

**NYC0102BLT1G**



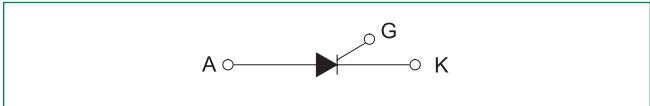
**Description**

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

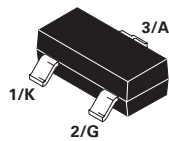
**Features**

- High dv/dt noise immunity
- Gating Current < 200  $\mu$ 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**



Resources



Accessories



Samples

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

Rating	Symbol	Value	Unit
Peak Repetitive Off-State Voltage (Note 1) ( $R_{GK} = 1\text{ k}\Omega$ , $T_J = -40$ 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 <sup>2</sup> sec
Forward Peak Gate Power (Pulse Width $\leq 1.0$ 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 $\leq 20$ s, $T_A = 25^\circ\text{C}$ )	$I_{FGM}$	0.5	A
Reverse Peak Gate Voltage (Pulse Width $\leq 1.0$ 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	$^\circ\text{C}/\text{W}$

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) ( $V_{DRM} = 200\text{V}$ , $R_{GK} = 1\text{ k}\Omega$ )	$I_{DRM}$	-	-	1.0	$\mu\text{A}$
		-	-	100	
Peak Repetitive Reverse Blocking Current ( $V_{RRM} = 200\text{V}$ , $R_{GK} = 1\text{ k}\Omega$ )	$I_{RRM}$	-	-	1.0	$\mu\text{A}$
		-	-	100	

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

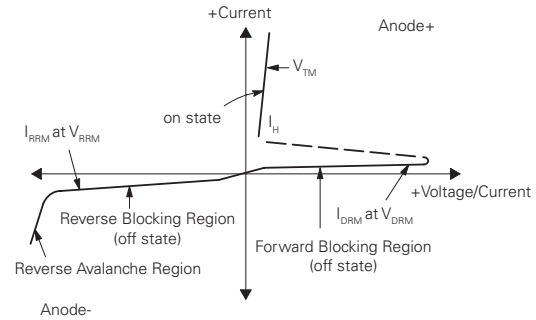
Characteristic	Symbol	Min	Typ	Max	Unit
Peak Forward On-State Voltage ( $I_{TM} = 0.4$ A, $t_p < 1$ ms, $T_C = 25^\circ\text{C}$ )	$V_{TM}$	-	-	1.7	V
Gate Trigger Current ( $V_D = 12$ V, $R_L = 100$ $\Omega$ , $T_C = 25^\circ\text{C}$ )	$I_{GT}$	-	-	200	$\mu\text{A}$
Gate Trigger Voltage ( $V_D = 12$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

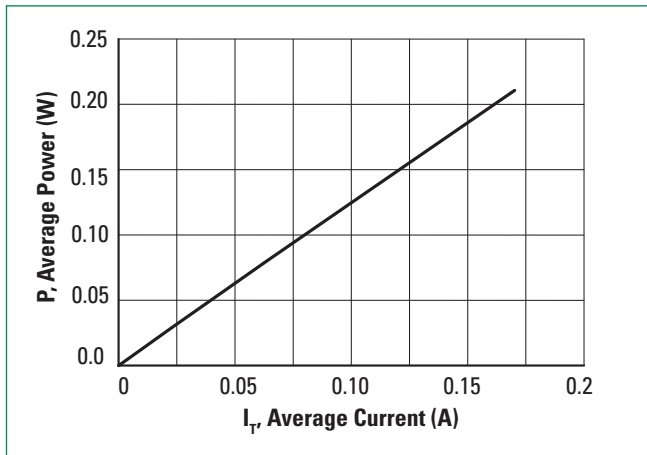
Characteristic	Symbol	Min	Typ	Max	Unit
Critical Rate-of-Rise of Off State Voltage ( $R_{GK} = 1$ k $\Omega$ , $T_C = 125^\circ\text{C}$ )	$dv/dt$	200	-	-	V/ $\mu\text{s}$
Critical Rate of Rise of On-State Current ( $I_G = 2 \times I_{GT}$ , 60 Hz, $t_r < 100$ ns, $T_J = 125^\circ\text{C}$ )	$di/dt$	-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

**Voltage/Current Characteristics of SCR**

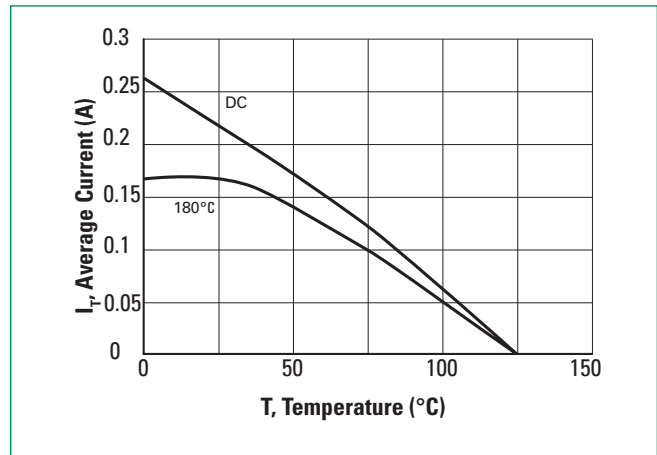
Symbol	Parameter
$V_{DRM}$	Peak Repetitive Forward Off State Voltage
$I_{DRM}$	Peak Forward Blocking Current
$V_{RRM}$	Peak Repetitive Reverse Off State Voltage
$I_{RRM}$	Peak Reverse Blocking Current
$V_{TM}$	Maximum On State Voltage
$I_H$	Holding Current



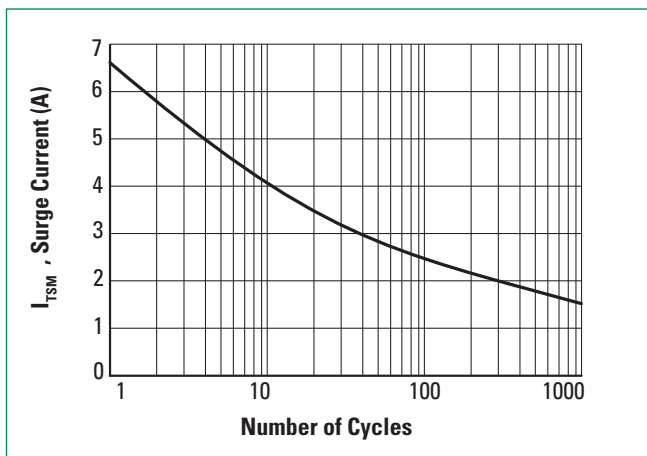
**Figure 1. Maximum Average Power vs. Average Current**



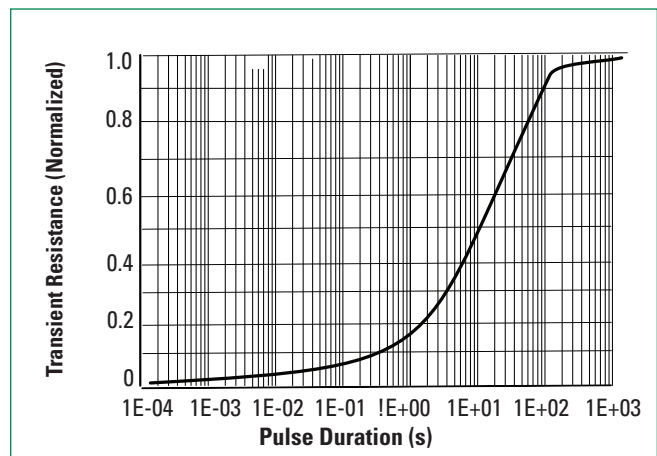
**Figure 2. Current Derating**



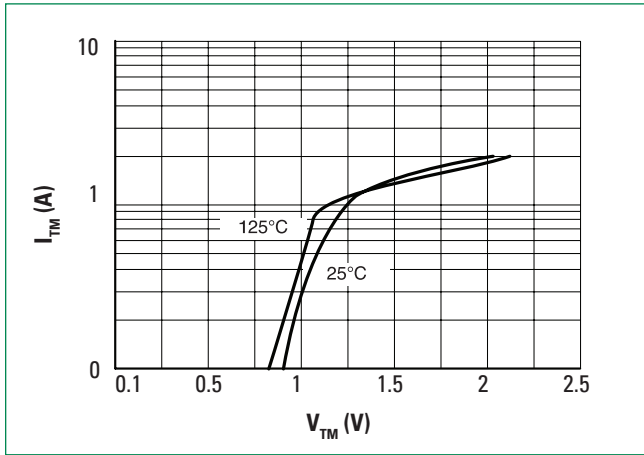
**Figure 3. Surge Current  $I_{TSM}$  vs. Number of Cycles**



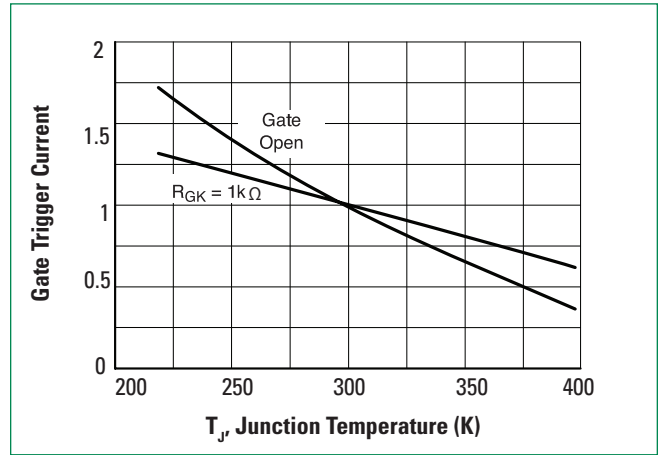
**Figure 4. Thermal Response**



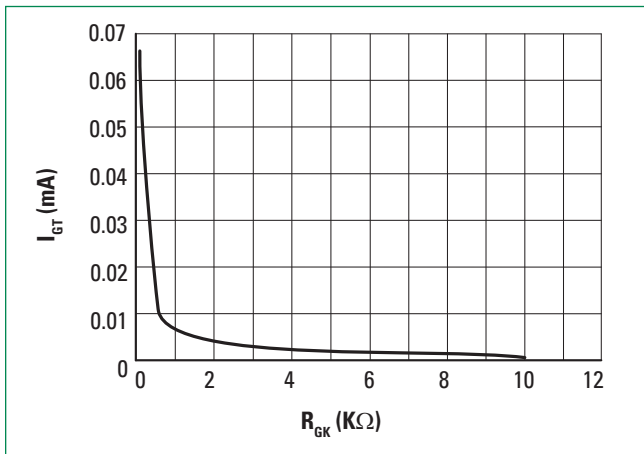
**Figure 5. On-State Characteristics**



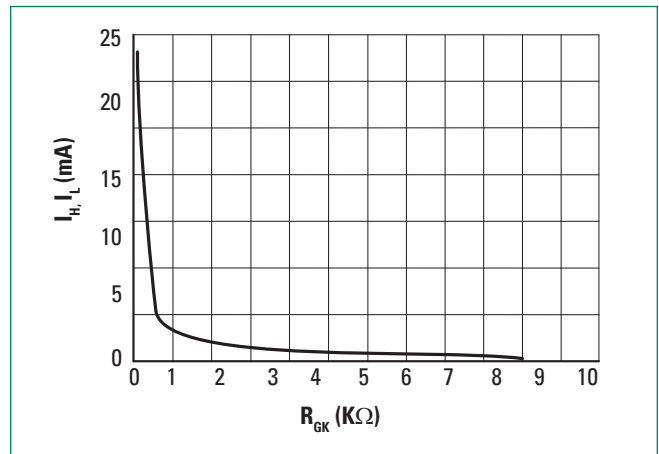
**Figure 6. Gate Trigger Current vs.  $T_J$  (Normalized to 25 C)**



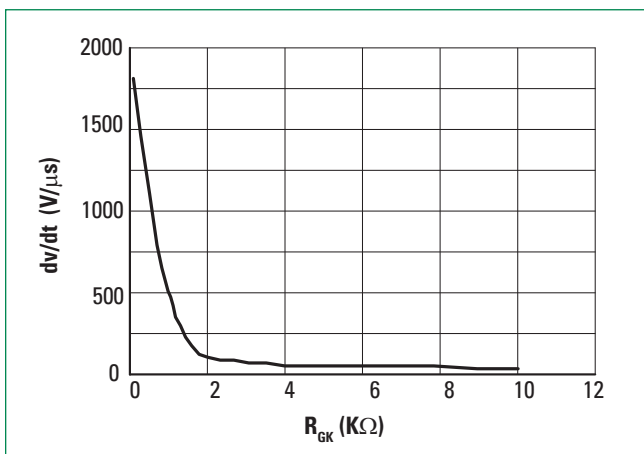
**Figure 7. Gate Trigger Current vs.  $R_{GK}$**



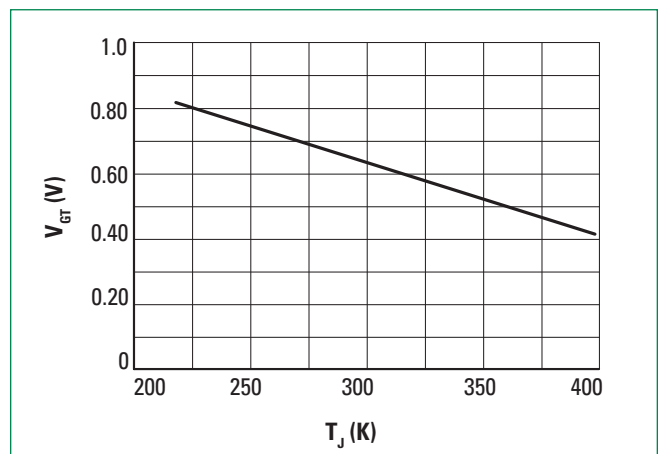
**Figure 8. Holding and Latching Current vs.  $R_{GK}$**



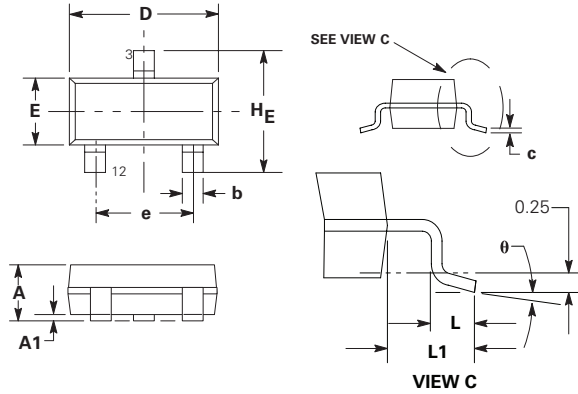
**Figure 9.  $dV/dt$  vs.  $R_{GK}$**



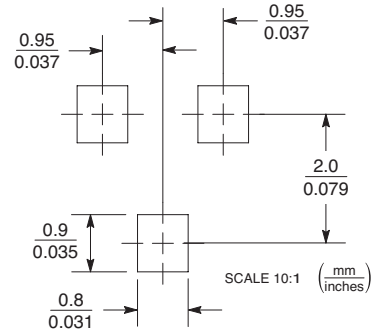
**Figure 10. Gate Triggering Voltage vs.  $T_J$**



**Dimensions**



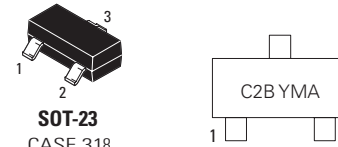
**Soldering Footprint**



Dim	Inches			Millimeters		
	Min	Nom	Max	Min	Nom	Max
A	0.035	0.041	0.046	0.89	1.03	1.17
A1	0.004	0.004	0.006	0.01	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	0.120	2.80	2.90	3.04
E	0.047	0.051	0.055	1.20	1.30	1.40
e	---	0.075	---	---	1.90	---
L	0.016	0.019	0.024	0.40	0.49	0.60
L1	0.018	0.022	0.025	0.46	0.55	0.64
HE	0.083	0.091	0.104	2.10	2.30	2.64
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**



**SOT-23**  
CASE 318  
STYLE 8  
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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