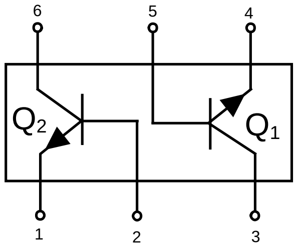
Dual General Purpose Transistors

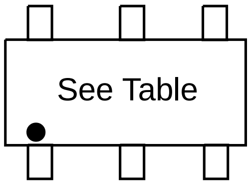
NPN Duals

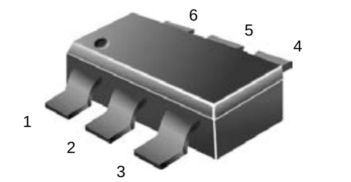
These transistors are designed for general purpose amplifier applications. They are housed in the SOT–363/SC–88 which is designed for low power surface mount applications.

We declare that the material of product compliance with RoHS requirements.

LBC846ADW1T1G
LBC846BDW1T1G
LBC847BDW1T1G
LBC847CDW1T1G
LBC848BDW1T1G
LBC848CDW1T1G







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 Per Device FR– 5 Board, (1) T_A = 25°C Derate above 25°C	P_D	380 250 3.0	mW mW 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
LBC846ADW1T1G	1A	3000 Units/Reel
LBC846ADW1T3G	1A	10000 Units/Reel
LBC846BDW1T1G	1B	3000 Units/Reel
LBC846BDW1T3G	1B	10000 Units/Reel
LBC847BDW1T1G	1F	3000 Units/Reel
LBC847BDW1T3G	1F	10000 Units/Reel
LBC847CDW1T1G	1G	3000 Units/Reel
LBC847CDW1T3G	1G	10000 Units/Reel
LBC848BDW1T1G	1K	3000 Units/Reel
LBC848BDW1T3G	1K	10000 Units/Reel
LBC848CDW1T1G	1L	3000 Units/Reel
LBC848CDW1T3G	1L	10000 Units/Reel

LBC846ADW1T1G Series

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)	LBC846 Series		65	—	—	
	LBC847 Series		45	—	—	
	LBC848 Series		30	—	—	
Collector–Emitter Breakdown Voltage		$V_{(BR)CES}$				V
(I_C = 10 µA, V_{EB} = 0)	LBC846 Series		80	—	—	
	LBC847 Series		50	—	—	
	LBC848 Series		30	—	—	
Collector–Base Breakdown Voltage		$V_{(BR)CBO}$				V
(I_C = 10 µA)	LBC846 Series		80	—	—	
	LBC847 Series		50	—	—	
	LBC848 Series		30	—	—	
Emitter–Base Breakdown Voltage		$V_{(BR)EBO}$				V
(I_E = 1.0 µA)	LBC846 Series		6.0	—	—	
	LBC847 Series		6.0	—	—	
	LBC848 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

Characteristic		Symbol	Min	Typ	Max	Unit
DC Current Gain		h_{FE}				—
(I_C = 2.0 mA, V_{CE} = 5.0 V)	LBC846A		110	180	220	
	LBC846B, LBC847B, LBC848B		200	290	450	
	LBC847C, LBC848C		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

Characteristic		Symbol	Min	Typ	Max	Unit
Current–Gain — Bandwidth Product (I_C = 10 mA, V_{CE} = 5.0 Vdc, f = 100 MHz)		f_T	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,	LBC846A,LBC846B, LBC847B, LBC848B		—	—	10	
f = 1.0 kHz, BW = 200 Hz)	LBC847C, LBC848C		—	—	4.0	

TYPICAL CHARACTERISTICS

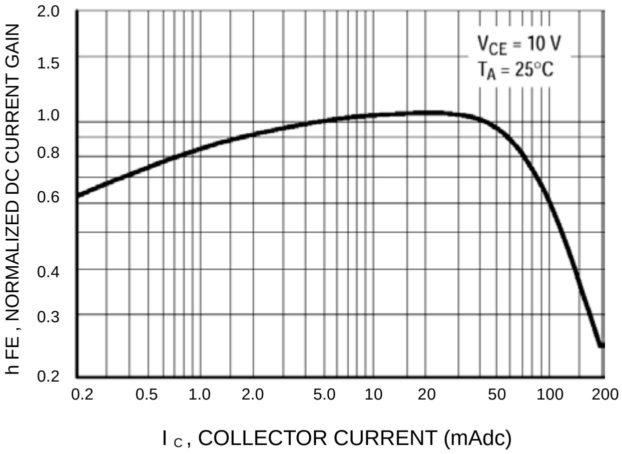


Figure 1. Normalized DC Current Gain

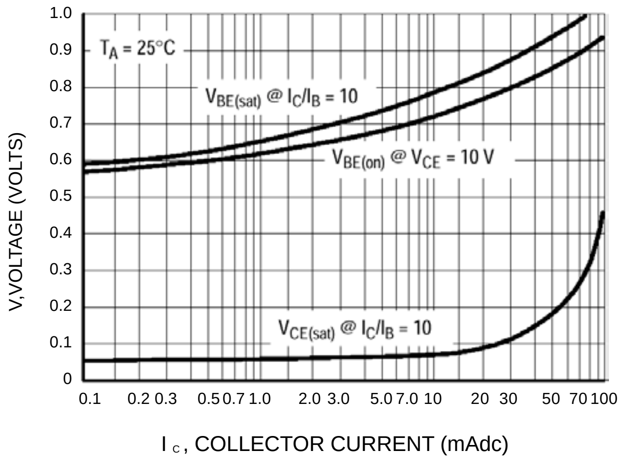


Figure 2. "Saturation" and "On" Voltages

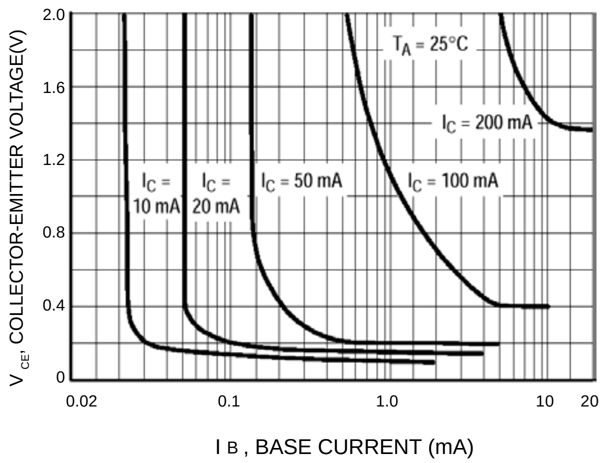


Figure 3. Collector Saturation Region

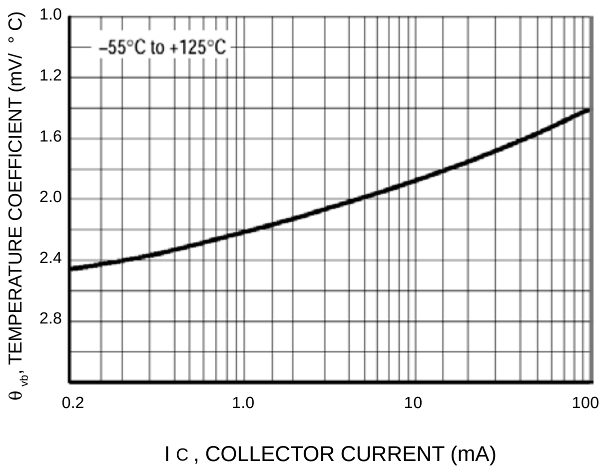


Figure 4. Base–Emitter Temperature Coefficient

TYPICAL CHARACTERISTICS

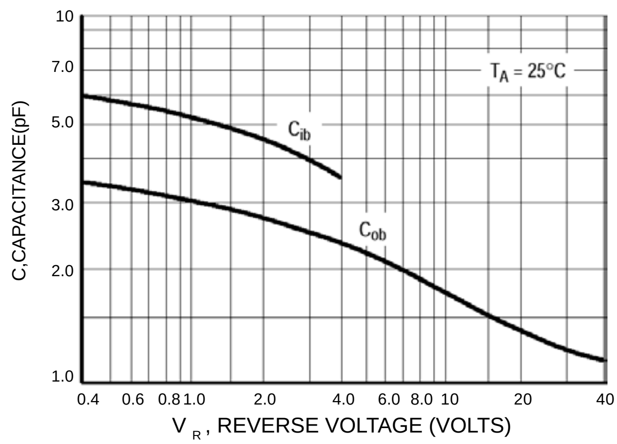


Figure 5. Capacitances

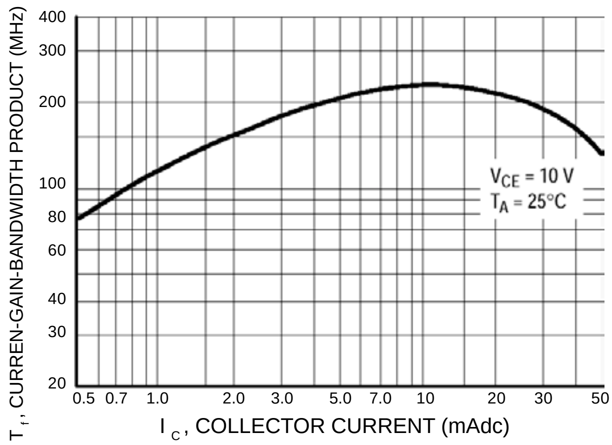


Figure 6. Current–Gain – Bandwidth Product

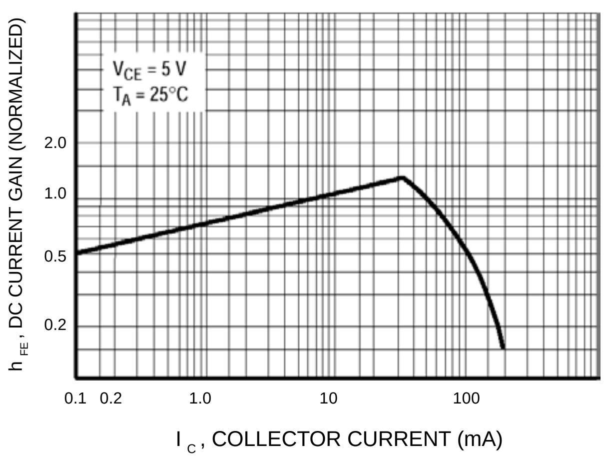


Figure 7. DC Current Gain

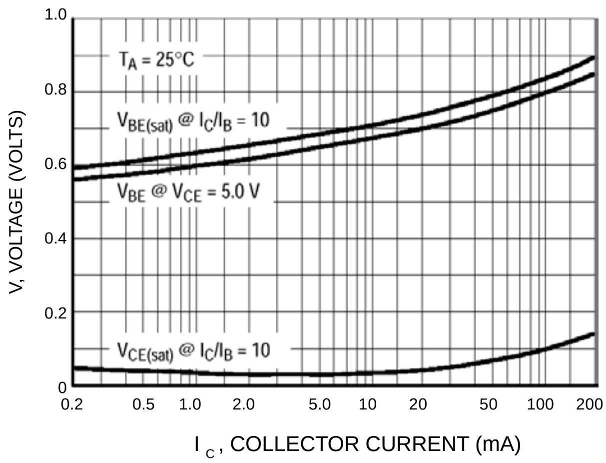


Figure 8. “On” Voltage

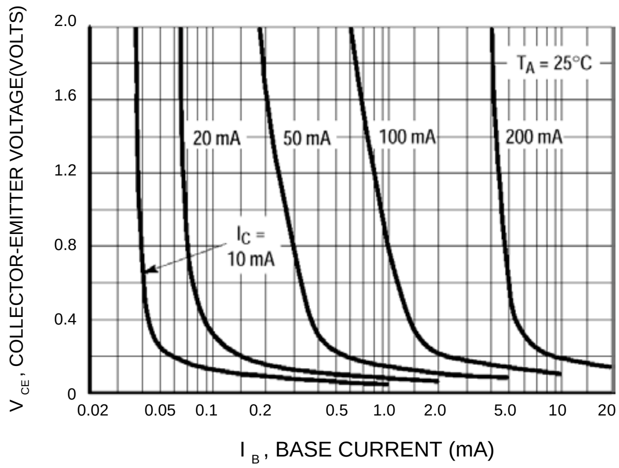


Figure 9. Collector Saturation Region

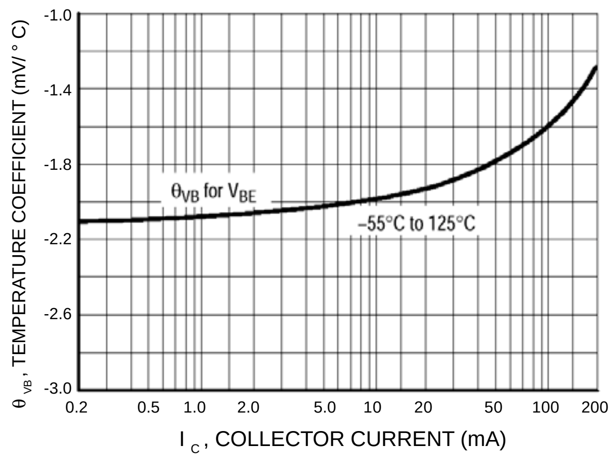


Figure 10. Base–Emitter Temperature Coefficient

LBC846ADW1T1G Series

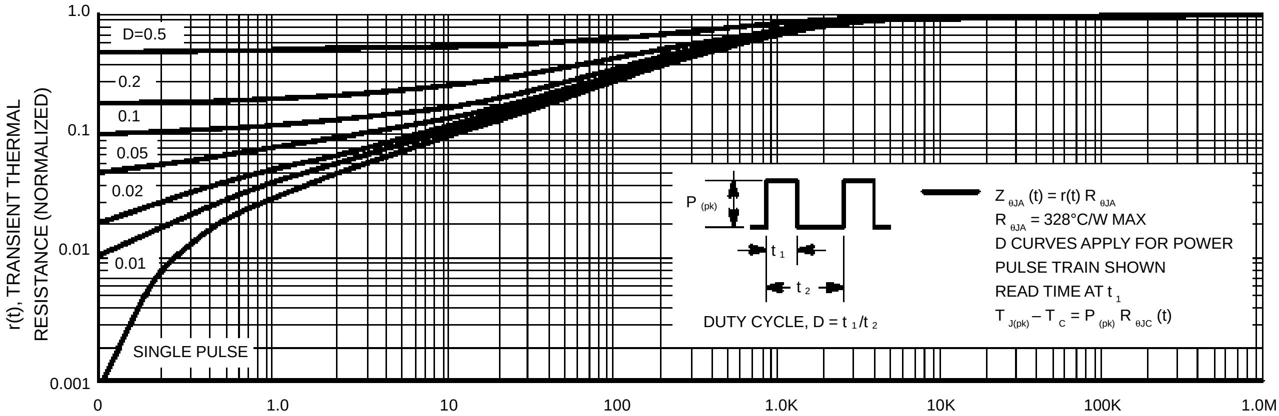


Figure 11. Thermal Response

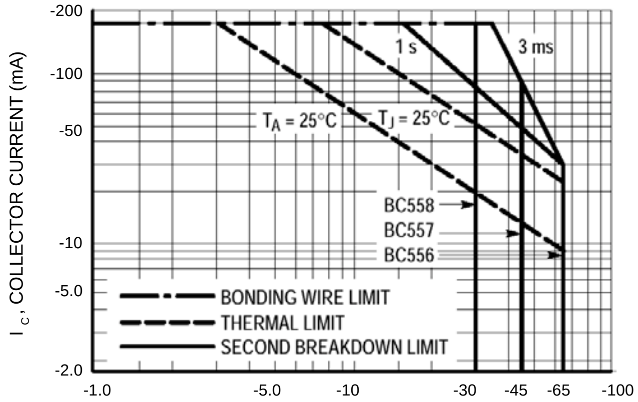


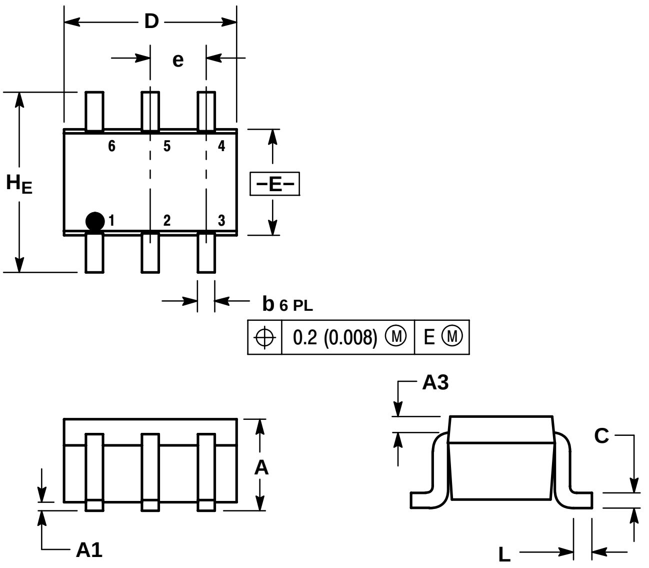
Figure 12. Active Region Safe Operating Area

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.

LBC846ADW1T1G Series

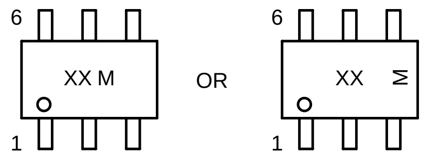
SC−88



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