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## NTE56065 TRIAC, 600V<sub>RM</sub>, 12A, High Commutation

### Description:

The NTE56065 is a glass passivated, high commutation TRIAC in an isolated full-pack type package designed for use in circuits where high static and dynamic dV/dt and high di/dt can occur. This device will commutate the full rated RMS current at the maximum rated junction temperature, without the aid of a snubber.

### Absolute Maximum Ratings:

Repetitive Peak Off-State Voltage (Note 1), V <sub>DRM</sub> .....	600V
RMS On-State Current (Full Sine Wave, T <sub>HS</sub> ≤ 56°C), I <sub>T</sub> (RMS) .....	12A
Non-Repetitive Peak On-State Current, I <sub>TSM</sub> (Full Sine Wave, T <sub>J</sub> = +25°C prior to Surge)	
t = 20ms .....	95A
t = 16.7ms .....	105A
I <sup>2</sup> t for Fusing (t = 10ms), I <sup>2</sup> t .....	45A <sup>2</sup> sec
Repetitive Rate-of-Rise of On-State Current after Triggering, di <sub>T</sub> /dt (I <sub>TM</sub> = 20A, I <sub>G</sub> = 0.2A, di <sub>G</sub> /dt = 0.2A/μs) .....	100A/μs
Peak Gate Current, I <sub>GM</sub> .....	2A
Peak Gate Voltage, V <sub>GM</sub> .....	5V
Peak Gate Power, P <sub>GM</sub> .....	5W
Average Gate Power (Over Any 20ms Period), P <sub>G(AV)</sub> .....	500mW
Operating Junction Temperature, T <sub>J</sub> .....	+125°C
Storage Temperature Range, T <sub>stg</sub> .....	-40° to +150°C
Thermal Resistance, Junction-to-Heatsink (Full or Half Cycle), R <sub>thJHS</sub>	
With Heatsink Compound .....	4.0K/W
Without Heatsink Compound .....	5.5K/W
Typical Thermal Resistance, Junction-to-Ambient, R <sub>thJA</sub> .....	55K/W

Note 1. Although not recommended, off-state voltages up to 800V may be applied without damage, but the TRIAC may switch to the on-state. The rate-of-rise of current should not exceed 15A/μs.

**Electrical Characteristics:** ( $T_J = +25^\circ\text{C}$  unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
<b>Static Characteristics</b>						
Gate Trigger Current MT <sub>2</sub> (+), G (+)	I <sub>GT</sub>	V <sub>D</sub> = 12V, I <sub>T</sub> = 0.1A, Note 2	2	18	50	mA
MT <sub>2</sub> (+), G (-)			2	21	50	mA
MT <sub>2</sub> (-), G (-)			2	34	50	mA
Latching Current MT <sub>2</sub> (+), G (+)	I <sub>L</sub>	V <sub>D</sub> = 12V, I <sub>T</sub> = 0.1A	-	31	60	mA
MT <sub>2</sub> (+), G (-)			-	34	90	mA
MT <sub>2</sub> (-), G (-)			-	30	60	mA
Holding Current	I <sub>H</sub>	V <sub>D</sub> = 12V, I <sub>T</sub> = 0.1A	-	31	60	mA
On-State Voltage	V <sub>T</sub>	I <sub>T</sub> = 17A	-	1.3	1.6	V
Gate Trigger Voltage	V <sub>GT</sub>	V <sub>D</sub> = 12V, I <sub>T</sub> = 0.1A	-	0.7	1.5	V
		V <sub>D</sub> = 400V, I <sub>T</sub> = 0.1A, T <sub>J</sub> = +125°C	0.25	0.4	-	V
Off-State Leakage Current	I <sub>D</sub>	V <sub>D</sub> = 600V, T <sub>J</sub> = +125°C	-	0.1	0.5	mA
<b>Dynamic Characteristics</b>						
Critical Rate-of-Rise of Off-State Voltage	dV <sub>D</sub> /dt	V <sub>DM</sub> = 402V, T <sub>J</sub> = +125°C, Exponential Waveform, Gate Open	1000	4000	-	V/μs
Critical Rate-of-Change of Commutating Current	dl <sub>com</sub> /dt	V <sub>DM</sub> = 400V, T <sub>J</sub> = +125°C, I <sub>TRMS</sub> = 12A, without Snubber, Gate Open	-	24	-	A/ms
Gate Controlled Turn-On Time	t <sub>gt</sub>	I <sub>TM</sub> = 12A, V <sub>D</sub> = V <sub>DRMmax</sub> , I <sub>G</sub> = 0.1A, dl <sub>G</sub> /dt = 5A/μs	-	2	-	μs
<b>Isolation Characteristics</b>						
RMS Isolation Voltage from All 3 Pins to External Heatsink	V <sub>ISOL</sub>	f = 50 – 60Hz, Sinusoidal Waveform, R.H. ≤ 65%, Clean and Dustfree	-	-	2500	V
Capacitance from T2 to External Heatsink	C <sub>ISOL</sub>	f = 1MHz	-	10	-	pF

Note 2. Device does not trigger in the MT<sub>2</sub> (-), G (+) quadrant.

