

DCQA_(C)-xx Series



CE Report

RoHS



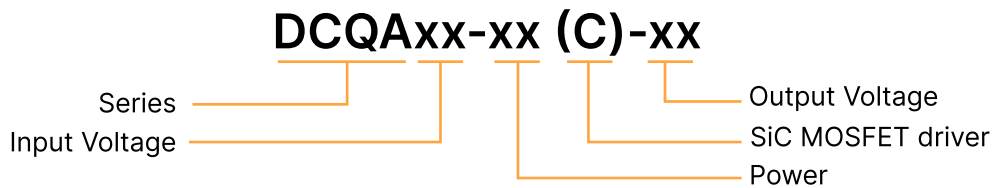
FEATURES

- 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



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) |
|----------------|--------------------------------------|--------------------------------------------|----------------|---------------------------------|--------------------------|------------------------------|
| DCQA05-1C-2005 | 5VDC (4.5-5.5) | 456/53 | +20/-5.0 | +80/-40 | 75/79 | 100 |
| DCQA05-3C-1505 | | 343/20 | +15/-5.0 | +80/-40 | 76/83 | 1000 |
| DCQA05-3C-1803 | | 415/20 | +18/-3.0 | +80/-40 | 76/83 | 680 |
| DCQA05-3C-2004 | | 407/18 | +20/-4.0 | +80/-40 | 76/83 | 470 |

DC-DC CONVERTERS

| 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) |
|-----------------|--------------------------------------|--------------------------------------------|----------------|---------------------------------|--------------------------|------------------------------|
| DCQA12-3C-1502 | 12VDC (10.8-13.2) | 167/8 | +15/-2.5 | +100/-100 | 75/88 | 2200 |
| DCQA12-1C2 | | 210/15 | +15/-3.5 | +111/-111 | 75/81 | 220 |
| DCQA12-3C-1504 | | 215/8 | +15/-4.0 | +120/-120 | 75/88 | 2200 |
| DCQA12-3C-1803 | | 200/8 | +18/-3.0 | +100/-100 | 75/88 | 2200 |
| DCQA12-01C-20 | | 240/20 | +20/-4.0 | +100/-100 | 75/80 | 220 |
| DCQA12-1C-20 | | 260/20 | +20/-5.0 | +100/-100 | 75/80 | 220 |
| DCQA12-3C-2005 | | 213/14 | +20/-5.0 | +90/-90 | 75/88 | 1000 |
| DCQA15-1C | 15VDC (13.5-16.5) | 151/15 | +15/-4.0 | +100/-100 | 75/82 | 220 |
| DCQA15-3C-1504 | | 171/8 | +15/-4.0 | +120/-120 | 75/88 | 2200 |
| DCQA15-01C-18 | | 177/16 | +18/-3.0 | +100/-100 | 75/80 | 220 |
| DCQA15-3C-1803 | | 167/14 | +18/-3.0 | +100/-100 | 75/88 | 1000 |
| DCQA15-01C-2004 | | 193/16 | +20/-4.0 | +100/-100 | 75/80 | 220 |
| DCQA15-01C-2005 | | 150/20 | +20/-5.0 | +80/-40 | 73/76 | 220 |
| DCQA15-3C-2005 | | 167/8 | +20/-5.0 | +90/-90 | 75/88 | 2200 |
| DCQA24-3C-1504 | 24VDC (21.6-26.4) | 131/10 | +15/-4.0 | +120/-120 | 75/88 | 2200 |
| DCQA24-3C-1803 | | 112/14 | +18/-3.0 | +100/-100 | 75/88 | 1000 |
| DCQA24-01C-20 | | 125/13 | +20/-4.0 | +100/-100 | 75/80 | 220 |
| DCQA24-3C-2005 | | 129/11 | +20/-5.0 | +90/-90 | 75/82 | 2200 |

INPUT CHARACTERISTICS

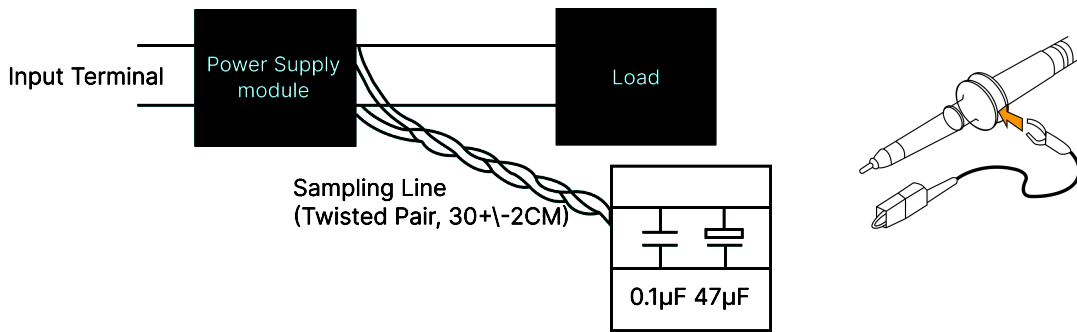
| Parameter | Conditions | Min. | Typ. | Max. | Units |
|--------------------------|-----------------------------|------|------|------|-------|
| Input current (No-load) | Nominal voltage input@48VDC | -- | 5 | 20 | mA |
| Reflected ripple current | | 3 | 15 | 20 | mA |
| Input impulse voltage | 1sec. 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 |
| Ripple & Noise | 20MHz bandwidth | -- | 50 | 120 | mVp-p |
| Dynamic response step deviation | | -- | +/-3 | +/-5 | % |
| Temperature drift coefficient | 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°C for derating (See Figure 4) | -40 | -- | +105 | °C | |
| Storage temperature | | -55 | -- | +125 | °C | |

GENERAL CHARACTERISTICS

| Parameter | Conditions | Min. | Typ. | Max. | Units |
|-------------------------------------------|-----------------------------------------------------------------------------|------|------|------|--------|
| 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

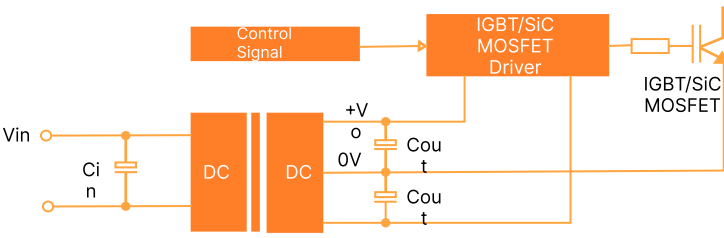


Figure 1: Application circuit

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 |

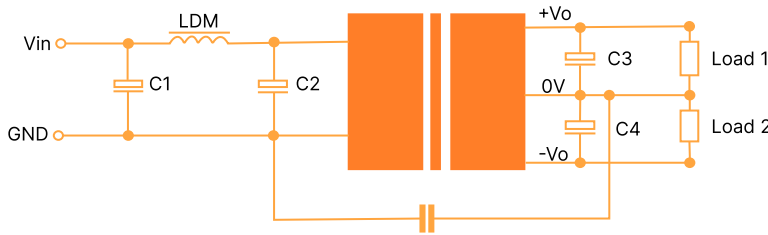


Figure 2: EMC Typical Recommended Circuits

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 $R_L = V_{out}^2 / (P_{out} * 10\%)$.
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

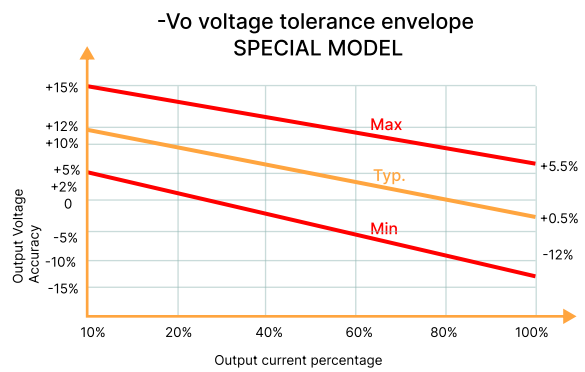
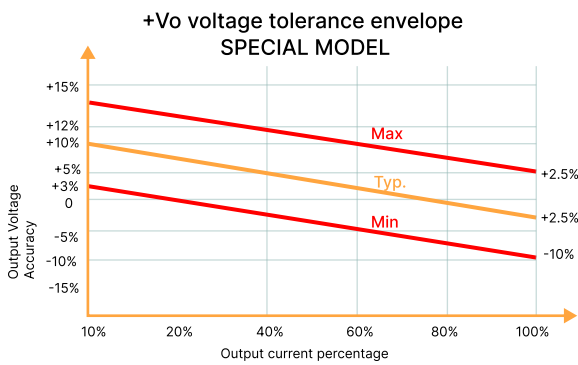
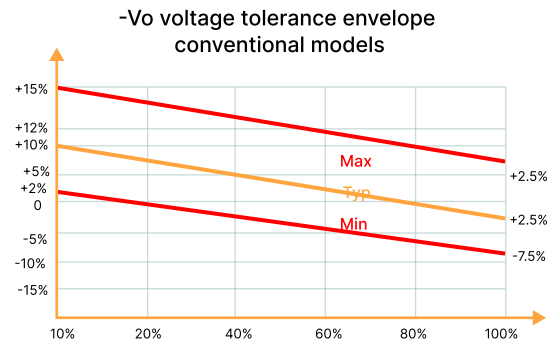
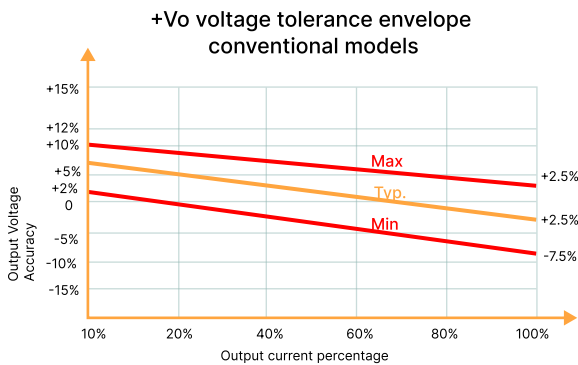


Figure 6: Efficiency Vs Input Voltage (100% Load)

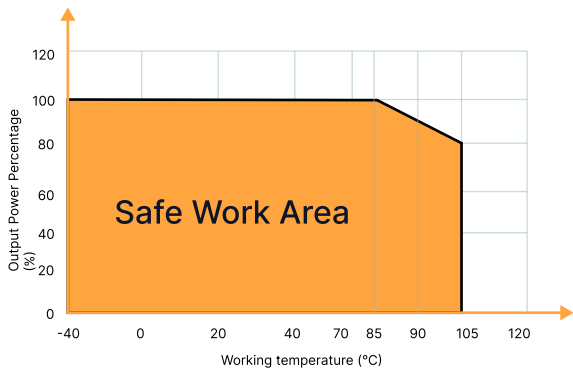
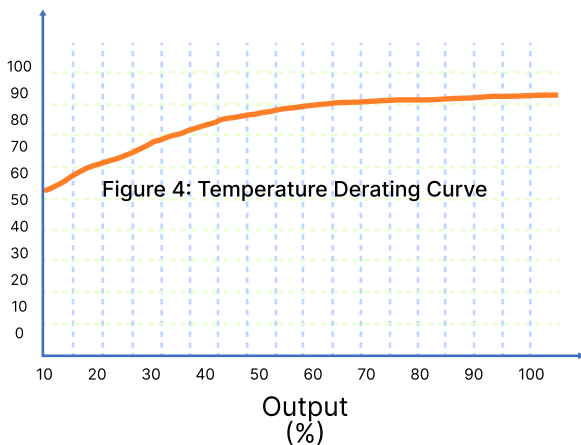
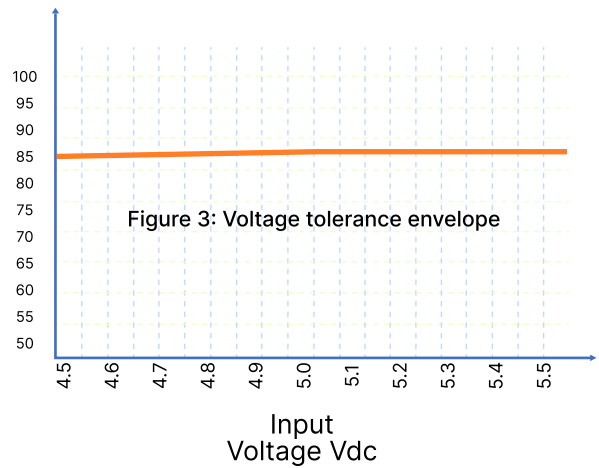
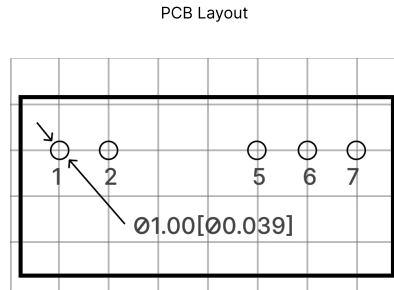
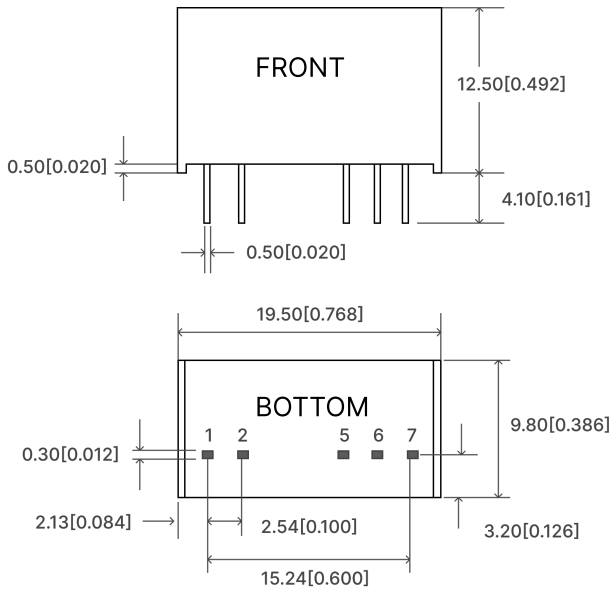


Figure 5: Efficiency Vs Output Load (Nominal Voltage Input)



OVERALL DIMENSIONS AND PIN FUNCTIONS

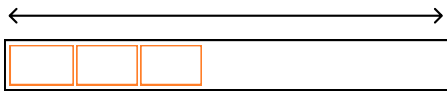


Unit: mm[inch]
Pin diameter tolerances: ± 0.10
General tolerances: ± 0.50

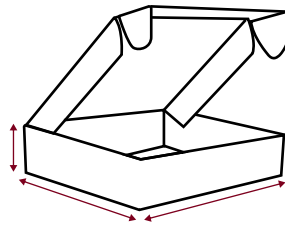
Table 3: Pin Function Table

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

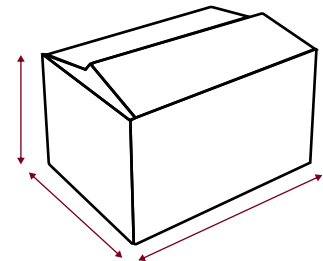
PACKAGING METHOD



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.