



# IGBT SNUBBER CAPACITORS

## KP-3C - Direct Mounting



### Highlights

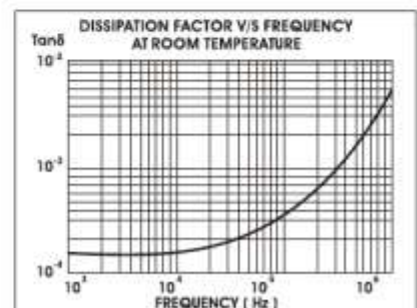
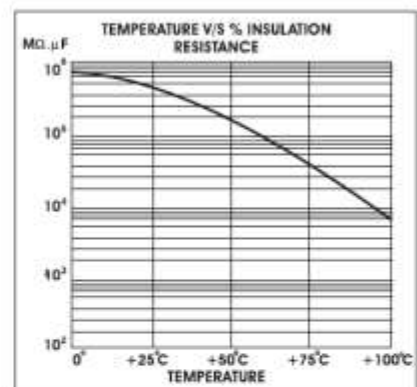
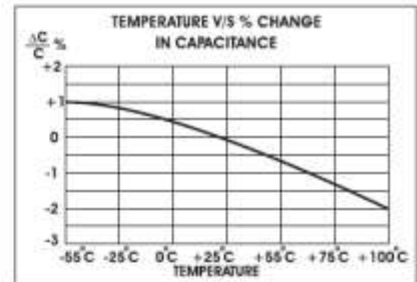
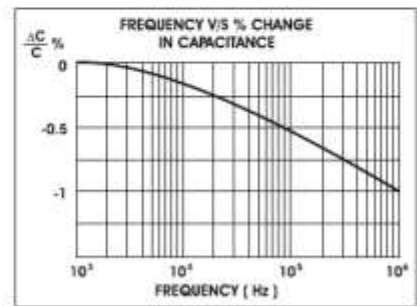
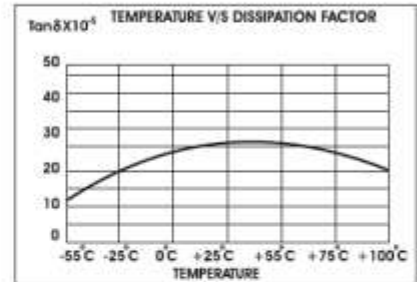
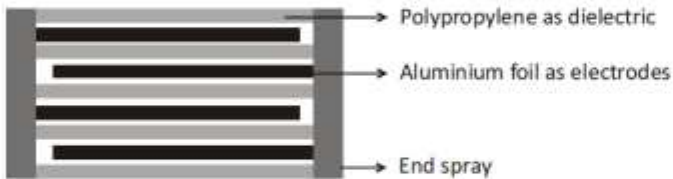
- ▶ Low inductance
- ▶ High DV/DT
- ▶ Low ESR
- ▶ Low loss polypropylene dielectric
- ▶ Impregnated elements eliminate corona

### Applications

These capacitors are used in high voltage, high current and high pulse applications such as:

- ▶ IGBT protection circuits
- ▶ Snubber networks
- ▶ Low frequency tuning circuits

### Construction





## Technical Specifications

### Physical Characteristics

- ▶ Dielectric material
- ▶ Electrode material
- ▶ Winding construction
- ▶ Enclosure

Polypropylene film  
Aluminium foil  
Non-inductive, extended foil, impregnated  
Preformed UL 94 V-0 plastic case with  
thermosetting resin fill

### Electrical Characteristics

- ▶ Capacitance range
- ▶ Capacity tolerance
- ▶ Rated voltage VDC
- ▶ Rated voltage VAC
- ▶ Test voltage between terminals
- ▶ Test voltage terminal to case
- ▶ Dissipation factor (Tand)
- ▶ Temperature range
- ▶ Insulation resistance at 25°C  
at a test voltage of 500 VDC  
applied for 1 minute

0.1 MFD to 3.0 MFD  
±5%(J), ±10%(K)  
1000, 1250, 1500, 2000  
480, 550, 630, 750  
2.5x rated voltage VDC for 10 seconds  
3KVAC at 50Hz for 60 seconds  
≤0.0005 at 1 KHz and 25°C  
-40°C to 85°C  
C ≤ 0.33 MFD      C > 0.33 MFD  
≥1000,000MΩ      ≥30,000MΩ



# IGBT SNUBBER CAPACITORS

## KP-3C - Direct Mounting

### Standard Capacitor Values

#### Working Voltage 1000 VDC (480 VAC)

Rated Capacitance MFD	Case Code	DV/DT V/ $\mu$ Sec	I Peak Amps	Irms Max at 100KHz & 55°C Amps	ESR Max at 100KHz m $\Omega$	Terminal Styles
0.10	K2	900	90	5.60	11.20	DL
0.15	K2	900	135	5.70	10.80	DL
0.22	K3	900	198	6.80	10.40	DL
0.22	B1	900	198	18.20	4.20	TL,RL,STL,FT,SL,MTL,2P
0.22	C1	900	198	18.20	4.20	CR,CT
0.27	B1	900	243	18.70	4.00	TL,RL,STL,FT,SL,MTL,2P
0.27	C1	900	243	18.70	4.00	CR,CT
0.33	B1	900	297	19.70	3.70	TL,RL,STL,FT,SL,MTL,2P
0.33	C1	900	297	19.70	3.70	CR,CT
0.39	B1	900	351	20.60	3.70	TL,RL,STL,FT,SL,MTL,2P
0.39	C1	900	351	20.60	3.50	CR,CT
0.47	B5	900	423	21.10	3.50	TL,RL,STL,FT,SL,MTL,2P
0.56	B5	800	392	21.30	3.50	TL,RL,STL,FT,SL,MTL,2P
0.68	B5	800	476	21.30	3.20	TL,RL,STL,FT,SL,MTL,2P
0.75	B5,B2	800	525	25.60	3.00	TL,RL,STL,FT,SL,MTL,2P
0.82	B5	800	574	26.00	3.00	TL,RL,STL,FT,SL,MTL,2P
1.00	B5	900	900	26.00	3.00	TL,RL,STL,FT,SL,MTL,2P
1.00	B3	800	900	26.00	3.00	TL,RL,STL,SL,MTL,2P
1.20	B3	800	960	26.00	2.50	TL,RL,STL,SL,MTL,2P
1.50	B3	800	1200	26.00	2.50	TL,RL,STL,SL,MTL,2P
1.75	B4	500	875	28.00	2.50	TL,RL,STL,SL,MTL,3P
2.00	B4	500	1000	28.20	2.50	TL,RL,STL,SL,MTL,3P
2.20	C2	400	880	28.50	2.40	TL,RL,STL,SL,MTL,4P
2.50	C2	400	1000	29.00	2.20	TL,RL,STL,SL,MTL,4P
3.00	C2	400	1200	30.00	2.00	TL,RL,STL,SL,MTL,4P

#### Working Voltage 1250 VDC (550 VAC)

Rated Capacitance MFD	Case Code	DV/DT V/ $\mu$ Sec	I Peak Amps	Irms Max at 100KHz & 55°C Amps	ESR Max at 100KHz m $\Omega$	Terminal Styles
0.10	K2	1000	100	5.60	11.20	DL
0.15	K2	1000	150	5.70	10.80	DL
0.22	K3	1000	220	6.80	10.40	DL
0.22	B1	1000	220	18.20	4.20	TL,RL,STL,FT,SL,MTL,2P
0.22	C1	1000	220	18.20	4.20	CR,CT
0.27	B1	1000	270	18.70	4.00	TL,RL,STL,FT,SL,MTL,2P
0.27	C1	1000	270	18.70	4.00	CR,CT
0.33	B1	1000	330	19.70	3.70	TL,RL,STL,FT,SL,MTL,2P
0.33	C1	1000	330	19.70	3.70	CR,CT
0.39	B1	1000	390	20.60	3.70	TL,RL,STL,FT,SL,MTL,2P
0.39	C1	1000	390	20.60	3.50	CR,CT
0.47	B5	1000	470	21.10	3.50	TL,RL,STL,FT,SL,MTL,2P

Custom-designed capacitors are available on request



## IGBT SNUBBER CAPACITORS

## KP-3C - Direct Mounting

## Standard Capacitor Values

## Working Voltage 1250 VDC (550 VAC)

Rated Capacitance MFD	Case Code	DV/DT V/ $\mu$ Sec	I Peak Amps	I <sub>rms</sub> Max at 100KHz & 55°C Amps	ESR Max at 100KHz m $\Omega$	Terminal Styles
0.56	B5	1000	560	21.30	3.50	TL,RL,STL,FT,SL,MTL,2P
0.68	B5	900	612	21.30	3.20	TL,RL,STL,FT,SL,MTL,2P
0.75	B5,B2	900	675	25.60	3.00	TL,RL,STL,FT,SL,MTL,2P
0.82	B5	900	738	26.00	3.00	TL,RL,STL,FT,SL,MTL,2P
1.00	B5	900	900	26.00	3.00	TL,RL,STL,FT,SL,MTL,2P
1.00	B3	1000	1000	26.00	3.00	TL,RL,STL,SL,MTL,2P
1.20	B3	900	1080	26.00	2.50	TL,RL,STL,SL,MTL,2P
1.50	B3	900	1350	26.00	2.50	TL,RL,STL,SL,MTL,2P
1.75	B4	600	1050	28.00	2.50	TL,RL,STL,SL,MTL,3P
2.00	B4	600	1100	28.20	2.50	TL,RL,STL,SL,MTL,3P
2.20	C2	500	880	28.50	2.40	TL,RL,STL,SL,MTL,4P
2.50	C2	500	1250	29.00	2.20	TL,RL,STL,SL,MTL,4P
3.00	C2	500	1500	30.00	2.00	TL,RL,STL,SL,MTL,4P

## Working Voltage 1500 VDC (630 VAC)

Rated Capacitance MFD	Case Code	DV/DT V/ $\mu$ Sec	I Peak Amps	I <sub>rms</sub> Max at 100KHz & 55°C Amps	ESR Max at 100KHz m $\Omega$	Terminal Styles
0.10	K2	1100	110	5.60	11.20	DL
0.15	K2	1100	165	5.70	10.80	DL
0.22	K4	1100	242	6.80	10.40	DL
0.22	B1	1100	242	18.20	4.20	TL,RL,STL,FT,SL,MTL,2P
0.22	C1	1100	242	18.20	4.20	CR,CT
0.27	B1	1100	297	18.70	4.00	TL,RL,STL,FT,SL,MTL,2P
0.27	C1	1100	297	18.70	4.00	CR,CT
0.33	B1	1100	363	19.70	3.70	TL,RL,STL,FT,SL,MTL,2P
0.33	C1	1100	363	19.70	3.70	CR,CT
0.39	B1	1100	429	20.60	3.70	TL,RL,STL,FT,SL,MTL,2P
0.39	C1	1100	429	20.60	3.50	CR,CT
0.47	B5	1100	517	21.10	3.50	TL,RL,STL,FT,SL,MTL,2P
0.56	B5	1000	560	21.30	3.50	TL,RL,STL,FT,SL,MTL,2P
0.68	B5	1000	680	21.30	3.20	TL,RL,STL,FT,SL,MTL,2P
0.75	B5,B2	1000	750	25.60	3.00	TL,RL,STL,FT,SL,MTL,2P
0.82	B5	1000	820	26.00	3.00	TL,RL,STL,FT,SL,MTL,2P
1.00	B3	1000	1000	26.00	3.00	TL,RL,STL,SL,MTL,2P
1.20	B3	1000	1200	26.00	2.50	TL,RL,STL,SL,MTL,2P
1.50	B3	1000	1500	26.00	2.50	TL,RL,STL,SL,MTL,2P
1.75	B4	700	1225	28.00	2.50	TL,RL,STL,SL,MTL,3P
2.00	B4	700	1400	28.20	2.50	TL,RL,STL,SL,MTL,3P
2.20	C2	600	1320	28.50	2.40	TL,RL,STL,SL,MTL,4P
2.50	C2	600	1500	29.00	2.20	TL,RL,STL,SL,MTL,4P
3.00	C2	600	1800	30.00	2.00	TL,RL,STL,SL,MTL,4P

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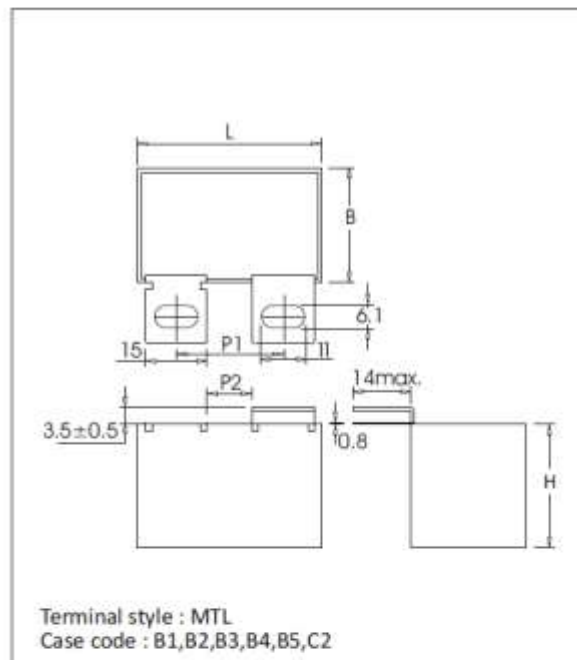
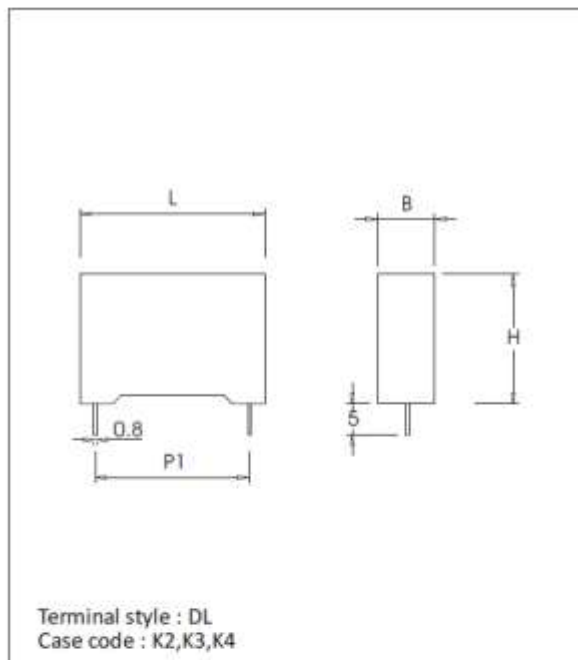
### KP-3C - Direct Mounting

### Standard Capacitor Values

Working Voltage 2000 VDC (750 VAC)

Rated Capacitance MFD	Case Code	DV/DT V/ $\mu$ Sec	I Peak Amps	I <sub>rms</sub> Max at 100KHz & 55°C Amps	ESR Max at 100KHz m $\Omega$	Terminal Styles
0.10	B1	1300	130	13.20	8.40	TL,RL,STL,FT,MTL,2P
0.15	B5	1200	180	15.11	7.00	TL,RL,STL,SL,FT,MTL,2P
0.22	B5	1200	264	19.80	4.50	TL,RL,STL,SL,FT,MTL,2P
0.27	B5	1200	324	21.70	4.30	TL,RL,STL,SL,FT,MTL,2P
0.33	B3	1200	396	22.20	4.10	TL,RL,STL,MTL,2P
0.39	B3	1200	468	22.50	4.00	TL,RL,STL,MTL,2P
0.47	B3	1200	564	22.50	4.00	TL,RL,STL,MTL,2P
0.56	B4	1000	560	22.70	3.80	TL,RL,STL,MTL,3P
0.68	B4	1000	680	22.80	3.70	TL,RL,STL,MTL,3P
0.75	C2	800	600	23.20	3.40	TL,RL,STL,MTL,4P
0.82	C2	800	656	23.20	3.30	TL,RL,STL,MTL,4P
1.00	C2	800	800	23.30	3.20	TL,RL,STL,MTL,4P

### Capacitor Drawings and Terminal Styles



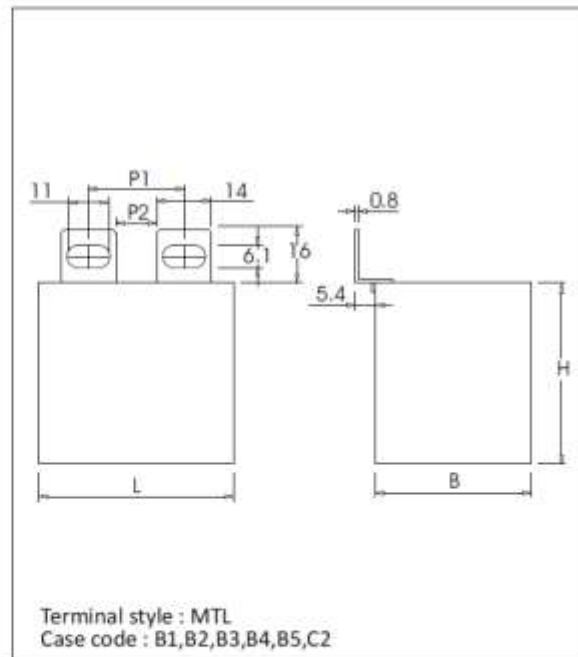
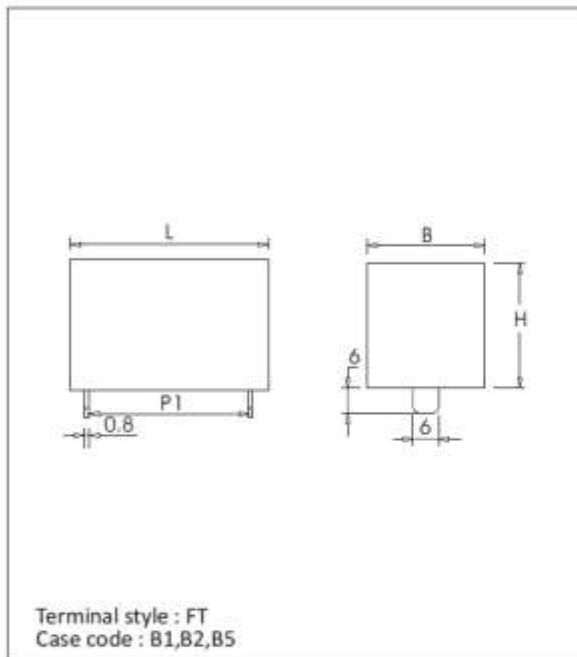
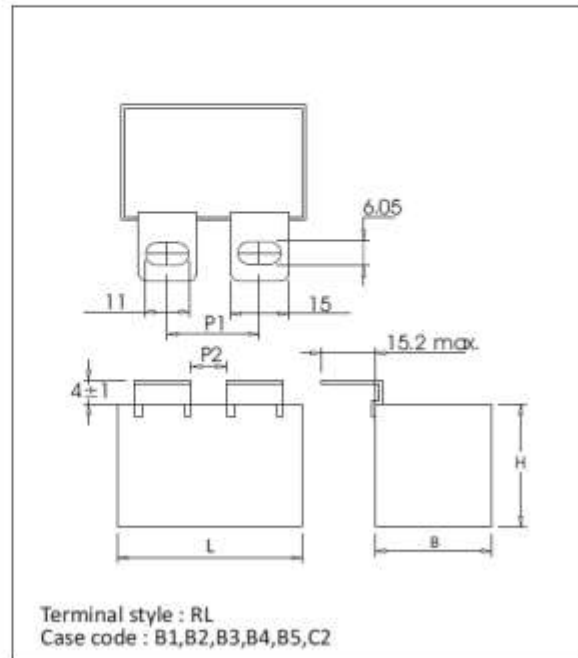
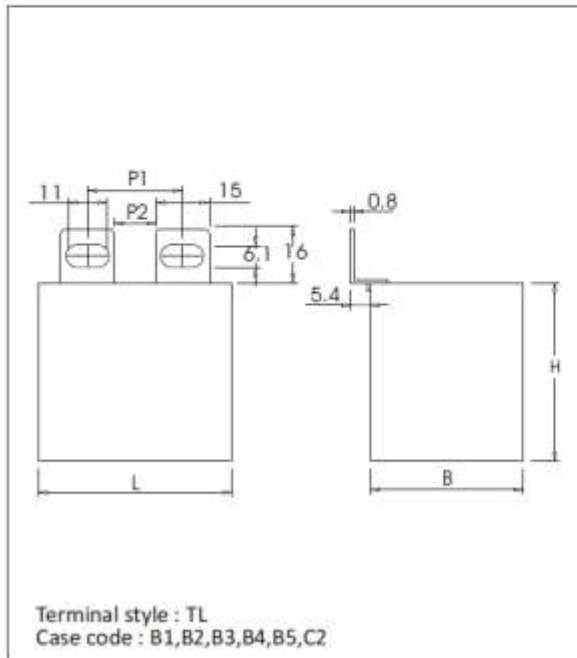
Dimensions in mm. For details see Case Code table



# IGBT SNUBBER CAPACITORS

## KP-3C - Direct Mounting

### Capacitor Drawings and Terminal Styles



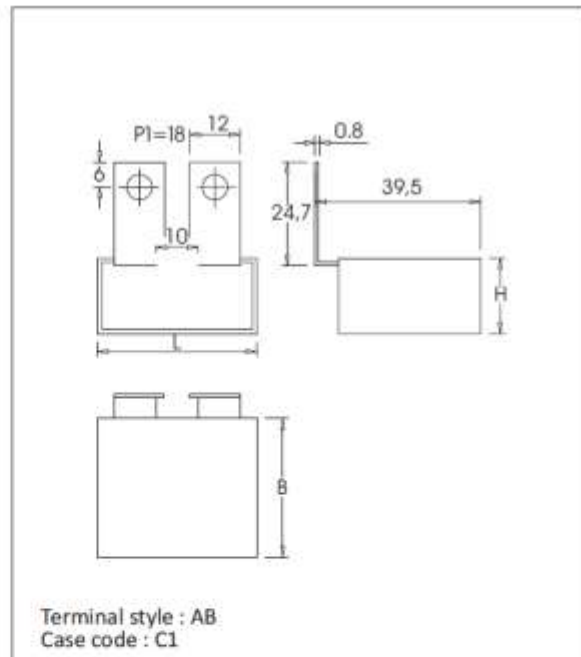
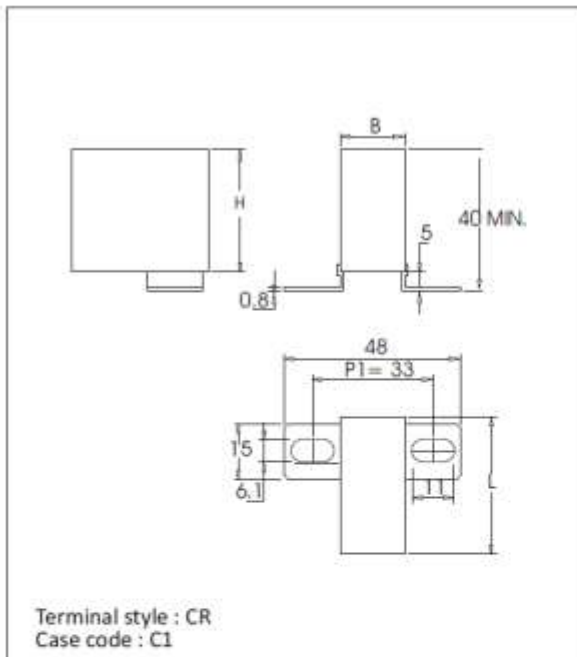
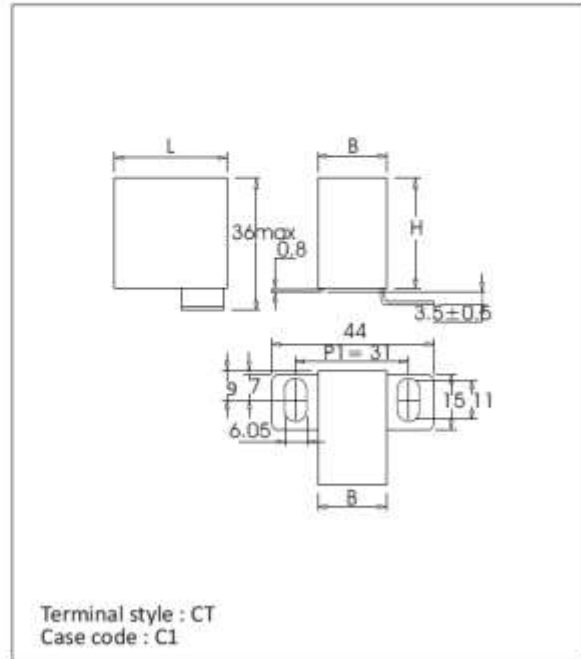
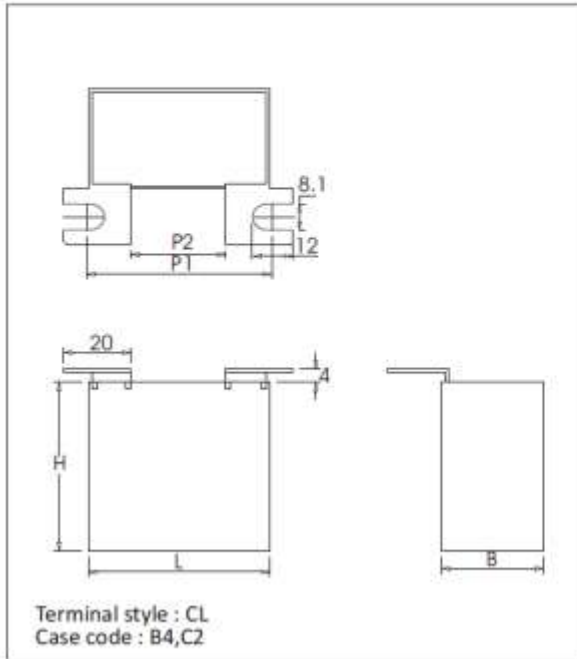
Dimensions in mm. For details see Case Code table



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## KP-3C - Direct Mounting

### Capacitor Drawings and Terminal Styles



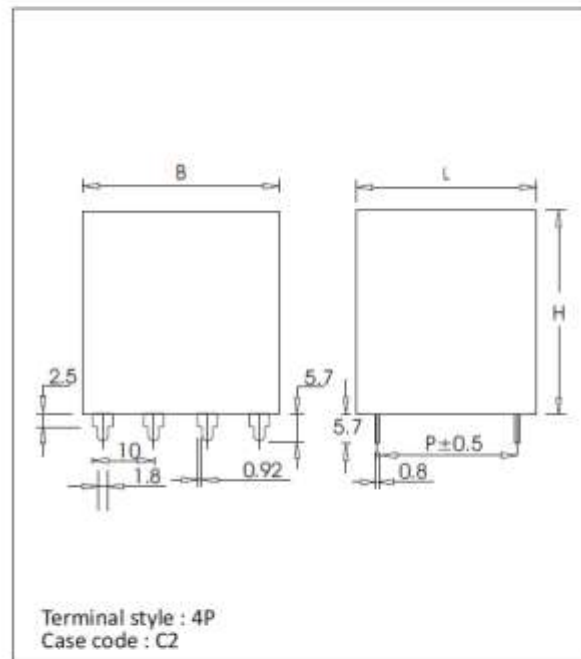
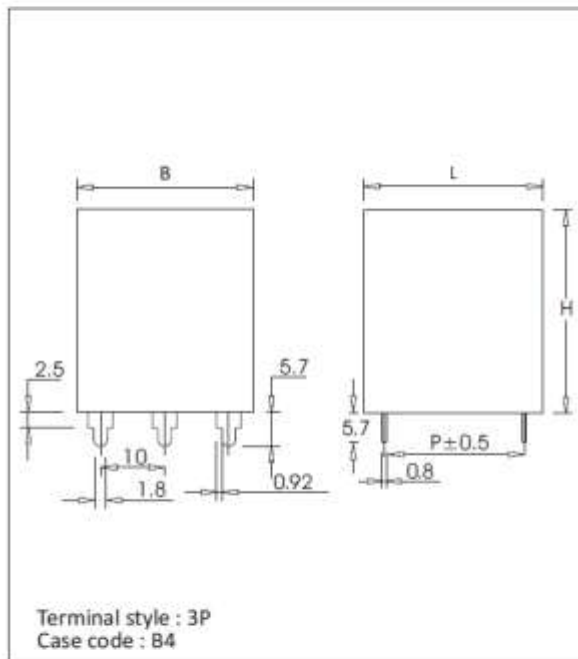
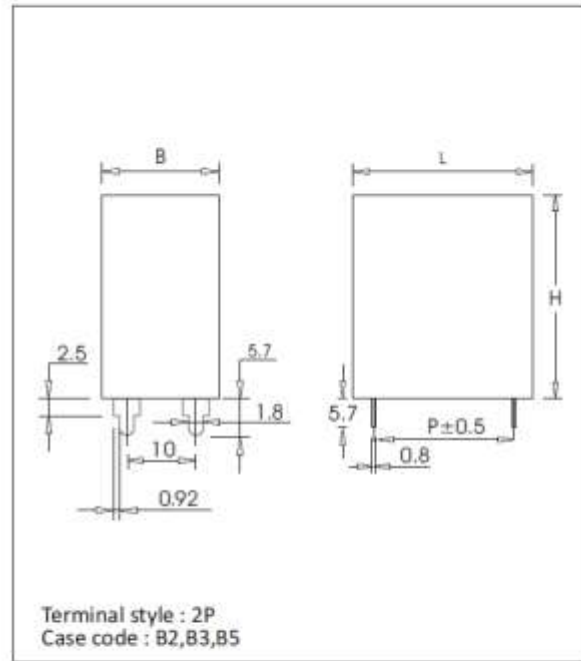
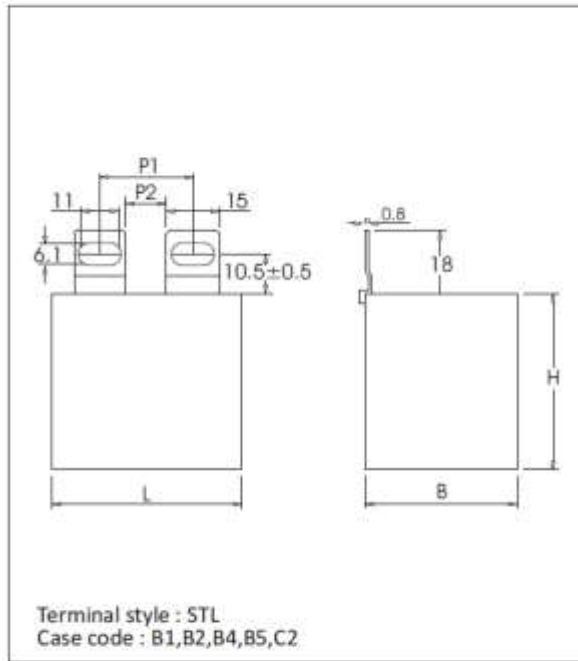
Dimensions in mm. For details see Case Code table



# IGBT SNUBBER CAPACITORS

## KP-3C - Direct Mounting

### Capacitor Drawings and Terminal Styles



Dimensions in mm. For details see Case Code table





## IGBT SNUBBER CAPACITORS

## KP-3C - Direct Mounting

## Table of case codes and Dimensions

Case code	Dimensions in mm*			P1	P2	Terminal Styles
	B±1	H±1	L±1			
K2	11	20	32.0	27.5	--	DL
K3	13	22	32.0	27.5	--	DL
K4	14	24	32.0	27.5	--	DL
B1	17	29	41.5	32.5	-	DL,FT,2P
B1	17	29	41.5	39.0	-	DL,FT,2P
B1	17	29	41.5	25.5	8.5	TL,RL,STL,SL
B1	17	29	41.5	25.5	11.5	MTL
B2	24	38	45.0	27.0	11.5	TL,RL,STL,SL
B2	24	38	45.0	27.0	13.0	MTL
B3	30	45	45.0	39.0	-	FT,2P
B3	30	45	45.0	27.0	13.0	MTL
B4	30	50	54.0	27.0	11.5	TL,RL,STL,SL
B4	30	50	54.0	48.0	-	3P
B4	30	50	54.0	55.0	28.0	CL
B4	30	50	54.0	27.0	13.0	MTL
B5	28	30	45.0	27.0	11.5	TL,RL,STL,SL
B5	28	30	45.0	27.0	13.5	MTL
B5	28	30	45.0	39.0	-	FT,2P
C1	18	33	38.0	33.0	-	CR
C1	18	33	38.0	31.0	-	CT
C1	18	33	38.0	18.0	-	AB
C2	43	50	54.0	27.0	11.5	TL,RL,STL,SL
C2	43	50	54.0	27.0	13.5	MTL
C2	43	50	54.0	55.0	28.0	CL
C2	43	50	54.0	48.0	-	4P

\* Refer to "Capacitor Drawings"

**Precaution**

1. These capacitors are not suitable for 'across the line' applications
2. VAC(rated) : Frequency should be less than 1000Hz
3. VDC(rated) :  $1.4 \times V_{rms} + VDC$  should be less than rated VDC



**AQL AND INSPECTION LEVEL**

1. Inspection level and AQLs are selected from ISO-2859 / IS 2500 or IEC – 410. Sampling plan is single sampling for normal inspection.
2. Symbols used:      IL      =      Inspection level (ISO-2859/IS-2500/IEC – 410)  
                                  AQL   =      acceptable quality level

NO	ITEM	PERFORMANCE REQUIREMENTS	TEST METHOD	I.L.	A.Q.C	
1	VISUAL INSPECTION Marking  Mechanical Failure	Rated capacitance Rated voltage Tolerance Trade mark Lead wire broken Insufficient coating	Marking should be legible  There shall be no mechanical failure	Visual inspection  -do-	General inspection level II	1.0%
2	DIMENSION	Should confirm to the specification chart	As specified in the data sheet	Gauging	Special inspection level S-1	2.5%
3	ELECTRICAL PROPETIES Voltage Proof  Capacitance  Tangent of loss angle Insulation Resistance	Between termination  As per relevant specification Within specified tolerance As per relevant specification As per relevant specification	No break down or flash over of applicant  Measuring frequency 1 kHz Measuring frequency 1 kHz As per method in the specification	Test voltage and duration of level 1	General Inspection	0.1%