

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 $^\circ\text{C/W}$
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 $^\circ\text{C/W}$
Operating Junction Temperature Range, T_J	-55° to $+150^\circ\text{C}$
Storage Temperature Range, T_{stg}	-55° 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
OFF Characteristics						
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	μA
		$V_{CB} = 50\text{V}$, $I_E = 0$, $T_A = +125^\circ\text{C}$	—	—	10	μA
	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
ON Characteristics (Note 3)						
DC Current Gain	h_{FE}	$V_{CE} = 10V, I_C = 0.1mA$	35	–	–	
		$V_{CE} = 10V, I_C = 1mA$	50	–	–	
		$V_{CE} = 10V, I_C = 10mA$	100	–	–	
		$V_{CE} = 10V, I_C = 150mA$	100	–	300	
		$V_{CE} = 10V, I_C = 500mA$	50	–	–	
Collector–Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C = 150mA, I_B = 15mA$	–	–	0.4	V
		$I_C = 500mA, I_B = 50mA$	–	–	1.6	V
Base–Emitter Saturation Voltage	$V_{BE(sat)}$	$I_C = 150mA, I_B = 15mA$	–	–	1.3	V
		$I_C = 500mA, I_B = 50mA$	–	–	2.6	V
Small–Signal Characteristics						
Current Gain–Bandwidth Product	f_T	$I_C = 50mA, V_{CE} = 20V,$ $f = 100MHz, \text{Note 3}$	300	–	–	MHz
Output Capacitance	C_{obo}	$V_{CB} = 10V, I_E = 0, f = 1MHz$	–	–	8	pF
Input Capacitance	C_{ibo}	$V_{EB} = 2V, I_C = 0, f = 1MHz$	–	–	30	pF
Switching Characteristics						
Turn–On Time	t_{on}	$V_{CC} = 30V, I_C = 150mA,$ $I_{B1} = 15mA$	–	–	45	ns
Delay Time	t_d		–	–	10	ns
Rise Time	t_r		–	–	40	ns
Turn–On Time	t_{off}	$V_{CC} = 6V, I_C = 150mA,$ $I_{B1} = I_{B2} = 15mA$	–	–	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 $\leq 2\%$.

