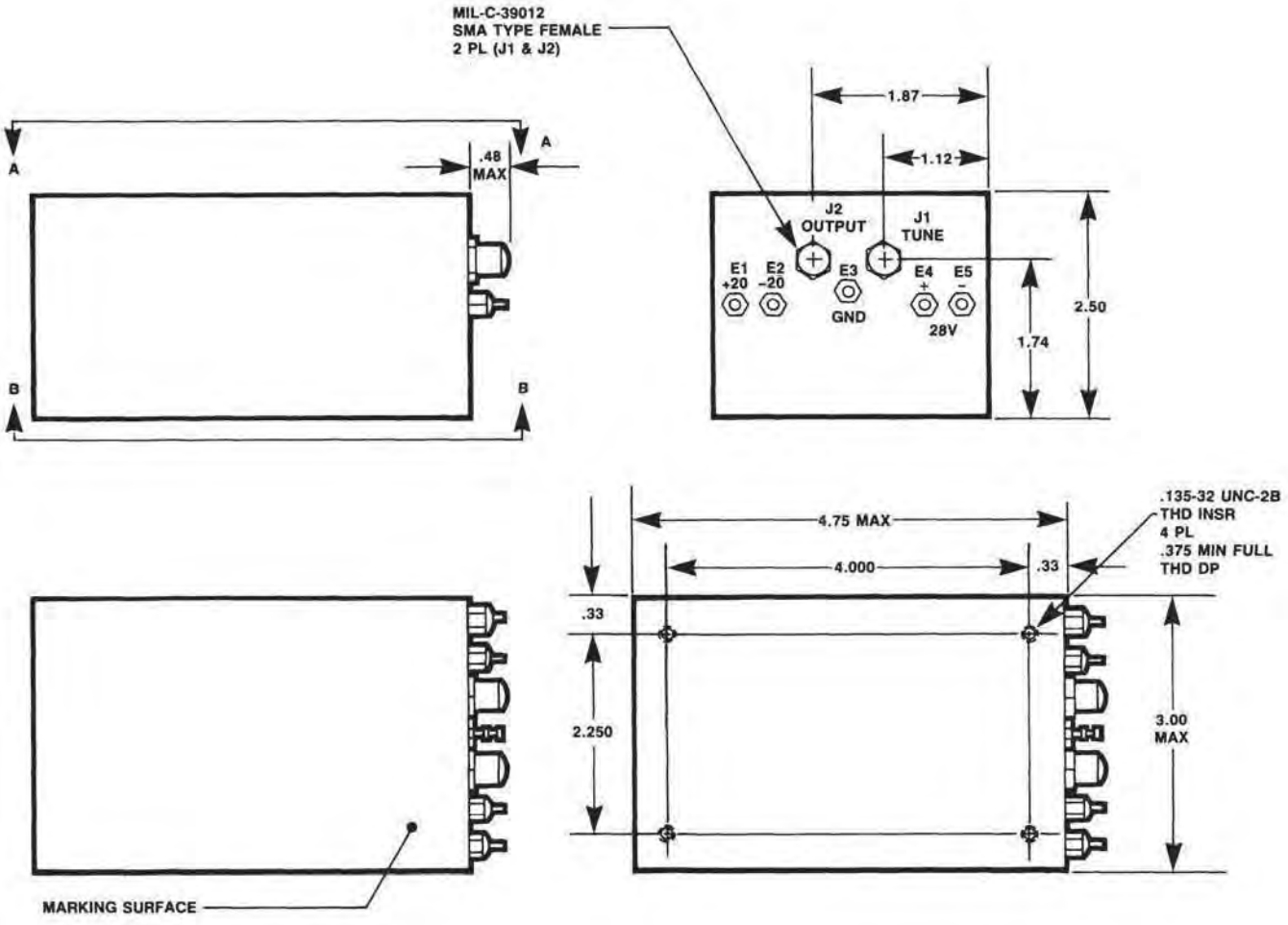
VCA SERIES

Guaranteed Specifications @ -54° to +85° C Case Temperature (Partial Listing) PC6

Model No.	VCA-0850	VCA-8000	VCA-12000
Frequency Range (GHz)	.85-1.45	8-12.4	12.4-18
Power Output (min.) @ 50Ω	+15 dBm	+13 dBm	+13 dBm
Power Flatness (max.) @ 50Ω	±2 dB	±2 dB	±2 dB
Harmonics (min.)	20 dBc	20 dBc	20 dBc
Spurious (min.)	60 dBc	60 dBc	60 dBc
Residual FM (PK-PK, max.)	25 kHz	150 kHz	150 kHz
Load VSWR	1.5:1	1.5:1	1.5:1
Linearity	±1.0%	±1.0%	±1.0%
Mod. Sense Ratio	1.8:1	2.0:1	2.0:1
Operating Temperature	-54° to +85° C	-54° to +85° C	-54° to +85° C
Tuning Voltage	0 to +10 V	0 to +10 V	0 to +10 V
Input Power	+20 V @ 600 mA -20 V @ 250 mA +28 V @ 4.0 A (heater)	+20 V @ 600 mA -20 V @ 250 mA +28 V @ 4.0 A (heater)	+20 V @ 600 mA -20 V @ 250 mA +28 V @ 4.0 A (heater)
Modulation Bandwidth (Full Power)	1 MHz	1 MHz	1 MHz
Case Type	IN-842177	IN-842177	IN-842177

CASE DRAWING

IN-842177



Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

YIG-TUNED OSCILLATORS WITH DIGITAL OR ANALOG DRIVERS

All Avantek YIG-tuned oscillators are now available with either digitally-tuned or analog voltage-tuned drivers. These drivers control the main tuning coil current via 12 bit digital logic or via an analog voltage, thus eliminating the need to build and align tuning current sources.

Both the digital and analog drivers are available in either commercial or extended temperature range versions. The commercial version, used with Avantek's commercial YIG-tuned devices, is specified over 0° C to +65° C, while the extended temperature range version will meet all of the environmental specifications of Avantek's militarized YIG-tuned devices, including operation over the -54° C to +85° C temperature range.

DRIVER SELECTION GUIDE

Guaranteed Specifications[1] at 25° C Case Temperature (Operating Temperature per Device) PC6

Specification	Analog Driver	Digital Driver
Tuning Range	0.000 volts at input corresponds to lowest frequency	All zeros at input coresonds to lowest frequency
	10.000 volts at input corresponds to highest frequency	All ones at input corresponds to highest frequency
Tuning Accuracy: at 25° C on baseplate, 1/2 hour after turn-on, excluding hysteresis and non-linearity	±(0.1% of frequency +2 MHz)	±(0.1% of frequency +2 MHz)
Resolution	NA	12 bit positive true logic for increasing frequency
Interface Logic	NA	TTL or CMOS
Tuning Input Resistance	≥10 Kohm	NA
Common Mode Rejection	≥40 dB	NA
Residual FM: (15 Hz-15 kHz bandwidth)	$4x10^{-6}$ of oscillator frequency in hertz +40 kHz, typ.	$4x10^{-6}$ of oscillator frequency in hertz +40 kHz, typ
Non-Linearity	Device specification applies	±(½ bit + device non-linearity)
Pushing: +15 Volts:	±(0.01% of frequency +1 MHz + oscillator pushing)/volt, typ.	±(0.001% of frequency +0.1 MHz + oscillator pushing)/volt, typ.
-15 Volts:	±(0.01% of frequency +1 MHz)/volt, typ.	±(0.001% of frequency +1 MHz)/volt, typ.
Power Supply Voltage:	±15 volts: ±5%	±15 volts: ±5%
Power Supply Current:		
+15 Volts:	Oscillator bias current + tuning current at max freq[2] +30 mA	Oscillator bias current + tuning current at max freq[2] +40 mA
-15 Volts:	(Current requirement of -5 volt of oscillator if present +30 mA)	(Current requirement of -5 volt of oscillator if present +40 mA)
Weight	Oscillator weight +12 oz.	Oscillator weight +13 oz.
Device Specifications That Do Not Apply	Main Tuning Coil Sensitivity	Main Tuning Coil Sensitivity
	Main Tuning Coil Input	Main Tuning Coil Input
	Impedance at 1 kHz	Impedance at 1 kHz
	Pushing Figure, -5 volts if used	Pushing Figure, -5 volts if used

Notes 1: These specifications are in addition to the standard specifications for the basic YIG device to which the driver is coupled except as noted.

2: Tuning current at max freq is: $\frac{\text{Max freq (MHz)}}{\text{Sensitivity (MHz/mA)}}$ = Max current (mA)

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

YIG-TUNED OSCILLATORS WITH DRIVERS

Guaranteed Specifications at 25° C Case Temperature (Operating Temperature per Device) PC6

Model Number	Frequency (GHz)	Power Supply Current (mA), Max. +15 V	Power Supply Current (mA), Max. -15 V	Residual FM (kHz, p-p) Typical	YTO Model	Case Type
COMMERCIAL OSCILLATORS WITH ANALOG DRIVERS (Partial Listing)						
AVD-7104	1-2.2	300	30	50	AV-7104	AD 1
AVD-7224	2-4	400	100	60	AV-7224	AD 1
AVD-7236	2-6	500	30	70	AV-7236	AD 1
AVD-7238	2-8	625	125	75	AV-7238	AD 1
AVD-7453	4-8	600	100	75	AV-7453	AD 1
AVD-74010	4-10	725	100	80	AV-74010	AD 1
AVD-7873	8-12.4	900	30	90	AV-7873	AD 2
AVD-78218	8-18	1200	30	120	AV-78218	AD 2
AVD-71261	12-18	1225	30	120	AV-71261	AD 2
AVD-71826	18-26.5	1075	30	150	AV-71826	AD 2
COMMERCIAL OSCILLATORS WITH DIGITAL DRIVERS (Partial Listing)						
ADD-7104	1-2.2	300	40	50	AV-7104	DD 1
ADD-7224	2-4	400	100	60	AV-7224	DD 1
ADD-7236	2-6	525	40	70	AV-7236	DD 1
ADD-7238	2-8	650	125	75	AV-7238	DD 1
ADD-7453	4-8	600	100	75	AV-7453	DD 1
ADD-74010	4-10	750	100	80	AV-74010	DD 1
ADD-7873	8-12.4	925	40	90	AV-7873	DD 2
ADD-78218	8-18	1225	40	120	AV-78218	DD 2
ADD-71261	12-18	1250	40	120	AV-71261	DD 2
ADD-71826	18-26.5	1100	40	150	AV-71826	DD 2
MILITARY OSCILLATORS WITH ANALOG DRIVERS (Partial Listing)						
AVD-7214	2-4	400	100	60	AV-7214	AD 2
AVD-7218	2-8	700	100	75	AV-7218	AD 2
AVD-7413	4-8	700	100	75	AV-7413	AD 2
AVD-7814	8-12.4	900	40	90	AV-7814	AD 2
AVD-78418	8-18	1225	40	120	AV-78418	AD 2
AVD-71214	12-18	1225	40	120	AV-71214	AD 2
MILITARY OSCILLATORS WITH DIGITAL DRIVERS (Partial Listing)						
ADD-7214	2-4	400	125	60	AV-7214	DD 2
ADD-7218	2-8	725	125	75	AV-7218	DD 2
ADD-7413	4-8	725	125	75	AV-7413	DD 2
ADD-7814	8-12.4	925	50	90	AV-7814	DD 2
ADD-78418	8-18	1225	50	120	AV-78418	DD 2
ADD-71214	12-18	1225	50	120	AV-71214	DD 2

Notes 1: All *other* specifications are the same as the YTO model

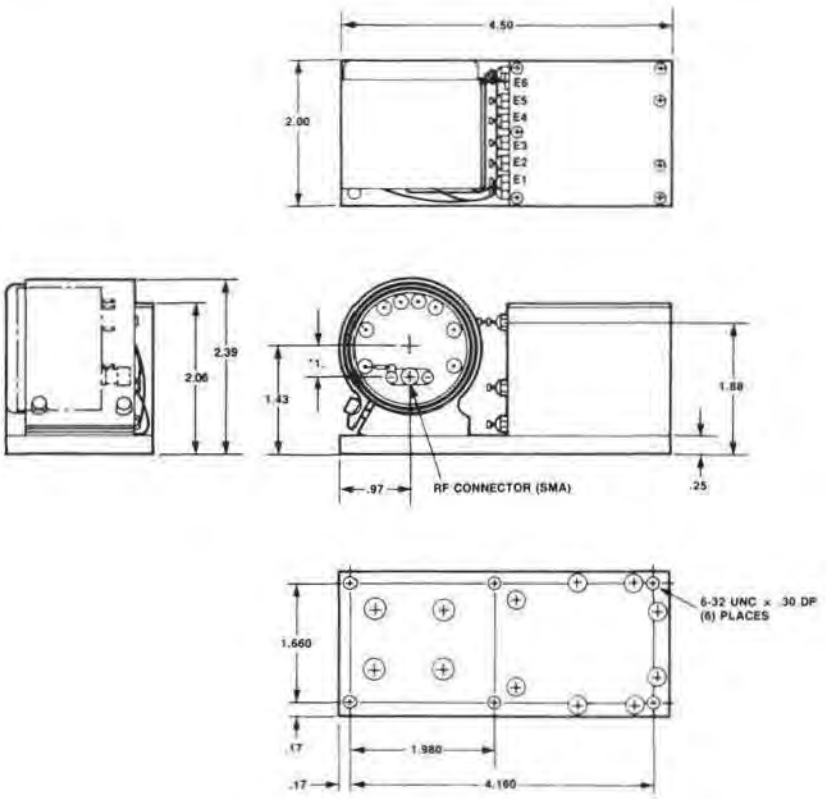
2: The following specifications are typical for all AVD units:
   a) Input Tuning Voltage (VDC): 0 to 10
   b) Power Supply Voltage Sensitivity (MHz/V): 0.5 typical up to 8 GHz, 1 typical up to 18 GHz
   c) CMRR (dB): 40 typical

3: Frequency drift with temperature of the YTO/Driver Assembly will be no greater than that specified for the YTO model alone. For applications requiring lower drift with temperature, contact factory.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

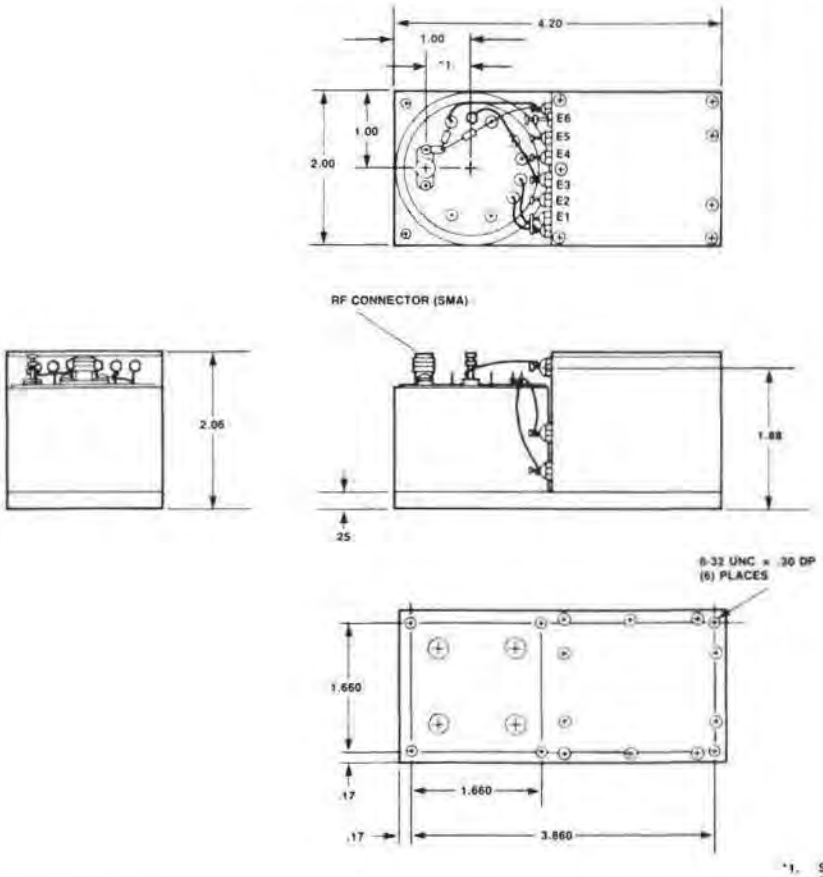
CASE DRAWINGS

AD 1



*1. SEE INDIVIDUAL OSC. DRAWING FOR DIMENSION

AD 2

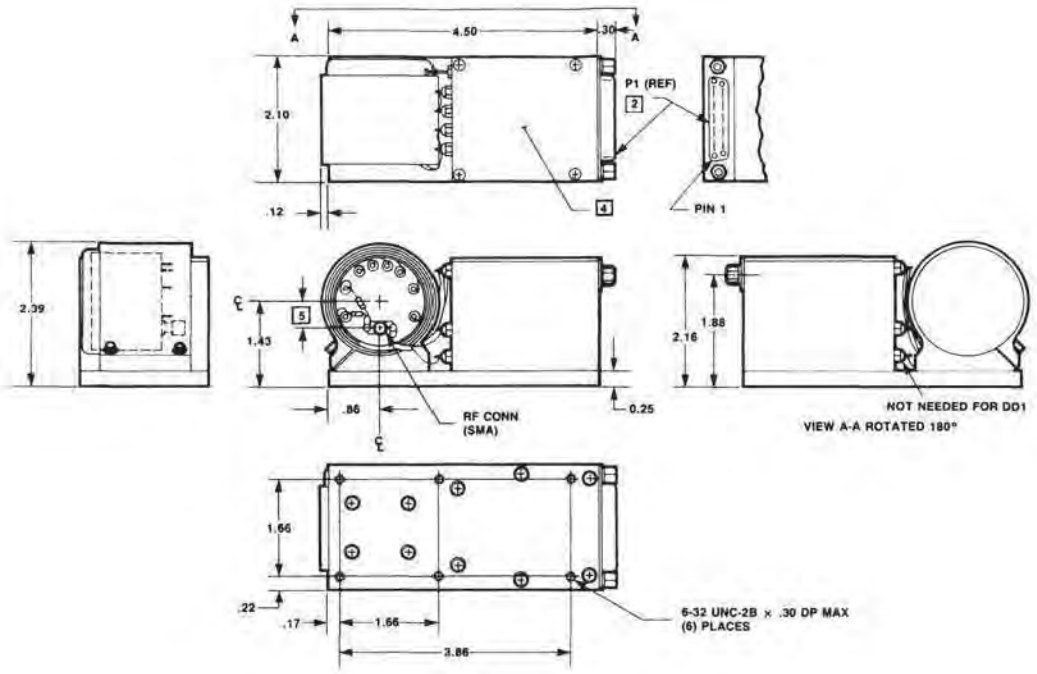


*1. SEE INDIVIDUAL OSC. DRAWING FOR DIMENSION

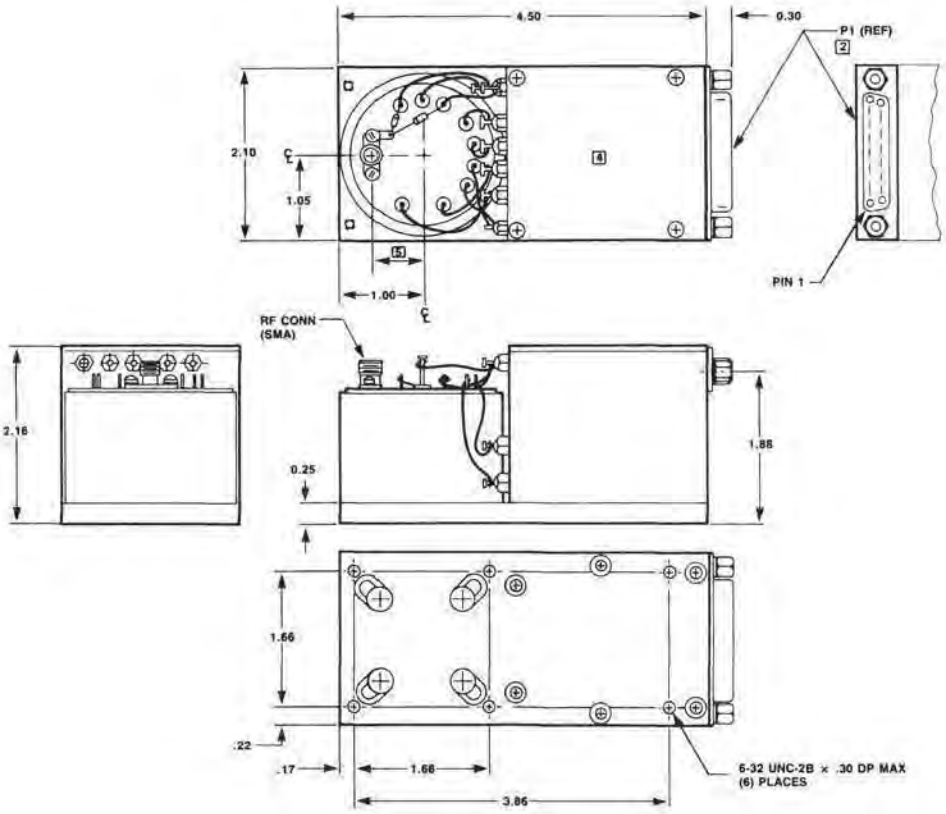
Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

CASE DRAWINGS

DD 1



DD 2



Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

LIMITED FREQUENCY RANGE VARACTOR-TUNED OSCILLATORS

COMMERCIAL VARACTOR TUNED OSCILLATORS

Avantek VTO-8000 Series oscillators use a silicon transistor chip as a negative resistance oscillator. The oscillation frequency is determined by a varactor diode acting as a voltage-variable capacitor in a thin-film microstripline resonator. This provides extremely fast tuning speed, limited primarily by the internal impedance of the user-supplied voltage driver.

A typical oscillator can be swept across its frequency band in less than one microsecond.

The VTO-8000 Series varactor-tuned oscillators are packaged in TO-8 transistor cans for simple installation in a conventional 50-Ohm microstripline PC board. They are ideal for the most compact, lightweight commercial and military equipment designs.

VTO-8000 SERIES

Guaranteed Specifications at 25° C Case Temperature (0 to 65° C Operating Temperature) PC6

Model	Frequency Range (GHz)	Power Output Into 50 Ohms, Min. (dBm)	Power Output Variation Maximum (dB)	Tuning Voltage Limits (at each end of specified freq. range) +VDC @ Low Freq.	Tuning Voltage Limits (at each end of specified freq. range) +VDC @ High Freq.	Input Power (±1% Reg.) Voltage (VDC)	Input Power (±1% Reg.) Current (mA) Maximum	All Harmonics Typical (dBc)	Case Type
VTO-8030	0.3-0.45	+10	±1.5	5±4	50±10	+15	50	-15	TO-8V
VTO-8040	0.4-0.6	+13	±1.5	3±1	40±8	+15	50	-15	TO-8V
VTO-8060	0.6-1.0	+13	±1.5	3±1	40±8	+15	50	-15	TO-8V
VTO-8080	0.8-1.4	+13	±1.5	2±1.5	35±10	+15	50	-15	TO-8V
VTO-8090	0.9-1.6	+13	±1.5	2±1	48+8; -10	+15	50	-15	TO-8V
VTO-8100	1.0-1.4	+10	±1.5	2±1	48±8	+15	50	-15	TO-8V
VTO-8150	1.5-2.5	+10	±1.5	2.5±1	47±8	+15	50	-18	TO-8V
VTO-8200	2.0-3.0	+10	±1.5	2+2, -1	30±8	+15	50	-18	TO-8V
VTO-8240	2.4-3.7	+10	±1.5	2+2; -1	30±8	+15	50	-18	TO-8V
VTO-8300	3.0-3.5	+10	±1.5	3.5 min.	11 max.	+15	50	-18	TO-8V
VTO-8350	3.5-4.5	+10	±1.5	5 min.	35 max.	+15	50	-20	TO-8V
VTO-8360	3.6-4.3	+10	±1.5	8±2	24±4	+15	50	-25	TO-8V
VTO-8400	4.0-4.5	+10	±1.5	2 min.	14 max.	+15	50	-25	TO-8V
VTO-8420	4.2-5.0	+10	±1.5	7.5±2.5	25+2.5; -4	+15	50	-25	TO-8V
VTO-8430	4.3-5.8	+10	±1.5	5.5±2	24+3	+15	50	-25	TO-8V
VTO-8490	4.9-5.9	+10	±1.5	5.5±2	24+3; -4	+15	50	-25	TO-8V
VTO-8520	5.2-6.1	+10	±1.5	5.5±2	24±3	+15	50	-25	TO-8V
VTO-8540	5.4-5.9	+10	±1.5	8 min.	28 max.	+15	50	-15	TO-8V
VTO-8580	5.8-6.6	+7	±1.5	5±2.5	24+3; -5	+15	50	-25	TO-8V
VTO-8650	6.5-8.6	+10	±1.5	2±1	20±5	+15	100	-20	TO-8V
VTO-8790	7.9-10.1	+10	±2	3±2	26±4	+15	150	-10	TO-8V
VTO-8810	8.1-9.1	+10	±2	2 min.	16 max.	+15	100	-15	TO-8V
VTO-8850	8.5-9.6	+10	±1.5	5±2	13±5	+15	100	-25	TO-8V
VTO-8950	9.5-10.5	+10	±1.5	4±1	10 max.	+15	100	-20	TO-8V
VTO-81000	10.0-10.25	+10	±1.5	0 min.	15 max.	+15	100	-15	TO-8V

COMMERCIAL HYPERABRUPT VARACTOR TUNED OSCILLATORS

This family of oscillators is similar to the standard commercial VTO-8000 Series except for the incorporation of a silicon hyperabrupt varactor tuning diode. This enables the oscillator to be tuned over the specified range in less than 20 volts rather than 40-50 volts in conventional oscillators. They feature extremely fast tuning speed, limited primarily by the internal impedance of the user-supplied voltage driver.

VTO-9000 SERIES

Guaranteed Specifications at 25° C Case Temperature (0° to 65° C Operating Temperature) PC6

Model	Frequency Range (GHz)	Power Output Into 50 Ohms, Min. (dBm)	Power Output Variation Maximum (dB)	Tuning Voltage Limits (at each end of specified freq. range) +VDC @ Low Freq.	Tuning Voltage Limits (at each end of specified freq. range) +VDC @ High Freq.	Input Power (±1% Reg.) Voltage (VDC)	Input Power (±1% Reg.) Current (mA) Maximum	All Harmonics Typical (dBc)	Case Type
VTO-9032	0.32-0.64	+10	±2	0 min.	+20 max.	+15	50	-14	TO-8V
VTO-9050	0.5-0.9	+10	±2	0 min.	+20 max.	+15	50	-10	TO-8V
VTO-9068	0.68-1.36	+10	±2	0 min.	+20 max.	+15	50	-14	TO-8V
VTO-9090	0.9-1.6	+10	±2	+2 min.	+18 max.	+15	50	-14	TO-8V
VTO-9120	1.2-2.0	+10	±2	+2 min.	+14 max.	+15	50	-14	TO-8V
VTO-9130	1.3-2.3	+10	±1.5	+2 min.	+20 max.	+15	50	-15	TO-8V
VTO-9140	1.4-2.1	+10	±1.5	+4±2	+10±2	+15	50	-15	TO-8V

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

VARACTOR TUNED OSCILLATORS, EXTENDED TEMPERATURE RANGE

Avantek MTO-8000 Series oscillators are extended temperature range versions of the widely used VTO-8000 Series commercial varactor-tuned oscillators. They are designed, manufactured, tested and guaranteed to perform over the temperature range of -54° to +85° C. For applications demanding even higher reliability, screened units ("R" series) are also available.

The MTO-8000 Series varactor-tuned oscillators are packaged in TO-8 transistor cans for simple installation in a conventional 50-Ohm microstripline PC board. They are ideal for the most compact, lightweight, commercial and military equipment designs.

MTO-8000 SERIES

Guaranteed Specifications, -54° to +85° C Case Temperature

PC6

Model	Frequency Range (MHz)	Power Output Into 50 Ohms, Min. (dBm)	Power Output Variation Maximum (dB)	Tuning Voltage Limits (at each end of specified freq. range): +VDC @ Low Freq.	Tuning Voltage Limits (at each end of specified freq. range): +VDC @ High Freq.	Input Bias Power (±1% Reg.) Voltage (VDC)	Input Bias Power (±1% Reg.) Current (mA) Maximum	All Harmonics Typical (dBc)	Case Type
MTO-8040	400-600	+10	±2.5	3.5±1.5	38±8	+15	50	-10	TO-8V
MTO-8060	600-900	+10	±2.5	3±1	26+10; -8	+15	50	-12	TO-8V
MTO-8090	900-1500	+10	±2.5	2±1	30+10; -8	+15	50	-11	TO-8V
MTO-8240	2400-3700	+10	±2.0	2+2; -1	30±8	+15	50	-10	TO-8V
MTO-8360	3600-4300	+10	±2.0	8±2	24±4	+15	50	-22	TO-8V
MTO-8650	6500-8600	+10	±2.0	2±1	20±4	+15	100	-18	TO-8V
MTO-8950	9500-10500	+10	±2.5	4±1.5	10 max	+15	100	-20	TO-8V

CASE DRAWING—See page 85 for TO-8V.
CASE DRAWING—See page 85 for VTD.

BUFFERED VARACTOR TUNED OSCILLATORS

The VTD Series varactor-tuned oscillators with integral buffer amplifiers are packaged in a hermetic dual-in-line package 0.97 by 0.498 by 0.2 in., weighing less than 0.2 oz. The oscillator and buffer stages are fabricated on precision-finished alumina substrates using advanced thin-film technology and Avantek silicon transistor chips.

Internal buffering isolates the oscillator from variations in load impedance, minimizes frequency pulling while producing +13 dBm of output power. This permits the VTD to be used without external buffer amplifiers or wideband isolators. In addition, the combination of a lightly-loaded oscillator and a matched buffer provides clean output signal with low harmonic content and a minimum of spurious signals.

The small size and mass of the VTD permits them to be maintained at their optimum operating temperature with a small, low power heater. This isolates the oscillator from variations in ambient temperature—minimizing frequency drift.

These units have the frequency agility, fast settling times and dependability required for ECM systems and can be qualified to MIL specifications. They are also ideal for many civilian applications including instrumentation, phase-locked local oscillators in receivers, and other communications equipment.

VTD SERIES

Guaranteed Specifications at 80° C ±5° C Case Temperature

PC6

Model	Frequency Range (GHz)	Power Output (dBm) Minimum	Output Power Variation (±dB) Maximum	Tuning Voltage Limits +VDC @ Low Freq.	Tuning Voltage Limits +VDC @ High Freq.	Pushing Figure (MHz/V) Typical	Pulling Figure (3:1 VSWR) all phases) (MHz) Maximum	All Harmonics (dBc) Maximum	Input Power (+1% regulation) Voltage (VDC)	Input Power (+1% regulation) Current (mA) Maximum	Case Type
VTD-600	0.6-1.0	+13	1.5	3.0±1.0	40±8	6	2	-20	+12	125	VTD
VTD-2000	2.0-2.8	+13	2.0	4.5±1.5	25±3	6	2	-20	+12	125	VTD
VTD-2800	2.8-3.8	+13	2.0	4.5±1.5	25±3	6	2	-20	+12	125	VTD
VTD-3800	3.8-4.9	+13	2.0	4.5±1.5	25±3	10	3	-20	+12	125	VTD
VTD-4900	4.9-6.1	+13	2.0	4.5±1.5	25±3	10	5	-20	+12	125	VTD

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

LOW NOISE VARACTOR-TUNED OSCILLATOR

The Avantek® LNO-550 varactor-tuned oscillator has been designed specifically for low noise applications. The oscillator uses a silicon transistor chip along with a silicon abrupt tuning varactor in a thin-film microstrip circuit. This design provides extremely good noise performance under acoustic and vibration environments.

The LNO-550 is packaged in a hermetic TO-8 transistor can for simple installation in conventional 50-ohm microstripline PC boards. It is ideal for compact, lightweight military and commercial equipment designs.

LNO-550

Guaranteed Specifications @ -54° to +85° C Case Temperature PC6

Model	Frequency Range (MHz) Minimum	Power Output (dBm) Minimum	Power Output Variation (dB) Maximum	Drift (MHz) Maximum	Second Harmonics (dBc) Minimum	Tuning Voltage (VDC)	Phase Noise 50 kHz from Carrier (dBc/Hz), Max.	Input Current @ +12 VDC (mA), Nom.	Case Type
LNO-550	550-775	+10	±2.5	20	-10	+2.5±1 to +17±3	-110	50	TO-8V

CASE DRAWINGS— See page 85 for TO-8V.

LOW NOISE VCO WITH TWO TUNING PORTS

The Avantek® LNO-8000 varactor tuned oscillator is specifically designed for low noise performance in the X-Band frequency range. It features a separate fine tuning port which is ideal for phase lock applications. The oscillator utilizes a silicon transistor chip along with two silicon abrupt diodes in a thin-film microstrip circuit.

This type of oscillator has comparable noise performance to Gunn oscillators currently in use with significant savings in input power consumption. The LNO-8000 is packaged in a hermetic low profile Avanpak™ case and is available with or without RF connectors. It is well suited for military or commercial equipment where size, weight or noise performance is critical.

LNO-8000, LOW NOISE VCO with TWO TUNING PORTS

Guaranteed Specifications at -54° to +85° C Case Temperature PC6

Frequency Range, Minimum	7.8-8.5 GHz
Output Power, Minimum	+10 dBm
Power Variation, Maximum	±2.5 dB
Drift, Maximum	150 MHz
Pulling @ 25° C, Maximum (12 dB Return Loss)	8 MHz
2nd Harmonics, Minimum	-15 dBc
Course Tuning Voltage	-2 to -20 VDC
Maximum Tuning Voltage	-25 VDC
Fine Tuning Voltage	+10±0.5 VDC
Course Tuning Modulation Sensitivity, Maximum	125 MHz/V
Fine Tuning Modulation Sensitivity @ 25° C, Maximum	4.5 to 6.5 MHz/V
Phase Noise	
10 kHz from Carrier, Typical	-72 dBc/Hz
100 kHz from Carrier, Maximum	-98 dBc/Hz
Typical	-100 dBc/Hz
1 MHz from Carrier, Typical	-128 dBc/Hz
Power Input	
+15 VDC, Nominal	100 mA
-15 VDC, Nominal	50 mA
Installation Drawing Number	IN-029186

Artisan Technology Group - Quality Instrumentation Guaranteed | (888) 88-SOURCE | www.artisantg.com

TVRO VARACTOR TUNED OSCILLATOR

The Avantek SO80-1506 varactor-tuned transistor oscillator is specifically designed to offer performance, reliability and economy as a voltage variable or phase-locked local oscillator in satellite earth station (TVRO) receivers. Covering the 3.6-4.2 GHz frequency band, the SO80-1506 may be used as a low-side LO for IFs in the 50 to 100 MHz range.

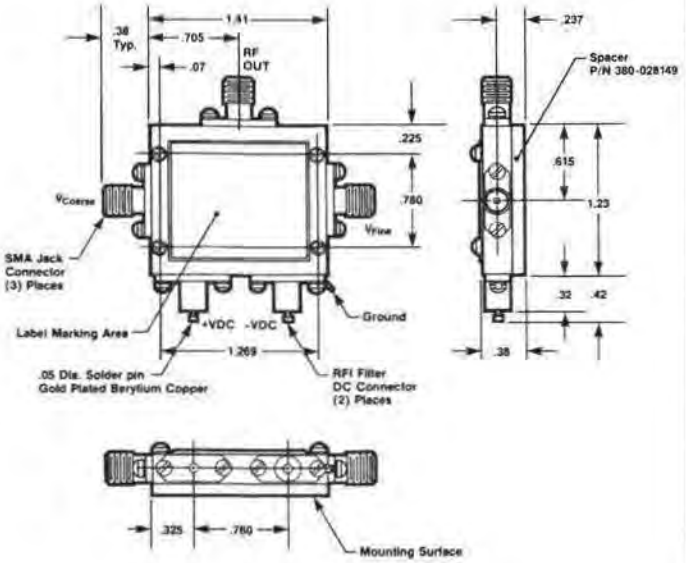
SO80-1506

Guaranteed Performance at 25° C Case Temperature PC6

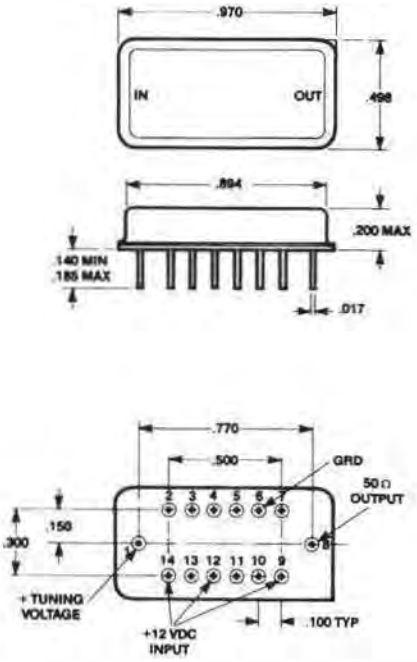
Model	Frequency Range (GHz) Min.	Power Output (dBm) Minimum	Power Output Variation (dBm) Maximum	Tuning Voltage (VDC) @ 3.63 GHz	Tuning Voltage (VDC) @ 4.13 GHz	Input Current @ +15 DVC ±1% (mA) Maximum	Case Type
SO80-1506	3.63-4.13	+7	±1.5	1-4	5.5-13	50	TO-8V

CASE DRAWINGS

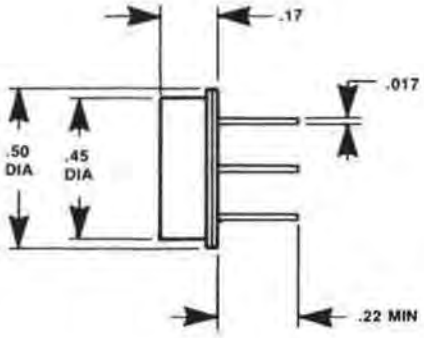
IN-029186

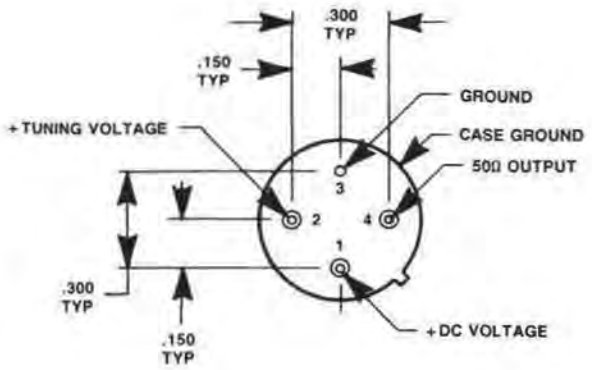


VTD PACKAGE



TO-8V





Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

DIELECTRICALLY STABILIZED OSCILLATORS

The DSO series of dielectrically stabilized oscillators use high-Q dielectric resonators which produce highly stable low noise oscillators that operate over wide temperature ranges and in severe environmental conditions. They use much less power and have far fewer components than crystal oscillators. Their high Q provides good noise performance and they are less susceptible to vibration than cavity stabilized VCOs. Oscillator-to-load coupling is minimized by an internal buffer amplifier resulting in higher Q and minimum frequency pulling due to load variations. All Avantek DSOs are housed in hermetically sealed packages with or without SMA connectors.

DSO 1000 SERIES FIXED TUNED DSOs

Guaranteed Specifications at -54° to +85°C Case Temperature (Partial Listing)[1]

PC6

Model	Fixed Frequency (GHz)[1]	Temperature Stability (PPM/°C), Max.	Power Output Into 50 Ohms (dBm), Min.	Input Bias Power (±1% Reg.) Voltage (VDC)	Input Bias Power (±1% Reg.) Current (mA) Maximum	Case Type[2]
DSO-1030	3.0	3	+10	+15	75	OD-40
DSO-1045	4.5	3	+10	+15	75	OD-50
DSO-1075	7.5	3	+10	+15	75	OD-20
DSO-1120	12.0	3	+10	+15	75	OD-10
DSO-1150	15.0	3	+10	+15	75	OD-10
DSO-1180	18.0	3	+10	+15	75	OD-10
DSO-1265	26.5	3	+7	+15	75	OD-10
DSO-1400	40.0	3	+7	+15	75	OD-70

Notes 1: The factory can set the frequency of these oscillators to any user specified frequency within the frequency range of 3.0 to 40.0 GHz.
2: Available in a connectorless package.

DSO 2000 SERIES MECHANICALLY TUNED DSOs

Guaranteed Specifications at -54° to +85°C Case Temperature (Partial Listing)[1]

Model	Fixed Frequency (GHz)[1]	Temperature Stability (PPM/°C), Max.	Power Output Into 50 Ohms (dBm), Min.	Mechanical Tuning Range (MHz), Min.	Input Bias Power (±1% Reg.) Voltage (VDC)	Input Bias Power (±1% Reg.) Current (mA) Maximum	Case Type[2]
DSO-2030	3.0	5	+10	±10	+15	75	OD-42
DSO-2045	4.5	5	+10	±10	+15	75	OD-52
DSO-2075	7.5	5	+10	±25	+15	75	OD-22
DSO-2120	12.0	5	+10	±25	+15	75	OD-12
DSO-2180	18.0	5	+10	±25	+15	75	OD-12
DSO-2265	26.5	5	+7	±25	+15	100	OD-12

Notes 1: The factory can supply mechanically tuned DSOs at any frequency between 3.0 and 26.5 GHz.
2: Available in a connectorless package.

DSO 3000 SERIES ELECTRONICALLY TUNED DSOs

Guaranteed Specifications at -54° to +85°C Case Temperature (Partial Listing)[1]

Model	Fixed Frequency (GHz)	Temperature Stability (PPM/°C), Max.	Power Output Into 50 Ohms (dBm), Min.	Electronic Tuning Range (MHz), Min.[2]	Input Bias Power (±1% Reg.) Voltage (VDC)	Input Bias Power (±1% Reg.) Current (mA) Maximum	Case Type[3]
DSO-3030	3.0	5	+10	0.1%	+15	100	OD-41
DSO-3045	4.5	5	+10	0.1%	+15	100	OD-51
DSO-3075	7.5	5	+10	0.1%	+15	100	OD-21
DSO-3120	12.0	5	+10	0.1%	+15	100	OD-11
DSO-3180	18.0	5	+10	0.1%	+15	100	OD-11

Notes 1: The factory can supply electronically tuned DSO's at any frequency between 3.0 and 18.0 GHz.
2: Electronic tuning with a 0 to 20 volt input.
3: Also available in connectorless packages.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

DSO-4000 SERIES ELECTRONICALLY AND MECHANICALLY TUNED DSOs

Guaranteed Specifications at –54° to +85° C Case Temperature (Partial Listing)[1]

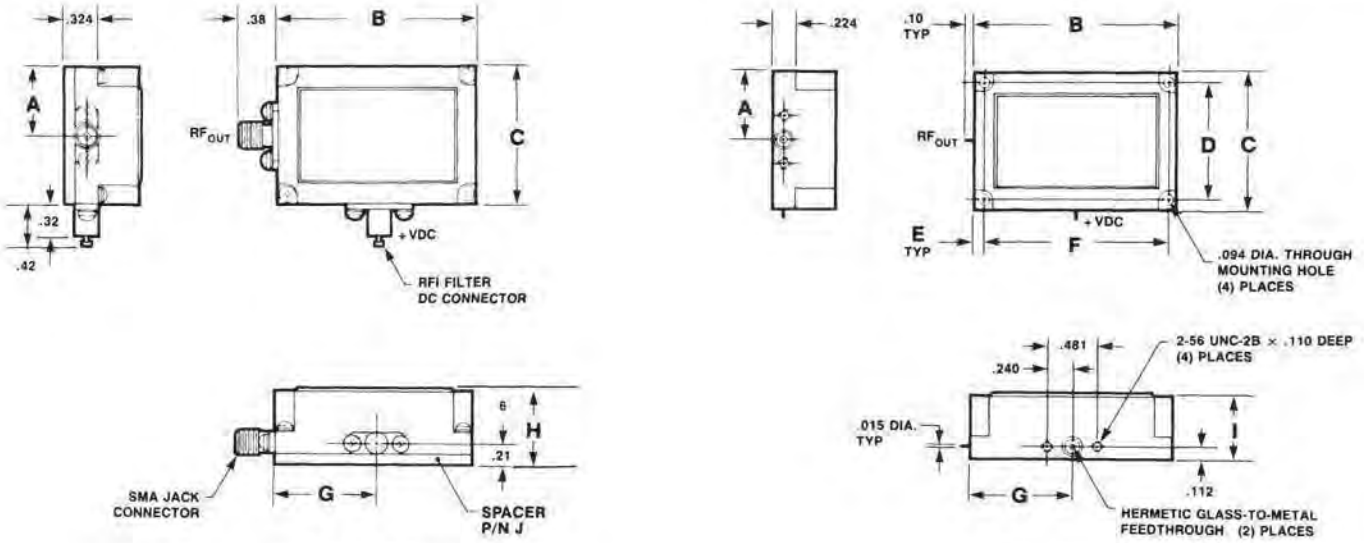
Model	Center Frequency (GHz)[1]	Temperature Stability (PPM/°C), Max.	Power Output Into 50 ohms (dBm), Min.	Mechanical Tuning Range (MHz), Min.	Electronic Tuning Range Min.[2]	Input Bias Power (±1% Reg.) Voltage (VDC)	Input Bias Power (±1% Reg.) Current (mA) Max.	Case Type
DSO-4030	3.0	5	+10	±10	0.1%	+15	100	OD-44
DSO-4045	4.5	5	+10	±10	0.1%	+15	100	OD-54
DSO-4075	7.5	5	+10	±25	0.1%	+15	100	OD-24
DSO-4120	12.0	5	+10	±25	0.1%	+15	100	OD-14
DSO-4180	18.0	5	+10	±25	0.1%	+15	100	OD-14

Notes 1: The factory can supply electronically/mechanically tuned DSO's at any frequency between 3.0 and 18.0 GHz.
2: Electronic tuning with a 0 to 20 volt input.
3: Also available in connectorless packages.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

CASE DRAWINGS

OD-10/20/50

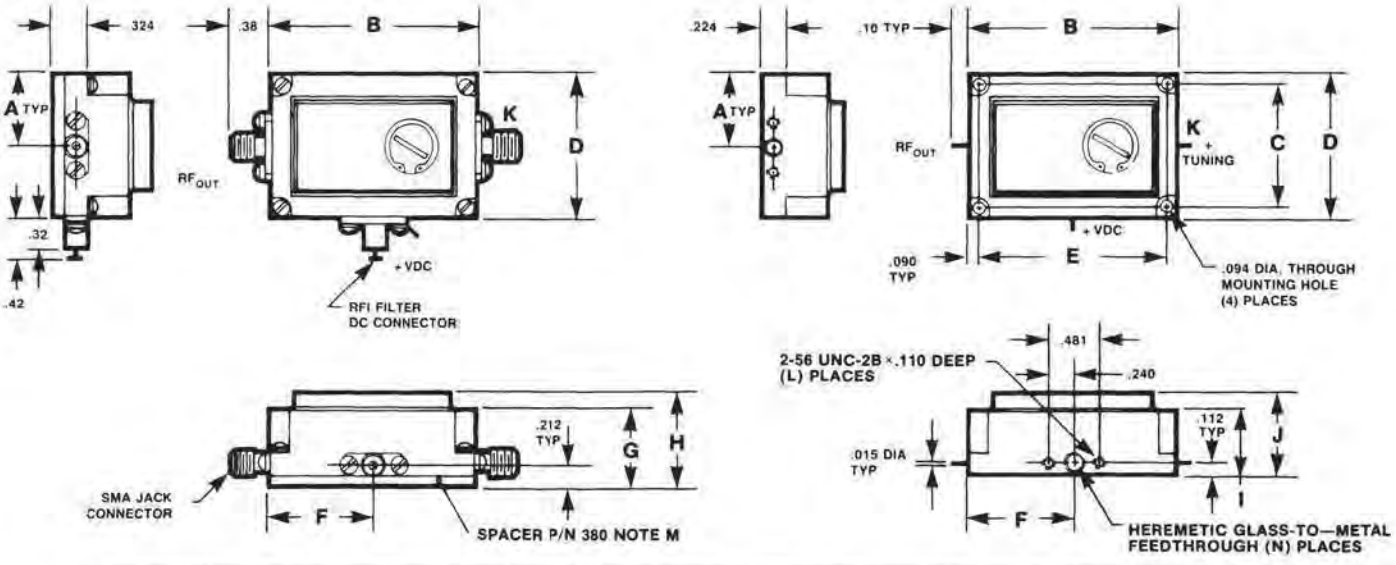


SMA PACKAGE

PIN PACKAGE

CASE TYPE	DIMENSION									SPACER
	A	B	C	D	E	F	G	H	I	J
OD-10	.530	1.63	1.06	.872	.094	1.442	.82	.59	.49	380-029135
OD-20	.675	1.98	1.35	1.17	.090	1.795	.99	.69	.59	380-028928
OD-50	.800	2.40	1.60	1.42	.090	2.22	1.20	.810	.710	—

OD-12/14/22/24/42/44/52/54



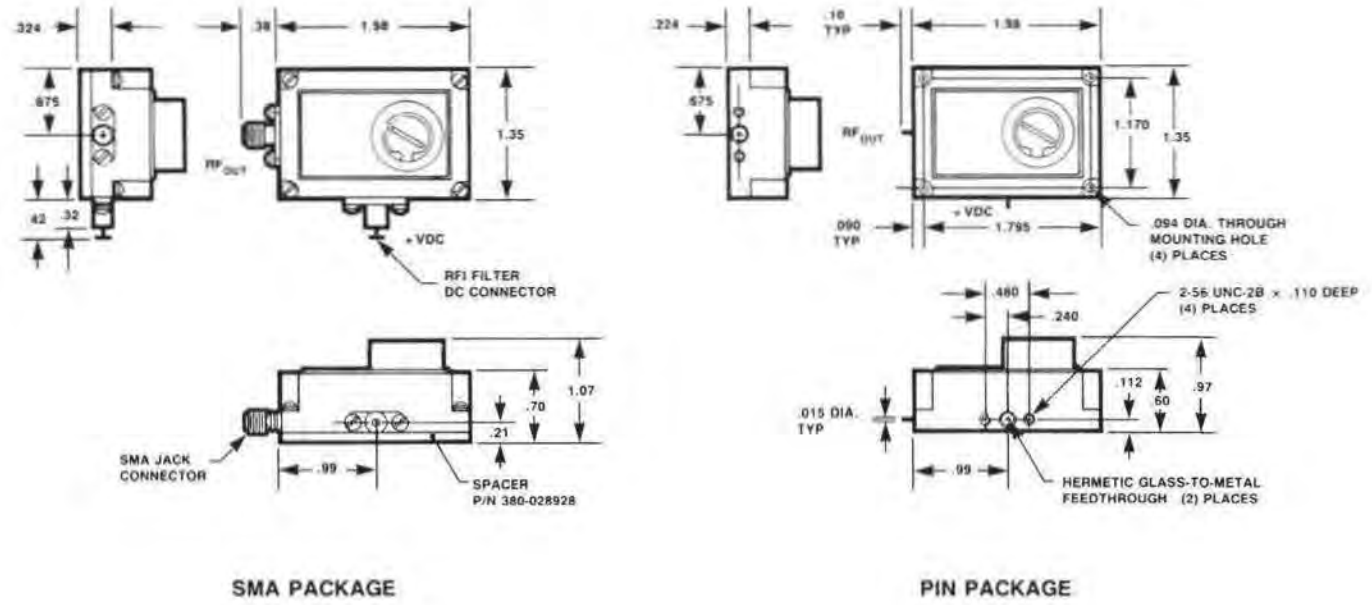
CASE TYPE	DIMENSION									NOTES			
	A	B	C	D	E	F	G	H	I	J	K	L	M	N
OD-12	.53	1.63	.872	.1.06	1.442	.82	.60	.72	.50	.62	N.A.*	4	029135	2
OD-14	.53	1.63	.872	1.06	1.442	.82	.60	.72	.50	.62	TUNING	6	029135	3
OD-22	.675	1.98	1.17	1.35	1.795	.99	.70	.875	.60	.775	N.A.*	4	028928	2
OD-24	.675	1.98	1.17	1.35	1.795	.99	.70	.875	.60	.775	TUNING	6	028928	3
OD-42	1.00	2.50	1.82	2.00	2.32	1.25	.895	1.080	.795	.980	N.A.	4	—	2
OD-44	1.00	2.50	1.82	2.00	2.32	1.25	.895	1.080	.795	.980	TUNING	6	—	3
OD-52	.80	2.40	1.42	1.60	2.22	1.20	.805	.980	.705	.880	N.A.	4	—	2
OD-54	.80	2.40	1.42	1.60	2.22	1.20	.805	.980	.705	.880	TUNING	6	—	3

*No connection this side.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

CASE DRAWINGS, continued

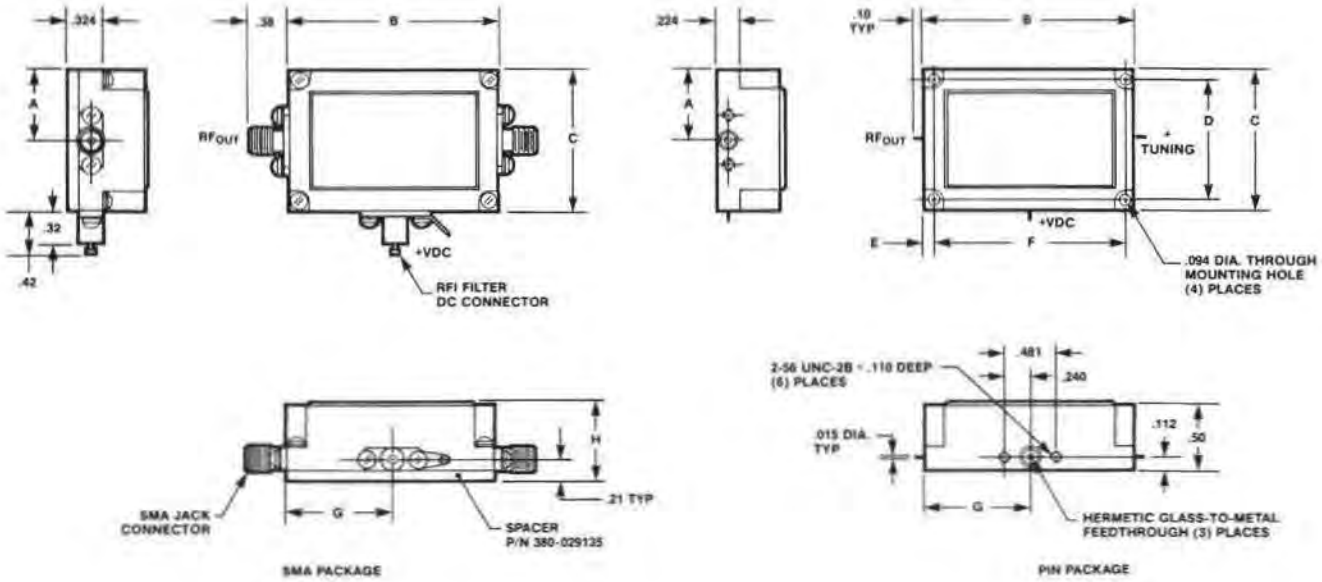
OD-23



SMA PACKAGE

PIN PACKAGE

OD 11/21/41/51



SMA PACKAGE

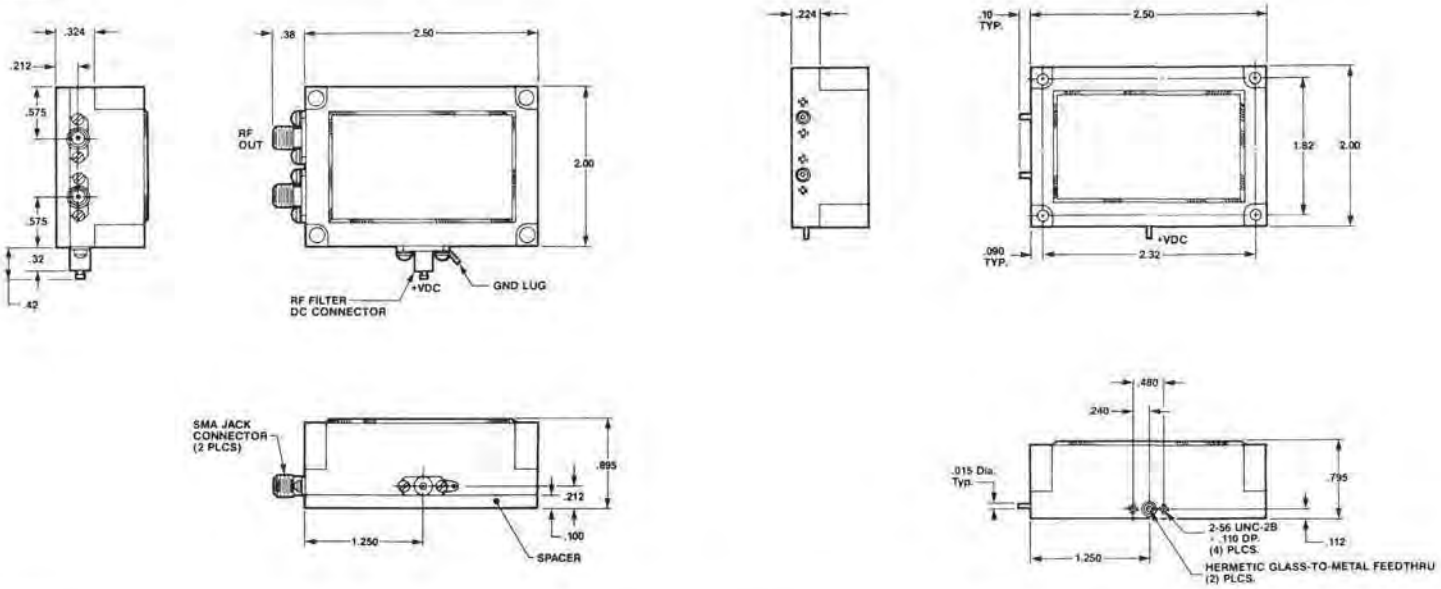
PIN PACKAGE

CASE TYPE	DIMENSION									SPACER
	A	B	C	D	E	F	G	H	I	J
OD-11	.530	1.63	1.06	.872	.094	1.442	.82	.60	.49	380-029135
OD-21	.675	1.98	1.35	1.170	.090	1.795	.99	.70	.59	380-028928
OD-41	1.00	2.50	2.00	1.82	.090	2.32	1.25	.895	.795	—
OD-51	.80	2.40	1.60	1.42	.090	2.22	1.20	.805	.705	—

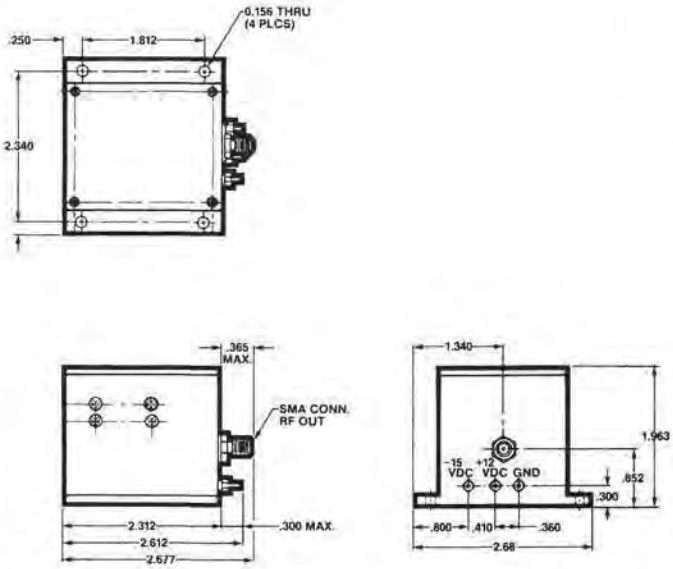
Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

CASE DRAWINGS

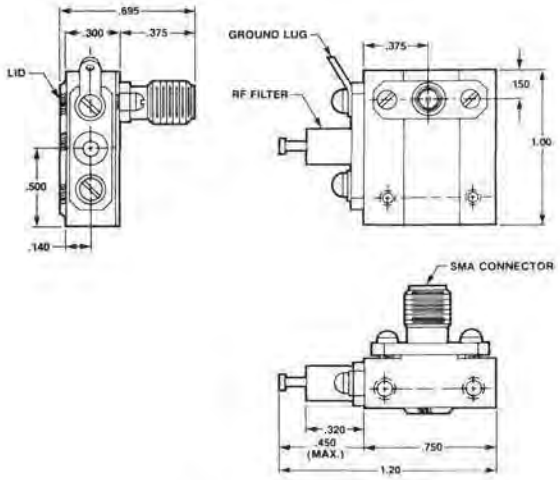
OD-40



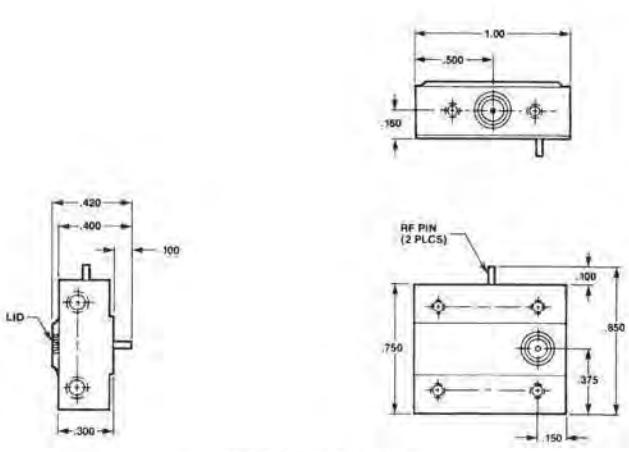
OD-60



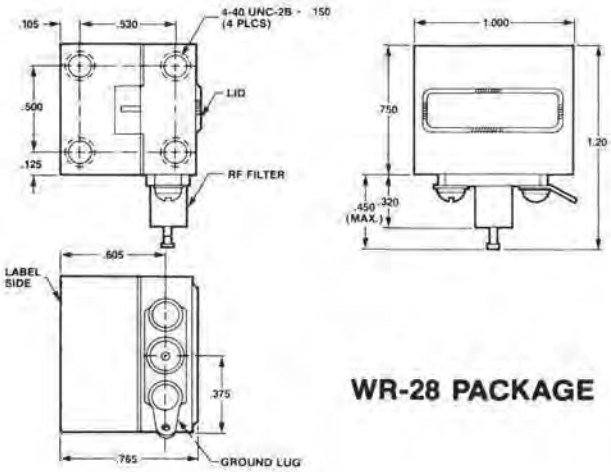
OD-70



SMA PACKAGE



PIN PACKAGE



WR-28 PACKAGE

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

SILICON MMIC FREQUENCY CONVERTERS

The MSF series is a family of silicon Monolithic Microwave Integrated Circuit (MMIC) frequency converters. These devices are optimized to simultaneously function as a self-oscillating LO and two-port active mixer with up or down conversion gain, or as a simple active mixer with a low-power injected LO at the input or output. They are ideally suited for very low cost or size constrained applications where adequate conversion gain flatness, LO-RF and LO-IF isolation or spurious signal rejection can be achieved using simple external filters.

The MSF-88XX series is designed for applications from 0.5 to 8.0 GHz. The MSF-86XX series is designed for applications from 0.1 to 2.0 GHz. Both MSF series are fabricated using a 10 GHz F_t silicon bipolar MMIC process that features sub-micrometer nitride self-alignment and ion-implantation to achieve excellent unit-unit uniformity. Biasing requires a fixed single polarity supply with an external current stabilizing resistor.

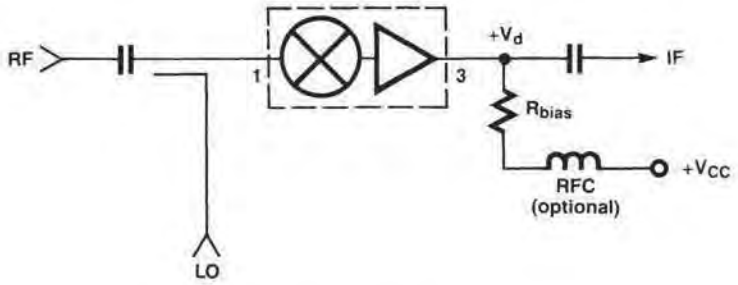
MSF Series

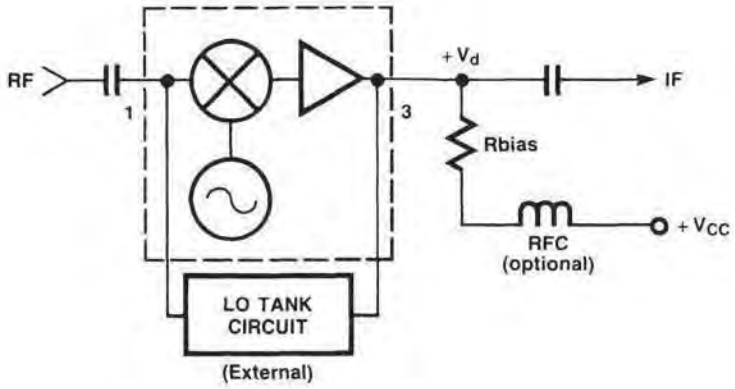
Typical Specifications @ 25° C Case Temperature PC1

Part Number	RF Frequency (GHz)	RF-IF Conversion Gain (dB)	P_{1dB} (dBm)	Third Order Intercept Point (dBm)	Minimum Power Supply Voltage (V_{cc})	Device Voltage (V_d)	Device Current (Id)	Case Type
-20 dBm RF Input at 4.2 GHz and L.O. at 5.15 GHz								
MSF-8835	4.2	9.0	9.0	16	10	7.5	35	micro-X
MSF-8870	4.2	9.0	9.0	16	10	7.5	35	70-mil hermetic
MSF-8885	4.2	8.5	9.0	16	10	7.5	35	85-mil plastic
-20 dBm RF Input at 1.575 GHz and L.O. at 1.4 GHz								
MSF-8635	1.575	8.5	-2.5	7	5	3.6	16	micro-X
MSF-8670	1.575	8.5	-2.5	7	5	3.6	16	70-mil hermetic
MSF-8685	1.575	8.0	-2.5	7	5	3.6	16	85-mil plastic

FUNCTIONAL BLOCK DIAGRAMS

2-Port Active Mixer

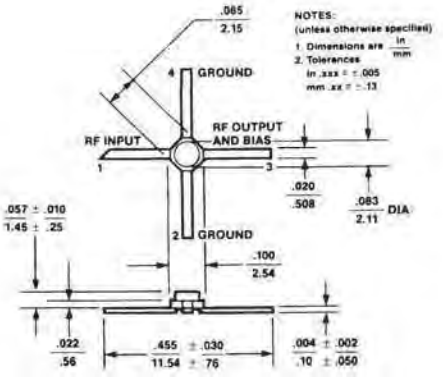




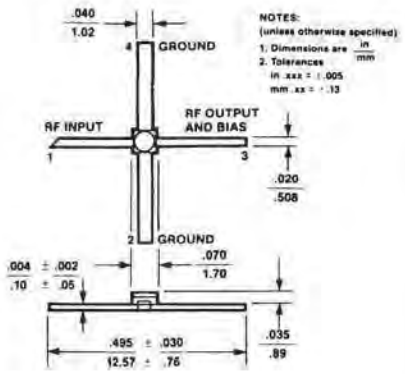
Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

CASE DRAWINGS

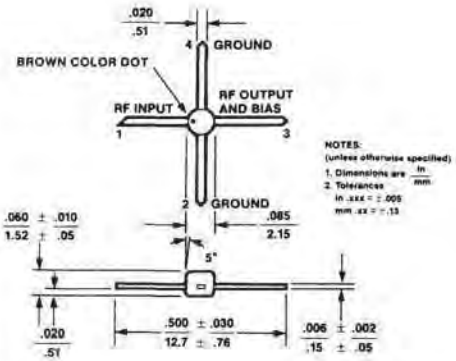
MICRO-X



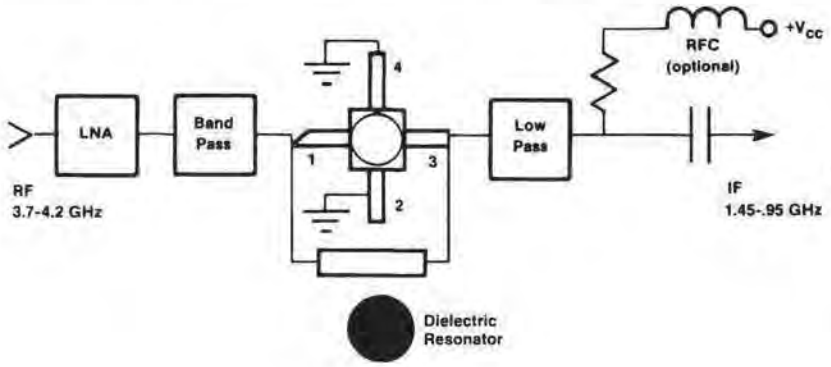
70 MIL STRIPLINE

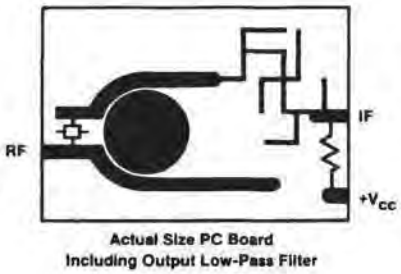


85 MIL PLASTIC



EXAMPLE OF TVRO BLOCK DOWN CONVERTER USING MSF-88XX SERIES—CONVERSION GAIN = 7.5 ± .5 dB FROM 3.7-4.2 GHz WITH SELF-OSCILLATING LO AT 5.15 GHz

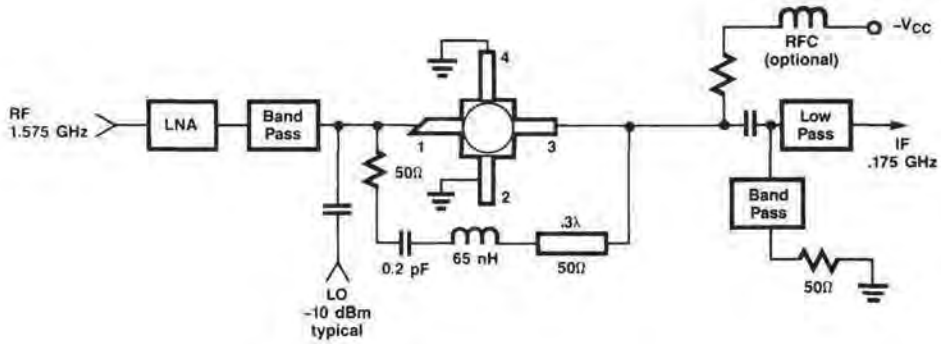


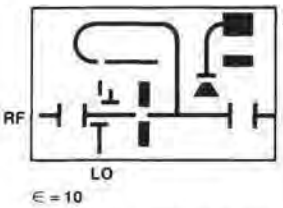


Actual Size PC Board
Including Output Low-Pass Filter

COMPONENT COUNT:
1-Si MMIC
2-PC Filters
1-Resistor
1-Capacitor
1-Dielectric Puck

EXAMPLE OF GPS DOWNCONVERTER USING MSF-86XX SERIES—CONVERSION GAIN = 9 dB AT 1.575 GHz WITH INJECTION-LOCKED SELF-OSCILLATING LO AT 1.273 GHz





Actual size PC board is 1.10" x 0.73."
Do not scale.

COMPONENT COUNT
1 – Si MMIC
2 – Resistors
3 – Capacitors
1 – Wire Inductor

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

NEW WIDEBAND THIN FILM DOUBLE & TRIPLE BALANCED CONNECTORED MIXERS

The new Thin Film Mixer Series features RF/LO frequency ranges from 0.75 GHz to 26 GHz and IF ranges from DC to 10 GHz.

The TF Series of Mixers offers excellent gain and phase matching and tracking from unit-to-unit and lot-to-lot as well as superior stability over temperature. Conversion loss typically varies <0.5 dB from -55 to +100° C.

NEW THIN FILM MIXERS

Typical Specifications at 25° C Case Temperature

PC2

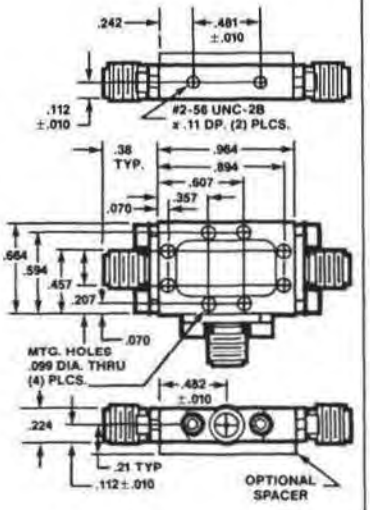
Model	Frequency Range RF & LO (GHz)	Frequency Range IF (GHz)	Conversion Loss (dB)	Isolation LO to RF (dB)	Isolation LO to IF (dB)	VSWR RF Port	VSWR LO Port	Case Type
TFX-72	2-7	DC-1.0	6.0	35	35	2.5:1	2.0:1	TFX/TFY
TFX-824	2-8	0.005-4.0	6.5	22	35	2.0:1	2.0:1	TFX/TFY
TFX-1221(P)	2-12	DC-1.0	6.5	25	25	2.5:1	2.0:1	TFX/TFY
TFX-158	8-15	DC-1.0	6.0	30	30	2.0:1	2.0:1	TFX/TFY
TFX-167	7-16	DC-4.0	6.5	30	20	2.5:1	2.0:1	TFX/TFY
TFX-184	4-18	DC-4.0	7.0	25	20	2.5:1	2.5:1	TFX/TFY
TFX-185	5-18	DC-5.0	6.5	25	20	2.5:1	2.5:1	TFX/TFY
TFX-186	6-18	DC-5.5	6.5	30	25	2.5:1	2.5:1	TFX/TFY
TFX-1866	6-18	0.05-6.0	7.5	25	30	2.0:1	2.0:1	TFX/TFY
TFX-1824	2-18	0.005-4.0	7.5	25	25	2.0:1	2.0:1	TFX/TFY
TFX-18210	2-18	1.0-10.0	7.5	25	30	2.0:1	2.0:1	TFX/TFY
TFX-18075	0.75-18.0	DC-0.5	10.0	25	20	2.7:1	2.5:1	TFX/TFY
TFW-18075D	0.75-18.0	DC-0.3	8.0	25	20	2.7:1	2.5:1	TFW
TFX-2021	2-20	DC-0.5	7.5	25	30	2.5:1	2.0:1	TFX/TFY
TFK-2621	2-26	DC-0.5	8.0	35	25	2.5:1	2.5:1	TFK

(P) Preliminary

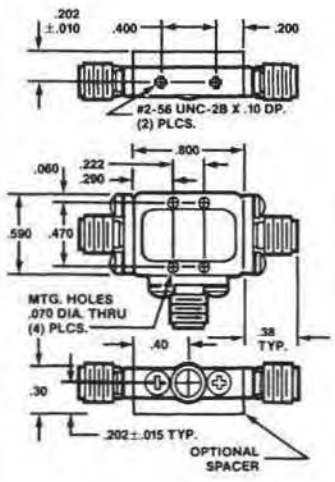
Note 1: Mixers are available for use with low-power (+7 to +13 dBm), medium power (+10 to +17 dBm), and high-power (+17 to +24 dBm) LOs. Models TFX-1866, TFX-824 and TFX-18210 have two diode quads each and operate only with medium (+10 to +17 dBn) and high-power (+13 to +20 dBm) LOs.

CASE DRAWINGS

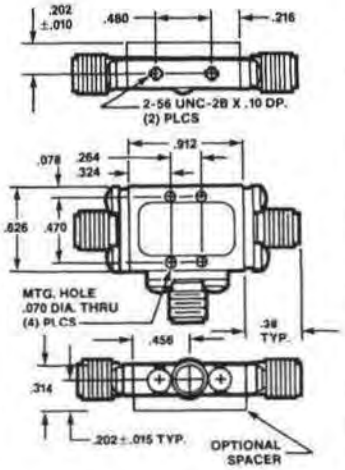
TFX



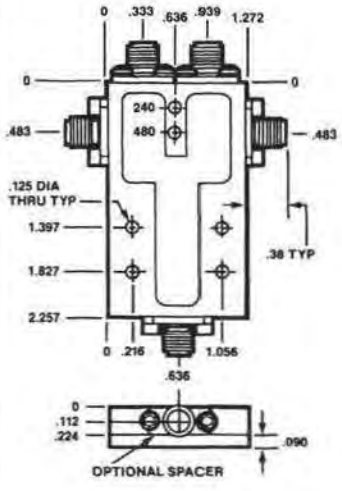
TFY



TFK



TFW



Artisan Technology Group - Quality Instrumentation... Guaranteed | (888) 88-SOURCE | www.artisantg.com

WIDEBAND DOUBLE BALANCED CONNECTORED MIXERS

Covering the frequency range from 2 to 26.0 GHz, these Avanpak packaged mixers feature high isolation, relatively low conversion loss and good 50-ohm match (low VSWR) at all ports. DBX and DBY mixers are identical electrically except the DBYs are somewhat smaller for use where size is a critical factor.

Three versions of the basic mixers are available requiring nominal local oscillator drive levels, and providing two-tone, third-order input intercept points as follows:

L-suffix:
+7 dBm LO drive, +8 dBm intercept point

M-suffix:
+10 dBm LO drive, +13 dBm intercept point

H-suffix:
+20 dBm LO drive, +25 dBm intercept point

For new design, the TFX series of thin-film mixers, listed on page ___, is recommended.

AVANPAK™ DOUBLE BALANCED MIXER SELECTION GUIDE

Typical Specifications at 25° C Case Temperature

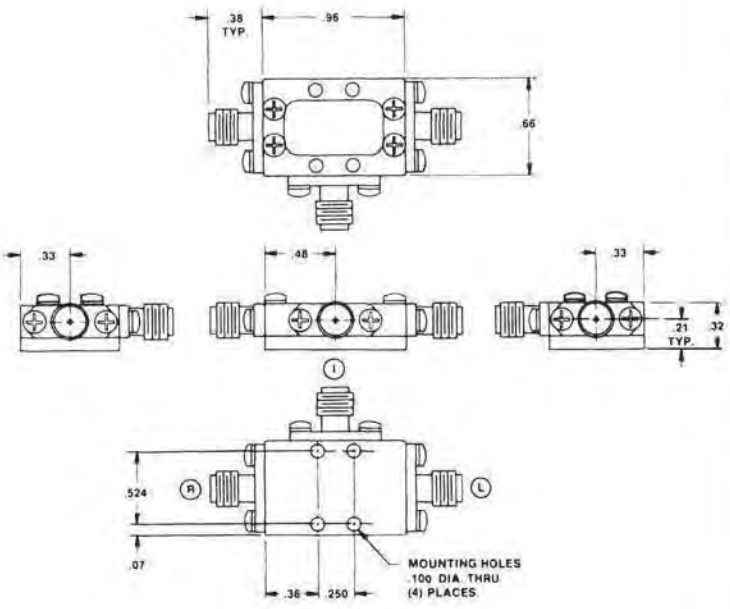
PC2

Model DBX/DBY	Frequency Range RF & LO (GHz)	Frequency Range IF (GHz)	Conversion Loss (dB)	Isolation LO to RF (dB)	Isolation LO to IF (dB)	VSWR RF Port	VSWR LO Port	Case Type
3503M/H	.05-3.0[1]	.001-3.0	8.0	30	35	2.0	2.0	DBX/DBY
72L/M/H	2-7	DC-1.3	6.0	35	25	2.5	1.7	DBX/DBY
824M/H	2-8	.005-4.0	6.5	25	30	2.0	2.0	DBX/DBY
1221L/M/H	2-12	DC-1.3	6.0	35	25	2.5	2.0	DBX/DBY
158L/M/H	8-15	DC-1.0	6.0	30	20	2.0	1.7	DBX/DBY
167L/M/H	7-16	DC-4.0	6.5	30	20	2.0	1.7	DBX/DBY
184L/M/H[2]	4-18	DC-4.0	6.5	30	20	2.5	2.0	DBX/DBY
185L/M/H	5-18	DC-6.0	6.5	30	20	2.5	2.0	DBX/DBY
186L/M/H	6-18	DC-7.0	7.0	30	20	2.5	2.0	DBX/DBY
1824M/H	2-18	.005-4.0	7.0	25	30	2.5	2.0	DBX/DBY
18212M/H	2-18[3]	0.5-12	7.5	30	20	2.5	2.0	DBX/DBY

Notes 1: LO = .05-3.5 GHz.
2: Also available with LS/MS/HS suffix with 30 dB typ LO to IF isolation & IF response to 1.5 GHz for swept frequency applications.
3: LO = 2-26 GHz.

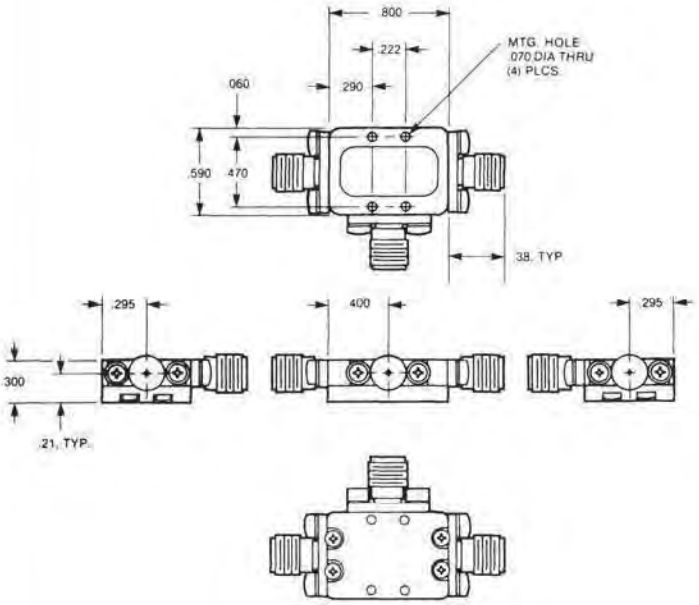
CASE DRAWINGS

DBX
CASE (WITH CONNECTORS AND BOTTOM SPACER PLATE)



Approx. Weight 22 grams (0.8 oz)

DBY
CASE (WITH CONNECTORS AND BOTTOM SPACER PLATE)



Approx. Weight 16 grams (0.6 oz)

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

CONNECTORED MIXER/PREAMPLIFIER COMBINATIONS

AVANPAK™ MIXER/PREAMPLIFIER SELECTION GUIDE

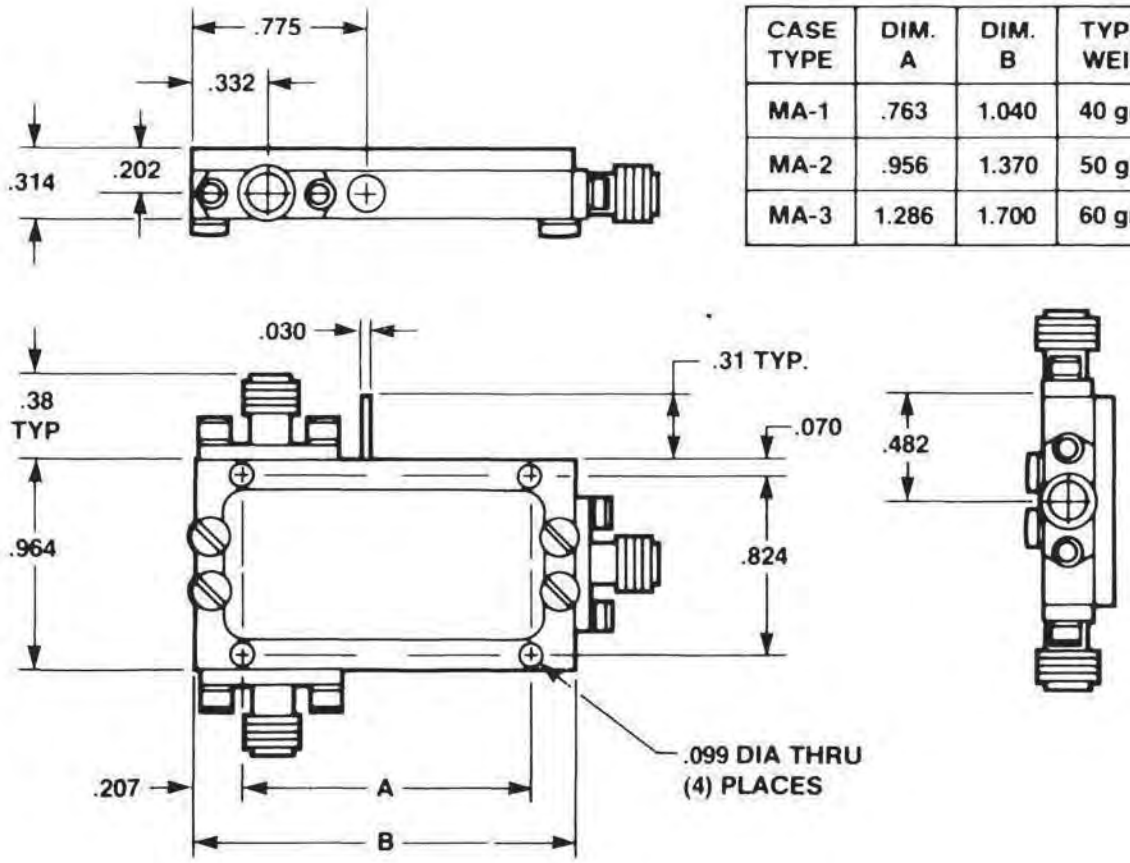
Guaranteed Specifications at 25° C Case Temperature

PC2

Model Number	Consisting of the Following Products	Frequency Range RF (GHz)	LO (GHz)	IF (MHz)	RF-IF Gain (dB) Min.	Noise Figure (dB) Typ.	Power Output for 1 dB Gain Compression (dBm) Min.	DC Current (mA) Typ.	Case Type
MXA-2512	DBX-3503M, UTO-210, UTO-210	.5-2	.5-2	10-200	10	11	8	30	MA-3
MXA-3012	DBX-3503M, UTO-1012, UTO-1013	.05-3.0	.05-3.5	10-1000	22	10.5	7	50	MA-2
MXA-7202	TFX-72M, UTO-514, UTO-516	2-7	2-7	30-160	22	8.5	9	45	MA-2
MXA-7203	TFX-72M, UTO-514, UTO-519, UTO-509	2-7	2-7	30-160	33	8.5	20	135	MA-3
MXA-8203	TFX-1824, UTO-210, UTO-210, UTO-210	2-8	2-8	10-200	18	11.0	12	45	MA-3
MXA-10911	TFX-186M, UTO-222	9-10	9-10	70	20	9	19	50	MA-1
MXA-18422	TFX-184M, UTO-2012, UTO-2012	4-18	4-18	500-2000	9	11.5	12	100	MA-2
MXA-18423	TFX-184M, UTO-2012, UTO-2012, UTO-2013	4-18	4-18	500-2000	18	11.5	19	200	MA-3
MXA-18662	TFX-1866M, PPA-6232	6-18	8-16	2000-6000	9	12	12	150	MA-2
MXA-18803	TFX-1824, UTO-210, UTO-210	8-18	8-18	10-200	10	11.0	8	30	MA-3
MXA-18201	TFX-1824M, UTO-222	2-18	2-18	10-200	18	10.5	20	50	MA-1
MXA-18202	TFX-1824M, UTO-511, UTO-516	2-18	2-18	10-250	22	9.5	9	45	MA-2
MXA-18203	TFX-1824M, UTO-511, UTO-516, UTO-509	2-18	2-18	10-250	37	9.5	20	135	MA-3

CASE DRAWINGS

MA-X



CASE TYPE	DIM. A	DIM. B	TYPICAL WEIGHT
MA-1	.763	1.040	40 grams
MA-2	.956	1.370	50 grams
MA-3	1.286	1.700	60 grams

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

MODULAR
DOUBLE BALANCED
CONNECTORLESS MIXERS

UMX MIXER SELECTION GUIDE

Typical Specifications at 25° C Case Temperature

PC2

Model	Frequency Range RF & LO (MHz)	Frequency Range IF (MHz)	Conversion Loss (dB)	Isolation LO to RF (dB)	Isolation LO to IF (dB)	VSWR RF Port	VSWR LO Port	Case Type
UMX-520	1-500	DC-500	6.0	55	45	1.7	2.5	TO-8M
UMX-570[1]	1-500	DC-500	5.5	35	45	1.7	3.0	TO-8M
UMX-2020	10-2000	DC-1000	7.0	40	30	2.0	3.0	TO-8M
UMX-4220	3700-4200[2]	DC-1300	5.0	35	25	1.5	1.5	TO-8M

Notes 1: +27 dBm LO drive, +32 dBm intercept point.
2: LO =2400-5500 MHz.

PPM-2515M, PLANARPAK™ SURFACE MOUNTED TRIPLE BALANCED MIXER

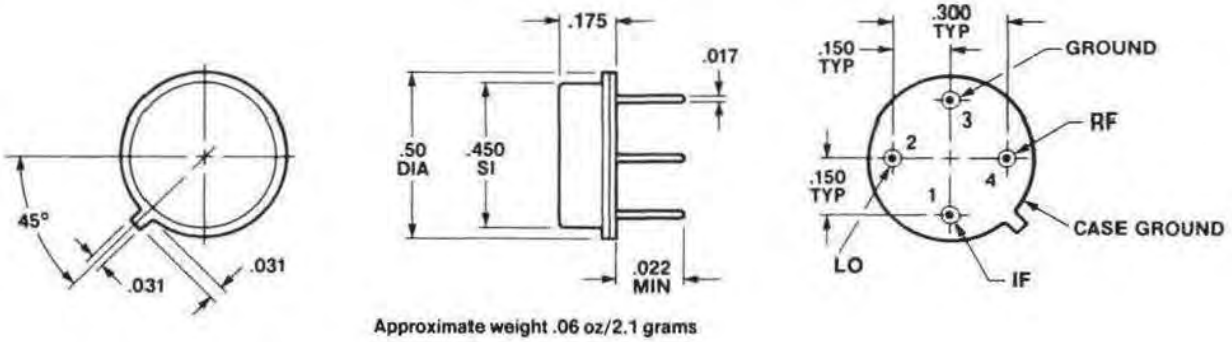
Typical Specifications @ 25° C Case Temperature

PC2

Model	Frequency Range (GHz) RF/LO	Frequency Range (GHz) IF	Conv. Loss (dB) Typical	ISOL. LO/RF Typical	ISOL. LO/IF Typical	VSWR RF/IF	VSWR LO	Case Type
PPM-2515M	.05-2.5	.001-1.5	7.6	35	35	1.5	2.5	PP-38M

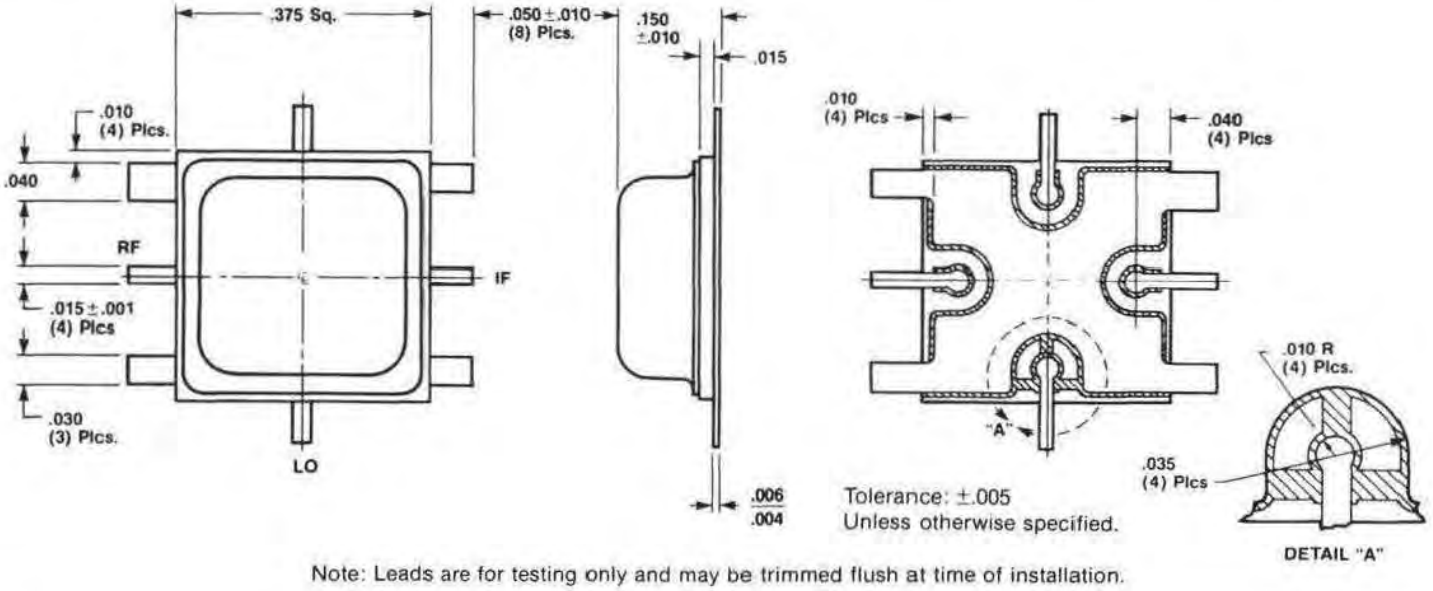
CASE DRAWINGS

TO-8M



Approximate weight .06 oz/2.1 grams

PP-38M



Tolerance: ±.005
Unless otherwise specified.

Note: Leads are for testing only and may be trimmed flush at time of installation.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

WIDEBAND YIG-TUNED BANDPASS FILTERS

Avantek YIG filters offer performance equivalent to high-Q cavity resonators, but may be tuned over multi-octave frequency ranges by varying the current through their magnetic coils. They are available in two-, three- and four-sphere versions to offer a choice of skirt selectivity, off-resonance isolation and insertion loss with all versions optimized to provide approximately maximally-flat phase response. Since they use the same basic magnetic circuit and tuning coils as the YIG-tuned oscillators, these YIG filters offer equivalent dynamic tuning characteristics to simplify the design of tracking oscillator/filter combinations.

MULTI-OCTAVE FILTERS

Guaranteed Specifications at 25° C Case Temperature (+10° to +60° C Operating Temperature) PC6

Model	Frequency Range (GHz)	3 dB Bandwidth (MHz) Minimum	Insertion Loss (dB) Maximum	Off Resonance Isolation (dB) Minimum	Passband Ripple & Spurious (dB) Maximum	Case Type
2 to 8 GHz						
AFP-20821	2-8	25	3	45	2.0	FIL 1
AFP-30821	2-8	25	4	70	2.0	FIL 1
AFP-40821	2-8	20	5	80	2.0	FIL 1
8 to 18 GHz						
AFP-21821	8-18	25	3	45	2.0	FIL 2
AFP-31821	8-18	25	5	70	2.5	FIL 2
AFP-41821	8-18	25	5	80	2.5	FIL 2

EXTENDED RANGE FILTERS

Guaranteed Specifications at 25° C Case Temperature (+10° to +60° C Operating Temperature) PC6

1 to 18 GHz						
AFP-21851	1-18	25	5	45	2.5	FIL 2
AFP-31851	1-18	20	7	70	2.5	FIL 2
AFP-41851	1-18	20	9	80	2.5	FIL 2
2 to 18 GHz						
AFP-21841	2-18	25	4	45	2.5	FIL 2
AFP-31841	2-18	25	5	70	2.5	FIL 2
AFP-41841	2-18	20	8	80	2.5	FIL 2
2 to 26 GHz						
AFP-12641	2-26	20	5	25	1.0	FIL 2

MULTI-OCTAVE WIDE BANDWIDTH FILTERS

Guaranteed Specifications at 25° C Case Temperature (+10° to +60° C Operating Temperature) PC6

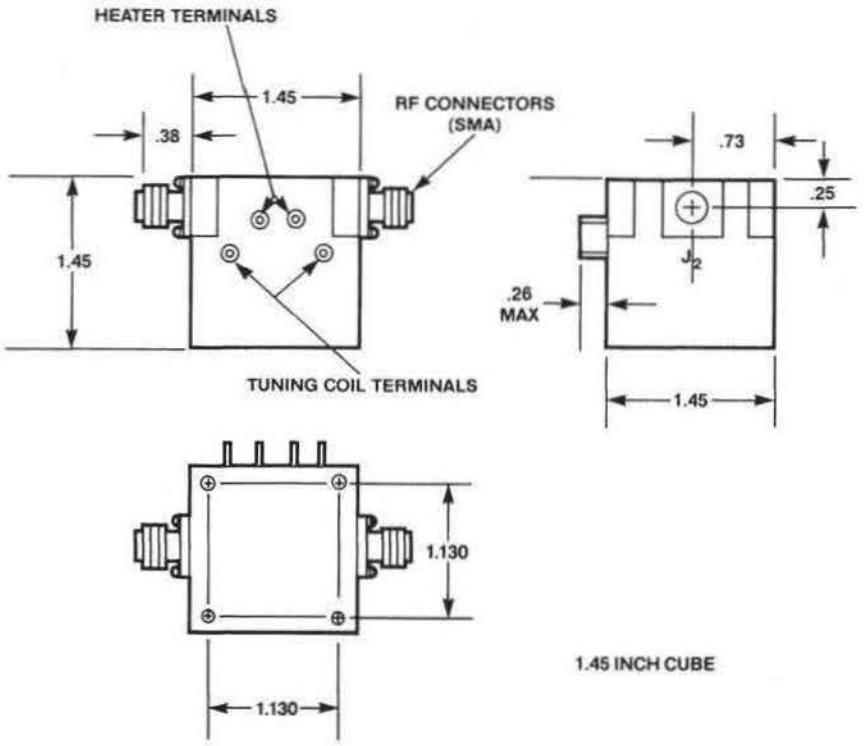
8 to 18 GHz						
AFW-21821	8-18	250	4	45	2.0	FIL 2
AFW-31821	8-18	300	5	70	2.5	FIL 2
AFW-41821	8-18	400	7	80	2.5	FIL 2

*3 dB bandwidths from 100 to 500 MHz are available on special order.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

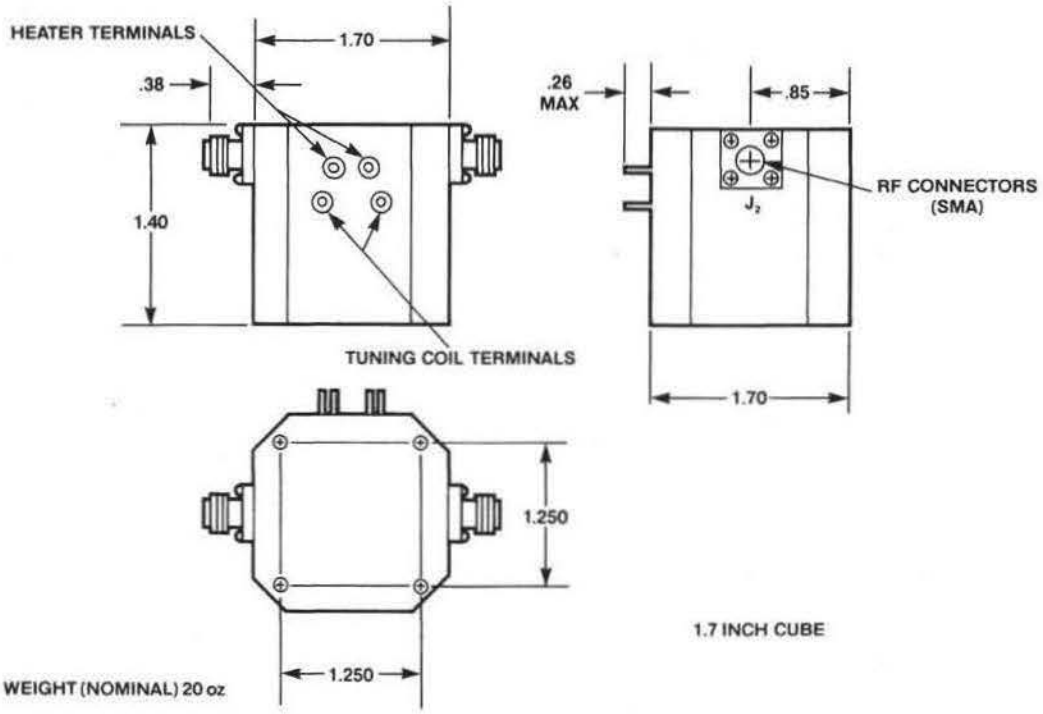
CASE DRAWINGS

FIL 1



WEIGHT (NOMINAL) 12 oz

FIL 2



WEIGHT (NOMINAL) 20 oz

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

YIG-TUNED BANDPASS FILTERS WITH ANALOG OR DIGITAL DRIVERS

DRIVER SELECTION GUIDE

Guaranteed Specifications at 25° C Case Temperature (Operating Temperature per Device) PC6

Specification	Analog Driver	12 Bit Digital Driver
Tuning Range	0.000 volts at input corresponds to lowest frequency 10.000 volts at input corresponds to highest frequency	All zeroes at input corresponds to lowest frequency All ones at input corresponds to highest frequency
Tuning Accuracy: at 25°C on baseplate, 1/2 hour after turn-on, excluding hysteresis and non-linearity	±(0.08% of frequency + 2 MHz)	±(0.08% of frequency + 2 MHz)
Resolution	NA	12 bit positive true logic for increasing frequency
Interface Logic	NA	TTL or CMOS
Tuning Input Resistance	≥10 kohm	NA
Common Mode Rejection	≥40 dB	NA
Residual FM: (15 Hz-15 kHz bandwidth)	NA	NA
Non-Linearity:	Device specification applies	±(½ bit + device non-linearity)
Pushing: +15 Volts:	±(0.01% of frequency + 1 MHz)/volt, typ	±(0.001% of frequency + 0.1 MHz)/volt typical
-15 Volts:	±(0.01% of frequency + 1 MHz)/volt, typical	±(0.001% of frequency + 0.,1 MHz)/volt, typical
Power Supply Voltage:	±15 volts: ±5%	±15 volts: ±5%
Power Supply Current:		
+15 Volts:	Tuning coil current at max frequency* + 30 mA	Filter oil current at max frequency + 40 mA
-15 Volts:	30 mA	40 mA
Weight	Filter weight + 10 oz.	Filter weight + 10 oz.
Device Specifications That Do Not Apply	Tuning Sensitivity Tuning Coil Resistance Tuning Coil Impedance	Tuning Sensitivity Tuning Coil Resistance Tuning Coil Impedance

Notes 1: Tuning current at max freq is: $\frac{\text{Max freq (MHz)}}{\text{Sensitivity (MHz/mA)}}$ = Max current (mA)

2: These specifications are in addition to the standard specifications for the basic YIG device to which the driver is coupled except as noted.

YIG-TUNED FILTERS WITH DRIVERS

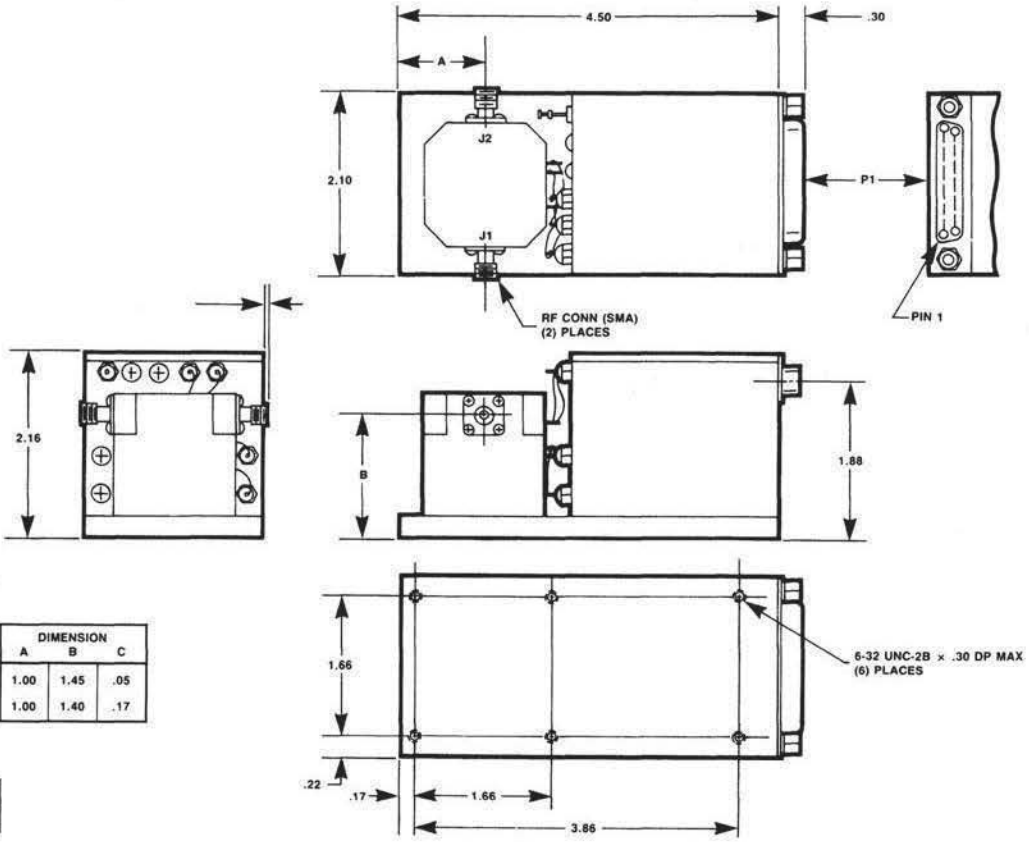
Guaranteed Specifications at 25° C Case Temperature (Operating Temperature per Drive) PC6

Model Number	Frequency (GHz)	Off Resonance Isolation (dB) Minimum	Power Supply Current (mA), Maximum +15 V	Power Supply Current (mA), Maximum -15 V	YTF Model	Case Type
MULTI-OCTAVE COMMERCIAL FILTERS WITH ANALOG DRIVERS						
FPD-20821	2-8	45	450	50	AFP-20821	FPD 1
FPD-30821	2-8	70	450	50	AFP-30821	FPD 1
FPD-40821	2-8	80	450	50	AFP-40821	FPD 1
FPD-21821	8-18	45	950	50	AFP-21821	FPD 2
FPD-31821	8-18	70	950	50	AFP-31821	FPD 2
FPD-41821	8-18	80	950	50	AFP-41821	FPD 2
EXTENDED RANGE COMMERCIAL FILTERS WITH ANALOG DRIVERS						
FPD-21841	2-18	45	950	50	AFP-21841	FPD 2
FPD-31841	2-18	70	950	50	AFP-31841	FPD 2
FPD-41841	2-18	80	950	50	AFP-41841	FPD 2
MULTI-OCTAVE COMMERCIAL FILTERS WITH DIGITAL DRIVERS						
FDD-20821	2-8	45	450	50	AFP-20821	FDD 1
FDD-30821	2-8	70	450	50	AFP-30821	FDD 1
FDD-40821	2-8	80	450	50	AFP-40821	FDD 1
FDD-21821	8-18	45	950	50	AFP-21821	FDD 2
FDD-31821	8-18	70	950	50	AFP-31821	FDD 2
FDD-41821	8-18	80	950	50	AFP-41821	FDD 2
EXTENDED RANGE COMMERCIAL FILTERS WITH DIGITAL DRIVERS						
FDD-21841	2-18	45	950	50	AFP-21841	FDD 2
FDD-31841	2-18	70	950	50	AFP-31841	FDD 2
FDD-41841	2-18	80	450	50	AFP-41841	FDD 2

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

CASE DRAWINGS

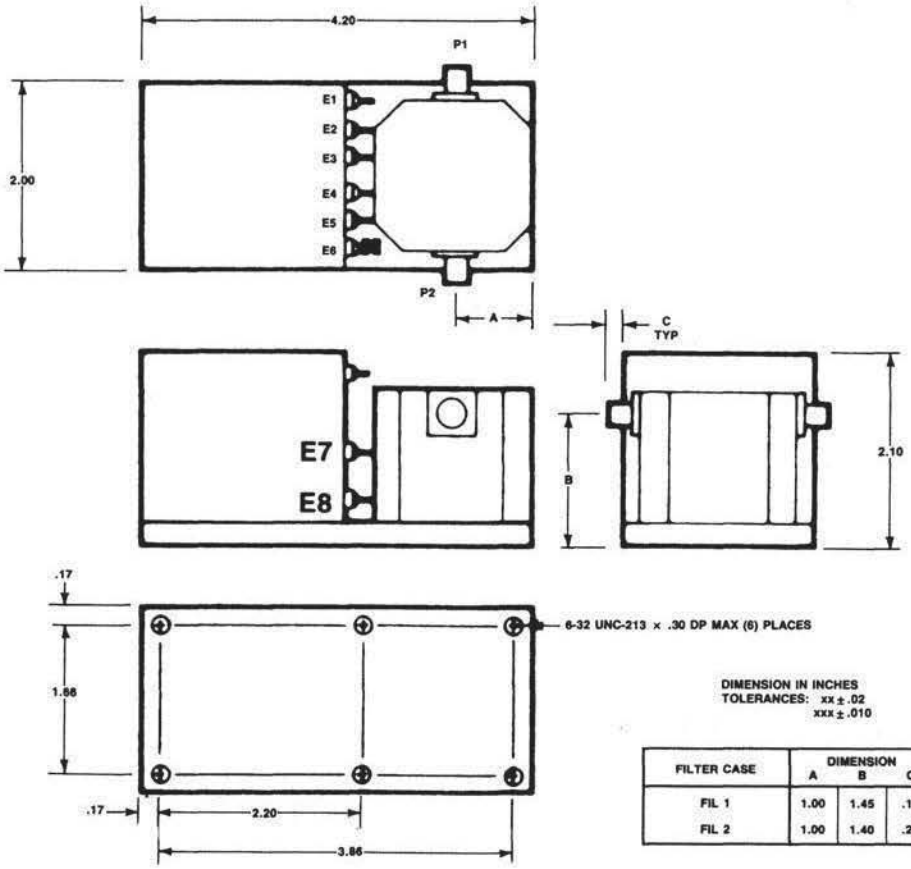
FDD 1/2



FILTER CASE	DIMENSION A	B	C
FIL 1	1.00	1.45	.05
FIL 2	1.00	1.40	.17

J1	RF IN
J2	RF OUT

FPD 1/2



DIMENSION IN INCHES
TOLERANCES: xx ± .02
xxx ± .010

FILTER CASE	DIMENSION A	B	C
FIL 1	1.00	1.45	.10
FIL 2	1.00	1.40	.23

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

VOLTAGE CONTROLLED ATTENUATORS

THIN-FILM ATTENUATORS

The UTF and PPF series thin-film, precision, broadband voltage controlled attenuators are specifically designed to provide flexible gain control in a cascade of amplifiers. Installed near the input of a cascade they provide the widest control range while near the output they provide the best noise figure. The consistent input and output impedance allows several modules to be cascaded for even wider attenuation range. Their long-term stability allows them to be used as trimmers to precisely match the performance of two or more amplifier cascades without frequent adjustment.

UTF Series Signal Attenuators

Guaranteed Specifications at 0° to 50° C Case Temperature[1]

PC2

Model	Frequency Range (MHz)	Insertion Loss, Maximum (dB)	Attenuation Minimum (dB)	Typical Switching Speed 10 to 90%	VSWR Maximum	Control Power Typical	Input Power Typical	Case Type
UTF-015	5-1000	2.0, 5-500 MHz 2.5, 500-1000 MHz	15	.5 msec	2.0	0 to -10 VDC, 0 to 7 mA	+15 VDC, 7 mA	TO-8F
UTF-025	5-500	2.5	30	75 μsec	2.0	0 to +15 VDC, 0 to 7 mA	+15 VDC, 15 mA	TO-8F
	5-1000	2.5	25	75 μsec	2.0			
	5-2000	3.3	20	75 μsec	2.5			
UTF-030	100-500	2.5	40	500 nsec	2.0	0 to +15 VDC 0 to 10 mA	+15 VDC 10 mA	TO-8F
	500-1000	3.0	35	500 nsec	2.0			
	1000-2000	3.5	25	500 nsec	2.0			
UTF-040	10-1000	2.0, 5-500 MHz 2.5, 500-1000 MHz	40, 30-250 MHz 35, 10-500 MHz 30, 10-1000 MHz	.4 msec	2.0, 10-500 MHz 2.5, 10-1000 MHz	0 to -12 VDC, 0 to 75 mA	+15 VDC, 10 mA	TO-8F

Note 1: The factory can guarantee operation over -55° to +105° C if required.

CASE DRAWING See page 104 for TO-8F.

PPF-030, PLANARPAK™ SURFACE MOUNTED ATTENUATOR

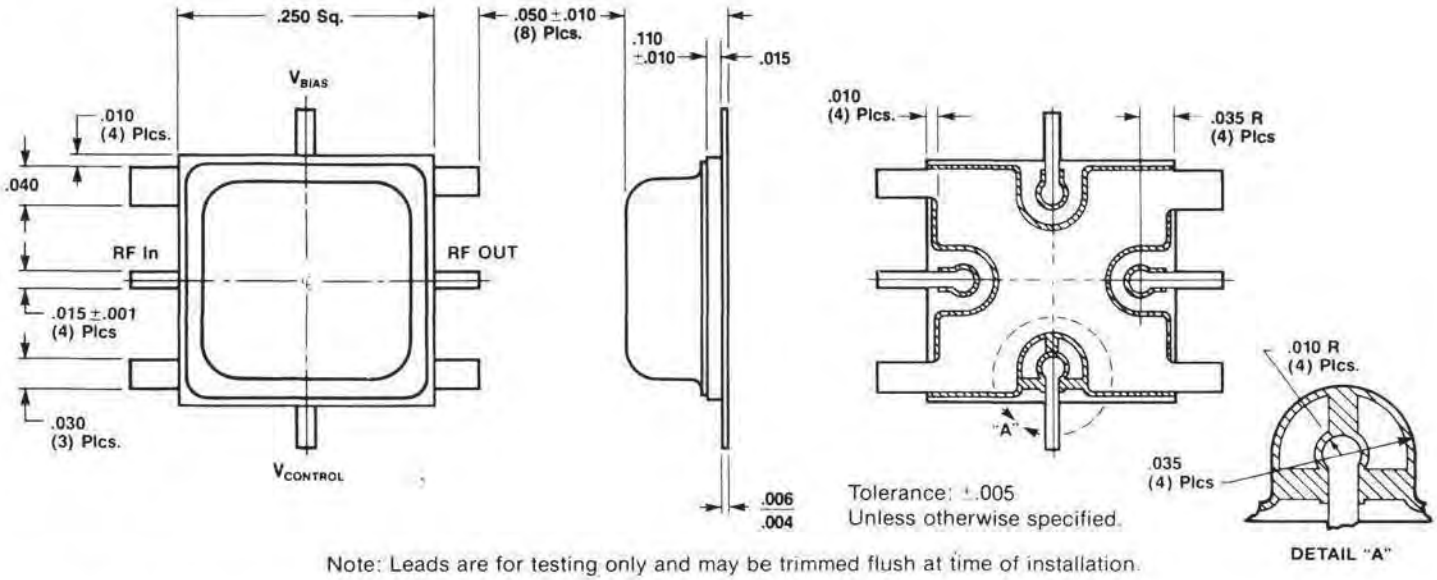
Guaranteed Specifications at 0 to +50° C Case Temperature

PC2

Model	Frequency Range (MHz)	Insertion Loss (dB) Maximum	Attenuation (dB) Minimum	VSWR (50Ω) Maximum	Switching Speed (μsec) Maximum	Control Voltage (V)	Case Type
PPF-030	100-500	2.5	40	2.0	1.0	0 to +15	PP-25F
	500-1000	3.0	35	2.0	1.0		
	1000-2000	3.5	25	2.0	1.0		

CASE DRAWING See page 104 for TO-8F.

PP-25F



Note: Leads are for testing only and may be trimmed flush at time of installation.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

THIN FILM POWER LIMITERS

Avanpak limiters are designed to provide passive protection against high peak and moderate CW power levels while maintaining low insertion loss and VSWR at normal operating levels. Two series are offered: one for peak levels up to 200 watts (-0 series) and one for peak levels up to 1000 watts (-1 series). Both feature removable SMA connectors and laser welded hermetic cases.

AVANPAK THIN-FILM LIMITERS

Guaranteed Specifications @ 25° C Case Temperature (-55° to +85° C Operating Temperature) PC2

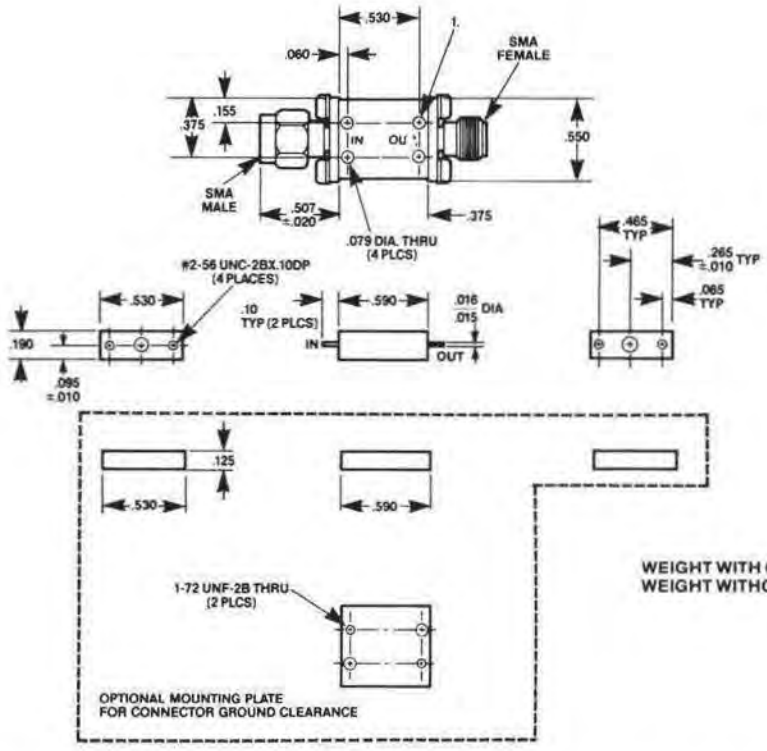
Model	Frequency Range (GHz)	VSWR Maximum	Maximum Insertion Loss (dB) at Frequency (GHz) 2-4	4-8	8-12	12-18	Case Type
AHL-0402-0	2-4	1.8	1.0	—	—	—	AHL
AHL-0802-0	2-8	1.8	1.0	1.3	—	—	AHL
AHL-1202-0	2-12	1.8	1.0	1.3	1.8	—	AHL
AHL-1802-0	2-18	1.8	1.0	1.3	1.8	2.2	AHL
AHL-0402-1	2-4	1.8	1.4	—	—	—	AHL
AHL-0802-1	2-8	1.8	1.4	1.8	—	—	AHL
AHL-1202-1	2-12	1.8	1.4	1.8	2.2	—	AHL
AHL-1802-1	2-18	1.8	1.4	1.8	2.2	2.8	AHL

Notes 1: All specifications at -10 dBm power.
2: Case dimensions and weight are exclusive of connectors.

Additional Specifications which apply to all units
1: Limiting threshold +6 dBm, minimum, +10 dBm, typical.
2: Flat leakage: 100 mW maximum with 200 watts (-0 series) or 1000 watts (-1 series) peak; 1.0 microsecond pulse width; 0.1% duty cycle.
3: Spike leakage: 0.1 erg maximum with 20 nanosecond risetime pulses.
4: Maximum continuous input 2 Watts (-0 series), 4 watts (-1 series).
5: Recovery time: 100 nanoseconds Max (-0 series), 200 nanoseconds Max (-1 series).
6: Case Weight: 5.0 grams (excluding connectors).

CASE DRAWING

AHL



CONNECTOR OPTION TABLE		
DASH NO.	INPUT	OUTPUT
-001	FEM	FEM
-002	NONE	NONE
-003	MALE	MALE
-004	MALE	FEM
-005	FEM	MALE

WEIGHT WITH CONNECTORS AND SPACER = 10.5 GRAMS
WEIGHT WITHOUT CONNECTORS AND SPACER = 5.0 GRAMS

NOTES (UNLESS OTHERWISE SPECIFIED)
DIMENSIONS IN INCHES
TOLERANCES XX ±.02
XXX ±.010

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

UTL/GPL SERIES, VOLTAGE CONTROLLED SIGNAL LIMITERS

These thin-film limiters feature voltage programmable output levels with input levels as high as +26 dBm. They have VSWR of less than 2:1, low insertion loss, excellent second and third harmonic suppression, and very low AM-to PM conversion. Recovery from fully saturated input levels is less than 50 nanoseconds.

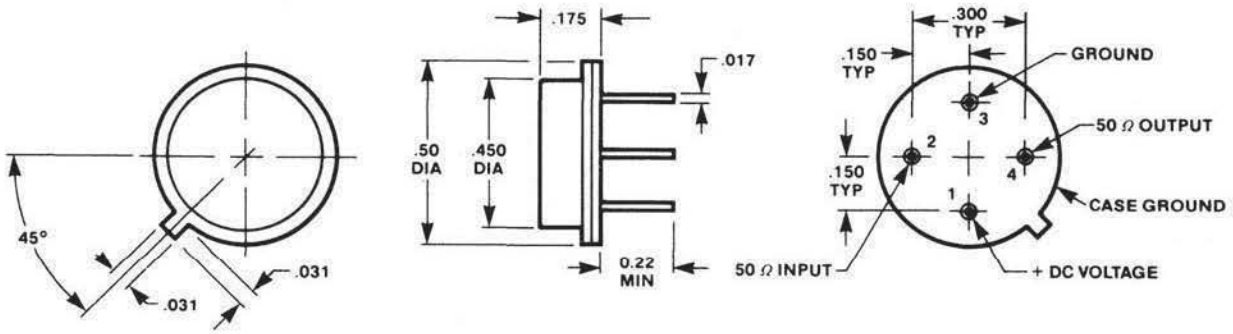
Guaranteed Specifications @ 25° C Case Temperature PC2

Model	Frequency Range (MHz)	Input Power Limiting Range (dBm) Minimum	Saturated Output Power (dBm) Maximum	Output Flatness (dB) Typical	Insertion Loss (dB) Maximum	Operating Bias (VAC) Nominal	Case Type
UTL-1001	50-1000	0 to +20	-10 to 0[1]	±1.0	3.0	+5 to +20	TO-8U
UTL-1002	5-1000	0 to +20	-10 to 0[1]	±1.0	3.0	+5 to +20	TO-8U
GPL-1001	5-1000	0 to +20	-4.0	±1.0	5.0	+15	TO-12

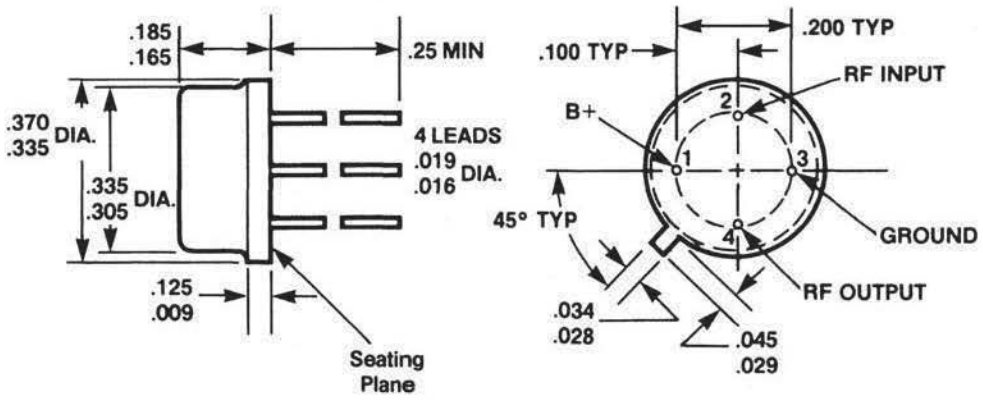
Note 1: Determined by bias voltage.

CASE DRAWINGS

TO-8U



TO-12



DIMENSIONS IN INCHES
TOLERANCES: XX ± .02
XXX ± .010

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

THIN-FILM DETECTORS

Avantek offers both analog and one bit digital detector products. All are temperature compensated and impedance matched to simplify power measurements. Internal biased Schottky diodes and integral video circuitry provide a one part, drop in solution for the systems designer.

UTD SERIES, LEVEL DETECTORS

Guaranteed Specifications @ 25° C Case Temperature

PC2

Model	Frequency Range (MHz)	Detected Voltage at P_{In} = 10 dBm (mV), Typ.	Flatness (dB), Max.	Tangential Sensitivity w/BW = 1 MHz (dB)	Input Impedance (Ohms)	Input VSWR Maximum	Output Offset Voltage (mV), Typ.	Differential Voltage Tracking (mV), Typ.	Case Type
UTD-1000	10-1000	-90	±1.0	-40	50	1.7:1	±15	±5	TO-8F
UTD-1001	10-1000	-90	±1.0	-40	300	—	±15	±5	TO-8F

PPD-2001, PLANARPAK™ SURFACE MOUNTED LEVEL DETECTOR

Guaranteed Specifications at 0° to 50° C Case Temperature

PC2

Model	Frequency Range (MHz)	VSWR (50Ω) Maximum	Sensitivity (V/mW) Typical	Flatness (@ input) (dB) Maximum	Video B/W (kHz) Typical	Power (VDC) Nominal	Case Type
PPD-2001	20-2000	1.8	.9	±.3	150	±15	PP-25DA

TTL COMPATIBLE THRESHOLD DETECTORS

The new threshold detectors feature voltage or resistance adjustable threshold level and TTL compatible output. They are extremely compact parts for built-in-test applications.

Guaranteed Specifications at 25° C Case Temperature

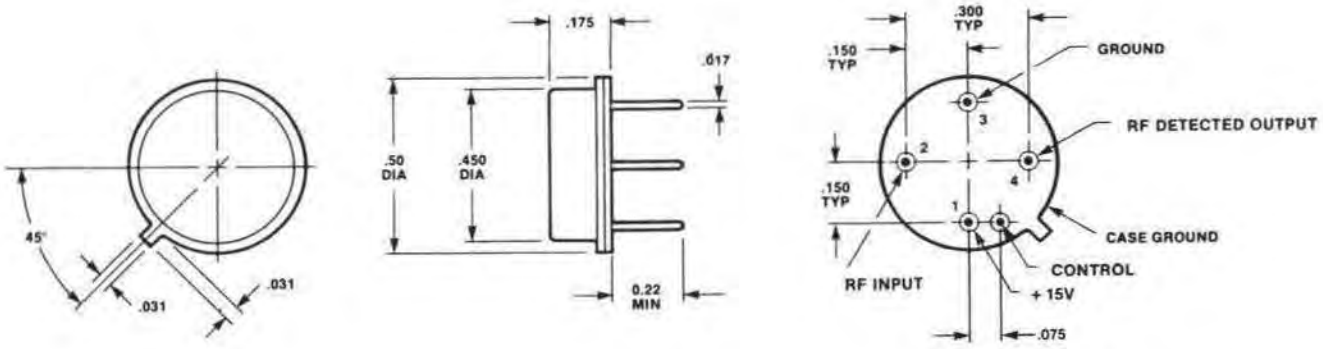
PC2

Model	Frequency Range (MHz)	Input Flatness[1] (dB), Max.	Input Operating Range (dBm), Typ.	Input VSWR Max.	Threshold Control Level Typ.	Supply Voltage Range Min./Max.	Supply Current @ 15 VDC (mA), Typ.	Case Type
UTD-2002[1]	10-2000	±0.7	-10 to +10	1.7	0-1 Volts 300-3K ohms	+11 to +16	12	TO-8F
UTD-2004	10-2000	±1.0	-30 to -10	2.0[2]	1-10K ohms	+5 to +20	3	TO-8F
PPD-6002	100-6000	±1.0	-10 to +10	2.0	0-1 Volts 300-3K ohms	+11 to +16	12	PP-25DD
ATD-18021	10-18000	±1.5	-30 to -10	3.0	1-10K ohms	+5 to +20	3	AT-1

Notes 1: P_{IN} = -10 to +10 dBm
2: P_{IN} <-20 dBm

CASE DRAWING

TO-8F



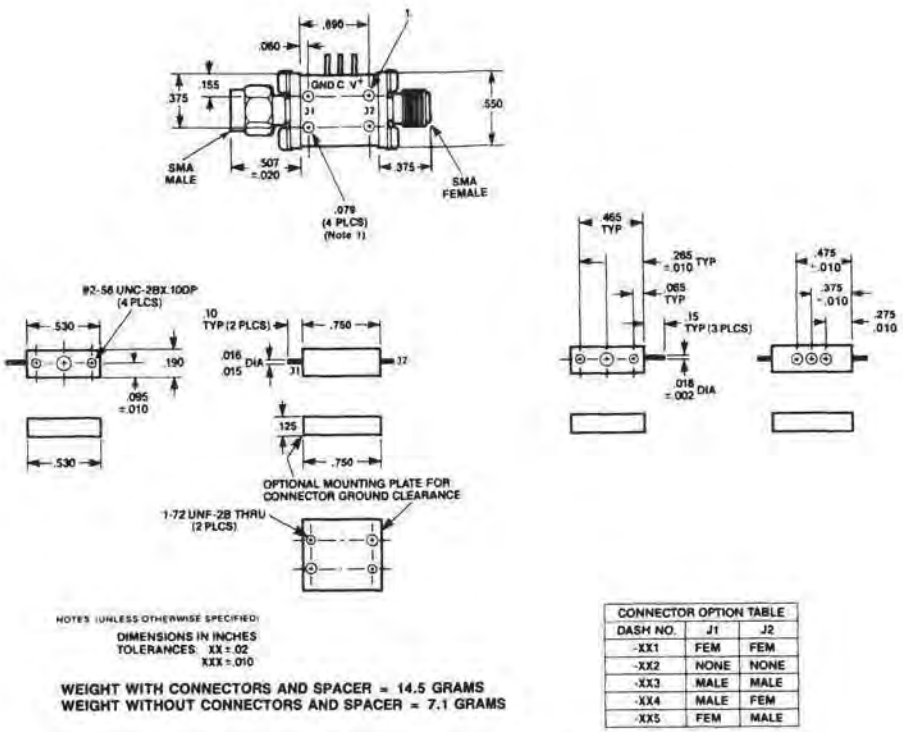
NOTE:
ALL DIMENSIONS IN INCHES
TOLERANCES: XX ± .02
XXX ± .010

APPROXIMATE WEIGHT .06 OZ.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

CASE DRAWING

AT-1



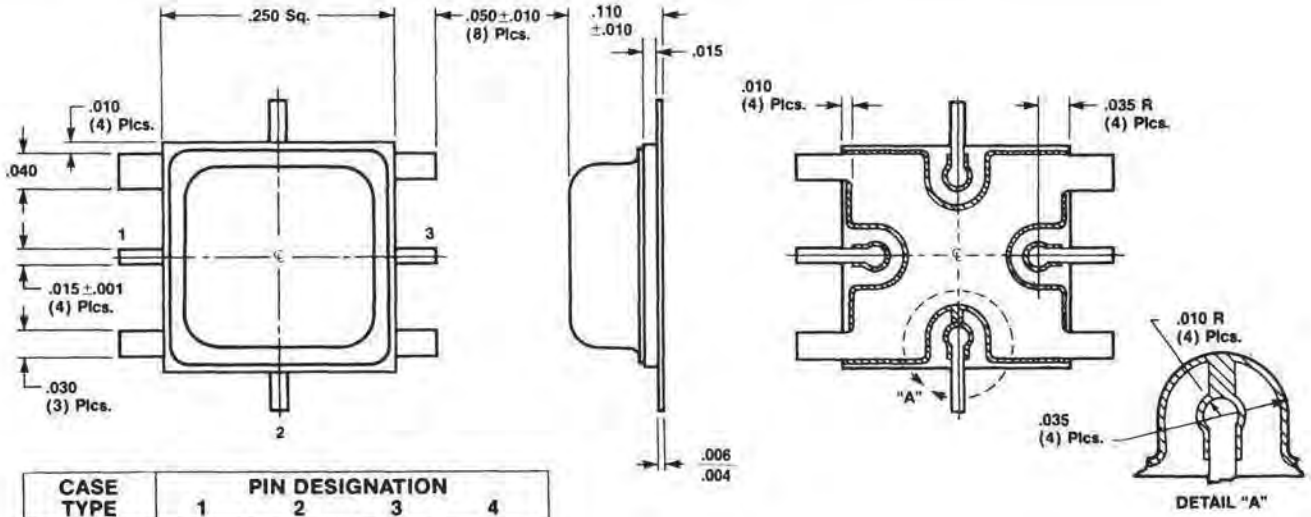
NOTES (UNLESS OTHERWISE SPECIFIED)
DIMENSIONS IN INCHES
TOLERANCES: XX ± .02
XXX ± .010

WEIGHT WITH CONNECTORS AND SPACER = 14.5 GRAMS
WEIGHT WITHOUT CONNECTORS AND SPACER = 7.1 GRAMS

CONNECTOR OPTION TABLE		
DASH NO.	J1	J2
-XX1	FEM	FEM
-XX2	NONE	NONE
-XX3	MALE	MALE
-XX4	MALE	FEM
-XX5	FEM	MALE

Notes 1. Clearance hole is for #1-72 UNC-2A × 5/16" for mounting optional spacer plate.
2. Use connector kits SK-005 and SK-006.
3. SMA connectors optional at J1 and J2, shown for dimensional purposes.

PP-25DA/DD



CASE TYPE	PIN DESIGNATION 1	2	3	4
PP25DA	RF In	V-	V_{OUT}	V+
PP25DD	RF In	V Control	V_{OUT}	V+

Tolerance: ±.005
Unless otherwise specified.

Note: Leads are for testing only and may be trimmed flush at time of installation.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

AVANPAK™, THIN-FILM PIN-DIODE SWITCHES

Avantek's line of microwave switches has given the industry a new standard to measure by. All thin-film construction and the Avanpak packaging system results in a switch more compact and a lot more rugged than anything else available.

This line of extremely small switches uses Avantek's proven thin-film hybrid processing techniques found in other products for the EW market: laser-machined substrates, gold metalization, precise photolithography, laser trimmed resistors and laser welded packages. The result is a great savings in space, with the premium quality and reliability found in all Avantek components.

Avantek's line of microwave switches will soon be expanded to include both reflective and non-reflective models designed to operate over the full 0.5-18 GHz band. Contact Avantek for details.

AH SERIES, SINGLE POLE, SINGLE THROW (SPST) PIN-DIODE SWITCHES

Guaranteed Specifications[2] at 25° C Case Temperature[3]

PC2

Model Number	Frequency (GHz)	Switching Speed[1] (Nanoseconds) Maximum	Isolation (dB), Min.	VSWR Maximum	Insertion Loss Max. (dB) Freq. GHz .5-2.0	2.0-4.0	4.0-8.0	8.0-12.0	12.0-18.0	Case Type	Weight[4] (Grams)
LOW LOSS											
AHS-0402-0XX	2.0-4.0	25	40	1.8	—	0.9	—	—	—	SPST-0	5.5
AHS-0802-0XX	2.0-8.0	25	40	1.8	—	0.9	1.2	—	—	SPST-0	5.5
AHS-1202-0XX	2.0-12.0	25	40	1.8	—	0.9	1.2	1.7	—	SPST-0	5.5
AHS-1802-0XX	2.0-18.0	25	40	1.8	—	0.9	1.2	1.7	2.1	SPST-0	5.5
HIGH ISOLATION											
AHS-0402-1XX	2.0-4.0	25	60	1.8	—	1.1	—	—	—	SPST-1	6.5
AHS-0802-1XX	2.0-8.0	25	60	1.8	—	1.1	1.4	—	—	SPST-1	6.5
AHS-1202-1XX	2.0-12.0	25	60	1.8	—	1.1	1.4	1.9	—	SPST-1	6.5
AHS-1802-1XX	2.0-18.0	25	60	1.8	—	1.1	1.4	1.9	2.4	SPST-1	6.5

Notes 1: Speed is defined as 50% input trigger to 90% detected R.F. change including driver delay. Rise and fall times are less than 10 nS typical.
2: All specifications are at +10 dBm input power. Maximum input is +30 dBm.
3: Operating temperature: -55° C to +100° C.
4: Weight excluding connectors.
5: 40 dB min >2 GHz.
6: 60 dB min >2 GHz.

MODEL NUMBERING DESCRIPTION

TYPICAL PART NUMBER

AHD1202-024

- **Type (Double Throw)**
- **Upper Frequency, GHz**
- **Lower Frequency, GHz**
- **Connector Option(A)**
- **Driver Option(B)**
- **Option:**
  - **0 = Reflective**
  - **1 = Non-Reflective**

(A) CONNECTOR OPTION TABLE			
Dash	J0	J1	J2
-XX1	FEM	FEM	FEM
-XX2	NONE	NONE	NONE
-XX3	MALE	MALE	MALE
-XX4	MALE	FEM	FEM
-XX5	FEM	MALE	MALE

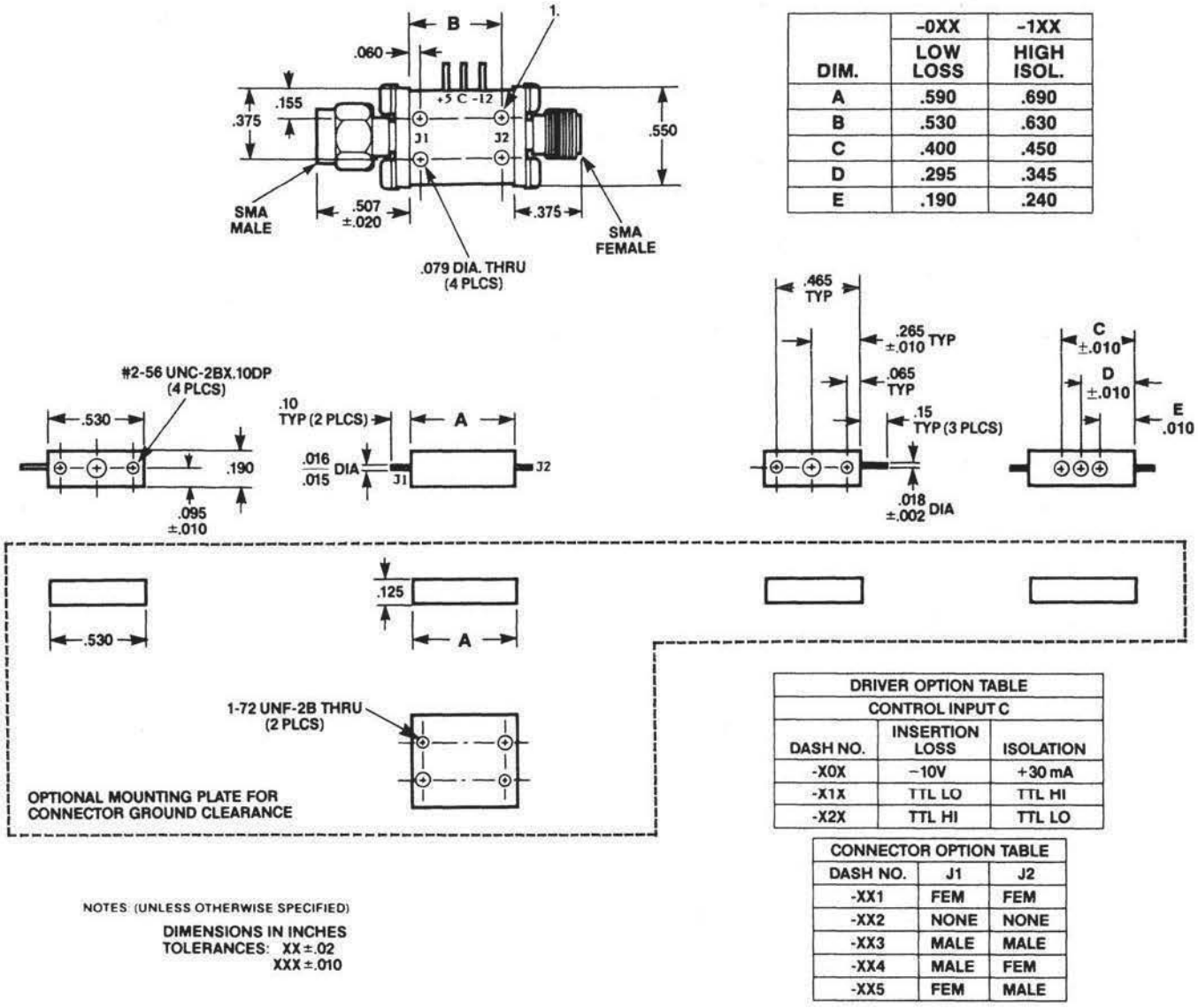
(B) DRIVER OPTION TABLE				
Dash No.	C1		C2	
	Insertion Loss	Isolation	Insertion Loss	Isolation
-X0X	-30 mA	+30 mA	-30 mA	+30 mA
-X1x	TTL LO	TTL HI	TTL LO	TTL HI
-X2X	TTL HI	TTL LO	TTL HI	TTL LO
-X3X	TTL LO	TTL HI	TTL HI	TTL LO
-X4X	TTL HI	TTL LO	TTL LO	TTL HI

Driver Bias: +5.0±0.5V at 150 mA maximum
-5.0 to -15.0V at 150 mA maximum
TTL LO=0 to 0.8V at 1.6 mA maximum sink
TTL HI=2.0 to 5.0V at 40 μA maximum source

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

CASE DRAWING

SPST



DIM.	-0XX LOW LOSS	-1XX HIGH ISOL.
A	.590	.690
B	.530	.630
C	.400	.450
D	.295	.345
E	.190	.240

DRIVER OPTION TABLE		
CONTROL INPUT C		
DASH NO.	INSERTION LOSS	ISOLATION
-X0X	−10V	+30 mA
-X1X	TTL LO	TTL HI
-X2X	TTL HI	TTL LO

CONNECTOR OPTION TABLE		
DASH NO.	J1	J2
-XX1	FEM	FEM
-XX2	NONE	NONE
-XX3	MALE	MALE
-XX4	MALE	FEM
-XX5	FEM	MALE

NOTES: (UNLESS OTHERWISE SPECIFIED)
DIMENSIONS IN INCHES
TOLERANCES: XX ±.02
XXX ±.010

Notes 1: Clearance hole is for #1-72 UNC-2A × 5/16" for mounting optional spacer plate.
2: Use connector kits SK-005 and SK-006.
3: SMA connectors optional at J1 and J2, shown for dimensional purposes.

WEIGHT (Grams)	-0XX LOW LOSS	-1XX HIGH ISOLATION
WITH CONNECTORS AND SPACER	11.5	13.0
WITHOUT CONNECTOR AND SPACER	5.5	6.5

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

AH SERIES, SINGLE POLE, DOUBLE THROW (SPDT) PIN-DIODE SWITCHES

Guaranteed Specifications[2] at 25° C Case Temperature[3]

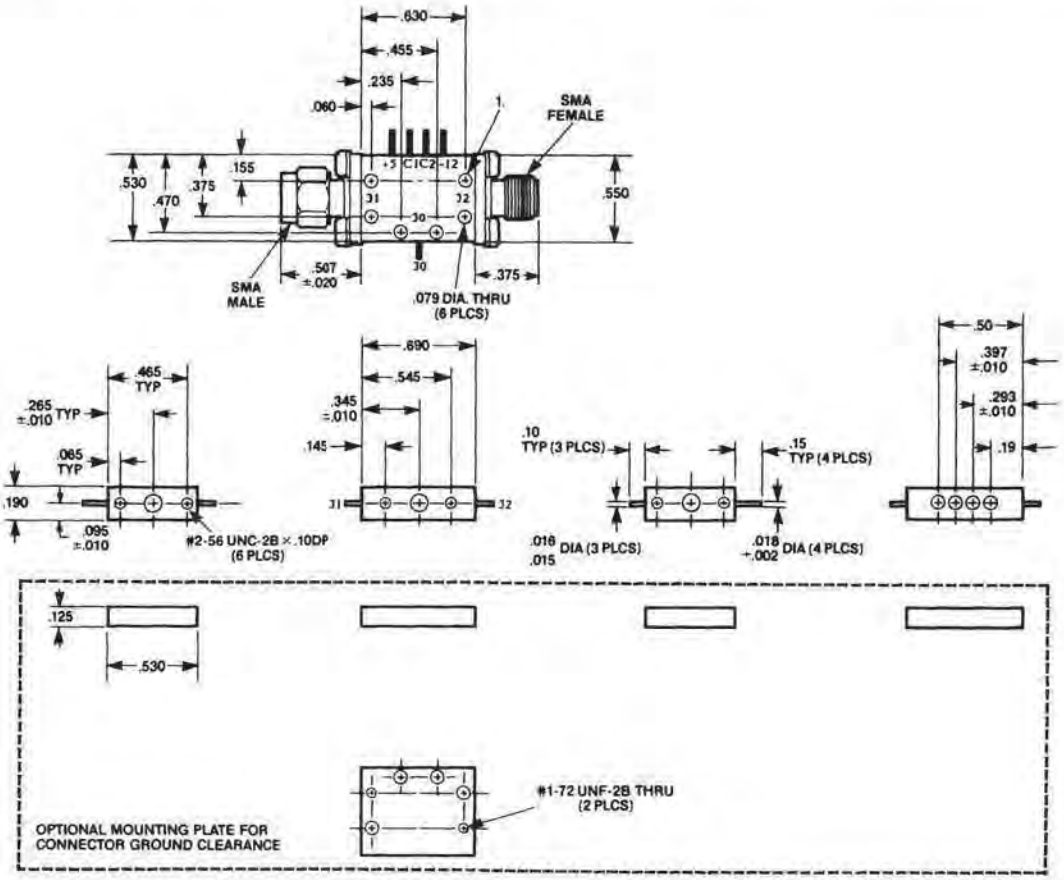
PC2

Model Number	Frequency (GHz)	Switching Speed[1] (Nanoseconds) Maximum	Isolation (dB) Min.	VSWR Maximum	Insertion Loss Max. (dB) Freq. GHz .5-2.0	2.0-4.0	4.0-8.0	8.0-12.0	12.0-18.0	Case Type	Weight[4] (Grams)
REFLECTIVE											
AHD-0402-0XX	2.0-4.0	50	50	1.8	—	1.3	—	—	—	SPDT	6.5
AHD-0802-0XX	2.0-8.0	50	50	1.8	—	1.3	1.8	—	—	SPDT	6.5
AHD-1202-0XX	2.0-12.0	50	50	1.8	—	1.3	1.8	2.3	—	SPDT	6.5
AHD-1802-0XX	2.0-18.0	50	50	1.8	—	1.3	1.8	2.3	2.9	SPDT	6.5

Notes 1: Speed is defined as 50% input trigger to 90% detected R.F. change including driver delay. Rise and fall times are less than 15 nS typical.
2: All specifications are at +10 dBm input power. Maximum input is +30 dBm.
3: Operating temperature: -55° C to +100° C.
4: Weight excluding connectors.

CASE DRAWING

SPDT



MODEL NUMBERING DESCRIPTION

TYPICAL PART NUMBER

AHS1202-124

- Type (Single Throw)
- Upper Frequency, GHz
- Lower Frequency, GHz
- Connector Option[A]
- Driver Option[B]
- Isolation Option: 0 = Reflective, 1 = Non-Reflective

(A) CONNECTOR OPTION TABLE		
Dash	J0	J2
-XX1	FEM	FEM
-XX2	NONE	NONE
-XX3	MALE	MALE
-XX4	MALE	FEM
-XX5	FEM	MALE

(B) DRIVER OPTION TABLE		
	Control Input C	
Dash No.	Insertion Loss	Isolation
-X0X	-10V	+30 mA
-X1X	TTL LO	TTL HI
-X2X	TTL HI	TTL LO

Driver Bias: +5±.5V at 150 mA maximum
-5 to -15V at 75 mA maximum
TTL LO=0 to .8V at 1.6 mA maximum sink
TTL HI=2 to 5V at 40 μA maximum source

DRIVER OPTION TABLE				
DASH	C1		C2	
	INSERTION LOSS	ISOLATION	INSERTION LOSS	ISOLATION
-X0X	-30 mA	+30 mA	-30 mA	+30 mA
-X1X	TTL LO	TTL HI	TTL LO	TTL HI
-X2X	TTL HI	TTL LO	TTL HI	TTL LO
-X3X	TTL LO	TTL HI	TTL HI	TTL LO
-X4X	TTL HI	TTL LO	TTL LO	TTL HI

CONNECTORED OPTION TABLE			
DASH	J0	J1	J2
-XX1	FEM	FEM	FEM
-XX2	NONE	NONE	NONE
-XX3	MALE	MALE	MALE
-XX4	MALE	FEM	FEM
-XX5	FEM	MALE	MALE

NOTES: (UNLESS OTHERWISE SPECIFIED)
DIMENSIONS IN INCHES
TOLERANCES: XX ± .02
XXX ± .010

WEIGHT WITH CONNECTORS AND SPACER = 14.5 GRAMS
WEIGHT WITHOUT CONNECTORS AND SPACER = 6.5 GRAMS

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

AH SERIES, SINGLE POLE, MULTI-THROW PIN-DIODE SWITCHES

Guaranteed Specifications[2] at 25° C Case Temperature[3]

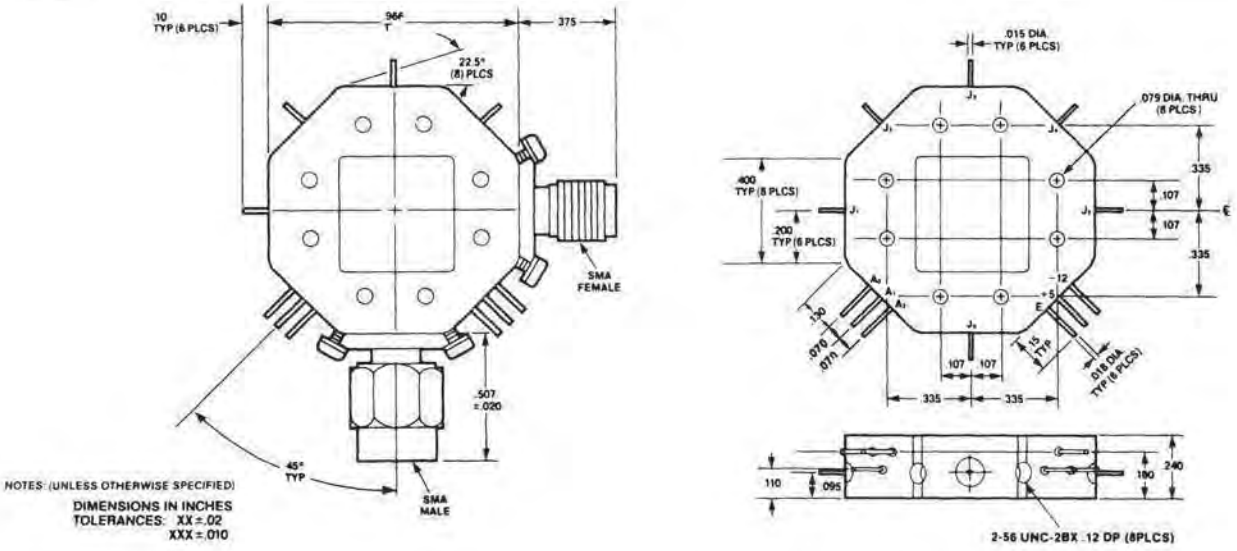
PC2

Model Number	Frequency (GHz)	Switching Speed[1] (Nanoseconds) Maximum	Isolation (dB), Min.	VSWR Maximum	Insertion Loss Max. (dB) Freq. GHz .5-2.0	2.0-4.0	4.0-8.0	8.0-12.0	12.0-18.0	Case Type	Weight[4] (Grams)
TRIPLE THROW REFLECTIVE											
AHT-0402-0XX	2.0-4.0	75	50	2.0	—	1.4	—	—	—	SPMT	17.5
AHT-0802-0XX	2.0-8.0	75	50	2.0	—	1.4	2.0	—	—	SPMT	17.5
AHT-1202-0XX	2.0-12.0	75	50	2.0	—	1.4	2.0	2.5	—	SPMT	17.5
AHT-1802-0XX	2.0-18.0	75	50	2.0	—	1.4	2.0	2.5	3.1	SPMT	17.5
FOUR THROW REFLECTIVE											
AHQ-0402-0XX	2.0-4.0	75	50	2.0	—	1.6	—	—	—	SPMT	17.5
AHQ-0802-0XX	2.0-8.0	75	50	2.0	—	1.6	2.2	—	—	SPMT	17.5
AHQ-1202-0XX	2.0-12.0	75	50	2.0	—	1.6	2.2	2.7	—	SPMT	17.5
AHQ-1802-0XX	2.0-18.0	75	50	2.0	—	1.6	2.2	2.7	3.4	SPMT	17.5
FIVE THROW REFLECTIVE											
AHF-0402-0XX	2.0-4.0	75	50	2.0	—	1.7	—	—	—	SPMT	17.5
AHF-0802-0XX	2.0-8.0	75	50	2.0	—	1.7	2.2	—	—	SPMT	17.5
AHF-1202-0XX	2.0-12.0	75	50	2.0	—	1.7	2.2	2.7	—	SPMT	17.5
AHF-1802-0XX	2.0-18.0	75	50	2.0	—	1.7	2.2	2.7	3.5	SPMT	17.5

Notes 1: Speed is defined as 50% input trigger to 90% detected R.F. change including driver delay. Rise and fall times are less than 15 nS typical.
2: All specifications are at +10 dBm input power. Maximum input is +30 dBm.
3: Operating temperature: -55° C to +100° C.
4: Weight excluding connectors.

CASE DRAWING

SPMT



CONNECTOR OPTION TABLE		
DASH	J0	J1 - J5
-0X1	FEM	FEM
-0X2	NONE	NONE
-0X3	MALE	MALE
-0X4	MALE	FEM
-0X5	FEM	MALE

WEIGHT WITH CONNECTORS = 26.5 GRAMS
WEIGHT WITHOUT CONNECTORS = 17.5 GRAMS

DRIVER OPTION TABLE			
Dash No.	Type	Low Insertion Loss	Isolation
X0X	No Driver	+30 mA	-20 mA
X1X	No Driver	-30 mA	+20 mA
X2X	Decoded Driver	See truth table	
X3X	Standard Driver	TTL LO	TTL HI
X4X	Inverted Driver	TTL HI	TTL LO

Note: X3X and X4X dash # not available with SPST models.

Truth Table for X2X Decoded Driver				
LOW LOSS PORT	TTL Input Level A0	A1	A2	E
J1	1	0	0	1
J2	0	1	0	1
J3	1	1	0	1
J4	0	0	1	1
J5	1	0	1	1
ALL OFF	X	X	X	0

Driver Bias: +5.0±0.5V at 75 mA maximum.
-5.0 to -15.0V at 150 mA maximum.

TTL LO = 0 to 0.8V at 1.6 mA maximum sink.
TTL Hi = 2.0 to 5.0V at 40 MA maximum source.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

MODEL NUMBERING DESCRIPTION

TYPICAL PART NUMBER

AHQ1202-024

- Type (Four Throw)
- Upper Frequency, GHz
- Lower Frequency, GHz
- Connector Option(A)
- Driver Option(B)
- Option:
  - 0 = Reflective
  - 1 = Non-Reflective

(A) CONNECTOR OPTION TABLE		
Dash	J0	J1-J5
XX1	FEM	FEM
XX2	NONE	NONE
XX3	MALE	MALE
XX4	MALE	FEM
XX5	FEM	MALE

(B) DRIVER OPTION			
Dash No.	Type	Low Insertion Loss	Isolation
X0X	No Driver	+30 mA	-20mA
X1X	No Driver	-30 mA	+20 mA
X2X	Decoded Driver	See truth table	
X3X	Standard Driver	TTL LO	TTL HI
X4X	Inverted Driver	TTL HI	TTL LO

Note: X3X and X4X dash # not available with SP5T models.

Truth Table for X2X Decoded Driver				
	TTL Input Level			
	A0	A1	A2	E
J1	1	0	0	1
J2	0	1	0	1
J3	1	1	0	1
J4	0	0	1	1
J5	1	0	1	1
ALL OFF	X	X	X	0

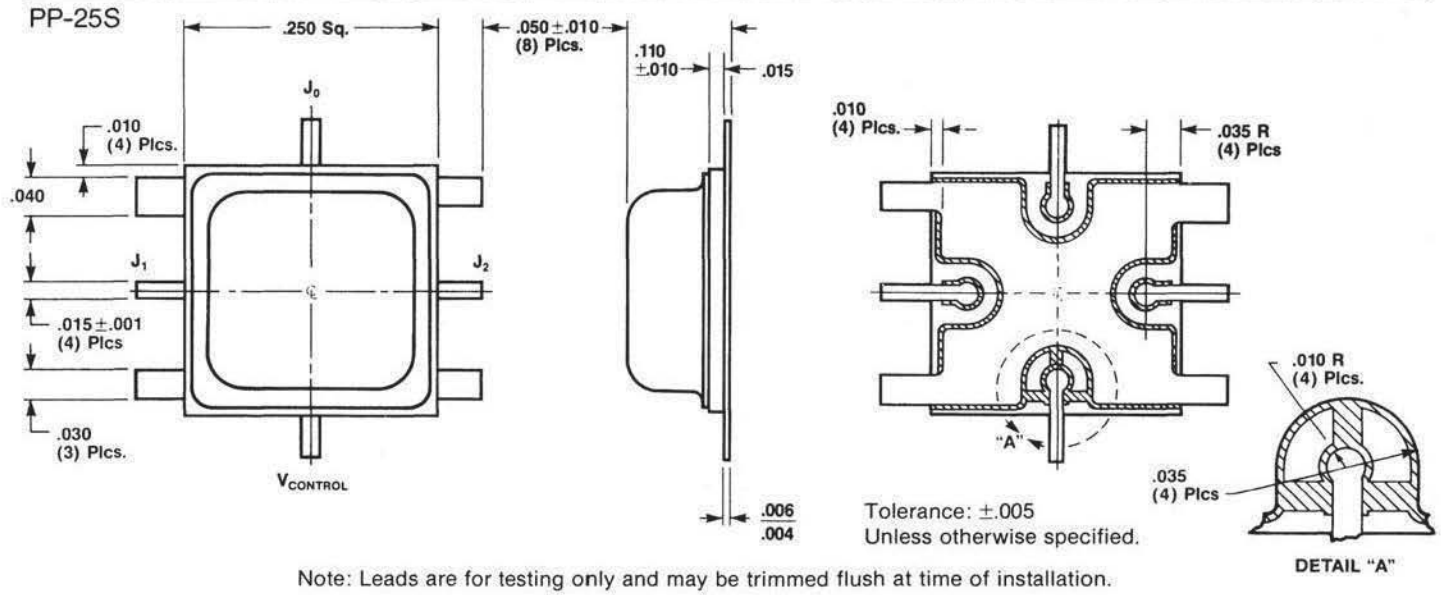
Driver Bias: +5.0±0.5V at 75 mA maximum.
-5.0 to -15.0V at 150 mA maximum.
TTL LO=0 to 0.8V at 1.6 mA maximum sink.
TTL HI=2.0 to 5.0V at 40 μA maximum source.

PPS-010, PLANARPAK™ SURFACE MOUNTED, NON-REFLECTIVE, SPDT SWITCH

Guaranteed Specifications at 0° to 50° C. Case Temperature PC2

Model	Frequency Range (MHz)	Insertion Loss (dB) Maximum	Isolation (dB) Minimum	VSWR (50Ω) Maximum	Switching Speed (μsec) Maximum	Control Voltage (VDC)	Case Type
PPS-010	10-200	1.5	40	1.7	5.0	±15	PP-25S
	200-500	1.5	30				
	500-2000	2.5	20				

CASE DRAWING



Tolerance: ±.005
Unless otherwise specified.

Note: Leads are for testing only and may be trimmed flush at time of installation.

Artisan Technology Group - Quality Instrumentation Guaranteed | (888) 88-SOURCE | www.artisantg.com

SILICON BIPOLAR TRANSISTORS

Avantek's line of VHF, UHF and microwave silicon bipolar transistors combine high gain, low noise figures and moderate power output for applications up to 6 GHz (oscillator applications up to 12 GHz). Special attention is paid to the industry's need for wide dynamic range VHF-UHF transistors.

All Avantek silicon bipolar transistors use nitride self-alignment and ion-implantation for precise control of emitter and base doping. The transistor die are metalized with one micrometer thick gold and passivated with silicon nitride.

SILICON BIPOLAR TRANSISTORS

Typical Specifications at 25°C Case Temperature

PC1

LOW NOISE

Part Number	Maximum Useable Frequency[1] (GHz)	Test Frequency (GHz)	NF_O (dB)	P_{1dB} (dBm)	$\|S_{21E}\|^2$ @ 1 GHz (dB)	f_{max}[2] (GHz)	Case Type
AT-41400	4.5	2.0	1.6	19.0	18.0	16.0	chip
AT-60100	3.0	2.0	1.9	4.0	12.5	15.0	chip
AT-60200	3.5	2.0	1.9	6.5	15.5	15.0	chip
AT-60500	4.0	2.0	1.8	16.0	17.5	15.0	chip
AT-41410	4.5	2.0	1.6	19.0	18.0	15.0	100 mil stripline
AT-60510	4.0	2.0	1.8	16.0	17.5	14.0	100 mil stripline
AT-41435	4.2	2.0	1.7	19.0	17.5	14.0	micro-X
AT-60535	4.0	2.0	1.8	16.0	17.0	13.0	micro-X
AT-41470	4.5	2.0	1.6	19.0	18.0	16.0	70 mil stripline
AT-60570	4.0	2.0	1.8	16.0	17.5	15.0	70 mil stripline
AT-41472	1.0	0.5	1.3	20.5	11.5	8.0	TO-72
AT-41485	4.0	1.0	1.4	18.5	17.5	13.0	85 mil plastic
AT-60585	4.0	1.0	1.4	15.0	17.0	12.0	85 mil plastic
AT-41486	4.0	1.0	1.4	18.0	17.5	13.0	surface mount plastic
AT-60586	4.0	1.0	1.4	15.0	17.0	12.0	surface mount plastic

GENERAL PURPOSE AND MEDIUM POWER

PC1

Part Number	Maximum Useable Frequency[1] (GHz)	Test Frequency (GHz)	NF_O (dB) Typ.	P_{1dB} (dBm)	$\|S_{21E}\|^2$ @ 1 GHz (dB)	f_{max} (GHz)	Case Type
AT-00500	3.0	2.0	2.5	16.0	15.5	9.0	chip
AT-01600	2.3	2.0	3.0	22.0	13.0	9.0	chip
AT-42000	3.8	2.0	1.9	21.0	17.0	15.0	chip
AT-00510	3.0	2.0	2.5	16.0	15.0	8.0	100 mil stripline
AT-01610	2.3	2.0	3.0	22.0	12.5	8.0	100 mil stripline
AT-42010	3.8	2.0	1.9	21.0	17.0	14.0	100 mil stripline
AT-00535	3.0	2.0	2.5	16.0	15.0	8.0	micro-X
AT-01635	2.2	2.0	3.0	22.0	12.0	8.0	micro-X
AT-42035	3.8	2.0	1.9	21.0	17.0	14.0	micro-X
AT-00570	3.0	2.0	2.5	16.0	15.5	9.0	70 mil stripline
AT-01670	2.3	2.0	3.0	22.0	13.0	9.0	70 mil stripline
AT-42070	3.8	2.0	1.9	21.0	17.5	15.0	70 mil stripline
AT-00572	1.0	0.5	1.9	19.0	10.0	4.0	TO-72
AT-01672	1.0	0.5	2.0	24.0	9.0	3.0	TO-72
AT-42085	3.0	1.0	1.4	20.5	17.0	12.0	85 mil plastic
AT-42086	3.0	1.0	1.4	20.0	17.0	12.0	surface mount plastic

LINEAR POWER

PC1

Part Number	Maximum Useable Frequency[1] (GHz)	Test Frequency (GHz)	P_{1dB} (dBm)	G_{1dB} (dB)	$\|S_{21E}\|^2$ @ 1 GHz (dB)	f_{max} (GHz)	Case Type
AT-64020	2.0	2.0	28.0	10.0	12.5	8.0	200 mil BeO
AT-64023	2.2	4.0	27.0	9.5	12.0	8.0	Flange BeO

Note 1: Frequency at which $|S_{21E}|^2$ gain equals 6 dB.
2: Frequency at which MAG equals unity or 0 dB. See Glossary for definitions.

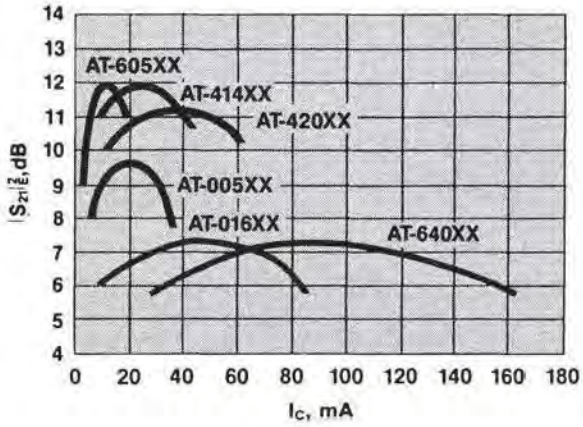
Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

RECOMMENDED Si BIPOLAR TRANSISTORS FOR CLASS-A AMPLIFIER APPLICATIONS

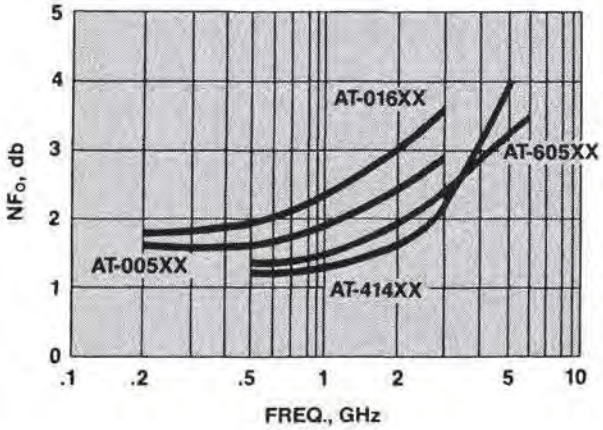
Frequency	Low Noise Amplifier Stages		Intermediate Amplifier Stages		Driver/Output Amplifier Stages	
100 MHz		AT-00572	AT-00572	AT-01672	AT-01672	
500 MHz	AT-00572 AT-60570 AT-60585 AT-60586	AT-41435-3 AT-41470 AT-41485	AT-00572 AT-01635 AT-41435-5	AT-41485 AT-42070 AT-42085 AT-42086	AT-01672 AT-01635	AT-64020
1 GHz	AT-01670 AT-60570 AT-60585 AT-60586	AT-41435-3 AT-41470 AT-41485 AT-41486	AT-41435-5 AT-41410 AT-41485 AT-41486	AT-42035 AT-42070 AT-42085 AT-42086	AT-64020 AT-01610 AT-01635	AT-42035 AT-42070 AT-42085 AT-42086
2 GHz	AT-60570 AT-60585 AT-60586	AT-41435-3 AT-41470 AT-41485 AT-41486	AT-41435-5 AT-41410 AT-41485 AT-41486	AT-42035 AT-42070 AT-42085 AT-42086	AT-64023 AT-64020 AT-01610 AT-01635	AT-42035 AT-42070 AT-42085 AT-42086
4 GHz	AT-60570 AT-60585	AT-41435-3 AT-41470 AT-41485	AT-41435-5 AT-42035 AT-42070	AT-41485 AT-42085	AT-64023 AT-42035 AT-42070	AT-42085

TYPICAL PERFORMANCE: Si BIPOLAR TRANSISTORS

TYPICAL OPTIMUM NOISE FIGURE (NF_O) vs. FREQUENCY



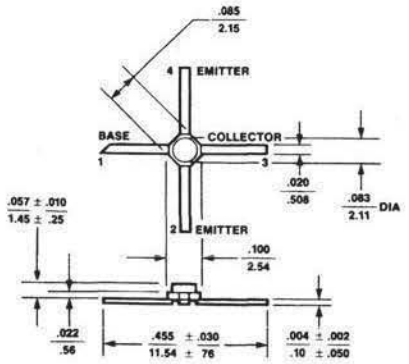
TYPICAL INSERTION POWER GAIN ($|S_{21}|^2_E$) vs. COLLECTOR CURRENT FREQUENCY = 2 GHz



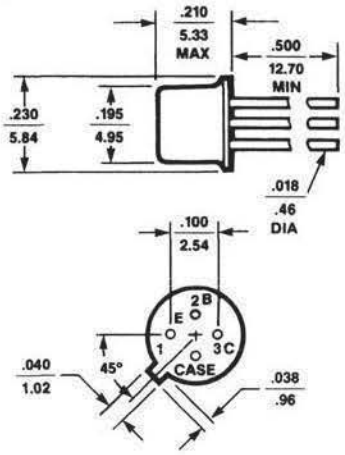
Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

CASE DRAWINGS

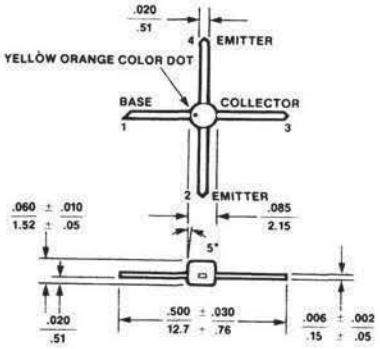
AVANTEK micro-X PACKAGE



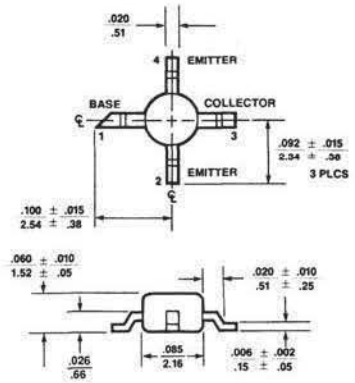
AVANTEK TO-72 PACKAGE



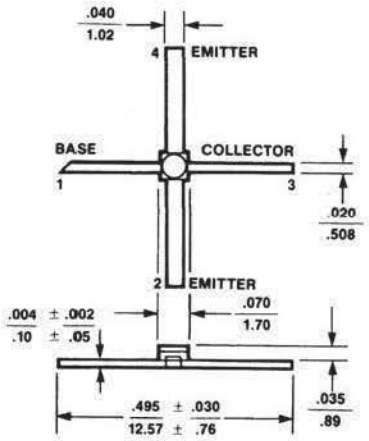
AVANTEK 85 PLASTIC PACKAGE



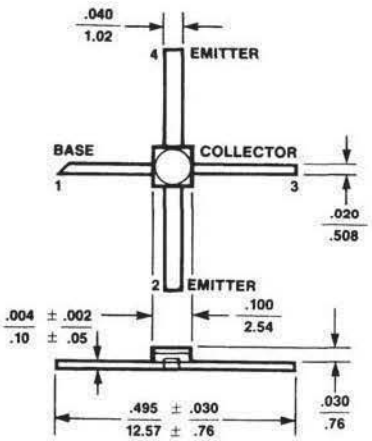
AVANTEK SURFACE MOUNT PLASTIC



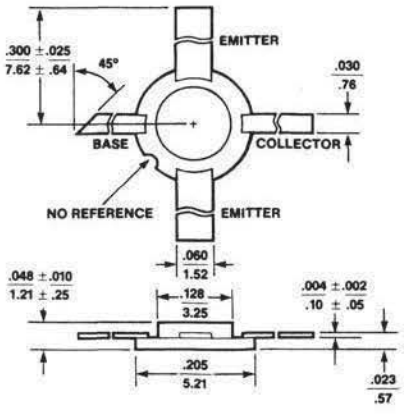
AVANTEK 70 mil PACKAGE



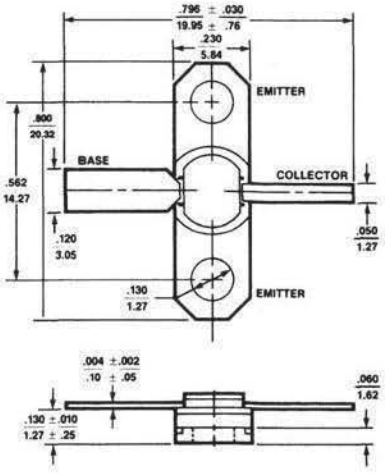
AVANTEK 100 mil PACKAGE



AVANTEK 20 mil BeO PACKAGE



AVANTEK 230 mil BeO FLANGE PACKAGE



NOTES:

(Unless otherwise specified)

1. Dimensions are $\frac{\text{in}}{\text{mm}}$
2. Tolerances
   in .xxx = ±.005
   mm .xx = ±.13

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

GaAs FIELD EFFECT TRANSISTORS

LOW NOISE AND GENERAL PURPOSE GaAs FETs

Avantek's line of low noise and general purpose gallium arsenide field effect transistors offer high gain, low noise figure and moderate power output for amplifier applications up to 18 GHz. These devices are suitable for use in space, airborne, military ground and shipboard, and commercial environments.

All Avantek small signal FETs have nominal gate lengths of .3 microns. Proven gold based metalization systems and nitride passivation assure a rugged, reliable device.

LOW NOISE and GENERAL PURPOSE GaAs FETs

Typical Specifications at T_A = 25° C

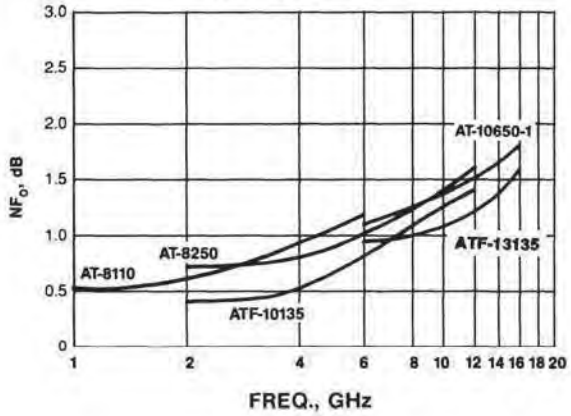
PC1

Model	Gate Width (um)	Optimum Frequency Range (GHz)	Test Frequency (GHz)	NF_O (dB)	G_A (dB)	P_{1dB} (dBm)	Case Type
Low Noise GaAs FETs							
AT-8111	750	1-6	4	0.9	13.0	23.0	chip
AT-8251	500	2-10	4	0.8	14.0	21.0	chip
AT-10600	250	6-18	12	1.6	9.0	18.0	chip
AT-8110	750	1-6	4	0.9	13.0	23.0	70 mil
AT-8250	500	2-10	4	0.8	14.0	21.0	70 mil
AT-10650-1	250	6-16	12	1.5	9.0	18.0	50 mil
AT-10650-3	250	6-16	12	1.7	9.0	18.0	50 mil
ATF-10135	500	2-12	4	0.5	13.0	20.0	micro-X
ATF-10235	500	2-12	4	0.8	13.0	20.0	micro-X
ATF-10335	250	6-16	12	1.2	9.5	17.5	micro-X
AT-10435	250	6-16	12	1.4	9.0	17.5	micro-X

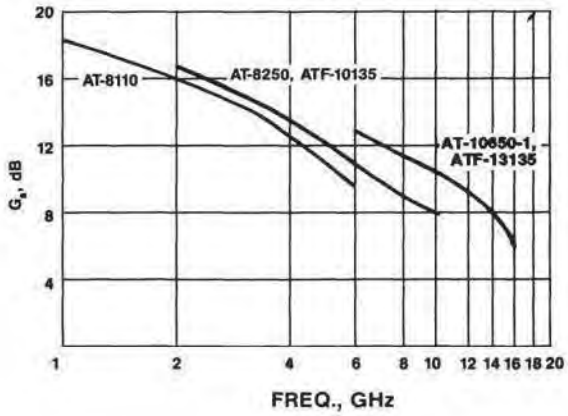
Model	Gate Width (um)	Optimum Frequency Range (GHz)	Test Frequency (GHz)	NF_O (dB)	G_A (dB)	P_{1dB} (dBm)	Case Type
General Purpose GaAs FETs							
AT-12570-5	500	2-10	4	1.0	14.0	20.5	70 mil
AT-10650-5	250	6-16	12	2.1	9.0	18.0	50 mil
AT-12535	500	2-10	4	1.2	13.0	19.0	micro-X
ATF-20135	500	2-12	4	1.2	13.0	20.0	micro-X
AT-10635	250	6-16	12	2.2	8.0	18.0	micro-X
ATF-20235	250	6-16	12	1.8	9.0	17.5	micro-X

Typical Performance = Low Noise and General Purpose GaAs FETs

OPTIMUM NOISE FIGURE (NF_O) vs. FREQUENCY



ASSOCIATED GAIN (G_A) vs. FREQUENCY



Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

MEDIUM POWER GaAs FETs

Avantek's line of medium power gallium arsenide field effect transistors are designed for linear amplification up to 14 GHz. These devices are suitable for applications in space, airborne, military ground and shipboard, and commercial environments.

All Avantek medium power FET's have nominal 0.5 micron gate lengths and an interdigitated four-cell structure using airbridge interconnects between fingers. Proven gold based metalization systems and nitride passivation assure a rugged, reliable device.

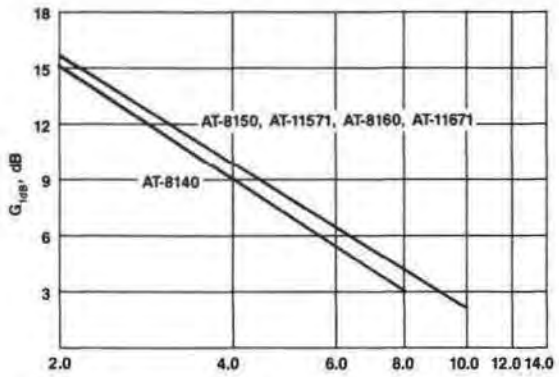
MEDIUM POWER GaAs FETs

Typical Specifications at 25° C Case Temperature PC1

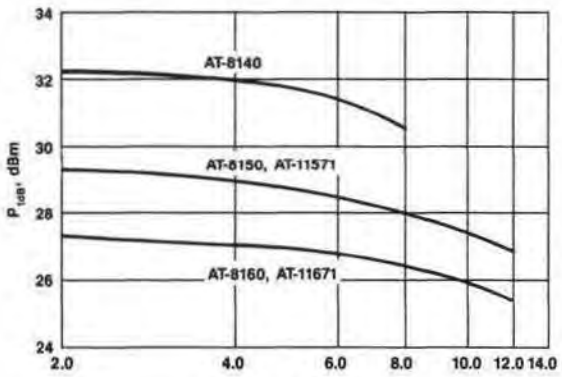
Model	Optimum Frequency Range (GHz)	Test Frequency (GHz)	P_{1dB} (dBm)	G_{1dB} (dB)	Case Type
AT-8141	2-8	4	32.0	90	chip
AT-8151	2-12	4	29.0	11.0	chip
AT-8161	2-14	4	27.0	12.0	chip
AT-8140	2-8	4	32.0	9.0	100 mil flange
AT-8150	2-8	4	29.0	10.0	100 mil flange
AT-8160	2-10	4	27.0	10.0	100 mil flange
AT-11571	2-8	4	29.0	10.5	70 mil flange
AT-11671	2-10	4	27.0	11.0	70 mil flange

TYPICAL PERFORMANCE: MEDIUM POWER GaAs FETs

OUTPUT POWER @ 1dB COMPRESSION GAIN (P_{1db}) vs. FREQUENCY



1 dB COMPRESSED GAIN vs. FREQUENCY



RECOMMENDED GaAs FETs FOR CLASS-A AMPLIFIER APPLICATIONS

Frequency	Low Noise Amplifier Stages	Intermediate Amplifier Stages	Driver/Output Amplifier Stages
2 GHz	AT-8110/8250 AT-12535	AT-8110/8160/12570-5	AT-8150/8140
4 GHz	AT-8110/8250 AT-12535	AT-8110/8160/12570-5	AT-8150/8140
8 GHz	AT-10650-1 AT-8250	AT-8160	AT-8150
12 GHz	AT-10650-1 AT-8250/8251	AT-11671	AT-11571
18 GHz			AT-10650-3

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

IMFET™ INTERNALLY MATCHED POWER GaAs FETs

Avantek's IMFET™ family of internally matched field effect transistors offers the designer entirely matched power amplifier modules suitable for use in commercial and military applications. These devices are optimized to operate over specific telecommunications and radar bands.

Avantek IMFET devices offer high gain, power added efficiency and linearity. Power outputs are typical 4 watts afor the "-3" devices and 7 watts for the "-6" devices.

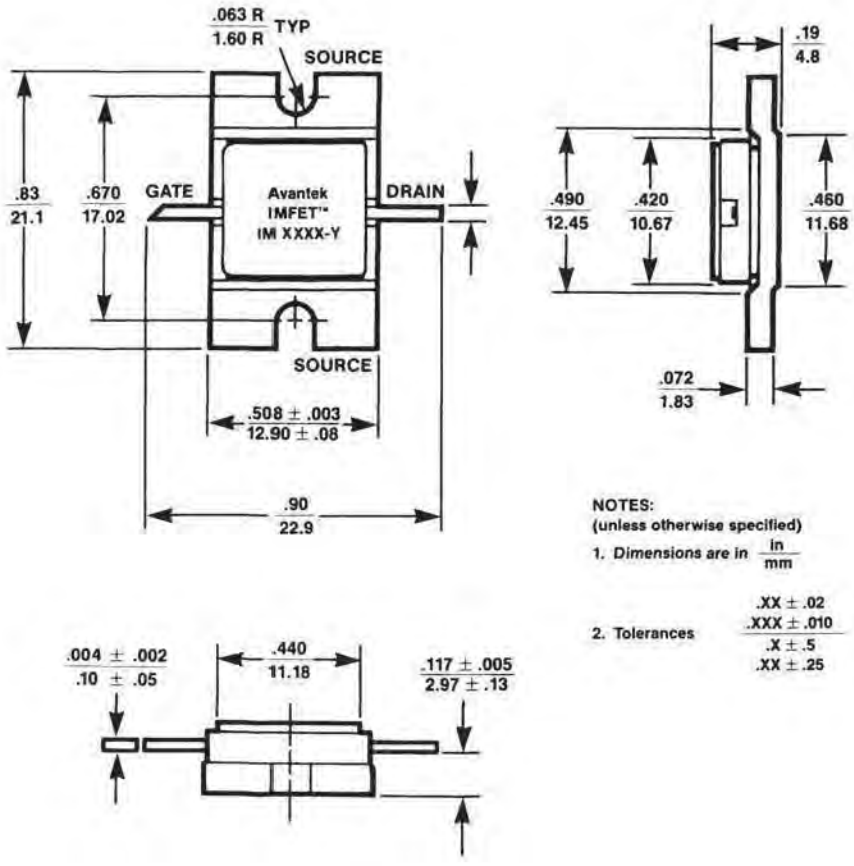
Fully distributed input and output thin-film matching circuitry incorporated into the package allow all guaranteed specifications to be achieved without the use of external tuning elements when the device is operated in a 50 ohm system. The active GaAs FET die use a nominal 0.5 micron gate length geometry and provide a total gate periphery of 10 mm for the -3 and 20 mm for the -6. Proven gold metalization systems and nitride passivation assure a rugged, reliable device.

IMFET™ INTERNALLY MATCHED POWER GaAs FETs

Typical Specifications @ T_A = 25° C

Model	Optimum Frequency Range (GHz)	P_{1dB} (dBm)	G_{1dB} (dB)	η_{ADD} (%)	Case Type
IM-2935-3	2.9-3.5	36.0	11.5	35.0	IMFET
IM-3742-3	3.7-4.2	36.0	11.5	35.0	IMFET
IM-3742-6	3.7-4.2	38.5	9.5	30.0	IMFET
IM-4450-3	4.4-5.0	36.0	10.5	35.0	IMFET
IM-4450-6	4.4-5.0	38.5	8.5	30.0	IMFET
IM-5459-3	5.4-5.9	36.0	9.0	35.0	IMFET
IM-5964-3	5.9-6.4	36.0	9.0	35.0	IMFET
IM-5964-6	5.9-6.4	38.5	7.5	30.0	IMFET
IM-6471-3	6.4-7.1	36.0	8.0	35.0	IMFET
IM-7178-3	7.1-7.8	36.0	7.5	35.0	IMFET
IM-7984-3	7.9-8.4	36.0	7.0	35.0	IMFET

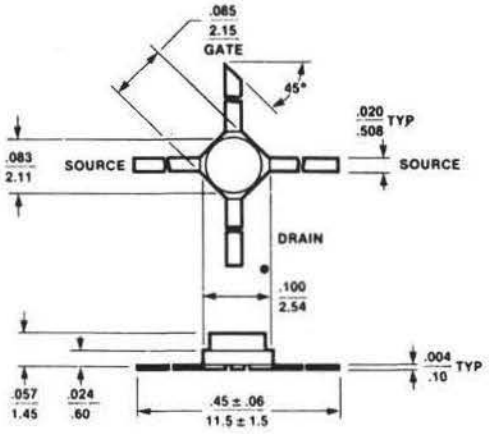
IMFET PACKAGE DRAWING



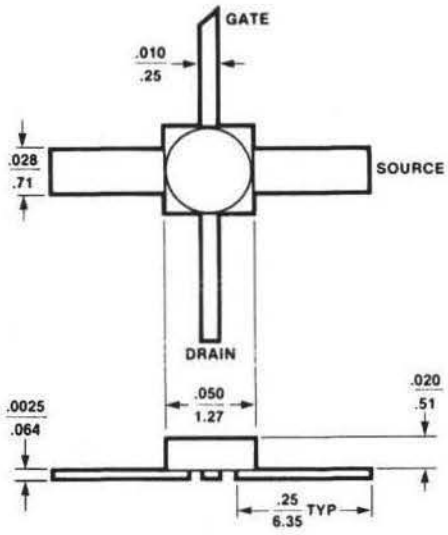
Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

CASE DRAWINGS

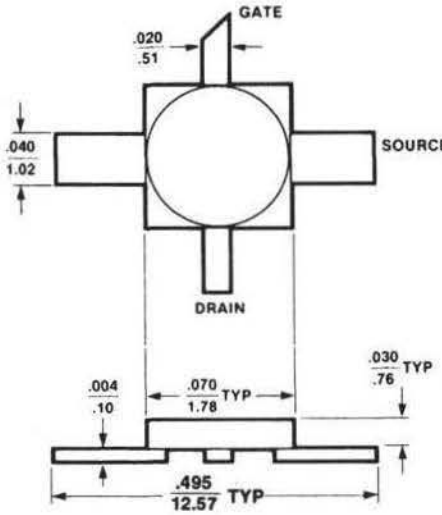
micro-X PACKAGE



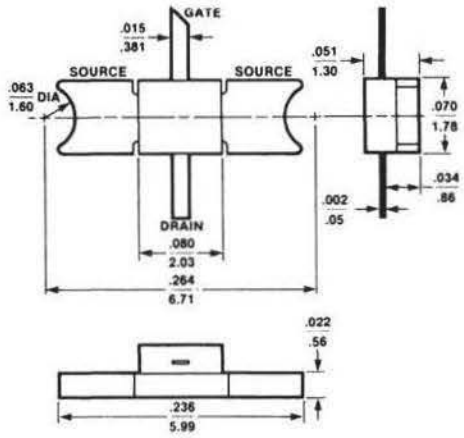
50 mil STRIPLINE PACKAGE



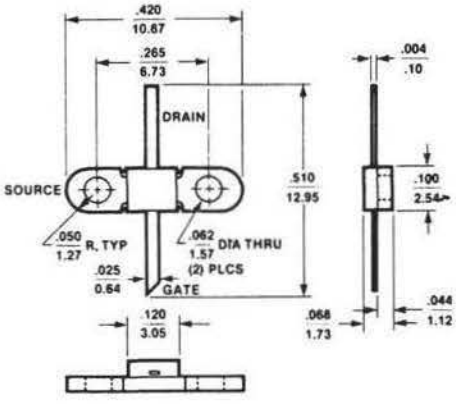
70 mil STRIPLINE PACKAGE



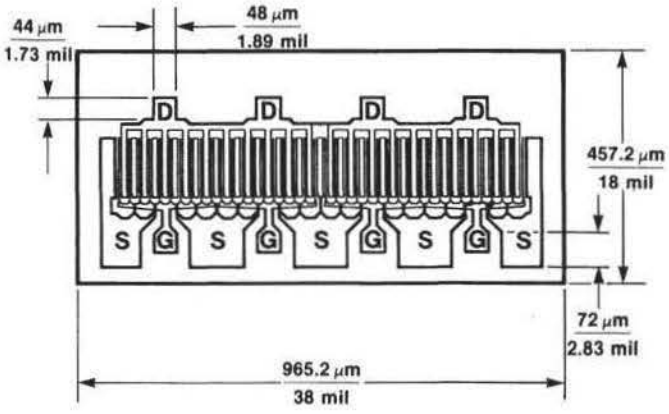
70 mil FLANGE PACKAGE



100 mil FLANGE PACKAGE



CHIP



Artisan Technology Group - Quality Instrumentation... Guaranteed | (888) 88-SOURCE | www.artisantg.com

OTHER AVANTEK CAPABILITIES

INTEGRATED SUBASSEMBLIES AND "SUPERCOMPONENTS"

In addition to supplying one of the industry's widest lines of solid-state microwave and millimeter-wave components, Avantek is also committed to providing a broad capability of integrating these components into complete, functional subassemblies. An Avantek integrated subassembly offers a number of significant advantages to the customer, including:

- Minimizing outside vendor problems, which means a much higher probability of on-time delivery and fewer potential technical problems.
- Better subassembly performance margins based upon Avantek's superior component performance.
- Smaller size due to the elimination of interconnects and reduction of components dimensions.
- Higher reliability due to strict Avantek workmanship standards and precision thin-film implementation.
- Cost-effective production, with an emphasis on repeatability and process control.
- More gain per unit area which results in smaller size, less variation in gain over temperature and less power dissipation.
- Consistently lower noise figure because of Avantek FETs which exhibit the lowest noise figure in the microwave industry on a consistent, repeatable basis in production quantities.
- Lower risk because Avantek will not commit to a specification unless it is really achievable.
- A producible design which can be manufactured in large quantities on a consistent, repeatable basis.
- Military qualification to applicable standards.
- Program support and management.

Avantek is currently incorporating two innovative state-of-the-art MMIC chips into its products: 1) a GaAs FET distributed amplifier covering 2-18 GHz and 2) a high gain feedback amplifier covering 2-12 GHz. Avantek also has a GaAs MMIC design effort devoted to specific functions needed for subassembly applications. Avantek has also developed a strong filter design synthesis capability which allows implementation of both narrowband and broadband filters on thin-film substrates, with minimum development time.

Thin-film (or hybrid MIC) subassemblies use Avantek unpackaged chip transistors, which are optimized for performance in a hybrid configuration without package parasitics, and an advanced thin-film process technology. Thin-film construction routinely produces circuits in volume using advanced techniques such as vacuum deposition and laser trimming of resistor networks, automated wire bonding, and laser drilling of plated through holes.

The single most significant criterion for implementing a microwave function in a thin-film integrated subassembly is small size. The volume occupied by discrete microwave components which are interconnected by semi-rigid coax, can be significantly reduced by connectorless integration into a single machined housing. The fact that all functions are implemented with thin-film circuitry makes this size reduction even more dramatic.

Avantek's capabilities in the thin-film subassemblies area include the following:

- Microwave front-end assemblies containing switches, filters, mixers, amplifiers, multipliers, couplers, attenuators, etc.
- Phase and/or amplitude matched multichannel microwave front-end assemblies including the LO distribution chain.
- Up/down converters containing FET preamplifiers, filters, mixers, with LO distribution including multipliers and limiting amplifiers.
- Gain block subassemblies containing FET preamplifiers, filters, switched or analog attenuators, power dividers, couplers, etc.
- Transmit/receive modules containing low noise FET preamps, T/R switches, attenuators, phase shifters and power amplifiers.
- Voltage controlled oscillator subassemblies including varactor, YIG analog and digitally tuned models.
- Shipboard maritime transceiver for INMARSAT communications.

AVANTEK ADVANTAGES

- The broad base of Avantek standard microwave components, coupled with the high level of component design expertise resident in the various product areas, provides the subsystem designer with the best system building blocks available in the world today.
- The high level of vertical integration combined with the large component production volume assures a reliable supply of microwave components.
- Avantek design expertise and easy access to component knowledge in the various product divisions, assures our customers the most effective component selection and system design to meet the overall requirements.

The bottom line is that Avantek is a high quality, low risk supplier of microwave components and subassemblies.

Please contact Avantek Component Sales to discuss your specific component and subassembly requirements.

DIGITAL AND ANALOG LIGHTWAVE SYSTEMS

Avantek lightwave systems integrate with other communications products or operate separately in a variety of applications. Analog, digital and video transmission over fiber optic cable offers the user a wide range of technology to most efficiently match Avantek lightwave communications with your applications.

Digital lightwave systems with integral multiplexing capabilities are particularly attractive for metropolitan or local distribution of T1 circuits for telephone companies or private networks. They also serve as links to digital microwave systems.

A unique multiplex architecture in the digital lightwave products provides comprehensive network management capabilities and flexible network design.

Networks using drop/insert or loop protected configurations enable users to reduce the equipment required at each site and the number of optical fiber cables needed. These configurations increase system reliability and capability.

Analog lightwave systems serve as excellent extenders for analog-based networks. Broadcast quality video also can be implemented on Avantek lightwave systems.

These lightwave systems are often more economical than other distribution methods. And, in special applications, where isolation of other electronics and freedom from electromagnetic interference is required, this may be the only feasible transmission method.

DIGITAL MICROWAVE RADIOS

Avantek manufactures a variety of microwave digital radio terminals and repeaters for the transmission of digitally encoded voice or data in the 2, 4, 6, 18 and 23 GHz frequency bands. Models are available that satisfy FCC Rules Part 21 for operation of point-to-point microwave radio in the common carrier frequency bands as well as Part 94 for operation in the private operational fixed service frequency bands. Specialized products operating in the narrow 2 GHz band are available for use by businesses such as banks, insurance companies and retailers. Other models are specifically designed to meet the requirements of the Federal Government.

These radio systems can transmit up to 672 voice and/or data channels simultaneously with transmission rates as high as 45 Mbps.

Avantek can provide a complete service to customers ranging from consultation to determine the proper system configuration to a complete "turnkey" offering in which Avantek, acting as prime contractor, engineers, furnishes and installs a complete microwave radio system such that the customer need do nothing but count the savings realized through a privately owned digitally microwave radio systems.

For further information on Avantek Microwave Digital Radio and Lightwave Systems, please call (415) 498-1400.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

AVANTEK

Avantek Corporate Sales Offices

Regional Sales Offices

EASTERN
Avantek, Inc.
Suite N-165
10005 Old Columbia Road
Columbia, MD 21046
(301) 381-2600

CENTRAL
Avantek, Inc.
Woodcreek Plaza, Suite 180
101 W. Renner Road
Richardson, TX 75080
(214) 437-5694

WESTERN
Avantek, Inc.
200 N. Westlake Blvd., Suite 100
Westlake Village, CA 91362
(805) 373-3870

EUROPE
Avantek, Ltd.
Frimley Business Park, Unit 6
Frimley, Camberley
Surry GU16 SSG
United Kingdom
(44) 276-685753

Direct Sales Offices

MASSACHUSETTS
Avantek, Inc.
Suite 11
4 Court House Lane
Chelmsford, MA 01824
(617) 453-8846

NEW YORK
Avantek, Inc.
North Shore Atrium, Suite 118E
6800 Jericho Turnpike
Syosset, NY 11791
(516) 496-4500

PENNSYLVANIA
Avantek, Inc.
Suite 200
997 Old Eagle School Road
Wayne, PA 19087
(215) 254-9440

GEORGIA
Avantek, Inc.
Suite 140
2301 Park Lake Drive
Atlanta, GA 30345
(404) 493-7815

FLORIDA
Avantek, Inc.
1645 Honey Bear Lane
Dunedin, FL 33528
(404) 493-7815
(813) 787-3218

INDIANA
Avantek, Inc.
3304 Mallard Cove Lane
Fort Wayne, IN 46816
(219) 432-4965

CALIFORNIA
Avantek, Inc.
3175 Bowers Ave.
Santa Clara, CA 95054
(408) 986-8644

ILLINOIS
Avantek, Inc.
Suite 503
Countryside Executive Center
1250 W. Northwest Highway
Palatine, IL 60067
(312) 358-8963

KANSAS
Avantek, Inc
Suite 122
10,000 W. 75th Street
Shawnee Mission, KS 66204
(913) 677-3716

COLORADO
Avantek, Inc.
Suite 261
14261 E. 4th Avenue
Aurora, CO 80011
(303) 367-1000

Avantek Worldwide Distributors

Distributors

NORTHWEST
CALIFORNIA (Northern), IDAHO MONTANA, NEVADA (Northern), OREGON, WASHINGTON, WYOMING
Penstock, Inc.
520 Mercury Drive
Sunnyvale, CA 94086-4018
(408) 730-0300 (No. Calif.)
(206) 462-2118 (Washington)

SOUTHWEST
ARIZONA, CALIFORNIA (Southern), NEW MEXICO, NEVADA (Southern), TEXAS (El Paso area)
Sertek, Inc
5356 Sterling Center Drive
Westlake Village, CA 91361
(818) 707-2872

1046 N. Tustin, Suite "I"
Orange, CA 92667
(714) 997-7311 or 7314
(619) 224-6911 (San Diego)

2111 East Broadway Road., Suite 5
Tempe, AZ 85282
(602) 894-9405

COLORADO, UTAH
Sertek, Inc.
(800) 334-7127

CENTRAL
ARKANSAS, LOUISIANA (West of the Mississippi River), OKLAHOMA, TEXAS, (Except El Paso area)
Thorson Distributing Company
4445 Alpha Road
Dallas, TX 75234
(214) 233-5744

MIDWEST
ILLINOIS, INDIANA, IOWA, KANSAS, KENTUCKY, MICHIGAN, MISSOURI, MINNESOTA, NEBRASKA, NORTH DAKOTA, OHIO, PENNSYLVANIA (Western), SOUTH DAKOTA, WISCONSIN
Penstock Midwest
Suite 504
Countryside Executive Center
1250 W. Northwest Highway
Palatine, IL 60067
(312) 934-3700

NORTHEAST
NEW ENGLAND STATES NEW YORK (Upstate)
Sickles Distribution Sales
175 Bedford St., Suite 12
Lexington, MA 02173
(617) 862-5100

EAST CENTRAL NEW JERSEY, NEW YORK (Metropolitan)
Penstock East
180 North Street
Teterboro, NJ 07608
(201) 288-7313

DISTRICT OF COLUMBIA, MARYLAND, PENNSYLVANIA (Central & Eastern), VIRGINIA, WEST VIRGINIA
Applied Specialties, Inc.
10101 G. Bacon Drive
Beltsville, MD 20705
(301) 595-5393 (Metro D.C.)
(301) 792-2211 (Maryland)
(800) 638-8555

SOUTHEAST
ALABAMA, FLORIDA, GEORGIA, LOUISIANA (East of the Mississippi) MISSISSIPPI, NORTH & SOUTH CAROLINA, TENNESSEE
Applied Specialties of Florida
8420 Ulmerton Road, Suite 406
Largo, FL 33541
(813) 530-7309
(800) 722-4599

Component Distributors, Inc.
Suite 3
312 So. Harbor City Boulevard
Melbourne, FL 32901
(305) 724-9910
(800) 558-2351

Component Distributors, Inc.
Suite F
11309 S. Memorial Parkway
Huntsville, AL 35803
(205) 883-7501

Component Distributors, Inc.
Suite 206
5505 Creedmoor Road
Raleigh, NC 27612
(919) 787-7311

Component Distributors, Inc.
Suite 2
6264 Crooked Creek Road
Norcross, GA 30092
(404) 441-3320

CANADA
Sertek, Inc
5356 Sterling Center Drive
Westlake Village, CA 91361
(818) 707-2872

International Distributors

WEST GERMANY, WEST BERLIN, AUSTRIA
Kontron Phystech GmbH
Oskar-von-Miller, Str 1
D-8057 Eching bei Munchen
West Germany
(49) 89-81-65-770

FRANCE
Scie Dimes
1, ru Lavoisier Z.I. B.P. 25
91430 Igny, France
(33) 1-69-41-8282

ENGLAND, SCOTLAND, IRELAND, WALES
Wave Devices LTD
Laser House
132/140 Goswell Road
London EC1V 7LE
England
(44) 1-251-5181

SWEDEN, DENMARK, FINLAND, NORWAY
Visitron AB
Box 6063
S-162 06 Vallingby
Sweden
(46) 8-380130
(47) 2-64-6870 (Norway)

ITALY
BFI Elettronica SRL
18 Massena
20145 Milano, Italy
(39) 2-316-716 or
347-687

JAPAN
Yamada Corporation
Shin-Aoyama Building East
1-1. 1-Chome Minamiaoyama
Minato-Ku, Tokyo 107 Japan
(81) 03-475-1121

2/88

Artisan Technology Group - Quality Instrumentation... Guaranteed | (888) 88-SOURCE | www.artisantg.com

AVANTEK

Avantek Worldwide Sales Representatives

Domestic Sales Representatives*

ARIZONA, NEVADA, NEW MEXICO, TEXAS (EL PASO Area)
Cain Technology
Suite 5
2111 E. Broadway Road
Tempe, AZ 85282
(602) 966-4322

ALASKA, CALIFORNIA (Northern), OREGON, WASHINGTON, IDAHO (Northwestern to Boise)
Cain-White & Company
105 Fremont Avenue, Suite D
Los Altos, CA 94022
(415) 948-6533

Cain White/Northwest
10800 N.E. 8th St., Suite 800
Bellevue, WA 98004
(206) 462-2118

CALIFORNIA (Southern), HAWAII
Cain Technology
Unit C-4
16525 Sherman Way
Van Nuys, CA 91406
(818) 904-9392

Cain Technology
Suite I,
1046 N. Tustin
Orange, CA 92667
(714) 997-7311

MARYLAND, VIRGINIA, WEST VIRGINIA DIST. of COLUMBIA, NORTH & SOUTH CAROLINA
Applied Engineering Consultants
10101 G. Bacon Drive
Beltsville, MD 20705
(301) 595-5393 (Metro D.C.)
(301) 792-2211 (Maryland)
(800) 638-8555 (All other)

MINNESOTA, NORTH & SOUTH DAKOTA IOWA (Northern), WISCONSIN (Except Southeastern)
Electronic Sales Agencies, Inc.
Suite 132
8053 Bloomington Freeway
Bloomington, MN 55420
(612) 884-8291

NEW ENGLAND STATES
R. J. Sickles Associates
Suite 12
175 Bedford Street
Lexington, MA 02173
(617) 862-5100

NEW JERSEY (Northern)
NEW YORK (Metropolitan)
Technical Marketing Associates
180 North Street
Teterboro, NJ 07608
(201) 393-9330

NEW YORK (Upper State)
Robtron
531/2 Jordan Street
Skaneateles, NY 13152
(315) 685-5731

TEXAS (Northeastern), OKLAHOMA, ARKANSAS, LOUISANA (Northern)
Thorson Southwest
Suite 109
4445 Alpha Road
Dallas, TX 75244
(214) 233-5744

TEXAS (Southwestern)
Thorson Southwest
Suite 170
8920 Business Park Drive
Austin, TX 78759
(512) 345-1985

TEXAS (Southeastern)
LOUISIANA (Southern)
Thorson Southwest
Suite 116
14515 Briar Hills Parkway
Houston, TX 77077
(713) 558-8205

International Sales Representatives

AUSTRALIA
Graphic Electronic Industries Pty. Ltd.
168 Payneham Road
Evandale
South Australia 5069
(61) 8-363-0277

BELGIUM
Simac Electronics PVBA
Vooruitgangstraat, 52 Bus 3
1210 Brussels, Belgium
(32) 2-2192453

FRANCE
Scie Dimes
1, rue Lavoisier Z.I. B.P. 25
91430 Igny, France
(33) 1-69-41-8282

GERMANY
Kontron Phystech GmbH
Oskar-von-Miller Str 1
D-8057 Eching bei Munchen
West Germany
(49) 89-81-65-77-376

Kontron Phystech GmbH
Maybach Strasse 39A
D-7000 Stuttgart
West Germany
(49) 711-8917-134

Kontron Phystech GmbH
Markt 71
5205 St. Augustin 1
West Germany
(49) 22-41-29045

INDIA
Hinditron Services Pvt. Ltd.
69-A.L. Jagmohandas Marg
Bombay 400 006 India
(91) 22-812-5344

ISRAEL
Gallium Electronics, Ltd.
P.O. Box 1379
5 Ussishkin Street
Ramat Hasharon, 47100 Israel
(972) 3-402-242

ITALY
BFI Elettronica SRL
18 Massena
20145 Milano, Italy
(39) 2-316-716 or
347-687

BFI Elettronica SRL
8, Barnaba Oriani
00197 Roma, Italy
(39) 6-87-94-58 or
80-52-77

JAPAN
Yamada Corporation
Shin-Aoyama Building East
1-1. 1-Chome Minamiaoyama
Minato-Ku, Tokyo 107, Japan
(81) 03-475-1121

KOREA
Sangsoo Sangsa Company
Suite 402, Sunmyunghoi Bldg.
24-2, Yoido-Dong, Youngdeungpo-Ku
Seoul 150, Korea
(82) 2-782-8514

THE NETHERLANDS
Simac Electronics B.V.
High Tech Park
5503 HP Veldhoven
The Netherlands
(31) 40-582911

REPUBLIC OF SOUTH AFRICA
South Continental Devices (Pty.) Ltd.
P.O. Box 56420, Pinegowrie, 2123
5th Floor, Randover House
Dover Street
Randburg, Republic of South Africa
(27) 11-789-2400

SPAIN
BFI Electronica S.A.
Duque de Sevilla, 2
28002 Madrid, Spain
(34) 1-411-4177

SWEDEN, NORWAY, FINLAND, DENMARK
Visitron AB
P.O. Box 6063
Sorterargatan 2
S-16206 Vallingby, Sweden
(46) 8-38-01-30

SWITZERLAND
Walter Electronics AG
Frauenfelderstrasse 49
CH-8370 Sirnach
Switzerland
(41) 073-264040

TAIWAN
Sertek, International, Inc.
3rd Floor, Section 2
135 Chien Kuo North Road
Taipei 10479, Taiwan R.O.C.
(886) 2-501-0055

YUGOSLAVIA
Belram S.A.
83 Avenue des Mimosas
1150 Brussels, Belgium
(32) 2-734-33-32

*For areas not covered, contact your nearest Avantek Sales Office listed on the reverse.

2/88

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

AVANTEK

3175 Bowers Avenue
Santa Clara, California 95054-3292
Phone (408) 727-0700

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Artisan Technology Group is an independent supplier of quality pre-owned equipment

Gold-standard solutions

Extend the life of your critical industrial, commercial, and military systems with our superior service and support.

We buy equipment

Planning to upgrade your current equipment? Have surplus equipment taking up shelf space? We'll give it a new home.

Learn more!

Visit us at **artisantg.com** for more info on price quotes, drivers, technical specifications, manuals, and documentation.

Artisan Scientific Corporation dba Artisan Technology Group is not an affiliate, representative, or authorized distributor for any manufacturer listed herein.

We're here to make your life easier. How can we help you today?

(217) 352-9330 | sales@artisantg.com | artisantg.com

ARTISAN® TECHNOLOGY GROUP