

Typical Product Features

- ◆ Fixed Voltage Input, Isolated unregulated output
- ◆ Conversion efficiency up to 87%
- ◆ Sustainable short-circuit protection
- ◆ Reinforced insulation
- ◆ Small SIP Package
- ◆ Isolation voltage 5000Vac/6000Vdc
- ◆ Working temperature: -40°C ~ +105°C
- ◆ Plastic case, meet UL94 V-0 standard



Test conditions: Unless otherwise specified, all parameter tests are conducted at nominal input voltage, pure resistive rated load, and a room temperature environment of 25 °C.

Application

QAXX3-XXXXR3 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 List

Part No.	Input Voltage Range (VDC)		Output Voltage/ Current (Vo/Io)		Input Current (mA) Nominal voltage		Max capacitive load	Ripple & Noise ① (20MHz bandwidth) Max./ Typ.	Efficiency (%) @output full load, input nominal voltage	
	Nominal value	Range	Voltage (VDC) +Vo/-Vo	Current (mA) +Io/-Io	Full Load typ.	No-load typ.			uF	mVp-p
*QA123-1509R3	12	10.8 - 13.2	+15/-9	+100/-100	--	--	--	--	--	--
QA153-1509R3	15	13.5 - 16.5	+15/-9	+100/-100	189	16	2200	150	82	87
QA243-1509R3	24	21.6 - 26.4	+15/-9	+100/-100	113	8	2200	150	78	83

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

In order to ensure that the module can work efficiently and reliably, its minimum output load cannot be less than 10% of the rated load when in use. If the power you need is indeed small, please connect a resistor in parallel at the output end. The recommended resistance value is equivalent to 10% of the rated power.

Input Specifications

Item	working conditions	Min.	Typ.	Max.	Unit
Input impulse voltage (1sec. max.)	12Vdc Input	-0.7	--	18	Vdc
	15Vdc Input	-0.7	--	21	
	24Vdc Input	-0.7	--	30	

Input filter	Capacitive filter
Hot Plug	Unavailable

Output Specifications

Item	working conditions		Min.	Typ.	Max.	Unit
*QA123-1509R3	+Vo	Vin=15Vdc, Pin6 & Pin7 +Io= +100mA	--	--	--	Vdc
	-Vo	Vin=15Vdc, Pin5 & Pin6 -Io= -100mA	--	--	--	
QA153-1509R3	+Vo	Vin=15Vdc, Pin6 & Pin7 +Io= +100mA	14.25	15	15.75	
	-Vo	Vin=15Vdc, Pin5 & Pin6 -Io= -100mA	-8.55	-9	-9.45	
QA243-1509R3	+Vo	Vin=15Vdc, Pin6 & Pin7 +Io= +100mA	14.13	14.87	15.61	
	-Vo	Vin=15Vdc, Pin5 & Pin6 -Io= -100mA	7.28	7.81	8.40	
Output Voltage Accuracy			See the error envelope curve (Figure 1)			
Load Regulation	10%~100% load	Positive output	--	8	15	%
		Negative output	--	10	15	
Line Regulation	Input voltage change ±1%	Positive output	--	±1.2	±1.5	--
		Negative output	--	±1.2	±1.5	
Temperature Drift Coefficient	100% Load		--	--	±0.03	%/°C
Output Short Circuit Protection	Continuous, self-recovery					

General Specifications

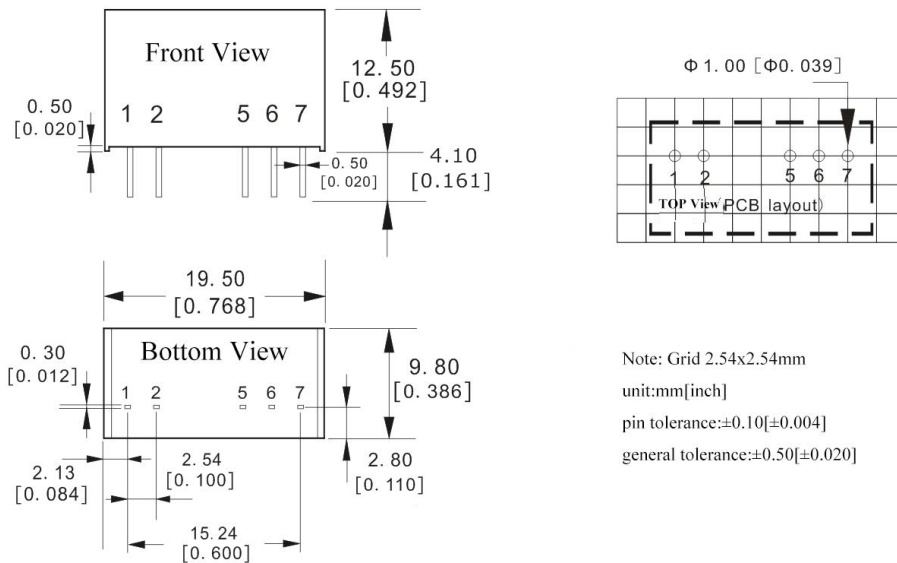
Items	Conditions	Min.	Typ.	Max.	Unit
Switching Frequency	Nominal input voltage full load	--	235	--	KHz
Operating Temperature	Refer to temperature derating curve (Figure 2)	-40	--	+105	°C
Storage Temperature		-55	--	+125	
Shell temperature rise during work	Ta =25°C	--	25	--	
Pin Withstand Soldering Temp	Distance to case 1.5mm, 10S	--	--	300	
Relative humidity	No condensation	5	--	95	%RH
Isolation Voltage	Input-Output, test 1min, leakage current<0.5mA	5000	--	--	Vac
		6000	--	--	Vdc
Insulation Resistance	Input/Output, insulation voltage 500Vdc	1000	--	--	MΩ
Isolation Capacitor	Input/Output,100KHz/0.1V	--	5	6.5	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 V-0)				
Product Weight	3.7g (Typ.)				
Cooling Method	Natural air cooling				

Packing Method	Tube(525*18*10mm)		25PCS
	Minimum Carton(542*110*155mm)		1400PCS(Total 80Tubes)
Package Size	L x W x H	19.50 × 9.80 × 12.50 mm	0.768 × 0.386 × 0.492 inch

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

Packing Dimension



Note: Grid 2.54x2.54mm
unit:mm[inch]
pin tolerance:±0.10[±0.004]
general tolerance:±0.50[±0.020]

Packing Code	L x W x H	
H	19.50 × 9.80 × 12.50 mm	0.768 × 0.386 × 0.492 inch

Pin Definition

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

Note: if the definition of pin is not in accordance with the model selection manual, please refer to the label on actual item.

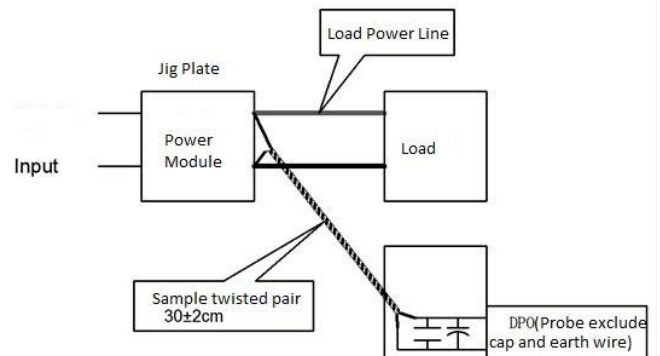
Ripple & Noise Test Instructions (Twisted Pair Method 20MHz Bandwidth)

Test Method:

1.12# twisted pair to connect, Oscilloscope bandwidth set as 20MHz, 100M bandwidth probe, terminated with 0.1uF polypropylene capacitor and 10uF high frequency low resistance electrolytic capacitor in parallel, oscilloscope set as Sample pattern.

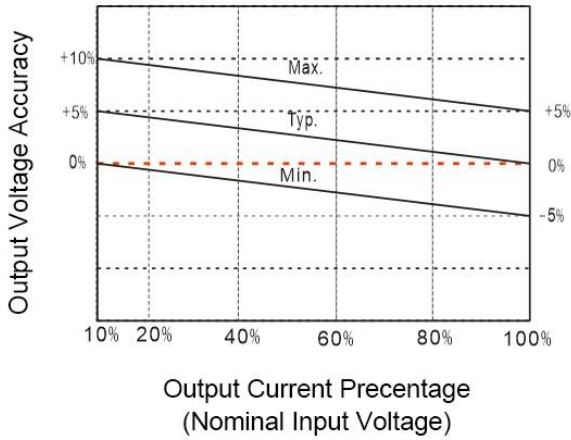
2. Output Ripple& Noise Test Method:

Input terminal connect to power supply, output terminal connect to electronic load through jig plate, Use 30cm±2 cm sampling line, Power line selected from corresponding diameter wire with insulation according to the flow of output current.

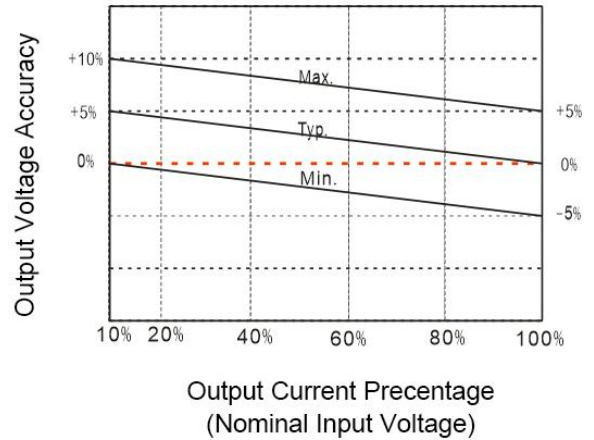


Product Characteristic Curve

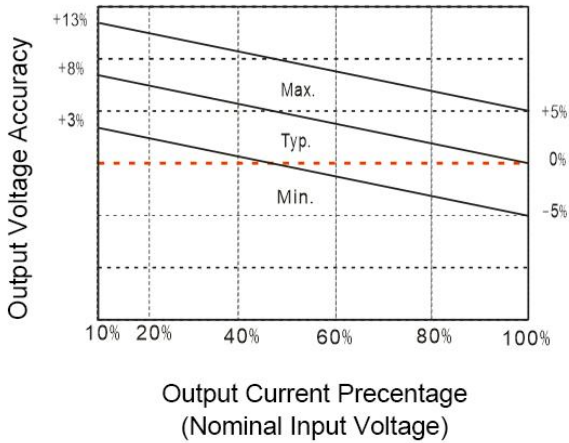
QA153-1509R3
Main circuit error envelope curve



QA153-1509R3
Auxiliary circuit error envelope curve



QA243-1509R3
Main circuit error envelope curve



QA243-1509R3
Auxiliary circuit error envelope curve

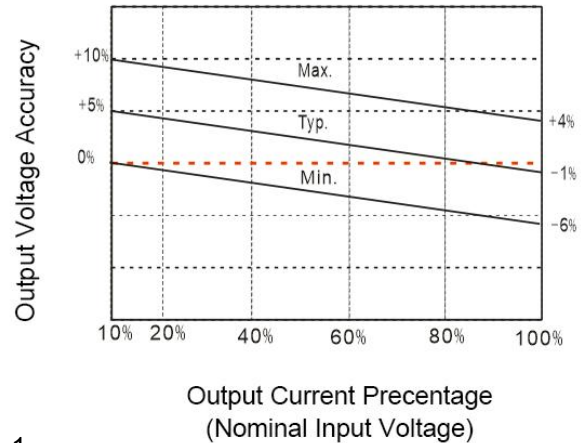


Figure 1

Temperature Derating Curve

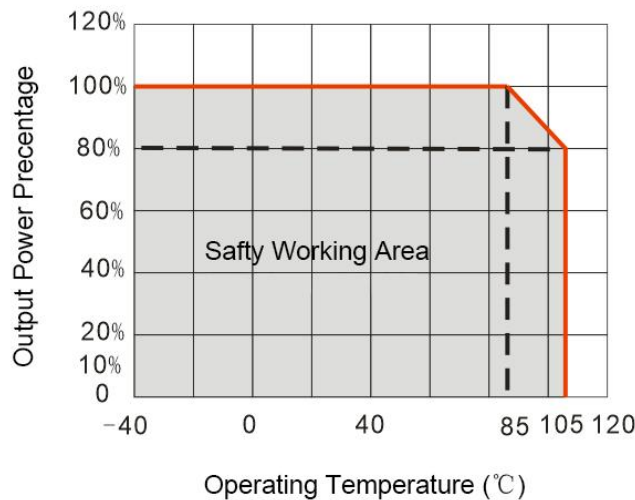
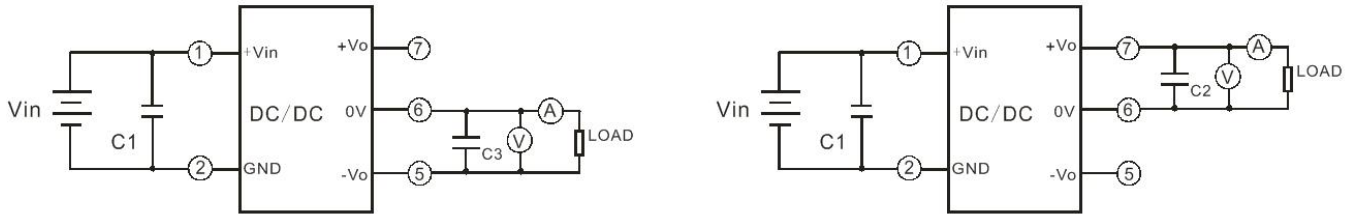


Figure 2

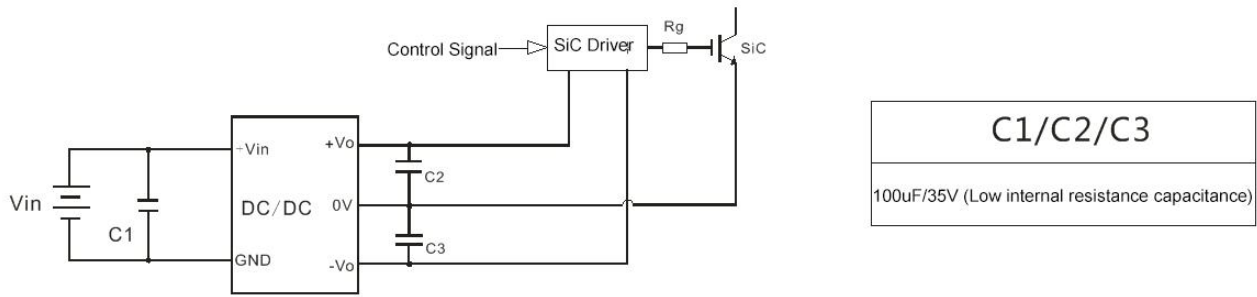
Design and Application Circuit Reference

① **Test Method**

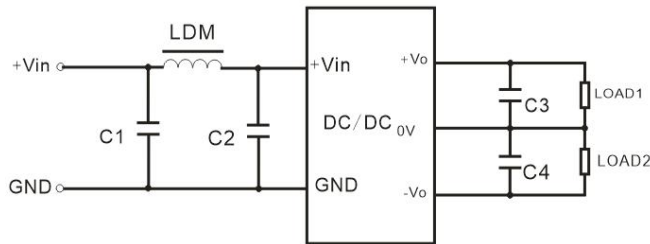


Note: C1,C2,C3 as 100μF/35V(Low internal resistance capacitor)

② **Typical Application**

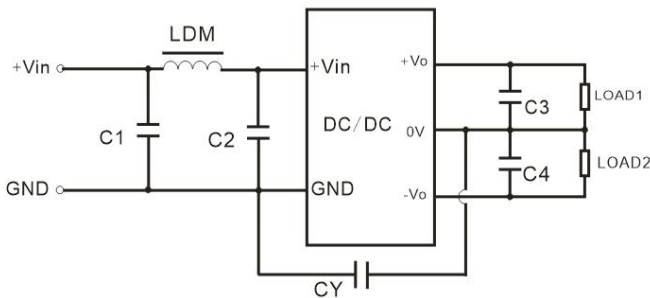


③ **EMC typical recommended circuit**



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

Note:

1. This product cannot be used in parallel and does not support hot swapping;
2. The connection line between the module power supply and the SiC driver should be as short as possible;
3. The output filter capacitor (low internal resistance electrolytic capacitor) is close to the module power supply and SiC 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 end of the product. It is not recommended to use tantalum capacitors, otherwise there will be a certain risk of failure;
6. If the product operates below the minimum required load, there is no guarantee that the product performance will meet all the performance indicators in this manual;
7. All index testing methods in this article are based on our company's corporate standards;
8. Product specifications are subject to change without prior notice.

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