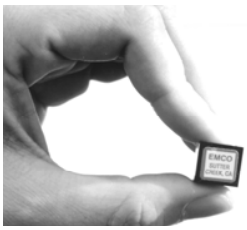
Ultra-Miniature DC to HV DC Converters

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

Q Series

EMCO HIGH VOLTAGE CORPORATION



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

Avalanche 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.

4752BN

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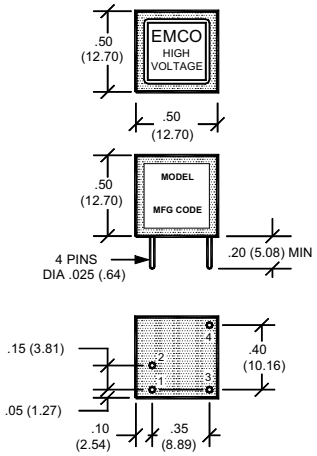
CASE A
Q01 to Q20



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*

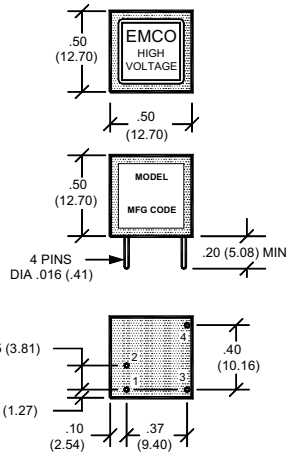
ELECTRICAL SPECIFICATIONS*[1]
INPUT VOLTAGE: Models Q01-Q10: 0 to 5, 12 or 24 VDC
Models Q12-Q50: 0 to 5 VDC
TYPICAL TURN-ON VOLTAGE: 0.7 Volts
OUTPUT VOLTAGE TOLERANCE: +5%, -10%
At full rated output voltage, full load, 25°C.
ISOLATION: < +/- 500V BIAS ON OUTPUT RTN (PIN 4)
OPERATING TEMP: -25° to +70° 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:
1. Specifications after 30 minute warm-up, full load, at 25°C unless other wise noted.
Post-wave solder installation recommended

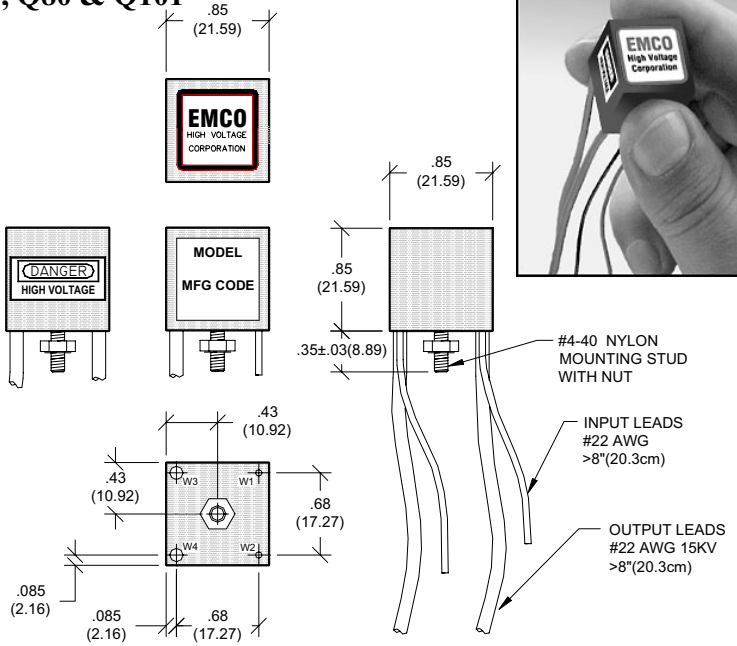
CASE B
Q30 to Q50



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)

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