



# DMD1050

## L-Band Satellite Modem Board



### HIGHLIGHTS

- ▶ MIL-STD-188-165A Compliant
- ▶ Compact size 7 x 9.125 Inches x 1.1 Inch
- ▶ 950 to 2050 MHz L-Band Tx/Rx
- ▶ Built in MIL 188-114A and Ethernet data interfaces
- ▶ BPSK/QPSK/OQPSK/8PSK/16QAM modulation
- ▶ 2.4 Kbps to 20 Mbps, 1 bps steps
- ▶ FEC - Viterbi, Reed-Solomon, Sequential, Trellis, Turbo Product Code
- ▶ Optional 10 MHz High-Stability Reference
- ▶ Input Connectors for BUC and LNB Voltages
- ▶ Excellent Spurious Performance
- ▶ Fully Compliant with IESS 308/309/310/314/315
- ▶ Optional DVB to EN301-210 and EN300-421
- ▶ Standard Features Include: Reed-Solomon, Asynchronous Overhead and Automatic Uplink Power Control
- ▶ M&C Options include SNMP, Web Browser & RS232 Terminal Ports

### OVERVIEW

The DMD1050 L-Band Satellite Modem board offers a complete modem on a compact PCB daughter board. The compact size saves space and offers system engineers greater flexibility integrating the modem board into the host system. With standards including MIL-STD-188-165A, IESS-308, -309, -310, -314/315 and DVB, and covering data rates up to 20 Mbps, the DMD1050 covers virtually all your Satellite IP, Telecom, Video and Internet applications.

The extensive list of integrated hardware and software options give you the ability to integrate the modem on

many platforms and provide an upgrade path for future networks. Options may be purchased with the product or easily upgraded in the field through the web browser or terminal port.

The DMD1050 has an impressive remote accessibility line-up. Remote control via serial RS-232, 10 BaseT SNMP Ethernet or web browser interfaces allow for monitor and control of all the modem's features.

Compatibility with current modems, such as the DMD20, DMD50, DMD2050, and SLM-5650A are maintained for seamless substitution and addition to your existing systems.

The DMD1050 modem board integrates supporting hardware for BUC and LNB. Interconnects allow the user to supply external voltages and 10 MHz Reference for BUC and LNB.

### Software Options

- Data Rate Upgrades
- Turbo FEC
- IDR, IBS Framing
- 8PSK
- 16QAM
- DVB-S

# DMD1050 L-Band Satellite Modem Board

## SPECIFICATIONS

Published specifications reflect the maximum DMD1050 performance. Each DMD1050 can be configured to customer requirements via hardware / software options applied at the factory or in the field.

### DMD1050 BER Performance

Modulation/FEC	Code Rate	$1 \times 10^{-5}$	$1 \times 10^{-6}$	$1 \times 10^{-7}$	$1 \times 10^{-8}$	Data Rate Range
BPSK VIT	1/2	5.5 (5.1)	6.1 (5.7)	6.7 (6.2)	7.4 (6.8)	2.4 Kbps – 10.0 Mbps
QPSK VIT	1/2	5.5 (5.1)	6.1 (5.7)	6.7 (6.2)	7.4 (6.8)	4.8 Kbps – 10.0 Mbps
QPSK VIT	3/4	6.8 (6.3)	7.6 (7.0)	8.3 (7.7)	8.9 (8.4)	7.2 Kbps – 15.0 Mbps
QPSK VIT	7/8	7.9 (7.2)	8.6 (7.9)	9.3 (8.6)	10.2 (9.4)	8.4 Kbps – 17.5 Mbps
QPSK VIT R-S	1/2	3.8 (3.4)	4.1 (3.6)	4.2 (3.8)	4.4 (4.0)	4.8 Kbps – 8.88 Mbps
QPSK VIT R-S	3/4	5.4 (4.7)	5.6 (4.9)	5.8 (5.1)	6.0 (5.3)	7.2 Kbps – 13.33 Mbps
QPSK VIT R-S	7/8	6.5 (6.0)	6.7 (6.4)	6.9 (6.7)	7.2 (7.1)	7.8 Kbps – 15.55 Mbps
QPSK SEQ	1/2	5.6 (5.1)	5.9 (5.4)	6.3 (5.8)	6.7 (6.2)	4.8 Kbps – 2.048 Mbps
QPSK SEQ	3/4	6.1 (5.6)	6.5 (6.1)	7.0 (6.5)	7.4 (6.9)	7.2 Kbps – 2.048 Mbps
QPSK SEQ	7/8	6.9 (6.4)	7.4 (6.9)	7.9 (7.4)	8.4 (7.9)	8.4 Kbps – 2.048 Mbps
QPSK TPC	1/2	2.7 (2.4)	2.9 (2.6)	3.1 (2.8)	3.3 (3.0)	4.8 Kbps – 9.54 Mbps
QPSK TPC	3/4	3.6 (3.2)	3.8 (3.4)	4.1 (3.7)	4.4 (4.0)	7.2 Kbps – 15.0 Mbps
QPSK TPC	7/8	4.2 (3.9)	4.3 (4.0)	4.4 (4.1)	4.5 (4.2)	8.4 Kbps – 17.5 Mbps
8PSK TRE	2/3	7.8 (6.4)	8.7 (7.2)	9.5 (8.1)	10.2 (8.9)	9.6 Kbps – 20.0 Mbps
8PSK TRE R-S	2/3	5.8 (5.4)	6.2 (5.6)	6.5 (5.8)	6.7 (6.1)	8.9 Kbps – 18.3 Mbps
8PSK TPC	3/4	6.0 (5.6)	6.2 (5.8)	6.4 (6.0)	6.8 (6.3)	10.8 Kbps – 20.0 Mbps
8PSK TPC	7/8	6.9 (6.5)	7.0 (6.6)	7.1 (6.7)	7.2 (6.8)	12.6 Kbps – 20.0 Mbps
16QAM VIT	3/4	10.7 (9.9)	11.5 (10.7)	12.4 (11.6)	13.3 (12.5)	14.4 Kbps – 20.0 Mbps
16QAM VIT	7/8	11.9 (11.1)	12.7 (11.9)	13.5 (12.7)	14.3 (13.5)	16.8 Kbps – 20.0 Mbps
16QAM VIT R-S	3/4	8.9 (8.3)	9.1 (8.6)	9.3 (8.8)	9.5 (9.1)	13.3 Kbps – 20.0 Mbps
16QAM VIT R-S	7/8	10.3 (9.9)	10.5 (10.2)	10.8 (10.4)	11.0 (10.7)	15.5 Kbps – 20.0 Mbps
16QAM TPC	3/4	7.0 (6.7)	7.4 (7.1)	7.8 (7.5)	8.2 (7.9)	14.4 Kbps – 20.0 Mbps
16QAM TPC	7/8	8.0 (7.6)	8.1 (7.7)	8.2 (7.8)	8.3 (7.9)	16.84 Kbps – 20.0 Mbps

### Modulator

Modulation:	BPSK, QPSK, and OQPSK (8PSK, 16QAM Optional)
L-Band Tuning Range:	950 to 2050 MHz in 1 Hz Steps
Impedance:	50 Ohm
Connector:	SMA (50 ohm) or F-Type (75 ohm) Female
Return Loss:	10 dB Minimum
Output Power:	0 to -25 dBm
Output Accuracy:	±1.0 dB Over Frequency and Temperature
Output Spectrum:	Selectable, Meets MIL 188-165A and INTELSAT IESS 308-309-310 Compliant (DVB-S Optional)
Spurious:	-55 dBc In-Band -45 dBc Out-of-Band
Harmonics:	-45 dBc
On/Off Power Ratio:	>60 dB
Scrambler:	CCITT V.35 or IBS (Others Optional)
FEC:	Viterbi, K = 7 at 1/2, 3/4 and 7/8 Trellis 2/3 Turbo Product Code (Optional) Per IESS 315 BPSK 21/44 QPSK/OQPSK 1/2, 3/4, 7/8 8PSK/16QAM 3/4, 7/8
Outer Encoder Options:	Reed-Solomon INTELSAT (DVB Optional) Custom (N, K) Reed-Solomon (Optional)
Data Clock Source:	Internal, External, Rx Recovered
Internal Stability:	$1 \times 10^{-8}$ Typical, $1 \times 10^{-9}$ Optional
BUC DC Current:	4 Amps Maximum (Externally Supplied)
BUC Internal Reference:	10 MHz, 3 dBm ± 3 dB

### Demodulator

Demodulation:	BPSK, QPSK, and OQPSK (8PSK, 16QAM Optional)
L-Band Tuning Range:	950 to 2050 MHz in 1 Hz Steps
Impedance:	50 or 75 Ohm
Connector:	SMA (50 ohm) or F-Type (75 ohm) Female
Return Loss:	10 dB Minimum
Spectrum:	Selectable, meets MIL 188-165A and INTELSAT IESS 308/309/310 Compliant (DVB-S optional)
Input Level:	-55 to +10 dBm
Total Input Power:	+20 dBm or +40 dBc (the Lesser)
FEC:	Viterbi, K = 7 at 1/2, 3/4 and 7/8 Rate Sequential 1/2, 3/4, 7/8 (Optional) Trellis 2/3 Turbo Product Code (Optional) Per IESS 315 BPSK 21/44 Custom (N, K) Reed-Solomon QPSK/OQPSK 1/2, 3/4, 7/8 8PSK/16QAM 3/4, 7/8
Decoder Options:	Reed-Solomon INTELSAT (DVB-S Optional)
Descrambler:	CCITT V.35 or IBS (Others Optional)
Acquisition Range:	Programmable ±1 kHz to ± 255 kHz
Sweep Delay Value:	100 msec to 9000 msec. in 100 msec Steps
LNB DC Current:	750 mA Maximum (Externally Supplied)
LNB Internal Reference:	10 MHz, 3 dBm ± 3 dB

### Plesiochronous Buffer

Size:	0 ms to 64 msec
Centering:	Automatic on Underflow or Overflow
Centering Modes:	IBS: Integral Number of Frames IDR: Integral Number of Multi-Frames
Clock:	Transmit, External, Rx Recovered or SCT (Internal)

### Monitor and Control

Remote RS-485/Terminal RS-232/Ethernet 10 Base-T, (SNMP & Web Browser)

### Terrestrial Interfaces

MIL STD 188-114A:	Differential, All Rates, Clock/Data, DCE
Ethernet 10/100 Base-T:	2 Port Ethernet Switch/Bridge

### Environmental

Prime Power:	24VDC, 1.7 Amps Maximum
Operating Temperature:	0 to 50°C, 95% Humidity, Non-Condensing
Storage Temperature:	-20 to 70°C, 99% Humidity, Non-Condensing

### Physical

Size:	7"W x 9.125"D x 1.1"H (17.78 x 23.17 x 2.54 cm)
Weight:	1.3 pounds (.589 kg)



Front View



Rear View



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