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## MMBT2907A Silicon PNP Transistor General Purpose Amp SOT-23 Type Surface Mount Package

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

Collector-Base Voltage, $V_{CBO}$ .....	60V
Collector-Emitter Voltage, $V_{CEO}$ .....	60V
Emitter-Base Voltage, $V_{EBO}$ .....	5V
Continuous Collector Current, $I_C$ .....	600mA
Total Device Dissipation (FR-5 Board, Note 1), $P_D$ .....	225mW
Derate above $+25^\circ\text{C}$ .....	1.8mW/ $^\circ\text{C}$
Thermal Resistance, Junction-to-Ambient (FR-5 Board, Note 1), $R_{thJA}$ .....	556 $^\circ\text{C}/\text{W}$
Total Device Dissipation (Alumina Substrate, Note 2), $P_D$ .....	300mW
Derate above $+25^\circ\text{C}$ .....	2.4mW/ $^\circ\text{C}$
Thermal Resistance, Junction-to-Ambient (Alumina Substrate, Note 2), $R_{thJA}$ .....	417 $^\circ\text{C}/\text{W}$
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-Base Breakdown Voltage	$V_{(BR)CBO}$	$I_C = 10\mu\text{A}, I_E = 0$	60	-	-	V
Collector-Emitter Breakdown Voltage	$V_{(BR)CEO}$	$I_C = 10\text{mA}, I_B = 0$ , Note 3	60	-	-	V
Emitter-Base Breakdown Voltage	$V_{(BR)EBO}$	$I_E = 10\mu\text{A}, I_C = 0$	5	-	-	V
Collector Cutoff Current	$I_{CBO}$	$V_{CB} = 50\text{V}, I_E = 0$	-	-	0.01	$\mu\text{A}$
		$V_{CB} = 50\text{V}, I_E = 0, T_A = +125^\circ\text{C}$	-	-	10	$\mu\text{A}$
	$I_{CEX}$	$V_{CE} = 30\text{V}, V_{EB(off)} = 0.5\text{V}$	-	-	50	nA
Base Current	$I_B$	$V_{CE} = 30\text{V}, V_{EB(off)} = 0.5\text{V}$	-	-	50	nA

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

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

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
<b>ON Characteristics (Note 3)</b>						
DC Current Gain	$h_{FE}$	$V_{CE} = 10\text{V}, I_C = 0.1\text{mA}$	35	-	-	
		$V_{CE} = 10\text{V}, I_C = 1\text{mA}$	50	-	-	
		$V_{CE} = 10\text{V}, I_C = 10\text{mA}$	100	-	-	
		$V_{CE} = 10\text{V}, I_C = 150\text{mA}$	100	-	300	
		$V_{CE} = 10\text{V}, I_C = 500\text{mA}$	50	-	-	
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C = 150\text{mA}, I_B = 15\text{mA}$	-	-	0.4	V
		$I_C = 500\text{mA}, I_B = 50\text{mA}$	-	-	1.6	V
Base-Emitter Saturation Voltage	$V_{BE(sat)}$	$I_C = 150\text{mA}, I_B = 15\text{mA}$	-	-	1.3	V
		$I_C = 500\text{mA}, I_B = 50\text{mA}$	-	-	2.6	V
<b>Small-Signal Characteristics</b>						
Current Gain-Bandwidth Product	$f_T$	$I_C = 50\text{mA}, V_{CE} = 20\text{V}, f = 100\text{MHz}, \text{Note 3}$	300	-	-	MHz
Output Capacitance	$C_{obo}$	$V_{CB} = 10\text{V}, I_E = 0, f = 1\text{MHz}$	-	-	8	pF
Input Capacitance	$C_{ibo}$	$V_{EB} = 2\text{V}, I_C = 0, f = 1\text{MHz}$	-	-	30	pF
<b>Switching Characteristics</b>						
Turn-On Time	$t_{on}$	$V_{CC} = 30\text{V}, I_C = 150\text{mA}, I_{B1} = 15\text{mA}$	-	-	45	ns
Delay Time	$t_d$		-	-	10	ns
Rise Time	$t_r$		-	-	40	ns
Turn-Off Time	$t_{off}$	$V_{CC} = 6\text{V}, I_C = 150\text{mA}, I_{B1} = I_{B2} = 15\text{mA}$	-	-	100	ns
Delay Time	$t_s$		-	-	80	ns
Rise Time	$t_f$		-	-	30	ns

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

