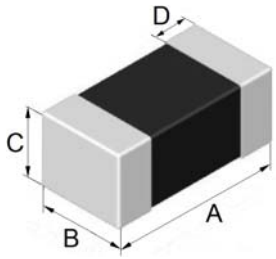
SMD Transient Voltage Suppressors TVSM0603EHLV-Series

1. Dimension



Series	A(mm)	B(mm)	C(mm)	D(mm)
0603	1.60±0.15	0.80±0.10	0.90 max	0.30±0.10

2. Part Numbering

TVSM 0603 EHL V 470 - 500 P □

A B C D E F G H

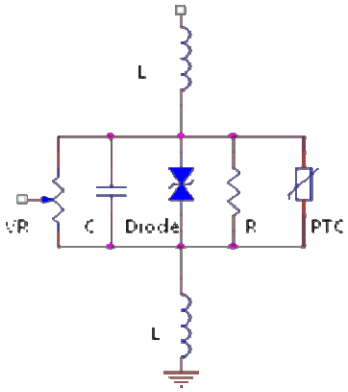
A: Series Multilayer Varistor
B: Dimension
C: Category Code High Performance Low Speed Signal ESD Protection
D: Product Grade Vehicle Grade
E: Voltage Code 470=Breakdown Voltage 47V
F: Characteristic Code 500=Capacitance 50pF
G: Characteristic Unit Code P＝pF
H: Inner Code

3. Features

1. RoHS compliant
2. SMD type
3. Meet ISO10605 and IEC61000-4-2 standards
4. Meet ISO7637-2 standards, pulse 1, 2A, 2B, 3A and 3B
5. Large withstanding ESD voltage capability : 25KV
6. Qualified based on AEC-Q200
7. Bidirectional and symmetrical V/I characteristics
8. Excellent low leakage current : < 0.8μA
9. Operating temperature range : -55~+125℃
10. 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. Technology Data

TAI-TECH Part Number	Maximum allowable continuous DC voltage (V)	Breakdown voltage (V)	Maximum allowable clamping voltage (V)	Maximum ESD protection (KV)
TVSM0603EHLV240-500P	16	28~38	57	25
TVSM0603EHLV470-500P	28	48~72	108	25

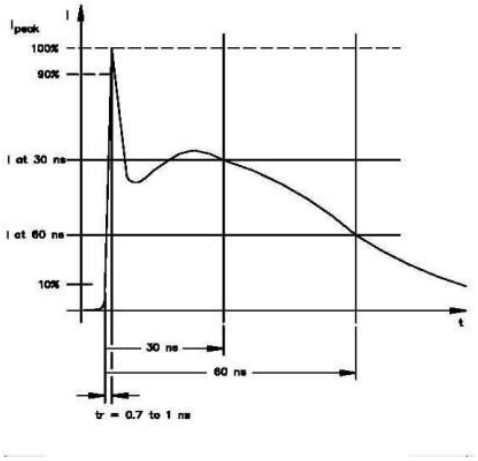
Notes :

1. The breakdown voltage was measured at 1mA.
2. The clamping voltage was measured at 8/20μs standard current.
3. The leakage current was tested at working voltage.

4-1. Reference Data			
ITEM	Symbol	Unit	Value
Typical capacitance value @ 1MHz	C	pF	50±30%
Response time	Trise	ns	< 1
Non-linear coefficient	α		> 20
Leakage current (at initial state)	I_{LDC}	μA	< 0.8
Leakage current (after ESD test)	I_{LDCA}	μA	< 4
Operation ambient temperature	T_{OPT}	℃	-55~+125
Storage temperature range	T_{STG}	℃	-55~+150

4-2. Other Data	
Body	Nano special ceramic
End termination	Ag/Ni/Sn
Packaging	Reel
Complies with standard	ISO10605 AEC-Q200
Complies with ISO7637-2 standards	Pulse 1, 2A, 2B, 3A and 3B
Complies with RoHs standard	Yes
Lead content	< 1000 ppm
Marking	None

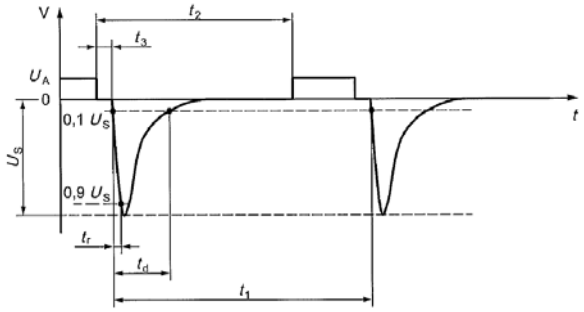
5. ESD Wave Form



ISO10605 standards

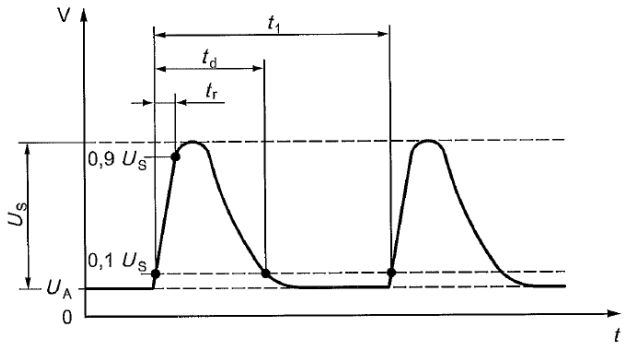
SEVERITY LEVEL	From inside vehicle	From outside vehicle
I	±4 KV	±4 KV
II	±8 KV	±8 KV
III	±14 KV	±15 KV
IV	±15 KV	±25 KV

6. ISO7637-2 Pulse 1, 2A, 2B, 3A and 3B Wave Forms



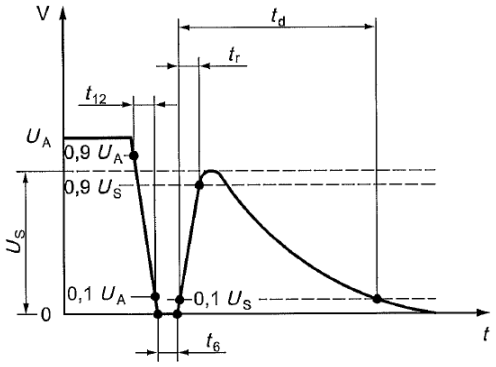
Parameters for test pulse 1

Parameters	12V System	24V System
Pulse Voltage (Us)	-75~-150V	-300~-600V
Pulse Period (t1)	≥0.5s	≥0.5s
Rise Time (tr)	1μs	3μs
Output Resistance (Ri)	10Ω	50Ω
Pulse Width (td)	2ms	1ms



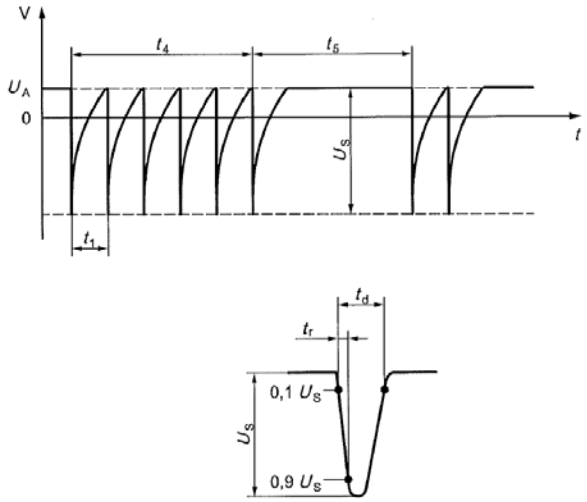
Parameters for test pulse 2A

Parameters	12V System	24V System
Pulse Voltage (Us)	37~112V	37~112V
Pulse Period (t1)	0.2~5s	0.2~5s
Rise Time (tr)	1μs	1μs
Output Resistance (Ri)	2Ω	2Ω
Pulse Width (td)	0.05ms	0.05ms



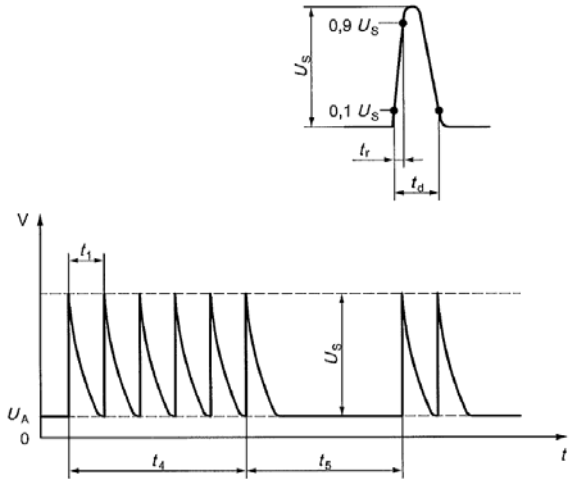
Parameters for test pulse 2B

Parameters	12V System	24V System
Pulse Voltage (Us)	10V	20V
t12	1±0.5ms	1±0.5ms
t6	1±0.5ms	1±0.5ms
Rise Time (tr)	1±0.5ms	1±0.5ms
Pulse Width (td)	0.2~2s	0.2~2s
Output Resistance (Ri)	0~0.05Ω	0~0.05Ω



Parameters for test pulse 3A

Parameters	12V System	24V System
Pulse Voltage (Us)	-112~-220V	-150~-300V
Pulse Period (t1)	100μs	100μs
Rise Time (tr)	5±1.5ns	5±1.5ns
Output Resistance (Ri)	50Ω	50Ω
Pulse Width (td)	150±45ns	150±45ns
Burst Interval (t5)	90ms	90ms
Burst Duration (t4)	10ms	10ms



Parameters for test pulse 3B

Parameters	12V System	24V System
Pulse Voltage (Us)	75~150V	150~300V
Pulse Period (t1)	100μs	100μs
Rise Time (tr)	5±1.5ns	5±1.5ns
Output Resistance (Ri)	50Ω	50Ω
Pulse Width (td)	150±45ns	150±45ns
Burst Interval (t5)	90ms	90ms
Burst Duration (t4)	10ms	10ms