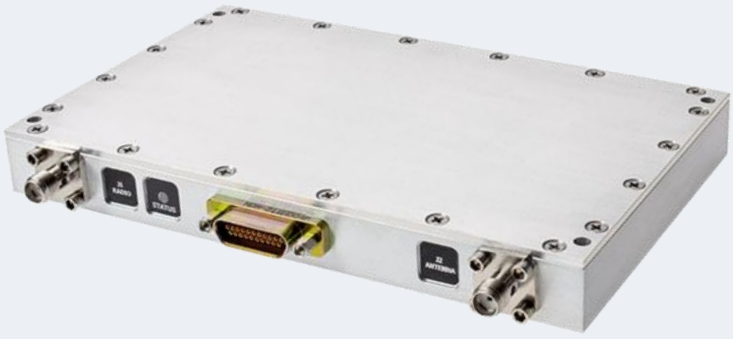


Description

The TTRM4010-D02 SISO 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 +47 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.

TTRM4010-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

CHARACTERISTICS & SPECIFICATIONS

Specifications subject to change without notice. Typical performance at 12VDC 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	40	—	—	dBm
BPSK Power Output 20 MHz BW, -7 dB EVM Limit	46	—	—	dBm
Saturated Power Output CW Sweep at Design Limit	—	47	—	dBm
Small Signal Gain	23	26	—	dB
Small Signal Gain Flatness	—	—	2	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	10	13	—	dB
Small Signal Gain Flatness	—	—	2	dB (Peak to Peak)
Noise Figure	—	2	2.5	dB
Input Return Loss	—	—	-10	dB

Power Supply Specifications

Parameter	Min.	Typ.	Max	Unit	Notes
Supply Voltage Range	10	28	32	VDC	—
RMS Operating Current Draw (Idle)	—	2.9	—	A	12VDC Supply Voltage, Idle in Receive Mode
RMS Operating Current Draw (64QAM Power Output)	—	3.15	—	A	12VDC Supply Voltage, 802.11 WLAN Signal, 50% Duty Cycle
RMS Operating Current Draw (BPSK Power Output)	—	6.9	—	A	12VDC 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)	5.3 x 3.25 x 0.6 (134.6 x 82.6 x 15.2)	in (mm)	—
Cooling	Baseplate Conduction	—	—
Weight	13 (369)	oz (g)	—

Interface Specifications

Parameter	Value	Notes
RF Connectors (Input / Output)	SMA-F / SMA-F	—
Power / Signal Connector	MDM-21SH016P-A174	Connector appearing on unit (Manufacturer P/N)
Mating Connector	M83513/03-C03C	Mating connector required for interfacing (Manufacturer P/N)
Test Integration Cable	CBL58	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	IP55		—
Shock / Vibration	Designed to comply with MIL-STD-810 Shock / Vibration Test Methods		—

Protections & Maximum Ratings

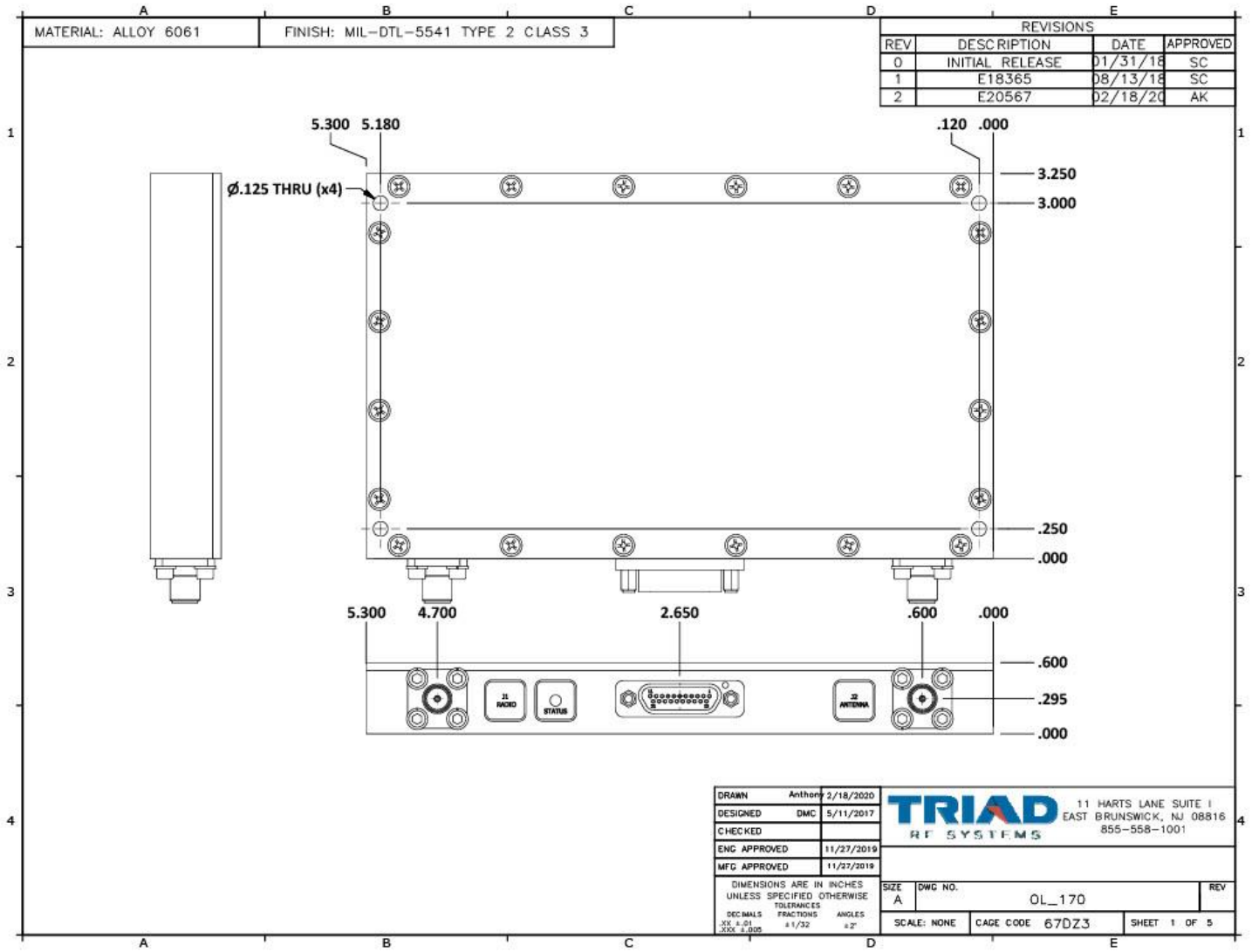
Parameter	Value	Unit	Notes
Maximum RF Input (Per Channel)	24	dBm	CW Power
Over Temp Protection Trip Level	85	°C	Internally Monitored System Temperature
RF Output Open Load Survivability	45	dBm	CW with Open Circuit at Antenna Port

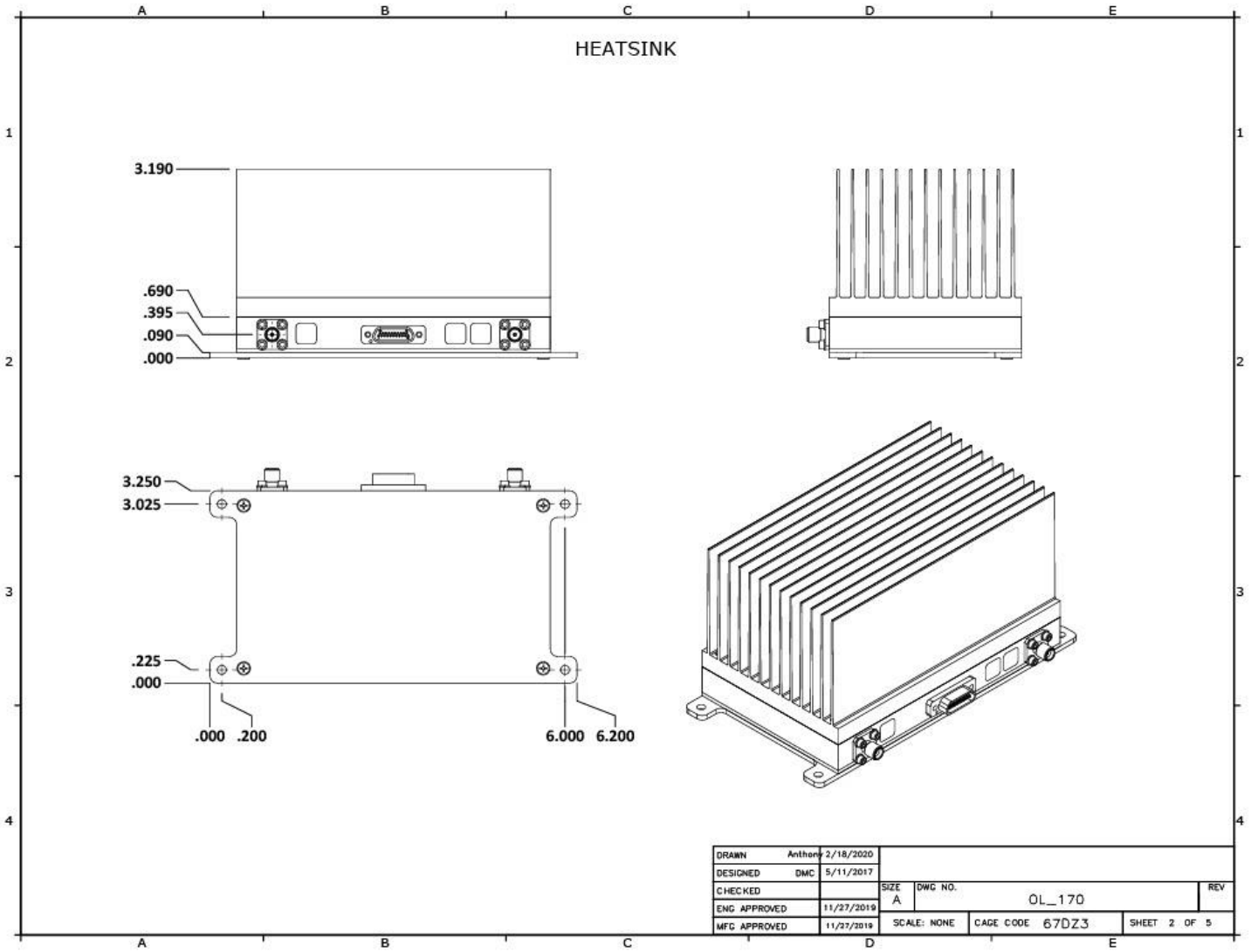
DC / CONTROL CONNECTORS

Input / Output Pins

TTRM Connector Part Number			Mating Connector Part Number	
MDM-21SH016P-A174			M83513/03-C03C	
Pin	**Label**	**Type**	**I/O**	**Notes**
1	Vin	Power	N/A	Supply Voltage
2	Vin	Power	N/A	Supply Voltage
3	Vin	Power	N/A	Supply Voltage
12	Vin	Power	N/A	Supply Voltage
13	Vin	Power	N/A	Supply Voltage
9	GND	Power	N/A	Power Supply Return
10	GND	Power	N/A	Power Supply Return
11	GND	Power	N/A	Power Supply Return
20	GND	Power	N/A	Power Supply Return
21	GND	Power	N/A	Power Supply Return
4	FWD DET	Signal	Output	TX AMP RMS Power Detector
5	TEMP	Signal	Output	Temp Monitor Temp in DegC = (Vout - 0.5V) * 100
6	RAD DET	Signal	Output	Radio Input RMS Power Detector
7	STATUS	Signal	Output	Amplifier Status TTL HIGH = Normal Operation TTL LOW = Error Condition
8	I/O	Signal	Input	TA: TTL High or No Connection = Enable TTL Low = Disable Manual Switching TTRM: TTL High = Tx Amp Enabled TTL Low = Rx Amp Enabled Automatic Switching TTRM: Pin not required. Do not use.
19	SIG GND	Signal	N/A	Signal Ground
14	N/C	N/A	N/A	NO CONNECTION
15	N/C	N/A	N/A	NO CONNECTION
16	N/C	N/A	N/A	NO CONNECTION
17	N/C	N/A	N/A	NO CONNECTION
18	N/C	N/A	N/A	NO CONNECTION

MECHANICAL DRAWING

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3.025
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.000
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6.000
6.200
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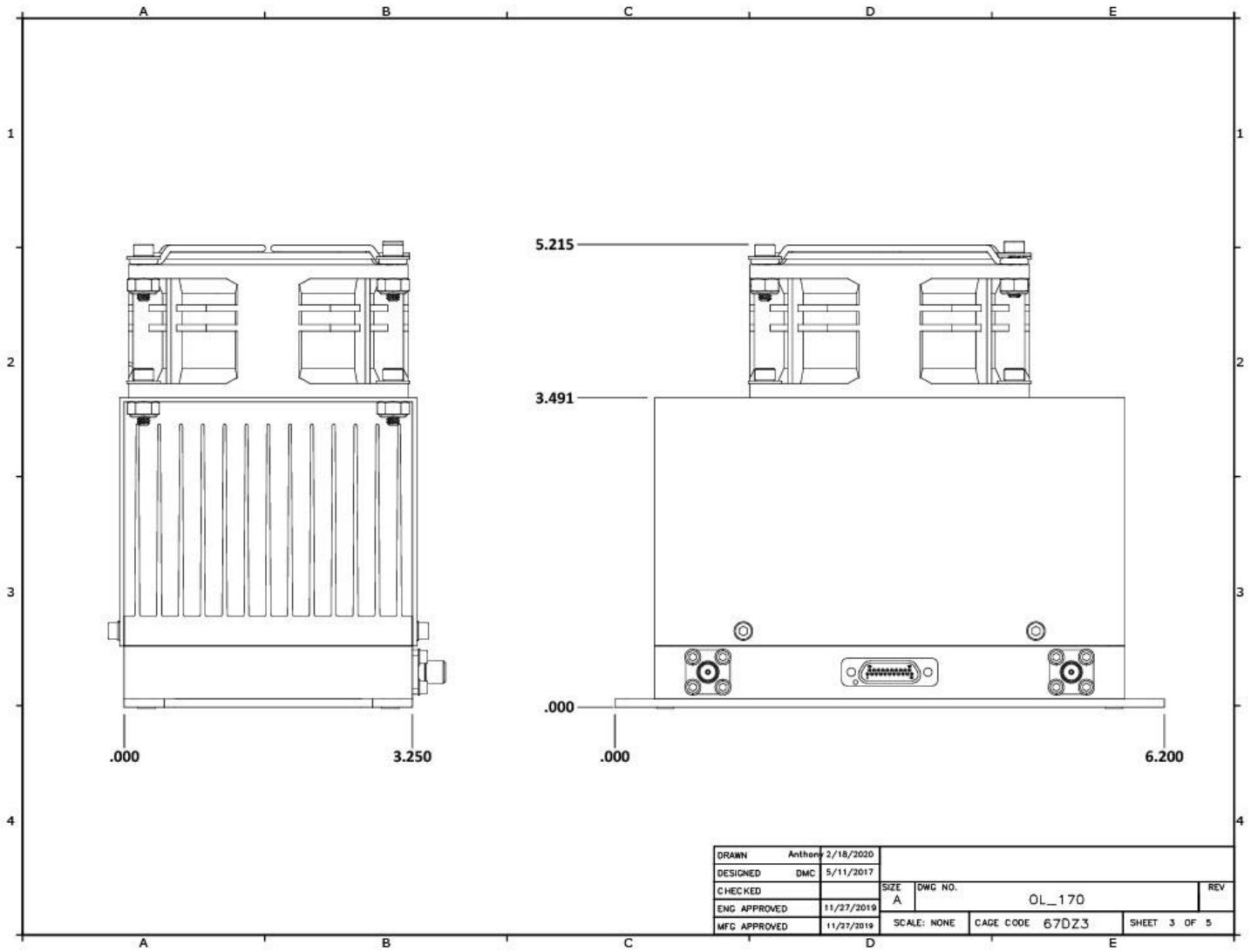
DESIGNED DMC 5/11/2017
CHECKED
ENG APPROVED 11/27/2019
MFG APPROVED 11/27/2019
SIZE A
DWG NO. OL_170
REV
SCALE: NONE
CAGE CODE 67DZ3
SHEET 2 OF 5


A
B
C
D
E
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2
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4
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DESIGNED DMC 5/11/2017
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ENG APPROVED 11/27/2019
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REV
SCALE: NONE
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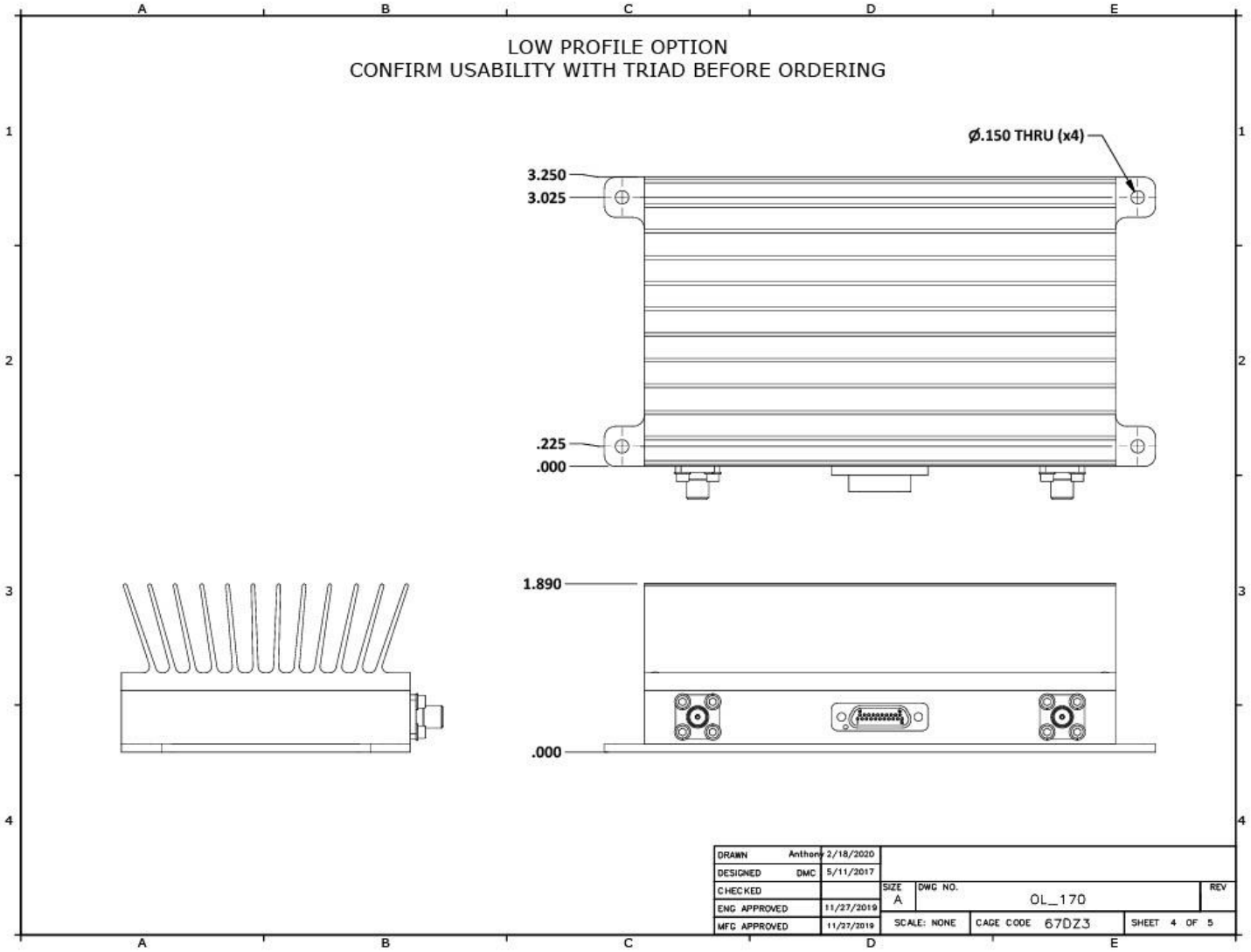
SHEET 3 OF 5


LOW PROFILE OPTION
CONFIRM USABILITY WITH TRIAD BEFORE ORDERING
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.000
1.890
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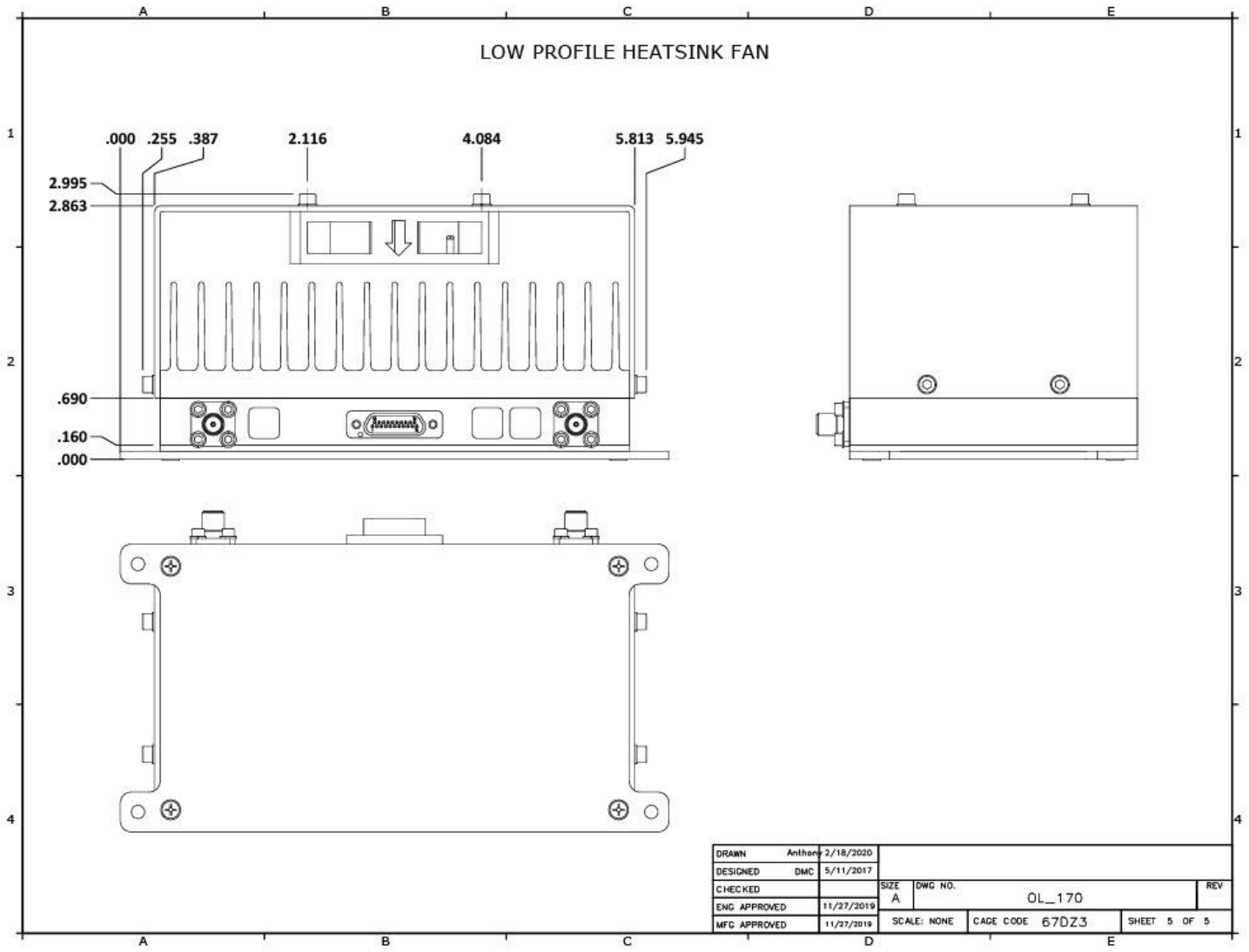
SHEET 4 OF 5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DESIGNED DMC 5/11/2017
CHECKED
ENG APPROVED 11/27/2019
MFG APPROVED 11/27/2019
SIZE A
DWG NO. OL_170
REV
SCALE: NONE
CAGE CODE 67DZ3
SHEET 5 OF 5