

■ 壓敏電阻器

ZINC OXIDE VARISTOR

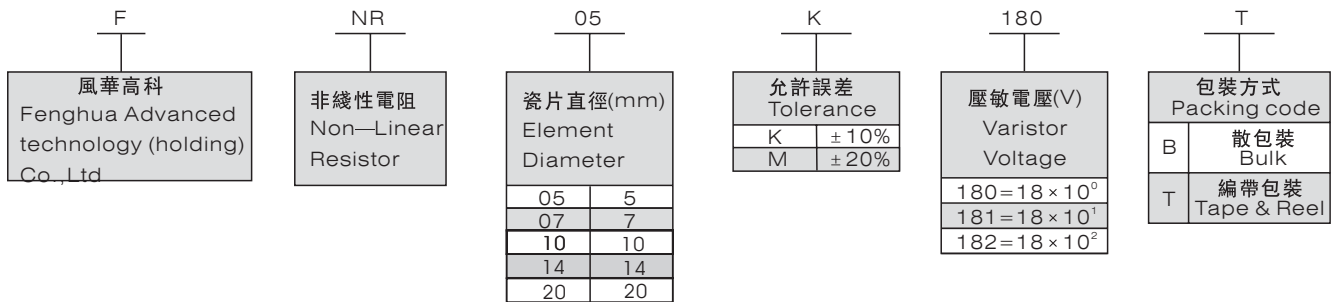
是以氧化鋅為主要原料制造的半導體電子陶瓷元件，其電阻值隨施加電壓的改變而呈非線性變化，由于電阻值對電壓變化十分敏感，故稱壓敏電阻器或突波吸收器

Are non-linear resistors utilize a semiconductor electronic ceramic element mainly composed of Zinc Oxide and its resistors change as a function of the applied voltage .It' s called Varistor or Transient surge absorbers

● 特性 FEATURES

- * 電壓範圍寬 (18V~1.8KV) Widely voltage range 18V~1.8KV
- * 反應速度快 (≤25ns) Fast response to the rapidly increase Voltage(≤25ns)
- * 非線性指數大 Excellent non-linearity voltage
- * 無極性 Symmetric V-I characteristics
- * 通流量大(2000A/cm²) Great withstanding surge current (2000A/cm²)
- * 無續流 No follow-on current
- * 壽命長 Long life

● 訂貨方式 HOW TO ORDER



● 特性曲綫 CHARACTERISTICS

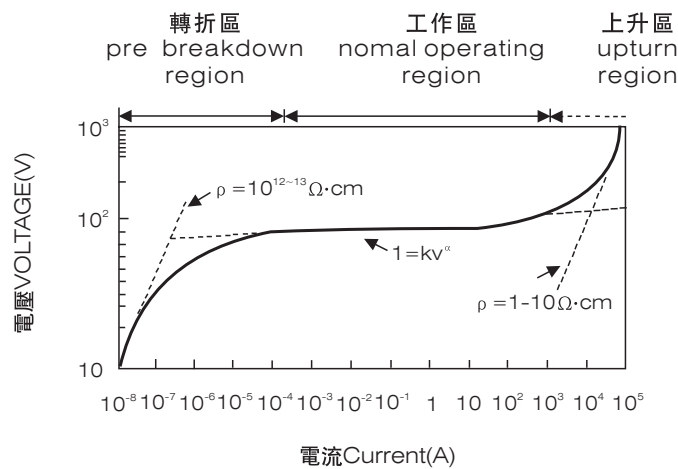
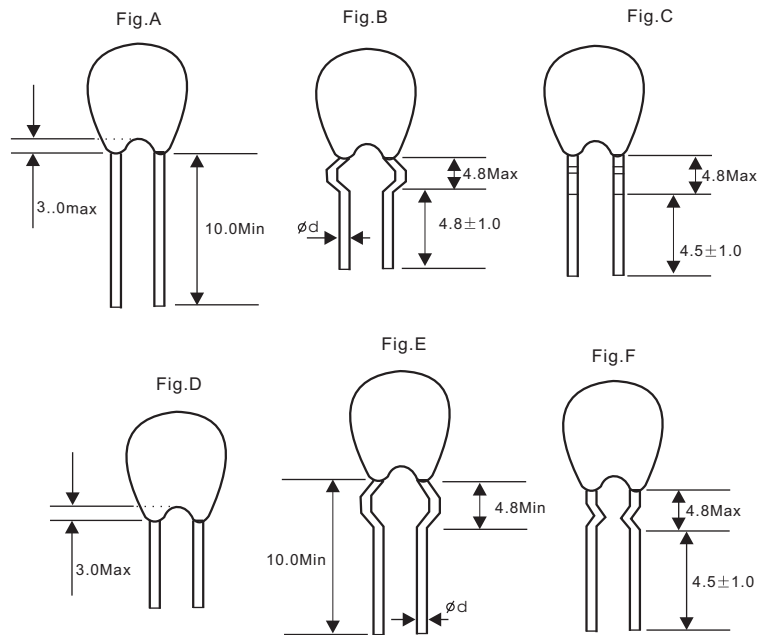


圖 Fig1
Voltage Current Characteristic

壓敏電阻器 ZINC OXIDE VARISTOR

• 引綫類型 LEAD STYLE

| 代碼 Code | 結構 Configuration |
|------------|----------------------------|
| A | 長直脚 straight long |
| B | 外彎短脚 Outside Crimped short |
| C | 垂直彎脚 Vertical Crimped |
| D | 直短脚 straight short |
| E | 外彎長脚 Outside Crimped Long |
| F | 內彎短脚 Inside Crimped short |

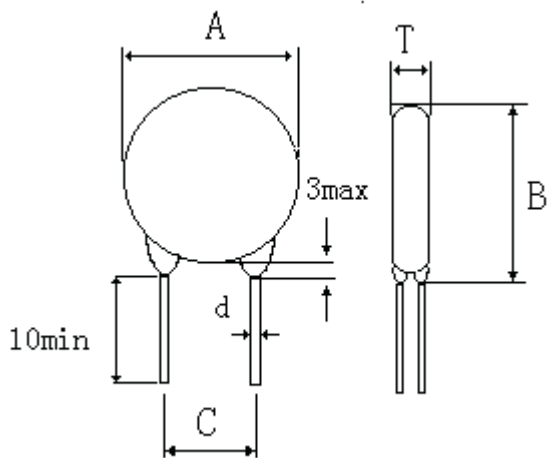


• 包裝方式及數量 QUANTITY & MEASURE

| 規格 Code | 數量 Quantity/塑料袋 Plastic bag | | |
|------------|-----------------------------|---------|---------|
| | 散裝 Bluk | | 編帶 Tape |
| | A.E | B.F.E | |
| 05K | 500 | 1000PCS | 2500PCS |
| 07K | 500 | 1000PCS | 1500PCS |
| 10K | 300 | 500PCS | 1000PCS |
| 14K | 150 | 500PCS | 1000PCS |
| 20K | 100 | 300PCS | 500PCS |
| 25K | 50 | 200PCS | |
| 32K | 50 | | |
| 40K | 25 | | |

• 結構尺寸 DIMENSION

T厚度 Thickness (max) (單位Unit:mm)

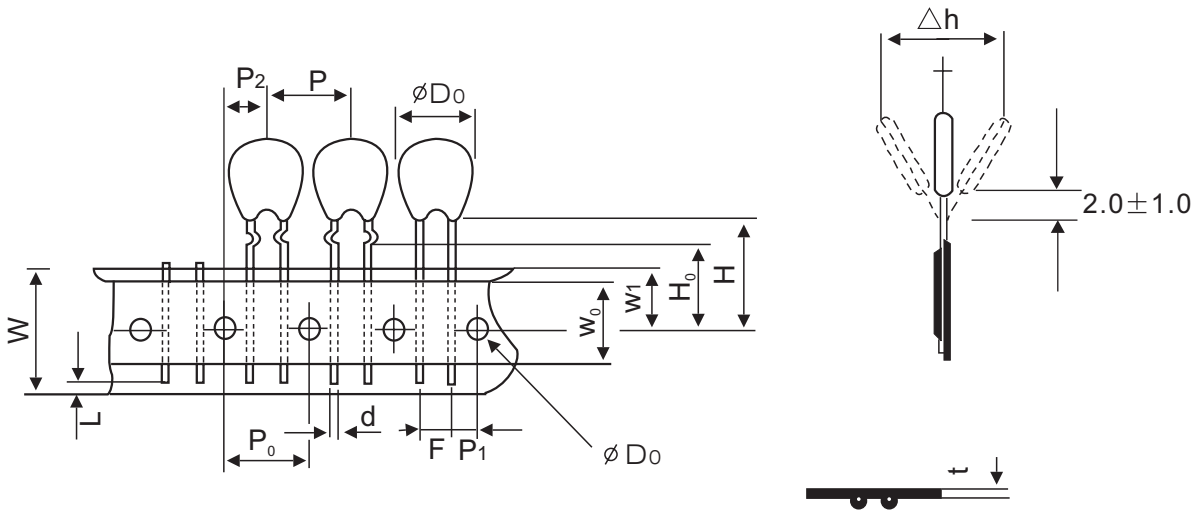


單位 (Unit) : mm

| 規格 Part Code | A | B | d | C |
|--------------------|------|-------|----------|-------|
| | MAX | MAX | | |
| 05K | 7.5 | 10 | 0.6±0.05 | 5±1 |
| 07K | 9.5 | 14 | 0.6±0.05 | 5±1 |
| 10K | 14 | 19 | 0.8±0.05 | 7.5±1 |
| 14K | 17.5 | 20/22 | 0.8±0.05 | 7.5±1 |
| 20K | 24 | 28/30 | 1.0±0.05 | 10±1 |
| 25K | 30 | 33 | 1.5±0.05 | 15±1 |
| 32K | 38 | 43 | 1.5±0.05 | 18±1 |
| 40K | 48 | 52 | 1.5±0.05 | 18±1 |

| 規格 Part Code | 05k | 07k | 10k | 14k | 20k | 25k | 32k | 40k |
|--------------------|-----|-----|-----|-----|------|------|------|------|
| 180 | 4.5 | 4.5 | 4.6 | 4.6 | 4.6 | | | |
| 220 | 4.6 | 4.6 | 4.7 | 4.7 | 4.9 | | | |
| 270 | 4.7 | 4.7 | 4.8 | 4.8 | 5.0 | | | |
| 330 | 4.9 | 4.9 | 5.0 | 5.0 | 5.2 | | | |
| 390 | 4.8 | 4.8 | 5.3 | 5.3 | 5.5 | | | |
| 470 | 4.9 | 4.9 | 5.4 | 5.4 | 5.6 | | | |
| 560 | 5.0 | 5.0 | 5.5 | 5.5 | 5.7 | | | |
| 680 | 5.2 | 5.2 | 5.6 | 5.6 | 5.8 | | | |
| 820 | 4.1 | 4.1 | 4.7 | 4.7 | 4.9 | | | |
| 101 | 4.3 | 4.3 | 4.9 | 4.9 | 5.1 | | | |
| 121 | 4.5 | 4.5 | 5.1 | 5.1 | 5.3 | | | |
| 151 | 4.8 | 4.8 | 5.4 | 5.4 | 5.6 | | | |
| 181 | 4.3 | 4.3 | 5.0 | 5.0 | 5.2 | | | |
| 201 | 4.4 | 4.4 | 5.0 | 5.0 | 5.2 | 5.4 | 5.6 | 5.6 |
| 221 | 4.5 | 4.5 | 5.0 | 5.0 | 5.3 | 5.5 | 5.7 | 5.7 |
| 241 | 4.6 | 4.6 | 5.2 | 5.2 | 5.4 | 5.6 | 5.8 | 5.8 |
| 271 | 4.9 | 4.9 | 5.4 | 5.4 | 5.6 | 5.8 | 6.0 | 6.0 |
| 301 | 5.0 | 5.0 | 5.5 | 5.5 | 5.7 | 5.9 | 6.1 | 6.1 |
| 331 | 5.1 | 5.1 | 5.8 | 5.8 | 6.0 | 6.1 | 6.3 | 6.3 |
| 361 | 5.2 | 5.2 | 6.0 | 6.0 | 6.2 | 6.4 | 6.6 | 6.6 |
| 391 | 5.4 | 5.4 | 6.2 | 6.2 | 6.4 | 6.6 | 6.8 | 6.8 |
| 431 | 5.7 | 5.7 | 6.5 | 6.5 | 6.7 | 6.9 | 7.1 | 7.1 |
| 471 | 6.0 | 6.0 | 6.8 | 6.8 | 7.0 | 7.2 | 7.4 | 7.4 |
| 511 | 6.0 | 6.0 | 6.8 | 6.8 | 7.0 | 7.2 | 7.4 | 7.4 |
| 561 | 6.0 | 6.0 | 6.8 | 6.8 | 7.0 | 7.2 | 7.9 | 7.9 |
| 621 | | 7.1 | 7.3 | 7.3 | 7.8 | 8.0 | 8.2 | 8.2 |
| 681 | | 7.3 | 7.6 | 7.6 | 7.8 | 8.0 | 8.2 | 8.2 |
| 751 | | | 8.0 | 8.0 | 8.2 | 8.4 | 8.6 | 8.6 |
| 781 | | | 8.1 | 8.1 | 8.3 | 8.5 | 8.7 | 8.7 |
| 821 | | | 8.3 | 8.3 | 8.5 | 8.7 | 8.9 | 8.9 |
| 911 | | | 8.8 | 8.8 | 9.0 | 9.2 | 9.4 | 9.4 |
| 102 | | | 9.3 | 9.3 | 9.5 | 9.7 | 9.9 | 9.9 |
| 112 | | | 9.9 | 9.9 | 10.1 | 10.3 | 10.5 | 10.5 |

• 編帶產品 TAPING SPECIFICATION



單位Unit:mm

| Series Symbol | $\phi 5$ | $\phi 7$ | $\phi 10$ | $\phi 14$ |
|------------------|-----------------|-----------------|-----------------|-----------------|
| ϕD | 7.0Max | 9.0Max | 14.0Max | 17.0Max |
| ϕd | 0.6 ± 0.05 | 0.6 ± 0.05 | 0.8 ± 0.05 | 0.8 ± 0.05 |
| P | 12.7 ± 1.0 | 12.7 ± 1.0 | 15.0 ± 1.0 | 30.0 ± 1.0 |
| P_0 | 12.7 ± 1.0 | 12.7 ± 1.0 | 15.0 ± 1.0 | 15.0 ± 1.0 |
| P_1 | 3.85 ± 0.70 | 3.85 ± 0.70 | 3.75 ± 0.70 | 3.85 ± 0.70 |
| P_2 | 6.35 ± 1.30 | 6.35 ± 1.30 | 7.5 ± 1.30 | 7.5 ± 1.30 |
| ϕD_0 | 4.0 ± 0.2 | 4.0 ± 0.2 | 4.0 ± 0.2 | 4.0 ± 0.2 |
| W | 18 ± 1.0 | 18 ± 1.0 | 18 ± 1.0 | 18 ± 1.0 |
| w_0 | 12.5 MIN | 12.5 MIN | 12.5 MIN | 12.5 MIN |
| w_1 | 9.0 ± 1.0 | 9.0 ± 1.0 | 9.0 ± 1.0 | 9.0 ± 1.0 |
| w_2 | 3.0 MAX | 3.0 MAX | 3.0 MAX | 3.0 MAX |
| H | 20 | 20 | 20 | 20 |
| H_0 | 16.0 ± 1.0 | 16.0 ± 1.0 | 16.0 ± 1.0 | 16.0 ± 1.0 |
| Δh | 0 ± 2.0 | 0 ± 2.0 | 0 ± 2.01 | 0 ± 2.01 |
| t | 0.6 ± 0.3 | 0.6 ± 0.3 | 0.6 ± 0.3 | 0.6 ± 0.3 |
| L | 9.0 ± 1.0 | 9.0 ± 1.0 | 9.0 ± 1.0 | 9.0 ± 1.0 |
| F | 5.0 ± 1.0 | 5.0 ± 1.0 | 7.5 ± 1.0 | 7.5 ± 1.0 |

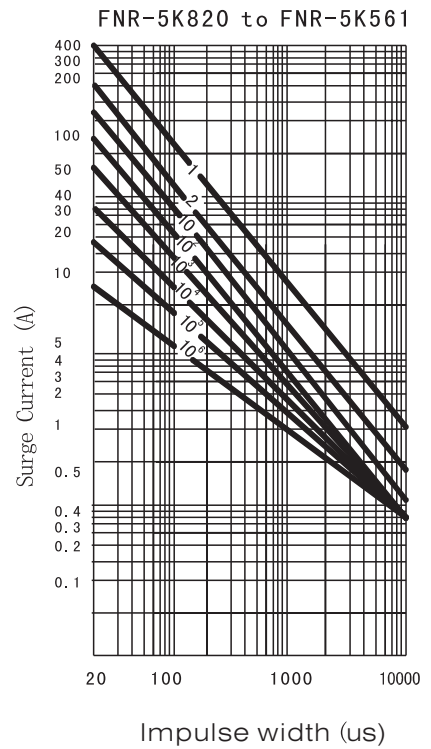
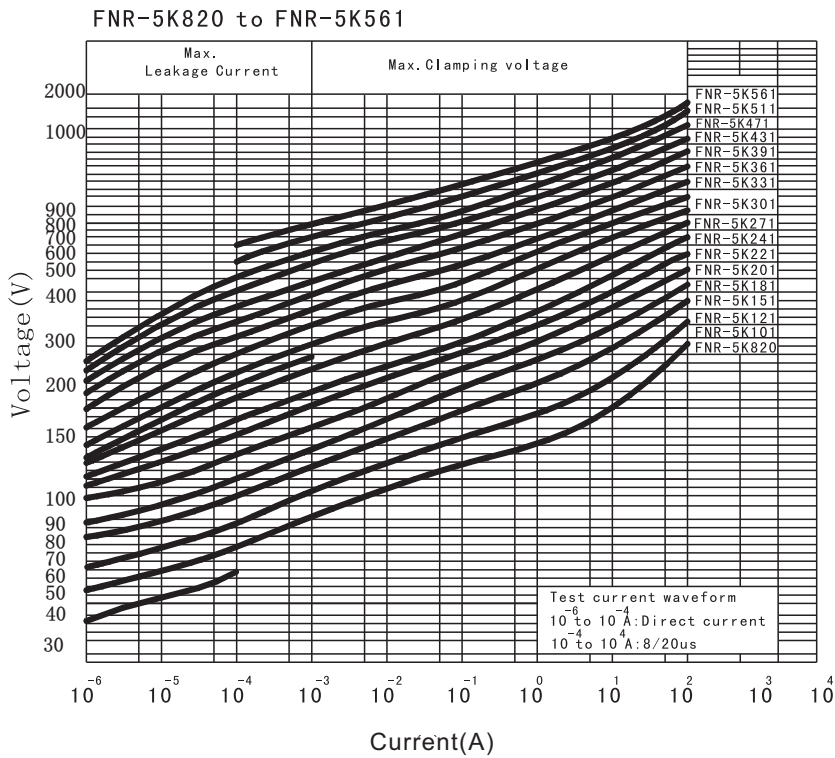
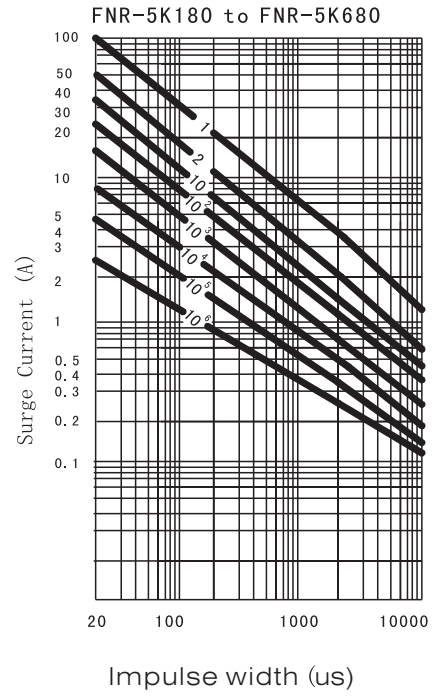
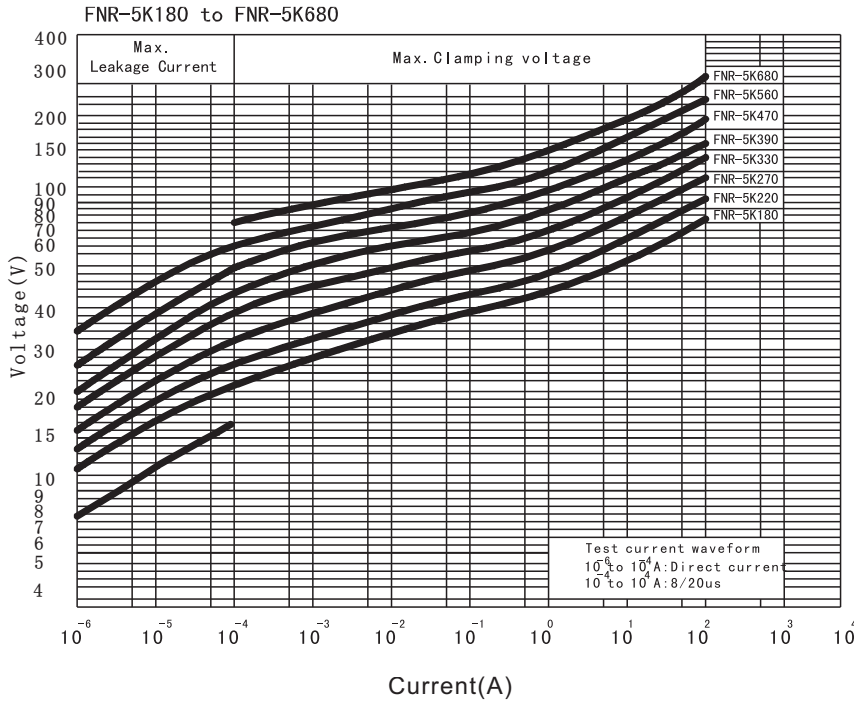
• 5K系列電性能 SERIES SPECIFICATION

| 型號規格 Part Number | 最大允許 使用電壓 Maximum operating Voltage | | 壓敏電壓 Varistor Voltage | 最大限制電壓 Maximum clamping Voltage | | 最大通流容量 Maximum Withstanding Surge Current (8/20 μ S) | 最大能量耐量 Maximum Energy (2ms) | 最大靜態 功率 Rated Wattage | 靜態電容量 (參考值) (1K Hz) Capacitance (Reference) |
|------------------------|---|-----------|-----------------------------|---------------------------------------|-----------|--|---------------------------------------|--------------------------------|---|
| | AC (V) | DC (V) | | V0.1mA (V) | Vc (V) | | | | |
| FNR-05K180 | 11 | 14 | 18 (16.2~19.8) | 40 | 1 | 100 | 0.4 | 0.01 | 1600 |
| FNR-05K220 | 14 | 18 | 22 (19.8~24.2) | 48 | 1 | 100 | 0.5 | 0.01 | 1300 |
| FNR-05K270 | 17 | 22 | 27 (24.3~29.7) | 60 | 1 | 100 | 0.6 | 0.01 | 1050 |
| FNR-05K330 | 20 | 26 | 33 (29.7~36.3) | 73 | 1 | 100 | 0.8 | 0.01 | 900 |
| FNR-05K390 | 25 | 31 | 39 (35.1~42.9) | 86 | 1 | 100 | 0.9 | 0.01 | 500 |
| FNR-05K470 | 30 | 38 | 47 (42.3~51.7) | 104 | 1 | 100 | 1.1 | 0.01 | 450 |
| FNR-05K560 | 35 | 45 | 56 (50.4~61.6) | 123 | 1 | 100 | 1.3 | 0.01 | 400 |
| FNR-05K680 | 40 | 56 | 68 (61.2~74.8) | 150 | 1 | 100 | 1.6 | 0.01 | 350 |
| FNR-05K820 | 50 | 65 | 82 (73.8~90.2) | 155 | 5 | 400 | 1.8 | 0.1 | 250 |
| FNR-05K101 | 60 | 85 | 100 (90~110) | 175 | 5 | 400 | 2.2 | 0.1 | 200 |
| FNR-05K121 | 75 | 100 | 120 (108~132) | 210 | 5 | 400 | 2.5 | 0.1 | 170 |
| FNR-05K151 | 95 | 125 | 150 (135~165) | 260 | 5 | 400 | 4.0 | 0.1 | 140 |
| FNR-05K181 | 115 | 150 | 180 (162~198) | 315 | 5 | 400 | 4.5 | 0.1 | 110 |
| FNR-05K201 | 130 | 170 | 200 (180~220) | 355 | 5 | 400 | 5.0 | 0.1 | 80 |
| FNR-05K221 | 140 | 180 | 220 (198~242) | 380 | 5 | 400 | 6.0 | 0.1 | 70 |
| FNR-05K241 | 150 | 200 | 240 (216~264) | 415 | 5 | 400 | 6.5 | 0.1 | 70 |
| FNR-05K271 | 175 | 225 | 270 (243~297) | 475 | 5 | 400 | 8.0 | 0.1 | 65 |
| FNR-05K301 | 200 | 250 | 300 (270~330) | 525 | 5 | 400 | 8.0 | 0.1 | 55 |
| FNR-05K331 | 210 | 275 | 330 (297~363) | 580 | 5 | 400 | 8.5 | 0.1 | 60 |
| FNR-05K361 | 230 | 300 | 360 (324~396) | 620 | 5 | 400 | 10.0 | 0.1 | 50 |
| FNR-05K391 | 250 | 320 | 390 (351~429) | 675 | 5 | 400 | 10.0 | 0.1 | 50 |
| FNR-05K431 | 275 | 350 | 430 (387~473) | 745 | 5 | 400 | 12.0 | 0.1 | 45 |
| FNR-05K471 | 300 | 385 | 470 (423~517) | 810 | 5 | 400 | 13.0 | 0.1 | 40 |
| FNR-05K511 | 320 | 415 | 510 (459~561) | 845 | 5 | 400 | 14.0 | 0.1 | 39 |
| FNR-05K561 | 350 | 460 | 560 (504~616) | 920 | 5 | 400 | 14.0 | 0.1 | 39 |

• 5K系列 Series

V-I Curve

Impulse Lifetime Ratings
(2 time:5 minutes internal
up to 10 times 2 minutes internal
up to 10⁶ times 10 seconds internal)

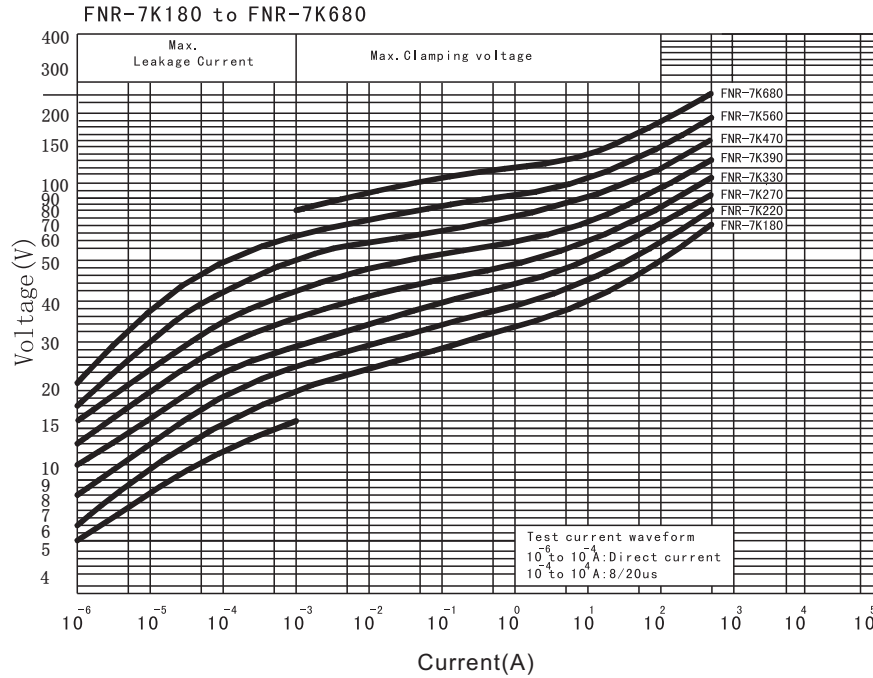


• 7K系列電性能 SERIES SPECIFICATION

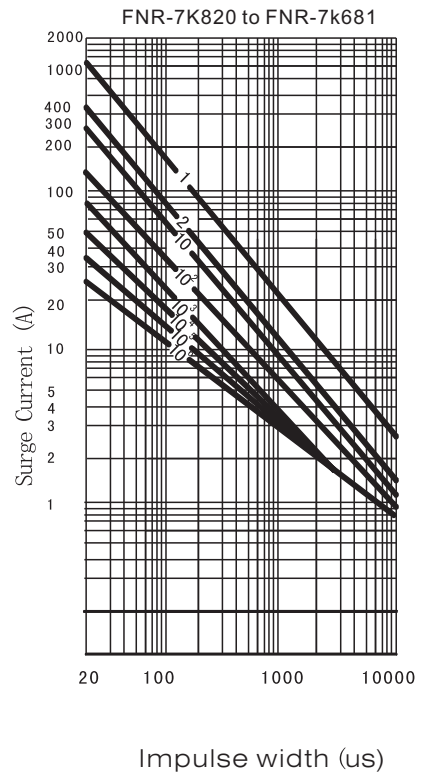
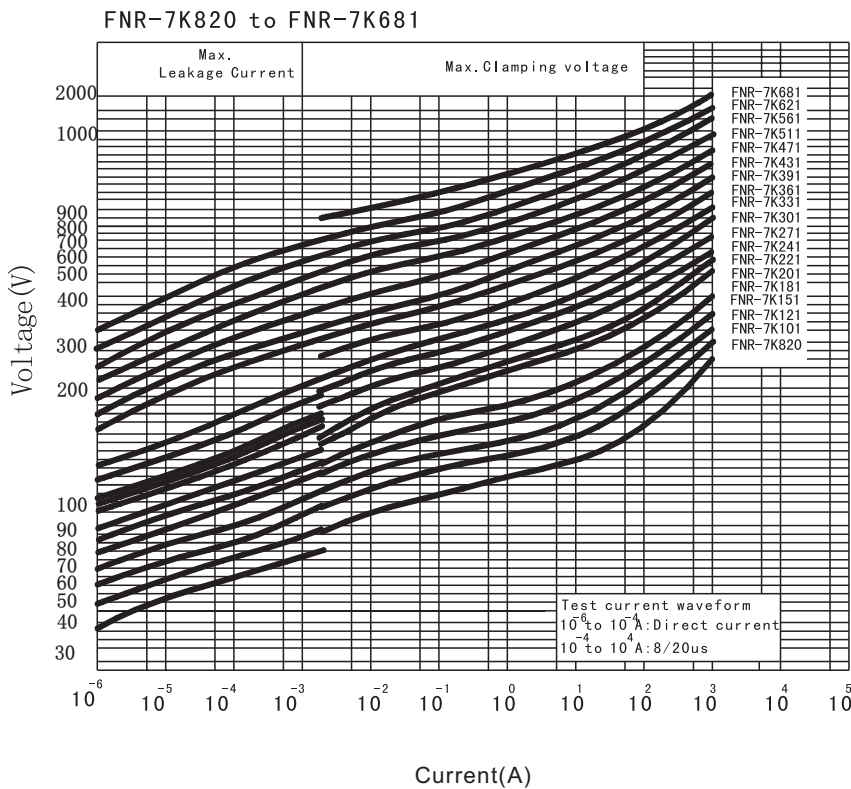
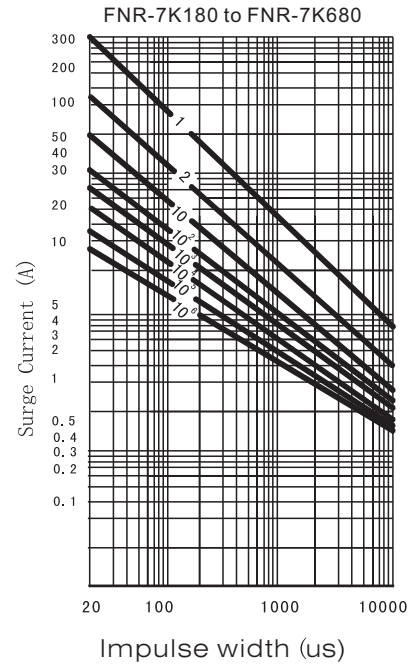
| 型號規格 Part Number | 最大允許 使用電壓 Maximum operating Voltage | | 壓敏電壓 Varistor Voltage | 最大限制電壓 Maximum clamping Voltage | | 最大通流容量 Maximum Withstanding Surge Current (8/20 μ S) | 最大能量耐量 Maximum Energy (2ms) | 最大靜態 功率 Rated Wattage | 靜態電容量 (參考值) (1K Hz) Capacitance (Reference) |
|------------------------|---|-----------|-----------------------------|---------------------------------------|-----------------------|--|--------------------------------------|--------------------------------|---|
| | AC (V) | DC (V) | | V _{0.1mA} (V) | V _c (V) | | | | |
| FNR-07K180 | 11 | 14 | 18(16.2~19.8) | 36 | 3 | 250 | 0.9 | 0.02 | 3500 |
| FNR-07K220 | 14 | 18 | 22(19.8~24.2) | 43 | 3 | 250 | 1.1 | 0.02 | 2800 |
| FNR-07K270 | 17 | 22 | 27(24.3~29.7) | 53 | 3 | 250 | 1.4 | 0.02 | 2000 |
| FNR-07K330 | 20 | 26 | 33(29.7~36.3) | 65 | 3 | 250 | 1.7 | 0.02 | 1500 |
| FNR-07K390 | 25 | 31 | 39(35.1~42.9) | 77 | 3 | 250 | 2.1 | 0.02 | 1350 |
| FNR-07K470 | 30 | 38 | 47(42.3~51.7) | 93 | 3 | 250 | 2.5 | 0.02 | 1150 |
| FNR-07K560 | 35 | 45 | 56(50.4~61.6) | 110 | 3 | 250 | 3.1 | 0.02 | 950 |
| FNR-07K680 | 40 | 56 | 68(61.2~74.8) | 135 | 3 | 250 | 3.6 | 0.02 | 700 |
| FNR-07K820 | 50 | 65 | 82(73.8~90.2) | 135 | 10 | 1200 | 4.2 | 0.25 | 550 |
| FNR-07K101 | 60 | 85 | 100(90~110) | 165 | 10 | 1200 | 4.8 | 0.25 | 500 |
| FNR-07K121 | 75 | 100 | 120(108~132) | 200 | 10 | 1200 | 5.9 | 0.25 | 450 |
| FNR-07K151 | 95 | 125 | 150(135~165) | 250 | 10 | 1200 | 8.0 | 0.25 | 350 |
| FNR-07K181 | 115 | 150 | 180(162~198) | 300 | 10 | 1200 | 10.0 | 0.25 | 300 |
| FNR-07K201 | 130 | 170 | 200(180~220) | 340 | 10 | 1200 | 13.0 | 0.25 | 250 |
| FNR-07K221 | 140 | 180 | 220(198~242) | 360 | 10 | 1200 | 13.0 | 0.25 | 250 |
| FNR-07K241 | 150 | 200 | 240(216~264) | 395 | 10 | 1200 | 13.0 | 0.25 | 200 |
| FNR-07K271 | 175 | 225 | 270(243~297) | 455 | 10 | 1200 | 15.0 | 0.25 | 170 |
| FNR-07K301 | 200 | 250 | 300(270~330) | 500 | 10 | 1200 | 17.0 | 0.25 | 150 |
| FNR-07K331 | 210 | 275 | 330(297~363) | 550 | 10 | 1200 | 22.0 | 0.25 | 150 |
| FNR-07K361 | 230 | 300 | 360(324~396) | 595 | 10 | 1200 | 20.0 | 0.25 | 130 |
| FNR-07K391 | 250 | 320 | 390(351~429) | 650 | 10 | 1200 | 22.0 | 0.25 | 130 |
| FNR-07K431 | 275 | 350 | 430(387~473) | 710 | 10 | 1200 | 26.0 | 0.25 | 110 |
| FNR-07K471 | 300 | 385 | 470(423~517) | 775 | 10 | 1200 | 26.0 | 0.25 | 100 |
| FNR-07K511 | 320 | 415 | 510(459~561) | 840 | 10 | 1200 | 26.0 | 0.25 | 100 |
| FNR-07K561 | 350 | 460 | 560(504~616) | 925 | 10 | 1200 | 26.0 | 0.25 | 90 |
| FNR-07K621 | 385 | 505 | 620(558~682) | 1025 | 10 | 1200 | 26.0 | 0.25 | 80 |
| FNR-07K681 | 420 | 561 | 680(612~748) | 1120 | 10 | 1200 | 26.0 | 0.25 | 75 |

• 7K系列 Series

V-I Curve



Impulse Lifetime Ratings
 (2 time:5 minutes internal
 up to 10 times 2 minutes internal
 up to 10^6 times 10 seconds internal)



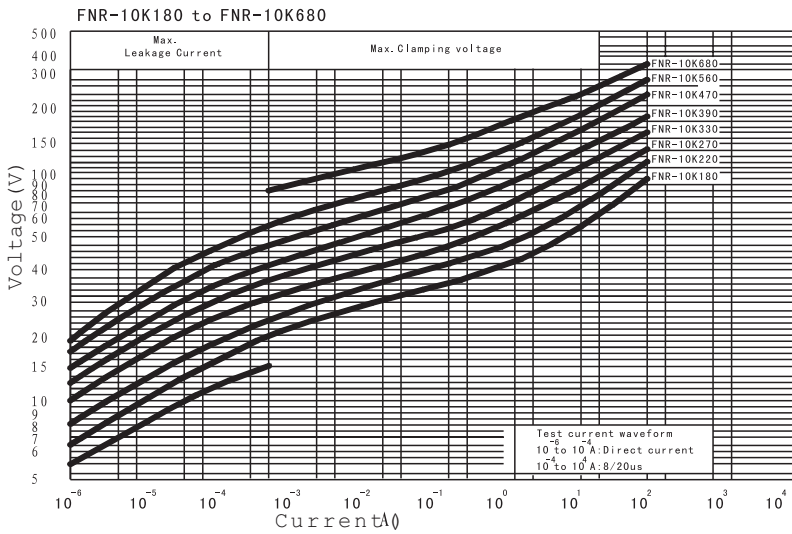
• 10K系列電性能 SERIES SPECIFICATION

| 型號規格 Part Number | 最大允許 使用電壓 Maximum operating Voltage | | 壓敏電壓 Varistor Voltage | 最大限制電壓 Maximum clamping Voltage | | 最大通流量 Maximum Withstanding Surge Current (8/20 μ S) | 最大能量耐量 Maximum Energy (2ms) | 最大靜態 功率 Rated Wattage | 靜態電容量 (參考值) (1k Hz) Capacitance (Reference) |
|------------------------|---|-----------|-----------------------------|---------------------------------------|-----------|---|---------------------------------------|--------------------------------|---|
| | AC (V) | DC (V) | | V0.1mA (V) | Vc (V) | | | | |
| FNR-10K180 | 11 | 14 | 18(16.2~19.8) | 36 | 5 | 500 | 2.1 | 0.05 | 7500 |
| FNR-10K220 | 14 | 18 | 22(19.8~24.2) | 43 | 5 | 500 | 2.5 | 0.05 | 6000 |
| FNR-10K270 | 17 | 22 | 27(24.3~29.7) | 53 | 5 | 500 | 3.0 | 0.05 | 4000 |
| FNR-10K330 | 20 | 26 | 33(29.7~36.3) | 65 | 5 | 500 | 4.0 | 0.05 | 3000 |
| FNR-10K390 | 25 | 31 | 39(35.1~42.9) | 77 | 5 | 500 | 4.6 | 0.05 | 2600 |
| FNR-10K470 | 30 | 38 | 47(42.3~51.7) | 93 | 5 | 500 | 5.5 | 0.05 | 2200 |
| FNR-10K560 | 35 | 45 | 56(50.4~61.6) | 110 | 5 | 500 | 7.0 | 0.05 | 1800 |
| FNR-10K680 | 40 | 56 | 68(61.2~74.8) | 135 | 5 | 500 | 8.2 | 0.05 | 1300 |
| FNR-10K820 | 50 | 65 | 82(73.8~90.2) | 135 | 25 | 2500 | 8.4 | 0.4 | 1800 |
| FNR-10K101 | 60 | 85 | 100(90~110) | 165 | 25 | 2500 | 10.0 | 0.4 | 1400 |
| FNR-10K121 | 75 | 100 | 120(108~132) | 200 | 25 | 2500 | 15.0 | 0.4 | 1100 |
| FNR-10K151 | 95 | 125 | 150(135~165) | 250 | 25 | 2500 | 20.0 | 0.4 | 900 |
| FNR-10K181 | 115 | 150 | 180(162~198) | 300 | 25 | 2500 | 23.0 | 0.4 | 700 |
| FNR-10K201 | 130 | 170 | 200(180~220) | 340 | 25 | 2500 | 26.0 | 0.4 | 500 |
| FNR-10K221 | 140 | 180 | 220(198~242) | 360 | 25 | 2500 | 30.0 | 0.4 | 450 |
| FNR-10K241 | 150 | 200 | 240(216~264) | 395 | 25 | 2500 | 32.0 | 0.4 | 400 |
| FNR-10K271 | 175 | 225 | 270(243~297) | 455 | 25 | 2500 | 40.0 | 0.4 | 350 |
| FNR-10K301 | 200 | 250 | 300(270~330) | 500 | 25 | 2500 | 35.0 | 0.4 | 325 |
| FNR-10K331 | 210 | 275 | 330(297~363) | 550 | 25 | 2500 | 39.0 | 0.4 | 325 |
| FNR-10K361 | 230 | 300 | 360(324~396) | 595 | 25 | 2500 | 32.0 | 0.4 | 300 |
| FNR-10K391 | 250 | 320 | 390(351~429) | 650 | 25 | 2500 | 52.0 | 0.4 | 270 |
| FNR-10K431 | 275 | 350 | 430(387~473) | 710 | 25 | 2500 | 58.0 | 0.4 | 250 |
| FNR-10K471 | 300 | 385 | 470(423~517) | 775 | 25 | 2500 | 58.0 | 0.4 | 230 |
| FNR-10K511 | 318 | 415 | 510(459~561) | 840 | 25 | 2500 | 58.0 | 0.4 | 200 |
| FNR-10K561 | 350 | 455 | 560(504~616) | 925 | 25 | 2500 | 58.0 | 0.4 | 180 |
| FNR-10K621 | 385 | 505 | 620(558~682) | 1025 | 25 | 2500 | 58.0 | 0.4 | 130 |
| FNR-10K681 | 420 | 560 | 680(612~748) | 1120 | 25 | 2500 | 60.0 | 0.4 | 130 |
| FNR-10K751 | 460 | 615 | 750(675~825) | 1240 | 25 | 2500 | 65.0 | 0.4 | 120 |
| FNR-10K781 | 485 | 640 | 780(702~858) | 1290 | 25 | 2500 | 65.0 | 0.4 | 120 |
| FNR-10K821 | 510 | 670 | 820(738~902) | 1355 | 25 | 2500 | 71.0 | 0.4 | 110 |
| FNR-10K911 | 550 | 745 | 910(819~1001) | 1500 | 25 | 2500 | 78.0 | 0.4 | 100 |
| FNR-10K102 | 625 | 825 | 1000(900~1100) | 1650 | 25 | 2500 | 84.0 | 0.4 | 90 |
| FNR-10K112 | 680 | 895 | 1100(990~1210) | 1815 | 25 | 2500 | 91.0 | 0.4 | 80 |

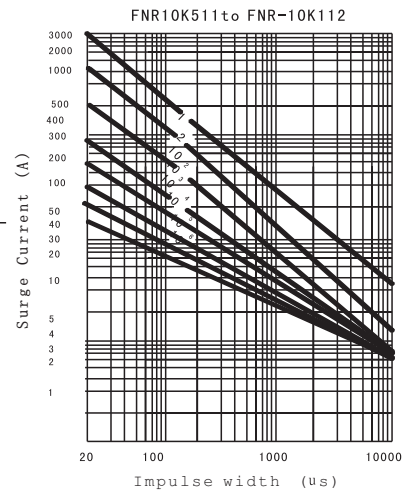
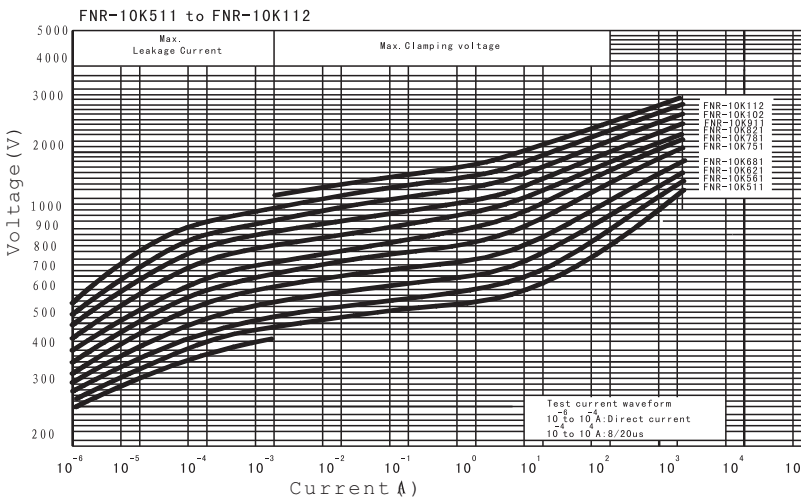
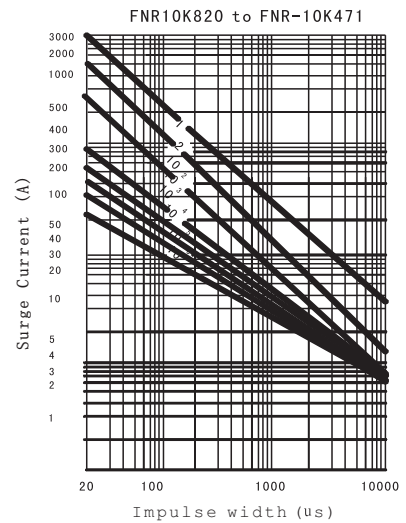
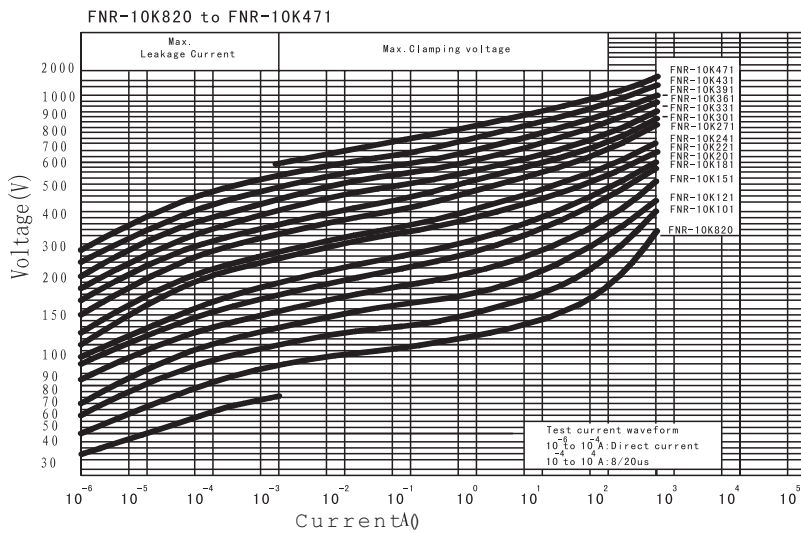
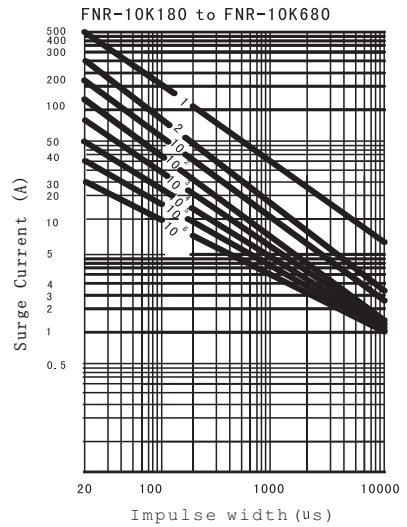
壓敏電阻器 ZINC OXIDE VARISTOR

• 10K系列 Series

V-I Curve



Impulse Lifetime Ratings

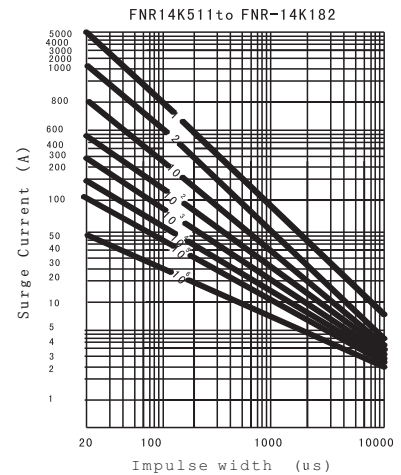
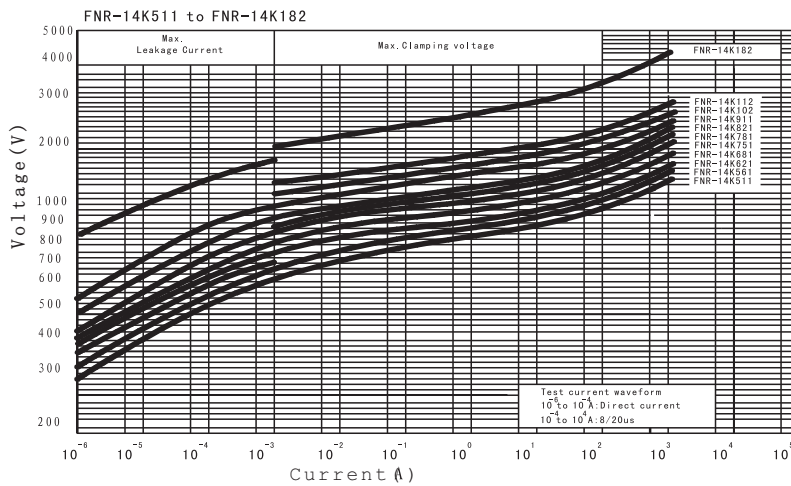
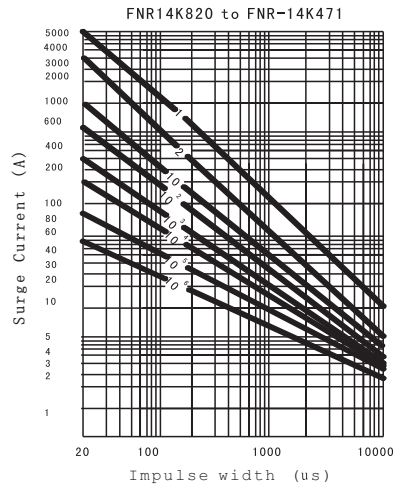
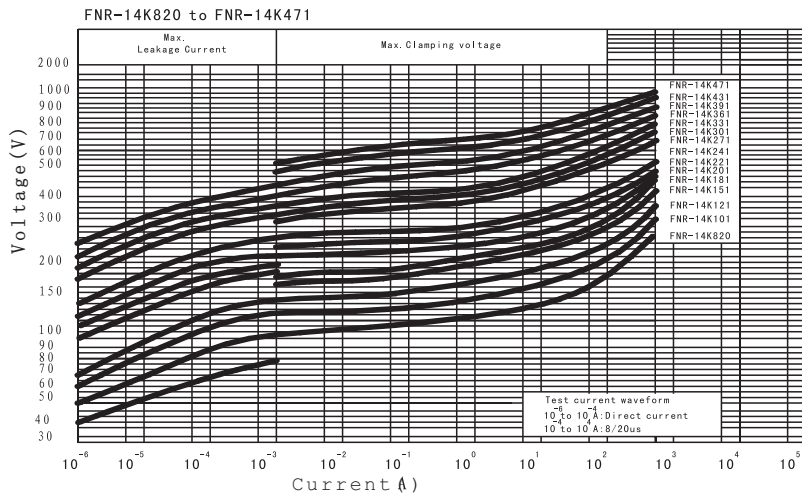
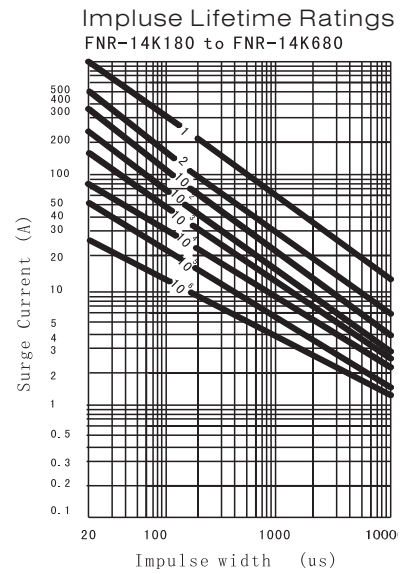
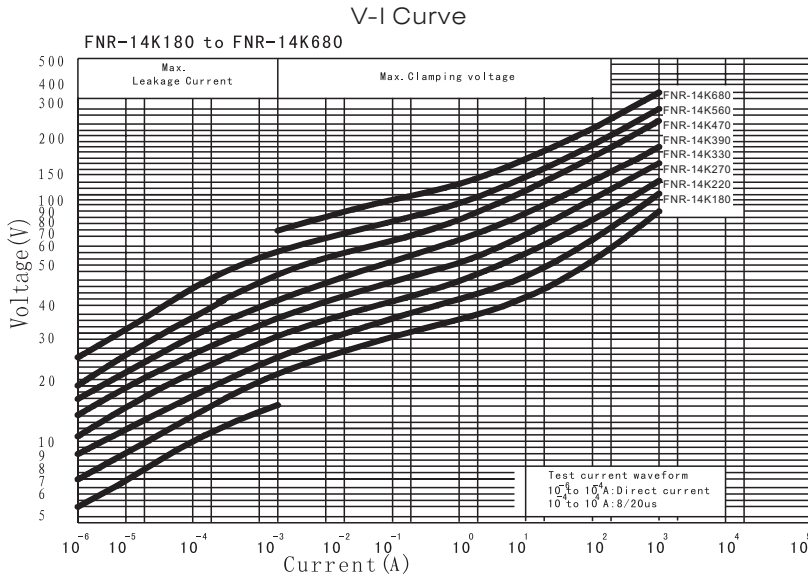


• 14K系列電性能 SERIES SPECIFICATION

| 型號規格 Part Number | 最大允許 使用電壓 Maximum operating Voltage | | 壓敏電壓 Varistor Voltage | 最大限制電壓 Maximun clamping Voltage | | 最大通流容量 Maximum Withstanding Surge Current (8/20 μ S) | 最大能量耐量 Maximum Energy (2ms) | 最大靜態 功率 Rated Wattage | 靜態電容量 (參考值) (1K Hz) Capacitance (Reference) |
|------------------------|---|-----------|-----------------------------|---------------------------------------|-----------------------|--|--------------------------------------|--------------------------------|---|
| | AC (V) | DC (V) | | V _{0.1mA} (V) | V _c (V) | | | | |
| FNR-14K180 | 11 | 14 | 18(16.2~19.8) | 36 | 10 | 1000 | 4.0 | 0.1 | 18000 |
| FNR-14K220 | 14 | 18 | 22(19.8~24.2) | 43 | 10 | 1000 | 5.0 | 0.1 | 15000 |
| FNR-14K270 | 17 | 22 | 27(24.3~29.7) | 53 | 10 | 1000 | 6.0 | 0.1 | 10000 |
| FNR-14K330 | 20 | 26 | 33(29.7~36.3) | 65 | 10 | 1000 | 7.5 | 0.1 | 7500 |
| FNR-14K390 | 25 | 31 | 39(35.1~42.9) | 77 | 10 | 1000 | 8.6 | 0.1 | 6500 |
| FNR-14K470 | 30 | 38 | 47(42.3~51.7) | 93 | 10 | 1000 | 10.0 | 0.1 | 5500 |
| FNR-14K560 | 35 | 45 | 56(50.4~61.6) | 110 | 10 | 1000 | 11.0 | 0.1 | 4500 |
| FNR-14K680 | 40 | 56 | 68(61.2~74.8) | 135 | 10 | 1000 | 14.0 | 0.1 | 3300 |
| FNR-14K820 | 50 | 65 | 82(73.8~90.2) | 135 | 50 | 4500 | 15.0 | 0.6 | 2900 |
| FNR-14K101 | 60 | 85 | 100(90~110) | 165 | 50 | 4500 | 18.0 | 0.6 | 2400 |
| FNR-14K121 | 75 | 100 | 120(108~220) | 200 | 50 | 4500 | 26.0 | 0.6 | 1900 |
| FNR-14K151 | 95 | 125 | 150(135~165) | 250 | 50 | 4500 | 32.0 | 0.6 | 1500 |
| FNR-14K181 | 115 | 150 | 180(162~198) | 300 | 50 | 4500 | 39.0 | 0.6 | 1250 |
| FNR-14K201 | 130 | 170 | 200(180~220) | 340 | 50 | 4500 | 45.0 | 0.6 | 1000 |
| FNR-14K221 | 140 | 180 | 220(198~242) | 360 | 50 | 4500 | 52.0 | 0.6 | 1000 |
| FNR-14K241 | 150 | 200 | 240(216~264) | 395 | 50 | 4500 | 52.0 | 0.6 | 900 |
| FNR-14K271 | 175 | 225 | 270(243~297) | 455 | 50 | 4500 | 65.0 | 0.6 | 750 |
| FNR-14K301 | 200 | 250 | 300(270~330) | 500 | 50 | 4500 | 71.0 | 0.6 | 650 |
| FNR-14K331 | 210 | 275 | 330(297~363) | 550 | 50 | 4500 | 78.0 | 0.6 | 650 |
| FNR-14K361 | 230 | 300 | 360(324~396) | 595 | 50 | 4500 | 84.0 | 0.6 | 550 |
| FNR-14K391 | 250 | 320 | 390(351~429) | 650 | 50 | 4500 | 91.0 | 0.6 | 500 |
| FNR-14K431 | 275 | 350 | 430(387~473) | 710 | 50 | 4500 | 97.0 | 0.6 | 450 |
| FNR-14K471 | 300 | 385 | 470(423~517) | 775 | 50 | 4500 | 104.0 | 0.6 | 440 |
| FNR-14K511 | 318 | 415 | 510(459~561) | 840 | 50 | 4500 | 104.0 | 0.6 | 380 |
| FNR-14K561 | 350 | 455 | 560(504~616) | 925 | 50 | 4500 | 104.0 | 0.6 | 345 |
| FNR-14K621 | 385 | 505 | 620(585~682) | 1025 | 50 | 4500 | 110.0 | 0.6 | 250 |
| FNR-14K681 | 420 | 560 | 680(612~748) | 1120 | 50 | 4500 | 117.0 | 0.6 | 250 |
| FNR-14K751 | 460 | 615 | 750(675~825) | 1240 | 50 | 4500 | 130.0 | 0.6 | 230 |
| FNR-14K781 | 485 | 640 | 780(702~858) | 1290 | 50 | 4500 | 136.0 | 0.6 | 230 |
| FNR-14K821 | 510 | 670 | 820(738~903) | 1355 | 50 | 4500 | 143.0 | 0.6 | 200 |
| FNR-14K911 | 550 | 745 | 910(819~1001) | 1500 | 50 | 4500 | 156.0 | 0.6 | 180 |
| FNR-14K102 | 625 | 825 | 1000(900~1100) | 1650 | 50 | 4500 | 169.0 | 0.6 | 150 |
| FNR-14K112 | 680 | 895 | 1100(990~1210) | 1815 | 50 | 4500 | 182.0 | 0.6 | 150 |
| FNR-14K182 | 1000 | 1465 | 1800(1620~1980) | 2970 | 50 | 4500 | 312.0 | 0.6 | 100 |

壓敏電阻器 ZINC OXIDE VARISTOR

• 14K系列 Series



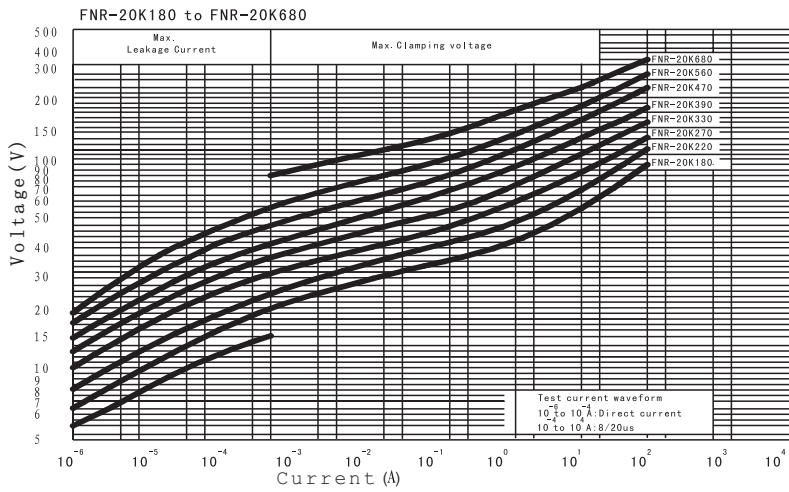
• 20K系列電性能 SERIES SPECIFICATION

| 型號規格 Part Number | 最大允許 使用電壓 Maximum operating Voltage | | 壓敏電壓 Varistor Voltage V0.1mA (V) | 最大限制電壓 Maximum clamping Voltage | | 最大通流容量 Maximum Withstanding Surge Current (8/20 μ S) | 最大能量耐量 Maximum Energy (2ms) (J) | 最大靜態 功率 Rated Wattage (W) | 靜態電容量 (參考值) (1K Hz) Capacitance (Reference) (PF) |
|------------------------|---|-----------|--|---------------------------------------|-----------|--|---|---------------------------------------|---|
| | AC (V) | DC (V) | | Vc (V) | IP (A) | | | | |
| FNR-20K180 | 11 | 14 | 18(16.2~19.8) | 36 | 20 | 2000 | 11.0 | 0.2 | 18000 |
| FNR-20K220 | 14 | 18 | 22(19.8~24.2) | 43 | 20 | 2000 | 13.0 | 0.2 | 30000 |
| FNR-20K270 | 17 | 22 | 27(24.3~29.7) | 53 | 20 | 2000 | 15.0 | 0.2 | 20000 |
| FNR-20K330 | 20 | 26 | 33(29.7~36.3) | 65 | 20 | 2000 | 20.0 | 0.2 | 17000 |
| FNR-20K390 | 25 | 31 | 39(35.1~42.9) | 77 | 20 | 2000 | 24.0 | 0.2 | 15000 |
| FNR-20K470 | 30 | 38 | 47(42.3~51.7) | 93 | 20 | 2000 | 30.0 | 0.2 | 13000 |
| FNR-20K560 | 35 | 45 | 56(50.4~61.6) | 110 | 20 | 2000 | 35.0 | 0.2 | 11000 |
| FNR-20K680 | 40 | 56 | 68(61.2~74.8) | 135 | 20 | 2000 | 40.0 | 0.2 | 7000 |
| FNR-20K820 | 50 | 65 | 82(73.8~90.2) | 135 | 100 | 6500 | 27.0 | 1.0 | 5500 |
| FNR-20K101 | 60 | 85 | 100(90~110) | 165 | 100 | 6500 | 33.0 | 1.0 | 4800 |
| FNR-20K121 | 75 | 100 | 120(108~220) | 200 | 100 | 6500 | 52.0 | 1.0 | 3800 |
| FNR-20K151 | 95 | 125 | 150(135~165) | 250 | 100 | 6500 | 65.0 | 1.0 | 3000 |
| FNR-20K181 | 115 | 150 | 180(162~198) | 300 | 100 | 6500 | 78.0 | 1.0 | 2500 |
| FNR-20K201 | 130 | 170 | 200(180~220) | 340 | 100 | 6500 | 91.0 | 1.0 | 2000 |
| FNR-20K221 | 140 | 180 | 220(198~242) | 360 | 100 | 6500 | 97.0 | 1.0 | 2000 |
| FNR-20K241 | 150 | 200 | 240(216~264) | 395 | 100 | 6500 | 100.0 | 1.0 | 1800 |
| FNR-20K271 | 175 | 225 | 270(243~297) | 455 | 100 | 6500 | 117.0 | 1.0 | 1600 |
| FNR-20K301 | 200 | 250 | 300(270~330) | 500 | 100 | 6500 | 136.0 | 1.0 | 1400 |
| FNR-20K331 | 210 | 275 | 330(297~363) | 550 | 100 | 6500 | 136.0 | 1.0 | 1400 |
| FNR-20K361 | 230 | 300 | 360(324~396) | 595 | 100 | 6500 | 156.0 | 1.0 | 1200 |
| FNR-20K391 | 250 | 320 | 390(351~429) | 650 | 100 | 6500 | 169.0 | 1.0 | 1000 |
| FNR-20K431 | 275 | 350 | 430(387~473) | 710 | 100 | 6500 | 182.0 | 1.0 | 900 |
| FNR-20K471 | 300 | 385 | 470(423~517) | 775 | 100 | 6500 | 195.0 | 1.0 | 900 |
| FNR-20K511 | 318 | 415 | 510(459~561) | 840 | 100 | 6500 | 195.0 | 1.0 | 800 |
| FNR-20K561 | 350 | 455 | 560(504~616) | 925 | 100 | 6500 | 195.0 | 1.0 | 700 |
| FNR-20K621 | 385 | 505 | 620(585~682) | 1025 | 100 | 6500 | 195.0 | 1.0 | 500 |
| FNR-20K681 | 420 | 560 | 680(612~748) | 1120 | 100 | 6500 | 208.0 | 1.0 | 460 |
| FNR-20K751 | 460 | 615 | 750(675~825) | 1240 | 100 | 6500 | 227.0 | 1.0 | 420 |
| FNR-20K781 | 485 | 640 | 780(702~858) | 1290 | 100 | 6500 | 234.0 | 1.0 | 420 |
| FNR-20K821 | 510 | 670 | 820(738~903) | 1355 | 100 | 6500 | 247.0 | 1.0 | 400 |
| FNR-20K911 | 550 | 745 | 910(819~1001) | 1500 | 100 | 6500 | 280.0 | 1.0 | 350 |
| FNR-20K102 | 625 | 825 | 1000(900~1100) | 1650 | 100 | 6500 | 299.0 | 1.0 | 320 |
| FNR-20K112 | 680 | 895 | 1100(990~1210) | 1815 | 100 | 6500 | 325.0 | 1.0 | 300 |
| FNR-20K182 | 1000 | 1465 | 1800(1620~1980) | 2970 | 100 | 6500 | 400.0 | 1.0 | 200 |

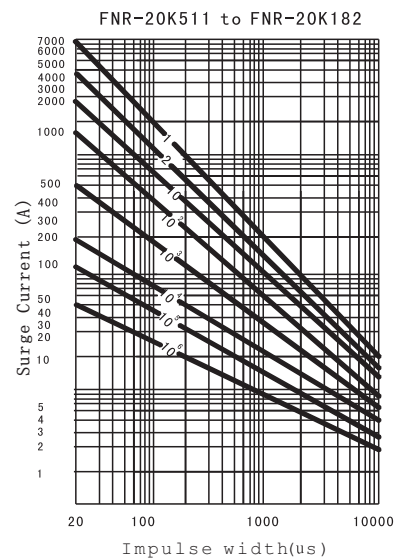
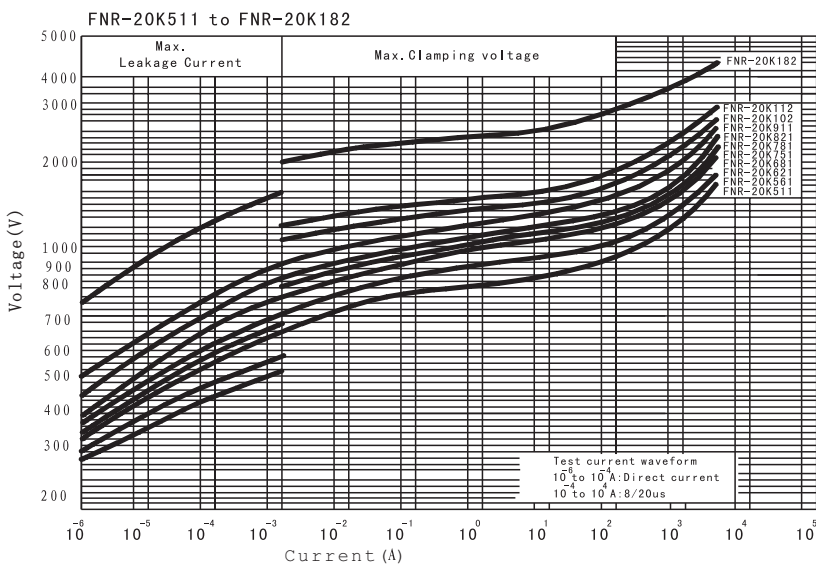
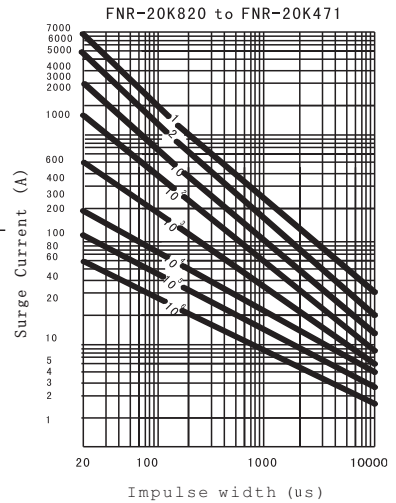
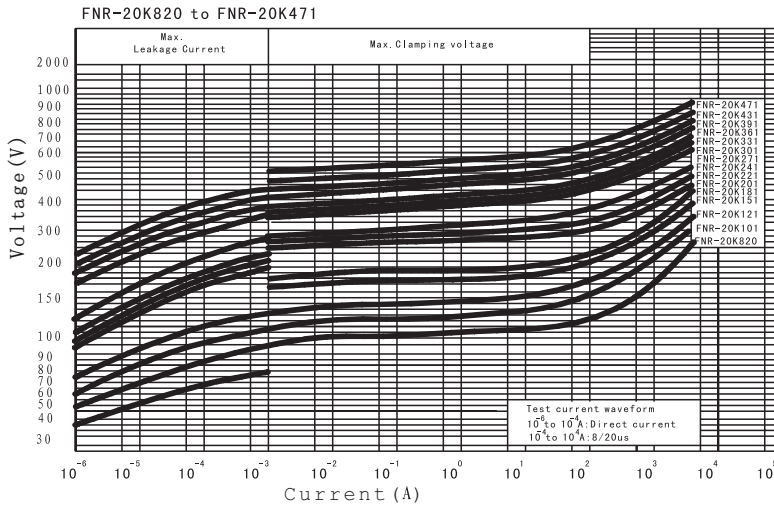
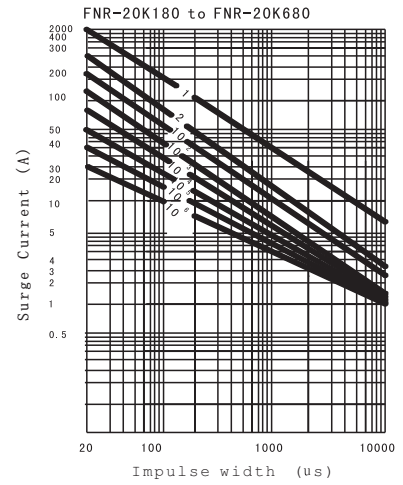
壓敏電阻器 ZINC OXIDE VARISTOR

• 20K系列 Series

V-I Curve



Impluse Lifetime Ratings

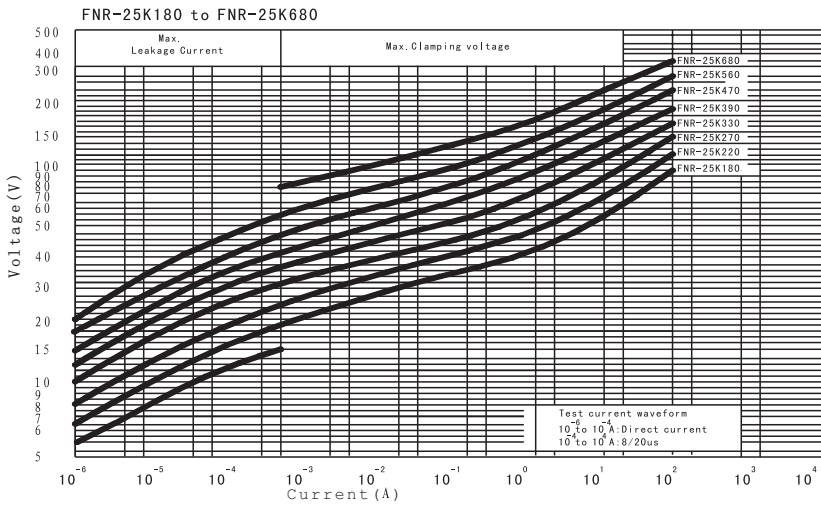


• 25K系列電性能 SERIES SPECIFICATION

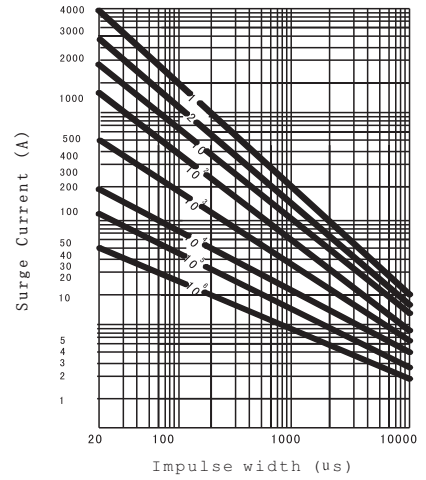
| 型號規格 Part Number | 最大允許 使用電壓 Maximum operating Voltage | | 壓敏電壓 Varistor Voltage V0.1mA (V) | 最大限制電壓 Maximum clamping Voltage | | 最大通流量 Maximum Withstanding Surge Current (8/20 μ S) | 最大能量耐量 Maximum Energy (2ms) (J) | 最大靜態 功率 Rated Wattage (W) | 靜態電容量 (參考值) (1K Hz) Capacitance (Reference) (PF) |
|------------------------|---|-----------|--|---------------------------------------|-----------|---|---|---------------------------------------|---|
| | AC (V) | DC (V) | | Vc (V) | IP (A) | | | | |
| FNR-25K470 | 30 | 38 | 47(42.3~51.7) | 89 | 40 | 2500 | 15 | 1.0 | 10000 |
| FNR-25K560 | 35 | 45 | 56(50.4~61.6) | 106 | 40 | 2500 | 21 | 1.0 | 8000 |
| FNR-25K680 | 40 | 56 | 68(61.2~74.8) | 129 | 40 | 2500 | 23 | 1.0 | 7000 |
| FNR-25K820 | 50 | 65 | 82(73.8~90.2) | 156 | 200 | 10000 | 35 | 1.0 | 6000 |
| FNR-25K101 | 60 | 85 | 100(90~110) | 190 | 200 | 10000 | 32 | 1.0 | 5000 |
| FNR-25K121 | 75 | 100 | 120(108~132) | 216 | 200 | 10000 | 36 | 1.0 | 4000 |
| FNR-25K151 | 95 | 125 | 150(135~165) | 270 | 200 | 10000 | 39 | 1.0 | 3000 |
| FNR-25K201 | 130 | 170 | 200(180~220) | 360 | 200 | 10000 | 45 | 1.0 | 2400 |
| FNR-25K221 | 140 | 180 | 220(198~242) | 385 | 200 | 10000 | 52 | 1.0 | 2200 |
| FNR-25K241 | 150 | 200 | 240(216~264) | 420 | 200 | 10000 | 78 | 1.0 | 2000 |
| FNR-25K271 | 175 | 225 | 270(243~297) | 473 | 200 | 10000 | 117 | 1.0 | 1700 |
| FNR-25K301 | 200 | 250 | 300(270~330) | 500 | 200 | 10000 | 130 | 1.0 | 1500 |
| FNR-25K331 | 210 | 275 | 330(297~363) | 550 | 200 | 10000 | 140 | 1.0 | 1400 |
| FNR-25K361 | 230 | 300 | 360(324~396) | 595 | 200 | 10000 | 156 | 1.0 | 1400 |
| FNR-25K391 | 250 | 320 | 390(351~429) | 650 | 200 | 10000 | 195 | 1.0 | 1200 |
| FNR-25K431 | 275 | 350 | 430(387~473) | 710 | 200 | 10000 | 234 | 1.0 | 1100 |
| FNR-25K471 | 300 | 385 | 470(423~517) | 775 | 200 | 10000 | 286 | 1.0 | 1000 |
| FNR-25K511 | 318 | 415 | 510(459~561) | 840 | 200 | 10000 | 290 | 1.0 | 900 |
| FNR-25K561 | 350 | 455 | 560(504~616) | 925 | 200 | 10000 | 300 | 1.0 | 850 |
| FNR-25K621 | 385 | 505 | 620(558~682) | 1025 | 200 | 10000 | 338 | 1.0 | 800 |
| FNR-25K681 | 420 | 560 | 680(612~748) | 1120 | 200 | 10000 | 390 | 1.0 | 1200 |
| FNR-25K751 | 460 | 615 | 750(675~825) | 1240 | 200 | 10000 | 455 | 1.0 | 1100 |
| FNR-25K781 | 485 | 640 | 780(702~858) | 1290 | 200 | 10000 | 481 | 1.0 | 1050 |
| FNR-25K821 | 510 | 670 | 820(738~902) | 1355 | 200 | 10000 | 520 | 1.0 | 1000 |
| FNR-25K911 | 550 | 745 | 910(819~1001) | 1500 | 200 | 10000 | 546 | 1.0 | 900 |
| FNR-25K102 | 625 | 825 | 1000(900~1100) | 1650 | 200 | 10000 | 585 | 1.0 | 800 |
| FNR-25K112 | 680 | 895 | 1100(990~1210) | 1815 | 200 | 10000 | 650 | 1.0 | 700 |
| FNR-25K182 | 1000 | 1465 | 1800(1620~1980) | 2970 | 200 | 10000 | 700 | 1.0 | 600 |

• 25K系列 Series

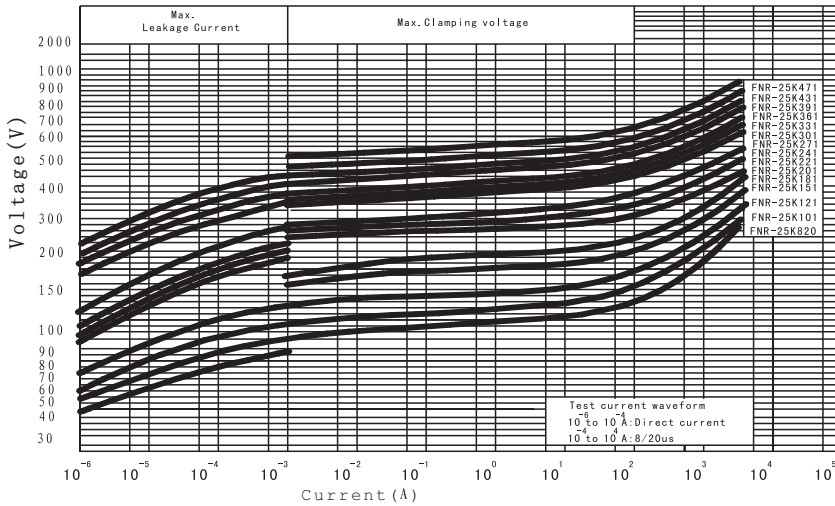
V-I Curve



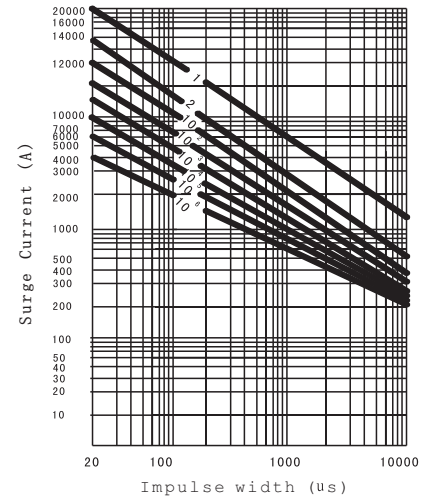
Impulse Lifetime Ratings
FNR-25K180 to FNR-25K680



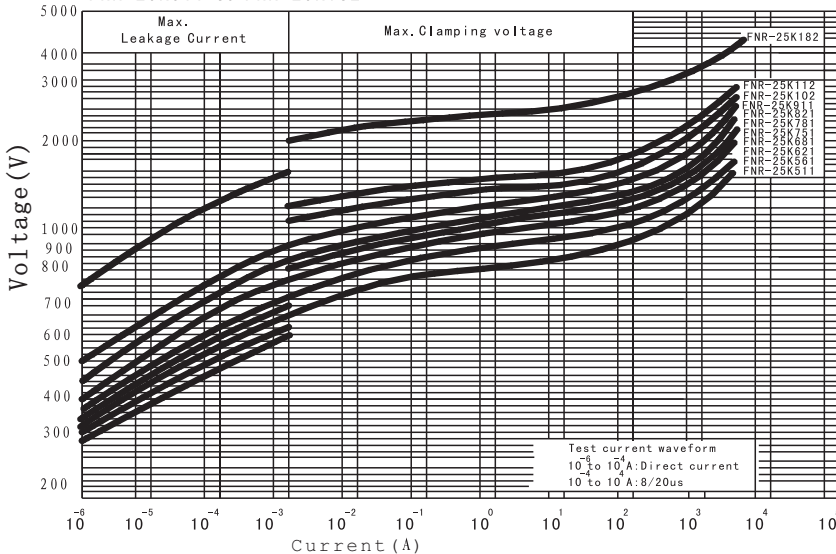
FNR-25K820 to FNR-25K471



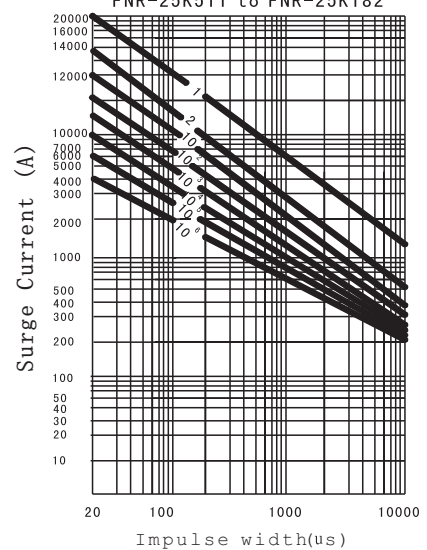
FNR-25K820 to FNR-25K471



FNR-25K511 to FNR-25K182



FNR-25K511 to FNR-25K182

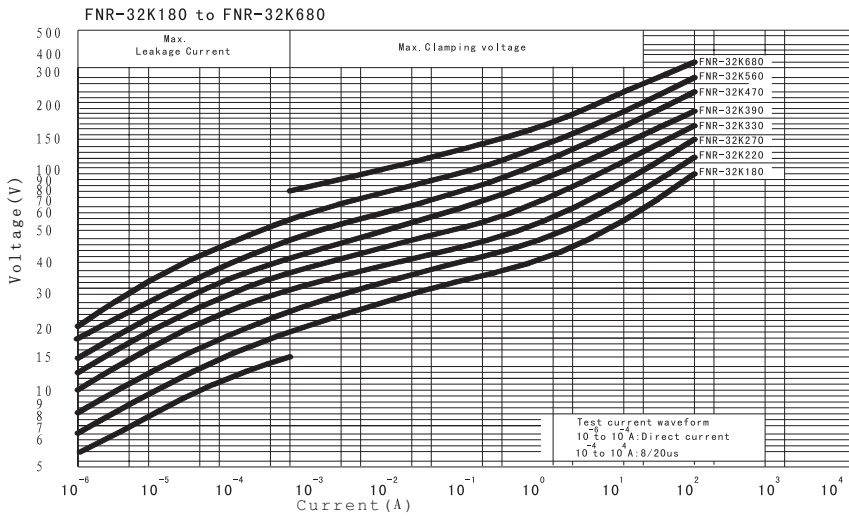


• 32K系列電性能 SERIES SPECIFICATION

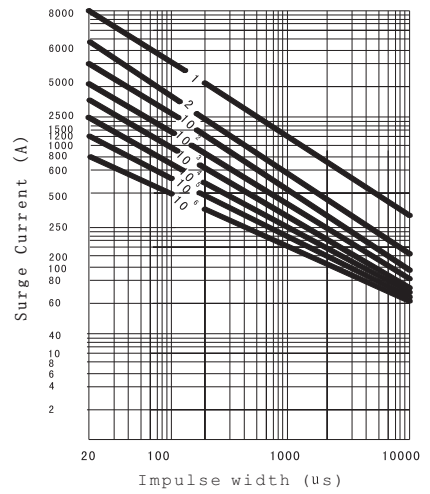
| 型號規格 Part Number | 最大允許 使用電壓 Maximum operating Voltage | | 壓敏電壓 Varistor Voltage V0.1mA (V) | 最大限制電壓 Maximum clamping Voltage | | 最大通流量 Maximum Withstanding Surge Current (8/20 μ S) | 最大能量耐量 Maximum Energy (2ms) (J) | 最大靜態 功率 Rated Wattage (W) | 靜態電容量 (參考值) (1K Hz) Capacitance (Reference) (PF) |
|------------------------|---|-----------|--|---------------------------------------|-----------|---|---|---------------------------------------|---|
| | AC (V) | DC (V) | | VC (V) | IP (A) | | | | |
| FNR-32K470 | 30 | 38 | 47(42.3~51.7) | 89 | 40 | 5000 | 25 | 1.2 | 11000 |
| FNR-32K560 | 35 | 45 | 56(50.4~61.6) | 106 | 40 | 5000 | 30 | 1.2 | 10000 |
| FNR-32K680 | 40 | 56 | 68(61.2~74.8) | 129 | 40 | 5000 | 32 | 1.2 | 9000 |
| FNR-32K820 | 50 | 65 | 82(73.8~90.2) | 156 | 200 | 20000 | 35 | 1.2 | 8000 |
| FNR-32K101 | 60 | 85 | 100(90~110) | 190 | 200 | 20000 | 49 | 1.2 | 7000 |
| FNR-32K121 | 75 | 100 | 120(108~132) | 216 | 200 | 20000 | 54 | 1.2 | 6000 |
| FNR-32K151 | 95 | 125 | 150(135~165) | 270 | 200 | 20000 | 65 | 1.2 | 5000 |
| FNR-32K201 | 130 | 170 | 200(180~220) | 360 | 200 | 20000 | 91 | 1.2 | 4700 |
| FNR-32K221 | 140 | 180 | 220(198~242) | 385 | 200 | 20000 | 117 | 1.2 | 4300 |
| FNR-32K241 | 150 | 200 | 240(216~264) | 395 | 200 | 20000 | 156 | 1.2 | 4000 |
| FNR-32K271 | 175 | 225 | 270(243~297) | 455 | 200 | 20000 | 195 | 1.2 | 3500 |
| FNR-32K301 | 200 | 250 | 300(270~330) | 500 | 200 | 20000 | 200 | 1.2 | 3200 |
| FNR-32K331 | 210 | 275 | 330(297~363) | 550 | 200 | 20000 | 210 | 1.2 | 3000 |
| FNR-32K361 | 230 | 300 | 360(324~396) | 595 | 200 | 20000 | 234 | 1.2 | 3000 |
| FNR-32K391 | 250 | 320 | 390(351~429) | 650 | 200 | 20000 | 286 | 1.2 | 2500 |
| FNR-32K431 | 275 | 350 | 430(387~473) | 710 | 200 | 20000 | 338 | 1.2 | 2250 |
| FNR-32K471 | 300 | 385 | 470(423~517) | 775 | 200 | 20000 | 390 | 1.2 | 1900 |
| FNR-32K511 | 318 | 415 | 510(459~561) | 840 | 200 | 20000 | 400 | 1.2 | 1800 |
| FNR-32K561 | 350 | 455 | 560(504~616) | 925 | 200 | 20000 | 410 | 1.2 | 1700 |
| FNR-32K621 | 380 | 505 | 620(558~682) | 1025 | 200 | 20000 | 442 | 1.2 | 3200 |
| FNR-32K681 | 420 | 560 | 680(612~748) | 1120 | 200 | 20000 | 492 | 1.2 | 3000 |
| FNR-32K751 | 460 | 615 | 750(675~825) | 1240 | 200 | 20000 | 559 | 1.2 | 2700 |
| FNR-32K781 | 485 | 640 | 780(702~858) | 1290 | 200 | 20000 | 624 | 1.2 | 2600 |
| FNR-32K821 | 510 | 670 | 820(738~902) | 1355 | 200 | 20000 | 689 | 1.2 | 2400 |
| FNR-32K911 | 550 | 745 | 910(819~1001) | 1500 | 200 | 20000 | 754 | 1.2 | 2200 |
| FNR-32K102 | 625 | 825 | 1000(900~1100) | 1650 | 200 | 20000 | 819 | 1.2 | 1900 |
| FNR-32K112 | 680 | 895 | 1100(990~1210) | 1815 | 200 | 20000 | 910 | 1.2 | 1700 |
| FNR-32K182 | 1000 | 1465 | 1800(1620~1980) | 2970 | 200 | 20000 | 920 | 1.2 | 1000 |

• 32K系列 Series

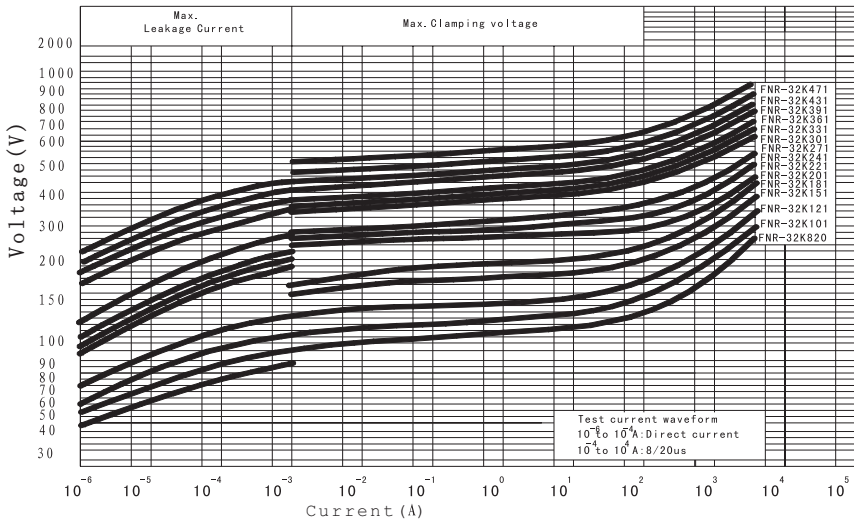
V-I Curve



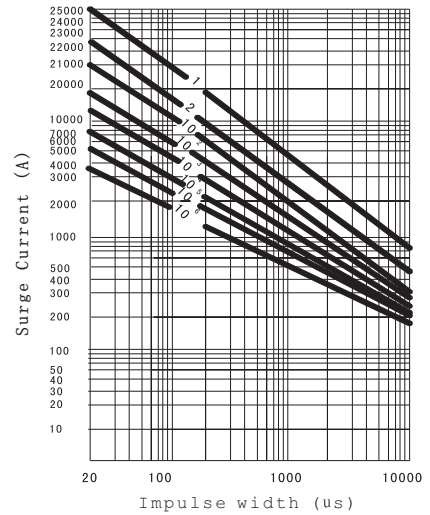
Impluse Lifetime Ratings
FNR-32K180 to FNR-32K680



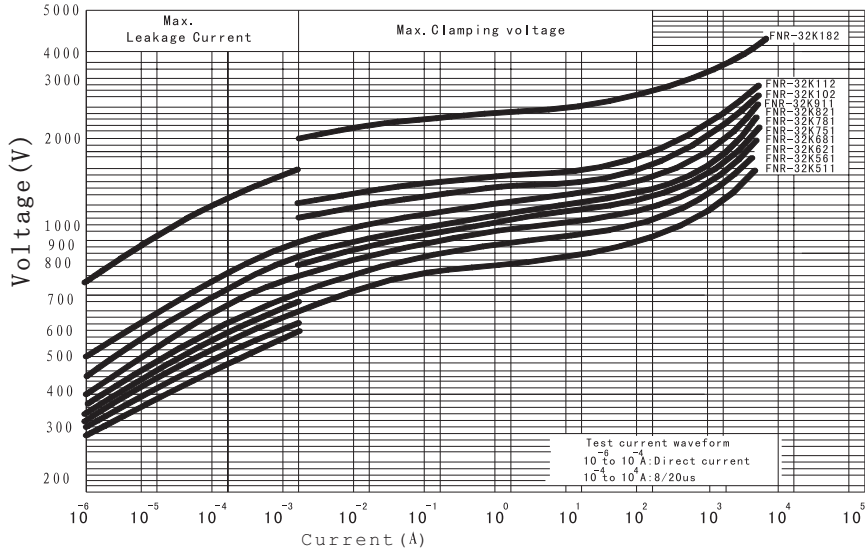
FNR-32K820 to FNR-32K471



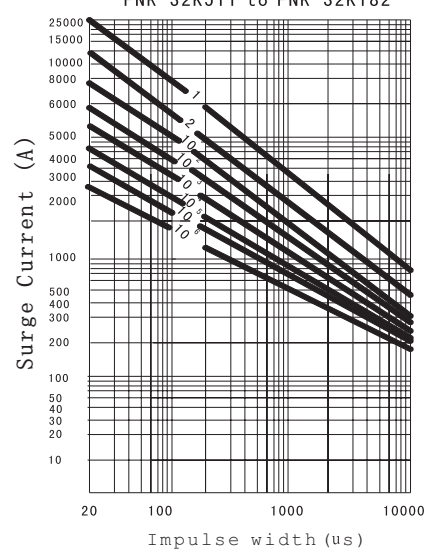
FNR-32K820 to FNR-32K471



FNR-32K511 to FNR-32K182



FNR-32K511 to FNR-32K182



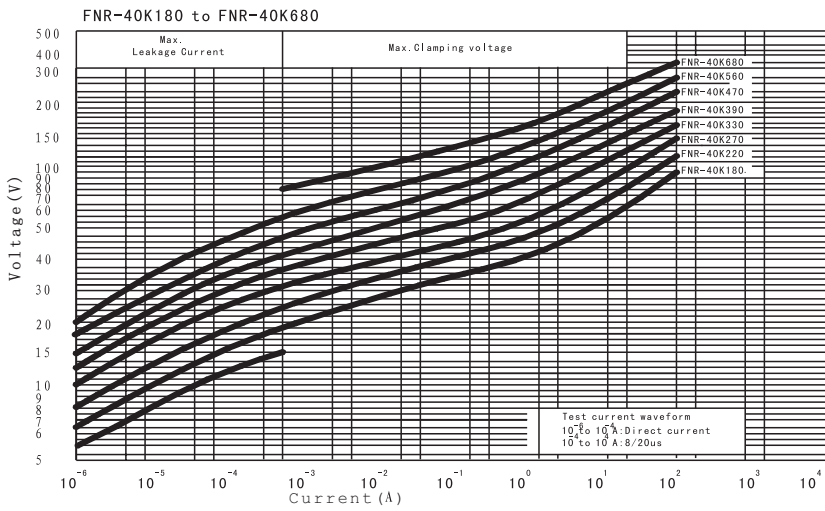
• 40K系列電性能 SERIES SPECIFICATION

| 型號規格 Part Number | 最大允許 使用電壓 Maximum operating Voltage | | 壓敏電壓 Varistor Voltage | 最大限制電壓 Maximum clamping Voltage | | 最大通流容量 Maximum Withstanding Surge Current (8/20 μ S) | 最大能量耐量 Maximum Energy (2ms) | 最大靜態 功率 Rated Wattage | 靜態電容量 (參考值) 1K Hz Capacitance (Reference) |
|------------------------|---|-----------|-----------------------------|---------------------------------------|-----------|--|---------------------------------------|--------------------------------|---|
| | AC (V) | DC (V) | | V0.1mA (V) | VC (V) | | | | |
| FNR-40K201 | 130 | 170 | 200(180~220) | 360 | 200 | 40000 | 208 | 1.4 | 10000 |
| FNR-40K221 | 140 | 180 | 220(198~242) | 360 | 200 | 40000 | 234 | 1.4 | 9500 |
| FNR-40K241 | 150 | 200 | 240(216~264) | 395 | 200 | 40000 | 286 | 1.4 | 9000 |
| FNR-40K271 | 175 | 225 | 270(243~297) | 455 | 200 | 40000 | 308 | 1.4 | 7500 |
| FNR-40K301 | 200 | 250 | 300(270~330) | 500 | 200 | 40000 | 320 | 1.4 | 7000 |
| FNR-40K331 | 210 | 275 | 330(297~363) | 550 | 200 | 40000 | 330 | 1.4 | 6500 |
| FNR-40K361 | 230 | 300 | 360(324~396) | 595 | 200 | 40000 | 390 | 1.4 | 6000 |
| FNR-40K391 | 250 | 320 | 390(351~429) | 650 | 200 | 40000 | 442 | 1.4 | 5000 |
| FNR-40K431 | 275 | 350 | 430(387~473) | 710 | 200 | 40000 | 494 | 1.4 | 4500 |
| FNR-40K471 | 300 | 385 | 470(423~517) | 775 | 200 | 40000 | 546 | 1.4 | 3600 |
| FNR-40K511 | 318 | 415 | 510(459~561) | 840 | 200 | 40000 | 585 | 1.4 | 3300 |
| FNR-40K561 | 350 | 455 | 560(504~616) | 925 | 200 | 40000 | 585 | 1.4 | 3000 |
| FNR-40K621 | 380 | 505 | 620(558~682) | 1025 | 200 | 40000 | 585 | 1.4 | 3300 |
| FNR-40K681 | 420 | 560 | 680(612~748) | 1120 | 200 | 40000 | 650 | 1.4 | 3000 |
| FNR-40K751 | 460 | 615 | 750(675~825) | 1240 | 200 | 40000 | 715 | 1.4 | 2500 |
| FNR-40K781 | 485 | 640 | 780(702~858) | 1290 | 200 | 40000 | 780 | 1.4 | 2450 |
| FNR-40K821 | 510 | 670 | 820(738~902) | 1355 | 200 | 40000 | 832 | 1.4 | 2400 |
| FNR-40K911 | 550 | 745 | 910(819~1001) | 1500 | 200 | 40000 | 910 | 1.4 | 2200 |
| FNR-40K102 | 625 | 825 | 1000(900~1100) | 1650 | 200 | 40000 | 1040 | 1.4 | 2000 |
| FNR-40K112 | 680 | 895 | 1100(990~1210) | 1815 | 200 | 40000 | 1105 | 1.4 | 1800 |
| FNR-40K182 | 1000 | 1465 | 1800(1620~1980) | 1970 | 200 | 40000 | 1300 | 1.4 | 1600 |

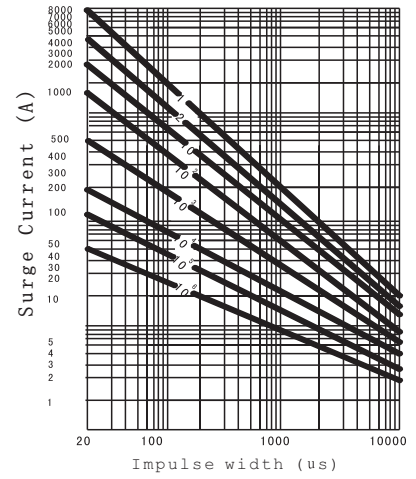
壓敏電阻器 ZINC OXIDE VARISTOR

• 40K系列 Series

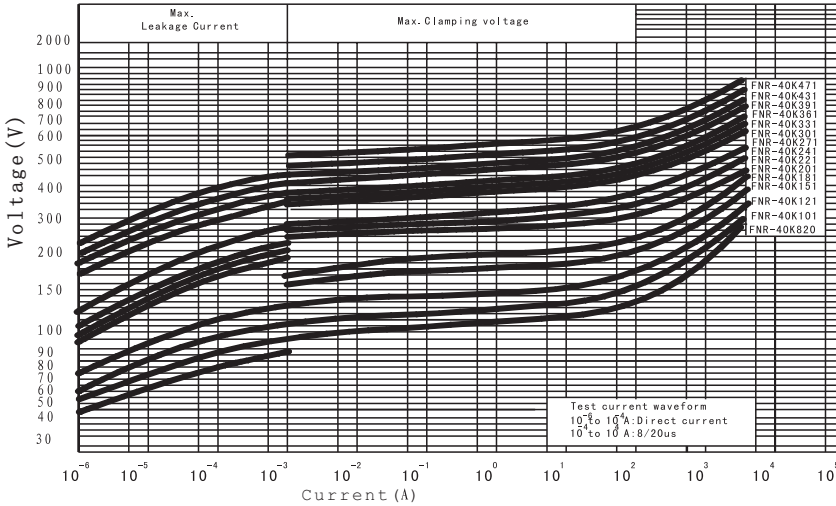
V-I Curve



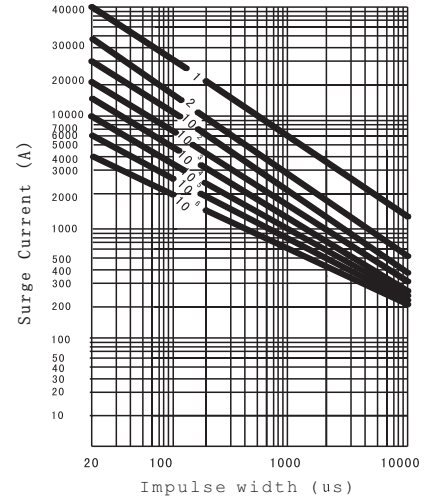
Impulse Lifetime Ratings
FNR-40K180 to FNR-40K680



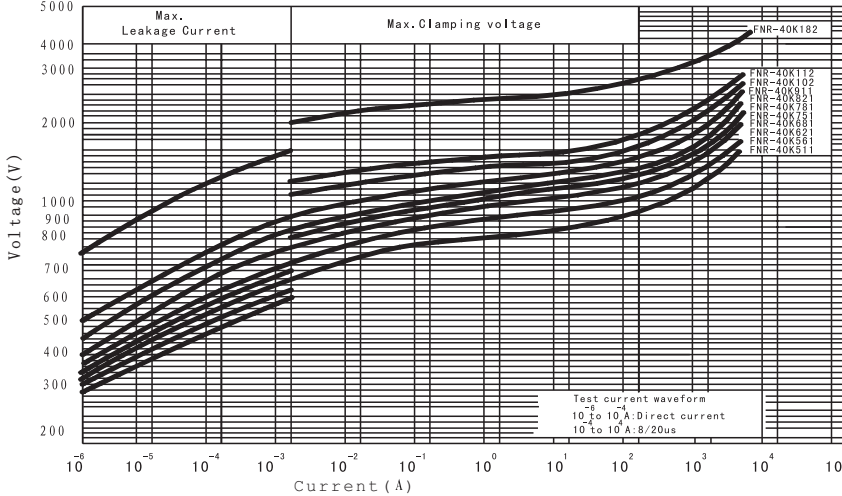
FNR-40K820 to FNR-40K471



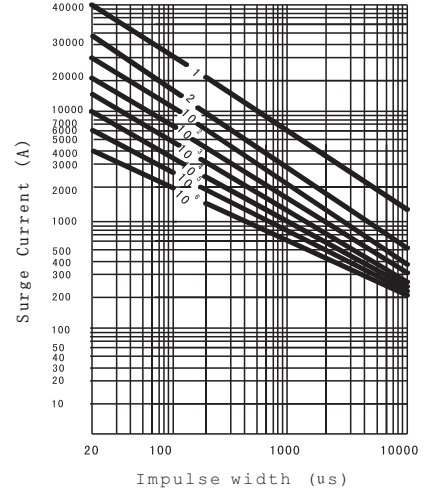
FNR-40K820 to FNR-40K471



FNR-40K511 to FNR-40K182



FNR-40K511 to FNR-40K182



- 壓敏電阻器選用方法(參考) HOW TO SELECT A VARISTOR(ONLY REFERENCE)

A: 壓敏電壓的選取

對於過壓保護方面的應用，壓敏電壓值應大于實際電路的電壓值，一般用以下公式計算：

$$V_{1mA} = a \cdot v / b \cdot c$$

a 電源電壓波動系數，一般取值1.2

v 在電路中壓敏電阻器兩端的直流電壓（交流時取電壓峰值）

b 壓敏電壓誤差，一般取0.85

c 元件的老化系數，一般取0.9

A: Varistor voltage

Varistor Voltage should be more than the operating voltage in over protective circuit, The formula is shown as the following.

$$V_{1mA} = a \cdot v / b \cdot c$$

a-power Voltage ripple coefficient usually 1.2

v-DC Voltage (significant value only AC power)

b-Tolerance usually take 0.85

c-Ageing coefficient usually take 0.9

B: 通流量的選取

通常產品給出的通流量是按照產品標準給定的波形、衝擊次數和間隙時間進行脈衝實驗時產品所能承受的最大電流值，產品所能承受的衝擊數是波形、幅值和間隙時間的函數，當電流波形幅值降低50%時衝擊次數可增加一倍，所以在實際應用中，壓敏電阻器所吸收的浪涌電流應小于產品的最大通流量，以延長產品的工作壽命。

B: Withstanding surge current

In general, withstanding surge current is max, Pulse current value which determined by test conditions such as wave- shape ,amplitude and intermal time, when the amplitude decrease to 50% of the initial , it should be increased to 2 times of the initial in order to keep the life longer, the surge current which is sbsorbed by the varistor should be less than max. withstanding surge current

• 用途 APPLICATIONS

| MODEL NUMBER 5mm | MODEL NUMBER 7mm | MODEL NUMBER 10mm | MODEL NUMBER 14mm | MODEL NUMBER 20mm | 主要用途 Recommended Applications |
|---------------------|---------------------|----------------------|----------------------|----------------------|--|
| FNR-05 K180 | FNR-07 K180 | FNR-10 K180 | FNR-14 K180 | FNR-20 K180 | <ul style="list-style-type: none"> Protection of various kinds of semiconductors Protection of automobile equipment Absorption of switching surge from various kinds of relays and electro-magnetic valves (DC below 48V) Protection of electronic equipment from electrostatic discharge 積體電路、電晶體等半導體元件保護 汽車電裝品 DC 48V以下激磁線圈，如：繼電器、電磁等 靜電防制 移動電話 |
| FNR-05 K220 | FNR-07 K220 | FNR-10 K220 | FNR-14 K220 | FNR-20 K220 | |
| FNR-05 K270 | FNR-07 K270 | FNR-10 K270 | FNR-14 K270 | FNR-20 K270 | |
| FNR-05 K330 | FNR-07 K330 | FNR-10 K330 | FNR-14 K330 | FNR-20 K330 | |
| FNR-05 K390 | FNR-07 K390 | FNR-10 K390 | FNR-14 K390 | FNR-20 K390 | |
| FNR-05 K470 | FNR-07 K470 | FNR-10 K470 | FNR-14 K470 | FNR-20 K470 | |
| FNR-05 K560 | FNR-07 K560 | FNR-10 K560 | FNR-14 K560 | FNR-20 K560 | |
| FNR-05 K680 | FNR-07 K680 | FNR-10 K680 | FNR-14 K680 | FNR-20 K680 | |
| FNR-05 K820 | FNR-07 K820 | FNR-10 K820 | FNR-14 K820 | FNR-20 K820 | <ul style="list-style-type: none"> Telephone. Communication line (DC 48V) 電話機用: DC48V通信回路 |
| FNR-05 K101 | FNR-07 K101 | FNR-10 K101 | FNR-14 K101 | FNR-20 K101 | |
| FNR-05 K121 | FNR-07 K121 | FNR-10 K121 | FNR-14 K121 | FNR-20 K121 | |
| FNR-05 K151 | FNR-07 K151 | FNR-10 K151 | FNR-14 K151 | FNR-20 K151 | |
| FNR-05 K181 | FNR-07 K181 | FNR-10 K181 | FNR-14 K181 | FNR-20 K181 | <ul style="list-style-type: none"> AC 100V Line-Line Applications (Japan) 用于AC 100V電源綫之間(日本) |
| FNR-05 K201 | FNR-07 K201 | FNR-10 K201 | FNR-14 K201 | FNR-20 K201 | |
| FNR-05 K221 | FNR-07 K221 | FNR-10 K221 | FNR-14 K221 | FNR-20 K221 | |
| FNR-05 K241 | FNR-07 K241 | FNR-10 K241 | FNR-14 K241 | FNR-20 K241 | <ul style="list-style-type: none"> AC 100V to 120V, Line-Line Applications (Japan, u.s., Canada) 用于AC100V、120V電源綫之間(日本、美國、加拿大等) |
| FNR-05 K271 | FNR-07 K271 | FNR-10 K271 | FNR-14 K271 | FNR-20 K271 | |
| FNR-05 K301 | FNR-07 K301 | FNR-10 K301 | FNR-14 K301 | FNR-20 K301 | |
| FNR-05 K331 | FNR-07 K331 | FNR-10 K331 | FNR-14 K331 | FNR-20 K331 | <ul style="list-style-type: none"> Telephone Line Application (250V Insulation Resistance Test Applicable) 用于電話機250V絕緣阻抗測試。 |
| FNR-05 K361 | FNR-07 K361 | FNR-10 K361 | FNR-14 K361 | FNR-20 K361 | |
| FNR-05 K391 | FNR-07 K391 | FNR-10 K391 | FNR-14 K391 | FNR-20 K391 | |

| MODEL NUMBER 5mm | MODEL NUMBER 7mm | MODEL NUMBER 10mm | MODEL NUMBER 14mm | MODEL NUMBER 20mm | 主要用途 Recommended Applications |
|-----------------------------|---|---|---|---|---|
| FNR-05 K431 FNR -05 K471 | FNR-07 K431 FNR-07 K471 | FNR-10 K431 FNR-10 K471 | FNR-14 K431 FNR-14 K471 | FNR-20 K431 FNR-20 K471 | <ul style="list-style-type: none"> · AC200-220V Line-Line Applications · AC100V to 220V. Line-Ground Applications · Ac200-220電源綫間應用 · Ac100 to 220電源與對地應用 |
| FNR-05 K561 | FNR-07 K561 FNR-07 K621 FNR-07 K681 | FNR-10 K561 FNR-10 K621 FNR-10 K681 | FNR-14 K561 FNR-14 K621 FNR-14 K681 | FNR-20 K561 FNR-20 K621 FNR-20 K681 | <ul style="list-style-type: none"> · AC 240V Line-Line Applications (U.K., Australia, Middle East Countries) · AC 240V電源綫間應用 (英國、中東、澳洲等國) |
| | | FNR-10 K751 FNR-10 K781 FNR-10 K821 | FNR-14 K751 FNR-14 K781 FNR-14 K821 | FNR-20 K751 FNR-20 K781 FNR-20 K821 | <ul style="list-style-type: none"> · AC 380V, Line-Line Ground Applications AC 380V 電源綫間應用及電源對地間應用。 |
| | | FNR-10 K911 | FNR-14 K911 | FNR-20 K911 | <ul style="list-style-type: none"> · AC 415V, Line-Line line-Ground Applications AC 415V電源綫間應用及電源對地間應用 |
| | | FNR-10 K102 FNR-10 K112 | FNR-14 K102 FNR-14 K112 | FNR-20 K102 FNR-20 K112 | <ul style="list-style-type: none"> · AC 480V, Line-Line Ground Applications AC 480V 電源綫間應用及電源對地間應用 |
| | | | FNR-14 K182 | FNR-20 K182 | <ul style="list-style-type: none"> · Line Ground Applications (For AC 1200V Withstanding Test) · AC 1200V電源對地間應用 |

• 保險絲配用建議(SELECT OF FUSE in conformity to FNR Varistor):

* 和壓敏電阻大小配合選用表 (If conform with diameter):

| Part Number | FNR05K series | FNR07K series | FNR10K series | FNR14K series | FNR20K series |
|-------------|---------------|---------------|---------------|---------------|---------------|
| Fuse rating | 1 To 2 A | 2 to 3A | 3 to 5A | 3 to 10A | 5 to 15A |

* 和壓敏電阻最大峰值電流配合選用表 (If conform with Max Peak current):

| Max. Peak Current(8/20 μ S 1 time) (A) | Up to 500 | 5001 to 2000 | 2001 to 6000 |
|--|-----------|--------------|--------------|
| Fuse rating | 3A | 5A | 10A |

● 電氣特性及測試方法 ELECTRICAL PERFORMANCE TEST

標準測試條件: 溫度:5℃~35℃, 濕度:45%~85%

Standard Test Conditions: Temperature: 5℃~35℃, humidity: 45%~85%

| 項目 Item | 測試方法 Test method | 性能 Performance |
|---|---|--|
| 壓敏電壓 Varistor Voltage | 在DC 1mA (φ5產品為 DC 0.1mA) 電流條件下的電壓值U _{1mA} (φ5產品為U _{0.1mA}) 定為壓敏電壓。 In DC 1mA (only φ5 products voltage at DC 0.1mA) would be setted to varistor's voltage in ±10%. | 公差: ±10% Tolerance: ±10% |
| 漏電流 Leakage current | 在0.83U _{1mA} (φ5產品為U _{0.1mA}) 電壓下的電流值。 Current in 0.83U _{1mA} (φ5products U _{0.1mA}) voltage. | 請看標準 Please see standard |
| 限制電壓 Clamping Voltage | 在規定波形下施加規定電流后壓敏電阻器兩端的電壓峰值。 The max voltage between two terminals with the specified standard impulse current. | 請看標準 Please see standard |
| 最大通流容量 Max peak current | 用8/20μS 波形衝擊后應無損傷, 壓敏電壓變率 ≤ ±10%。 Use 8/20μS wave form, According to following current no damage after shock one times in single direction every five minutes, voltage change percentage ≤ ±10%. | 壓敏電壓變化率在 ±10% 內。 Varistor Voltage changed percentage ≤ ±10%. |
| 能量耐量 Maximum energy | 用2ms 方波衝擊一次, 衝擊后應無損傷, 壓敏電壓變化率 ≤ ±10%。 No camage after shock with 2ms square wave, Varistor voltage changed percentage ≤ ±10%. | 壓敏電壓變化率在 ±10% 內。 Varistor Voltage changed percentage ≤ ±10%. |
| 電壓溫度系數 Temperature coefficient of varistor Voltage | 在規定溫度下顯示壓敏電壓的變化值。 Varistor Voltage changed percentage on Specified temperature. | ≤ ±0.05% |
| 靜態電容量 Capacitance | 條件: 1KHz, 1V Condition: 1KHz, 1V | |
| 耐電壓 Bear of voltage | 條件: 2500VAC 引出端與外殼間1min。 Condition: 2500VAC The distance of leads terminal and crust is 1 min. | 要求: 外觀無可見損傷; 應無擊穿或飛弧。 Request: No break out and damage; No hit into product and flying arc. |

• 機械性能測試 (Machine characteristic test)

| 項目 | 試驗方法及測試設備 | 要求 |
|---|--|---|
| 引出端強度 Lead terminal tensile strength | 條件: 拉力: 10N; 10±10S 彎曲: 5N; 90°, 二次 Condition: Pull: 10N; 10±1S Bend: 5N; 90°, two times | 要求: 無可見損傷。 Request: No break out and damage |
| 可焊性 Solder ability | 條件: 試驗Tb,方法1; 槽焊法。 T=235±5°C; t=±0.5S Condition: Test Tb, Method 1; Solder in trough method T=235±5°C; t=±0.5S | 要求: 焊料在2S內流合。 Request: Solder |
| 標志耐溶劑 The sign of melted-resistant solvent | 條件: 70%的1.1.2三氯, 1.2.2氟乙烷和30%的異丙醇的混合物; 室溫, 浸漬5min; 用脫脂棉在正反方向各擦拭5次, 共10次; 擦拭速度: 2次/S。 Condition: Mixture with 70% 1.1.2 three chlorin, 1.2.2 fluorin-ethane and 30% cymene-alcohol; room temperature, dip 5 min; clean 5 times on positive and negative direction with absorbent cotton, total 10 times; cleaning speed: 2 times/S | 要求: 標志清晰。 -5% ≤ ΔV/V ≤ 5% Request: Clear Sign. -5% ≤ ΔV/V ≤ 5% |
| 耐焊接熱 Solder ability | 條件: 260±5°C; 5±1S Condition: 260±5°C; 5±1S | 要求: 無可見損傷 -5% ≤ ΔV/V ≤ 5% I _L ≤ 20 μA Request: No break out and damage -5% ≤ ΔV/V ≤ 5% I _L ≤ 20 μA |
| 振動 Vibration | 條件: 正弦波; 10Hz~55Hz~10Hz 一次掃描時間: 1 min 全振幅: 1.5mm 3個方向, 共6h。 Condition: sine wave; 10Hz~55Hz~10Hz Scanning time once: 1 min Whole view picture: 1.5mm 3 direction, total 6h. | 要求: 無可見損傷 -5% ≤ ΔV/V ≤ 5% Request: No break out and damage -5% ≤ ΔV/V ≤ 5% |
| 碰撞 Impact | 條件: 390m/S ² 6ms 三個方向, 共4000次。 Condition: 390m/S ² 6ms 3 Direction, total 4000 times. | 要求: 無可見損傷 -5% ≤ ΔV/V ≤ 5% Request: No break out and damage -5% ≤ ΔV/V ≤ 5% |

● 氣候試驗

| 項目 | 試驗方法及測試設備 | 要求 |
|---|--|--|
| <p>溫度快速變化 Temp cycle test</p> | <p>條件: $\theta A: -40 \pm 2^{\circ}C$; $\theta B: -40 \pm 2^{\circ}C$; T1:30min t2:2min~3min 循環次數: 5次</p> <p>Condition: $\theta A: -40 \pm 2^{\circ}C$; $\theta B: -40 \pm 2^{\circ}C$; T1:30min t2:2min~3min Cycle times:5</p> | <p>要求: 無可見損傷 $-5\% \leq \Delta V/V \leq 5\%$</p> <p>Request: No break out and damage $-5\% \leq \Delta V/V \leq 5\%$</p> |
| <p>高溫負荷 Heat burthen</p> | <p>條件: $85^{\circ}C$ 施加電壓: 505VDC 負荷方式: 連續 周期測量時間: 500h 累計試驗時間: 1000h 恢復1h~2h后測量。</p> <p>Condition: $85^{\circ}C$, Inflicted voltage: 505VDC Burthen quomodo: continuous; Circular measure time: 500h Total testing time: 1000h Measure after coming back in 1h~2h.</p> | <p>要求: 無可見損傷、標志清晰 $-10\% \leq \Delta V/V \leq 10\%$</p> <p>Request: No break out and damage, and sign is clear; $-10\% \leq \Delta V/V \leq 10\%$</p> |
| <p>高溫貯存 Stockpile in high temperature</p> | <p>條件: $125 \pm 2^{\circ}C$ 周期測量時間: 500h 恢復時間: 1000h</p> <p>Conidition: $125 \pm 2^{\circ}C$ Circular measure time: 500h Total testing time: 1000h Measure after coming back in 1h~2h.</p> | <p>要求: 無可見損傷 $-5\% \leq \Delta V/V \leq 5\%$</p> <p>Request: No break out and damage $-5\% \leq \Delta V/V \leq 5\%$</p> |
| <p>氣候順序 Weather oder</p> | <p>條件: 干熱: $85 \pm 2^{\circ}C$, 16h 循環濕熱: Db, 一個循環, 24h, $55^{\circ}C$ 級; 低溫: $-40 \pm 3^{\circ}C$, 2h</p> <p>Condition: Dry and heat: $85 \pm 2^{\circ}C$, 16h Low temperature $-40 \pm 3^{\circ}C$, 2h Circular wet and heat: Db, a cycle, 24h, $55^{\circ}C$ level;</p> | <p>要求: 無可見損傷 $-5\% \leq \Delta V/V \leq 5\%$</p> <p>Request: No break out and damage $-5\% \leq \Delta V/V \leq 5\%$</p> |
| <p>穩態濕熱 Steady state hot and damp</p> | <p>4只樣品不施加電壓, 另4只樣品施加最大連續電壓的10% 嚴酷度: 96h</p> <p>4 samples not with voltage, and other 4 samples with 10 percent of maximal continuous voltage Strict degree: 96h</p> | <p>要求: 外觀無可見損傷 限制電壓變化率 $\leq +20\%$ 壓敏電壓變化率 $\leq \pm 10\%$</p> <p>Request: No break out and damage. Limited voltage changed rate $\leq +20\%$ Varistor voltage changed rete $\leq \pm 10\%$</p> |

单击下面可查看定价，库存，交付和生命周期等信息

[>>FH\(风华高科\)](#)