

**Proven
Reliability**

F SERIES

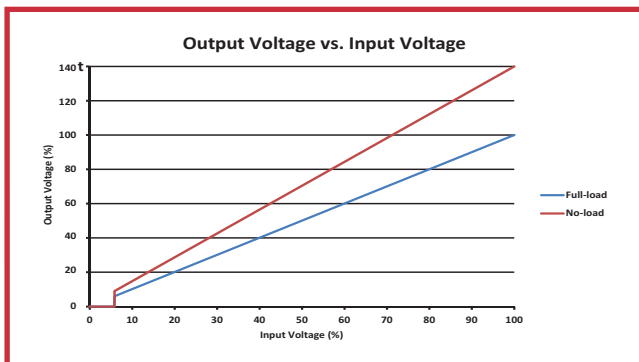
ISOLATED, PROPORTIONAL DC TO HV DC CONVERTERS

200V to 8kV at 10W



PRODUCT DESCRIPTION

The F Series is a broad line of robust, field-proven DC to HV DC converters which deliver 10 Watts continuous output power. Outputs range from 200V to 8kV. The input and output are galvanically isolated so a unit can be used to deliver a positive or negative high-voltage. The output voltage is proportional to input voltage with a low 0.7V typical turn-on voltage. The F Series employs EMCO's quasi-sinewave oscillator, a fully enclosed transformer, input and output filtering, and a 5-sided metal enclosure. As a result, these modules exhibit very low EMI/RFI, noise and ripple. A dual output option with center-tap pin which, when grounded provides both positive and negative outputs from one compact module.



APPLICATIONS

- Electrophoresis
- Capacitor Charging
- Piezo Devices
- Field Generation
- Grid Bias
- Mass Spectrometry
- Electrostatic Chuck
- Igniter / Spark Module
- Sustaining Ion Pumps

OPTIONS

- Dual output (Center Tap) Models Available (CT Suffix)
- Mounting Holes (F02 thru F60 only)(H Suffix)

PRODUCT SELECTION TABLE

| MODEL | OUTPUT VOLTAGE*2 | OUTPUT CURRENT*1 |
|-------|------------------|------------------|
| F02 | 0 to 200V | 50 mA |
| F03 | 0 to 300V | 33.3 mA |
| F04 | 0 to 400V | 25 mA |
| F05 | 0 to 500V | 20 mA |
| F06 | 0 to 600V | 16 mA |
| F08 | 0 to 800V | 12.5 mA |
| F10 | 0 to 1kV | 10 mA |
| F12 | 0 to 1.2kV | 8.3 mA |
| F15 | 0 to 1.5kV | 6.6 mA |
| F20 | 0 to 2kV | 5 mA |
| F30 | 0 to 3kV | 3.3 mA |
| F40 | 0 to 4kV | 2.5 mA |
| F50 | 0 to 5kV | 2 mA |
| F60 | 0 to 6kV | 1.66 mA |
| F70 | 0 to 7kV | 1.5 mA |
| F80 | 0 to 8kV | 1.25 mA |

FEATURES

- Proportional Input/Output
- Compact, PCB Mount Package
- Metal Case / Shielded Transformer
- Short Circuit Protection
- Low Ripple, Low EMI / RFI
- Proven Reliability
- Input/Output Isolation
- Low Leakage Current
- Low Input/Output Coupling Capacitance
- No External Components Required
- No Minimum Load Required
- MTBF: >810K hrs per Bellcore TR-332
- RoHS Compliant

ISO 9001:2008
CERTIFIED

ISO 14001:2004
CERTIFIED

RoHS
COMPLIANT

IPC
Certified J-STD-001
Application Specialist

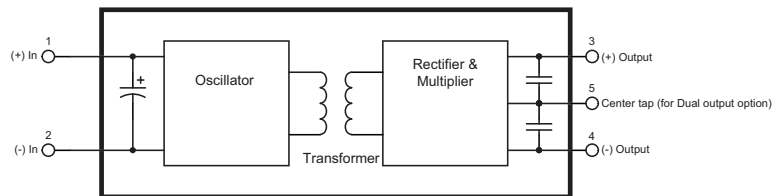
ELECTRICAL SPECIFICATIONS*2

| MODELS | INPUT VOLTAGE | OUTPUT CURRENT | RIPPLE ⁴ | REVERSIBLE MODEL | OUTPUT VOLTAGE | DUAL OUTPUT (CENTER TAP) MODEL | OUTPUT VOLTAGE |
|-----------|---------------|----------------|---------------------|------------------|----------------|--------------------------------|----------------|
| F02/F02CT | 0 to 12V | 50mA | <1.0% | F02 | 0 to 200V | F02CT | 0 to +/- 100V |
| F03/F03CT | 0 to 12V | 33.3mA | <1.0% | F03 | 0 to 300V | F03CT | 0 to +/- 150V |
| F04/F04CT | 0 to 12V | 25mA | <1.0% | F04 | 0 to 400V | F04CT | 0 to +/- 200V |
| F05/F05CT | 0 to 12V | 20mA | <0.1% | F05 | 0 to 500V | F05CT | 0 to +/- 250V |
| F06/F06CT | 0 to 12V | 16mA | <0.1% | F06 | 0 to 600V | F06CT | 0 to +/- 300V |
| F08/F08CT | 0 to 12V | 12.5mA | <0.1% | F08 | 0 to 800V | F08CT | 0 to +/- 400V |
| F10/F10CT | 0 to 12V | 10mA | <0.1% | F10 | 0 to 1kV | F10CT | 0 to +/- 500V |
| F12/F12CT | 0 to 12V | 8.3mA | <0.1% | F12 | 0 to 1.2kV | F12CT | 0 to +/- 600V |
| F15/F15CT | 0 to 12V | 6.6mA | <0.1% | F15 | 0 to 1.5kV | F15CT | 0 to +/- 750V |
| F20/F20CT | 0 to 12V | 5mA | <1.0% | F20 | 0 to 2kV | F20CT | 0 to +/- 1kV |
| F30/F30CT | 0 to 15V | 3.3mA | <1.0% | F30 | 0 to 3kV | F30CT | 0 to +/- 1.5kV |
| F40/F40CT | 0 to 15V | 2.5mA | <1.0% | F40 | 0 to 4kV | F40CT | 0 to +/- 2kV |
| F50/F50CT | 0 to 15V | 2mA | <1.0% | F50 | 0 to 5kV | F50CT | 0 to +/- 2.5kV |
| F60/F60CT | 0 to 15V | 1.66mA | <1.0% | F60 | 0 to 6kV | F60CT | 0 to +/- 3kV |
| F70/F70CT | 0 to 15V | 1.5mA | <2.5% | F70 | 0 to 7kV | F70CT | 0 to +/- 3.5kV |
| F80/F80CT | 0 to 15V | 1.25mA | <2.5% | F80 | 0 to 8kV | F80CT | 0 to +/- 4kV |

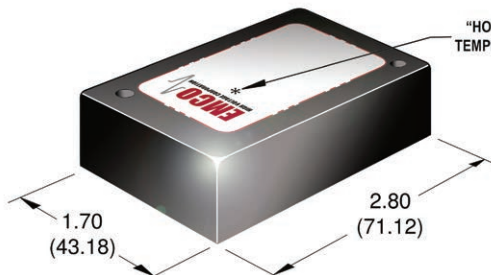
F-SERIES ELECTRICAL SPECIFICATIONS*3

| PARAMETER | VALUE |
|------------------------------------|--|
| INPUT VOLTAGE | 0 TO 12V (F02 TO F20) |
| | 0 TO 15V (F30 TO F80) |
| TURN-ON VOLTAGE | <0.7V |
| INPUT CURRENT | <500MA, NO LOAD |
| | <1.5A, FULL LOAD |
| ISOLATION | < +/-3.5kV BIAS (F02 TO F60) |
| | < +/-500V BIAS (F70 TO F80) |
| INPUT CAPACITANCE | ~240uF |
| RESPONSE TIME | 260 ms (typical) |
| OUTPUT VOLTAGE TOLERANCE | +/-5% (Full Load, 100% output voltage) |
| FREQUENCY | 25 kHz TO 125 kHz |
| OPERATING TEMPERATURE ⁵ | -10C to +70C (Case) |
| STORAGE TEMPERATURE | -25C to +90C |

BLOCK DIAGRAM

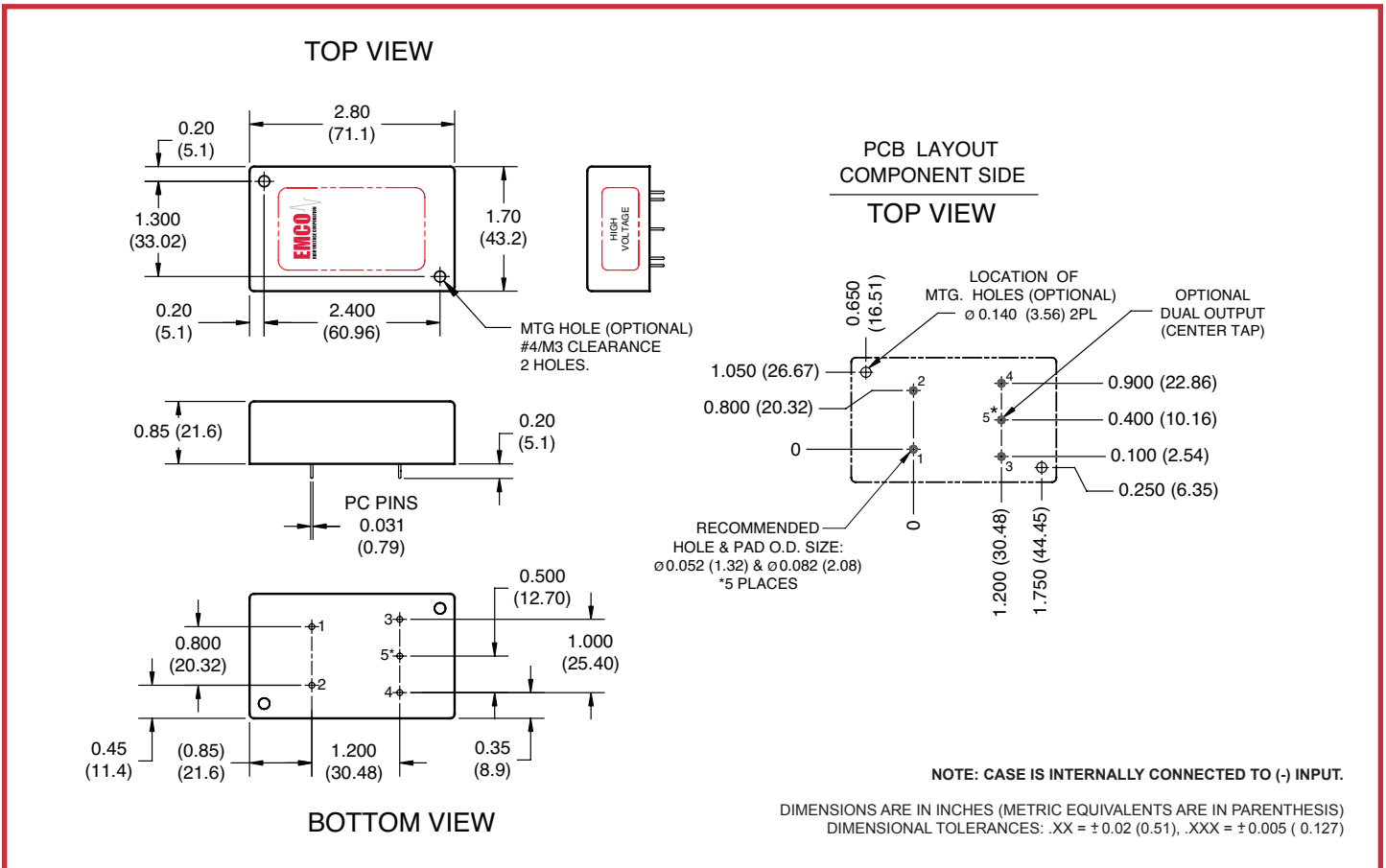


HOT SPOT CASE TEMPERATURE POINT



DIMENSIONS ARE IN INCHES (METRIC EQUIVALENTS ARE IN PARENTHESIS)
 DIMENSIONAL TOLERANCES: .XX = ± 0.03 (0.76), .XXX = ± 0.005 (0.127)

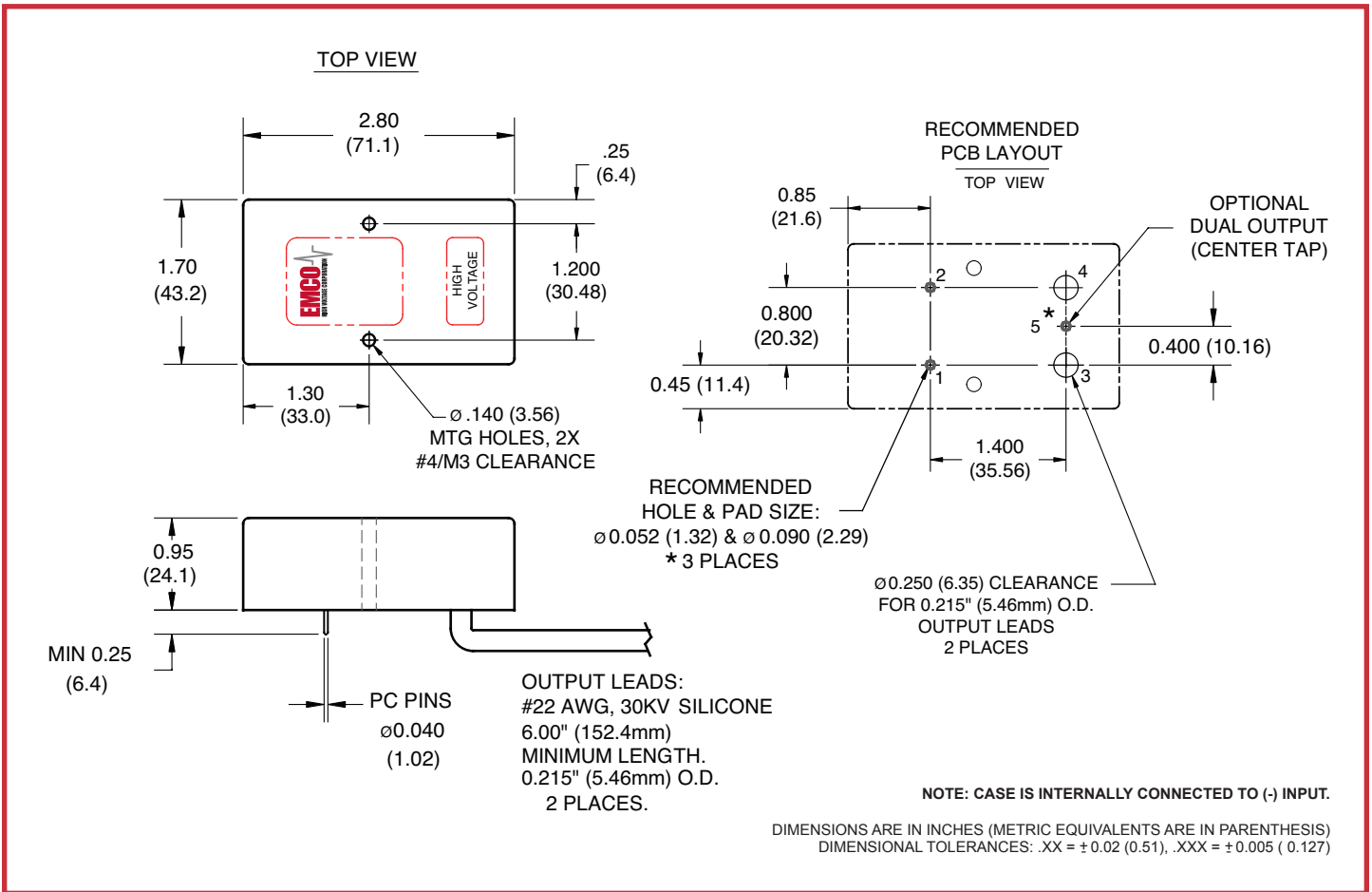
MECHANICAL SPECIFICATIONS F02-F60



| PARAMETER | VALUE |
|---------------|---|
| WEIGHT | <5 OZ (142 GRAMS) |
| VOLUME | 4.0 cu. In. (66.3 cc) |
| DIMENSIONS | 2.80L (71.1L) x 1.70W (43.2W) x 0.85H (21.6H) |
| CASE MATERIAL | Black Anodized Aluminum |

| PIN # | FUNCTION |
|-------|-----------------------------------|
| 1 | (+) Input |
| 2 | (-) Input |
| 3 | (+) Output |
| 4 | (-) Output |
| 5 | Dual Output/Center Tap (optional) |

MECHANICAL SPECIFICATIONS F70-F80



| PARAMETER | VALUE |
|---------------|--|
| WEIGHT | <5 OZ (142 GRAMS) |
| VOLUME | 4.5 cu. in. (74.1cc) |
| DIMENSIONS | 2.80L (71.12L) x 1.70W (43.18W) x 0.95H (24.13H) |
| CASE MATERIAL | Black Anodized Aluminum |

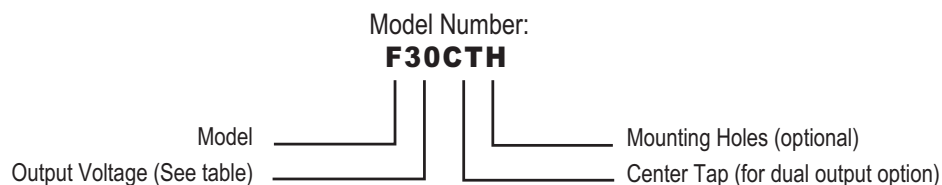
| PIN # | FUNCTION |
|-------|-----------------------------------|
| 1 | (+) Input |
| 2 | (-) Input |
| 3 | (+) Output |
| 4 | (-) Output |
| 5 | Dual Output/Center Tap (optional) |

OPTION CODE TABLE

| OPTION | | ORDER CODE | MODELS |
|----------|---------------------------------|------------|-----------|
| POLARITY | Positive / Negative reversible | Blank | ALL |
| | Dual Output (center tap) option | CT | ALL |
| OPTIONS | Mounting Holes | H | UP TO 6KV |

HOW TO ORDER

PART NUMBER SELECTOR:



EXAMPLE: **F30CTH** (**F**-Model, **30**-Output Voltage, **CT**-Center Tap, **H**-Holes)

* Notes:

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 1 hour warm up, full load, at 25C unless otherwise indicated.
4. Ripple specification for dual output units applies to the voltage between the positive and negative output terminals.
5. Proper thermal management techniques are required to maintain safe case temperature at maximum power output

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