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## MMBT5551 Silicon NPN Transistor High Voltage Amp/Driver SOT-23 Type Surface Mount Package

**Description:**

The MMBT5551 is a silicon NPN transistor in an SOT-23 type surface mount case designed for use in high voltage applications.

**Absolute Maximum Ratings:**

Collector-Emitter Voltage, $V_{CEO}$ .....	160V
Collector-Base Voltage, $V_{CBO}$ .....	180V
Emitter-Base Voltage, $V_{EBO}$ .....	6V
Continuous Collector Current, $I_C$ .....	600mA
Total Power Dissipation ( $T_A = +25^\circ\text{C}$ , FR-5 Board, Note 1), $P_D$ .....	225mW
Derate Above $25^\circ\text{C}$ .....	1.8mW/ $^\circ\text{C}$
Thermal Resistance, Junction-to-Ambient, $R_{thJA}$ .....	556 $^\circ\text{C}/\text{mW}$
Total Power Dissipation ( $T_A = +25^\circ\text{C}$ , Alumina Substrate, Note 2), $P_D$ .....	300mW
Derate Above $25^\circ\text{C}$ .....	2.4mW/ $^\circ\text{C}$
Thermal Resistance, Junction-to-Ambient, $R_{thJA}$ .....	417 $^\circ\text{C}/\text{mW}$
Operating Junction Temperature Range, $T_J$ .....	-55 $^\circ$ to +150 $^\circ\text{C}$
Storage Temperature Range, $T_{stg}$ .....	-55 $^\circ$ to +150 $^\circ\text{C}$

Note 1. FR-5 = 1.000 (25.4mm) x .750 (19.05mm) x .062 (1.57mm).

Note 2. Alumina = .400 (10.2mm) x .300 (7.62mm) x .024 (.609mm), 99.5% alumina.

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

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
<b>OFF Characteristics</b>						
Collector-Emitter Breakdown Voltage	$V_{(BR)CEO}$	$I_C = 1\text{mA}$ , $I_B = 0$ , Note 3	160	-	-	V
Collector-Base Breakdown Voltage	$V_{(BR)CBO}$	$I_C = 100\mu\text{A}$ , $I_E = 0$	180	-	-	V
Emitter-Base Breakdown Voltage	$V_{(BR)EBO}$	$I_E = 10\mu\text{A}$ , $I_C = 0$	6	-	-	V
Collector Cutoff Current	$I_{CBO}$	$V_{CB} = 120\text{V}$ , $I_E = 0$	-	-	50	nA
		$V_{CB} = 120\text{V}$ , $I_E = 0$ , $T_A = +100^\circ\text{C}$	-	-	50	$\mu\text{A}$
Emitter Cutoff Current	$I_{EBO}$	$V_{EB} = 4\text{V}$ , $I_C = 0$	-	-	50	nA

Note 3. Pulse Test: Pulse Width = 300 $\mu\text{s}$ , Duty Cycle = 2%.

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

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
<b>ON Characteristics</b> (Note 3)						
DC Current Gain	$h_{FE}$	$I_C = 1\text{mA}, V_{CE} = 5\text{V}$	80	-	-	
		$I_C = 10\text{mA}, V_{CE} = 5\text{V}$	80	-	250	
		$I_C = 50\text{mA}, V_{CE} = 5\text{V}$	30	-	-	
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C = 10\text{mA}, I_B = 1\text{mA}$	-	-	0.15	V
		$I_C = 50\text{mA}, I_B = 5\text{mA}$	-	-	0.20	V
Base-Emitter Saturation Voltage	$V_{BE(sat)}$	$I_C = 10\text{mA}, I_B = 1\text{mA}$	-	-	1.0	V
		$I_C = 50\text{mA}, I_B = 5\text{mA}$	-	-	1.0	V

Note 3. Pulse Test: Pulse Width =  $300\mu\text{s}$ , Duty Cycle = 2%.

