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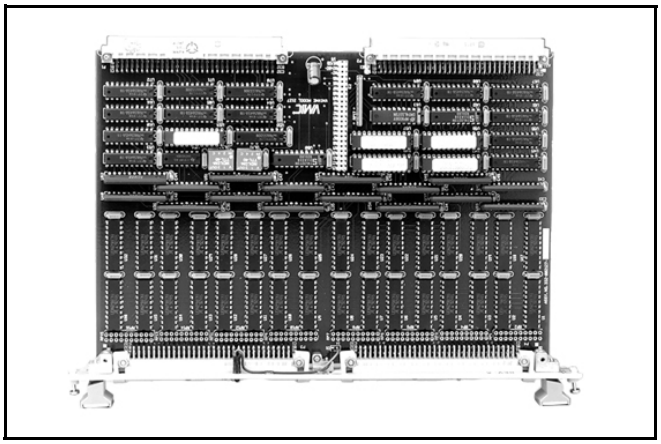
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Find the *Abaco Systems / VMIC VMIVME-2127-000* at our website: ***Click HERE***

VMIVME-2127
128-bit Voltage Source Digital Output Board with Built-in-Test Support

- 128 bits of voltage outputs
- High-current drivers (350 mA source)
- Heavy load option available
- Automatic overcurrent shutdown protection
- Thermal shutdown protection
- Output fault indication available in status register
- High breakdown voltage (35 V)
- Output clamp diodes for inductive flyback protection
- Compatible with Intelligent I/O Controllers
- Built-in-Test logic for fault isolation
- VMEbus compatible (ANSI/IEEE STD 1014-1987 IEC 821 and 297)
- A24:A16:D32/D16/D08 (EO): slave 39/3D:29/2D:6U form factor
- Front panel with fail LED
- Sockets are provided for warming resistors, which are supplied by the user
- External power connections can be made at the front panel (P3 to P4) or at P2



FUNCTIONAL CHARACTERISTICS

Compliance: This product complies with the VMEbus specification (ANSI/IEEE STD 1014-1987 IEC 821 and 297) with the following mnemonics: A24:A16: D32/D16/ D08 (EO): Slave: 39/3D:29/2D: 6U form factor

Output Connector Type: Three types of female mating connectors may be used to interface with P3 and P4. A 96-pin mass-terminated (IDC) connector, a 64-pin IDC connector, and a 96-pin discrete wire connector.

Part numbers for ERNI IDC DIN 96-pin and 0.033-inch 30 AWG ribbon cable are:

96-pin connector	913 031 (ERNI)
96-conductor cable	913 049 (ERNI)

Part numbers for Panduit IDC DIN 64-pin connectors and 0.050-inch ribbon cable are:

64-pin connector	120-964-435E (Panduit)
Strain relief	100-000-032 (Panduit)
64-conductor cable	9V28064-XXX (Belden)

Harting discrete wire connectors consist of a contact housing with female crimp-on contacts. The Harting part numbers are:

96-pin connector	09 03 096 3214 (Harting)
Female crimp-on contacts	09 02 000 8484 (Harting)
Crimp tool (for stripped wire)	09 99 000 0075 (Harting)

The discrete wire connector needs a shell housing that has holding levers. We recommend the Harting housing. Its order number is 09 03 096 0501. This housing will latch the discrete wire cable to the board connector and provide a strain relief.

I/O Organization: Sixteen output ports, eight bits wide for a total of 128 outputs, addressable to any address within the short supervisory and/or short nonprivileged or the standard supervisory and/or standard nonprivileged I/O map.

Addressing Scheme: Thirty-two bytes individually addressable on 8-, 16-, or 32-bit boundaries. A Board ID Register is located at the base address of the board. A Control and Status Register (CSR) is stacked above the ID Register. The sixteen output bytes are placed above the CSR. Twenty jumpers establish the base address of the board. Another jumper is used for standard or short

Ordering Options

October 20, 1997 800-002127-000 C	A	B	C	–	D	E	F
VMIVME-2127 –		0	0	–			

A = Output Loading
0 = Standard Load
1 = Heavy Load Option
BC = 00 (Options reserved for future use)

Recommended Connector Components for Cabling to P3 and P4

Style	*Description*	*I/O Connectors*
96-pin IDC	Mating Connector (96-pin Mass Terminated)	ERNI No. 913 031
	0.033-inch Ribbon Cable (96-pin Mass Terminated)	ERNI No. 913 049
64-pin IDC	Mating Connector (64-pin Mass Terminated)	Panduit No. 120-964-435E
	Strain Relief	Panduit No. 100-000-032
	Ribbon Cable (64-Conductor Mass Terminated)	Belden No. 9V28064-XXX
96-pin Discrete Wire	Mating Connector (96-pin Discrete)	Harting No. 09 03 096 3214
	Female Crimp Contacts (for 96-pin Discrete)	Harting No. 09 02 000 8484
	Connector Shell Housing (for 96-pin Connectors)	Harting No. 09 03 096 0501
Right Angle Male	PC Board Connector Part Number	ERNI No. 913 216

*The Harting crimp tool part number is 09 99 000 0075.

For Ordering Information, Call:
1-800-322-3616 or 1-256-880-0444 • FAX (256) 882-0859
E-mail: info@vmic.com Web Address: www.vmic.com
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I/O accesses. The following address map shows the relative locations of all the registers used by the board.

Address Map:

Offset	Register Name or Description
$00	Board ID
$02	Control and Status Register (CSR)
$04	Not Used
$06	Not Used
$08	Not Used
$0A	Not Used
$0C	Not Used
$0E	Not Used
$10	Output Data Word (16 bits) 0
$12	Output Data Word (16 bits) 1
$14	Output Data Word (16 bits) 2
$16	Output Data Word (16 bits) 3
$18	Output Data Word (16 bits) 4
$1A	Output Data Word (16 bits) 5
$1C	Output Data Word (16 bits) 6
$1E	Output Data Word (16 bits) 7

Output Drivers: The output drivers provide overcurrent (short circuit) and thermal shutdown protection. Overcurrent protection occurs at 370 mA minimum allowing for safe operation at currents as high as 350 mA. The thermal shutdown is a function of the load, number of channels per byte that are ON and the duty cycle. Figure 3 shows the allowable output current as a function of duty cycle and the number of ON channels at 25 and 50 °C.

Since the thermal shutdown restricts the allowable output current for many applications, a heavy load option is available in which two output devices are placed in parallel. The placement of two devices in parallel may or may not double the short circuit protection current. However, it does double the overload protection (thermal shutdown) current. Figure 4 shows the allowable output current as a function of duty cycle and the number of ON channels for the heavy load option at 25 and 50 °C.

Since instantaneous currents in excess of 370 mA may cause the output device to protect itself by shutting OFF, inrush currents of cold incandescent lamps can cause the device to shut OFF. To reduce the inrush current, 10-pin SIP sockets are provided for filament warming resistors.

Fault Indication: Overcurrent conditions cause the channel(s) affected to be turned OFF. Thermal shutdown causes the entire byte affected to be turned OFF. Overcurrent conditions are latched, thus keeping the affected channels OFF until reset by the user. In the case of thermal shutdown, once the overheated part has cooled, the byte will turn back ON.

In either case, Fault bits are available in the Control and Status Register (CSR) to indicate that shutdown has occurred. Eight bits are available for Fault indication. One Fault bit is available for every 16 outputs.

Data Polarity: A logic *one* written to an output bit will turn ON the drive transistor. This yields an output of logic *one*. Thus, a logic *one* asserts the output. This data polarity is called positive true.

Built-in-Test: This board is designed with internal Built-in-Test logic that supports testing of all the on-board active components except the output drivers. All Output Data Registers have read-back capability. Thus, the user can monitor the data written to this board and determine if it is functioning properly. A front panel Fail LED is provided to help in isolating a faulty board. This LED is illuminated at power up and can be extinguished under program control upon the successful completion of user-defined diagnostic software.

PHYSICAL/ENVIRONMENTAL

Temperature Range: 0 to +55 °C, operating -20 to +85 °C, storage

Humidity Range: 20 to 80 percent relative, noncondensing

Altitude: Operation to 10,000 ft

Cooling: Forced air convection

Dimensions: Double Eurocard (6U), 160 x 233.35 mm

Power Requirements: 3.0 A (typical) at 5 V

The user must supply power to the output drivers. This power requirement is determined by the user load. Connections can be made at either the front panel (P3 or P4) or at P2. To facilitate connections made at P2, VMIC offers the VMIACC-0131 P2 Power Accessory which is recommended, but not required.

MTBF: 80,010 hours (217E)

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APPLICATIONS —

Relay Drivers
Lamp Drivers
Solenoid Drivers
Hammer Drivers
Stepper Motor Drivers
SCR Drivers
LED Drivers
High-Current, High-Voltage Drivers

INCANDESCENT LAMP DRIVER — The use of lamp warming resistors is recommended to prevent inrush current from tripping the overcurrent protection. Sixteen empty 10-pin SIP sockets are provided for the warming resistors. These resistors must be 10-pin bussed resistor SIPs. It is the user's responsibility to determine the proper resistance value. It is also the user's responsibility to make sure the power ratings of the warming resistors are not exceeded.

Example: Two 40 mA, 28 V filament lamps may have as much as (40 mA x 2) x 12 = 960 mA of cold filament inrush current. The warming resistors should draw approximately 10 percent of the rated (warm) current of the lamp or lamps in use. For this example, the current would be (40 mA x 2) x 0.1 = 8 mA. Since the warming resistor value will be at least 10 times greater than the resistance of the lamp itself, the following formula can be used to calculate the warming resistance: R = 28 V/0.008 mA = 3,500 ¾. The power dissipated by these resistors would then be $P = I^2 * R = (0.008A)^2 * 3,500$ ¾ = 0.224 W. It is recommended the user try out the selected values to ensure that they are functioning correctly.

TRADEMARKS

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APPLICATION AND CONFIGURATION GUIDES — The following Application and Configuration Guides are available from VMIC to assist the user in the selection, specification, and implementation of systems based on VMIC's products.

Title	Document No.
Digital Input Board Application Guide	825-000000-000
Change-of-State Board Application Guide	825-000000-002
Digital I/O (with Built-in-Test) Product Line Description	825-000000-003
Synchro/Resolver (Built-in-Test) Subsystem Configuration Guide	825-000000-004
Analog I/O Products (with Built-in-Test) Configuration Guide	825-000000-005
Connector and I/O Cable Application Guide	825-000000-006
Data Acquisition Noise Reduction Application Guide	825-000000-026
Installation Guide for the P2 Power Adapter	522-800131-000

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ELECTRICAL CHARACTERISTICS at T_A = 25 °C, V_S = 35 V (unless otherwise noted).

		Limit			
Characteristics	**Test Conditions**	**Min.**	**Typ.**	**Max.**	**Units**
Functional Supply Range (V_S)		7.0	–	35	V
Output Leakage Current	V_{IN} = 0.4 V*	–	< -5.0	-200	mA
Output Sustaining Voltage	I_{OUT} = -350 mA, L = 2.0 mH	35	–	–	V
Output Saturation Voltage	I_{OUT} = -100 mA	–	1.6	1.8	V
	I_{OUT} = -225 mA	–	1.7	1.9	V
	I_{OUT} = -350 mA	–	1.8	2.0	V
Channel Shutdown Threshold		-370	-500	–	mA
Clamp Diode Leakage Current	V_R = 35 V, TA = 70 °C	–	–	50	µA
Clamp Diode Forward Voltage	I_F = 350 mA	–	1.5	1.8	V
Thermal Shutdown		–	165	–	°C
Thermal Hysteresis		–	15	–	°C
Turn On/Turn Off Time	R_L = 100 ¾	–	3	6	µs

*All inputs simultaneously.

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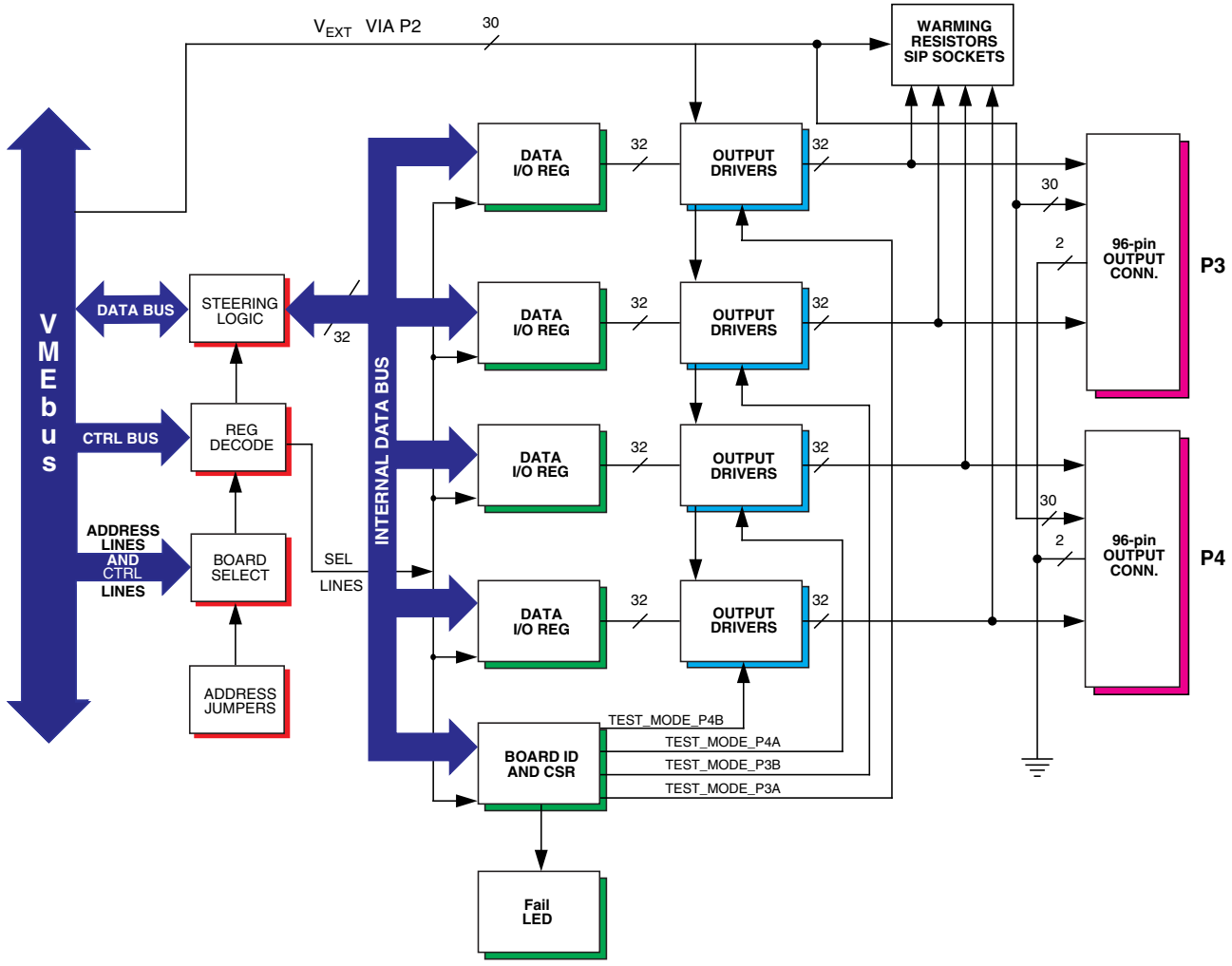


Figure 1. VMIVME-2127 Functional Block Diagram

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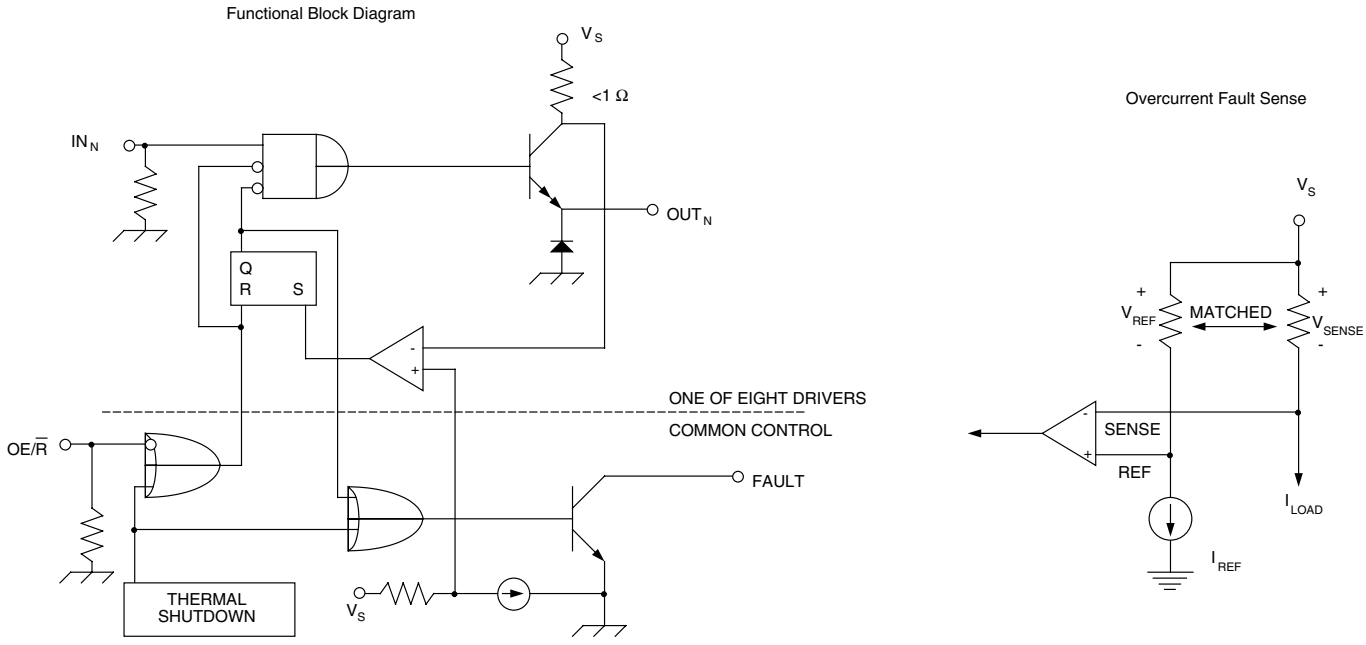
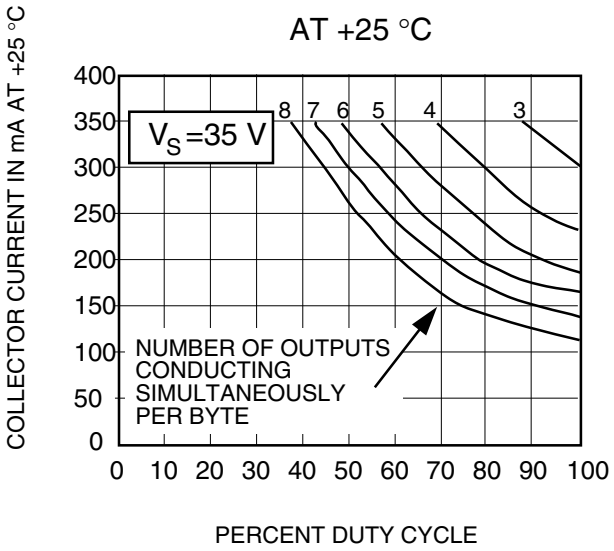
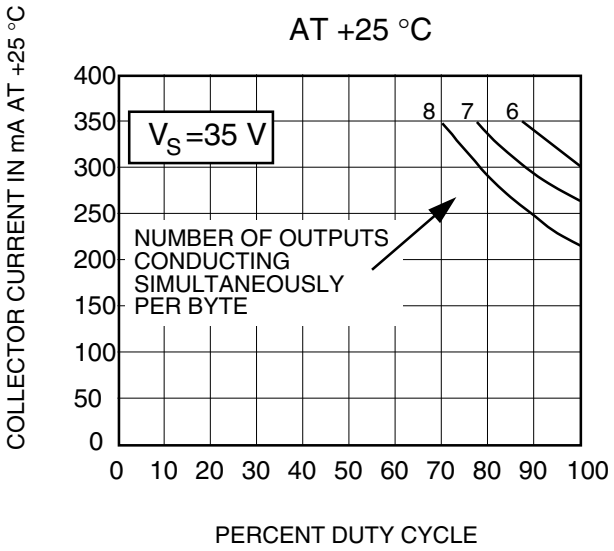


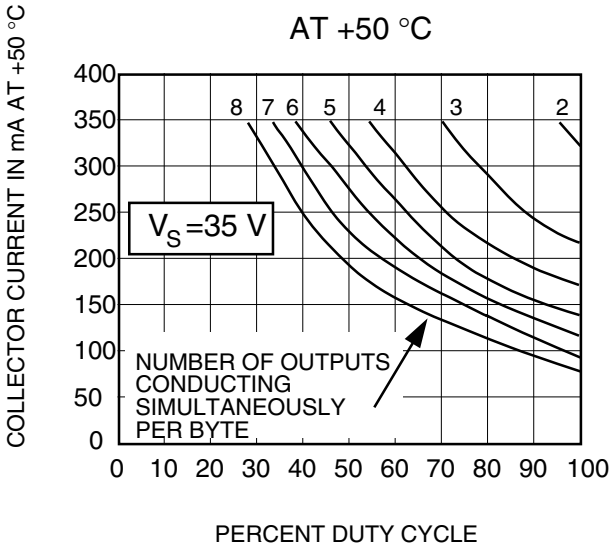
Figure 2. Output Description (UDN2987 Drivers)

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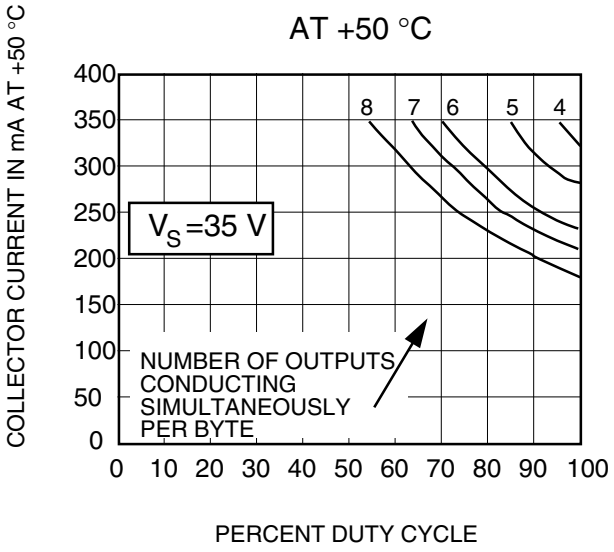






S2127/F3

Figure 3. Allowable Output Current as a Function of Duty Cycle for Standard Load Option



S2127/F4

Figure 4. Allowable Output Current as a Function of Duty Cycle for Heavy Load Option

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