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	A	
Peak Non-Repetitive Surge Current (One Full Cycle, 60 Hz, T _{Jinitial} = 25°C)	I _{TSM}	60	A	
Circuit Fusing Consideration (t = 8.3 msec)	l ² t	6.6	A ² sec	
Peak Gate Power (Pulse Width \leq 10 μ sec, T _C = 93°C)	Р _{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 μ sec, T _C = 93°C)	I _{GM}	4.0	A	
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







G = Pb-Free Package

PIN ASSIGNMENT				
Main Terminal 1				
Main Terminal 2				
Gate				
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	Мах	Unit
Thermal Resistance, – Junction-to-Case – Junction-to-Ambient – Junction-to-Ambient (Note 2)	${f R}_{ heta JC} \ {f R}_{ heta JA} \ {f R}_{ heta JA}$	3.5 88 80	°C/W
Maximum Lead Temperature for Soldering Purposes (Note 3)	TL	260	°C

ELECTRICAL CHARACTERISTICS ($T_J = 25^{\circ}C$ unless otherwise noted; Electricals apply in both directions)

Characteristic	Symbol	Min	Тур	Max	Unit		
DFF CHARACTERISTICS							
Peak Repetitive Forward or Reverse Blocking Current (VAK = Rated V_{DRM} or V_{RRM} ; Gate Open)	T _J = 25°C T _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 All Four Quadrants	V_{GD}	0.2	0.4	-	V		
Holding Current (V _D = 12 V, Initiating Current = \pm 100 mA)			-	-	20	mA	
Latching Current (V _D = 12 V, I _G = 60 mA) MT2(+), G(+) MT2(+), G(-) MT2(-), G(-) MT2(-), G(+)		١L	- - - -		30 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 = 250 Hz, CL = 5.0 μ fd, LL = 80 mH, RS = 56 Ω , CS = 0.03 μ fd) With snubber	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°C)	dv/dt	60	-	-	V/μs
Critical Rate of Rise of On–State Current (T _J = 110°C, f = 120 Hz, I _G = 2 x I _{GT} , tr \leq 100 ns)	dl/dt	-	-	50	A/μs

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

3. 1/8" from case for 10 seconds.

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

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.

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.





PACKAGE DIMENSIONS

DPAK (SINGLE GAUGE)





NOTES:

- 1. DIMENSIONING AND TOLERANCING PER ASME

- DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994.
 CONTROLLING DIMENSION: INCHES.
 THERMAL PAD CONTOUR OPTIONAL WITHIN DI-MENSIONS b3, L3 and Z.
 DIMENSIONS D AND E DO NOT INCLUDE MOLD FLASH, PROTRUSIONS, OR GATE BURRS SHALL NOT EXCEED 0.006 INCHES PER SIDE.
 DIMENSIONS ON DE A DE DETERMINED AT THE E DIMENSIONS ON DE ADE DETERMINED AT THE
- 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.

	INCHES		MILLIN	IETERS
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	BSC	0.51 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

*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



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

	INCHES		MILLIN	IETERS
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
Е	0.018	0.023	0.46	0.58
F	0.037	0.045	0.94	1.14
G	0.090 BSC		2.29 BSC	
н	0.034	0.040	0.87 1.0	
J	0.018	0.023	0.46	0.58
К	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
V	0.035	0.050	0.89	1.27
Ζ	0.155		3.93	

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

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