Sensitive Gate Triacs

Silicon Bidirectional Thyristors

Designed for high volume, low cost, industrial and consumer applications such as motor control; process control; temperature, light and speed control.

Features

- Passivated Die for Reliability and Uniformity
- Four-Quadrant Triggering
- Blocking Voltage to 600 V
- On-State Current Rating of 6.0 A RMS at 93°C
- Low Level Triggering and Holding Characteristics
- Epoxy Meets UL 94 V-0 @ 0.125 in
- 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) (T _J = -40 to 110°C, Sine Wave, 50 to 60 Hz, Gate Open)	V _{DRM,} V _{RRM}	600	V
On-State RMS Current (Full Cycle Sine Wave, 60 Hz, T _C = 85°C)	I _{T(RMS)}	6.0	Α
Peak Non-Repetitive Surge Current (One Full Cycle, 60 Hz, T _{Jinitial} = 25°C)	I _{TSM}	60	Α
Circuit Fusing Consideration (t = 8.3 msec)	I ² t	6.6	A ² sec
Peak Gate Power (Pulse Width ≤ 10 μsec, T _C = 93°C)	P _{GM}	2.0	W
Average Gate Power (t = 8.3 msec, T _C = 93°C)	P _{G(AV)}	1.0	W
Peak Gate Current (Pulse Width \leq 20 µsec, T _C = 93°C)	I _{GM}	4.0	Α
Peak Gate Voltage (Pulse Width \leq 20 μ sec, T _C = 93°C)	V_{GM}	5.0	V
Operating Junction Temperature Range	TJ	-40 to 110	°C
Storage Temperature Range	T _{stg}	-40 to 150	°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.

 V_{DRM} and V_{RRM} for all types can be applied on a continuous basis. Blocking voltages shall not be tested with a constant current source such that the voltage ratings of the device are exceeded.

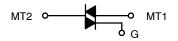
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TRIACS 6.0 AMPERES RMS 600 VOLTS



MARKING DIAGRAMS

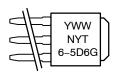


DPAK CASE 369C STYLE 6





IPAK CASE 369D STYLE 6



Y = Year

WW = Work Week

NYT6-5D6= Device Code

G = Pb-Free Package

PIN ASSIGNMENT				
1	Main Terminal 1			
2	Main Terminal 2			
3	Gate			
4	Main Terminal 2			

ORDERING INFORMATION

See detailed ordering and shipping information in the package dimensions section on page 2 of this data sheet.

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance, - Junction-to-Case - Junction-to-Ambient - Junction-to-Ambient (Note 2)	$egin{array}{l} R_{ hetaJC} \ R_{ hetaJA} \ R_{ hetaJA} \end{array}$	3.5 88 80	°C/W
Maximum Lead Temperature for Soldering Purposes (Note 3)	T _L	260	°C

ELECTRICAL CHARACTERISTICS (T_{.1} = 25°C unless otherwise noted; Electricals apply in both directions)

Characteristic		Symbol	Min	Тур	Max	Unit
OFF CHARACTERISTICS	•					
Peak Repetitive Forward or Reverse Blocking Current (VAK = Rated V _{DRM} or V _{RRM} ; Gate Open)	T _J = 25°C Γ _J = 110°C	I _{DRM,} I _{RRM}	_ _	_ _	0.001 0.5	mA
ON CHARACTERISTICS	•		•	•		
Forward On–State Voltage ($I_{TM} = \pm 8.5 \text{ A}$)		V_{TM}	-	-	1.6	V
Gate Trigger Current (Continuous dc) (V_D = 12 V, R_L = 30 Ω) MT2(+), G(+) MT2(+), G(-) MT2(-), G(-) MT2(-), G(+)		I _{GT}	- - - -	- - - -	5.0 5.0 5.0 10	mA
Gate Trigger Voltage (V_D = 12 V, R_L = 30 Ω) MT2(+), G(+) MT2(+), G(-) MT2(-), G(-) MT2(-), G(+)		V _{GT}	- - - -	- - - -	1.3 1.3 1.3 1.3	V
Gate Non-Trigger Voltage (Continuous dc) – (V $_{D}$ = 12 V, R $_{L}$ = 30 $\Omega,$ T $_{J}$ = All Four Quadrants	110°C)	V_{GD}	0.2	0.4	-	V
Holding Current (V _D = 12 V, Initiating Current = ±100 mA)		l _Η	-	-	20	mA
Latching Current (V_D = 12 V, I_G = 60 mA) MT2(+), G(+) MT2(+), G(-) MT2(-), G(-) MT2(-), G(+)		ΙL	- - -	- - -	30 30 30 30	mA
DYNAMIC CHARACTERISTICS			•			
Rate of Change of Commutating Current (V _D = 200 V, I _{TM} = 1.8 A, Commutating dv/dt = 1.0 V/ μ sec, T _J = 110°C, f = CL = 5.0 μ fd, LL = 80 mH, RS = 56 Ω , CS = 0.03 μ fd) With snubber	: 250 Hz,	di/dt(c)	-	1.5	-	A/ms
Critical Rate of Rise of Off–State Voltage ($V_D = 0.67~X$ Rated V_{DRM} , Exponential Waveform, Gate Open, $T_J = 110^{\circ} C_{DRM}$	5)	dv/dt	60	-	-	V/μs
Critical Rate of Rise of On–State Current $(T_J = 110^{\circ}\text{C}, f = 120 \text{ Hz}, I_G = 2 \times I_{GT}, \text{tr} \le 100 \text{ ns})$		dl/dt	-	-	50	A/μs

^{2.} These ratings are applicable when surface mounted on the minimum pad sizes recommended.

ORDERING INFORMATION

Device	Package Type	Package	Shipping [†]
NYT6-5D6DTG	IPAK (Pb-Free)	369D	75 Units / Rail
NYT6-5D6DT4G	DPAK (Pb-Free)	369C	2500 / Tape & Reel

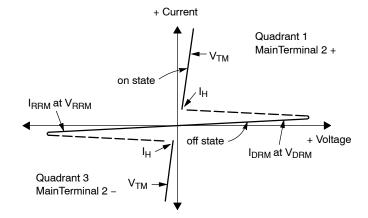
[†]For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, BRD8011/D.

^{3. 1/8&}quot; from case for 10 seconds.

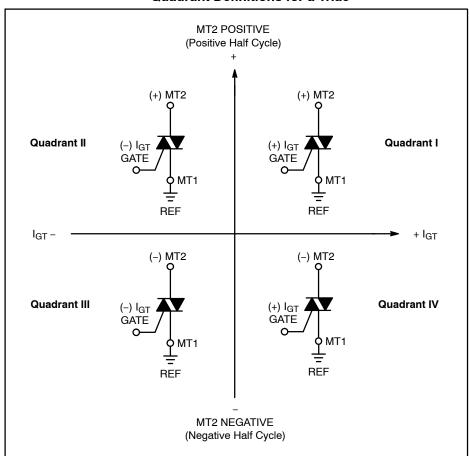
^{4.} Pulse Test: Pulse Width \leq 2.0 msec, Duty Cycle \leq 2%.

Voltage Current Characteristic of Triacs (Bidirectional Device)

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

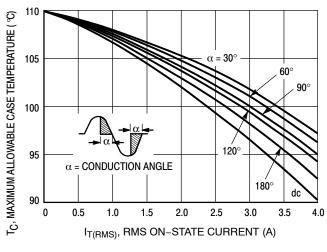


Quadrant Definitions for a Triac



All polarities are referenced to MT1.

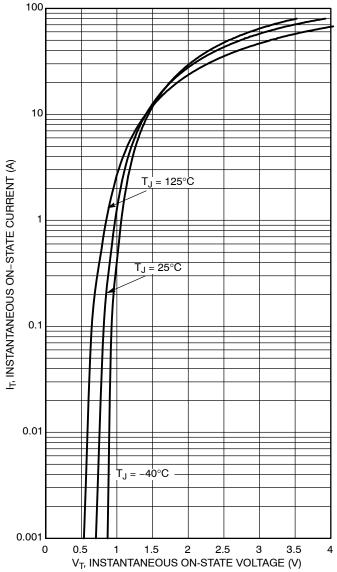
With in-phase signals (using standard AC lines) quadrants I and III are used.



6.0 P(AV), AVERAGE POWER DISSIPATION (WATTS) 180° 5.0 120° 90° 4.0 α = CONDUCTION ANGLE 3.0 2.0 60° α = 30 $^{\circ}$ 1.0 0.5 2.0 2.5 3.0 3.5 4.0 $I_{T(RMS)}$, RMS ON-STATE CURRENT (A)

Figure 1. RMS Current Derating

Figure 2. On-State Power Dissipation



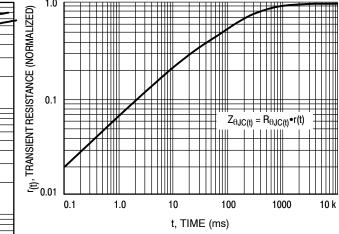
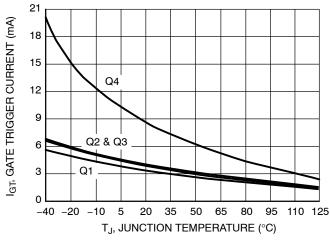


Figure 4. Transient Thermal Response

Figure 3. Maximum On-State Voltage Characteristics



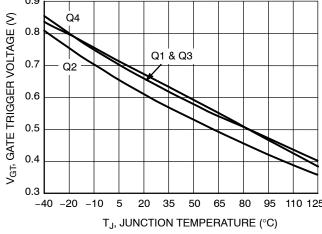


Figure 5. Typical Gate Trigger Current

Figure 6. Typical Gate Trigger Voltage

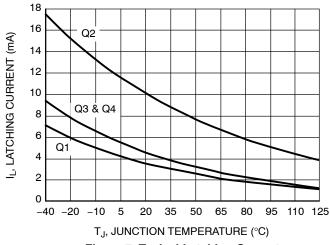


Figure 7. Typical Latching Current

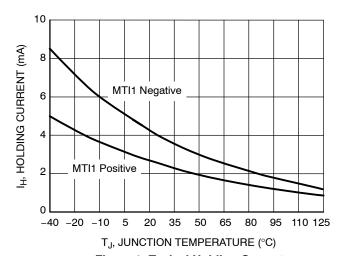
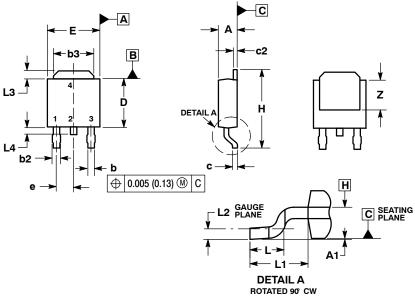


Figure 8. Typical Holding Current

PACKAGE DIMENSIONS

DPAK (SINGLE GAUGE)

CASE 369C ISSUE D



NOTES:

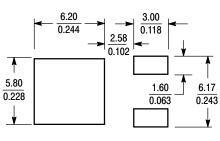
- 1. DIMENSIONING AND TOLERANCING PER ASME

- 1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994.
 2. CONTROLLING DIMENSION: INCHES.
 3. THERMAL PAD CONTOUR OPTIONAL WITHIN DIMENSIONS 53, L3 and Z.
 4. DIMENSIONS D AND E DO NOT INCLUDE MOLD FLASH, PROTRUSIONS, OR BURRS. MOLD FLASH, PROTRUSIONS, OR GATE BURRS SHALL NOT EXCEED 0.006 INCHES PER SIDE.
- 5. DIMENSIONS D AND E ARE DETERMINED AT THE OUTERMOST EXTREMES OF THE PLASTIC BODY.
- 6. DATUMS A AND B ARE DETERMINED AT DATUM PLANE H.

		HES	MILLIMETERS	
DIM	MIN	MAX	MIN	MAX
Α	0.086	0.094	2.18	2.38
A1	0.000	0.005	0.00	0.13
b	0.025	0.035	0.63	0.89
b2	0.030	0.045	0.76	1.14
b3	0.180	0.215	4.57	5.46
С	0.018	0.024	0.46	0.61
c2	0.018	0.024	0.46	0.61
D	0.235	0.245	5.97	6.22
Е	0.250	0.265	6.35	6.73
е	0.090	BSC	2.29 BSC	
Н	0.370	0.410	9.40	10.41
L	0.055	0.070	1.40	1.78
L1	0.108 REF		2.74 REF	
L2	0.020	0.020 BSC		BSC
L3	0.035	0.050	0.89	1.27
L4		0.040		1.01
Z	0.155		3.93	

STYLE 6: PIN 1. MT1 2. MT2 3. GATE 4. MT2

SOLDERING FOOTPRINT*

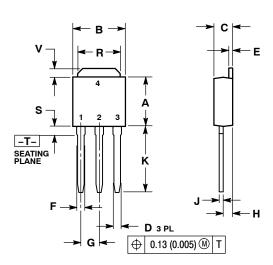


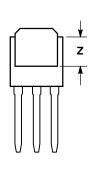
SCALE 3:1

^{*}For additional information on our Pb-Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

PACKAGE DIMENSIONS

IPAK CASE 369D **ISSUE C**





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

	INCHES		INCHES MILLIMETER	
DIM	MIN	MAX	MIN	MAX
Α	0.235	0.245	5.97	6.35
В	0.250	0.265	6.35	6.73
С	0.086	0.094	2.19	2.38
D	0.027	0.035	0.69	0.88
Ε	0.018	0.023	0.46	0.58
F	0.037	0.045	0.94	1.14
G	0.090 BSC 2.29 B		BSC	
Н	0.034	0.040	0.87	1.01
J	0.018	0.023	0.46	0.58
Κ	0.350	0.380	8.89	9.65
R	0.180	0.215	4.45	5.45
S	0.025	0.040	0.63	1.01
٧	0.035	0.050	0.89	1.27
7	0 155		3 93	

STYLE 6: PIN 1. MT1 2. MT2

3. GATE

MT2

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