General Purpose Transistors Dual NPN

BC846ADW1T1G S-BC846ADW1T1G
BC846BDW1T1G S-BC846BDW1T1G
BC847BDW1T1G S-BC847BDW1T1G
BC847CDW1T1G S-BC847CDW1T1G
BC848BDW1T1G S-BC848BDW1T1G
BC848CDW1T1G S-BC848CDW1T1G

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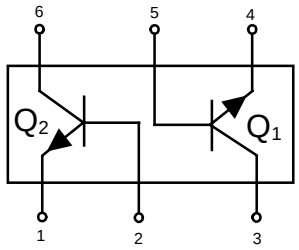
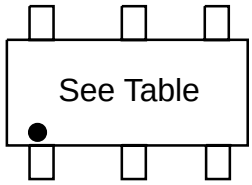
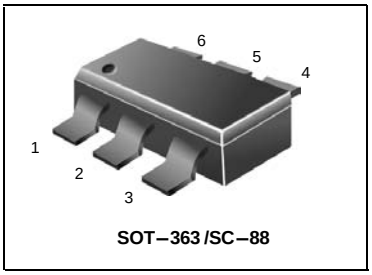
These transistors are designed for general purpose amplifier applications. They are housed in the SOT–363/SC–88 which is designed for low power surface mount applications.







SOT–363 /SC–88

MAXIMUM RATINGS

Rating	Symbol	BC846	BC847	BC848	Unit
Collector–Emitter Voltage	V_{CEO}	65	45	30	V
Collector–Base Voltage	V_{CBO}	80	50	30	V
Emitter–Base Voltage	V_{EBO}	6.0	6.0	5.0	V
Collector Current –Continuous	I_C	100	100	100	mAdc

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Total Device Dissipation	P_D	380	mW
Per Device		250	mW
FR– 5 Board, (1) T_A = 25°C			
Derate above 25°C		3.0	mW/°C
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	328	°C/W
Junction and Storage Temperature	T_J , T_{stg}	–55 to +150	°C

1. FR–5 = 1.0 x 0.75 x 0.062 in.

ORDERING INFORMATION

Device		Marking	Shipping
BC846ADW1T1G	S-BC846ADW1T1G	1A	3000 Units/Reel
BC846ADW1T3G	S-BC846ADW1T3G	1A	10000 Units/Reel
BC846BDW1T1G	S-BC846BDW1T1G	1B	3000 Units/Reel
BC846BDW1T3G	S-BC846BDW1T3G	1B	10000 Units/Reel
BC847BDW1T1G	S-BC847BDW1T1G	1F	3000 Units/Reel
BC847BDW1T3G	S-BC847BDW1T3G	1F	10000 Units/Reel
BC847CDW1T1G	S-BC847CDW1T1G	1G	3000 Units/Reel
BC847CDW1T3G	S-BC847CDW1T3G	1G	10000 Units/Reel
BC848BDW1T1G	S-BC848BDW1T1G	1K	3000 Units/Reel
BC848BDW1T3G	S-BC848BDW1T3G	1K	10000 Units/Reel
BC848CDW1T1G	S-BC848CDW1T1G	1L	3000 Units/Reel
BC848CDW1T3G	S-BC848CDW1T3G	1L	10000 Units/Reel

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ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise noted)

Characteristic		Symbol	Min	Typ	Max	Unit
OFF CHARACTERISTICS						
Collector–Emitter Breakdown Voltage		$V_{(BR)CEO}$				V
(I_C = 10 mA)	BC846 Series		65	—	—	
	BC847 Series		45	—	—	
	BC848 Series		30	—	—	
Collector–Emitter Breakdown Voltage		$V_{(BR)CES}$				V
(I_C = 10 µA, V_{EB} = 0)	BC846 Series		80	—	—	
	BC847 Series		50	—	—	
	BC848 Series		30	—	—	
Collector–Base Breakdown Voltage		$V_{(BR)CBO}$				V
(I_C = 10 µA)	BC846 Series		80	—	—	
	BC847 Series		50	—	—	
	BC848 Series		30	—	—	
Emitter–Base Breakdown Voltage		$V_{(BR)EBO}$				V
(I_E = 1.0 µA)	BC846 Series		6.0	—	—	
	BC847 Series		6.0	—	—	
	BC848 Series		5.0	—	—	
Collector Cutoff Current	(V_{CB} = 30 V)	I_{CBO}	—	—	15	nA
	(V_{CB} = 30 V, T_A = 150°C)		—	—	5.0	µA
ON CHARACTERISTICS						
DC Current Gain		h_{FE}				—
(I_C = 2.0 mA, V_{CE} = 5.0 V)	BC846A		110	180	220	
	BC846B, BC847B, BC848B		200	290	450	
	BC847C, BC848C		420	520	800	
Collector–Emitter Saturation Voltage (I_C = 10 mA, I_B = 0.5 mA)		$V_{CE(sat)}$	—	—	0.25	V
(I_C = 100 mA, I_B = 5.0 mA)			—	—	0.6	
Base–Emitter Saturation Voltage (I_C = 10 mA, I_B = 0.5 mA)		$V_{BE(sat)}$	—	0.7	—	V
(I_C = 100 mA, I_B = 5.0 mA)			—	0.9	—	
Base–Emitter Voltage (I_C = 2.0 mA, V_{CE} = 5.0 V)		$V_{BE(on)}$	580	660	700	mV
(I_C = 10 mA, V_{CE} = 5.0 V)			—	—	770	
SMALL–SIGNAL CHARACTERISTICS						
Current–Gain — Bandwidth Product		f_T	100	—	—	MHz
(I_C = 10 mA, V_{CE} = 5.0 Vdc, f = 100 MHz)						
Output Capacitance (V_{CB} = 10 V, f = 1.0 MHz)		C_{obo}	—	—	4.5	pF
Noise Figure (I_C = 0.2 mA,		NF				dB
V_{CE} = 5.0 V_{dc}, R_S = 2.0 kΩ,	BC846A,BC846B, BC847B, BC848B		—	—	10	
f = 1.0 kHz, BW = 200 Hz)	BC847C, BC848C		—	—	4.0	

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BC848CDW1T1G S-BC848CDW1T1G

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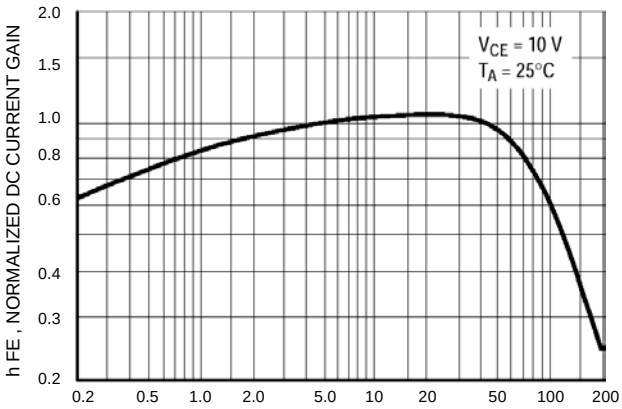
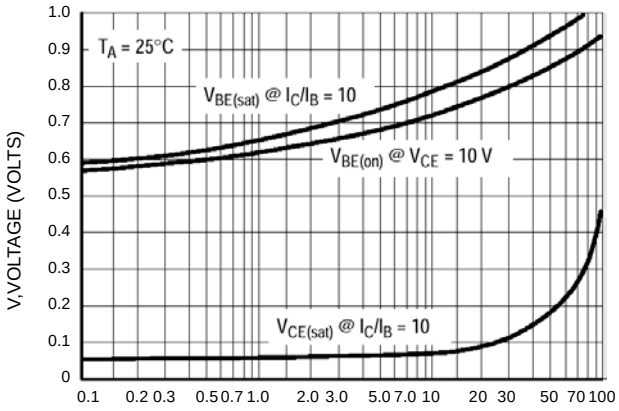
TYPICAL CHARACTERISTICS



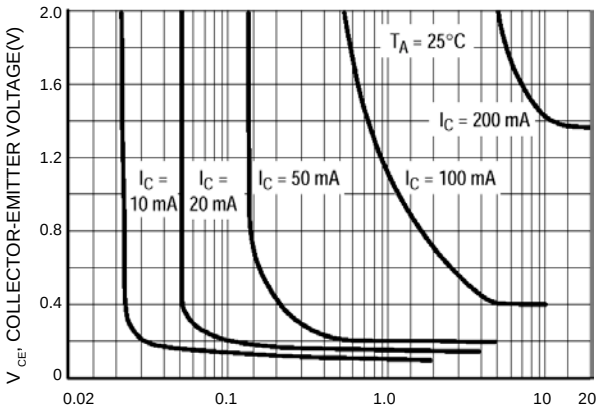
I C , COLLECTOR CURRENT (mAdc)

Figure 1. Normalized DC Current Gain



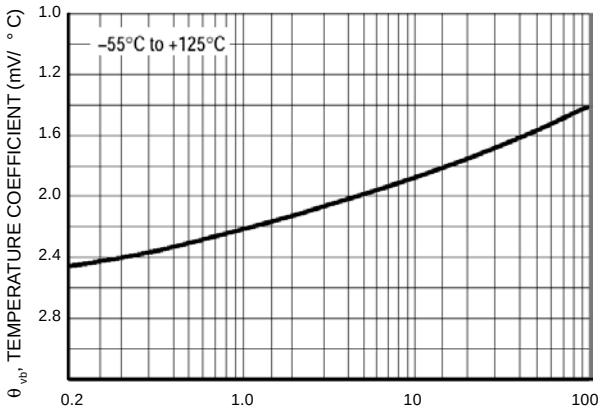
I C , COLLECTOR CURRENT (mAdc)

Figure 2. “Saturation” and “On” Voltages



I B , BASE CURRENT (mA)

Figure 3. Collector Saturation Region



I C , COLLECTOR CURRENT (mA)

Figure 4. Base–Emitter Temperature Coefficient

JXND ELECTRONICS CO.,LTD

TYPICAL CHARACTERISTICS

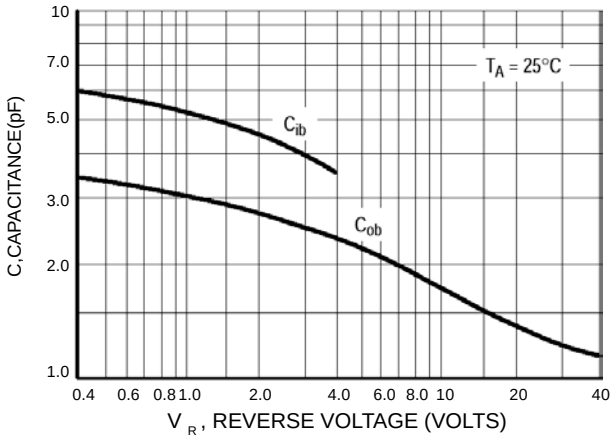


Figure 5. Capacitances

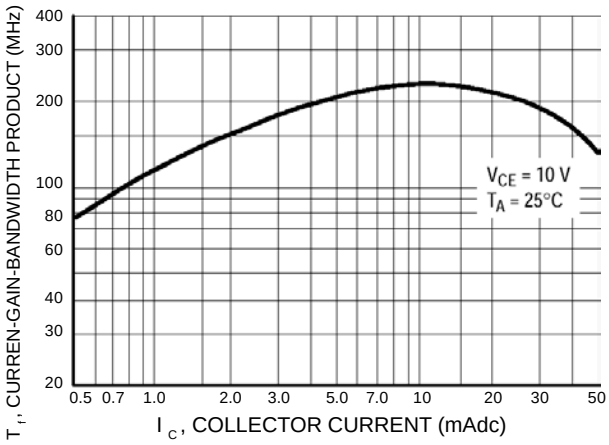


Figure 6. Current–Gain – Bandwidth Product

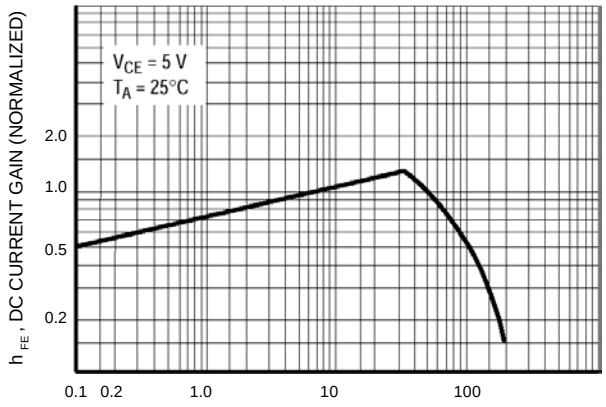


Figure 7. DC Current Gain

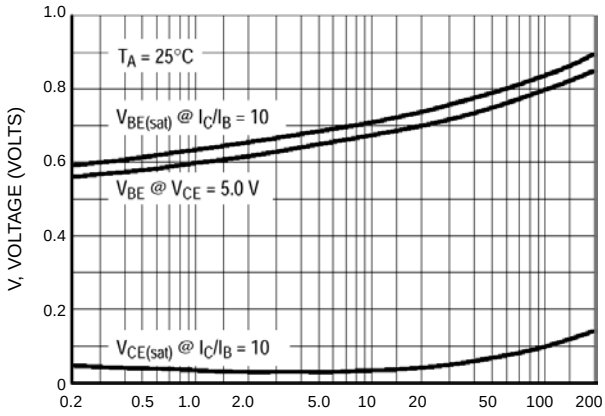


Figure 8. “On” Voltage

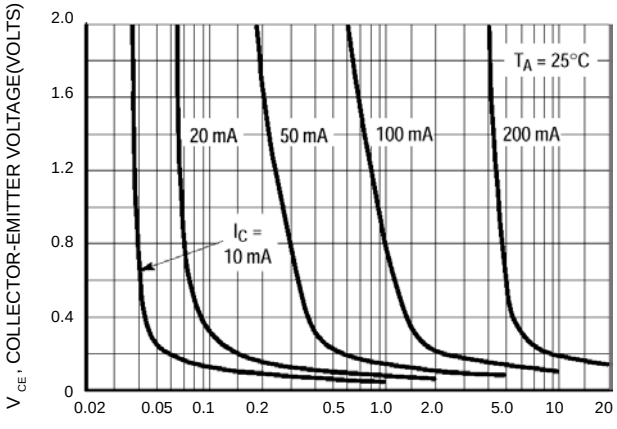


Figure 9. Collector Saturation Region

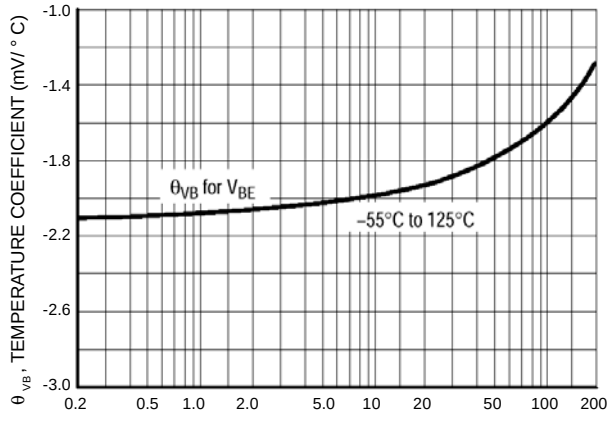


Figure 10. Base–Emitter Temperature Coefficient

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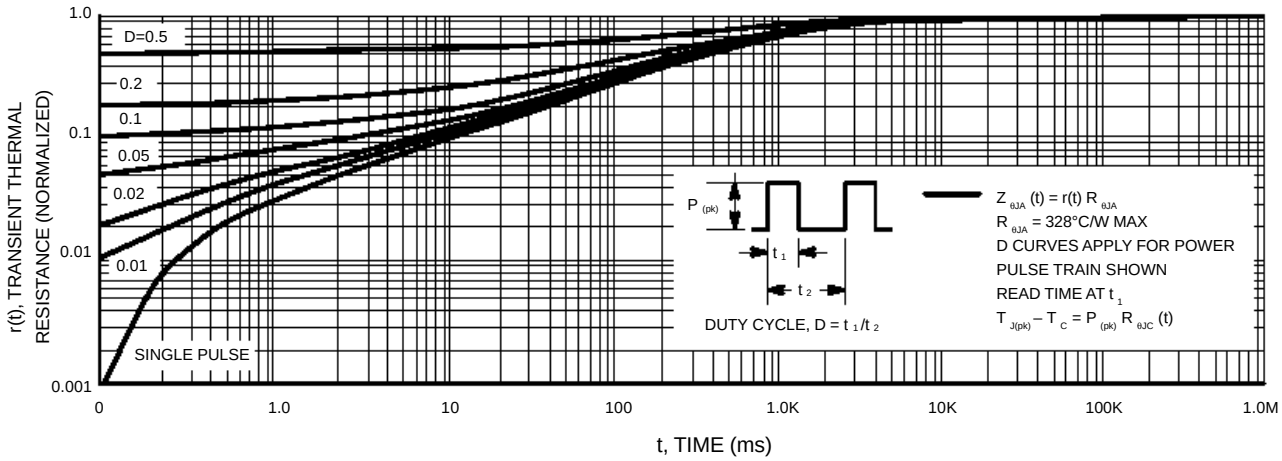

Figure 11. Thermal Response

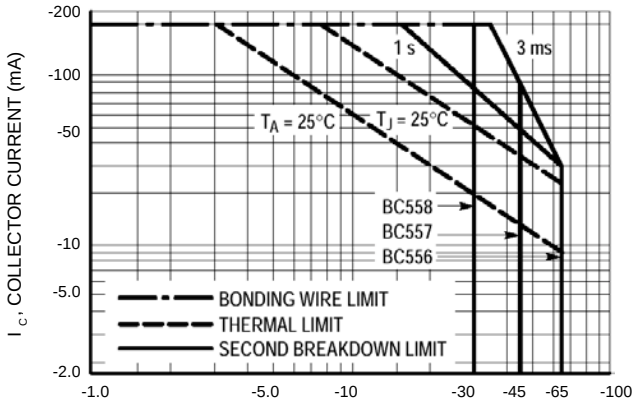

Figure 12. Active Region Safe Operating Area

The safe operating area curves indicate I_C–V_{CE} limits of thetransistor that must be observed for reliable operation. Collector load lines for specific circuits must fall below the limits indicated by the applicable curve.

The data of Figure 12 is based upon $T_{J(pk)}$ = 150°C; T_C or T_A is variable depending upon conditions. Pulse curves are valid for duty cycles to 10% provided $T_{J(pk)} \leq$ 150°C. T_J (pk) may be calculated from the data in Figure 12. At high case or ambient temperatures, thermal limitations will reduce the power that can be handled to values less than the limitations imposed by the secondary breakdown.

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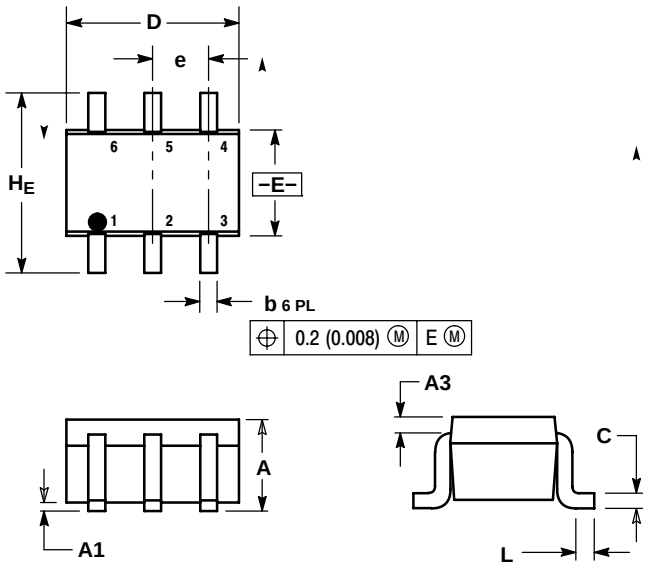
JXND ELECTRONICS CO.,LTD

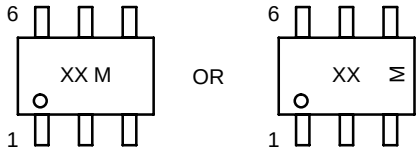
SC−88



NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. 419B−01 OBSOLETE, NEW STANDARD 419B−02.

	MILLIMETERS			INCHES		
DIM	MIN	NOM	MAX	MIN	NOM	MAX
A	0.80	0.95	1.10	0.031	0.037	0.043
A1	0.00	0.05	0.10	0.000	0.002	0.004
A3		0.20 REF			0.008 REF	
b	0.10	0.21	0.30	0.004	0.008	0.012
C	0.10	0.14	0.25	0.004	0.005	0.010
D	1.80	2.00	2.20	0.070	0.078	0.086
E	1.15	1.25	1.35	0.045	0.049	0.053
e		0.65 BSC			0.026 BSC	
L	0.10	0.20	0.30	0.004	0.008	0.012
H_E	2.00	2.10	2.20	0.078	0.082	0.086

GENERIC MARKING DIAGRAM*



XX = Specific Device Code
M = Date Code