NYC222, NYC226, NYC228

Sensitive Gate Silicon Controlled Rectifiers

Reverse Blocking Thyristors

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

MAXIMUM RATINGS (T_J = 25°C unless otherwise noted)

Rating	Symbol	Value	Unit
Peak Repetitive Off−State Voltage (Note 1) (R_{GK} = IK, T_J = −40 to +110°C, Sine Wave, 50 to 60 Hz, Gate Open) NYC222 NYC226 NYC228	V_{DRM}, V_{RRM}	50 400 600	V
On-State Current RMS (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	A^2s
Forward Peak Gate Power (Pulse Width ≤ 1.0 μsec, T_A = 25°C)	P_{GM}	0.5	W
Forward Average Gate Power (t = 8.3 msec, T_A = 25°C)	$P_{G(AV)}$	0.1	W
Forward Peak Gate Current (Pulse Width ≤ 1.0 μs, 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

Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

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.

ON Semiconductor®

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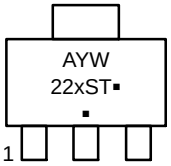
SCRs
1.5 AMPERES RMS
400 thru 600 VOLTS

MARKING DIAGRAM

SOT−223
CASE 318E
STYLE 11



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)	1000 /Tape & Reel
NYC228STT1G	SOT−223 (Pb−Free)	1000 /Tape & Reel

†For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specification Brochure, BRD8011/D.

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction−to−Ambient PCB Mounted	$R_{\theta JA}$	156	°C/W
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

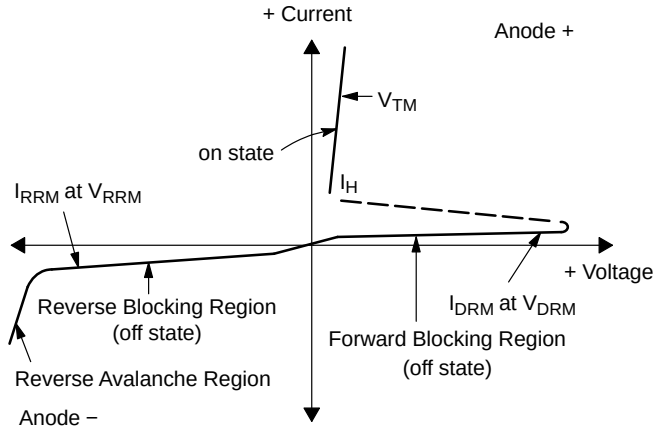
ELECTRICAL CHARACTERISTICS (T_C = 25°C unless otherwise noted.)

Characteristic		Symbol	Min	Typ	Max	Unit
OFF CHARACTERISTICS						
Peak Repetitive Forward or Reverse Blocking Current (V_{AK} = Rated V_{DRM}/V_{RRM}; R_{GK} = 1000 Ω)	T_C = 25°C T_C = 110°C	I_{DRM}, I_{RRM}	− −	− −	10 200	μA μA
ON CHARACTERISTICS						
Peak Forward On−State Voltage (Note 2) (I_{TM} = 2.2 A Peak)		V_{TM}	−	1.2	1.7	V
Gate Trigger Current (dc) (Note 3) (V_{AK} = 7 Vdc, R_L = 100 Ω)	T_C = 25°C T_C = −40°C	I_{GT}	− −	30 −	200 500	μA
Gate Trigger Voltage (dc) (Note 3) (V_{AK} = 7 Vdc, R_L = 100 Ω)	T_C = 25°C T_C = −40°C	V_{GT}	− −	− −	0.8 1.2	V
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 T_C = −40°C	I_H	− −	2.0 −	5.0 10	mA
DYNAMIC CHARACTERISTICS						
Critical Rate of Rise of Off−State Voltage (T_C = 110°C)		dv/dt	−	25	−	V/μs

2. Pulse Width = 1.0 ms, Duty Cycle ≤ 1%.
3. R_{GK} Current not included in measurement.

Voltage Current Characteristic of SCR

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



CURRENT DERATING

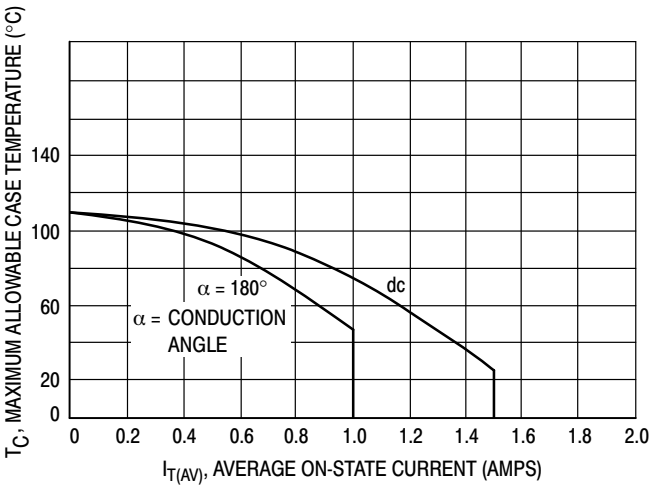


Figure 1. Maximum Case Temperature

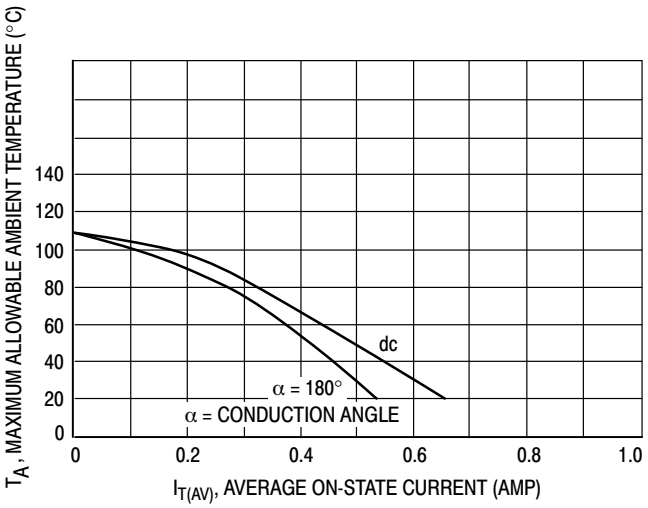


Figure 2. Maximum Ambient Temperature

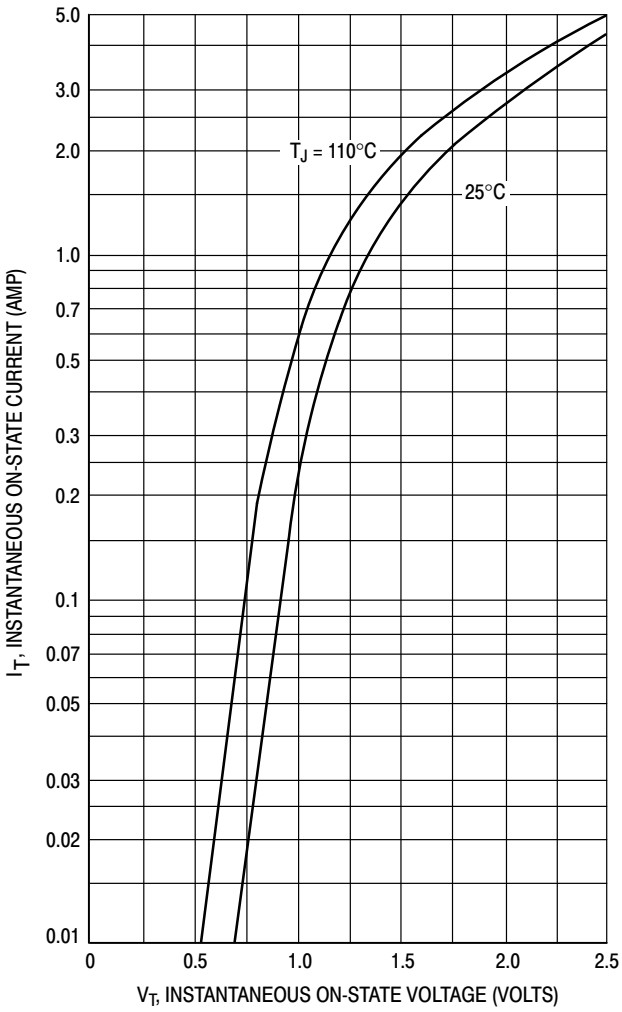


Figure 3. Typical Forward Voltage

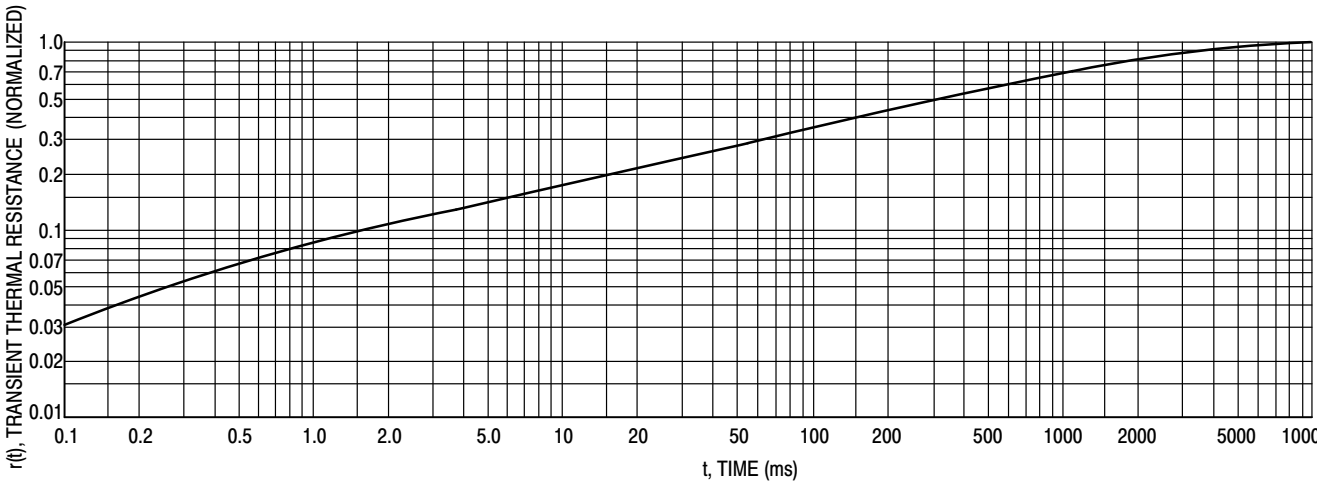


Figure 4. Thermal Response

TYPICAL CHARACTERISTICS

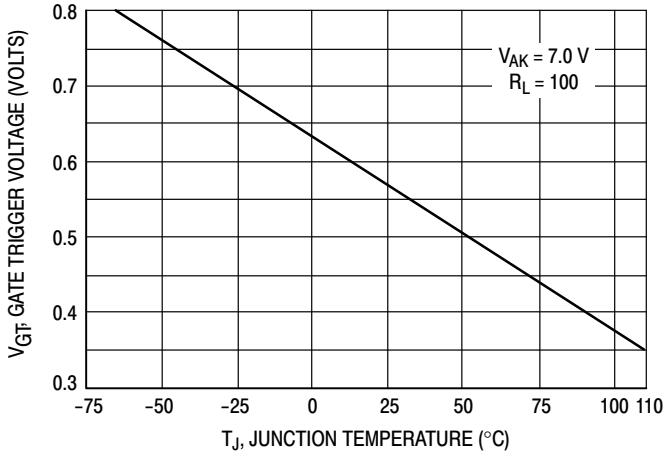


Figure 5. Typical Gate Trigger Voltage

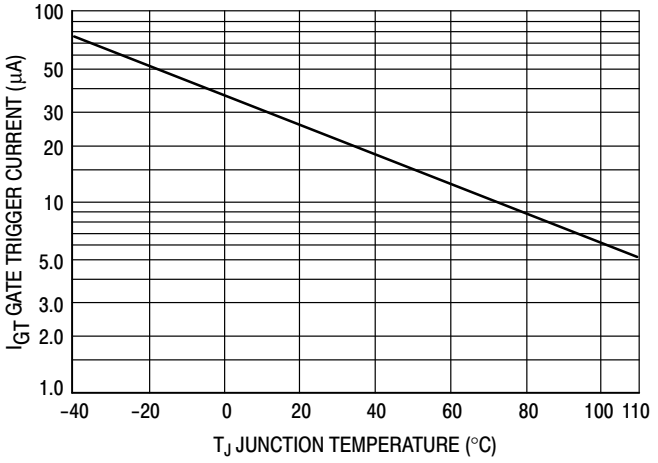


Figure 6. Typical Gate Trigger Current

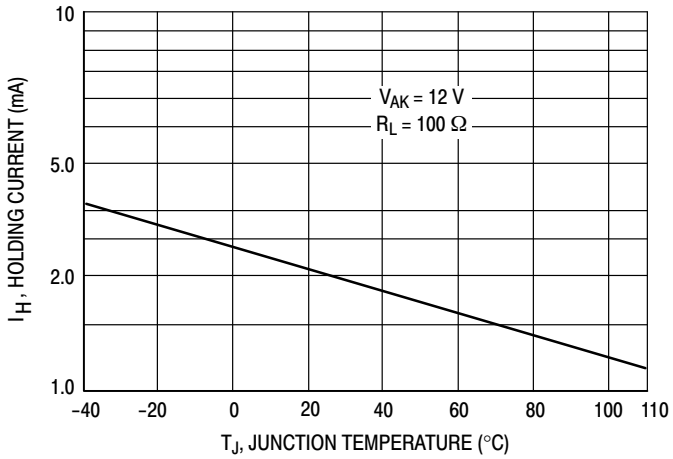


Figure 7. Typical Holding Current

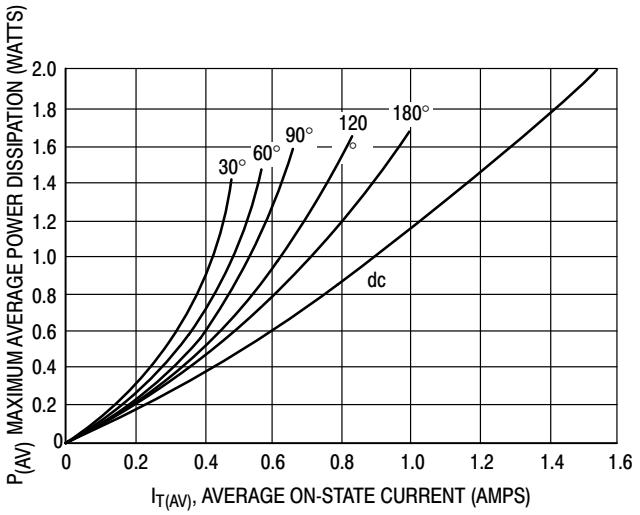
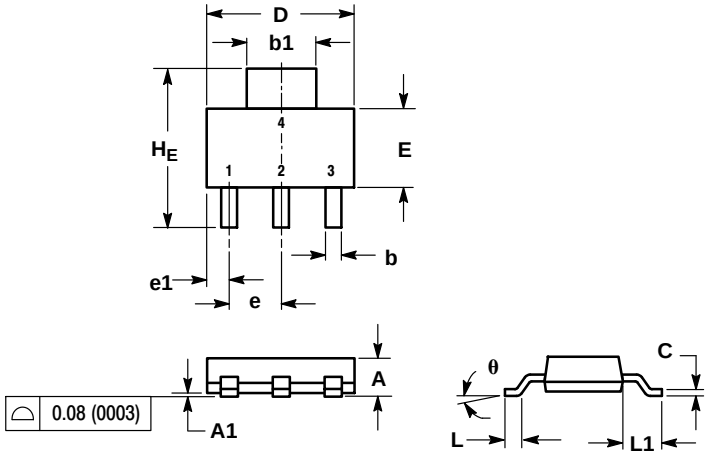


Figure 8. Power Dissipation

PACKAGE DIMENSIONS

SOT−223 (TO−261)
CASE 318E−04
ISSUE N

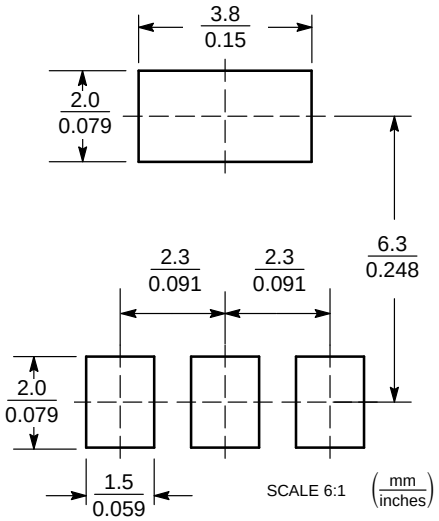


NOTES:
1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994.
2. CONTROLLING DIMENSION: INCH.

	MILLIMETERS			INCHES		
DIM	MIN	NOM	MAX	MIN	NOM	MAX
A	1.50	1.63	1.75	0.060	0.064	0.068
A1	0.02	0.06	0.10	0.001	0.002	0.004
b	0.60	0.75	0.89	0.024	0.030	0.035
b1	2.90	3.06	3.20	0.115	0.121	0.126
c	0.24	0.29	0.35	0.009	0.012	0.014
D	6.30	6.50	6.70	0.249	0.256	0.263
E	3.30	3.50	3.70	0.130	0.138	0.145
e	2.20	2.30	2.40	0.087	0.091	0.094
e1	0.85	0.94	1.05	0.033	0.037	0.041
L	0.20	−−−	−−−	0.008	−−−	−−−
L1	1.50	1.75	2.00	0.060	0.069	0.078
H_E	6.70	7.00	7.30	0.264	0.276	0.287
θ	0°	–	10°	0°	–	10°

STYLE 11:
PIN 1. MT 1
2. MT 2
3. GATE
4. MT 2

SOLDERING FOOTPRINT



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