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NTE2311 Silicon NPN Transistor High Voltage, High Speed Switch

Description:

The NTE2311 is a silicon NPN transistor in a TO218 type case designed for use in high voltage, high speed switching applications.

Features:

- High Blocking Capability: $V_{CEX} = 1000V$
- Wide Surge Area: $I_{CSM} = 55A @ 350V$

Applications:

- Switchmode Power Supply
- DC/DC and DC/AC Converters
- Motor Control

Absolute Maximum Ratings: ($T_C = +25^{\circ}C$ unless otherwise specified)

Collector–Emitter Voltage, V_{CEO}	450V
Collector–Emitter Voltage ($V_{BE} = -2.5V$), V_{CEX}	1000V
Emitter–Base Voltage, V_{EBO}	7V
Collector Current ($t_p \leq 5ms$), I_C	
Continuous	15A
Peak	30A
Base Current ($t_p \leq 5ms$), I_B	
Continuous	4A
Peak	20A
Power Dissipation, P_{tot}	
$T_C = +25^{\circ}C$	150W
$T_C = +60^{\circ}C$	115W
Operating Junction Temperature Range, T_J	-65° to $+175^{\circ}C$
Thermal Resistance, Junction–to–Case, R_{thJC}	$1^{\circ}C/W$

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

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
OFF Characteristics						
Collector–Emitter Sustaining Voltage	$V_{CEO(sus)}$	$I_B = 0, I_C = 200mA, L = 25mH$	450	–	–	V
Emitter–Base Breakdown Voltage	$V_{(BR)EBO}$	$I_C = 0, I_E = 50mA$	7	–	30	V
Collector Cutoff Current	I_{CEX}	$T_J = +25^{\circ}C$	–	–	0.2	mA
		$T_J = +125^{\circ}C$				
	I_{CER}	$T_J = +25^{\circ}C$	–	–	0.5	mA
		$T_J = +125^{\circ}C$				

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

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit	
OFF Characteristics (Cont,d)							
Emitter Cutoff Current	I_{EBO}	$I_C = 0, V_{BE} = -5V$	-	-	1	mA	
ON Characteristics (Note 1)							
DC Current Gain	h_{FE}	$I_C = 8A_{dc}, V_{CE} = 5V_{dc}$	10	-	-	-	
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C = 8A, I_B = 1.6A$	-	-	1.5	V	
		$I_C = 12A, I_B = 2.4A$	-	-	5.0	V	
Base-Emitter Saturation Voltage	$V_{BE(sat)}$	$I_C = 8A, I_B = 1.6A$	-	-	1.6	V	
Switching Characteristics (Switching Times on Resistive Load)							
Turn-On Time	t_{on}	$V_{CC} = 150V, I_C = 8A,$ $I_{B1} = -I_{B2} = 1.6A$	-	0.55	1.0	μs	
Storage Time	t_s		-	1.5	3.0	μs	
Fall Time	t_f		-	0.3	0.8	μs	
Switching Characteristics (Switching Times on Inductive Load)							
Storage Time	t_s	$T_J = +25^\circ\text{C}$	$V_{CC} = 300V,$ $V_{BB} = -5V,$ $L_B = 3\mu H,$ $I_C = 8A,$ $I_{Bend} = 1.6A$	-	3.5	-	μs
		$T_J = +125^\circ\text{C}$		-	-	5.0	μs
Fall Time	t_f	$T_J = +25^\circ\text{C}$		-	0.08	-	μs
		$T_J = +125^\circ\text{C}$		-	-	0.4	μs

Note 1. Pulse Test: Pulse Width < 300 μs , Duty Cycle < 2%

