Description

The TTRM4005D-D02 2x2 Bi-Directional Amplifier is a class AB GaN module with an operating frequency range of 4400 to 5000 MHz. Designed for both military and commercial applications, this amplifier features an input voltage range of +10 to +32 VDC and a saturated RF output power of +43 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.

TTRM4005D-D02

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Features

- Over / Under / Reverse Voltage Protection
- Temperature Monitor Output
- Over-Temperature Protection
- Manual Tx/Rx Switching

Applications

- Unmanned Systems
- Military or Commercial Radio Systems
- Aircraft Systems

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	4400	—	5000	MHz
64QAM Power Output 20 MHz BW, -27 dB EVM Limit	37	—	—	dBm
BPSK Power Output 20 MHz BW, -7 dB EVM Limit	43	—	—	dBm
Saturated Power Output CW Sweep at Design Limit	—	43	—	dBm
Small Signal Gain	25.5	28.5	—	dB
Small Signal Gain Flatness	—	—	2.5	dB (peak to peak)
Input Return Loss	—	—	-12	dB
Tx / Rx Switching Time	—	1	2	µS

Rx Specifications (Per Channel)

Parameter	Min.	Typ.	Max	Unit
Small Signal Gain	8.5	13.5	—	dB
Small Signal Gain Flatness	—	—	2	dB (Peak to Peak)
Noise Figure	—	2.5	6	dB
Input Return Loss	—	—	-8	dB

Power Supply Specifications

Parameter	Min.	Typ.	Max	Unit	Notes
Supply Voltage Range	10	28	32	VDC	—
RMS Operating Current Draw (Idle)	—	0.3	—	A	28VDC Supply Voltage, Idle in Receive Mode
RMS Operating Current Draw (64QAM Power Output)	—	2.22	—	A	28VDC Supply Voltage, 802.11 WLAN Signal, 50% Duty Cycle
RMS Operating Current Draw (BPSK Power Output)	—	4.25	—	A	28VDC Supply Voltage, 802.11 WLAN Signal, 50% Duty Cycle

CHARACTERISTICS & SPECIFICATIONS (CONT.)

Specifications subject to change without notice.

Mechanical Specifications

Parameter	Value	Unit	Notes
Dimensions (L x W x H)	6 x 4 x 1.47 (152.4 x 101.6 x 37.3)	in (mm)	—
Cooling	Baseplate Conduction	—	—
Weight	28.8 (816)	oz (g)	—

Interface Specifications

Parameter	Value	Notes
RF Connectors (Input / Output)	TNC-F / TNC-F	—
Power / Signal Connector	PT02E12-14P	Connector appearing on unit (Manufacturer P/N)
Mating Connector	PT06E12-14S-SR	Mating connector required for interfacing (Manufacturer P/N)
Test Integration Cable	CBL68	Triad P/N available for purchase separately

Environmental Specifications

Parameter	Min.	Max	Unit
Operating Temperature (Housing Temp.)	-40	85	°C
Storage Temperature	-55	85	°C
Altitude	0 (0)	30000 (9144)	ft. (m.)
Ingress Protection Rating	IP67		—
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)	30	dBm	CW Power
Over Temp Protection Trip Level	85	°C	Internally Monitored System Temperature
RF Output Open Load Survivability	42	dBm	CW with Open Circuit at Antenna Port

DC / CONTROL CONNECTORS

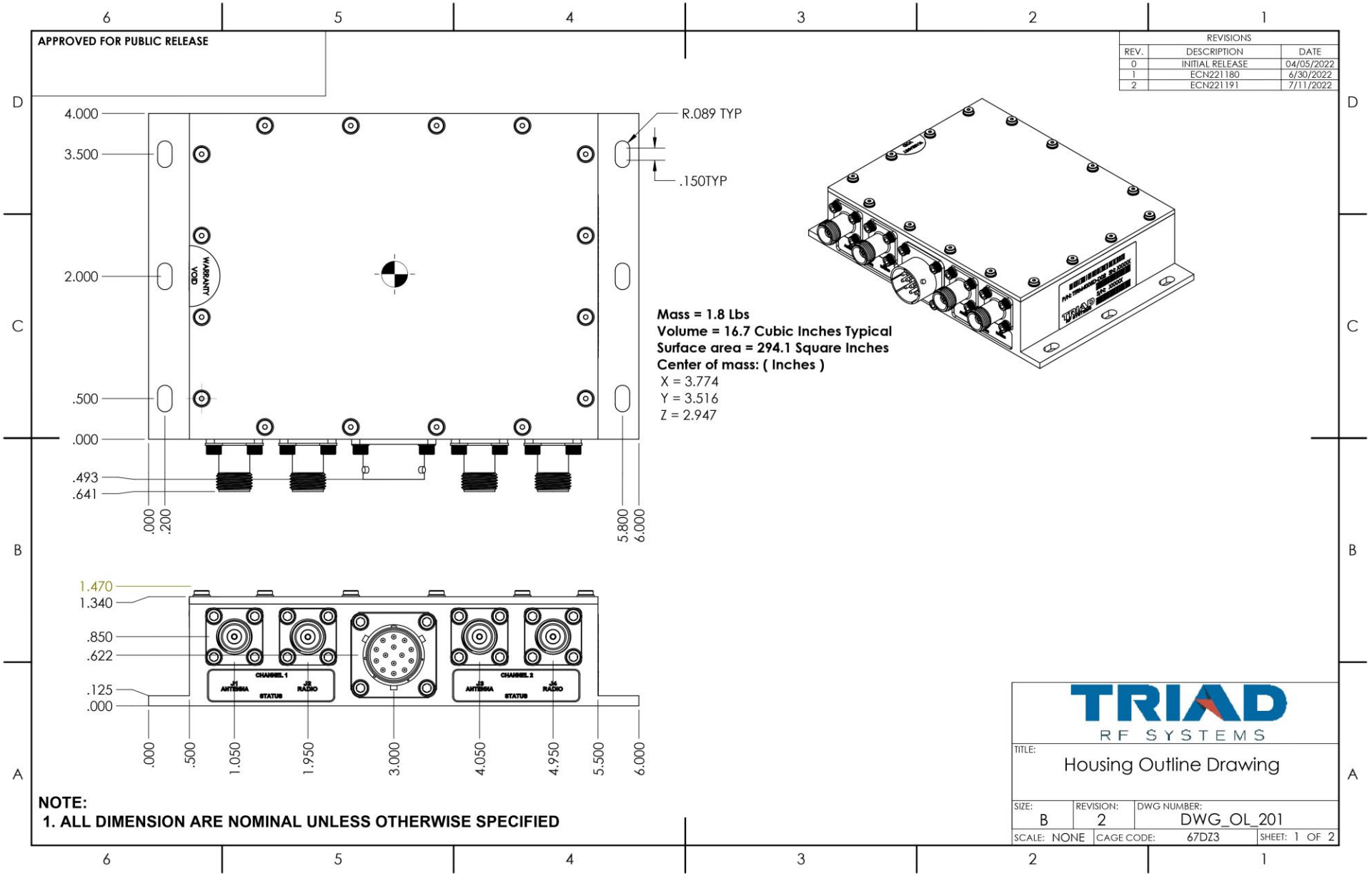
Input / Output Pins

TTRM Connector Part Number			Mating Connector Part Number	
PT02E12-14P			PT06E12-14S-SR	
Pin	**Label**	**Type**	**I/O**	**Notes**
B	Vin	Power	N/A	Supply Voltage - Range Specified in Data Sheet
E	Vin	Power	N/A	Supply Voltage - Range Specified in Data Sheet
F	Vin	Power	N/A	Supply Voltage - Range Specified in Data Sheet
L	GND	Power	N/A	Power Supply Return (Ground)
K	GND	Power	N/A	Power Supply Return (Ground)
P	GND	Power	N/A	Power Supply Return (Ground)
A	STATUS	Signal	Output	Amplifier Status TTL HIGH = Normal Operation TTL LOW = Error Condition
C	I/O	Signal	Input	Manual Switching TTRM: TTL High = Tx Amp Enabled TTL Low = Rx Amp Enabled Automatic Switching TTRM: Pin not required. Do not use.
J	N/C	N/A	N/A	NO CONNECTION
M	TEMP	Signal	Output	Temp Monitor Temp in DegC = (Vout - 0.5V) * 100
R	SIG GND	Signal	N/A	Signal Ground
D	N/C	N/A	N/A	NO CONNECTION
N	N/C	N/A	N/A	NO CONNECTION
H	N/C	N/A	N/A	NO CONNECTION

MECHANICAL DRAWING

APPROVED FOR PUBLIC RELEASE

REVISIONS		
REV.	DESCRIPTION	DATE
0	INITIAL RELEASE	04/05/2022
1	ECN221180	6/30/2022
2	ECN221191	7/11/2022

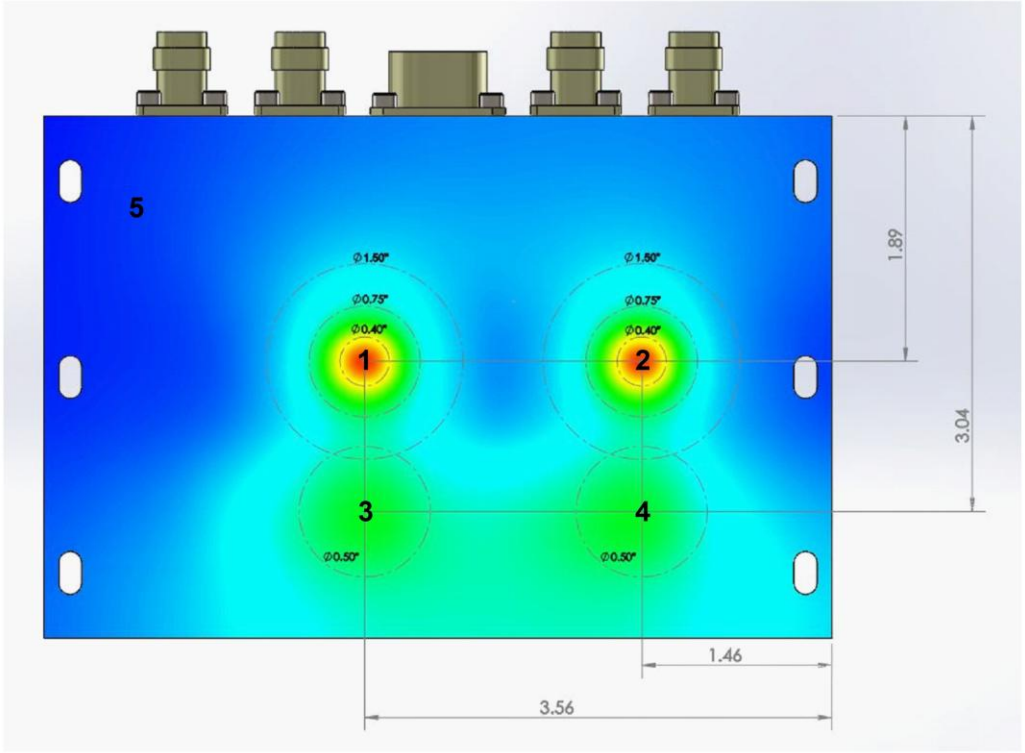


Mass = 1.8 Lbs
Volume = 16.7 Cubic Inches Typical
Surface area = 294.1 Square Inches
Center of mass: (Inches)
X = 3.774
Y = 3.516
Z = 2.947

NOTE:
1. ALL DIMENSION ARE NOMINAL UNLESS OTHERWISE SPECIFIED

TRIAD RF SYSTEMS

TITLE: Housing Outline Drawing		
SIZE: B	REVISION: 2	DWG NUMBER: DWG_OL_201
SCALE: NONE	CAGE CODE: 67DZ3	SHEET: 1 OF 2



Dissipated Power (W)					
Operating Condition/Location	**1**	**2**	**3**	**4**	**5 (Uniform)**
64QAM/20MHz 34dBM Output Power @ 80% Duty Cycle	10	10	3	3	6
BPSK/20MHz 42dBM Output Power @ 80% Duty Cycle	24	24	8	8	6

SIZE:	REVISION:	DWG NUMBER:	
B	2	OL_201	
SCALE: NONE	CAGE CODE: 67DZ3		SHEET: 2 OF 2