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PXI Modules

3060 Series RF Combiners

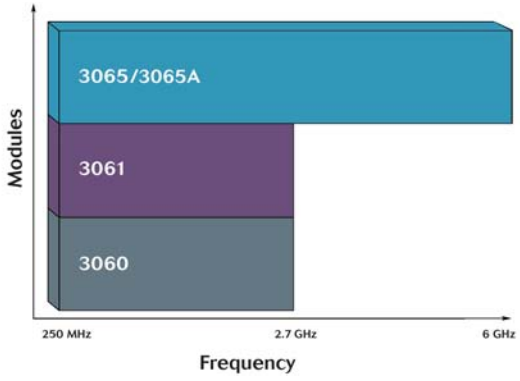


Highly flexible PXI RF Combiner modules for communications system test applications

- Integrated RF switch and power combiners
- 2 or 3 input variants
- Frequency range up to 2.7 GHz or 6 GHz
- High speed electronic RF switching
- Internally stored calibration data
- 2 year calibration cycle
- Single slot 3U high

Introduction

The 3060 Series are high performance RF conditioning modules supplied in a compact single slot wide 3U high PXI package. The 3060 Series support applications in the frequency range up to 6 GHz as depicted on the right. The modules are ideally suited for use in conjunction with Aeroflex 3020 Series Digital RF Signal Generators and 3030 Series RF Digitizers. Together these modules enable development of compact, high performance and low cost modular test systems for RF transceiver and component testing.



In addition to providing summing of signals the 3060 Series modules support various input and output switched path configurations to enable testing of single port and multi port RF devices and to enable system level self test without the need to disconnect the test subject.

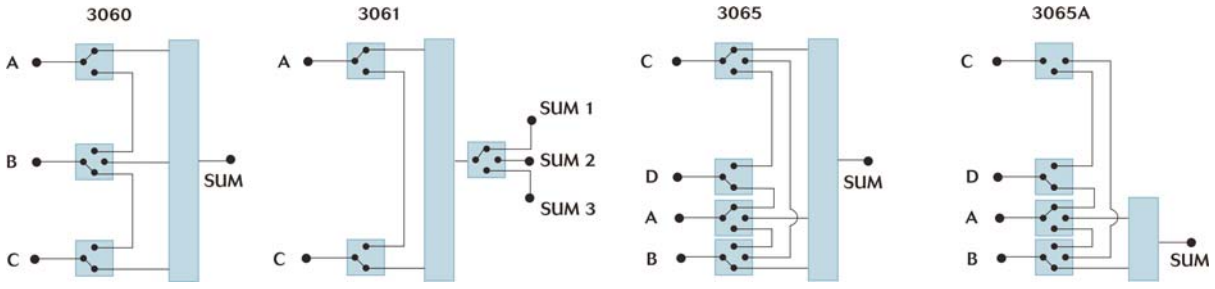


Figure 1. 3060 Series combiner block diagram

Using the versatile 3060 Series RF conditioning modules the PXI 3000 test system can be used for multiple applications such as: transceiver testing, amplifier intermodulation testing and simultaneous testing of multiple DUTs among many others.

Software Control

The 3060 Series modules are supplied with .dll and .net instrument drivers for use in application development environments such as LabWindows CVI, LabView, C, C++, VB, VS .net and a soft front panel for manual control.

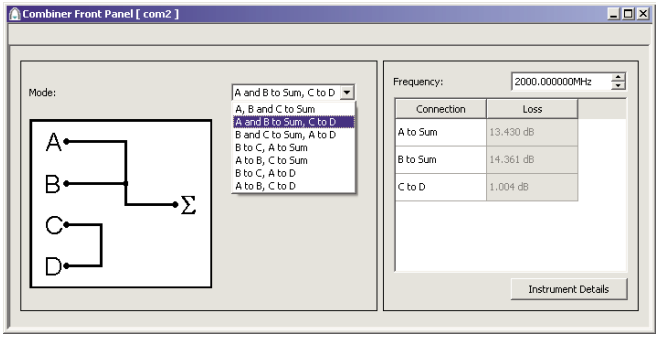


Figure 2. 3065/3065A Configurations are selectable using PXI Studio.(3065 configuration shown)

Fast Switching

High speed electronic RF switching is used to ensure reliable and repeatable performance as well as ensure fast settling times, especially important in high volume manufacturing applications.

Calibration

Frequency response calibration data is internally stored in all the 3060 Series modules to help minimize test system uncertainties. Data is in the form of frequency response data for each RF signal path which can be read out with/without temperature compensation applied. Calibration data values can be queried over the PCI bus for any given frequency making it possible to simplify system level calibration right up to the plane of the device under test connection port.

Customer Support

Users can elect to purchase PXI modules with optional warranty extensions.

Standard Extended Warranty provides either 36 months or 60 months warranty period plus the benefits of guaranteed product repair times in the event of failure.

Standard Extended Warranty can also be provided inclusive of scheduled calibration.

On request Aeroflex can provide customized Premium Warranty support designed around your specific needs.

SPECIFICATION

Frequency Range

3060	*ABC–Σ: 250 MHz to 2.7 GHz (useable to 3 GHz)*
	A-B and B-C: 250 MHz to 2.7 GHz (useable 70 MHz to 3 GHz)
3061	*All paths 250 MHz to 2.7 GHz (useable to 3 GHz)*
3065/3065A	*All paths: 250 MHz to 6 GHz (useable from 70 MHz)*

Supported port routing

3060

1. *A,B,C to SUM*
2. *A-B, C to SUM*
3. *C-B, A to SUM*

3061

1. *A,B to SUM 1 (SUM 2,3 terminated)*
2. *A,B to SUM 2 (SUM 1,3 terminated)*
3. *A,B to SUM 3 (SUM 1,2 terminated)*
4. *A-B (SUM 1,2,3 terminated)*

3065

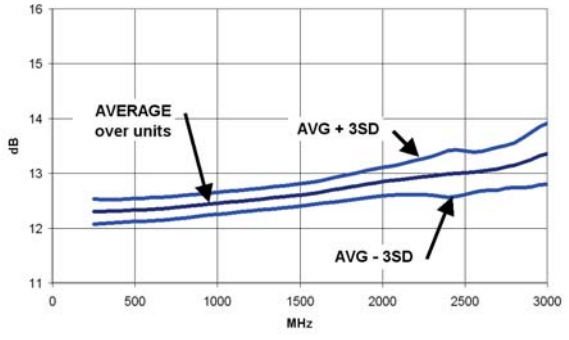
1. *A,B,C to SUM*
2 *A-B, C to SUM*
3. *C-B, A to SUM*
4. *A-D, B,C to SUM*
5. *C-D, A,B to SUM*
6. *A-D, B-C*
7. *A-B, D-C*

3065A

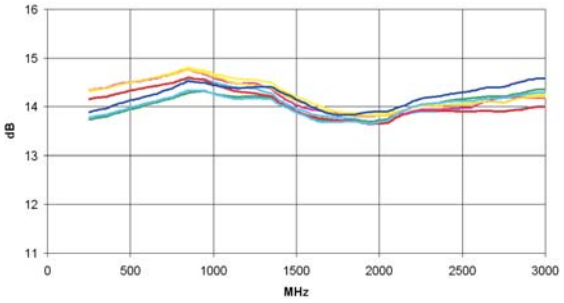
1. *A,B to SUM (C terminated)*
2. *A-B, C-D*
3. *A-D, B-C*

Insertion Loss

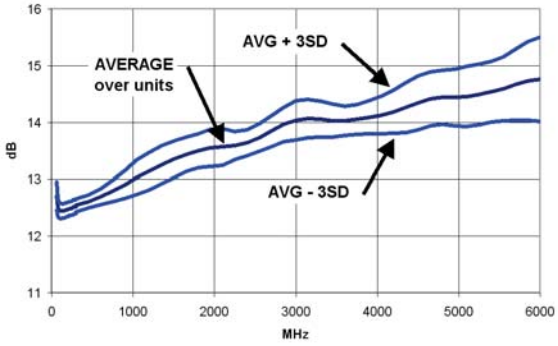
	3060		*3061*	*3065*		*3065A*	
	Up to 2.5 GHz	*Above 2.5 GHz*	*Up to 2.7 GHz*	*Up to 2.7 GHz*	*Above 2.7 GHz*	*Up to 2.7 GHz*	*Above 2.7 GHz*
A -Σ	*<15 dB*	*<16 dB*	*>13 dB, <16 dB*	*<15.5 dB*	*<17.5 dB*	*<9.5 dB*	*<11.5 dB*
B -Σ					*<18.5 dB*	*<9.5 dB*	*<12.5 dB*
C -Σ			*NA*	*<16 dB*	*<16 dB*	*NA*	*NA*
A-B	*<2 dB*	*<3 dB*	*<3 dB*	*<3 dB*	*<5 dB*	*<3 dB*	*<5 dB*
B-C			*NA*				
A-C	*NA*	*NA*					
C-D							



3060 Insertion Loss A to Sum (sample size = 250)



3061 Insertion Loss A to Sum (typical units)



3065 Insertion Loss A to Sum (sample size = 64)

Calibration Uncertainty (23°C +/-5°C)

3060/3061	*All frequencies*	*<0.2 dB*
3065/3065A	*Below 2.7 GHz*	*≤0.2 dB*
	2.7 to 5 GHz	*≤0.3 dB*
	5 GHz to 6 GHz	*≤0.4 dB*

Temperature Stability

±0.006 dB/°C (A,B,C to SUM port)
±0.002 dB/°C (all other paths)

Repeatability

After warm up following a return from a change of mode valid for at least 2 hours and excluding temperature influence

3060/3065/3065A	*Better than ±0.05 dB*
3061	*Better than ±0.1 dB*

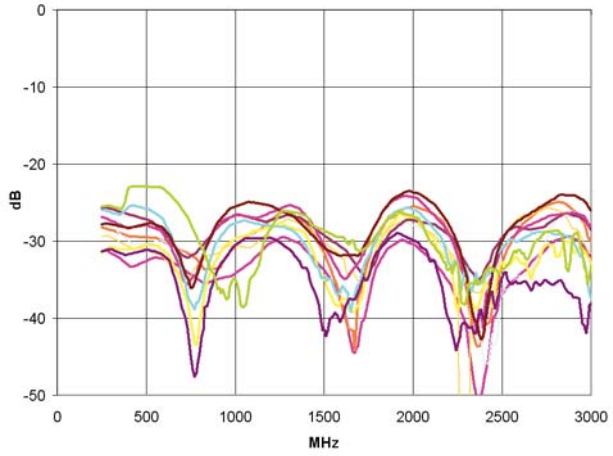
Frequency Response Flatness (without correction)

3060/3061	*Typically <2 dB*
3065/3065A	*250 MHz to 2.7 GHz typically <2.5 dB*
	2.7 GHz to 6 GHz typically <3.5 dB

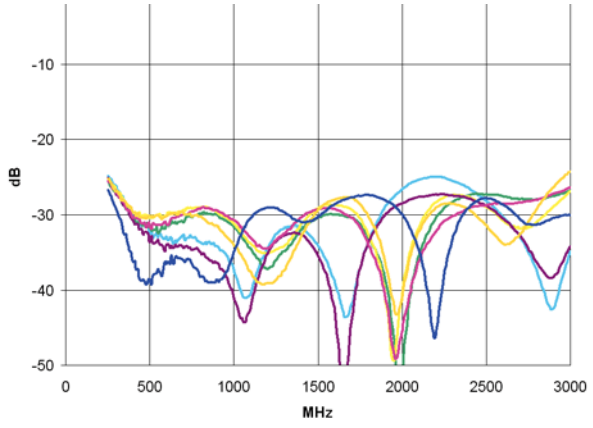
Return Loss

(unused ports terminated into 50 ohms)

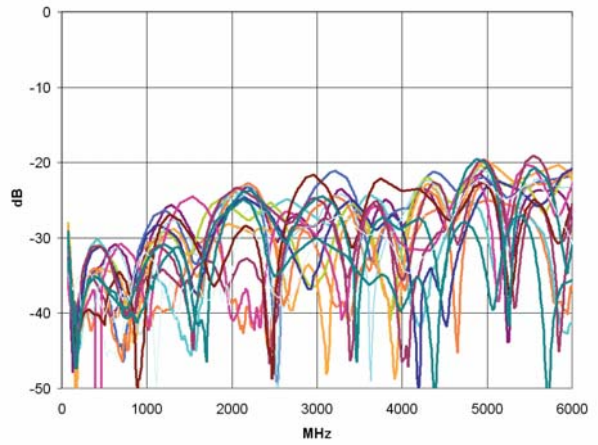
		3060	3061	3065		3065A	
				Up to 2.7 GHz	Above 2.7 GHz	Up to 2.7 GHz	Above 2.7 GHz
Σ	-	>20 dB	>20 dB	>20 dB	typ 20 dB	>20 dB	typ 17 dB
A	connected to Σ	>16 dB	>15 dB	>11 dB (typ 14 dB)		>11 dB (typ 14 dB)	>11 dB (typ 14 dB)
	connected to B	>15 dB				>14 dB(typ 17 dB)	>11 dB (typ 14 dB)
	connected to C or D	N/A	N/A				
B	connected to Σ	>16 dB	>15 dB				
	connected to A or C	>15 dB			>11 dB (typ 14 dB)		
C	connected to Σ	>16 dB	N/A	>14 dB (typ 17 dB)		N/A	N/A
	connected to B	>15 dB				>14 dB(typ 17 dB)	>11 dB (typ 14 dB
	connected to D	N/A					
D	connected to A						
	connected to C						



3060 Sum Port Return Loss (typical units)



3061 Sum Port Return Loss (typical units)



3065 Sum Port Return Loss (typical units)

Isolation Between Ports

(unused ports terminated into 50 ohms)

3060	*A-C >35 dB* *A-B >35 dB* *B-C >35 dB below 2 GHz otherwise >32 dB*
3061	*All ports >30 dB*
3065/3065A	*A-B >30 dB, typically 35 dB* *All other ports >35 dB*

Max Power (Σ)

3060	*+27 dBm, 3 VDC continuous*
3061	*+30 dBm, 40 VDC continuous* *+33 dBm MS* 1:1 where M<0.5 ms*
3065	*+27 dBm, 3 VDC continuous* *+30 dBm MS* 1:8 where M <0.5 ms*
3065A	*+30 dBm, 3 VDC continuous* *+33 dBm MS* 1:8 where M <0.5 ms*

** Mark Space ratio*

Max Power (A, B, C, D)

+24 dBm

GENERAL

Standard Warranty

24 months

Calibration Interval

Recommended 2 year

Power Consumption (typical)

+3.3 V	*<50 mA*	*(transiently rising to 250 mA during power up)*
+5 V	*<50 mA*	
+12 V	*<50 mA*	
-12 V	*<50 mA*	

Electromagnetic Compatibility

EN 61326-1:1997, Emissions Class A, Immunity Table 1 – Performance Critieria B

Safety

EN 61010-1:2001 Safety requirements for electrical equipment for measurement, control and laboratory use-Part 1, General requirements

Driver Software

VXIpnp compliant software driver

INTERFACES

All connectors are SMA

DIMENSIONS AND WEIGHT

Dimensions

Single width 3U PXI module

Weight

3060/3065/3065A	*330 g (0.7 lbs)*
3061	*400 g (0.88 lbs)*

RATED RANGE OF USE

Operating Temperature

0 to 50°C, meets IEC-60068-2-1 and 60068-2-2

Operating Humidity

10 to 90% non-condensing, meets IEC-60068-2-56

CONDITIONS OF STORAGE AND TRANSPORT

Storage Temperature

-20 to +70°C, meets IEC-60068-2-1 and 60068-2-2

Storage Humidity

5 to 93% non-condensing, meets IEC-60068-2-56

Shock

30 g peak, half sine, 9 ms pulse. Tested in accordance with IEC-60068-2-27

Random vibration 5 Hz to 500 Hz, 2.46 g rms non-operating. Tested in accordance with IEC-60068-2-64

COMPLIANCE

PXI Specification, Revision 2.2
VXIpnp Specifications (VPP-2, VPP-3.x, VPP-4.x and VPP-7)

VERSIONS, OPTIONS AND ACCESSORIES

When ordering please quote the full ordering number information.

Ordering Numbers	Versions
3060	PXI RF combiner (250 MHz to 2.7 GHz)
	Supplied with:
	2 x SMA link cable (180 mm)
	1 x SMA link cable (130 mm)
3061	PXI RF combiner with switched outputs (250 MHz to 2.7 GHz)
	Supplied with:
	2 x SMA link cable (180 mm)
3065	PXI RF combiner (250 MHz to 6 GHz)
	Supplied with:
	2 x SMA link cable (180 mm)
	1 x SMA link cable (130 mm)
3065A	PXI RF Low Loss combiner (250 MHz to 6 GHz)
	Supplied with:
	2 x SMA link cable (180 mm)
	Each module supplied with
	CD ROM containing VXI PNP driver, soft front panel and user documentation
	Service Options
W3060/103	Standard Extended Warranty 36 months
W3060/103C	Standard Extended Warranty 36 months with scheduled calibration
W3060/105	Standard Extended Warranty 60 months
W3060/105C	Standard Extended Warranty 60 months with scheduled calibration
	Optional Accessories
43139/738	SMA link cable (130 mm)
43139/739	SMA link cable (180 mm)
82532	SMA 50 ohm termination
46885/224	SMA connector saver

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Our passion for performance is defined by three attributes represented by these three icons: solution-minded, performance-driven and customer-focused.

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