General Purpose Transistors

PNP Silicon

These transistors are designed for general purpose amplifier applications. They are housed in the SC−89 package which is designed for low power surface mount applications.

Features

- Pb−Free Packages are Available
- S- Prefix for Automotive and Other Applications Requiring Unique Site and Control Change Requirements; AEC-Q101 Qualified and PPAP Capable.

SC-89

MAXIMUM RATINGS (T_A = 25°C)

Rating	Symbol	Max	Unit
Collector−Emitter Voltage	V_{CEO}	−45	V
Collector−Base Voltage	V_{CBO}	−50	V
Emitter−Base Voltage	V_{EBO}	−5.0	V
Collector Current – Continuous	I_C	−100	mAdc

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Total Device Dissipation, FR−4 Board (Note 1) T_A = 25°C Derated above 25°C	P_D	200 1.6	mW mW/°C
Thermal Resistance, Junction−to−Ambient (Note 1)	$R_{\theta JA}$	600	°C/W
Total Device Dissipation, FR−4 Board (Note 2) T_A = 25°C Derated above 25°C	P_D	300 2.4	mW mW/°C
Thermal Resistance, Junction−to−Ambient (Note 2)	$R_{\theta JA}$	400	°C/W
Junction and Storage Temperature Range	T_J, T_{stg}	−55 to +150	°C

1. FR−4 @ min pad.
2. FR−4 @ 1.0 $\times$ 1.0 in pad.

ORDERING INFORMATION

Device	Marking	Package	Shipping[†]
LBC857ATT1G,S-LBC857ATT1G	3E	SC−89	3,000 / Tape & Reel
LBC857BTT1G,S-LBC857BTT1G	3F	SC−89	3,000 / Tape & Reel
LBC857CTT1G,S-LBC857CTT1G	3G	SC−89	3,000 / Tape & Reel

LBC857ATT1G Series , S-LBC857ATT1G Series

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

Characteristic		Symbol	Min	Typ	Max	Unit
OFF CHARACTERISTICS						
Collector–Emitter Breakdown Voltage (I_C = –10 mA) LBC857 Series		$V_{(BR)CEO}$	–45	–	–	V
Collector–Emitter Breakdown Voltage (I_C = –10 μA, V_{EB} = 0) LBC857B Only		$V_{(BR)CES}$	–50	–	–	V
Collector–Base Breakdown Voltage (I_C = –10 μA) LBC857 Series		$V_{(BR)CBO}$	–50	–	–	V
Emitter–Base Breakdown Voltage (I_E = –1.0 μA) LBC857 Series		$V_{(BR)EBO}$	–5.0	–	–	V
Collector Cutoff Current (V_{CB} = –30 V) (V_{CB} = –30 V, T_A = 150°C)		I_{CBO}	– –	– –	–15 –4.0	nA μA
ON CHARACTERISTICS						
DC Current Gain (I_C = –10 μA, V_{CE} = –5.0 V) (I_C = –2.0 mA, V_{CE} = –5.0 V)	LBC857A LBC857B LBC857C LBC857A LBC857B LBC857C	h_{FE}	– – – 125 220 420	90 150 270 180 290 520	– – – 250 475 800	–
Collector–Emitter Saturation Voltage (I_C = –10 mA, I_B = –0.5 mA) (I_C = –100 mA, I_B = –5.0 mA)		$V_{CE(sat)}$	– –	– –	–0.3 –0.65	V
Base–Emitter Saturation Voltage (I_C = –10 mA, I_B = –0.5 mA) (I_C = –100 mA, I_B = –5.0 mA)		$V_{BE(sat)}$	– –	–0.7 –0.9	– –	V
Base–Emitter On Voltage (I_C = –2.0 mA, V_{CE} = –5.0 V) (I_C = –10 mA, V_{CE} = –5.0 V)		$V_{BE(on)}$	–0.6 –	– –	–0.75 –0.82	V
SMALL–SIGNAL CHARACTERISTICS						
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_{ob}	–	–	4.5	pF
Noise Figure (I_C = –0.2 mA, V_{CE} = –5.0 Vdc, R_S = 2.0 kΩ, f = 1.0 kHz, BW = 200 Hz)		NF	–	–	10	dB

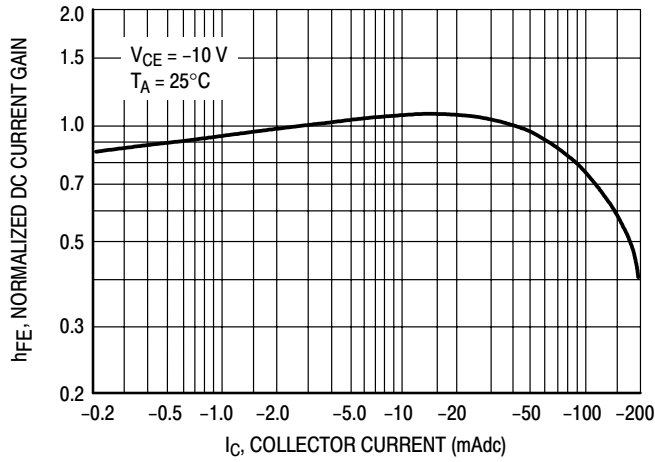**LBC857ATT1G,LBC857BTT1G,LBC857CTT1G**
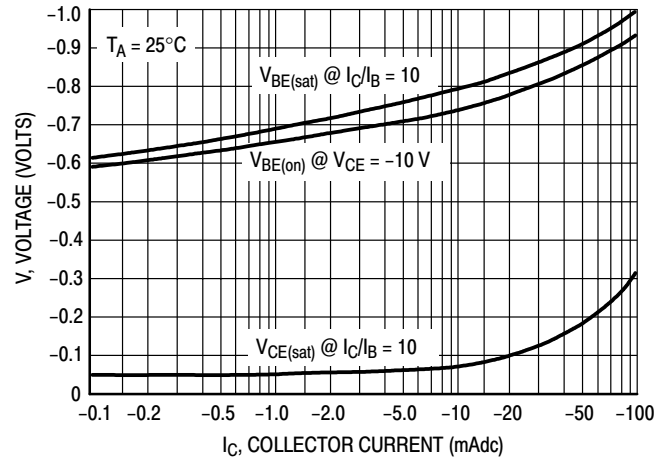

Figure 1. Normalized DC Current Gain

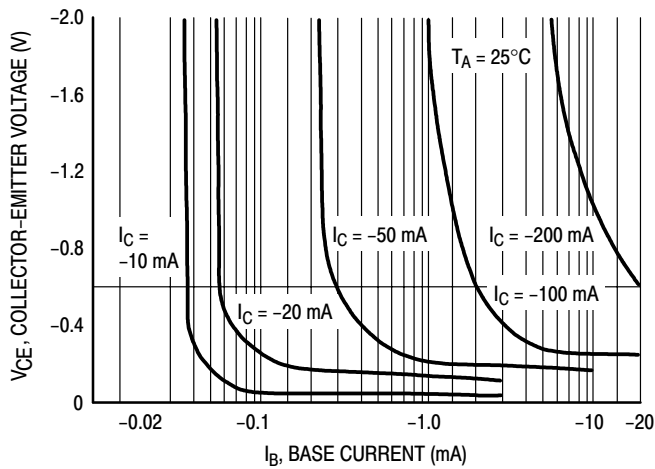Figure 2. "Saturation" and "On" Voltages
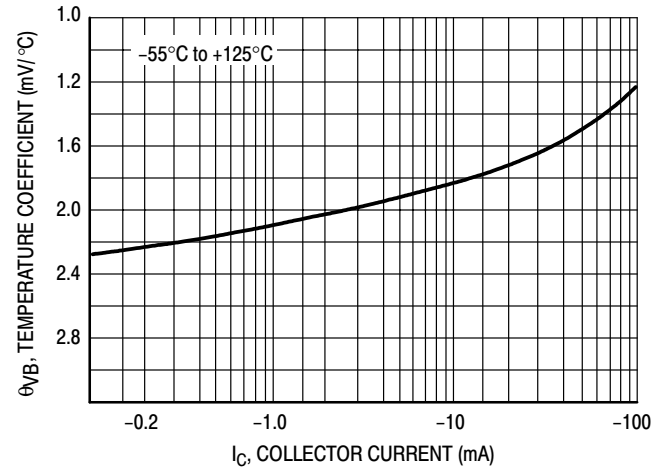

Figure 3. Collector Saturation Region

Figure 4. Base–Emitter Temperature Coefficient

LBC857ATT1G Series , S-LBC857ATT1G Series
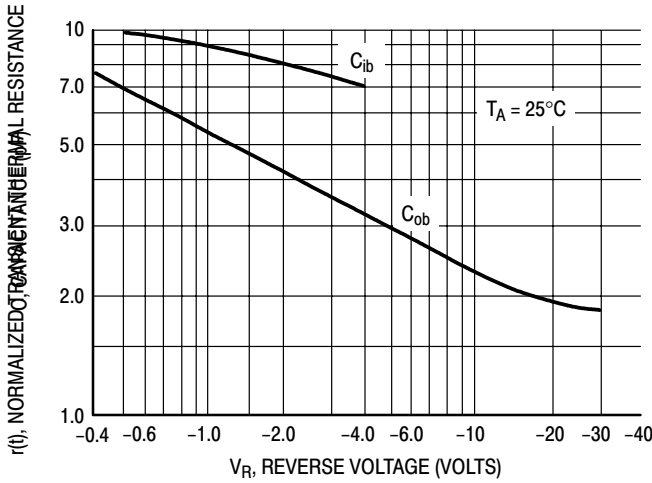
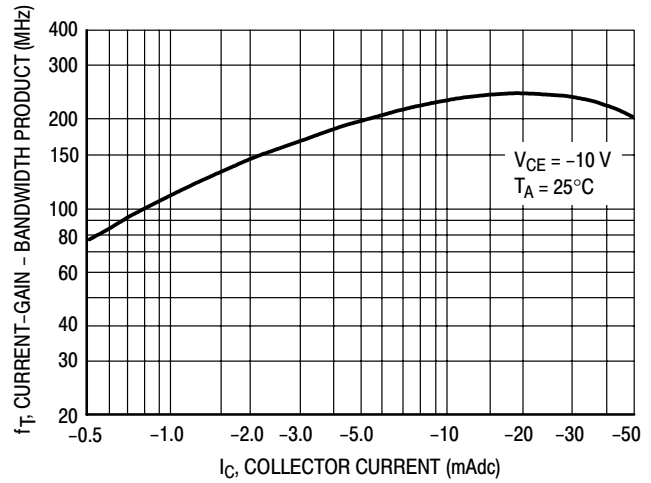### LBC847ATT1G,LBC847BTT1G,LBC847CTT1G
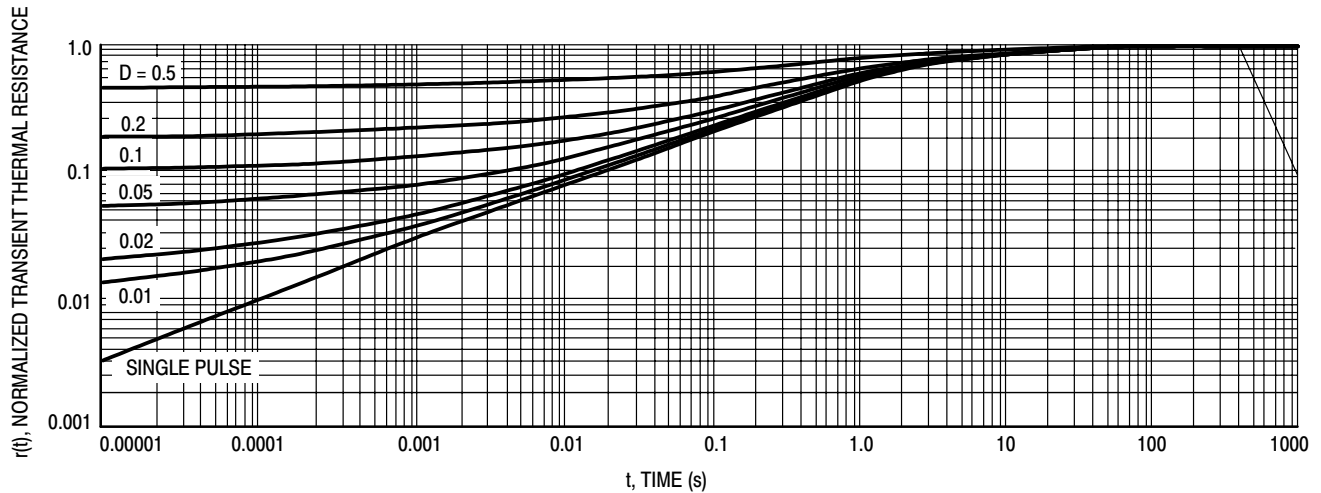
Figure 5. Capacitances

Figure 6. Current–Gain – Bandwidth Product

Figure 7. Thermal Response

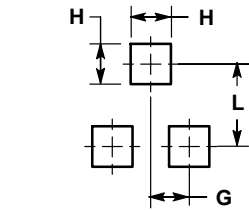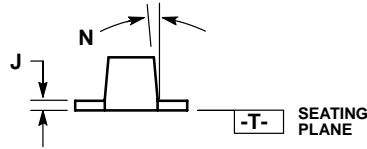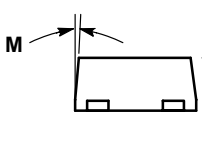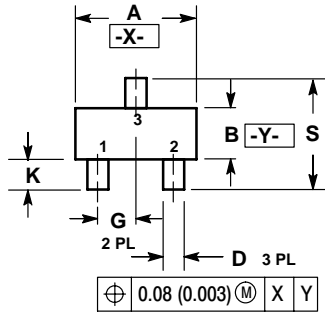The safe operating area curves indicate I_C–V_{CE} limits of the transistor that must be observed for reliable operation. Collector load lines for specific circuits must fall below the limits indicated by the applicable curve.

The data of Figure 8 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 7. 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.

Figure 8. Active Region Safe Operating Area

LBC857ATT1G Series , S-LBC857ATT1G Series

SC−89

NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: MILLIMETERS
3. MAXIMUM LEAD THICKNESS INCLUDES LEAD FINISH THICKNESS. MINIMUM LEAD THICKNESS IS THE MINIMUM THICKNESS OF BASE MATERIAL.
4. 463C-01 OBSOLETE, NEW STANDARD 463C-02.

DIM	MILLIMETERS			INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
A	1.50	1.60	1.70	0.059	0.063	0.067
B	0.75	0.85	0.95	0.030	0.034	0.040
C	0.60	0.70	0.80	0.024	0.028	0.031
D	0.23	0.28	0.33	0.009	0.011	0.013
G	0.50 BSC			0.020 BSC		
H	0.53 REF			0.021 REF		
J	0.10	0.15	0.20	0.004	0.006	0.008
K	0.30	0.40	0.50	0.012	0.016	0.020
L	1.10 REF			0.043 REF		
M	---	---	10 °	---	---	10 °
N	---	---	10 °	---	---	10 °
S	1.50	1.60	1.70	0.059	0.063	0.067

SEATING PLANE

RECOMMENDED PATTERN OF SOLDER PADS

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Jantx2N5416 US6T6TR KSF350 068071B