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BC547A

Silicon NPN Transistor

Audio Amplifier, Switch

TO-92 Type Package

Absolute Maximum Ratings:

Collector–Emitter Voltage, V_{CEO}	45V
Collector–Base Voltage, V_{CB}	50V
Emitter–Base Voltage, V_{EB}	6V
Continuous Collector Current, I_C	100mA
Total Device Dissipation ($T_A = +25^\circ\text{C}$), P_D	625mW
Derate Above 25°C	5.0mW/ $^\circ\text{C}$
Total Device Dissipation ($T_C = +25^\circ\text{C}$), P_D	1.5W
Derate Above 25°C	12mW/ $^\circ\text{C}$
Operating Junction Temperature Range, T_J	-55° to $+150^\circ\text{C}$
Storage Temperature Range, T_{stg}	-55° to $+150^\circ\text{C}$
Thermal Resistance, Junction–to–Case, R_{thJC}	83.3 $^\circ\text{C}/\text{W}$
Thermal Resistance, Junction–to–Ambient, R_{thJA}	200 $^\circ\text{C}/\text{W}$

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

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
OFF Characteristics						
Collector–Emitter Breakdown Voltage	$V_{(BR)CEO}$	$I_C = 1\text{mA}, I_B = 0$	45	–	–	V
Collector–Base Breakdown Voltage	$V_{(BR)CBO}$	$I_C = 100\mu\text{A}, I_E = 0$	50	–	–	V
Emitter–Base Breakdown Voltage	$V_{(BR)EBO}$	$I_E = 10\mu\text{A}, I_C = 0$	6	–	–	V
Collector Cutoff Current	I_{CES}	$V_{CE} = 50\text{V}, V_{EB} = 0\text{V}$	–	0.2	15	nA
ON Characteristics						
DC Current Gain	h_{FE}	$V_{CE} = 5\text{V}, I_C = 10\mu\text{A}$	–	90	–	
		$V_{CE} = 5\text{V}, I_C = 2\text{mA}$	110	180	220	
		$V_{CE} = 5\text{V}, I_C = 100\text{mA}$	–	120	–	
Collector–Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C = 10\text{mA}, I_B = 0.5\text{mA}$	–	0.09	0.25	V
		$I_C = 100\text{mA}, I_B = 5\text{mA}$	–	0.2	0.6	V
		$I_C = 10\text{mA}, I_B = \text{See Note 1}$	–	0.3	0.6	V
Base–Emitter Saturation Voltage	$V_{BE(sat)}$	$I_C = 10\text{mA}, I_B = 0.5\text{mA}$	–	0.7	–	V
Base–Emitter On Voltage	$V_{BE(on)}$	$I_C = 2\text{mA}, V_{CE} = 5\text{V}$	0.55	–	0.7	V
		$I_C = 10\text{mA}, V_{CE} = 5\text{V}$	–	–	0.77	V

Note 1. I_B is value for which $I_C = 11\text{mA}$ at $V_{CE} = 1\text{V}$.

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

Small-Signal Characteristics						
Current Gain-Bandwidth Product	f_T	$I_C = 10\text{mA}, V_{CE} = 5\text{V}, f = 100\text{MHz}$	150	300	-	MHz
Output Capacitance	C_{obo}	$V_{CB} = 10\text{V}, I_C = 0, f = 1.0\text{MHz}$	-	1.7	4.5	pF
Input Capacitance	C_{ibo}	$V_{EB} = 0.5\text{V}, I_C = 0, f = 1.0\text{MHz}$	-	10	-	pF
Small-Signal Current Gain	h_{fe}	$I_C = 2\text{mA}, V_{CE} = 5\text{V}, f = 1\text{kHz}$	125	220	260	
Noise Figure	NF	$I_C = 0.2\text{mA}, V_{CE} = 5\text{V}, R_s = 2\text{k}\Omega, f = 1\text{kHz}, \Delta f = 200\text{Hz}$	-	2	10	dB

