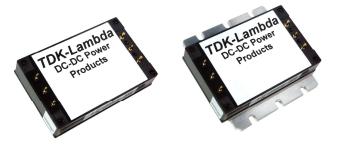
# **TDK·Lambda**

## **FQA Series**

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





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	Х		Х	
FQA020ADC-N07-S	-40 to +40	20		Х	Х	
FQA020ADC-007-M	-40 to +40	20	Х			Х

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



### Specifications

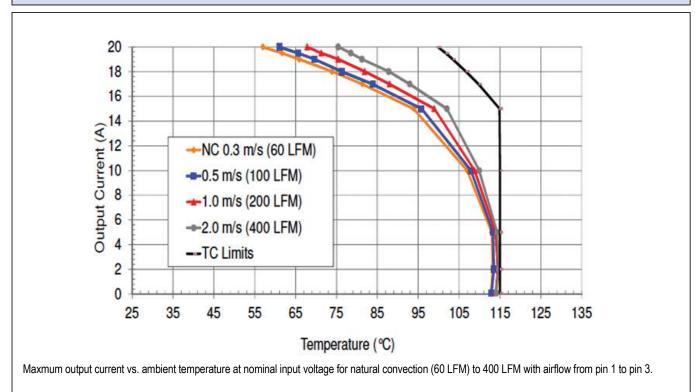
Model				FQA
Input/Output				
Input Voltage range	Vdc	-40 to +40		
Input Current (maximum)	Α	20A		
DC Resistance (typical)	mΩ	Positive leg: 7.5m $\Omega$ , negative leg: 5m $\Omega$		
Power Loss	W	5W at 20A		
Differential Mode Attenuation at 300 kHz	dB	50dB (typical with a 50 $\Omega$ source & load impedance		
Common Mode Attenuation at 30 MHz	dB	50dB (typical with a 50 $\Omega$ source & load impedance		
Qualification Methods	-	Consistent with MIL-STD-883F and MIL-STD-202G		
		Radiated Emmisions	RE101	Navy
		Radiated Emmisions	RE102	10kHz to 18GHz Fixed Wing internal, >25m Nose to Tail
		Conducted Emissions	CE101	Surface ships and submarines
Compliance Matrix		Conducted Emissions	CE102	Basic Curve
(Tested to the most stringent listed)		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	-	UL	/CSA/EN609	950-1, CE Mark (LVD and RoHS)
Environmental				
Operating Baseplate Temperature (max) <sup>(1)</sup>	°C	Standard screening (-S): -40°C to +115°C, Enhanced screening (-M): -55°C to +115°C		
Storage Temperature	°C	-65 to 125°C		
Operating Humidity (non condensing)	%RH	MIL-STD 883 Method 1004.7		
Cooling	-	Conduction, convection or forced air		
Withstand Voltage (For 1 minute)	VAC	Terminals to Case: 2250Vdc		
Vibration	-	MIL-STD-202G, Method 201A, Unpowered, sweep 1: 5 to 50 Hz at 0.5g, 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	100g (Flanged version)		
Size (LxWxH)	mm	Flanged version: 60.6 x 55.9 x 12.7, Non-flanged version: 60.6 x 39 x 12.7		
Size (LxWxH)	Inches	Flanged version: 2.39 x 2.2 x 0.5, Non-flanged version: 2.39 x 1.54 x 0.5"		
MTBF - Telcordia SR-332 issue 3	Hours	50°C ambient, full load: 15,000,000 hours		
Warranty	Years	3		

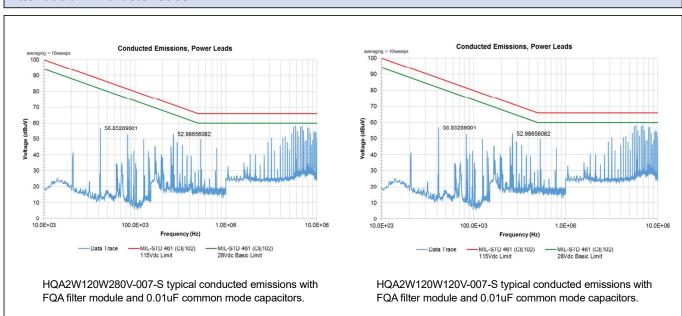
Notes

See website for detailed specifications, test methods and installation manual 1. See thermal performance section

# TDK·Lambda

### **Thermal Performance**

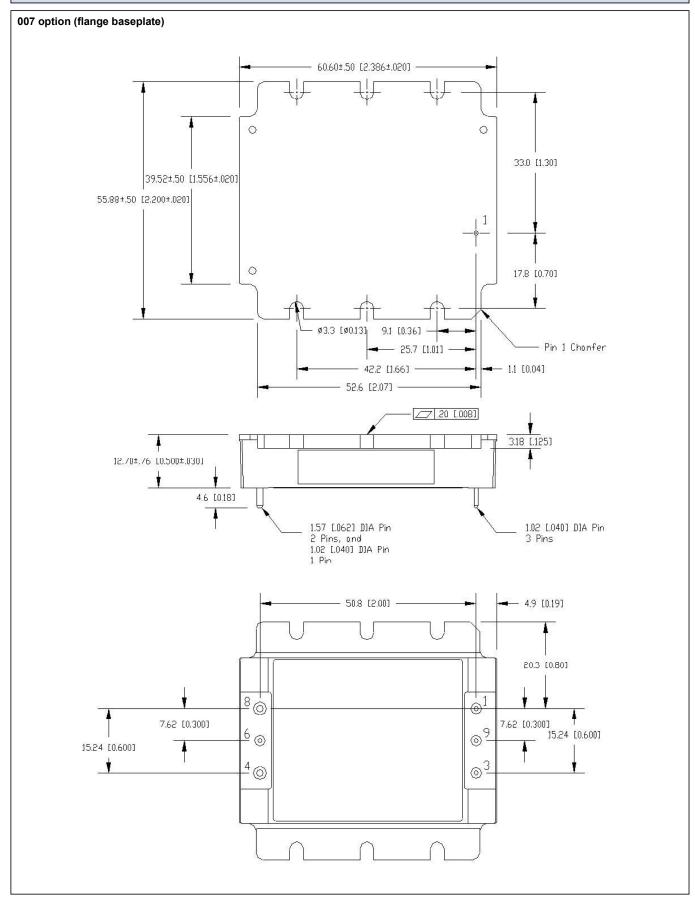




### **Attenuation Characteristics**

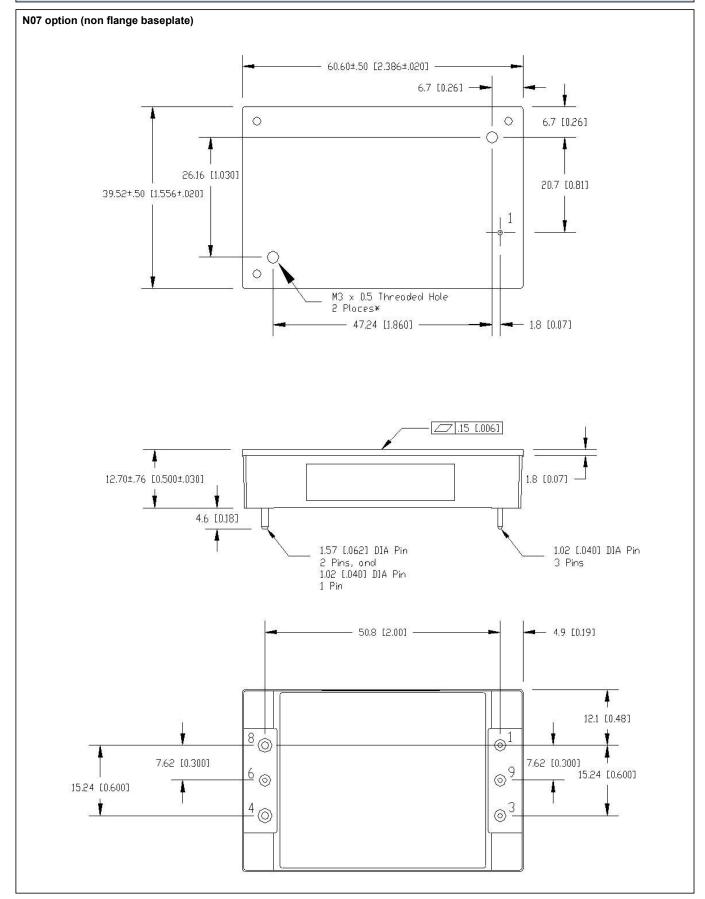


### **Outline Drawing**





### **Outline Drawing**



## Trusted • Innovative • Reliable



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

### **Evaluation Board**

Evaluation Board Part #	Content
FQX-HQX-EVK-D0	Evaluation PCB that can accommodate FQA or FQB filters plus two (2) HQA DC-DC Quarter Brick Modules. Filters and DC-DC bricks are not included.

# TDK·Lambda



### TDK-Lambda France SAS

Tel: +33 1 60 12 71 65 france@fr.tdk-lambda.com www.emea.lambda.tdk.com/fr/

### Italy Sales Office

Tel: +39 02 61 29 38 63 info.italia@it.tdk-lambda.com www.emea.lambda.tdk.com/it/

### Netherlands

info@nl.tdk-lambda.com www.emea.lambda.tdk.com/nl/

### TDK-Lambda Germany GmbH

Tel: +49 7841 666 0 info.germany@de.tdk-lambda.com www.emea.lambda.tdk.com/de/



Austria Sales Office

Tel: +43 2256 655 84 info@at.tdk-lambda.com www.emea.lambda.tdk.com/at/



#### Switzerland Sales Office

Tel: +41 44 850 53 53 info@ch.tdk-lambda.com www.emea.lambda.tdk.com/ch/

#### TDK-Lambda Nordic

Tel: +45 8853 8086 www.emea.lambda.tdk.com/dk/

#### TDK-Lambda UK Ltd.

TDK-Lambda Ltd.

Tel: +9 723 902 4333 info@tdk-lambda.co.il

Tel: +44 (0) 12 71 85 66 66 powersolutions@uk.tdk-lambda.com www.emea.lambda.tdk.com/uk/



\*

www.emea.lambda.tdk.com/il/

Commercial Support: Tel: +7 (495) 505 5674 Technical Support: Tel: +7 (812) 658 0463

info@tdk-lambda.ru www.emea.lambda.tdk.com/ru/



## TDK-Lambda Americas

Tel: +1 800-LAMBDA-4 or 1-800-526-2324 powersolutions@us.tdk-lambda.com www.us.lambda.tdk.com



### TDK Electronics do Brasil Ltda Tel: +55 11 3289-9599

sales.br@tdk-electronics.tdk.com www.tdk-electronics.tdk.com/en



TDK-Lambda Corporation Tel: +81-3-6778-1113 www.jp.lambda.tdk.com



Wuxi TDK-Lambda Electronics Co. Ltd.

Tel: +86 21 6485-0777 powersolutions@cn.tdk-lambda.com www.lambda.tdk.com.cn



TDK-Lambda Singapore Pte Ltd. Tel: +65 6251 7211 tls.mkt@sg.tdk-lambda.com www.sg.lambda.tdk.com



#### TDK India Private Limited, Power Supply Division

Tel: +91 80 4039-0660 mathew.philip@in.tdk-lambda.com www.sg.lambda.tdk.com



FQA Oct 22, 2019 v1.5