

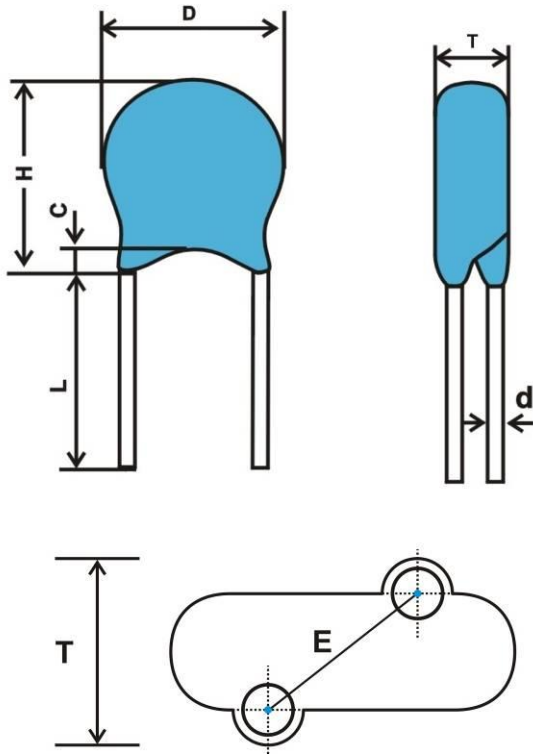
TSV

SPECIFICATIONS

Varistor Voltage (Threshold Voltage)		18V ~ 1800V
Working Voltage (Max. Allowable Voltage)	AC(rms)	11VAC ~ 1000VAC
	DC	14VDC ~ 1465VDC
Peak Current for 8/20 μ S Current Wave	General Type	100A ~ 6500A
	Hi-energy Type	250A ~ 10 000A
Energy Range For 10/1000 μ S Current Wave	General Type	0.4J ~ 625J
	Hi-energy Type	0.6J ~ 990J
Operation Ambient Temperature Range		-40 $^{\circ}$ C ~ +85 $^{\circ}$ C
Storage Temperature Range		-55 $^{\circ}$ C ~ +125 $^{\circ}$ C
Insulation Resistance		>1000 M Ω
Hi-Pot (Leads to Coating)		2500 VDC for 1 min.
Typical Response Time		<25ns
Maximum Voltage-Temperature Coefficient		<-0.05% / $^{\circ}$ C



DIMENSION



T Thickness(mm max.)

Part Code	D07	D10	D14	D20
180K	3.6	4.0	4.1	4.4
220K	3.8	4.0	4.3	4.5
270K	4.0	4.3	4.5	4.8
330K	3.7	4.1	4.2	4.5
390K	3.9	4.3	4.4	4.7
470K	4.1	4.5	4.6	4.9
560K	4.2	4.5	4.7	4.7
680K	4.3	5.0	5.0	5.0
820K	3.5	3.9	4.0	4.3
101K	3.8	4.2	4.3	4.6
121K	4.0	4.4	4.5	4.8
151K	4.3	4.7	4.8	5.1
181K	3.4	3.8	3.9	4.2
201K	3.5	3.9	4.0	4.3
221K	3.6	4.0	4.1	4.4
241K	3.7	4.1	4.2	4.5
271K	3.9	4.2	4.3	4.6
301K	4.1	4.3	4.4	4.7
331K	4.2	4.5	4.6	4.9
361K	4.3	4.7	4.8	5.1
391K	4.4	4.8	4.9	5.2
431K	4.6	5.0	5.1	5.4
471K	5.0	5.2	5.5	5.8
511K	5.2	5.5	5.6	5.9
561K	5.4	5.7	5.8	6.1
621K	5.5	5.7	5.8	6.1
681K	5.6	5.8	5.9	6.2
751K	5.8	6.0	6.1	6.4
781K	6.0	6.3	6.4	6.7
821K	6.3	6.5	6.6	6.9
911K	--	6.6	6.7	7.0
102K	--	7.0	7.1	7.4
112K	--	7.4	7.5	7.9
122K	--		7.7	9.1
142K	--		8.7	9.1
152K	--		9	9
162K	--		9.7	9.9
182K	--		9.7	10.1

L:20mm min

SIZE	D MAX	H MAX	d+/-0.05	E	c max
D07	9.5	12.5	0.6	5.0	3.0
D10	12.5	16.0	0.8	7.5	3.0
D14	16.5	20.0	0.8	7.5	3.0
D20	23.0	26.5	1.0	10.0	3.0

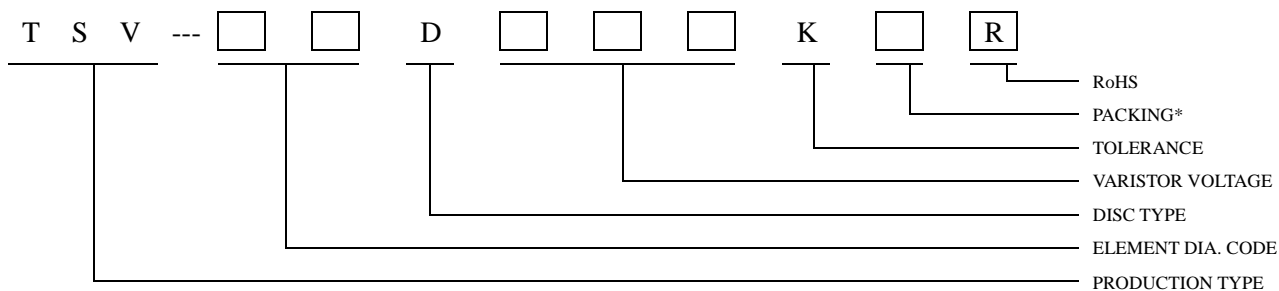
TSV

ZINC OXIDE VARISTOR 7D

SPECIFICATION

Part No	Varistor Voltage (V1.0mA) Volts	Max. Allowable Voltage		Max. Clamping Voltage		Max. Peak Current (8/20us)		Maximum Energy (10/100us)		Rated Power Watts	Cap. (max) pF@1kHz
		ACrms	DC	Vc	Ip	General	Hi-energy	General	Hi-energy		
		Volts	Volts	Volts	Amps	Watts	Amps	Joules	Joules		
TSV07D180K	16.2~19.8	11	14	36	2.5	250 / 125x2	500 / 250x2	0.9	2.0	0.02	2800
TSV07D220K	19.8~24.2	14	18	43				1.1	2.4		2300
TSV07D270K	24.3~29.7	17	22	53				1.4	3.0		1800
TSV07D330K	29.7~36.3	20	26	65				1.7	3.5		1500
TSV07D390K	35.1~42.9	25	31	77				2.1	4.0		1300
TSV07D470K	42.3~51.7	30	38	93				2.5	5.0		1100
TSV07D560K	50.4~61.6	35	45	110				3.1	6.0		890
TSV07D680K	61.2~74.8	40	56	135				3.6	7.0		740
TSV07D820K	73.8~90.2	50	65	135	10	1200 / 600x2	1750 / 1200x2	5.5	10.0	0.25	600
TSV07D101K	90~110	60	85	165				6.5	12		500
TSV07D121K	108~132	75	100	200				7.8	13		420
TSV07D151K	135~165	95	125	250				9.7	15		330
TSV07D181K	162~198	115	150	300				11.7	16		280
TSV07D201K	180~220	130	170	340				13	17		250
TSV07D221K	198~242	140	180	360				14	19		230
TSV07D241K	216~264	150	200	395				15	21		210
TSV07D271K	243~297	175	225	455				18	24		185
TSV07D301K	270~330	190	250	505				20	26		165
TSV07D331K	297~363	210	275	545				23	28		150
TSV07D361K	324~396	230	300	595				24	32		140
TSV07D391K	351~429	250	320	650				26	35		130
TSV07D431K	387~473	275	350	710				28	40		115
TSV07D471K	423~517	300	385	775				29	42		105
TSV07D511K	459~561	320	415	845				31	45		100
TSV07D561K	504~616	350	460	930				35	49		90
TSV07D621K	558~682	385	505	1020				38	55		80
TSV07D681K	612~748	420	560	1120				42	60		75
TSV07D751K	675~825	460	615	1240				45	64		70
TSV07D781K	702~858	485	640	1290				48	69		65
TSV07D821K	738~902	510	670	1355				52	73		60

#680K—180K Max. Clamping Voltage testing current 2.5A.



*Blank for Bulk ; A for Ammo ; T for Tape & Reel

TSV

ZINC OXIDE VARISTOR 10D

SPECIFICATION

Part No	Varistor Voltage (V1.0mA)	Max. Allowable Voltage		Max. Clamping Voltage		Max. Peak Current (8/20us)		Maximum Energy (10/100us)		Rated Power	Cap. (max)
		ACrms	DC	Vc	Ip	General	Hi-energy	General	Hi-energy		
	Volts	Volts	Volts	Volts	Amps	Watts	Amps	Joules	Joules	Watts	pF@1kHz
TSV10D180K	16.2~19.8	11	14	36	5	500 / 250x2	1000 / 500x2	2.1	3.0	0.05	5600
TSV10D220K	19.8~24.2	14	18	43				2.5	5.0		4500
TSV10D270K	24.3~29.7	17	22	53				3.0	6.0		3700
TSV10D330K	29.7~36.3	20	26	65				4.0	7.0		3000
TSV10D390K	35.1~42.9	25	31	77				4.6	9.0		2400
TSV10D470K	42.3~51.7	30	38	93				5.5	11		2100
TSV10D560K	50.4~61.6	35	45	110				7.0	13		1800
TSV10D680K	61.2~74.8	40	56	135				8.2	15		1500
TSV10D820K	73.8~90.2	50	65	135	25	2500 / 1250x2	3500 / 2500x2	12	17	0.40	1200
TSV10D101K	90~110	60	85	165				15	18		1000
TSV10D121K	108~132	75	100	200				18	21		830
TSV10D151K	135~165	95	125	250				22	25		670
TSV10D181K	162~198	115	150	300				27	30		560
TSV10D201K	180~220	130	170	340				30	35		500
TSV10D221K	198~242	140	180	360				32	39		450
TSV10D241K	216~264	150	200	395				35	42		420
TSV10D271K	243~297	175	225	455				37	49		370
TSV10D301K	270~330	190	250	505				40	54		330
TSV10D331K	297~363	210	275	545				43	58		300
TSV10D361K	324~396	230	300	595				47	65		280
TSV10D391K	351~429	250	320	650				60	70		260
TSV10D431K	387~473	275	350	710				65	80		230
TSV10D471K	423~517	300	385	775				67	85		210
TSV10D511K	459~561	320	415	845				69	90		200
TSV10D561K	504~616	350	460	930				70	92		180
TSV10D621K	558~682	385	505	1020				72	95		160
TSV10D681K	612~748	420	560	1120				75	98		150
TSV10D751K	675~825	460	615	1240				77	100		130
TSV10D781K	702~858	485	640	1290	80	105	125				
TSV10D821K	738~902	510	670	1355	85	110	120				
TSV10D911K	819~1001	550	745	1500	93	130	110				
TSV10D102K	900~1100	625	825	1650	102	140	100				
TSV10D112K	990~1210	680	895	1815	115	155	90				

#680K—180K Max. Clamping Voltage testing current 5A.

TSV

ZINC OXIDE VARISTOR 14D

SPECIFICATION

Part No	Varistor Voltage (V1.0mA)	Max. Allowable Voltage		Max. Clamping Voltage		Max. Peak Current (8/20us)		Maximum Energy (10/100us)		Rated Power	Cap. (max)
		ACrms	DC	Vc	Ip	General	Hi-energy	General	Hi-energy		
	Volts	Volts	Volts	Volts	Amps	Watts	Amps	Joules	Joules	Watts	pF@1kHz
TSV14D180K	16.2~19.8	11	14	36	10	1000 / 500x2	2000 / 1000x2	4	7	0.10	11100
TSV14D220K	19.8~24.2	14	18	43				5	8		9100
TSV14D270K	24.3~29.7	17	22	53				6	10		7400
TSV14D330K	29.7~36.3	20	26	65				7.5	12		6100
TSV14D390K	35.1~42.9	25	31	77				8.6	13		5100
TSV14D470K	42.3~51.7	30	38	93				10	17		4300
TSV14D560K	50.4~61.6	35	45	110				11	20		3600
TSV14D680K	61.2~74.8	40	56	135				14	24		2900
TSV14D820K	73.8~90.2	50	65	135	50	4500 / 2500x2	6000 / 4500x2	22	27	0.60	2400
TSV14D101K	90~110	60	85	165				28	33		2000
TSV14D121K	108~132	75	100	200				32	40		1700
TSV14D151K	135~165	95	125	250				40	53		1300
TSV14D181K	162~198	115	150	300				50	60		1100
TSV14D201K	180~220	130	170	340				57	70		1000
TSV14D221K	198~242	140	180	360				60	78		900
TSV14D241K	216~264	150	200	395				63	84		830
TSV14D271K	243~297	175	225	455				70	99		740
TSV14D301K	270~330	190	250	505				77	108		670
TSV14D331K	297~363	210	275	545				85	115		610
TSV14D361K	324~396	230	300	595				93	130		560
TSV14D391K	351~429	250	320	650				100	140		510
TSV14D431K	387~473	275	350	710				115	155		460
TSV14D471K	423~517	300	385	775				118	175		430
TSV14D511K	459~561	320	415	845				121	180		390
TSV14D561K	504~616	350	460	930				125	185		360
TSV14D621K	558~682	385	505	1020				128	190		320
TSV14D681K	612~748	420	560	1120				130	200		290
TSV14D751K	675~825	460	615	1240				143	210		270
TSV14D781K	702~858	485	640	1290				148	220		260
TSV14D821K	738~902	510	670	1355				157	235		240
TSV14D911K	819~1001	550	745	1500				175	255		220
TSV14D102K	900~1100	625	825	1650				190	280		200
TSV14D112K	990~1210	680	895	1815	213	310	180				
TSV14D122K	1080~1320	750	990	1980	232	324	160				
TSV14D182K	1620~1980	1100	1465	2970	250	335	130				

#680K—180K Max. Clamping Voltage testing current 10A.

TSV

ZINC OXIDE VARISTOR 20D

SPECIFICATION

Part No	Varistor Voltage (V1.0mA)	Max. Allowable Voltage		Max. Clamping Voltage		Max. Peak Current (8/20us)		Maximum Energy (10/100us)		Rated Power Watts	Cap. (max) pF@1kHz
		ACrms	DC	Vc	Ip	General	Hi-energy	General	Hi-energy		
		Volts	Volts	Volts	Amps	Watts	Amps	Joules	Joules		
TSV20D180K	16.2~19.8	11	14	36	20	2000 / 1000x2	3000 / 2000x2	11	13	0.20	28500
TSV20D220K	19.8~24.2	14	18	43				14	16		18500
TSV20D270K	24.3~29.7	17	22	53				16	19		13000
TSV20D330K	29.7~36.3	20	26	65				23	24		11500
TSV20D390K	35.1~42.9	25	31	77				26	28		8500
TSV20D470K	42.3~51.7	30	38	93				30	34		7400
TSV20D560K	50.4~61.6	35	45	110				38	44		6500
TSV20D680K	61.2~74.8	40	56	135				41	49		5800
TSV20D820K	73.8~90.2	50	65	135				45	56		4900
TSV20D101K	90~110	60	85	165	100	6500 / 4500x2	10000 / 6500x2	50	70	1.00	4000
TSV20D121K	108~132	75	100	200				55	85		3300
TSV20D151K	135~165	95	125	250				70	106		2700
TSV20D181K	162~198	115	150	300				85	130		2200
TSV20D201K	180~220	130	170	340				95	140		2000
TSV20D221K	198~242	140	180	360				100	155		1800
TSV20D241K	216~264	150	200	395				108	168		1650
TSV20D271K	243~297	175	225	455				127	190		1500
TSV20D301K	270~330	190	250	505				136	210		1300
TSV20D331K	297~363	210	275	545				150	228		1200
TSV20D361K	324~396	230	300	595				163	255		1100
TSV20D391K	351~429	250	320	650				180	275		1000
TSV20D431K	387~473	275	350	710				190	305		930
TSV20D471K	423~517	300	385	775				204	350		850
TSV20D511K	459~561	320	415	845				210	360		780
TSV20D561K	504~616	350	460	930				215	380		710
TSV20D621K	558~682	385	505	1020				224	390		650
TSV20D681K	612~748	420	560	1120				230	400		600
TSV20D751K	675~825	460	615	1240				255	420		530
TSV20D781K	702~858	485	640	1290				265	440		510
TSV20D821K	738~902	510	670	1355				282	460		500
TSV20D911K	819~1001	550	745	1500	310	510	440				
TSV20D102K	900~1100	625	825	1650	342	565	400				
TSV20D112K	990~1210	680	895	1815	383	620	360				
TSV20D122K	1080~1320	750	990	1980	408	660	350				
TSV20D182K	1620~1980	1100	1465	2970	625	990	320				

#680K—180K Max. Clamping Voltage testing current 20A.

TSV

ZINC OXIDE VARISTOR

Approval No.	CUL (Canada)	UL (USA)	VDE (Germany)
	E360986	E360986	40036445
7D	180K, 220K, 270K, 330K,	180K, 220K, 270K, 330K,	180K, 220K, 270K, 330K,
	390K, 470K, 560K, 680K,	390K, 470K, 560K, 680K,	390K, 470K, 560K, 680K,
	820K, 101K, 121K, 151K,	820K, 101K, 121K, 151K,	820K, 101K, 121K, 151K,
	181K, 201K, 221K, 241K,	181K, 201K, 221K, 241K,	181K, 201K, 221K, 241K,
	271K, 301K, 331K, 361K,	271K, 301K, 331K, 361K,	271K, 301K, 331K, 361K,
	391K, 431K, 471K, 511K,	391K, 431K, 471K, 511K,	391K, 431K, 471K, 511K,
	561K, 621K, 681K, 751K,	561K, 621K, 681K, 751K,	561K, 621K, 681K, 751K,
	781K, 821K	781K, 821K	781K, 821K
10D	180K, 220K, 270K, 330K,	180K, 220K, 270K, 330K,	180K, 220K, 270K, 330K,
	390K, 470K, 560K, 680K,	390K, 470K, 560K, 680K,	390K, 470K, 560K, 680K,
	820K, 101K, 121K, 151K,	820K, 101K, 121K, 151K,	820K, 101K, 121K, 151K,
	181K, 201K, 221K, 241K,	181K, 201K, 221K, 241K,	181K, 201K, 221K, 241K,
	271K, 301K, 331K, 361K,	271K, 301K, 331K, 361K,	271K, 301K, 331K, 361K,
	391K, 431K, 471K, 511K,	391K, 431K, 471K, 511K,	391K, 431K, 471K, 511K,
	561K, 621K, 681K, 751K,	561K, 621K, 681K, 751K,	561K, 621K, 681K, 751K,
	781K, 821K, 911K, 102K,	781K, 821K, 911K, 102K,	781K, 821K, 911K, 102K,
	112K	112K	112K
14D	180K, 220K, 270K, 330K,	180K, 220K, 270K, 330K,	180K, 220K, 270K, 330K,
	390K, 470K, 560K, 680K,	390K, 470K, 560K, 680K,	390K, 470K, 560K, 680K,
	820K, 101K, 121K, 151K,	820K, 101K, 121K, 151K,	820K, 101K, 121K, 151K,
	181K, 201K, 221K, 241K,	181K, 201K, 221K, 241K,	181K, 201K, 221K, 241K,
	271K, 301K, 331K, 361K,	271K, 301K, 331K, 361K,	271K, 301K, 331K, 361K,
	391K, 431K, 471K, 511K,	391K, 431K, 471K, 511K,	391K, 431K, 471K, 511K,
	561K, 621K, 681K, 751K,	561K, 621K, 681K, 751K,	561K, 621K, 681K, 751K,
	781K, 821K, 911K, 102K,	781K, 821K, 911K, 102K,	781K, 821K, 911K, 102K,
	112K, 122K, 142K, 152K,	112K, 122K, 142K, 152K,	112K, 122K
	162K, 182K	162K, 182K	
20D	180K, 220K, 270K, 330K,	180K, 220K, 270K, 330K,	N/A
	390K, 470K, 560K, 680K,	390K, 470K, 560K, 680K,	
	820K, 101K, 121K, 151K,	820K, 101K, 121K, 151K,	
	181K, 201K, 221K, 241K,	181K, 201K, 221K, 241K,	
	271K, 301K, 331K, 361K,	271K, 301K, 331K, 361K,	
	391K, 431K, 471K, 511K,	391K, 431K, 471K, 511K,	
	561K, 621K, 681K, 751K,	561K, 621K, 681K, 751K,	
	781K, 821K, 911K, 102K,	781K, 821K, 911K, 102K,	
	112K, 122K, 142K, 152K,	112K, 122K, 142K, 152K,	
	162K, 182K	162K, 182K	

Note: Specification are subject to change without notice. For more detail and update, please visit our website.