DC/DC Converter
QAXX3C-XXXXR3 Series

Typical Product Features

- ◆ Fixed Voltage Input, Isolated unregulated output
- ◆ Conversion efficiency up to 85%
- ◆ Sustainable short-circuit protection
- ◆ Reinforced insulation
- ◆ Isolation voltage 5000Vac/6000Vdc
- ◆ Working temperature: -40℃～+105℃
- ◆ 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 ℃.

Application

QAXX3C-XXXXR3 series ---- is a DC-DC power supply designed for SiC MOSFET drivers. It uses an asymmetric voltage output to minimize the drive loss of SiC MOSFET. 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 (Max)	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	Min.	Typ.
QA123C-1504R3	12	10.8 – 13.2	+15/-4	+135/-135	225	12	2200	150	82	85
QA123C-1803R3			+18/-3	+120/-120	210	12	1000	150	82	85

Note: 1. "*" are models under developing.

2.Both positive and negative outputs have the same capacitive load.

Input Specifications

Item	working conditions	Min.	Typ.	Max.	Unit
Input impulse voltage (1sec. max.)	12Vdc Input	-0.7	--	18	Vdc
Input filter	Capacitive filter				

Output Specifications

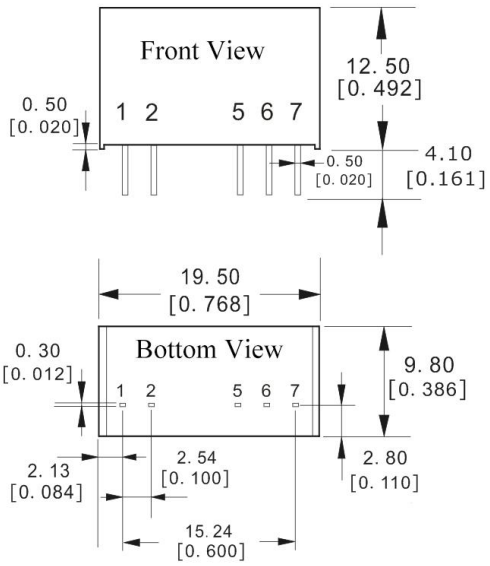
Item		working conditions	Min.	Typ.	Max.	Unit
QA123C-1504R3	+Vo	Vin=12Vdc, Pin6 & Pin7 +Io= +135mA	14	14.75	15.5	Vdc
	-Vo	Vin=12Vdc, Pin5 & Pin6 -Io= -135mA	3.8	4	4.2	
QA123C-1803R3	+Vo	Vin=12Vdc, Pin6 & Pin7 +Io= +120mA	17.1	18	18.9	
	-Vo	Vin=12Vdc, Pin5 & Pin6 -Io= -120mA	3.0	3.15	3.3	
Output Voltage Accuracy		10%-100% load	See the error envelope curve (Photo 1-Photo 4)			--
Load Regulation		10%~100% load Positive output	--	10	17	%

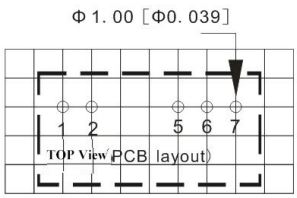
		Negative output	--	13	17	%
Line Regulation	Full input voltage range	Positive output	--	±1.2	±1.5	%
		Positive output	--	±1.2	±1.5	%
Ripple & Noise①	Nominal input,full load, 20MHZ bandwidth		--	80	150	mVp-p
Temperature Drift Coefficient	100% Load		--	±0.04	±0.1	%/°C
Output Short Circuit Protection	Continuous, self-recovery					
NOTE: ①Ripple & Noise tested by twisted-pair method;						

General Specifications

Items	Conditions	Min.	Typ.	Max.	Unit
Isolation Voltage	Input-Output, test 1min, leakage current<0.5mA	5000	--	--	Vac
		6000	--	--	Vdc
Isolation Capacitor	Input/Output,100KHz/0.1V	--	5	--	pF
Insulation Resistance	Input/Output, insulation voltage 500Vdc	1000	--	--	MΩ
Operating Temperature	Refer to Temperature Derating Curve(Photo 5)	-40	--	+105	℃
Storage Temperature		-55	--	+125	
Shell temperature rise during	Ta =25℃, nominal input, full load	--	30	--	
Pin Withstand Soldering Temp	Distance to case 1.5mm, 10S			300	
Relative humidity	No condensation	5	--	95	%RH
MTBF	MIL-HDBK-217F@25℃	35X10^5	--	--	Hours
Case Material		Black flame-retardant heat-resistant Plastic(UL94 V-0)			
Product Weight		3.7g (Typ.)			
Packing Method	Tube(525*18*10mm)	25PCS			
	Minimum Carton(542*110*155mm)	1400PCS(Total 56Tubes)			
	Gross weight of Minimum carton	8300g			

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 × 12.50mm	0.768 × 0.386 × 0.492inch

Pin Definition

Pin-Out	1	2	3, 4	5	6	7
Dual Output(QA)	+Vin	GND	NP	-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.

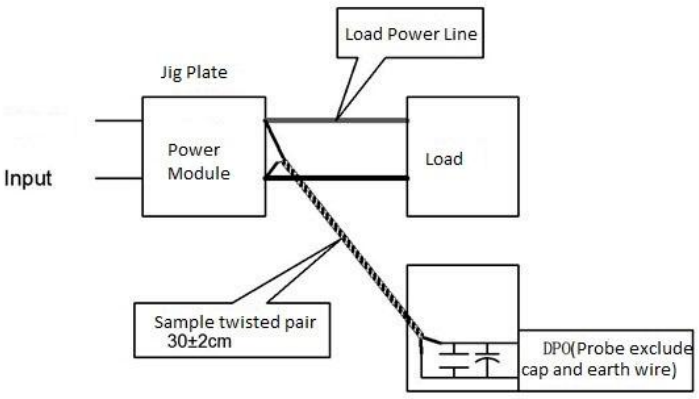
Ripple & Noise Test Instructions (Twisted Pair Method 20MHz Bandwidth)

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:

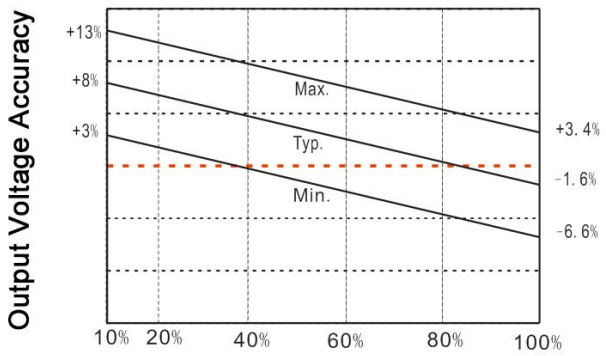
Input terminal connect to power supply, output terminal connect to electronic load through jig plate, Use 30cm±2 cm sampling line, Power line selected from corresponding diameter wire with insulation according to the flow of output current.



Product Characteristic Curve

QA123C-1504R3

Main circuit error envelope curve

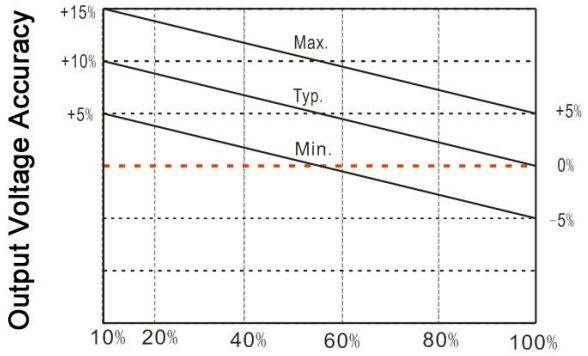


Output Current Precentage
(Nominal Input Voltage)

Photo 1

QA123C-1504R3

Auxiliary circuit error envelope curve



Output Current Precentage
(Nominal Input Voltage)

Photo 2

QA123C-1803R3

Main circuit error envelope curve

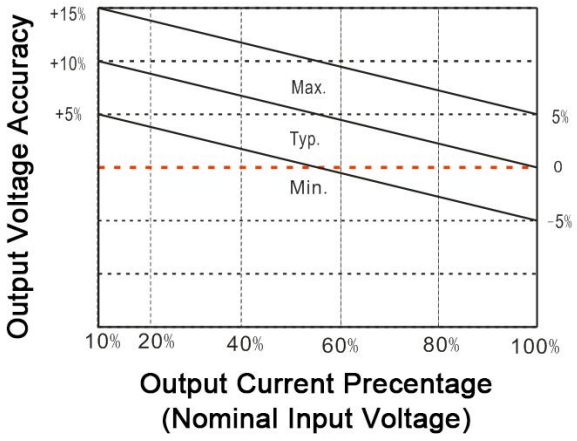


Photo 3

QA123C-1803R3

Auxiliary circuit error envelope curve

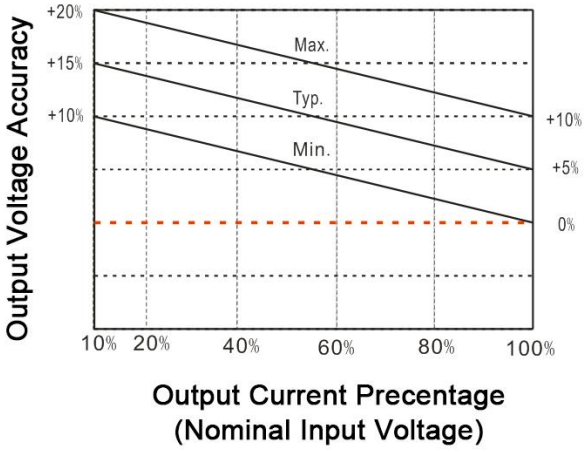


Photo 4

Temperature Derating Curve

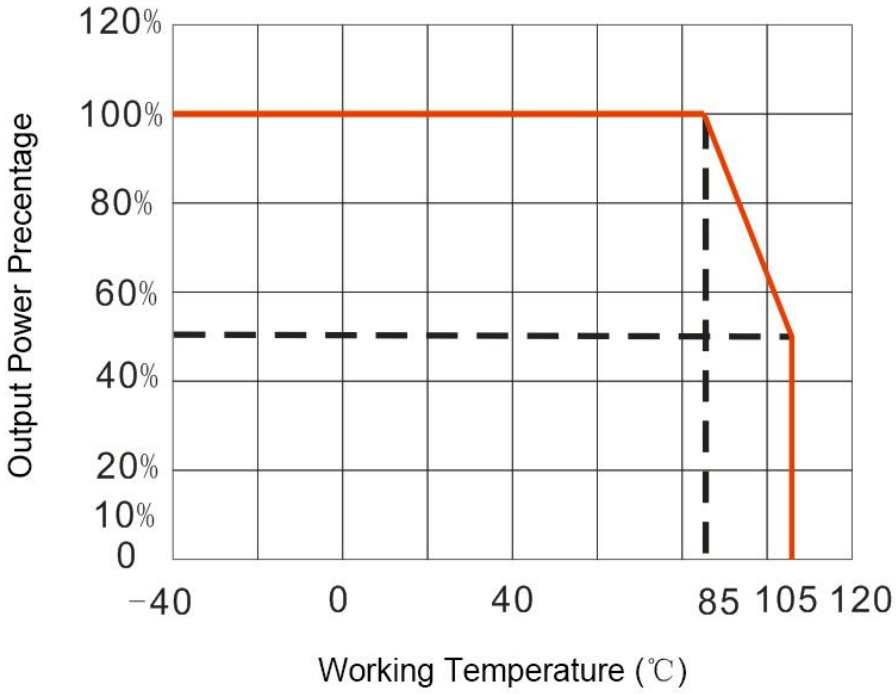
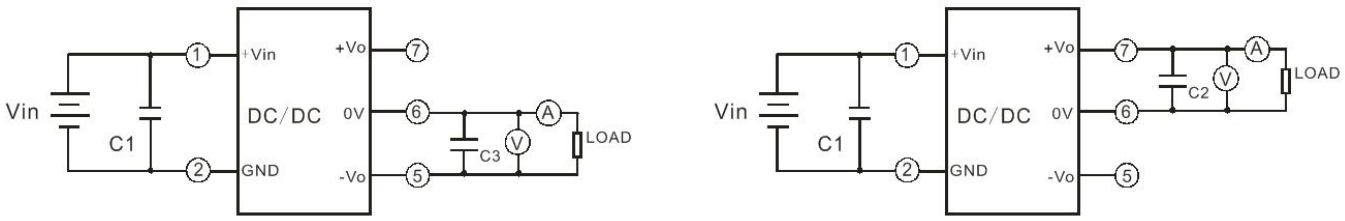


Photo 5

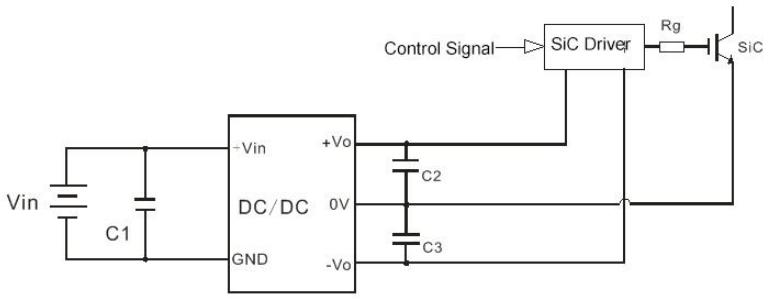
Design and Application Circuit Reference

① **Test Method**



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

② **Typical Application**



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

Photo 6

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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