



# TMRSS01-Metal Oxide Varistors

## Feature:

Wide operating voltage (V 1mA) range from 8V to 1800V  
 Fast responding to transient over-voltage  
 Large absorbing transient energy capability  
 Low clamping ratio and no following-on current

**Application:** Surge absorber, motor, de-excitation device, household appliances, etc.

## Part Number:

TMRSS01	-	1	0	D	3	9	1	K	B
		↓	↓	↓	↓	↓	↓	↓	↓

<b>Product Code</b> TMRSS01: Metal Oxide Varistors	<b>Disc Diameter:</b> 05=5mm; 07=7mm 10=10mm; 14=14mm 20=20mm	<b>Type:</b> D: Disk S: Square	<b>Nominal Varistor Voltage:</b> 180=18V 220=22V ... 101=100V 391=390V 431=430V 182=1800V ...	<b>Tolerance:</b> K=±10%	<b>Packaging:</b> T:tape&reel B:bulk

## Electrical Rating:

Item	Test Condition / Description		Requirement	
Varistor Voltage	The voltage between two terminals with the specified measuring current 1mA. DC applied is call Vb.		To meet the specified value	
Maximum Allowable Voltage	The recommended maximum sine wave voltage (RMS) or the maximum DC voltage can be applied continuously			
Rated Wattaget	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 10/1000µsec. or 2 msec. is applied.			
Withstanding Surge Current	The maximum current within the varistor voltage change of ±10% with the standard impulse current (8/20µsec.) applied one time.			
Surge Life	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.		$\frac{\Delta V_b}{V_b} \leq \pm 10\%$	
	05D series	180K to 680K		10A (8/20µsec.)
		820K to 751K		20A (8/20µsec.)
	07D series	180K to 680K		25A (8/20µsec.)
		820K to 821K		50A (8/20µsec.)
	10D series	180K to 680K		50A (8/20µsec.)
		820K to 182K		100A (8/20µsec.)
	14D series	180K to 680K		75A (8/20µsec.)
		820K to 182K		150A (8/20µsec.)
	20D series	180K to 680K		100A (8/20µsec.)
820K to 182K		200A (8/20µsec.)		



# TMRSS01-Metal Oxide Varistors

## Electrical Characteristics

### 05D Series

Type Number		Maximum Allowable Voltage		Varistor Voltage	Maximum Clamping Voltage		Withstanding Surge Current		Maximum Energy (10/1000 $\mu$ s)		Rated Power	Typical Capacitance (Reference)
Standard	High Surge	Vac(V)	Vdc(V)	V <sub>1mA</sub> (V)	I <sub>p</sub> (A)	V <sub>c</sub> (V)	I(A) Standard	I(A) High Surge	(J) Standard	(J) High Surge	(W)	@1KHz(pf)
05D180K	05D180KJ	11	14	18(15~21.6)	1	40	100	250	0.4	0.6	0.01	1400
05D220K	05D220KJ	14	18	22(19.5~26)	1	48	100	250	0.5	0.7	0.01	1150
05D270K	05D270KJ	17	22	27(24~31)	1	60	100	250	0.6	0.9	0.01	930
05D330K	05D330KJ	20	26	33(29.5~36.5)	1	73	100	250	0.8	1.1	0.01	760
05D390K	05D390KJ	25	31	39(35~43)	1	80	100	250	0.9	1.2	0.01	640
05D470K	05D470KJ	30	38	47(42~54)	1	104	100	250	1.1	1.5	0.01	530
05D560K	05D560KJ	35	45	56(50~62)	1	123	100	250	1.3	1.8	0.01	450
05D680K	05D680KJ	40	56	68(61~75)	1	150	100	250	1.6	2.2	0.01	370
05D820K	05D820KJ	50	65	82(74~90)	5	145	400	800	2.5	4	0.1	300
05D101K	05D101KJ	60	85	100(90~110)	5	177	400	800	3	4.1	0.1	250
05D121K	05D121KJ	75	100	120(108~132)	5	210	400	800	4	4.9	0.1	210
05D151K	05D151KJ	95	125	150(135~165)	5	260	400	800	4.1	6.5	0.1	165
05D181K	05D181KJ	115	150	180(162~198)	5	320	400	800	4.9	7.5	0.1	140
05D201K	05D201KJ	130	170	200(180~220)	5	355	400	800	6.5	8.5	0.1	125
05D221K	05D221KJ	140	180	220(198~242)	5	380	400	800	7.5	9	0.1	110
05D241K	05D241KJ	150	200	240(216~264)	5	415	400	800	8	10.5	0.1	100
05D271K	05D271KJ	175	225	270(243~297)	5	475	400	800	8.5	11	0.1	95
05D301K	05D301KJ	190	250	300(270~330)	5	520	400	800	9	12	0.1	85
05D331K	05D331KJ	210	275	330(297~363)	5	570	400	800	9.5	13	0.1	75
05D361K	05D361KJ	230	300	360(324~396)	5	620	400	800	10	16	0.1	70
05D391K	05D391KJ	250	320	390(351~429)	5	675	400	800	12	17	0.1	65
<b>05D431K</b>	05D431KJ	275	350	430(387~473)	5	745	400	800	13	20	0.1	60
05D471K	05D471KJ	300	385	470(423~517)	5	810	400	800	15	21	0.1	55
05D511K	05D511KJ	320	415	510(459~561)	5	845	400	800	16	22.5	0.1	50
05D561K	05D561KJ	350	460	560(504~616)	5	920	400	800	16	24	0.1	50
05D621K	05D621KJ	385	505	620(558~682)	5	1025	400	800	21	25	0.1	40
05D681K	05D681KJ	420	560	680(612~748)	5	1120	400	800	21	29	0.1	35
05D751K	05D751KJ	460	615	750(675~825)	5	1240	400	800	22	32	0.1	30



# TMRSS01-Metal Oxide Varistors

## 07D Series

Type Number		Maximum Allowable Voltage		Varistor Voltage	Maximum Clamping Voltage		Withstanding Surge Current		Maximum Energy (10/1000µs)		Rated Power	Typical Capacitance (Reference)
Standard	High Surge	Vac(V)	Vdc(V)	V <sub>1mA</sub> (V)	I <sub>p</sub> (A)	V <sub>c</sub> (V)	I(A) Standard	I(A) High Surge	(J) Standard	(J) High Surge	(W)	@1KHz(pf)
07D180K	07D180KJ	11	14	18(15~21.6)	2.5	36	250	500	0.9	2	0.02	2800
07D220K	07D220KJ	14	18	22(19.5~26)	2.5	43	250	500	1.1	2.4	0.02	2300
07D270K	07D270KJ	17	22	27(24~31)	2.5	53	250	500	1.4	3	0.02	1800
07D330K	07D330KJ	20	26	33(29.5~36.5)	2.5	65	250	500	1.7	3.5	0.02	1500
07D390K	07D390KJ	25	31	39(35~43)	2.5	77	250	500	2.1	4	0.02	1300
07D470K	07D470KJ	30	38	47(42~54)	2.5	93	250	500	2.5	5	0.02	1100
07D560K	07D560KJ	35	45	56(50~62)	2.5	110	250	500	3.1	6	0.02	900
07D680K	07D680KJ	40	56	68(61~75)	2.5	135	250	500	3.6	7	0.02	740
07D820K	07D820KJ	50	65	82(74~90)	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	13	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(180~220)	10	340	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	500	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	925	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	67.2	65	0.25	70
07D781K	07D781KJ	185	640	780(702~858)	10	1290	1200	1750	67.2	65	0.25	70
07D821K	07D821KJ	510	670	820(738~902)	10	1355	1200	1750	67.2	70	0.25	60



# TMRSS01-Metal Oxide Varistors

## 10D Series

Type Number		Maximum Allowable Voltage		Varistor Voltage	Maximum Clamping Voltage		Withstanding Surge Current		Maximum Energy (10/1000µs)		Rated Power	Typical Capacitance (Reference)
Standard	High Surge	Vac(V)	Vdc(V)	V1mA(V)	Ip(A)	Vc(V)	I(A) Standard	I(A) High Surge	(J) Standard	(J) High Surge	(W)	@ 1KHz(pf)
10D180K	10D180KJ	11	14	18(15~21.6)	5	36	500	1000	2.1	3	0.05	5600
10D220K	10D220KJ	14	18	22(19.5~26)	5	43	500	1000	2.5	5	0.05	4500
10D270K	10D270KJ	17	22	27(24~31)	5	53	500	1000	3	6	0.05	3700
10D330K	10D330KJ	20	26	33(29.5~36.5)	5	65	500	1000	4	7	0.05	3000
10D390K	10D390KJ	25	31	39(35~43)	5	77	500	1000	4.6	9	0.05	2400
10D470K	10D470KJ	30	38	47(42~54)	5	93	500	1000	5.5	11	0.05	2100
10D560K	10D560KJ	35	45	56(50~62)	5	110	500	1000	7	13	0.05	1800
10D680K	10D680KJ	40	56	68(61~75)	5	135	500	1000	8.2	15	0.05	1500
10D820K	10D820KJ	50	65	82(74~90)	25	135	2500	3500	12	17	0.4	1200
10D101K	10D101KJ	60	85	100(90~110)	25	165	2500	3500	15	18	0.4	1000
10D121K	10D121KJ	75	100	120(108~132)	25	200	2500	3500	18	21	0.4	830
10D151K	10D151KJ	95	125	150(135~165)	25	250	2500	3500	22	25	0.4	670
10D181K	10D181KJ	115	150	180(162~198)	25	300	2500	3500	27	30	0.4	560
10D201K	10D201KJ	130	170	200(180~220)	25	340	2500	3500	30	35	0.4	500
10D221K	10D221KJ	140	180	220(198~242)	25	360	2500	3500	32	39	0.4	450
10D241K	10D241KJ	150	200	240(216~264)	25	395	2500	3500	35	42	0.4	420
10D271K	10D271KJ	175	225	270(243~297)	25	455	2500	3500	40	49	0.4	370
10D301K	10D301KJ	190	250	300(270~330)	25	500	2500	3500	40	54	0.4	330
10D331K	10D331KJ	210	275	330(297~363)	25	550	2500	3500	40	58	0.4	300
10D361K	10D361KJ	230	300	360(324~396)	25	595	2500	3500	43	65	0.4	280
10D391K	10D391KJ	250	320	390(351~429)	25	650	2500	3500	47	70	0.4	260
10D431K	10D431KJ	275	350	430(387~473)	25	710	2500	3500	60	80	0.4	230
10D471K	10D471KJ	300	385	470(423~517)	25	775	2500	3500	65	85	0.4	210
10D511K	10D511KJ	320	415	510(459~561)	25	845	2500	3500	70	90	0.4	200
10D561K	10D561KJ	350	460	560(504~616)	25	925	2500	3500	70	92	0.4	180
10D621K	10D621KJ	385	505	620(558~682)	25	1025	2500	3500	70	95	0.4	160
10D681K	10D681KJ	420	560	680(612~748)	25	1120	2500	3500	70	98	0.4	150
10D751K	10D751KJ	460	615	750(675~825)	25	1240	2500	3500	70	100	0.4	130
10D781K	10D781KJ	185	640	780(702~858)	25	1290	2500	3500	80	105	0.4	130
10D821K	10D821KJ	510	670	820(738~902)	25	1355	2500	3500	85	110	0.4	120
10D911K	10D911KJ	550	745	910(819~1001)	25	1500	2500	3500	93	130	0.4	110
10D102K	10D102KJ	625	825	1000(900~1100)	25	1650	2500	3500	102	140	0.4	100
10D112K	10D112KJ	680	895	1100(990~1210)	25	1815	2500	3500	115	155	0.4	90
10D182K	10D182KJ	1000	1465	1800(1620~1980)	25	2970	2500	3500	133	250	0.4	70

## 14D Series

Type Number		Maximum Allowable Voltage		Varistor Voltage	Maximum Clamping Voltage		Withstanding Surge Current		Maximum Energy (10/1000µs)		Rated Power	Typical Capacitance (Reference)
Standard	High Surge	Vac(V)	Vdc(V)	V1mA(V)	Ip(A)	Vc(V)	I(A) Standard	I(A) High Surge	(J) Standard	(J) High Surge	(W)	@ 1KHz(pf)
14D180K	14D180KJ	11	14	18(15~21.6)	10	36	1000	2000	4	7	0.1	11100
14D220K	14D220KJ	14	18	22(19.5~26)	10	43	1000	2000	5	8	0.1	9100
14D270K	14D270KJ	17	22	27(24~31)	10	53	1000	2000	6	10	0.1	7400
14D330K	14D330KJ	20	26	33(29.5~36.5)	10	65	1000	2000	7.5	12	0.1	6100
14D390K	14D390KJ	25	31	39(35~43)	10	77	1000	2000	8.6	13	0.1	5100
14D470K	14D470KJ	30	38	47(42~54)	10	93	1000	2000	10	17	0.1	4300
14D560K	14D560KJ	35	45	56(50~62)	10	110	1000	2000	11	20	0.1	3600
14D680K	14D680KJ	40	56	68(61~75)	10	135	1000	2000	14	24	0.1	2900
14D820K	14D820KJ	50	65	82(74~90)	50	135	4500	6000	22	27	0.6	2400
14D101K	14D101KJ	60	85	100(90~110)	50	165	4500	6000	28	33	0.6	2000
14D121K	14D121KJ	75	100	120(108~132)	50	200	4500	6000	32	40	0.6	1700
14D151K	14D151KJ	95	125	150(135~165)	50	250	4500	6000	40	53	0.6	1300
14D181K	14D181KJ	115	150	180(162~198)	50	300	4500	6000	50	60	0.6	1100
14D201K	14D201KJ	130	170	200(180~220)	50	340	4500	6000	57	70	0.6	1000
14D221K	14D221KJ	140	180	220(198~242)	50	360	4500	6000	60	78	0.6	900
14D241K	14D241KJ	150	200	240(216~264)	50	395	4500	6000	63	84	0.6	830
14D271K	14D271KJ	175	225	270(243~297)	50	455	4500	6000	70	99	0.6	740
14D301K	14D301KJ	190	250	300(270~330)	50	500	4500	6000	77	108	0.6	670
14D331K	14D331KJ	210	275	330(297~363)	50	550	4500	6000	85	115	0.6	610
14D361K	14D361KJ	230	300	360(324~396)	50	595	4500	6000	93	130	0.6	560
14D391K	14D391KJ	250	320	390(351~429)	50	650	4500	6000	100	140	0.6	510
14D431K	14D431KJ	275	350	430(387~473)	50	710	4500	6000	115	155	0.6	460
14D471K	14D471KJ	300	385	470(423~517)	50	775	4500	6000	125	175	0.6	430
14D511K	14D511KJ	320	415	510(459~561)	50	845	4500	6000	125	180	0.6	390
14D561K	14D561KJ	350	460	560(504~616)	50	925	4500	6000	125	185	0.6	360
14D621K	14D621KJ	385	505	620(558~682)	50	1025	4500	6000	125	190	0.6	320
14D681K	14D681KJ	420	560	680(612~748)	50	1120	4500	6000	130	200	0.6	290
14D751K	14D751KJ	460	615	750(675~825)	50	1240	4500	6000	143	210	0.6	270
14D781K	14D781KJ	185	640	780(702~858)	50	1290	4500	6000	148	220	0.6	260
14D821K	14D821KJ	510	670	820(738~902)	50	1355	4500	6000	157	235	0.6	240
14D911K	14D911KJ	550	745	910(819~1001)	50	1500	4500	6000	175	255	0.6	220
14D102K	14D102KJ	625	825	1000(900~1100)	50	1650	4500	6000	190	280	0.6	200
14D112K	14D112KJ	680	895	1100(990~1210)	50	1815	4500	6000	213	310	0.6	180
14D182K	14D182KJ	1000	1465	1800(1620~1980)	50	2970	4500	6000	250	335	0.6	130



# TMRSS01-Metal Oxide Varistors

## 20D Series

Type Number		Maximum Allowable Voltage		Varistor Voltage	Maximum Clamping Voltage		Withstanding Surge Current		Maximum Energy (10/1000μs)		Rated Power	Typical Capacitance (Reference)
Standard	High Surge	Vac(V)	Vdc(V)	V1mA(V)	Ip(A)	Vc(V)	I(A) Standard	I(A) High Surge	(J) Standard	(J) High Surge	(W)	@1KHz(pF)
20D180K	20D180KJ	11	14	18(15~21.6)	20	36	2000	3000	11	13	0.2	28500
20D220K	20D220KJ	14	18	22(19.5~26)	20	43	2000	3000	14	16	0.2	18500
20D270K	20D270KJ	17	22	27(24~31)	20	53	2000	3000	16	19	0.2	13000
20D330K	20D330KJ	20	26	33(29.5~36.5)	20	65	2000	3000	23	24	0.2	11500
20D390K	20D390KJ	25	31	39(35~43)	20	77	2000	3000	26	28	0.2	8500
20D470K	20D470KJ	30	38	47(42~54)	20	93	2000	3000	30	34	0.2	7400
20D560K	20D560KJ	35	45	56(50~62)	20	110	2000	3000	41	41	0.2	6500
20D680K	20D680KJ	40	56	68(61~75)	20	135	2000	3000	46	49	0.2	5800
20D820K	20D820KJ	50	65	82(74~90)	100	135	6500	10000	38	56	1	4900
20D101K	20D101KJ	60	85	100(90~110)	100	165	6500	10000	45	70	1	4000
20D121K	20D121KJ	75	100	120(108~132)	100	200	6500	10000	55	85	1	3300
20D151K	20D151KJ	95	125	150(135~165)	100	250	6500	10000	70	106	1	2700
20D181K	20D181KJ	115	150	180(162~198)	100	300	6500	10000	85	130	1	2200
20D201K	20D201KJ	130	170	200(180~220)	100	340	6500	10000	95	140	1	2000
20D221K	20D221KJ	140	180	220(198~242)	100	360	6500	10000	100	155	1	1800
20D241K	20D241KJ	150	200	240(216~264)	100	395	6500	10000	108	168	1	1650
20D271K	20D271KJ	175	225	270(243~297)	100	455	6500	10000	127	190	1	1500
20D301K	20D301KJ	190	250	300(270~330)	100	500	6500	10000	136	210	1	1300
20D331K	20D331KJ	210	275	330(297~363)	100	550	6500	10000	150	228	1	1200
20D361K	20D361KJ	230	300	360(324~396)	100	595	6500	10000	63	255	1	1100
20D391K	20D391KJ	250	320	390(351~429)	100	650	6500	10000	180	275	1	1000
20D431K	20D431KJ	275	350	430(387~473)	100	710	6500	10000	190	305	1	930
20D471K	20D471KJ	300	385	470(423~517)	100	775	6500	10000	220	350	1	850
20D511K	20D511KJ	320	415	510(459~561)	100	845	6500	10000	220	360	1	780
20D561K	20D561KJ	350	460	560(504~616)	100	925	6500	10000	220	380	1	710
20D621K	20D621KJ	385	505	620(558~682)	100	1025	6500	10000	220	390	1	650
20D681K	20D681KJ	420	560	680(612~748)	100	1120	6500	10000	230	400	1	600
20D751K	20D751KJ	460	615	750(675~825)	100	1240	6500	10000	255	420	1	580
20D781K	20D781KJ	185	640	780(702~858)	100	1290	6500	10000	265	440	1	560
20D821K	20D821KJ	510	670	820(738~902)	100	1355	6500	10000	282	460	1	525
20D911K	20D911KJ	550	745	910(819~1001)	100	1500	6500	10000	310	510	1	495
20D102K	20D102KJ	625	825	1000(900~1100)	100	1650	6500	10000	342	565	1	480
20D112K	20D112KJ	680	895	1100(990~1210)	100	1815	6500	10000	383	620	1	460
20D122K	20D122KJ	740	975	1200(1080~1320)	100	2010	6500	10000	412	660	1	440
20D142K	20D142KJ	850	1100	1400(1260~1540)	100	2255	6500	10000	470	725	1	415
20D152K	20D152KJ	900	1220	1500(135~1650)	100	2475	6500	10000	529	815	1	400
20D162K	20D162KJ	1000	1280	1600(1440~1760)	100	2640	6500	10000	606	896	1	330
20D182K	20D182KJ	1000	1465	1800(1620~1980)	100	2970	6500	10000	625	660	1	320

### Packing Dimensions

Unit:mm

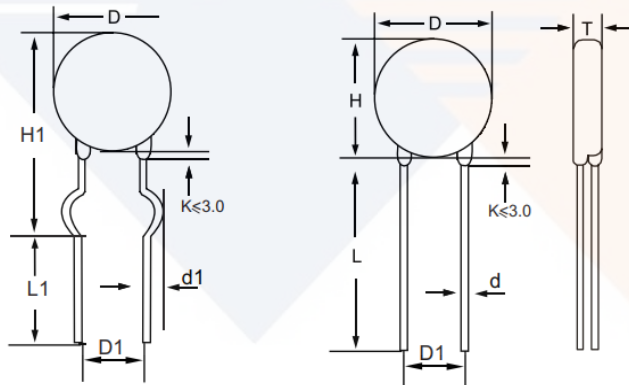


Table 1

Symble	Dimensions
H(max.)	26.5
H1(max.)	28
L(min.)	20
L1(min.)	15
D(max.)	23
D1(±0.8)	7.5+0.8/10.0+1.0
T(max.)	Table 2
d(±0.05)	0.8
d1(±0.4)	1.4

Table 2

Model	T(max.)	Model	T(max.)
180K	4.8	301K	5.8
220K	4.9	331K	6
270K	5	361K	6.2
330K	5.2	391K	6.5
390K	5.5	431K	6.7
470K	5.6	471K	6.9
560K	5.7	511K	7
680K	5.08	561K	7.2
820K	4.9	621K	7.5
101K	5.1	681K	8.2
121K	5.3	751K	5.3
151K	5.6	781K	8.5
181K	5	821K	9
201K	5.2	911K	9.5
221K	5.3	102K	10.1
241K	5.4	112K	10.6
271K	5.6	182K	13.2
301K	5.7	-	-