

Snubber Capacitors – PPB – SNB (L)



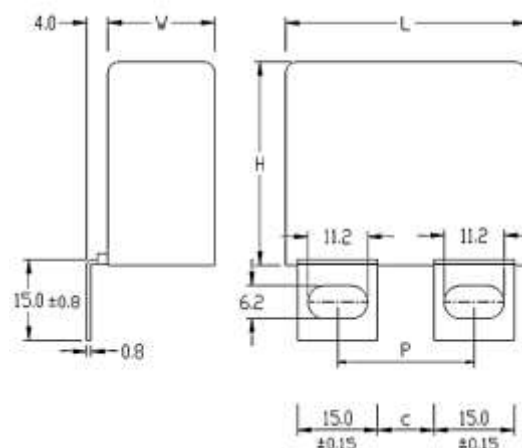
APPLICATION: These capacitors are suitable for high current, high pulse & high frequency applications such as – Speed Controls, IGBT Snubber Circuits, PV & wind Inverters, Motor Drives etc. (For IGBT Protection)

REFERENCE STANDARD : IEC – 61071, IEC 60068-2

TECHNICAL SPECIFICATION :

Dielectric :	Polypropylene film
Electrodes :	Aluminium foil (Internally series connected)
Rated Voltage (DC) :	1000V, 1250V, 1500V, 2000V, 2500V, 3000V
Rated Voltage (AC) :	500V, 575V, 650V, 700V, 750V, 800V
Encapsulation :	UL – Class 94 V-0 (Flame retardant epoxy)
Capacitance Range :	0.1 to 3.3 μ F
Capacitance Tolerance :	$\pm 5\%$ (J) , $\pm 10\%$ (K)
Lug Terminal :	Tin plated copper
Operating Temperature :	-40°C to 85°C
Climate Category :	55/85/56
Tangent of loss angle :	$\leq 5 \times 10^{-4}$ at 1 kHz.
I.R. at 500 VDC/ min. :	For $C \leq 0.33 \mu\text{F} \geq 100 \text{ kM } \Omega$ For $C > 0.33 \mu\text{F} \geq 30 \text{ kM } \Omega$
Test voltage between terminals:	1.6x Rated Voltage VDC for 2 sec
Test voltage between terminals and case :	3 kV ac @ 50 Hz / 1 minute
Storage temperature :	-25 to 40° C with RH Maximum 75% without condensation

Capacitor Dimension (mm.)

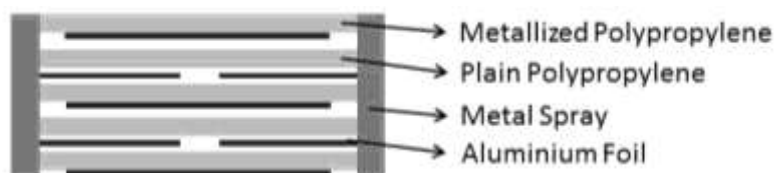


P	C
25.5	10.5
27.0	12.0

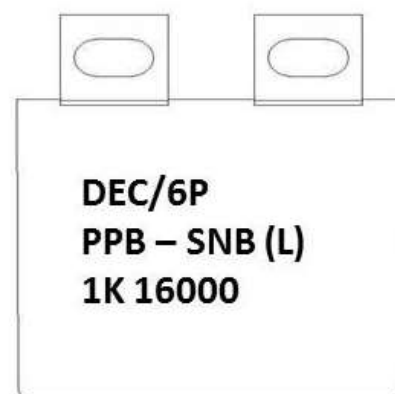
MARKING DETAILS :

- 1) DEC – Brand Name
- 2) MPB- Film Foil Polypropylene Box type capacitor
- 3) SNB (L) – Snubber Lug Type
- 4) 5H - Year & Month code
- 5) K - % Tolerance 10%
- 6) 1000V- Rated voltage (DC)

CAPACITOR CONSTRUCTION :



PPB – SNB (L) Capacitor Construction



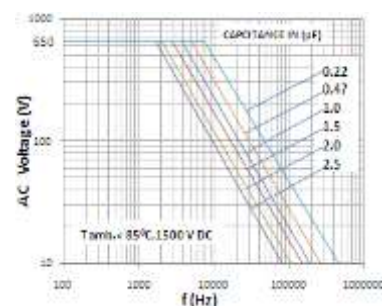
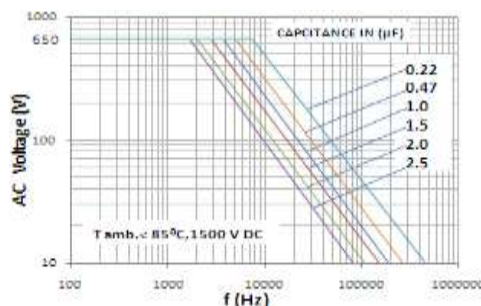
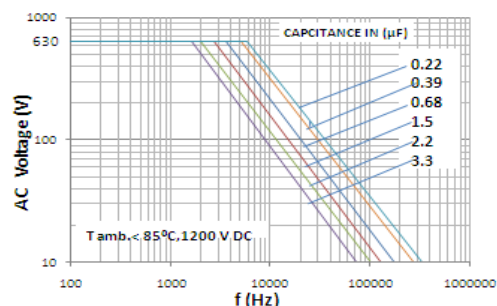
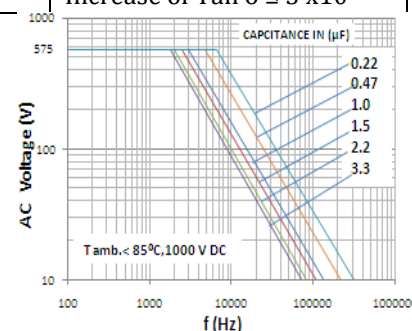
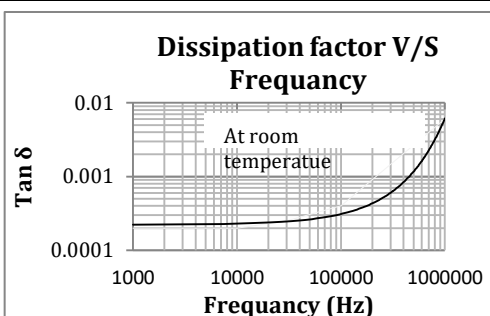
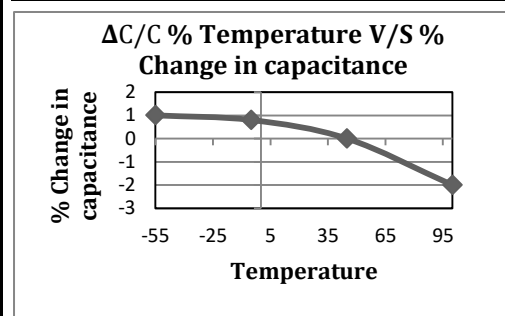
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TESTS & REQUIREMENTS:

DEC Snubber capacitors conform to the following IEC 61071 and DEC designed tests.

Sr. No.	Test Details	Test Conditions	Acceptance Standard
1	Thermal stability test under overload conditions (IEC - 61071 Clause # 5.10.1)	Natural cooling: Ambient $\pm 5^{\circ}\text{C}$ $1.21 \times P$ $\text{max.} = (U^2/2) \times W2 \times C \times \tan \delta =$ $121 \times (I^2 \text{ max.}/W2 \times C) \times \tan \delta$ with $W2 = 2 \times \pi \times f2$ for I_{max} . (See specification table above) $f2 = 10 \text{ kHz}$ for Duration 48 hrs. Measure the temp. every 1.5 h during the last 6 hrs.	Temperature rise $< 1^{\circ}\text{C}$ $\Delta C/C \leq 3\%$ Increase of $\tan \delta \leq 1.2 \times$ initial $\tan \delta + 0.0150$ (measured at 10kHz)
2	Self-healing test (IEC 61071 Clause # 5.11.2)	Apply : $1.5 \times U_r$ DC for 10 secs Number of clearings ≤ 5 followed by an increase in the voltage at 100 V/s till 5 clearings occur with a max. of $2.5 \times U_r$ DC for a duration of 10 s. Then reduce the voltage to U_r dc without clearing.	$ \Delta C/C \leq 0.5\%$ $\tan \delta \leq 1.2 \times \text{initial } \tan \delta + 0.0001$ (measured at 10kHz)
3	Endurance test between terminals (IEC - 61071 Clause # 5.15.1)	Sequence : $1.25 \times U_r$ DC at 85°C or U_r DC at 105°C for 500 hrs, $1000 \times$ discharge at $1.4 \times \hat{i}$ (maximum repetitive peak current in continuous operation) followed by $1.25 \times U_r$ DC at 85°C or U_r DC at 105°C for 500 hrs.	$\Delta C/C \leq 3\%$ Increase of $\tan \delta \leq 0.0150$ (measured at 10kHz)
4	Peak Current	Apply U_r DC for 10000 cycles One cycle consists of Charge Time $< 10 \text{ s}$; Discharge Time : 1 s Peak Current $> 1700 \text{ A}$.	No loosening of Terminals, crack or other damages. $\Delta C/C \leq \pm 3\%$ Increase of $\tan \delta \leq 5 \times 10^{-4}$
5	Transient Voltage	$1.6 \times U_r$ DC applied per cycle and each cycle consisting of charge & discharge of the capacitor under test directly, so as to get a charge-discharge voltage waveform as close to as $1.2 \times 50 \mu\text{s}$ for 1000 cycles Followed by $2 \times U_r$ DC for 1000 cycles	No loosening of Terminals, crack or other damages. $\Delta C/C \leq \pm 3\%$ Increase of $\tan \delta \leq 5 \times 10^{-4}$
6	Ripple Frequency Test	Apply 500 VDC Pulse Current Spike $\geq 100\text{A}$ @ 24 kHz Duration and temp. : 100 hrs. at 60°C	No loosening of Terminals, crack or other damages. $\Delta C/C \leq \pm 3\%$ Increase of $\tan \delta \leq 5 \times 10^{-4}$



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RATED VOLTAGE: 1000VDC / UR ac = 500 V ac @ f ≤ 1 kHz

Rated Capacitance (μF)	Case Size (mm) L x W x H	Terminal Pitch (mm) P	DV/DT V/μ Sec	IPeak (Amps)	IRms at 100 kHz & 70°C (Amps)	Typical ESR at 100kHz (m Ω)
0.22	45 17 31	25.5	1150	290	17.5	5.8
0.27	45 17 31	25.5	1100	325	18.0	4.7
0.33	45 17 31	25.5	1100	400	19.4	4.1
0.39	45 17 31	25.5	1100	420	20.2	3.6
0.47	45 17 31	25.5	1100	460	20.9	3.6
0.56	45 20 38	25.5	980	500	21.2	3.6
0.68	45 20 38	25.5	980	610	21.2	3.5
0.75	45 20 38	25.5	980	675	25.1	3.1
0.82	45 20 38	25.5	980	745	25.8	3.0
1.0	45 24 38	25.5	980	905	26.0	3.0
1.2	45 30 40	27.0	920	1090	26.0	2.4
1.5	45 30 40	27.0	920	1345	26.2	2.4
1.75	45 35 44	27.0	870	1540	28.2	2.1
2.0	45 35 44	27.0	870	1700	28.3	2.0
2.2	45 35 44	27.0	800	1700	28.6	2.0
2.5	55 35 46	27.0	700	1780	28.9	2.4
3.0	55 43 50	27.0	700	1810	32.0	2.2
3.3	55 43 50	27.0	700	1920	32.6	2.0

RATED VOLTAGE: 1250VDC / UR ac = 575 V ac @ f ≤ 1 kHz

Rated Capacitance (μF)	Case Size (mm) L x W x H	Terminal Pitch (mm) P	DV/DT V/μ Sec	I Peak (Amps)	IRms at 100 kHz & 70°C (Amps)	Typical ESR at 100kHz (m Ω)
0.22	45 17 31	25.5	1410	310	18.3	4.3
0.27	45 17 31	25.5	1210	335	18.6	4.0
0.33	45 17 31	25.5	1210	415	19.6	3.8
0.39	45 17 31	25.5	1210	475	20.5	3.6
0.47	45 17 31	25.5	1210	570	21.1	3.6
0.56	45 20 38	25.5	1120	630	21.4	3.6
0.68	45 20 38	25.5	1120	755	21.4	3.5
0.75	45 20 38	25.5	1120	830	25.7	3.1
0.82	45 24 38	25.5	1120	900	26.0	3.0
1.0	45 24 38	25.5	1120	1120	26.3	3.0
1.2	45 35 44	27.0	950	1100	26.4	2.4
1.5	45 35 44	27.0	950	1200	26.4	2.4
1.75	55 35 46	27.0	900	1390	28.4	2.1
2.0	55 35 46	27.0	900	1575	28.5	2.0
2.2	55 43 50	27.0	850	1780	28.8	2.0
2.5	55 43 50	27.0	800	1980	28.9	2.2
3.0	55 43 50	27.0	750	2020	32.2	2.2
3.3	55 43 50	27.0	750	2060	32.8	2.0



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RATED VOLTAGE : 1500V / 1600 VDC / UR ac = 650 V ac @ f ≤ 1 kHz

Rated Capacitance (μF)	Case Size (mm) L x W x H	Terminal Pitch (mm) P	DV/DT V/μ Sec	I Peak (Amps)	IRms at 100 kHz & 70°C (Amps)	Typical ESR at 100kHz (m Ω)
0.22	45 17 31	25.5	1500	345	17.9	5.8
0.27	45 17 31	25.5	1350	375	18.4	4.7
0.33	45 17 31	25.5	1350	460	19.8	4.1
0.39	45 20 38	25.5	1350	540	20.6	3.6
0.47	45 20 38	25.5	1350	650	21.3	3.6
0.56	45 35 44	27.0	1275	725	21.5	3.6
0.68	45 35 44	27.0	1275	875	21.5	3.5
0.75	45 35 44	27.0	1275	920	25.3	3.1
0.82	45 35 44	27.0	1275	1050	26.0	3.0
1.0	45 35 44	27.0	1275	1280	26.3	3.0
1.2	45 35 44	27.0	1150	1470	26.5	2.4
1.5	55 35 46	27.0	1150	1800	26.5	2.4
1.75	55 35 46	27.0	1000	1820	28.4	2.1
2.0	55 43 50	27.0	1000	1975	28.5	2.0
2.2	55 43 50	27.0	1000	2075	28.8	2.0
2.5	55 43 50	27.0	900	2130	29.1	2.4

RATED VOLTAGE: 2000VDC / UR ac = 700 V ac @ f ≤ 1 kHz

Rated Capacitance (μF)	Case Size (mm) L x W x H	Terminal Pitch (mm) P	DV/DT V/μ Sec	I Peak (Amps)	IRms at 100 kHz & 70°C (Amps)	Typical ESR at 100kHz (m Ω)
0.1	45 17 31	25.5	1850	200	13.1	8.6
0.15	45 17 31	25.5	1850	285	15.0	7.2
0.22	45 20 38	25.5	1850	415	19.7	5.8
0.27	45 20 38	25.5	1850	510	21.4	4.7
0.33	45 24 38	25.5	1675	560	22.2	4.1
0.39	45 30 40	27.0	1675	655	22.4	3.6
0.47	45 30 40	27.0	1675	800	22.4	3.6
0.56	45 35 44	27.0	1600	880	22.6	3.6
0.68	55 35 46	27.0	1600	1075	22.8	3.5
0.75	55 35 46	27.0	1490	1120	25.3	3.1
0.82	45 43 50	27.0	1490	1220	26.0	3.0
1.0	55 43 50	27.0	1490	1490	26.3	3.0
1.2	55 43 50	27.0	1370	1570	26.5	2.4
1.5	55 43 50	27.0	1370	1610	26.5	2.4



Snubber Capacitors – PPB – SNB (L)



Rated Voltage 2500VDC / UR ac = 750V ac @ f ≤ 1 kHz

Rated Capacitance (μF)	Case Size (mm) L x W x H	Terminal Pitch (mm) P	DV/DT V/μ Sec	I Peak (Amps)	Irms at 100 kHz & 70°C (Amps)	Typical ESR at 100kHz (m Ω)
0.1	45 17 31	25.5	2100	220	14.0	8.2
0.15	45 20 38	25.5	2100	300	16.0	7.0
0.22	45 24 38	25.5	2100	430	20.2	5.8
0.27	45 30 40	25.5	1950	540	21.6	4.7
0.33	45 30 40	25.5	1720	580	22.8	4.1
0.39	45 35 44	25.5	1720	680	22.8	3.6
0.47	55 35 46	27	1720	830	22.9	3.6
0.56	55 35 46	27	1650	890	23.6	3.6
0.68	55 35 46	27	1650	1100	23.8	3.5
0.75	55 43 50	27	1520	1190	25.7	3.1

Rated Voltage 3000VDC / UR ac = 800 V ac @ f ≤ 1 kHz

Rated Capacitance (μF)	Case Size (mm) L x W x H	Terminal Pitch (mm) P	DV/DT V/μ Sec	I Peak (Amps)	Irms at 100 kHz & 70°C (Amps)	Typical ESR at 100kHz (m Ω)
0.1	45 20 38	25.5	2200	240	15.0	8.0
0.15	45 24 38	25.5	2200	330	16.7	6.8
0.22	45 30 40	27	2200	460	20.8	5.4
0.27	45 35 44	27	2050	580	21.9	4.3
0.33	55 35 46	27	1800	600	23.5	4.1
0.39	55 35 46	27	1800	700	23.8	3.6
0.47	55 35 46	27	1800	860	24.5	3.6
0.56	55 43 50	27	1700	920	24.9	3.6

