ELECTRONICS, INC.
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NTE5511 thru NTE5513
Silicon Controlled Rectifier (SCR)
5 Amp

Description:

The NTE5511 thru NTE5513 all–diffused, three junction, silicon controlled rectifiers (SCR's) are intended for use in power–control and power–switching applications. These devices are available in a TO66 type package and have a blocking voltage capability of up to 600V and a forward current rating of 5A (rms value) at a case temperature of +75°C.

Features:

- Designed Especially for High–Volume Systems
- Readily Adaptable for PC Boards and Metal Heat Sinks
- Low Switching Losses
- High di/dt and dv/dt Capabilities
- Shorted Emitter Gate–Cathode Construction
- Forward and Reverse Gate Dissipation Ratings
- All–Diffused Construction Assures Exceptional Uniformity and Stability of Characteristics
- Direct–Soldered Internal Construction Assures Exceptional Resistance to Fatigue
- Symmetrical Gate–Cathode Construction Provides Uniform Current Density, Rapid Electrical Conduction, and Efficient Heat Dissipation
- All–Welded Construction and Hermetic Sealing
- Low Leakage Currents, Forward and Reverse
- Low Forward Voltage Drop at High Current Levels
- Low Thermal Resistance

Absolute Maximum Ratings: (For Operation with Sinusoidal AC Supply Voltage at a Frequency between 50Hz and 400Hz, and with Resistive or Inductive Load)

Transient Peak Reverse Voltage (Non–Repetitive), V_{RM} (non–rep)
- NTE5511 . . . . . 330V
- NTE5512 . . . . . 660V
- NTE5513 . . . . . 700V

Peak Reverse Voltage (Repetitive), V_{RM} (rep)
- NTE5511 . . . . . 200V
- NTE5512 . . . . . 400V
- NTE5513 . . . . . 600V

Peak Forward Blocking Voltage (Repetitive), V_{FBOM} (rep)
- NTE5511 . . . . . 600V
- NTE5512 . . . . . 600V
- NTE5513 . . . . . 700V

Average DC Forward Current, $I_{F(av)}$
(T_C = +75°C mounted on heat sink, conduction angle or 180°) 3.2A

RMS Forward Current (T_C = +75°C mounted on heat sink), I_{FRMS} 5A

Peak Surge Current (For one cycle of applied voltage), $i_{FM(surge)}$ 60A

Sub–Cycle Surge (Non–Repetitive, for a period of 1ms to 8.3ms), I^2t . . . . . $15A^2sec$

Rate of Change of Forward Current (Note 1), di/dt 200A/μs

Gate Power (Peak, Forward, or Reverse, for 10μs duration, Note 2), P_{GM} 13W

Average Gate Power (Note 2), P_{GAV} 500mW

Operating Case Temperature Range, T_C . . . . . –40° to +100°C

Storage Temperature Range, T_{stg} . . . . . –40° to +125°C

Note 1. $V_{FB} = v_{BOO}$(min value), I_{GT} = 200mA, 0.5μs rise time

Note 2. Any values of peak gate current or peak gate voltage to give the maximum gate power is permissible.

Electrical Characteristics: (At Maximum Ratings, T_C = +25°C unless otherwise specified)

Parameter	Symbol	Test Conditions		Min	Typ	Max	Unit
Forward Breakover Voltage NTE5511	v_{BOO}	T_C = +100°C		200	–	–	V
NTE5512				400	–	–	V
NTE5513				600	–	–	V
Peak Blocking Forward Current NTE5511	I_{FBOM}	V_{FBO} = 200V	T_C = +100°C	–	0.10	1.5	mA
NTE5512		V_{FBO} = 400V		–	0.20	3.0	mA
NTE5513		V_{FBO} = 600V		–	0.40	4.0	mA
Peak Blocking Reverse Current NTE5511	I_{RBOM}	V_{RBO} = 200V	T_C = +100°C	–	0.05	0.75	mA
NTE5512		V_{RBO} = 400V		–	0.10	1.5	mA
NTE5513		V_{RBO} = 600V		–	0.20	2.0	mA
Forward Voltage Drop	v_F	I_F = 30A		–	2.15	2.80	V
DC Gate–Trigger Current	I_{GT}			–	8	15	mA
DC Gate–Trigger Voltage	V_{GT}			–	1.2	2.0	V
Holding Current	I_{Hold}			–	10	20	mA
Critical Rate of Applied Forward Voltage	dv/dt	V_{FB} = v_{BOO} (min), exponential rise, T_C = +100°C		10	200	–	V/μs
Turn–On Time (Delay Time + Rise Time)	t_{on}	V_{FB} = v_{BOO} (min), i_F = 4.5A, I_{GT} = 200mA, 0.1μs rise time		0.75	1.5	–	μs
Turn–Off Time (Reverse Recovery Time + Gate Recovery Time)	t_{off}	i_F = 2A, 50μs pulse width, dv_{FB}/dt = 20V/μs, di_r/dt = 30A/μs, I_{GT} = 200mA, T_C = +75°C		–	15	50	μs
Thermal Resistance, Junction–to–Case	$R_{\Theta JC}$			–	–	4	°C/W