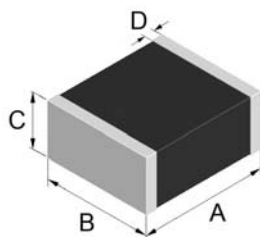


SMD Transient Voltage Suppressors

TVSM2220LCXV-Series

1. Dimension



Series	A(mm)	B(mm)	C(mm)	D(mm)
2220	5.50±0.20	5.00±0.20	3.50 max	0.50+0.30/-0.10

2. Part Numbering

TVSM 2220 LCX V 220 - 500 J □
 A B C D E F G H

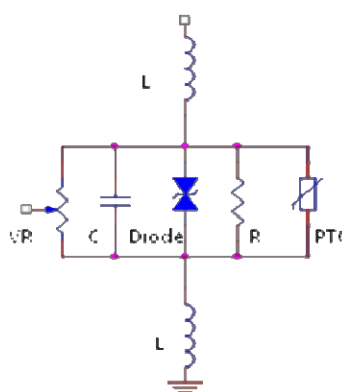
A: Series	Multilayer Varistor
B: Dimension	
C: Category Code	Load Dump Protection
D: Product Grade	Vehicle Grade
E: Voltage Code	220=Breakdown Voltage 22V
F: Characteristic Code	500=Load Dump Energy 50J
G: Characteristic Unit Code	J=Joule
H: Inner Code	

3. Features

1. RoHS compliant
2. SMD type
3. Meet ISO16750-2 Test A
4. Qualified based on AEC-Q200
5. Bidirectional and symmetrical V/I characteristics
6. Large withstanding surge current capability
7. Large load dump withstanding capability
8. Operating temperature range : -55~+150℃
9. Multi-Layers construction provides higher power dissipation

Equivalent Circuit

L	Body Inductance
C	Device Capacitance
VR	Voltage Variable Resistor
R	Insulation Resistor
Diode	Voltage Clamped
PTC	for Low Leakage Current



4. Rating and Characteristics

TAI-TECH Part Number	Continuous Operating Voltage (Max)	Breakdown Voltage (V)	Clamping Voltage (V) (Max)	Peak current (A)	Jump Start Voltage (V) (5min)	Load Dump (J) (10 times)	Response Time (nsec)	Leakage Current	Typical Capacitance Value (pF) (@1K)
TVSM2220LCXV220-500J	13 V _{AC} 16 V _{DC}	20.9~24.2	35	3000	24	50	1	50μA (at initial state) 200μA (after surge test)	23000
TVSM2220LCXV270-500J	15 V _{AC} 20 V _{DC}	25.6~29.7	43	3000	28.5	50	1	50μA (at initial state) 200μA (after surge test)	20000

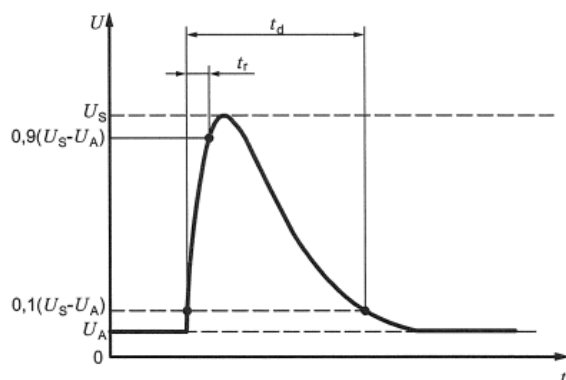
Note:

1. The breakdown voltage was measured at 1mA.
2. The clamping voltage was measured at 8/20μs standard current. 2220(5A)
3. The peak current was tested at 8/20μs waveform.
4. Load dump meet ISO16750-2 Test A.
5. The leakage current was tested at working voltage.
6. The capacitance value only for customer reference, it's not formal specification.

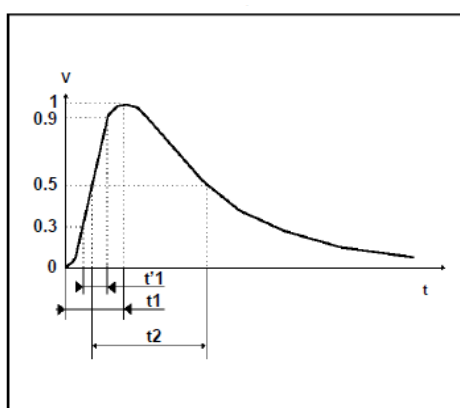
4-1. Reference Data

Parameter	Value
Operation ambient temperature	-55~150℃
Storage temperature range	-55~150℃
Body	Nano Special Ceramic
End termination	Ag/Ni/Sn
Packaging	Reel
Complies with standard	JASO ISO16750-2 IEC61000-4-5
Complies with RoHs standard	Yes
Lead content	< 1000 ppm
Marking	None

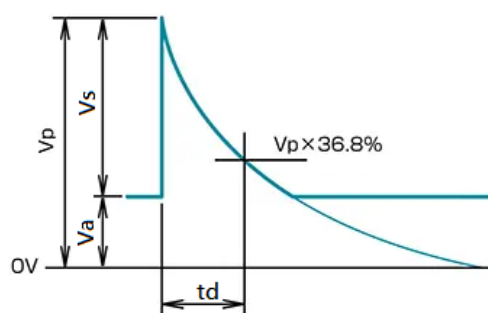
5. Load Dump and Surge Wave Forms



Load dump test waveform



8/20 μ s waveform current



JASO test waveform

ISO16750-2 Test A

Parameter	12V System
Pulse Voltage U_S	79~101V
Supply Voltage U_A	14V
Output Resistance R_i	0.5~4 Ω
Pulse Width t_d	40~400ms
Rise Time t_r	5~10ms

I EC61000-4-5 standard

SEVERITY LEVEL	t_1 (=1.67 t_1')	t_2
1	8 μ s	20 μ s

JASO A-1 standard

Parameter	12V System
V_A	14V
V_S	56V
V_P	70V
R_i	0.8 Ω
t_d	200ms