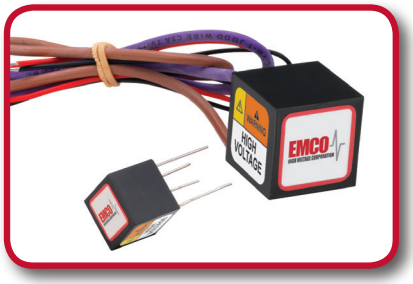
Proven Reliability

Q SERIES

ISOLATED, PROPORTIONAL DC TO HV DC CONVERTERS

100V to 10,000V @ 0.5 Watts

NOW UL RECOGNIZED



PRODUCT DESCRIPTION

The Q Series is a broad line of ultra-miniature, high reliability DC to HV DC converters supplying up to 5,000 volts in only 0.125 cubic inches and up to 10,000 volts in only 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 <0.7V input to maximum input voltage, allowing for an adjustable output voltage.

OPTIONS

Dual Output (Center Tap) option available (up to Q09)
External Copper Shield (S suffix))
Control Pin Option (Single output units, up to Q50) (C suffix)
Extended Operating Temperature (up to Q50) (T suffix)
Ordering Information (see Page 11)

APPLICATIONS

Avalanche Photodiodes
Photomultiplier Tubes
Light Sources
Piezo Devices
Sustaining Ion Pumps
Electrophoresis
Printers
Igniters
Capacitor Charging

FEATURES

Ultra-Miniature Case Size
Proven Reliability
No External Components Required
Low Ripple and EMI/RFI
Proportional Input/Output
Input/Output Isolation
Low Leakage Current <250nA
Low input/output coupling capacitance, <50 pF typical
MTBF: >3 million hrs. per Bellcore TR 332
Short circuit protection, 1 minute minimum
Control Pin can be used for ON/OFF control
RoHS Compliant
UL Recognized

PRODUCT OVERVIEW

OUTPUT VOLTAGE*2	MODELS
100 VDC	Q01
150 VDC	Q015
200 VDC	Q02
250 VDC	Q025
300 VDC	Q03
350 VDC	Q035
400 VDC	Q04
450 VDC	Q045
500 VDC	Q05
600 VDC	Q06
700 VDC	Q07
800 VDC	Q08
900 VDC	Q09
1,000 VDC	Q10
1,200 VDC	Q12
1,500 VDC	Q15
2,000 VDC	Q20
2,500 VDC	Q25
3,000 VDC	Q30
4,000 VDC	Q40
5,000 VDC	Q50
6,000 VDC	Q60
8,000 VDC	Q80
10,000 VDC	Q101

Complete List of Models on pages 2-5

ISO 9001:2008 CERTIFIED ISO 14001:2004 CERTIFIED RoHS COMPLIANT c UL us E139109 CE IPC Certified J-STD-001 Application Specialist

ELECTRICAL SPECIFICATIONS[*3] (100V - 900V)

OUTPUT VOLTAGE[*2]	MODEL[*6]	MAXIMUM OUTPUT CURRENT[*1]	RIPPLE P-P	OUTPUT VOLTAGE[*2]	MODEL[*6]	MAXIMUM OUTPUT CURRENT[*1]	RIPPLE P-P
REVERSIBLE: 0 TO (+) OR (-) Vout[*7]				DUAL OUTPUT (CENTER TAP): 0 TO (+) AND (-) Vout			
0 to 100VDC	Q01	5.000 mA	<1.000 %	0 to +/- 50 VDC	Q01CT	5.000 mA	<1.000 %
0 to 150VDC	Q015	3.333 mA	<0.500 %	0 to +/- 75 VDC	Q015CT	3.333 mA	<0.500 %
0 to 200VDC	Q02	2.500 mA	<0.250 %	0 to +/-100 VDC	Q02CT	2.500 mA	<0.250 %
0 to 250VDC	Q025	2.000 mA	<0.250 %	0 to +/-125 VDC	Q025CT	2.000 mA	<0.250 %
0 to 300VDC	Q03	1.667 mA	<0.250 %	0 to +/-150 VDC	Q03CT	1.667 mA	<0.250 %
0 to 350VDC	Q035	1.429 mA	<0.250 %	0 to +/-175 VDC	Q035CT	1.429 mA	<0.250 %
0 to 400VDC	Q04	1.250 mA	<0.100 %	0 to +/-200 VDC	Q04CT	1.250 mA	<0.100 %
0 to 450VDC	Q045	1.111 mA	<0.150 %	0 to +/-225 VDC	Q045CT	1.111 mA	<0.150 %
0 to 500VDC	Q05	1.000 mA	<0.150 %	0 to +/-250 VDC	Q05CT	1.000 mA	<0.150 %
0 to 600VDC	Q06	0.833 mA	<0.100 %	0 to +/-300 VDC	Q06CT	0.833 mA	<0.100 %
0 to 700VDC	Q07	0.714 mA	<0.250 %	0 to +/-350 VDC	Q07CT	0.714 mA	<0.250 %
0 to 800VDC	Q08	0.625 mA	<0.300 %	0 to +/-400 VDC	Q08CT	0.625 mA	<0.300 %
0 to 900VDC	Q09	0.556 mA	<0.250 %	0 to +/-450 VDC	Q09CT	0.556 mA	<0.250 %

PARAMETER	VALUE
INPUT VOLTAGE	0 to 5, 12, 15 or 24 VOLTS
TYPICAL TURN-ON VOLTAGE	<0.7 VOLTS
ISOLATION	< +/- 500 VDC BIAS ON OUTPUT RETURN (PIN4)
OUTPUT VOLTAGE TOLERANCE	+10%, -10% (AT 100% OUTPUT, FULL LOAD)
FREQUENCY	75-500KHZ (TYPICAL)
CONTROL PIN	0 to VIN (SEE PAGE 10 FOR DETAILS) (SINGLE OUTPUT UNITS ONLY)
STORAGE TEMPERATURE	-55 to +105°C
STANDARD OPERATING TEMPERATURE	-25 to +70°C[*4] (CASE)
EXTENDED OPERATING TEMPERATURE	-55 to +75°C[*4] (CASE)

	INPUT CURRENT	
VIN	NO-LOAD	FULL-LOAD
5 VDC	<100 mA	<250 mA
12 VDC	<40 mA	<100 mA
15 VDC	<32 mA	<80 mA
24 VDC	<20 mA	<50 mA

ELECTRICAL SPECIFICATIONS*3 (1,000V - 2,000V)

OUTPUT VOLTAGE*2	MODEL	MAXIMUM OUTPUT CURRENT*1	RIPPLE P-P
POSITIVE			
0 to +1000 VDC	Q10	0.500 mA	<0.250 %
0 to +1200 VDC	Q12	0.417 mA	<0.250 %
0 to +1500 VDC	Q15	0.333 mA	<0.250 %
0 to +2000 VDC	Q20	0.250 mA	<0.250 %
NEGATIVE			
0 to -1000 VDC	Q10N	0.500 mA	<0.250 %
0 to -1200 VDC	Q12N	0.417 mA	<0.250 %
0 to -1500 VDC	Q15N	0.333 mA	<0.250 %
0 to -2000 VDC	Q20N	0.250 mA	<0.250 %

PARAMETER	VALUE
INPUT VOLTAGE	0 to 5, 12, 15 or 24 VOLTS
TYPICAL TURN-ON VOLTAGE	<0.7 VOLTS
ISOLATION	< +/- 500 VDC BIAS ON OUTPUT RETURN (PIN4)
OUTPUT VOLTAGE TOLERANCE	+10%, -10% (AT 100% OUTPUT, FULL LOAD)
FREQUENCY	75-500KHZ (TYPICAL)
CONTROL PIN	0 to VIN (SEE PAGE 10 FOR DETAILS)
STORAGE TEMPERATURE	-55 to +105°C
STANDARD OPERATING TEMPERATURE	-25 to +70°C*4 (CASE)
EXTENDED OPERATING TEMPERATURE	-55 to +75°C*4 (CASE)

	INPUT CURRENT	
VIN	NO-LOAD	FULL-LOAD
5 VDC	<100 mA	<250 mA
12 VDC	<40 mA	<100 mA
15 VDC	<32 mA	<80 mA
24 VDC	<20 mA	<50 mA

ELECTRICAL SPECIFICATIONS*3 (2,500V - 5,000V)

OUTPUT VOLTAGE*2	MODEL	MAXIMUM OUTPUT CURRENT*1	RIPPLE P-P
		POSITIVE	
0 to +2,500 VDC	Q25	0.200 mA	<0.500 %
0 to +3,000 VDC	Q30	0.167mA	<0.500 %
0 to +4,000 VDC	Q40	0.125 mA	<0.500 %
0 to +5,000 VDC	Q50	0.100 mA	<0.500 %
		NEGATIVE	
0 to -2,500 VDC	Q25N	0.200 mA	<0.500 %
0 to -3,000 VDC	Q30N	0.167 mA	<0.500 %
0 to -4,000 VDC	Q40N	0.125 mA	<0.500 %
0 to -5,000 VDC	Q50N	0.100 mA	<0.500 %

PARAMETER	VALUE
INPUT VOLTAGE	0 to 5, 12, 15 or 24 VOLTS
	0 TO 5V (FOR MODELS OVER 3KV)
TYPICAL TURN-ON VOLTAGE	<0.7 VOLTS
ISOLATION	< +/- 500 VDC BIAS ON OUTPUT RETURN (PIN4)
OUTPUT VOLTAGE TOLERANCE	+10%, -10% (AT 100% OUTPUT, FULL LOAD)
FREQUENCY	75-500KHZ (TYPICAL)
CONTROL PIN	0 to VIN (SEE PAGE 10 FOR DETAILS)
STORAGE TEMPERATURE	-55 to +105°C
STANDARD OPERATING TEMPERATURE	-25 to +60°C*4 (CASE)
EXTENDED OPERATING TEMPERATURE	-55 to +70°C*4 (CASE)

	INPUT CURRENT	
VIN	NO-LOAD	FULL-LOAD
5 VDC	<250 mA	<400 mA
12 VDC	<100 mA	<250 mA
15 VDC	<75 mA	<125 mA
24 VDC	<35 mA	<75 mA

0 TO 5V ONLY (FOR MODELS OVER 3kV)

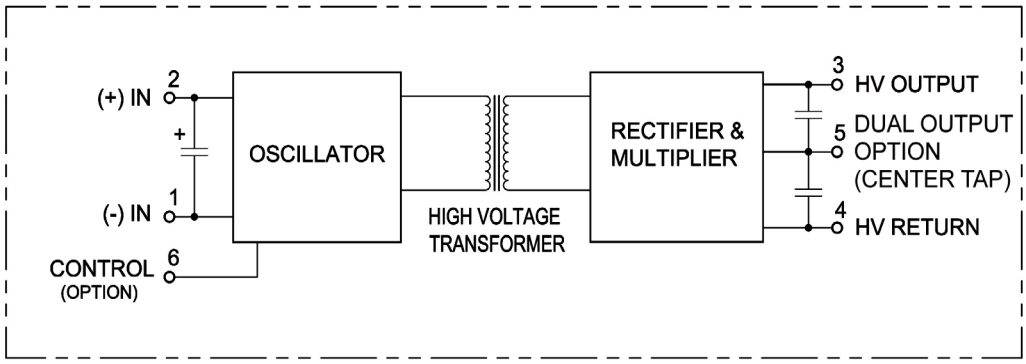
ELECTRICAL SPECIFICATIONS*3 (6,000V - 10,000V)

OUTPUT VOLTAGE*2	MODEL	MAXIMUM OUTPUT CURRENT*1	RIPPLE P-P
POSITIVE			
0 to +6,000 VDC	Q60	83 µA	<1.000 %
0 to +8,000 VDC	Q80	62.5 µA	<1.000 %
0 to +10,000 VDC	Q101	50 µA	<1.000 %
NEGATIVE			
0 to -6,000 VDC	Q60N	83 uA	<1.000 %
0 to -8,000 VDC	Q80N	62.5 uA	<1.000 %
0 to -10,000 VDC	Q101N	50 uA	<1.000 %

PARAMETER	VALUE
INPUT VOLTAGE	0 to 5 VOLTS
TYPICAL TURN-ON VOLTAGE	<0.7 VOLTS
ISOLATION	< +/- 500 VDC BIAS ON OUTPUT RETURN (W4)
OUTPUT VOLTAGE TOLERANCE	+10%, -10% (AT 100% OUTPUT, FULL LOAD)
FREQUENCY	75-500KHZ (TYPICAL)
STORAGE TEMPERATURE	-20° TO +105°C
STANDARD OPERATING TEMPERATURE	-10 TO +60°C*4 (CASE)

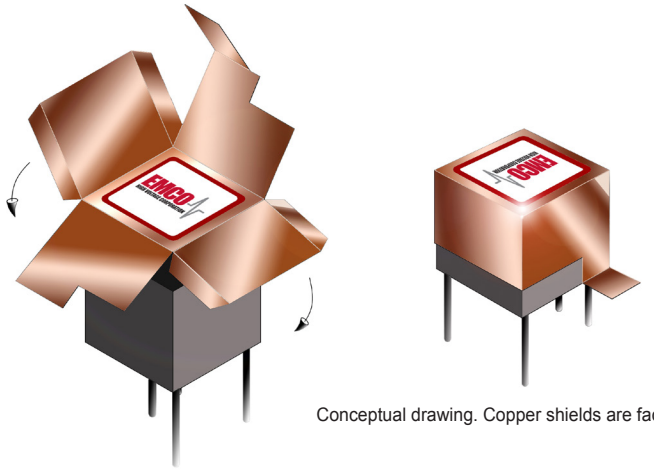
	INPUT CURRENT	
VIN	NO-LOAD	FULL-LOAD
5 VDC	<175 mA	<250 mA

BLOCK DIAGRAM



NOTE: Pin designators for pin out models up to 5KV.

COPPER SHIELD PLACEMENT



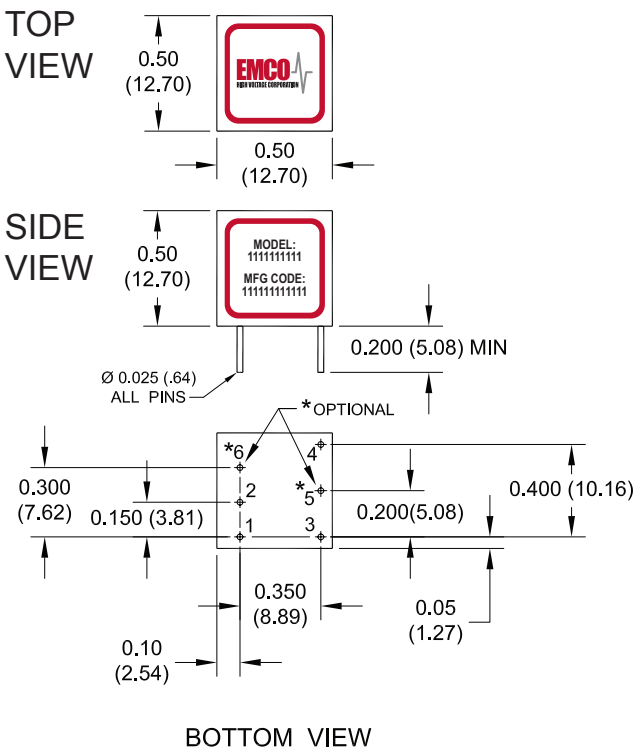
Conceptual drawing. Copper shields are factory installed.

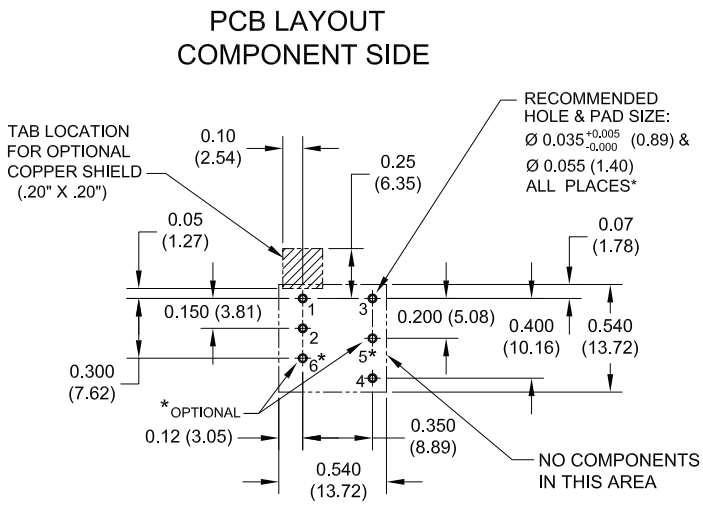
DETAILED PRODUCT DESCRIPTION

The Q Series is a broad line of ultra-miniature, high reliability DC to HV DC converters supplying up to 5,000 volts in only 0.125 cubic inches and up to 10,000 volts in only 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 <0.7V input to maximum input voltage, allowing for an adjustable output voltage. Output is load dependent. A control pin option allows full control of the output via a high impedance input, ideal for error-amplifier control in closed-loop systems. Isolation is <+/- 500V bias on output return and output power is 0.5 watt. No external components or minimum load are required. The output ripple is extremely low for this package size, as low as .1%. Light weight and wide temperature range make these units ideal for portable, battery-powered equipment. Many models feature a dual output (center tap) option, which creates both a positive and a negative output from miniature, one low cost unit. An alternate pin pattern is available for users wishing to upgrade without modifying their board design. Output is load dependent.

Application notes are available on this series, and technical assistance is readily available.

MECHANICAL SPECIFICATIONS (100V - 2,000V)





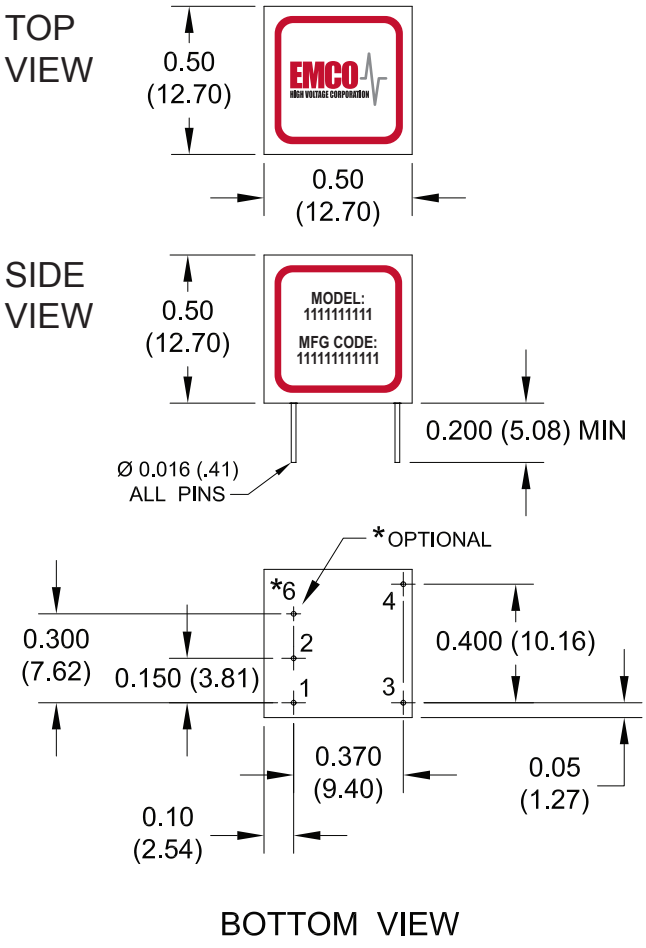
*OPTIONAL

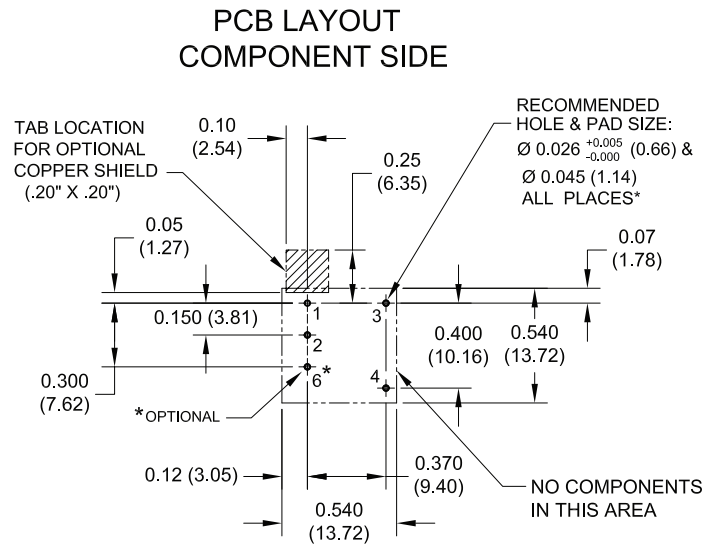
DIMENSIONS ARE IN INCHES (METRIC EQUIVALENTS ARE IN PARENTHESIS)
DIMENSIONAL TOLERANCES: .XX = ± 0.02 (0.51), .XXX = ± 0.005 (0.127)

PARAMETER	VALUE
WEIGHT	0.15 OUNCES APPROX. (4.25 GRAMS)
VOLUME	0.125 CUBIC INCHES (2.05CM^3)
DIMENSIONS	0.50L (12.7) X 0.50W (12.7) 0.50H (12.7)

PIN #	100V TO 900V	1,000V TO 2,000V
1	INPUT (-)	INPUT (-)
2	INPUT (+)	INPUT (+)
3	OUTPUT (+)	HV OUTPUT
4	OUTPUT (-)	OUTPUT RETURN
5*	DUAL OUTPUT/CENTER TAP	
6*	CONTROL PIN	

MECHANICAL SPECIFICATIONS (2,500V - 5,000V)





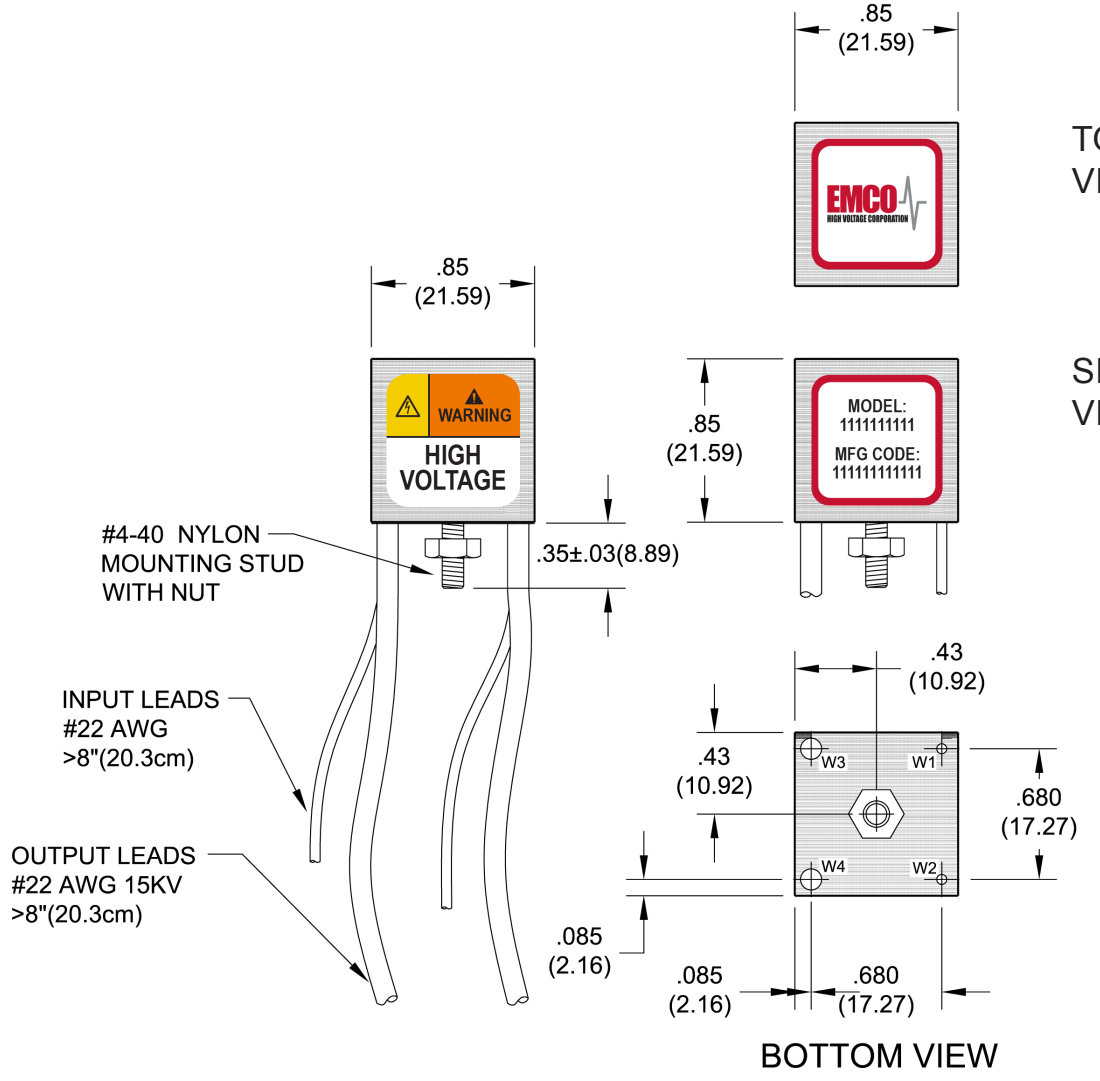
*OPTIONAL

DIMENSIONS ARE IN INCHES (METRIC EQUIVALENTS ARE IN PARENTHESIS)
DIMENSIONAL TOLERANCES: .XX = ± 0.02 (0.51), .XXX = ± 0.005 (0.127)

PARAMETER	VALUE
WEIGHT	0.15 OUNCES APPROX. (4.25 GRAMS)
VOLUME	0.125 CUBIC INCHES (2.05CM^3)
DIMENSIONS	0.50L (12.7) X 0.50W (12.7) 0.50H (12.7)

PIN #	FUNCTION
1	INPUT (-)
2	INPUT (+)
3	HV OUTPUT
4	HV RETURN
5*	
6*	CONTROL PIN

MECHANICAL SPECIFICATIONS (6,000V - 10,000V)



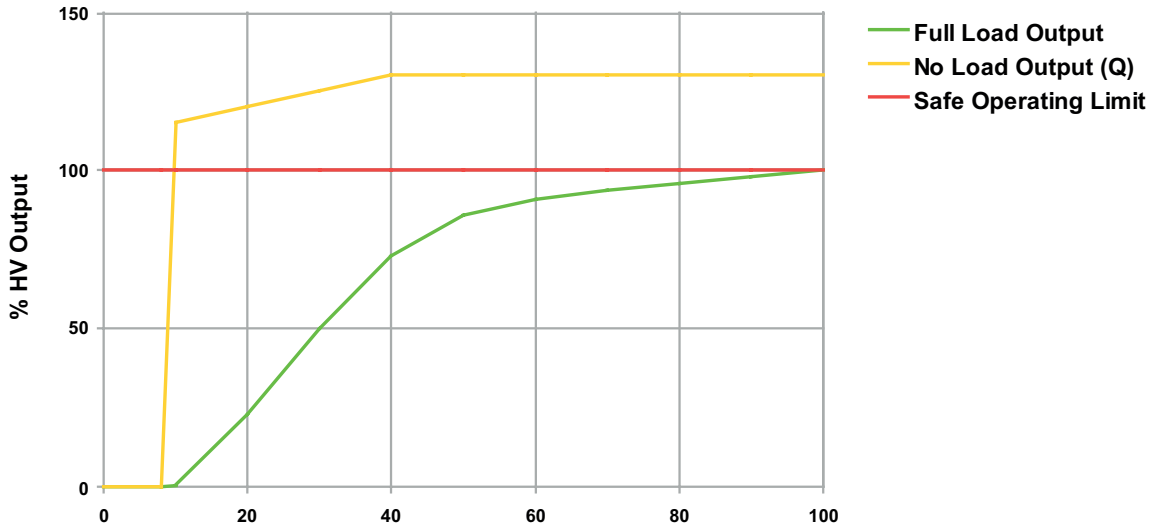
DIMENSIONS ARE IN INCHES (METRIC EQUIVALENTS ARE IN PARENTHESIS)
DIMENSIONAL TOLERANCES: .XX = ± 0.02 (0.51), .XXX = ± 0.005 (0.127)

PARAMETER	VALUE
WEIGHT	1 OUNCE (28.3 GRAMS)
VOLUME	0.614 CU INCHES (10.06 CU CM)
DIMENSIONS	0.85L (21.59) X 0.85W (21.59) X 0.85H (21.59)

WIRE	COLOR	FUNCTION
1	RED	INPUT (+)
2	BLACK	INPUT (-)
3	BROWN	HV OUTPUT
4	VIOLET	HV RETURN

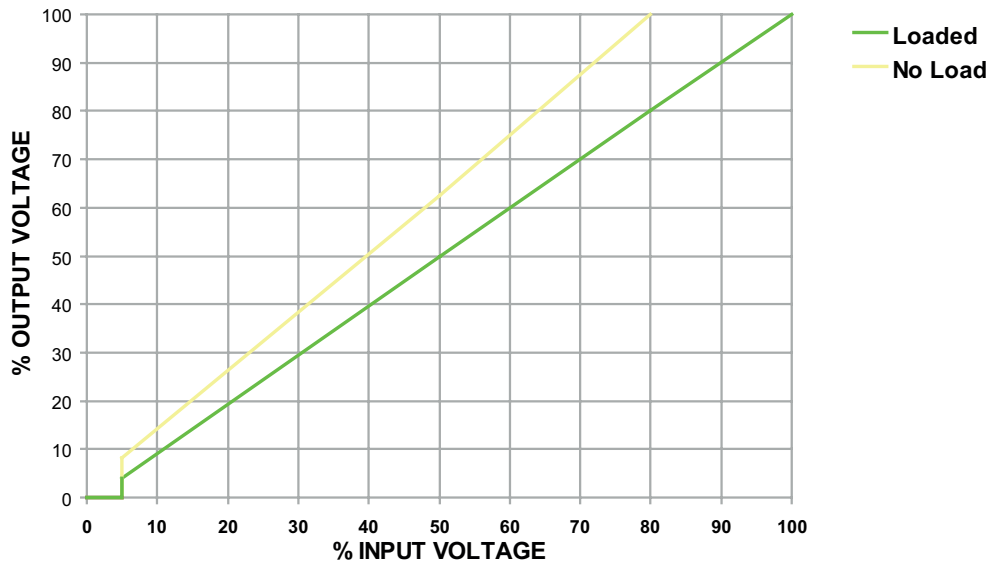
APPLICATION NOTES

Typical HV Output vs. Control Voltage



NOTE: Vin held at maximum

TYPICAL INPUT vs. OUTPUT VOLTAGE



NOTE: Control Pin tied to Vin Pin

OPTION CODES

ORDERING INFORMATION		ORDER CODE	AVAILABILITY
SERIES	0.5 WATT	Q	ALL MODELS
OUTPUT VOLTAGE	SEE TABLES		
POLARITY DESIGNATOR	POSITIVE OUTPUT	BLANK	ALL MODELS
	NEGATIVE OUTPUT[*7]	N	Q10 AND UP
	DUAL OUTPUT (CENTER TAP) OPTION	CT	UP TO 900V
INPUT VOLTAGE	5 VDC	5	ALL MODELS
	12 VDC	12	UP TO 3KV
	15 VDC	15	UP TO 3KV
	24 VDC	24	UP TO 3KV
OPTIONS	CONTROL PIN	C	UP TO 5KV
	EXTENDED TEMP	T	UP TO 5KV
	External Copper Shield	S	ALL MODELS

HOW TO ORDER

PART NUMBER SELECTOR:

Model Number:

Q 10 N - 5 C T S

Q Series
10 Output Voltage (See table...)
N Polarity Designator
S for Shield (optional)
T for Extended Temperature
C for Control Pin (optional)
5 Input Voltage

EXAMPLE

Q10N-5CTS: Q Series 0.5W, **1000** VDC, **N** negative, **5** VDC input, **C** for Control Pin, **T** for Extended Temperature, **S** for Shield.

*Note:
1. At maximum rated output voltage
2. Output Voltage is load dependent. Under light or no-load conditions, reduce the Input Voltage so maximum rated Output Voltage is not exceeded.
3. Specifications are after 30 minute warm-up, full-load at 25ºC, unless otherwise noted.
4. Proper thermal management techniques are required to maintain safe case temperature at maximum power output.
5. Ripple specification for dual output units applies to the voltage between the positive and negative output terminals.
6. For dual output units [CT option], the negative output voltage will be 10% larger than the positive output voltage with respect to the center tap pin.
7. For models Q01 thru Q09, one unit is used for positive or negative by reversing the output leads. See App Notes.

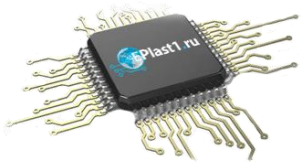
Компания «ЭлектроПласт» предлагает заключение долгосрочных отношений при поставках импортных электронных компонентов на взаимовыгодных условиях!

Наши преимущества:

- Оперативные поставки широкого спектра электронных компонентов отечественного и импортного производства напрямую от производителей и с крупнейших мировых складов;
- Поставка более 17-ти миллионов наименований электронных компонентов;
- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
- Техническая поддержка проекта, помощь в подборе аналогов, поставка прототипов;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
- Лицензия ФСБ на осуществление работ с использованием сведений, составляющих государственную тайну;
- Поставка специализированных компонентов (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Aeroflex, Peregrine, Syfer, Eurofarad, Texas Instrument, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits,General Dynamics и др.);

Помимо этого, одним из направлений компании «ЭлектроПласт» является направление «Источники питания». Мы предлагаем Вам помощь Конструкторского отдела:

- Подбор оптимального решения, техническое обоснование при выборе компонента;
- Подбор аналогов;
- Консультации по применению компонента;
- Поставка образцов и прототипов;
- Техническая поддержка проекта;
- Защита от снятия компонента с производства.



Как с нами связаться

Телефон: 8 (812) 309 58 32 (многоканальный)
Факс: 8 (812) 320-02-42
Электронная почта: org@eplast1.ru
Адрес: 198099, г. Санкт-Петербург, ул. Калинина, дом 2, корпус 4, литера А.