

NTE5424

Silicon Controlled Rectifier (SCR) for TV Power Supply Switching

Description:

The NTE5424 is a silicon controlled rectifier (SCR) in a TO220 type package designed for high-speed switching applications such as power inverters, switching regulators, and high-current pulse applications. This device features fast turn-off, high dv/dt, and high di/dt characteristics and may be used at frequencies up to 25kHz.

Features:

- Fast Turn-Off Time
- High di/dt and dv/dt Capabilities
- Shorted-Emitter Gate-Cathode Construction
- Low Thermal Resistance
- Center-Gate Construction

Absolute Maximum Ratings:

Repetitive Peak Off-State Voltage (Gate Open, Note 1), V_{DRM}	400V
Repetitive Peak Reverse Voltage (Gate Open, Note 1), V_{RRM}	400V
RMS On-State Current ($T_C = +60^\circ\text{C}$, $t_1/t_2 = 0.5$), $I_{T(RMS)}$	5.0A
Average On-State Current ($T_C = +60^\circ\text{C}$, $t_1/t_2 = 0.5$), $I_{T(AV)}$	3.2A
Peak Surge (Non-Repetitive) On-State Current (One Cycle), I_{TSM}	
60Hz Sinusoidal	80A
50Hz Sinusoidal	75A
Peak Forward Gate Power Dissipation (10 μ s max, Note 2), P_{GM}	13W
Peak Reverse Gate Power Dissipation (10 μ s max, Note 2), P_{RGM}	13W
Average Gate Power Dissipation (10ms max, Note 2), $P_{G(AV)}$	500mW
Rate of Change of On-State Current $V_{DM} = 400\text{V}$, $I_{GT} = 500\text{mA}$, $t_r = 0.5\mu\text{s}$, di/dt	200A/ μ s
Fusing Current ($T_C = +60^\circ\text{C}$, 8.3ms), I^2t	26A ² s
Operating Case Temperature Range, T_C	-40° to +100°C
Storage Temperature Range, T_{stg}	-40° to +150°C
Lead Temperature (During Soldering, 10sec max), T_L	+225°C
Thermal Resistance, Junction-to-Case, R_{thJC}	2.2°C/W

Note 1. These values do not apply if there is a positive gate signal. Gate must be open or negatively biased.

Note 2. Any product of gate current and gate voltage which results in a gate power less than the maximum is permitted.

Electrical Characteristics: ($T_C = +25^\circ\text{C}$, "Maximum Ratings" unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Peak Forward Blocking Current	I_{DRM}	$V_D = 400\text{V}$, $T_C = +100^\circ\text{C}$	—	0.5	3.0	mA
Peak Reverse Blocking Current	I_{RRM}	$V_R = 400\text{V}$, $T_C = +100^\circ\text{C}$	—	0.3	1.5	mA
Forward ON Voltage	V_{TM}	$I_{\text{TM}} = 30\text{A}$	—	2.34	4.0	V
Gate Trigger Current, Continuous DC	I_{GT}	Anode Voltage = 12V, $R_L = 30\Omega$	—	—	50	mA
Gate Trigger Voltage, Continuous DC	V_{GT}	Anode Voltage = 12V, $R_L = 30\Omega$	—	1.2	2.5	V
DC Holding Current	I_H		—	20	50	mA
Rate of Rise of Off-State Voltage	dv/dt	$V_D = 400\text{V}$, $T_C = +80^\circ\text{C}$	100	250	—	V/ μs
Turn-On Time	t_{gt}	$V_D = 400\text{V}$, $I_T = 8\text{A}$ (Peak), $I_{\text{GT}} = 300\text{mA}$, $t_r = 0.1\mu\text{s}$	—	0.7	—	μs
Circuit Commutated Turn-Off Time	t_q	$V_D = 400\text{V}$, Pulse Duration = 50 μs , $dv/dt = 100\text{V}/\mu\text{s}$, $-di/dt = -10\text{A}/\mu\text{s}$, $I_{\text{GT}} = 100\text{mA}$ at turn-on, $I_T = 4\text{A}$, $V_{\text{GK}} = 0\text{V}$ at turn-off, $T_C = +75^\circ\text{C}$	—	4.4	—	μs

