







DATA SHEET

Super High Voltage Disc Ceramic Capacitor

Serie: 123001

Range 222= 2200pf

Tolerance M= ±20%

Voltage 4000 Volt

Material Character. 5U

Body Diam. 13,5mm

Pitch 10mm

Body Thickn. 6,5mm

Super High Voltage Disc Ceramic Capacitor

Serie No.: **I23001**

DRW: Jason CHKD Wilson MATL: Wilson **TOLERANCE** Mason DATE 30.04.2011 Customer: APPD: Schumi **FINISH** Sheet No. Jamy 1 from 14









Features

Wide rated Voltage range, wide nominal capacitance range Flame retardent, insulating coating applied Recomended Application Filter circuit of high voltage power High voltage circuit of television set and monitor High voltage circuit of various electronic equipment

| Characteristics | Temp.Char. SL | Temp.Char. Y5P | Temp.Cl | har. Y5U | Temp.C | har. Y5V | | | | |
|-----------------------|---|---|---------------|-------------|----------------|----------|--|--|--|--|
| Operating Temperature | | 30°C | ~ +85°C | | | | | | | |
| Rated Voltage | 4KVDC ~ 6KVDC | 4KVDC ~ 15KVDC | 4KVDC ~ | 15KVDC | 4KVDC ~ 15KVDC | | | | | |
| Withstanding Voltage | 1,5 times related voltage | | | | | | | | | |
| Capacitance | Within the speci | Within the specified tolerance, testing at 25°C, 1Vrms and 1KHz (at 1MHz for SL products) | | | | | | | | |
| Capacitance | 10 ~ 330pf | 100 ~ 2200pf | 470 ~ 3 | 3300pf | 1000 ~ | 10000pf | | | | |
| Dissipation Factor | Cr<30pf, Q≥ 400+20Cr Cr≥30pf, Q≥1000 | tg ≤ 2,5% | | tg≤ | 3,5% | | | | | |
| Insulation Resistance | | Charge at 500VDC for 6 | 0 seconds, Rj | ≥ 1000MΩ | | | | | | |
| Temperature | Temperatur Cha | rarcteristics Code | SL | Y5P | Y5U | Y5V | | | | |
| Characteristics | Temperatur Coe | . +100 ~ - 1000 10-6/°C | . ± 10% | .+22 ~ +56% | .+22 ~ +82% | | | | | |

Rated Capacitance

The first and second digits identify the first and second significant figures of the capacitance, the third digit identifies the multiplier. The capacitance unit is pf,

Capacitance Tolerance

| Letter Symbol | Capacitance Tolerance | Letter Symbol | Capacitance Tolerance |
|---------------|-----------------------|---------------|-----------------------|
| С | ±0,25pf | K | ±10% |
| D | ±0,5pf | M | ±20% |
| J | ±5% | Z | .+80 ~ -20% |

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| | Voltage Disc Capacitor |
|-----------|---------------------------|
| Part No.: | I23001 |

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Customer:









Standard atmospheric condition

Temperature: 15~35°C Relative Humidity: 45~75%

Atmospheric pressure: 86~106KPa (860~1060mbar

Operating and storage temperature range

Operating Temperature:

| Temperature | Lowest Operating | Highest Operating |
|-----------------|------------------|-------------------|
| • | | |
| Characteristics | Temperature | Temperature |
| SL | 25°C | .+85°C |
| COH | 25°C | .+85°C |
| Y5P | 25°C | .+85°C |
| Y5U | 25°C | .+85°C |
| Y5U | 25°C | .+85°C |
| Y5V | 25°C | .+85°C |
| Z5U | 10°C | .+85°C |
| Z5V | 10°C | .+85°C |
| YR | 25°C | .+125°C |

Storage Temperature Range: -10 to + 40°C

Characteristics and test methods

Electrical characteristics and test methods

| Jamy | | | Shoo | t No. | 3 from 14 | Customer: | | | |
|---|---|---------|----------------|---|--|--|------------------------|--|--|
| Wilson | TOLER | RANCE | Mason | DATE | 30.04.2011 | | | | |
| | | , | wrapped on env | elope for 1 to 5 s | Super High Voltage Di Ceramic Capacitor | | | | |
| Voltage Pr | The Voltage of 300% rated voltage (for rated voltage 540V and 500V) 200% rated voltage (for rated voltage 1000V to 2000V), 175% rated voltage (for rated voltage 3000V), or 150% rated Voltage (for DCG or SBBLC) shall be applied between leads for 1 to 5seconds. The voltages of 250% rated voltage (for 50V capacitors) or 1300V (fort 500V, 1KV and over) shall be applied between leads connected together and metal foil | | | | | | down or flashover | | |
| Insulatio Resistand | | voltage | (for Vr≤500VDC | e shall be meas (); 500VDC (for 5seconds of cha | | 1000M Ω min Ω mir | 1000M n (for SBBLC) | | |
| Quality factories dissipation factories | | | | r dissipation fa ame condition | | Cr-rated capacitance in unit of pf 2,5% max. (for Y5P,Y5U and Z5U 0,5% max. (for YR) 3,5% max. (for Y5V and Z5U) 5%max. (for SBBLC Y5V and Y5U) 3,5%max. (for SBBLC Y5P) | | | |
| | | | | | | Q≥100 | 00 (forCr<30pf) | | |
| Capacitano tolerance | | and 1Vr | | be measured at : (Hz and 1Vrms (III) | | | | | |

DRW:JasonCHKDWilsonMATL:WilsonTOLERANCEMasonDATE30.04.2011APPD:SchumiFINISHJamySheet No.3 from 14









| | | • | • | | h thermal equilibri at the thermal equ | • | | re or each step | in the following | iable. | ļ | Class I | |
|-----------------|--|-------------------------|----------------------|-----------|---|-------------|---------------------------------|-----------------|------------------|--------|---|----------------|---------------|
| | | | | • | at the thermal equ Temperatur | | each step. | | | | | | #:-:t. |
| | Step | Temperature 20 ± 2°C | • | Step | • | | | | | | Temperature coefficient: Refer to specification sheet | | |
| | | 25 ± 2°C | | 4 5 | 85 ±2°C (125±2°C 20 ± 2°C | ioi rk) | | | | | | · · | |
| | 2 3 | 25 ± 2 °C | | 5 | 20 ± 2 C | | | | | | ļ | Capacitance d | |
| | ŭ | | ion Cl. tha ata | oo 1 ond | oton 2 may be om | ittad | | | | | ļ | Within ±1% o | |
| | | | | | step 2 may be om rift shall be calcula | | following forn | aulac | | | | (Whichever is | greater) |
| | The tempera | (Cm - Co) | and the capac | itarice u | riit Silaii be calcula | ited by the | Tollowing Torri | iuias. | | | | | |
| | = | | x10 ⁶ | (nnr | m/°C) | | | | | | | Class II & III | |
| Temperature | | Co (T- To) | XIO | (ppi | 11/ 0) | | | | | | ļ | Temperature | Permitti |
| Characteristics | | | Co - C | 1 | C ₅ - Co | | C ₅ - C ₁ | | | | ļ | Characteris | capacita |
| naraciensiics | | | = | - (| or | or | | | | | ļ | tics | chang |
| | | | Co | | Co | | Co | | | | ļ | Y5P | ± 10% |
| | Where | | | | | | | | | | ļ | | 15% to -30% |
| | Co | Capacitance | • | | | | | | | | ļ | | 22% to -56% |
| | Cm | Capacitance | • | - | 1 | | | | | | ļ | | 22% to -56% |
| | C1,0 | C5 Capacitance | = | = | | | | | | | ļ | Y5V ± | 22% to -82% |
| | То | Measuring te | • | • | | | | | | | ļ | Z5V ± | 22% to -82% |
| | Т | Measuring te | emperature at | Step 2 a | nd /or step 4 | | | | | | ļ | | |
| | Pre-trateme | | | | | | | | | | ļ | | |
| | | | • | | 5 ±2°C and a relat | | • | | | | ļ | | |
| | | | | | y to cool in contair | | | | | | | <u> </u> | |
| Robustness of | The capacitor body shall be held in such a manner so that axis of the lead is vertical. The tensile force of 10N (for Ø 0,6mm lead | | | | | | | | | | itor shal be i | | |
| Termination | ot 5N (for Ø 0,5mm lead) shall be applied to the lead in a direction of ist axis and acting in a direction away from the body of the | | | | | | | | of the | | | | |
| | | | | | capacitor fo | r 10 ±1 se | conas. | | | | | no loosene | eed or cut of |

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Ceramic Capacitor

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| Bending | The capacitor is held in such a manner so that axis of the lead is vertical. As mass applying a force of 5N (for Ø 0,6mm lead) or 2,5N (for Ø 0,5mm lead) is then suspended from the end of the lead. The body of the capacitor is then inclined within a period of 2 to 3 seconds, through an angle of approximately 90° in the vertical plane and then returned to its initial position over the same period of time. This operation constitutes one bend. The lead shall be subjected to a total of 2 alternating bends in to opposite directions. | The lead shall be no broken. | | | |
|---------------------------------|---|--|--|--|--|
| Endurance characte | ristics and test methods. | | | | |
| Solderability | Solder temperature: 235 ±5°C Immersion time; 2 ± 0,5 seconds Immersion speed: 25 ± 6mm/s | A new uniform coating of the surface being imr | of solder shall cover a minimum of 95% mersed. | | |
| | Frequency range: 10~55Hz. | Apperance | No visible damage | | |
| Vibration | Amplitutde (total excursion); 1,5mm | Capacitance change | Within specified tolerance | | |
| VIDIALIOII | Total duration: 6hours. This motion shall be aplied for 2 hours in aech of three mutually perpendicular directions. | Quality factor or dissipation factor | Refer to clause 5.1.2 | | |
| | Solder temperature and immersion time: 260 ± 5°C, 10 ± 0,5 seconds. | Apperance | No visible damage | | |
| Resistance to Soldering Heat | The immersing depth shall be a position 1,27mm from the seating plane. | Capacitance change | ± 2,5% or ± 0,25pf (whichever is greater, for class I). ± 5% (for Y5P and YR). ±15% (for Y5U and Z5U). ±20% (for Y5V and Z5V). | | |
| | Post treatment: The capacitor shall be preversed at the standard atmospheric condition for 24 ± | Voltage Proof (for | | | |
| | 2hours. | between leads only) | | | |
| Solvent resistance | The capacitor shall be immersed into isopropylalcohol. For 30 ± seconds. | Apperance | No visible damage legible marking | | |

| | | | | | | | | | | | Part No.: |
|---|-------|--------|------|--------|--------|--------|-----------|-------|-------|------------|-----------|
| | DRW: | Jason | CHKD | Wilson | MATL: | Wilson | TOLERANCE | Mason | DATE | 30.04.2011 | Customor: |
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| | | | | | | | Apperanc | ce | No visi | ble damage Le | gible mark | king | |
|-------------------|----------|--|----------------------|-------------------------------|-------------------------------|-----------------|-----------------|---------------|--------------------------------------|-------------------|-------------|---------------|------------|
| | | | | | | | | | ± 5% o | or ± 0,5pf (which | never is th | e greater for | r class 1) |
| | | | | | | | Capacitance C | Change | ± 10% | (Y5P and YR) | | | |
| | | | | | | | Оараспанос С | Jilange | ± 20% | (Y5U and Z5U) |) | | |
| | | | h l 4b | 44 | t | 05 - 000 for | | | ± 30% | (Y5V and Z5V) | | | |
| | | • | be placed in the | | • | | | | Q ≥ 20 | 0 + 10Cr (for C | Cr <10pf | | |
| Temperature Cycle | | 30minutes then at room temperature for 3 minutes at 85 ±2°C (125 ±2°C for YR) for 30minutes and at room temperature for 3 minutes. This operation constitutes one cycle | | | | | | | Q ≥ 275 + 5/2Cr (for 10pf ≤ CR<30pf | | | | |
| Temperature Oyole | | | e subjected to a | | | | Quality factor | | $Q \ge 350$ (for $Cr \ge 30pf$) | | | | |
| | | | ed at the standar | | | | dissipation fa | actor | 5% ma | x. (Y5V & Z5V) |) | | |
| | | • | | | | 3% ma | x. (Y5P, YR, Y | 5U & Z5U |) | | | | |
| | | | | | | 7,5% n | nax. (SBBLC) | | | | | | |
| | | | | | Insulation Resi | istance | 1000M | Ω min. | | | | | |
| | | | | | 500M Ω min. (SBBLC) | | | | | | | | |
| | | | | | | | Voltage pro | | | tween leads on | ly. | | |
| | | The capacitor shall be stored for 500^{+24} hours at a temperature of $40 \pm 2^{\circ}$ C and a relative humidity of 90 to 95%. Post treatment: The capacitor shall be preseved for 1 to 2 hours at the standard atmospheric condition. | | | | | | | | ble damage | | | |
| | | | | | | | | | As the | | | | |
| | | | | | | | | | As the | | | | |
| Damp Heat | relative | | | | | | | | | Ω min (Class I | • | | |
| | | 21 | Insulation Resistanc | | 1000111 12 111111 (01000 11) | | | | | | | | |
| | | | | | 500M Ω min (Class III) | | | | | | | | |
| | | | | | | | Voltage pro | | For be | tween leads on | ly. | | |
| | | | | | | | Apperanc | | I | | | | |
| | The | voltage that is | equal to 200% ra | ted voltage (for | 50V and 500V c | apacitors), or | Capacitance C | | ļ | | | | |
| For demands | | | for 1KV~3KV cap | | | | Quality facto | | | | The same | us before | |
| Endurance | SBBL | C) shall be appli | ed continuously t | to the capacitor | at temperature o | f 85 ± 3°C (125 | dissipation fa | actor | ļ | | | | |
| | | | ± 3°C for YF | R) for 1000 ⁺⁴⁸ ho | ours. | | Insulation Resi | istance | | | | | |
| | | | | | | | Voltage pro | oof | Super High Voltage Di | | | Valtaga Dica | |
| | | | | | | | <u> </u> | | • | | - | _ | _ |
| | | | | | | | | eramic | Capacitor | | | | |
| | | | | | | | | | | | Part | No.: | I23001 |
| | ason | CHKD | Wilson | MATL: | Wilson | TOLERANCE | Mason | | ΛTE | 30.04.2011 | Custor | ner | |
| APPD: So | humi | | | FINISH | Jamy | | Shee | et No. | | 6 from 14 | Custor | | |









Structure and ROHs Materail request

The marking of class I temperature characteristics is the color block on top of the capacitor

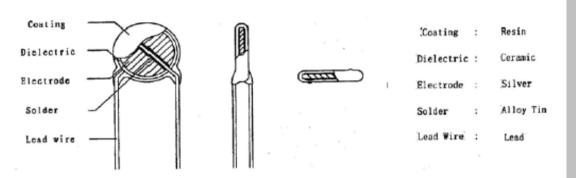
| Temperature | C | Ο Δ | SL | | | | | | | |
|-----------------|--|-----------|-----------|----|--|--|--|--|--|--|
| Characteristics | Bla | ack | None | | | | | | | |
| | The marking of class II & III temperature characteristics is symbols specified in following table: | | | | | | | | | |
| Temperature | Y5P | Y5U / Z5U | Y5V / Z5V | YR | | | | | | |
| Characteristics | Black | E | F HRR&F | | | | | | | |

Capacitance

When rated capacitcance is under 1ßßpf the capacitance marking is value being rated capacitance in unit pf. When rated capacitance is 100pf or over the capacitance marking is made in third digit method.

Tolerance:

| The tolerance table. | | | | | | | | | | | |
|---|-------------------|-------|-------------|------------|-------------|--|--|--|--|--|--|
| Tolerance: $\pm 0,25$ pf $\pm 0,5$ pf $\pm 5\%$ $\pm 10\%$ ± 20 | | | | | | | | | | | |
| Symbol | М | | | | | | | | | | |
| The tolerance following table | ecified in | | | | | | | | | | |
| Tolerance: | ± 10% | ± 20% | .+50%, -20% | .+100%, 0% | .+80%, -20% | | | | | | |
| Symbol | Symbol K M SL P Z | | | | | | | | | | |
| Poted Voltage | - | | | | | | | | | | |



| Components | Material | ROHS request | Remark | |
|------------|-----------|-----------------------------|---|--|
| Coating | Resin | Cd <100ppm; | | |
| Dielectric | Ceramic | Pb <100ppm; | Appendix 1; SGS report | |
| Electrode | Silver | LIC Ctr DDD DDDC | (Availbale as customer request or See Appendix | |
| Solder | Alloy tin | HG, Ctr PBBs, PBDEs, N.D | 1 | |
| Lead Wire | Lead | 1,,,,, | | |

Rated Voltage

When rated voltage is 50V the voltage marking is symbol "____" under capcitance marking.

When rated voltage is 500V the voltage marking is symbol "__" over capcitance marking.

When rated voltage is 1000Vor over, the voltage marking is symbols 1KV, 2KV, 3KV, 6KV..... over capacitance marking.

| Super High | Voltage Disc |
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| Ceramic | Capacitor |

Part No.: **I23001**

Customer:

| DRW: | Jason | CHKD | Wilson | MATL: | Wilson | TOLERANCE | Mason | DATE | 30.04.2011 |
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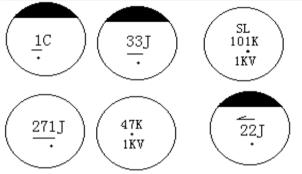


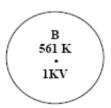




Example of marking (Class I)

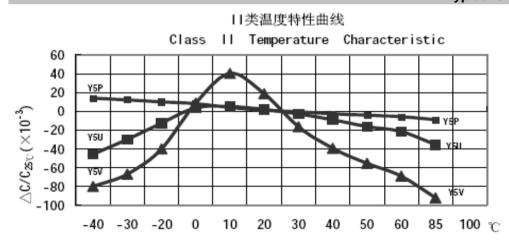
Example of marking (Class II & III) over 1000 Volt

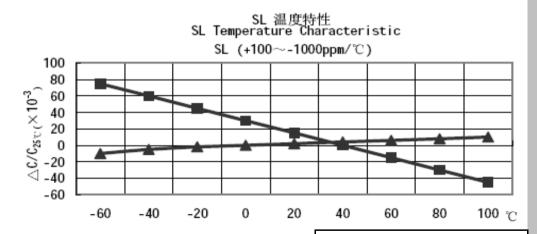






Typical Characteristics Graph





| Super High Voltage Disc Ceramic Capacitor | | |
|--|--------|--|
| Part No · | 123001 | |

CHKD MATL: DRW: Wilson Wilson **TOLERANCE** Mason 30.04.2011 Jason DATE APPD: Schumi FINISH Sheet No. Jamy 8 from 14

Part No.. 12300

Customer:

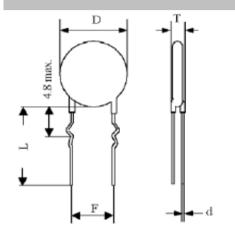


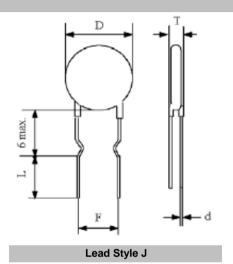


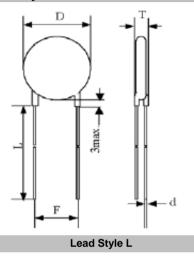


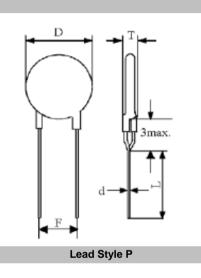


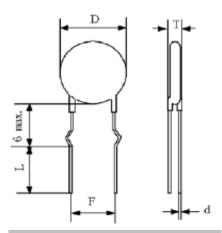
Lead Style











Lead Style W

| | Par |
|-----|-------|
| 011 | Custo |
| 1/1 | Cusio |

Super High Voltage Disc Ceramic Capacitor

Part No.: **I23001**

Customer:

Lead Style K

CHKD Wilson MATL: 30.04.20 DRW: Wilson TOLERANCE Mason Jason DATE APPD: FINISH Schumi Sheet No. 9 from 14 Jamy

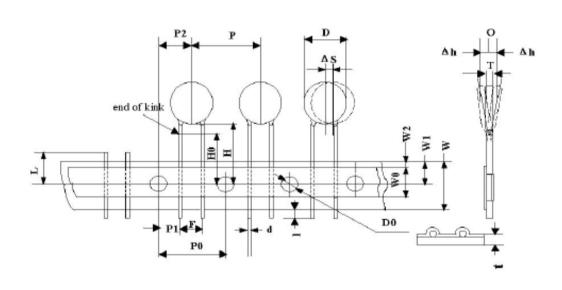


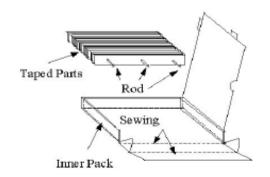






Packing Style F





| Symbol | Dimension (mm) |
|--------|---------------------------------|
| P0 | 12,7 ±0,2 |
| P0 | 12,7 ±1,0 |
| F | 5,0 +0,5/-0,2 |
| P1 | 3,85 ±0,4 |
| P2 | 6,35 ±0,4 |
| H0 | 16,0 ±0,5 |
| Н | 20,0 ±0,5 |
| W | 18,0 ±0,5 |
| W0 | 8,0 min |
| W1 | 9,0 ±0,3 |
| W2 | 3,0max. |
| t | 0,7 ±0,2 |
| D | To comply with individual sheet |
| D0 | 4,0 ±0,2 |
| d | To comply with individual sheet |
| I | 2,0 max. |
| L | 11 max. |
| Т | To comply with individual sheet |
| ΔS | 0,5 max |
| ΔΗ | 0,5 max |

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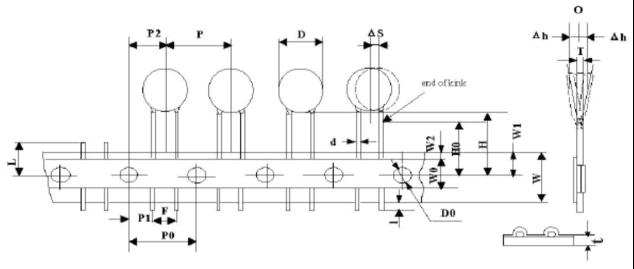




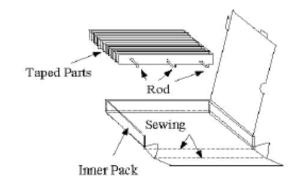




Packing Style V



| Symbol | Dimension (mm) |
|--------|---------------------------------|
| P0 | 15,0 ±0,2 |
| P0 | 15,0 ±1,0 |
| F | 7,5 +0,5/-0,2 |
| P1 | 3,75 ±0,4 |
| P2 | 7,5 ±0,4 |
| H0 | 16,0 ±0,5 |
| Н | 20,0 ±0,5 |
| W | 18,0 ±0,5 |
| W0 | 11,5 min |
| W1 | 9,0 ±0,3 |
| W2 | 3,0max. |
| t | 0,7 ±0,2 |
| D | To comply with individual sheet |
| D0 | 4,0 ±0,2 |
| d | To comply with individual sheet |
| I | 2,0 max. |
| L | 11 max. |
| Т | To comply with individual sheet |
| ΔS | 0,5 max |
| ΔΗ | 0,5 max |



Super High Voltage Disc Ceramic Capacitor

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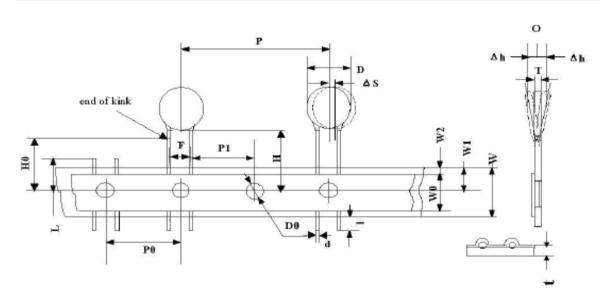


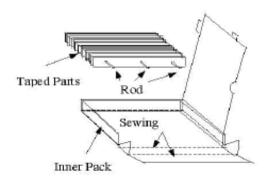




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Packing Style U





| Symbol | Dimension (mm) |
|--------|---------------------------------|
| P0 | 12,7 ±0,2 |
| P0 | 25,4 ±1,0 |
| F | 10,0 +0,5/-0,2 |
| P1 | 7,7 ±0,4 |
| P2 | |
| H0 | 16,0 ±0,5 |
| Н | 20,0 ±0,5 |
| W | 18,0 ±0,5 |
| W0 | 11,5 min |
| W1 | 9,0 ±0,3 |
| W2 | 3,0max. |
| t | 0,7 ±0,2 |
| D | To comply with individual sheet |
| D0 | 4,0 ±0,2 |
| d | To comply with individual sheet |
| I | 2,0 max. |
| L | 11 max. |
| Т | To comply with individual sheet |
| ΔS | 0,5 max |
| ΔΗ | 0,5 max |

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Ordering Informations

| Serie | Range | Tolerance Code | Material Code | Voltage Code | Lead Length | Lead Style | Lead Pitch | Lead Diameter | ROHS | Packing Code |
|--------|--------------------|-------------------|------------------|---------------|------------------|-------------------|----------------------|------------------|--------------------|----------------------------|
| I23001 | 222 | M | 5U | U | 11 | ı | D | 7 | R | BU |
| 123001 | ZZZ | IVI | 30 | U | 11 | L | ט | , | ĸ | БО |
| | 222= 2200pf | M= ±20% | 5U= Y5U | U= 4KV | 11 = 11mm | L= Style L | D= Pitch 10mm | 7= 0,65mm | R= ROHS Conform | BU= Bulk Ware |
| | , | | | | 25= 25mm | P= Style P | | | N= NON ROHS | TF= Tape Style F |
| | | | | • | | W= Style W | | | Conform | TV= Tape Style U |
| | | | | | | J= Style J | | | | TU= Tape Style U |
| | | | | | | K= Style K | | | ! | • |

Super High Voltage Disc Ceramic Capacitor

Part No.: **I23001**

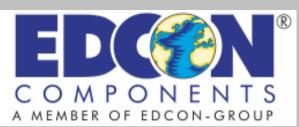
Customer:

| DRW: | Jason | CHKD | Wilson | MATL: | Wilson | TOLERANCE | Mason | DATE | 30.04.2011 |
|-------|--------|------|--------|--------|--------|-----------|-----------|------|------------|
| APPD: | Schumi | | | FINISH | Jamy | | Sheet No. | | 13 from 14 |



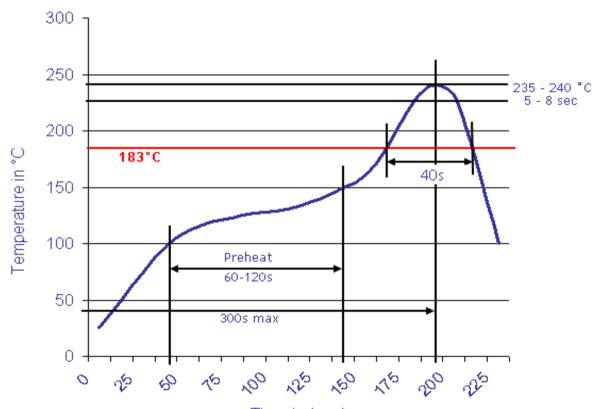






Soldering Profile Curve

Classification Reflow Profile (JEDEC J-STD-020C)



Time in (sec)

Super High Voltage Disc Ceramic Capacitor

Part No.: **I23001**

Customer:

MATL: DRW: CHKD Wilson Wilson TOLERANCE Mason DATE 30.04.2011 Jason APPD: FINISH Schumi Sheet No. 14 from 14 Jamy