Deki
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Film Capacitors

Series/Type: Metallized Polypropylene Snubber Capacitor
Series code: 121

121 - Metallized PP Snubber Capacitor - Box

Overview

The 121 series capacitor is a double side metallized polypropylene film capacitor with a rectangular, plastic box-type design, filled with flame retardant resin (UL94 V-0 grade)

Applications

Specially designed as snubber capacitor for IGBT, filtering, clamping, Coupling-decoupling, pulse and blocking.

Benefits

- Used in high frequency circuit & high voltages
- High ripple current handling
- Suitable for high frequency
- Self-healing
- Low losses
- Flame retardant Plastic case(UL94 V-0) and filled with Hard epoxy resin
- Automotive Grade[1]

Part Number System

121	224	K	3A	1	A
Series Code	Rated Capacitance Value	Rated Cap. Tolerance	Rated DC Voltage	Packing Type*	Design Reference
Metallized PP AC Filter Capacitor	Three-digit (224) indicate rated capacitance in Pico Farad (First two digits indicate value & third digit indicates number of zeroes to be suffixed to first two digits)	J = ±5% K = ±10% M = ±20%	2M=850 3A=1000 2P=1200 3C=1600 3D=2000 3E=2500 3F=3000	See packing type details	Internal code

1. Automotive grade available on request.

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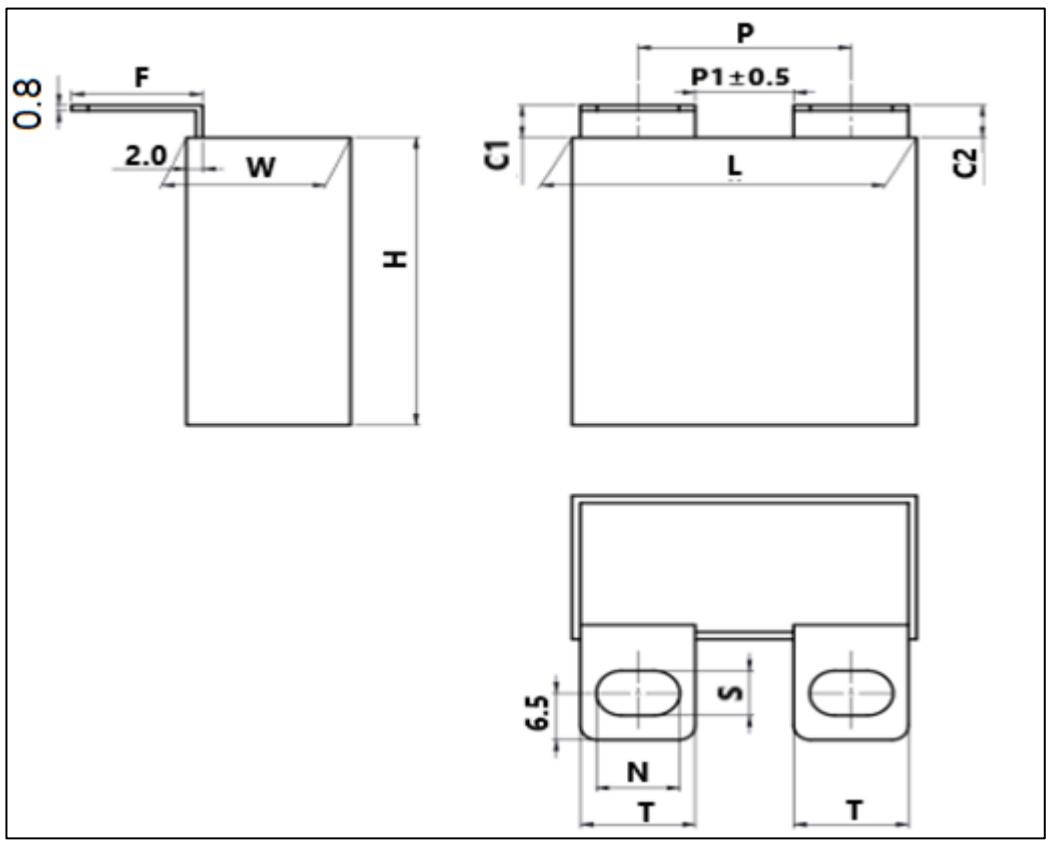
***Packing Type details:**

1: Bulk packing (original pitch)
2: Bulk packing (after forming & cutting)
3: Ammo packing (after forming & taping)
4: Bulk packing (after forming in original pitch without cut)
5: Bulk packing (after formed & without cut)
6: Ammo packing (Straight lead)
7: Bulk packing (Straight lead cut)
8: Reel packing (Straight lead)

Drawing & dimensions

Drawing- A



T(mm)	F(mm)	N(mm)	S(mm)
14.0	16.0	10.2	6.0

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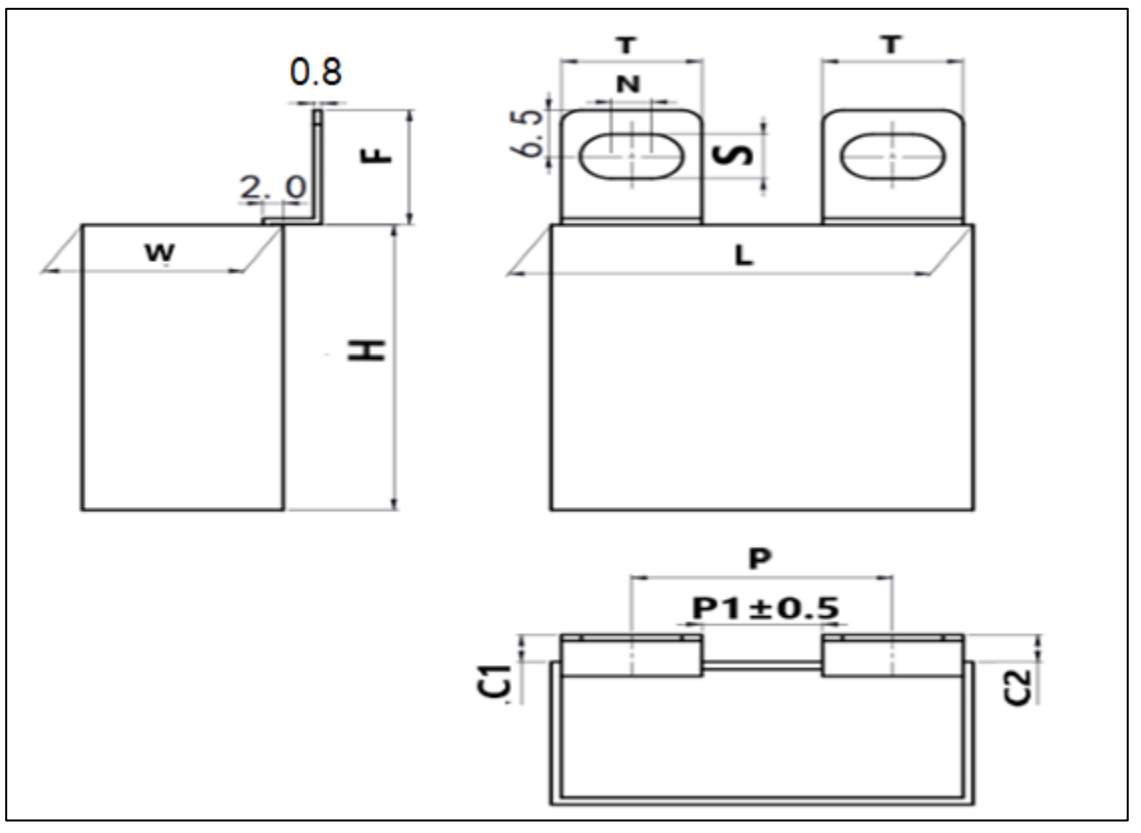
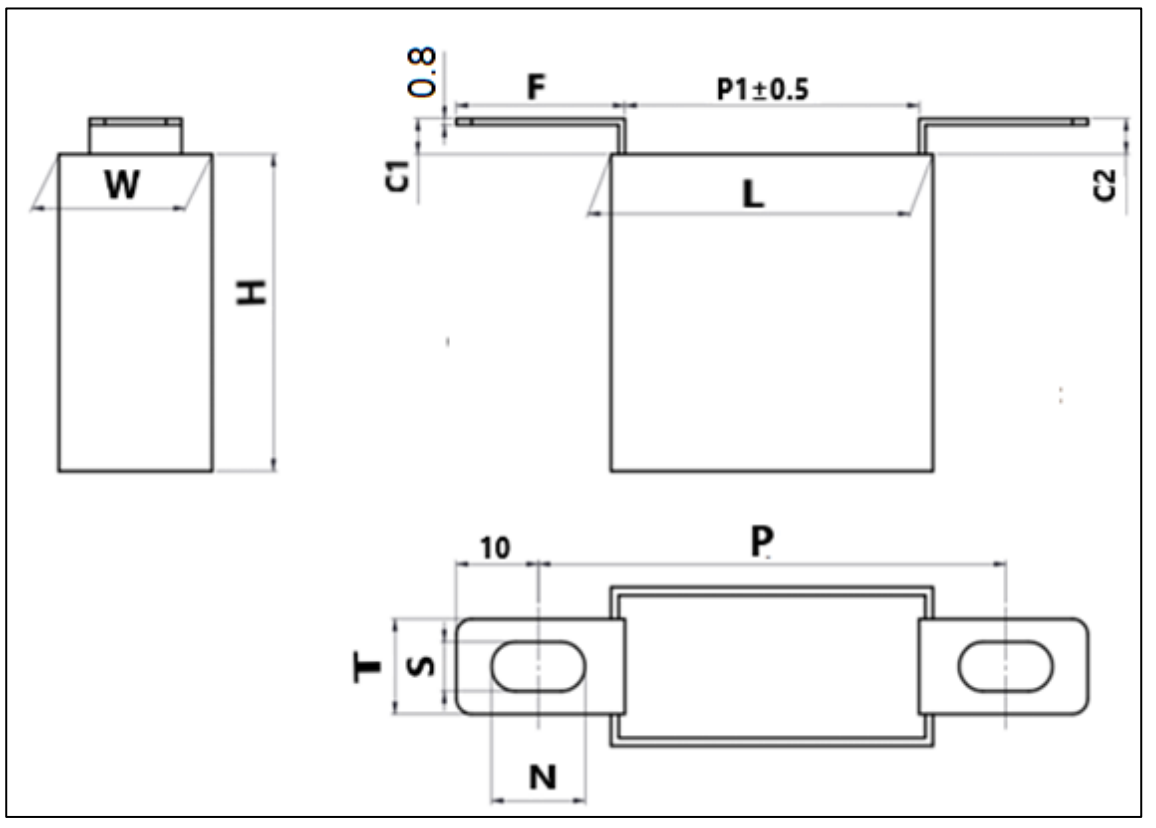
Drawing- B



T(mm)	F(mm)	N(mm)	S(mm)
14.0	16.0	10.2	6.0

Drawing- C



T(mm)	F(mm)	N(mm)	S(mm)
14.0	22.0	11.2	6.2
12.0	22.0	11.2	6.2

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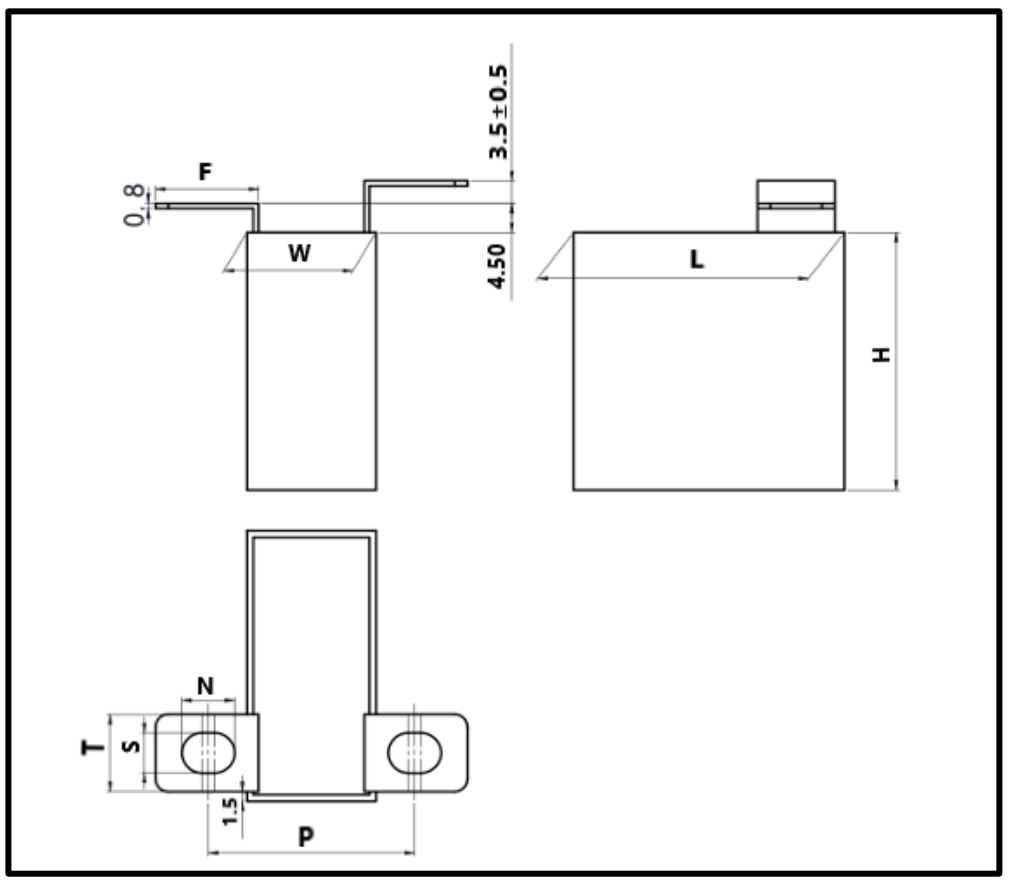
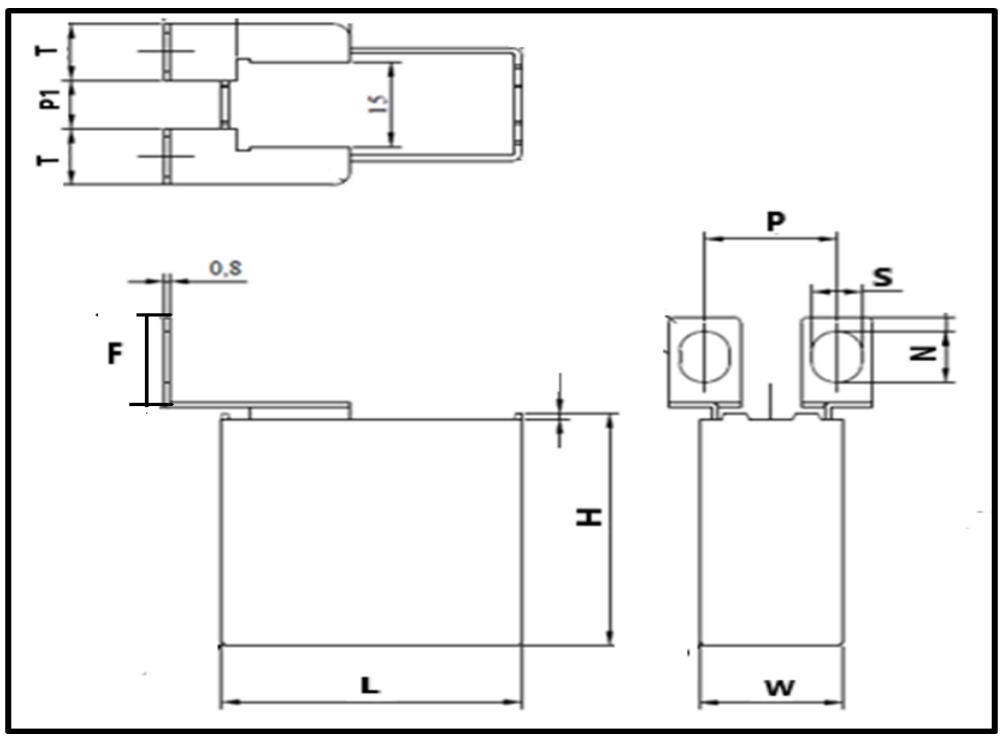
Drawing- D



T(mm)	F(mm)	N(mm)	S(mm)
16.0	12.0	8.2	6.2

Drawing- E



T(mm)	F(mm)	N(mm)	S(mm)
10.0	16.0	6.0	7.0

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121 - Metallized PP Snubber Capacitor - Box

General Technical Data

Dielectric	Double side Metallized Polypropylene film, Self-healing property
Application	Snubber capacitor for IGBT
Climatic Category	40/85/56 (IEC 60068 –1)
Max. Operating Temperature Range	-40°C to +85°C
Rated Temperature	+85°C(hotspot)
Applicable Standard	IEC 61071
Protection	Solvent resistance plastic case UL 94 V-0 compliant Thermosetting Epoxy resin sealing UL 94 V-0 compliant
Leads	Tin Plated Lugs
Installation	Any position
Packaging	Packed in cardboard trays with protection for the terminals
Marking Details	Manufacturer’s logo, Capacitor type, Rated capacitance, Tol., Rated voltage
RoHS Compliance	RoHS

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Electrical Parameters

Rated Capacitance range	0.047µF ~ 6.5µF	
Capacitance Tolerance	±5%, ±10%, ±20% measured at T= 20˚C ± 5˚C	
Rated DC Voltage(Ur)	850VDC ~ 3000VDC	
Permissible AC Voltage	450VAC ~ 750 VAC	
Dissipation factor Tan δ @ 20˚C	0.0010@1KHz	
Insulation resistance Rins given as time constant τ= $C_{R.}R_{ins}$ at 100VDC 20˚C,relative humidity ≤ 65% RH and for 60sec	Cn≤0.33µF I.R ≥ 100,000 MΩ	Cn>0.33µF I.R ≥ 30,000 s
Voltage proof test between terminals	1.6xUn For 60 s	
*Available on request Voltage proof between terminal to case	2000 VAC For 60 s	

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Dimension and Ordering code details:

Cap Value* (µF)	Dimensions Max. (WxHxL)	Size code	Irms Max @ 100 KHz	ESR 85°C @ 100 kHz mΩ	ESL (nH)	Dv/dt	I peak (Amps)	Part code
DC rated Voltage = 850Vdc,Vrms = 450Vac								
0.22	15x25x37	A,B,C,D,E	6	5	23	1200	264	121 224 K 2M 1 *
0.47	15x25x37	A,B,C,D,E	9	5	23	1200	564	121 474 K 2M 1 *
0.56	16x30x37	A,B,C,D,E	10	5	23	1200	696	121 564 K 2M 1 *
0.68	16x30x37	A,B,C,D,E	12	5	23	1200	816	121 684 K 2M 1 *
1.0	20x34x37	A,B,C,D,E	14	5	23	1200	1200	121 105 K 2M 1 *
1.2	20x34x37	A,B,C,D,E	16	5	23	1200	1440	121 125 K 2M 1 *
1.5	20x34x37	A,B,C,D,E	18	5	23	1200	1800	121 155 K 2M 1 *
1.5	20x40x42	A,B,C,D,E	18.5	4.5	29	750	1125	121 155 K 2M 1 *
2.0	20x40x42	A,B,C,D,E	19	4.5	29	750	1500	121 205 K 2M 1 *
2.2	20x40x42	A,B,C,D,E	19.5	4.5	29	750	1650	121 225 K 2M 1 *
2.5	24x40x42	A,B,C,D,E	20	4.5	29	750	1875	121 255 K 2M 1 *
3.0	24x44x42	A,B,C,D,E	21	4.5	29	750	2250	121 305 K 2M 1 *
3.3	30x45x42	A,B,C,D,E	21.5	4.5	29	750	2475	121 335 K 2M 1 *
4.0	35x50x42	A,B,C,D,E	22	4.5	29	750	3000	121 405 K 2M 1 *
4.0	30x45x57.5	A,B,C,D,E	23	4	33	450	1800	121 405 K 2M 1 *
4.7	30x45x57.5	A,B,C,D,E	24.5	4	33	450	2115	121 475 K 2M 1 *
5.0	30x45x57.5	A,B,C,D,E	25	4	33	450	2250	121 505 K 2M 1 *
6.0	35x50x57.5	A,B,C,D,E	26	4	33	450	2700	121 605 K 2M 1 *
6.5	35x50x57.5	A,B,C,D,E	27	4	33	450	2925	121 655 K 2M 1 *
DC rated Voltage = 1000Vdc,Vrms = 500Vac								
0.47	15x25x37	A,B,C,D,E	9	5	23	1300	611	121 474 K 3A 1 *
0.68	16x30x37	A,B,C,D,E	10.5	5	23	1300	884	121 684 K 3A 1 *
0.82	16x30x37	A,B,C,D,E	12	5	23	1300	1066	121 824 K 3A 1 *
1.0	20x34x37	A,B,C,D,E	15	4.5	23	1300	1300	121 105 K 3A 1 *
1.2	20x34x37	A,B,C,D,E	17	4.5	23	1300	1560	121 125 K 3A 1 *
1.2	20x40x42	A,B,C,D,E	16	4.5	29	850	1020	121 125 K 3A 1 *
1.5	20x40x42	A,B,C,D,E	16	4.5	29	850	1275	121 155 K 3A 1 *
2	24x44x42	A,B,C,D,E	17	4.5	29	850	1700	121 205 K 3A 1 *
2.2	24x44x42	A,B,C,D,E	20	4.0	29	850	1870	121 225 K 3A 1 *
2.5	30x45x42	A,B,C,D,E	21	4.0	29	850	2125	121 255 K 3A 1 *
3.0	30x45x42	A,B,C,D,E	21.5	4.0	29	850	2550	121 305 K 3A 1 *
3.3	30x45x57.5	A,B,C,D,E	20	4.0	33	500	1650	121 335 K 3A 1 *
4.0	30x45x57.5	A,B,C,D,E	21	4.0	33	500	2000	121 405 K 3A 1 *
4.7	35x50x57.5	A,B,C,D,E	22	4.0	33	500	2350	121 475 K 3A 1 *
5.0	35x50x57.5	A,B,C,D,E	23	4.0	33	500	2500	121 505 K 3A 1 *

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Cap Value* (µF)	Dimensions (WxHxL)	Size code	Irms Max @ 100 KHz	ESR 85°C @ 100 kHz mΩ	ESL (nH)	Dv/dt	I peak (Amps)	Part code
DC rated Voltage = 1250Vdc,Vrms = 600Vac								
0.33	15x25x37	A,B,C,D,E	9	4.5	23	1500	495	121 334 K 3B 1 *
0.47	16x30x37	A,B,C,D,E	11	4.5	23	1500	705	121 474 K 3B 1 *
0.68	20x34x37	A,B,C,D,E	12.5	4.5	23	1500	1020	121 684 K 3B 1 *
0.75	20x34x37	A,B,C,D,E	13	4.5	23	1500	1125	121 754 K 3B 1 *
0.82	20x40x42	A,B,C,D,E	14.5	4.0	29	950	779	121 824 K 3B 1 *
1.0	20x40x42	A,B,C,D,E	16	4.0	29	950	950	121 105 K 3B 1 *
1.2	24x44x42	A,B,C,D,E	19	4.0	29	950	1140	121 125 K 3B 1 *
1.5	24x44x42	A,B,C,D,E	19.5	4.0	29	950	1425	121 155 K 3B 1 *
2.0	30x45x42	A,B,C,D,E	20	4.0	29	950	1900	121 205 K 3B 1 *
2.2	30x45x42	A,B,C,D,E	21	4.0	29	950	2090	121 225 K 3B 1 *
2.2	30x45x57.5	A,B,C,D,E	21	3.8	33	600	1320	121 225 K 3B 1 *
2.5	30x45x57.5	A,B,C,D,E	22	3.8	33	600	1500	121 255 K 3B 1*
3.0	30x45x57.5	A,B,C,D,E	23	3.8	33	600	1800	121 305 K 3B 1 *
3.3	35x50x57.5	A,B,C,D,E	24	3.8	33	600	1980	121 335 K 3B 1 *
4.0	35x50x57.5	A,B,C,D,E	25	3.8	33	600	2400	121 405 K 3B 1 *
DC rated Voltage = 1600Vdc,Vrms = 650Vac								
0.22	15x25x37	A,B,C,D,E	8	6.0	23	1900	418	121 224 K 3C 1 *
0.33	16x30x37	A,B,C,D,E	10	6.0	23	1900	627	121 334 K 3C 1 *
0.39	20x34x37	A,B,C,D,E	12	5.5	23	1900	741	121 394 K 3C 1 *
0.47	30x34x37	A,B,C,D,E	14	5.5	23	1900	893	121 474 K 3C 1 *
0.68	20x40x42	A,B,C,D,E	16	4.0	29	1250	850	121 684 K 3C 1*
0.82	24x44x42	A,B,C,D,E	19	4.0	29	1250	1025	121 824 K 3C 1 *
1.0	30x45x42	A,B,C,D,E	19.5	4.0	29	1250	1250	121 105 K 3C 1 *
1.2	30x45x42	A,B,C,D,E	20	4.0	29	1250	1500	121 125 K 3C 1 *
1.5	30x45x42	A,B,C,D,E	21	4.0	29	1250	1875	121 155 K 3C 1 *
1.5	30x45x57.5	A,B,C,D,E	22	3.5	33	750	1125	121 155 K 3C 1 *
2.0	35x50x57.5	A,B,C,D,E	24	3.5	33	750	1500	121 205 K 3C1 *
DC rated Voltage = 2000Vdc,Vrms = 700Vac								
0.1	15x25x37	A,B,C,D,E	7	8.0	23	2241	224	121 104 K 3D 1 *
0.15	15x25x37	A,B,C,D,E	8.5	8.0	23	2241	336	121 154 K 3D 1 *
0.22	16x30x37	A,B,C,D,E	10	6.0	23	2241	493	121 224 K 3D 1 *
0.33	20x34x37	A,B,C,D,E	13	6.0	23	2241	740	121 334 K 3D 1 *
0.47	20x40x42	A,B,C,D,E	15.5	4.0	29	1300	611	121 474 K 3D 1 *
0.56	24x44x42	A,B,C,D,E	18	4.0	29	1300	728	121 564 K 3D 1 *
0.68	30x45x42	A,B,C,D,E	18.5	3.5	29	1300	884	121 684 K 3D 1 *
0.82	30x45x42	A,B,C,D,E	19	3.5	29	1300	1066	121 824 K 3D 1 *
1.0	30x45x42	A,B,C,D,E	21	3.5	29	1300	1300	121 105 K 3D 1 *
1.0	30x45x57.5	A,B,C,D,E	24	4.0	33	850	850	121 105 K 3D 1 *
1.2	30x45x57.5	A,B,C,D,E	23	4.0	33	850	1020	121 125 K 3D 1 *
1.5	35x50x57.5	A,B,C,D,E	24	4.0	33	850	1275	121 155 K 3D 1*

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Cap Value[1] (µF)	Dimensions (WxHxL)	Size code	Irms Max @ 100 KHz	ESR 85°C @ 100 kHz mΩ	ESL (nH)	Dv/dt	I peak (Amps)	Part code[2]
DC rated Voltage = 2500Vdc,Vrms = 725Vac								
0.068	15x25x37	A,B,C,D,E	6.5	8.5	23	3230	219	121 683 K 3E 1 *
0.1	16x30x37	A,B,C,D,E	8	8.5	23	3230	323	121 104 K 3E 1 *
0.15	20x34x37	A,B,C,D,E	11	8.0	23	3230	485	121 154 K 3E 1 *
0.18	20x34x37	A,B,C,D,E	12.5	7.5	23	3230	581	121 184 K 3E 1 *
0.22	20x40x42	A,B,C,D,E	14	4.0	29	2100	711	121 224 K 3E 1 *
0.33	24x44x42	A,B,C,D,E	15.5	4.0	29	2100	693	121 334 K 3E 1 *
0.47	30x45x42	A,B,C,D,E	18	3.5	29	2100	987	121 474 K 3E 1 *
0.68	30x45x42	A,B,C,D,E	18.5	3.5	29	2100	1428	121 684 K 3E 1 *
0.68	30x45x57.5	A,B,C,D,E	19	3.5	33	1200	816	121 684 K 3E 1 *
1.0	35x50x57.5	A,B,C,D,E	19.5	3.5	33	1200	1200	121 105 K 3E 1 *
DC rated Voltage = 3000Vdc,Vrms = 800Vac								
0.047	15x25x37	A,B,C,D,E	7.5	8.5	23	3361	158	121 473 K 3F 1 *
0.068	16x30x37	A,B,C,D,E	9	8.0	23	3361	229	121 683 K 3F 1 *
0.1	20x34x37	A,B,C,D,E	10.5	7.5	23	3361	336	121 104 K 3F 1 *
0.15	20x34x37	A,B,C,D,E	12	7.0	23	3361	504	121 154 K 3F 1 *
0.22	20x40x42	A,B,C,D,E	13	5.0	29	2050	451	121 224 K 3F 1 *
0.33	30x45x42	A,B,C,D,E	16.5	4.5	29	2050	677	121 334 K 3F 1 *
0.47	30x45x42	A,B,C,D,E	18	4.0	29	2050	964	121 474 K 3F 1 *
0.47	30x45x57.5	A,B,C,D,E	18.5	4.0	29	1200	564	121 474 K 3F 1 *
0.68	35x50x57.5	A,B,C,D,E	19	4.0	33	1200	816	121 684 K 3F 1 *
0.82	35x50x57.5	A,B,C,D,E	20	3.5	33	1200	984	121 824 K 3F 1 *

* Internal code

Note: 1. Intermediate values available on request

2. Other tol. Available on request

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Testing and Standards as per IEC- 61071

<table>
<tr><th>S.no</th><th>TEST</th><th>TEST METHOD</th><th>PERFORMANCE</th></tr>
<tr><td>1</td><td>Withstand Voltage test</td><td>a) Test voltage between terminals is 1.6Un.DC -60sec
b) Terminal and case: 2000Vac 60s</td><td>During the test, neither puncture nor flashover shall occur.
Self-healing breakdown are permitted.</td></tr>
<tr><td>2</td><td>Capacitance Measurement</td><td>The capacitance measurement shall be carried out after the voltage test between terminals :at 1KHz,1000mV</td><td>The capacitance measured shall not differ from the rated capacitance by more than ±5%</td></tr>
<tr><td>3</td><td>IR measurement between T-T</td><td>Capacitors are subjected 100Vdc for a period of 60s</td><td>Within specified limit</td></tr>
<tr><td>4</td><td>Tan δ measurement</td><td>The tan δ measurement shall be carried out after the voltage test between terminals :at 1KHz,1000mV</td><td>≤0.0010 @1kHz @1000mV @20℃</td></tr>
<tr><td>5</td><td>Resistance to soldering heat</td><td>Solder bath temperature at 260±5℃, immersion for 10s</td><td>I△C/CI≦0.5%;
Increase of Tan δ(1kHz)≤30%</td></tr>
<tr><td>6</td><td>Solder-ability</td><td>1) Solder specimen: H60A or H63A
2) Solder temp:235±5℃
Dipping time:2±0.5s</td><td>The lead wire should be covered with new solder over Circumference</td></tr>
<tr><td>7</td><td>Vibration tests</td><td>f=10Hz~55Hz / a=±0.35mm.
Test duration per axis = 10frequency cycles (3 axes offset from each other by 90°), 1 octave/min</td><td>Appearance and lead without breakage, The change of the capacitance Before and after the mechanical tests ≤0.5%
Increase of tan δ(1kHz) ≤30%</td></tr>
<tr><td>8</td><td>Robustness of terminations</td><td>1) Pull test
<table>
<tr><th>lead dia.(mm)</th><th>load(N)</th><th>time(sec)</th></tr>
<tr><td>0.5< d ≤ 0.8</td><td>10</td><td>10±1</td></tr>
<tr><td>0.8< d ≤ 1.25</td><td>20</td><td>10±1</td></tr>
</table>
2) Bend test
<table>
<tr><th>lead dia.(mm)</th><th>load(N)</th><th>kg</th></tr>
<tr><td>0.5< d ≤ 0.8</td><td>5</td><td>0.51</td></tr>
<tr><td>0.8< d ≤ 1.25</td><td>10</td><td>1</td></tr>
</table></td><td>No visible damage</td></tr>
<tr><td>9</td><td>Surge discharge test</td><td>The units shall be subjected to five such discharges (test voltage equal 1.1Un) ;
If a maximum surge current is specified, Shall be test with $1.1i_s$. After this test the units shall be subjected to a withstand voltage test between terminals</td><td>No visible damage
the change of capacitance shall be less than ±0.5%;
The change of tan δ shall be meet below requirements.
tan δ ≤1.2x tanδ_0+1×10^{-4}
(tan δ is the value after the test, tanδ_0 is the value before the test)</td></tr>
</table>

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10	Self-healing test	The capacitor or element shall be subjected for 10 s to a DC voltage equal to the routine test voltage, If fewer than five clearings occur during this time, the voltage shall be increased slowly until five or more clearings have occurred since the start of the test or until the voltage has reached 2,5 times the rated voltage. If fewer than five clearings have occurred when the voltage has reached 2,5 UN, for a time of 10 s, the test shall be finished.	The change of capacitance shall be less than ±0.5% The change of tan δ shall be meet below requirements. $tan\delta \leq 1.1\times tan\delta_0+1\times10^{-4}$ (tanδ is the value after the test, $tan\delta_0$ is the value before the test)
11	Damp heat, steady state	Acc. to IEC 60068-2-78 40±2°C/93±3%RH 56days: After completion of the steady-state test, the Capacitor shall be subjected to a voltage test between terminals	No puncturing or flashover. Self-healing punctures are permitted. The change in capacitance shall not exceed 2 %. Increase of tanδ(1kHz) ≤0.015
12	Thermal shock test	Change of temperature acc. to IEC 60068-2-14 Test Nb T.max=85°C T.Min=-40°C Transition time:1h equivalent to 1°C/min 5 cycles After this test the units shall be subjected to a withstand voltage test between terminals	No puncturing or flashover; Self-healing punctures permitted. I△C/CI≦2%; Increase of Tan δ(1kHz)≤30%
13	Thermal stability test	Temperature : (θamb)+5℃,frequency=10kHz regulate the adjusting the power to be 1.21×Pmax the capacitor shall be subjected for a period of at least 48h During the last 6h, the temperature of the case near the top shall be measured at least four times; throughout this period of 6h, the temperature rise shall not increase by more than 1°C	Temperature rise＜1℃ |△C/C|≤2% at 1kHz Increase of Tan δ(1kHz) ≤1.2×tan δ0+1x10^-4
14	Endurance Test	Test sequence: a) 1.3Vr at ambient temperature 85℃, duration:500h; b) 1000 times discharge at 1.4I_P (max.repetitive peak current in continuous operation) c) 1.3Vr at ambient temperature 85℃, duration:500h; d) After this test, the units shall Be subjected to a withstand voltage test between terminals.	The change of capacitance shall be less than ±3% at 1kHz The change of tan δ shall be met below requirements. |△tan δ|≤30% at 1kHz

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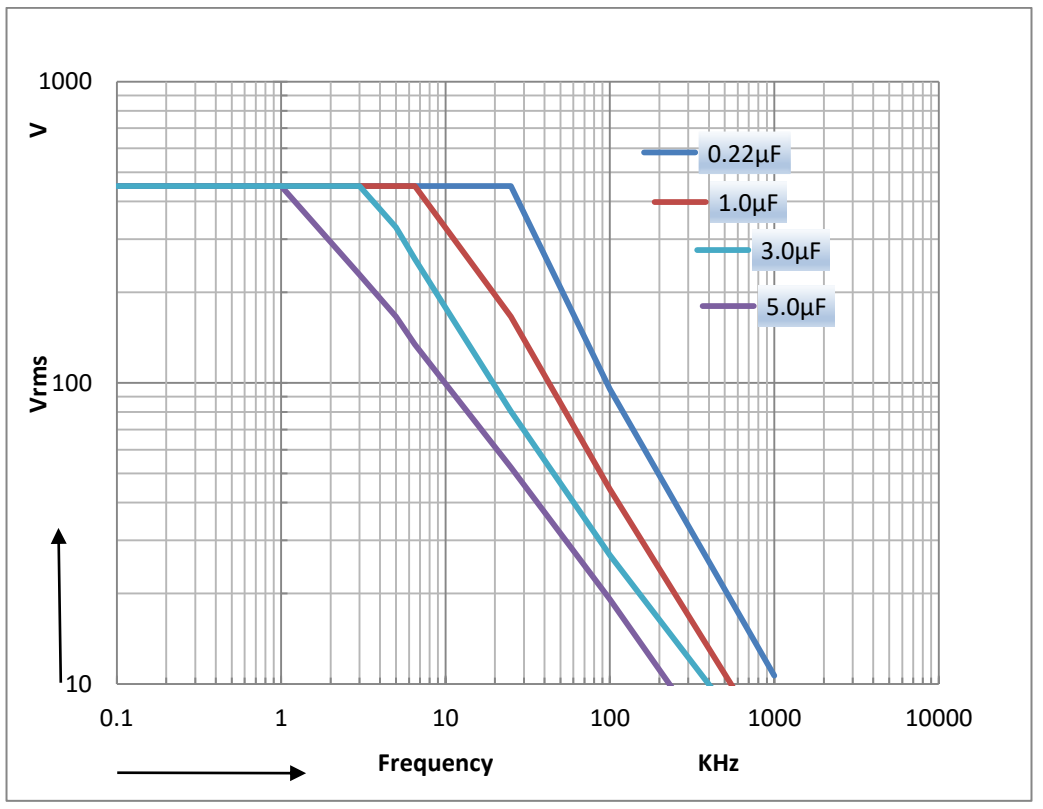
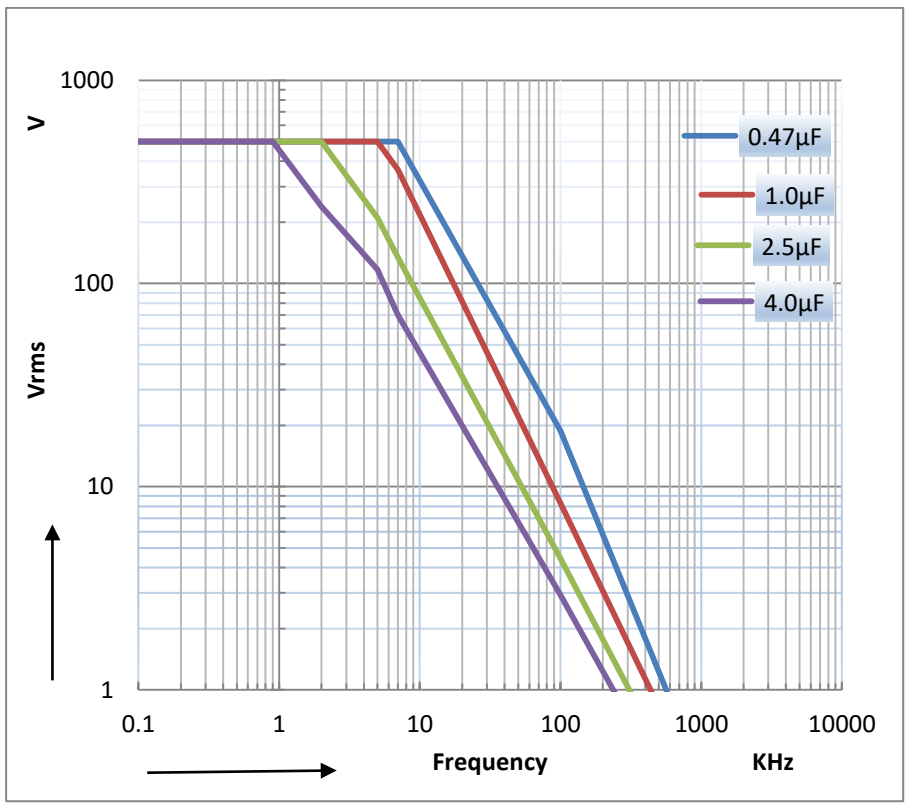
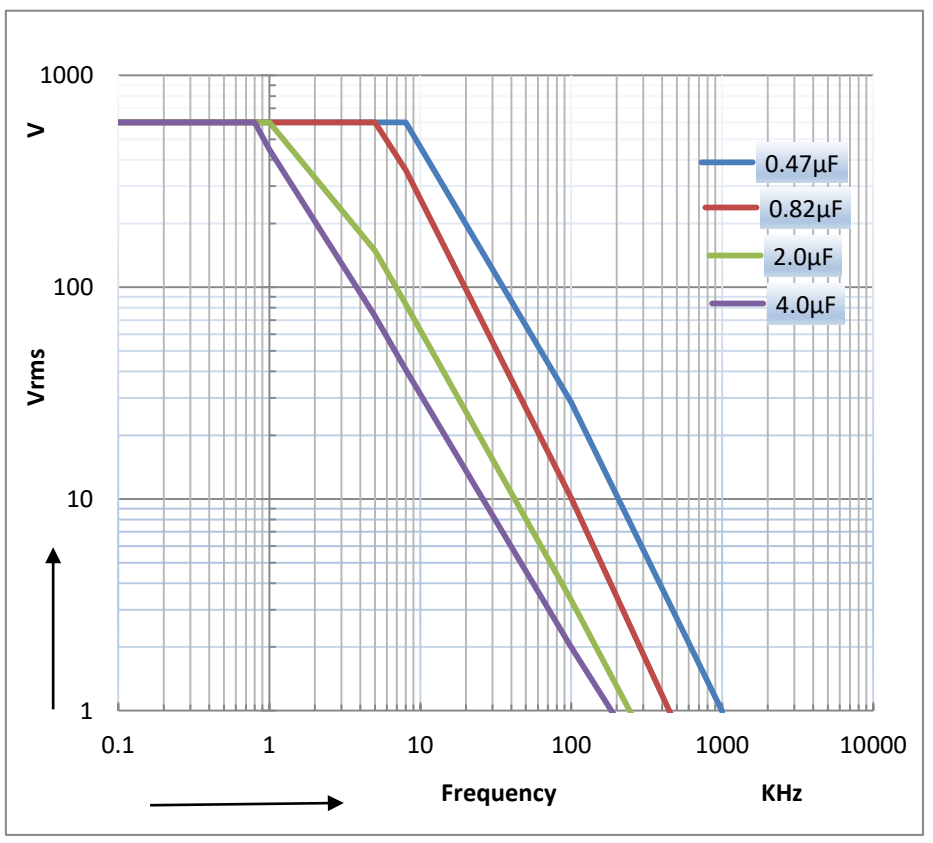
Voltage(Vrms) Vs frequency at 85°C temp.



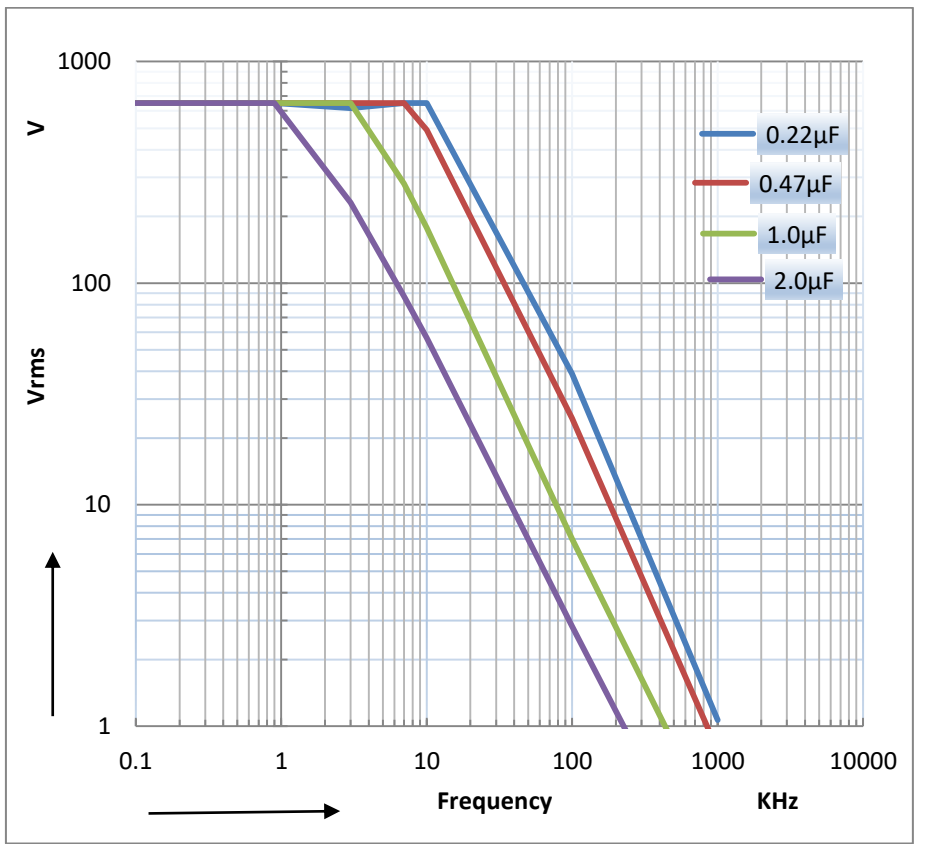
850Vdc/450Vac



1000Vdc/500Vac



1200Vdc/600Vac



1600Vdc/650Vac

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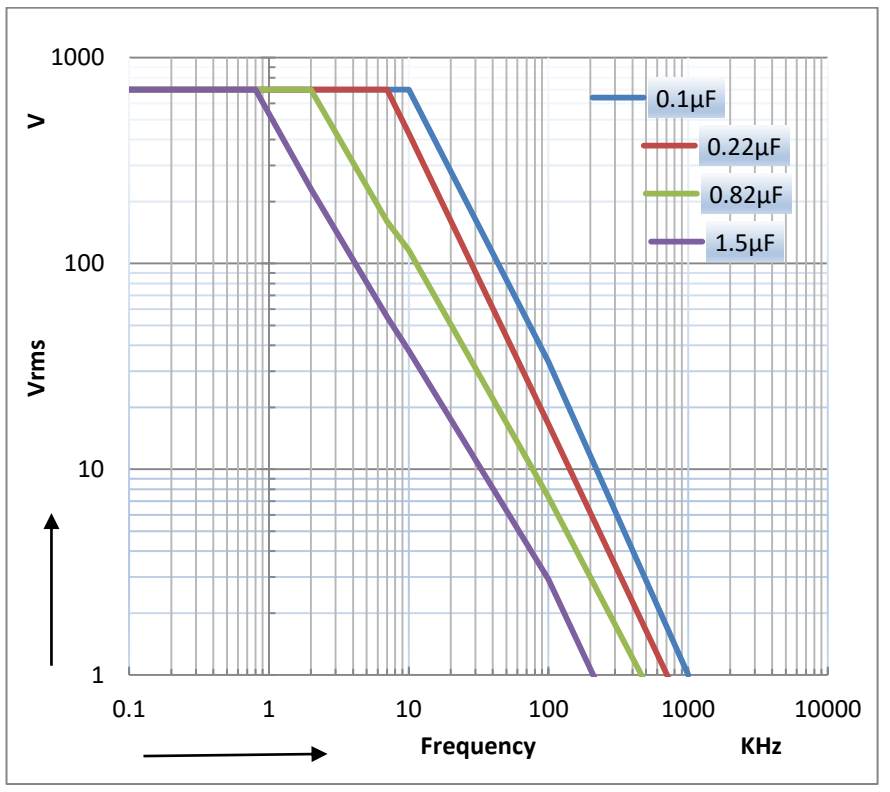
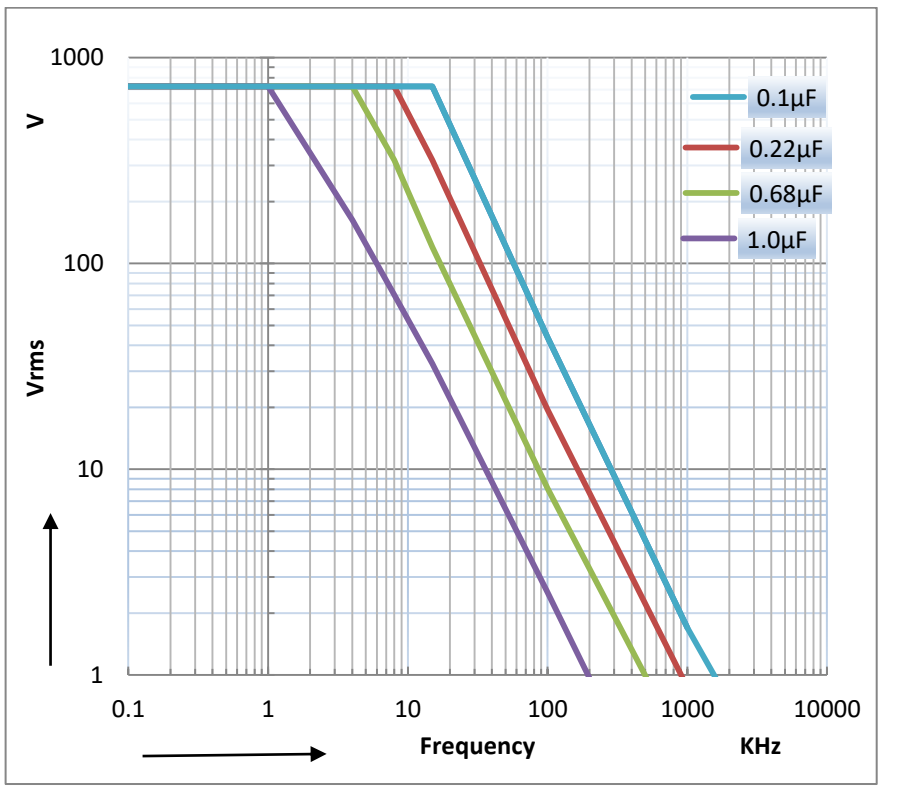
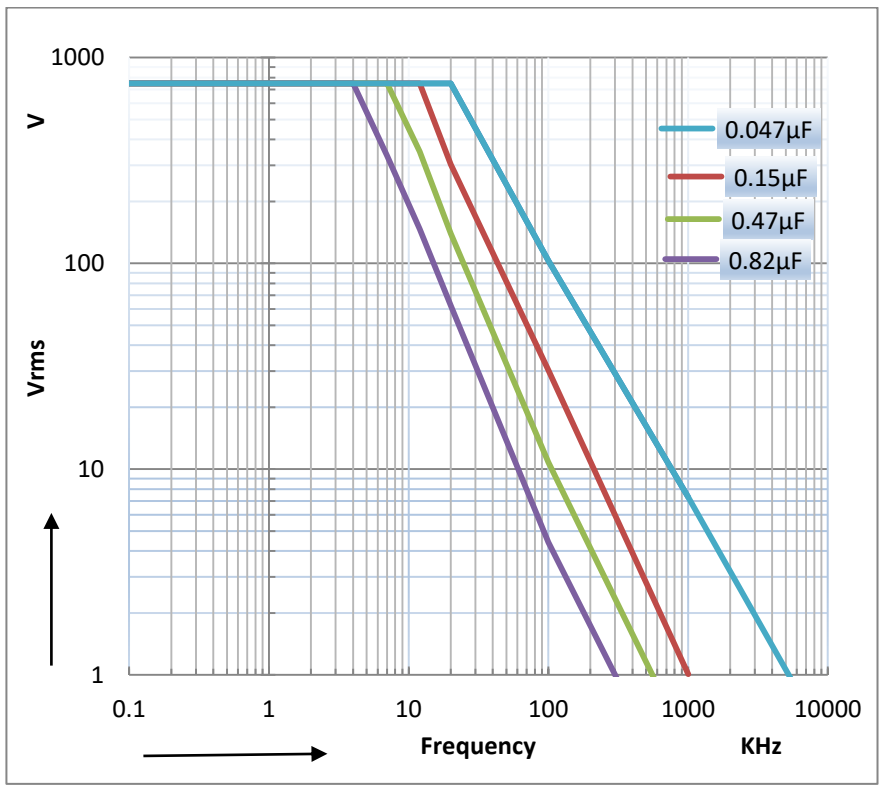
Voltage (Vrms) Vs frequency (f) at 85°C temp.



2000Vdc/700Vac



2500Vdc/725Vac



3000Vdc/750Vac

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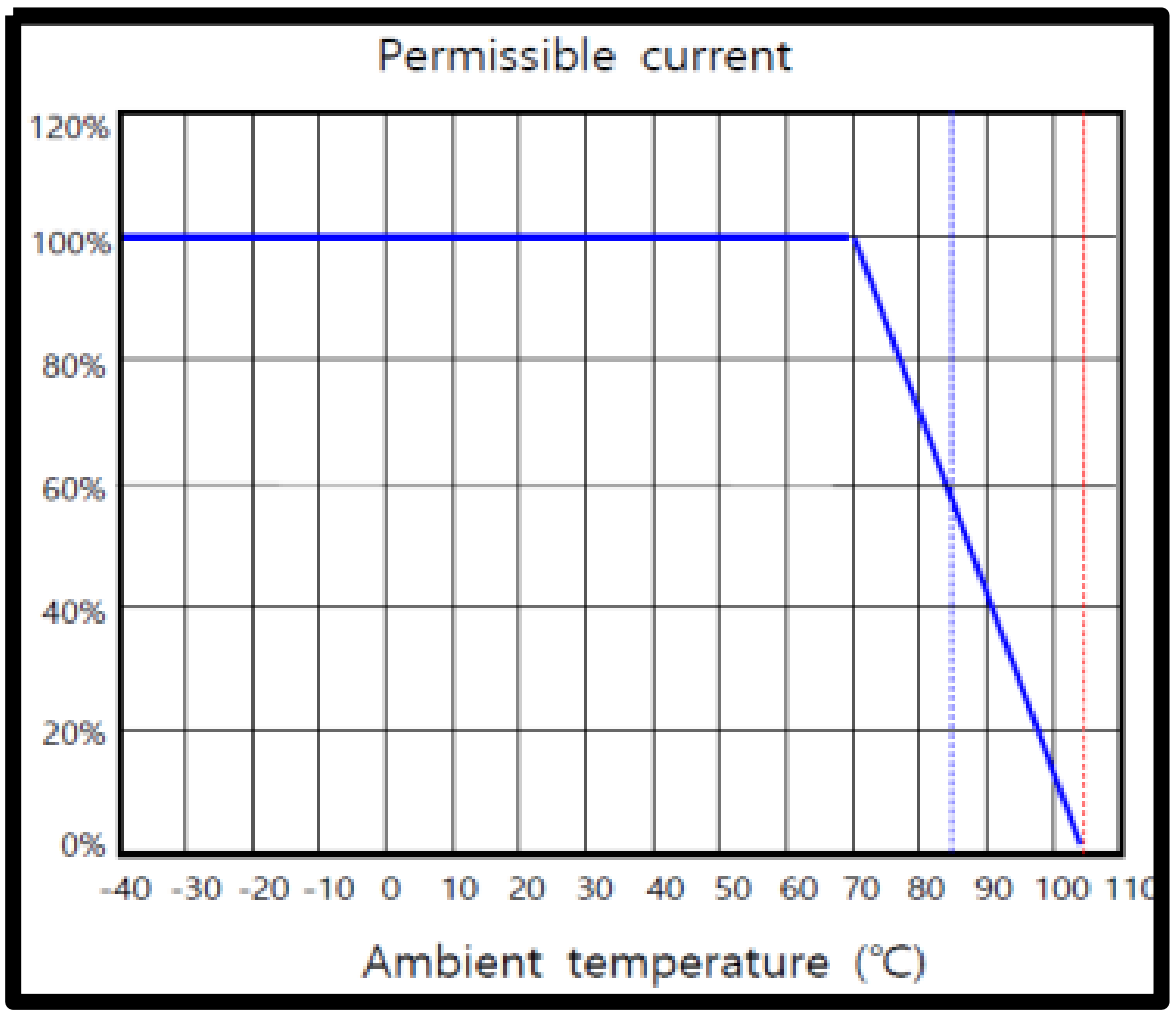
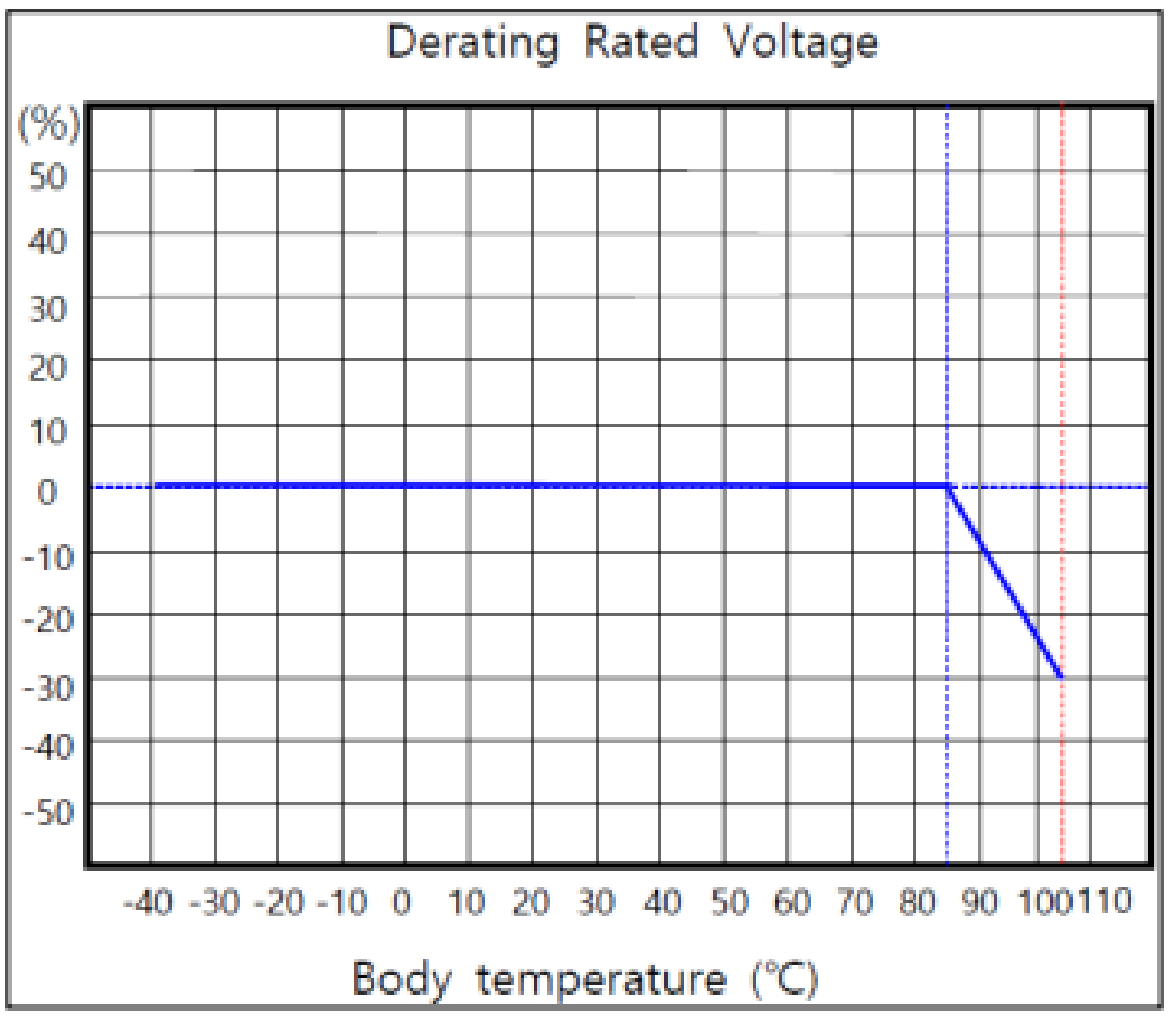
Current (Irms) vs Temperature



Voltage Vs Temperature



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Disclaimer

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