

Small Signal Surface Mount Transistor

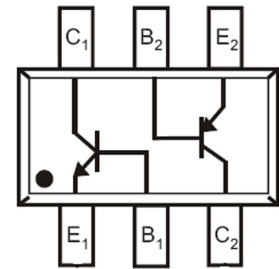


Features

- Epitaxial planar die construction.
- Two internal isolated NPN/PNP Transistors In one package.
- Ultra-small surface mount package.

Applications:

- Ideal for low power amplification and switching.



SOT-363

Maximum Rating @ $T_A = 25^\circ\text{C}$ unless otherwise specified

Parameter	Symbol	NPN	PNP	Unit
Collector-Base Voltage	V_{CB0}	50	-50	V
Collector-Emitter Voltage	V_{CE0}	45	-45	
Emitter-Base Voltage	V_{EB0}	6	-5	
Collector Current -Continuous	I_C	100	-100	mA
Collector Current -Peak	I_{CM}	200	-200	
Emitter Current -Peak	I_{EM}			
Power Dissipation	P_D	200		mW
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	625		$^\circ\text{C}/\text{W}$
Operating and Storage Temperature	T_j, T_{stg}	-65 to +150		$^\circ\text{C}$

Electrical Characteristics Of TR1 NPN Transistor @ $T_A = 25^\circ\text{C}$ unless otherwise specified

Parameter	Symbol	Test conditions	Min.	Typ.	Max.	Unit
Collector-base breakdown voltage	$V_{(BR)CB0}$	$I_C = 10\mu\text{A}, I_E = 0$	50			V
Collector-emitter breakdown voltage	$V_{(BR)CE0}$	$I_C = 10\text{mA}, I_B = 0$	45			
Emitter-base breakdown voltage	$V_{(BR)EB0}$	$I_E = 1\mu\text{A}, I_C = 0$	6			
Collector cut-off current	I_{CBO}	$V_{CB} = 30\text{V}, I_E = 0$			15	nA
DC current gain	h_{FE}	$V_{CE} = 5\text{V}, I_C = 2\text{mA}$	200	290	450	
Collector-emitter saturation voltage	$V_{CE(sat)}$	$I_C = 10\text{mA}, I_B = 0.5\text{mA}$ $I_C = 100\text{mA}, I_B = 5\text{mA}$		0.09 0.2	0.25 0.6	V
Base-emitter saturation voltage	$V_{BE(sat)}$	$I_C = 10\text{mA}, I_B = 0.5\text{mA}$ $I_C = 100\text{mA}, I_B = 5\text{mA}$		0.7 0.9		
Base-emitter voltage	$V_{BE(on)}$	$V_{CE} = 5\text{V}, I_C = 2\text{mA}$ $V_{CE} = 5\text{V}, I_C = 10\text{mA}$	0.58	0.66	0.7 0.72	
Transition frequency	f_T	$V_{CE} = 5\text{V}, I_C = 10\text{mA}, f = 100\text{MHz}$	100	300		MHz
Output Capacitance	C_{obo}	$V_{CB} = 10\text{V}, f = 1\text{MHz}$		3.5	6	pF
Noise Figure	N_F	$V_{CE} = 5\text{V}, f = 1\text{MHz}, I_C = 200\mu\text{A}$ $R_g = 2\text{K}\Omega$		2	10	dB

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Electrical Characteristics Of TR2 PNP Transistor @ $T_A=25^\circ\text{C}$ unless otherwise specified

Parameter	Symbol	Test conditions	Min.	Typ.	Max.	Unit
Collector-base breakdown voltage	$V_{(BR)CBO}$	$I_C = -10\mu\text{A}, I_E = 0$	-50			V
Collector-emitter breakdown voltage	$V_{(BR)CEO}$	$I_C = -10\text{mA}, I_B = 0$	-45			
Emitter-base breakdown voltage	$V_{(BR)EBO}$	$I_E = -1\mu\text{A}, I_C = 0$	-5			
Collector cut-off current	I_{CBO}	$V_{CB} = -30\text{V}, I_E = 0$			-15	nA
DC current gain	h_{FE}	$V_{CE} = -5\text{V}, I_C = -2\text{mA}$	220	290	475	
Collector-emitter saturation voltage	$V_{CE(sat)}$	$I_C = -10\text{mA}, I_B = -0.5\text{mA}$ $I_C = -100\text{mA}, I_B = -5\text{mA}$		-0.075 -0.25	-0.3 -0.65	V
Base-emitter saturation voltage	$V_{BE(sat)}$	$I_C = -10\text{mA}, I_C = -0.5\text{mA}$ $I_C = -100\text{mA}, I_C = -5\text{mA}$		-0.7 -0.85	-0.95	
Base-emitter on voltage	$V_{BE(on)}$	$V_{CE} = -5\text{V}, I_B = -2\text{mA}$ $V_{CE} = -5\text{V}, I_B = -10\text{mA}$	-0.6	-0.65	-0.75 -0.82	
Transition frequency	f_T	$V_{CE} = -5\text{V}, I_C = -10\text{mA}, f = 100\text{MHz}$	100	200		MHz
Output Capacitance	C_{obo}	$V_{CB} = -10\text{V}, f = 1\text{MHz}$		3	4.5	pF
Noise Figure	NF	$V_{CE} = -5\text{V}, f = 10\text{kHz}, I_C = -0.2\text{mA}$ $R_g = 2\text{K}\Omega,$			10	dB

Typical Characteristics @ $T_A = 25^\circ\text{C}$ unless otherwise specified

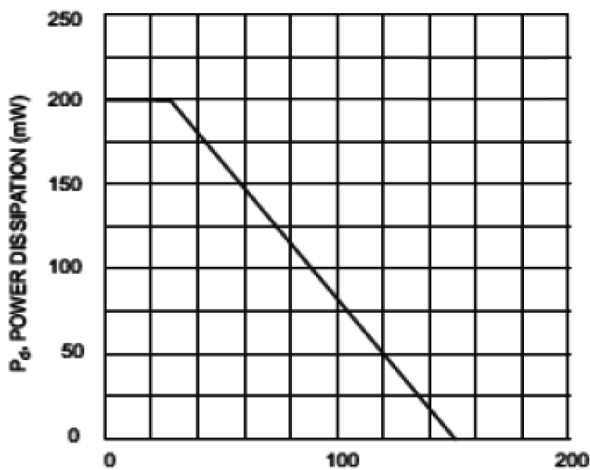


Fig. 1, Power Derating Curve (Total Device)

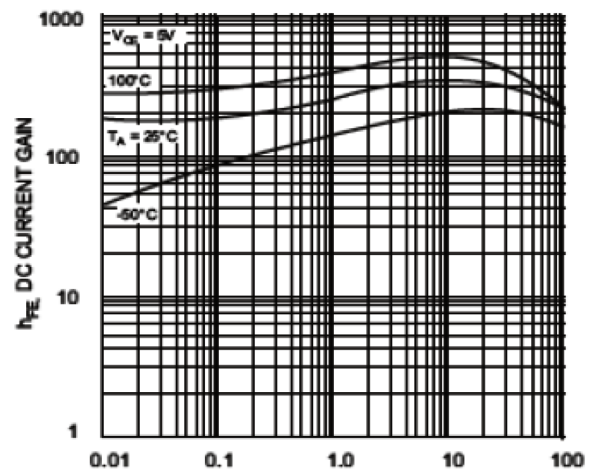


Fig. 2, DC Current Gain vs Collector Current (BC847B)



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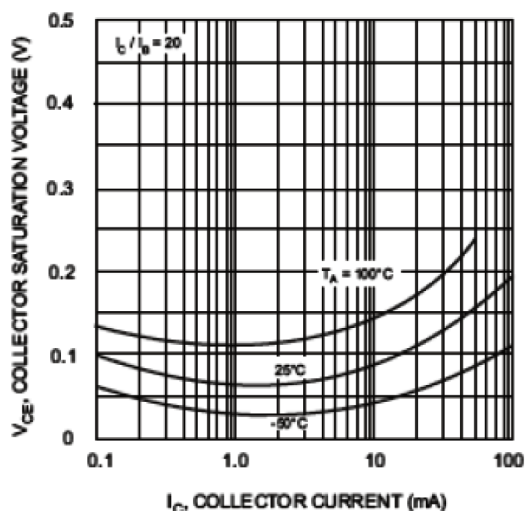


Fig. 3, Collector Saturation Voltage vs Collector Current (BC847B)

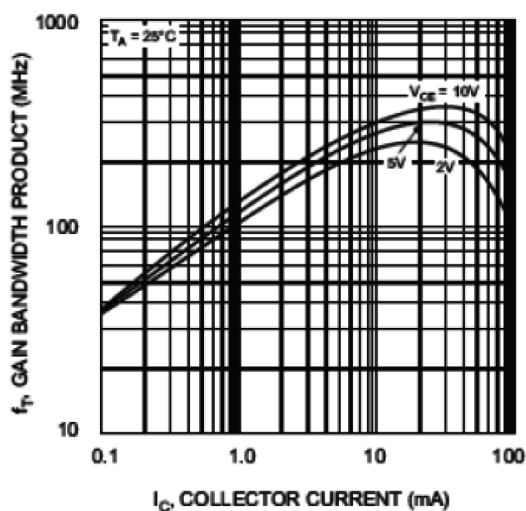
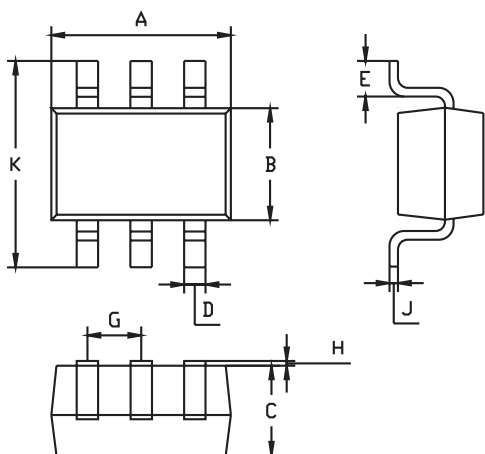


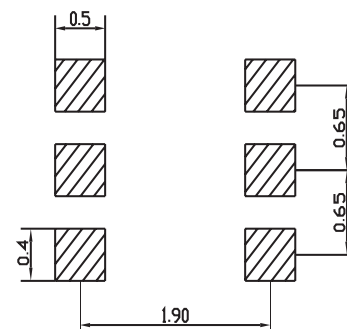
Fig. 4, Gain Bandwidth Product vs Collector Current (BC847B)

Package Outline



SOT-363		
Dim	Min.	Max.
A	1.8	2.2
B	1.15	1.35
C	1 Typical	
D	0.10	0.30
E	0.25	0.40
G	0.65 Typical	
H	0.02	0.10
J	0.1 Typical	
K	2.1	2.3
All Dimensions in mm		

Soldering Footprint



Dimensions : Millimetres

Part Number Table

Description	Part Number
Transistor, Array, NPN/PNP, 45V, 100mA, SOT-363	BC847PN-7-F

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