07D Series

ROHS

Radial Lead Varistor (MOV)

www.unsemi.com.tw

Description

The 07D series radial leaded varistors provides an ideal circuit protection solution for lower DC voltage applications by offering higher surge ratings than ever before available in such small discs. The maximum peak surge current rating can reach up to 1.75KA (8/20 μs pulse) to protect against high peak surges, including indirect lightning strike interference, system switching transients and abnormal fast transients from the power source.

Features

- Wide operating voltages ranging from 11Vrms to 510Vrms(AC)
- 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.

Material

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

Applicable

- 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℃~ +85℃
- Storage Temperature: -40℃~ +125℃
- Working Surface Temperature: +115℃
- Insulation Resistance: > 100MΩ
- Coating (Epoxy Resin): Flame-Retardant to UL 94V-0
- Approval Standard and File Number:
  VDE：40046112
  CQC：16001161423
  CSA&CUL：E489912

Part Numbering

07 - D - XXX - K - X - X - X - X

(1) (2) (3) (4) (5) (6) (7) (8)

(1) Size(mm) : 05mm to 32mm

(2) Type : D: Disk, S: Square

(3) Varistor Voltage : 470($47*10^0$=47V) , 471($47*10^1$=470V)

(4) Tolerance : K±10%, L±15%, M±20%

(5) Surge Current Standard: J:High Surge (B: 2KV/1KA E: 4KV/2KA) surge Pulse 40times

(6) Taping Mode : TR : Reel

(7) Lead Form : C:Crimped, Short leg : NO : X.X

(8) Coating : H:Epoxy Coating 125℃

Note: (5)、(6)、(7)、(8) options is non-standard

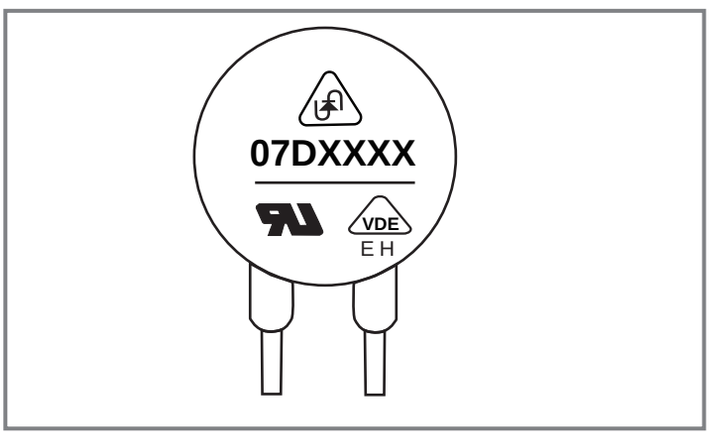
Electrical Characteristics (@ 25℃ Unless Otherwise Specified)

Part Number		Maximum Allowable Voltage		Varistor Voltage	Withstanding Surge Current 8/20μS				Max Clamping Voltage		Maximum Energy (10/1000μs)		Rated Power
Standard	High Surge	VAC (V)	VDC (V)	V1mA (V)	I(A) Standard		I(A) High Surge		Vc (V)	IP (A)	(J) Standard	(J) High Surge	(W)
					1 time	2 times	1 time	2 times					
07D180L	07D180LJ	11	14	18(15.3-20.7)	250	125	500	250	36	2.5	0.9	2.0	0.02
07D220K	07D220KJ	14	18	22(19.8-24.2)	250	125	500	250	43	2.5	1.1	2.4	0.02
07D270K	07D270KJ	17	22	27(24.3-29.7)	250	125	500	250	53	2.5	1.4	3.0	0.02
07D330K	07D330KJ	20	26	33(29.7-36.3)	250	125	600	250	65	2.5	1.7	3.5	0.02
07D390K	07D390KJ	25	31	39(35.1-42.9)	250	125	500	250	77	2.5	2.1	4.0	0.02
07D470K	07D470KJ	30	38	47(42.3-51.7)	250	125	500	250	93	2.5	2.5	5.0	0.02
07D560K	07D560KJ	35	45	56(50.4-61.6)	250	125	500	250	110	2.5	3.1	6.0	0.02
07D680K	07D680KJ	10	56	68(61.2-74.8)	250	125	500	250	135	2.5	3.6	7.0	0.02
07D820K	07D820KJ	50	65	82(73.8-90.2)	1200	600	1750	1250	135	10	5.5	10.0	0.25
07D101K	07D101KJ	50	85	100(90-110)	1200	600	1750	1250	165	10	6.5	12.0	0.25
07D121K	07D121KJ	75	100	120(108-132)	1200	600	1750	1250	200	10	7.8	12.0	0.25
07D151K	07D151KJ	95	125	150(135-165)	1200	600	1750	1250	250	10	9.7	13.0	0.25
07D181K	07D181KJ	115	150	180(162-198)	1200	600	1750	1250	300	10	11.7	16.0	0.25
07D201K	07D201KJ	130	170	200(185-225)	1200	600	1750	1250	340	10	13.0	17.0	0.25
07D221K	07D221KJ	140	180	220(198-242)	1200	600	1750	1250	360	10	14.0	19.0	0.25
07D241K	07D241KJ	150	200	240(216-264)	1200	600	1750	1250	395	10	15.0	21.0	0.25
07D271K	07D271KJ	175	225	270(243-297)	1200	600	1750	1250	455	10	18.0	24.0	0.25
07D301K	07D301KJ	190	250	300(270-330)	1200	600	1750	1250	505	10	20.0	26.0	0.25
07D331K	07D331KJ	210	275	330(297-363)	1200	600	1750	1250	550	10	23.0	28.0	0.25
07D361K	07D361KJ	230	300	360(324-396)	1200	600	1750	1250	595	10	25.0	32.0	0.25
07D391K	07D391KJ	250	320	390(351-429)	1200	600	1750	1250	650	10	25.0	35.0	0.25
07D431K	07D431KJ	275	350	430(387-473)	1200	600	1750	1250	710	10	28.0	40.0	0.25
07D471K	07D471KJ	300	385	470(423-517)	1200	600	1750	1250	775	10	30.0	42.0	0.25
07D511K	07D511KJ	320	415	510(459-561)	1200	600	1750	1250	845	10	30.0	45.0	0.25
07D561K	07D561KJ	350	460	560(504-616)	1200	600	1750	1250	920	10	30.0	49.0	0.25
07D621K	07D621KJ	385	505	620(558-682)	1200	600	1750	1250	1025	10	33.0	55.0	0.25
07D681K	07D681KJ	420	560	680(612-748)	1200	600	1750	1250	1120	10	33.0	60.0	0.25
07D751K	07D751KJ	460	615	750(675-825)	1200	600	1750	1250	1240	10	65.0	67.0	0.25
07D781K	07D781KJ	485	640	780(702-858)	1200	600	1750	1250	1290	10	65.0	67.0	0.25
07D821K	07D821KJ	510	670	820(738-902)	1200	600	1750	1250	1355	10	65.0	70.0	0.25

Approval Standard And File Number

Certified Model No.		c UL us E489912	VDE 40046112	CQC 16001161423	CSA & CUL E489912
07D180L	07D180LJ	YES	YES	YES	YES
07D220K	07D220KJ	YES	YES	YES	YES
07D270K	07D270KJ	YES	YES	YES	YES
07D330K	07D330KJ	YES	YES	YES	YES
07D390K	07D390KJ	YES	YES	YES	YES
07D470K	07D470KJ	YES	YES	YES	YES
07D560K	07D560KJ	YES	YES	YES	YES
07D680K	07D680KJ	YES	YES	YES	YES
07D820K	07D820KJ	YES	YES	YES	YES
07D101K	07D101KJ	YES	YES	YES	YES
07D121K	07D121KJ	YES	YES	YES	YES
07D151K	07D151KJ	YES	YES	YES	YES
07D181K	07D181KJ	YES	YES	YES	YES
07D201K	07D201KJ	YES	YES	YES	YES
07D221K	07D221KJ	YES	YES	YES	YES
07D241K	07D241KJ	YES	YES	YES	YES
07D271K	07D271KJ	YES	YES	YES	YES
07D301K	07D301KJ	YES	YES	YES	YES
07D331K	07D331KJ	YES	YES	YES	YES
07D361K	07D361KJ	YES	YES	YES	YES
07D391K	07D391KJ	YES	YES	YES	YES
07D431K	07D431KJ	YES	YES	YES	YES
07D471K	07D471KJ	YES	YES	YES	YES
07D511K	07D511KJ	YES	YES	YES	YES
07D561K	07D561KJ	YES	YES	YES	YES
07D621K	07D621KJ	YES		YES	YES
07D681K	07D681KJ	YES		YES	YES
07D751K	07D751KJ			YES	
07D781K	07D781KJ			YES	
07D821K	07D821KJ			YES	

Part Marking



Marking	
Trademark	UN logo
Part No.	07DXXXK/KJ
Standard for Safety	UL / VDE / CQC
———	High Surge
H	H:Epoxy Coating 125℃
E	4KV/2KA(40times)

Packaging Information

Unit:Pcs

Dimension	Part No.	Bag	Small Carton	Carton
07D	180L to 821K	1000	10000	20000
07D (Short leg)	180L to 821K	1000	15000	30000

Package Dimensions Unit: mm

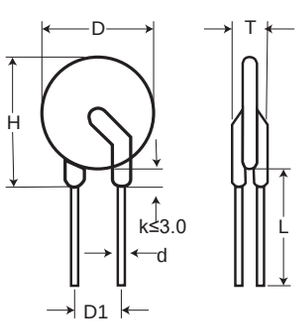


TABLE1	
Symbol	Dimension
H(max.)	14.0
L(min.)	20.0
D(max.)	9.00
D1(±0.8)	5.00
T(max.)	TABLE2
d(±0.05)	0.60

TABLE2			
Model	T(max.)	Model	T(max.)
180L	4.5	241K	4.6
220K	4.6	271K	4.9
270K	4.7	301K	5.0
330K	4.9	331K	5.1
390K	4.8	361K	5.2
470K	4.9	391K	5.4
560K	5.0	431K	5.7
680K	5.2	471K	6.0
820K	4.1	511K	6.2
101K	4.3	561K	6.5
121K	4.5	621K	7.1
151K	4.8	681K	7.3
181K	4.3	751K	7.5
201K	4.4	781K	7.7
221K	4.5	821K	8.0

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 0.6mm / 1.0 Kg 0.8mm / 1.0 Kg 1.0mm / 2.0 Kg	No visible damage
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 0.6mm / 0.5 Kg 0.8mm / 0.5 Kg 1. .0mm / 1.0 Kg	No visible damage
Vibration	The Specimen shall be vibrated by its lead wires with a total amplitude of 1.5mm and a varying frequency of10~55~10HZ(each minutes) for a period of 2 hours respectively in each X,Y and Z directions.	No visible damage △VB/VB%≦±5%
Soldering-solder ability	After dipping the terminal to depth of approximately 3mm 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%

Reliability Test (ENVIRONMENTAL RATINGS)

Test Parameter	Test Condition / Description	Performance Requirements
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 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.	△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℃ / Period 1 / 40+3℃ / 30 min. 2 / Room Temp / 15 min. 3 / 85+2℃ / 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.Vb and mechanical damage shall be examined.	No visible damage △VB/VB%≦±10%
Voltage Proof	Voltage：2500VAC Leakage Current≦0.5mA Time：60 Seconds	No Breakdown

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