

## NTE308

### Integrated Thyristor/Rectifier (ITR)

### TV Horizontal Deflection & Commutating Switch

#### **Absolute Maximum Ratings:**

Repetitive Peak Forward Off-State and Reverse Voltage, $V_{DRM}$ , $V_{RRM}$ .....	800V
RMS On-State Current, $I_{TRMSM}$ , $I_{FRMSM}$ .....	8A
Mean On-State Current ( $T_C = +80^\circ\text{C}$ ), $I_{TAVM}$ , $I_{FAVM}$	
Thyristor .....	3.4A
Diode .....	3.45A
Repetitive Peak On-State Current, $I_{TRM}$ , $I_{FRM}$ .....	50A
Surge Current ( $t = 10\text{ms}$ , $t_{vi} = +100^\circ\text{C}$ ), $I_{TSM}$ , $I_{FSM}$	
Thyristor .....	80A
Diode .....	60A
Non-Repetitive Rate of Rise of On-State Current, $di/dt_{crit}$ .....	500A/ $\mu\text{s}$
Repetitive Rate of Rise of On-State Current ( $I_{TM} = 20\text{A}$ , $t_{vi} = +100^\circ\text{C}$ , $V_{DM} = 640\text{V}$ ), $di/dt_{crit}$ (Pulse Generator Data: $v_L = 8\text{V}$ , $i_K = 0.25\text{A}$ , $di_G/dt \geq 0.25\text{A}/\mu\text{s}$ )	
$f_o = 50\text{Hz}$ .....	300A/ $\mu\text{s}$
$f_o = 16\text{kHz}$ .....	100A/ $\mu\text{s}$
Rate of Rise of Off-State Voltage ( $t_{vi} = +100^\circ\text{C}$ , $V_D = 536\text{V}$ ), $dv/dt_{crit}$ .....	400V/ $\mu\text{s}$
Rate of Rise of Voltage Subsequent to Prior On-State Current, $dv/dt_{crit}$ $t_{vi} = +100^\circ\text{C}$ , $V_D = 536\text{V}$ .....	1000V/ $\mu\text{s}$
Peak Gate Power Losses ( $t_g \leq 10\mu\text{s}$ ), $P_{GM}$ .....	10W
Total Mean Gate Power Loss for One Cycle, $P_G$ .....	2W
Operating Temperature Range, $T_{opr}$ .....	$-40^\circ$ to $+100^\circ\text{C}$
Storage Temperature Range, $T_{stg}$ .....	$-40^\circ$ to $+130^\circ\text{C}$
Thermal Resistance, Junction-to-Case, $R_{thJC}$ .....	2.3 $^\circ\text{C}/\text{W}$
Thermal Resistance, Junction-to-Ambient, $R_{thJA}$	
Without Heatsink .....	35 $^\circ\text{C}/\text{W}$
On Vertical Cooling Fin 60mm x 60mm x 1.5mm, Al or Cu, Roughened Surface ..	10 $^\circ\text{C}/\text{W}$

#### **Electrical Characteristics:**

Maximum On-State Voltage ( $t_{vi} = +25^\circ\text{C}$ , $i_T = i_F = 10\text{A}$ ), $V_T$ , $V_F$	
Thyristor .....	2.16V
Diode .....	2.2V
Threshold Voltage, $V_{(TO)}$	
Thyristor .....	1.6V
Diode .....	1.4V
Forward Slope Resistance, $r_T$ , $r_F$	
Thyristor .....	53 $\Omega$
Diode .....	70 $\Omega$

### Electrical Characteristics (Cont'd):

Maximum Gate Trigger Voltage ( $t_{vi} = +25^{\circ}\text{C}$ , $V_D = 6\text{V}$ , $R_A = 20\Omega$ ), $V_{GT}$ .....	2.0V
Minimum Gate Trigger Voltage ( $t_{vi} = +100^{\circ}\text{C}$ , $V_D = 6\text{V}$ , $R_A = 20\Omega$ ), $V_{GT}$ .....	0.1V
Maximum Gate Trigger Current ( $t_{vi} = +25^{\circ}\text{C}$ , $V_D = 6\text{V}$ , $R_A = 20\Omega$ ), $I_{GT}$ .....	50mA
Maximum Holding Current ( $t_{vi} = +25^{\circ}\text{C}$ , $V_D = 6\text{V}$ , $R_A = 20\Omega$ ), $I_H$ .....	100mA
Maximum Latching Current ( $t_{vi} = +25^{\circ}\text{C}$ , $V_D = 6\text{V}$ , $R_{GK} \geq 20\Omega$ ), $I_L$ .....	210mA
(Pulse Generator Data: $i_G = 0.25\text{A}$ , $di_G/dt = 0.25\text{A}/\mu\text{s}$ , $t_g = 4\mu\text{s}$ )	
Typical Capacitance, Anode–Cathode at Zero Voltage ( $t_{vi} = +25^{\circ}\text{C}$ , $f_o = 16\text{kHz}$ ), $C_{zero}$ .....	250pF
Maximum Lag Charge ( $t_{vi} = +100^{\circ}\text{C}$ , $i_{FM} = 10\text{A}$ , $-di_F/dt = 10\text{A}/\mu\text{s}$ ), $Q_S$ .....	0.96 $\mu\text{As}$
Maximum Forward Off–State and Reverse Current ( $t_{vi} = +100^{\circ}\text{C}$ , $v_D = 800\text{V}$ ), $i_D$ , $i_R$ .....	1.5mA
Maximum Gate Controlled Delay Time ( $t_{vi} = +25^{\circ}\text{C}$ , $V_D = 536\text{V}$ , $i_{TM} = 5\text{A}$ ), $t_{gd}$ .....	0.8 $\mu\text{s}$
(Pulse Generator Data: $i_G = 0.25\text{A}$ , $di_G/dt = 0.5\text{A}/\mu\text{s}$ )	
Maximum Pulse Turn–Off Time ( $t_{vi} = +100^{\circ}\text{C}$ ), $t_{qp}$ .....	5.1 $\mu\text{s}$
Typical Pulse Turn–Off Time ( $t_{vi} = +80^{\circ}\text{C}$ , $f_o = 16\text{kHz}$ ), $t_{qp}$ .....	3.8 $\mu\text{s}$
Maximum Reverse Recovery Time ( $t_{vi} = +25^{\circ}\text{C}$ , $i_{FM} = 10\text{A}$ , $-di_F/dt = 10\text{A}/\mu\text{s}$ ), $t_{rr}$ .....	0.7 $\mu\text{s}$

