Typical Features

- ◆ Fixed voltage input, isolated & unregulated output
- ◆ Efficiency up to 82% (Typ.)
- ◆ Mini size SIP package
- ◆ Reinforced insulation
- ◆ Isolation voltage 3500VAC/6000VDC
- ◆ Continuous short circuit protection, self-recovery
- ◆ Operating temperature from -40℃ to +85℃
- ◆ Plastic case, flame class UL94-V0

Application

QAXX3C-XXXXR2 series --- DC-DC modular converters specially designed for SiC MOSFET driver. It has asymmetric voltage output to decrease SiC MOSFET drive loss, also the output short circuit protection and self-recovery.

Typical Product List

Certificate	Part No.	Input Voltage Range		Output Voltage/Current (Vo/Io)		Input Current (mA) Typ. @Nominal volt.		Max Capacitive load	Efficiency (%) @Full load nominal volt.	
		Nominal (VDC)	Range (VDC)	Vo (VDC)	Io (mA)	Full load	No load	uF	Min	Typ.
-	QA123C-1504R2	12	10.8 - 13.2	+15/-4	+100/-100	210	25	220	77	80
-	QA123C-1509R2			+15/-9	+100/-100	260	25	220	77	80
-	QA123C-1804R2			+18/-4	+100/-100	245	25	220	77	80
-	QA123C-1809R2			+18/-9	+100/-100	280	25	220	77	80
-	QA123C-2005R2			+20/-5	+90/-90	295	25	220	77	80
-	QA153C-1509R2	15	13.5 - 16.5	+15/-9	+100/-100	230	25	220	77	80
-	QA153C-1504R2			+15/-4	+100/-100	165	25	220	77	80
-	QA153C-1804R2			+18/-4	+100/-100	180	25	220	79	82
-	QA153C-1809R2			+18/-9	+100/-100	225	25	220	77	80
-	QA153C-2005R2			+20/-5	+90/-90	220	25	220	77	80
-	QA243C-1503R2	24	21.6 - 26.4	+15/-3	+100/-100	95	20	220	78	81
-	QA243C-1504R2			+15/-4	+120/-120	120	20	220	78	82
-	QA243C-1508R2			+15/-8	+120/-120	145	20	220	78	82
	QA243C-1509R2			+15/-9	+100/-100	125	20	220	78	82
-	QA243C-1803R2			+18/-3	+100/-100	110	20	220	78	81
-	QA243C-1804R2			+18/-4	+100/-100	115	20	220	79	82
-	QA243C-2005R2			+20/-5	+90/-90	120	20	220	78	82

Note 1: The maximum capacitive load is the capacitance allowed to be used when the power supply starts up at full load. The converter may not start if the capacitor exceeds this value.

Note 2: The efficiency is tested at the nominal input voltage and the rated load.

Note 3: Please contact Aipu sales for other output voltages requirements of this series but not listed in this table.

Input Specifications

Item	Test conditions	Min.	Typ.	Max.	Unit
Input inrush voltage (1sec. max.)	12Vdc Input	-0.7	--	18	VDC
	15Vdc Input	-0.7	--	21	
	24Vdc Input	-0.7	--	30	
Input filter	Capacitor filter				
Hot Plug	Unavailable				

Output Specifications

Item	Test conditions		Min.	Typ.	Max.	Unit
Output voltage accuracy	Please refer to the output voltage deviation graph (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	%
		Positive output	--	±1.2	±1.5	
Temperature drift coefficient	100% Load		--	--	±0.03	%/°C
Ripple & Noise	10%-100% load, 20MHz bandwidth		--	80	150	mVp-p
Short circuit protection	Continuous, self-recovery					
Note: The Ripple & Noise is tested by the Twisted Pair Method, please refer to the following test instruction.						

General Specifications

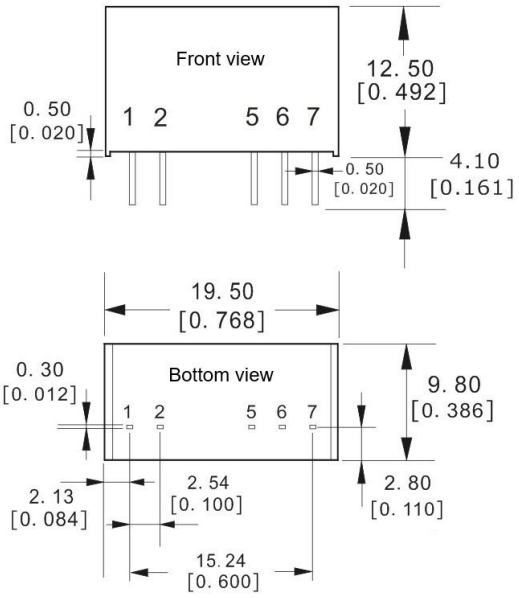
Item	Test conditions		Min.	Typ.	Max.	Unit
Switching frequency	Nominal input voltage, full load		--	80	--	KHz
Operating temperature	Refer to the temperature derating graph (Figure 2)		-40	--	+85	℃
Storage temperature			-55	--	+125	
Case temperature rise	Within the operating derating range		--	25°	--	
Pin soldering temperature	1.5mm from the case, soldering time 10S		--	--	300	
Relative humidity	No condensation		5	--	95	%RH
Isolation voltage	I/P-O/P	Dielectric test 1 min, leakage Current <1mA	3500	--	--	VAC
			6000	--	--	VDC
Insulation resistance	I/P-O/P	@500VDC	1000	--	--	MΩ
Isolation capacitance	I/P-O/P	100KHz/0.1V	--	5	--	pF
Vibration			10-150Hz, 5G, 30 Min. along X, Y and Z			
MTBF	MIL-HDBK-217F@25℃		3500	--	--	K Hours
Transformer CL distance			5	--	--	mm
Transformer CR distance			5	--	--	
PCB CL&CR distance			5.5	--	--	
Case material	Plastic in Black, flame class UL94-V0					
Unit weight	3.7g (Typ.)					

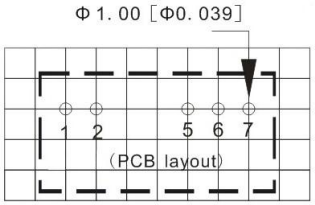
Cooling method	Natural air		
Packing	Tube size (525x18x10mm)		25PCS/Tube
	Carton size (542x110x155mm)		1400PCS (Total 56 Tubes)
Unit dimensions	L x W x H	19.50 × 9.80 × 12.50 mm	0.768 × 0.386 × 0.492 inch

EMC Performance

Item		Test Standard	Performance/Class
EMI	CE	CISPR32/EN55032	CLASS B (With the Recommended EMC Circuit)
	RE	CISPR32/EN55032	CLASS B (With the Recommended EMC Circuit)
EMS	ESD	IEC/EN61000-4-2	Contact ±6kV, Air ±8kV perf. Criteria B

Mechanical Dimensions





PCB layout vertical view
Grid 2.54x2.54 [0.10x0.10]

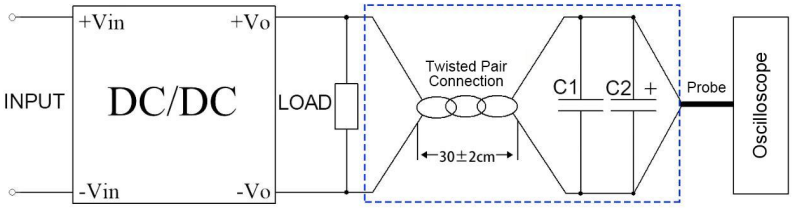
Unit: mm[inch]
Pin section tolerance: ±0.10[±0.004]
General tolerance: ±0.50[±0.020]

Pin-out Function Description

Pin No.	1	2	3	4	5	6	7
Dual (D)	+Vin	GND	No Pin	No Pin	-Vo	0V(COM)	+Vo

Note: Please take the pin definition on the product label as the right one if it is different than the data sheet description.

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



1. The Ripple & noise test needs 12# twisted pair cables, an oscilloscope which should be set at the Sample Mode, bandwidth 20MHz. 100M bandwidth probe with cap and ground removed. C1(0.1uF) polypropylene capacitor and C2(10uF) high frequency low impedance electrolytic capacitor are connected in parallel with the probes and one side of the twisted pair.
2. Refer to the test diagram, the converter output connects to the electronic load by the jig with cables which size should be defined according to the output current value. The other side of the twisted pair (length 30cm±2 cm) should be connected in parallel with the

load. The test can start after the input power on.

3. It is recommended to use a ≥10% load or a high frequency low impedance electrolytic capacitor (≥100uF) load at the output to avoid the output ripple increasing.

Product Characteristics Graphs

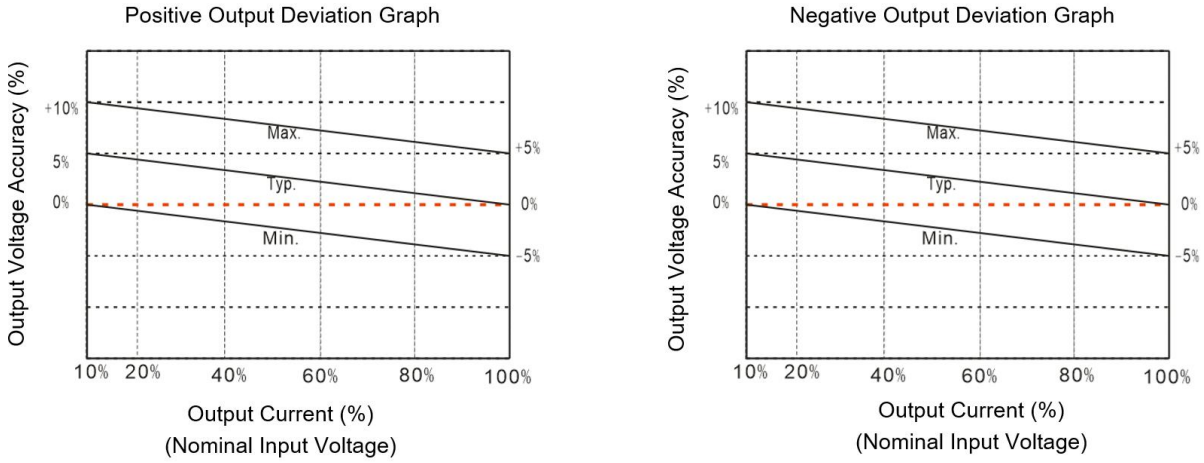


Figure 1

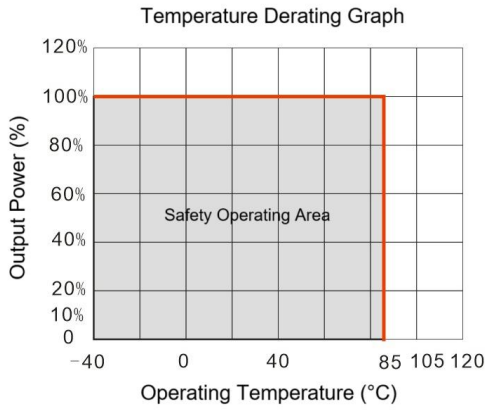


Figure 2

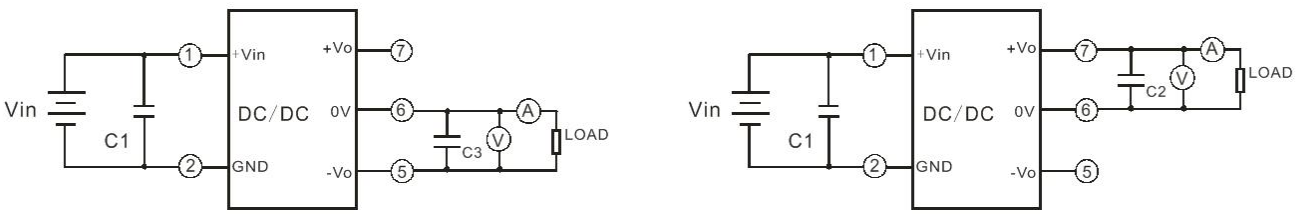
Recommended Circuits for Application

1. Output load requirements

a. To ensure the converter operates efficiently and reliably, its minimum load should not be less than 10% of the rated load. It is recommended to connect a resistor in parallel to the output when the real load is less than 10% (the sum of the power consumed should be ≥10% of the rated power).

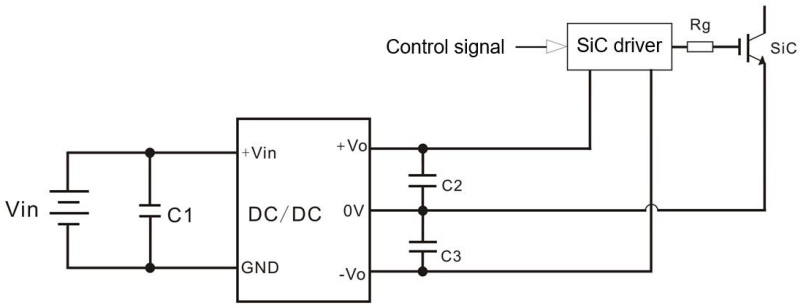
b. The maximum capacitive load is tested at the rated full load. The converter may not start or be broken at the capacitive over-load.

2. Test circuit diagrams



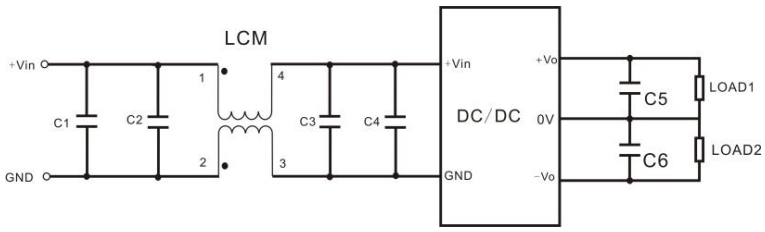
3. Typical application circuit diagram

To improve the output ripple and noise, a capacitor filter net should be used at the input and output. The application circuit diagram is shown below, suitable capacitors should be chosen as the recommendation. The converter may not start if the capacitances are too big.

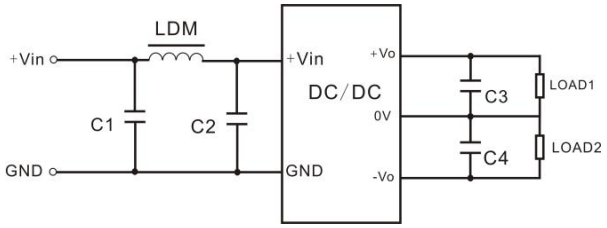


C1/C2/C3
100uF/50V (Low ESR Capacitors)

4. Recommended EMC circuit diagrams



Input Voltage		12/15/24Vdc
EMI	C1/C2	1uF/50V
	C3/C4	1uF/50V
	C5/C6	100uF/50V
	LCM	33uH (CMC)



Input Voltage		12/15/24Vdc
EMI	C1/C2	1uF/50V
	C3/C4	100uF/35V
	LDM	2.2uH (DMC)

Application Notice

1.This series of products cannot be used in parallel, and do not support hot-plug.

2.The product should be used according to the specification, otherwise it could be permanently damaged.

3. The product performance cannot be guaranteed if it works at a lower load than the minimum load defined.

4. The product performance cannot be guaranteed if it works under over-load condition.

5. Unless otherwise specified, all values or indicators on this datasheet are tested at Ta=25℃, humidity<75%RH, nominal input voltage and rated load (pure resistance load).

6. All values or indicators on this datasheet have been tested based on Aipupower test specifications.

7.The specifications are specially for the parts listed on this datasheet, any other non-standard model performances could be out of the specifications. Please contact our technician for specific requirements.

8. Aipupower can provide customization service.

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