RHENXV
Your Vision, Our Solutions

DC-DC CONVERTERS

DCQA_-xx Series

CE Report RoHS 3 YEARS WARRANTY

FEATURES

- Wide operating temperature range：-40°C to +105°C
- Up to 87% efficiency
- No load current as low as 5mA
- Isolation voltage 3.5KVAC/6KVDC
- Sustainable short-circuit protection
- 3 Years Warranty

DESCRIPTION

IGBT/SiC MOSFET driver specific DC/DC module power supply, constant voltage input, isolated, non regulated, positive and negative dual output, SIP packaging.

MODEL NUMBERING

DCQAxx-xx-xx

- Series
- Input Voltage
- Output Voltage
- Power

SELECTION GUIDE

Product Model	Input Voltage Standard Value (range)	Input current (mA, Typ.) Full load/No load	Output Voltage	Output Current (mA) (Max./Min.)	Efficiency % (Min./Typ.)	Maximum Capacitive load (μF)
DCQA05-3-1509	5VDC (4.5-5.5)	382/62	+15/-8.7	+80/-40	75/82	1000
DCQA12-1-1508	12VDC (10.8-13.2)	280/40	+15/-8.0	+120/-120	75/81	1000
DCQA12-04-1508		223/20	+15/-8.0	+100/-80	75/80	220
DCQA12-02-1508		162/20	+15/-8.7	+80/-40	75/80	220
DCQA12-3-1509		242/8	+15/-9.0	+100/-100	75/88	2200

Product Model	Input Voltage Standard Value (range)	Input current (mA, Typ.) Full load/No load	Output Voltage	Output Current (mA) (Max./Min.)	Efficiency % (Min./Typ.)	Maximum Capacitive load (μF)
DCQA15-01-09	15VDC (13.5-16.5)	84/20	+9.0/--	+111/--	76/81	220
DCQA15-01-A09		84/20	+9.0/-9.0	+55/-55	76/81	220
DCQA15-1-1502		193/17	+15/-2.5	+100/-100	75/80	220
DCQA15-1M		162/15	+15/-5.0	+100/-100	75/81	220
DCQA15-1		230/35	+15/-8.0	+120/-120	76/81	1000
DCQA15-01		130/20	+15/-8.7	+80/-40	76/81	220
DCQA15-3-1509		195/8	+15/-9.0	+100/-100	75/88	2200
DCQA15-01-17		143/20	+17/-8.7	+80/-40	76/81	220
DCQA24-1-1508	24VDC (21.6-26.4)	144/30	+15/-8.0	+120/-120	76/81	1000
DCQA24-03		81/20	+15/-8.7	+80/-40	75/80	220
DCQA24-3-1509		135/8	+15/-9.0	+100/-100	75/83	2200

INPUT CHARACTERISTICS

Parameter	Conditions	Min.	Typ.	Max.	Units
Input current (No-load)	Nominal voltage input@48VDC	- -	5	20	mA
Reflected ripple current		3	15	20	mA
Input impulse voltage	1sec. max.	-0.7	- -	16	VDC
		-0.7	- -	13	VDC
		-0.7	- -	26	VDC
		-0.7	- -	15	VDC
Input filter	Capacitive filtering				

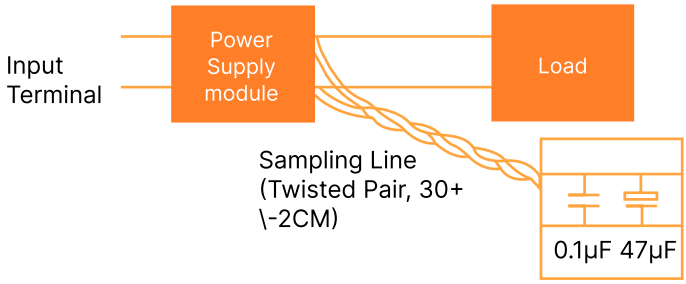
Remarks: This product does not support hot plug

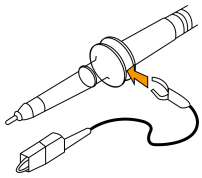
OUTPUT CHARACTERISTICS

Parameter	Conditions		Min.	Typ.	Max.	Units
Output voltage accuracy	See Figure 3 (envelope curve)					
Linear regulation rate	Input voltage variation+/- 1%		- -	+/-1.2	+/-1.5	
Load regulation rate	10% to 100% load	-Vo	- -	8	12	%
		+Vo	- -	10	20	%

Parameter	Conditions	Min.	Typ.	Max.	Units
Ripple & Noise	20MHz bandwidth	- -	50	120	mVp-p
Dynamic response step deviation		- -	+/-3	+/-5	%
Temperature drift coeicient	100% load	- -	+/-0.03	- -	%/°C
Short circuit protection	Sustainable, Self-healing				

Note: The testing method for ripple and noise is the parallel line testing method.





GENERAL CHARACTERISTICS

Parameter	Conditions		Min.	Typ.	Max.	Units
Isolation voltage	Input-output, Test time 1 minute, Leakage current less than 1 mA	IGBT driver	3000	- -	- -	VAC
		SiC MOSFET driver	3500	- -	- -	VAC
			6000	- -	- -	VDC
Insulation resistance	Input-output, Insulation voltage 500VDC		1000	- -	- -	MΩ
Isolation capacitance	Input-output, 100KHz/0.1V		- -	3	30	pF
Working temperature	Temperature≥ 85°Cforderating(SeeFigure4)		-40	--	+105	°C
Storage temperature			-55	--	+125	°C
Storage humidity	Non condensing		--	--	95	%RH
Housing temperature rise during operation	Ta=25°C,Nominalinput,Fulloutput		--	15	25	°C
Soldering temperature resistance of pins	The distance from the welding spot to the shell is 1.5mm, 10 seconds		--	--	300	°C
	RE FLOW:Peak temperature Tc≤245°C, maximum time above 217°C for 60 seconds.		--	--	245	°C
Switchingfrequency	Full load, Nominal input voltage		--	270	--	kHz
Meantimebetween failures【MTBF】	MIL-HDBK-217F@25°C		3500	--	--	kHours

PHYSICAL CHARACTERISTICS

Parameter	Contents
Housing material	Black lame retardant and heat-resistant plastic (UL94V-0)
Overall dimensions	19.50 × 9.80 × 12.50mm
Weight	4.2g(Typ.)
Cooling mode	Natural air cooling

EMC CHARACTERISTICS

Parameter	Category	Content
EMI	Conductive disturbance	CISPR32/EN55032 CLASS B（The recommended circuit is shown in Figure 2）
	Radiation disturbance	CISPR32/EN55032 CLASS B (The recommended circuit is shown in Figure 2)
EMS	Electrostatic discharge	IEC/EN61000-4-2 Contact ±4KV perf. Criteria B

CIRCUIT DESIGN AND APPLICATION

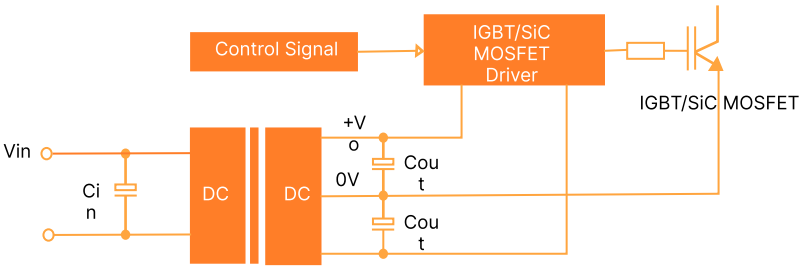


Figure 1: Application circuit

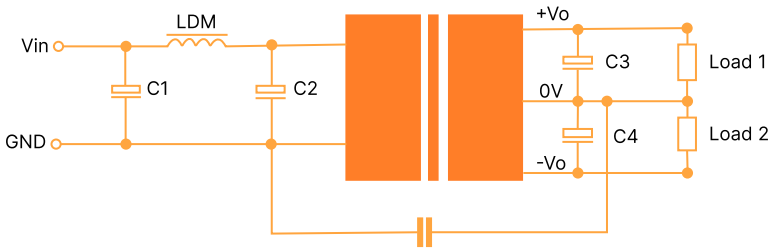


Figure 2: EMC Typical Recommended Circuits

Table 1:
Recommended Capacitive Load Values

Vin(VDC)	Cin(μF)	Vo(VDC)	Cout(μF)
Nominal voltage	1-10	Nominal voltage	2.2-22

Table 2: Recommended Circuit Parameter Values

Category	Component	Value
EMI	C1	4.7μF /50V
	C2	4.7μF /50V
	C3,C4	2.2-22μF /50V
	CY	270pF/2kV
	LDM	6.8μH

1. Typical application: If further reduction of input and output ripple is required, a capacitor Filter network can be connected at the input and output ends. The application circuit is shown in Figure 1. However, suitable Filter capacitors should be selected. If the capacitance is too large, it may cause overcurrent or poor startup of the power supply. For each output, while ensuring safe and reliable operation, the recommended capacitance load values are shown in Table 1.

2. EMC requirements: For situations with high EMC requirements, a typical EMC recommended circuit is shown in Figure 2.

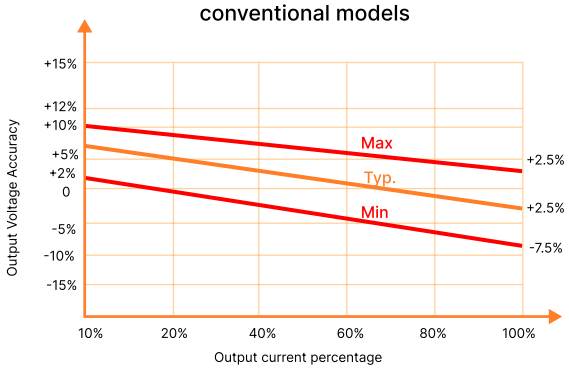
3. Input requirements: Ensure that the Fluctuation range of the input voltage does not exceed the upper and lower limits of the input voltage Specified in this data sheet, and the input power must be greater than the output power Specified in this data sheet. For situations with a 24V input voltage, it is recommended to connect a TVS tube between the positive and negative input pins for protection (recommended parameters for TVS tubes: 30V, bidirectional, SOD-123 packaging).

4. Output load requirements: Try to avoid using it without load as much as possible; When the actual power of the load is less than 10% of the rated output power in this data sheet, or when it needs to be used in no-load situations, it is recommended to connect a load resistor externally at the output end. The load resistor can be calculated according to 5-10% of the rated power in this data sheet. The calculation formula for the load resistor value is RL=Vout²/(Pout*10%).

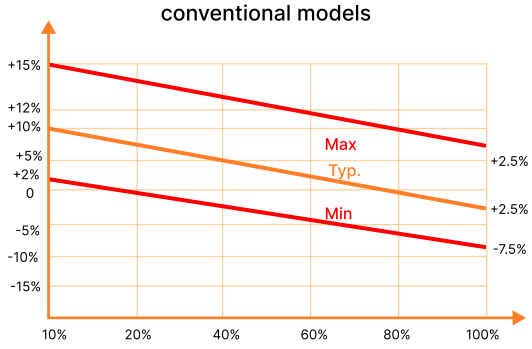
5. Overload protection: Under normal working conditions, the output circuit of this product has no protection function for overload situations. The simplest method is to connect a self recovery fuse in series at the input end, or add a circuit breaker outside the circuit; Or during design and selection, the actual power of the circuit should be around 60-80% of the rated power in this data sheet.

PRODUCT CHARACTERISTIC CURVE

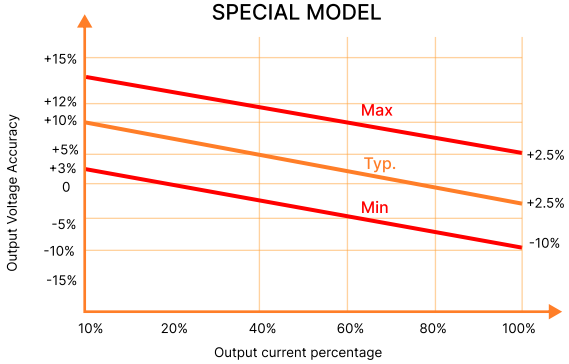
+Vo voltage tolerance envelope
conventional models



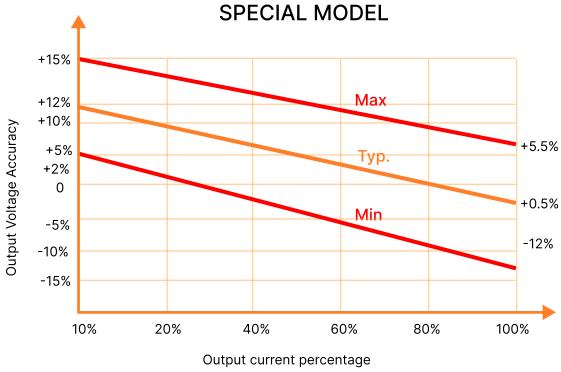
-Vo voltage tolerance envelope
conventional models

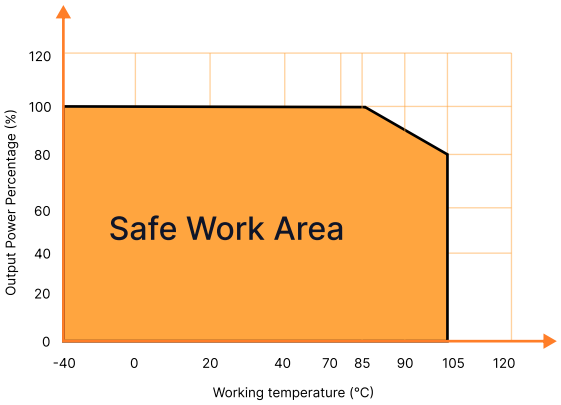


+Vo voltage tolerance envelope
SPECIAL MODEL



-Vo voltage tolerance envelope
SPECIAL MODEL





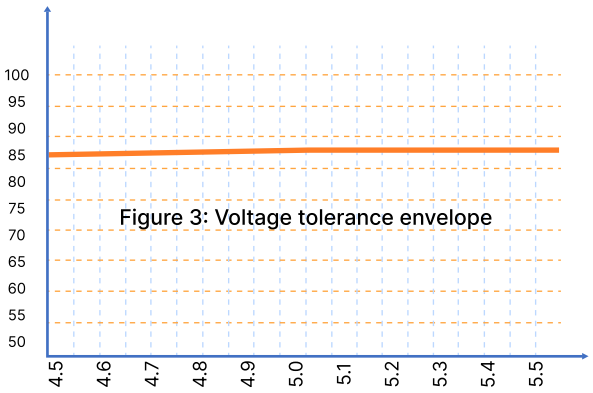


Figure 6: Efficiency Vs Input Voltage (100% Load)

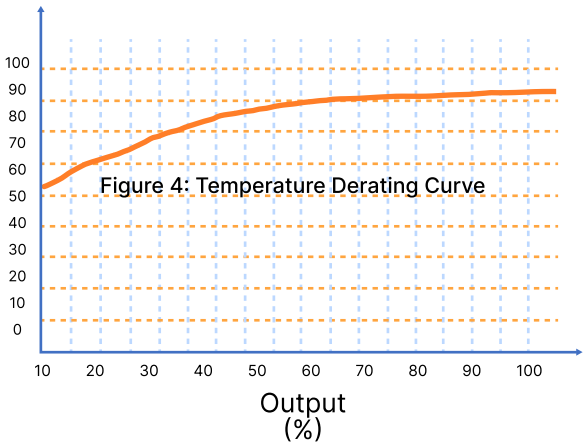
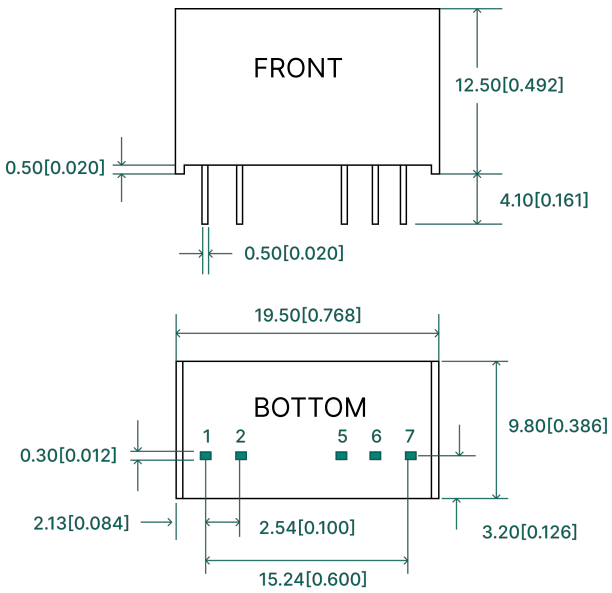
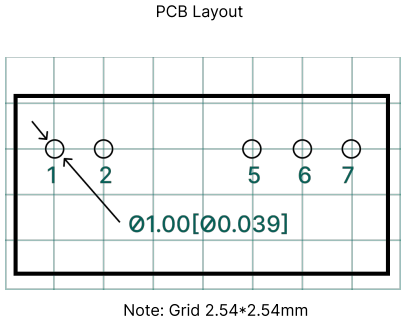


Figure 5: Efficiency Vs Output Load (Nominal Voltage Input)

OVERALL DIMENSIONS AND PIN FUNCTIONS



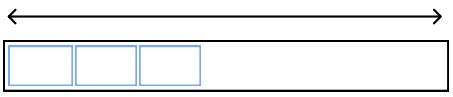


Unit: mm[inch]
Pin diameter tolerances: ±0.10
General tolerances: ±0.50

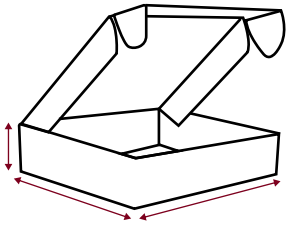
Table 3: Pin Function Table

Pin	Function
1	Vin
2	GND
5	-Vo
6	0V
7	+Vo

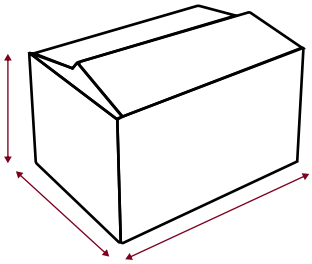
PACKAGING METHOD



18 Pieces/Tube



486 Pieces/Inner box



2430 Pieces/Outer box

NOTES & INSTRUCTIONS

1.The input voltage shall not exceed the specified range value, otherwise permanent and unrecoverable damage maybe caused;

2. Unless otherwise specified,the parameters in this manual are measured at 25 °C,40%~75% humidity, input nominal voltage and output pure resistance mode under full load;

3.All index test methods are based on the company's enterprise standards.

4.The copyright and the final interpretation right of the product belong to RHENXV.