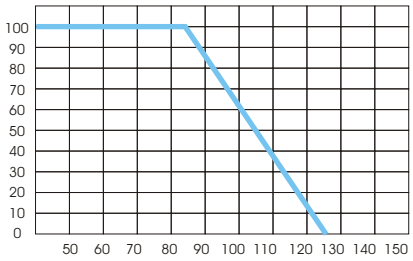
Metal Oxide Varistors

Transient/Surge Absorbers

Transient Voltage Surge Suppressors

Features

Varistor Voltage Range ..... 18 TO 1800Vdc
Peak Current For 8/20 μs Current Wave ..... 100 TO 6500A
Energy Range For 10/1000 μs Current Wave ... 0.4 TO 625Joul
Storage Temperature Range ..... -40 TO +125℃
Operation Ambient Temperature Range ..... -40 TO +85℃
Typical Response Time ..... <25ns
Insulation Resistance ..... >1000MΩ



Specifications

Device Ratings and Characteristics

Part No. / Device Marking	Maximum Allowable Voltage		Varistor voltage (@1mA)			Clamping Voltage @ Test Current (8/20 μs)		Maximum Energy (J)	Maximum Peak Current (8/20 μs)	Rated power	Typical Capacitance (@1KHz)	Standards
	ACrms(v)	DC(v)	Min	Vb(Vdc)	Max	Vc(V)	Ip(A)	10/1000 μS	(A)	(W)	(PF)	
05D180K	11	14	14.4	18	21.6	44	1	0.4	100	0.01	1600	?
07D180K						42	2.5	0.9	250	0.02	3800	?
10D180K						39	5	2.1	500	0.05	16000	?
14D180K						39	10	4.0	1000	0.10	25000	?
20D180K						39	20	11.0	2000	0.20	40000	?
05D220K	14	18	18.7	22	26.0	51	1	0.5	100	0.01	1500	?
07D220K						47	2.5	1.1	250	0.02	3600	?
10D220K						43	5	2.5	500	0.05	11000	?
14D220K						43	10	5.0	1000	0.10	20000	?
20D220K						43	20	14.0	2000	0.20	30000	?
05D270K	17	22	23.0	27	31.1	60	1	0.6	100	0.01	1450	?
07D270K						53	2.5	14	250	0.02	3400	?
10D270K						53	5	3.0	500	0.05	8000	?
14D270K						53	10	6.0	1000	0.10	16000	?
20D270K						53	20	18.0	2000	0.20	24500	?
05D330K	20	26	29.5	33	36.5	73	1	0.8	100	0.01	1400	?
07D330K						65	2.5	1.7	250	0.02	2900	?
10D330K						65	5	4.0	500	0.05	6300	?
14D330K						65	10	7.5	1000	0.10	12200	?
20D330K						65	20	23.0	2000	0.20	20000	?
05D390K	25	31	35	39	46	86	1	0.9	100	0.01	700	?
07D390K					43	77	2.5	2.1	250	0.02	1600	?
10D390K					43	77	5	4.6	500	0.05	5200	?
14D390K					43	77	10	8.6	1000	0.10	7000	?
20D390K					43	77	20	26.0	2000	0.20	13800	?
05D470K	30	38	42	47	55	104	1	1.1	100	0.01	650	?
07D470K					52	93	2.5	2.5	250	0.02	1550	?
10D470K					52	93	5	5.5	500	0.05	4600	?
14D470K					52	93	10	10.0	1000	0.10	6750	?
20D470K					52	93	20	33.0	2000	0.20	13500	?
05D560K	35	45	50	56	66	123	1	1.3	100	0.01	600	?
07D560K					62	110	2.5	3.1	250	0.02	1500	?
10D560K					62	110	5	7.0	500	0.05	3750	?
14D560K					62	110	10	11.0	1000	0.10	6500	?
20D560K					62	110	20	41.0	2000	0.20	12200	?
05D680K	40	56	61	68	80	150	1	1.6	100	0.01	580	?
07D680K					75	135	2.5	3.6	250	0.02	1200	?
10D680K					75	135	5	8.2	500	0.05	2800	?
14D680K					75	135	10	14.0	1000	0.10	5500	?
20D680K					75	135	20	46.0	2000	0.20	11500	?

Note: 1. 05D series Varistor voltage test current by DC 0.1 mA

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	ACrms(v)	DC(v)	Min	Vb(Vdc)	Max	Vc(V)	Ip(A)	10/1000 μS	(A)	(W)	(PF)	
05D820K	50	65	74	82	90	145	5	2.5	400	0.10	310	? ?
07D820K						135	10	5.5	1200	0.25	860	? ?
10D820K						135	25	12.0	2500	0.40	1920	? ?
14D820K						135	50	22.0	4500	0.60	4300	? ?
20D820K						135	100	38.0	6500	1.00	8200	? ?
05D101K	60	85	90	100	110	175	5	3.0	400	0.10	290	? ?
07D101K						165	10	6.5	1200	0.25	750	? ?
10D101K						165	25	15.0	2500	0.40	1800	? ?
14D101K						165	50	28.0	4500	0.60	3500	? ?
20D101K						165	100	45.0	6500	1.00	8000	? ?
05D121K	75	100	108	120	132	210	5	4.0	400	0.10	270	? ?
07D121K						200	10	7.8	1200	0.25	530	? ?
10D121K						200	25	18.0	2500	0.40	1500	? ?
14D121K						200	50	32.0	4500	0.60	2500	? ?
20D121K						200	100	55.0	6500	1.00	5500	? ?
05D151K	95	125	135	150	165	260	5	4.8	400	0.10	240	? ?
07D151K						250	10	9.5	1200	0.25	410	? ?
10D151K						250	25	22.0	2500	0.40	1200	? ?
14D151K						250	50	40.0	4500	0.60	2100	? ?
20D151K						250	100	70.0	6500	1.00	4200	? ?
05D181K	115	150	162	180	198	325	5	5.9	400	0.10	140	? ?
07D181K						300	10	11.7	1200	0.25	300	? ?
10D181K						300	25	27.0	2500	0.40	620	? ?
14D181K						300	50	50.0	4500	0.60	1250	? ?
20D181K						300	100	85.0	6500	1.00	2500	? ?
05D210K	130	170	185	200	225	355	5	6.5	400	0.10	120	? ? ? ?
07D210K						340	10	13.0	1200	0.25	250	? ? ? ?
10D210K						340	25	30.0	2500	0.40	570	? ? ? ?
14D210K						340	50	57.0	4500	0.60	1150	? ? ? ?
20D210K						340	100	95.0	6500	1.00	2300	? ? ? ?
05D221K	140	180	198	220	242	380	5	7.0	400	0.10	110	? ? ? ?
07D221K						360	10	14.0	1200	0.25	250	? ? ? ?
10D221K						360	25	32.0	2500	0.40	560	? ? ? ?
14D221K						360	50	60.0	4500	0.60	1100	? ? ? ?
20D221K						360	100	100.0	6500	1.00	2200	? ? ? ?
05D241K	150	200	216	240	264	415	5	8.0	400	0.10	110	? ? ? ?
07D241K						395	10	15.0	1200	0.25	240	? ? ? ?
10D241K						395	25	35.0	2500	0.40	550	? ? ? ?
14D241K						395	50	63.0	4500	0.60	1050	? ? ? ?
20D241K						395	100	108.0	6500	1.00	2200	? ? ? ?
05D271K	170	225	247	270	303	475	5	8.5	400	0.10	110	? ? ? ?
07D271K						455	10	18.0	1200	0.25	220	? ? ? ?
10D271K						455	25	40.0	2500	0.40	530	? ? ? ?
14D271K						455	50	70.0	4500	0.60	1000	? ? ? ?
20D271K						455	100	127.0	6500	1.00	2100	? ? ? ?

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	Acrms(v)	DC(v)	Min	Vb(Vdc)	Max	Vc(V)	Ip(A)	10/1000 μS	(A)	(W)	(PF)	
05D301K	195	250	270	300	330	505	5	9.0	400	0.10	100	? ? ? ?
07D301K						500	10	20.0	1200	0.25	190	? ? ? ?
10D301K						500	25	42.0	2500	0.40	500	? ? ? ?
14D301K						500	50	73.0	4500	0.60	900	? ? ? ?
20D301K						500	100	150.0	6500	1.00	1800	? ? ? ?
05D331K	210	275	297	330	363	600	5	10.0	400	0.10	90	? ? ? ?
07D331K						550	10	25.0	1200	0.25	180	? ? ? ?
10D331K						550	25	47.0	2500	0.40	450	? ? ? ?
14D331K						550	50	93.0	4500	0.60	850	? ? ? ?
20D331K						550	100	163.0	6500	1.00	1750	? ? ? ?
05D361K	230	300	324	360	396	620	5	10.0	400	0.10	80	? ? ? ?
07D361K						595	10	25.0	1200	0.25	170	? ? ? ?
10D361K						595	25	47.0	2500	0.40	450	? ? ? ?
14D361K						595	50	93.0	4500	0.60	800	? ? ? ?
20D361K						595	100	163.0	6500	1.00	1700	? ? ? ?
05D391K	250	320	351	390	429	675	5	12.0	400	0.10	80	? ? ? ?
07D391K						650	10	25.0	1200	0.25	160	? ? ? ?
10D391K						650	25	60.0	2500	0.40	430	? ? ? ?
14D391K						650	50	100.0	4500	0.60	800	? ? ? ?
20D391K						650	100	180.0	6500	1.00	1400	? ? ? ?
05D431K	275	350	387	340	473	745	5	13.0	400	0.10	70	? ? ? ?
07D431K						710	10	28.0	1200	0.25	150	? ? ? ?
10D431K						710	25	65.0	2500	0.40	400	? ? ? ?
14D431K						710	50	115.0	4500	0.60	650	? ? ? ?
20D431K						710	100	190.0	6500	1.00	1350	? ? ? ?
05D471K	300	385	423	470	517	810	5	15.0	400	0.10	70	? ? ? ?
07D471K						775	10	30.0	1200	0.25	130	? ? ? ?
10D471K						775	25	70.0	2500	0.40	300	? ? ? ?
14D471K						775	50	125.0	4500	0.60	550	? ? ? ?
20D471K						775	100	220.0	6500	1.00	1200	? ? ? ?
05D511K	320	410	459	510	561	880	5	15.0	400	0.10	65	? ? ? ?
07D511K						845	10	30.0	1200	0.25	120	? ? ? ?
10D511K						845	25	70.0	2500	0.40	260	? ? ? ?
14D511K						845	50	125.0	4500	0.60	450	? ? ? ?
20D511K						845	100	220.0	6500	1.00	1050	? ? ? ?
05D561K	350	460	504	560	616	940	5	15.0	400	0.10	65	? ? ? ?
07D561K						915	10	30.0	1200	0.25	120	? ? ? ?
10D561K						915	25	70.0	2500	0.40	200	? ? ? ?
14D561K						915	50	125.0	4500	0.60	400	? ? ? ?
20D561K						915	100	220.0	6500	1.00	850	? ? ? ?
05D621K	385	505	558	620	682	1050	5	15.0	400	0.10	65	? ? ? ?
07D621K						1025	10	30.0	1200	0.25	120	? ? ? ?
10D621K						1025	25	70.0	2500	0.40	170	? ? ? ?
14D621K						1025	50	125.0	4500	0.60	350	? ? ? ?
20D621K						1025	100	220.0	6500	1.00	570	? ? ? ?
05D681K	420	560	612	680	748	1150	5	15.0	400	0.10	60	? ?
07D681K						1120	10	30.0	1200	0.25	110	? ? ? ?
10D681K						1120	25	70.0	2500	0.40	160	? ? ? ?
14D681K						1120	50	130.0	4500	0.60	350	? ? ? ?
20D681K						1120	100	230.0	6500	1.00	550	? ? ? ?

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	Acrms(v)	DC(v)	Min	Vb(Vdc)	Max	Vc(V)	Ip(A)	10/1000 μS	(A)	(W)	(PF)	
05D751K 07D751K 10D751K 14D751K 20D751K	460	615	675	750	825	1290 1240 1240 1240 1240	5 10 25 50 100	15.0 33.0 75.0 143.0 255.0	400 1200 2500 4500 6500	0.10 0.25 0.40 0.60 1.00	60 100 150 330 530	? ? ? ? ? ? ? ? ? ? ? ? ? ? ? ? ? ?
07D781K 10D781K 14D781K 20D781K	485	640	702	780	858	1290 1290 1290 1290	10 25 50 100	3.7 8.0 148.0 265.0	1200 2500 4500 6500	0.25 0.40 0.60 1.00	90 150 330 500	? ? ? ? ? ? ? ? ? ? ? ? ? ? ? ?
07D821K 10D821K 14D821K 20D821K	510	670	738	820	902	1355 1355 1355 1355	10 25 50 100	40.0 85.0 157.0 282.0	1200 2500 4500 6500	0.25 0.40 0.60 1.00	90 150 330 500	? ? ? ? ? ? ? ? ? ? ? ? ? ? ? ?
10D991K 14D991K 20D991K	550	745	819	910	1001	1500 1500 1500	25 50 100	93.0 175.0 310.0	2500 4500 6500	0.40 0.60 1.00	140 300 460	? ? ? ? ? ? ? ? ? ? ? ?
10D102K 14D102K 20D102K	625	825	900	1000	1100	1650 1650 1650	25 50 100	102.0 190.0 342.0	2500 4500 6500	0.40 0.60 1.00	140 300 480	? ? ? ? ? ? ? ? ? ? ? ?
10D112K 14D112K 20D112K	680	895	990	1100	1210	1815 1815 1815	25 50 100	115.0 213.0 383.0	2500 4500 6500	0.40 0.60 1.00	130 200 400	? ? ? ? ? ?
14D182K 20D182K	1000	1465	1620	1800	1980	2970 2970	50 100	337.0 625.0	4500 6500	0.60 1.00	150 250	

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Application Notes for UL Recognized Components

Related Standards

Standard NO.	UL 1414	UL 1449(2nd Edition)	CSA	VDE
Title	Across-The-Line Components	Transient Voltage Surge Suppressors	Accessories and Parts for Electronic Products	Varistors for use in Electronic equipment
File No.	E165143	E50709	LR109736-1	21557-4790-0001
Symbols	△	☆	※	○

Selection guide

1. Determine the necessary steady-state voltage (working voltage)
2. Establish the transient energy absorbed by the varistor.
3. Calculate the peak transient current through the varistor.
4. Determine power dissipation requirement.
5. Select a model to provide the required voltage-clampling characteristics.