

# Type SCM Single/Dual IGBT Snubber Capacitor Modules

## High Peak Current Snubber with Integrated Hyperfast Diode



Use style SCM as a discharge restrictive de-coupling to protect dual IGBT modules from overvoltage, Figure 1. Style SCM may also be used as an "N" or "P" type snubber component for a clamp snubber where single IGBT modules are used, figure 2.

### Highlights

- Direct mount to the IGBT module
- Low inductance
- Low Loss
- Hyperfast diodes integrated into package
- Self healing
- Other terminal spacing, capacitance values and voltage ratings, also available upon request.

### Specifications

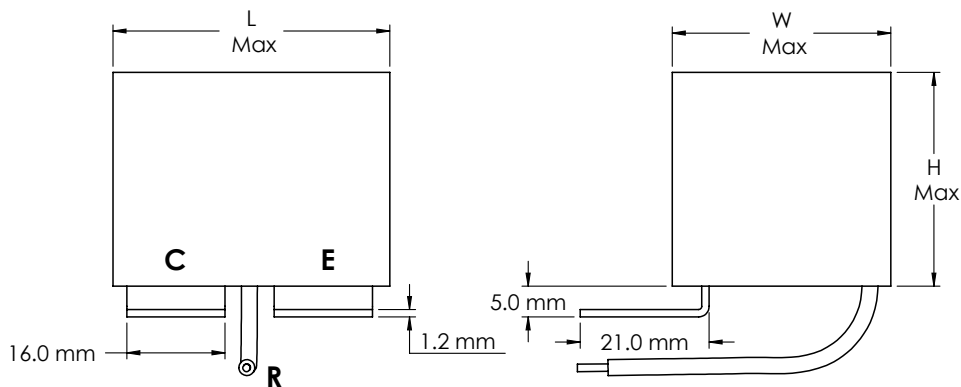
|                             |   |
|-----------------------------|---|
| Capacitance Range           | 0.47 to 2.0 $\mu$ F                           |
| Capacitance Tolerance       | $\pm$ 10% (K) standard, $\pm$ 5% (J) optional |
| Rated Voltage               | 600 to 1200 Vdc                               |
| Operating Temperature Range | -55 $^{\circ}$ C to 70 $^{\circ}$ C           |

#### Regulatory Information

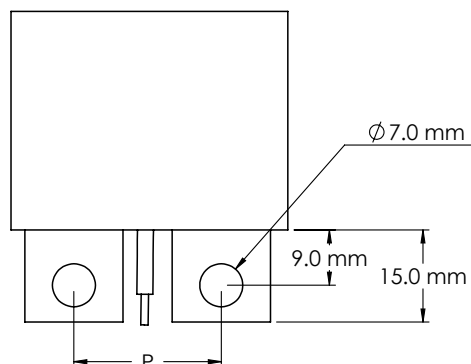
### Dimensions

#### Construction Details

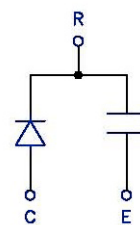
|                   |                   |
|-------------------|-------------------|
| Case Material     | Plastic UL94V-0   |
| Resin Material    | Dry Resin UL94V-0 |
| Terminal Material | Tin Plated Copper |



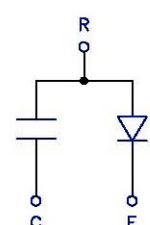
Wire: UL1015  
AWG 18  
200 mm Min



#### N Type



#### P Type



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### Part Numbering System

| SCM                     | 105                          | K              | 122            | H1           | N           | 24          | -F                       |
|-------------------------|------------------------------|----------------|----------------|--------------|-------------|-------------|--------------------------|
| Series Type Designation | Capacitance in $\mu\text{F}$ | Tolerance Code | Voltage        | Diode Rating | Polarity    | Lug Spacing | RoHS Compliant Indicator |
|                         | 104=0.1 $\mu\text{F}$        | J = $\pm 5\%$  | 601 = 600 Vdc  |              | N or P Type | 24=24mm     |                          |
|                         | 105=1 $\mu\text{F}$          | K = $\pm 10\%$ | 122 = 1200 Vdc |              |             | 28=28mm     |                          |
|                         | 225=2.2 $\mu\text{F}$        |                | 202 = 2000 Vdc |              |             | 29=29mm     |                          |

### Ratings

**Note:** Other ratings, sizes and performance specification available upon request. Contact us.

| Catalog Part Number | Typical Application IGBT Module |          |         |      |      | Diode Characteristics |     |                   |           |         |       |       | Dimensions |      |  |  |
|---------------------|---------------------------------|----------|---------|------|------|-----------------------|-----|-------------------|-----------|---------|-------|-------|------------|------|--|--|
|                     | Cap                             | S=Single | Ic      | Vce  | Type | Vrrm                  | If  | Trr               | Ipk surge | Ipk rep | W     | L     | H          | P    |  |  |
|                     | ( $\mu\text{F}$ )               | D=Dual   | (A)     | (V)  |      | (V)                   | (A) | ( $\mu\text{s}$ ) | (A)       | (A)     | (mm)  | (mm)  | (mm)       | (mm) |  |  |
| SCM474K601H7N29-F   | 0.47                            | S        | 200-300 | 600  | N    | 600                   | 30  | 0.040             | 300       | 70      | 43.82 | 55.88 | 34.04      | 29   |  |  |
| SCM474K601H7P29-F   | 0.47                            | S        | 200-300 | 600  | P    | 600                   | 30  | 0.040             | 300       | 70      | 43.82 | 55.88 | 34.04      | 29   |  |  |
| SCM105K601H7N24-F   | 1.00                            | D        | 100-200 | 600  | N    | 600                   | 30  | 0.040             | 300       | 70      | 38.10 | 47.63 | 31.75      | 24   |  |  |
| SCM105K601H7P24-F   | 1.00                            | D        | 100-200 | 600  | P    | 600                   | 30  | 0.040             | 300       | 70      | 38.10 | 47.63 | 31.75      | 24   |  |  |
| SCM105K601H5N29-F   | 1.00                            | S        | 300-400 | 600  | N    | 600                   | 50  | 0.045             | 500       | 100     | 46.36 | 56.52 | 38.10      | 29   |  |  |
| SCM105K601H5P29-F   | 1.00                            | S        | 300-400 | 600  | P    | 600                   | 50  | 0.045             | 500       | 100     | 46.36 | 56.52 | 38.10      | 29   |  |  |
| SCM155K601H7N24-F   | 1.50                            | D        | 200-300 | 600  | N    | 600                   | 30  | 0.040             | 300       | 70      | 34.29 | 55.88 | 30.48      | 24   |  |  |
| SCM155K601H7P24-F   | 1.50                            | D        | 200-300 | 600  | P    | 600                   | 30  | 0.040             | 300       | 70      | 38.10 | 47.63 | 31.75      | 24   |  |  |
| SCM205K601H5N24-F   | 2.00                            | D        | 300-400 | 600  | N    | 600                   | 50  | 0.045             | 500       | 100     | 43.82 | 55.88 | 34.04      | 24   |  |  |
| SCM205K601H5P24-F   | 2.00                            | D        | 300-400 | 600  | P    | 600                   | 50  | 0.045             | 500       | 100     | 43.82 | 55.88 | 34.04      | 24   |  |  |
| SCM205K601H2N29-F   | 2.00                            | S        | 400-600 | 600  | N    | 600                   | 100 | 0.050             | 1000      | 200     | 46.36 | 56.52 | 38.10      | 29   |  |  |
| SCM205K601H2P29-F   | 2.00                            | S        | 400-600 | 600  | P    | 600                   | 100 | 0.050             | 1000      | 200     | 46.36 | 56.52 | 38.10      | 29   |  |  |
| SCM474K122H8N29-F   | 0.47                            | S        | 200-300 | 1200 | N    | 1200                  | 30  | 0.065             | 300       | 60      | 34.29 | 55.88 | 30.48      | 29   |  |  |
| SCM474K122H8P29-F   | 0.47                            | S        | 200-300 | 1200 | P    | 1200                  | 30  | 0.065             | 300       | 60      | 38.10 | 47.63 | 31.75      | 29   |  |  |
| SCM105K122H8N24-F   | 1.00                            | D        | 100-200 | 1200 | N    | 1200                  | 30  | 0.065             | 300       | 60      | 44.45 | 63.50 | 37.34      | 24   |  |  |
| SCM105K122H8P24-F   | 1.00                            | D        | 100-200 | 1200 | P    | 1200                  | 30  | 0.065             | 300       | 60      | 44.45 | 63.50 | 37.34      | 24   |  |  |
| SCM105K122H4N29-F   | 1.00                            | S        | 300-400 | 1200 | N    | 1200                  | 50  | 0.085             | 500       | 100     | 43.82 | 55.88 | 34.04      | 29   |  |  |
| SCM105K122H4P29-F   | 1.00                            | S        | 300-400 | 1200 | P    | 1200                  | 50  | 0.085             | 500       | 100     | 46.36 | 56.52 | 38.10      | 29   |  |  |
| SCM155K122H8N24-F   | 1.50                            | D        | 200-300 | 1200 | N    | 1200                  | 30  | 0.065             | 300       | 60      | 44.45 | 63.50 | 37.34      | 24   |  |  |
| SCM155K122H8P24-F   | 1.50                            | D        | 200-300 | 1200 | P    | 1200                  | 30  | 0.065             | 300       | 60      | 46.36 | 56.52 | 38.10      | 24   |  |  |
| SCM205K122H4N24-F   | 2.00                            | D        | 300-400 | 1200 | N    | 1200                  | 50  | 0.065             | 500       | 100     | 53.98 | 63.50 | 43.18      | 24   |  |  |
| SCM205K122H4P24-F   | 2.00                            | D        | 300-400 | 1200 | P    | 1200                  | 50  | 0.065             | 500       | 100     | 53.98 | 63.50 | 43.18      | 24   |  |  |
| SCM205K122H1N29-F   | 2.00                            | S        | 400-600 | 1200 | N    | 1200                  | 100 | 0.090             | 1000      | 200     | 53.98 | 63.50 | 43.18      | 29   |  |  |
| SCM205K122H1P29-F   | 2.00                            | S        | 400-600 | 1200 | P    | 1200                  | 100 | 0.090             | 1000      | 200     | 53.98 | 63.50 | 43.18      | 29   |  |  |

Ipk surge at 25 °C and Ipk repetitive at 25 °C and 20 kHz.

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## High Peak Current Snubber with Integrated Hyperfast Diode

### Typical Applications

#### Discharge Restrictive De-coupling

The circuit in Figure 1 operates on the same principles as the de-coupling capacitor, but only during turn-off switching. As the IGBT turns off, energy trapped in the loop inductance is transferred to the capacitor. The diode blocks oscillations from occurring and excess charge on the capacitor is discharged through the external resistor.

- 1 or 2 wire taps for connecting external resistor
- Flame resistant case and epoxy, meets UL 94V0
- Other terminal pitches and capacitance values available.

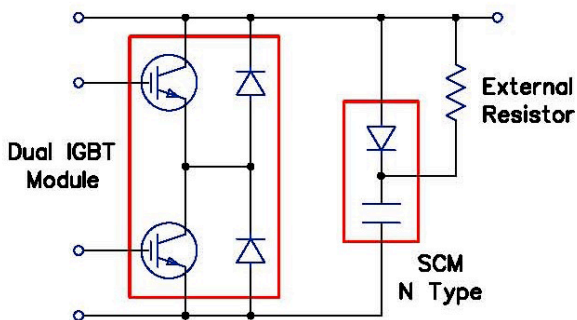


Figure 1

Style SCM Discharge restrictive decoupling used to protect dual IGBT modules

#### RCD Clamp

The function of this snubber is similar to a clamp, Figure 2. At turn-off, the snubber diode is forward biased and the snubber is activated. The energy trapped in the stray inductance is absorbed by the snubber capacitor. During turn-on the snubber caps that were fully charged to bus voltage have a discharge path through the forward biased free-wheel diode, the IGBT, and the snubber resistors. This reduces the reverse recovery voltage transient.

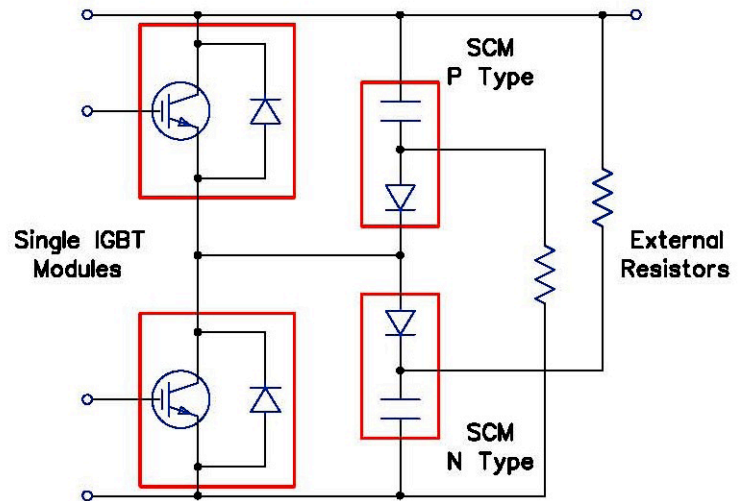


Figure 2

Style SCM "P" type and "N" type used as a clamp to protect an inverter using two "single" IGBT modules

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