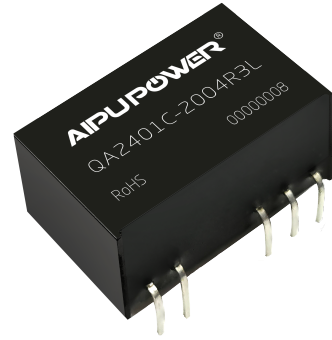


Typical Product Features

- ◆ Fixed Voltage Input, Isolated unregulated output
- ◆ Efficiency up to 83%(Typ.)
- ◆ Continuous short-circuit protection
- ◆ Reinforced Insulated
- ◆ Mini SIP Package
- ◆ Isolation voltage 4200Vac/6000Vdc
- ◆ Ambient temperature: -40°C~+105°C
- ◆ Plastic case, flame class UL94 V-0



Test conditions: Unless otherwise specified, all parameter values had been tested at rated input voltage, pure resistive rated load, and at room temperature 25 °C.

Application

QA2401C-2004R3L ---- is a DC-DC module convertor specially designed for SIC driver. It has asymmetric voltage output to decrease SIC drive loss, output short-circuit protection and self-recovery.

Product List

Certificate	Part No.	Input Voltage (VDC)		Output Voltage/ Current (Vo/Io)		Input Current (mA) @Rated voltage		Max Capacitive load uF	Ripple & Noise ^① (20MHz) Max/Typ mVp-p	Efficiency (%) @full load, input rated voltage	
		Rated	Range	Vo (VDC)	Io(mA) Max/Min	Full Load (Typ.)	No-load (Typ.)			Min	Typ
-	QA2401C-2004R3L	24	21.6 - 26.4	+20/-4.0	+100/-100	120	10	1000	150/100	79	83

Note: ① The ripple & noise tested by the twisted pair method.

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

Input Specifications

Item	Operating conditions	Min.	Typ.	Max.	Unit
Input inrush voltage (1sec. max.)	24Vdc Input	-0.7	--	30	Vdc
Input filter	Capacitive filter				
Hot Plug	Unavailable				

Output Specifications

Item	Operating conditions		Min.	Typ.	Max.	Unit
QA2401C-2004R3L	+Vo	Vin=24Vdc, Pin6 & Pin7 +Io= +100mA	18.57	19.55	20.52	VDC
	-Vo	Vin=24Vdc, Pin5 & Pin6 -Io= -100mA	-3.88	-4.09	-4.30	
Output Voltage Accuracy	Please refer to the output voltage deviation 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	%
		Positive output	--	±1.2	±1.5	
Temperature Drift Coefficient	100% Load		--	--	±0.03	%/°C
Output Short Circuit Protection	Continuous, self-recovery					

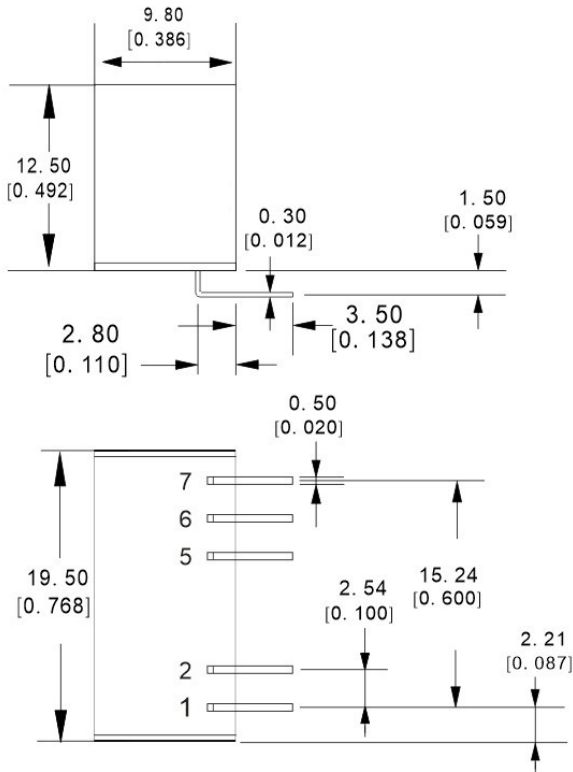
General Specifications

Items	Conditions	Min.	Typ.	Max.	Unit
Switching Frequency	Rated input voltage full load	--	240	--	KHz
Operating Temperature	Please refer to the temperature derating curve (Figure 2)	-40	--	+105	°C
Storage Temperature		-55	--	+125	
Case temperature rise	Operating at Ta =25°C	--	25	--	
Pin Soldering Temperature	1.5mm from the case, 10S	--	--	300	
Relative humidity	No condensation	5	--	95	%RH
Isolation Voltage	Input-Output, test 1min, leakage current<0.5mA	4200	--	--	Vac
		6000	--	--	Vdc
Insulation Resistance	Input-Output, @ 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	Plastic in Black, flame class UL94 V-0				
Product Weight	3.7g (Typ.)				
Cooling Method	Natural air				
Packing	Tube(525*18*10mm)	25PCS			
	Carton(542*110*155mm)	1400PCS (Total 80 Tubes)			
Package Size	L x W x H	19.50x12.5x9.80 mm		0.768x0.492x0.386 inch	

EMC Performance

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

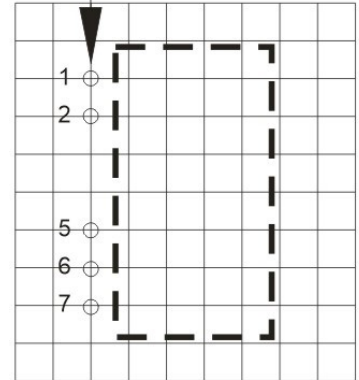
Packaging Dimensions



Dimensions

Φ 1.00 [Φ0.039]

Dual output



Note:

Unit: mm[inch]

Grid: 2.54X2.54[0.10x0.10]

Pin section tolerance:±0.1[±0.004]

General tolerance: ±0.5[±0.020]

Recommended PCB layout

Pin Definition

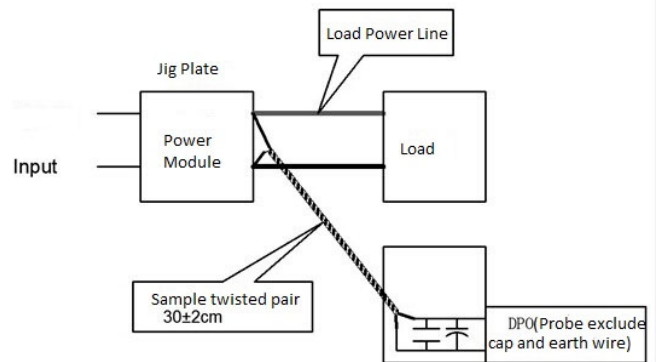
Pin No.	1	2	3,4	5	6	7
Dual (D)	+Vin	GND	(No pin)	-Vo	0V	+Vo

Note: Please take the pin definition on the product label as the right one if there is any difference between the data sheet and the one printed on the product label.

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

1) Ripple noise test need 12# twisted pair cables, an oscilloscope which bandwidth should be set to 20MHz, 0.1uF polypropylene capacitor and 10uF high-frequency low-resistance electrolytic capacitor are connected in parallel with the probes (100M bandwidth). The oscilloscope should be set at the Sample Mode.

2) The output ripple noise test diagram is shown on the right. 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 twisted pair (length 30cm±2 cm) should be connected in parallel with the load, the location is as close as possible to the output pins or terminals. The test can be started after input power on.



Product Performance Curve

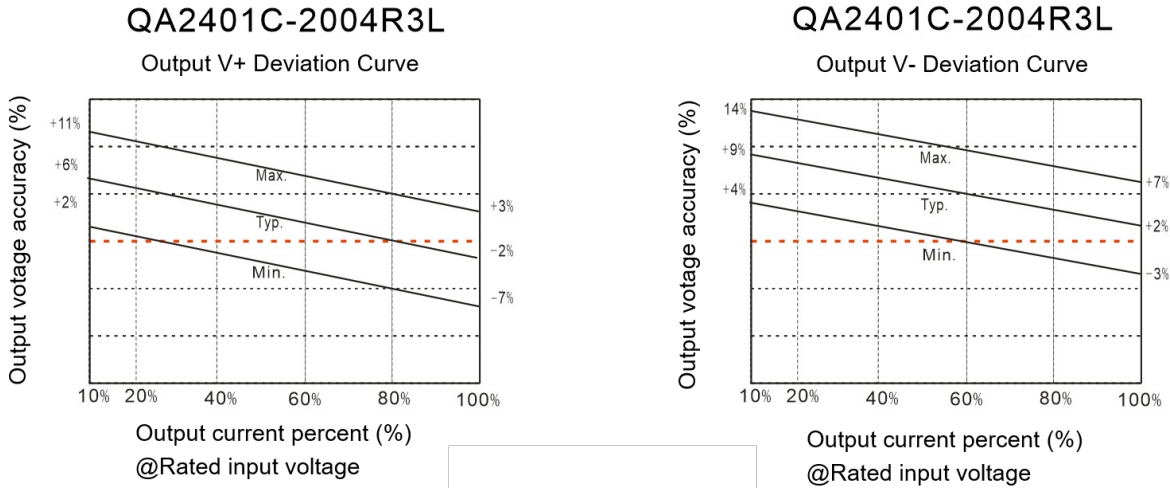


Figure 1

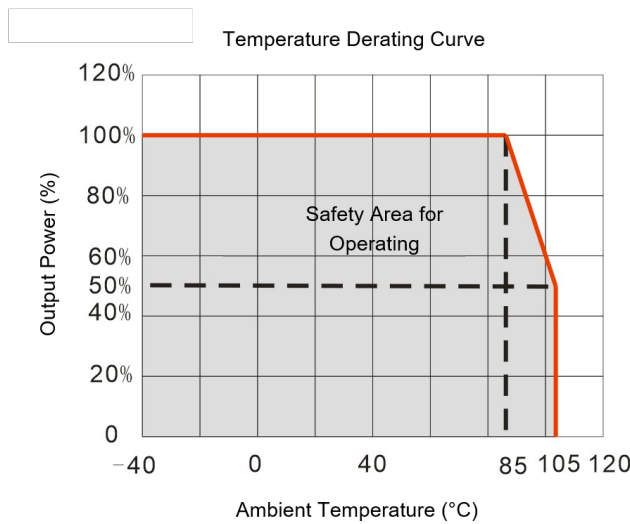
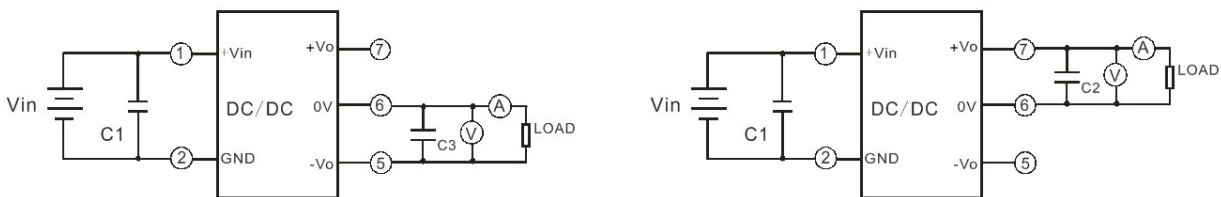


Figure 2

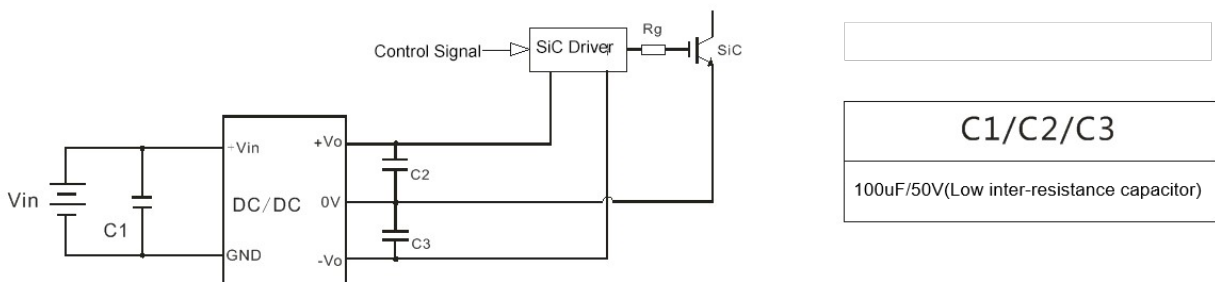
Recommended Circuits for Application

1. Typical Test circuit

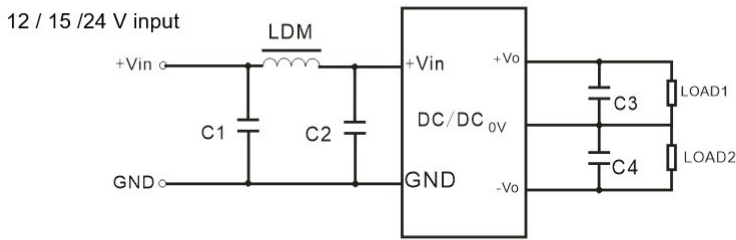


C1/C2/C3 100μF/50V (Low internal resistance capacitor)

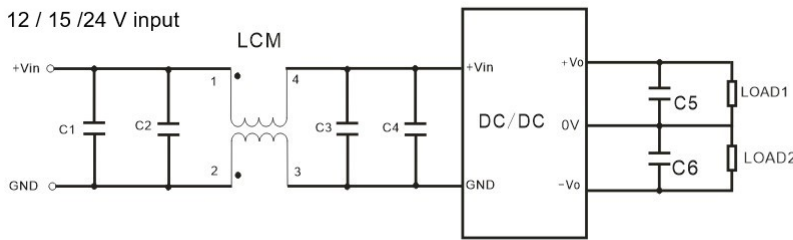
2. Typical application circuit



3. Recommended EMC Circuit



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



Input Voltage		12/15/24VDC
EMI	C1/C2	4.7 μF/50V
	C3/C4	1 μF/50V
	C5/C6	100 μF/30V
	LCM	22 μH CMC

Application Notice:

1. This product cannot be used in parallel and does not support hot plugging.
2. The connecting lead wire between the module converter and the SiC driver should be as short as possible.
3. The output filter (low inter-resistance electrolytic capacitor) should be close to the module converter and the SiC driver.
4. The SiC drive average output power must be less than the rated power of the module converter.
5. It is recommended to use ceramic capacitors or electrolytic capacitors at the input or output. Tantalum capacitor should not be used to avoid the risk of failure.
6. The product performance in this manual cannot be guaranteed if it works at a lower load than the minimum load defined.
7. All values or indicators in this manual had been tested based on Aipupower test specifications.

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