

**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**

- Forward Power Measurement
- Temp. Monitor Output
- Manual or Automatic Tx/Rx Switching Available
- Over-Temperature Protection
- Optional Heatsink
- Tx / Rx Status Monitor

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    | 5000 |       | 6000 | MHz  |
| PSat Power Output      |      | +47.0 |      | dBm  |
| Gain                   |      | 28.0  |      | dB   |
| Gain Flatness          |      | 1.0   |      | ± dB |
| Input Return Loss      | -15  |       |      | dB   |
| Operating Voltage      | +10  | +12   | +30  | VDC  |
| Current Draw           |      | 6.0   | 15.0 | A    |
| Tx / Rx Switching Time |      | 1.0   | 2.0  | uS   |

| Rx SPECIFICATIONS |     |       |     |      |
|-------------------|-----|-------|-----|------|
| PARAMETER         | MIN | TYP.  | MAX | UNIT |
| P1dB Power Output |     | +5.0  |     | dBm  |
| Gain              |     | 12.0  |     | dB   |
| Gain Flatness     |     |       | 1.0 | ± dB |
| Noise Figure      |     | 3.0   |     | dB   |
| OIP3              |     | +15.0 |     | dBm  |
| Input Return Loss | -10 |       |     | dB   |
| Current Draw      |     | 100.0 |     | mA   |

| MECHANICAL                     |  |      |
|--------------------------------|--|------|
| PARAMETER                      | VALUE  | UNIT |
| Dimensions (L x W x H)         | 5.3 x 3.25 x 0.6                                   | in   |
| RF Connectors (Input / Output) | SMA-F / SMA-F                                      | --   |
| DC / Control Connector         | 21 Pin Micro-D                                     | --   |
| Cooling                        | Baseplate Conduction - Optional Heatsink Available | --   |
| Mounting                       | 4-40 Thru Holes                                    | --   |
| Weight                         | 13   | oz.  |
| Weight With Heatsink           | 35   | oz.  |

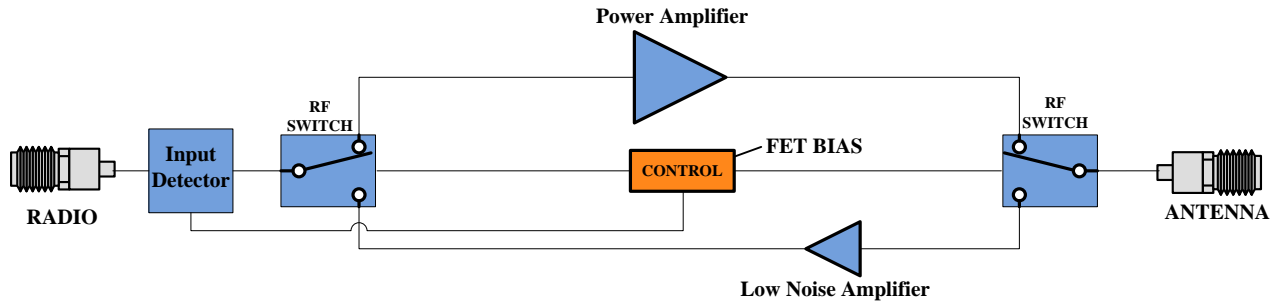
| ENVIRONMENTAL / PROTECTIONS           |                             |     |      |
|---------------------------------------|-----------------------------|-----|------|
| PARAMETER                             | MIN                         | MAX | UNIT |
| Operating Temperature (Housing Temp.) | -40                         | +85 | °C   |
| Humidity Range                        | 0-95                        |     | %    |
| Altitude                              | 0-30,000                    |     | ft.  |
| Shock / Vibration                     | MIL-STD-810 and equivalents |     | --   |
| Max RF Input                          | 17                          |     | dBm  |
| PA Baseplate Shutoff Temperature      | +85                         |     | °C   |

| INPUT/OUTPUT PINS         |          |   |        |          |
|---------------------------|----------|---|--------|----------|
| AMPLIFIER CONNECTOR TYPE: |          | 21 PIN MICRO-D FEMALE   |        |          |
| TRIAD CABLE PART NUMBER:  |          | CBL45   |        |          |
| PIN LABEL                 | NAME     | DESCRIPTION   | TYPE   | LEVEL    |
| 1-3,12-13                 | +VDC     | Supply Voltage - Range Specified in Datasheet                       | Power  | --       |
| 4                         | FWD DET  | Tx Amp RMS Power Detector   | Output | Analog   |
| 5                         | TEMP     | Temp Monitor: Temp in DegC = (Vout - 0.5V) * 100                    | Output | Analog   |
| 6                         | RAD DET  | Radio Input RMS Power Detector                                      |        |          |
| 9-11,20-21                | GND      | +VDC Supply Return  |        |          |
| 7                         | Status   | BDA Status - TTL High = Normal Operation, TTL Low = Error Condition | Output | 5V TTL   |
| 8                         | Tx/Rx    | TTL High or No Connection = Tx, TTL Low = Rx                        | Input  | 3.3V TTL |
| 19                        | SGND     | Signal Ground   |        |          |
| 14-18                     | Reserved | Reserved for future use   | --     | --       |

| 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   | 16            | ≤ -21 dB |
| QPSK   | 12 Mbps   | 25            | ≤ -15 dB |
| BPSK   | 9 Mbps    | 40            | ≤ -7 dB  |

See our [application note](#) that describes how this table was calculated and provides notes on in-system performance

### High-Level Block Diagram

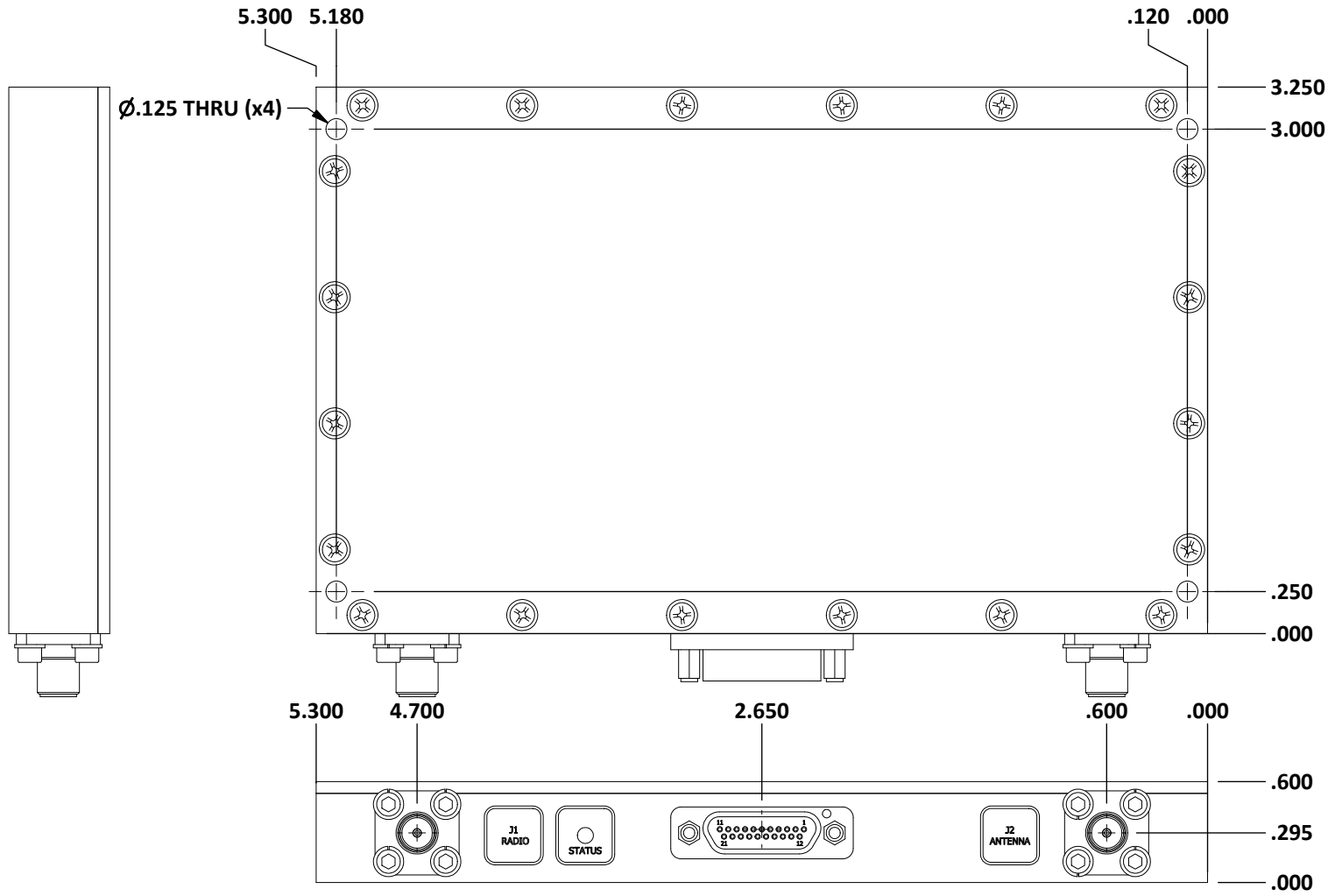


| Ordering Guide – Configuration Information |                  |                  |
|--|------------------|------------------|
| Model Number                               | Amplifier Option | Heat Sink Option |
| <b>TTRMXXXX</b>                            | <b>- XXX</b>     | <b>- XXX</b>     |

| Amplifier Options |  | Heat Sink Options |                                       |
|-------------------|--|-------------------|---------------------------------------|
| Suffix            | Description  | Suffix            | Description                           |
| D01               | Automatic Tx/Rx Switching  | (none)            | No Heat Sink Included                 |
| D02               | Manual Tx/Rx Switching   | HS                | Standard Heat Sink                    |
| DXX               | Custom Amplifier Configuration (issued by Triad upon customer request) | HSF               | Heat Sink with Integrated Cooling Fan |
|                   |  | HSX               | Custom Heat Sink Configuration        |

MATERIAL: ALLOY 6061      FINISH: MIL-DTL-5541 TYPE 2 CLASS 3

| REVISIONS |                 |          |          |
|-----------|-----------------|----------|----------|
| REV       | DESCRIPTION     | DATE     | APPROVED |
| 0         | INITIAL RELEASE | 01/31/18 | SC       |
| 1         | E18365          | 08/13/18 | SC       |
| 2         | E20567          | 02/18/20 | AK       |



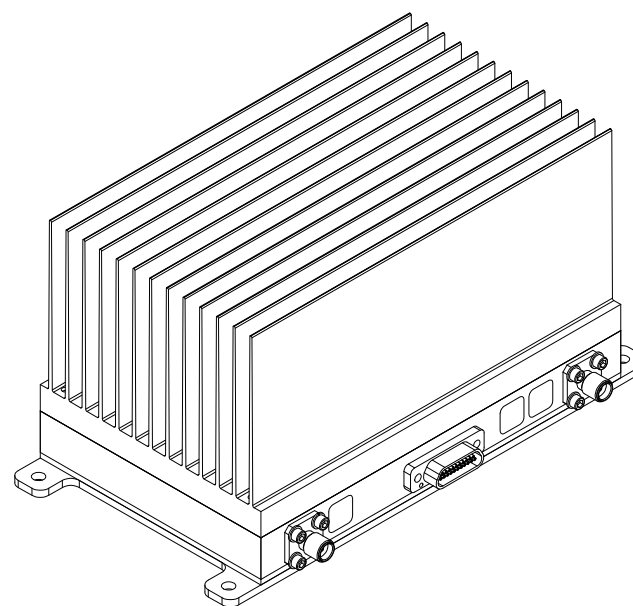
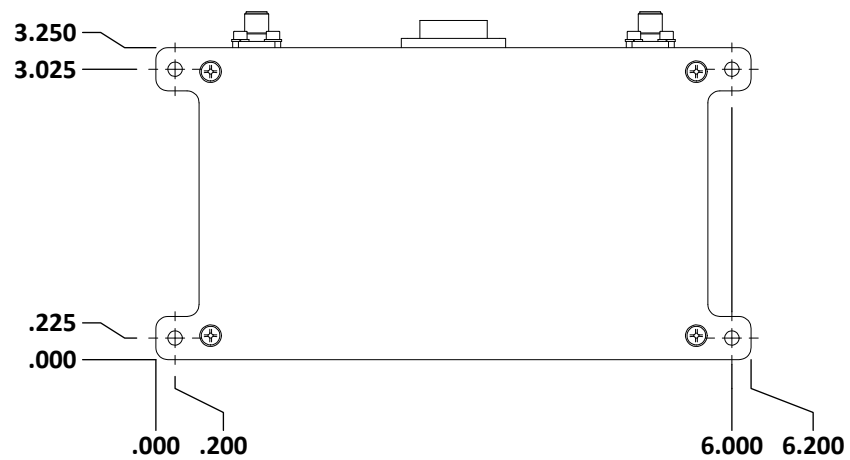
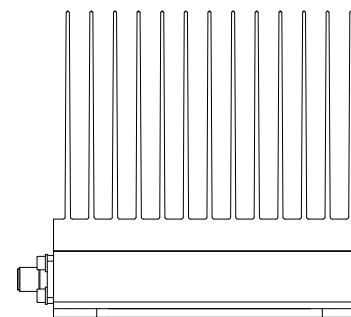
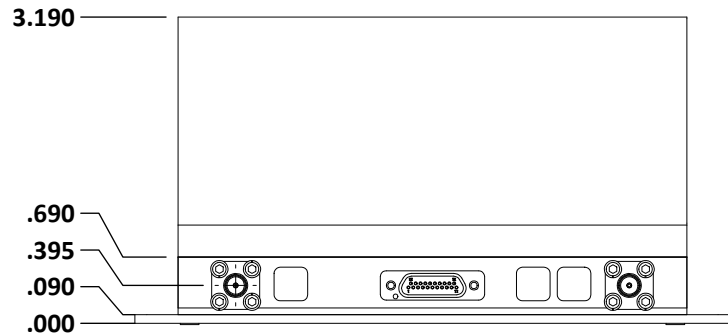
|              |         |            |
|--------------|---------|------------|
| DRAWN        | Anthony | 2/18/2020  |
| DESIGNED     | DMC     | 5/11/2017  |
| CHECKED      |         |            |
| ENG APPROVED |         | 11/27/2019 |
| MFG APPROVED |         | 11/27/2019 |

**TRIAD** RF SYSTEMS  
 11 HARTS LANE SUITE 1  
 EAST BRUNSWICK, NJ 08816  
 855-558-1001

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

|             |                 |              |
|-------------|-----------------|--------------|
| SIZE        | DWG NO.         | REV          |
| A           | OL_170          |              |
| SCALE: NONE | CAGE CODE 67DZ3 | SHEET 1 OF 5 |

# HEATSINK



|              |         |            |             |                 |              |
|--------------|---------|------------|-------------|-----------------|--------------|
| DRAWN        | Anthony | 2/18/2020  |             |                 |              |
| DESIGNED     | DMC     | 5/11/2017  |             |                 |              |
| CHECKED      |         |            | SIZE        | DWG NO.         | REV          |
| ENG APPROVED |         | 11/27/2019 | A           | OL_170          |              |
| MFG APPROVED |         | 11/27/2019 | SCALE: NONE | CAGE CODE 67DZ3 | SHEET 2 OF 5 |

A

B

C

D

E

1

1

2

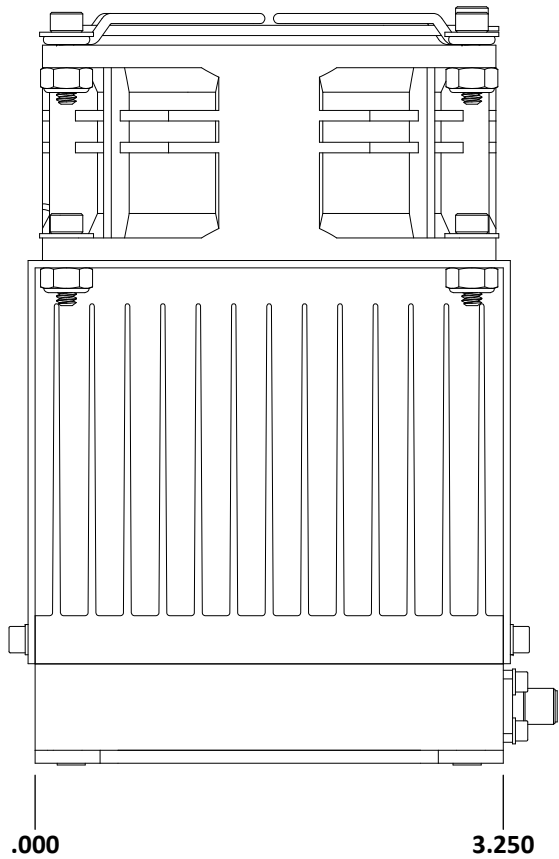
2

3

3

4

4



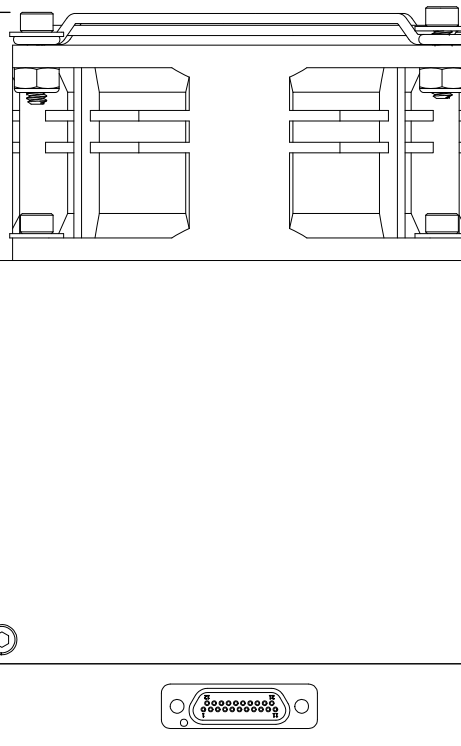
5.215

3.491

.000

.000

6.200



|              |         |            |             |                 |              |
|--------------|---------|------------|-------------|-----------------|--------------|
| DRAWN        | Anthony | 2/18/2020  |             |                 |              |
| DESIGNED     | DMC     | 5/11/2017  |             |                 |              |
| CHECKED      |         |            | SIZE        | DWG NO.         | REV          |
| ENG APPROVED |         | 11/27/2019 | A           | OL_170          |              |
| MFG APPROVED |         | 11/27/2019 | SCALE: NONE | CAGE CODE 67DZ3 | SHEET 3 OF 5 |

A

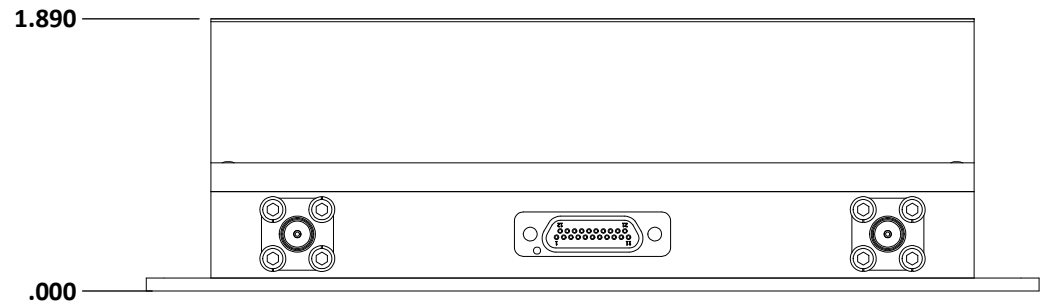
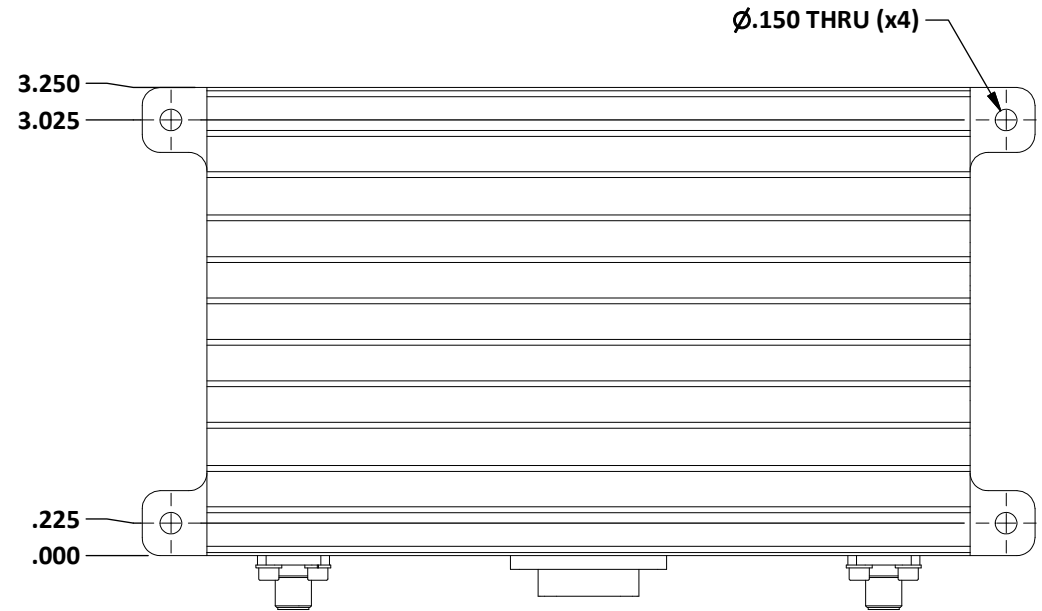
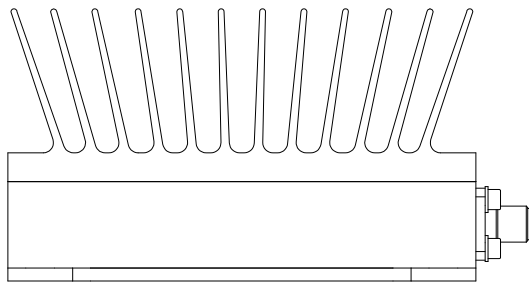
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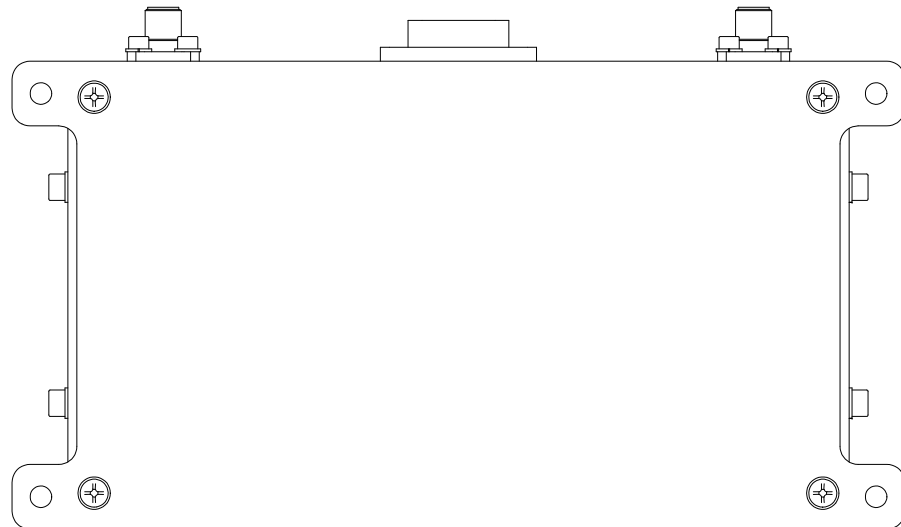
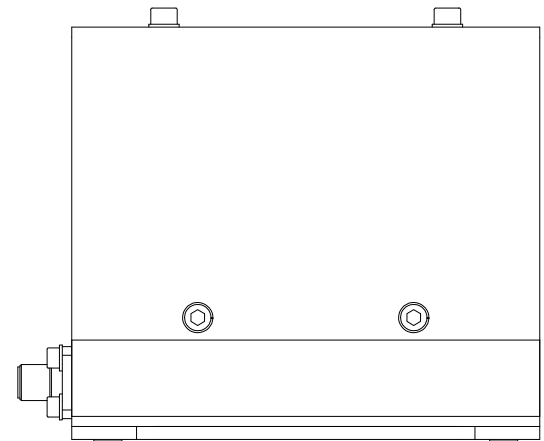
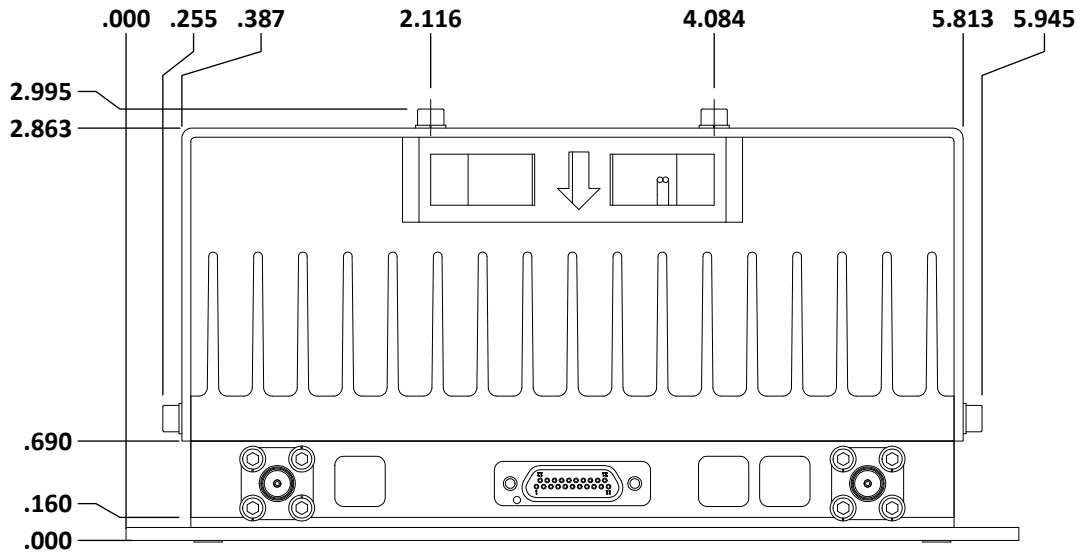
E

LOW PROFILE OPTION  
 CONFIRM USABILITY WITH TRIAD BEFORE ORDERING



|              |         |            |             |                   |
|--------------|---------|------------|-------------|-------------------|
| DRAWN        | Anthony | 2/18/2020  |             |                   |
| DESIGNED     | DMC     | 5/11/2017  |             |                   |
| CHECKED      |         |            | SIZE<br>A   | DWG NO.<br>OL_170 |
| ENG APPROVED |         | 11/27/2019 | REV         |                   |
| MFG APPROVED |         | 11/27/2019 | SCALE: NONE | CAGE CODE 67DZ3   |
|              |         |            | SHEET 4     | OF 5              |

# LOW PROFILE HEATSINK FAN



|              |         |            |             |                 |              |
|--------------|---------|------------|-------------|-----------------|--------------|
| DRAWN        | Anthony | 2/18/2020  |             |                 |              |
| DESIGNED     | DMC     | 5/11/2017  |             |                 |              |
| CHECKED      |         |            | SIZE        | DWG NO.         | REV          |
| ENG APPROVED |         | 11/27/2019 | A           | OL_170          |              |
| MFG APPROVED |         | 11/27/2019 | SCALE: NONE | CAGE CODE 67DZ3 | SHEET 5 OF 5 |