

**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**

Auto Tx/Rx Switching (RF Detect)

Over-Temperature Protection

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            | 5000 |       | 6000 | MHz  |
| PSat Power Output              |      | +44.0 |      | dBm  |
| Gain                           |      | 25.0  |      | dB   |
| Gain Flatness                  |      | 1.0   |      | ± dB |
| Input Return Loss              | -15  |       |      | dB   |
| Operating Voltage              | +10  | +12   | +14  | VDC  |
| Tx / Rx Switching Time         |      | 1.0   | 2.0  | uS   |
| RX SPECIFICATIONS(PER CHANNEL) |      |       |      |      |
| PARAMETER                      | MIN  | TYP.  | MAX  | UNIT |
| P1dB Power Output              |      | +5.0  |      | dBm  |
| Gain                           |      | 10.0  |      | dB   |
| Gain Flatness                  |      |       | 1.0  | ± dB |
| Noise Figure                   |      | 2.5   | 0.0  | dB   |
| OIP3                           |      | +15.0 |      | dBm  |
| Input Return Loss              | -10  |       |      | dB   |
| Current Draw                   |      | 100.0 | 0.0  | mA   |

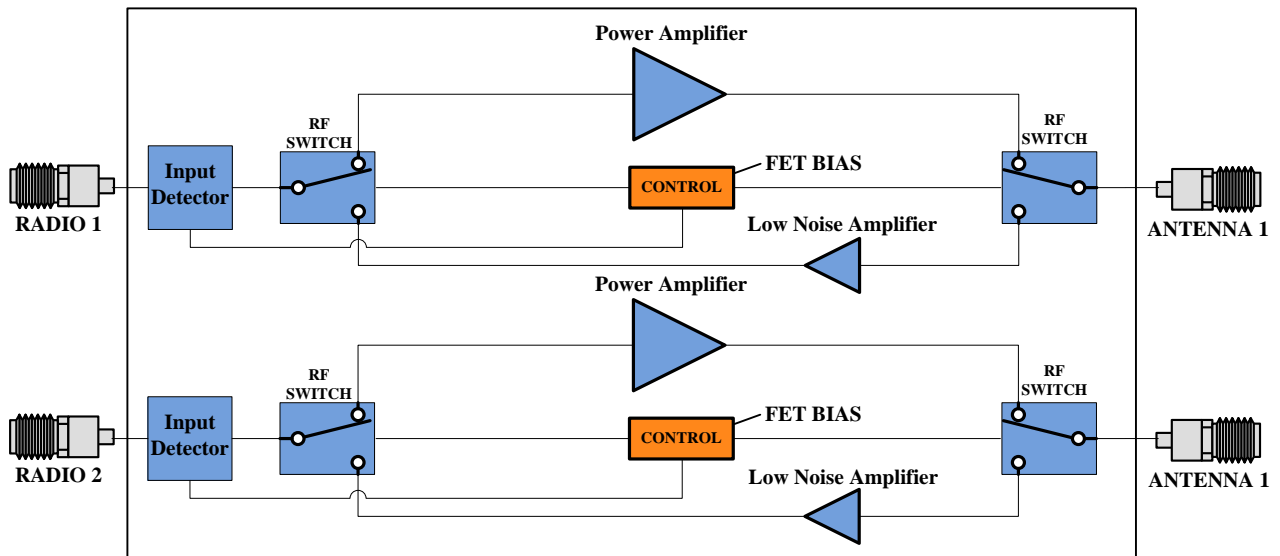
| MECHANICAL                            |  |     |      |
|---------------------------------------|--|-----|------|
| PARAMETER                             | VALUE  |     | UNIT |
| Dimensions (L x W x H)                | 6 x 4.77 x 2.5                                     |     | in   |
| RF Connectors (Input / Output)        | TNC-F / TNC-F                                      |     | --   |
| DC / Control Connector                | Circular Locking                                   |     | --   |
| Cooling                               | Baseplate Conduction - Optional Heatsink Available |     | --   |
| Mounting                              | #8 Slots   |     | --   |
| Weight                                | 40   |     | 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                          | 20   |     | dBm  |
| PA Baseplate Shutoff Temperature      | +85  |     | °C   |

| INPUT/OUTPUT PINS             |                         |   |
|-------------------------------|-------------------------|---|
| AMPLIFIER CONNECTOR TYPE:     | 14 PIN CIRCULAR LOCKING |   |
| TRIAD CABLE PART NUMBER:      | CBL68                   |   |
| MATING CONNECTOR PART NUMBER: | 689                     |   |
| PIN LABEL                     | NAME                    | DESCRIPTION   |
| B, E, F                       | +VDC                    | Supply Voltage - Range Specified in Datasheet                                   |
| L,K,P                         | GND                     | Ground  |
| A                             | STATUS                  | BDA Status - TTL High = Normal Operation, TTL Low = Error Condition             |
| C                             | Tx/Rx                   | TTL Control Line for Manual TX/RX Control - TTL LOW: RX Mode, TTL HIGH: TX Mode |
| J                             | STATE                   | BDA Operational State - TTL High = Tx Amp Active, TTL Low = Rx Amp Active       |
| M                             | TEMP                    | Temp Monitor: Temp in DegC = (Vout - 0.5V) * 100                                |
| R                             | SGND                    | Signal Ground   |
| D                             | FAN+                    | Fan supply (+28v)   |
| N                             | FAN-                    | Fan return (GND)  |
| H                             | NC                      | No Connection   |

| 802-11G (20 MHz BW) DATA RATE VS. OUTPUT POWER(PER CHANNEL) |           |               |          |
|---|-----------|---------------|----------|
| OFDM MODULATION   | DATA RATE | POUT (W) MIN. | EVM      |
| 64QAM   | 54 Mbps   | 5             | ≤ -27 dB |
| 16QAM   | 36 Mbps   | 10            | ≤ -21 dB |
| QPSK  | 12 Mbps   | 16            | ≤ -15 dB |
| BPSK  | 9 Mbps    | 20            | ≤ -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

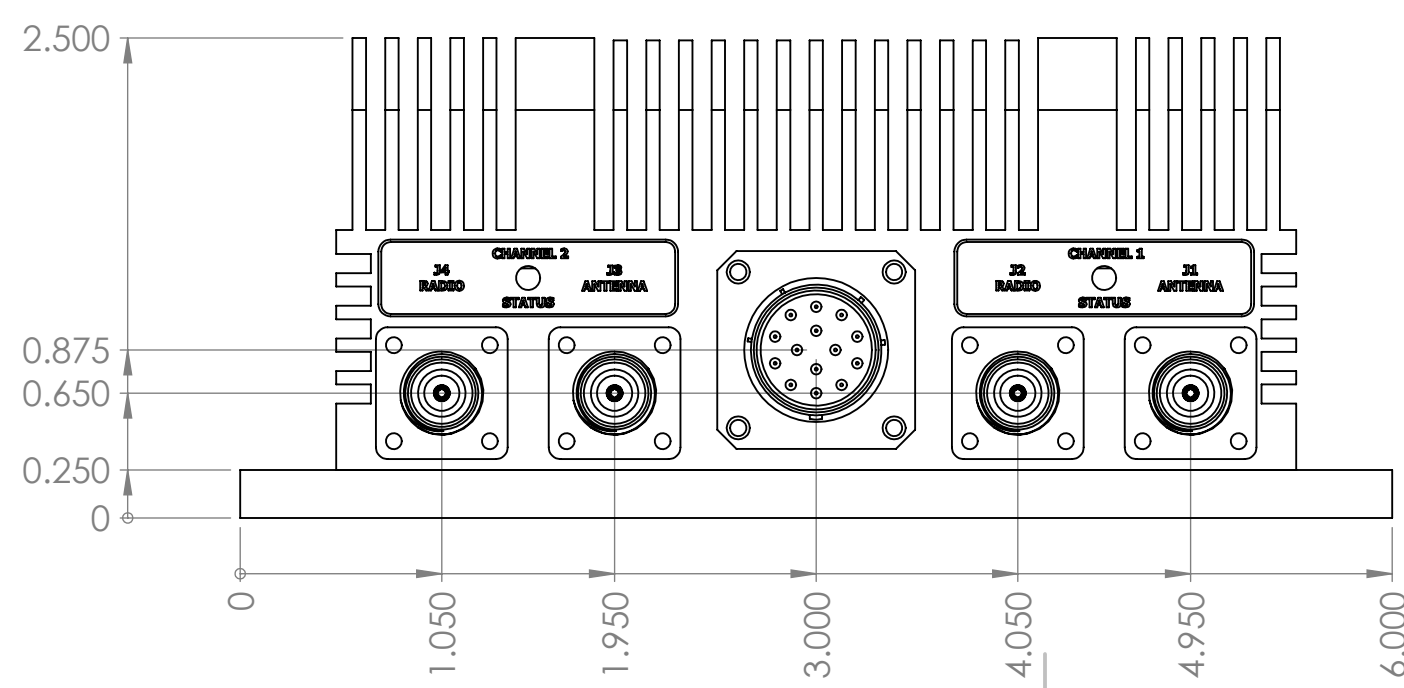
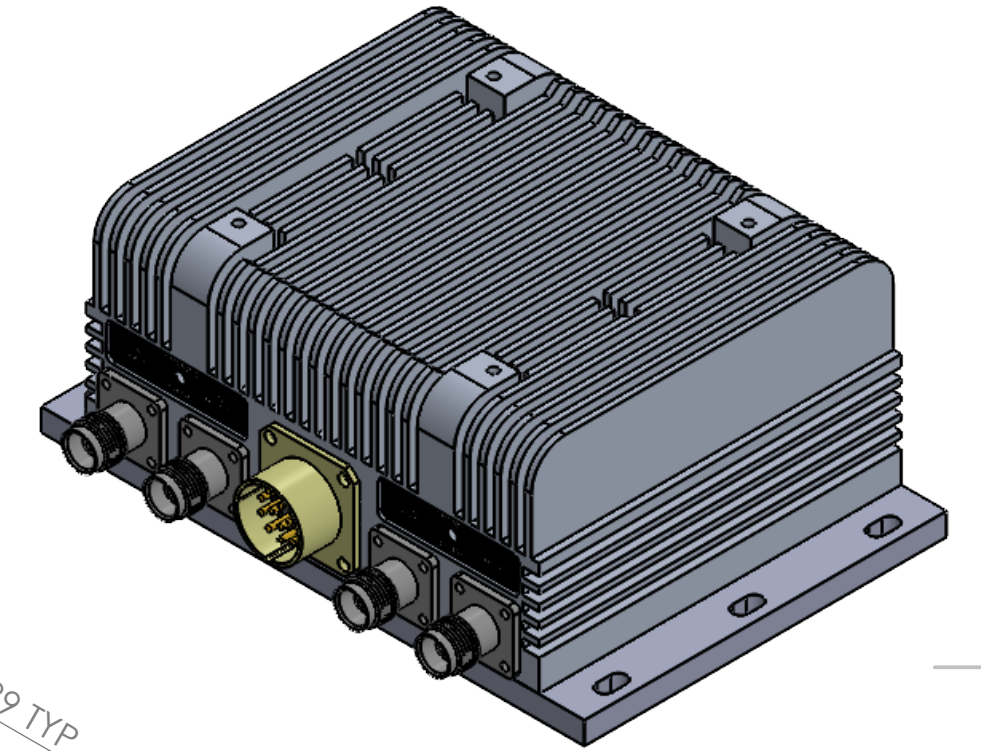
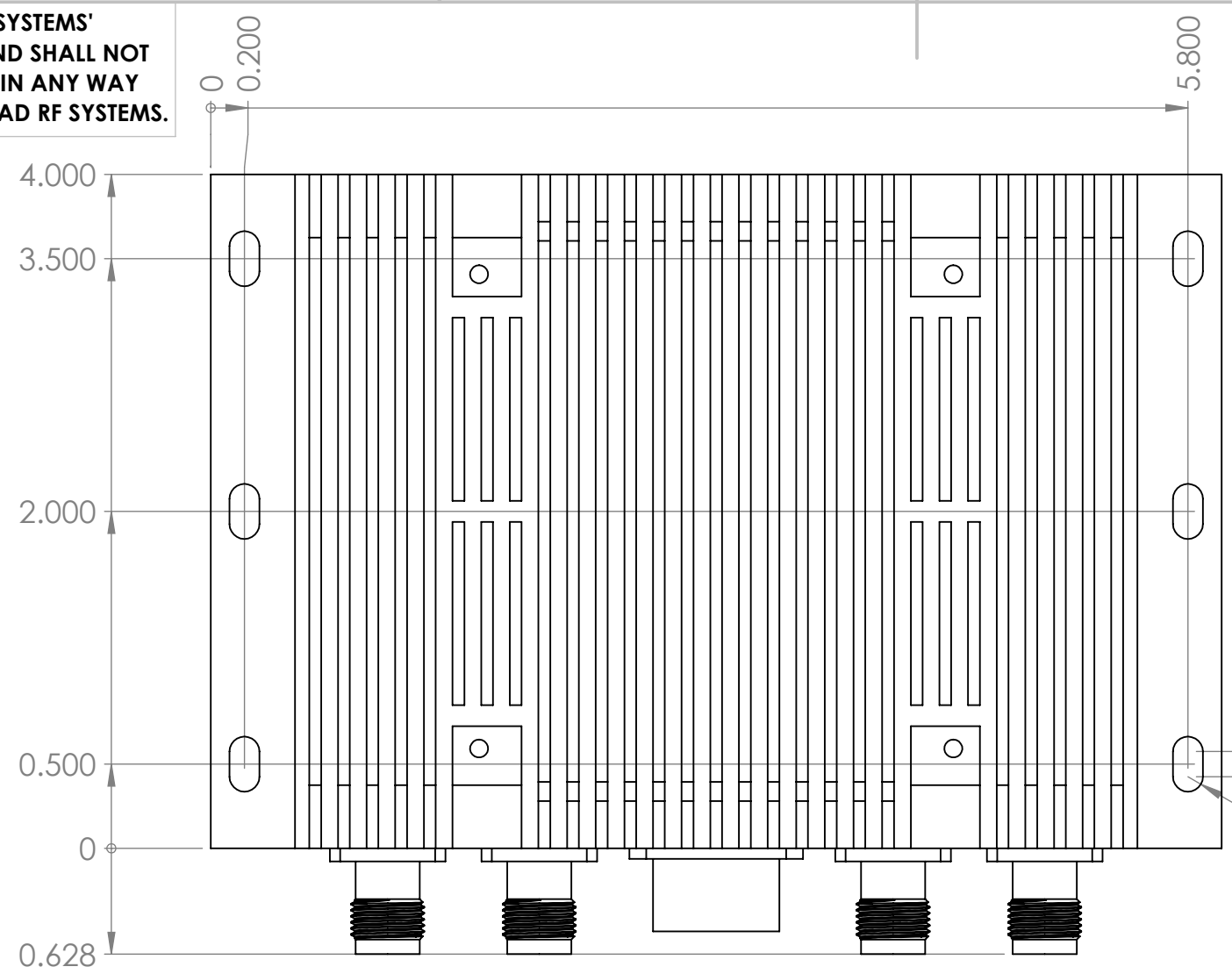
| Model Number | Amplifier Option | Heat Sink Option |
|--------------|------------------|------------------|
|--------------|------------------|------------------|

| Amplifier Options |  | Heat Sink Options |                               |
|-------------------|--|-------------------|-------------------------------|
| Suffix            | Description  | Suffix            | Description                   |
| D01               | Automatic Tx/Rx Switching  | (none)            | Integrated Heat Sink          |
| D02               | Manual Tx/Rx Switching   | F                 | Fan with Integrated Heat Sink |
| DXX               | Custom Amplifier Configuration (issued by Triad upon customer request) |                   |                               |

Please confirm with Triad that the desired configuration is available prior to ordering.

THIS DOCUMENT CONTAINS TRIAD RF SYSTEMS' PROPRIETARY DATA/INFORMATION AND SHALL NOT BE DUPLICATED, DISCLOSED, OR USED IN ANY WAY WITHOUT WRITTEN CONSENT FROM TRIAD RF SYSTEMS.

| REVISIONS |                 |           |      |
|-----------|-----------------|-----------|------|
| REV       | DESCRIPTION     | DATE      | APPR |
| 0         | INITIAL RELEASE | 9/28/2018 | SC   |
| 1         | ECN 21785       | 3/16/2021 | SC   |



|                 |             |                                       |   |
|-----------------|-------------|---------------------------------------|---|
| <b>APPROVAL</b> | <b>DATE</b> |                                       | <b>Triad RF Systems</b><br>11 Harts Ln, Suite I<br>East Brunswick, NJ 08816 |
| DRAWN: DT       | 3/15/2021   |                                       |   |
| DESIGNED: DMC   | 9/28/2018   | TITLE:<br>HOUSING OUTLINE DRAWING 190 |   |
| ENG CHECK: SC   | 3/15/2021   | SIZE: B                               | REVISION: 1.1   |
| MFG CHECK:      |             | DWG NUMBER: OL_190                    |   |
| OPS:            |             | SCALE: NONE                           | CAGE CODE: 67DZ3  |
|                 |             |                                       | SHEET: 1 OF 2   |

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES AND INCLUDE THICKNESS OF PLATING/FINAL FINISH TREATMENT

**TOLERANCE**  
 2 PLACE DECIMAL: XX=±.01  
 3 PLACE DECIMAL: XXX=±.005  
 ANGULAR DIMENSIONS: ±1/2°

D

C

B

A

D

C

B

A

6

5

4

3

2

1

6

5

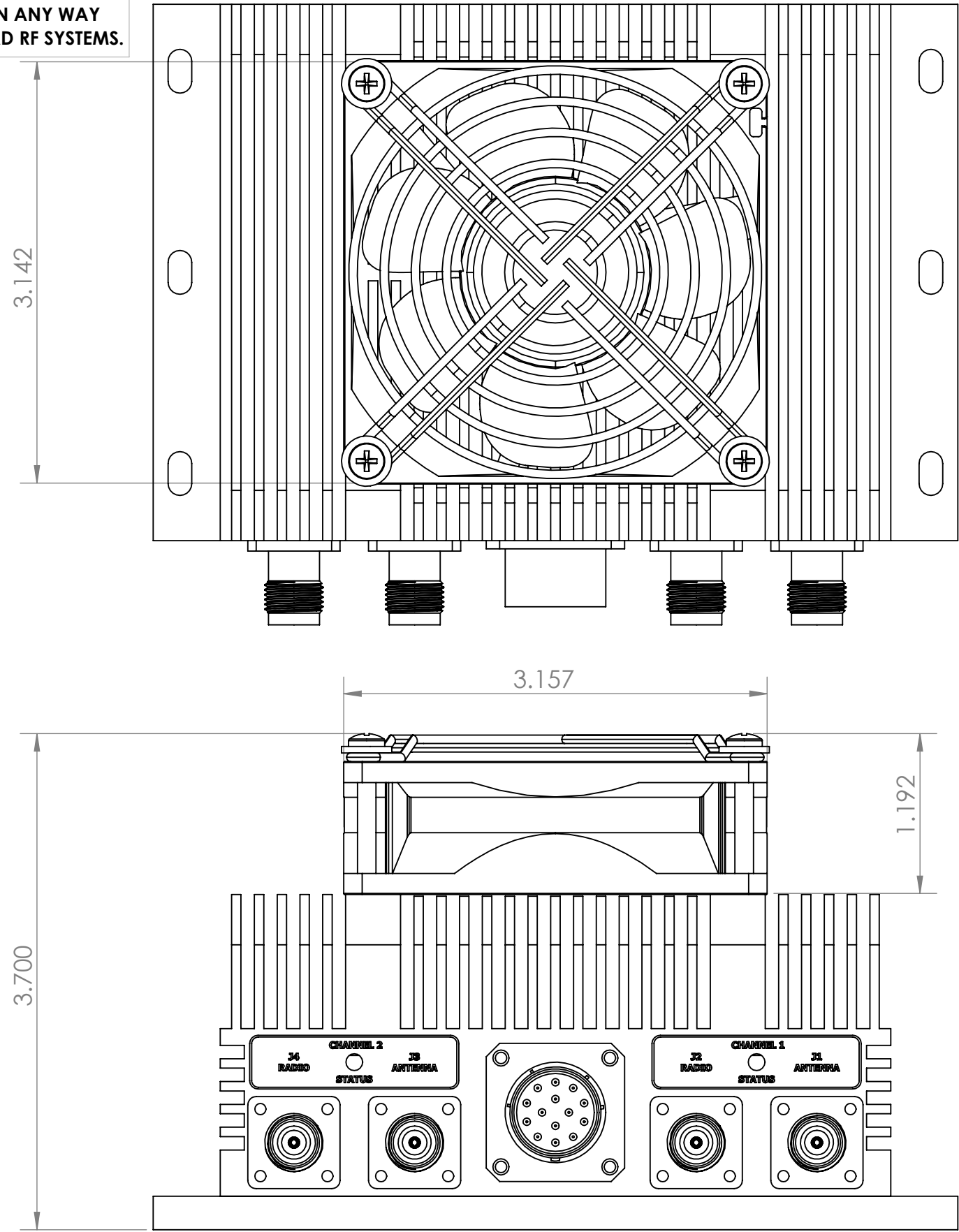
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3

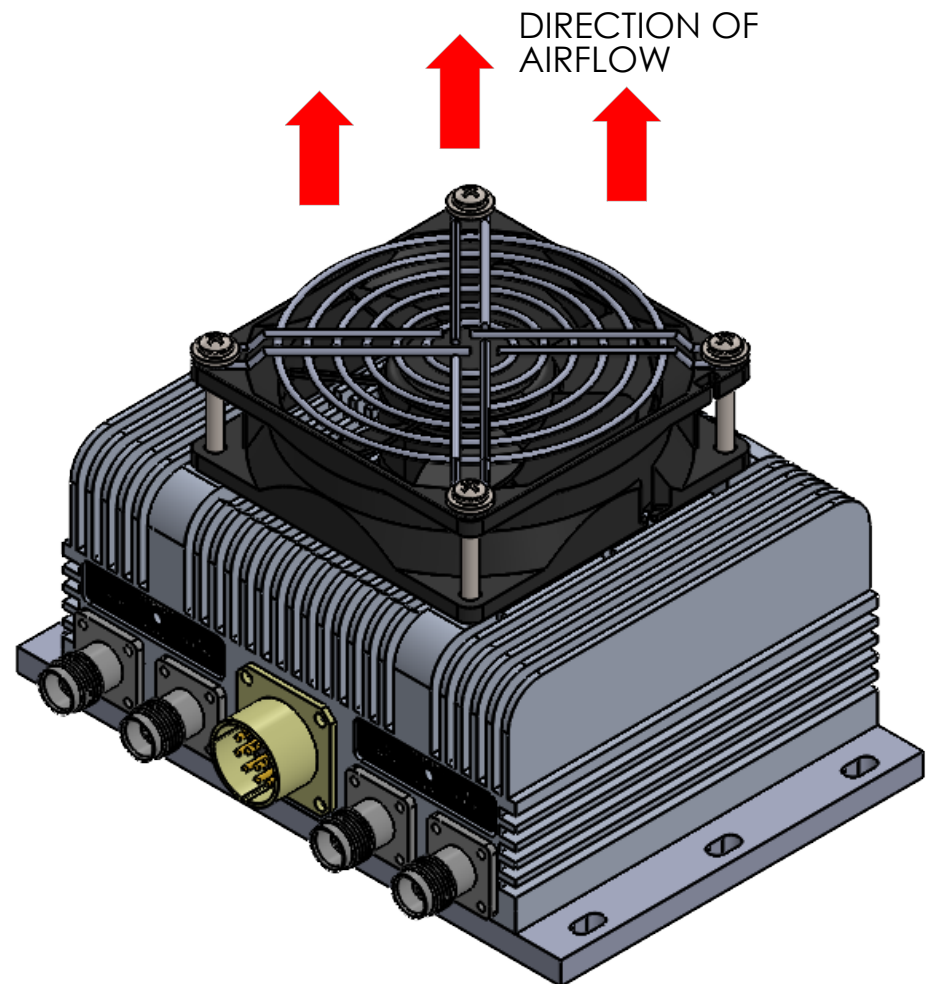
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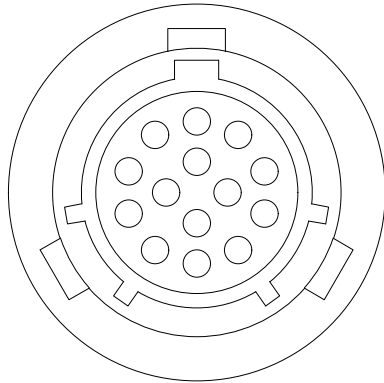
# COOLING FAN OPTION



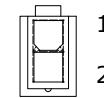
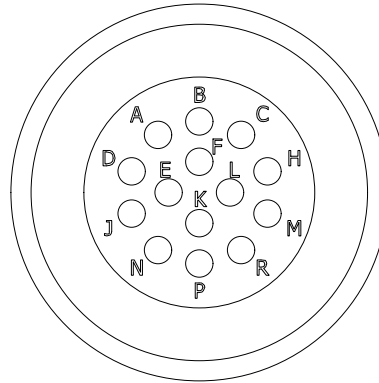
|                 |    |             |      |                                       |           |               |
|-----------------|----|-------------|------|---------------------------------------|-----------|---------------|
| <b>APPROVAL</b> |    | <b>DATE</b> |      | TITLE:<br>HOUSING OUTLINE DRAWING 190 |           |               |
| DRAWN:          | DT | 3/15/2021   |      | SIZE:                                 | REVISION: | DWG NUMBER:   |
| ENG CHECK:      | SC | 3/15/2021   |      | B                                     | 1.1       | OL_190        |
| MFG CHECK:      |    | SCALE:      | NONE | CAGE CODE:                            | 67DZ3     | SHEET: 2 OF 2 |

| REVISIONS |                 |         |          |
|-----------|-----------------|---------|----------|
| REV       | DESCRIPTION     | DATE    | APPROVED |
| 0         | INITIAL RELEASE | 7/11/18 | DMC      |
| 1         | E19504          | 7/6/20  | AK       |

CONNECTOR FRONT VIEW  
PT06E12-14S-SR



CONNECTOR BACK VIEW  
PT06E12-14S-SR



Molex 0039013023 Front View

| CBL68 Wiring - Connector PN PT06E12-14S-SR |        |            |       |             |
|--|--------|------------|-------|-------------|
| PIN  | LABEL  | WIRE COLOR | AWG   | WIRE LENGTH |
| B, E, F                                    | +VDC   | Red        | 18    | 18"         |
| L, K, P                                    | GND    | Black      | 18    | 18"         |
| A  | STATUS | White      | 20-24 | 18"         |
| C  | TX/RX  | Blue       | 20-24 | 18"         |
| J  | STATE  | Grey       | 20-24 | 18"         |
| M  | TEMP   | Orange     | 20-24 | 18"         |
| R  | SGND   | Black      | 20-24 | 18"         |
| D  | FAN+   | Red        | 20-24 | 4"          |
| N  | FAN-   | Black      | 20-24 | 4"          |
| H  | NC     | -          | -     | -           |

| MOLEX 0039013023 PINOUT |                       |
|-------------------------|-----------------------|
| PIN                     | PIN ON PT06E12-14S-SR |
| 1                       | D                     |
| 2                       | N                     |

ALL WIRES MUST CONFORM TO MIL-W-16878/4 STANDARD  
 MOLEX 0039013023 CONNECTOR TO SUPPLY POWER TO FAN  
 PINS USED ON FAN SUPPLY CONNECTOR - MOLEX 0039000040

|               |     |           |
|---------------|-----|-----------|
| DRAWN         | DMC | 7/11/2018 |
| DESIGNED      | DMC | 7/11/2018 |
| CHECKED       | DMC | 7/7/2020  |
| ENG. APPROVED | DMC | 7/7/2020  |
| MFG. APPROVED | DMC | 7/7/2020  |



11 HARTS LANE SUITE I  
 EAST BRUNSWICK, NJ 08816  
 855-558-1001

CBL68 Assembly

DIMENSIONS ARE IN INCHES  
 UNLESS SPECIFIED OTHERWISE  
 TOLERANCES  
 DECIMALS FRACTIONS ANGLES  
 .XX ±.01 ± 1/32 ± 1'  
 .XXX ±.005 ± 1/32 ± 1'  
 WHEN IN DOUBT, ASK!

|             |                 |              |
|-------------|-----------------|--------------|
| SIZE        | DWG. NO.        | REV          |
| A           | CBL68           | 1            |
| SCALE: NONE | CAGE CODE 67DZ3 | SHEET 1 OF 1 |