

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

Rating	Symbol	Value	Unit
Peak Repetitive Off-State Voltage (Note 1) ($R_{GK} = 1\text{K}$, $T_J = -40$ to $+110^\circ\text{C}$, 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, $T_C = 80^\circ\text{C}$)	$I_{T(RMS)}$	1.5	A
Average On-State Current, ($T_C = 65^\circ\text{C}$, $f = 60$ Hz, Time = 1 sec)	$I_{T(RMS)}$	2.0	A
Peak Non-repetitive Surge Current, @ $T_A = 25^\circ\text{C}$, (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 , $T_A = 25^\circ\text{C}$)	P_{GM}	0.5	W
Forward Average Gate Power ($t = 8.3$ msec, $T_A = 25^\circ\text{C}$)	$P_{G(AV)}$	0.1	W
Forward Peak Gate Current (Pulse Width ≤ 1.0 μs , $T_A = 25^\circ\text{C}$)	I_{FGM}	0.2	A
Reverse Peak Gate Voltage (Pulse Width ≤ 1.0 μs , $T_A = 25^\circ\text{C}$)	V_{RGM}	5.0	V
Operating Junction Temperature Range @ Rated V_{RRM} and V_{DRM}	T_J	-40 to $+110$	$^\circ\text{C}$
Storage Temperature Range	T_{stg}	-40 to $+150$	$^\circ\text{C}$

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®

www.onsemi.com

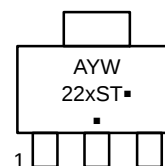
SCRs
1.5 AMPERES RMS
400 thru 600 VOLTS



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	$^{\circ}\text{C/W}$
Thermal Resistance, Junction-to-Tab Measured on MT2 Tab Adjacent to Epoxy	$R_{\theta JT}$	25	$^{\circ}\text{C/W}$
Maximum Device Temperature for Soldering Purposes for 10 Secs Maximum	T_L	260	$^{\circ}\text{C}$

ELECTRICAL CHARACTERISTICS ($T_C = 25^{\circ}\text{C}$ unless otherwise noted.)

Characteristic	Symbol	Min	Typ	Max	Unit
----------------	--------	-----	-----	-----	------

OFF CHARACTERISTICS

Peak Repetitive Forward or Reverse Blocking Current ($V_{AK} = \text{Rated } V_{DRM}/V_{RRM}$; $R_{GK} = 1000 \Omega$)	I_{DRM}, I_{RRM}	-	-	10	μA
$T_C = 110^{\circ}\text{C}$		-	-	200	μA

ON CHARACTERISTICS

Peak Forward On-State Voltage (Note 2) ($I_{TM} = 2.2 \text{ A Peak}$)	V_{TM}	-	1.2	1.7	V
Gate Trigger Current (dc) (Note 3) ($V_{AK} = 7 \text{ Vdc}$, $R_L = 100 \Omega$)	I_{GT}	-	30	200	μA
$T_C = -40^{\circ}\text{C}$		-	-	500	
Gate Trigger Voltage (dc) (Note 3) ($V_{AK} = 7 \text{ Vdc}$, $R_L = 100 \Omega$)	V_{GT}	-	-	0.8	V
$T_C = -40^{\circ}\text{C}$		-	-	1.2	
Gate Non-Trigger Voltage ($V_{AK} = V_{DRM}$, $R_L = 100 \Omega$)	V_{GD}	0.1	-	-	V
$T_C = 110^{\circ}\text{C}$					
Holding Current ($V_{AK} = 12 \text{ V}$, $R_{GK} = 1000 \Omega$) Initiating Current = 200 mA	I_H	-	2.0	5.0	mA
$T_C = -40^{\circ}\text{C}$		-	-	10	

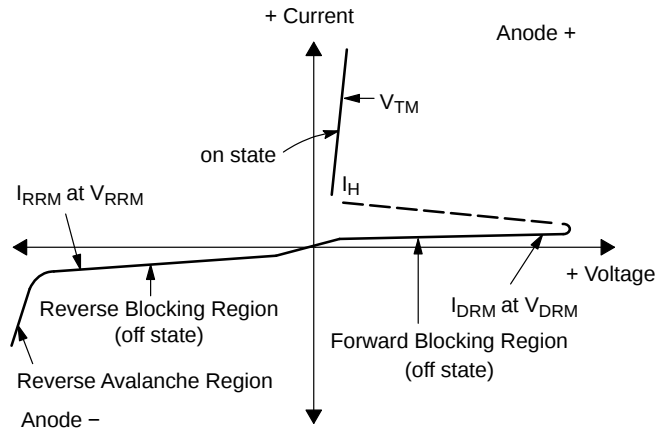
DYNAMIC CHARACTERISTICS

Critical Rate of Rise of Off-State Voltage ($T_C = 110^{\circ}\text{C}$)	dv/dt	-	25	-	V/ μs
---	---------	---	----	---	------------------

- Pulse Width = 1.0 ms, Duty Cycle $\leq 1\%$.
- 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

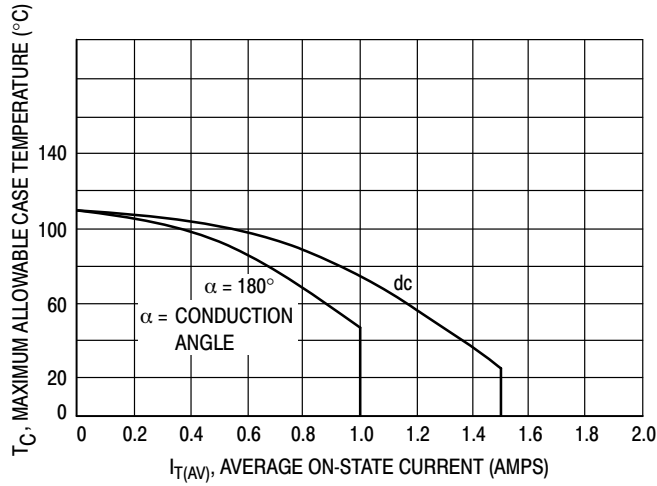


Figure 1. Maximum Case Temperature

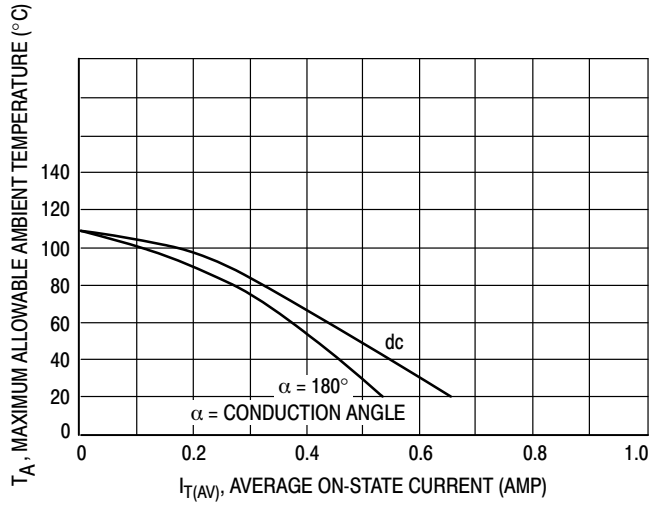


Figure 2. Maximum Ambient Temperature

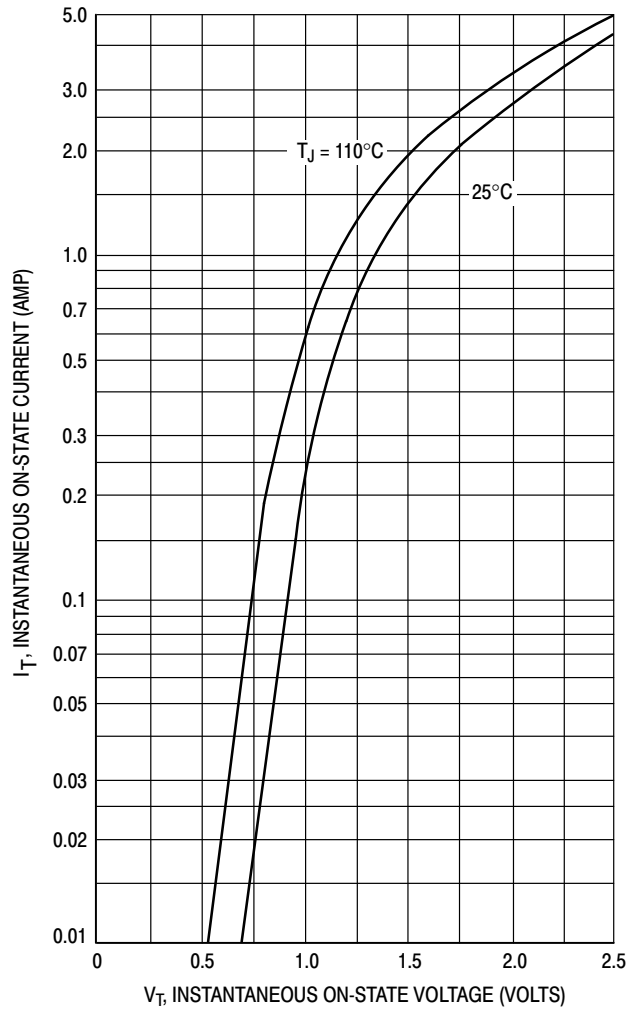


Figure 3. Typical Forward Voltage

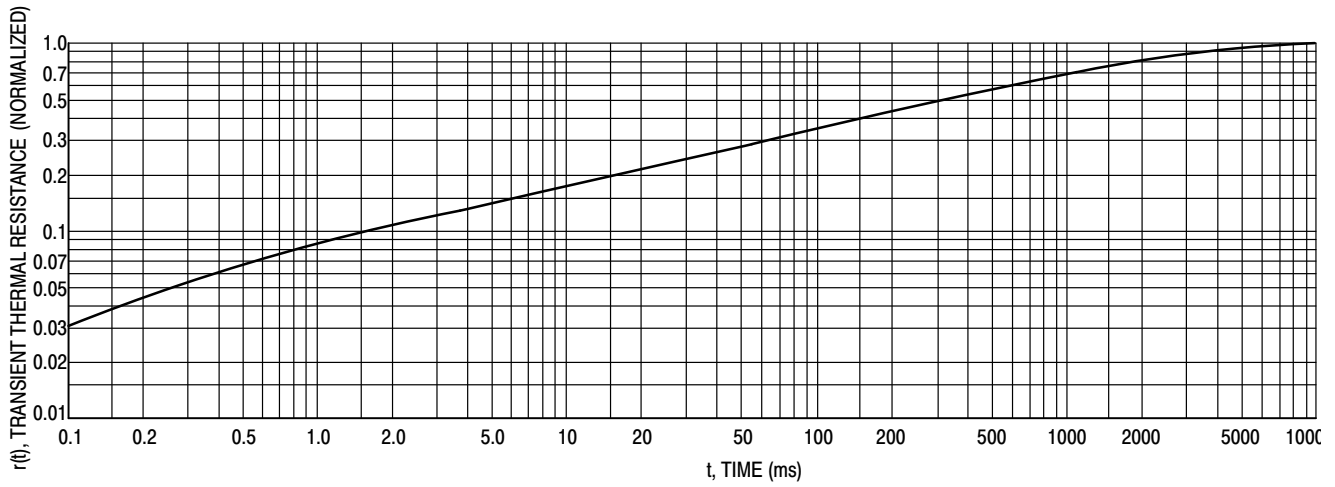


Figure 4. Thermal Response

TYPICAL CHARACTERISTICS

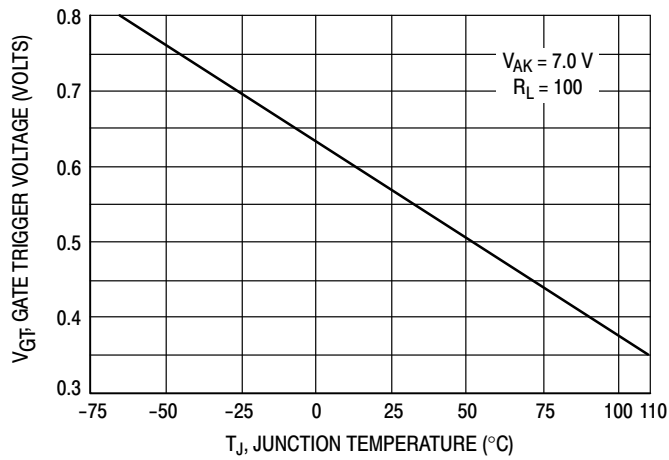


Figure 5. Typical Gate Trigger Voltage

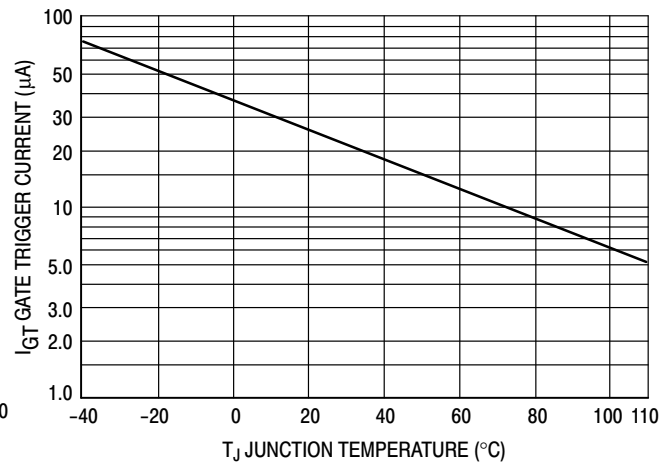


Figure 6. Typical Gate Trigger Current

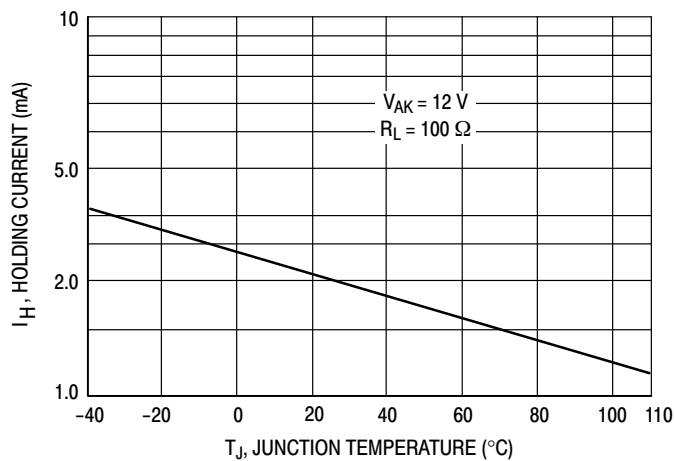


Figure 7. Typical Holding Current

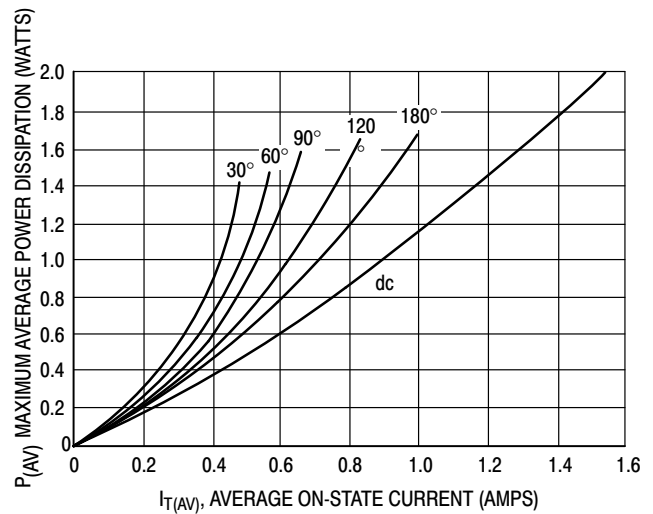
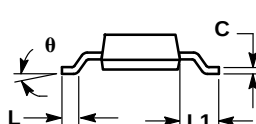
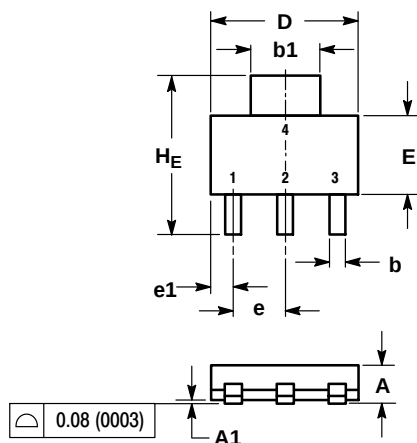


Figure 8. Power Dissipation

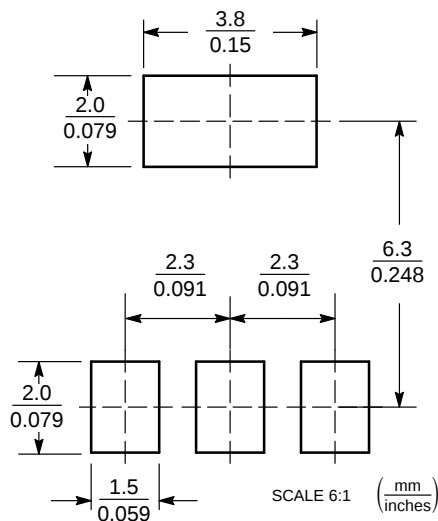
NYC222, NYC226, NYC228

PACKAGE DIMENSIONS

SOT-223 (TO-261) CASE 318E-04 ISSUE N



SOLDERING FOOTPRINT



NOTES:

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

DIM	MILLIMETERS			INCHES		
	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
- MT 2
- GATE
- MT 2

ON Semiconductor and the  are registered trademarks of Semiconductor Components Industries, LLC (SCILLC) or its subsidiaries in the United States and/or other countries. SCILLC owns the rights to a number of patents, trademarks, copyrights, trade secrets, and other intellectual property. A listing of SCILLC's product/patent coverage may be accessed at www.onsemi.com/site/pdf/Patent-Marking.pdf. SCILLC reserves the right to make changes without further notice to any products herein. SCILLC makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does SCILLC assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation special, consequential or incidental damages. "Typical" parameters which may be provided in SCILLC data sheets and/or specifications can and do vary in different applications and actual performance may vary over time. All operating parameters, including "Typicals" must be validated for each customer application by customer's technical experts. SCILLC does not convey any license under its patent rights nor the rights of others. SCILLC products are not designed, intended, or authorized for use as components in systems intended for surgical implant into the body, or other applications intended to support or sustain life, or for any other application in which the failure of the SCILLC product could create a situation where personal injury or death may occur. Should Buyer purchase or use SCILLC products for any such unintended or unauthorized application, Buyer shall indemnify and hold SCILLC and its officers, employees, subsidiaries, affiliates, and distributors harmless against all claims, costs, damages, and expenses, and reasonable attorney fees arising out of, directly or indirectly, any claim of personal injury or death associated with such unintended or unauthorized use, even if such claim alleges that SCILLC was negligent regarding the design or manufacture of the part. SCILLC is an Equal Opportunity/Affirmative Action Employer. This literature is subject to all applicable copyright laws and is not for resale in any manner.

PUBLICATION ORDERING INFORMATION

LITERATURE FULFILLMENT:

Literature Distribution Center for ON Semiconductor
P.O. Box 5163, Denver, Colorado 80217 USA
Phone: 303-675-2175 or 800-344-3860 Toll Free USA/Canada
Fax: 303-675-2176 or 800-344-3867 Toll Free USA/Canada
Email: orderlit@onsemi.com

N. American Technical Support: 800-282-9855 Toll Free
USA/Canada
Europe, Middle East and Africa Technical Support:
Phone: 421 33 790 2910
Japan Customer Focus Center
Phone: 81-3-5817-1050

ON Semiconductor Website: www.onsemi.com

Order Literature: <http://www.onsemi.com/orderlit>

For additional information, please contact your local Sales Representative