

**SURGE SUPPRESSOR
METAL OXIDE VARISTOR
NEC-MOV SERIES**

NV100D05 ~ NV470D05
 NV100D07 ~ NV470D07
 NV082D10 ~ NV910D10
 NV082D14 ~ NV910D14
 NV100D19 ~ NV910D19

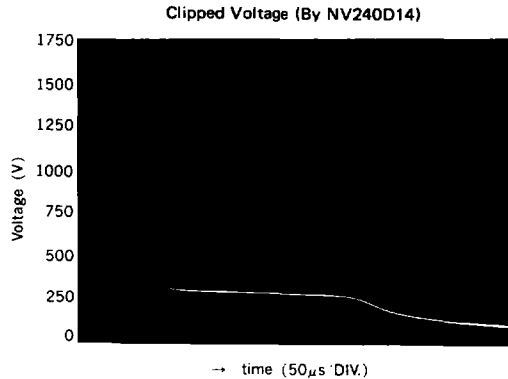
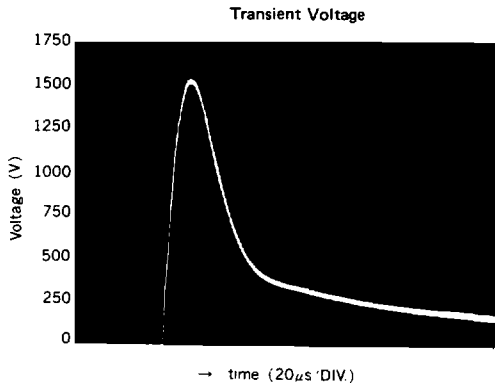
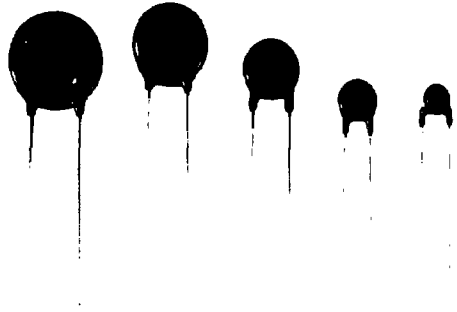
The NEC-MOV series are the best device for transient voltage protection. When exposed to high transient voltage the NEC-MOV's impedance changes from a very high value to a very low conducting value thus clamping the transient voltage to a safe level. Therefore NEC-MOV protects many electric equipment from surge voltage and keep a safe drive.

FEATURES

- Excellent transient voltage suppression characteristics.
- High surge current.
- Fast response time. (< 50 ns)
- V-I characteristics are the same in both polarity.

APPLICATIONS

- Protects equipment against failures by transient surge voltage.



Outline Drawing (Unit : mm)

| Type Number | D(MAX.) | H(MAX.) | T(MAX.) | W |
|-------------|---------|---------|---------|-----|
| NV100D05 | 7.0 | 10.0 | 4.3 | 1.2 |
| NV120D05 | 7.0 | 10.0 | 4.3 | 1.3 |
| NV150D05 | 7.0 | 10.0 | 4.5 | 1.5 |
| NV200D05 | 7.0 | 10.0 | 5.0 | 1.7 |
| NV220D05 | 7.0 | 10.0 | 5.0 | 1.8 |
| NV240D05 | 7.0 | 10.0 | 5.3 | 1.9 |
| NV270D05 | 7.0 | 10.0 | 5.3 | 2.1 |
| NV360D05 | 7.5 | 10.5 | 6.0 | 2.6 |
| NV390D05 | 7.5 | 10.5 | 6.0 | 2.7 |
| NV430D05 | 7.5 | 10.5 | 6.5 | 2.9 |
| NV470D05 | 7.5 | 10.5 | 6.5 | 3.1 |

| Type Number | D(MAX.) | H(MAX.) | T(MAX.) | W |
|-------------|---------|---------|---------|-----|
| NV100D07 | 9.0 | 12.0 | 4.3 | 1.2 |
| NV120D07 | 9.0 | 12.0 | 4.3 | 1.3 |
| NV150D07 | 9.0 | 12.0 | 4.5 | 1.5 |
| NV200D07 | 9.0 | 12.0 | 5.0 | 1.7 |
| NV220D07 | 9.0 | 12.0 | 5.0 | 1.8 |
| NV240D07 | 9.0 | 12.0 | 5.3 | 1.9 |
| NV270D07 | 9.0 | 12.0 | 5.3 | 2.1 |
| NV360D07 | 9.5 | 12.5 | 6.0 | 2.6 |
| NV390D07 | 9.5 | 12.5 | 6.0 | 2.7 |
| NV430D07 | 9.5 | 12.5 | 6.5 | 2.9 |
| NV470D07 | 9.5 | 12.5 | 6.5 | 3.1 |

| Type Number | D(MAX.) | H(MAX.) | T(MAX.) | W |
|-------------|---------|---------|---------|-----|
| NV082D10 | 12.0 | 15.0 | 3.5 | 1.3 |
| NV100D10 | 12.0 | 15.0 | 4.3 | 1.4 |
| NV120D10 | 12.0 | 15.0 | 4.3 | 1.5 |
| NV150D10 | 12.0 | 15.0 | 4.5 | 1.7 |
| NV200D10 | 12.0 | 15.0 | 5.0 | 1.9 |
| NV220D10 | 12.0 | 15.0 | 5.0 | 2.0 |
| NV240D10 | 12.0 | 15.0 | 5.3 | 2.1 |
| NV270D10 | 12.0 | 15.0 | 5.3 | 2.3 |
| NV360D10 | 12.5 | 15.5 | 6.0 | 2.8 |
| NV390D10 | 12.5 | 15.5 | 6.0 | 2.9 |
| NV430D10 | 12.5 | 15.5 | 6.5 | 3.1 |
| NV470D10 | 12.5 | 15.5 | 6.5 | 3.3 |
| NV620D10 | 12.5 | 15.5 | 7.5 | 4.1 |
| NV680D10 | 12.5 | 15.5 | 8.0 | 4.5 |
| NV750D10 | 12.5 | 15.5 | 8.5 | 4.8 |
| NV780D10 | 12.5 | 15.5 | 8.5 | 5.0 |
| NV820D10 | 12.5 | 15.5 | 9.0 | 5.2 |
| NV910D10 | 12.5 | 15.5 | 9.5 | 5.6 |

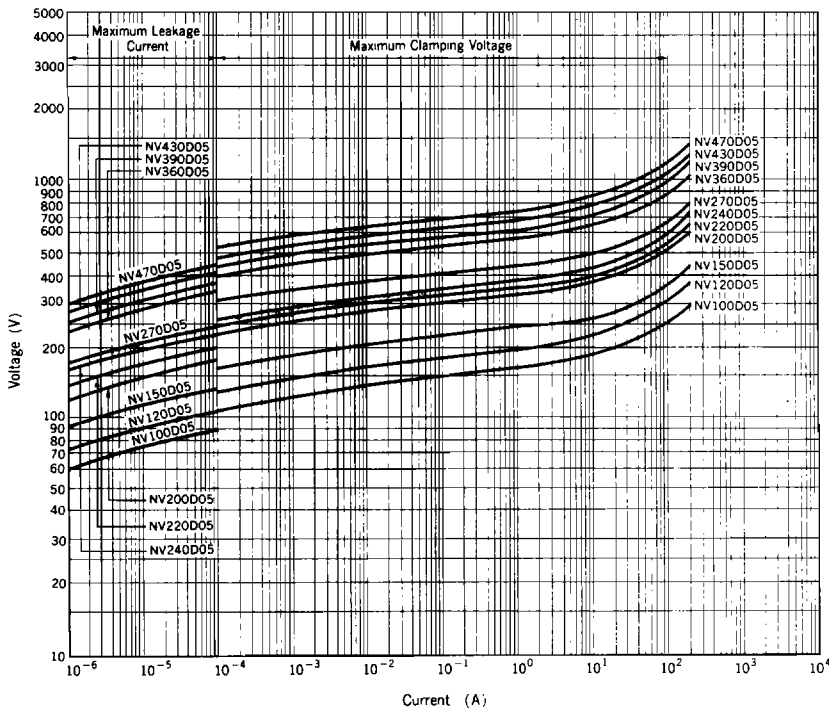
| Type Number | D(MAX.) | H(MAX.) | T(MAX.) | W |
|-------------|---------|---------|---------|-----|
| NV082D14 | 16.0 | 21.0 | 3.5 | 1.3 |
| NV100D14 | 16.0 | 21.0 | 4.3 | 1.4 |
| NV120D14 | 16.0 | 21.0 | 4.3 | 1.5 |
| NV150D14 | 16.0 | 21.0 | 4.5 | 1.7 |
| NV200D14 | 16.0 | 21.0 | 5.0 | 1.9 |
| NV220D14 | 16.0 | 21.0 | 5.0 | 2.0 |
| NV240D14 | 16.0 | 21.0 | 5.3 | 2.1 |
| NV270D14 | 16.0 | 21.0 | 5.3 | 2.3 |
| NV360D14 | 16.5 | 21.5 | 6.0 | 2.8 |
| NV390D14 | 16.5 | 21.5 | 6.0 | 2.9 |
| NV430D14 | 16.5 | 21.5 | 6.5 | 3.1 |
| NV470D14 | 16.5 | 21.5 | 6.5 | 3.3 |
| NV620D14 | 16.5 | 21.5 | 7.5 | 4.1 |
| NV680D14 | 16.5 | 21.5 | 8.0 | 4.5 |
| NV750D14 | 16.5 | 21.5 | 8.5 | 4.8 |
| NV780D14 | 16.5 | 21.5 | 8.5 | 5.0 |
| NV820D14 | 16.5 | 21.5 | 9.0 | 5.2 |
| NV910D14 | 16.5 | 21.5 | 9.5 | 5.6 |

| Type Number | D(MAX.) | H(MAX.) | T(MAX.) | W |
|-------------|---------|---------|---------|-----|
| NV100D19 | 20.0 | 25.0 | 4.8 | 1.6 |
| NV120D19 | 20.0 | 25.0 | 4.8 | 1.7 |
| NV150D19 | 20.0 | 25.0 | 5.0 | 1.9 |
| NV200D19 | 20.0 | 25.0 | 5.4 | 2.1 |
| NV220D19 | 20.0 | 25.0 | 5.4 | 2.2 |
| NV240D19 | 20.0 | 25.0 | 5.7 | 2.3 |
| NV270D19 | 20.0 | 25.0 | 5.7 | 2.5 |
| NV360D19 | 21.0 | 26.0 | 6.3 | 3.0 |
| NV390D19 | 21.0 | 26.0 | 6.3 | 3.1 |
| NV430D19 | 21.0 | 26.0 | 6.8 | 3.3 |
| NV470D19 | 21.0 | 26.0 | 6.8 | 3.5 |
| NV620D19 | 21.0 | 26.0 | 7.8 | 4.3 |
| NV680D19 | 21.0 | 26.0 | 8.0 | 4.7 |
| NV750D19 | 21.0 | 26.0 | 8.5 | 5.0 |
| NV780D19 | 21.0 | 26.0 | 8.5 | 5.2 |
| NV820D19 | 21.0 | 26.0 | 9.0 | 5.4 |
| NV910D19 | 21.0 | 26.0 | 9.5 | 5.8 |

RATINGS AND CHARACTERISTICS (NV100D05 ~ NV470D05)

| Type Number | Varistor Voltage | Maximum Allowable Voltage | | Clamping Voltage | Energy | Peak Current | Operating Ambient Temperature | Storage Temperature | Capacitance (reference value) |
|-------------|-------------------------------|---------------------------|--------|----------------------|--------|--------------|-------------------------------|-----------------------|-------------------------------|
| | V _{0.1mA} (±10%) (V) | ACrms (V) | DC (V) | V _{25A} (V) | (J) | 8×20 μs (A) | T _{opt} (°C) | T _{stg} (°C) | 1 k ~1 MHz (pF) |
| NV100D05 | 100 | 60 | 85 | 175 | 2.0 | 200 | -40 ~ 85 | -40 ~ 125 | 40 ~ 150 |
| NV120D05 | 120 | 75 | 100 | 210 | 2.5 | | | | |
| NV150D05 | 150 | 95 | 125 | 260 | 3.0 | | | | |
| NV200D05 | 200 | 130 | 170 | 355 | 4.0 | | | | |
| NV220D05 | 220 | 140 | 180 | 380 | 4.5 | | | | |
| NV240D05 | 240 | 150 | 200 | 415 | 5.0 | | | | |
| NV270D05 | 270 | 175 | 225 | 475 | 6.0 | | | | |
| NV360D05 | 360 | 230 | 300 | 620 | 7.5 | | | | |
| NV390D05 | 390 | 250 | 320 | 675 | 8.0 | | | | |
| NV430D05 | 430 | 275 | 350 | 745 | 9.0 | | | | |
| NV470D05 | 470 | 300 | 385 | 810 | 10.0 | | | | |

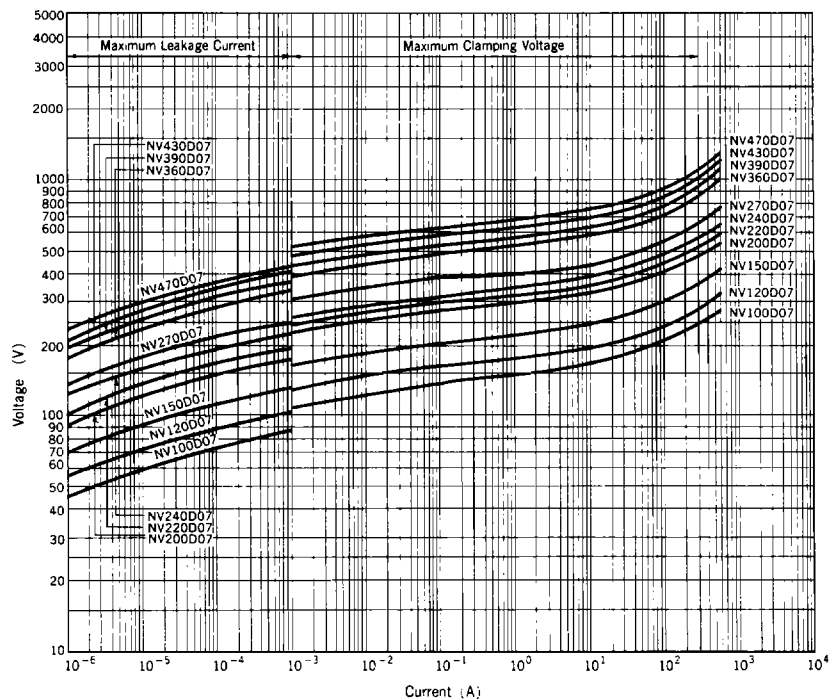
Fig. 1 V-I Characteristics



RATINGS AND CHARACTERISTICS (NV100D07 ~ NV470D07)

| Type Number | Varistor Voltage | Maximum Allowable Voltage | | Clamping Voltage | Energy | Peak Current | Operating Ambient Temperature | Storage Temperature | Capacitance (reference value) |
|-------------|------------------|---------------------------|--------|------------------|--------|---------------|-------------------------------|-----------------------|-------------------------------|
| | V1mA (±10%) (V) | ACrms (V) | DC (V) | V50A (V) | (J) | 8 × 20 μs (A) | T _{opt} (°C) | T _{stg} (°C) | 1 k ~ 1 MHz (pF) |
| NV100D07 | 100 | 60 | 85 | 165 | 4.5 | 600 | -40 ~ 85 | -40 ~ 125 | 70 ~ 250 |
| NV120D07 | 120 | 75 | 100 | 200 | 5.0 | | | | |
| NV150D07 | 150 | 95 | 125 | 250 | 6.0 | | | | |
| NV200D07 | 200 | 130 | 170 | 340 | 10.0 | | | | |
| NV220D07 | 220 | 140 | 180 | 360 | 10.0 | | | | |
| NV240D07 | 240 | 150 | 200 | 395 | 10.0 | | | | |
| NV270D07 | 270 | 175 | 225 | 455 | 12.0 | | | | |
| NV360D07 | 360 | 230 | 300 | 595 | 15.0 | | | | |
| NV390D07 | 390 | 250 | 320 | 650 | 17.0 | | | | |
| NV430D07 | 430 | 275 | 350 | 710 | 20.0 | | | | |
| NV470D07 | 470 | 300 | 385 | 775 | 20.0 | | | | |

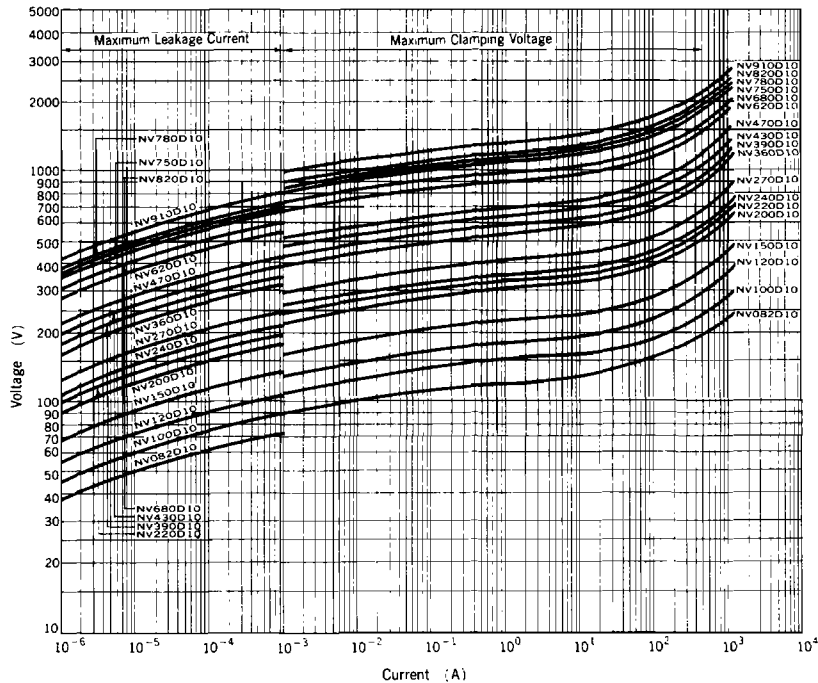
Fig. 2 V-I Characteristics



RATINGS AND CHARACTERISTICS (NV082D10 ~ NV910D10)

| Type Number | Varistor Voltage | Maximum Allowable Voltage | | Clamping Voltage | Energy | Peak Current 8 x 20 μ s (A) | Operating Ambient Temperature T _{opt} (°C) | Storage Temperature T _{stg} (°C) | Capacitance (reference value) 1 k ~ 1 MHz (pF) |
|-------------|-----------------------|---------------------------|--------|------------------|--------|------------------------------------|--|--|---|
| | V1mA (\pm 10%) (V) | ACrms (V) | DC (V) | V25A (V) | (J) | | | | |
| NV082D10 | 82 | 50 | 65 | 135 | 8 | 1250 | -40 ~ 85 | -40 ~ 125 | 250 ~ 800 |
| NV100D10 | 100 | 60 | 85 | 165 | 10 | | | | |
| NV120D10 | 120 | 75 | 100 | 200 | 12 | | | | |
| NV150D10 | 150 | 95 | 125 | 250 | 16 | | | | |
| NV200D10 | 200 | 130 | 170 | 340 | 20 | | | | |
| NV220D10 | 220 | 140 | 180 | 360 | 23 | | | | |
| NV240D10 | 240 | 150 | 200 | 395 | 25 | | | | |
| NV270D10 | 270 | 175 | 225 | 455 | 30 | | | | |
| NV360D10 | 360 | 230 | 300 | 595 | 35 | | | | |
| NV390D10 | 390 | 250 | 320 | 650 | 40 | | | | |
| NV430D10 | 430 | 275 | 350 | 710 | 45 | | | | |
| NV470D10 | 470 | 300 | 385 | 775 | 45 | | | | |
| NV620D10 | 620 | 385 | 505 | 1025 | 45 | | | | |
| NV680D10 | 680 | 420 | 560 | 1120 | 45 | | | | |
| NV750D10 | 750 | 460 | 615 | 1240 | 50 | | | | |
| NV780D10 | 780 | 485 | 640 | 1290 | 50 | | | | |
| NV820D10 | 820 | 510 | 670 | 1355 | 55 | | | | |
| NV910D10 | 910 | 550 | 745 | 1500 | 60 | | | | |

Fig. 3 V-I Characteristics



RATINGS AND CHARACTERISTICS (NV100D19 ~ NV910D19)

| Type Number | Varistor Voltage | Maximum Allowable Voltage | | Clamping Voltage | Energy | Peak Current | Operating Ambient Temperature | Storage Temperature | Capacitance (reference value) |
|-------------|------------------|---------------------------|--------|------------------|--------|--------------|-------------------------------|-----------------------|-------------------------------|
| | V1mA (±10%) (V) | ACrms (V) | DC (V) | V100A (V) | (J) | 8x20 μs (A) | T _{opt} (°C) | T _{stg} (°C) | 1 k ~ 1 MHz (pF) |
| NV100D19 | 100 | 60 | 85 | 165 | 19 | 3000 | -40 ~ 85 | -40 ~ 125 | 300 ~ 2000 |
| NV120D19 | 120 | 75 | 100 | 200 | 21 | | | | |
| NV150D19 | 150 | 95 | 125 | 250 | 27 | | | | |
| NV200D19 | 200 | 130 | 170 | 340 | 37 | | | | |
| NV220D19 | 220 | 140 | 180 | 360 | 42 | | | | |
| NV240D19 | 240 | 150 | 200 | 395 | 42 | | | | |
| NV270D19 | 270 | 175 | 225 | 455 | 52 | | | | |
| NV360D19 | 360 | 230 | 300 | 595 | 68 | | | | |
| NV390D19 | 390 | 250 | 320 | 650 | 73 | | | | |
| NV430D19 | 430 | 275 | 350 | 710 | 80 | | | | |
| NV470D19 | 470 | 300 | 385 | 775 | 90 | | | | |
| NV620D19 | 620 | 385 | 505 | 1025 | 100 | | | | |
| NV680D19 | 680 | 420 | 560 | 1120 | 110 | | | | |
| NV750D19 | 750 | 460 | 615 | 1240 | 120 | | | | |
| NV780D19 | 780 | 485 | 640 | 1290 | 130 | | | | |
| NV820D19 | 820 | 510 | 670 | 1355 | 140 | | | | |
| NV910D19 | 910 | 550 | 745 | 1500 | 150 | | | | |

Fig. 5 V-I Characteristics

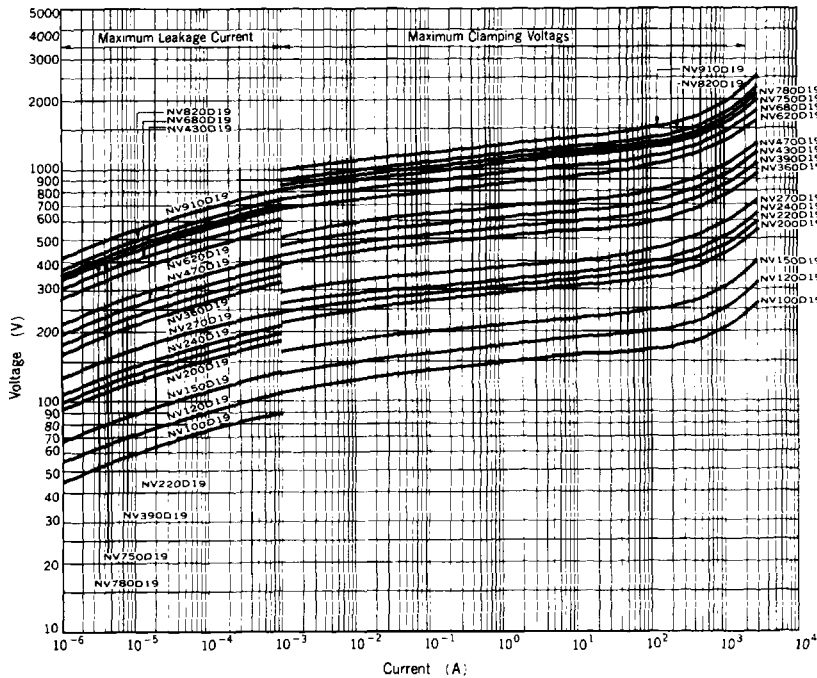


Fig. 6 Peak Current-Pulse Width Rating (Impulse Number N=2)

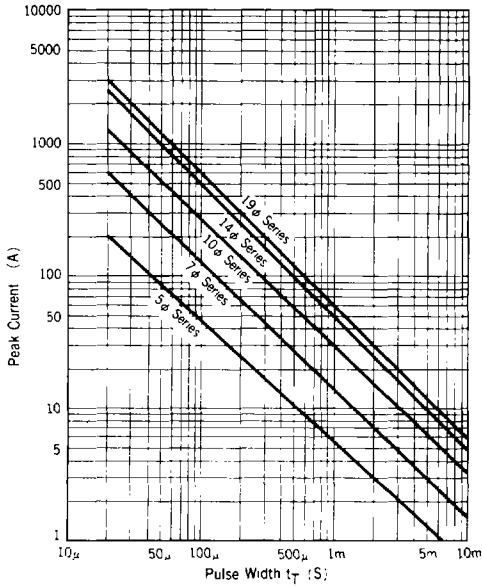
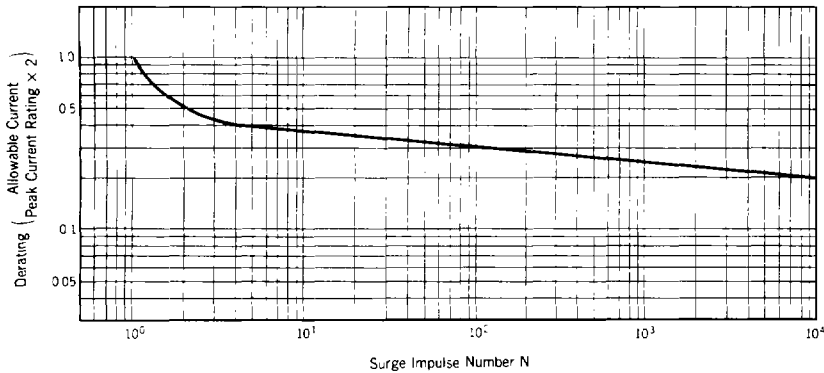


Fig. 7 Derating Curve

ex. 14 φ Series

Pulse width $t_T=200\mu$ s, Impulse number $N=10^4$
 I (at $t_T=200\mu$ s) = 250A (See Fig. 6)
 Derating (at $N=10^4$) = 0.2 (See Fig. 7)
 Allowable current $I = 250 \times 0.2 = 100A$



NOTICE

- Applied voltage should not be over the maximum ratings.
- Should the NEC-MOV be subjected to surge current and energy levels in excess of maximum ratings, it may physically fail by package rupture or explosion of material. It is recommended that protective fusing be used in a circuit.
- When the NEC-MOV are used in a high frequency circuit, notice it's capacitance and avoid to fever.