



Direct mount type film capacitor For Snubber

MIC-UB series



■ Features

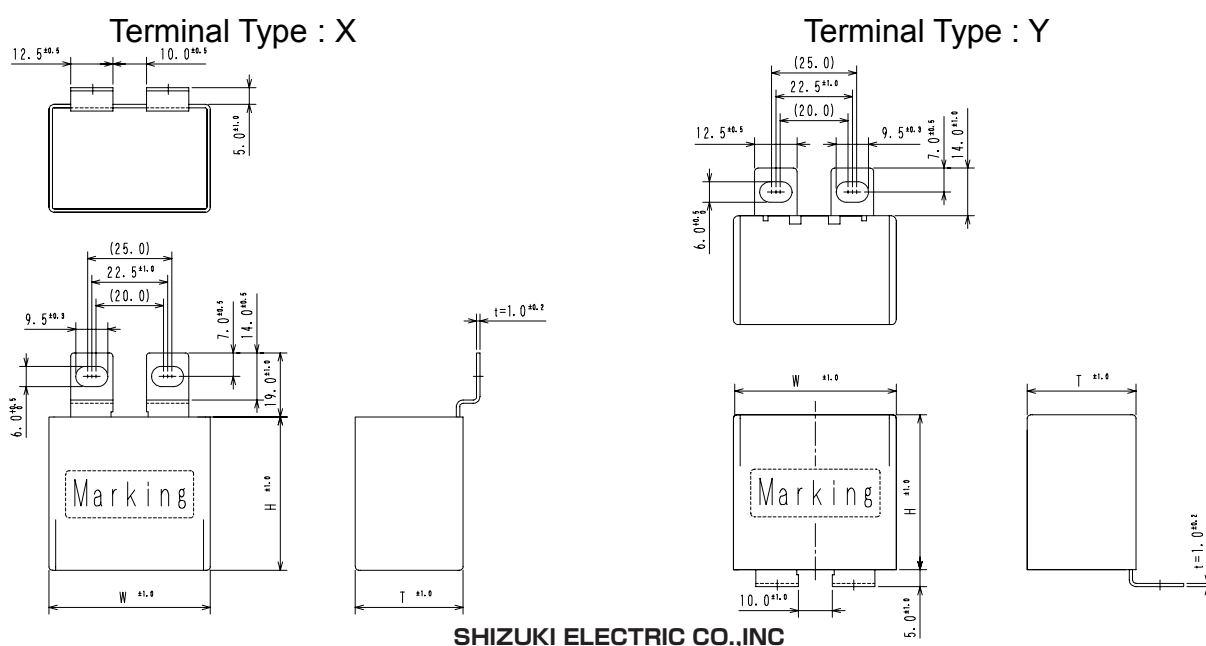
- Direct mount to IGBT/IPM terminals.
- Low ESR
- Low Inductance
- 85°C resistant case and filling resin / UL-94,V-0
- RoHS compliant

■ General specifications

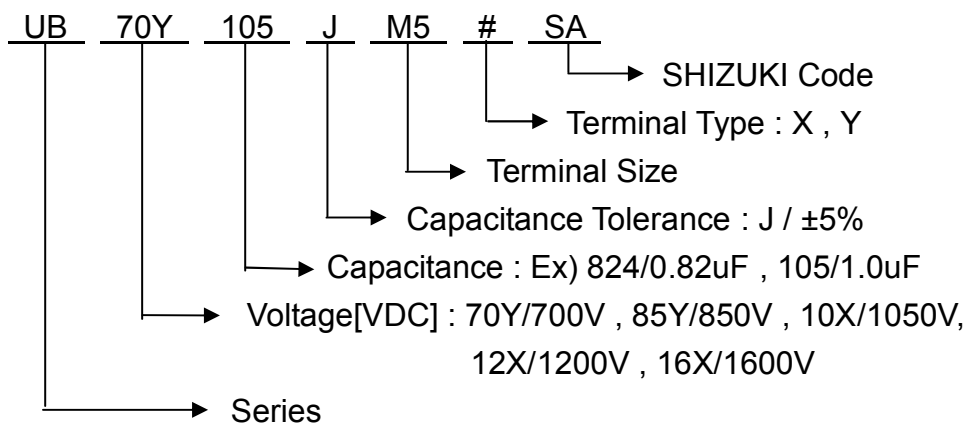
Reference Standards	:	IEC 61071 , JEM1419
Capacitance Tolerance	:	±5%
Dissipation Factor	:	<1.0uF : 0.1% max. ≥1.0uF : 0.2% max at 1kHz , 20°C
Test Voltage (T-T)	:	1.5 × rated voltage (VDC) for 10 second
Insulation Resistance (I.R.)	:	>1000/C _R MΩ at 100VDC for 1 minute at 20 °C
Temperature range	:	-40 °C to +85 °C (Capacitor surface)
Max. permissible operating temperature	:	Capacitor surface 105 °C (I _{rms} =0A)
ESL	:	W=38.0mm : <25nH W=47.5mm : <30nH
Lifetime Expectancy	:	100,000 hour at 85 °C (Capacitor surface) for R.V. Change of capacitance versus -5% or more

■ Dimensional Drawings

NS-KE3469



Construction of Parts Code



Electrical Specifications and Dimension

Parts Code /Ordering Code	R.V. [VDC]	Cap. [uF]	Irms* ¹ [Arms]	Ipeak* ² [A]	dv/dt* ³ [V/us]	ESR* ⁴ [mΩ]	Dimension [mm]		
							W	H	T
UB70Y105JM5#SA	700	1.0	11.6	540	540	3.1	38.0	33.5	23.0
UB70Y125JM5#SA	700	1.2	13.4	650	540	2.9	38.0	33.5	23.0
UB70Y155JM5#SA	700	1.5	16.1	820	540	2.8	38.0	39.0	25.5
UB70Y185JM5#SA	700	1.8	18.6	980	540	2.5	38.0	39.0	25.5
UB70Y205JM5#SA	700	2.0	19.0	740	370	3.4	47.5	39.5	26.0
UB70Y225JM5#SA	700	2.2	20.4	810	370	3.3	47.5	39.5	26.0
UB70Y255JM5#SA	700	2.5	22.6	920	370	3.1	47.5	39.5	26.0
UB70Y305JM5#SA	700	3.0	23.6	1110	370	3.0	47.5	39.5	26.0
UB70Y335JM5#SA	700	3.3	25.5	1220	370	2.9	47.5	39.5	26.0
UB70Y355JM5#SA	700	3.5	26.7	1290	370	2.8	47.5	45.5	32.0
UB70Y405JM5#SA	700	4.0	27.1	1480	370	2.9	47.5	45.5	32.0
UB85Y824JM5#SA	850	0.82	15.3	530	650	3.1	38.0	33.5	23.0
UB85Y105JM5#SA	850	1.0	15.5	650	650	2.9	38.0	39.0	25.5
UB85Y125JM5#SA	850	1.2	17.9	780	650	2.7	38.0	39.0	25.5
UB85Y155JM5#SA	850	1.5	21.4	980	650	2.5	38.0	39.0	25.5
UB85Y185JM5#SA	850	1.8	21.0	800	440	4.5	47.5	39.5	26.0
UB85Y205JM5#SA	850	2.0	22.8	890	440	4.0	47.5	39.5	26.0
UB85Y225JM5#SA	850	2.2	24.7	970	440	3.5	47.5	39.5	26.0
UB85Y255JM5#SA	850	2.5	27.3	1110	440	3.0	47.5	45.5	32.0
UB85Y305JM5#SA	850	3.0	27.6	1330	440	2.8	47.5	45.5	32.0
UB85Y335JM5#SA	850	3.3	27.8	1460	440	2.6	47.5	45.5	32.0
UB85Y355JM5#SA	850	3.5	29.2	1550	440	2.5	47.5	45.5	32.0
UB10X684JM5#SA	1050	0.68	11.8	520	760	3.8	38.0	33.5	23.0
UB10X824JM5#SA	1050	0.82	12.1	620	760	3.3	38.0	39.0	25.5
UB10X105JM5#SA	1050	1.0	16.1	760	760	2.8	38.0	39.0	25.5
UB10X125JM5#SA	1050	1.2	18.7	910	760	2.4	38.0	39.0	30.0
UB10X155JM5#SA	1050	1.5	19.7	770	510	3.5	47.5	39.5	26.0
UB10X185JM5#SA	1050	1.8	22.8	930	510	3.3	47.5	45.5	32.0
UB10X205JM5#SA	1050	2.0	24.9	1030	510	3.1	47.5	45.5	32.0
UB10X225JM5#SA	1050	2.2	26.0	1140	510	3.0	47.5	45.5	32.0
UB10X255JM5#SA	1050	2.5	27.3	1290	510	2.9	47.5	49.5	39.0
UB10X305JM5#SA	1050	3.0	28.0	1550	510	2.8	47.5	49.5	39.0

*1. The maximum rms current for continuous operation. (Max.at100kHz,Tamb.70°C)

*2. The maximum peak current for non repetitive operation

*3. The maximum voltage pulse slope for non repetitive operation

The maximum peak voltage must not exceed the "Maximum permissible voltages"

*4. Typical value at100kHz, Tamb.20 °C

■ Electrical Specifications and Dimension

Parts Code /Ordering Code	Voltage [VDC]	Cap. [μF]	Irms ^{*1} [Arms]	Ipeak ^{*2} [A]	dv/dt ^{*3} [V/μs]	ESR ^{*4} [mΩ]	Dimension [mm]		
							W	H	T
UB12X474JM5#SA	1200	0.47	12.9	410	870	4.1	38.0	33.5	23.0
UB12X564JM5#SA	1200	0.56	14.8	490	870	3.8	38.0	33.5	23.0
UB12X684JM5#SA	1200	0.68	17.3	590	870	3.5	38.0	39.0	25.5
UB12X824JM5#SA	1200	0.82	19.4	710	870	3.0	38.0	39.0	30.0
UB12X105JM5#SA	1200	1.0	23.7	870	870	2.5	38.0	39.0	30.0
UB12X125JM5#SA	1200	1.2	20.4	710	590	3.4	47.5	39.5	26.0
UB12X155JM5#SA	1200	1.5	24.4	890	590	3.3	47.5	45.5	32.0
UB12X185JM5#SA	1200	1.8	25.4	1060	590	3.2	47.5	45.5	32.0
UB12X205JM5#SA	1200	2.0	27.1	1180	590	3.1	47.5	49.5	39.0
UB12X225JM5#SA	1200	2.2	26.6	1300	590	2.9	47.5	49.5	39.0
UB12X255JM5#SA	1200	2.5	29.2	1480	590	2.8	47.5	49.5	39.0

UB16X224JM5#SA	1600	0.22	10.0	280	1310	5.7	38.0	33.5	23.0
UB16X274JM5#SA	1600	0.27	11.0	350	1310	4.9	38.0	39.0	25.5
UB16X334JM5#SA	1600	0.33	12.6	430	1310	3.9	38.0	39.0	30.0
UB16X394JM5#SA	1600	0.39	13.6	410	1310	2.9	38.0	39.0	30.0
UB16X474JM5#SA	1600	0.47	14.4	410	890	6.2	47.5	39.5	26.0
UB16X564JM5#SA	1600	0.56	16.0	490	890	5.8	47.5	45.5	32.0
UB16X684JM5#SA	1600	0.68	17.4	600	890	5.2	47.5	45.5	32.0
UB16X824JM5#SA	1600	0.82	20.2	730	890	4.6	47.5	45.5	32.0
UB16X105JM5#SA	1600	1.0	22.0	890	890	3.8	47.5	49.5	39.0

^{*1}. The maximum rms current for continuous operation (Max.at100kHz, Tamb.70°C)

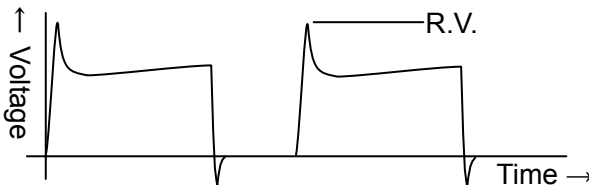
^{*2}. The maximum peak current for non repetitive operation

^{*3}. The maximum voltage pulse slope for non repetitive operation

The maximum peak voltage must not exceed the "Maximum permissible voltages"

^{*4}. Typical value at100kHz, Tamb.20 °C

■ Terms and Definitions

Symbol	Terms and Definitions
R.V.	Rated DC voltage Maximum operating peak voltage of either polarity but of a non-reversing type waveform, for which the capacitor has been designed, for continuous operation. 
C _R	Rated capacitance
Irms	Sine wave Current root mean square value maximum r.m.s. current for continuous operation
dv/dt	Rated voltage pulse slope
ESR	Equivalent series resistance

■ Performance and Tests

NE-KE3966

No.	Test	Test Method		Requirement
2.1	Voltage Tests	T-T ^{*1}	Rated volt. x 1.5 VDC 10 sec.	Shall withstand the test
		T-C ^{*2}	2000 VAC min. 10 sec.	Shall withstand the test
2.2	Capacitance	1000±200Hz and 5Vrms max.		Per the attached drawing
2.3	Insulation Resistance	T-T ^{*1}	Measure 60±5 sec. after charged at 100±15VDC	1000 MΩ/C _R ^{*3} min.
		T-C ^{*2}	Measure 60±5 sec. after charged at 500±50VDC	1000 MΩ/term. min.
2.4	Dissipation Factor (D.F.)	1000±200Hz and 5Vrms max. under the standard conditions		<1.0uF : 0.1% max. ≥1.0uF : 0.2% max
2.5	Damp Heat Test	Temperature : 40±2°C Relative humidity : 93±3% Preferred test durations are : 24 h and 56 days		No physical defects Capacitance change ΔC/C : ±2% D.F change Δtanδ : ≤0.05% (at 1kHz) Insulation resistance : 50% of min. As-specified value
2.6	Low Temperature Test	Temperature : -40±3°C Voltage : R.V.x1.1 (VDC) Durations : 48h		No physical defects Capacitance change ΔC/C : ±4%
2.7	Thermal Shock Test	Upper temperature : 85°C Lower temperature : -40°C Transition time : 1h Temperature change average rate below 5°C/minit Durations : 5cycle		Capacitance change ΔC/C : ±5% ESR change ΔESR : ≤1mΩ (at 100kHz) Insulation resistance : 50% of min. As-specified value
2.8	Endurance Test	Temperature : 85±3°C Voltage : R.V.x1.25 (VDC) Durations : 1000h		No physical defects Capacitance change ΔC/C : ±5% D.F change Δtanδ : ≤0.05% (at 1kHz) Insulation resistance : 50% of min. As-specified value
2.9	Vibration Test	Frequency range : 10 Hz to 55 Hz Amplitude : ±0.35 mm Duration per axis : 10 frequency cycles (3 axes offset from each other by 90°), 1 octave/min.		Termination shall not be loose nor break

*1 : T - T: between terminals

*2 : T - C: between the terminals connected together and the case

*3 : C_R: Rated capacitance in micro farads (μF)

■ Routine Tests and Type Tests

Following table shows the tests to be performed and the quantities of samples for routine tests and type tests.

No.	Tests to be Performed		Routine Test In-process Inspection (n)*	Type Test
—	Physical		100% (N/A)	N/A
—	Marking		100% (N/A)	N/A
—	Shorts & Opens		100% (N/A)	N/A
2.1	Voltage Test	T-T	100% (N/A)	n = 10
		T-C	N/A (N/A)	n = 10
2.2	Capacitance		100% (n = 5)	n = 10
2.3	Insulation	T-T	100% (n = 5)	n = 10
	Resistance	T-C	N/A (N/A)	n = 10
2.4	D.F.		100% (n = 5)	n = 10
2.5	Damp Heat Test		N/A (N/A)	n = 10
2.6	Low Temperature Test		N/A (N/A)	n = 10
2.7	Thermal Shock Test		N/A (N/A)	n = 5
2.8	Endurance Test		N/A (N/A)	n = 10
2.9	Vibration Test		N/A (N/A)	n = 5

Note : D.F. = Dissipation Factor

Routine Test : Test report covering the quantity (n)* shown in parentheses will be forwarded on each shipment or each invoice.

Type Test : Test report or technical paper will be forwarded if requested.

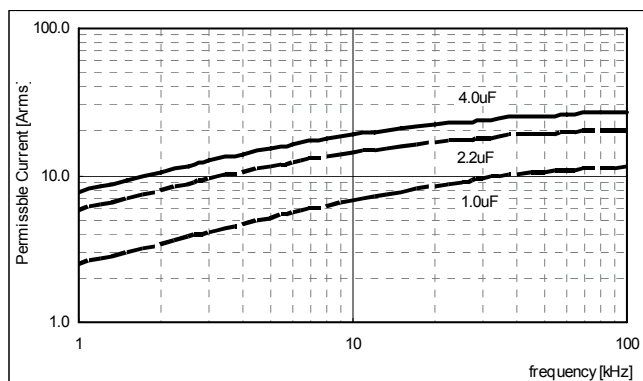
■ Maximum permissible voltages

Conditions within the Operating Temperature

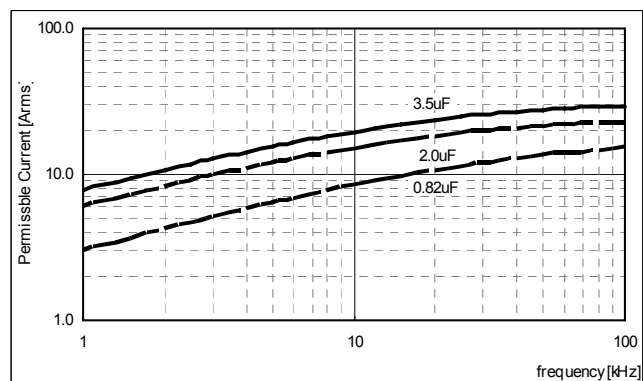
Voltage Ratio	Duration	Frequency
1.10 x R.V.	≤30%/operating time	—
1.15 x R.V.	≤30minutes/24hours	—
1.20 x R.V.	≤5minutes	≤200times/life time
1.30 x R.V.	≤1minute	≤200times/life time
1.50 x R.V.	≤0.1second	≤200times/life time

■ Permissible Current

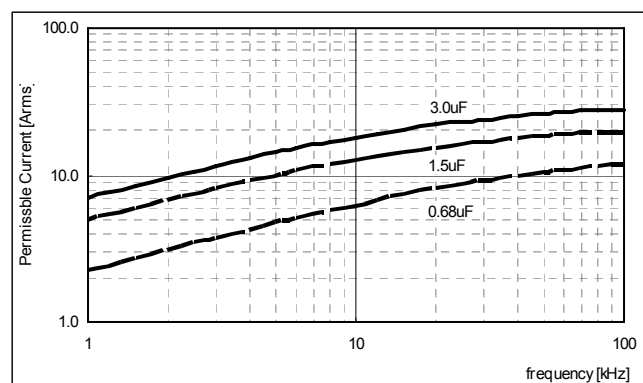
[700VDC]



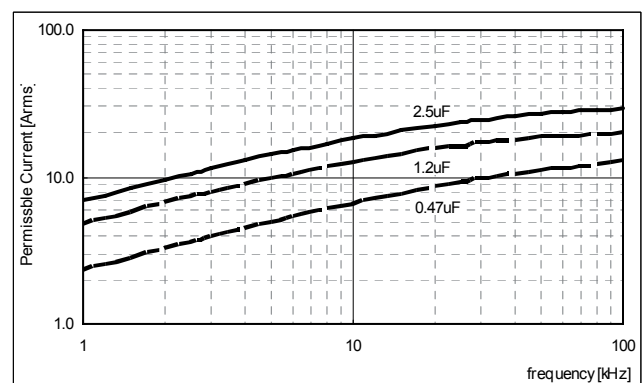
[850VDC]



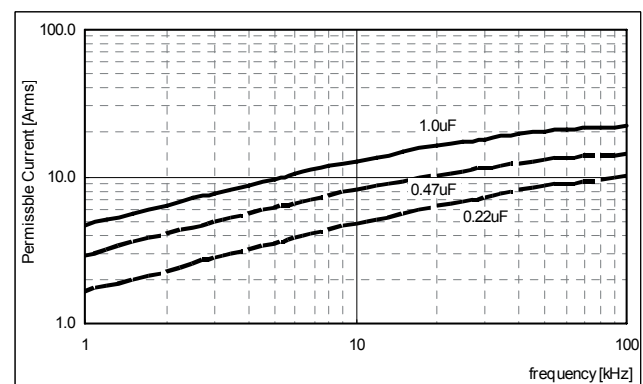
[1000VDC]



[1200VDC]



[1600VDC]



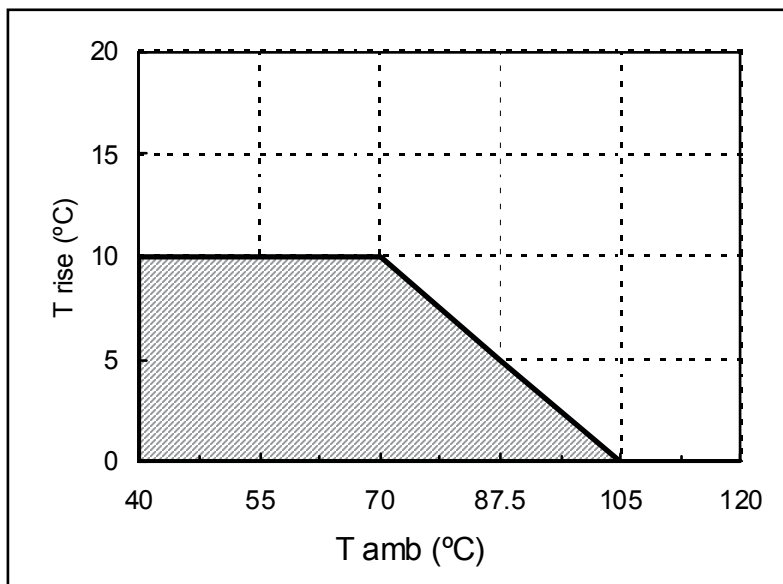
* Temperature : Capacitor surface temperature at 70°C

* Permissible R.M.S. Voltage (sinewave) : $I_{rms} / (2 \times \pi \times \text{Frequency}[\text{Hz}] \times \text{Cap.}[\text{F}])$

■ Operating Temperature

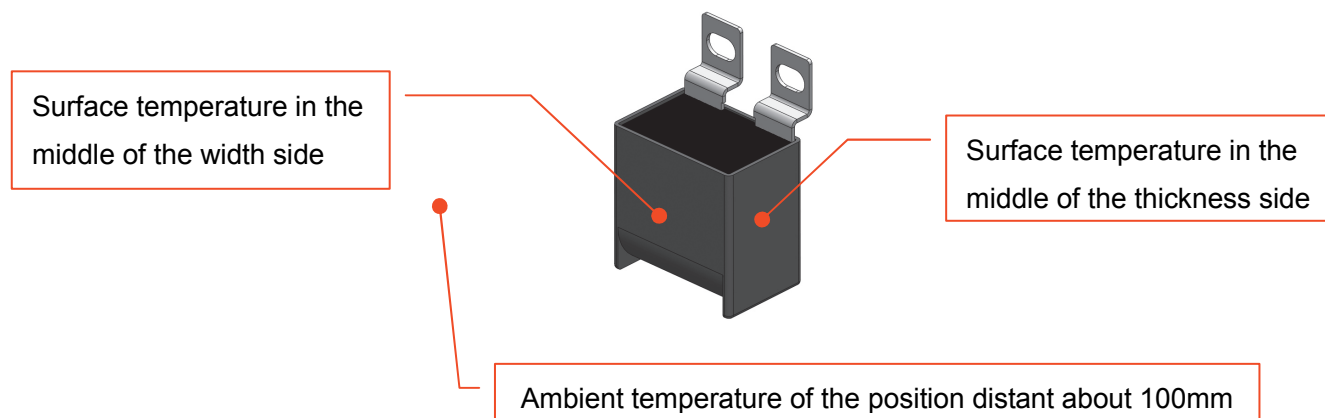
Operating temperature must be within the hatched area on the following graph.

T_{amb} : Ambient temperature T_{rise} : Capacitor surface temperature rise (Self-heating)



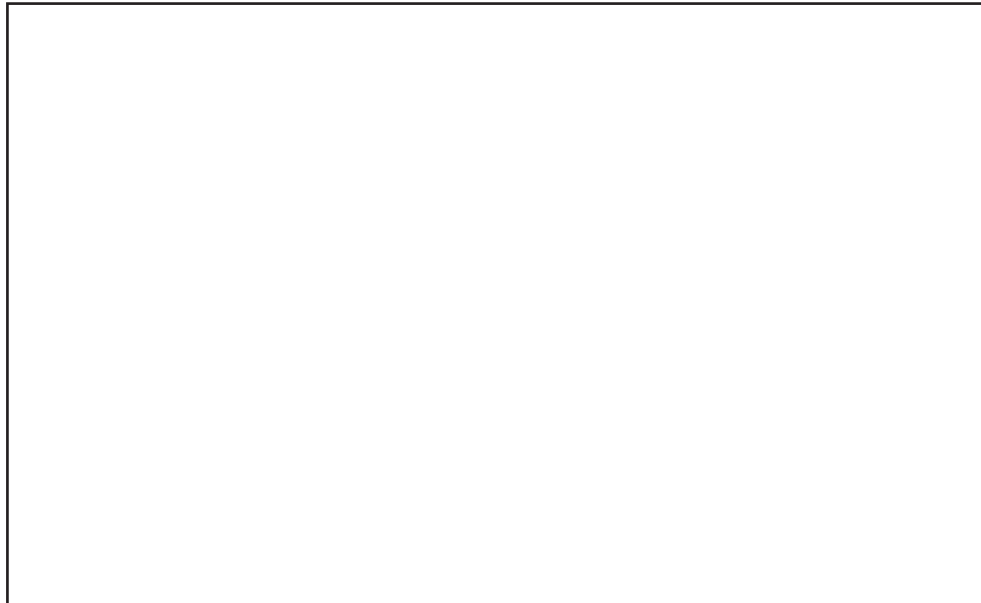
■ Measurement of Self-heat

- 1) Please fix thermocouple such as CA-wire or CC-wire on capacitor surface by thermally-conductive adhesive tape such as aluminum, and measure capacitor temperature in calm environment not to be influenced by heat of peripheral parts.
- 2) Whichever is higher, surface temperature of main body or surface temperature of a lead drawer side, is defined as temperature rise.
- 3) Ambient temperature should be measured at 100mm away from the capacitor.
- 4) Please confirm the real heat generation (hottest point) of the capacitor in the system by all means.



■ Cautions in Selection

- 1) Please check the environment of usage and mounting, and use capacitors within the range of rated property specified in catalog and approval specifications.
- 2) Please use capacitors within category temperature range specified in catalog and approval specifications. Please follow the prescribed instruction in case that there is a distinction between storage temperature and operating temperature.
- 3) Do not use capacitors under rapid temperature change, even if within specified temperature range.
- 4) Do not use capacitors under high humidity environment that induces dew condensation.
- 5) It is necessary to select the most suitable capacitor according to usage conditions. Please note that property degradation of capacitor may be accelerated if capacitor choice is wrong.
- 6) Please consult us in advance if application specific capacitor will be applied to other applications.
- 7) Do not do charge and discharge under the conditions that exceeding specified level, because it causes property degradation or breakdown.
- 8) Voltage applied to capacitor should be under peak value of surge and ripple unless otherwise prescribed.
- 9) Operating voltage should be derated according to specified derating rate when capacitors are used with rated voltage and over maximum operating temperature.
- 10) Capacitor temperature rise by self-heating in calm environment should be under specified value. Please note that temperature rise changes according to operating temperature. Please refer to another section for measuring method of capacitor temperature rise.
- 11) Please use same series and same rating capacitors considering current balance in case that multiple capacitors are connected in parallel.
- 12) Please use same series and same rating capacitors considering voltage balance in case that multiple capacitors are connected in series.
- 13) Beat noise may be generated in case that AC voltage is applied to capacitor. Please consult us if beat noise becomes a issue.



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