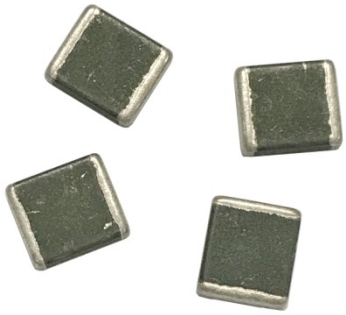
SM2220A Series

METAL OXIDE VARISTORS

Features



- EIA size:2220
- Variable capacitance
- Operating voltage: 18Vdc ~385Vdc
- High surge suppress capability
- Bidirectional and symmetrical V/I characteristics
- Multilayer ceramic construction technology
- RoHS & Halogen Free (HF) compliant
- Operating temperature range: -40℃ ~ +85℃
- Storage temperature range: -40℃ ~ +125℃

Applications

- Used to Help Achieve Electromagnetic Compliance of End Products
- Provides On-Board Transient Voltage Protection for ICs, CMOS and MOSFET
- Suppression of Inductive Switching or Other Transient Events Such as EFT and Surge Voltage at the Circuit Board.
- Protection of Components and Circuits Sensitive to ESD Transients Occurring on Power supplies, Control and Signal Lines.

Part Number Code

S	M	2	2	2	0	A	2	4	0	K
LOGO			Packaging: 2220			Standard		Varistor Voltage: 24V		Tolerance: K:±10%

Electrical Characteristics

Type Number	Varistor Voltage	Max. Allowable Voltage		Max. Energy (10/1000μs)	Max. Clamping Voltage (8/20μs)		Withstanding urge Current (8/20μs)
	V_{1mA}(V)	V_{AC}(V)	V_{DC}(V)	(J)	I_P(A)	V_C(V)	I(A)
SM2220A240K	21.6~27	14	18	2.5	10	59	1200
SM2220A270K	26.4~33	17	22	2.5	10	72	1200
SM2220A300K	28.8~36	18	24	2.5	10	79	1200
SM2220A330K	31.2~39	20	26	2.5	10	85	1200
SM2220A390K	36~45	25	30	2.5	10	99	1200
SM2220A470K	45.6~57	30	38	2.5	10	125	1200
SM2220A530K	50.4~63	32	42	2.5	10	138	1200
SM2220A560K	54~67.5	35	45	2.5	10	148	1200
SM2220A680K	67.2~84	40	56	2.5	10	184	1200
SM2220A760K	72~90	43	60	2.5	10	198	1200
SM2220A820K	78~97.5	46	65	2.5	10	214	1200
SM2220A900K	81.6~102	49	68	2.5	10	224	1200
SM2220A101K	102~127.5	60	85	2.5	10	280	1200
SM2220A181K	162~198	115	150	5.6	10	315	500
SM2220A221K	198~242	140	180	5.6	10	360	500
SM2220A241K	216~264	150	200	5.6	10	415	500
SM2220A271K	243~297	175	225	5.6	10	475	500
SM2220A391K	351~429	250	320	8.5	10	650	500
SM2220A431K	387~473	275	350	8.5	10	710	500
SM2220A471K	423~517	300	385	8.5	10	775	500

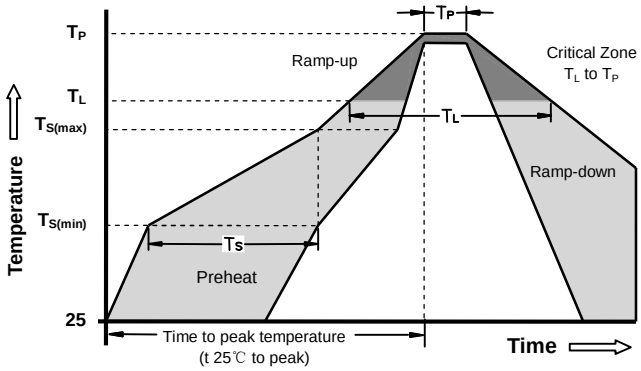
Environmental Performance

Item	Specifications	Test Condition
Bias Humidity	V_V / V_V≤±10%	90%RH, 40ºC, Working Voltage, 1000 hrs
Thermal Shock	V_V / V_V≤±10%	-40ºC to 85ºC,30min.cycle,5 cycles
Full Load Voltage	V_V / V_V≤±10%	Working Voltage,85ºC,1000 hrs

General Technical Data

Operating Temperature		-40~+85 ºC
Storage Temperature		-40~+125 ºC
Response Time		<1ns
Solderability		245±5 ºC, 3±1sec
Solder leach resistance		260±5 ºC,10±1sec
Taping Package Storage Condition	Storage Temperature	5~40ºC
	Relative Humidity	To 65%
	Storage Time	12 Months max

Soldering Parameters - Reflow Soldering (Surface Mount Devices)



Reflow Condition		Pb - Free assembly
Pre Heat	-Temperature Min ($T_{s(min)}$)	150°C
	-Temperature Max ($T_{s(max)}$)	200°C
	- Time (min to max) (t_s)	60 -180 Seconds
Average ramp up rate (Liquids Temp T_L) to peak		3°C/second max
$T_{S(max)}$ to TL - Ramp-up Rate		3°C/second max
Reflow	- Temperature (T_L) (Liquids)	217°C
	- Time (min to max) (t_s)	60 -150 Seconds
Peak Temperature (T_P)		260 +0/-5°C
Time within 5°C of actual peak Temperature (t_p)		20 - 40 Seconds
Ramp-down Rate		6°C/second max
Time 25°C to peak Temperature (T_P)		8 minutes Max
Do not exceed		260°C

Precaution for soldering

Note that this product will be easily damaged by rapid heating, rapid cooling or local heating.
Do not give heat shock over 100°C in the process of soldering. We recommend to take preheating and gradual cooling

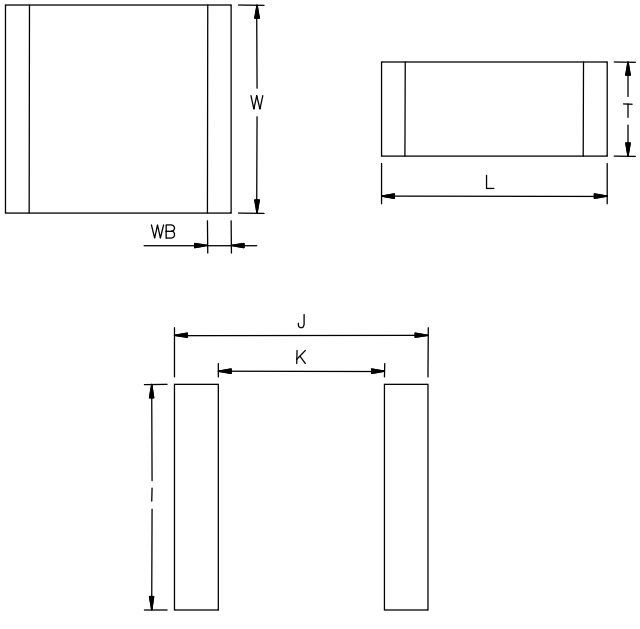
Soldering gun procedure

Note the follows, in case of using solder gun for replacement.
1)The tip temperature must be less than 280 for the period within 3 seconds by using soldering gun under 30W
2) The soldering gun tip shall not touch this product directly.

Soldering volume

Note that excess of soldering volume will easily get crack the body of this product.

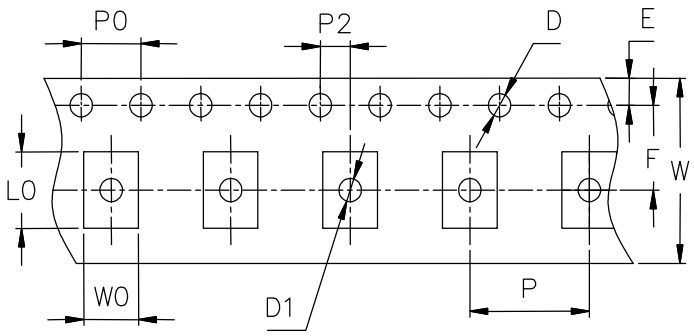
Dimensions And Recommended Pad Layout



Recommended Soldering Pad Layout

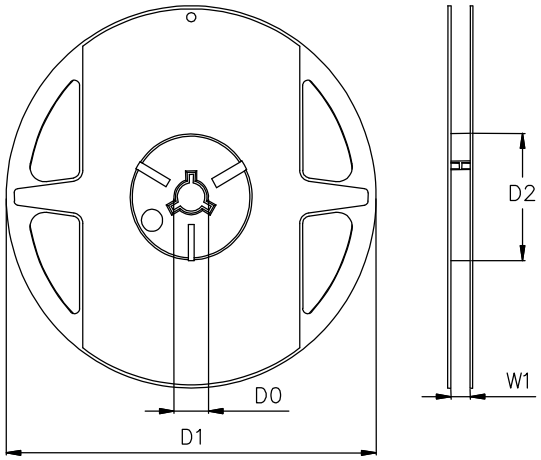
Symbol	Millimeters	Inches
L	5.70±0.50	0.224±0.02
W	5.08±0.50	0.20±0.02
$T_{max.}$	3.80	0.15
WB	0.60±0.25	0.024±0.01
I	5.5	0.217
J	6.4	0.252
K	4.2	0.165

Taping and Reel Specifications



Symbol	Millimeters	Inches
W	12.00±0.20	0.472±0.008
E	1.75±0.10	0.069±0.004
F	5.50±0.05	0.217±0.002
D	1.55±0.05	0.061±0.002
D1	Φ1.50±0.05	Φ0.059±0.002
P	8.00±0.10	0.315±0.004
P0	4.00±0.05	0.157±0.002
P2	2.00±0.05	0.079±0.002
L0	7.62±0.10	0.300±0.004
W0	6.57±0.10	0.259±0.004

Packing Specifications



Symbol	Millimeters	Inches
D0	13.5±0.1	0.531±0.004
D1	178±2.0	7.008±0.079
D2	Φ60.0±0.5	Φ2.362±0.02
W1	12.82±0.2	0.505±0.008

Taping Specifications

There Shall be the portion having no product in both the head and the end of taping, and there shall be the cover tape in the heat of taping.

Quantity of products in the taping package

SIZE EIA (EIAJ)	2220
Standard Packing Quantity (PCS/reel)	500