



承 认 书

APPROVAL SHEET

编 号 No.	
日期 Date	

客 户 Customer	
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品 名 Product	Disc Type Varistor for Surge Protection
系 列 Series	07D Series

料号 Part No.	规格描述 Specification	备注 Remark
贝特电子 Betterfuse		
客 户 Customer		

环保特别提示 Special instructions for environmental protection
本产品:

供应商-贝特电子 Supplier-Betterfuse	零件承认章 Approval Signet	客 户 Customer	零件承认章 Approval Signet
制 作 Make	YaLan Wang		
审 核 Check	Fei Gao		
确 认 Approval	Jun Li		

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零件承认后敬请回签一份给我司留存, 或将承认后的封面传真(0769-8352 1857)至我司, 谢谢!			



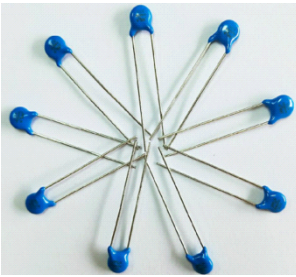
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1. SCOPE AND DESCRIPTION




Following electronic product specifications apply to piezoresistor of the 07D series. The 07D series is High surge current handling capability for over-voltage protection.

Its main applications are for transistor, diode, IC, thyristor or triac semiconductor protection, surge protection in consumer electronics, in industrial electronics, in electronic home appliances, gas and petroleum appliances, relay and electromagnetic valve surge absorption.

2. GENERAL INFORMATION





2.1 Features

- * Wide operating voltage (V1mA) range from 18V to 820V.
- * Fast responding to transient over-voltage.
- * Large absorbing transient energy capability.
- * Low clamping ratio and no follow-on current.
- * Meets MSL level 1, per J-STD-020 ISO9001-2018
- * Safety number :  E317616 VDE-40028836 CQC12001076478

2.2 Application

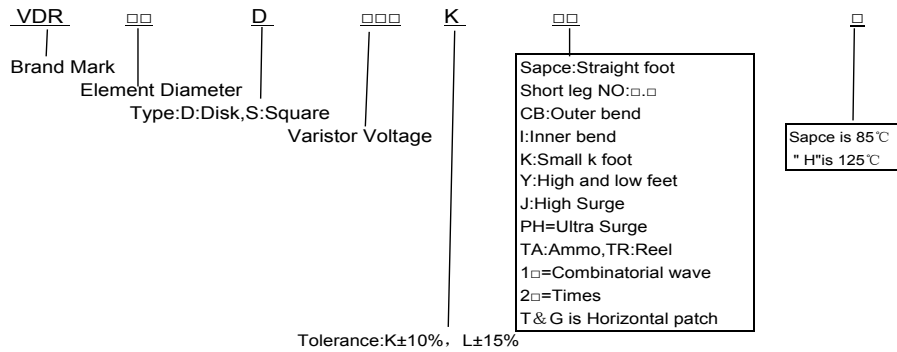
- * Transistor, Diode, IC, Thyristor or Triac semiconductor protection.
- * Surge protection in consumer electronics.
- * Surge protection in industrial electronics.
- * Surge protection in electronic home appliances, gas and petroleum appliances.
- * Relay and electromagnetic valve surge absorption.

3. AGENCY APPROVALS

Agency	Agency File Number	Type.
	E317616	070D101K;101KH;121K;121KH;151K;151KH;180L;181K;181KH;070D201K;201KH;220K;221K;221KH;241K;241KH;270K;271K;070D271KH;301K;301KH;330K;331K;331KH;361K;361KH;390K;070D391K;391KH;431K;431KH;470K;471K;471KH;511K;511KH;070D560K;561KH;621K;621KH;680K;681K;751K;781K;820K;070D820KH;821K;
	40028836	07D180L~07D680K;07D820K~07D561K
	CQC12001076478	180L~821K
	70147058	07D820K;07D101K;07D121K;07D151K;07D181K;07D201K;07D221K;07D241K;07D271K;07D301K;07D331K;07D361K;07D391K;07D431K;057471K;07D511K;07D561K;07D621K



4. PART NUMBERING SYSTEM



4.1. New coding rules for varistors

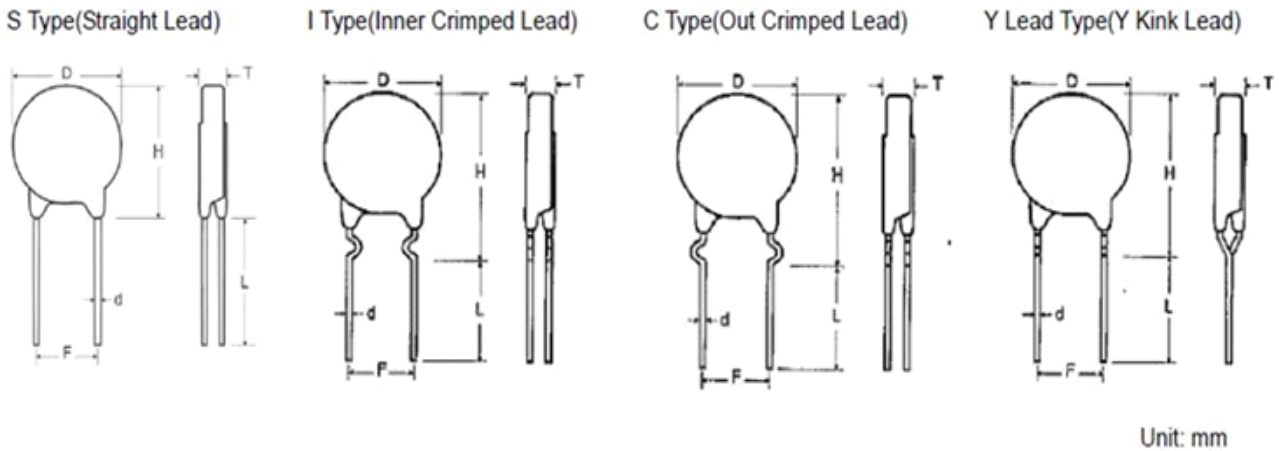
New Coding Rules for Varistors

Sapce:is Straight foot & 85°C	空白表示标准直接及85度
"H" is 125°C	H:代表高温粉125度
Short leg:NO:□.□	K后数值表剪短角长度±0.5
U:+10/-0	K后U: 表示电压值+10/-0
D:-10/+0	K后D: 表示电压值-10/+0
M:+5/-5	K后M: 表示电压值+5/-5
CB:Outer bend	CB:表示内弯脚
I:Inner bend	I:表示内弯脚
Y:High and low feet	Y:前后弯脚
J:High Surge	J:表示高焦耳 (J2或J3依表定)
PH=Ultra Surge	PH:表示超高能
1□=Combinatorial wave	BC 2/1 DC 3/1.5 EC 4/2 SC 6/3
2□=Times	YC 10/5 C:代表40次
- G :is Horizontal patch	- G表示卧式贴片加窄带卷装
- L:Horizontal plug-in	- L表示卧式插件散装
- TA:Ammo,-TR:Reel	- TA表示盒装-TR表示卷装
- T1 T2 T3 T4 is bushing	- T1透明-T2黑色-T3蓝色带脚-T4蓝色
- TA:Ammo,-TR:Reel	- TA表盒装-TR表示卷装



5. MECHANICAL CHARACTERISTICS

Dimensions



Part No.	Part No.	T Max.	D Max.	H Max.		L min.	F ±0.8	d ± 0.05
				S	I/C/Y			
VDR-07D180L	VDR-07D180LJ	4.5	9.0	11.0	14.0	20.0	5.0	0.6
VDR-07D220K	VDR-07D220KJ	4.6	9.0	11.0	14.0	20.0	5.0	0.6
VDR-07D270K	VDR-07D270KJ	4.7	9.0	11.0	14.0	20.0	5.0	0.6
VDR-07D330K	VDR-07D330KJ	4.9	9.0	11.0	14.0	20.0	5.0	0.6
VDR-07D390K	VDR-07D390KJ	4.9	9.0	11.0	14.0	20.0	5.0	0.6
VDR-07D470K	VDR-07D470KJ	4.9	9.0	11.0	14.0	20.0	5.0	0.6
VDR-07D560K	VDR-07D560KJ	5.0	9.0	11.0	14.0	20.0	5.0	0.6
VDR-07D680K	VDR-07D680KJ	5.2	9.0	11.0	14.0	20.0	5.0	0.6
VDR-07D820K	VDR-07D820KJ	4.1	9.0	11.0	14.0	20.0	5.0	0.6
VDR-07D101K	VDR-07D101KJ	4.3	9.0	11.0	14.0	20.0	5.0	0.6
VDR-07D121K	VDR-07D121KJ	4.5	9.0	11.0	14.0	20.0	5.0	0.6
VDR-07D151K	VDR-07D151KJ	4.8	9.0	11.0	14.0	20.0	5.0	0.6
VDR-07D181K	VDR-07D181KJ	4.3	9.0	11.0	14.0	20.0	5.0	0.6
VDR-07D201K	VDR-07D201KJ	4.4	9.0	11.0	14.0	20.0	5.0	0.6
VDR-07D221K	VDR-07D221KJ	4.5	9.0	11.0	14.0	20.0	5.0	0.6
VDR-07D241K	VDR-07D241KJ	4.6	9.0	11.0	14.0	20.0	5.0	0.6
VDR-07D271K	VDR-07D271KJ	4.9	9.0	11.0	14.0	20.0	5.0	0.6
VDR-07D301K	VDR-07D301KJ	5.0	9.0	11.0	14.0	20.0	5.0	0.6
VDR-07D331K	VDR-07D331KJ	5.1	9.0	11.0	14.0	20.0	5.0	0.6
VDR-07D361K	VDR-07D361KJ	5.2	9.0	11.0	14.0	20.0	5.0	0.6
VDR-07D391K	VDR-07D391KJ	5.4	9.0	11.0	14.0	20.0	5.0	0.6
VDR-07D431K	VDR-07D431KJ	5.7	9.0	11.0	14.0	20.0	5.0	0.6
VDR-07D471K	VDR-07D471KJ	6.0	9.0	11.0	14.0	20.0	5.0	0.6
VDR-07D511K	VDR-07D511KJ	6.2	9.0	11.0	14.0	20.0	5.0	0.6
VDR-07D561K	VDR-07D561KJ	6.5	9.0	11.0	14.0	20.0	5.0	0.6
VDR-07D621K	VDR-07D621KJ	7.1	9.0	11.0	14.0	20.0	5.0	0.6
VDR-07D681K	VDR-07D681KJ	7.3	9.0	11.0	14.0	20.0	5.0	0.6
VDR-07D751K	VDR-07D751KJ	7.5	9.0	11.0	14.0	20.0	5.0	0.6
VDR-07D781K	VDR-07D781KJ	7.7	9.0	11.0	14.0	20.0	5.0	0.6
VDR-07D821K	VDR-07D821KJ	8.0	9.0	11.0	14.0	20.0	5.0	0.6

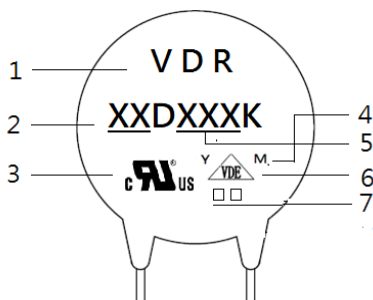


General Characteristics

- *Operating Temperature: $(-40\text{ }^{\circ}\text{C} \sim +85\text{ }^{\circ}\text{C})$ & $(-40\text{ }^{\circ}\text{C} \sim +125\text{ }^{\circ}\text{C})$
- *Storage Temperature: $(-40\text{ }^{\circ}\text{C} \sim +125\text{ }^{\circ}\text{C})$
- *Working Surface Temperature: $+115\text{ }^{\circ}\text{C}$
- *Insulation Resistance: $> 100\text{M } \Omega$
- *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



1. Varistor
2. Disk Size
3. cULUS Accreditation Logo
4. "Y" & "M" Product Line Code
5. Varistor Voltage
6. VDE Accreditation Logo
7. "J" is High Surge Code, not "J" is Standard Surge
"H" is High temperature range, not "H" is Standard



6. ELECTRICAL SPECIFICATIONS

Electrical characteristics

Part Number		Maximum Allowable Voltage		Varistor Voltage	Maximum Clamping Voltage		Withstanding Surge Current		Energy 10/1000µS		Rated Power	Typical Capacitance (Reference)
Standard	High Surge	AC (V)	DC (V)	V1mA(V)	IP(A)	VC(V)	I(A) Standard	I(A) High Surge	(J) Standard	(J) High Surge	(W)	@1KHzPF
07D180L	07D180LJ	11	14	18(15.3~20.7)	2.5	36	250	500	0.9	2.0	0.02	2800
07D220K	07D220KJ	14	18	22(19.8~24.2)	2.5	43	250	500	1.1	2.4	0.02	2300
07D270K	07D270KJ	17	22	27(24.3~29.7)	2.5	53	250	500	1.4	3.0	0.02	1800
07D330K	07D330KJ	20	26	33(29.7~36.3)	2.5	65	250	500	1.7	3.5	0.02	1500
07D390K	07D390KJ	25	31	39(35.1~42.9)	2.5	77	250	500	2.1	4.0	0.02	1300
07D470K	07D470KJ	30	38	47(42.3~51.7)	2.5	93	250	500	2.5	5.0	0.02	1100
07D560K	07D560KJ	35	45	56(50.4~61.6)	2.5	110	250	500	3.1	6.0	0.02	890
07D680K	07D680KJ	40	56	68(61.2~74.8)	2.5	135	250	500	3.6	7.0	0.02	740
07D820K	07D820KJ	50	65	82(73.8~90.2)	10	135	1200	1750	5.5	10	0.25	600
07D101K	07D101KJ	60	85	100(90~110)	10	165	1200	1750	6.5	12	0.25	500
07D121K	07D121KJ	75	100	120(108~132)	10	200	1200	1750	7.8	12	0.25	420
07D151K	07D151KJ	95	125	150(135~165)	10	250	1200	1750	9.7	13	0.25	330
07D181K	07D181KJ	115	150	180(162~198)	10	300	1200	1750	11.7	16	0.25	280
07D201K	07D201KJ	130	170	200(185~225)	10	330	1200	1750	13	17	0.25	250
07D221K	07D221KJ	140	180	220(198~242)	10	360	1200	1750	14	19	0.25	230
07D241K	07D241KJ	150	200	240(216~264)	10	395	1200	1750	15	21	0.25	210
07D271K	07D271KJ	175	225	270(243~297)	10	455	1200	1750	18	24	0.25	185
07D301K	07D301KJ	190	250	300(270~330)	10	505	1200	1750	20	26	0.25	165
07D331K	07D331KJ	210	275	330(297~363)	10	550	1200	1750	23	28	0.25	150
07D361K	07D361KJ	230	300	360(324~396)	10	595	1200	1750	25	32	0.25	140
07D391K	07D391KJ	250	320	390(351~429)	10	650	1200	1750	25	35	0.25	130
07D431K	07D431KJ	275	350	430(387~473)	10	710	1200	1750	28	40	0.25	115
07D471K	07D471KJ	300	385	470(423~517)	10	775	1200	1750	30	42	0.25	105
07D511K	07D511KJ	320	415	510(459~561)	10	845	1200	1750	30	45	0.25	100
07D561K	07D561KJ	350	460	560(504~616)	10	920	1200	1750	30	49	0.25	90
07D621K	07D621KJ	385	505	620(558~682)	10	1025	1200	1750	33	55	0.25	80
07D681K	07D681KJ	420	560	680(612~748)	10	1120	1200	1750	33	60	0.25	75
07D751K	07D751KJ	460	615	750(675~825)	10	1240	1200	1750	65	67	0.25	70
07D781K	07D781KJ	485	640	780(702~858)	10	1290	1200	1750	65	67	0.25	70
07D821K	07D821KJ	510	670	820(738~902)	10	1355	1200	1750	65	70	0.25	60



Reliability Test

Mechanical Ratings

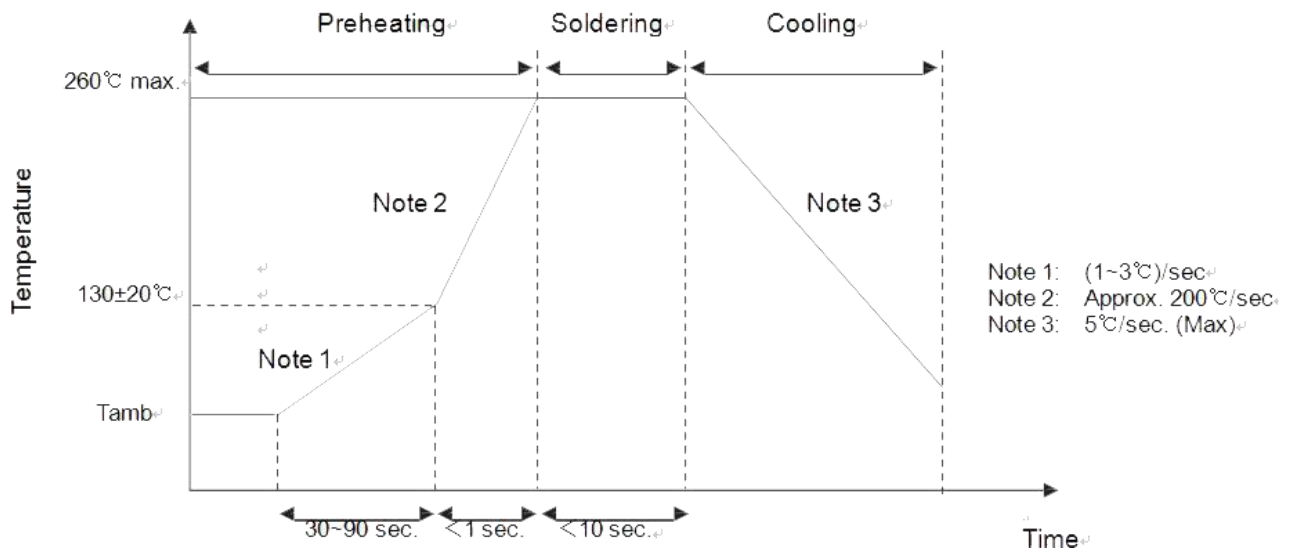
Test Parameter	Test Condition / Description			Performance Requirements
Terminal Pull Strength	After gradually applying the load specified below and keeping the unit fixed for ten seconds, the terminal shall be visually examined for any damage.	Diameter	Loading	No visible damage
		0.6mm	1.0 Kg	
		0.8mm	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 1.5mm and a varying frequency of 10~55~10HZ(each minutes) for a period of 2 hours respectively in each X,Y and Z directions.			No visible damage $\Delta VB/VB\% \leq \pm 5\%$
Soldering-solderability	After dipping the terminal to depth of approximately 3mm from the specimen in a soldering bath of 260°C 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°C for 10±1 (D5: 5±1) seconds or iron of 400±5°C for 3±0.5 seconds. There after the change of Vb and mechanical damage shall be examined.			No visible damage $\Delta VB/VB\% \leq \pm 5\%$

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. temp : 125±2°C ; Period : 1000±24hours.			$\Delta VB/VB\% \leq \pm 10\%$	
High Temperature Storage	In a drying oven without load. Ambient temp : 125±2°C ; period : 1000±24hours			$\Delta VB/VB\% \leq \pm 5\%$	
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. condition : 40±2°C , 90 to 95%R.H. ; period : 1000±24 hours			$\Delta VB/VB\% \leq \pm 10\%$	
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	No visible damage $\Delta VB/VB\% \leq \pm 10\%$
		1	-40±3°C	30 min.	
		2	Room Temp	15 min.	
		3	85±2°C	30 min.	
		4	Room Temp	15 min.	
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 $\Delta VB/VB\% \leq \pm 10\%$	
Voltage Proof	Voltage : 2500VAC Leakage Current ≤ 0.5mA Time : 60 Seconds			No Breakdown	



7. SOLDERING PARAMETERS



260°C < 10s(Wave Soldering)

Soldering Peak: 260°C -10sec Max.(IEC 60068-20)

8. ORDERING INFORMATION

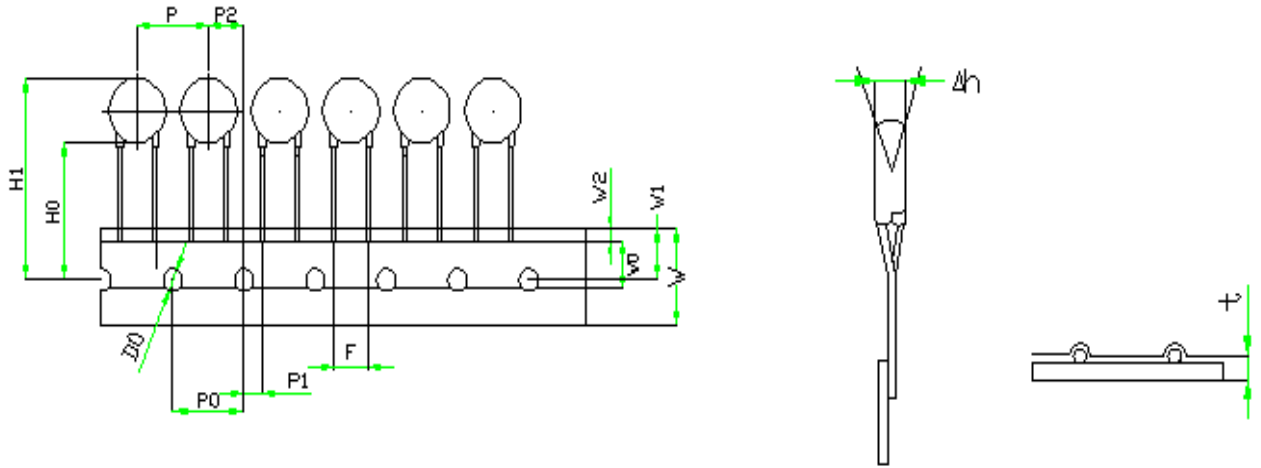
The following information are necessary in order to place your order with us correctly:

Series No.	Amp Code	Packaging Code	Quantity	Purchase Order No.
07D				



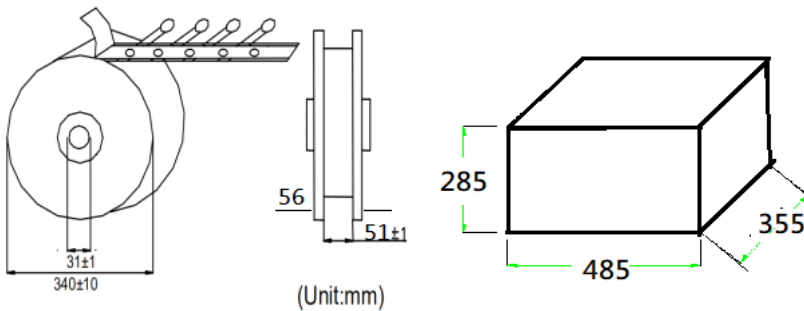
9. PACKING INFORMATION

Taping detail



Symbol	P	P0	P1	P2	F	W	W0	W1
07D	12.7±1.0	12.7±0.3	3.85±0.5	6.35±1.3	5.0±0.8	18.0±0.8	8±1.0	9.0±0.5
Symbol	W2	H0		H1	Δh		D0	t
07D	3.0max.	20.0±2.0		32.0max.	0±0.5		4.0±0.2	0.6±0.3

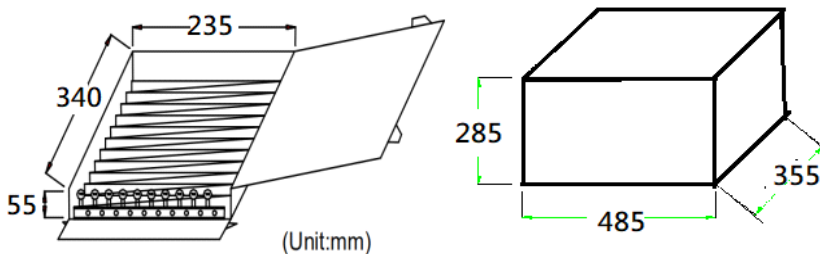
Reel Box



Disc Size/mm	pcs/reel
Φ 07(180K~271K)	2000
Φ 07(331K~561K)	1500
Φ 07(621K~821K)	1000

4 Reels/ Carton

Ammo Box



Disc Size/mm	pcs/ box
Φ 07(180K~331K)	1500
Φ 07(391K~821K)	1000

10 Boxes/Carton

Packaging specification / bulk packaging quantity

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



Details - Catalog VDE approved products



Certificate no. 40028836 [Back](#)

Product	Varistor
Product group	PTC, NTC and VDR-resistors
Company	Cerglass MFG Inc No. 450 ZhongZhen 3rd Rd., Yingge District 23942 NEW TAIPEI CITY TAIWAN
Certification mark	VDE Registration
VDE Reg-No.	D267
Additional information	<p>Appendix 100A : Type Code</p> <p>Appendix 101A : Type Code</p> <p>Appendix 102A : Type Code</p> <p>Appendix 103A : Type Code</p> <p>Appendix 104A : Type Code</p> <p>Appendix 105A : Type Code</p> <p>Appendix 106A : Type Code</p> <p>Appendix 107A : Type Code</p> <p>Appendix 108A : Type Code</p> <p>Appendix 109A : Type Code</p> <p>Appendix 110A : Type Code</p> <p>Appendix 111A : Type Code</p>
Please note	The picture documentation may show testing labels pending approval by National Certification Bodies and they shall not be affixed to products prior to such an approval.
Standards	<p>IEC 61051-2:1991</p> <p>IEC 61051-2:1991/AMD1:2009</p> <p>IEC 61051-2-2:1991</p> <p>IEC 61051-1:2007</p>

Type	Technical Data
05D180L to 05D680K	
05D820K to 05D471K	
07D180L to 07D680K	
07D820K to 07D561K	
10D180L to 10D680K	
10D201KJ to 10D112KJ	
10D820K to 10D112K	
14D270K to 14D680K	
14D820K to 14D751K	
20D270K to 20D680K	
20D820K to 20D911K	