

Disc type capacitors with leads  
High voltage ceramic capacitors, commercial grade, safety standard approved



# CS45 series



## FEATURES

- Compliant with IEC and the safety standards of various countries.
- Withstand voltage is 2,600V AC.
- Flame-resistant reinforced outer insulation prevents fires, electrical shock, and other potential hazards.
- Conform to RoHS directive due to lead(Pb) free of lead-wire and internal solder material.
- Compatible with halogen-free external resin coating.

## APPLICATION

Y capacitor for AC adapter, charger, power supplies

## PART NUMBER CONSTRUCTION

CS45	-E	2GA	102	M	-	□	K	A			
Series name*	Temperature characteristics	Rated voltage		Nominal capacitance		Capacitance tolerance		Lead-wire type	Application classification	Internal code	
-SL	+350 to -1,000ppm/°C	2GA	X1:440V AC Y2:300V AC	100	10pF	J	±5%	G	Long lead	K	Safety standard approved
-B	±10%		221	220pF	K	±10%	N	Short lead			
-E	+20, -55%			472	4,700pF	M	±20%	V	Taping	A	Halogen-free
-F	+30, -80%										

\* Please refer to P-3 about the product dimensions.

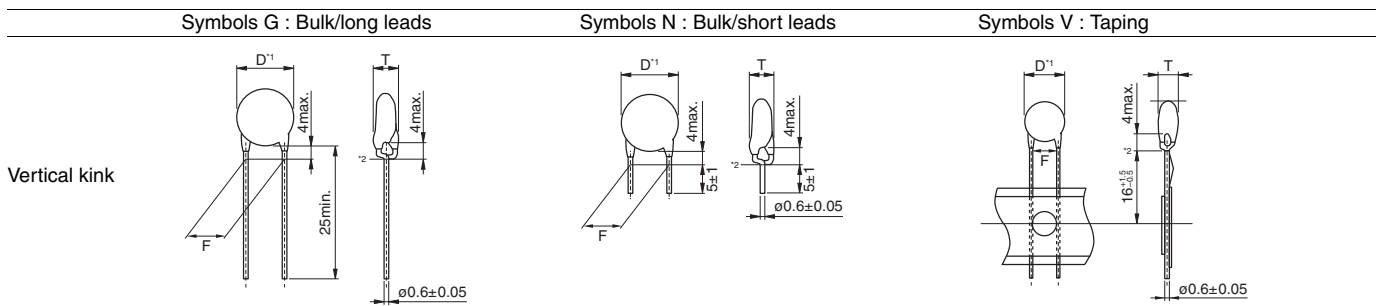
## OPERATING TEMPERATURE RANGE

Temperature characteristics	Operating temperature (°C)	Storage temperature (°C)*
SL	-40 to 125	-40 to 125
B	-40 to 125	-40 to 125
E	-40 to 125	-40 to 125
F	-40 to 125	-40 to 125

The maximum operating temperature of +125°C includes capacitor self-generated heat of up to 20°C.  
\* After capacitor is mounted on board, the storage temperature range is applied.

## STANDARD LEAD-WIRE SHAPES

Dimensions in mm



TDK's standard product is vertical kink. TDK recommends short leads for bulk products.

\*1 Body diameter (D) is reference value if D is smaller than maximum dimension of lead to lead distance (F).

\*2 Coating on leads shall not extend beyond the bottom of vertical kink.

- RoHS Directive Compliant Product: See the following for more details. <https://product.tdk.com/en/environment/rohs/index.html>
- Halogen-free: Indicate 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.

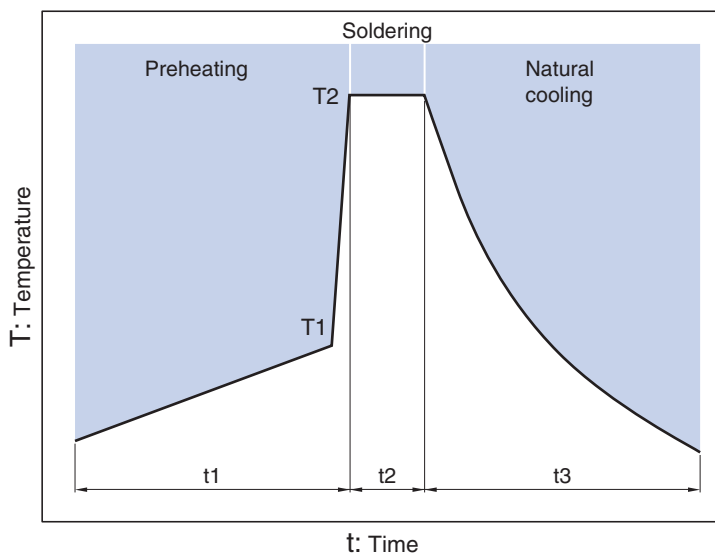
# Overview of CS45 series

## CERTIFIED STATUS OF VARIOUS COUNTRIES

Safety standard	IEC standard No.	Standard No.	Temperature characteristics	Sub-class	Rated voltage	Approval report No.*	
						Taiwan	Xiamen
ENEC		EN 60384-14				ENEC-01049	
UL		UL60384-14				E37861	
cUL/CSA		AS3250		X1, Y2	X1:440V AC Y2:300V AC	CS6268	
SAA	IEC 60384-14	AS3250	SL,B,E,F			CQC14001112768	CQC14001112449
CQC		IEC 60384-14				SZ03001-12006	SU03047-12006
KTL		K60384-14		X1	440V AC	SZ03001-12008	SU03047-12008
				Y2	300V AC	SZ03001-12008	SU03047-12008

\* Certificate numbers shall be changed owing to the revisions of the related standards and renewal of certificate.

## 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.

## CS45 type

## MARKINGS

Item	Markings	Description	Marking examples
1.Series	CS	CS45 series	<p>(Marking position is reference.)</p>
2.Nominal capacitance	10	10pF	
3.Capacitance tolerance	J	±5%	
4.Rated voltage Eac	440~X1 300~Y2	X1:440V AC Y2:300V AC	
5.TDK's trademark		Production base code	
6.Date code	04	2020.4*	

\* 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.

## RATED VOLTAGE Eac: X1:440V, Y2:300V

## CAPACITANCE AND DIMENSIONS

Temperature characteristics	Capacitance	Capacitance tolerance	Dimensions (mm)				Part numbers		
			Dmax. *	Tmax.	F (applied to bulk)	F (applied to taping)	Bulk/long leads (Symbols: G)	Bulk/short leads (Symbols: N)	Taping (Symbols: V)
SL	10pF	±5%	(7.0)	5.0	7.5±1.5	7.5±0.8	<a href="#">CS45SL2GA100J-GKA</a>	<a href="#">CS45SL2GA100J-NKA</a>	<a href="#">CS45SL2GA100J-VKA</a>
SL	15pF	±5%	(7.0)	5.0	7.5±1.5	7.5±0.8	<a href="#">CS45SL2GA150J-GKA</a>	<a href="#">CS45SL2GA150J-NKA</a>	<a href="#">CS45SL2GA150J-VKA</a>
SL	22pF	±5%	(7.0)	5.0	7.5±1.5	7.5±0.8	<a href="#">CS45SL2GA220J-GKA</a>	<a href="#">CS45SL2GA220J-NKA</a>	<a href="#">CS45SL2GA220J-VKA</a>
SL	33pF	±5%	(7.0)	5.0	7.5±1.5	7.5±0.8	<a href="#">CS45SL2GA330J-GKA</a>	<a href="#">CS45SL2GA330J-NKA</a>	<a href="#">CS45SL2GA330J-VKA</a>
SL	47pF	±5%	(7.0)	5.0	7.5±1.5	7.5±0.8	<a href="#">CS45SL2GA470J-GKA</a>	<a href="#">CS45SL2GA470J-NKA</a>	<a href="#">CS45SL2GA470J-VKA</a>
SL	68pF	±5%	(7.5)	5.0	7.5±1.5	7.5±0.8	<a href="#">CS45SL2GA680J-GKA</a>	<a href="#">CS45SL2GA680J-NKA</a>	<a href="#">CS45SL2GA680J-VKA</a>
B	100pF	±10%	(6.5)	5.0	7.5±1.5	7.5±0.8	<a href="#">CS45-B2GA101K-GKA</a>	<a href="#">CS45-B2GA101K-NKA</a>	<a href="#">CS45-B2GA101K-VKA</a>
B	150pF	±10%	(6.5)	5.0	7.5±1.5	7.5±0.8	<a href="#">CS45-B2GA151K-GKA</a>	<a href="#">CS45-B2GA151K-NKA</a>	<a href="#">CS45-B2GA151K-VKA</a>
B	220pF	±10%	(6.5)	5.0	7.5±1.5	7.5±0.8	<a href="#">CS45-B2GA221K-GKA</a>	<a href="#">CS45-B2GA221K-NKA</a>	<a href="#">CS45-B2GA221K-VKA</a>
B	330pF	±10%	(6.5)	5.0	7.5±1.5	7.5±0.8	<a href="#">CS45-B2GA331K-GKA</a>	<a href="#">CS45-B2GA331K-NKA</a>	<a href="#">CS45-B2GA331K-VKA</a>
B	470pF	±10%	(7.0)	5.0	7.5±1.5	7.5±0.8	<a href="#">CS45-B2GA471K-GKA</a>	<a href="#">CS45-B2GA471K-NKA</a>	<a href="#">CS45-B2GA471K-VKA</a>
B	680pF	±10%	(8.0)	5.0	7.5±1.5	7.5±0.8	<a href="#">CS45-B2GA681K-GKA</a>	<a href="#">CS45-B2GA681K-NKA</a>	<a href="#">CS45-B2GA681K-VKA</a>
E	1,000pF	±20%	(6.5)	5.0	7.5±1.5	7.5±0.8	<a href="#">CS45-E2GA102M-GKA</a>	<a href="#">CS45-E2GA102M-NKA</a>	<a href="#">CS45-E2GA102M-VKA</a>
E	1,500pF	±20%	(7.5)	5.0	7.5±1.5	7.5±0.8	<a href="#">CS45-E2GA152M-GKA</a>	<a href="#">CS45-E2GA152M-NKA</a>	<a href="#">CS45-E2GA152M-VKA</a>
E	2,200pF	±20%	(8.0)	5.0	7.5±1.5	7.5±0.8	<a href="#">CS45-E2GA222M-GKA</a>	<a href="#">CS45-E2GA222M-NKA</a>	<a href="#">CS45-E2GA222M-VKA</a>
E	3,300pF	±20%	10.0	5.0	7.5±1.5	7.5±0.8	<a href="#">CS45-E2GA332M-GKA</a>	<a href="#">CS45-E2GA332M-NKA</a>	<a href="#">CS45-E2GA332M-VKA</a>
E	4,700pF	±20%	11.0	5.0	7.5±1.5	7.5±0.8	<a href="#">CS45-E2GA472M-GKA</a>	<a href="#">CS45-E2GA472M-NKA</a>	<a href="#">CS45-E2GA472M-VKA</a>
F	10,000pF	±20%	14.5	5.0	7.5±1.5	7.5±0.8	<a href="#">CS45-F2GA103M-GKA</a>	<a href="#">CS45-F2GA103M-NKA</a>	<a href="#">CS45-F2GA103M-VKA</a>

\* The values in parentheses "( )" are reference values.

Click the part number for details.

• Please refer to p-4 about the taping dimensions.

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

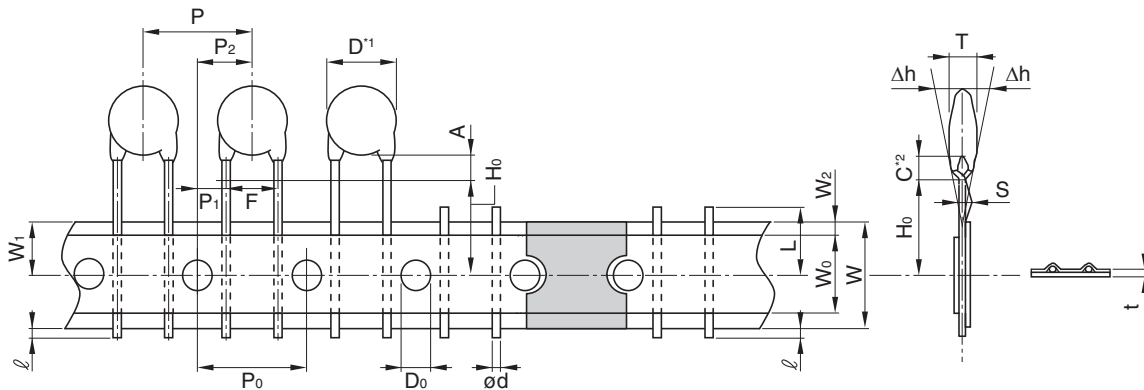
Please be sure to request delivery specifications that provide further details on the features and specifications of the products for proper and safe use. (3/5)  
Please note that the contents may change without any prior notice due to reasons such as upgrading.

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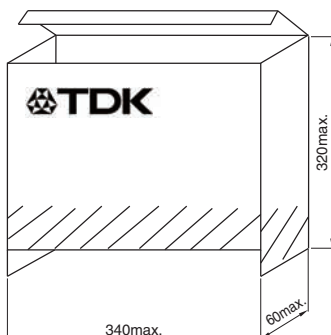
## CS45 type

## TAPING DIMENSIONS



Item	Symbols	Dimensions (mm)	Remarks
Body diameter	D	Refer to P-3	*1 Body diameter (D) is reference value if D is smaller than maximum dimension of lead to lead distance (F).
Body thickness	T	Refer to P-3	
Lead-wire diameter	ød	0.6±0.05	
Pitch of component	P	15.0±1.0	Including the slant of body
Feed hole pitch	P <sub>0</sub>	15.0±0.3	Excepting the tape splicing part
Feed hole center to lead-wire	P <sub>1</sub>	3.75±0.7	
Feed hole center to component center	P <sub>2</sub>	7.5±1.3	Including the slanting body due to bending lead-wire
Lead-to lead distance	F	7.5±0.8	Measuring point is bottom kink
Component alignment	Dh	0 ±2.0	Including the slanting body due to bending lead-wire
Carrier tape width	W	18.0+1.0,-0.5	
Adhesive tape width	W <sub>0</sub>	10.0 Min.	
Hole position	W <sub>1</sub>	9.0±0.5	
Adhesive tape position	W <sub>2</sub>	4.0 Max.	Adhesive tape do not stick out the tape
Bottom of kink from tape center	H <sub>0</sub>	16.0+1.5,-0.5	
Lead-wire protrusion	ℓ	1.0 Max.	
Feed hole diameter	D <sub>0</sub>	4.0±0.2	
Carrier tape thickness (Including adhesive tape)	t	0.6±0.3	Including adhesive tape
Length of snapped lead-wire	L	11.0 Max.	
Coating on lead-wire	C	4.0 Max.	*2 Coating on leads shall not extend beyond the bottom of vertical kink.
Height of kink	A	4.0 Max.	Measuring point is bottom kink
Spring action	S	2.0 Max.	

## AMMO PACK INNER BOX SIZE



Dimensions in mm

## PACKAGE QUANTITY

Type	Package quantity	
	Bulk (pieces / bag)	Taping (pieces / box)
CS45	1000	1000