TDK

February 2016

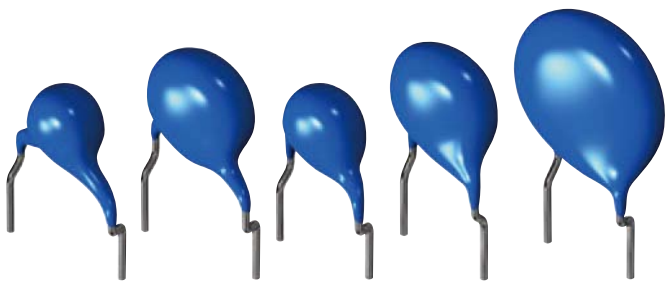
Disc Type Capacitors with Lead

High Voltage Ceramic Capacitors

Commercial Grade, Safety Standard Approved

CD45 series

Type: **CD45 [SL, B, E characteristics, Eac: X1=440V, Y1=400V]**



REMINDERS FOR USING THESE PRODUCTS

Before using these products, be sure to request the delivery specifications.

SAFETY REMINDERS

Please pay sufficient attention to the warnings for safe designing when using these products.

⚠ REMINDERS

- Do not use or store in locations where there are conditions such as gas corrosion (salt, acid, alkali, etc.).
- Before soldering, be sure to preheat components.
  The preheating temperature should be set so that the temperature difference between the solder temperature and product temperature does not exceed 150°C.
- Soldering corrections after mounting should be within the range of the conditions determined in the specifications.
  If overheated, a short circuit, performance deterioration, or lifespan shortening may occur.
- Self heating (temperature increase) occurs when the power is turned ON, so the tolerance should be sufficient for the set thermal design.
- Do not use for a purpose outside of the contents regulated in the delivery specifications.
- The products listed on this catalog are intended for use in general electronic equipment (AV equipment, telecommunications equipment, home appliances, amusement equipment, computer equipment, personal equipment, office equipment, measurement equipment, industrial robots) under a normal operation and use condition.
  The products are not designed or warranted to meet the requirements of the applications listed below, whose performance and/or quality require a more stringent level of safety or reliability, or whose failure, malfunction or trouble could cause serious damage to society, person or property.
  If you intend to use the products in the applications listed below or if you have special requirements exceeding the range or conditions set forth in the each catalog, please contact us.

(1) Aerospace/Aviation equipment
(2) Transportation equipment (cars, electric trains, ships, etc.)
(3) Medical equipment
(4) Power-generation control equipment
(5) Atomic energy-related equipment
(6) Seabed equipment
(7) Transportation control equipment
(8) Public information-processing equipment
(9) Military equipment
(10) Electric heating apparatus, burning equipment
(11) Disaster prevention/crime prevention equipment
(12) Safety equipment
(13) Other applications that are not considered general-purpose applications

- Please refer to the guideline of notabilia for fixed ceramic capacitors issued by JEITA(Japan Electronics and Information Technology Association, EIAJ RCR-2335).

When designing your equipment even for general-purpose applications, you are kindly requested to take into consideration securing protection circuit/device or providing backup circuits in your equipment.

Disc Type Capacitors with Lead

Product compatible with RoHS directive
Halogen-free

High Voltage Ceramic Capacitors, Commercial Grade, Safety Standard Approved

Overview of CD45 Series

FEATURES

- Compliant with IEC and the safety standards of various countries.
- This ceramic capacitor meets reinforced insulation's Safety Standards.
  Since it is rated at a withstand voltage of AC.4000V, it can be used in single-unit configurations within European Class II devices.
- Flame-resistant reinforced outer insulation prevents fires, electrical shock, and other potential hazards.
- These products shall conform to RoHS Directive due to lead(Pb) free of lead wire and internal solder material.
- Compatible with halogen-free external resin coating.

APPLICATION

For use in Y capacitor for AC adapter, charger, power supplies

PART NUMBER CONSTRUCTION

CD45 - E 2GA 102 M - □ K A

Series name*	Temperature characteristics		Rated voltage		Nominal capacitance		Capacitance tolerance		Lead type		Application classification		Internal code	
	SL	+350 to –1000ppm/°C	2GA	X1: 440V Y1: 400V	100	10pF	J	±5%	G	Long lead	K	Safety standard	A	Halogen-free
	B	±10%			102	1,000pF	K	±10%	N	Short lead				
	E	+20, –55%			222	2,200pF	M	±20%	V	Taping				

* Please refer to P-6 ～ 8 about the product dimensions.

OPERATING TEMPERATURE RANGE

Temperature characteristics	Temperature range*	
	Operating temperature (°C)	Storage temperature** (°C)
SL	–25 to +125	–25 to +125
B	–25 to +125	–25 to +125
E	–25 to +125	–25 to +125

* The maximum operating temperature of 125°C includes capacitor self-generated heat of up to 20°C.
** The storage temperature range applies to after MLCC is mounted on board.

- RoHS Directive Compliant Product: See the following for more details related to RoHS Directive compliant products. http://product.tdk.com/en/environment/rohs/
- Halogen-free: Indicates that Cl content is less than 900ppm, Br content is less than 900ppm, and that the total Cl and Br content is less than 1500ppm.

Overview of CD45 Series

PACKAGE QUANTITY

Type	Package quantity	
	Taping (pieces / box)	Bulk (pieces / bag)
CD45	1000	1000

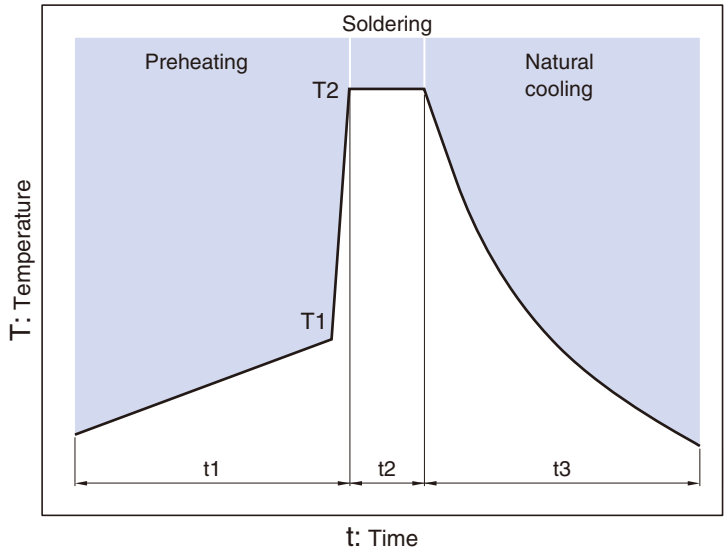
CERTIFIED STATUS OF VARIOUS COUNTRIES

Safety standard	IEC standard No.	Standard No.	Temperature characteristics	Class	Rated voltage	Approval report No.*	
						Taiwan	Xiamen
ENEC	IEC 60384-14	EN 60384-14	SL,B,E	X1, Y1	X1:440V AC Y1:400V AC	ENEC-01048	
UL		UL60384-14				E37861	
cUL/CSA							
SAA		AS3250				CS6268	
CQC		IEC 60384-14				CQC14001112767	CQC14001112447
KTL		K60384-14		X1	440V AC	SZ03001-12002	SU03047-12002
				Y1	400V AC	SZ03001-12004	SU03047-12004

* Certificate numbers shall be changed owing to the revisions of the related standards.

Overview of CD45

RECOMMENDED FLOW PROFILE



Preheating		Peak		Natural cooling
Temp.	Time	Temp.	Time	Time
T1	t1	T2	t2	t3
110°C min.	30 to 60s.	260°C	Within 10s.	Over 60s.

CD45 Type

CAPACITANCE AND DIMENSIONS

□Temperature Characteristics: SL (+350 to -1000ppm/°C)

□Rated Voltage Eac: X1=440V, Y1=400V

Capacitance (pF)	Capacitance tolerance	Dimensions (mm)					Part No.*
		D max.	T max.	F (Applied to bulk)	F (Applied to taping)	d	
10	±5%	7.0	6.0	10.0+2.0, –1.0	10.0±1.0	0.6±0.05	CD45SL2GA100J-□KA**
15	±5%	7.0	6.0	10.0+2.0, –1.0	10.0±1.0	0.6±0.05	CD45SL2GA150J-□KA
22	±5%	7.0	6.0	10.0+2.0, –1.0	10.0±1.0	0.6±0.05	CD45SL2GA220J-□KA
33	±5%	7.0	6.0	10.0+2.0, –1.0	10.0±1.0	0.6±0.05	CD45SL2GA330J-□KA
47	±5%	8.0	6.0	10.0+2.0, –1.0	10.0±1.0	0.6±0.05	CD45SL2GA470J-□KA
68	±5%	9.0	6.0	10.0+2.0, –1.0	10.0±1.0	0.6±0.05	CD45SL2GA680J-□KA

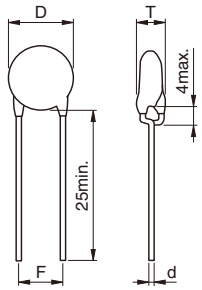
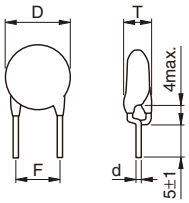
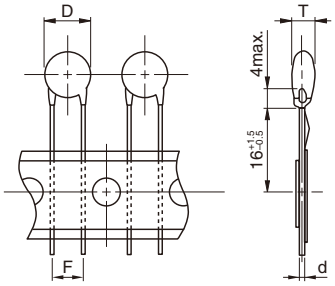
* The part numbers are TDK's standard specification products.

** The " □ " of the Part Number contains the lead wire type G, N or V. Please refer to the details of each shape is shown below.

• Please refer to P-9 about the taping dimemsions.

LIST OF STANDARD LEAD SHAPES

Dimemsions in mm

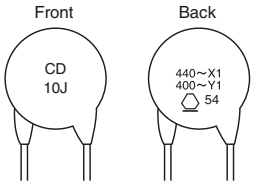
	Symbol G Bulk/Long lead	Symbol N Bulk/Short lead	Symbol V Taping
Vertical kink			

• TDK's standard product is vertical kink.

• TDK's recommendation is short lead type with the symbol N for bulk products.

MARKINGS

Item	Markings	Specifications	Marking examples
1. Series	CD	CD45 series	
2. Nominal capacitance	10	10pF	
3. Capacitance tolerance	J	±5%	
4. Rated voltage Eac	440～X1 400～Y1	X1: AC.440V Y1: AC.400V	
5. TDK's logogram	⬡	Production base code	
6. Date code	54	2015.4*	



(Marking position is reference.)

* Year and month of production: last digit of year + month denoted by 1, 2, 3, 4, 5, 6, 7, 8, 9, O (October), N (November), or D (December).

* The expression has become simplified due to a revision in the standards.

CD45 Type

CAPACITANCE AND DIMENSIONS

□Temperature Characteristics: B (±10%)

□Rated Voltage Eac: X1=440V, Y1=400V

Capacitance (pF)	Capacitance tolerance	Dimensions (mm)					Part No.*
		D max.	T max.	F (Applied to bulk)	F (Applied to taping)	d	
100	±10%	6.5	6.0	10.0+2.0, –1.0	10.0±1.0	0.6±0.05	CD45-B2GA101K-□KA**
150	±10%	6.5	6.0	10.0+2.0, –1.0	10.0±1.0	0.6±0.05	CD45-B2GA151K-□KA
220	±10%	6.5	6.0	10.0+2.0, –1.0	10.0±1.0	0.6±0.05	CD45-B2GA221K-□KA
330	±10%	7.0	6.0	10.0+2.0, –1.0	10.0±1.0	0.6±0.05	CD45-B2GA331K-□KA
470	±10%	8.0	6.0	10.0+2.0, –1.0	10.0±1.0	0.6±0.05	CD45-B2GA471K-□KA

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LIST OF STANDARD LEAD SHAPES

Dimemsions in mm

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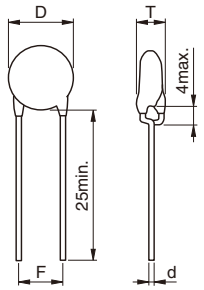
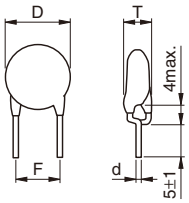
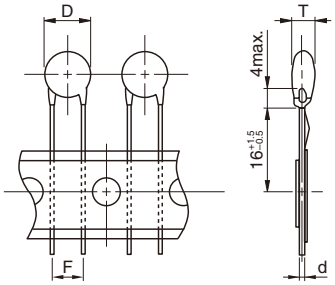
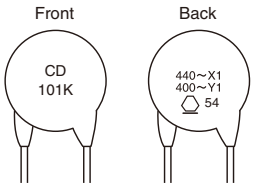
Vertical kink			

• TDK's standard product is vertical kink.

• TDK's recommendation is short lead type with the symbol N for bulk products.

MARKINGS

Item	Markings	Specifications	Marking examples
1. Series	CD	CD45 series	
2. Nominal capacitance	101	100pF	
3. Capacitance tolerance	K	±10%	
4. Rated voltage Eac	440～X1 400～Y1	X1: AC.440V Y1: AC.400V	
5. TDK's logogram	⬡	Production base code	
6. Date code	54	2015.4*	



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CD45 Type

CAPACITANCE AND DIMENSIONS

□Temperature Characteristics: E (+20, –55%)

□Rated Voltage Eac: X1=440V, Y1=400V

Capacitance (pF)	Capacitance tolerance	Dimensions (mm)					Part No.*
		D max.	T max.	F (Applied to bulk)	F (Applied to taping)	d	
680	±20%	6.5	6.0	10.0+2.0, –1.0	10.0±1.0	0.6±0.05	CD45-E2GA681M-□KA**
1,000	±20%	7.0	6.0	10.0+2.0, –1.0	10.0±1.0	0.6±0.05	CD45-E2GA102M-□KA
1,500	±20%	8.0	6.0	10.0+2.0, –1.0	10.0±1.0	0.6±0.05	CD45-E2GA152M-□KA
2,200	±20%	9.0	6.0	10.0+2.0, –1.0	10.0±1.0	0.6±0.05	CD45-E2GA222M-□KA
3,300	±20%	11.0	6.0	10.0+2.0, –1.0	10.0±1.0	0.6±0.05	CD45-E2GA332M-□KA
4,700	±20%	13.0	6.0	10.0+2.0, –1.0	10.0±1.0	0.6±0.05	CD45-E2GA472M-□KA

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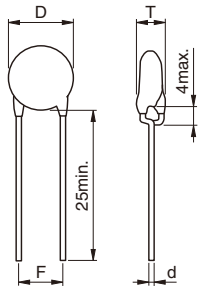
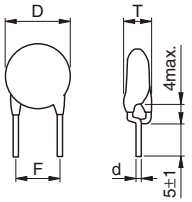
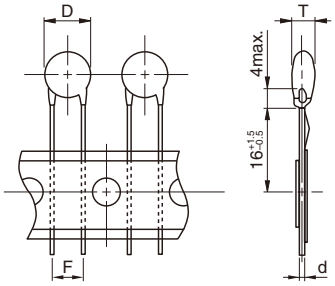
LIST OF STANDARD LEAD SHAPES

Dimemsions in mm

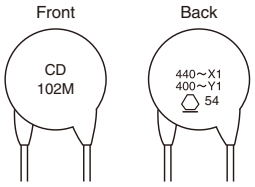
	Symbol G Bulk/Long lead	Symbol N Bulk/Short lead	Symbol V Taping
Vertical kink			

• TDK's standard product is vertical kink.

• TDK's recommendation is short lead type with the symbol N for bulk products.

MARKINGS

Item	Markings	Specifications	Marking examples
1. Series	CD	CD45 series	
2. Nominal capacitance	102	1000pF	
3. Capacitance tolerance	M	±20%	
4. Rated voltage Eac	440～X1 400～Y1	X1: AC.440V Y1: AC.400V	
5. TDK's logogram	⬡	Production base code	
6. Date code	54	2015.4*	



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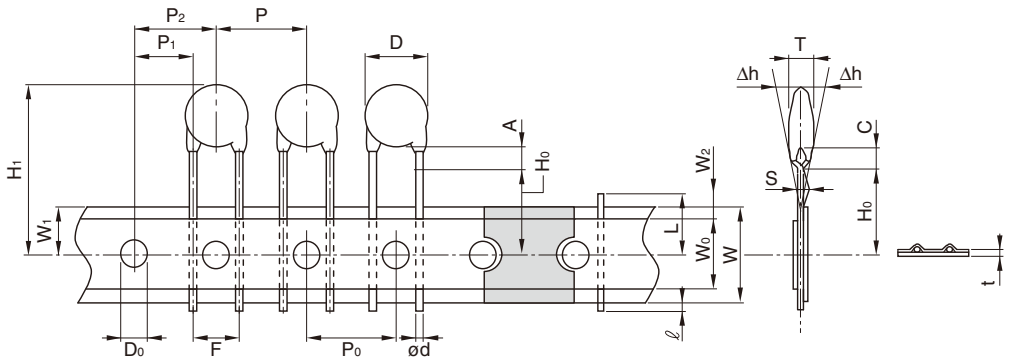
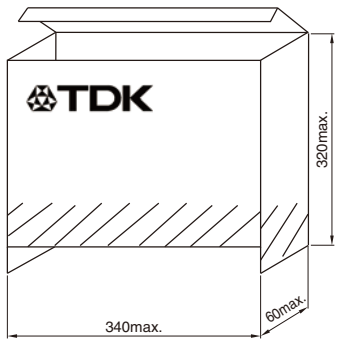
CD45 Type

TAPING DIMEMSIONS



Item	Symbol	Dimensions(mm)	Remarks
Body diameter	D	Depends on the specification of each product.	
Body thickness	T	Depends on the specification of each product.	
Lead-wire diameter	ød	0.6±0.05	
Pitch of component	P	15.0±0.10	Including the slant of body
Feed hole pitch	P_0	15.0±0.3	Excepting the tape splicing part
Feed hole center to lead	P_1	10.0±0.7	
Feed hole center to component center	P_2	15.0±1.3	
Lead-to lead distance	F	10±1	Measuring point is bottom kink
Component alignment	Δh	0±2.0	Including the slanting body due to bending lead-wire
Tape width	W	18.0+1.0, –0.5	
Adhesive tape width	W_0	10.0min.	
Hole position	W_1	9.0±0.5	
Adhesive tape position	W_2	4.0max.	Adhesive tape do not stick out the tape
Bottom of kink from tape center	H_0	16.0+1.5, –0.5	
Height of body from tape center	H_1	46.0max.	
Lead-wire protrusion	ℓ	1.0max.	
Feed hole diameter	D_0	4.0±0.2	
Total tape thickness	t	0.6±0.3	Including adhesive tape
Length of snipped lead	L	11.0max.	
Coating on lead	C	4.0max.	
Height of kink	A	4.0max.	Measuring point is bottom kink
Spring action	S	2.0max.	

AMMO PACK INNER BOX SIZE



Dimensions in mm

• For more information about products with other capacitance or other data, please contact us.