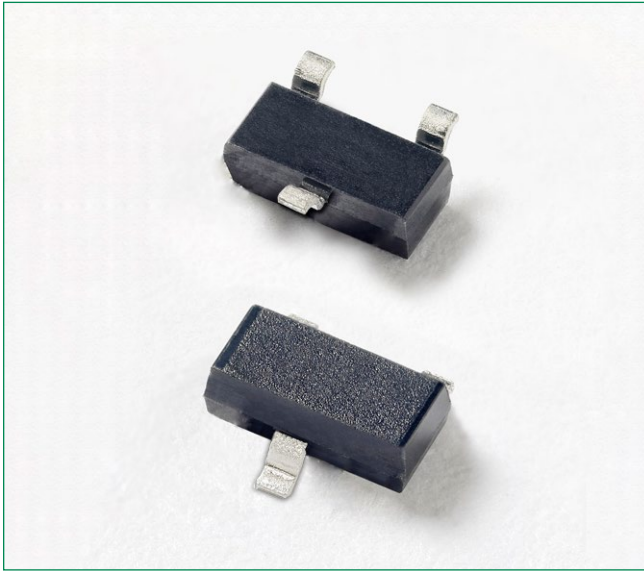


NYC0102BLT1G



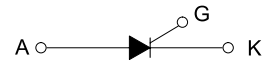
Description

This NYC0102 SCR thyristor has been designed for low-power switching applications by implementing a sensitive gate triggered component.

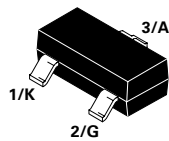
Features

- High dv/dt noise immunity
- Gating Current < 200 μ A (micro amp)
- Miniature SOT-23 Package for High Density PCB
- RoHS compliant and Halogen Free/BFR free, Lead-Free

Functional Diagram



Pin Out



Additional Information



Datasheet



Resources



Samples

Maximum Ratings ($T_J = 25^\circ\text{C}$ unless otherwise noted)

| Rating | Symbol | Value | Unit |
|--|-----------------------|-------------|--------------------|
| Peak Repetitive Off-State Voltage (Note 1) ($R_{GK} = I_K$, $T_J = -40$ to $+110^\circ\text{C}$, Sine Wave, 50 to 60 Hz) | V_{DRM} & V_{RRM} | 200 | V |
| On-State RMS Current (All Conduction Angles; $T_C = 80^\circ\text{C}$) | I_T (RMS) | 0.25 | A |
| Peak Non-Repetitive Surge Current (1/2 Cycle Sine Wave, 60 Hz, $T_A = 25^\circ\text{C}$) | I_{TSM} | 7.0 | A |
| Circuit Fusing Consideration ($t = 8.3$ ms) | I^2t | 0.2 | A ² sec |
| Forward Peak Gate Power (Pulse Width ≤ 1.0 sec, $T_A = 25^\circ\text{C}$) | P_{GM} | 0.1 | W |
| Forward Average Gate Power ($t = 8.3$ ms, $T_A = 25^\circ\text{C}$) | $P_{GM(AV)}$ | 0.02 | W |
| Forward Peak Gate Current (Pulse Width ≤ 20 s, $T_A = 25^\circ\text{C}$) | I_{FGM} | 0.5 | A |
| Reverse Peak Gate Voltage (Pulse Width ≤ 1.0 s, $T_A = 25^\circ\text{C}$) | V_{RGM} | 8.0 | V |
| Operating Junction Temperature Range @ Rated V_{RRM} and V_{DRM} | T_J | -40 to +125 | $^\circ\text{C}$ |
| Storage Temperature Range | T_{stg} | -40 to +150 | $^\circ\text{C}$ |

Thermal Characteristics

| Rating | Symbol | Value | Unit |
|---|-----------------|-------|--------------------|
| Total Component Dissipation FR-5 Board $T_A = 25^\circ\text{C}$ | P_D | 225 | mW |
| Thermal Resistance, Junction-to-Ambient | $R_{\theta JA}$ | 380 | $^\circ\text{C/W}$ |

Stresses exceeding Maximum Ratings may damage the component. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect component reliability.

1. V_{DRM} and V_{RRM} for all types can be applied on a continuous basis. Ratings apply for zero or negative gate voltage; however, positive gate voltage shall not be applied concurrent with negative potential on the anode. Blocking voltages shall not be tested with a constant current source such that the voltage ratings of the components are exceeded.

Electrical Characteristics - OFF

| Characteristic | | Symbol | Min | Typ | Max | Unit |
|---|---|-----------|--------|--------|------------|---------------|
| Peak Repetitive Forward Blocking Current (Note 3) ($V_{DRM} = 200\text{V}$, $R_{GK} = 1\text{k}\Omega$) | $T_J = 25^\circ\text{C}$ $T_J = 125^\circ\text{C}$ | I_{DRM} | - - | - - | 1.0 100 | μA |
| Peak Repetitive Reverse Blocking Current ($V_{RRM} = 200\text{V}$, $R_{GK} = 1\text{k}\Omega$) | $T_J = 25^\circ\text{C}$ $T_J = 125^\circ\text{C}$ | I_{RRM} | - - | - - | 1.0 100 | |

Electrical Characteristics - ON ($T_J = 25^\circ\text{C}$ unless otherwise noted)

| Characteristic | Symbol | Min | Typ | Max | Unit |
|--|----------|-----|-----|-----|---------------|
| Peak Forward On-State Voltage ($I_{TM} = 0.4$ A, $t_p < 1$ ms, $T_C = 25^\circ\text{C}$) | V_{TM} | - | - | 1.7 | V |
| Gate Trigger Current ($V_D = 12$ V, $R_L = 100\ \Omega$, $T_C = 25^\circ\text{C}$) | I_{GT} | - | - | 200 | μA |
| Gate Trigger Voltage ($V_D = 12$ V, $R_L = 100\ \Omega$, $T_C = 25^\circ\text{C}$) | V_{GT} | - | - | 0.8 | V |
| Holding Current ($I_T = 50$ mA, $R_{GK} = 1\text{k}\Omega$, $T_C = 25^\circ\text{C}$) | I_H | - | - | 6.0 | mA |
| Gate Non-Trigger Voltage ($V_D = V_{DRM}$, $R_L = 3.3\text{k}\Omega$, $T_C = 125^\circ\text{C}$) | V_{GD} | 0.1 | - | - | V |
| Latching Current ($I_G = 1.0$ mA, $R_{GK} = 1\text{k}\Omega$, $T_C = 25^\circ\text{C}$) | I_L | - | - | 7.0 | mA |
| Gate Reverse Voltage ($I_{RG} = 10\ \mu\text{A}$) | V_{RG} | 8.0 | - | - | V |

Dynamic Characteristics

| Characteristic | Symbol | Min | Typ | Max | Unit |
|---|---------|-----|-----|-----|------------------|
| Critical Rate-of-Rise of Off State Voltage ($R_{GK} = 1\text{k}\Omega$, $T_C = 125^\circ\text{C}$) | dv/dt | 200 | - | - | V/ μs |
| Critical Rate of Rise of On-State Current ($I_G = 2I_{GT}$, 60 Hz, $t_f < 100$ ns, $T_J = 125^\circ\text{C}$) | di/dt | - | - | 50 | A/ μs |

Voltage/Current Characteristics of SCR

| Symbol | Parameter |
|-----------|---|
| V_{DRM} | Peak Repetitive Forward Off State Voltage |
| I_{DRM} | Peak Forward Blocking Current |
| V_{RRM} | Peak Repetitive Reverse Off State Voltage |
| I_{RRM} | Peak Reverse Blocking Current |
| V_{TM} | Maximum On State Voltage |
| I_H | Holding Current |

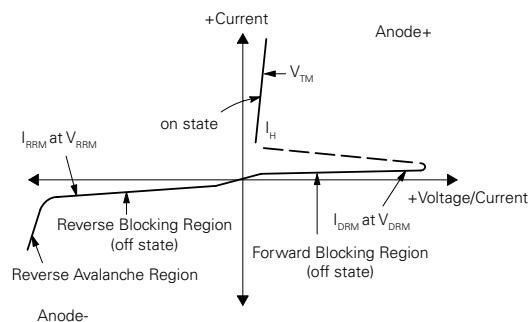


Figure 1. Maximum Average Power vs. Average Current

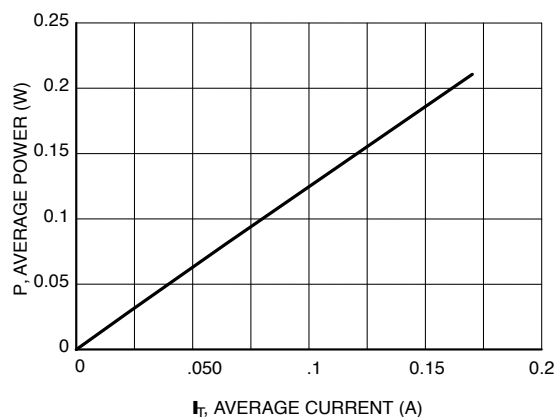


Figure 2. Current Derating

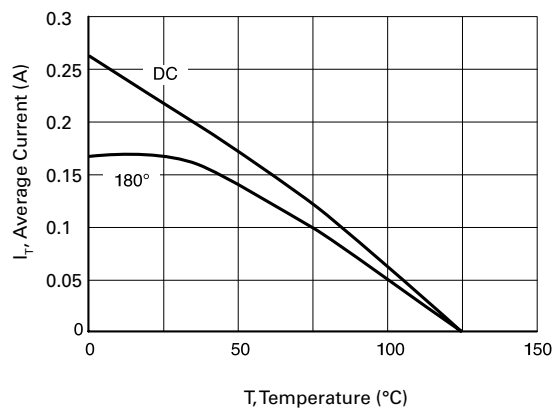


Figure 3. Surge Current I_{TSM} vs. Number of Cycles

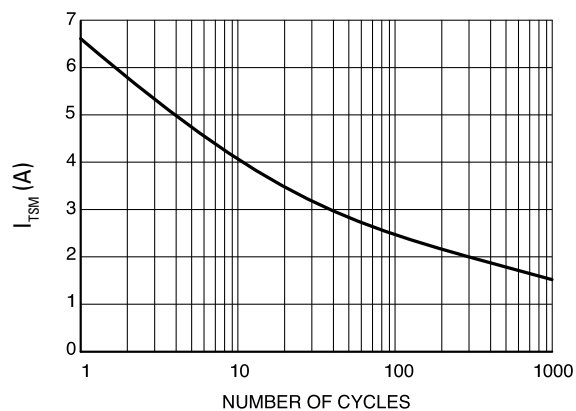


Figure 4. Thermal Response

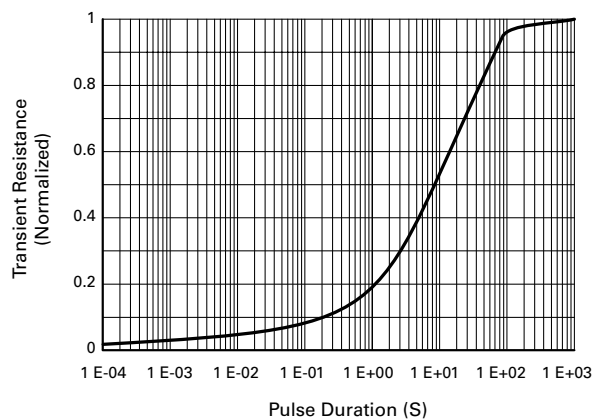


Figure 5. On-State Characteristics

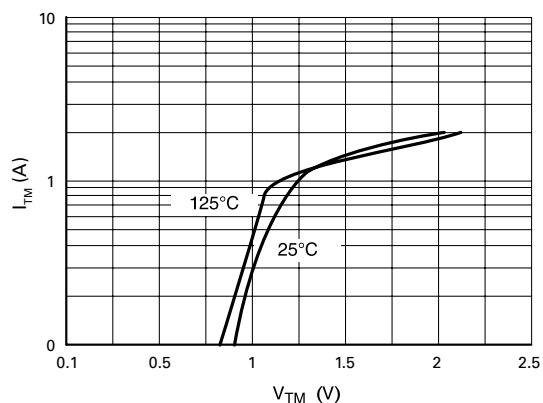


Figure 6. Gate Trigger Current vs. T_J (Normalized to 25 C)

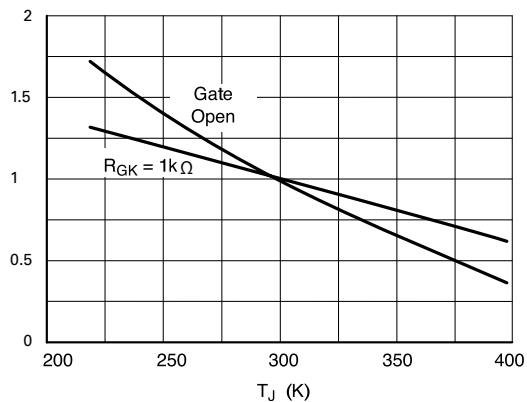


Figure 8. Gate Trigger Current vs. R_{GK}

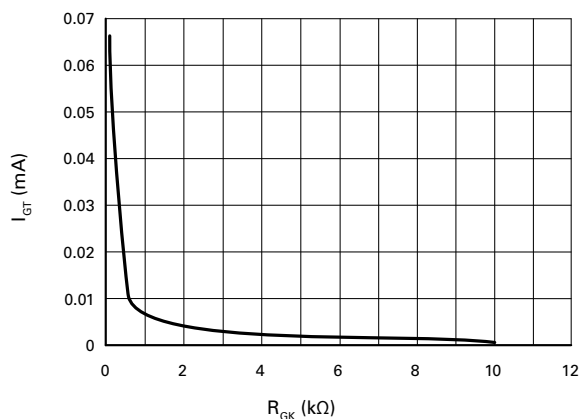


Figure 9. Holding and Latching Current vs. R_{GK}

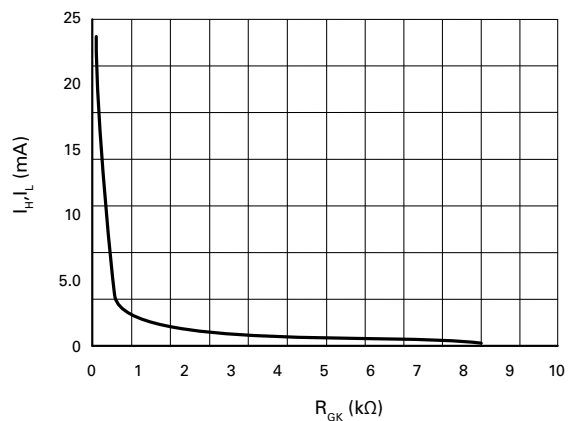


Figure 10. dV/dt vs. R_{GK}

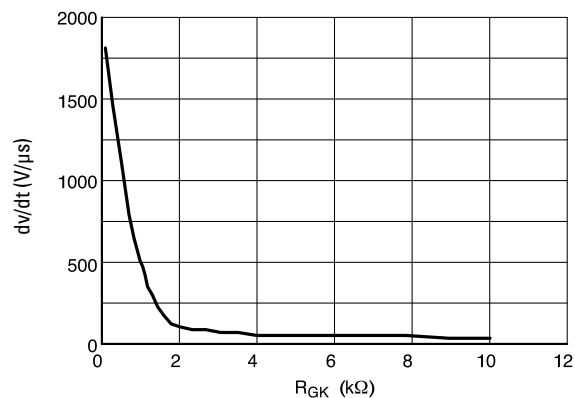
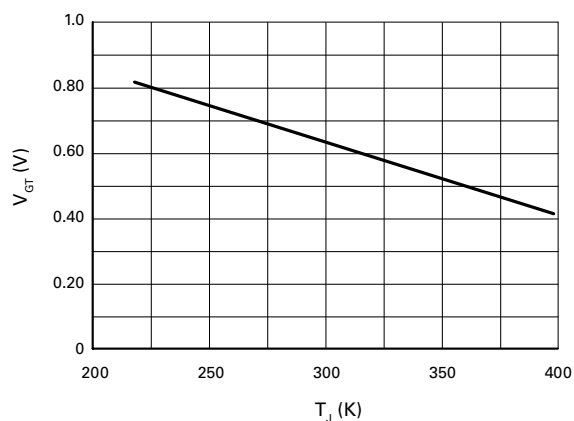
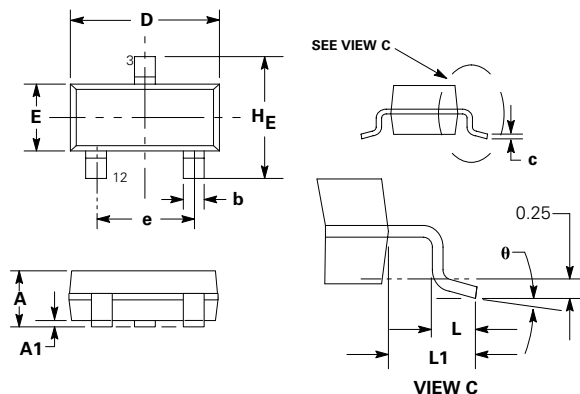


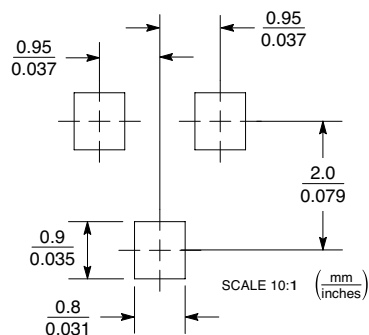
Figure 11. Gate Triggering Voltage vs. T_J



Dimensions



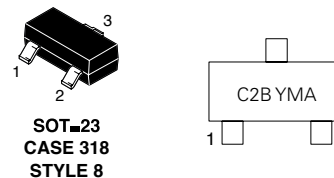
Soldering Footprint



| Dim | Inches | | | Millimeters | | |
|-----|--------|-------|-------|-------------|------|------|
| | Min | Nom | Max | Min | Nom | Max |
| A | 0.035 | 0.041 | 0.046 | 0.89 | 1.03 | 1.17 |
| A1 | 0.001 | 0.004 | 0.006 | 0.05 | 0.10 | 0.15 |
| b | 0.012 | 0.016 | 0.020 | 0.30 | 0.40 | 0.50 |
| c | 0.003 | 0.006 | 0.008 | 0.08 | 0.14 | 0.20 |
| D | 0.110 | 0.114 | 0.118 | 2.80 | 2.90 | 3.00 |
| E | 0.047 | 0.051 | 0.055 | 1.20 | 1.30 | 1.40 |
| e | --- | 0.075 | --- | --- | 1.90 | --- |
| L | 0.016 | 0.019 | 0.023 | 0.40 | 0.49 | 0.58 |
| L1 | 0.018 | 0.022 | 0.025 | 0.46 | 0.55 | 0.64 |
| HE | 0.083 | 0.091 | 0.098 | 2.10 | 2.30 | 2.49 |
| ø | 0° | --- | 10° | 0° | --- | 10° |

1. Diminishing and tolerancing per ANSI Y 14.5M, 1982.
2. Controlling Dimension: Inch
3. Maximum lead thickness includes lead finish thickness. Minimum lead thickness is the minimum thickness of base material.
4. Dimensions D and E do not include mold flash, protrusions, or gate burrs.

Part Marking System



C2B= Specific Device Code
YMA= Date Code*
▪ Pb-Free Package

(Note: Microdot may be in either location)

*Date Code orientation and/or overbar may vary depending upon manufacturing location.

| Pin Assignment | |
|----------------|---------|
| 1 | Cathode |
| 2 | Gate |
| 3 | Anode |

Ordering Information

| Device | Package | Shipping |
|--------------|---------------------|----------------------|
| NYC0102BLT1G | SOT-23 (Pb-Free) | 3000/Tape & Reel/Box |

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