07D Disc Varistor

FEATURES

* Wide operating voltages ranging from 5Vrms to 1000Vrms (6Vdc to 1465Vdc).
* Fast response time of less than 25nS, instantly clamping the transient over voltage.
* High surge current handling capability.
* High energy absorption capability.
* Low clamping voltages, providing better surge protection
* Low capacitance values, providing digital switching circuitry protection.
* High insulation resistance, preventing electric arching to the adjacent devices or circuits.

APPLICATIONS

* Transistor, Diode, IC, Thyristor or Triac semiconductor protection.
* Surge protection in consumer electronics.
* Surge protection in industrial electronics.
* Surge protection in electronic home appliances, gas and petroleum appliances.
* Relay and electromagnetic valve surge absorption.

General Characteristics Definition

*Operating Temperature:	-40 °C ~ +85 °C
*Storage Temperature:	-40 °C ~ +125 °C
*Working Surface Temperature:	+115 °C
*Insulation Resistance:	> 100M Ω
*Coating (Epoxy Resin):	Flame-Retardant to UL 94 V-0

Material

*Coating:	Epoxy Resin
*Lead Wire:	The Copper Wire
*Electrode:	Silver Solder
*Disk:	Zinc Oxide

Ordering Information

TC 07 D 471 □ □ □ □ □

Brand Mark :

TC

Size(mm)

5mm to 53mm

Type

D: Disk , **S**: Square

Varistor Voltage

180L(18V) to 821K(820V)

Coating & Environment

L:Epoxy Coating & Lead-free

Series

N:Standard Series

Bulk or Taping Mode

B:Bulk★, **A**:Ammo, **R**:Reel

Lead Form

S:Straight, **C**:Crimped, **I**:Inner, **Y**:Y kink

Tolerance

K±10%, L±15%, M±20%

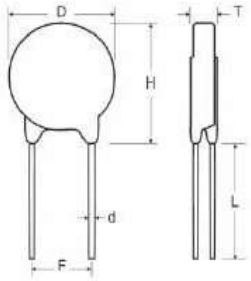
B: Bulk (Standard lead 20-30mm min.)

★= 3KA/6KV **J** = High Surge & High Energy

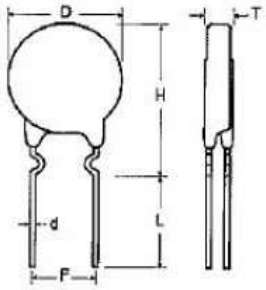
Metal Oxide Varistor：TC Series
Disc Type Varistor for Surge Protection

■Dimensions

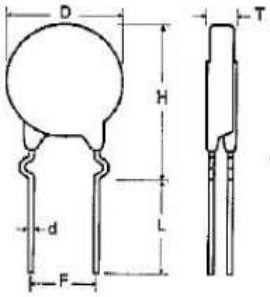
S Type(Straight Lead)



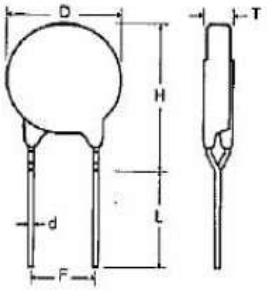
I Type(Inner Crimped Lead)



C Type(Out Crimped Lead)



Y Lead Type(Y Kink Lead)



Unit: mm

Part No.	D Max.	H Max.		L min.	F ±0.8	d ± 0.05	T Max.
		SB	CB / IB / YB				
07D751K	9.0	11.0	14.0	20.0	5.0	0.6	6.5
07D681K	9.0	11.0	14.0	20.0	5.0	0.6	6.4
07D621K	9.0	11.0	14.0	20.0	5.0	0.6	6.4
07D561K	9.0	11.0	14.0	20.0	5.0	0.6	6.2
07D511K	9.0	11.0	14.0	20.0	5.0	0.6	5.8
07D471K	9.0	11.0	14.0	20.0	5.0	0.6	5.6
07D431K	9.0	11.0	14.0	20.0	5.0	0.6	5.3
07D391K	9.0	11.0	14.0	20.0	5.0	0.6	5.1
07D361K	9.0	11.0	14.0	20.0	5.0	0.6	5.0
07D331K	9.0	11.0	14.0	20.0	5.0	0.6	4.8
07D301K	9.0	11.0	14.0	20.0	5.0	0.6	4.7
07D271K	9.0	11.0	14.0	20.0	5.0	0.6	4.5
07D241K	9.0	11.0	14.0	20.0	5.0	0.6	4.3
07D221K	9.0	11.0	14.0	20.0	5.0	0.6	4.2
07D201K	9.0	11.0	14.0	20.0	5.0	0.6	4.1
07D181K	9.0	11.0	14.0	20.0	5.0	0.6	4.1
07D151K	9.0	11.0	14.0	20.0	5.0	0.6	4.8
07D121K	9.0	11.0	14.0	20.0	5.0	0.6	4.5
07D101K	9.0	11.0	14.0	20.0	5.0	0.6	4.3
07D820K	9.0	11.0	14.0	20.0	5.0	0.6	4.1
07D680K	9.0	11.0	14.0	20.0	5.0	0.6	4.5
07D560K	9.0	11.0	14.0	20.0	5.0	0.6	4.5
07D470K	9.0	11.0	14.0	20.0	5.0	0.6	4.1
07D390K	9.0	11.0	14.0	20.0	5.0	0.6	4.1
07D330K	9.0	11.0	14.0	20.0	5.0	0.6	3.9
07D270K	9.0	11.0	14.0	20.0	5.0	0.6	3.9
07D220K	9.0	11.0	14.0	20.0	5.0	0.6	3.8
07D180L	9.0	11.0	14.0	20.0	5.0	0.6	3.8

Disc Type Varistor for Surge Protection

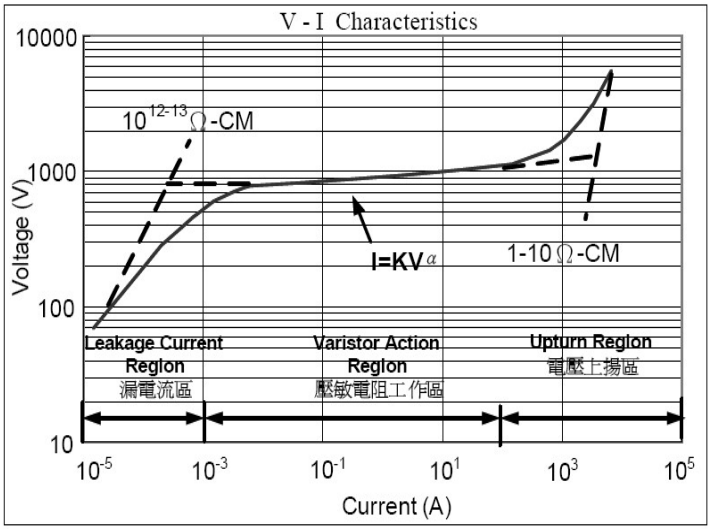
07D Standard & High Surge

Part No.	Maximum Allowable Voltage		Energy 10/1000μS		Withstanding Surge Current 8/20μS				Rated Power	Varistor Voltage	Max Clamping Voltage	Capacitance
	ACrms	DC	Standard	High Surge	Standard (A)		High Surge(A)		(W)	AT 1mA	AT2.5A	1KHz
	(V)	(V)	(J)	(J)	1 TIME	2 TIME	1 TIME	2 TIME		(V)	(V)	PF
07D180L	10	14	2.1	2.4	1200	600	1750	1250	0.25	18(15-21)	38	1400
07D220K	14	18	2.4	2.8	1200	600	1750	1250	0.25	22(20-24)	43	1150
07D270K	17	22	2.8	3.0	1200	600	1750	1250	0.25	27(24-30)	53	930
07D330K	20	26	3.5	4	1200	600	1750	1250	0.25	33(30-36)	65	760
07D390K	25	31	4.2	4.6	1200	600	1750	1250	0.25	39(35-43)	77	640
07D470K	30	38	5.0	5.2	1200	600	1750	1250	0.25	47(42-52)	93	530
07D560K	35	45	6.2	6.5	1200	600	1750	1250	0.25	56(50-62)	110	450
07D680K	40	56	7.2	7.5	1200	600	1750	1250	0.25	68(61-75)	135	370
Part No.	Maximum Allowable Voltage		Energy 10/1000μS		Withstanding Surge Current 8/20μS				Rated Power	Varistor Voltage	Max Clamping Voltage	Capacitance
	ACrms	DC	Standard	High Surge	Standard (A)		High Surge(A)		(W)	AT 1mA	AT 10A	1KHz
	(V)	(V)	(J)	(J)	1 TIME	2 TIME	1 TIME	2 TIME		(V)	(V)	PF
07D820K	50	65	2.6	3.8	400	200	800	600	0.1	82(74-90)	135	300
07D101K	60	85	2.8	4.0	400	200	800	600	0.1	100(90-110)	165	250
07D121K	75	100	4.2	5.0	400	200	800	600	0.1	120(108-132)	200	210
07D151K	95	125	4.2	7.0	400	200	800	600	0.1	150(135-165)	250	165
07D181K	115	150	5.6	8.0	400	200	800	600	0.1	180(162-198)	300	140
07D201K	130	170	7.7	8.7	400	200	800	600	0.1	200(185-225)	330	125
07D221K	140	180	8.8	9.0	400	200	800	600	0.1	220(198-242)	360	110
07D241K	150	200	9.8	11.0	400	200	800	600	0.1	240(216-264)	395	110
07D271K	175	225	10.5	13.0	400	200	800	600	0.1	270(243-297)	455	95
07D301K	190	250	11.8	14.0	400	200	800	600	0.1	300(270-330)	505	85
07D331K	210	275	14.0	14.5	400	200	800	600	0.1	330(297-363)	550	75
07D361K	230	300	14.0	16.0	400	200	800	600	0.1	360(324-396)	595	70
07D391K	250	320	15.4	17.0	400	200	800	600	0.1	390(351-429)	650	65
07D431K	275	350	16.8	20.0	400	200	800	600	0.1	430(387-473)	710	60
07D471K	300	385	18.2	20.8	400	200	800	600	0.1	470(423-517)	775	55
07D511K	320	415	19.6	21.0	400	200	800	600	0.1	510(459-561)	845	50
07D561K	350	460	19.6	23.0	400	200	800	600	0.1	560(504-616)	920	45
07D621K	385	505	21.0	25.0	400	200	800	600	0.1	620(558-682)	1025	40
07D681K	420	560	21.0	29.0	400	200	800	600	0.1	680(612-748)	1120	35
07D751K	460	615	22.4	32.0	400	200	800	600	0.1	750(675-825)	1240	30

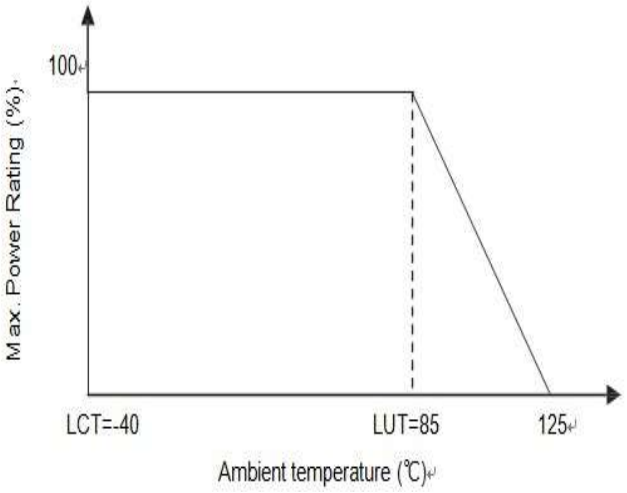
Approval Standard And File Number

Certified Model No.	c UL us UL1449 3rd & cUL E317616	VDE IEC-60950-1 & Annex Q 40028836	CQC GB/T10193-1997 GB/T10194-1997 12001076478	c UL us CSA & cUL E317616
07D180L	YES	YES	YES	YES
07D220K	YES	YES	YES	YES
07D270K	YES	YES	YES	YES
07D330K	YES	YES	YES	YES
07D390K	YES	YES	YES	YES
07D470K	YES	YES	YES	YES
07D560K	YES	YES	YES	YES
07D680K	YES	YES	YES	YES
07D820K	YES	YES	YES	YES
07D101K	YES	YES	YES	YES
07D121K	YES	YES	YES	YES
07D151K	YES	YES	YES	YES
07D181K	YES	YES	YES	YES
07D201K	YES	YES	YES	YES
07D221K	YES	YES	YES	YES
07D241K	YES	YES	YES	YES
07D271K	YES	YES	YES	YES
07D301K	YES	YES	YES	YES
07D331K	YES	YES	YES	YES
07D361K	YES	YES	YES	YES
07D391K	YES	YES	YES	YES
07D431K	YES	YES	YES	YES
07D471K	YES	YES	YES	YES
07D511K	YES	YES	YES	YES
07D561K	YES	YES	YES	YES
07D621K	YES		YES	YES
07D681K	YES		YES	YES
07D751K			YES	
07D821K			YES	

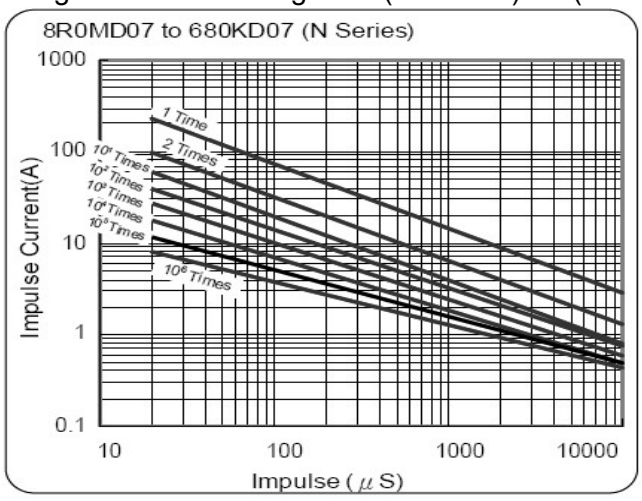
VARISTOR V - I CHARACTERISTICS

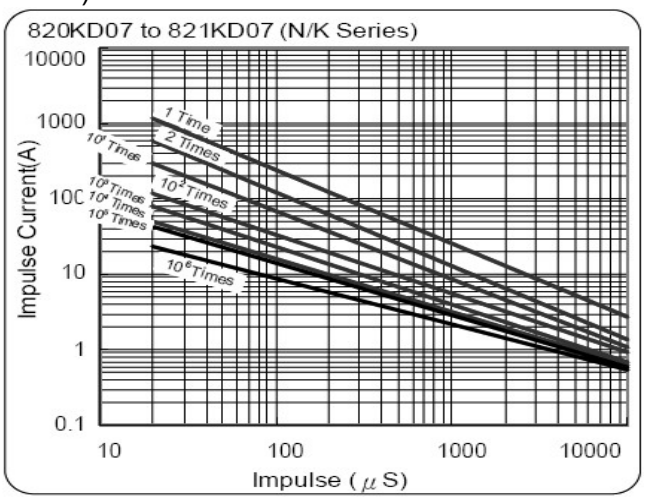


Power Derating Curve



Surge Life Time Ratings N (Standard) / K (Low Capacitance) Series

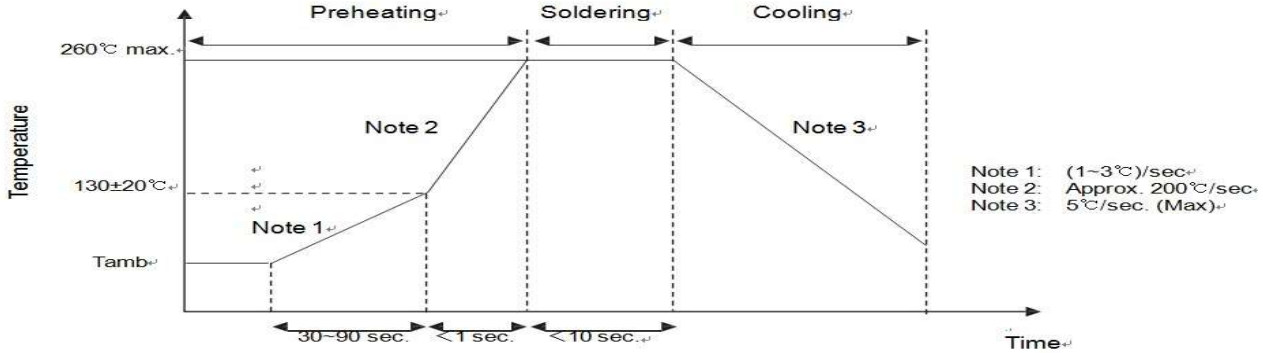




Current (A)

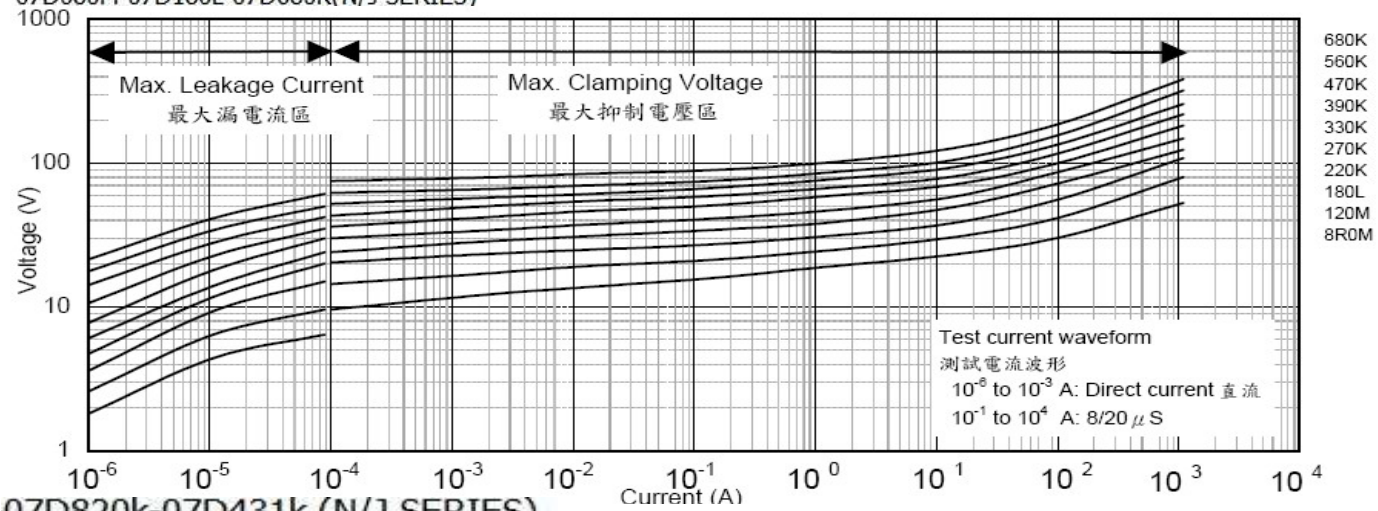
Soldering Recommendation

Wave Soldering Profile

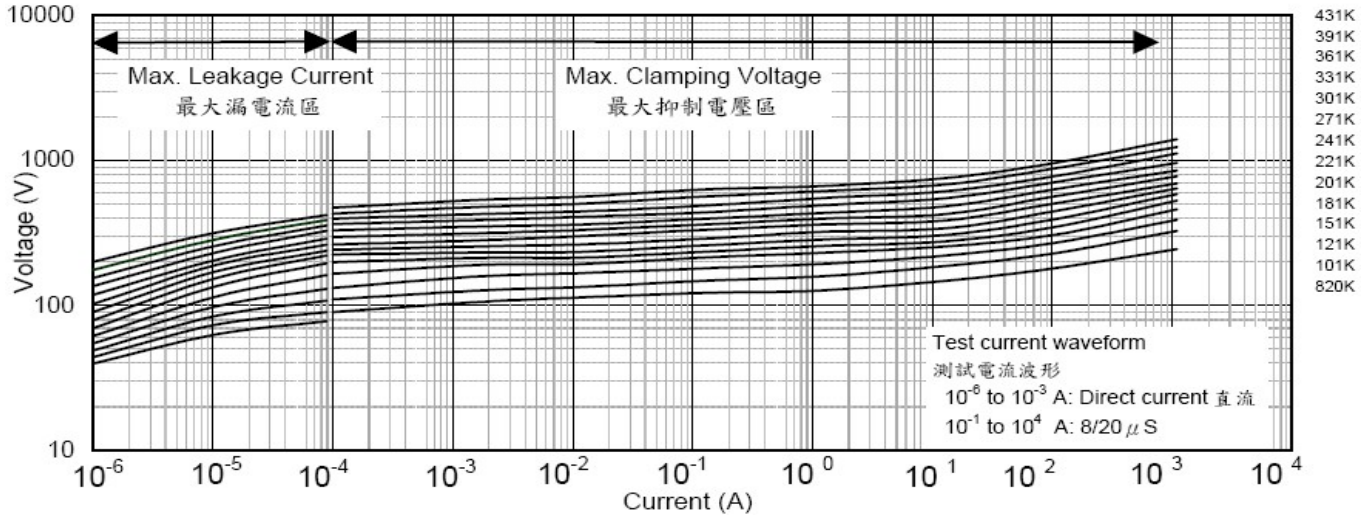


V-I CURVE

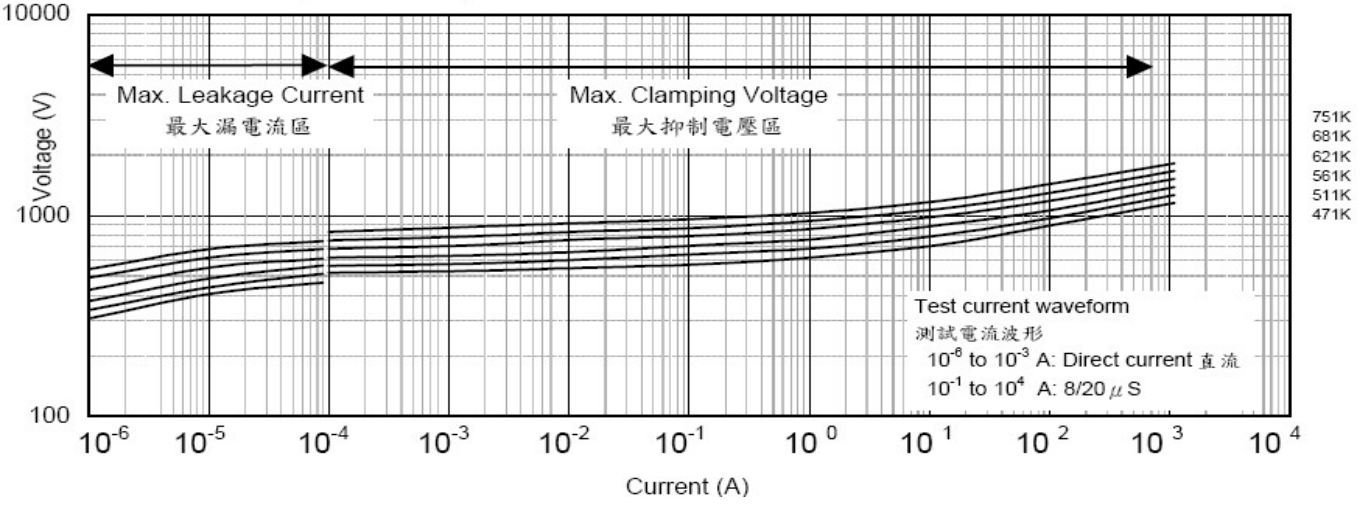
07D080M-07D180L-07D680K(N/J SERIES)



07D820k-07D431k (N/J SERIES)



07D471k-07D821k (N/J SERIES)

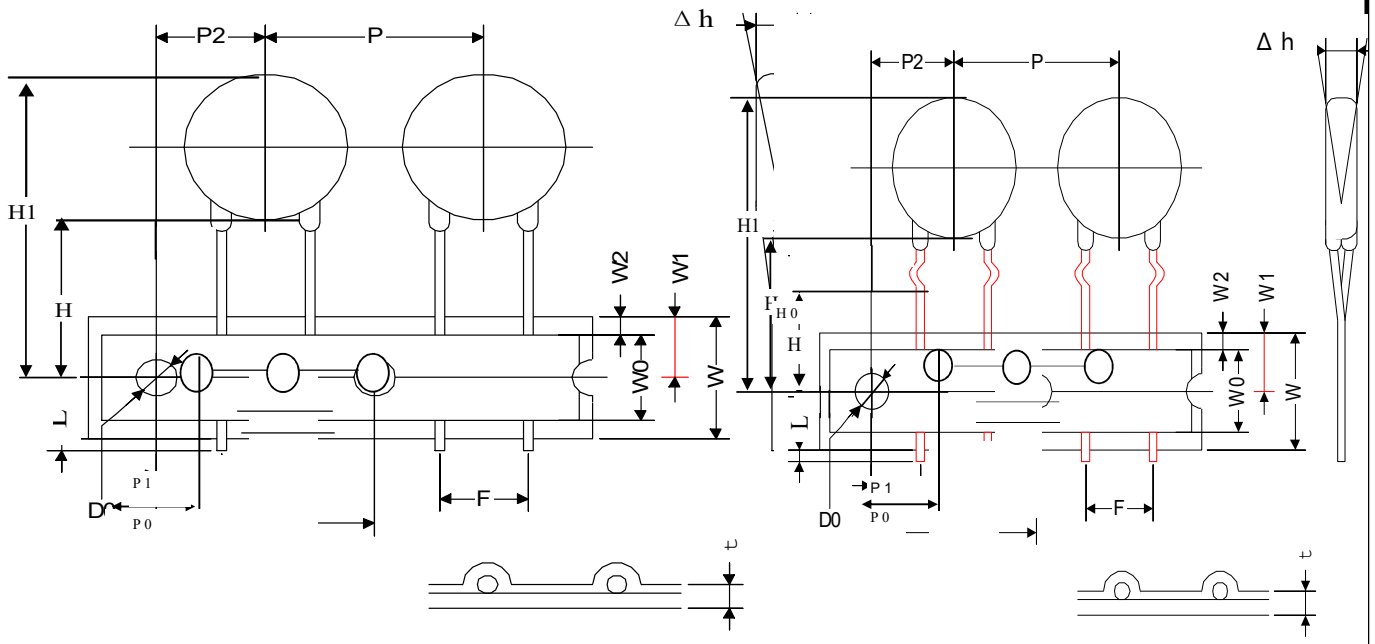


Metal Oxide Varistor：TC Series
Disc Type Varistor for Surge Protection

Dimension - PA / PR / CA / CR Ammo & Reel Series

PA / PR

CA / CR Series

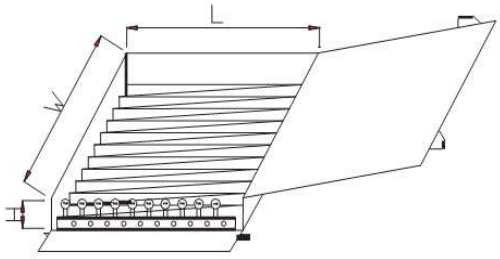


Unit: mm

Symbol	P	P0	P1	P2	F	W	W0	W1
07D	12.7±1.0	12.7±0.3	3.85±0.7	6.35±1.3	5.0±0.8	18.0±1.0	12.5max.	9.0±0.5
Symbol	W2	H	H0	H1	△h	L	D0	t
07D	3.0max.	20.0±2.0	16.0±1.0	29.0max.	0±0.2	1.0max.	4.0±0.2	0.6±0.3

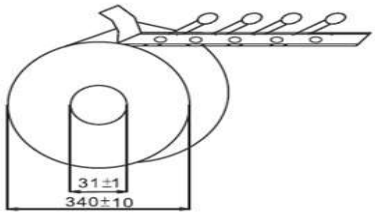
Packing Specifications Ammo & Reel Packing Dimension

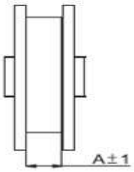
Ammo & Reel Box



Symbol Ammo

W±5	L±5	H±5
348	185	60
348	275	60





(Unit: mm)

Symbol Reel

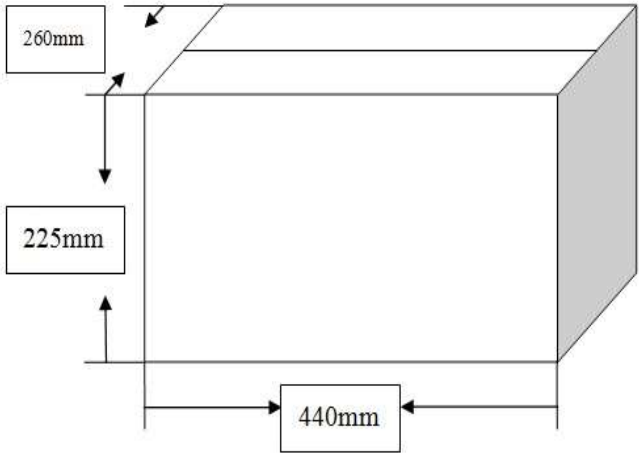
	05D	07D	10D	14D	20D
A	46	46	46	46	55

Metal Oxide Varistor：TC Series
Disc Type Varistor for Surge Protection

Unit:Pcs

Dimension	Part No.	Ammo		Reel	
		Box	Carton	Box	Carton
07D	180L to 561K	1,500	15,000	2,000	20,000
07D	621k to 821K	1,300	13,000	1,500	15,000

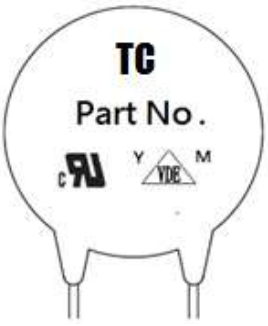
Packing Specifications /Bulk Packing Dimension /Quantity per Packing Method



Unit:Pcs

Dimension	Part No.	Bag	Small Carton	Carton
07D	180L to 821K	1,000	10,000	20,000
07D (Short leg)	180L to 821K	1,000	15,000	30,000

Marking & DIMENSIONS



Trademark : **TC**

Part No. : **07D180L-471K**
511K-821K No VDE

Standard for Safety: **CUL / VDE**

Date Code: **Y : Year M : Month**

Reliability Test

Mechanical Ratings

Test Parameter	Test Condition / Description			Performance Requirements
Terminal Pull Strength	After gradually applying the load specified below and keeping the unit fixed for ten seconds, the terminal shall be visually examined for any damage.	Diameter	Loading	No visible damage
		0.6mm	1.0 Kg	
		0.8mm	1.0 Kg	
		1.0mm	2.0 Kg	
Terminal Bending Strength	The unit shall be secured with its terminal kept vertical and the weight specified below be applied in the axial direction. The terminal shall gradually be bent by 90° in one direction, then 90° in the opposite direction, and again back to the original position. The damage of the terminal shall be visually examined.	Diameter	Loading	No visible damage
		0.6mm	0.5 Kg	
		0.8mm	0.5 Kg	
		1.0mm	1.0 Kg	
Vibration	The Specimen shall be vibrated by its lead wires with a total amplitude of 1.5㎜ and a varying frequency of 10~55~10HZ(each minutes) for a period of 2 hours respectively in each X,Yand Z directions.			No visible damage △VB/VB%≦±5%
Soldering-solderability	After dipping the terminal to depth of approximately 3㎜ from the specimen in a soldering bath of 260℃ for 10±1(D5: 5±1) seconds. Thereafter the terminal shall be visually examined.			Terminations shall be uniformly tinned
Soldering-Resistance to Solder Heat	After preheating the specimen, the specimen shall be completely immersed into a soldering bath having a temperature of 260±5℃ for 10±1 (D5: 5±1) seconds or iron of 400±5℃ for 3±0.5 seconds. There after the change of Vb and mechanical damage shall be examined.			No visible damage △VB/VB%≦±5%

ENVIRONMENTAL RATINGS

Dry Heat Loading	The specimen shall be applied continuously the maximum allowable voltage at the specified conditions for specified period and then stored at room temperature and normal humidity over 2 hours. Thereafter, the change of Vb and mechanical damage shall be examined. Ambient temp：125±2℃ ; Period：1000±24hours.			△VB/VB%≦±10%
High Temperature Storage	In a drying oven without load. Ambient temp：125±2℃ ; period：1000±24hours			△VB/VB%≦±5%
Damp Heat Loading	The specimen shall be applied continuously the maximum allowable voltage at the specified conditions for specified period and then stored at room temperature and normal humidity over 2 hours. Thereafter, the change of Vb and mechanical damage shall be examined. Ambient condition：40±2℃ , 90 to 95%R.H. ; period：1000±24 hours			△VB/VB%≦±10%
Temperature Cycle	Condition the specimen to each temperature form step 1 to step 4 in this order for the period shown in the table of specifications. The change of Vb and mechanical damage shall be examined after 2 hours.	Step	Temp°C	Period
		1	-40±3°C	30 min.
		2	Room Temp	15 min.
		3	85±2°C	30 min.
		4	Room Temp	15 min.
				No visible damage △VB/VB%≦±10%
Surge Lifetime Rating	The change of Vb shall be measured after the impulse listed below is applied 10,000 times continuously with the interval of ten seconds at room temperature.			No visible damage △VB/VB%≦±10%
Voltage Proof	Voltage：2500VAC Leakage Current≦0.5mA Time：60 Seconds			No Breakdown

⊢