

Metal Oxide Varistors (MOV) Datasheet

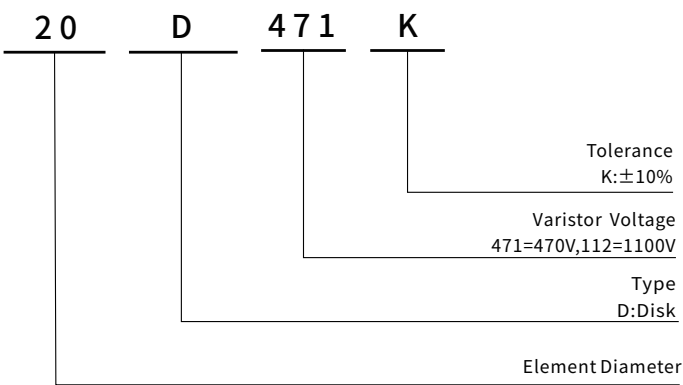
Features

- Wide operating voltage(V1mA)range from 18V to 1800V
- Fast responding to transient over-voltage.
- Large absorbing transient energy capability.
- Low clamping ratio and no following-on current.
- Coating (Epoxy Resin): Flame-Retardant to UL94 V-0
- Meets MSL level 1,per J-STD-020
- Operating Temperature: -40°C ~+105°C
- Storage Temperature: -40°C ~+125°C
- Safety Certification : UL/CUL, TÜV

Applications

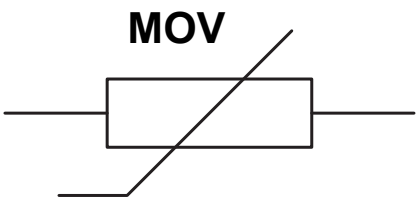
- Surge protection in electronic home appliances,gas and petroleum appliances
- Surge protection in industrial electronics
- Surge protection in consumer electronics
- Transistor,diode,IC,Thyristor or Triac semiconductor protection
- Relay and electromagnetic valve surge absorption

Part Number Code

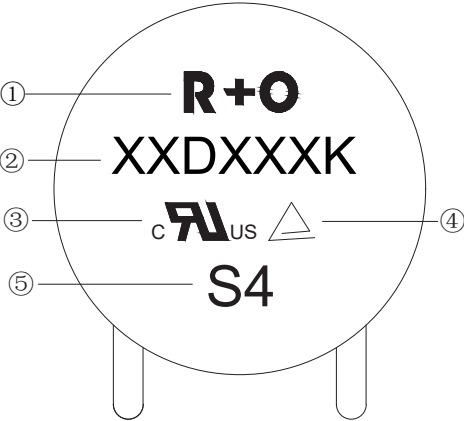


Varistors
Voltage
18V to 1800V

20D SERIES



Marking Code



- ① HJC Logo
- ② Part Number
- ③ UL+CUL Safety Certification Mark
- ④ TÜV Safety Certification Mark
- ⑤ Date Code

● **Electrical Characteristics** (Ta=25°C Unless otherwise specified)

Part Number	Marking	Varistor Voltage	Max. Allowable Voltage		Max. Energy (10/1000μs)	Max. Clamping Voltage (8/20μs)		Withstanding Surge Current (8/20μs)	Rated Power	Typical Capacitance (Reference)
		V _{1mA} (V)	V _{AC} (V)	V _{DC} (V)	(J)	I _P (A)	V _C (V)	(A)	(W)	@1KHz(pF)
20D180K	20D180K	18(16~20)	11	14	11	25	38	2000	0.2	39000
20D220K	20D220K	22(20~24)	14	18	14	25	43	2000	0.2	32000
20D270K	20D270K	27(24.3~31.1)	17	22	18	25	53	2000	0.2	22000
20D330K	20D330K	33(29.7~37.9)	20	26	23	25	65	2000	0.2	18000
20D390K	20D390K	39(35.2~44.8)	25	31	26	25	77	2000	0.2	16000
20D470K	20D470K	47(43~53)	30	38	33	25	93	2000	0.2	14000
20D560K	20D560K	56(51~63)	35	45	41	25	110	2000	0.2	12000
20D680K	20D680K	68(62~76)	40	56	46	25	135	2000	0.2	10000
20D820K	20D820K	82(74~90)	50	65	48	100	135	6500	1.0	5800
20D101K	20D101K	100(90~110)	60	85	52	100	165	6500	1.0	4800
20D121K	20D121K	120(108~132)	75	100	56	100	200	6500	1.0	4000
20D151K	20D151K	150(135~165)	95	125	71	100	250	6500	1.0	3000
20D181K	20D181K	180(162~198)	115	150	86	100	300	6500	1.0	2600
20D201K	20D201K	200(185~225)	130	170	97	100	340	6500	1.0	2400
20D221K	20D221K	220(198~242)	140	180	102	100	360	6500	1.0	1800
20D241K	20D241K	240(216~264)	150	200	110	100	395	6500	1.0	1500
20D271K	20D271K	270(243~297)	175	225	130	100	455	6500	1.0	1400
20D301K	20D301K	300(270~330)	195	250	139	100	505	6500	1.0	1350
20D331K	20D331K	330(297~363)	210	275	153	100	550	6500	1.0	1300
20D361K	20D361K	360(324~396)	230	300	166	100	595	6500	1.0	1250
20D391K	20D391K	390(351~429)	250	320	184	100	650	6500	1.0	1180
20D431K	20D431K	430(387~473)	275	350	194	100	710	6500	1.0	1100
20D471K	20D471K	470(423~517)	300	385	224	100	775	6500	1.0	1050
20D511K	20D511K	510(459~561)	320	418	224	100	842	6500	1.0	1000
20D561K	20D561K	560(504~616)	350	460	224	100	920	6500	1.0	970
20D621K	20D621K	620(558~682)	385	505	224	100	1025	6500	1.0	950
20D681K	20D681K	680(612~748)	420	560	235	100	1120	6500	1.0	900
20D751K	20D751K	750(675~825)	460	615	260	100	1240	6500	1.0	850
20D781K	20D781K	780(702~858)	485	640	269	100	1290	6500	1.0	750
20D821K	20D821K	820(738~902)	510	670	288	100	1355	6500	1.0	700
20D911K	20D911K	910(819~1001)	550	745	316	100	1500	6500	1.0	600
20D102K	20D102K	1000(900~1100)	625	825	349	100	1650	6500	1.0	500
20D112K	20D112K	1100(990~1210)	680	895	391	100	1815	6500	1.0	450
20D122K	20D122K	1200(1080~1320)	740	975	425	100	2010	6500	1.0	440
20D142K	20D142K	1400(1260~1540)	870	1150	481	100	2310	6500	1.0	410
20D152K	20D152K	1500(1350~1650)	900	1220	516	100	2475	6500	1.0	400
20D182K	20D182K	1800(1620~1980)	1000	1465	632	100	2970	6500	1.0	220

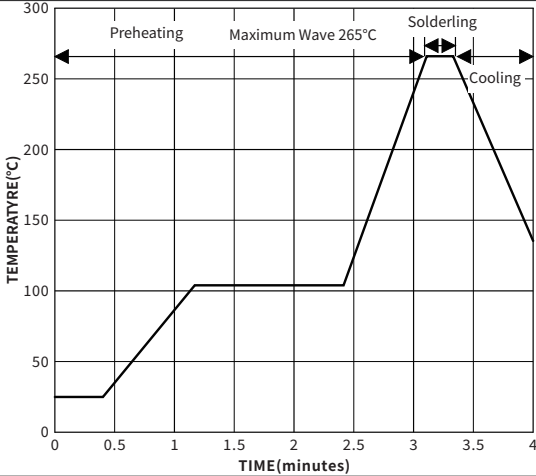
Note: Leakage Current @75%V_{1mA}: 180K~680K, IR ≤ 50μA ; 820K~182K, IR ≤ 25μA

Electrical Ratings

Items	Test Condition/Description	Requirement								
Varistor Voltage	The voltage between two terminals with the specified measuring current 1mA.DC applied is called Vb.	To meet the specified value								
Maximum Allowable Voltage	The recommended maximum sine wave voltage(RMS)orthe Maximum DC voltage can be applied continuously.									
Maximum Clamping Voltage	The maximum voltage between two terminals with the specification standard impulse current. Applied waveform:8/20μs									
Rated Wattage	The maximum average power that can be applied within the specified ambient temperature.									
Energy	The maximum energy within the varistor voltage change of ±10% when one impulse of 10/1000μs or 2ms is applied.									
Withstanding Surge Current	The maximum current within the varistor voltage change of ±10% with the standard impulse current(8/20μs)applied one time.									
Surge Life	The change of Vb shall be measured after the impulse listed below which is applied 10,000 times continuously with the interval of ten seconds at room temperature. <table><tr><td>Series</td><td>Varistor Voltage</td><td>Surge Current (8/20μs)</td></tr><tr><td rowspan="2">10D Series</td><td>180K to 680K</td><td>100A</td></tr><tr><td>820K to 182K</td><td>200A</td></tr></table>	Series	Varistor Voltage	Surge Current (8/20μs)	10D Series	180K to 680K	100A	820K to 182K	200A	$\frac{\Delta Vb}{Vb} \leq 10\%$
Series	Varistor Voltage	Surge Current (8/20μs)								
10D Series	180K to 680K	100A								
	820K to 182K	200A								

● Recommended Soldering Conditions

Wave Lead Free Soldering Recommendation



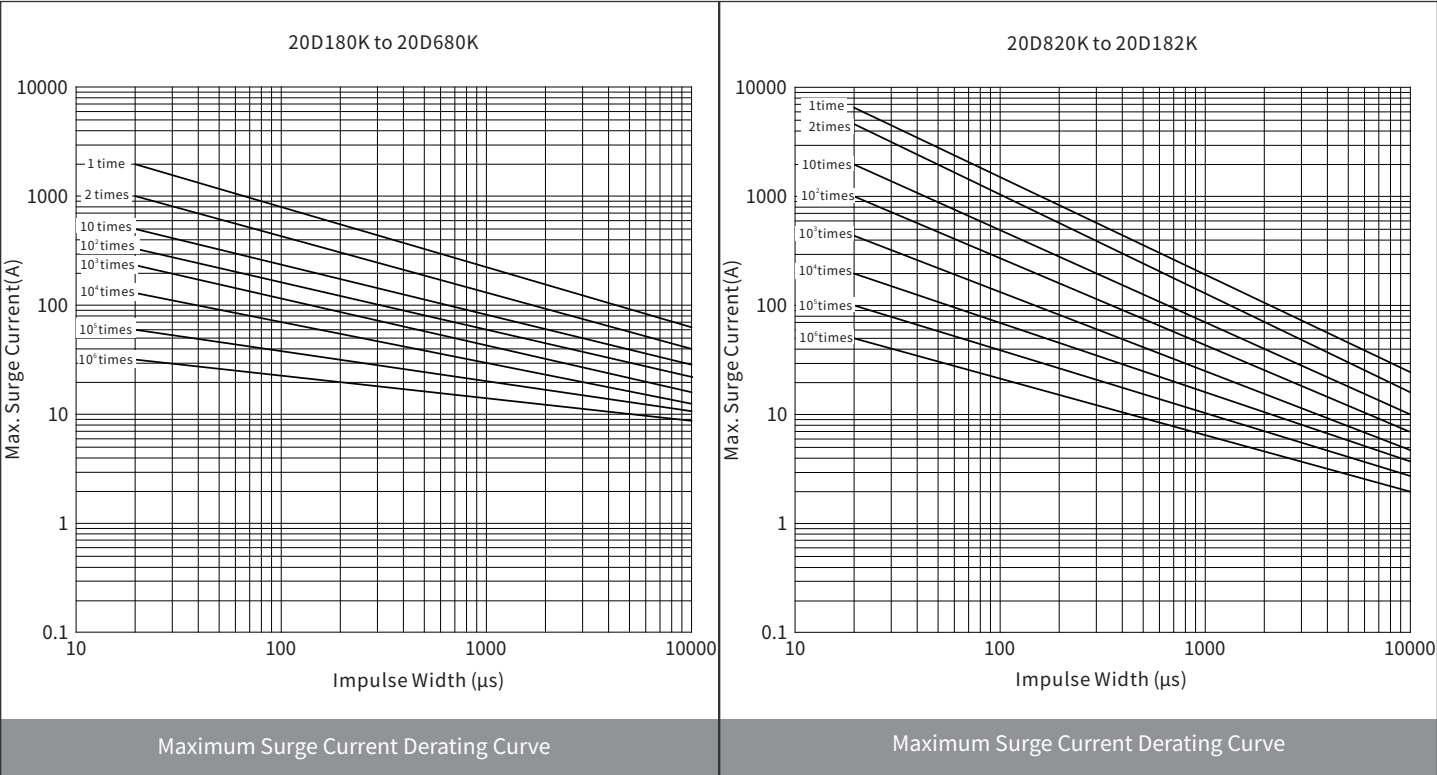
The graph shows the temperature profile for wave lead-free soldering. The y-axis is Temperature (°C) from 0 to 300, and the x-axis is Time (minutes) from 0 to 4. The profile includes a preheating phase (0-0.5 min), a maximum wave phase at 265°C (0.5-2.5 min), a soldering phase (2.5-3.5 min), and a cooling phase (3.5-4 min).

Item	Conditions
Peak Temperature	265°C
Dipping Time	10 secs. Max
Soldering	1 time

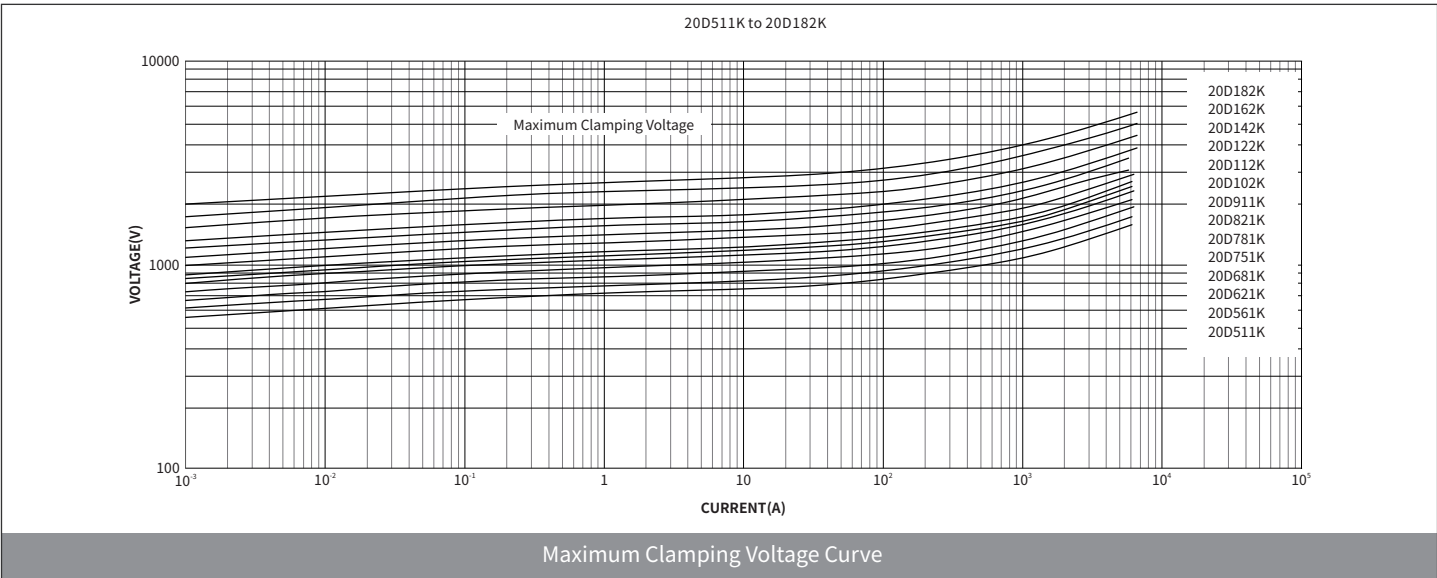
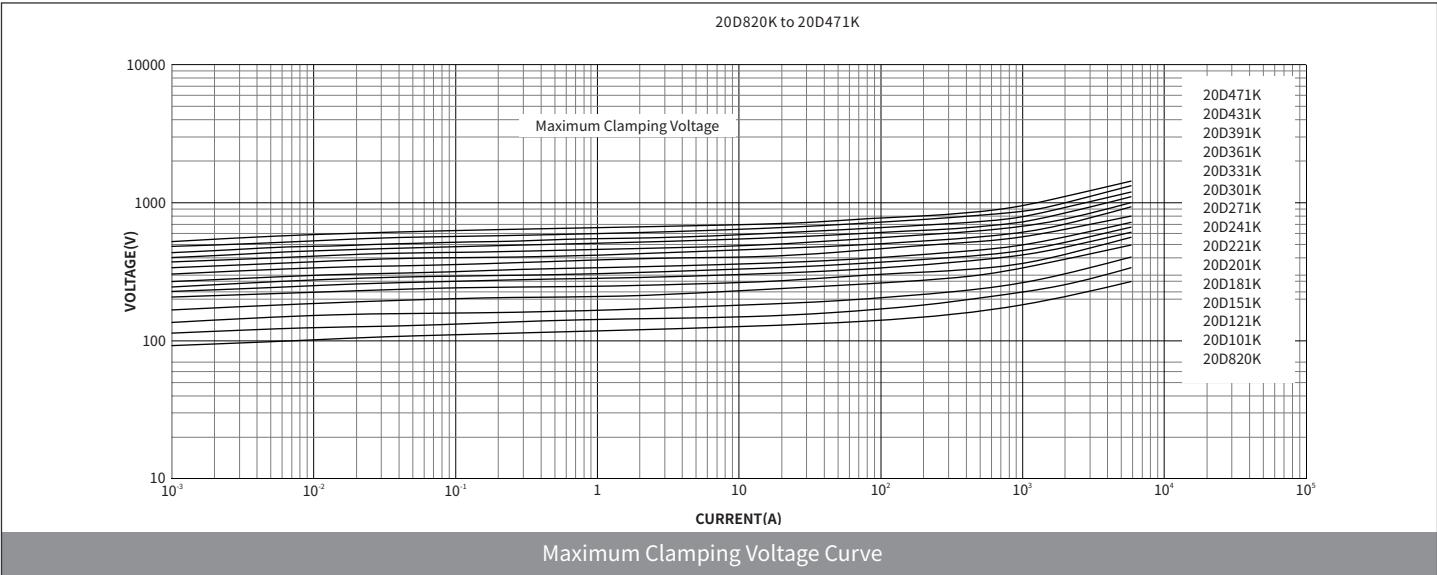
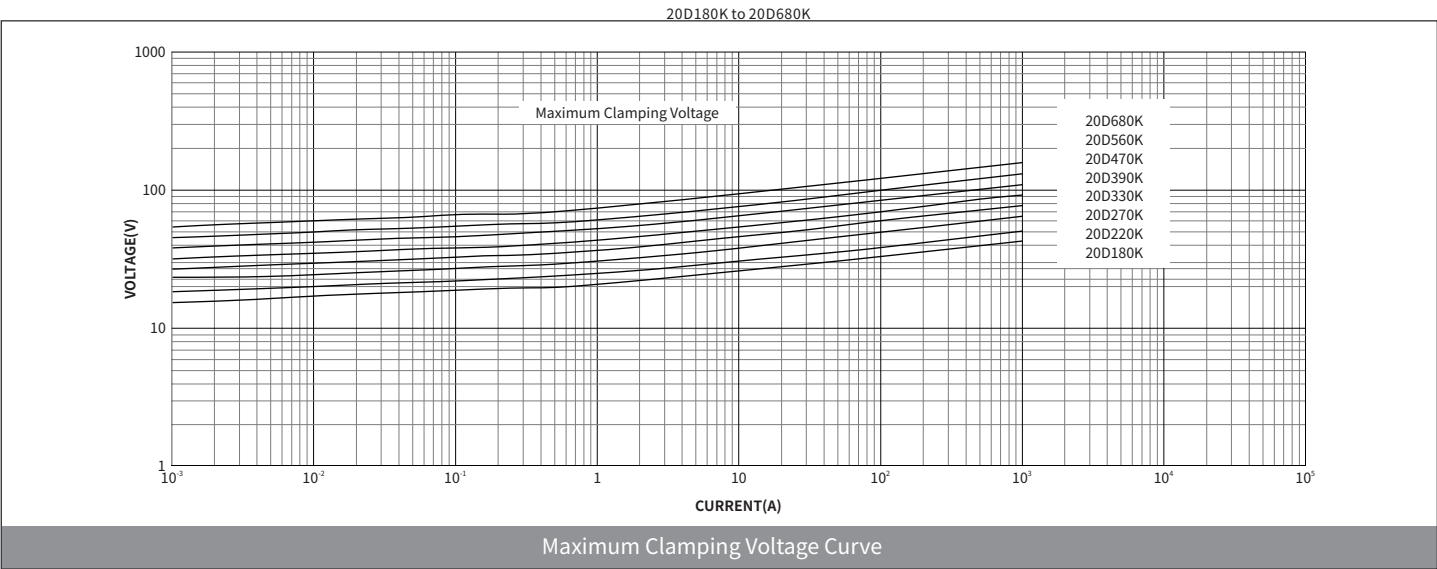
Recommendation Reworking Conditions with Soldering Iron

Item	Conditions
Temperature of Soldering Iron-tip	360°C Max
Soldering Time	3 secs. Max
Distance from Varistor	2 mm Min

● Maximum Surge Current Derating Curve (Ta=25°C Unless otherwise specified)



● Maximum Clamping Voltage Curve (Ta=25°C Unless otherwise specified)



● Dimensions

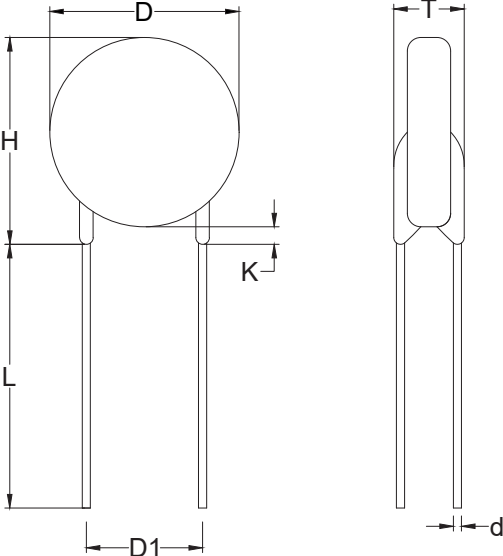
	TABLE 1				
	Symbol	Millimeters		Inches	
		Min.	Max.	Min.	Max.
	D	20.0	23.0	0.788	0.906
	H	20.5	26.0	0.807	1.024
	L	15.0	-	0.591	-
	K	-	2.5	-	0.099
	D1	9.0	11.0	0.355	0.434
	d	0.9	1.1	0.036	0.044
	T(max)	TABLE 2			

TABLE 2 T(max.)					
Voltage	Millimeters	Inches	Voltage	Millimeters	Inches
18V-39V	5.1	0.201	430V-560V	6.7	0.264
47V-68V	5.6	0.221	620V-780V	7.7	0.304
82V-150V	5.1	0.201	820V-1200V	8.9	0.351
180V-270V	5.7	0.225	1300V-1500V	10	0.394
330V-390V	6.1	0.241	1600V-1800V	11.8	0.441

● Ordering Information

SERIES	DELIVERY MODE	MPQ(PCS)
20D SERIES	Bulk	250