

MOV

Radial leaded metal oxide varistor



Product features

- Excellent surge current suppression
- Low leakage current
- 7, 10, 14, 20 mm disk type
- Encapsulation UL94-V0
- UL 1449 edition 4
IEC 61051-1/2
- Wide operating voltage range V_{RMS} 130 V to 680 V

Applications

- Smart meters
- Surge protective devices (SPD)
- Uninterruptible power supplies (UPS)
- Power distribution with integrated surge protection
- Power supplies and power converters
- Appliances

Agency information

- cURus: E340782 per UL1449
- TUV: J 50562561, J 50562664, J 50562779, J 50562785



Environmental compliance



Ordering part number

MOV 07 V130 Y -AP

Family name _____
Size _____
Working voltage (V_{RMS}) _____
Lead style _____
Packaging suffix _____

Ordering part number

Blank (bulk)
-AP (Ammo pack)

Electrical characteristics (+25 °C)

Part number	Varistor voltage ¹ V _{1mA} (V)	Max. operating voltage V _{RMS} (V)	V _{DC} (V)	Max. clamping voltage I _p (8/20 μs) (A)	V _p (V)	Max. surge current 8/20 μs 1 time (A)	Rated power (W)	Max. capacitance @ 1 KHz (pF)	Max. energy (10/1000 μs) (J)	T max. (mm)	cURus	TUV
MOV07V130	200	130	170	10	340	1200	0.25	250	13	4	√	√
MOV07V140	220	140	180	10	360	1200	0.25	230	14	4	√	√
MOV07V150	240	150	200	10	395	1200	0.25	210	15	4	√	√
MOV07V175	270	175	225	10	455	1200	0.25	185	18	4.5	√	√
MOV07V190	300	190	250	10	500	1200	0.25	165	20	4.5	√	√
MOV07V210	330	210	275	10	550	1200	0.25	150	23	4.5	√	√
MOV07V230	360	230	300	10	595	1200	0.25	140	24	4.5	√	√
MOV07V250	390	250	320	10	650	1200	0.25	130	26	5	√	√
MOV07V275	430	275	350	10	710	1200	0.25	115	28	5	√	√
MOV07V300	470	300	385	10	775	1200	0.25	105	29	5	√	√
MOV07V320	510	320	415	10	845	1200	0.25	100	31	5.5	√	√
MOV07V350	560	350	460	10	925	1200	0.25	90	35	5.5	√	√
MOV07V385	620	385	505	10	1025	1200	0.25	80	38	6	√	√
MOV07V420	680	420	560	10	1120	1200	0.25	75	42	6	√	√
MOV07V510	820	510	670	10	1355	1200	0.25	60	52	6.5	√	√
MOV10V130	200	130	170	25	340	2500	0.4	500	30	4.5	√	√
MOV10V140	220	140	180	25	360	2500	0.4	450	32	4.5	√	√
MOV10V150	240	150	200	25	395	2500	0.4	420	35	4.5	√	√
MOV10V175	270	175	225	25	455	2500	0.4	370	37	5	√	√
MOV10V190	300	190	250	25	500	2500	0.4	330	40	5	√	√
MOV10V210	330	210	275	25	550	2500	0.4	300	43	5	√	√
MOV10V230	360	230	300	25	595	2500	0.4	280	47	5	√	√
MOV10V250	390	250	320	25	650	2500	0.4	260	60	5	√	√
MOV10V275	430	275	350	25	710	2500	0.4	230	65	5.5	√	√
MOV10V300	470	300	385	25	775	2500	0.4	210	67	5.5	√	√
MOV10V320	510	320	415	25	845	2500	0.4	200	69	6	√	√
MOV10V350	560	350	460	25	925	2500	0.4	180	70	6	√	√
MOV10V385	620	385	505	25	1025	2500	0.4	160	72	6.5	√	√
MOV10V420	680	420	560	25	1120	2500	0.4	150	75	6.5	√	√
MOV10V460	750	460	615	25	1240	2500	0.4	130	77	6.5	√	√
MOV10V510	820	510	670	25	1355	2500	0.4	120	85	7	√	√
MOV10V550	910	550	745	25	1500	2500	0.4	110	93	7.5	√	√
MOV10V625	1000	625	825	25	1650	2500	0.4	100	102	7.5	√	√
MOV14V130	200	130	170	50	340	4500	0.6	1000	57	4.5	√	√
MOV14V140	220	140	180	50	360	4500	0.6	900	60	4.5	√	√
MOV14V150	240	150	200	50	395	4500	0.6	830	63	4.5	√	√
MOV14V175	270	175	225	50	455	4500	0.6	740	70	5	√	√
MOV14V190	300	190	250	50	500	4500	0.6	670	77	5	√	√
MOV14V210	330	210	275	50	550	4500	0.6	610	85	5	√	√
MOV14V230	360	230	300	50	595	4500	0.6	560	93	5	√	√
MOV14V250	390	250	320	50	650	4500	0.6	510	100	5	√	√
MOV14V275	430	275	350	50	710	4500	0.6	460	115	5.5	√	√
MOV14V300	470	300	385	50	775	4500	0.6	430	118	5.5	√	√
MOV14V320	510	320	415	50	845	4500	0.6	390	121	6	√	√

Electrical characteristics (+25 °C)

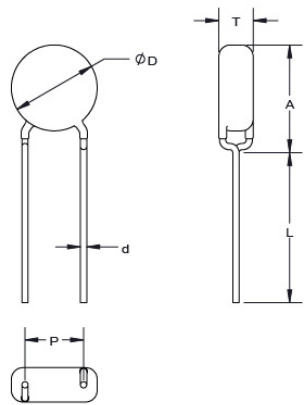
Part number	Varistor voltage ¹ V _{1mA} (V)	Max. operating voltage V _{RMS} (V)	V _{DC} (V)	Max. clamping voltage I _p (8/20 μs) (A)	V _p (V)	Max. surge current 8/20 μs 1 time (A)	Rated power (W)	Max. capacitance @ 1 KHz (pF)	Max. energy (10/1000 μs) (J)	T max. (mm)	cURus	TUV
MOV14V350	560	350	460	50	925	4500	0.6	360	125	6	✓	✓
MOV14V385	620	385	505	50	1025	4500	0.6	320	128	6.5	✓	✓
MOV14V420	680	420	560	50	1120	4500	0.6	290	130	6.5	✓	✓
MOV14V460	750	460	615	50	1240	4500	0.6	270	143	6.5	✓	✓
MOV14V510	820	510	670	50	1355	4500	0.6	240	157	7	✓	✓
MOV14V550	910	550	745	50	1500	4500	0.6	220	175	7.5	✓	✓
MOV14V625	1000	625	825	50	1650	4500	0.6	200	190	7.5	✓	✓
MOV20V130	200	130	170	100	340	6500	1	2000	95	5	✓	✓
MOV20V140	220	140	180	100	360	6500	1	1800	100	5	✓	✓
MOV20V150	240	150	200	100	395	6500	1	1650	108	5	✓	✓
MOV20V175	270	175	225	100	455	6500	1	1500	127	5	✓	✓
MOV20V190	300	190	250	100	500	6500	1	1300	136	5	✓	✓
MOV20V210	330	210	275	100	550	6500	1	1200	150	5.5	✓	✓
MOV20V230	360	230	300	100	595	6500	1	1100	163	5.5	✓	✓
MOV20V250	390	250	320	100	650	6500	1	1000	180	5.5	✓	✓
MOV20V275	430	275	350	100	710	6500	1	930	190	6	✓	✓
MOV20V300	470	300	385	100	775	6500	1	850	204	6	✓	✓
MOV20V320	510	320	415	100	845	6500	1	780	210	6	✓	✓
MOV20V350	560	350	460	100	925	6500	1	710	215	6.5	✓	✓
MOV20V385	620	385	505	100	1025	6500	1	650	224	7	✓	✓
MOV20V420	680	420	560	100	1120	6500	1	600	230	7	✓	✓
MOV20V460	750	460	615	100	1240	6500	1	530	255	7.5	✓	✓
MOV20V485	780	485	640	100	1290	6500	1	510	265	7.5	✓	✓
MOV20V510	820	510	670	100	1355	6500	1	500	282	7.5	✓	✓
MOV20V550	910	550	745	100	1500	6500	1	440	310	8	✓	✓
MOV20V625	1000	625	825	100	1650	6500	1	400	342	8	✓	✓
MOV20V680	1100	680	895	100	1815	6500	1	360	383	8.5	✓	✓

1. Varistor voltage tolerance: ±10%

2. Leakage current (@75% of V₁ mA) : ≤20 μA

Dimensions- mm
Drawing not to scale

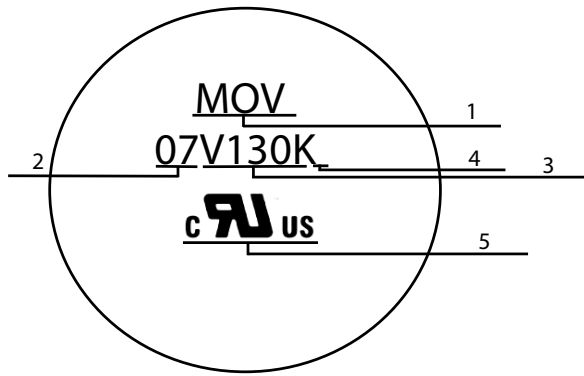
Y kink



Family	D max	T max	P	d	L (Bulk)	L (Ammo)	A max
MOV07	9.0	See Electrical characteristics table	5.0±0.5	0.6±0.5	3.5±0.5	17.5±1	14.0
MOV10	12.5		7.5±0.5	0.8±0.5	3.5±0.5	17.5±1	18.0
MOV14	16.5		7.5±0.5	0.8±0.5	3.5±0.5	17.5±1	22.5
MOV20	22.5		10.0±0.5	1.0±0.5	3.5±0.5	17.5±1	31.0

*Tin covered copper clad steel

Part marking



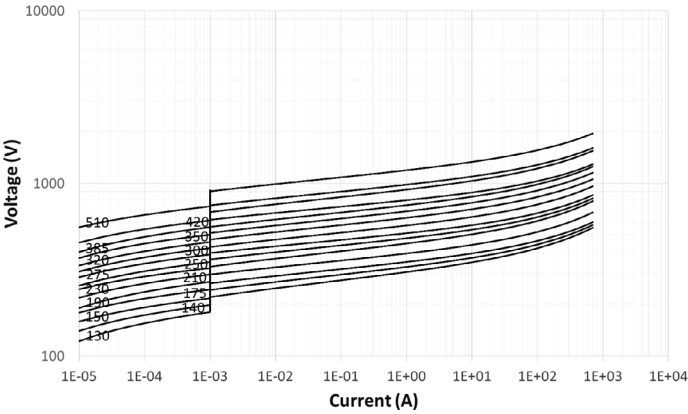
Item	Description	Content
1	Family name	MOV
2	Body size	07, 10, 14, 20
3	V _{RMS}	V130 = 130 Vac
4	V _{1mA} tolerance code	K = ±10%
5	Certification logo	cURus

General specifications

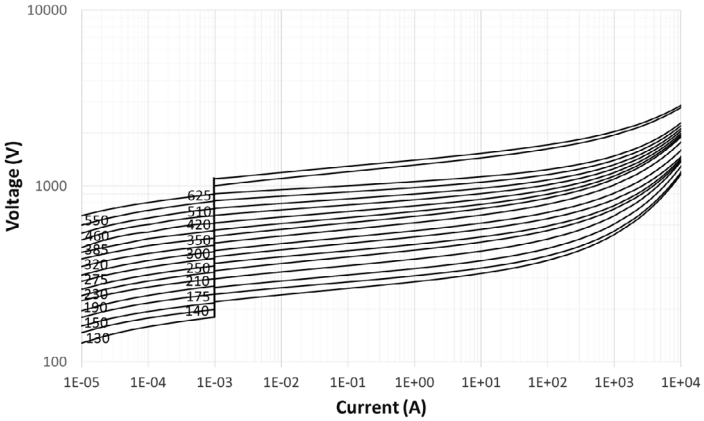
Operating temperature		-40 °C to +125 °C															
Lead pull strength	IEC 60068-2-21	Gradually applying the force specified and keeping the unit fixed for 10±1 sec. 0.5 < d ≤0.8 10 N 0.8< d ≤1.25 20 N															
Lead bending strength	IEC 60068-2-21	Hold specimen and apply the force specified below to each lead. Bend the specimen to 90°, then return to the original position. Repeat the procedure in the opposite direction. 0.5 < d ≤0.8 5 N 0.8< d ≤1.25 10 N															
Vibration	IEC 60068-2-6	Frequency range: 10 to 55 Hz Amplitude: 0.75 mm Direction:3 mutually perpendicular directions, 2 hours each.															
Solderability	IEC 60068-2-20	+245 ± 3 °C , 3 ± 0.3 second															
Resistance to welding heat	IEC 60068-2-20	+260 ± 3 °C , 10 ± 1 second															
Dielectric strength	IEC 61051-1	The two ends of the sample are connected together as an electrode, and the epoxy encapsulation body surrounding the sample with a metal ball is another electrode, and the voltage is applied for 2 minutes at 2500 V _{AC} .															
Damp heat test	IEC 60068-2-78	+40 ± 2 °C , 90 to 95% RH , 1344 hours															
Temperature cycling test	IEC 60068-2-14	The temperature abrupt change cycled for 5 cycles according to the following conditions.															
		<table><tr><th>Step</th><th>Temperature °C</th><th>Time (minute)</th></tr><tr><td>1</td><td>-40±3</td><td>30±3</td></tr><tr><td>2</td><td>+25±5</td><td>5±3</td></tr><tr><td>3</td><td>+125±2</td><td>30±3</td></tr><tr><td>4</td><td>+25±5</td><td>5±3</td></tr></table>	Step	Temperature °C	Time (minute)	1	-40±3	30±3	2	+25±5	5±3	3	+125±2	30±3	4	+25±5	5±3
		Step	Temperature °C	Time (minute)													
		1	-40±3	30±3													
		2	+25±5	5±3													
3	+125±2	30±3															
4	+25±5	5±3															
High temperature load test	MIL-STD-202 Method 108	+125±2 °C, 1000±24 hours, at VDC (Maximum operating voltage)															

V-I characteristics curves

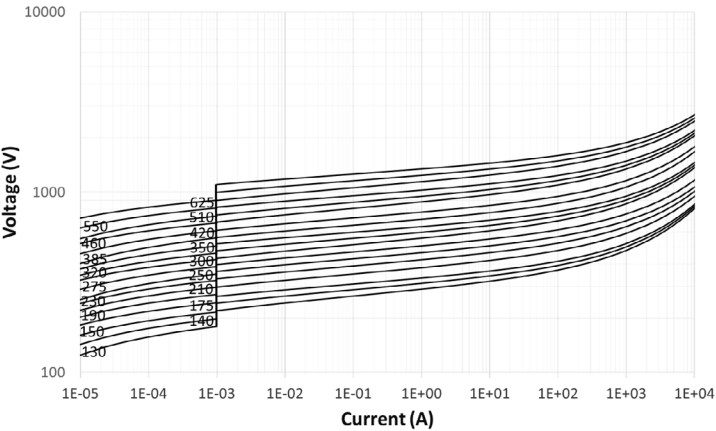
MOV07V130~510



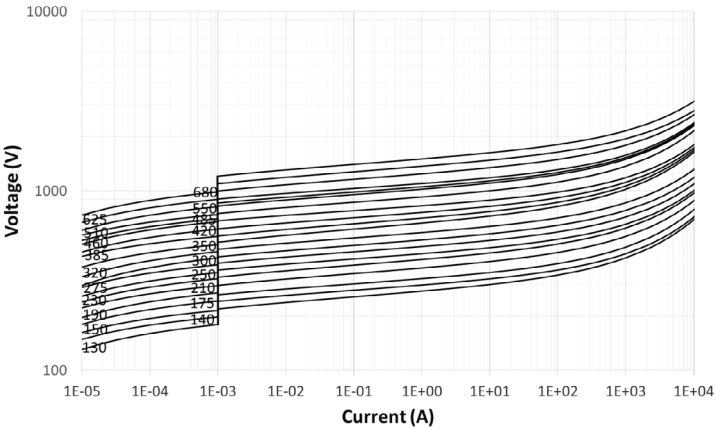
MOV10V130~625



MOV14V130~625

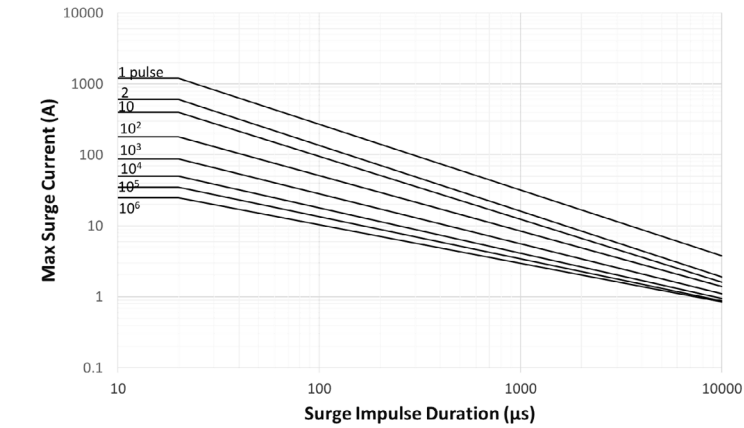


MOV20V130~680

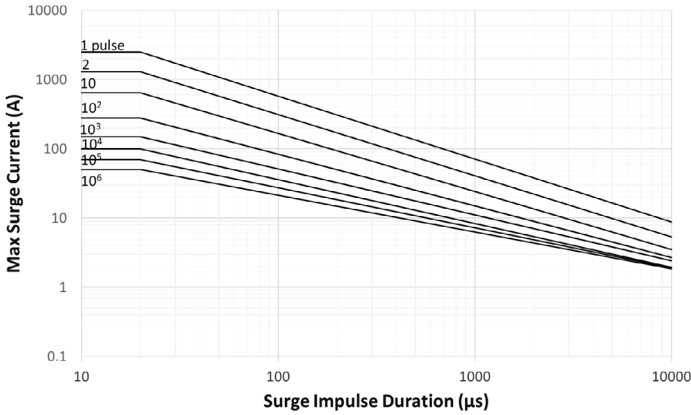


Pulse rating curves

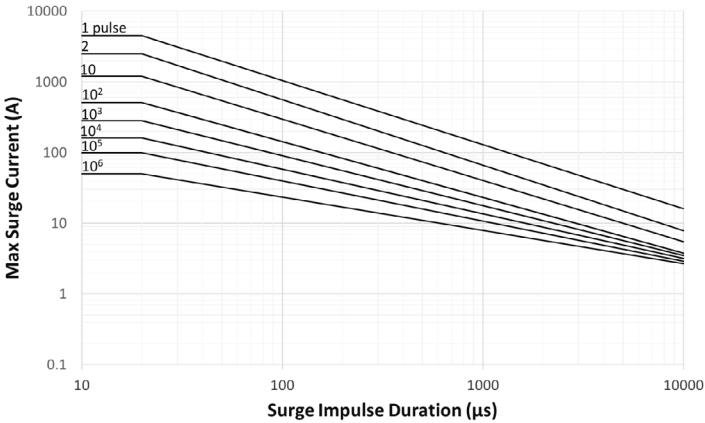
MOV07V130~510



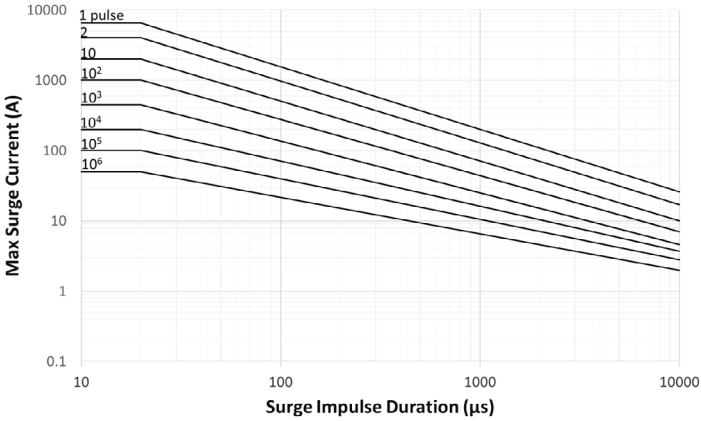
MOV10V130~625



MOV14V130~625



MOV20V130~680

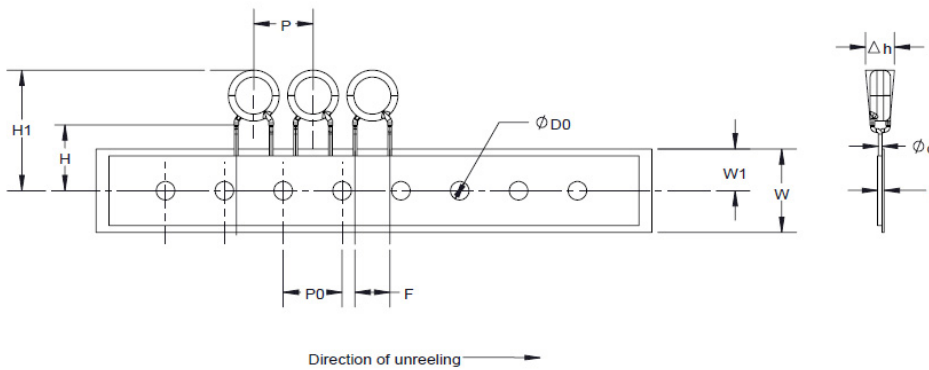


Packaging information

Quantity

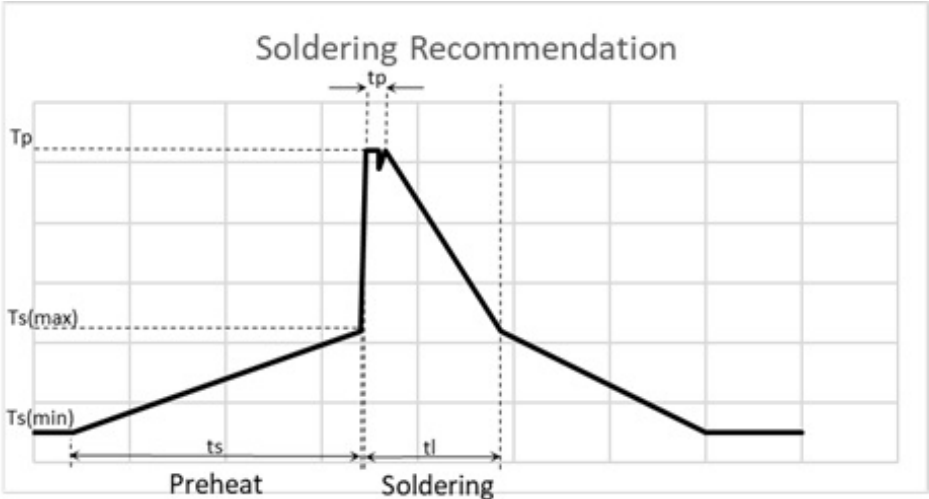
Part number	Bulk (pcs/bag)	Inner box	Shipping box	Ammo/box	Shipping box
MOV07V130-250	1000	2000	16000	1,500	7500
MOV07V 275-350	1000	2000	16000	1,250	6250
MOV07V385-510	1000	2000	16000	1,250	6250
MOV10V130-250	500	1000	8000	1,250	6250
MOV10V275-420	500	1000	8000	1250	6250
MOV10V460-625	400	800	6400	1000	5000
MOV14V130-250	250	500	4000	500	2000
MOV14V275-320	250	500	4000	500	2000
MOV14V350-420	250	500	4000	500	2000
MOV14V460-625	200	400	3200	400	1600
MOV20V130-250	100	200	1600	500	2000
MOV20V275-320	100	200	1600	500	2000
MOV20V350-420	100	200	1600	500	2000
MOV20V460-625	50	100	800	300	1200

Ammo pack dimension - mm



Dimension	Tolerance	MOV07	MOV10	MOV14	MOV20
f	± 0.5	5	7.5	7.5	10
P	± 1.0	12.7	12.7	25	25.4
P0	± 1.0	12.7	12.7	13	12.7
Δh	Max	2	2	2	2
W	± 1.0	18	18	18	18
W1	± 0.5	9	9	9	9
D0	± 0.2	4	4	4	4
d	± 0.05	0.6	0.8	0.8	1
H	± 1.0	17.5	17.5	17.5	17.5
H1	Max	32.5	36.5	41	49.5
t	± 0.2	0.5	0.5	0.5	0.5

Wave solder profile



Profile feature		Lead (Pb) free solder
Preheat	$T_s(max)$	130 °C ± 20 °C
	$T_s(min)$	Room temperature
	t_s	30 to 90 sconds
Soldering	T_p	260 °C maximum
	t_p	< 10 seconds
	Ramp-down rate	3.5 °C/second maximum

Manual solder

+360 °C (3 seconds maximum by soldering iron, distance from varistor 2 mm minimum), generally manual/hand soldering is not recommended.

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