VM1T-iB

The VM1T-iB is a solid-state, Class AB broadband power amplifier module based on advanced GaN HEMT technology. The VM1T-iB is intended for CW applications, offering exceptional performance in a small and lightweight form factor, double the power density compared to the industry leading equivalent. Advanced and unique features are accessible via an FPGA-based serial interface. The module primary functions may also be controlled using the discrete I/O interface.



PRODUCT FEATURES

- Small Form Factor (230 x 95 x 25 mm): Smaller and Lighter than Competing Models. Double the power density compared to the industry leading equivalent.
- Exceptional Bandwidth, Output Power and Efficiency
- Ultra-Fast and Effective Mute Function
- Comprehensive Built-In Test, Telemetry and Protection
- High-Resolution Power / Gain Control
- Supports Internally-Stored Calibration Look-Up Tables
- Innovative Space-Saving Connector System

TYPICAL APPLICATIONS

The VM1T-iB is ideal for:

- Electronic Warfare / Countermeasures
- Broadband Mobile Jamming Applications
- Airborne, Aircraft and UAV Equipment
- Power Amplifier Stage for Wireless Infrastructure
- Test and Measurement Equipment
- General Purpose Broadband Transmitter Amplification

ELECTRICAL CHARACTERISTICS TC = +25 °C, 32 VDC, 50 Ω System (unless otherwise noted)

PARAMETER	MIN	ТҮР	MAX	UNITS
Operating Frequency Range	20		520	MHz
Saturated Output Power (Psat)	52.5	53		dBm
Power-Added Efficiency @Psat	30	45		%
Gain @Psat	49	52		dB
Gain Flatness @Psat		±4		dB
Input Return Loss	10			dB
Output Return Loss	10			dB
Input Power @Psat			5	dBm
Noise Figure			15	dB
Harmonic Emissions			-10	dBc
Non-Harmonic Spurious Emissions			-60	dBc
DC Supply Voltage	24	28	32	V
Current Consumption @Psat		15	20	А
Mute / Enable Mode Switching Characteristics:				
tENABLE, tMUTE (50% CTRL to 10/90% RF)		500	1000	ns
Isolation in Mute Mode	80			dB
Current Consumption in Mute Mode			300	mA
Current Consumption in Shutdown			10	mA
Gain Control Characteristics:				
Adjustment Range		31.5		dB
Adjustment Resolution		0.5		dB

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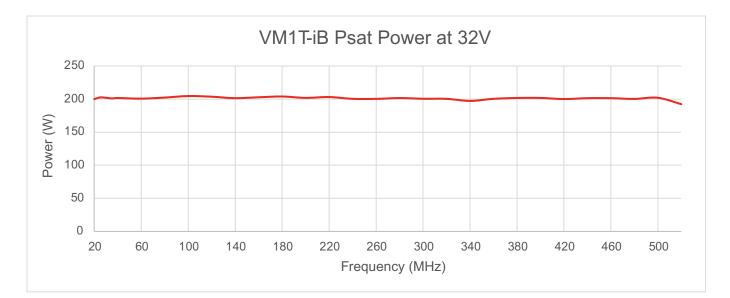
+44 (0)1989 760 590 sales@antaresdefencesystems.com www.antaresdefencesystems.com Part Number: VM1T-iB Part Version: Prototype Revision: A



CONTROL CHARACTERISTICS AND ADVANCED FEATURES

Ulta-Fast Mute/Enable Switching Control via discrete input Additional control via serial comms interface Serial Communications Interface Serial comms interface (High Noise Immunity) Interface: RS-485 Half Duplex Bulk-Resolution Power/Gain Control Control via serial comms interface User Memory Supports multiple calibration tables or user-specific data Supports multiple calibration tables or user-specific data Control via serial comms interface Bulk-In Test Functions Power-on BIT (PBIT) All BT data is accessible via the serial comms interface Bulk-In Test Functions Power-on BIT (PBIT) All BT data is accessible via the serial comms interface Temperature BIT Baseplate and Core temperatures monitored Angret-40 to to 1:25 'C Accuracy: 13 'C Voltage BIT Circical violage rails monitored Accuracy: 25 's Memory Integrity BIT CR Checking of User Settings and Factory Settings Alarmo uput Englese of torial violage rails monitored Accuracy: 25 's Memory Integrity BIT CR Checking of User Settings and Factory Settings Elapsed On-Time Recorder Part number Revision Termel Overload Protection Set Threshold: +57 'C Cacuracy: 25 'S Additional Features Catural VT Protection Termeshold: Protection Set protection Activity Protection Termeshold: HER Catural VT Protection Termeshold: HER Catural VT Protection	PARAMETER	VALUE	
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Optional Features Other serial interface standards e.g. I2C, SPI, CAN		Shutdown function	
		Integrated FWD and REV Power Monitors	
Integrated T/D Cultab (adds 20mme to lar -th)	Optional Features	Other serial interface standards e.g. I2C, SPI, CAN	
integrated 1/K Switch (adds 20mm to length)		Integrated T/R Switch (adds 20mm to length)	





MECHANICAL CHARACTERISTICS

PARAMETER	VALUE	UNITS
Dimensions (excl. connectors)	230 x 95 x 25	mm
Mass	900	g
RF In / Out Connectors	SMA Female	-
DC In / Control Connector	Mixed Technology Male: 2 Power + 12 Signal	-
Cooling Method	External Heatsink to Baseplate (Not Supplied)	-

ENVIRONMENTAL CHARACTERISTICS

PARAMETER	MIN TYP	MAX	UNITS
Case or Baseplate Temperature	-20	+80	°C
Cold Start Temperature (performance not guaranteed)	-40		°C
Relative Humidity (non-condensing)		95	%
Ingress Protection	IP51		-

ABSOLUTE MAXIMUM RATINGS (Not simultaneous)

RF Input Power	+10 dBm
RF Output Mismatch	VSWR ∞ :1 at all phase angles (for 1 minute)
Case or Baseplate Temperature (Operating)	-20 °C to +80 °C
Case or Baseplate Temperature (Non-Operating)	-40 °C to +100 °C
DC Supply Voltage (DC IN+ to GND)	24 V to 32 V
Control Interface (I/O to GND)	-0.5 V to 5.5 V
Mute / Enable Mode Switching Frequency	50 kHz
ESD Sensitivity	HBM Class 1A

Exceeding maximum ratings may cause permanent damage. Operation between operating range maximum and absolute maximum for extended periods may reduce device reliability. Absolute maximum ratings are stress figures only and functional operation under these conditions is not implied.

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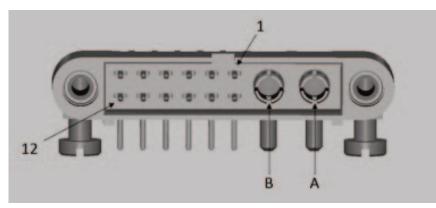




CONNECTOR PINOUT

Pin	Signal	Description	Electrical Characteristics	Direction
A	DC_IN-	VDC return	0 V	-
В	DC_IN+	VDC supply voltage	24-32 V	-
			@14 A max.	
			≤100 mV pk-pk ripple in 20 MHz BW	
1	COMMS_RS485HD_P	RS485 non-inverting receiver input	Refer to ADM3486E datasheet. Multidrop bus	In/Out
		and non-inverting driver output	not supported. Keeper resistors required	
2	COMMS_RS485HD_N	RS485 inverting receiver input	Refer to ADM3486E datasheet. Multidrop bus	In/Out
		and inverting driver output	not supported. Keeper resistors required	
3	PA_GOOD	PA Good bit:	3V3 CMOS	Out
		'0' = Fault		
		'1' = No Fault		
4	GND	Signal return	0 V	-
5	CAN_TERM	Open end of 120 $\boldsymbol{\Omega}$ resistor; other end internally	125 mW rated	-
		connected to COMMS_CAN_P		
6	PA_SHDN	PA Shutdown bit:	3V3 CMOS	In
		ʻ0' = No Shutdown	(5 V tolerant)	
		'1' = Shutdown		
7	GND	Signal return	0 V	-
8	TX_EN	Transmit Enable bit:	3V3 CMOS	In
		'0' = Mute	(5 V tolerant)	
		'1' = Transmit		
9	COMMS_CAN_P	CAN non-inverting receiver input	Refer to SN65HVD230D datasheet	In/Out
10	COMMS_CAN_P	and non-inverting driver output		In/Out
11	COMMS_CAN_N	CAN inverting receiver input	Refer to SN65HVD230D datasheet	In/Out
12	COMMS_CAN_N	and inverting driver output		In/Out

PIN DESIGNATIONS: (Overrides any other definition)

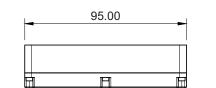


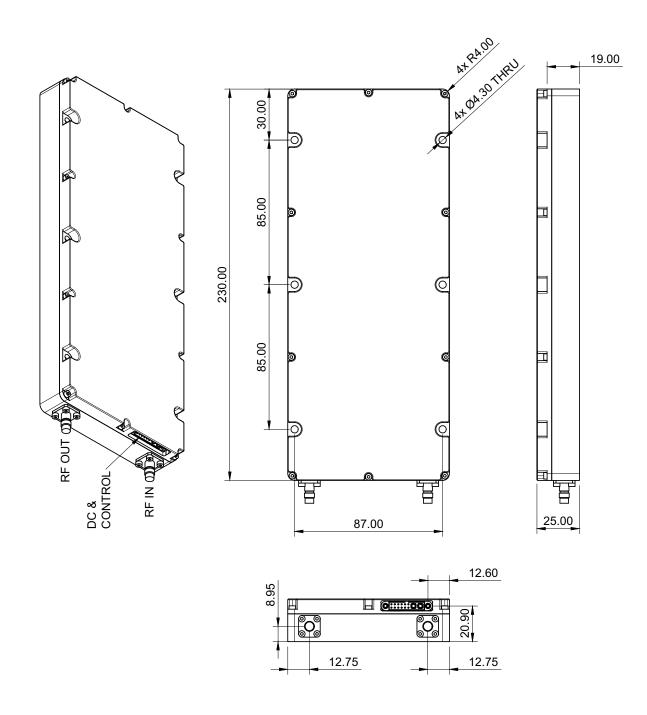
Connector Type:	CMM Micro Connector, 2x Male HP contacts + 12x Male LF contacts	
Manufacturer:	Nicomatic (https://www.nicomatic.com/family/3)	
Manufacturer Part No.:	221V12F23-0200-3400CMM	
Mating Cycles:	≥500	
Mates With:	222S12M16C-0200-4320 (Nicomatic)	
	M80-4C11205F1-02-325-00-000 (Harwin)	
Back Potting Shape:	14143-25 (Nicomatic)	

Antares Defence Systems Ltd Unit 5, Alton Road Industrial Estate, Alton Road Ross-on-Wye, Herefordshire, HR9 5NB +44 (0)1989 760 590 sales@antaresdefencesystems.com www.antaresdefencesystems.com Part Number: VM1T-iB Part Version: Prototype Revision: A



OUTLINE DIMENSIONED DRAWING: (in millimetres)





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ESD PRECAUTIONS

Although this product contains circuitry to protect it from damage due to ESD, when handling this product observe the same precautions as with any other ESD-sensitive device.



RoHS COMPLIANCE

RoHS compliant parts and processes are used in the manufacture of this product.



QUALITY

This product is designed and manufactured in the United Kingdom in accordance with the ISO 9001:2008 Quality Management System.

ORDERING INFORMATION

MODEL NAME	PART NUMBER	FINISH
VM1T-iB		Iridite TM NCP