

Typical product features

- ◆ Fixed Voltage Input, Isolated Unregulated Output
- ◆ Conversion efficiency up to 85%
- ◆ Continuous short circuit protection
- ◆ Meet enhanced isolation
- ◆ Small SIP Package
- ◆ Isolation voltage 5000Vac/ 6000Vdc
- ◆ Working temperature: -40°C~+105°C
- ◆ Plastic housing, meet UL94-V0 requirements



Test conditions: Unless otherwise specified, all parameters are tested at nominal input voltage, pure resistive rated load and 25°C room temperature.

Application

QAXXR3 Series ----- is a DC-DC module power supply designed for IGBT drivers. It uses an asymmetric voltage output to minimize IGBT drive losses. It also has output short-circuit protection and self-recovery capabilities.

Product Selection Guide

Certificate	Part no.	Input Voltage Range (VDC)		Input Voltage/Current (Vo/Io)		Input current (mA) Nominal Voltage		Max capacitive load uF	Ripple & Noise ^① (20MHz bandwidth) Max./ Typ. mVp-p	Efficiency (%)@full load output, nominal input voltage	
		Nominal value	range value	Voltage (V)	Current (mA)	Full load Typ	No Load Typ			Min.	Typ
-	QA01R3	15	13.5 - 16.5	+15/-8.7	+80/-40	120	12	2200	150	82	85
-	QA02R3	12	10.8 - 13.2	+15/-8.7	+80/-40	150	12	2200	150	81	84

Note: ① The ripple & noise test method uses the twisted pair method.

Input characteristics

Item	Working conditions	MIN	TYP	MAX	UNIT
Input surge voltage (1sec. max)	Input 12Vdc	-0.7	--	18	VDC
	Input 15Vdc	-0.7	--	21	
Input filter	Capacitive filtering				
Hot Plug	Unavailable				

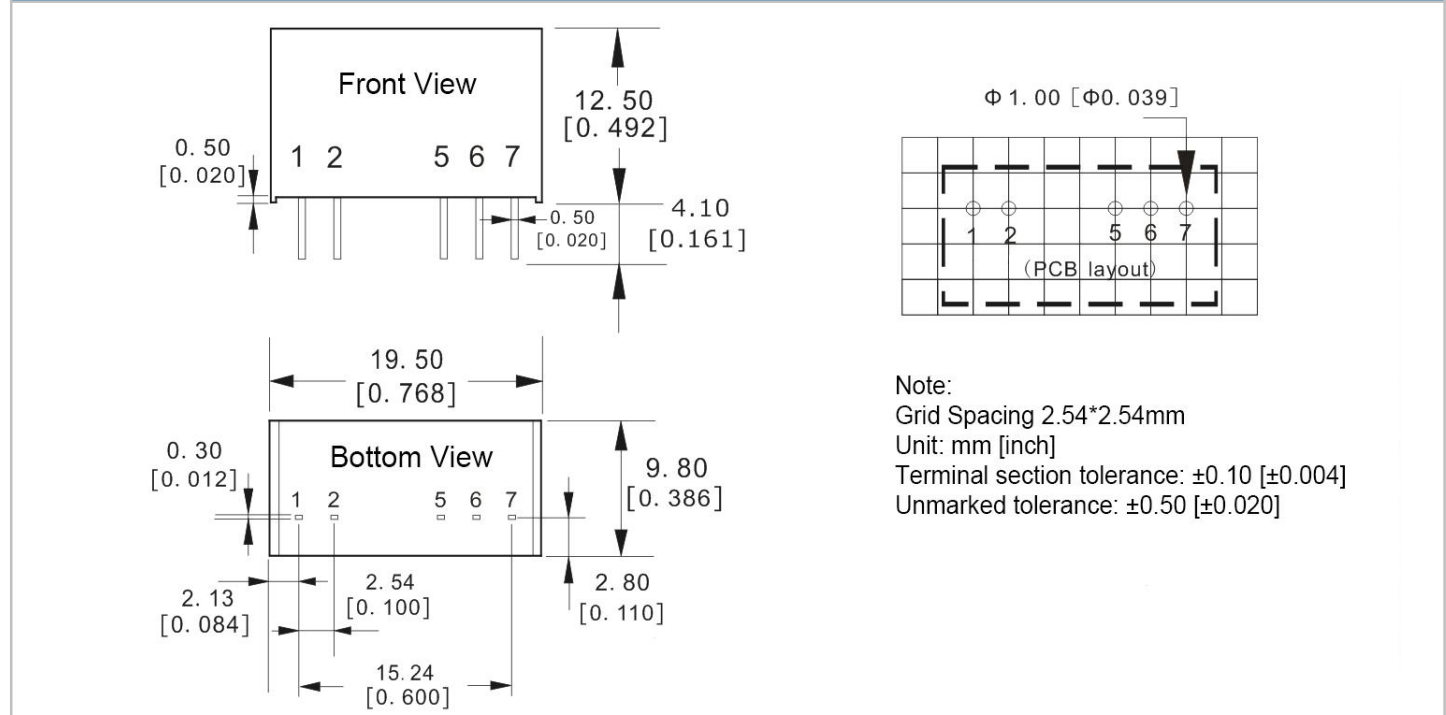
Output characteristics							
Item		Working conditions	MIN	TYP	MAX	UNIT	
QA01R3	+Vo	Vin=15Vdc, Pin6 & Pin7 +Io= +80mA	14.40	15.15	15.9	VDC	
	-Vo	Vin=15Vdc, Pin5 & Pin6 -Io= -40mA	-8.39	-8.83	-9.87		
QA02R3	+Vo	Vin=12Vdc, Pin6 & Pin7 +Io= +80mA	14.10	14.86	15.60		
	-Vo	Vin=12Vdc, Pin5 & Pin6 -Io= -40mA	8.26	8.7	9.14		
Output Voltage Accuracy		See the error envelope curve (Figure 1)					
Load Regulation	10% to 100% load		+Vo	--	8	15	%
			-Vo	--	10	15	
Linear voltage regulation	input voltage change ±1%		+Vo	--	±1.2	±1.5	--
			-Vo	--	±1.2	±1.5	
Temperature Drift Coefficient	100% load		-	-	±0.03	%/°C	
Output short circuit protection	Continuous short circuit protection, self-recovery						

General characteristics						
Item		Working conditions	MIN	TYP	MAX	UNIT
Switching frequency		Nominal input voltage full load	--	240	--	KHz
Operating temperature		Refer to temperature derating curve (Figure 2)	-40	--	+105	°C
Storage temperature		-	-55	--	+125	
Shell temperature rise		Ta=25°C	--	25	--	
Pin resistance soldering temperature		The distance between the soldering point and the shell is 1.5mm, 10 seconds	--	--	300	
Storage humidity		no condensation	5	--	95	%RH
Isolation Voltage		Input-output, test time 1 minute, leakage current less than 0.5mA	5000	--	--	Vac
			6000	--	--	Vdc
Insulation resistance		Input-output, insulation voltage 500VDC	1000	--	--	MΩ
Isolation Capacitor		Input/Output, 100KHz/0.1V	--	6	--	pF
Vibration		10-150Hz, 5G, 30 Min. along X, Y and Z				
MTBF		MIL-HDBK-217F@25°C	3500	--	--	K hours
Case Material		Black flame retardant heat resistant plastic (UL94-V0)				
Weight		3.7g (Typ.)				
Cooling Method		Natural air cooling				
Packaging		Single tube (525*18*10mm)	25PCS			
		Minimum packaging box (542*110*155mm)	1400PCS (total 80 tubes)			
Package dimension		L x W x H	19.50× 9.80 × 12.50mm		0.768 × 0.386 × 0.492inch	

Electromagnetic Compatibility Characteristics

EMI	CS	CISPR32/EN55032	CLASS B (EMC Recommended Circuit)
	RS	CISPR32/EN55032	CLASS B (EMC Recommended Circuit)
EMS	ESD	IEC/EN61000-4-2	Air±8kV,Contact±6kV perf.Criteria B

Package Dimension



Pin Definition

Pin Description	1	2	3	4	5	6
Single (S)	+Vin	GND	--	-Vo	--	+Vo
Dual (D)	+Vin	GND	--	-Vo	0V	+Vo

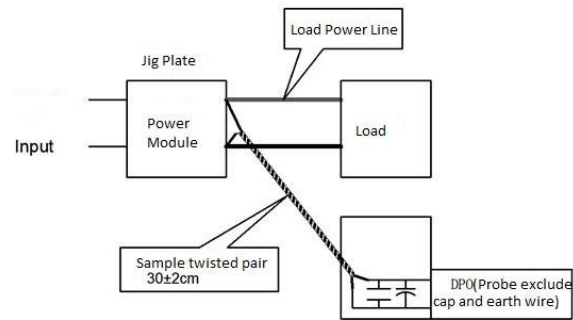
Note: If the pin definitions of the power module are inconsistent with those in the selection manual, the markings on the actual label shall prevail.

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

Test method:

- Ripple noise is connected using 12# twisted pair cable, the oscilloscope bandwidth is set to 20MHz, 100M bandwidth probe, and 0.1uF polypropylene capacitor and 10uF high frequency low resistance electrolytic capacitor are connected in parallel on the probe end, and the oscilloscope sampling uses Sample sampling mode.
- Output ripple noise test diagram:

Connect the power input end to the input power supply, and the power output is connected to the electronic load through the fixture board. The test uses a 30cm±2 cm sampling line to directly sample from the power output port. The power line selects the corresponding wire diameter with insulated wire according to the output current.



Temperature Derating Curve

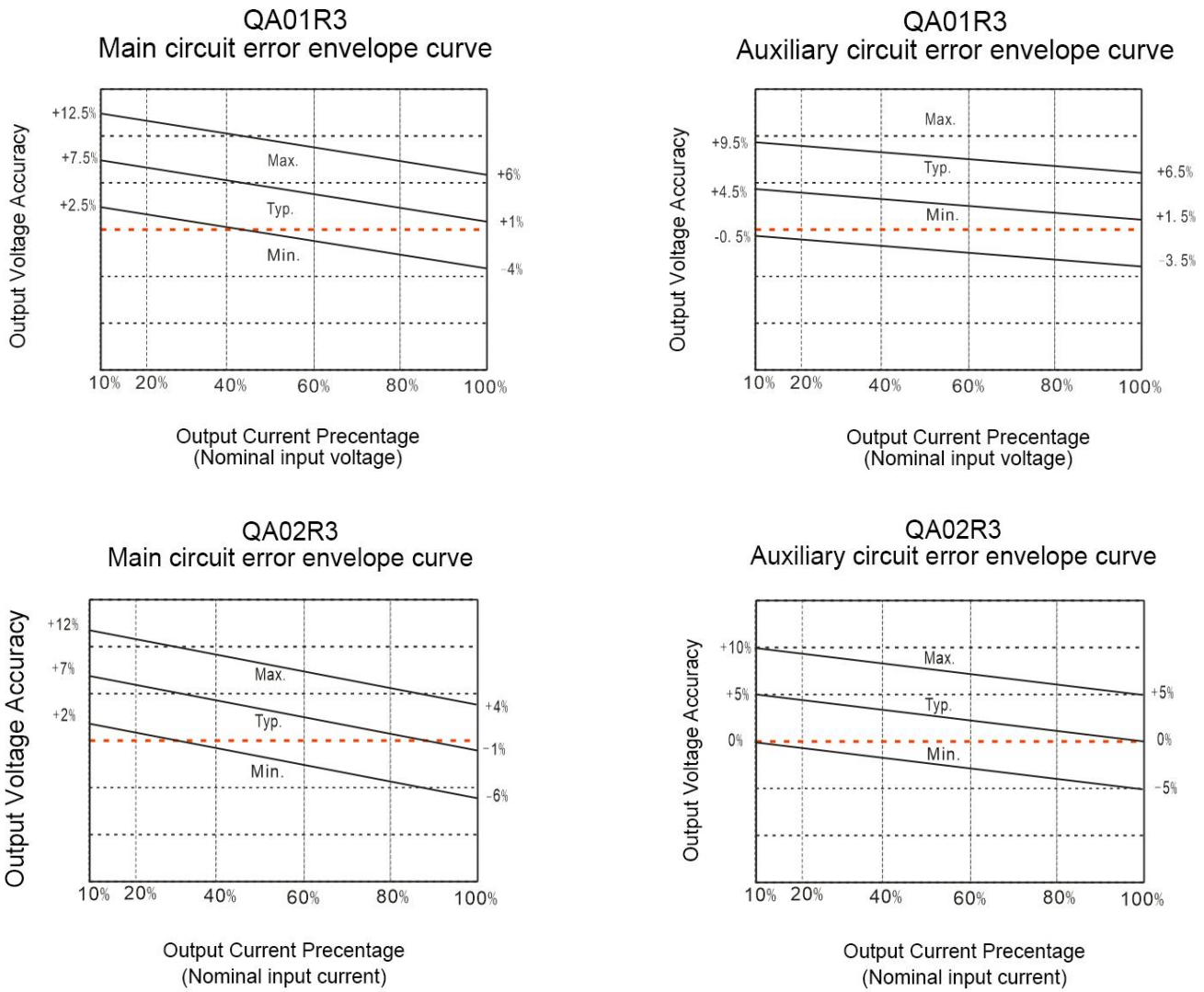


Figure 1

Temperature Derating Curve

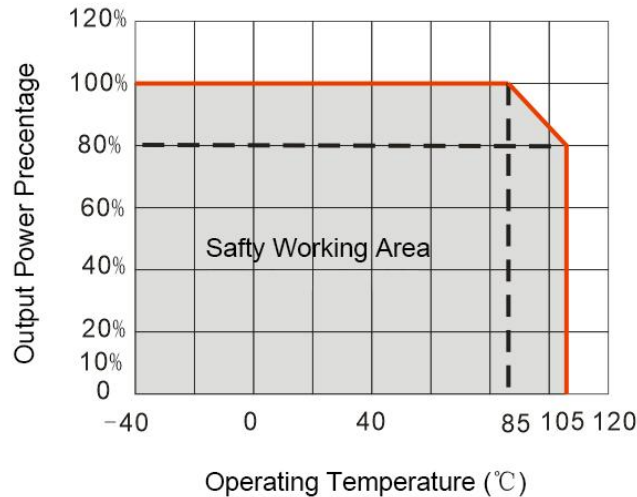
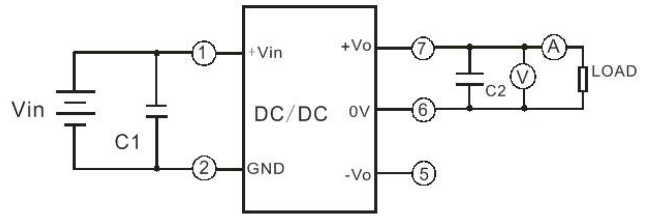
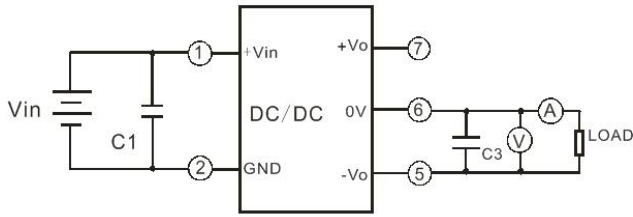


Figure 2

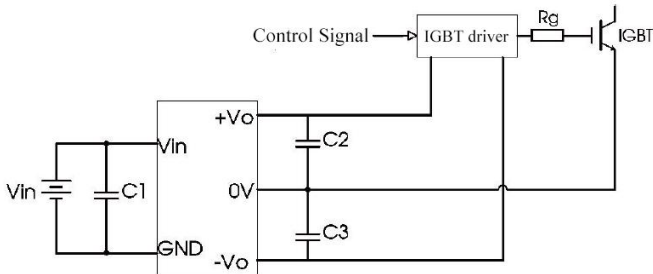
Design and Application Reference

① Test method



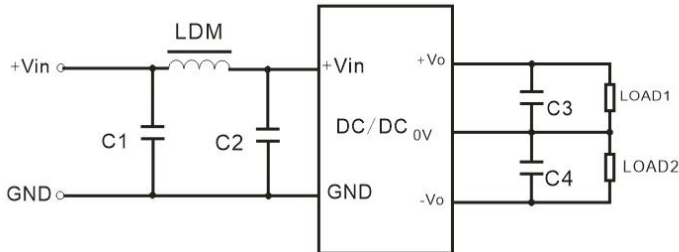
Note: C1, C2, C3 are 100μF/35V (low internal resistance capacitors)

② Typical applications



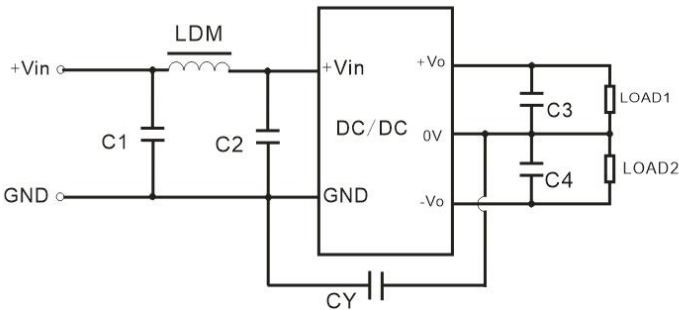
C1/ C2 /C3	
100uF/35V (Low internal resistance capacitor)	

③ EMC typical recommended circuit



Input voltage		5VDC	12/15/24VDC
EMI	C1/C2	4.7 μF/16V	1 μF/50V
	C3/C4	10 μF/50V	100 μF/30V
	LDM	6.8 μH	33 μH

Note: C3/C4 are low internal resistance capacitors



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EMI	C1/C2	4.7 μF/16V	1 μF/50V
	C3/C4	10 μF/50V	100 μF/30V
	LDM	6.8 μH	33 μH
	CY	330pF	330pF

Note: C3/C4 are low internal resistance capacitors

EMC Recommended Circuit

Note:

1. This product cannot be used in parallel and does not support hot plugging;
2. The connection line between the module power supply and the IGBT driver should be as short as possible;
3. The output filter capacitor (low internal resistance electrolytic capacitor) should be close to the module power supply and the IGBT driver;
4. The average output power of the driver must be less than the output power of the power module;
5. It is recommended to use ceramic capacitors or electrolytic capacitors for external capacitors at the input or output of the product. Tantalum capacitors are not recommended, otherwise there will be a certain risk of failure;
6. If the product works below the minimum required load, it cannot be guaranteed that the product performance meets all the performance indicators in this manual;
7. All indicator test methods in this article are based on the company's corporate standards;
8. Product specifications are subject to change without prior notice.

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