

Typical Features

- ◆ Fixed voltage input, isolated & unregulated output
- ◆ Efficiency up to 80% (Typ.)
- ◆ Continuous short-circuit protection, self -recovery
- ◆ No external components required
- ◆ Compact SIP Packaging
- ◆ Isolation voltage 3000VAC
- ◆ Operating temperature from -40°C to +105°C
- ◆ Plastic case, flame class UL94-V0



Application

The **QAXX series** is a DC-DC converter specifically designed for IGBT drivers. It features an asymmetric voltage output to minimize IGBT driving loss, along with continuous short-circuit protection and self-recovery.

Selection Guide

Certificate	Part No.	Input Voltage Range		Output Voltage/Current (Vo/Io)		Input Current @Nominal Input (Typ)		Maximum Capacitance Load	Rated Voltage at Full Load Output efficiency	
		Nominal Value (VDC)	Range Value (VDC)	Voltage (VDC)	Current (mA)	Full Load (mA)	No Load (mA)	μF	Min (%)	Typ (%)
-	QA01	15	14.5-15.5	+15/-8.7	+80/-40	130	20	220	77	80
-	QA01-09			+9.0	+111	84	20	220	77	80
-	QA01-A09			+9.0/-9.0	+55/-55	84	20	220	77	80
-	QA01-17			+17/-8.7	+80/-40	143	20	220	77	80
-	QA02	12	11.6-12.4	+15/-8.7	+80/-40	162	20	220	77	80
-	QA03	24	23.3-24.7	+15/-8.7	+80/-40	81	20	220	77	80
-	QA04	12	9-15	+15/-8.0	+100/-80	223	20	220	77	80

Note:

Note 1: Max. Capacitive Load refers to the maximum capacitance that can be connected to the output when the power supply starts under full load; exceeding this capacity may prevent the power supply from starting;

Note 2: The above efficiency values were measured at the Nominal Input Voltage and under rated output load;

Note 3: Models marked with "*" are under development. Due to space limitations, the list above is only a partial selection of products. For products not listed, please contact our Sales Department.

Input Specifications

Test Item	Test Conditions	Minimum	Typical	Max	Unit
Input Transient Voltage (1 sec. max.)	QA01	-0.7	--	16	VDC

	QA02	-0.7	--	13	VDC
	QA03	-0.7	--	26	VDC
	QA04	-0.7	--	15	VDC
Input filter	Capacitor Filter				
Hot Plug	N/A				

Output Specifications

Test Item		Test Conditions	Minimum	Typical	Max	Unit
QA01	+Vo	Vin=15 Vdc, +Io=+80 mA	14.25	15	15.75	VDC
	-Vo	Vin=15 Vdc, -Io=-40 mA	-8.00	-8.70	-9.40	VDC
QA01-09	+Vo	Vin=15 Vdc, +Io=+111 mA	8.46	9	9.54	VDC
	-Vo	/	/	/	/	VDC
QA01-A09	+Vo	Vin=15 Vdc, +Io=+55 mA	8.55	9	9.45	VDC
	-Vo	Vin=15 Vdc, -Io=-55 mA	-8.28	-9	-9.72	VDC
QA01-17	+Vo	Vin=15 Vdc, +Io=+80 mA	16.15	17	17.85	VDC
	-Vo	Vin=15 Vdc, -Io=-40 mA	-8.00	-8.70	-9.40	VDC
QA02	+Vo	Vin=12 Vdc, +Io=+80 mA	14.25	15	15.75	VDC
	-Vo	Vin=12 Vdc, -Io=-40 mA	-8.00	-8.70	-9.40	VDC
QA03	+Vo	Vin=24 Vdc, +Io=+80 mA	14.25	15	15.75	VDC
	-Vo	Vin=24 Vdc, -Io=-40 mA	-8.00	-8.70	-9.40	VDC
QA04	+Vo	Vin=12 Vdc, +Io=+100 mA	14.25	15	15.75	VDC
	-Vo	Vin=12 Vdc, -Io=-80 mA	-7.36	-8	-8.64	VDC
Output Voltage Accuracy	See error envelope curve (Figure 1)					
Load regulation	10% to 100% load	QA01-09	--	12	26	%
		Other Outputs	--	8	15	%
Linear voltage regulation	±1% of input voltage variation	Positive Output	-	±1.2	±1.5	%
		Negative Output	-	±1.2	±1.5	%
Temperature Coefficient	100% load	-	-	-	±0.03	%/°C
Ripple & Noise	0%–100% load, 20 MHz bandwidth	-	-	100	200	mVp-p
Output Short-circuit Protection (SCP)	Continuous short-circuit protection, Self-recovery					

Note: Ripple & noise testing uses the twisted-pair method; see the Ripple & Noise Test Instructions for details.

General Specifications

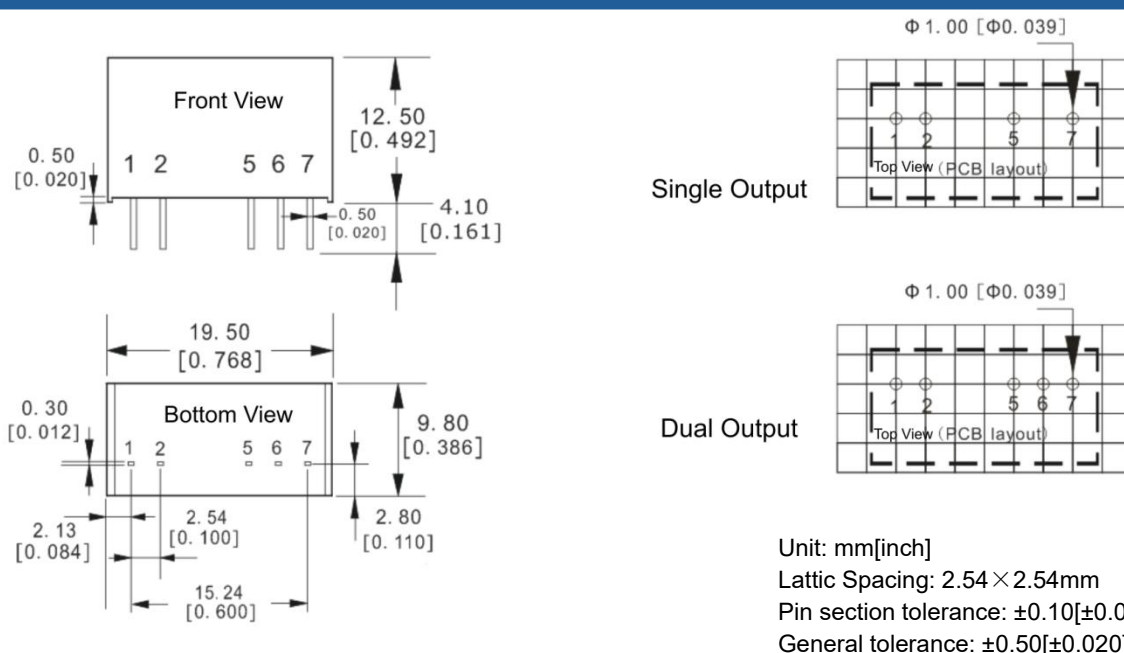
Test Item	Test Conditions	Minimum	Typical	Max	Unit
Switching Frequency	Nominal Input Voltage at Full Load	-	260	-	kHz
Operating temperature	Refer to the Derating Curve (Figure 2)	-40	-	+105	°C
Storage temperature	/	-55	-	+125	
Case Temperature Rise	Within the operating curve range	-	25	-	°C
Lead Soldering Temp.	10s (1.5mm from case)	-	-	300	

Relative Humidity	Non-condensing		5	-	95	%RH
Isolation Voltage	I/P-O/P	Test 1min, leakage current <1 mA	3000	-	-	VAC
Insulation Resistance	I/P-O/P	@500VDC	1000	-	-	MΩ
Isolation Capacitance	I/P-O/P	100 kHz/0.1 V	-	20	-	pF
Vibration			10–150 Hz, 5 G, 30 min. along the X, Y, and Z axes			
MTBF	MIL-HDBK-217F @ 25°C		3,500	-	-	K hours
Case Material	Black Flame-retardant Heat-resistant Plastic (UL94-V0)					
Weight	3.7 g (Typ.)					
Cooling Method	Natural Convection					
Packaging Method	Single tube (525 x 18 x 10 mm)			25 pcs		
	Per box (542 x 110 x 155 mm)			1,400 pcs (56 tubes total)		
Dimensions	L x W x H	19.50 × 9.80 × 12.50 mm		0.768 × 0.386 × 0.492 in		

EMC Performance

Component	Sub-item	Technical Standard	Performance Criteria
EMI	CE	CISPR 22/EN 55032	CLASS B (See EMC Recommended Circuit Diagram)
	RE	CISPR22/EN55032	CLASS B (see EMC recommended circuit diagram)
EMS	ESD	IEC/EN 61000-4-2	Air ±8 kV Contact ±6 kV Perf. Criteria B

Mechanical Dimensions

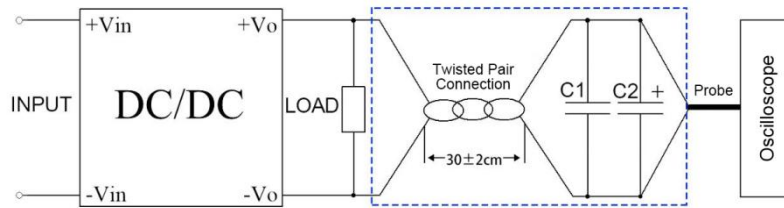


Pin Definitions

Pin Description	1	2	3	4	5	6	7
Single-channel (S)	+Vin	GND	NP	NP	-Vo	NP	+Vo
	Positive Input	Input Ground	No Pin	No Pin	Negative Output	No Pin	Positive Output
Dual (D)	+Vin	GND	NP	NP	-Vo	0V	+Vo
	Positive input	Input Ground	No pin	No Pin	Output Negative	Output Common (COM)	Output Positive

Note: If the pin definitions of the power module do not match those in the selection guide, refer to the markings on the physical label.

Ripple & Noise Test Instructions (Twisted Pair Method, 20MHz Bandwidth)



1. Measurement is conducted using the 12# twisted pair method with 20MHz bandwidth. The 100MHz probe must have the cap and ground lead removed, with a 0.1 μ F polypropylene capacitor and a 10 μ F high-frequency low-impedance electrolytic capacitor connected in parallel at the probe tip. Use "Sample" mode for oscilloscope acquisition.
2. For testing, connect the input to the power source and the output to an electronic load via a test jig. Sampling should be taken directly from the output terminals using a 30cm (± 2 cm) cable. Ensure the power cable gauge is appropriately selected based on the output current.

Application Notes:

1. Max. Capacitive Load is measured under pure resistive full-load conditions.
 2. A minimum load of 5% or an external high-frequency low-impedance electrolytic capacitor ($\geq 100\mu$ F) is recommended. Operating below this may increase output ripple and noise.
 3. We provide customized power solutions and technical support. For further inquiries or products not listed, please contact our team.
- 10 μ F/50V

Product Characteristic Curves

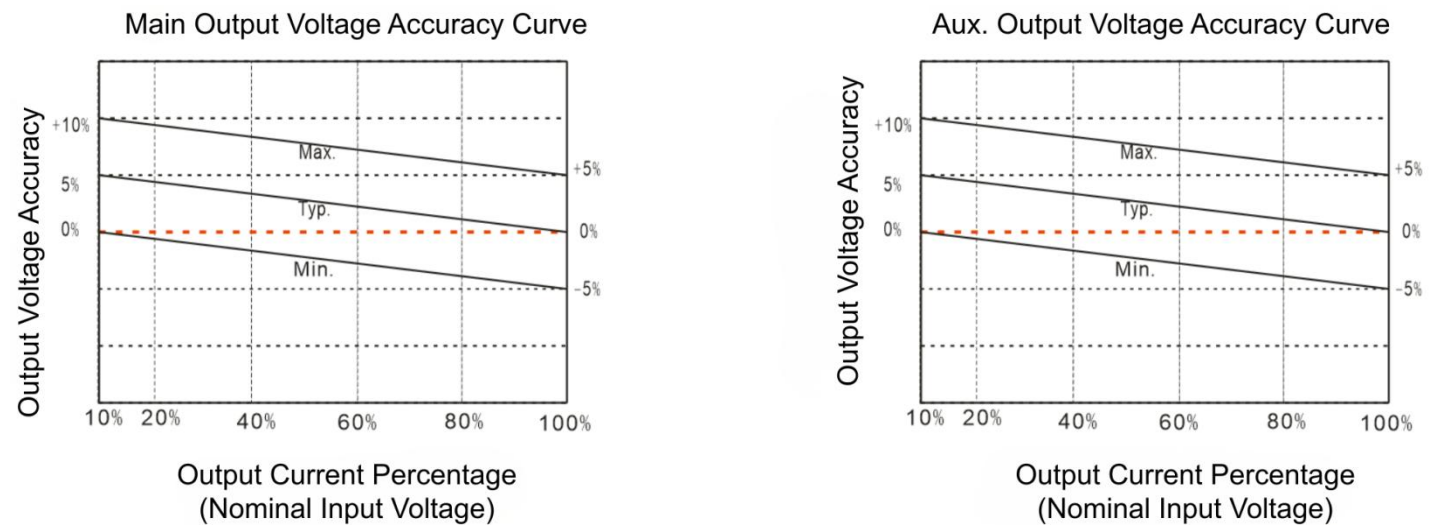


Figure 1

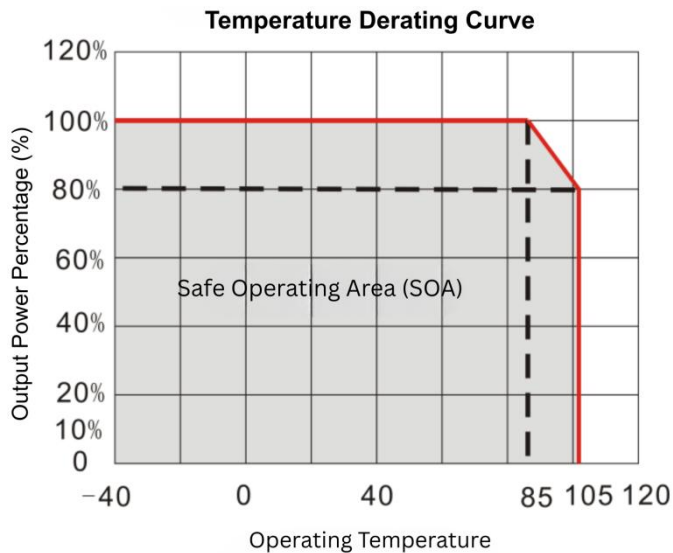


Figure 2

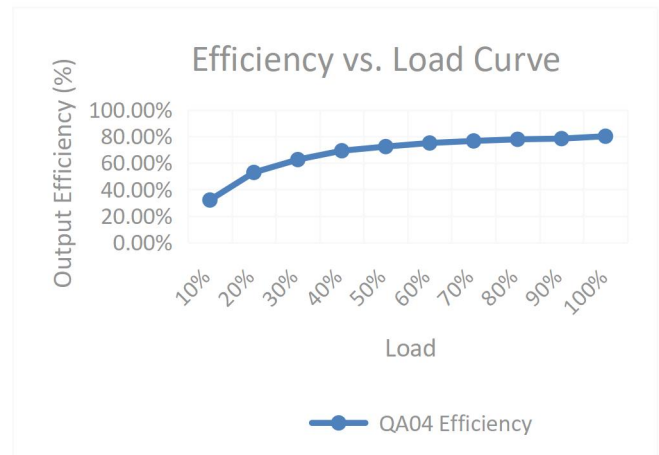


Figure 3

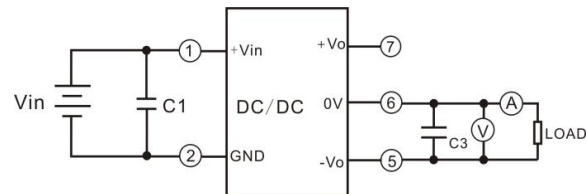
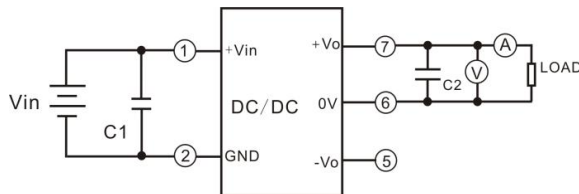
Design Reference Applications

➤ Output Load Requirements

a. To ensure efficient and reliable operation of this power module, the minimum load should not be less than 10% of the rated resistive load. If your power requirement is indeed lower, please connect a resistor in parallel at the output terminal equivalent to 10% of the rated load.

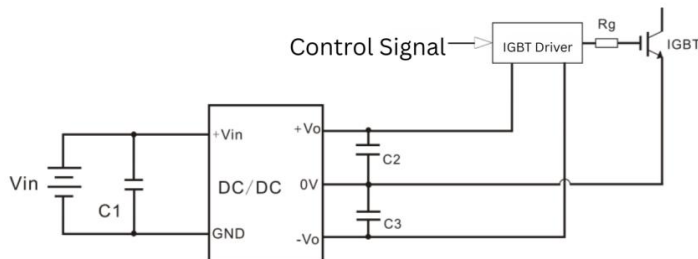
b. The product's Max. Capacitive Load is determined by nominal full-load testing; during use, the Max. Capacitive Load at the output terminal must not be exceeded, otherwise it may cause startup difficulties and damage the product.

➤ Testing Method



➤ Recommended Circuit

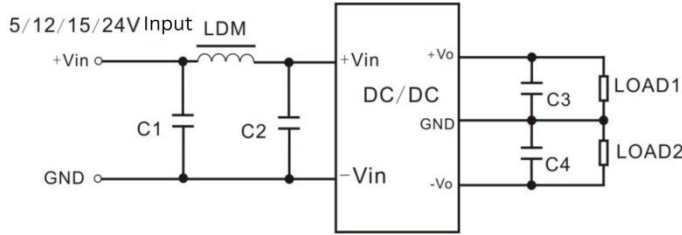
To effectively reduce ripple and noise, an external filter capacitor may be connected at the input and output terminals (see circuit below). Select appropriate capacitance, as excessive values may hinder startup. For safe and reliable operation, refer to the table below for recommended maximum capacitive loads for each output.



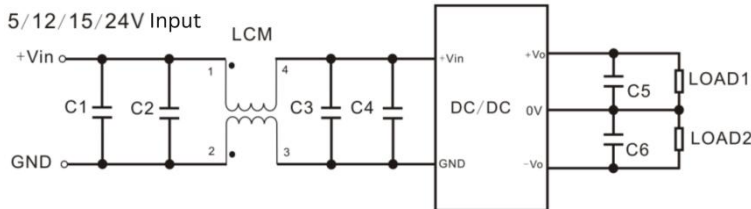
C1/C2/C3	
10μF/50V Low ESR Capacitor	

➤ EMC Typical Recommended Circuit

Input Voltage		12/15/24 Vdc
EMI	C1/C2	1 μF/50 V
	C3/C4	100uF/30V
	LDM	33 μH



Input Voltage		12/15/24 Vdc
EMI	C1/C2	4.7 μ F/50 V
	C3/C4	1 μ F/50 V
	C5/C6	100 μ F/50V
	LCM	22 μ H (Common Mode Choke)



Note:

1. Parallel connection and hot-plugging are not supported.
2. The product should be used within specified ranges; operation beyond these limits may cause permanent damage.
3. If operating below the minimum required load, the product's performance is not guaranteed to meet all specifications in this manual.
4. Operating beyond the load range will result in performance that may not meet the specifications listed in this manual.
5. Unless otherwise specified, all data above was measured at $T_a = 25^\circ\text{C}$, humidity < 75%, with nominal input voltage and rated resistive load.
6. All measurement and testing methods are based on our corporate standards.
7. Specifications apply to the standard models listed in this manual. For non-standard models, some parameters may differ; please contact our technical department for details.
8. Customized products and power solutions are available upon request.

Guangzhou Aipu Electron Technology Co., Ltd

Address: Building 4, HEDY Park, No.63, Punan Road, Huangpu Dist, Guangzhou, China

Tel: 86-20-84206763 Fax: 86-20-84206762 HOTLINE: 400-889-8821

E-mail: sales@aipu-elec.com Website: <https://www.aipupower.com>