DATA SHEET

Super High Voltage Disc Ceramic Capacitor

Serie: I23006

Range 221= 220pf

Tolerance K= ±10%

Voltage 15000 Volt

Material Character. 5P

Body Diam. 10,5mm

Pitch 10mm

Body Thickn. 10,0mm

										Super High Voltage Disc Ceramic Capacitor
										Serie No.: **I23006**
DRW:	Jason	CHKD	Wilson	MATL:	Wilson	TOLERANCE	Mason	DATE	30.04.2011	Customer:
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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.Char. Y5U	Temp.Char. 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 specified tolerance, testing at 25°C, 1Vrms and 1KHz (at 1MHz for SL products)			
	10 ~ 330pf	100 ~ 2200pf	470 ~ 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 60 seconds, Rj ≥ 1000MΩ			
Temperature Characteristics	Temperatur Chararcteristics Code		**SL** / **Y5P**	**Y5U** / **Y5V**
	Temperatur Coefficient (10-6 /°C)		. +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
C	±0,25pf	**K**	±10%
D	±0,5pf	**M**	±20%
J	±5%	**Z**	.+80 ~ -20%

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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 Characteristics	Lowest Operating Temperature	Highest Operating 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

Capacitance & tolerance	The Capacitance shall be measured at 25°C with 1Mhz and 1Vrms (Class1), 1KHz and 1Vrms (class II),1KHz and 0,1Vrms (for Calss III)	Refer to individual sheet
Quality factor or dissipation factor	The quality factor or dissipation factor shall be measured at the same conditions ab above	Q≥400+20Cr (forCr<30pf) Q≥1000 (forCr<30pf) 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)
Insulation Resistance	The insulation resistance shall be measured with rated voltage (for Vr≤500VDC); 500VDC (for Vr≥500VDC)within 50± 5seconds of charging	1000M Ω min 1000M Ω min (for SBBLC)
Voltage Proof	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 wrapped on envelope for 1 to 5 seconds.	No breakdown or flashover

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Temperature Characteristics	The capacitor shall be kept for enough time to reach thermal equilibrium at special temperature of each step in the following table. The capacitance measurement shall be made only at the thermal equilibrium of each step. Step 1: 20 ± 2°C; Step 2: .-25 ± 2°C; Step 3: 20 ± 2°C; Step 4: 85 ±2°C (125±2°C for YR); Step 5: 20 ± 2°C For temperature characteristics SL the steps 1 and step 2 may be omitted. The temperature coeffizient and the capacitance drift shall be calculated by the following formulas. $= \frac{(Cm - Co)}{Co\,(T - To)} \times 10^6$ (ppm/°C) $= \frac{Co - C_1}{Co}$ or $\frac{C_5 - Co}{Co}$ or $\frac{C_5 - C_1}{Co}$ Where Co Capacitance at step 3 Cm Capacitance at step 2 and/or step 4 C1,C5 Capacitance at step 1 and step 5 To Measuring temperature at Step 3 T Measuring temperature at Step 2 and /or step 4 Pre-tratement: The capacitor shall be stored at a temperature of 55 ±2°C and a relative humidity of 20% or less for 16 to 24 hours. And then the capacitor shall be allowed immediately to cool in container using appropriate dryer such as activated carbon, silica gel	Class I Temperature coefficient: Refer to specification sheet Capacitance drift: Within ±1% or ± 0,05pf (Whichever is greater) Class II & III Y5P ± 10% YR ± 15% to -30% Y5U ± 22% to -56% Z5U ± 22% to -56% Y5V ± 22% to -82% Z5V ± 22% to -82%
Robustness of Termination	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) 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 capacitor for 10 ±1 seconds.	The capacitor shal be no broken and the lead shall be no looseneed or cut off.

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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 characteristics 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 solder shall cover a minimum of 95% of the surface being immersed.	
Vibration	Frequency range: 10~55Hz. Amplitutde (total excursion); 1,5mm Total duration: 6hours. This motion shall be aplied for 2 hours in aech of three mutually perpendicular directions.	Apperance	No visible damage
		Capacitance change	Within specified tolerance
		Quality factor or dissipation factor	Refer to clause 5.1.2
Resistance to Soldering Heat	Solder temperature and immersion time: 260 ± 5°C, 10 ± 0,5 seconds. The immersing depth shall be a position 1,27mm from the seating plane. Post treatment: The capacitor shall be preversed at the standard atmospheric condition for 24 ± 2hours.	Apperance	No visible damage
		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).
		Voltage Proof (for between leads only)	
Solvent resistance	The capacitor shall be immersed into isopropylalcohol. For 30 ± seconds.	Apperance	No visible damage legible marking

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Temperature Cycle	The capacitor shall be placed in the test chamber at temperature of -25 ± 2°C for 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. The capacitor shall be subjected to a total of 5 cycle. Post-treatment: The capacitor shall be preversed at the standard atmospheric condition for 24 ± 2 hours.	Apperance	No visible damage Legible marking
		Capacitance Change	± 5% or ± 0,5pf (whichever is the greater for class 1) ± 10% (Y5P and YR) ± 20% (Y5U and Z5U) ± 30% (Y5V and Z5V)
		Quality factor or dissipation factor	Q ≥ 200 + 10Cr (for Cr <10pf Q ≥ 275 + 5/2Cr (for 10pf ≤ CR<30pf Q ≥ 350 (for Cr ≥ 30pf) 5% max. (Y5V & Z5V) 3% max. (Y5P, YR, Y5U & Z5U) 7,5% max. (SBBLC)
		Insulation Resistance	1000M Ω min. 500M Ω min. (SBBLC)
		Voltage proof	For between leads only.
Damp Heat	The capacitor shall be stored for 500 $^{+24}$ hours at a temperature of 40 ± 2°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.	Apperance	No visible damage
		Capacitance Change	As the same
		Q or DF	As the same
		Insulation Resistance	2500M Ω min (Class I) 1000M Ω min (Class II) 500M Ω min (Class III)
		Voltage proof	For between leads only.
Endurance	The voltage that is equal to 200% rated voltage (for 50V and 500V capacitors), or 125% rated voltage (for 1KV~3KV capacitors), or 125% rated voltage for over 4KV or SBBLC) shall be applied continuously to the capacitor at temperature of 85 ± 3°C (125 ± 3°C for YR) for 1000 $^{+48}$ hours.	Apperance	The same us before
		Capacitance Change	
		Quality factor or dissipation factor	
		Insulation Resistance	
		Voltage proof	

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Structure and ROHs Materail request

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

Temperature Characteristics	C0 Δ	SL
	Black	None

The marking of class II & III temperature characteristics is symbols specified in following table:

Temperature Characteristics	Y5P	Y5U / Z5U	Y5V / Z5V	YR
	Black	E	F	HRR&R

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 marking for Class I is the symbols specified in following table.

Tolerance:	± 0,25pf	±0,5pf	±5%	±10%	±20%
Symbol	C	D	J	K	M

The tolerance marking for Class II & III is the symbols specified in following table.

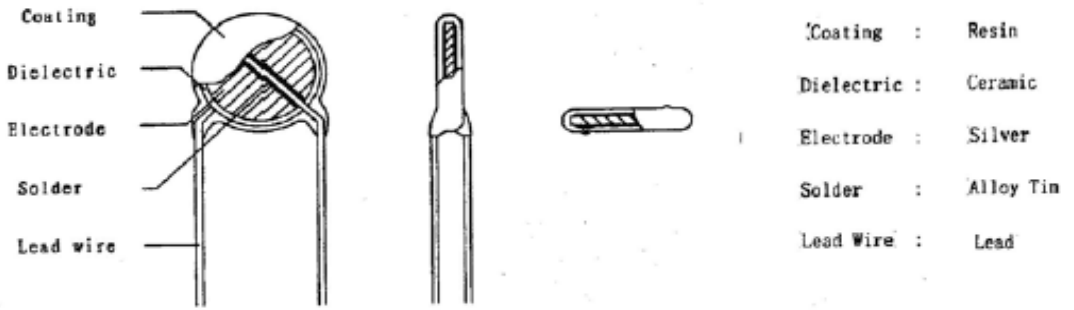
Tolerance:	± 10%	± 20%	.+50%, -20%	.+100%, 0%	.+80%, -20%
Symbol	K	M	SL	P	Z

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.



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

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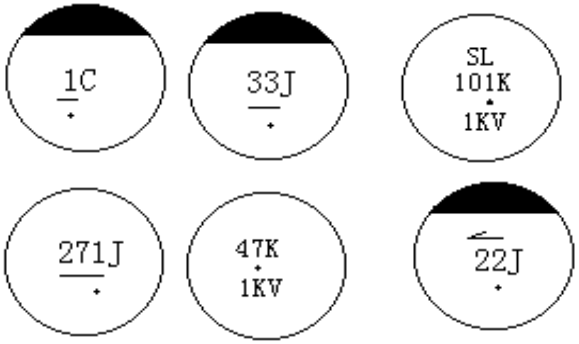
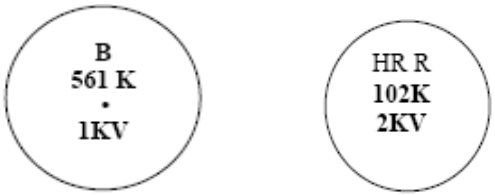
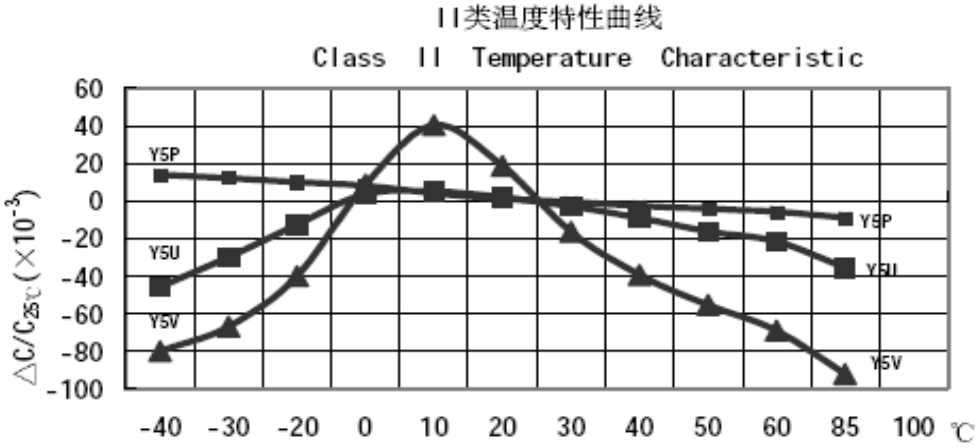
Example of marking (Class I)

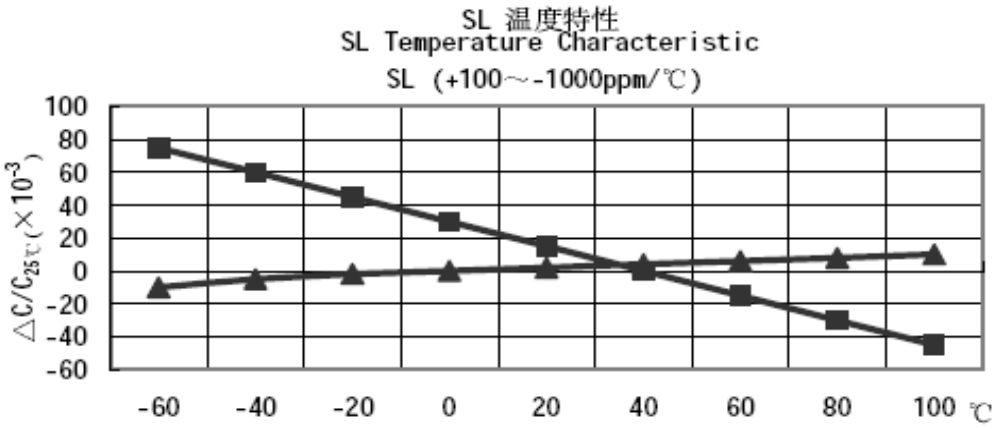


Example of marking (Class II & III) over 1000 Volt



Typical Characteristics Graph





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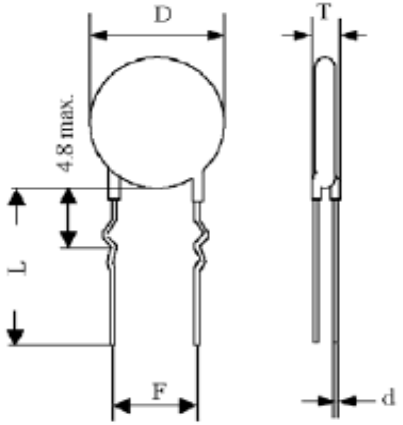
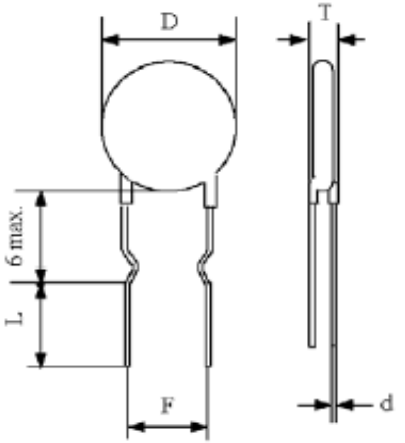
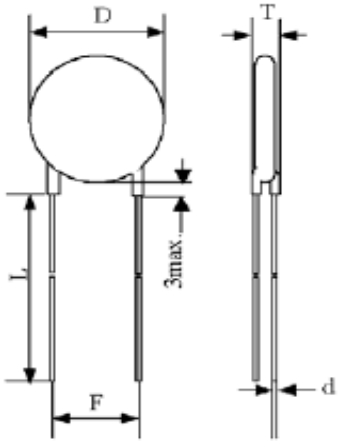
Lead Style



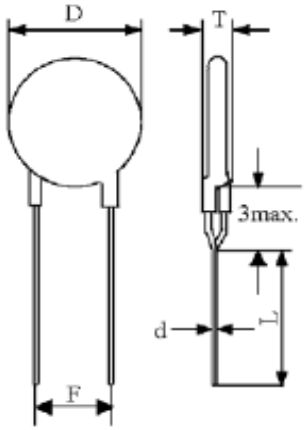
Lead Style W



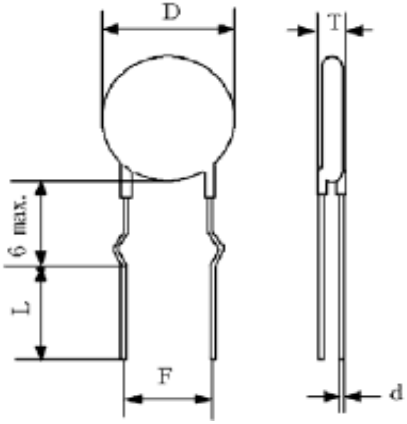
Lead Style J



Lead Style L



Lead Style P



Lead Style K

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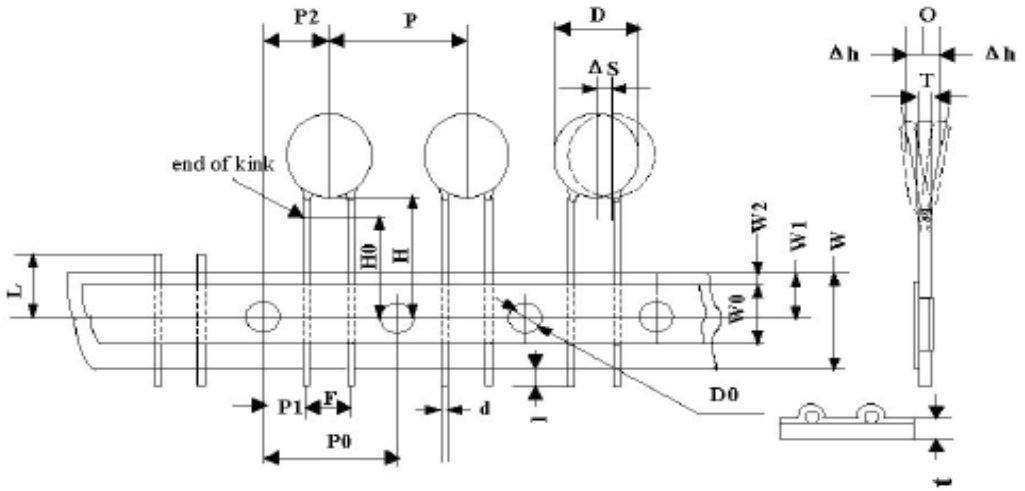
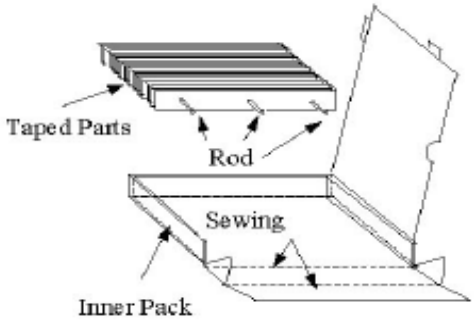
Packing Style F





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
H	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
l	2,0 max.
L	11 max.
T	To comply with individual sheet
Δ S	0,5 max
Δ H	0,5 max

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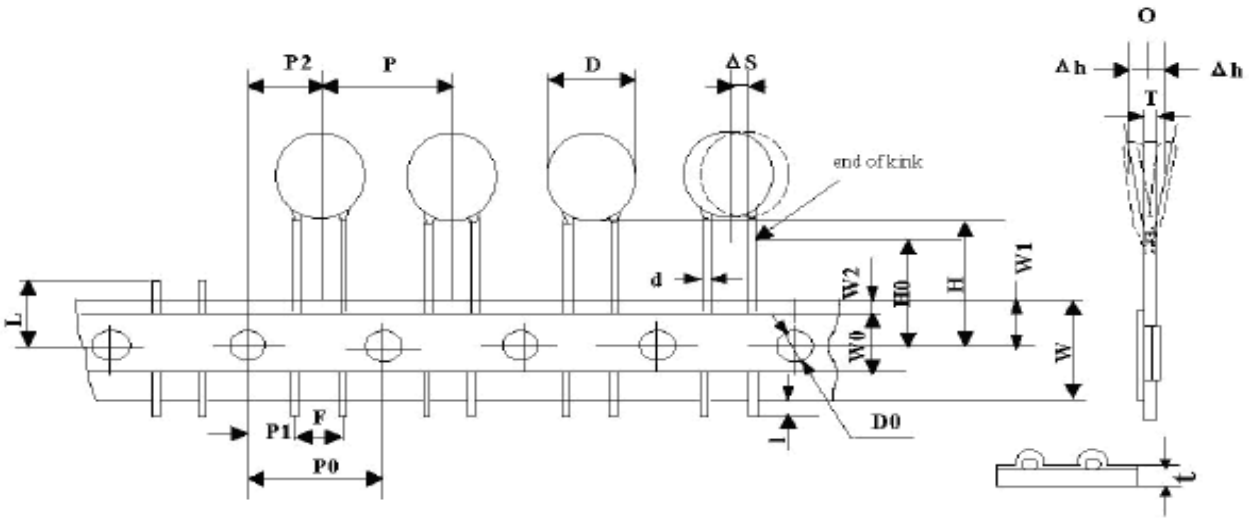
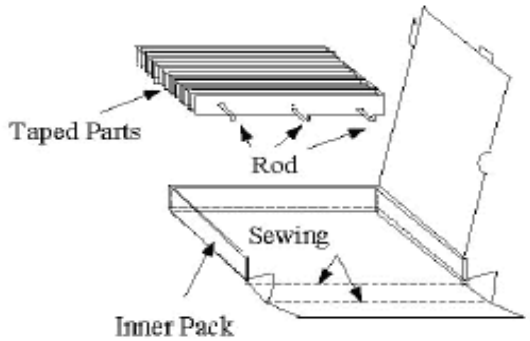
Packing Style V





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
H	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
l	2,0 max.
L	11 max.
T	To comply with individual sheet
Δ S	0,5 max
Δ H	0,5 max

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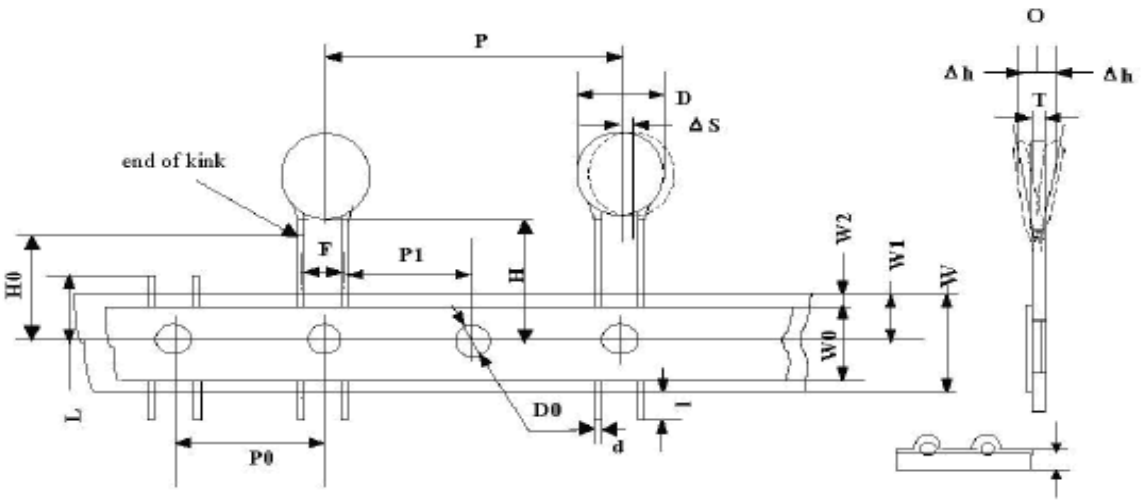
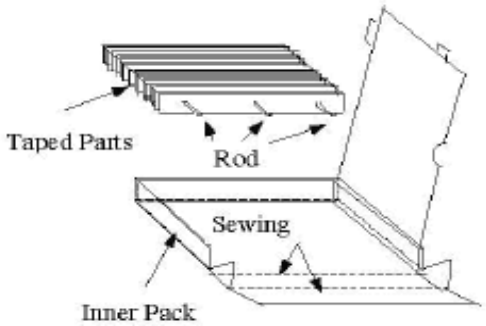
Packing Style U





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
H	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
l	2,0 max.
L	11 max.
T	To comply with individual sheet
Δ S	0,5 max
Δ H	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
I23006	-	**221**	**K**	**5P**	**M**	**11**	**L**	**D**	**8**	**R**	**BU**
		221= 220pf	**K=** ±10%	**5P=** Y5P	**M=** 15KV	**11=** 11mm	**L=** Style L	**D=** Pitch 10mm	**8=** 0,80mm	**R=** ROHS Conform	**BU=** Bulk Ware
						25= 25mm	**P=** Style P			**N=** NON ROHS Conform	**TF=** Tape Style F
							W= Style W				**TV=** Tape Style U
							J= Style J				**TU=** Tape Style U
							K= Style K				

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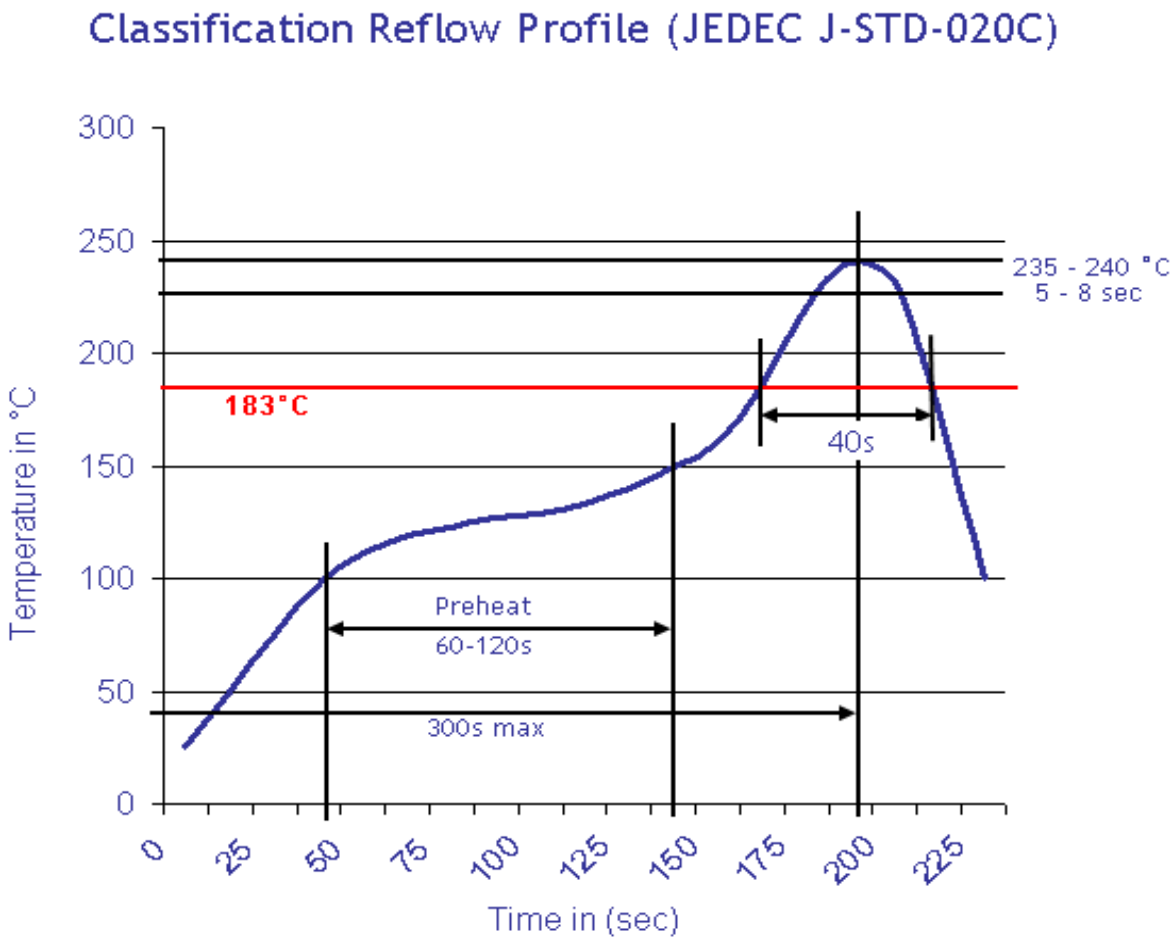
Soldering Profile Curve



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