







# DATA SHEET

# Super High Voltage Disc Ceramic Capacitor

**Serie: 123003** 

Range 471= 470pf

**Tolerance** M= ±20%

Voltage 8000 Volt

Material Character. 5U

Body Diam. 9,5mm

Pitch 10mm

Body Thickn. 8,0mm

Super High Voltage Disc Ceramic Capacitor

Serie No.: **123003** 

Customer:

DRW: Jason CHKD Wilson MATL: Wilson **TOLERANCE** Mason DATE 30.04.2011 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.Char. 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)									
Сараспансе	10 ~ 330pf	100 ~ 2200pf	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 6	0 seconds, Rj	≥ 1000MΩ							
Tomporatura	Temperatur Cha	rarcteristics Code	SL	Y5P	Y5U	Y5V					
Temperature 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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Part No.: **123003** 

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			Shee	t No	3 from 14	Customer:			
Wilson	TOLER	RANCE	Mason	DATE	30.04.2011	Part No.:			
	wrapped on envelope for 1 to 5 seconds.						gh Voltage Disc lic Capacitor		
Voltage Pr	oof	540V a 1000V t 3000V shall be voltage 1300 betw	and 500V) 200% to 2000V), 175% V), or 150% rated e applied betwee s of 250% rated V ( fort 500V, 11 veen leads conn	rated voltage (for rated voltage (for rated voltage (for Doen leads for 1 to voltage (for 50).  KV and over) sheeted together a	No break	down or flashover			
Insulatio Resistand		voltage	(for Vr≤500VDC	e shall be meas (); 500VDC (for 5seconds of cha	1000M $\Omega$ min 1000M $\Omega$ min (for SBBLC)				
Quality factories dissipation factories				r dissipation fa ame condition		2,5% max. (f 0,5% 3,5% max. 5%max. (for \$	pacitance in unit of pf or Y5P,Y5U and Z5U max. (for YR) (for Y5V and Z5U ) SBBLC Y5V and Y5U) . (for SBBLC Y5P)		
						Q≥400+20Cr (forCr<30pf) Q≥1000 (forCr<30pf)			
Capacitano tolerance		and 1Vi		be measured at a GHz and 1Vrms ( III)		Hz Refer to individual sheet			

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		_		
	The capacitor shall be kept for enough time to reach thermal equilibrium at special temperature of each step in the following table.	L		
	The capacitance measurement shall be made only at the thermal equilibrium of each step.	Class I		
	Step Temperature Step Temperature	Temperature coefficient:		
	1 20 ± 2°C 4 85 ±2°C (125±2°C for YR)	Refer to specification sheet		
	225 ± 2°C 5 20 ± 2°C	Capacitance drift:		
	$3   20 \pm 2$ °C	Within ±1% or ± 0,05pf		
	For temperature characteristics SL the steps 1 and step 2 may be omitted.	(Whichever is greater)		
	The temperature coeffizient and the capacitance drift shall be calculated by the following formulas.			
	( Cm - Co )			
	=	Class II & III		
	Co (T- To) x10 <sup>6</sup> (ppm/°C)	Temperature Permitting		
Temperature	$C_0 - C_1$ $C_5 - C_0$ $C_5 - C_1$	Characteris capacitance		
Characteristics	= or	tics change		
	Co Co Co	Y5P ± 10%		
	Where	YR ± 15% to -30%		
	Co Capacitance at step 3	Y5U ± 22% to -56%		
	Cm Capacitance at step 2 and/or step 4	Z5U ± 22% to -56%		
	C1,C5 Capacitance at step 1 and step 5	Y5V ± 22% to -82%		
	To Measuring temperature at Step 3	Z5V ± 22% to -82%		
	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			
	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)	The capacitor shal be no		
Robustness of	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	'   · · · · · · · · · · · · · · · · · ·		
Termination	capacitor for 10 ±1 seconds.	no looseneed or cut off.		
	Capacitor for 10 ±1 seconds.			

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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 character	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		
VIDIATION	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.		± 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		

										Ceramic	Capacitor
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								Apperanc	ce		ole damage Legi		( )	
							$\pm$ 5% or $\pm$ 0,5pf (whichever is the greater for class 1)							
					Capacitance C	Change	± 10% (Y5P and YR)							
					-	_	· ·	(Y5U and Z5U)						
	The capacitor shall be placed in the test chamber at temperature of -25 ± 2°C for								(Y5V and Z5V)					
	30minutes then at room temperature for 3 minutes at 85 ±2°C (125 ±2°C for YR) for						) + 10Cr ( for Cr	•						
Temperature (	Temperature Cycle  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								5 + 5/2Cr ( for 10					
						Quality factor			) (for Cr ≥ 30pf)					
			•	ed at the standar	•		•	dissipation fa			x. (Y5V & Z5V)			
									x. (Y5P, YR, Y5I	J & Z5U)				
									7,5% m	ax. (SBBLC)				
					Insulation Resi	istance	1000M	$\Omega$ min.						
									istarioc	500M Ω	min. (SBBLC)			
					Voltage pro	oof	For bety	ween leads only						
								Apperand	ce	No visib	ole damage			
					Capacitance C		As the s	same						
		The	capacitor shall b	e stored for 500	+24 hours at a te	emperature of 4	0 ± 2°C and a	Q or DF		As the s				
Damp Hea	at	relative	•		•	•	reseved for 1 to			2500M	Ω min (Class I )			
			2 hours at the standard atmospheric condition.				(				Ω min (Class II)	)		
								500M			00M Ω min (Class III )			
								Voltage pro	oof	For between leads only.				
								Apperanc	ce					
		Tho	valtage that is a	equal to 200% ra	tod valtago (for F	50\/ and 500\/ a	eanacitore) or	Capacitance C	Change					
				or 1KV~3KV cap				Quality factor			т	he same us befo	aro.	
Enduranc	е			ed continuously t				dissipation fa	actor		11	ne same us beit	<i>n</i> <del>c</del>	
		ODDEO		-	R) for 1000 <sup>+48</sup> ho	•	7 00 1 0 0 (120	Insulation Resi	istance					
								Voltage pro	oof			0	ul Maltana B'	
								T olicago pri		J			gh Voltage Disc ic Capacitor	
												Part No.:	123003	
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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

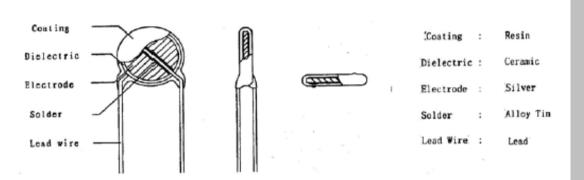
Temperature	C	Ο Δ	SL					
Characteristics	Bla	ack	None					
The marking of class II & III temperature characteristics is symbols specified in following table:								
specified in 10	nowing table.							
Temperature	Y5P	Y5U / Z5U	Y5V / Z5V	YR				
Characteristics	Black	E	F HRR&R					

#### 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	С	М						
The tolerance marking for Class II & III is the symbols specified in								
following table.								
Tolerance:	± 10%	± 20%	.+50%, -20%	.+100%, 0%	.+80%, -20%			
Symbol	ool K M SL P Z							
Datad Valtage								



Components	Material	ROHS request	Remark
Coating	Resin	Cd <100ppm;	
Dielectric	Ceramic	Pb <100ppm;	Appendix 1; SGS report
Electrode	Silver	HO OF BBB BBBE	(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.

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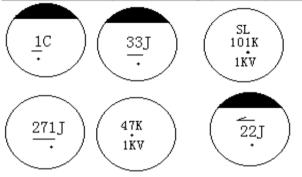


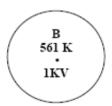




# Example of marking (Class I)

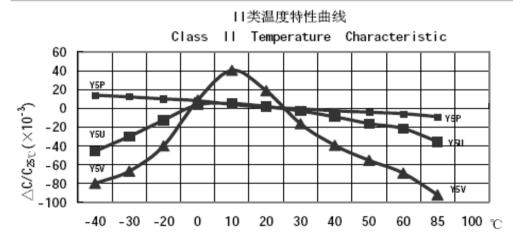
# Example of marking (Class II & III) over 1000 Volt

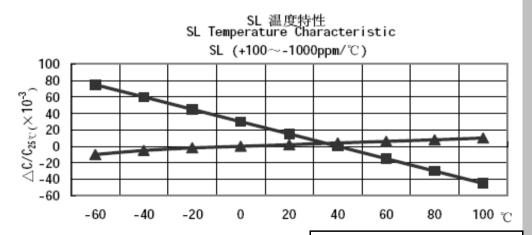






### **Typical Characteristics Graph**





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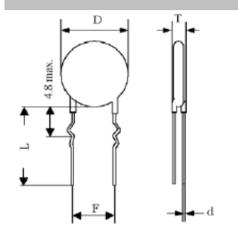


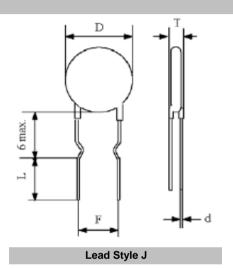


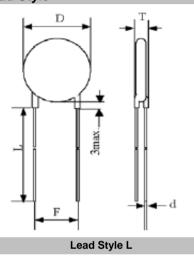


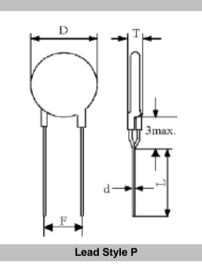
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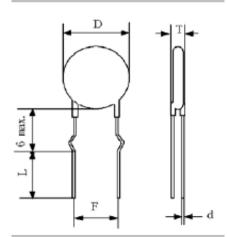
# **Lead Style**











Lead Style W

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Customer:

Lead Style K

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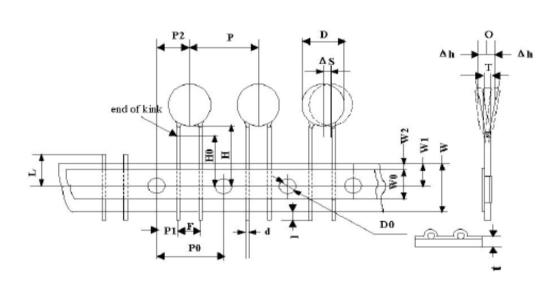


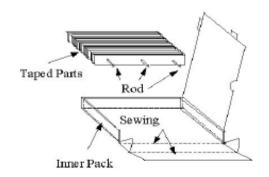






Packing Style F





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
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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	Ceramic	Capacitor

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Customer:

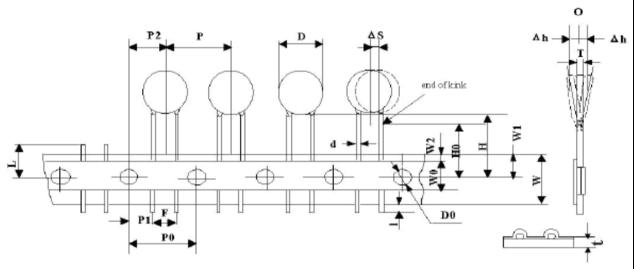




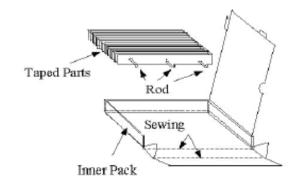




# Packing Style V



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
1	2,0 max.
L	11 max.
Т	To comply with individual sheet
ΔS	0,5 max
ΔΗ	0,5 max



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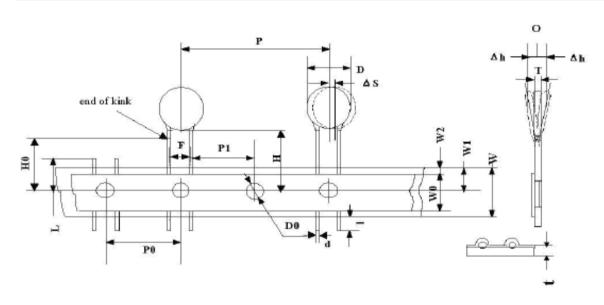
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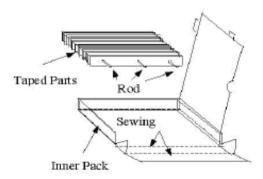






# Packing Style U





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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Part No.: **I23003** 

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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
102002	·	474	Na 1	EII	-	44		<b>D</b>	7	В	DU
I23003	-	471	M	5U		11	L	D	/	R	BU
	i				1						
		<b>471=</b> 470pf	<b>M=</b> ±20%	<b>5U=</b> Y5U	<b>Z=</b> 8KV	<b>11=</b> 11mm	L= Style L	<b>D=</b> Pitch 10mm	<b>7=</b> 0,65mm	R= ROHS Conform	<b>BU=</b> Bulk Ware
						_		1011111		N= NON	TF= Tape
						<b>25=</b> 25mm	P= Style P			ROHS	Style F
					•		M Chile M	'		Conform	TV= Tape
							W= Style W		•		Style U
							<b>J=</b> Style J				TU= Tape
							J= Style J				Style U
							K= Style K				

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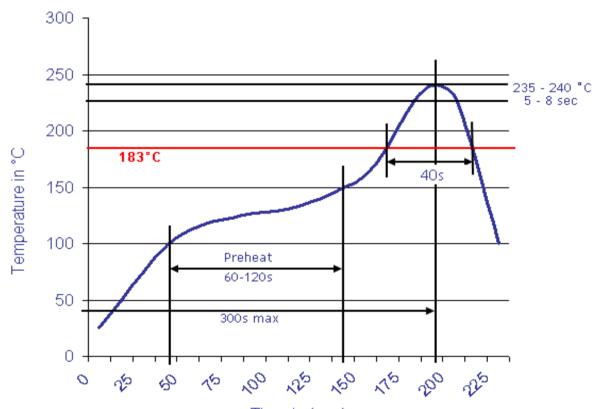






## **Soldering Profile Curve**

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



Time in (sec)

CHKD

Wilson MATL: Wilson TOLERANCE Mason DATE 30.04.2011
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