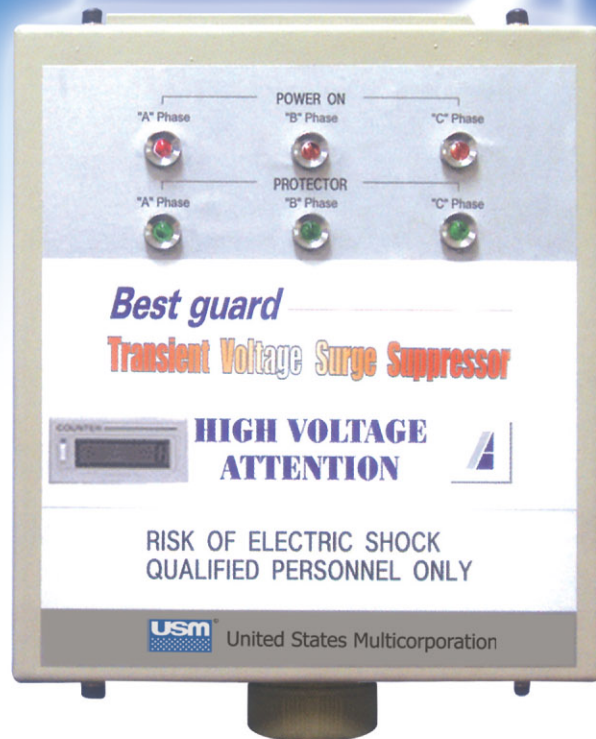


TVSS

Transient Voltage Surge Suppressor



United States Multicorporation
632 New York Drive. Pomona, CA91768. USA
E-mail: usm@california.usa.com

1. The definition of surge

What is surge? As it were, it is a kind of the electrical noise that is named generically as impulse of the both high voltage and high current if we speak easily. The source of surge are originated in the strike of lightning including the electrical circuit breaker, and the opening and shutting of inductive load. And the surge make have the equipment damaged or mis-operated after flow to the equipment through the cable for signal transmission. Also, it make have the life time of the equipment short, the damage of device inside circuit and capability low if the equipment will affected the stress by the surge for long time, etc. The surge is classified into the transient (an instant over voltage) and the surge (a drafted over voltage) according to the volume of voltage, the drafted and the shape of shape.

2 Surge

▪ Direct lightning

In this case that a lightning strike such a structure frame as a building and generate both the 20KV over voltage and the 200KA over current.

▪ Indirect lightning

Include approximately 6KV energy. Induction lightning Ins case that ground electric potential is rapidly increased to leading of the over voltage and the over current inducted through such the conductor as the line of power, communication, ground and metal pipe buried underground at the lightning originated ground around.

▪ Induction lightning

In this case that a lightning strike the line of the communication and the power transmission and appear the most and include approximately 6KV energy.

▪ Electric discharge

In this case that the electric charge inducted due to the discharge between the ground and the cloud or the cloud and the cloud have the equipment damaged the equipment after stream through the power line, a metal or the ground.

2-1 Surge (Static electricity)

ESD(electro-shortic discharge)

2-2 Surge (Surge by the nuclear)

NEMP (Nuclear Eletro-Magnetic Pulse)

3.Thunderbolt & Surge Standard

- NEMA (National Electrical Manufacturing Association)
- NFPA (National Fire Protection Association) 20, 70, 75 & 78
- UL1449 (Underwriter Laboratories)
- UL497, UL497A & B tele-data communication line

4.Environment condition to the surge

In C62.41 of IEEE (Institute of Electrical & Electronic Engineers) which is International Electrical & Electronic standard have TVSS that is used under AC 600V below standardized by the test proposal under over-environment appeared according to the actual environmental condition. Located environmental condition is classified into three(category A B C) according to the location category and the exposure level of each category is divided by the low, medium and high, etc according to the occurred frequency of switching transient and the test waveform is decided according to the category .

5.Suppression Voltage (Surge Clamping Voltage)

Suppression Voltage

The Suppression voltage of the complete panel mount Surge Protective Device shall be assessed by UL these figures must not exceed the values shown in Table UL suppression voltage rating for modules of subassemblies are not acceptable

table

Service Voltage	UL1449 Suppression Voltage
120	400
240	800
277	800
350	1500
480	1500

Surge Counter, DRY Contact 480KA~80KA High Quality type Surge Protector

■ NST□□□SD/NST□□□S/NST□□□ ■ Surge current(8/20uS)



Mode	Phase	In	I _{max}	CM	DM	Total
240KA	480KA	120KA	240KA	720KA	960KA	1680KA
200KA	400KA	100KA	200KA	600KA	800KA	1400KA
160KA	320KA	80KA	160KA	480KA	640KA	1120KA
120KA	240KA	60KA	120KA	360KA	480KA	840KA
80KA	160KA	40KA	80KA	240KA	320KA	560KA
40KA	80KA	20KA	40KA	120KA	160KA	280KA

In : (Nominal discharge Current, 20X8/20uS)

I_{max} : (Maximum discharge Current, 8/20uS)

CM/DM : Common Mode/Differential Mode, 8/20uS

CM/DM : Custom production

■ Specification

- HEAVY ~ duty panel in put POWER
 - Parallel connection type
- Features
 - One MODULES type
 - Free replaceable FUSE
 - Surge event COUNTER
 - Audible alarm & remote contact
 - Sine wave tracking / Noise filter (OPTION)
- Redundant protection technology
- Protection Mode
 - L-N, N-G, L-G(1Ø), L-N, N-G(3Ø)
- Devices : UL Listed
 - 40KA MOV(Metal Oxide Varistor)
 - Surge Suppression Fuse
- Indication
 - Red ON : Power good
 - Green ON : Protector good
- MCOV
 - Rated Voltage 125%
- Surge life/ Phase
 - 10,000 impulse 3KA
- Response time : 1 nano-second
- Operating Frequency : DC ~ 400Hz
- Operating temperature : -40 ~ 85°C
- Operating Humidity : 95% RH
- Connection : AWG #8 ~ AWG #3
- Protection class : IP53
- Enclosure : NEMA 12 Meet steel
- Dimension : (240~200KA)
 - 305 × 350 × 127mm (W×D×H)
- Dimension : (160~120KA)
 - 250 × 290 × 127mm (W×D×H)
- Dimension : (80~40KA)
 - 160 × 220 × 85mm (W×D×H)
- Dimension : (NST40S, NST40 Series)
 - 110 × 170 × 80mm (W×D×H)

■ Model/Clamping voltage

Model		Phase [Un]	MCOV [Uc]	Clamping voltage [Up]
Surge current	Rated voltage			
NST240SD NST200SD NST160SD NST120SD NST80SD NST40SD	-120S -120Y -240P	1P 2W 120V 3P 4W 120/208V 1P 3W 120/240V	150Vrms	400Vpk
NST240S NST200S NST160S NST120S NST80S NST40S	-220S -220D -220Y	1P 2W 220V 3P 3W 220V 3P 4W 220/380V	275Vrms	800Vpk
NST240 NST200 NST160 NST120 NST80 NST40	-600S -380D	1P 2W 600V 3P 3W 380V	750Vrms 475Vrms	2500Vpk 1500Vpk
NST240 NST200 NST160 NST120 NST80 NST40	-480D -277Y	3P 3W 480V 3P 4W 277/480V	600Vrms 320Vrms	2000Vpk 1000Vpk

- Product explanation
 - S = Surge event COUNTER
 - D = Dry(remote) contact

■ Application

- HEAVY, BRANCH, LOCAL duty Panel
- UPS Power
- VMS Panel, Service entrance
- Dam & water control center
- Broadcasting station communication site
- Industrial Machine/ Equipment panel
- Rail road, Sub way HEAVY duty panel

■ Standards

- ANSI/IEEE C62.41 Cat.C3(1,2/50uS 20KV, 8/20uS 10KA)
- ANSI/IEEE C62.41 Meet UL1449 2nd
- KS C IEC 61312-1 (LPZ 1-2)
- KS C IEC 61643-1, 11 (Class II+III)

600KA~40KA General Quality type

■ NST□□□L Series



■ Specification

- HEAVY ~ LOCAL duty panel in put POWER
 - Parallel connection type
- Features
 - One MODULES type
 - Free replaceable FUSE
 - Sine wave tracking / Noise filter (Option)
- Redundant protection technology
- Protection Mode
 - L-N, N-G, L-G(1Ø), L-N, N-G(3Ø)
 - +~-, ~G, +~G (DC)
- Devices : UL Listed
 - 20mm MOV(Metal Oxide Varistor)
 - Surge Suppression Fuse
- Indication
 - Red ON : Power good
 - Green ON : Protector good
- MCOV
 - Rated Voltage 125%
- Surge life/ Phase
 - 10,000 impulse 3KA
- Response time : 1 nano-second
- Operating Frequency : DC ~ 400Hz
- Operating temperature : -40 ~ 85°C
- Operating Humidity : 95% RH
- Connection : AWG #8 ~ AWG #3
- Protection class : IP20
- Enclosure : NEMA 12 Meet steel
- Dimension : (300~180KA Series)
 - 190 × 245 × 40mm (W×D×H)
- Dimension : (160~100KA Series)
 - 160 × 230 × 40mm (W×D×H)
- Dimension : (80~20KA Series)
 - 120 × 203 × 40mm (W×D×H)

■ Application

- BRANCH, LOCAL duty Panel
- UPS, CCTV, DCS, PLC, SCADA
- VMS Panel, Service entrance
- Broadcasting station communication site
- Industrial Machine/ Equipment panel

■ Surge current(8/20uS)

Mode	Phase	In	I _{max}
300KA	600KA	150KA	300KA
250KA	500KA	125KA	250KA
240KA	480KA	120KA	240KA
200KA	400KA	100KA	200KA
180KA	360KA	90KA	180KA
160KA	320KA	80KA	160KA
120KA	240KA	60KA	120KA
100KA	200KA	50KA	100KA
80KA	160KA	40KA	80KA
60KA	120KA	30KA	60KA
50KA	100KA	25KA	50KA
40KA	80KA	20KA	40KA
30KA	60KA	15KA	30KA
20KA	40KA	10KA	20KA

In : (Nominal discharge Current, 20X8/20uS)

I_{max} : (Maximum discharge Current, 8/20uS)

■ Model/Clamping voltage

Model		Phase [Un]	MCOV [Uc]	Clampin voltage [Up]
Surge current	Rated voltage			
NST300L	-120S	1P 2W 120V	150Vrms	400Vpk
NST250L	-120Y	3P 4W 120/208V		
NST240L	-240P	1P 3W 120/240V		
NST200L	-220S	1P 2W 220V	275Vrms	800Vpk
NST180L	-220D	3P 3W 220V		
NST160L	-220Y	3P 4W 220/380V		
NST120L	-600S	1P 2W 600V	750Vrms	2500Vpk
NST100L	-380D	3P 3W 380V	475Vrms	1500Vpk
NST80L	-480D	3P 3W 480V	600Vrms	2000Vpk
NST60L	-277Y	3P 4W 277/480V	320Vrms	1000Vpk
NST50L	-020P	DC 2W 12V	20Vdc	27.7Vpk
NST40L	-030P	DC 2W 24V	30Vdc	43Vpk
NST30L	-060P	DC 2W 48V	60Vdc	92Vpk
NST20L	-100P	DC 2W 70V	100Vdc	137Vpk
	-150P	DC 2W 125V	150Vdc	207Vpk
	-250P	DC 2W 220V	250Vdc	344Vpk

- UL E242170

■ Standards

- ANSI/IEEE C62.41 Cat.B3/C1(1,2/50uS 6KV, 8/20uS 3KA)
- ANSI/IEEE C62.41 Meet UL1449 2nd
- KS C IEC 61312-1 (LPZ 1-2)
- KS C IEC 61643-1, 11 (Class II+III)