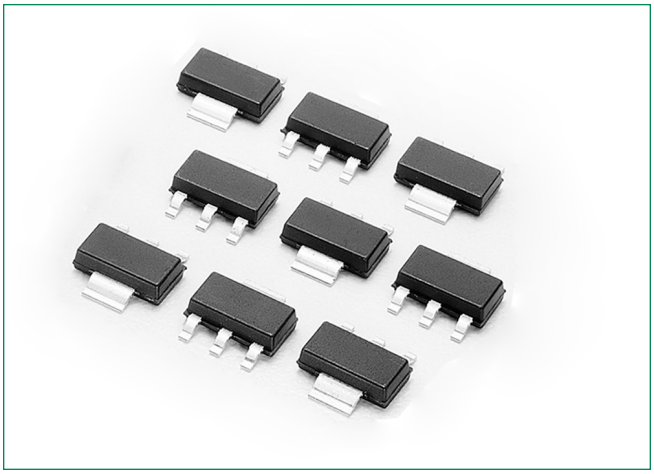
# NYC222, NYC226, NYC228



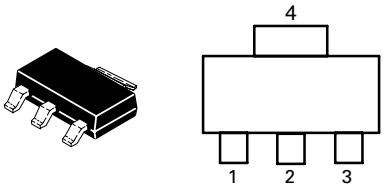
## Description

Designed and tested for repetitive peak operation required for CD ignition, fuel ignitors, flash circuits, motor controls and low-power switching applications.

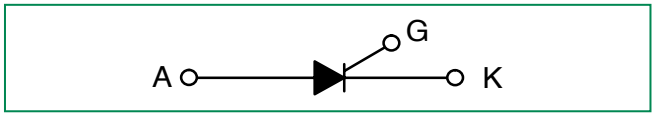
## Features

- Blocking Voltage to 600 V
- High Surge Current – 15 A
- Very Low Forward "On" Voltage at High Current
- Low-Cost Surface Mount SOT–223 Package
- These are Pb–Free Devices

## Pin Out




## Functional Diagram




## Additional Information

Datasheet | Resources | Samples


Revised: 12/18/18

## Maximum Ratings ($T_J$ = 25°C unless otherwise noted)

| Rating | | Symbol | Value | Unit |
|---|---|---|---|---|
| Peak Repetitive Off–State Voltage (Note 1) ($R_{GK}$ = $I_K$, $T_J$ – 40 to +110°C, Sine Wave, 50 to 60 Hz) | NYC222<br>NYC226<br>NYC228 | $V_{DRM}$, $V_{RRM}$ | 50<br>400<br>600 | V |
| On-State RMS Current (180° Conduction Angles; $T_C$ = 80°C) | | $I_{T\ (RMS)}$ | 1.5 | A |
| Average On–State Current, ($T_C$ = 65°C, f = 60 Hz, Time = 1 sec) | | $I_{T\ (RMS)}$ | 2.0 | A |
| Peak Non-repetitive Surge Current, @$T_A$ = 25°C, (1/2 Cycle, Sine Wave, 60 Hz) | | $I_{TSM}$ | 15 | A |
| Circuit Fusing Considerations (t = 8.3 ms) | | $I^2t$ | 0.9 | A2s |
| Forward Peak Gate Power (Pulse Width ≤ 1.0 sec, $T_A$ = 25°C) | | $P_{GM}$ | 0.5 | W |
| Forward Average Gate Power (t = 8.3 msec, $T_A$ = 25°C) | | $P_{GM\ (AV)}$ | 0.1 | W |
| Forward Peak Gate Current (Pulse Width ≤ 1.0 s, $T_A$ = 25°C) | | $I_{FGM}$ | 0.2 | A |
| Reverse Peak Gate Voltage (Pulse Width ≤ 1.0 µs, $T_A$ = 25°C) | | $V_{RGM}$ | 5.0 | V |
| Operating Junction Temperature Range @ Rated $V_{RRM}$ and $V_{DRM}$ | | $T_J$ | -40 to +110 | °C |
| Storage Temperature Range | | $T_{stg}$ | -40 to +150 | °C |

## Thermal Characteristics

| Rating | Symbol | Value | Unit |
|---|---|---|---|
| Thermal Resistance, Junction–to–Ambient PCB Mounted | $R_{\theta JA}$ | 156 | mW |
| Thermal Resistance, Junction–to–Tab Measured on MT2 Tab Adjacent to Epoxy | $R_{\theta JT}$ | 25 | °C/W |
| Maximum Device Temperature for Soldering Purposes for 10 Secs Maximum | $T_L$ | 260 | °C |

Stresses exceeding Maximum Ratings may damage the device. 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 device 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 devices are exceeded.


Revised: 12/18/18

## Electrical Characteristics - OFF ($T_J$ = 25°C unless otherwise noted)

| Characteristic | | Symbol | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|
| Peak Repetitive Forward or Reverse Blocking Current (Note 3) ($V_{AK}$ = Rated $V_{DRM}$ or $V_{RRM}$, $R_{GK}$ = 1000 kΩ | $T_J$ = 25°C | $I_{DRM}$, | - | - | 1.0 | µA |
| | $T_J$ = 110°C | | - | - | 200 | |

## Electrical Characteristics - ON ($T_J$ = 25°C unless otherwise noted; Electricals apply in both directions)

| Characteristic | | Symbol | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|
| Peak Forward On-State Voltage (Note 2) ($I_{TM}$ = 2.2 A Peak) | | $V_{TM}$ | – | 1.2 | 1.7 | V |
| HGate Trigger Current (Note 3) ($V_D$ = 12 V, $R_L$ = 100 Ω, $T_C$ = 25°C) | $T_C$ = 25°C | $I_{GT}$ | – | 30 | 200 | µA |
| | $T_C$ =–40°C | | – | – | 500 | |
| Gate Trigger Voltage (dc) (Note 3) ($V_{AK}$ = 7 Vdc, $R_L$ = 100Ω) | $T_C$ = 25°C | $V_{GT}$ | – | – | 0.8 | V |
| | $T_C$ =–40°C | | – | – | 1.2 | |
| Gate Non–Trigger Voltage ($V_{AK}$ = $V_{DRM}$, $R_L$ = 100 Ω) | $T_C$ = 110°C | $V_{GD}$ | 0.1 | – | – | V |
| Holding Current ($V_{AK}$ = 12 V, $R_{GK}$ = 1000 Ω) Initiating Current = 200 mA | $T_C$ = 25°C | $I_H$ | – | 2.0 | 5.0 | V |
| | $T_C$ =–40°C | | – | – | 10 | |

## Dynamic Characteristics

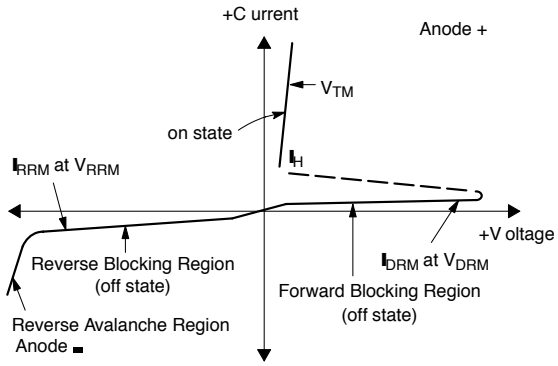
| Characteristic | Symbol | Min | Typ | Max | Unit |
|---|---|---|---|---|---|
| Critical Rate-of-Rise of Off State Voltage ($T_C$ = 110°C) | dv/dt | – | 25 | – | V/µs |
| Critical Rate of Rise of On–State Current ($T_C$ = 110°C, $I_G$ = 2 x $I_{GT}$, $R_{GK}$ = 1 kΩ) | di/dt | – | 20 | – | A/µs |

2. Pulse Width =1.0 ms, Duty Cycle ≤ 1%.

3. RGK Current not included in measurement.

## Voltage Current Characteristic 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 |





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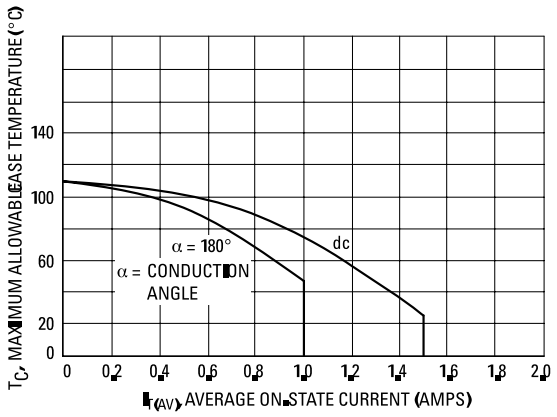
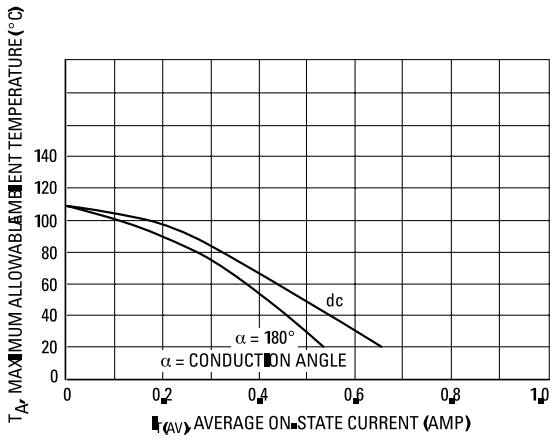
## Current Derating

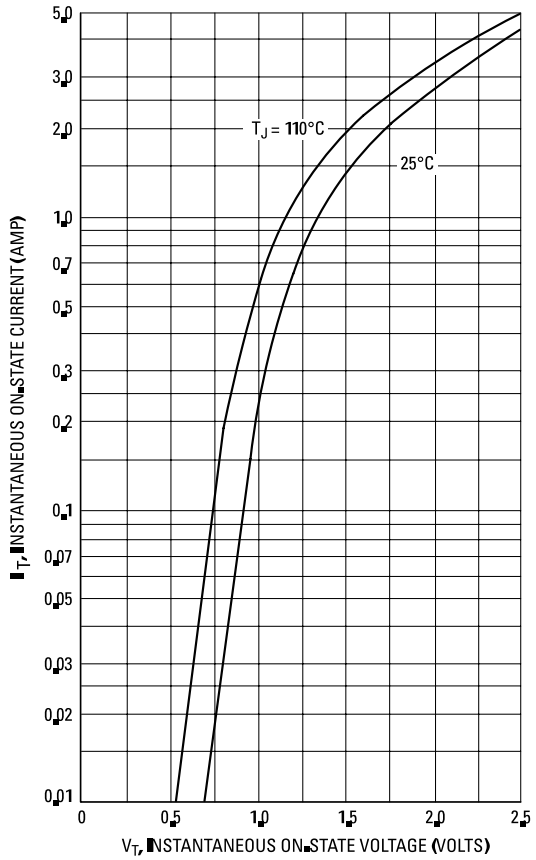
### Figure 1. Maximum Case Temperature



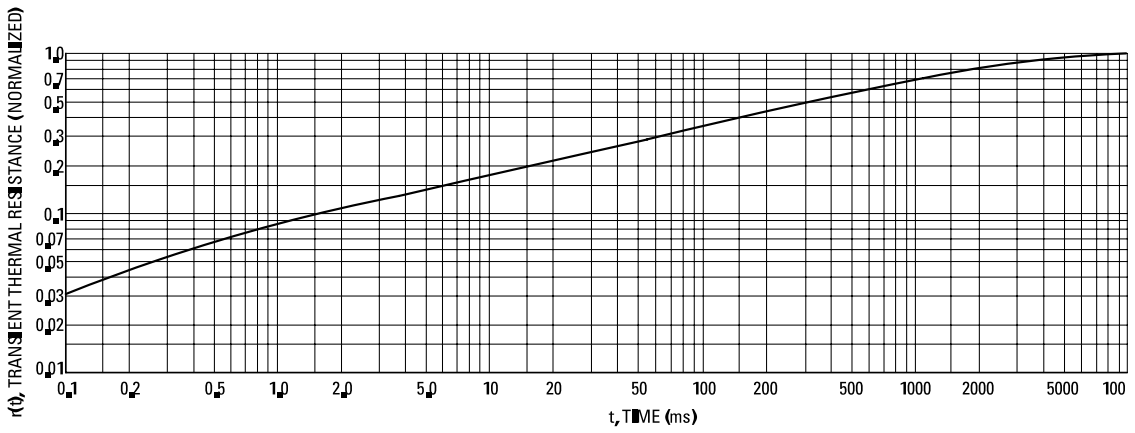

### Figure 2. Maximum Ambient Temperature




### Figure 3. Typical Forward Voltage




### Figure 4. Thermal Response





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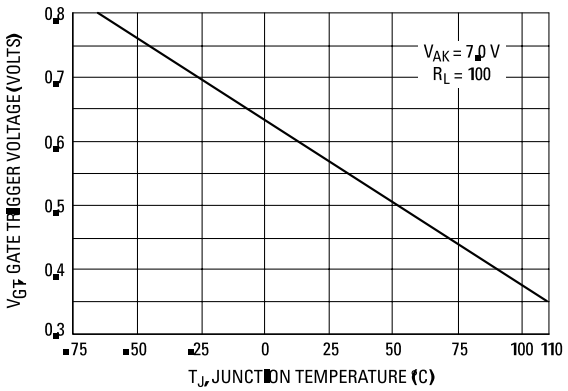
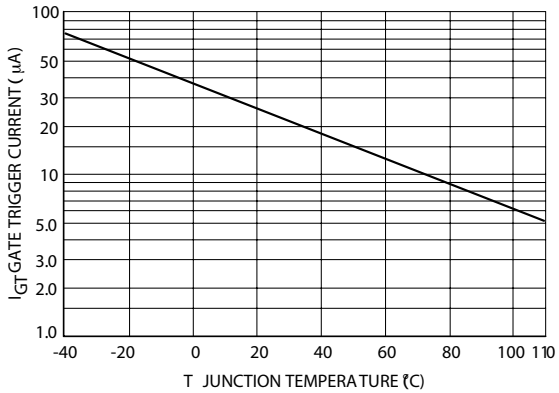
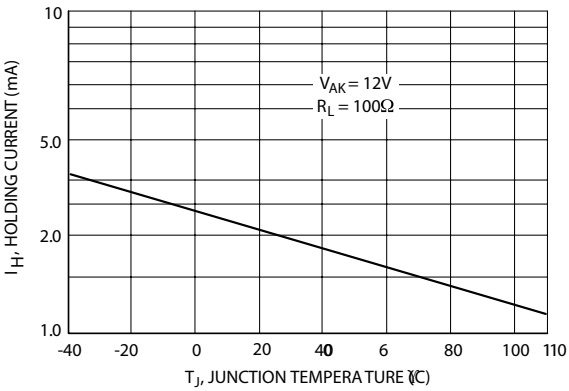
## Figure 5. Typical Gate Trigger Voltage



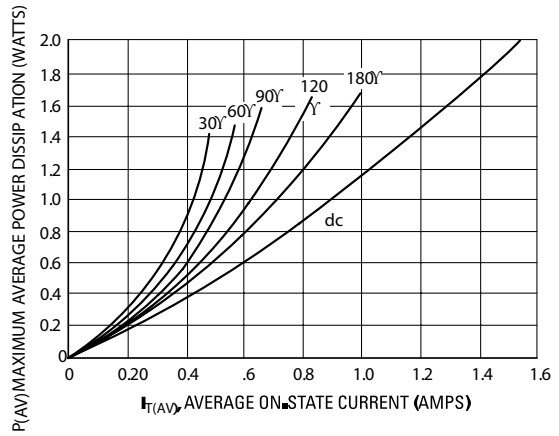

## Figure 6. Typical Gate Trigger Current



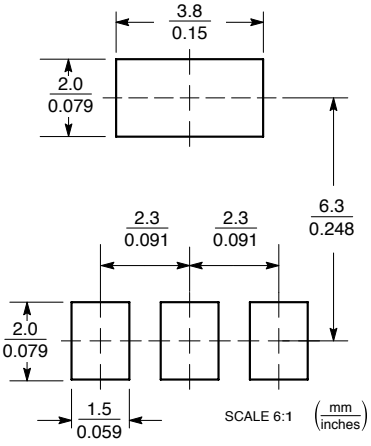

## Figure 7. Typical Holding Current




## Figure 8. Power Dissipation




## Soldering Footprint





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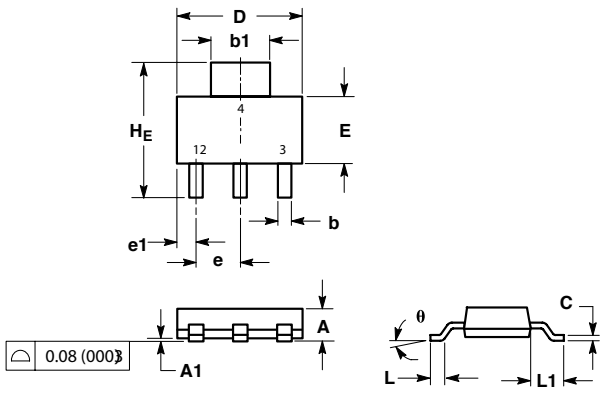
# Thyristors

## Surface Mount – 400V – 600V > NYC222, NYC226, NYC228

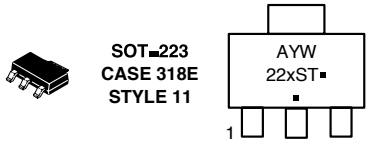
## Dimensions

| Dim | Inches | | | Millimeters | | |
|---|---|---|---|---|---|---|
| | Min | Nom | Max | Min | Nom | Max |
| A | --- | --- | 0.071 | --- | --- | 1.80 |
| A1 | 0.001 | 0.003 | 0.005 | 0.02 | 0.07 | 0.13 |
| b | 0.026 | 0.030 | 0.033 | 0.66 | 0.75 | 0.84 |
| b1 | 0.114 | 0.118 | 0.122 | 2.90 | 3.00 | 3.10 |
| c | 0.009 | 0.011 | 0.014 | 0.23 | 0.29 | 0.35 |
| D | 0.260 | 0.260 | 0.264 | 6.60 | 6.60 | 6.71 |
| E | 0.130 | 0.138 | 0.146 | 3.30 | 3.50 | 3.70 |
| e | --- | 0.091 | --- | --- | 2.30 | --- |
| e1 | 0.030 | 0.037 | 0.045 | 0.75 | 0.95 | 1.15 |
| L1 | 0.059 | 0.069 | 0.079 | 1.50 | 1.75 | 2.00 |
| $H_E$ | 0.268 | 0.276 | 0.283 | 6.80 | 7.00 | 7.20 |
| ø | 0° | --- | 10° | 0° | --- | 10° |




1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.

## Part Marking System




A= Assembly Location
Y= Year
W= Work Week
22xST= Specific Device Code
x = 2, 6 or 8
▪ = Pb-Free Package
(Note: Microdot may be in either location)

## Pin Assignment

| | |
|---|---|
| 1 | K (Cathode) |
| 2 | A (Anode) |
| 3 | G (Gate) |
| 4 | A (Anode) |

## Ordering Information

| Device | Package | Shipping |
|---|---|---|
| NYC222STT1G | SOT-223 (Pb-Free) | 1000/Tape & Reel |
| NYC226STT1G | SOT-223 (Pb-Free) | |
| NYC228STT1G | SOT-223 (Pb-Free) | |