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## NTE56057 TRIAC, 16A High Commutation

**Description:**

The NTE56057 is a glass passivated high commutation TRIAC in a TO220 type package intended for use in circuits where high static and dynamic  $dV/dt$  and high  $dI/dt$  can occur. This device will commute 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, $V_{DRM}$ .....	800V
RMS On-State Current (Full Sine Wave, $T_{mb} \leq +99^{\circ}C$ ), $I_{T(RMS)}$ .....	16A
Non-Repetitive Peak On-State Current, $I_{TSM}$ (Full Sine Wave, $T_J = +25^{\circ}C$ prior to Surge, with Reapplied $V_{DRM(max)}$ )	
$t = 20ms$ .....	140A
$t = 16.7ms$ .....	150A
$I^2t$ for Fusing ( $t = 10ms$ ), $I^2t$ .....	98A <sup>2</sup> sec
Repetitive Rate-of-Rise of On-State Current after Triggering, $dI_T/dt$ ( $I_{TM} = 20A$ , $I_G = 0.2A$ , $dI_G/dt = 0.2A/\mu s$ ) .....	100A/ $\mu s$
Peak Gate Current, $I_{GM}$ .....	2A
Peak Gate Voltage, $V_{GM}$ .....	5V
Peak Gate Power, $P_{GM}$ .....	5W
Average Gate Power (Over Any 20ms Period), $P_{G(AV)}$ .....	0.5W
Operating Junction Temperature, $T_J$ .....	+125 $^{\circ}C$
Storage Temperature Range, $T_{stg}$ .....	-40 $^{\circ}$ to +150 $^{\circ}C$
Thermal Resistance, Junction-to-Mounting Base, $R_{thJHS}$	
Full Cycle .....	1.2K/W
Half Cycle .....	1.7K/W
Typical Thermal Resistance, Junction-to-Ambient, $R_{thJA}$ .....	60K/W

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

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
<b>Static Characteristics</b>						
Gate Trigger Current $T_2 (+), G (+)$	$I_{GT}$	$V_D = 12V, I_T = 0.1A$ , Note 1	2	18	50	mA
$T_2 (+), G (-)$			2	21	50	mA
$T_2 (-), G (-)$			2	34	50	mA
Latching Current $T_2 (+), G (+)$	$I_L$	$V_D = 12V, I_T = 0.1A$	-	31	60	mA
$T_2 (+), G (-)$			-	34	90	mA
$T_2 (-), G (-)$			-	30	60	mA

Note 1. Device does not trigger in the  $T_2(-), G(+)$  quadrant.

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

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Holding Current	$I_H$	$V_D = 12\text{V}, I_{GT} = 0.1\text{A}$	-	31	60	mA
On-State Voltage	$V_T$	$I_T = 20\text{A}$	-	1.2	1.5	V
Gate Trigger Voltage	$V_{GT}$	$V_D = 12\text{V}, I_T = 0.1\text{A}$	-	0.7	1.5	V
		$V_D = 400\text{V}, I_T = 0.1\text{A}, T_J = +125^\circ\text{C}$	0.25	0.4	-	V
Off-State Leakage Current	$I_D$	$V_D = 800\text{V}, T_J = +125^\circ\text{C}$	-	0.1	0.5	mA
<b>Dynamic Characteristics</b>						
Critical Rate-of-Rise of Off-State Voltage	$dV_D/dt$	$V_{DM} = 536\text{V}, T_J = +125^\circ\text{C},$ Exponential Waveform, Gate Open	1000	4000	-	$\text{V}/\mu\text{s}$
Critical Rate-of-Change of Commutating Voltage	$dI_{com}/dt$	$V_{DM} = 400\text{V}, T_J = +125^\circ\text{C}, I_{T(RMS)} = 16\text{A},$ Without Snubber; Gate Open Circuit	-	28	-	$\text{A}/\text{ms}$
Gate Controlled Turn-On Time	$t_{gt}$	$I_{TM} = 20\text{A}, V_D = 800\text{V}, I_G = 0.1\text{A},$ $dI_G/dt = 5\text{A}/\mu\text{s}$	-	2	-	$\mu\text{s}$

