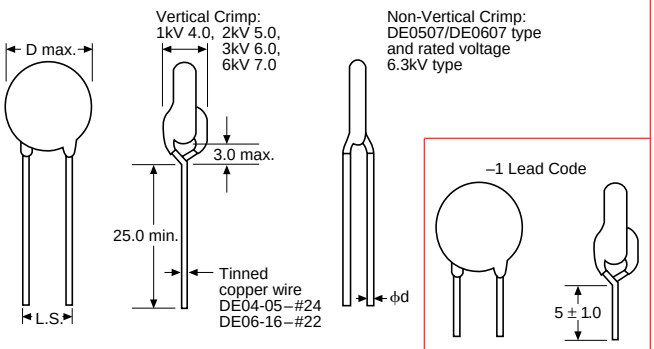
MEDIUM VOLTAGE CAPACITORS
1kV to 6kVDC E.I.A. CLASS II & III

DE Series

DIMENSIONS: mm



PART NUMBERING SYSTEM

TYPE	LEADS	–		TEMP. CHAR.	CAPACITANCE	TOL.	VOLTAGE
DE04	05	–	□	B	101	K	1K

CAPACITOR TYPE AND SIZE

LEAD SPACING
05 = 5
07 = 7.5
10 = 10

LEAD/ TAPING CODE
See following page

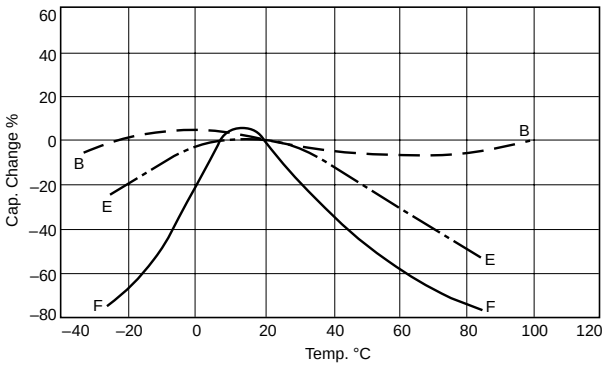
TEMPERATURE CHARACTERISTICS
Class I: Per standard EIA specifications.
Class II & III:
TEMPERATURE RANGE: –25°C to +85°C
MAX. CAP. CHANGE OVER TEMP. RANGE:
B = ±10%
E = +20, –55%
F = +30, –80%

CAPACITANCE VALUE
3-digit code

CAPACITANCE TOLERANCE
J = ±5%
K = ±10%
Z = +80, –20%

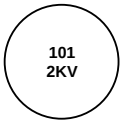
VOLTAGE
Identified by a one-digit number

TYPICAL TEMPERATURE CHARACTERISTICS

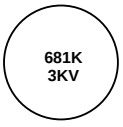


MARKING*

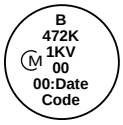
DE04, 05, 06



DE07, 08, 09



DE10 & Larger



*Three-digit capacitance code for values of 100pF and larger.
SL and F have no temperature characteristic marking.

MEDIUM VOLTAGE CAPACITORS
1kV to 6kVDC E.I.A. CLASS II & III

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Innovator in Electronics

DE Series

B CHARACTERISTIC (Similar to EIA Temperature Characteristic Y5P)

Part Number (□: optional lead code shown at the right)	Nominal Capacitance (pF)	Max. Body Diameter D (mm)	Lead Spacing F (mm)	Rated Voltage (kVDC)	□: Lead Configuration/Lead Code					
					Straight Long	Straight Short	Double Crimp	Taping*†		
								 Lead Spacing F: 5.0 Pitch of Component P: 12.7	 Lead Spacing F: 7.5 Pitch of Component P: 15.0	 Lead Spacing F: 7.5 Pitch of Component P: 30.0
DE0405□B101K1K DE0405□B151K1K DE0405□B221K1K DE0405□B331K1K	100 150 220 330	4.5	5.0	1	No Code	–1	–69	–979	—	—
DE0505□B471K1K	470	5								
DE0605□B681K1K DE0605□B102K1K	680 1000	6								
DE0805□B152K1K	1500	8								
DE0905□B222K1K	2200	9								
DE1005□B332K1K	3300	10								
DE1207□B472K1K	4700	12	7.5					—	–486	
DE1507□B682K1K	6800	15					–610			–477
DE0405□B101K2K DE0405□B151K2K DE0405□B221K2K	100 150 220	4.5	5.0	2			—	–979	—	—
DE0505□B331K2K	330	5								
DE0605□B471K2K	470	6								
DE0705□B681K2K	680	7								
DE0805□B102K2K	1000	8								
DE0905□B152K2K	1500	9								
DE1005□B222K2K	2200	10								
DE1207□B332K2K	3300	12	7.5					—	–486	
DE1507□B472K2K	4700	15					–610		—	–477
DE0507□B101K3K DE0507□B151K3K DE0507□B221K3K	100 150 220	5	7.5	3.15			–620		–486	—
DE0607□B331K3K	330	6								
DE0707□B471K3K	470	7								
DE0807□B681K3K	680	8								
DE0907□B102K3K	1000	9								
DE1107□B152K3K	1500	11								
DE1307□B222K3K	2200	13								
DE1507□B332K3K	3300	15					–610			–477
DE0910□B101K6K DE0910□B151K6K DE0910□B221K6K DE0910□B331K6K	100 150 220 330	9	10.0	6.3	No Code Bulk Only	—	—		—	—
DE1010□B471K6K	470	10								
DE1110□B681K6K	680	11								
DE1310□B102K6K	1000	13								

*900 pcs. for KH type

E CHARACTERISTIC (Similar to EIA Temperature Characteristic Y5U)

DE0505□E102Z1K	1000	5	5.0	1	No Code	–1	–69	–979	—	—
DE0705□E222Z1K	2200	7								
DE0905□E472Z1K	4700	9								
DE1307□E103Z1K	10000	13	7.5				–620	—	–486	
DE0605□E102Z2K	1000	6	5.0	2			—	–979	—	
DE0805□E222Z2K	2200	8								
DE1105□E472Z2K	4700	11								
DE1607□E103Z2K	10000	16	7.5				–610	—		–477
DE0707□E102Z3K	1000	7	7.5	3.15			–620		–486	—
DE1007□E222Z3K	2200	10								
DE1307□E472Z3K	4700	13								
DE1110□E102Z6K	1000	11	10.0	6.3	Bulk Only	—	—		—	
DE1510□E222Z6K	2200	15								

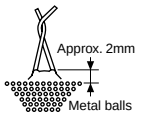
F CHARACTERISTIC (Similar to EIA Temperature Characteristic Y5V)

Part Number (□: optional lead code shown at the right)	Nominal Capacitance (pF)	Max. Body Diameter D (mm)	Lead Spacing F (mm)	Rated Voltage (kVDC)	□: Lead Configuration/Lead Code				
					Straight Long	Straight Short	Double Crimp	Taping*†	
								 Lead Spacing F: 5.0 Pitch of Component P: 12.7	 Lead Spacing F: 7.5 Pitch of Component P: 15.0
DE0605□F222Z1K	2200	6	5.0	1	No Code	–1	–69	–979	—
DE0705□F472Z1K	4700	7							
DE1005□F103Z1K	10000	10							
DE0505□F102Z2K	1000	5	5.0	2			—		
DE0705□F222Z2K	2200	7							
DE0905□F472Z2K	4700	9							
DE1207□F103Z2K	10000	12	7.5					—	–486

All "No Code" bulk versions standard through authorized Murata Electronics Distributors. †See page 64 for specifications.

*900 pcs. for KH type

MEDIUM VOLTAGE CAPACITORS
1kV to 6kVDC E.I.A. CLASS II & III–SPECIFICATIONS & TEST METHODS DE Series

Item			Specification: Temperature Compensating	Specification: High Dielectric Constant	Test Method
1	Operating Temperature Range		–25 to +85°C	–25 to +85°C	—
2	Capacitance		Within the specified tolerance.	Within the specified tolerance.	The capacitance shall be measured at 20°C with 1 ± 0.2kHz (SL: 1 ± 0.2MHz) and 5V(r.m.s.) max.
3	Q Dissipation Factor (D.F.)		SL: C ≥ 30pF: Q ≥ 1000 C < 30pF: Q ≥ 400 + 20C[1]	B, E: D.F. ≤ 2.5% F: D.F. ≤ 5.0%	Same condition as capacitance.
4	Insulation Resistance (I.R.)	Between lead wires	10000M ohms min.	10000M ohms min.	The insulation resistance shall be measured with 500 ± 50VDC within 60 ± 5 sec. of charging.
5	Dielectric Strength	Between lead wires	No failure.	No failure.	The capacitors shall not be damaged when DC voltage of 200% of the rated voltage is applied between the lead wires for 1 to 5 sec. (Charge/discharge current ≤50mA)
		Body Insulation	No failure.	No failure.	The capacitor is placed in the container with metal balls of diameter 1mm so that each lead wire, short-circuited, is kept approximately 2mm off the balls as shown in the figure, and DC voltage of 1.3kV is applied for 1 to 5 sec. between capacitor lead wires and small metals. (Charge/discharge current ≤50mA). 
6	Temperature Characteristic		T.C. SL: Temp. Coefficient +350 to –1000ppm/°C	T.C. B: Cap. Change within ±10% E: within $^{+20}_{-55}$% F: within $^{+30}_{-80}$%	The capacitance measurement shall be made at each step specified in table. Capacitance change from the value of step 3 shall not exceed the limit specified. Char. \ Step: 1 / 2 / 3 / 4 / 5 SL: — / — / 20 ± 2°C / 85 ± 2°C / 20 ± 2°C B, E, F: 20 ± 2°C / –25 ± 3°C / 20 ± 2°C / 85 ± 2°C / 20 ± 2°C **Pre-treatment** Capacitor shall be stored at 85 ± 2°C for 1 hour, then placed at room condition[2] for 24 ± 2 hours before initial measurements (B, E, F).
7	Vibration Resistance	Appearance	No marked defect.	No marked defect.	The capacitor shall firmly be soldered to the supporting lead wire and vibration which is 10 to 55Hz in the vibration frequency range, 1.5mm in total amplitude, and about 1 minute in the rate of vibration change from 10Hz to 55Hz and back to 10Hz is applied for a total of 6 hours; 2 hours each in 3 mutually perpendicular directions.
		Capacitance Change	Within the specified tolerance.	Within the specified tolerance.	
		Q. D.F.	SL: C ≥ 30pF: Q ≥ 1000 C < 30pF: Q ≥ 400 + 20C[1]	B, E: D.F. ≤ 2.5% F: D.F. ≤ 5.0%	
8	Soldering Effect	Appearance	No marked defect.	No marked defect.	The lead wire shall be immersed into the melted solder of 350 ± 10°C (body of ϕ5 and under: 270 ± 5°C) up to about 1.5 to 2mm from the main body for 3.5 ± 0.5 sec. (body of ϕ5 and under: 5 ± 0.5 sec.). **Pre-treatment** Capacitor shall be stored at 85 ± 2°C for 1 hour, then placed at room condition[2] for 24 ± 2 hours before initial measurements (B, E, F). **Post-treatment** Capacitor shall be stored for 1 to 2 hours at room condition[2] (SL). Capacitor shall be stored for 24 ± 2 hours at room condition[2] (B, E, F).
		Capacitance Change	SL: within ±2.5%	B: within ±5% E: within ±15% F: within ±20%	
		Dielectric Strength (between lead wires)	Pass the item No. 5.	Pass the item No. 5.	
9	Humidity (Under Steady State)	Appearance	No marked defect.	No marked defect.	Set the capacitor for 500 $^{+24}_{-0}$ hours at 40 ± 2°C in 90 to 95% humidity. **Pre-treatment** Capacitor shall be stored at 85 ± 2°C for 1 hour, then placed at room condition[2] for 24 ± 2 hours before initial measurements (B, E, F). **Post-treatment** Capacitor shall be stored for 1 to 2 hours at room condition[2].
		Capacitance Change	SL: within ±5%	B: within ±10% E: within ±20% F: within ±30%	
		Q. D.F.	SL: C ≥ 30pF: Q ≥ 350 C < 30pF: Q ≥ 275 + 5/2C[1]	B, E: D.F. ≤ 5.0% F: D.F. ≤ 7.5%	
		I.R.	1000M ohms min.	1000M ohms min.	
10	Humidity Loading	Appearance	No marked defect.	No marked defect.	Apply the rated voltage for 500 $^{+24}_{-0}$ hours at 40 ± 2°C in 90 to 95% humidity. (Charge/discharge current ≤50mA). **Pre-treatment** Capacitor shall be stored at 85 ± 2°C for 1 hour, then placed at room condition[2] for 24 ± 2 hours before initial measurements (B, E, F). **Post-treatment** Capacitor shall be stored for 1 to 2 hours at room condition[2] (SL). Capacitor shall be stored at 85 ± 2°C for 1 hour, then placed at room condition[2] for 24 ± 2 hours (B, E, F).
		Capacitance Change	SL: within ±7.5%	B: within ±10% E: within ±20% F: within ±30%	
		Q. D.F.	SL: C ≥ 30pF: Q ≥ 200 C < 30pF: Q ≥ 100 + 10/3C[1]	B, E: D.F. ≤ 5.0% F: D.F. ≤ 7.5%	
		I.R.	500M ohms min.	500M ohms min.	
11	Life	Appearance	No marked defect.	No marked defect.	Apply a DC voltage of 150% of the rated voltage for 1000 $^{+48}_{-0}$ hours at 85 ± 2°C. (Charge/discharge current ≤50mA). **Pre-treatment** Capacitor shall be stored at 85 ± 2°C for 1 hour, then placed at room condition[2] for 24 ± 2 hours before initial measurements (B, E, F). **Post-treatment** Capacitor shall be stored for 1 to 2 hours at room condition[2] (SL). Capacitor shall be stored at 85 ± 2°C for 1 hour, then placed at room condition[2] for 24 ± 2 hours (B, E, F).
		Capacitance Change	SL: within ±3%	B: within ±10% E: within ±20% F: within ±30%	
		Q. D.F.	SL: C ≥ 30pF: Q ≥ 350 C < 30pF: Q ≥ 275 + 5/2C[1]	B, E: D.F. ≤ 4.0% F: D.F. ≤ 7.5%	
		I.R.	2000M ohms min.	2000M ohms min.	
12	Strength of Lead	Pull	Lead wire shall not cut off. Capacitor shall not be broken.		As in figure, fix the body of capacitor, apply a tensile weight gradually to each lead wire in the radial direction of capacitor up to 10N (1.0kgf) 5N (0.51kgf) for lead diameter ϕ0.5, and keep it for 10 ± 1 sec. 
		Bending			Each lead wire shall be subjected to 5N (0.51kgf) 2.5N (0.25kgf) for lead diameter ϕ0.5 weight and then a 90° bend, at the point of egress, in one direction, return to original position, and then a 90° bend in the opposite direction at the rate of one bend in 2 to 3 seconds.
13	Solderability of Leads		Lead wire shall be soldered with uniform coating on the axial direction over 3/4 of the circumferential direction.		The lead wire of a capacitor shall be dipped into a methanol solution of 25wt% rosin and then into molten solder of 235 ± 5°C for 2 ± 0.5 seconds. In both cases the depth of dipping is up to about 1.5 to 2mm from the root of lead wires.

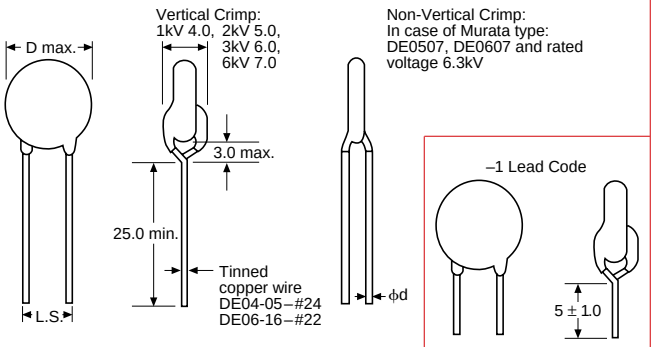
[1]"C" expresses nominal capacitance value (pF). [2]"room condition" temperature: 15 to 35°C; humidity: 45 to 75%; atmospheric pressure: 860 to 1060hPa.

HIGH TEMPERATURE CAPACITORS
250V to 3kVDC E.I.A. CLASS I & II

muRata
Innovator in Electronics

DE Series

DIMENSIONS: mm



PART NUMBERING SYSTEM

TYPE	LEADS	–	□	TEMP. CHAR.	CAPACITANCE	TOL.	VOLTAGE
DE04	05			SL	120	J	1K

CAPACITOR TYPE AND SIZE

LEAD SPACING
05 = 5
07 = 7.5
10 = 10

LEAD/ TAPING CODE
See following pages

TEMPERATURE CHARACTERISTICS
–25°C to +125°C
MAX. CAP. CHANGE OVER TEMP. RANGE
SL = +350–1000ppm/°C

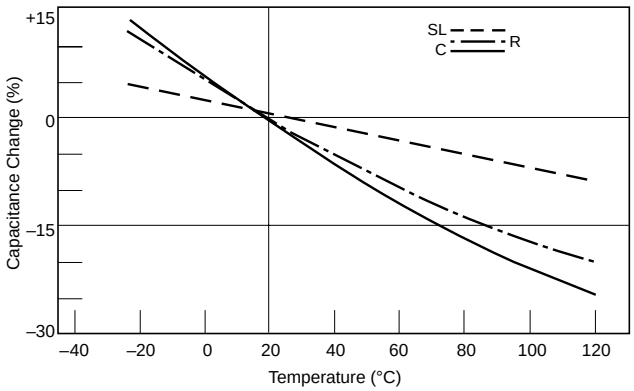
CAPACITANCE VALUE
Expressed in picofarads and identified by a three-digit number. First two digits represent significant figures. Last digit specifies the number of zeros to follow.

CAPACITANCE TOLERANCE
D = ±0.5pF
J = ±5% (SL only)
K = ±10%

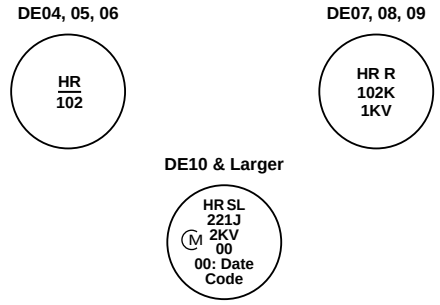
VOLTAGE
Identified by a one, two or three digit number.

	–25°C to +85°C	+85°C to +125°C
R =	±15%	+15, –30%
C =	±20%	+15, –30%

TYPICAL TEMPERATURE VS. CAPACITANCE CHANGE

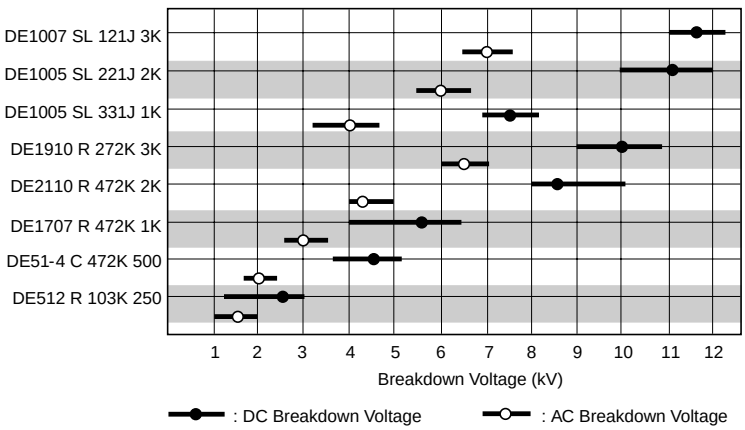


MARKING*



*Working Voltage not marked for 500V. Three-digit capacitance code for values 100pF and higher.

TYPICAL AC/DC BREAKDOWN VOLTAGE



SL CHARACTERISTIC

Part Number (□: optional lead code shown at the right)	Nominal Capacitance (pF)	Max. Body Diameter D (mm)	Lead Spacing F (mm)	Rated Voltage (kVDC)	□: Lead Configuration/Lead Code					
					Straight Long	Straight Short	Double Crimp	Taping*†		
								 Lead Spacing F: 5.0 Pitch of Component P: 12.7	 Lead Spacing F: 7.5 Pitch of Component P: 15.0	 Lead Spacing F: 7.5 Pitch of Component P: 30.0
DE0405□SL100D1K	10	4.5	5.0	1	No Code	–1	–69	–979	—	—
DE0405□SL120J1K	12									
DE0405□SL150J1K	15									
DE0405□SL180J1K	18									
DE0405□SL220J1K	22									
DE0405□SL270J1K	27									
DE0405□SL330J1K	33									
DE0405□SL390J1K	39									
DE0405□SL470J1K	47									
DE0505□SL560J1K	56	5								
DE0505□SL680J1K	68									
DE0605□SL820J1K	82	6								
DE0605□SL101J1K	100									
DE0605□SL121J1K	120									
DE0705□SL151J1K	150	7								
DE0705□SL181J1K	180									
DE0805□SL221J1K	220	8								
DE0905□SL271J1K	270	9								
DE1005□SL331J1K	330	10								
DE1005□SL391J1K	390									
DE1105□SL471J1K	470	11								
DE1207□SL561J1K	560	12	7.5				–620	—	–486	
DE0405□SL100D2K	10	4.5	5.0	2			–69	–979	—	
DE0405□SL120J2K	12									
DE0405□SL150J2K	15									
DE0405□SL180J2K	18									
DE0405□SL220J2K	22									
DE0405□SL270J2K	27									
DE0405□SL330J2K	33									
DE0505□SL390J2K	39	5								
DE0605□SL470J2K	47	6								
DE0605□SL560J2K	56									
DE0605□SL680J2K	68									
DE0705□SL820J2K	82	7								
DE0705□SL101J2K	100									
DE0805□SL121J2K	120	8								
DE0805□SL151J2K	150									
DE0905□SL181J2K	180	9								
DE1005□SL221J2K	220	10								
DE1107□SL271J2K	270	11	7.5				–620	—	–486	
DE1207□SL331J2K	330	12								
DE1307□SL391J2K	390	13								
DE1407□SL471J2K	470	14							—	–477
DE1507□SL561J2K	560	15								
DE0507□SL100D3K	10	5	7.5	3.15	—	—	—	—	–486	—
DE0507□SL120J3K	12									
DE0507□SL150J3K	15									
DE0507□SL180J3K	18									
DE0507□SL220J3K	22									
DE0607□SL270J3K	27	6								
DE0607□SL330J3K	33									
DE0607□SL390J3K	39									
DE0707□SL470J3K	47	7								
DE0707□SL560J3K	56									
DE0807□SL680J3K	68	8								
DE0807□SL820J3K	82									
DE0907□SL101J3K	100	9								
DE1007□SL121J3K	120	10								
DE1107□SL151J3K	150	11								
DE1107□SL181J3K	180									
DE1207□SL221J3K	220	12								
DE1407□SL271J3K	270	14							—	–477
DE1507□SL331J3K	330	15								

*900 pcs. for KH type

R CHARACTERISTIC (250V)

Part Number (□: optional lead code shown at the right)	Nominal Capacitance (pF)	Max. Body Diameter D (mm)	Lead Spacing F (mm)	Rated Voltage (VDC)	□: Lead Configuration/Lead Code			
					Straight Long	Straight Short	Double Crimp	Taping*†
								 Lead Spacing F: 5.0 Pitch of Component P: 12.7
DE506□R221K250	220	6	5.0	250	No Code	–1	–69	–979
DE506□R331K250	330							
DE506□R471K250	470							
DE506□R681K250	680							
DE506□R102K250	1000							
DE507□R152K250	1500	7						
DE508□R222K250	2200	8						
DE509□R332K250	3300	9						
DE510□R472K250	4700	10						
DE512□R682K250	6800	12						

All "No Code" bulk versions standard through authorized Murata Electronics Distributors. †See page 64 for specifications. *900 pcs. for KH type

HIGH TEMPERATURE CAPACITORS
250V to 3kVDC E.I.A. CLASS I & II

muRata
Innovator in Electronics

DE Series

R CHARACTERISTIC (1 to 3.15kV)

Part Number (□: optional lead code shown at the right)	Nominal Capacitance (pF)	Max. Body Diameter D (mm)	Lead Spacing F (mm)	Rated Voltage (kVDC)	□: Lead Configuration/Lead Code					
					Straight Long	Straight Short	Double Crimp	Taping*†		
								 Lead Spacing F: 5.0 Pitch of Component P: 12.7	 Lead Spacing F: 7.5 Pitch of Component P: 15.0	 Lead Spacing F: 7.5 Pitch of Component P: 30.0
DE0705□R221K1K DE0705□R331K1K DE0705□R471K1K	220 330 470	7	5.0	1	No Code	–1	–69	–979	—	—
DE0805□R681K1K	680	8								
DE0905□R102K1K	1000	9								
DE1105□R152K1K	1500	11								
DE1310□R222K1K	2200	13	10.0				–610	—	–486	
DE1510□R332K1K	3300	15							—	–477
DE1710□R472K1K	4700	17								
DE0707□R221K2K DE0707□R271K2K	220 270	7	7.5	2			–620	—	–486	—
DE0807□R331K2K DE0807□R391K2K	330 390	8								
DE0907□R471K2K DE0907□R561K2K	470 560	9								
DE1007□R681K2K	680	10								
DE1107□R821K2K	820	11								
DE1207□R102K2K DE1207□R122K2K DE1207□R152K2K	1000 1200 1500	12								
DE1407□R182K2K	1800	14								–477
DE1507□R222K2K	2200	15								
DE1707□R272K2K	2700	17								
DE1910□R332K2K	3300	19	10.0				–810	—	—	—
DE2010□R392K2K	3900	20								
DE2110□R472K2K	4700	21								
DE0707□R151K3K DE0707□R181K3K DE0707□R221K3K DE0707□R271K3K	150 180 220 270	7	7.5	3.15		—	—		–486	
DE0807□R331K3K	330	8								
DE0907□R391K3K	390	9								
DE1007□R471K3K DE1007□R561K3K	470 560	10								
DE1107□R681K3K	680	11								
DE1207□R821K3K	820	12								
DE1307□R102K3K	1000	13								
DE1407□R122K3K	1200	14								
DE1507□R152K3K	1500	15							—	–477
DE1607□R182K3K	1800	16								
DE1707□R222K3K	2200	17								
DE1910□R272K3K	2700	19	10.0							—

*900 pcs. for KH type

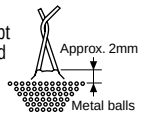
C CHARACTERISTIC

Part Number (□: optional lead code shown at the right)	Nominal Capacitance (pF)	Max. Body Diameter D (mm)	Lead Spacing F (mm)	Rated Voltage (VDC)	□: Lead Configuration/Lead Code			
					Straight Long	Straight Short	Double Crimp	Taping*†
								 Lead Spacing F: 5.0 Pitch of Component P: 12.7
DE50-6□C331K500 DE50-6□C471K500	330 470	6	5.0	500	No Code	–1	–69	–979
DE50-7□C681K500	680	7						
DE50-8□C102K500	1000	8						
DE50-9□C152K500	1500	9						
DE51-0□C222K500	2200	10						
DE51-2□C332K500	3300	12						
DE51-4□C472K500	4700	14	10.0				–610	—

†See page 64 for specifications.

*900 pcs. for KH type

HIGH TEMPERATURE CAPACITORS
250V to 3kVDC E.I.A. CLASS I & II–SPECIFICATIONS & TEST METHODS DE Series

	Item		Specification		Test Method
1	**Operating Temperature Range**		–25 to +125°C		—
2	**Capacitance**		Within the specified tolerance.		The capacitance shall be measured at 20°C with 1 ± 0.2kHz (SL: 1 ± 0.2MHz) and 5V(r.m.s.) max.
3	**Q** **Dissipation Factor (D.F.)**		C ≥ 30pF: Q ≥ 1000 C < 30pF: Q ≥ 400 + 20C[1](SL)	D.F. ≤ 0.4% (R [250V]) D.F. ≤ 0.2% (R [1 to 3.15kV]) D.F. ≤ 0.3% (C)	Same condition as capacitance.
4	**Insulation Resistance (I.R.)**	**Between lead wires**	10000M ohms min. (SL, R [1 to 3.15kV], C)	1000M ohms min. (R [250V])	The insulation resistance shall be measured with 500 ± 50VDC (R [250V]: 100 ± 15V) within 60 ± 5 sec. of charging.
5	**Dielectric Strength**	**Between lead wires**	No failure.		The capacitors shall not be damaged when DC voltage of 200% of the rated voltage (in case of rated voltage: 1 to 3.15kV) or DC voltage of 250% of the rated voltage (in case of rated voltage: 250V, 500V) is applied between the lead wires for 1 to 5 sec. (Charge/discharge current ≤50mA)
		Body Insulation	No failure.		The capacitor is placed in the container with metal balls of diameter 1mm so that each lead wire, short-circuited, is kept approximately 2mm off the balls as shown in the figure, and AC voltage of 1250V is applied for 1 to 5 sec. between capacitor lead wires and small metals. (Charge/discharge current ≤50mA) 
6	**Temperature Characteristic**		**T.C.** / **Temp. Coefficient**: **SL** / +350 to –1000ppm/°C **Temp. Range** / **Cap. Change** (C / R): –25 to +85°C: within ±20% / within ±15%; +85 to +125°C: within $^{+15}_{-30}$%		The capacitance measurement shall be made at each step specified in table. Capacitance change from the value of step 3 shall not exceed the limit specified. **Char.\Step** / **1** / **2** / **3** / **4** / **5**: **SL**: — / — / 20 ± 2°C / 85 ± 2°C/125 ± 2°C / 20 ± 2°C **C, R**: 20 ± 2°C / –25 ± 3°C / 20 ± 2°C / 85 ± 2°C/125 ± 2°C / 20 ± 2°C **Pre-treatment:** Capacitor shall be stored at 125 ± 3°C for 1 hour, then placed at room condition[2] for 24 ± 2 hours before initial measurements (R, C).
7	**Temperature Cycling**	**Appearance**	No marked defect.	No marked defect.	The capacitor shall be introduced into the test chamber, and shall be exposed to the temperature conditions of steps 1 to 4 as shown in table at 5 cycles. **Step** / **Temp. (°C)** / **Time (min.)** / **Step** / **Temp. (°C)** / **Time (min.)**: **1**: –25 ± 3 / 30 ± 3 / **3**: +125 ± 3 / 30 ± 3 **2**: room temp. / 3 max. / **4**: room temp. / 3 max. **Pre-treatment:** Capacitor shall be stored at 125 ± 3°C for 1 hour, then placed at room condition[2] for 24 ± 2 hours before initial measurements (R, C). **Post-treatment:** Capacitor shall be stored for 1 to 2 hours at room condition[2] (SL). Capacitor shall be stored for 24 ± 2 hours at room condition[2] (R, C). **Measurement Order:** I.R., Dielectric Strength → Pre-treatment → Capacitance, D.F. → Temp. Cycling test → Post-treatment → Capacitance, D.F., I.R., Dielectric Strength (R [250V]).
		Capacitance Change	Within ±5% (SL)	Within ±10% (R, C)	
		Q **D.F.**	C ≥ 30pF: Q ≥ 350 C < 30pF: Q ≥ 275 + 5/2C[1] (SL)	D.F. ≤ 0.4% (R, C)	
		I.R.	1000M ohms min.		
		Dielectric Strength (between lead wires)	Pass the item No. 5.		
8	**Vibration Resistance**	**Appearance**	No marked defect.		The capacitor shall firmly be soldered to the supporting lead wire and vibration which is 10 to 55Hz in the vibration frequency range, 1.5mm in total amplitude, and about 1 minute in the rate of vibration change from 10Hz to 55Hz and back to 10Hz is applied for a total of 6 hours; 2 hours each in 3 mutually perpendicular directions.
		Capacitance Change	Within the specified tolerance.		
		Q. **D.F.**	C ≥ 30pF: Q ≥ 1000 C < 30pF: Q ≥ 400 + 20C[1](SL)	D.F. ≤ 0.4% (R [250V]) D.F. ≤ 0.2% (R [1 to 3.15kV]) D.F. ≤ 0.3% (C)	
9	**Soldering Effect**	**Appearance**	No marked defect.		The lead wire shall be immersed into the melted solder of 350 ± 10°C up to about 1.5 to 2mm from the main body for 3.5 ± 0.5 sec. and the specified items shall be measured after leaving for 24 ± 2 hours. **Pre-treatment:** Capacitor shall be stored at 125 ± 3°C for 1 hour, then placed at room condition[2] for 24 ± 2 hours before initial measurements (R, C). **Post-treatment:** Capacitor shall be stored for 1 to 2 hours at room condition[2] (SL). Capacitor shall be stored for 24 ± 2 hours at room condition[2] (R, C). **Measurement Order:** Dielectric Strength → Pre-treatment → Capacitance → Soldering Effect test → Post-treatment → Capacitance, Dielectric Strength (R [250V]).
		Capacitance Change	Within ±2.5% (SL)	Within ±10% (R, C)	
		Dielectric Strength (between lead wires)	Pass the item No. 5.		
10	**Humidity (Under Steady State)**	**Appearance**	No marked defect.		Set the capacitor for 500 $^{+24}_{-0}$ hours at 40 ± 2°C in 90 to 95% humidity. **Pre-treatment:** Capacitor shall be stored at 125 ± 3°C for 1 hour, then placed at room condition[2] for 24 ± 2 hours before initial measurements (R, C). **Post-treatment:** Capacitor shall be stored for 1 to 2 hours at room condition[2]. **Measurement Order:** I.R. → Pre-treatment → Capacitance, D.F. → Humidity test → Post-treatment → Capacitance, D.F., I.R. (R [250V]). (Charge/discharge current ≤50mA).
		Capacitance Change	Within ±5% (SL)	Within ±10% (R, C)	
		Q **D.F.**	C ≥ 30pF: Q ≥ 350 C < 30pF: Q ≥ 275 + 5/2C[1] (SL)	D.F. ≤ 0.4% (R, C)	
		I.R.	1000M ohms min.		
11	**Life**	**Appearance**	No marked defect.		Apply a DC voltage of 200% of the rated voltage (in case of rated voltage: 250V, 500V) or DC voltage of 150% of the rated voltage (in case of rated voltage: 1 to 3.15kV) for 1000 $^{+48}_{-0}$ hours at 125 ± 2°C. **Pre-treatment:** Capacitor shall be stored at 125 ± 3°C for 1 hour, then placed at room condition[2] for 24 ± 2 hours before initial measurements (R, C). **Post-treatment:** Capacitor shall be stored for 1 to 2 hours at room condition[2] (SL). Capacitor shall be stored at 125 ± 3°C for 1 hour, then placed at room condition[2] for 24 ± 2 hours (R, C). **Measurement Order:** I.R. → Pre-treatment → Capacitance, D.F. → Life test → I.R.[3] → Post-treatment → Capacitance, D.F. (R [250V]). (Charge/discharge current ≤50mA).
		Capacitance Change	Within ±3% (SL)	Within ±10% (R, C)	
		Q **D.F.**	C ≥ 30pF: Q ≥ 350 C < 30pF: Q ≥ 275 + 5/2C[1] (SL)	D.F. ≤ 0.4% (R, C)	
		I.R.	2000M ohms min. (SL, R [1 to 3.15kV], C)	1000M ohms min. (R [250V])	
12	**Strength of Lead**	**Pull**	Lead wire shall not cut off. Capacitor shall not be broken.		As in figure, fix the body of capacitor, apply a tensile weight gradually to each lead wire in the radial direction of capacitor up to 10N (1.0kgf) and keep it for 10 ± 1 sec. 
		Bending			Each lead wire shall be subjected to 5N (0.51kgf) weight and then a 90° bend, at the point of egress, in one direction, return to original position, and then a 90° bend in the opposite direction at the rate of one bend in 2 to 3 seconds.
13	**Solderability of Leads**		Lead wire shall be soldered with uniform coating on the axial direction over 3/4 of the circumferential direction.		The lead wire of a capacitor shall be dipped into a methanol solution of 25wt% rosin and then into molten solder of 235 ± 5°C for 2 ± 0.5 seconds. In both cases the depth of dipping is up to about 1.5 to 2mm from the root of lead wires.

[1]"C" expresses nominal capacitance value (pF). [2]"room condition" temperature: 15 to 35°C; humidity: 45 to 75%; atmospheric pressure: 860 to 1060hPa.
[3]The measurement of I.R. will be held in 12 to 24 hours after Life test.