Description

The TTRM2005D-D02 2x2 Bi-Directional Amplifier is a class AB GaN module with an operating frequency range of 2200 to 2500 MHz. Designed for both military and commercial applications, this amplifier features an input voltage range of +12 to +32 VDC and a saturated RF output power of +42 dBm. With the capability of supporting any signal type and modulation format, all in a low-SWaP package, this unit is ideal for applications where high power-density, efficiency, and linearity are essential.

TTRM2005D-D02

TABLE OF CONTENTS

Features

- Temperature Monitor Output
- Over-Temperature Protection
- Amplifier Status Output
- Manual Tx/Rx Switching

Applications

- Unmanned Systems
- Military or Commercial Radio Systems
- Aircraft Systems
- Military MANET
- UAS, UGV, and USV Video/Data Links
- Point-to-Point and Mesh Networking

CHARACTERISTICS & SPECIFICATIONS

Specifications subject to change without notice. Typical performance at 28VDC at 25°C in a 50Ω system.

Tx Specifications (Per Channel)

Parameter	Min.	Typ.	Max	Unit
Operating Frequency	2200	—	2500	MHz
64QAM Power Output 20 MHz BW, -27 dB EVM Limit	36	—	—	dBm
BPSK Power Output 20 MHz BW, -7 dB EVM Limit	41	—	—	dBm
Saturated Power Output CW Sweep at Design Limit	—	42	—	dBm
Small Signal Gain	24	25	—	dB
Small Signal Gain Flatness	—	—	3	dB (peak to peak)
Input Return Loss	—	—	-15	dB
Tx / Rx Switching Time	—	1	2	µS

Rx Specifications (Per Channel)

Parameter	Min.	Typ.	Max	Unit
Small Signal Gain	12	13	—	dB
Small Signal Gain Flatness	—	—	1	dB (Peak to Peak)
Noise Figure	—	1.8	2	dB
Input Return Loss	—	—	-10	dB

Power Supply Specifications

Parameter	Min.	Typ.	Max	Unit	Notes
Supply Voltage Range	12	28	32	VDC	—
RMS Operating Current Draw (Idle)	—	—	0.25	A	28VDC Supply Voltage, Idle in Receive Mode
RMS Operating Current Draw (64QAM Power Output)	—	—	0.42	A	28VDC Supply Voltage, 802.11 WLAN Signal
RMS Operating Current Draw (BPSK Power Output)	—	—	0.75	A	28VDC Supply Voltage, 802.11 WLAN Signal

CHARACTERISTICS & SPECIFICATIONS (CONT.)

Specifications subject to change without notice.

Mechanical Specifications

Parameter	Value	Unit	Notes
Dimensions (L x W x H)	3.4 x 2.6 x 0.65 (86.4 x 66 x 16.5)	in (mm)	—
Cooling	Baseplate Conduction	—	—
Weight	4.7 (133)	oz (g)	—

Interface Specifications

Parameter	Value	Notes
RF Connectors (Input / Output)	SMP-M / SMP-M	—
Power / Signal Connector	M80-5401042	Connector appearing on unit (Manufacturer P/N)
Mating Connector	M80-4611005	Mating connector required for interfacing (Manufacturer P/N)
Test Integration Cable	CBL79	Triad P/N available for purchase separately

Environmental Specifications

Parameter	Min.	Max	Unit
Operating Temperature (Housing Temp.)	-20	85	°C
Storage Temperature	-55	85	°C
Altitude	0 (0)	30000 (9144)	ft. (m.)
Ingress Protection Rating	IP40		—
Shock / Vibration	Designed to comply with MIL-STD-810 Shock/Vibration Test Methods		—

Protections & Maximum Ratings

Parameter	Value	Unit	Notes
Maximum RF Input (Per Channel)	33	dBm	CW Power
Over Temp Protection Trip Level	91	°C	Internally Monitored System Temperature
RF Output Open Load Survivability	42	dBm	CW with Open Circuit at Antenna Port

DC / CONTROL CONNECTORS

Input / Output Pins

TTRM Connector Part Number			Mating Connector Part Number	
M80-5401042			M80-4611005	
Pin	**Label**	**Type**	**I/O**	**Notes**
1	STATUS	Signal	Output	Operational State TTL High = Amplifier Active TTL Low = Amplifier Fault
2	I/O	Signal	Input	Tx / Rx Switching TTL High = TX TTL Low or No Connection = RX
3	VDC	Power	N/A	Supply Voltage
4	VDC	Power	N/A	Supply Voltage
5	VDC	Power	N/A	Supply Voltage
6	TEMP	Signal	Output	Temperature Monitor Temp in DegC = (Vout - 0.5V) * 100
7	N/C	N/A	N/A	Not Connected
8	GND	Power	N/A	Supply Voltage Return
9	GND	Power	N/A	Supply Voltage Return
10	GND	Power	N/A	Supply Voltage Return

MECHANICAL DRAWING