Bi-Directional Amplifiers

TTRM1116

1200-1400 MHz 40 W Bi-Directional Amplifier

Description

This class AB GaN 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
Manual or Automatic Tx/Rx Switching Available
Received Signal Strength Indicator Output
Manual Gain Control
Internal Bypass Relay

Specifications subject to change without notice. Typical performance at +12VDC at 25°C in a 50Ω system

Tx Specifications				
Parameter	**Min**	**Typ.**	**Max**	**Unit**
Operating Frequency	1200		1400	MHz
PSat Power Output		+46.0		dBm
Gain	19.0	20.0		dB
Gain Flatness		0.5	1.0	± dB
Input Return Loss	-16	-17		dB
Operating Voltage	+10	+12	+28	VDC
Current Draw		2.0	4.0	A
Tx / Rx Switching Time		1.0	2.0	uS

Rx Specifications				
Parameter	**Min**	**Typ.**	**Max**	**Unit**
P1dB Power Output		+6.0		dBm
Gain		12.0		dB
Gain Flatness		0.3	0.5	± dB
Noise Figure		1.0	1.5	dB
Input Return Loss		-10		dB
Current Draw		0.1	0.2	mA

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rev 05/9/18

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Mechanical		
Parameter	**Value**	**Unit**
Dimensions (L x W x H)	4.93 x 2.53 x 0.7	in
RF Connectors (Input / Output)	SMA-F / SMA-F	--
DC / Control Connector	15 Pin Micro-D	--
Cooling	Baseplate Conduction - Optional Heatsink Available	--
Mounting	4-40 Thru Holes	--
Weight	4	oz.
Weight With Heatsink	7	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	26		dBm
PA Baseplate Shutoff Temperature	+85		°C

Input/Output Pins				
Amplifier Connector Type:		**15 Pin Micro-D Female**		
Triad Cable Part Number:		**CBL37**		
Pin Label	**Name**	**Description**	**Type**	**Level**
2,3,10,11	+VDC	Supply Voltage - Range Specified in Datasheet	Power	--
1,7,9,12	GND	Ground	Power	--
14	RSSI	Received Signal Strength Indicator	Output	Analog
8	SIG GND	Signal Ground	--	--
13	TX/RX	Tx/Rx Control Line (When manual switching "-D02" option equipped)- TTL Lo: RX Mode, TTL Hi: TX Mode	Input	5V TTL
4	CTL1	Power level control line 1	Input	5V TTL
6	CTL2	Power level control line 2	Input	5V TTL

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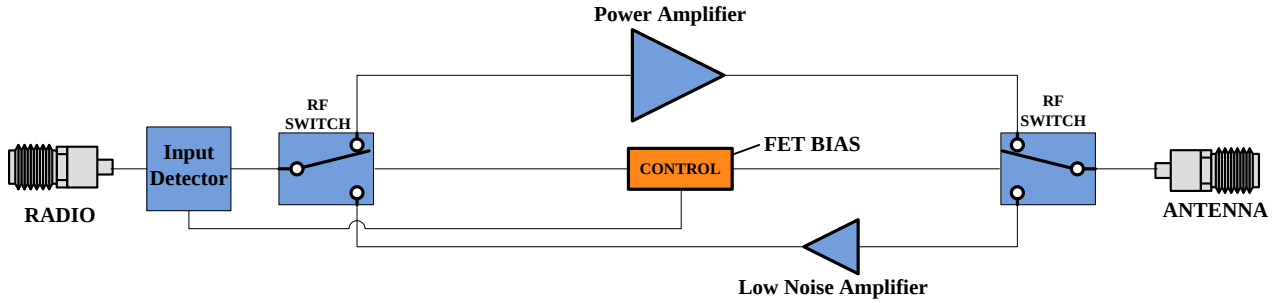
802-11g (20 MHz BW) Data Rate vs. Output Power			
OFDM Modulation	Data Rate	POut (W) Min.	EVM
64QAM	54 Mbps	10	≤ -27 dB
16QAM	36 Mbps	17	≤ -21 dB
QPSK	12 Mbps	20	≤ -15 dB
BPSK	9 Mbps	32	≤ -7 dB

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

High-Level Block Diagram

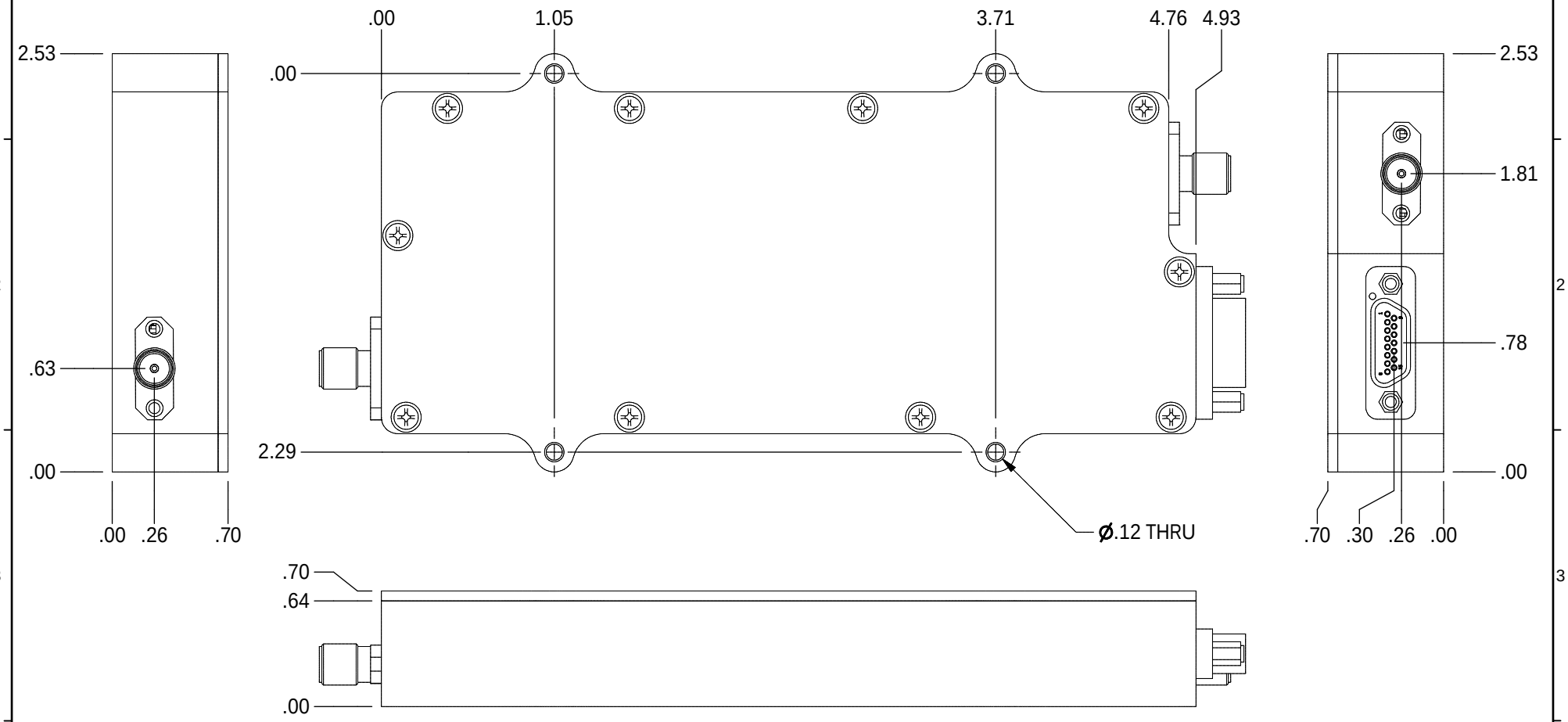


Ordering Guide – Configuration Information		
Model Number	Amplifier Option	Heat Sink Option
TTRMXXXX - XXX - XXX		

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	8/24/15	DH
1	E18318	5/31/18	SC



DRAWN	Dean	9/24/2015
DESIGNED	DMC	8/2/2016
CHECKED		
ENG APPROVED		
MFG APPROVED		

DIMENSIONS ARE IN INCHES
UNLESS SPECIFIED OTHERWISE
TOLERANCES
DECIMALS .XX ±.01 .XXX ±.005
FRACTIONS ±1/32
ANGLES ±2°

TRIAD RF SYSTEMS
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EAST BRUNSWICK, NJ 08816
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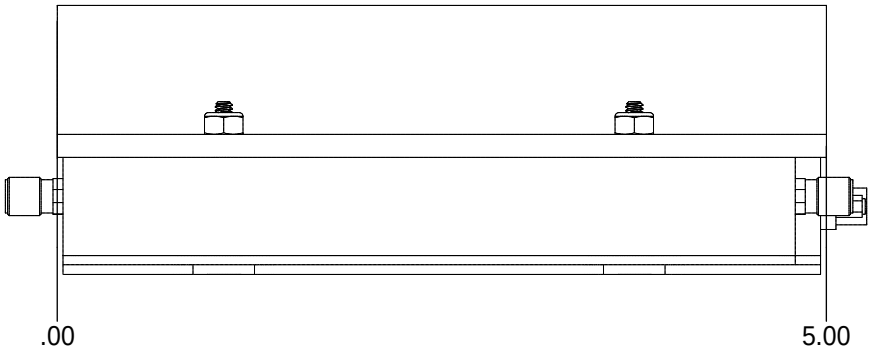
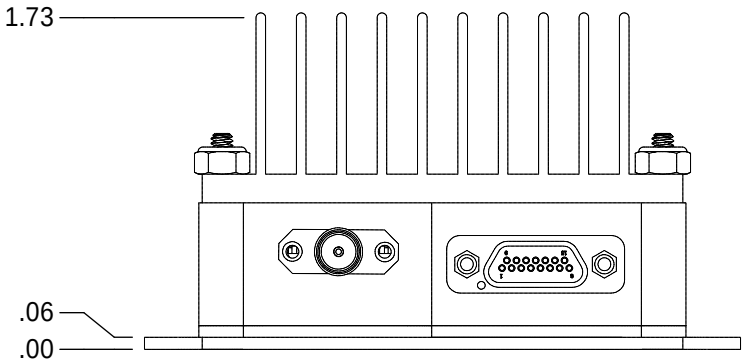
HOUSING OUTLINE DRAWING 155

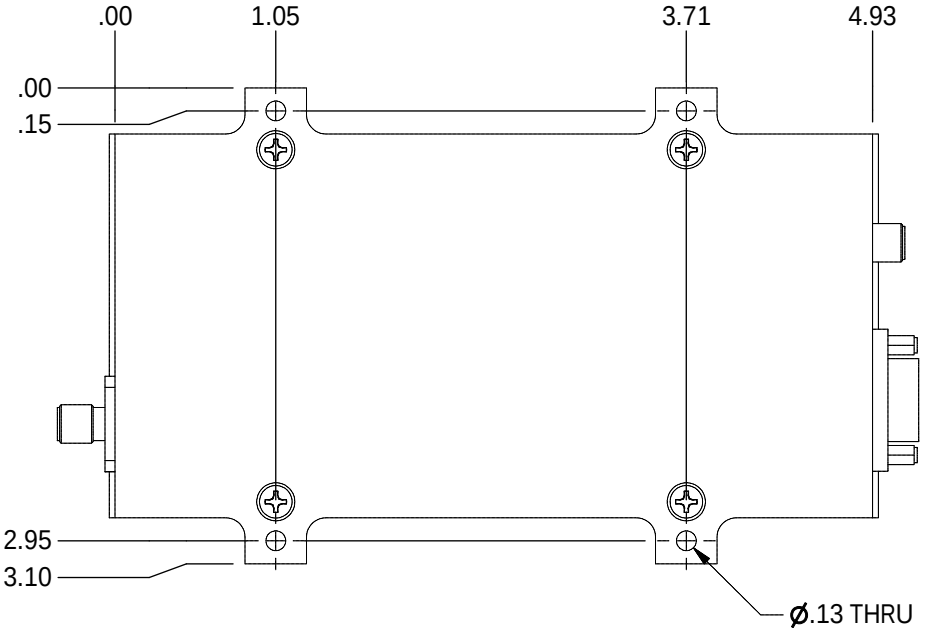
SIZE	DWG NO.	REV
A	OL_155	1

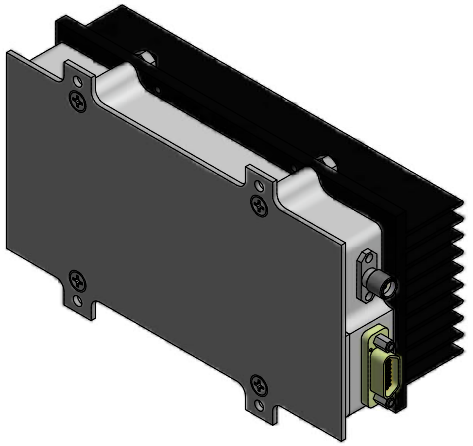
SCALE: NONE | CAGE CODE 67DZ3 | SHEET 1 OF 2

HEATSINK









DRAWN	Dean	9/24/2015	HOUSING OUTLINE DRAWING 155		
DESIGNED	DMC	8/2/2016			
CHECKED			SIZE A	DWG NO. OL_155	REV 1
ENG APPROVED					
MFG APPROVED			SCALE: NONE	CAGE CODE 67DZ3	SHEET 2 OF 2