

Disc Type Capacitors with Lead

High Voltage Ceramic Capacitors
Automotive Grade

Safety Standard Approved
CS series

Issue date: March 2013

- All specifications are subject to change without notice.
 - Conformity to RoHS Directive: This means that, in conformity with EU Directive 2002/95/EC, lead, cadmium, mercury, hexavalent chromium, and specific bromine-based flame retardants, PBB and PBDE, have not been used, except for exempted applications.
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BASIC INSULATION TYPE CLASS 2 HIGH DIELECTRIC

FEATURES

- AEC-Q200 compliant.
- 1,000 cycles guaranteed under heat shock testing at -55°C to $+125^{\circ}\text{C}$.
- It can be used as a Y capacitor for battery chargers used in automobiles (EV, PHEV).
- Compliant with IEC and the safety standards of various countries.
- Rated at a withstand voltage of AC.2600V.
- Compatible with halogen-free external resin coating.

OPERATING TEMPERATURE RANGE: -40 to $+125^{\circ}\text{C}$

TEMPERATURE CHARACTERISTICS AND TOLERANCE

| Temperature characteristics | Test temperature range | Capacitance tolerance |
|--|--------------------------------|-----------------------|
| SL (+350 to $-1000\text{ppm}/^{\circ}\text{C}$) | $+20$ to $+85^{\circ}\text{C}$ | J ($\pm 5\%$) |
| B ($\pm 10\%$) | -25 to $+85^{\circ}\text{C}$ | K ($\pm 10\%$) |
| Z5U (+22, -56%) | $+10$ to $+85^{\circ}\text{C}$ | M ($\pm 20\%$) |

PRODUCT IDENTIFICATION

CS 80 ZU 2GA 222 M A N K A
(1) (2) (3) (4) (5) (6) (7) (8) (9) (10)

- (1) Type
- (2) Shape
- (3) Temperature characteristics
- (4) Rated voltage
- (5) Nominal capacitance
- (6) Capacitance tolerance
- (7) For use in automobiles
- (8) Lead type
- (9) Safety standard
- (10) Halogen-free compatible product

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CAPACITANCE AND DIMENSIONS

| Part No. | Temperature characteristics | Capacitance (pF) | Capacitance tolerance | Dimensions (mm) | | | | Taping dimensions |
|--------------------|-----------------------------|------------------|-----------------------|-----------------|--------|---------|----------|-------------------|
| | | | | D max. | T max. | F | d | |
| CS45SL2GA100JA□*KA | SL (+350 to -1000ppm/°C) | 10 | J (±5%) | 7.0 | 7.0 | 7.5±1.5 | 0.6±0.05 | V2 |
| CS45SL2GA150JA□*KA | | 15 | J (±5%) | 7.0 | 7.0 | 7.5±1.5 | 0.6±0.05 | V2 |
| CS45SL2GA220JA□*KA | | 22 | J (±5%) | 7.0 | 7.0 | 7.5±1.5 | 0.6±0.05 | V2 |
| CS45SL2GA330JA□*KA | | 33 | J (±5%) | 7.0 | 7.0 | 7.5±1.5 | 0.6±0.05 | V2 |
| CS45SL2GA470JA□*KA | | 47 | J (±5%) | 8.0 | 7.0 | 7.5±1.5 | 0.6±0.05 | V2 |
| CS45SL2GA680JA□*KA | | 68 | J (±5%) | 9.0 | 7.0 | 7.5±1.5 | 0.6±0.05 | V2 |
| CS65-B2GA101KA□*KA | B (±10%) | 100 | K (±10%) | 7.0 | 7.0 | 7.5±1.5 | 0.6±0.05 | V2 |
| CS65-B2GA151KA□*KA | | 150 | K (±10%) | 7.0 | 7.0 | 7.5±1.5 | 0.6±0.05 | V2 |
| CS65-B2GA221KA□*KA | | 220 | K (±10%) | 7.0 | 7.0 | 7.5±1.5 | 0.6±0.05 | V2 |
| CS70-B2GA331KA□*KA | | 330 | K (±10%) | 7.5 | 7.0 | 7.5±1.5 | 0.6±0.05 | V2 |
| CS75-B2GA471KA□*KA | | 470 | K (±10%) | 9.0 | 7.0 | 7.5±1.5 | 0.6±0.05 | V2 |
| CS85-B2GA681KA□*KA | | 680 | K (±10%) | 9.5 | 7.0 | 7.5±1.5 | 0.6±0.05 | V2 |
| CS65ZU2GA102MA□*KA | Z5U (+22, -56%) | 1,000 | M (±20%) | 7.0 | 7.0 | 7.5±1.5 | 0.6±0.05 | V2 |
| CS75ZU2GA152MA□*KA | | 1,500 | M (±20%) | 8.0 | 7.0 | 7.5±1.5 | 0.6±0.05 | V2 |
| CS80ZU2GA222MA□*KA | | 2,200 | M (±20%) | 9.5 | 7.0 | 7.5±1.5 | 0.6±0.05 | V2 |
| CS95ZU2GA332MA□*KA | | 3,300 | M (±20%) | 12.0 | 7.0 | 7.5±1.5 | 0.6±0.05 | V2 |
| CS11ZU2GA472MA□*KA | | 4,700 | M (±20%) | 13.5 | 7.0 | 7.5±1.5 | 0.6±0.05 | V2 |

* □ : Lead shape symbol

LIST OF STANDARD LEAD SHAPES

The lead type is indicated by the letter which is the 15th character of the product name.

Example) TDK Product Name: **CS80ZU2GA222MANKA**

└ N: Lead type (Vertical kink, Short)

Dimensions in mm

| | Long lead Symbol G | Short lead Symbol N | Taping Symbol V |
|---------------|-----------------------|------------------------|--------------------|
| Vertical kink | | | |

- We recommend using a vertical kink type.
- For bulk products, we recommend a short lead type with the symbol N.

MARKINGS

| Item | Markings | Specifications | Marking examples |
|--------------------------|------------------|----------------------------|---|
| 1. Series | CS | CS series | <p>(Marking position is reference.)</p> |
| 2. Nominal capacitance | 222 | 2200pF | |
| 3. Capacitance tolerance | M | ±20% | |
| 4. Rated voltage Eac | 440~X1 300~Y2 | X1: AC.440V Y2: AC.300V | |
| 5. TDK's logogram | | Production base code | |
| 6. Date code | 29 | 2012.9* | |
| 7. Applications | — | For use in automobiles | |

(Underscore below date of production)

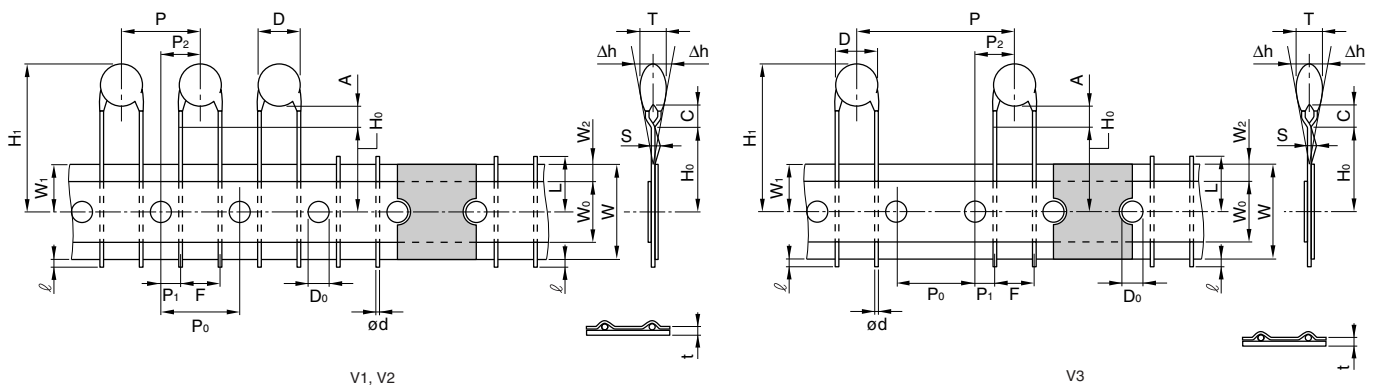
* Year and month of production: last digit of year + month denoted by 1, 2, 3, 4, 5, 6, 7, 8, 9, O (October), N (November), or D (December).

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

CERTIFIED STATUS OF VARIOUS COUNTRIES

| Safety standard | Standard No. | Temperature characteristics | Insulation sub-class | Rated voltage | Approval report No. | |
|-----------------|-------------------|-----------------------------|----------------------|----------------------------|---------------------|----------------|
| | | | | | Taiwan | Xiamen |
| BSI | BS EN60384-14 | SL, B, Z5U | X1, Y2 | X1: AC.440V Y2: AC.300V | KM37103 | KM37103 |
| VDE | EN 60384-14 | | | | 40017930 | 40017930 |
| SEV | EN 60384-14 | | | | 12.0263 | 12.0263 |
| SEMKO | EN 60384-14 | | | | 1125249 | 1125249 |
| NEMKO | EN 60384-14 | | | | P12215336 | P12215336 |
| DEMKO | EN 60384-14 | | | | D-01153 | D-01153 |
| FIMKO | EN 60384-14 | | | | FI 27399 | FI 27399 |
| IMQ | EN 60384-14 | | | | V3692 | V3692 |
| SAA | AS3250 | | | | CS6268 | CS6268 |
| UL | UL 60384-14 | | | | E37861 | E37861 |
| CSA | CAN/CSA-E60384-14 | | | | 1785515 | 1785515 |
| CQC | GB/T14472-1998 | | | | CQC12001082619 | CQC10001052862 |

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

TAPING DIMENSIONS
VERTICAL KINK LEAD TYPE


| Item | Symbol | Dimensions(mm) | | | Remarks |
|--------------------------------------|----------------|---|----------------|----------------|--|
| | | V1 | V2 | V3 | |
| 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 | 0.6±0.05 | 0.6±0.05 | |
| Pitch of component | P | 12.7±1.0 | 15.0±1.0 | 30.0±1.0 | Including the slant of body |
| Feed hole pitch | P ₀ | 12.7±0.3 | 15.0±0.3 | 15.0±0.3 | Excepting the tape splicing part |
| Feed hole center to lead | P ₁ | 3.85±0.7 | 3.75±0.7 | 3.75±0.7 | |
| Feed hole center to component center | P ₂ | 6.35±1.3 | 7.5±1.3 | 7.5±1.3 | |
| Lead-to lead distance | F | 5+0.8, -0.2 | 7.5±0.8 | 7.5±0.8 | Measuring point is bottom kink |
| Component alignment | Δh | 0±2.0 | 0±2.0 | 0±2.0 | Including the slanting body due to bending lead-wire |
| Tape width | W | 18.0+1.0, -0.5 | 18.0+1.0, -0.5 | 18.0+1.0, -0.5 | |
| Adhesive tape width | W ₀ | 10.0min. | 10.0min. | 10.0min. | |
| Hole position | W ₁ | 9.0±0.5 | 9.0±0.5 | 9.0±0.5 | |
| Adhesive tape position | W ₂ | 4.0max. | 4.0max. | 4.0max. | Adhesive tape do not stick out the tape |
| Bottom of kink from tape center | H ₀ | 16.0+1.5, -0.5 | 16.0+1.5, -0.5 | 16.0+1.5, -0.5 | |
| Height of body from tape center | H ₁ | 46.0max. | 46.0max. | 46.0max. | |
| Lead-wire protrusion | ℓ | 1.0max. | 1.0max. | 1.0max. | |
| Feed hole diameter | D ₀ | 4.0±0.2 | 4.0±0.2 | 4.0±0.2 | |
| Total tape thickness | t | 0.6±0.3 | 0.6±0.3 | 0.6±0.3 | Including adhesive tape |
| Length of snapped lead | L | 11.0max. | 11.0max. | 11.0max. | |
| Coating on lead | C | 4.0max. | 4.0max. | 4.0max. | |
| Height of kink | A | 4.0max. | 4.0max. | 4.0max. | Measuring point is bottom kink |
| Spring action | S | 2.0max. | 2.0max. | 2.0max. | |

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

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