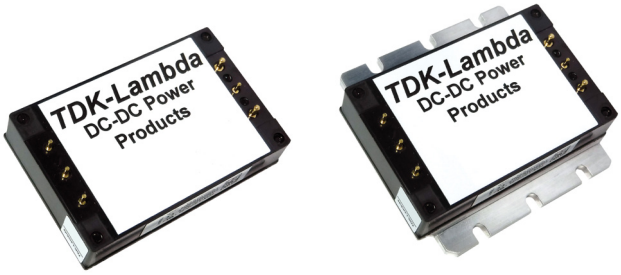
# MIL-COTS 20A, 40Vdc Passive EMC Filters

https://product.tdk.com/en/power/fqa
www.emea.lambda.tdk.com/fqa




COTS

The FQA filter modules have been designed to reduce differential and common mode conducted emissions from dc-dc switching converters. The series takes advantage of TDK technologies to simplify system level compliance to MILSTD-461. The encapsulated rugged package design and a choice of baseplate options make the FQA modules suitable for use in a wide variety of harsh and demanding environments, including MIL-COTS.

| Features | Benefits |
|---|---|
| • Filtering for Compliance to MIL-STD-461G | • Simplifies the system EMC filter |
| • Input Spike suppression per MIL-STD-1275D and RTCA/DO-160G | • Suitable for vehicle and airborne use |
| • High Differential and Common Mode Noise Attenuation | • Reduces system EMI |
| • -55 to 115°C Temperature Range (M-Grade) | • For operation in harsh environments |
| • Standard (S-Grade) or Enhanced Screening (M-Grade) Options | • Reduces cost for COTS applications |
| • Quarter Brick Size | • Industry standard mounting and heatsinks |

## Model Selector

| Model | Input Voltage (Vdc) | Maximum Current (A) | Flanged Baseplate | Non-Flanged Baseplate | Standard Screening (-S) | Enhanced Screening (-M) |
|---|---|---|---|---|---|---|
| FQA020ADC-007-S | -40 to +40 | 20 | X | | X | |
| FQA020ADC-N07-S | -40 to +40 | 20 | | X | X | |
| FQA020ADC-007-M | -40 to +40 | 20 | X | | | X |
| FQA020ADC-N07-M | -40 to +40 | 20 | | X | | X |

## Screening Options

| Operation | S-Grade (Standard Screening) | M-Grade (Enhanced Screening) |
|---|---|---|
| Functional Test | Room and Hot Test | Cold, Room, and Hot Test |
| Burn in | Yes | Extended, 96 hour |
| Temperature Cycling | No | 10 Cycles |
| Hi-Pot | 2250VDC | 2250VDC |
| Visual Inspection | Yes | Yes |

## Evaluation Kit

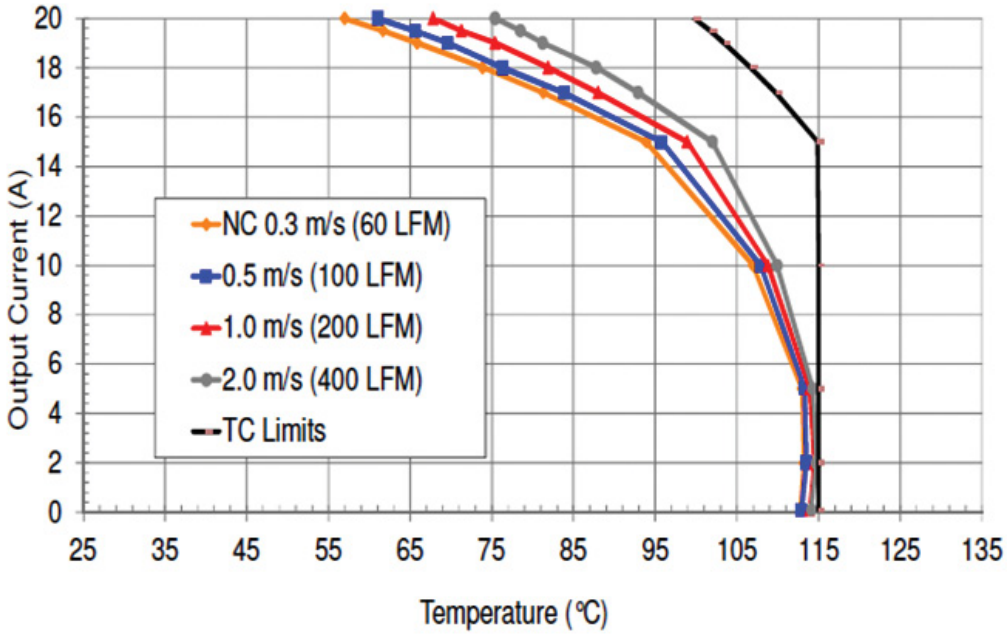
| Type | Part Number | Description |
|---|---|---|
| Evaluation Kit | FQX-HQA-EVK-D0 | Evaluation board for FQA or FQB filter plus two (2) HQA DC-DC quarter brick modules. Fitler and DC-DC modules are not included. |

## Specifications

| Model | | FQA | | |
|---|---|---|---|---|
| **Input/Output** | | | | |
| Input Voltage Range | Vdc | -40 to +40 | | |
| Input Current (max) | A | 20 | | |
| DC Resistance (typical) | mΩ | Positive Leg: 7.5, Negative Leg: 5 | | |
| Power Loss | W | 5 @ 20 A | | |
| Differential Mode Attenuation at 300 kHz | dB | 50 (50 Ω source & load impedance) | | |
| Common Mode Attenuation at 30 MHz | dB | 50 (50 Ω source & load impedance) | | |
| Qualification Methods | - | Consistent with MIL-STD-883F and MIL-STD-202G | | |
| Compliance Matrix (Tested with FQX-HQA-EVK-D0 evaluation board: FQA filter + 2X HQA DC-DC Converter, 200W resistive load) | | Radiated Emmisions | RE101 | Navy |
| | | Radiated Emmisions | RE102 | 10kHz to 18GHz Fixed Wing internal, >25m Nose to Tail |
| | | Conducted Emissions | CE101 | Surface ships and submarines |
| | | Conducted Emissions | CE102 | Basic Curve |
| | | Conducted Susceptibility | CS101 | Curve 2, Imax=10A |
| | | Conducted Susceptibility | CS114 | Curve 5 |
| | | Conducted Susceptibility | CS115 | Basic Test Signal |
| | | Conducted Susceptibility | CS116 | 10kHz to 100MHz |
| Safety Agency Certifications | - | IEC/UL/CSA/EN62368-1, 60950-1, CE Mark | | |
| **Environmental** | | | | |
| Operating Baseplate Temperature | °C | Standard screening (-S): -40 to 115; Enhanced screening (-M): -55 to 115 | | |
| Storage Temperature | °C | -65 to 125 | | |
| Operating Humidity (non condensing) | %RH | MIL-STD-883 Method 1004.7 | | |
| Cooling | - | Conduction, convection or forced air | | |
| Withstand Voltage (1 minute) | Vdc | 2250 (Terminals to Case) | | |
| Vibration | - | MIL-STD-202G, Method 201A, Unpowered, sweep 1: 5 to 50 Hz at 05.g, sweep 2: 50 to 500 Hz at 1.5g, three axis | | |
| Shock | - | MIL-STD-202G, Method 213B, Table 213-1, Test Condition I, Unpowered, 50G half sine 6ms, three axis | | |
| **Other** | | | | |
| Weight (Typ) | g | 100 | | |
| Size (LxWxH) | mm | Flanged version (-007-x): 60.6 x 55.9 x 12.7, Non-flanged version (-N07-x): 60.6 x 39.5 x 12.7 | | |
| Size (LxWxH) | Inches | Flanged version (-007-x): 2.39 x 2.20 x 0.50, Non-flanged version (-N07-x): 2.39 x 1.56 x 0.50 | | |
| MTBF - Telcordia SR-332 | Hrs | 15 M @ 50 °C ambient; full load | | |
| Warranty | yrs | 3 | | |

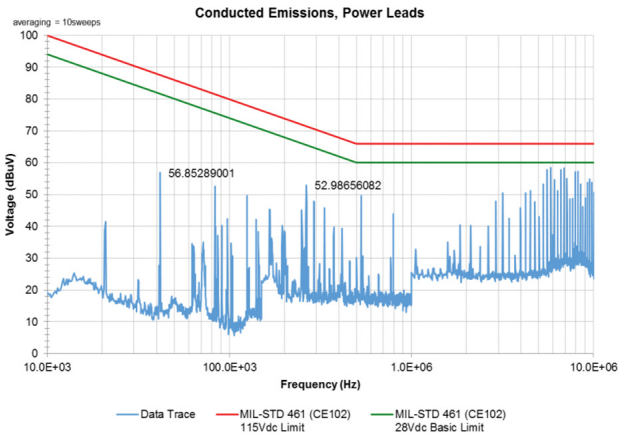
Notes
See website for detailed specifications
1. See thermal performance section

## Thermal Performance

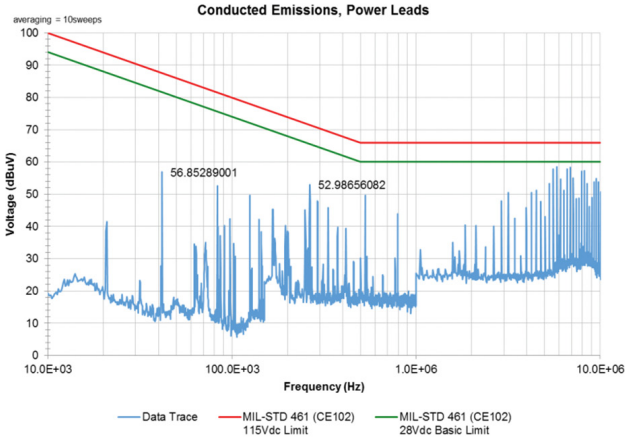



Maxmum output current vs. ambient temperature at nominal input voltage for natural convection (60 LFM) to 400 LFM with airflow from pin 1 to pin 3.

## Attenuation Characteristics



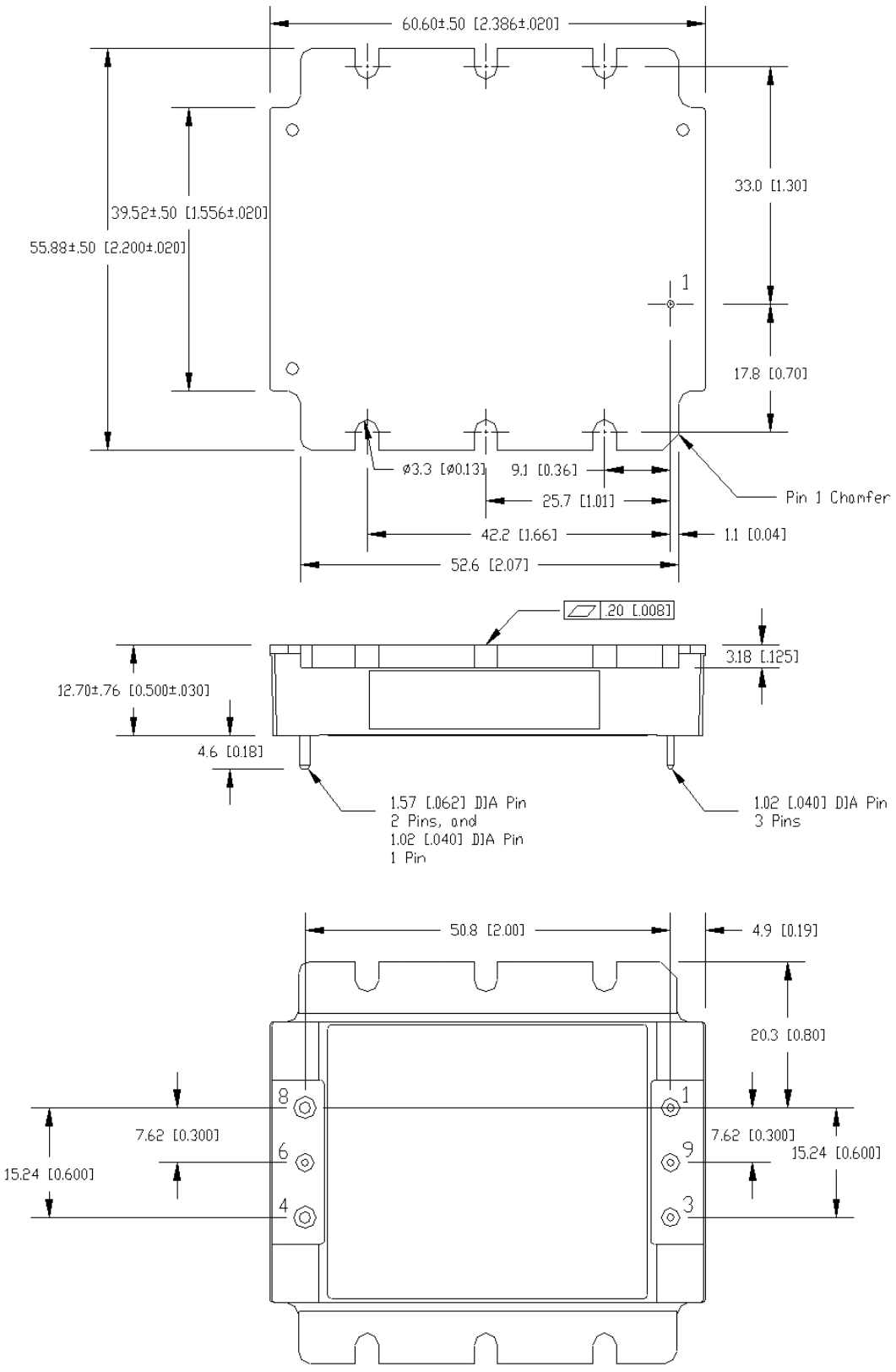

HQA2W120W280V-007-S typical conducted emissions with FQA filter module and 0.01uF common mode capacitors.




HQA2W120W120V-007-S typical conducted emissions with FQA filter module and 0.01uF common mode capacitors.

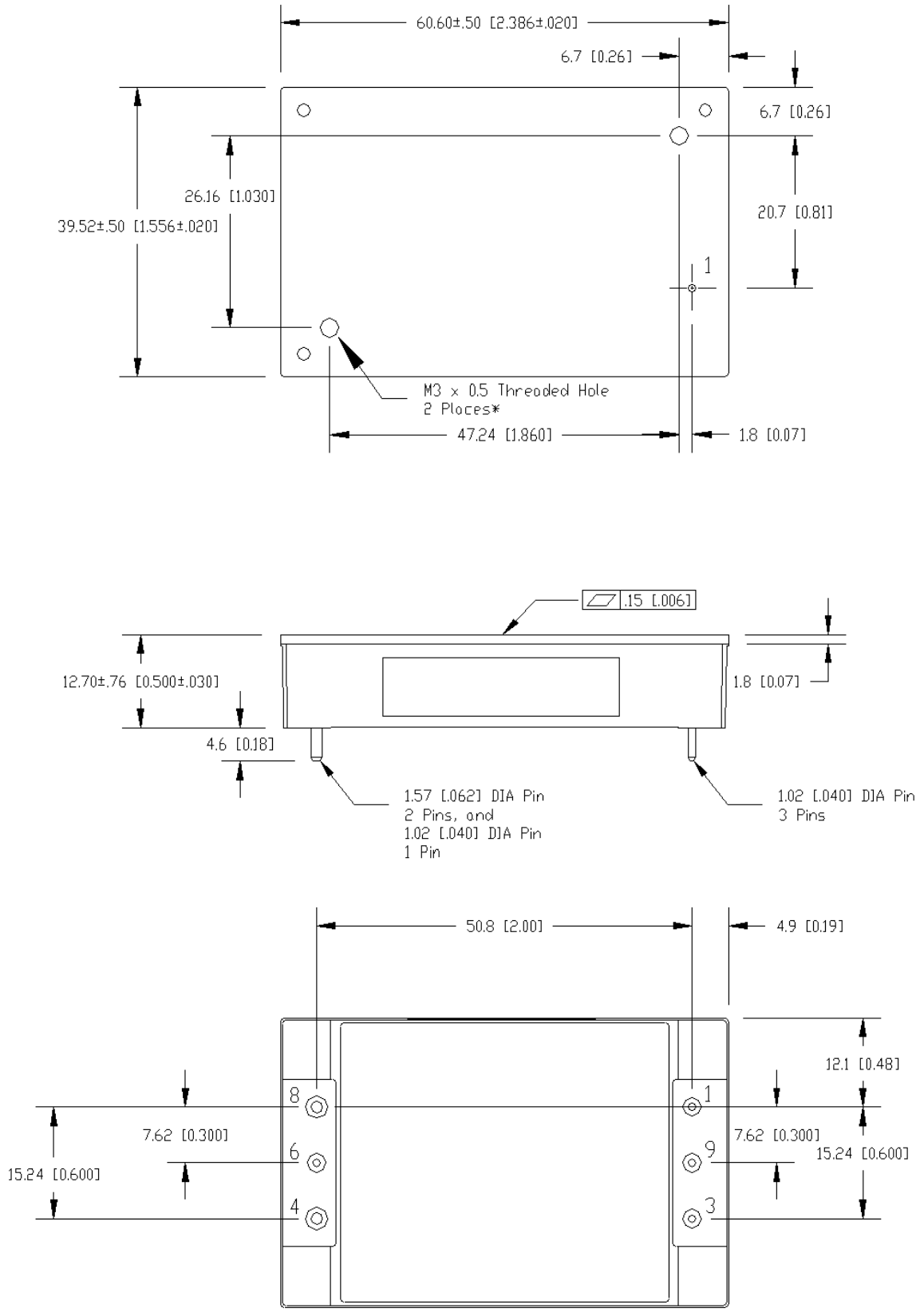
## Outline Drawing

**007 option (flange baseplate)**



## Outline Drawing

**N07 option (non flange baseplate)**



## Pinout

| PIN | Function |
|---|---|
| 1 | VIN (+) |
| 2 | Not populated |
| 3 | VIN (-) |
| 4 | VOUT (-) |
| 5 | Not populated |
| 6 | Common mode out* |
| 7 | Not populated |
| 8 | VOUT (+) |
| 9 | Common mode in* |

* In a typical application pin 6 would be connected to the Vout-/ground plane and pin 9 to chassis/ground for EMI measurement

Pin base material is Tellurium Copper with gold over nickel plating.

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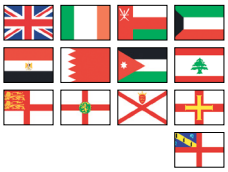

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For Additional Information, please visit
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