TTRM1102

2200-2500 MHz 126 W Bi-Directional Amplifier

Bi-Directional Amplifiers

Description

This class AB LDMOS module is designed for both military and commercial applications. It is capable of supporting any signal type and modulation format, including but not limited to 3-4G telecom, WLAN, OFDM, DVB, and CW/AM/FM. The latest device technologies and design methods are employed to offer high power density, efficiency, and linearity in a small, lightweight package.

Features

- Over / Under / Reverse Voltage Protection
- Auto Tx/Rx Switching (RF Detect)
- Reflected Power Measurement
- Auto Gain Control
- Forward Power Measurement
- High Speed T/R Switching Control

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

Tx Specifications				
Parameter	**Min**	**Typ.**	**Max**	**Unit**
Operating Frequency	2200		2500	MHz
PSat Power Output		+51.0		dBm
Gain		31.0		dB
Gain Flatness		1.0		± dB
Input Return Loss		-17		dB
Operating Voltage	+27		+30	VDC
Current Draw			13.0	A
Tx / Rx Switching Time		1.0	2.0	uS

Rx Specifications				
Parameter	**Min**	**Typ.**	**Max**	**Unit**
P1dB Power Output		+5.0		dBm
Gain		13.0		dB
Gain Flatness		1.0		± dB
Noise Figure		2.0		dB
Input Return Loss	-12			dB
Current Draw		100.0		mA

Triad RF Systems Inc. | 11 Harts Ln, Suite i, East Brunswick, NJ 08816
Tel: 1-(855) 558-1001 x1 | sales@triadrf.com

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Mechanical		
Parameter	**Value**	**Unit**
Dimensions (L x W x H)	7.38 x 4.39 x 1.31	in
RF Connectors (Input / Output)	N-Type F / N-Type F	--
DC / Control Connector	Circular Locking	--
Cooling	Baseplate Conduction - Optional Heatsink Available	--
Mounting	6-32 Thru	--
Weight	19	oz.

Environmental / Protections			
Parameter	**Min**	**Max**	**Unit**
Operating Temperature (Housing Temp.)	-40	+85	°C
Humidity Range	0-100		%
Altitude	0-30,000		ft.
Shock / Vibration	MIL-STD-810 and equivalents		--
Max RF Input	23		dBm
PA Baseplate Shutoff Temperature	+85		°C

Input/Output Pins				
Amplifier Connector Type:		**Circular Bayonet Locking Male**		
Triad Cable Part Number:		**CBL32**		
Pin Label	**Name**	**Description**	**Type**	**Level**
A	ON/OFF+	PA ON/OFF CONTROL (RS-422)	Input	RS-422
B	ON/OFF-	PA ON/OFF CONTROL (RS-422)	Input	5V TTL
E	TX/RX+	TX/RX CONTROL (RS-422)	Input	RS-422
F	TX/RX-	TX/RX CONTROL (RS-422)	Input	RS-422
G	BIT+	PA BUILT IN TEST (RS-422)	Output	RS-422
H	BIT-	PA BUILT IN TEST (RS-422)	Output	RS-422
J	GND	GROUND	Power	--
K	+VDC	Supply Voltage - Range Specified in Datasheet	Power	--
L	GND	GROUND	Power	--
M	+VDC	Supply Voltage - Range Specified in Datasheet	Power	--

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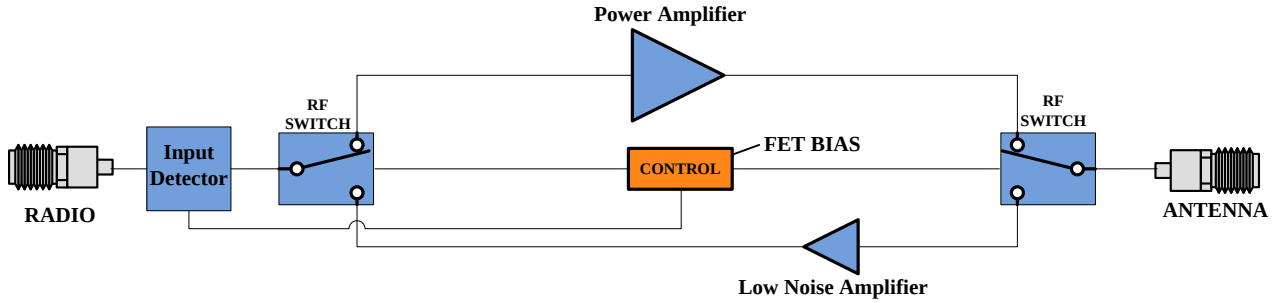
802-11g (20 MHz BW) Data Rate vs. Output Power			
OFDM Modulation	Data Rate	POut (W) Min.	EVM
64QAM	54 Mbps	32	≤ -27 dB
16QAM	36 Mbps	56	≤ -21 dB
QPSK	12 Mbps	63	≤ -15 dB
BPSK	9 Mbps	100	≤ -7 dB

See our application note that describes how this table was calculated and provides notes on in-system performance

High-Level Block Diagram

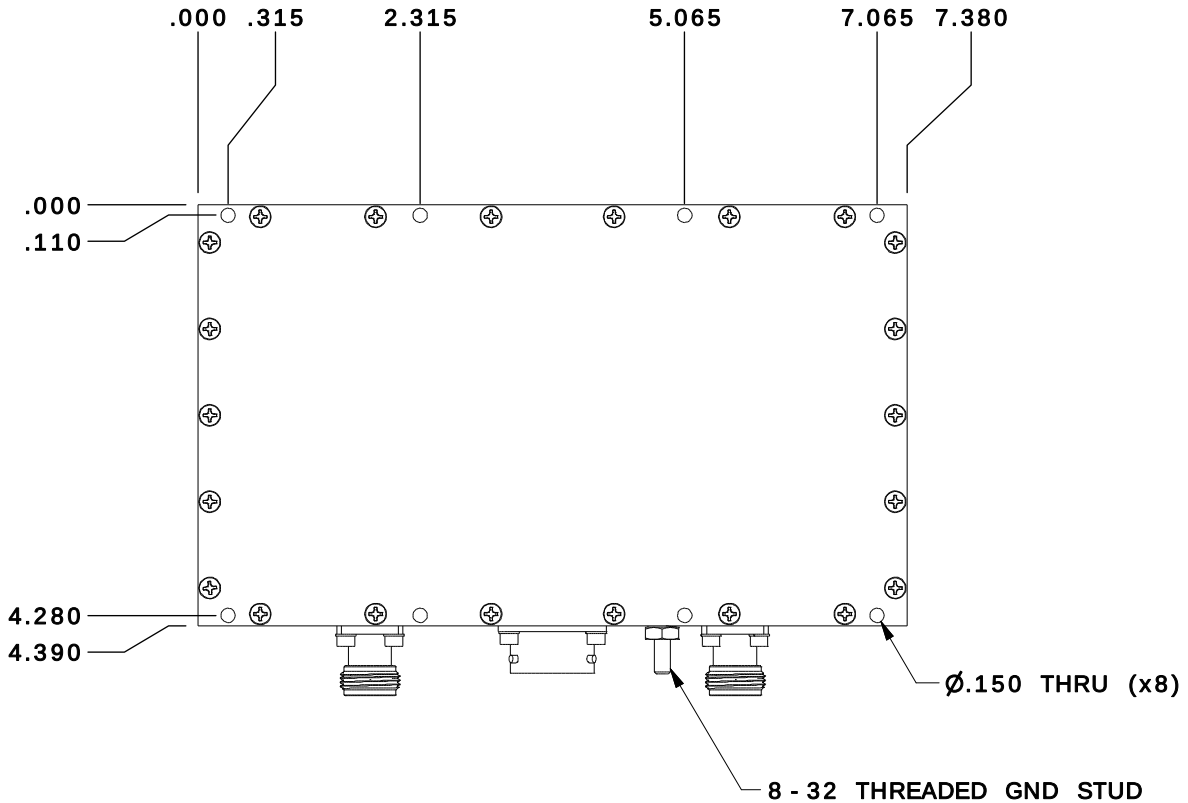


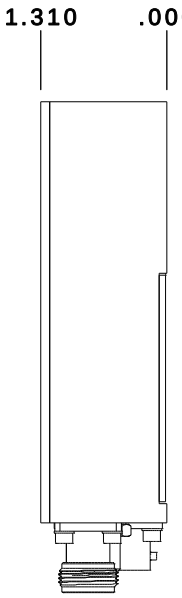
Ordering Guide – Configuration Information		
Model Number	Amplifier Option	Heat Sink Option
TTRMXXXX - XXX - XXX		

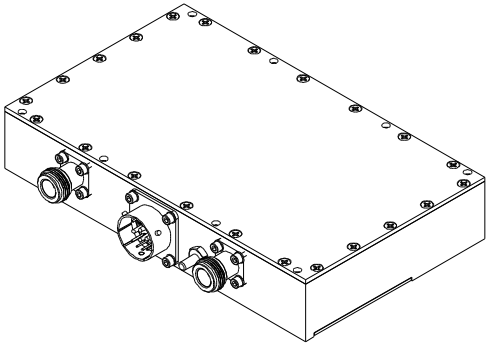
Amplifier Options	
Suffix	Description
D01	Automatic Tx/Rx Switching
D02	Manual Tx/Rx Switching
DXX	Custom Amplifier Configuration (issued by Triad upon customer request)

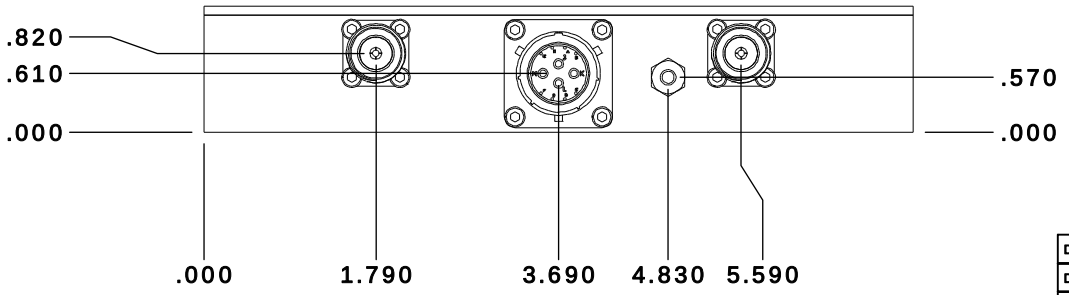
Heat Sink Options	
Suffix	Description
(none)	No Heat Sink Included
HS	Standard Heat Sink
HSF	Heat Sink with Integrated Cooling Fan
HSX	Custom Heat Sink Configuration

REVISIONS			
REV	DESCRIPTION	DATE	APPROVED
0	INITIAL RELEASE	1/14/16	DMC









DRAWN	DMC	1/18/2016
DESIGNED	DMC	11/1/2015
CHECKED		
ENG APPROVED		
MFG APPROVED		

DIMENSIONS ARE IN INCHES
UNLESS SPECIFIED OTHERWISE
TOLERANCES

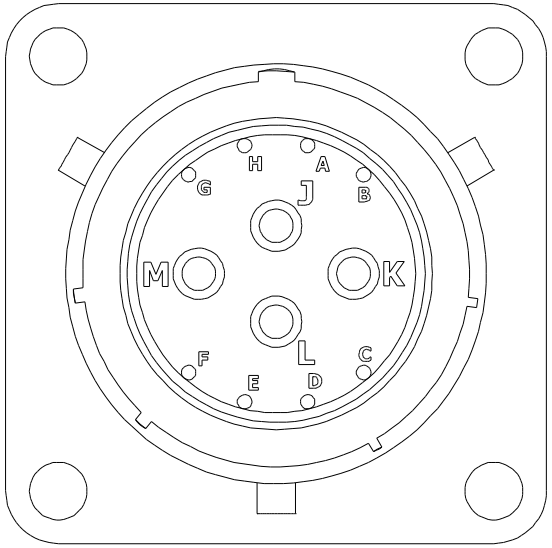
DECIMALS	FRACTIONS	ANGLES
.XX ±.01 .XXX ±.005	±1/32	±2°

TRIAD RF SYSTEMS
180 TICES LANE
BUILDING A, SUITE 107
EAST BRUNSWICK, NJ 08816
855 - 558 - 1001

HOUSING OUTLINE 149

SIZE	DWG NO.	REV
A	OL_149	0

SCALE: NONE	CAGE CODE 67DZ3	SHEET 1 OF 2



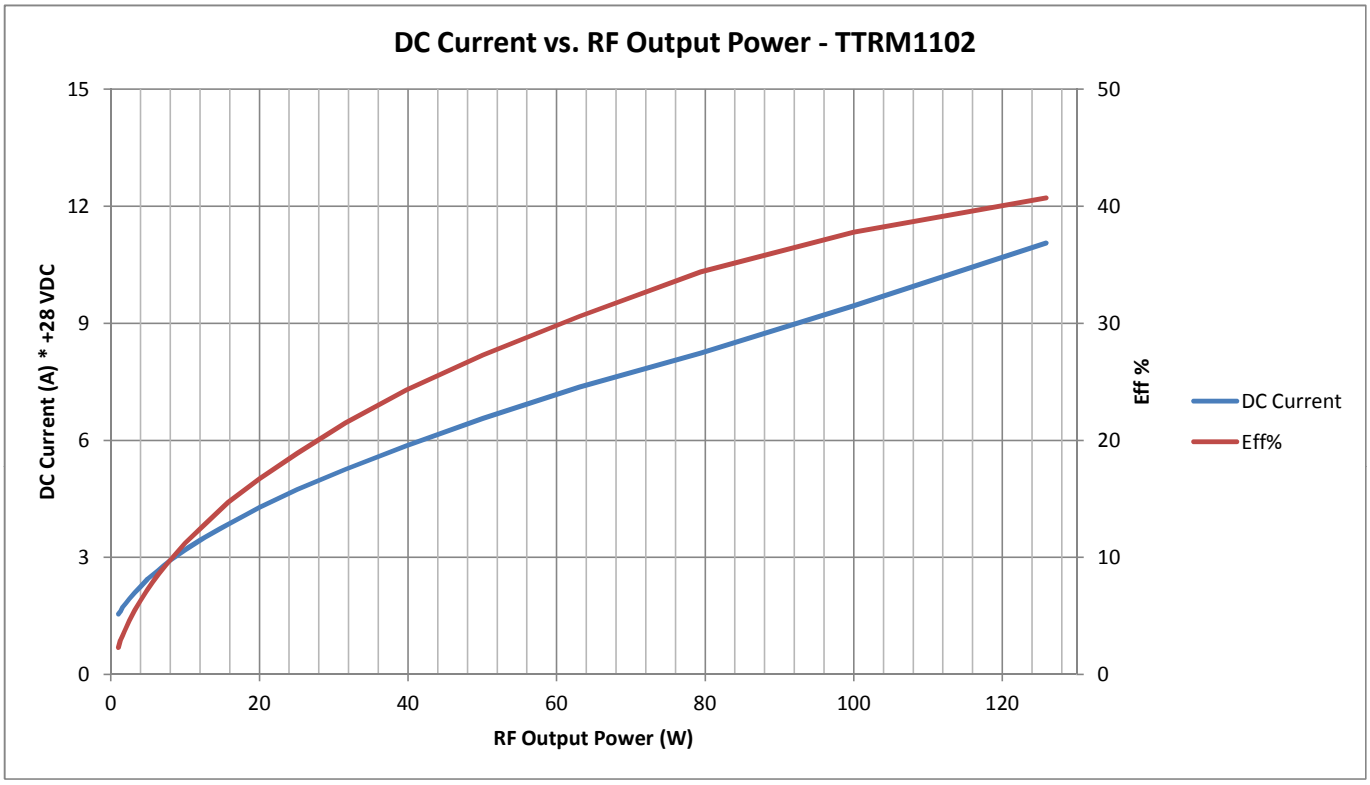
CONNECTOR ON AMPLIFIER: AMPHENOL CONNEX P/N PT02E-14-12P
(TRIAD P/N 400-039)

MATING CABLE REQUIRED: AMPHENOL P/N PT06E-14-12S(470)
(TRIAD P/N 400-083)

EQUIVALENT CONNECTOR FROM ALTERNATE MANUFACTURERS MAY BE USED -
CONTACT TRIAD FOR APPROVAL

TTRM1102 PINOUT		
PIN #	LABEL	FUNCTION
A	-	NOT USED
B	-	NOT USED
C	RS-422 TX+	RS-422 SERIAL INTERFACE TRANSMIT +
D	RS-422 TX-	RS-422 SERIAL INTERFACE TRANSMIT -
E	TX/RX+	BDA TX/RX CONTROL +
F	TX/RX-	BDA TX/RX CONTROL -
G	RS-422 RX+	RS-422 SERIAL INTERFACE RECIEVE +
H	RS-422 RX-	RS-422 SERIAL INTERFACE RECIEVE -
J,L	GND	GROUND
K,M	+VDC	SUPPLY VOLTAGE SPECIFIED ON DATASHEET

DRAWN DMC	1/18/2016	HOUSING OUTLINE 149
DESIGNED DH	4/10/2014	
CHECKED		SIZE A / DWG NO. OL_149 / REV 0
ENG APPROVED		
MFG APPROVED		SCALE: NONE / CAGE CODE 67DZ3 / SHEET 2 OF 2


DC Current vs. RF Output Power - TTRM1102
DC Current (A) * +28 VDC
Eff %
RF Output Power (W)
0
3
6
9
12
15
0
10
20
30
40
50
0
20
40
60
80
100
120
DC Current
Eff%