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NTE5728
Powerblock Module

Description:

The NTE5728 uses high voltage power thyristors/diodes and is electrically isolated from the metal base, allowing common heatsinks and compact assemblies to be built. This device is intended for general purpose applications such as battery chargers, welders and plating equipment and where high voltage and high current are required.

Features:

- High Voltage
- Electrically Isolated Base Plate
- 3000V_{RMS} Isolating Voltage
- High Surge Capability
- Large Creepage Distances

Ratings and Characteristics:

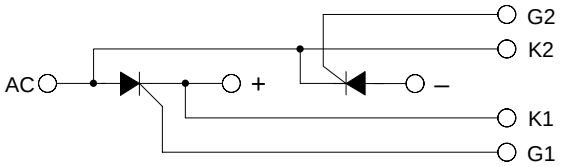
Average Forward Current (T_C = +85°C, 180° Conduction, Half Sine Wave), $I_{F(AV)}$ 250A
Maximum RMS On–State Current (As AC Switch), $I_{T(RMS)}$ 555A
Maximum Repetitive Peak Reverse and Off–State Blocking Voltage, V_{RRM}, V_{DRM} 1600V
Maximum Non–Repetitive Peak Reverse Voltage, V_{RSM} 1700V
Maximum Peak Reverse and Off–State Leakage Current (T_J = +130°C), I_{RRM}, I_{DRM} 50mA
RMS Isolation Voltage (50Hz, Circuit to Base, All Terminals Shorted, t = 1s), V_{ISO} 3000V
Critical Rate of Rise of Off–State Voltage (T_J = +130°C), dv/dt
(Linear to 80% Rated V_{DRM}) 500V/µs
(Linear to 67% Rated V_{DRM}) 1000V/µs
Operating Junction Temperature Range, T_J . . . . . –40° to +130°C
Storage Temperature Range, T_{stg} . . . . . –40° to +150°C
Thermal Resistance, Junction–to–Case (Per Junction, DC Operation), R_{thJC} . . . . . 0.125°C/W
Thermal Resistance, Case–to–Sink (Per Module, Note 1), R_{thCS} . . . . . 0.02°C/W

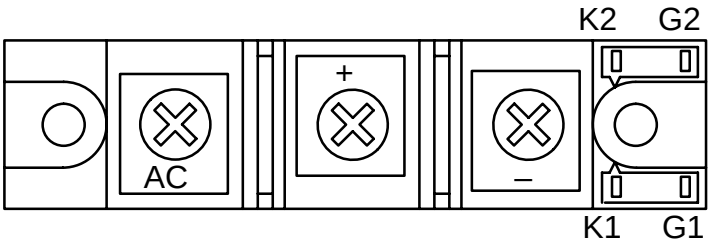
Note 1. Mounting surface flat, smooth and greased.

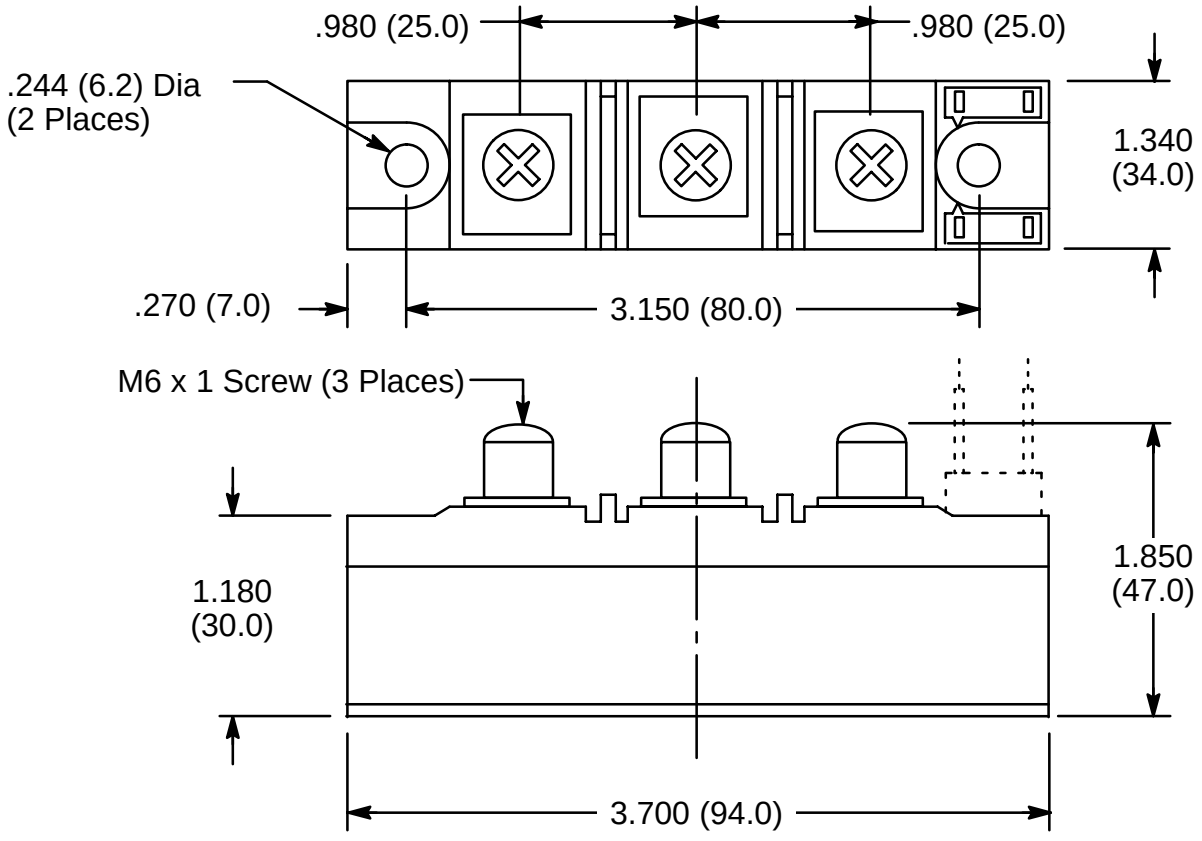
Electrical Specifications:

Parameter	Symbol	Test Conditions		Rating	Unit
Maximum Peak One–Cycle Non–Repetitive Surge Current	I_{FSM}	t = 10ms	Sinusoidal Half Wave, 100% V_{RRM} Reapplied, Initial T_J = +130°C	7150	A
		t = 8.3ms		7500	A
		t = 10ms	Sinusoidal Half Wave, No Voltage Reapplied, Initial T_J = +130°C	8500	A
		t = 8.3ms		8900	A
Maximum I^2t for Fusing	I^2t	t = 10ms	Sinusoidal Half Wave, 100% V_{RRM} Reapplied, Initial T_J = +130°C	255	A^2s
		t = 8.3ms		233	A^2s
		t = 10ms	Sinusoidal Half Wave, No Voltage Reapplied, Initial T_J = +130°C	361	A^2s
		t = 8.3ms		330	A^2s
Maximum $I^2\sqrt{t}$	$I^2\sqrt{t}$	t = 0.1 to 10ms, no voltage reapplied		3610	$A^2\sqrt{t}$
Threshold Voltage, Low level	$V_{T(TO)1}$	T_J = +130°C, (16.7% x π x $I_{T(AV)}$ < I < π x $I_{T(AV)}$)		0.97	V
Threshold Voltage, High level	$V_{T(TO)2}$	T_J = +130°C, (π x $I_{T(AV)}$ < I < 20 x π x $I_{T(AV)}$)		1.00	V
On–State Slope Resistance, Low Level	r_{t1}	T_J = +130°C, (16.7% x π x $I_{T(AV)}$ < I < π x $I_{T(AV)}$)		0.60	mΩ
On–State Slope Resistance, High Level	r_{t2}	T_J = +130°C, (π x $I_{T(AV)}$ < I < 20 x π x $I_{T(AV)}$)		0.57	mΩ
Maximum On–State Voltage Drop	V_{TM}	T_J = +130°C, I_{TM} = π x $I_{T(AV)}$, 180° Condition, Av. Power = $V_{T(TO)}$ x $I_{T(AV)}$ + r_t x $(I_{T(RMS)})^2$		1.44	V
Maximum Holding Current	I_H	Anode Supply = 12V, Initial I_T = 30A, T_J = +25°C		500	mA
Maximum Latching Current	I_L	Anode Supply = 12V, Resistive Load = 1Ω, Gat Pulse: 10V, 100µs, T_J = +25°C		1000	mA
Maximum Peak Gate Power	P_{GM}	T_J = +130°C, $t_p \leq$ 5ms		10	W
Maximum Average Gate Power	$P_{G(AV)}$	T_J = +130°C, f = 50Hz		2.0	W
Maximum Peak Gate Current	$+I_{GM}$	T_J = +130°C, $t_p \leq$ 5ms		3.0	A
Maximum Peak Negative Gate Voltage	$–V_{GT}$	T_J = +130°C, $t_p \leq$ 5ms		5.0	V
Maximum Required DC Gate Trigger Voltage to Trigger	V_{GT}	T_J = –40°C	Anode Supply = 12V, Resistive Load: R_A = 1Ω	4.0	V
		T_J = +25°C		3.0	V
		T_J = +130°C		2.0	V
Maximum Required DC Gate Trigger Current to Trigger	I_{GT}	T_J = –40°C	Anode Supply = 12V, Resistive Load: R_A = 1Ω	350	mA
		T_J = +25°C		200	mA
		T_J = +130°C		100	mA
Maximum Gate Voltage that will not Trigger	V_{GD}	T_J = +130°C, Rated V_{DRM} Applied		0.25	V
Maximum Gate Current that will not Trigger	I_{GD}	T_J = +130°C, Rated V_{DRM} Applied		10	mA
Maximum Rate of Rise of Turned–On Current	di/dt	T_J = +130°C, I_{TM} = 400A, Rated V_{DRM} Applied		500	A/µs
Typical Delay Time	t_d	T_J = +25°C, Gate Current = 1A di_G/dt = 1A/µs, V_D = 0.67% V_{DRM}		1.0	µs
Typical Rise Time	t_r			2.0	µs
Typical Turn–Off Time	t_q	T_J = +25°C, I_{TM} = 300A, –dI/dt = 15A/µs, V_R = 50V, dV/dt = 20V/µs, Gate 0V, 100Ω		50–150	µs

Circuit Diagram







NOTE: Can be used with Heat Sink NTE441A