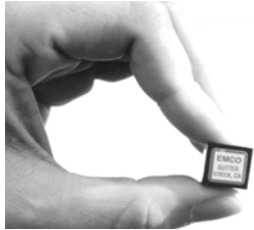


Ultra-Miniature DC to HV DC Converters



0 to + or -100 through 0 to + or - 10,000 VDC @ 0.5 Watts
Q Series



0.125 in³
Up to 5KV

DESCRIPTION

The Q Series is a broad line of ultra-miniature, DC to HV DC converters supplying up to 5,000 volts in 0.125 cubic inches and up to 10,000 volts in 0.614 cubic inches. These component-sized converters are ideal for applications requiring minimal size and weight. The output is directly proportional to the input voltage and is linear from approximately 0.7V input to maximum input voltage, allowing for a controllable output voltage. Isolation is < +/- 500V bias on output RTN and output power is 0.5 watts. No external components or minimum load are required. The output ripple is extremely low for this package size, as low as 0.05% (typical) and can be further reduced with the addition of an external capacitor. Light weight, low power consumption and wide temperature range make these units ideal for portable, battery-powered equipment. Application notes are available on this series. Technical assistance is readily available. **Typical delivery for low quantities: stock to one week. Larger quantities contact factory**

FEATURES

- Ultra-Miniature Case Size
- No External Components Required
- Low Ripple and EMI/RFI
- Proportional Input/Output
- Input/Output Isolation
- Short Circuit Protection, *short duration up to 1 min.*
- Proven Reliability
- Low Leakage Current
- MTBF: >3 million hrs per Bellcore TR-332

OPTIONS

- External Copper Shield (Add "S" to model #ie: Q10-5S)
- RoHS(- 'R' suffix denotes the product is designed to meet RoHS requirements i.e Q01-5R)
- Alternate Input/Output configurations: *contact factory*
- Epoxy: A. Low Outgassing (NASA approved per ASTM E-595-93)
 B. UL 94 V0 flammability rating
- Extended Operating Temp: (Q01-Q20) -55° to +75°C

WINNER!

- 2001 UC Davis Connect Most Innovative New Product Award
- 1999 Electronic Products Product of the Year Award
- 1998 EE Product News Runner up – Product of the Year Award

APPLICATIONS

- Avanche Photodiodes
- Photomultiplier Tubes
- Light Sources
- Piezo Devices
- Sustaining Ion Pumps
- Electrophoresis
- Printers
- Igniters
- Capacitor Charging
- Solid State Detectors

| MODEL | INPUT VOLTAGE | OUTPUT ² VOLTAGE | OUTPUT ¹ CURRENT | RIPPLE P-P | INPUT CURRENT | | INTERNAL OSCILLATOR FREQUENCY (TYPICAL) | CASE |
|---------|---------------|-----------------------------|-----------------------------|------------|----------------------|-----------|---|------|
| | | | | | NO LOAD ¹ | FULL LOAD | | |
| Q01-5 | 0 to 5V | 0 to +/-100V | 5 mA | <1.00% | <50mA | <175mA | 100-200kHz | A |
| Q01-12 | 0 to 12V | 0 to +/-100V | 5 mA | <1.00% | <20mA | <100mA | 100-200kHz | A |
| Q01-24 | 0 to 24V | 0 to +/-100V | 5 mA | <1.00% | <10mA | <50mA | 100-200kHz | A |
| Q02-5 | 0 to 5V | 0 to +/-200V | 2.5 mA | <0.25% | <50mA | <175mA | 200-350kHz | A |
| Q02-12 | 0 to 12V | 0 to +/-200V | 2.5 mA | <0.25% | <20mA | <75mA | 200-350kHz | A |
| Q02-24 | 0 to 24V | 0 to +/-200V | 2.5 mA | <0.25% | <10mA | <50mA | 200-350kHz | A |
| Q03-5 | 0 to 5V | 0 to +/-300V | 1.6 mA | <0.25% | <50mA | <175mA | 125-300kHz | A |
| Q03-12 | 0 to 12V | 0 to +/-300V | 1.6 mA | <0.25% | <20mA | <100mA | 125-300kHz | A |
| Q03-24 | 0 to 24V | 0 to +/-300V | 1.6 mA | <0.10% | <10mA | <50mA | 125-300kHz | A |
| Q04-5 | 0 to 5V | 0 to +/-400V | 1.25 mA | <0.05% | <50mA | <175mA | 200-350kHz | A |
| Q04-12 | 0 to 12V | 0 to +/-400V | 1.25 mA | <0.05% | <20mA | <100mA | 200-350kHz | A |
| Q04-24 | 0 to 24V | 0 to +/-400V | 1.25 mA | <0.05% | <10mA | <50mA | 200-350kHz | A |
| Q05-5 | 0 to 5V | 0 to +/-500V | 1 mA | <0.10% | <50mA | <200mA | 175-350kHz | A |
| Q05-12 | 0 to 12V | 0 to +/-500V | 1 mA | <0.05% | <20mA | <100mA | 175-350kHz | A |
| Q05-24 | 0 to 24V | 0 to +/-500V | 1 mA | <0.125% | <10mA | <50mA | 200-350kHz | A |
| Q06-5 | 0 to 5V | 0 to +/-600V | 0.8 mA | <0.10% | <50mA | <200mA | 150-275kHz | A |
| Q06-12 | 0 to 12V | 0 to +/-600V | 0.8 mA | <0.10% | <20mA | <100mA | 175-350kHz | A |
| Q06-24 | 0 to 24V | 0 to +/-600V | 0.8 mA | <0.10% | <10mA | <50mA | 150-275kHz | A |
| Q07-5 | 0 to 5V | 0 to +/-700V | 0.7 mA | <0.10% | <50mA | <175mA | 150-275kHz | A |
| Q07-12 | 0 to 12V | 0 to +/-700V | 0.7 mA | <0.10% | <20mA | <100mA | 150-275kHz | A |
| Q07-24 | 0 to 24V | 0 to +/-700V | 0.7 mA | <0.25% | <10mA | <50mA | 75-175kHz | A |
| Q08-5 | 0 to 5V | 0 to +/-800V | 0.625 mA | <0.30% | <50mA | <175mA | 200-350kHz | A |
| Q08-12 | 0 to 12V | 0 to +/-800V | 0.625 mA | <0.30% | <20mA | <100mA | 100-200kHz | A |
| Q08-24 | 0 to 24V | 0 to +/-800V | 0.625 mA | <0.25% | <10mA | <50mA | 100-200kHz | A |
| Q09-5 | 0 to 5V | 0 to +/-900V | 0.555 mA | <0.30% | <50mA | <175mA | 125-300kHz | A |
| Q09-12 | 0 to 12V | 0 to +/-900V | 0.555 mA | <0.25% | <20mA | <100mA | 125-300kHz | A |
| Q09-24 | 0 to 24V | 0 to +/-900V | 0.555 mA | <0.30% | <10mA | <50mA | 125-300kHz | A |
| Q10-5 | 0 to 5V | 0 to 1,000V | 0.5 mA | <0.25% | <50mA | <175mA | 400-500kHz | A |
| Q10-12 | 0 to 12V | 0 to 1,000V | 0.5 mA | <0.25% | <20mA | <100mA | 125-300kHz | A |
| Q10-24 | 0 to 24V | 0 to 1,000V | 0.5 mA | <0.25% | <10mA | <50mA | 125-300kHz | A |
| Q10N-5 | 0 to 5V | 0 to -1,000V | 0.5 mA | <0.25% | <50mA | <175mA | 125-300kHz | A |
| Q10N-12 | 0 to 12V | 0 to -1,000V | 0.5 mA | <0.25% | <20mA | <100mA | 125-300kHz | A |
| Q10N-24 | 0 to 24V | 0 to -1,000V | 0.5 mA | <0.25% | <10mA | <50mA | 125-300kHz | A |
| Q12-5 | 0 to 5V | 0 to 1,200V | 0.4 mA | <0.25% | <50mA | <175mA | 150-250kHz | A |
| Q12N-5 | 0 to 5V | 0 to -1,200V | 0.4 mA | <0.25% | <50mA | <175mA | 150-250kHz | A |
| Q15-5 | 0 to 5V | 0 to 1,500V | 0.3 mA | <0.25% | <75mA | <175mA | 125-350kHz | A |
| Q15N-5 | 0 to 5V | 0 to -1,500V | 0.3 mA | <0.25% | <75mA | <200mA | 125-350kHz | A |
| Q20-5 | 0 to 5V | 0 to 2,000V | 0.25 mA | <0.25% | <100mA | <200mA | 150-350kHz | A |
| Q20N-5 | 0 to 5V | 0 to -2,000V | 0.25 mA | <0.25% | <100mA | <200mA | 150-350kHz | A |
| Q30-5 | 0 to 5V | 0 to 3,000V | 0.16mA | <0.50% | <100mA | <200mA | 100-225kHz | B |
| Q30N-5 | 0 to 5V | 0 to -3,000V | 0.16mA | <0.50% | <100mA | <200mA | 125-275kHz | B |
| Q40-5 | 0 to 5V | 0 to 4000V | 0.125mA | <0.50% | <175mA | <300mA | 125-275kHz | B |
| Q40N-5 | 0 to 5V | 0 to -4000V | 0.125mA | <0.50% | <175mA | <300mA | 125-275kHz | B |
| Q50-5 | 0 to 5V | 0 to 5000V | 0.100mA | <0.50% | <250mA | <400mA | 200-350kHz | B |
| Q50N-5 | 0 to 5V | 0 to -5000V | 0.100mA | <0.50% | <250mA | <400mA | 200-350kHz | B |
| Q60-5 | 0 to 5V | 0 to 6000V | 83µA | <1.00% | <175mA | <250mA | 50-100kHz | C |
| Q60N-5 | 0 to 5V | 0 to -6000V | 83µA | <1.00% | <175mA | <250mA | 50-100kHz | C |
| Q80-5 | 0 to 5V | 0 to 8000V | 62.5µA | <1.00% | <175mA | <250mA | 50-100kHz | C |
| Q80N-5 | 0 to 5V | 0 to -8000V | 62.5µA | <1.00% | <175mA | <250mA | 50-100kHz | C |
| Q101-5 | 0 to 5V | 0 to 10,000V | 50µA | <1.00% | <175mA | <250mA | 50-75kHz | C |
| Q101N-5 | 0 to 5V | 0 to -10,000V | 50µA | <1.00% | <175mA | <250mA | 50-75kHz | C |

*Note: 1. At Maximum Rated Output Voltage.
 2. Output Voltage is load dependent. Under light or no load conditions, reduce input voltage so maximum rated output voltage is not exceeded.
 3. Specifications after 30 minute warm-up, full load, at 25°C unless otherwise noted.

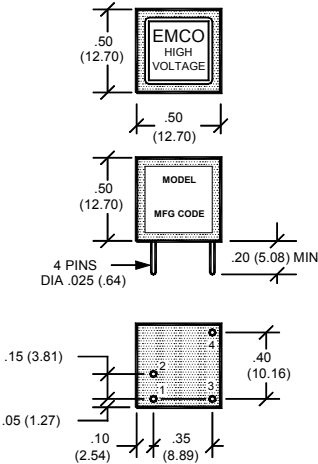
4752BN

Ultra-Miniature DC to HV DC Converters

0 to + or -100 through 0 to + or - 10,000 VDC @ 0.5 Watts
Q Series



CASE A Q01 to Q20



BOTTOM VIEW

Pin Diameter .025

PHYSICAL CHARACTERISTICS

SIZE: 0.5 x 0.5 x 0.5 (12.7 x 12.7 x 12.7)
WEIGHT: 0.15 Ounces Approx. (4.25 Grams)
PACKAGING: Fully Encapsulated
CASE MATERIAL: Glass-filled Epoxy
PINS: See Table

ELECTRICAL SPECIFICATIONS*1

INPUT VOLTAGE: Models Q01-Q10: 0 to 5, 12 or 24 VDC
Models Q12-Q50: 0 to 5 VDC
TYPICAL TURN-ON VOLTAGE: 0.7 Volts
OUTPUT VOLTAGE TOLERANCE: +5%, -10%
At full rated output voltage, full load, 25°C.
ISOLATION: < +/- 500V BIAS ON OUTPUT RTN (PIN 4)
OPERATING TEMP: -25° to +70° C (Q30 - Q50: -10° to +60° C)
OPTION: EXTENDED OPERATING TEMP (Q01-Q20) -55° to 75° C
STORAGE TEMP: -55° to +105° C

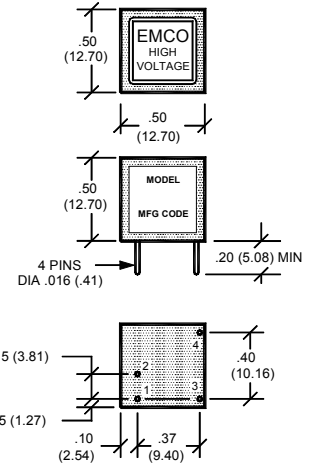
| Pin # | Function | Qxx | QxxN |
|-------|----------|-------|-------|
| 1 | Input | (-) | (-) |
| 2 | Input | (+) | (+) |
| 3 | Output | (+) | (-) |
| 4 | Output | (RTN) | (RTN) |

Dimensions are in inches
Dimensional Tolerances: ± .03 (.76mm)
(Metric Equivalents in Parenthesis)

*Notes:

- Specifications after 30 minute warm-up, full load, at 25°C unless other wise noted.
Post-wave solder installation recommended

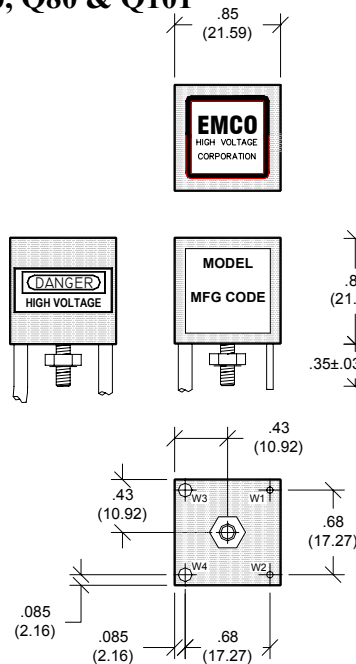
CASE B Q30 to Q50



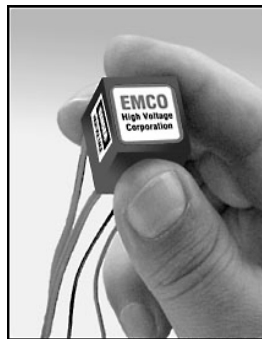
BOTTOM VIEW

Pin Diameter .016

CASE C Q60, Q80 & Q101



BOTTOM VIEW



PHYSICAL CHARACTERISTICS

SIZE: 0.85 x 0.85 x 0.85 (21.59 x 21.59 x 21.59)
WEIGHT: 1 Ounce (28.3 Grams)
PACKAGING: Fully Encapsulated
CASE MATERIAL: Glass-filled Epoxy

ELECTRICAL SPECIFICATIONS*1

INPUT VOLTAGE: 0 to 5 VDC
TYPICAL TURN-ON VOLTAGE: 0.7 Volts
OUTPUT VOLTAGE TOLERANCE: +5%, -10%
At full rated output voltage, full load, 25°C.
ISOLATION: < +/- 500V BIAS ON OUTPUT RTN (W4)
OPERATING TEMP: -10° to +60° C
STORAGE TEMP: -20° to +105° C
NOTE: Do not allow output voltage to exceed maximum rating.

| Wire # | Color | Function | Qxx | QxxN |
|--------|-------|----------|-------|-------|
| W1 | Red | Input | (+) | (+) |
| W2 | Black | Input | (-) | (-) |
| W3 | Brn | Output | (+) | (-) |
| W4 | Vio | Output | (RTN) | (RTN) |

Dimensions are in inches
Dimensional Tolerances: ± .03 (.76mm)
(Metric Equivalents in Parenthesis)

*Notes:

- Specifications after 30 minute warm-up, full load, at 25°C unless other wise noted.
Post-wave solder installation recommended