



Film

Snubber Capacitors for IGBT Modules

The Capacitance Company
KEMET
CHARGED.®

Why Choose KEMET

KEMET is your seamless, integrated, single source for capacitance solutions worldwide. With 95% of possible dielectric solutions, global availability, on-time delivery, plus full custom design services. One world. One KEMET.

Features & Benefits

- Wide capacitance & voltage range
- Direct mount version with six tab styles to fit most IGBTs
- 4-pin PCB mount version available
- Stable temperature characteristics
- Pb-free/RoHS-compliant
- Made with low-loss polypropylene film





Programs Supported

Power semiconductor snubbing, including IGBT direct mount

Steps for Choosing an IGBT Snubber Capacitor to Test

1. Choose the snubber voltage to match (or exceed) the IGBT voltage.
2. Choose an initial capacitance value using the diagram below.
3. Choose a tab style code from the diagrams on the reverse side.
4. Choose the desired part number from the datasheet.

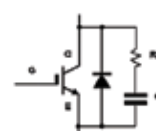
The tab style code is digit 13. Example: C4BSNBX4200ZALJ is tab style A.

| | IGBT with screw connections | IGBT with pin connections |
|--------------------|--|--|
| Snubber by itself |  Series C4BS direct mount Cap value = 0.5 μ F per 100 A IGBT current (1.0 μ F per 100 A if high inductance expected) |  Series C4AS PC board mount Cap value = 0.5 μ F per 100 A IGBT current (1.0 μ F per 100 A if high inductance expected) |
| Snubber in network |  Series C4AS PC board mount Cap value = 0.25 μ F per 100 A IGBT current |  Series C4AS PC board mount Cap value = 0.25 μ F per 100 A IGBT current |

This is a starting point. The engineer will pick the final cap value after evaluation and testing.



Snubber capacitor
by itself



Snubber capacitor
in a network

KEMET Products

| Series | Capacitor Type | Rated Voltage | Cap Range | Characteristics |
|--------|----------------|------------------|----------------------|--|
| C4AS | Radial Leads | 850 VDC/500 VAC | 0.15 – 5.0 μ F | <ul style="list-style-type: none">• Snubber applications• Climatic category (IEC 60068-1) 40/85/56• Pulse rise time (dv/dt) 469 to 3360 V/μs• Pitch (p) p = 27.5, 37.5, 52.5 mm• Terminals tinned copper 2 or 4 wires |
| | | 1000 VDC/600 VAC | 0.15 – 4.7 μ F | |
| | | 1200 VDC/630 VAC | 0.1 – 3.5 μ F | |
| | | 2000 VDC/700 VAC | 0.033 – 1.5 μ F | |
| | | 3000 VDC/750 VAC | 0.022 – 0.82 μ F | |
| C4BS | Direct Mount | 850 VDC/550 VAC | 0.47 – 5.0 μ F | <ul style="list-style-type: none">• Snubber-IGBT applications• Climatic category (IEC 60068-1) 40/85/56• Pulse rise time (dv/dt) 469 to 3361 V/μs• Box Length (L) L = 32 to 57.5 mm• Terminals tinned brass lugs |
| | | 1000 VDC/600 VAC | 0.47 – 4.0 μ F | |
| | | 1200 VDC/630 VAC | 0.33 – 3.3 μ F | |
| | | 2000 VDC/700 VAC | 0.10 – 1.5 μ F | |
| | | 3000 VDC/750 VAC | 0.047 – 0.82 μ F | |

For more information, samples and engineering kits, please visit us at www.kemet.com or call 1.877.myKEMET.



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Application of C4B Tab Styles

The tab style code is digit 13 in the part number. Example: C4BSNBX4200ZALJ is tab style A

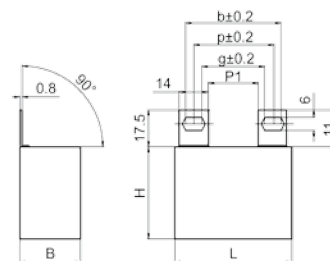
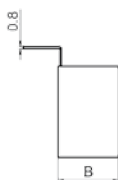
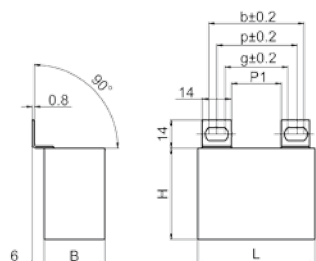
General description of tab styles. Also see detailed diagrams below.

| Tab Styles | Cap Length | Pitch Range | Notes |
|------------|----------------|----------------|--|
| A | 41.5 - 42.5 mm | 21.5 - 29.5 mm | Fits most common IGBTs |
| B | 41.5 - 42.5 mm | 16.0 - 28.0 mm | Fits most common IGBTs |
| H | 41.5 - 42.5 mm | 21.5 - 29.5 mm | Alternative to "A" with lower mounting height |
| A, B, H | 57.5 mm | | Larger pitches for high power IGBTs, see diagram below |
| E | B = 18 mm | 31 mm | For the Semikron Skiip® module, 31 mm terminals |
| F | | | Specialty type on demand, see diagram below |
| G | | | Specialty type on demand, see diagram below |

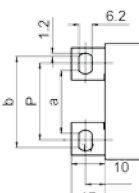
Sugg. tabs for common IGBTs (always check specific cases).

| IGBT Mfr | Series | A | B | E | H |
|--------------------|--------------|---|---|---|---|
| Semikron | SKM | | | | |
| Semikron | Skiip® | | | | |
| Powerex/Mitsubishi | CM up to 300 | | | | |
| Powerex/Mitsubishi | CM 400 & up | | | | |
| Infineon/Eupec | BSM | | | | |
| Microsemi | APT | | | | |

Above applies to cap length 41.5 - 42.5 mm or B=18 mm for tab style E.

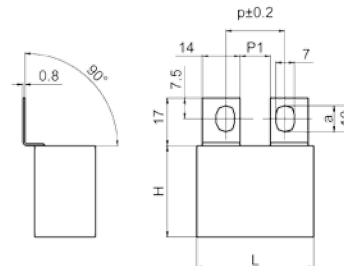
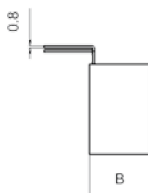
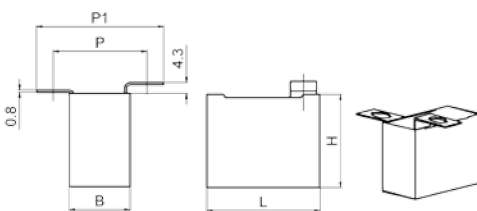


| Style | L | P | a | b | P1 |
|-------|------|------|------|------|------|
| A | 41.5 | 25.5 | 21.5 | 29.5 | 10.5 |
| A | 42 | 25.5 | 21.5 | 29.5 | 10.5 |
| A | 42.5 | 25.5 | 21.5 | 29.5 | 10.5 |
| A | 57.5 | 41 | 37 | 45 | 25 |

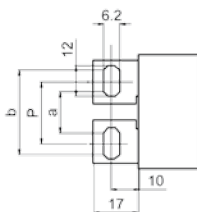


| Style | L | P | a | b | P1 |
|-------|------|----|----|----|----|
| B | 41.5 | 22 | 16 | 28 | 6 |
| B | 42 | 22 | 16 | 28 | 6 |
| B | 42.5 | 22 | 16 | 28 | 6 |
| B | 57.5 | 37 | 31 | 43 | 21 |

| Style | L | P | a | b | P1 |
|-------|------|------|------|------|------|
| H | 41.5 | 25.5 | 21.5 | 29.5 | 10.5 |
| H | 42 | 25.5 | 21.5 | 29.5 | 10.5 |
| H | 42.5 | 25.5 | 21.5 | 29.5 | 10.5 |
| H | 57.5 | 41 | 37 | 45 | 25 |



| Style | B | P | P1 | a | b |
|-------|----|----|----|----|----|
| E | 18 | 31 | 44 | 29 | 33 |
| E | 20 | 33 | 46 | 31 | 35 |
| E | 22 | 35 | 48 | 33 | 37 |
| E | 24 | 37 | 50 | 35 | 39 |
| E | 28 | 41 | 54 | 39 | 43 |
| E | 30 | 43 | 56 | 41 | 45 |



| Style | L | P | a | b | P1 |
|-------|------|----|----|----|----|
| F | 41.5 | 22 | 16 | 28 | 6 |
| F | 42 | 22 | 16 | 28 | 6 |
| F | 42.5 | 22 | 16 | 28 | 6 |
| F | 57.5 | 37 | 31 | 43 | 21 |

| Style | L | P | a | P1 |
|-------|------|----|---|------|
| G | 41.5 | 22 | 4 | 10.5 |
| G | 42 | 22 | 4 | 10.5 |
| G | 42.5 | 22 | 4 | 10.5 |
| G | 57.5 | 37 | 4 | 25 |