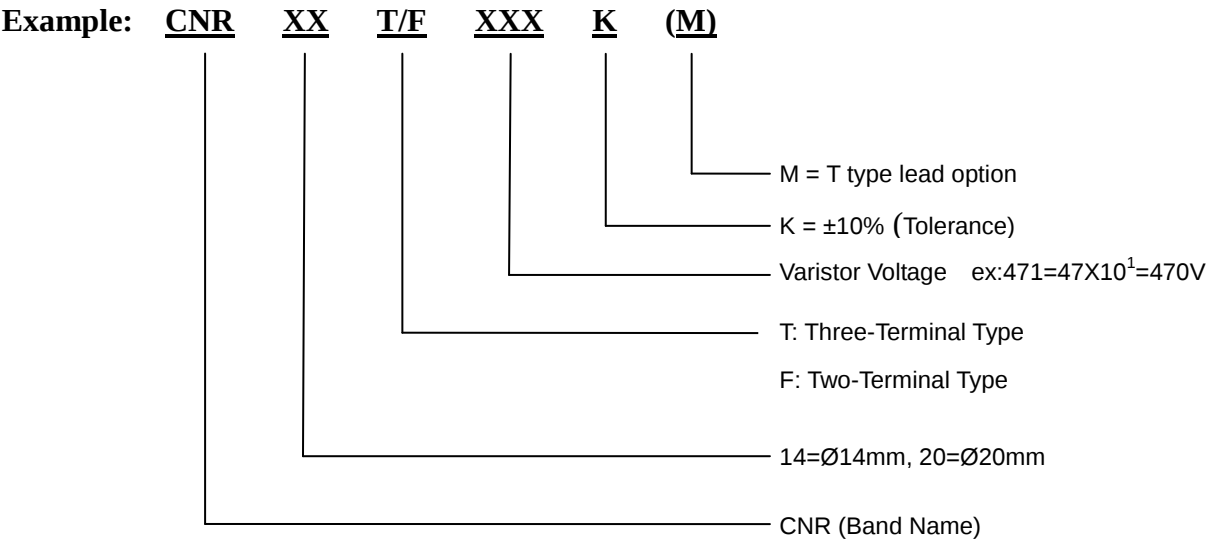


 CeNtRa Science Corp.	Thermal Fuse Metal Oxide Varistors			
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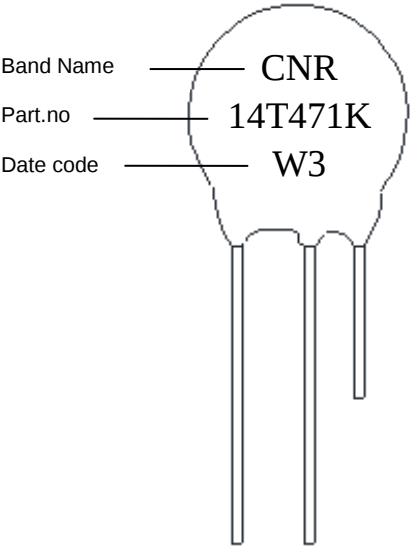
1. Scope:

This Specification covers the TMOV surge protector series for manufacturing Thermal Fuse Metal Oxide Varistors system.

2. PART NUMBER



3. Marking

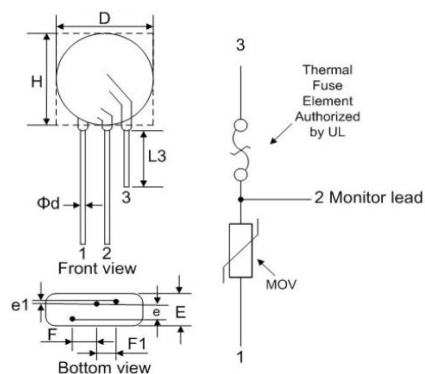


Date Code					
Year Code			Month Code		
W--2022	G--2026	L--2018	1--Jan	5--May	9--Sep
X--2023	H--2027	M--2019	2--Feb	6--Jun	o--Oct
Y--2024	J--2028	P--2020	3--Mar	7--Jul	n--Nov
Z--2025	K--2029	U--2021	4--Apr	8--Aug	d--Dec

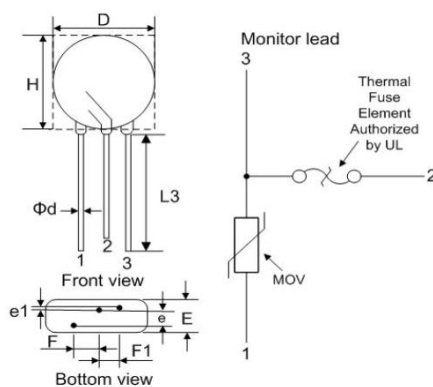


4. Production Dimensions (mm)

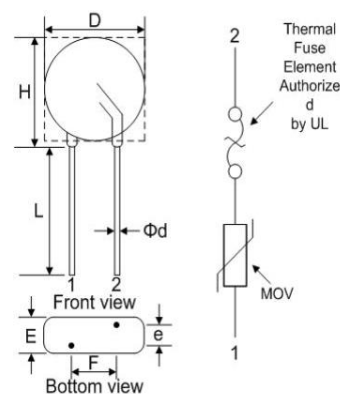
T series



T series (M)



F series



S		14T	14F	20T	20F
D(max)		19	19	24	24
H(max)		21	21	26	26
F(±1.0)		7.5	7.5 / 12.5	7.5	7.5 / 12.5
F1(±1.0)		5	-	5	-
e(max)	201K-391K	3.8	3.8	3.8	3.8
	431K-621K	5.5	5.5	5.5	5.5
	681K-911K	7.8	7.8	7.8	7.8
	102K-112K	10.0	10.0	10.0	10.0
e1(±1.0)		1.3	-	1.5	-
E(max.)	201K-391K	9.8	9.8	9.8	9.8
	431K-621K	11.5	11.5	11.5	11.5
	681K-911K	13.8	13.8	13.8	13.8
	102K-112K	16.0	16.0	16.0	16.0
L (min)		20	20	20	20
L3(min)		10	-	10	-
Φd(±0.05)		0.8	0.8	1.0	1.0
Epoxy Color		Green	Green	Green	Green

Unit : mm



5. ELECTRICAL SPECIFICATION

14 F/T series

Part No.	Maximum Allowable Voltage		Varistor Voltage (@1mA)			Clamping Voltage (@8/20µs)		Max Energy (@10/100 0µs)	Max Peak Current (@8/20µs)	UL1449 5 th In (@8/20 µs)	Rated Power	Typical Capacitance (@1KHz)
	AC(V)	DC(V)	V _N	Min.	Max.	V _C (V)	I _p (A)	(J)	(A)	(KA)	(W)	(pF)
14 T/F 201K	130	170	200	180	220	340	50	70	6000	-	0.6	1000
14 T/F 221K	140	180	220	198	242	360	50	78	6000	-	0.6	900
14 T/F 241K	150	200	240	216	264	395	50	85	6000	-	0.6	830
14 T/F 271K	175	225	270	243	297	455	50	100	6000	-	0.6	740
14 T/F 301K	195	250	300	270	330	500	50	107	6000	-	0.6	670
14 T/F 331K	210	275	330	297	363	550	50	115	6000	3	0.6	610
14 T/F 361K	230	300	360	324	396	595	50	125	6000	3	0.6	560
14 T/F 391K	250	320	390	351	429	650	50	140	6000	3	0.6	510
14 T/F 431K	275	350	430	387	473	710	50	155	6000	3	0.6	460
14 T/F 471K	300	385	470	423	517	775	50	175	6000	3	0.6	430
14 T/F 511K	320	410	510	459	561	845	50	190	6000	3	0.6	390
14 T/F 561K	350	460	560	504	616	915	50	200	6000	3	0.6	360
14 T/F 621K	385	510	620	558	682	1020	50	210	6000	3	0.6	320
14 T/F 681K	420	560	680	612	748	1120	50	220	6000	3	0.6	290
14 T/F 751K	460	615	750	675	825	1235	50	225	6000	3	0.6	270
14 T/F 781K	485	640	780	702	858	1290	50	240	6000	3	0.6	260
14 T/F 821K	510	670	820	738	902	1355	50	245	6000	3	0.6	240
14 T/F 911K	550	745	910	819	1001	1500	50	255	6000	3	0.6	220
14 T/F 102K	625	825	1000	900	1100	1650	50	280	6000	3	0.6	200
14 T/F 112K	680	895	1100	990	1210	1815	50	310	6000	3	0.6	180

**20 F/T series**

Part No.	Maximum Allowable Voltage		Varistor Voltage (@1mA)			Clamping Voltage (@8/20µs)		Max Energy (@10/100 0µs)	Max Peak Current (@8/20µs)	UL1449 5 th In (@8/20 µs)	Rated Power	Typical Capacitance (@1KHz)
	AC(V)	DC(V)	V _N	Min.	Max.	V _C (V)	I _p (A)	(J)	(A)	(KA)	(W)	(pF)
20 T/F 201K	130	170	200	180	220	340	100	140	10000	-	1.0	2000
20 T/F 221K	140	180	220	198	242	360	100	155	10000	-	1.0	1800
20 T/F 241K	150	200	240	216	264	395	100	170	10000	-	1.0	1650
20 T/F 271K	175	225	270	243	297	455	100	190	10000	-	1.0	1500
20 T/F 301K	195	250	300	270	330	500	100	205	10000	-	1.0	1300
20 T/F 331K	210	275	330	297	363	550	100	215	10000	3	1.0	1200
20 T/F 361K	230	300	360	324	396	595	100	225	10000	3	1.0	1100
20 T/F 391K	250	320	390	351	429	650	100	240	10000	3	1.0	1000
20 T/F 431K	275	350	430	387	473	710	100	270	10000	3	1.0	930
20 T/F 471K	300	385	470	423	517	775	100	350	10000	3	1.0	850
20 T/F 511K	320	410	510	459	561	845	100	380	10000	3	1.0	780
20 T/F 561K	350	460	560	504	616	915	100	400	10000	3	1.0	710
20 T/F 621K	385	510	620	558	682	1020	100	425	10000	3	1.0	650
20 T/F 681K	420	560	680	612	748	1120	100	435	10000	3	1.0	600
20 T/F 751K	460	615	750	675	825	1235	100	455	10000	3	1.0	530
20 T/F 781K	485	640	780	702	858	1290	100	461	10000	3	1.0	510
20 T/F 821K	510	670	820	738	902	1355	100	475	10000	3	1.0	500
20 T/F 911K	550	745	910	819	1001	1500	100	500	10000	3	1.0	440
20 T/F 102K	625	825	1000	900	1100	1650	100	560	10000	3	1.0	400
20 T/F 112K	680	895	1100	990	1210	1815	100	610	10000	3	1.0	360

Approvals – UL1449 5th Recognized, File E316325

14T/F 331~112K

20T/F 331~112K

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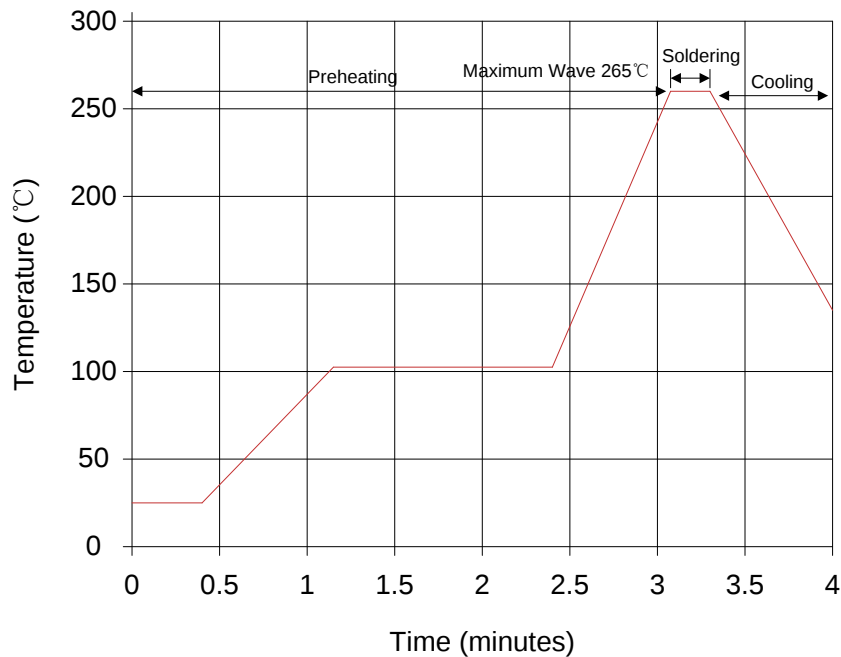
6. Environment Reliability Test

Item	Test Condition	Requirement															
Tensile of Terminations	2.0 Kgf; 10Sec.	No Outstanding Damage															
Bending of Terminations	1.0 Kgf ; 90°,3 Times	No Outstanding Damage															
Vibration	Freq:10-55hz;Amp:0.75mm,1Min.	No Outstanding Damage															
Solderability	Solder Temp:245±5℃ Immersed Time: ≤5Sec.	Min. 95% of The Terminal Should Be Covered With Solder Uniformly															
Resistance of soldering heat	Solder Temp: 260±5℃ Immersed Time: 10±1Sec.	$\Delta V_{1mA}/V_{1mA} \leq \pm 5\%$															
High Temperature Storage	Ambient Temp: 85±2℃, Duration:1000h	$\Delta V_{1mA}/V_{1mA} \leq \pm 5\%$															
Low Temperature Storage	Ambient Temp: -40±2℃, Duration:1000h	$\Delta V_{1mA}/V_{1mA} \leq \pm 5\%$															
High Humidity Storage /Damp Heat	Ambient Temp: 40±2℃, 90-95% R.H, Duration:1000h	$\Delta V_{1mA}/V_{1mA} \leq \pm 5\%$															
Temperature Cycle	<table border="1"> <thead> <tr> <th>Step</th><th>Temp.</th><th>Period (min)</th></tr> </thead> <tbody> <tr> <td>1</td><td>-40±3</td><td>30 ±3</td></tr> <tr> <td>2</td><td>Room Temp</td><td>15 ±3</td></tr> <tr> <td>3</td><td>-85±3</td><td>30 ±3</td></tr> <tr> <td>4</td><td>Room Temp</td><td>15 ±3</td></tr> </tbody> </table>	Step	Temp.	Period (min)	1	-40±3	30 ±3	2	Room Temp	15 ±3	3	-85±3	30 ±3	4	Room Temp	15 ±3	$\Delta V_{1mA}/V_{1mA} \leq \pm 5\%$
Step	Temp.	Period (min)															
1	-40±3	30 ±3															
2	Room Temp	15 ±3															
3	-85±3	30 ±3															
4	Room Temp	15 ±3															
High Temperature Load	Ambient temp:85±2℃, Duration:1000h, Load: MAX. Allowable Voltage	$\Delta V_{1mA}/V_{1mA} \leq \pm 10\%$															
High Humidity Load	Ambient Temp:85±2℃, 90-95%R.H. Duration:1000H, Load: MAX. Allowable Voltage	$\Delta V_{1mA}/V_{1mA} \leq \pm 10\%$															
Operating Temperature Range	-	-40℃ ~ +85℃															
Storage Temperature Range	-	-40℃ ~ +85℃															
Fuse temperature (Tf)	-	136℃															
Public frequency current	-	14 F/T 5A 20 F/T 15A															



7. Soldering Recommendations

7.1 Wave Lead Free Soldering Recommended



Item	Conditions
Peak Temperature	265°C
Dipping Time	10 seconds (max.)
Soldering	1 time

7.2 Recommendation Reworking Conditions with Soldering Iron

Item	Conditions
Temperature of Soldering Iron-tip	360°C (max.)
Soldering Time	3 seconds (max.)
Distance from Varistor	2mm (min.)