



DUAL SURFACE MOUNT NPN/PNP TRANSISTORS (COMPLIMENTARY)

This device contains two electrically-isolated complimentary pair (NPN and PNP) general-purpose transistors. This device is ideal for portable applications where board space is at a premium.

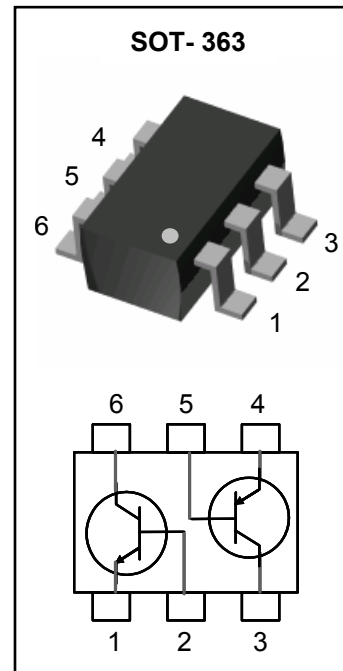
FEATURES

- Electrically-Isolated Complimentary Transistor Pairs
- Lead free in compliance with EU RoHS 2.0
- Green molding compound as per IEC 61249 standard

APPLICATIONS

- General Purpose Amplifier Applications
- Hand-Held Computers, PDAs

Device Marking Code: 47P



MAXIMUM RATINGS - NPN

$T_J = 25^{\circ}\text{C}$ Unless otherwise noted

Rating	Symbol	Value	Units
Collector-Base Voltage	V_{CBO}	50	V
Collector-Emitter Voltage	V_{CEO}	45	V
Emitter-Base Voltage Voltage	V_{EBO}	6.0	V
Collector Current	I_C	100	mA

MAXIMUM RATINGS - PNP

$T_J = 25^{\circ}\text{C}$ Unless otherwise noted

Rating	Symbol	Value	Units
Collector-Base Voltage	V_{CBO}	-50	V
Collector-Emitter Voltage	V_{CEO}	-45	V
Emitter-Base Voltage Voltage	V_{EBO}	-5.0	V
Collector Current	I_C	-100	mA

THERMAL CHARACTERISTICS

Characteristic	Symbol	Value	Units
Total Power Dissipation (Note 1)	P_D	200	mW
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 Ambient (Note 1)	R_{thja}	556	$^{\circ}\text{C}/\text{W}$

Note 1. FR-4 board 70 x 60 x 1mm with minimum recommended pad layout



NPN ELECTRICAL CHARACTERISTICS (Note 2)

$T_J = 25^\circ\text{C}$ Unless otherwise noted

Parameter	Symbol	Conditions	Min	Typ	Max	Units
Collector-Emitter Breakdown Voltage	$V_{(BR)CEO}$	$I_C = 10\text{mA}$	45	-	-	V
Collector-Emitter Breakdown Voltage	$V_{(BR)CES}$	$I_C = 10\mu\text{A}, V_{EB} = 0$	50	-	-	V
Collector-Base Breakdown Voltage	$V_{(BR)CBO}$	$I_C = 10\mu\text{A}$	50	-	-	V
Emitter-Base Breakdown Voltage	$V_{(BR)EBO}$	$I_E = 1.0\mu\text{A}$	6.0	-	-	V
Collector Cutoff Current	I_{CBO}	$V_{CB} = 30\text{V}, I_E = 0$ $T_J = 150^\circ\text{C}$	-	-	15	nA
			-	-	5	μA
Emitter Cutoff Current	I_{EBO}	$V_{EB} = 5\text{V}, I_C = 0$	-	-	100	nA
DC Current Gain	h_{FE}	$V_{CE} = 5\text{V}, I_C = 2.0\text{mA}$	200	-	450	-
Collector-Emitter Saturation Voltage	$V_{CE(SAT)}$	$I_C = 10\text{mA}, I_B = 0.5\text{mA}$ $I_C = 100\text{mA}, I_B = 5\text{mA}$	-	-	0.1	V
			-	-	0.4	V
Base-Emitter Saturation Voltage	$V_{BE(SAT)}$	$I_C = 10\text{mA}, I_B = 0.5\text{mA}$	-	0.75	-	V
Base-Emitter Voltage	V_{BE}	$V_{CE} = 5\text{V}, I_C = 2.0\text{mA}$	0.58	-	0.7	V
Gain-Bandwidth Product	f_T	$V_{CE} = 5\text{V}, I_C = 10\text{mA}$ $f = 100\text{MHz}$	100	-	-	MHz
Collector-Base Capacitance	C_{CBO}	$V_{CB} = 10\text{V}, f = 1.0\text{MHz}$	-	-	1.5	pF
Emitter-Base Capacitance	C_{EBO}	$V_{EB} = 0.5\text{V}, f = 1.0\text{MHz}$	-	7	-	pF

PNP ELECTRICAL CHARACTERISTICS (Note 2)

$T = 25^\circ\text{C}$ Unless otherwise noted

Parameter	Symbol	Conditions	Min	Typ	Max	Units
Collector-Emitter Breakdown Voltage	$V_{(BR)CEO}$	$I_C = -10\text{mA}$	-45	-	-	V
Collector-Emitter Breakdown Voltage	$V_{(BR)CES}$	$I_C = -10\mu\text{A}, V_{EB} = 0$	-50	-	-	V
Collector-Base Breakdown Voltage	$V_{(BR)CBO}$	$I_C = -10\mu\text{A}$	-50	-	-	V
Emitter-Base Breakdown Voltage	$V_{(BR)EBO}$	$I_E = -1.0\mu\text{A}$	-5.0	-	-	V
Collector Cutoff Current	I_{CBO}	$V_{CB} = -30\text{V}, I_E = 0$ $T_J = 150^\circ\text{C}$	-	-	-15	nA
			-	-	-4.0	μA
Emitter Cutoff Current	I_{EBO}	$V_{EB} = -5\text{V}, I_C = 0$	-	-	-100	nA
DC Current Gain	h_{FE}	$V_{CE} = -5\text{V}, I_C = -2.0\text{mA}$	200	-	475	-
Collector-Emitter Saturation Voltage	$V_{CE(SAT)}$	$I_C = -10\text{mA}, I_B = -0.5\text{mA}$ $I_C = -100\text{mA}, I_B = -5\text{mA}$	-	-	-0.3	V
			-	-	-0.65	V
Base-Emitter Saturation Voltage	$V_{BE(SAT)}$	$I_C = -10\text{mA}, I_B = -0.5\text{mA}$	-	-0.7	-	V
Base-Emitter Voltage	V_{BE}	$V_{CE} = -5\text{V}, I_C = -2.0\text{mA}$	-0.6	-	-0.75	V
Gain-Bandwidth Product	f_T	$V_{CE} = -5\text{V}, I_C = -10\text{mA}$ $f = 100\text{MHz}$	100	-	-	MHz
Collector-Base Capacitance	C_{CBO}	$V_{CB} = -10\text{V}, f = 1.0\text{MHz}$	-	-	4.5	pF
Emitter-Base Capacitance	C_{EBO}	$V_{EB} = -0.5\text{V}, f = 1.0\text{MHz}$	-	11	-	pF

Note 2. Short duration test pulse used to minimize self-heating



ELECTRICAL CHARACTERISTICS CURVE

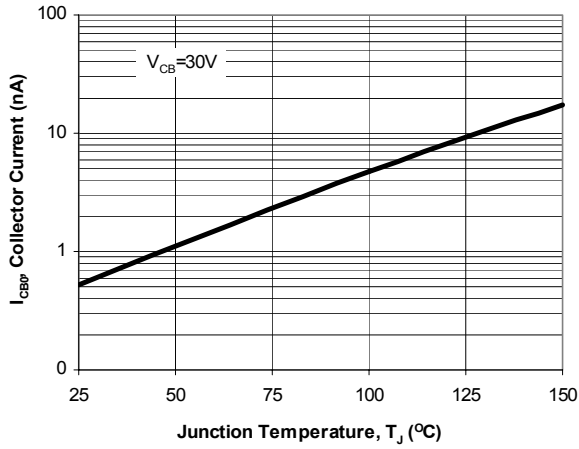


Fig. 1. Typical I_{CB0} vs. Junction Temperature

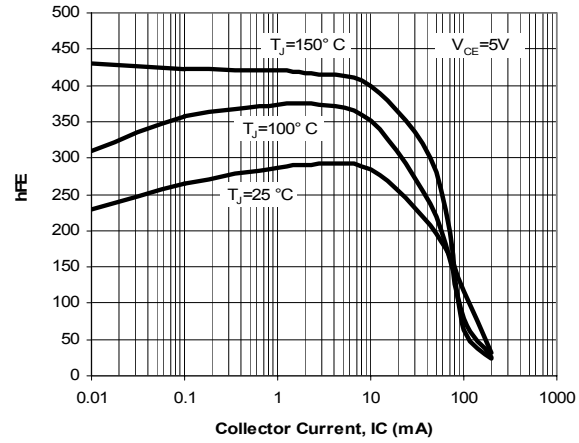


Fig. 2. Typical h_{FE} vs. Collector Current

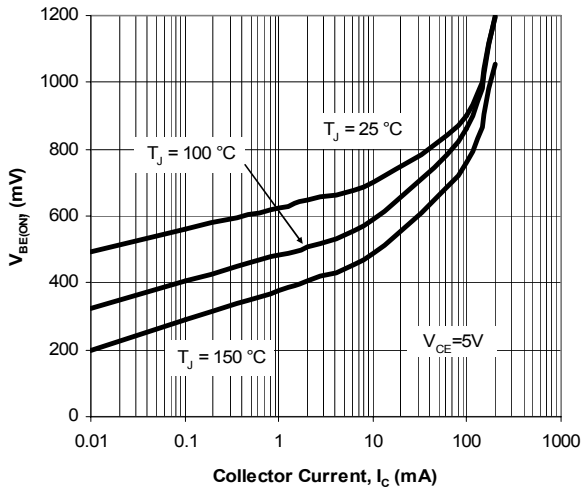


Fig. 3. Typical $V_{BE(ON)}$ vs. Collector Current

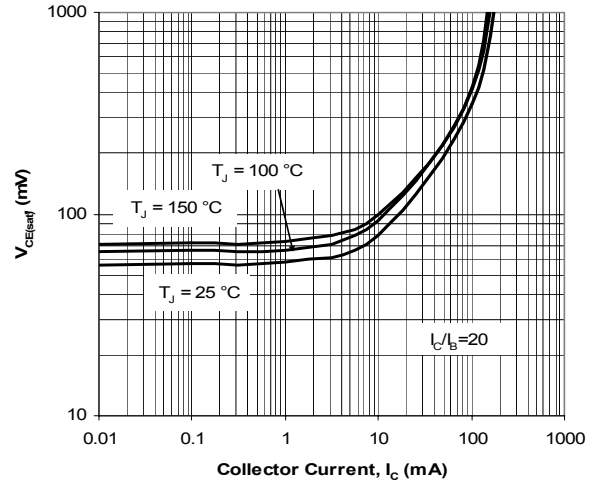


Fig. 4. Typical $V_{CE(SAT)}$ vs. Collector Current

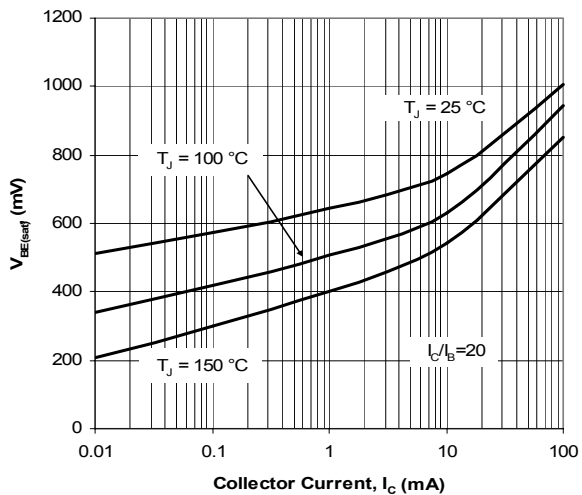


Fig. 5. Typical $V_{BE(SAT)}$ vs. Collector Current

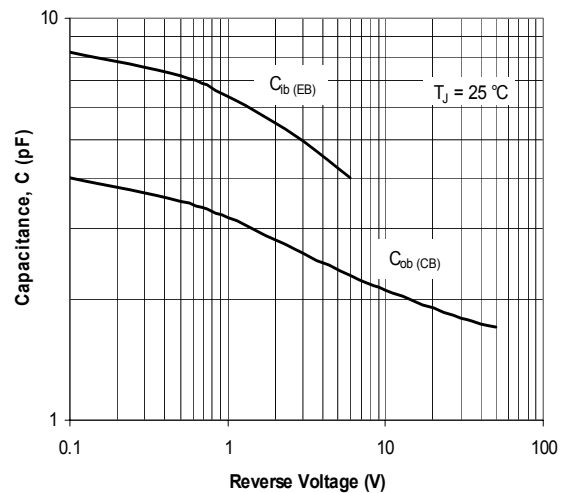
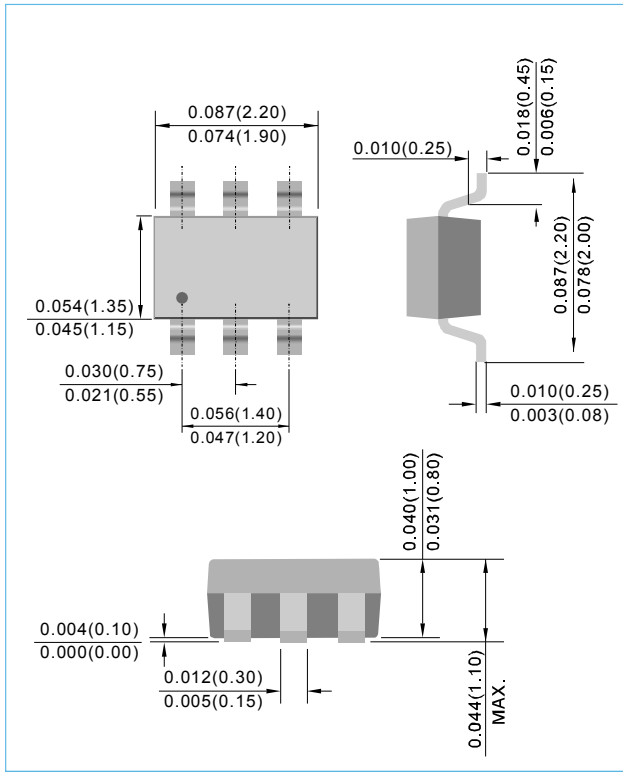


Fig. 6. Typical Capacitances vs. Reverse Voltage

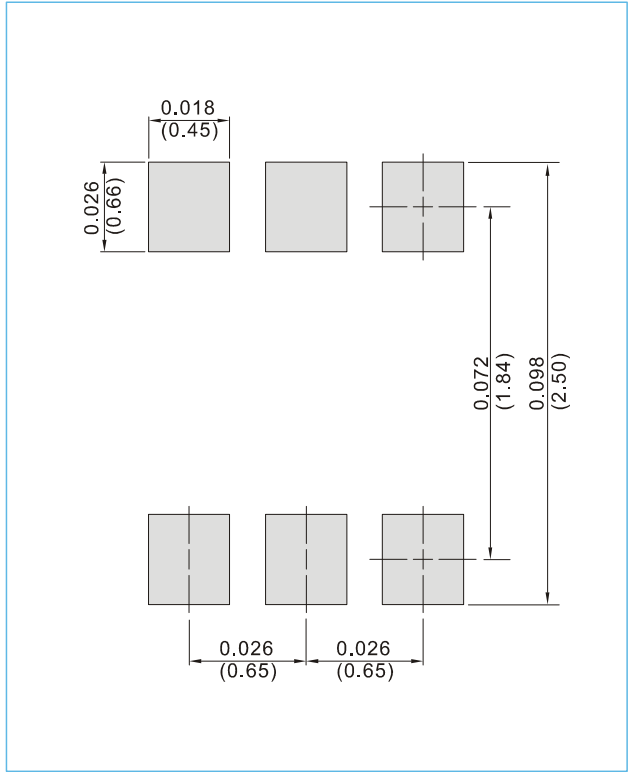


PACKAGE LAYOUT AND SUGGESTED PAD DIMENSIONS

SOT-363 Unit : inch(mm)



SOT-363 Unit : inch(mm)



ORDERING INFORMATION

BC847BPN T/R7 - 3,000 units per 7 inch reel

BC847BPN T/R13 -10,000 units per 13 inch reel

BC847BPN

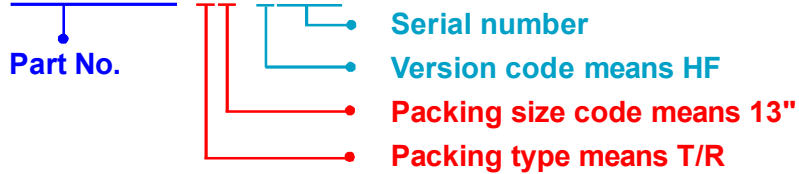
Part No_packing code_Version

BC847BPN_R1_00001

BC847BPN_R2_00001

For example :

RB500V-40_R2_00001



Packing Code XX				Version Code XXXXX		
Packing type	1 st Code	Packing size code	2 nd Code	HF or RoHS	1 st Code	2 nd ~5 th Code
Tape and Ammunition Box (T/B)	A	N/A	0	HF	0	serial number
Tape and Reel (T/R)	R	7"	1	RoHS	1	serial number
Bulk Packing (B/P)	B	13"	2			
Tube Packing (T/P)	T	26mm	X			
Tape and Reel (Right Oriented) (TRR)	S	52mm	Y			
Tape and Reel (Left Oriented) (TRL)	L	PANASERT T/B CATHODE UP (PBCU)	U			
FORMING	F	PANASERT T/B CATHODE DOWN (PBCD)	D			

BC847BPN

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