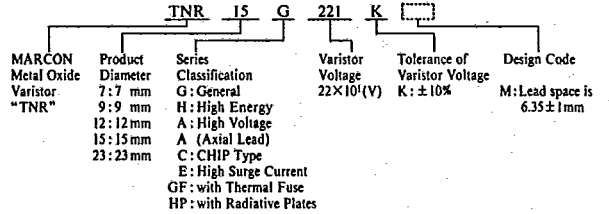




# METAL OXIDE VARISTORS TNR®

Marcon TNR Metal Oxide Varistors are voltage dependent, symmetrical resistors which perform in a manner similar to back-to-back zener diodes in circuit protective functions and offer advantages in performance and economics. When exposed to high energy voltage transients, the varistor impedance changes from a very high standby value to a very low conducting value thus clamping the transient voltage to a safe level. The dangerous energy of the incoming high voltage pulse is absorbed by the TNR varistor, thus protecting voltage sensitive circuit components.



- TNR Features**
1. Excellent transient voltage suppression
  2. High discharge current capability
  3. Wide range of voltage ratings
  4. Symmetrical V-I characteristics(Non Polarity)
  5. Instantaneous response
  6. Steady operation for repeating surge
  7. Low temperature coefficient
  8. High reliability
  9. UL recognized(G series)
- Applications**
1. Electronic instrument protection
  2. Telephone system protection
  3. Relay contact point protection
  4. Rectification diode protection
  5. SCR protection
  6. Reduction of abnormal voltage in high voltage current
  7. Switching transistor protection
  8. Reduction of switching surge in electromagnetic brake
  9. Prevention of error in digital circuit
  10. Reduction of noise from an abnormal voltage

**G-SERIES (Disc Type, Radial Lead)**



Operating temp. range: -40~+85°C  
Storage temp. range: -50~+125°C

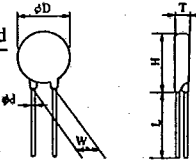
UL STANDARD 1414 FILE No.E 65426  
UL STANDARD 1449 FILE No.E 95427

Model Number	Maximum Applied Voltage (Continuous)		Maximum Peak Current (8/20µs)	Maximum Energy (2msec.)	Rated Wattage	Clamping Voltage		Capacitance (Typical) 1kHz	Varistor Voltage V0.1mA (V)			
	AC.(Vrms)	DC.(V)				(A)	(V)					
	(A)	(J)	(W)	(A)	(V)	(pF)	V0.1mA (V)					
TNR7G180K	10	14	100/1Time	0.3	0.01	1	40	2,200	18( 16~ 20)			
TNR7G220K	14	18		0.4			48	1,800	22( 20~ 24)			
TNR7G270K	17	22		0.5			60	1,500	27( 24~ 30)			
TNR7G330K	20	26		0.6			73	1,300	33( 30~ 36)			
TNR7G390K	25	30		0.8			86	1,150	39( 35~ 43)			
TNR7G470K	30	37	60/2Times	1.0			104	980	47( 42~ 52)			
TNR7G560K	35	44		1.1			123	840	56( 50~ 62)			
TNR7G680K	40	55		1.3			150	720	68( 61~ 75)			
TNR7G820K	50	65		2.0			145	260	82( 74~ 90)			
TNR7G101K	60	85		2.0			175	200	100( 90~110)			
TNR7G121K	75	100	3.0	210	170	120(108~132)						
TNR7G151K	95	125	3.0	260	140	150(135~165)						
TNR7G181K	110	145	4.0	325	120	180(162~198)						
TNR7G201K	130	170	5.0	355	110	200(180~220)						
TNR7G221K	140	180	400/1Time 250/2Times	5.0	0.1	5	380	105	220(198~242)			
TNR7G241K	150	200		5.0			415	98	240(216~264)			
TNR7G271K	175	225		6.0			475	88	270(243~297)			
TNR7G331K	210	270		8.0			600	76	330(297~363)			
TNR7G361K	230	300		8.0			620	71	360(324~396)			
TNR7G391K	250	320		8.0			675	67	390(351~429)			
TNR7G431K	275	350		10.0			745	60	430(387~473)			
TNR7G471K	300	385		10.0			810	57	470(423~517)			
	AC.(Vrms)	DC.(V)		(A)			(J)	(W)	(A)	(V)	(pF)	V0.1mA (V)
TNR9G150K	8	12		250/1Time 125/2Times			0.6	0.02	2	30	5,800	15( 13~ 17)
TNR9G180K	10	14	0.8		35	5,400	18( 16~ 20)					
TNR9G220K	14	18	1.0		43	4,900	22( 20~ 24)					
TNR9G270K	17	22	1.0		53	4,200	27( 24~ 30)					
TNR9G330K	20	26	1.2		65	3,500	33( 30~ 36)					
TNR9G390K	25	30	1.5		77	3,100	39( 35~ 43)					
TNR9G470K	30	37	1.8		93	2,600	47( 42~ 52)					
TNR9G560K	35	44	2.2		110	2,300	56( 50~ 62)					
TNR9G680K	40	55	2.5		135	1,900	68( 61~ 75)					
TNR9G820K	50	65	1,200/1Time 600/2Times		4.0	0.2	10			135	620	82( 74~ 90)
TNR9G101K	65	85		4.0	165			530	100( 90~110)			
TNR9G121K	75	100		5.0	195			460	120(108~132)			
TNR9G151K	90	125		6.0	245			380	150(135~165)			
TNR9G181K	110	145		8.0	295			335	180(162~198)			
TNR9G201K	130	170		10.0	330			310	200(180~220)			
TNR9G221K	140	180		10.0	360			280	220(198~242)			
TNR9G241K	155	200		10.0	390			270	240(216~264)			
TNR9G271K	170	225		12.0	440			245	270(243~297)			
TNR9G331K	210	270		15.0	540			210	330(297~363)			
TNR9G361K	230	300	16.0	590	200	360(324~396)						
TNR9G391K	255	320	17.0	640	185	390(351~429)						
TNR9G431K	275	350	20.0	700	170	430(387~473)						
TNR9G471K	300	385	20.0	765	160	470(423~517)						



METAL OXIDE VARISTORS **TNR®**

**G-SERIES**  
(Disk Type, Radial Lead)



unit : mm

Model Number	φD	H Max.	T Max.	L Min.	φd	W ± 1					
TNR7G180K	7 ± 1	11	5	25	0.5	5					
TNR7G271K			7								
TNR7G331K			7								
TNR7G471K			7								
TNR9G150K			9 ± 1				13	5	25	0.5	5
TNR9G271K								7			
TNR9G331K								7			
TNR9G471K								7			
TNR12G150K			13.5				16.5	5	25	0.8	7.5
TNR12G271K								7			
TNR12G331K	14	17.0	7	25	0.8	7.5					
TNR12G681K			7								
TNR12G751K			8.5								
TNR12G102K			8.5								
TNR12G112K			9								
TNR12G122K			10								
TNR12G152K	15 ± 1	19	5	25	0.8	7.5					
TNR12G182K			14								
TNR15G150K	17Max.	20	5	25	0.8	7.5					
TNR15G271K			7								
TNR15G331K			7								
TNR15G681K			8.5								
TNR15G751K			8.5								
TNR15G102K			8.5								
TNR15G112K			9								
TNR15G122K			10.5								
TNR15G152K			12.5								
TNR15G182K			14.5								
TNR23G180K	24	27	5	25	0.8	10					
TNR23G271K			7								
TNR23G331K			7								
TNR23G681K			8.5								
TNR23G751K			8.5								
TNR23G102K			9.5								
TNR23G112K			11								
TNR23G122K			13								
TNR23G152K			15								
TNR23G182K			15								

Model Number	Maximum Applied Voltage (Continuous)		Maximum Peak Current (8/20μs)	Maximum Energy (2msec.)	Rated Wattage	Clamping Voltage		Capacitance (Typical) 1kHz	Varistor Voltage
	AC(Vrms)	DC(V)				(A)	(V)		
TNR12G150K	8	12	500/1 Time	1.0	0.05	5	30	10,500	15( 13- 17)
TNR12G180K	10	14		1.5			35	9,000	18( 16- 20)
TNR12G220K	14	18		2.0			43	8,200	22( 20- 24)
TNR12G270K	17	22		2.5			53	6,900	27( 24- 30)
TNR12G330K	20	26		3.0			65	5,900	33( 30- 36)
TNR12G390K	25	30		3.5			77	5,100	39( 35- 43)
TNR12G470K	30	37		4.5			93	4,400	47( 42- 52)
TNR12G560K	30	44		5.5			110	3,800	56( 50- 62)
TNR12G680K	40	55		6.5			135	3,200	68( 61- 75)
TNR12G820K	55	65		8.0			165	2,200	82( 74- 90)
TNR12G101K	65	85	10.0	195	1,050	100( 90- 110)			
TNR12G121K	70	100	12.0	245	910	120( 108- 132)			
TNR12G151K	90	125	16.0	245	770	150( 135- 165)			
TNR12G181K	110	145	18.0	295	670	180( 162- 198)			
TNR12G201K	130	170	20.0	330	620	200( 180- 220)			
TNR12G221K	145	180	25.0	360	570	220( 198- 242)			
TNR12G241K	150	200	25.0	390	530	240( 216- 264)			
TNR12G271K	170	225	30.0	440	490	270( 243- 297)			
TNR12G331K	210	270	35.0	540	420	330( 297- 363)			
TNR12G361K	235	300	35.0	590	400	360( 324- 396)			
TNR12G391K	250	320	40.0	640	370	390( 351- 429)			
TNR12G431K	270	350	45.0	700	340	430( 387- 473)			
TNR12G471K	305	385	1,300/2	765	320	470( 423- 517)			
TNR12G561K	350	460	45.0	910	280	560( 504- 616)			
TNR12G621K	380	505	45.0	1,015	260	620( 558- 682)			
TNR12G681K	420	560	45.0	1,110	240	680( 612- 748)			
TNR12G751K	460	615	50.0	1,230	225	750( 675- 825)			
TNR12G821K	515	670	55.0	1,340	210	820( 738- 902)			
TNR12G911K	550	745	60.0	1,500	200	910( 819- 1,001)			
TNR12G102K	630	825	65.0	1,630	180	1,000( 900- 1,100)			
TNR12G112K	680	895	70.0	1,815	170	1,100( 990- 1,210)			
TNR12G122K	720	980	75.0	1,950	160	1,200( 1,080- 1,320)			
TNR12G152K	860	1,220	80.0	2,440	135	1,500( 1,350- 1,650)			
TNR12G182K	1,000	1,465	85.0	2,970	115	1,800( 1,620- 1,980)			
TNR15G150K	8	12	500/2 Times	5.0	0.1	10	30	12,000	15( 13- 17)
TNR15G180K	10	14		5.0			35	11,500	18( 16- 20)
TNR15G220K	14	18		5.0			43	11,000	22( 20- 24)
TNR15G270K	17	22		5.0			53	10,000	27( 24- 30)
TNR15G330K	20	26		6.0			65	8,500	33( 30- 36)
TNR15G390K	25	30		10.0			77	7,500	39( 35- 43)
TNR15G470K	30	37		10.0			93	6,500	47( 42- 52)
TNR15G560K	35	44		10.0			110	5,600	56( 50- 62)
TNR15G680K	40	55		12.0			135	4,800	68( 61- 75)
TNR15G820K	50	65		15.0			165	3,200	82( 74- 90)
TNR15G101K	60	85	20.0	195	2,470	100( 90- 110)			
TNR15G121K	75	100	20.0	245	2,280	120( 108- 132)			
TNR15G151K	95	125	25.0	245	1,070	150( 135- 165)			
TNR15G181K	110	145	30.0	295	930	180( 162- 198)			
TNR15G201K	130	170	35.0	330	850	200( 180- 220)			
TNR15G221K	140	180	40.0	360	800	220( 198- 242)			
TNR15G241K	150	200	40.0	390	740	240( 216- 264)			
TNR15G271K	175	225	50.0	440	680	270( 243- 297)			
TNR15G331K	210	270	60.0	540	590	330( 297- 363)			
TNR15G361K	230	300	65.0	590	540	360( 324- 396)			
TNR15G391K	250	320	70.0	640	510	390( 351- 429)			
TNR15G431K	275	350	75.0	700	480	430( 387- 473)			
TNR15G471K	300	385	80.0	765	450	470( 423- 517)			
TNR15G561K	350	460	85.0	910	390	560( 504- 616)			
TNR15G621K	385	505	85.0	1,015	360	620( 558- 682)			
TNR15G681K	420	560	90.0	1,110	340	680( 612- 748)			
TNR15G751K	460	615	100.0	1,230	310	750( 675- 825)			
TNR15G821K	510	670	110.0	1,340	280	820( 738- 902)			
TNR15G911K	550	745	120.0	1,500	265	910( 819- 1,001)			
TNR15G102K	625	825	130.0	1,630	250	1,000( 900- 1,100)			
TNR15G112K	680	895	140.0	1,815	230	1,100( 990- 1,210)			
TNR15G122K	720	980	150.0	1,950	215	1,200( 1,080- 1,320)			
TNR15G152K	860	1,220	160.0	2,440	185	1,500( 1,350- 1,650)			
TNR15G182K	1,000	1,465	170.0	2,970	150	1,800( 1,620- 1,980)			
TNR23G180K	10	14	2,000/1 Time	10.0	0.2	20	35	31,000	18( 16- 20)
TNR23G220K	14	18		13.0			43	30,000	22( 20- 24)
TNR23G270K	17	22		15.0			53	27,000	27( 24- 30)
TNR23G330K	20	26		20.0			65	23,000	33( 30- 36)
TNR23G390K	25	30		24.0			77	20,000	39( 35- 43)
TNR23G470K	30	37		30.0			93	17,500	47( 42- 52)
TNR23G560K	35	44		35.0			110	15,000	56( 50- 62)
TNR23G680K	40	55		40.0			135	13,000	68( 61- 75)
TNR23G820K	50	65		47.0			165	9,600	82( 74- 90)
TNR23G101K	60	85		60.0			195	6,900	100( 90- 110)
TNR23G121K	75	100	80.0	245	5,400	120( 108- 132)			
TNR23G151K	95	125	100.0	245	4,900	150( 135- 165)			
TNR23G181K	110	145	120.0	295	4,300	180( 162- 198)			
TNR23G201K	130	170	140.0	330	4,000	200( 180- 220)			
TNR23G221K	140	180	160.0	360	3,700	220( 198- 242)			
TNR23G241K	150	200	180.0	390	3,400	240( 216- 264)			
TNR23G271K	175	225	200.0	440	3,100	270( 243- 297)			
TNR23G331K	210	270	250.0	540	2,700	330( 297- 363)			
TNR23G361K	230	300	280.0	590	2,500	360( 324- 396)			
TNR23G391K	250	320	300.0	640	2,300	390( 351- 429)			
TNR23G431K	275	350	320.0	700	2,100	430( 387- 473)			
TNR23G471K	300	385	350.0	765	1,900	470( 423- 517)			
TNR23G561K	350	460	400.0	910	1,500	560( 504- 616)			
TNR23G621K	385	505	450.0	1,015	1,300	620( 558- 682)			
TNR23G681K	420	560	500.0	1,110	1,100	680( 612- 748)			
TNR23G751K	460	615	550.0	1,230	950	750( 675- 825)			
TNR23G821K	510	670	600.0	1,340	800	820( 738- 902)			
TNR23G911K	550	745	650.0	1,500	720	910( 819- 1,001)			
TNR23G102K	625	825	700.0	1,630	680	1,000( 900- 1,100)			
TNR23G112K	680	895	750.0	1,815	640	1,100( 990- 1,210)			
TNR23G122K	720	980	800.0	1,950	590	1,200( 1,080- 1,320)			
TNR23G152K	860	1,220	900.0	2,440	500	1,500( 1,350- 1,650)			
TNR23G182K	1,000	1,465	1,000.0	2,970	440	1,800( 1,620- 1,980)			