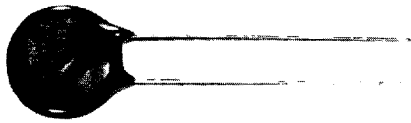



MARCON AMERICA CORP.
TNR® G (M) SERIES
HIGH PERFORMANCE METAL OXIDE VARISTORS


(200V thru 1600V only)
TNR-G Series

Applications:

Telephone Relays	Computer Equipment	Solid State Motor Control	Solid State Relays/Timers
Telephone Solid State Circuits	Railroad Circuitry	Television	Power Supplies
Communication Equipment	Numerical Control	Copier Machines	Solid State Security Systems
Relay Coils	Test Equipment	Calculators	Medical Equipment
Traffic Controllers	Instrumentation	Contact Arc Suppression	Fire Alarms

Specifications: (Other general specifications are on page 30.)

Operating ambient temperature	40° ~ +85°C (-40° F ~ +185° F)
Operating varistor surface temperature	+115°C max. (+239°F max.)
Storage temperature range	-50°C ~ +125°C (-58°F ~ +257°F)
Max. varistor temperature coefficient	-0.05%/C
U.S.A. Official Recognition (200V thru 1600V only)	*UL - Specification #1414 File #E65426 *UL - Specification #1449 File #E95427
Canadian Official Recognition (200V thru 1800V only)	** C.S.A. Specification #097864 X0000 Class 2221
Insulation resistance	Over 1,000 Meagohms
Hipot Encapsulation	2500 VDC for 1 minute
Impulse response time	0.05 μ seconds or less

*Underwriters Laboratories, Inc.® yellow cards are available upon request.

**Canadian Standard Association cards available upon request.



TNR® G (M) SERIES

• RATINGS AND CHARACTERISTICS

Model Number	Maximum Applied Voltage (Continuous)		Maximum Peak Current (8/20 μ s) (A)	Maximum Energy (1msec.) (J)	Clamping Voltage		Capacitance (Typical) 1kHz (pF)	Varistor Voltage V 1mA (V)	The closest GE model number (Reference purpose only)
	ACrms(V)	DC(V)			(A)	(V)			
TNR9G180KM	10	14	250	0.8	5	42	5,800	18(16~20)	V18ZA1
TNR12G180KM	10	14	500	1.5	5	40	9,700	18(16~20)	
TNR15G180KM	10	14	1,000	5.0	10	39	14,000	18(16~20)	V18ZA3
TNR9G220KM	14	18	250	1.0	5	47	4,900	22(20~24)	V22ZA1
TNR12G220KM	14	18	500	2.0	5	45	8,200	22(20~24)	
TNR15G220KM	14	18	1,000	5.0	10	43	12,000	22(20~24)	V22ZA3
TNR9G240KM	15	20	250	1.0	5	52	4,600	24(22~26)	V24ZA1
TNR12G240KM	15	20	500	2.0	5	50	7,600	24(22~26)	
TNR15G240KM	15	20	1,000	5.0	10	48	11,000	24(22~26)	V24ZA4
TNR9G270KM	17	22	250	1.0	5	57	4,200	27(24~30)	V27ZA1
TNR12G270KM	17	22	500	2.5	5	55	6,900	27(24~30)	
TNR15G270KM	17	22	1,000	5.0	10	53	10,000	27(24~30)	V27ZA4
TNR9G330KM	20	26	250	1.2	5	68	3,500	33(30~36)	V33ZA1
TNR12G330KM	20	26	500	3.0	5	65	5,900	33(30~36)	
TNR15G330KM	20	26	1,000	6.0	10	64	8,500	33(30~36)	V33ZA5
TNR9G390KM	25	31	250	1.5	5	79	3,100	39(35~43)	V39ZA1
TNR12G390KM	25	31	500	3.5	5	77	5,100	39(35~43)	
TNR15G390KM	25	31	1,000	10.0	10	76	7,500	39(35~43)	V39ZA6
TNR9G470KM	30	38	250	1.8	5	92	2,600	47(42~52)	V47ZA1
TNR12G470KM	30	38	500	4.5	5	90	4,400	47(42~52)	
TNR15G470KM	30	38	1,000	10.0	10	89	6,500	47(42~52)	V47ZA7
TNR9G560KM	35	45	250	2.2	5	107	2,300	56(50~62)	V56ZA2
TNR12G560KM	35	45	500	5.5	5	105	3,800	56(50~62)	
TNR15G560KM	35	45	1,000	10.0	10	103	5,600	56(50~62)	V56ZA8
TNR9G680KM	40	56	250	2.5	5	127	1,900	68(60~75)	V68ZA2
TNR12G680KM	40	56	500	6.5	5	125	3,200	68(60~75)	
TNR15G680KM	40	56	1,000	12.0	10	123	4,800	68(60~75)	V68ZA10
TNR9G820KM	50	66	1,000	4.0	10	135	620	82(74~90)	V82ZA2
TNR12G820KM	50	66	2,000	8.0	25	135	1,200	82(74~90)	
TNR15G820KM	50	66	4,000	15.0	50	135	1,700	82(74~90)	V82ZA12



TNR® G (M) SERIES

• RATINGS AND CHARACTERISTICS

Model Number	Maximum Applied Voltage (Continuous)		Maximum Peak Current (8/20 μ s)	Maximum Energy (1msec.)	Clamping Voltage		Capacitance (Typical) 1kHz	Varistor Voltage V 1mA	The closest GE model number (Reference purpose only)
	ACrms(V)	DC(V)			(A)	(J)			
TNR9G101KM	60	81	1,000	4	10	165	530	100(90~110)	V100ZA3
TNR12G101KM	60	81	2,000	10	25	165	1,050	100(90~110)	
TNR15G101KM	60	81	4,000	20	50	165	1,000	100(90~110)	V100ZA15
TNR9G121KM	75	102	1,000	5	10	195	460	120(108~132)	V120ZA1
TNR12G121KM	75	102	2,000	12	25	195	910	120(108~132)	
TNR15G121KM	75	102	4,000	20	50	195	1,280	120(108~132)	V120ZA6
TNR9G151KM	95	130	1,000	6	10	245	380	150(135~165)	V150ZA1
TNR12G151KM	95	130	2,000	16	25	245	770	150(135~165)	
TNR15G151KM	95	130	4,000	25	50	245	1,070	150(135~165)	V150ZA8 V95LA7B
TNR9G181KM	115	153	1,000	8	10	295	335	180(162~198)	V180ZA1
TNR12G181KM	115	153	2,000	18	25	295	670	180(162~198)	
TNR15G181KM	115	153	4,000	30	50	295	930	180(162~198)	V180ZA10
TNR23G201KM	130	175	5,000	70	100	325	2,300	200(188~220)	V130LA20B
TNR9G211KM	130	175	1,000	10	10	340	300	210(189~231)	V130LA1 V130LA2
TNR12G211KM	130	175	2,000	20	25	340	600	210(189~231)	
TNR15G211KM	130	175	4,000	40	50	340	830	210(189~231)	V130LA10A
TNR23G211KM	130	175	6,000	70	100	340	2,100	210(189~231)	V130LA20A
TNR23G231JM	150	200	6,000	80	100	360	2,100	230(218~242)	V150LA20B
TNR9G241KM	150	200	1,000	10	10	390	270	240(216~264)	V150LA1 V150LA2
TNR12G241KM	150	200	2,000	25	25	390	530	240(216~264)	
TNR15G241KM	150	200	4,000	40	50	390	740	240(216~264)	V150LA10A
TNR23G241KM	150	200	6,000	80	100	390	2,000	240(216~264)	V150LA20A
TNR9G391KM	250	330	1,000	17	10	640	185	390(354~429)	V250LA2 V250LA4
TNR12G391KM	250	330	2,000	40	25	640	370	390(354~429)	
TNR15G391KM	250	330	4,000	70	50	640	510	390(354~429)	V250LA15A V250LA20A
TNR23G391KM	250	330	6,000	130	100	640	1,400	390(354~429)	V250LA40A
TNR23G391JM	250	330	6,000	130	100	620	1,400	390(370~410)	V250LA40B
TNR9G431KM	275	369	1,000	20	10	700	170	430(389~473)	V275LA2 V275LA4
TNR12G431KM	275	369	2,000	45	25	700	340	430(389~473)	
TNR15G431KM	275	369	4,000	75	50	700	480	430(389~473)	V275LA15A V275LA20A
TNR23G431KM	275	369	6,000	140	100	700	1,300	430(389~473)	V275LA40A
TNR23G431JM	275	369	6,000	140	100	680	1,300	430(408~452)	V275LA40B



TNR® G (M) SERIES

• RATINGS AND CHARACTERISTICS

Model Number	Maximum Applied Voltage (Continuous)		Maximum Peak Current (8/20µs) (A)	Maximum Energy (1msec.) (J)	Clamping Voltage (A) (V)		Capacitance (Typical) 1kHz (pF)	Varistor Voltage V 1mA (V)	The closest GE model number (Reference purpose only)
	ACrms(V)	DC(V)			(A)	(V)			
TNR9G471KM	300	405	1,000	20	10	765	160	470(423~ 517)	V300LA4
TNR9G511KM	320	420	1,000	20	10	850	150	510(462~ 561)	V300LA2
TNR12G511KM	320	420	2,000	45	25	850	300	510(462~ 561)	
TNR15G511KM	320	420	4,000	80	50	850	420	510(462~ 561)	V320LA15A
TNR23G511KM	320	420	6,000	150	100	850	1,100	510(462~ 561)	V320LA40A
TNR23G511JM	320	420	6,000	150	100	810	1,100	510(484~ 536)	V320LA40B
TNR23G651JM	420	560	6,000	160	100	1,060	950	650(617~ 683)	V420LA40B
TNR12G681KM	420	560	2,000	45	25	1,110	240	680(612~ 748)	
TNR15G681KM	420	560	4,000	90	50	1,110	340	680(612~ 748)	V420LA20A
TNR23G681KM	420	560	6,000	160	100	1,110	900	680(612~ 748)	V420LA40A
TNR12G751KM	480	640	2,000	50	25	1,240	220	750(675~ 825)	
TNR15G751KM	480	640	4,000	100	50	1,240	310	750(675~ 825)	V460LA20A V480LA40A
TNR23G751KM	480	640	6,000	170	100	1,240	850	750(675~ 825)	V460LA40A V480LA80A
TNR23G751JM	480	640	6,000	170	100	1,160	850	750(712~ 788)	V460LA40B
TNR12G821KM	510	675	2,000	55	25	1,340	210	820(738~ 902)	
TNR15G821KM	510	675	4,000	110	50	1,340	280	820(738~ 902)	V510LA20A V510LA40A
TNR23G821KM	510	675	6,000	190	100	1,340	800	820(738~ 902)	V510LA80A
TNR23G821JM	510	675	6,000	190	100	1,280	800	820(779~ 860)	V510LA80B
TNR12G911KM	575	730	2,000	65	25	1,500	190	910(819~1,000)	
TNR15G911KM	575	730	4,000	120	50	1,500	270	910(819~1,000)	V550LA40A V575LA40A
TNR23G911KM	575	730	6,000	220	100	1,500	720	910(819~1,000)	V550LA80A V575LA80A
TNR23G911JM	575	730	6,000	220	100	1,410	720	910(864~ 956)	V550LA80B V575LA80B
TNR15G162KM	1,000	1,200	4,000	180	50	2,700	170	1,600(1,440~1,760)	V1000LA80A
TNR23G162KM	1,000	1,200	6,000	350	100	2,700	480	1,600(1,440~1,760)	V1000LA160A
TNR23G162SM	1,000	1,200	6,000	350	100	2,420	480	1,600(1,440~1,650)	V1000LA160B

• DIMENSIONS

Dimension unit: mm
inch

LEAD SPACE	Standard lead space	all items	$\frac{6.35 \pm 1}{0.25 \pm 0.039}$
	Option lead space per request	9 dia	$\frac{5 \pm 1}{0.197 \pm 0.039}$
		12 & 15 dia	$\frac{7.5 \pm 1}{0.295 \pm 0.039}$
		23 dia	$\frac{10 \pm 1}{0.394 \pm 0.039}$

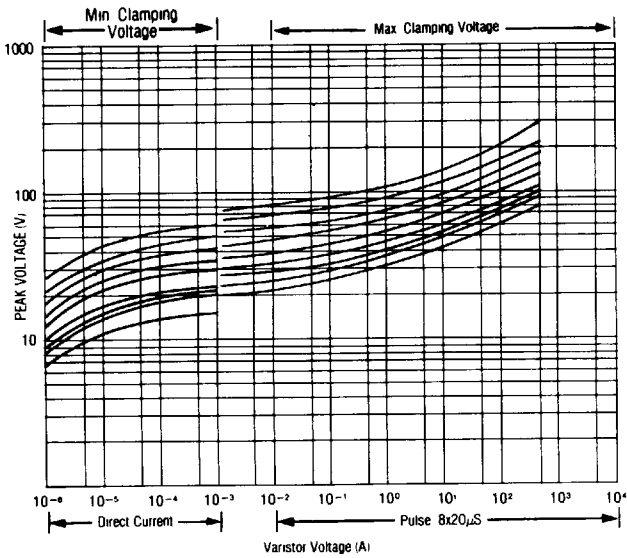
LEAD MATERIAL Tinned copper ply wire or Solder plated copper wire

	9		12			15			23				
Model Number	9G180KM ~ 9G241KM	9G391KM ~ 9G511KM	12G180KM ~ 12G241KM	12G391KM ~ 12G681KM	12G751KM ~ 12G911KM	15G180KM ~ 15G241KM	15G391KM ~ 15G681KM	15G751KM ~ 15G911KM	15G162KM	23G211KM ~ 23G241KM	23G391KM ~ 23G681KM	23G751KM ~ 23G911JM	23G162KM ~ 23G162SM
Dimension													
E	$\frac{5}{197}$ Max	$\frac{7}{276}$ Max	$\frac{5}{197}$ Max	$\frac{7}{276}$ Max	$\frac{8.5}{335}$ Max	$\frac{5}{197}$ Max	$\frac{7}{276}$ Max	$\frac{8.5}{335}$ Max	$\frac{11}{433}$ Max	$\frac{5}{197}$ Max	$\frac{7}{276}$ Max	$\frac{8.5}{335}$ Max	$\frac{11}{433}$ Max
e ₁	$\frac{3.5}{138}$ Max	$\frac{5.5}{217}$ Max	$\frac{3.5}{138}$ Max	$\frac{5.5}{217}$ Max	$\frac{7}{276}$ Max	$\frac{3.5}{138}$ Max	$\frac{5.5}{217}$ Max	$\frac{7}{276}$ Max	$\frac{9}{354}$ Max	$\frac{3.5}{138}$ Max	$\frac{5.5}{217}$ Max	$\frac{7}{276}$ Max	$\frac{9}{354}$ Max
D	$\frac{9 \pm 1}{0.354 \pm 0.039}$		$\frac{12 \pm 1}{0.472 \pm 0.039}$			$\frac{15 \pm 1}{0.591 \pm 0.039}$			$\frac{23 \pm 1}{0.906 \pm 0.039}$				
A	$\frac{13}{0.512}$ Max		$\frac{16}{0.630}$ Max			$\frac{19}{0.748}$ Max			$\frac{27}{1.063}$ Max				
l	$\frac{25}{.984}$ Min		$\frac{25}{984}$ Min			$\frac{30}{1.181}$ Min			$\frac{30}{1.181}$ Min				
d	$\frac{0.80}{0.024}$		$\frac{0.80}{0.031}$			$\frac{0.80}{0.031}$			$\frac{0.80}{0.031}$				



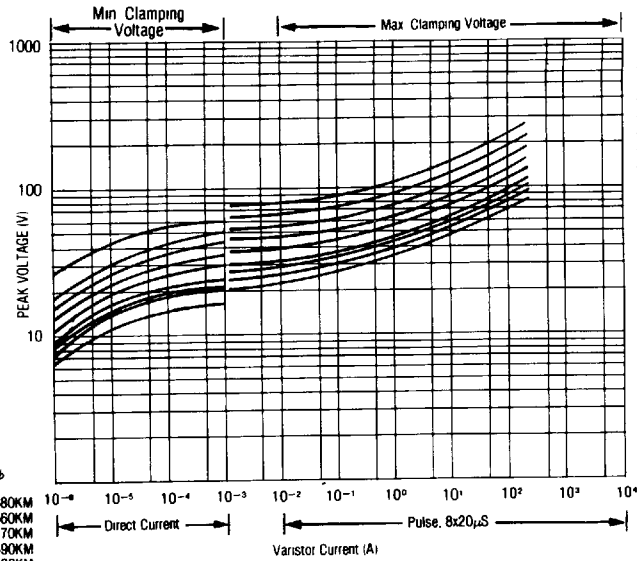
TNR® G (M) SERIES

• V-I CHARACTERISTICS AT ROOM TEMPERATURE



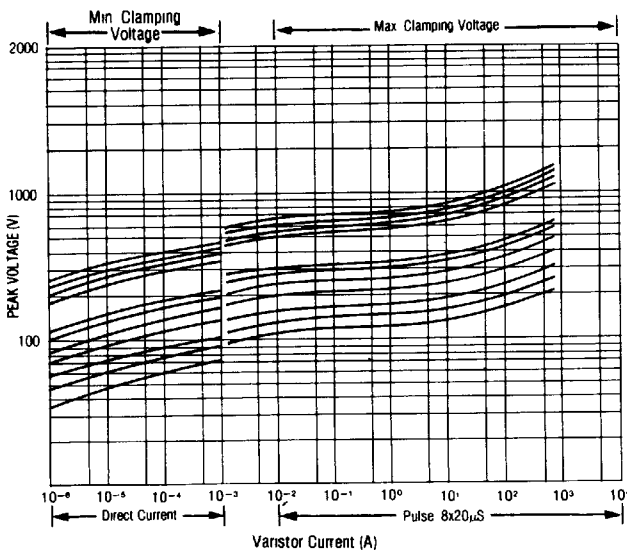
TYPE 12ϕ

- TNR12G680KM
- TNR12G560KM
- TNR12G470KM
- TNR12G390KM
- TNR12G330KM
- TNR12G270KM
- TNR12G240KM
- TNR12G220KM
- TNR12G180KM



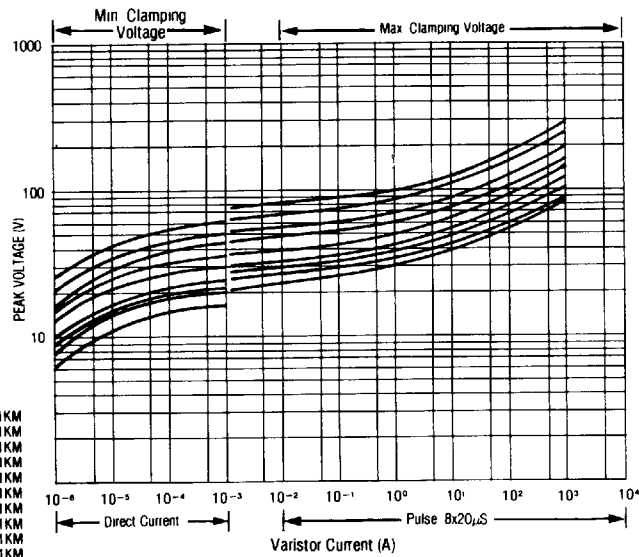
TYPE 9ϕ

- TNR9G680KM
- TNR9G560KM
- TNR9G470KM
- TNR9G390KM
- TNR9G330KM
- TNR9G270KM
- TNR9G240KM
- TNR9G220KM
- TNR9G180KM



TYPE 9ϕ

- TNR9G511KM
- TNR9G471KM
- TNR9G431KM
- TNR9G391KM
- TNR9G241KM
- TNR9G211KM
- TNR9G181KM
- TNR9G151KM
- TNR9G121KM
- TNR9G101KM
- TNR9G820KM



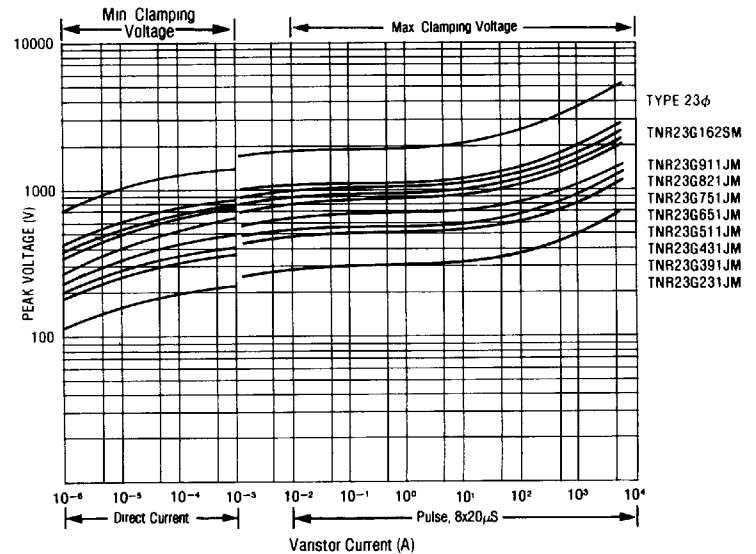
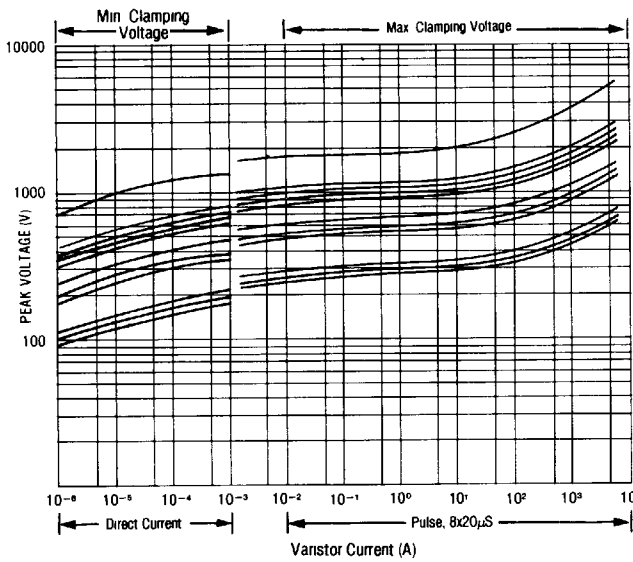
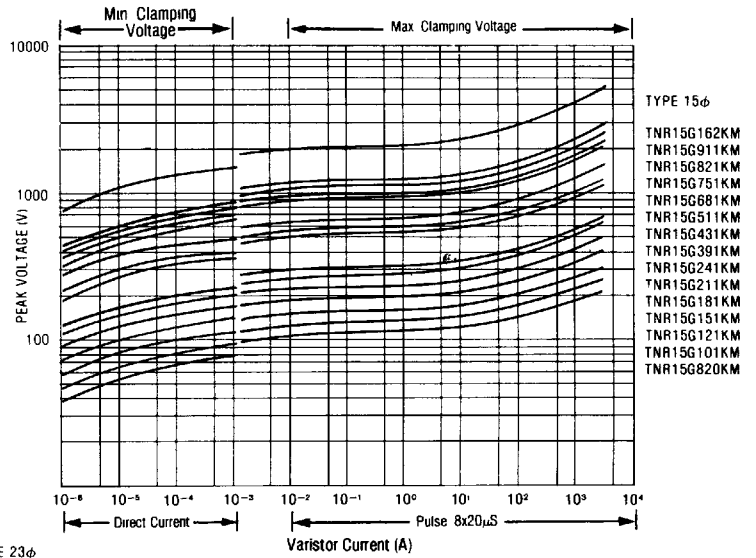
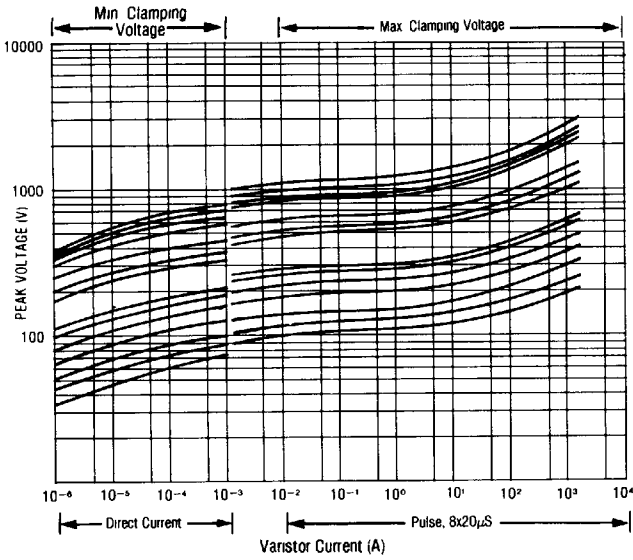
TYPE 15ϕ

- TNR15G680KM
- TNR15G560KM
- TNR15G470KM
- TNR15G390KM
- TNR15G330KM
- TNR15G270KM
- TNR15G240KM
- TNR15G220KM
- TNR15G180KM



TNR® G (M) SERIES

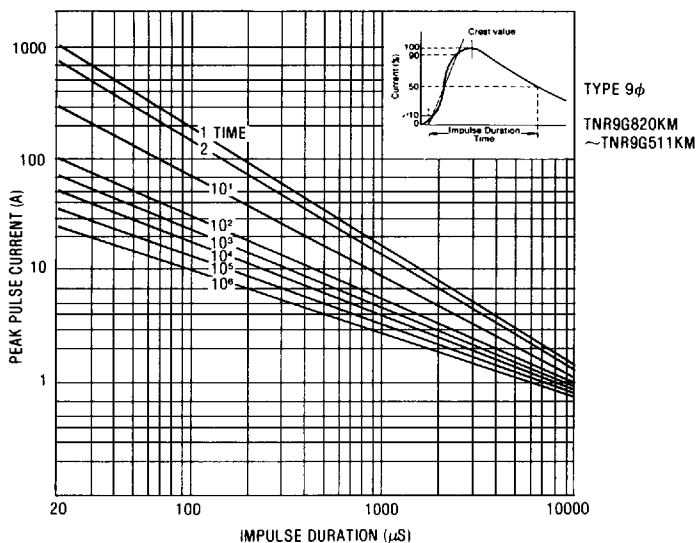
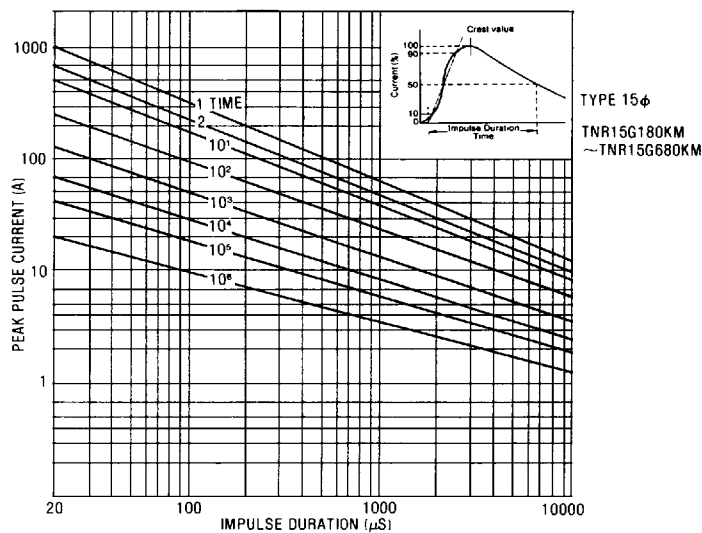
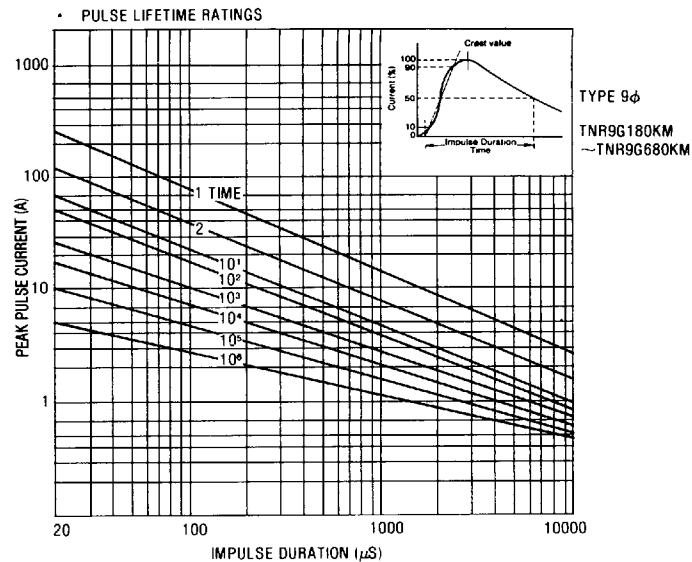
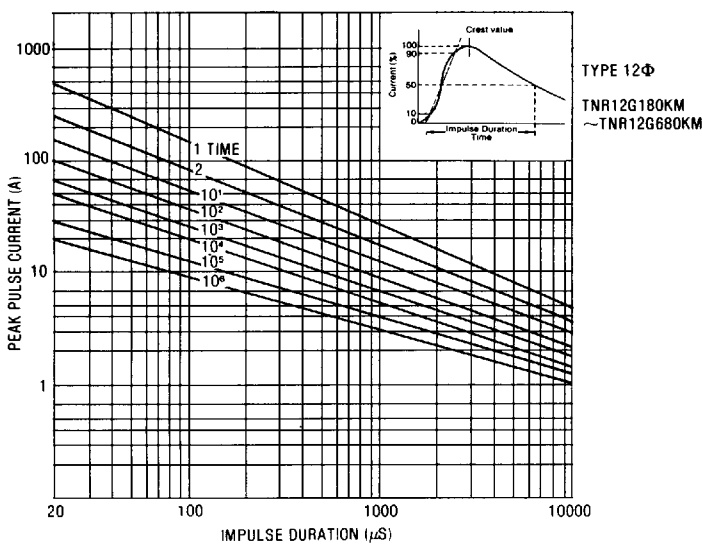
• V-I CHARACTERISTICS AT ROOM TEMPERATURE





TNR® G (M) SERIES

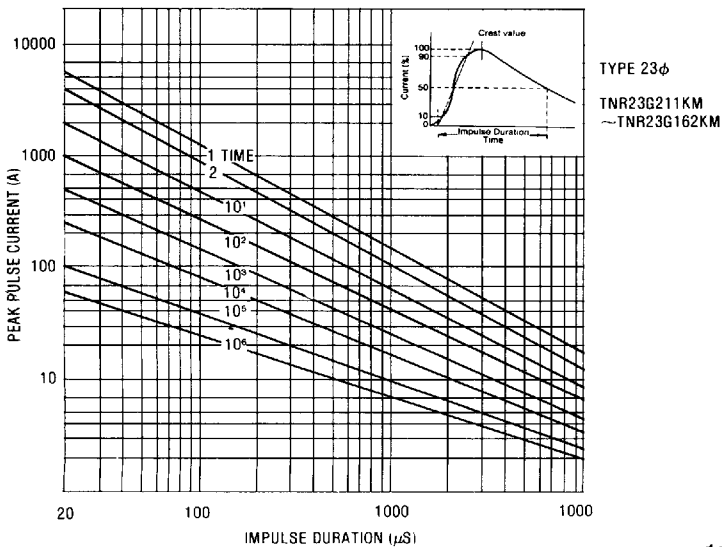
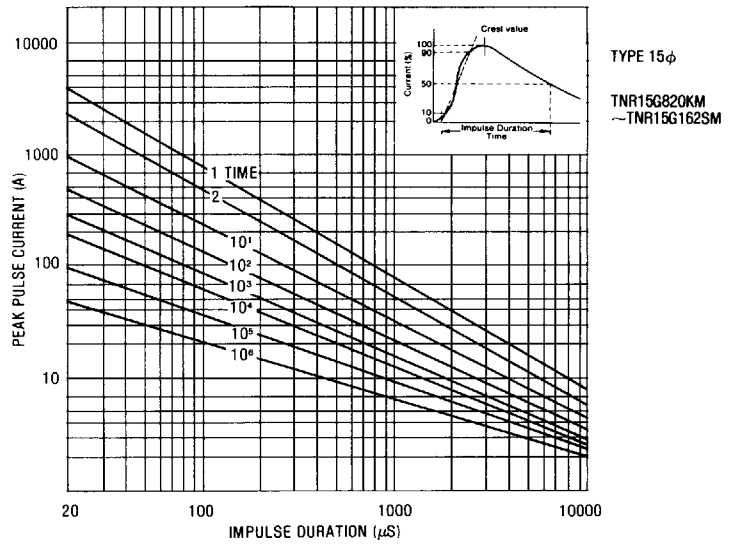
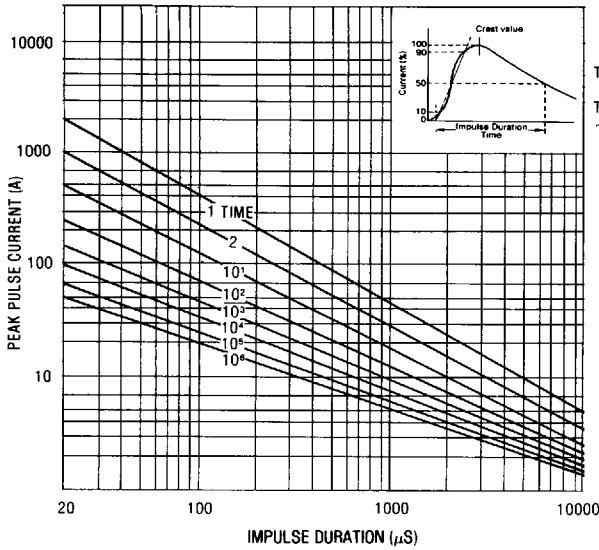
• PULSE LIFETIME RATINGS





TNR® G (M) SERIES

• PULSE LIFETIME RATINGS





TNR® G (M) SERIES

