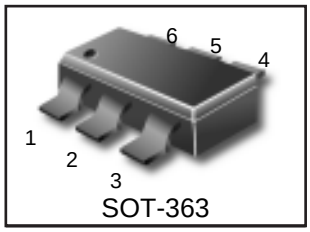
Dual General Purpose Transistors

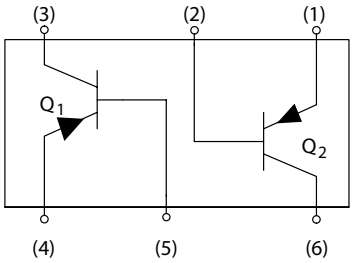
LBC85 DW1T1G**
S-LBC85 DW1T1G**



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.

S- Prefix for Automotive and Other Applications Requiring Unique Site and Control Change Requirements; AEC-Q101 Qualified and PPAP Capable.

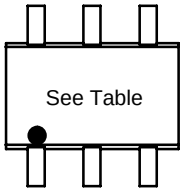


- Device Marking:
  (S-)LBC856ADW1T1G= 3A
  (S-)LBC856BDW1T1G= 3B
  (S-)LBC857BDW1T1G= 3F
  (S-)LBC857CDW1T1G= 3G
  (S-)LBC858BDW1T1G= 3K
  (S-)LBC858CDW1T1G = 3L

MAXIMUM RATINGS

Rating	Symbol	BC856	BC857	BC858	Unit
Collector–Emitter Voltage	V_{CEO}	–65	–45	–30	V
Collector–Base Voltage	V_{CBO}	–80	–50	–30	V
Emitter–Base Voltage	V_{EBO}	–5.0	–5.0	–5.0	V
Collector Current – Continuous	I_C	–100	–100	–100	mAdc

DEVICE MARKING



THERMAL CHARACTERISTICS

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

1. FR–5 = 1.0 x 0.75 x 0.062 in

ORDERING INFORMATION

Device	Shipping
LBC85*BDW1T1G	3000/Tape & Reel
LBC85*BDW1T3G	10000/Tape & Reel

LBC856ADW1T1G,LBC856BDW1T1G,LBC857BDW1T1G
LBC857CDW1T1G, LBC858BDW1T1G,LBC858CDW1T1G
S-LBC856ADW1T1G,S-LBC856BDW1T1G,S-LBC857BDW1T1G
S-LBC857CDW1T1G, S-LBC858BDW1T1G,S-LBC858CDW1T1G

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)	LBC856 Series		–65	–	–	
	LBC857 Series		–45	–	–	
	LBC858 Series		–30	–	–	
Collector–Emitter Breakdown Voltage		$V_{(BR)CES}$				V
(I_C = –10 μA, V_{EB} = 0)	LBC856 Series		–80	–	–	
	LBC857 Series		–50	–	–	
	LBC858 Series		–30	–	–	
Collector–Base Breakdown Voltage		$V_{(BR)CBO}$				V
(I_C = –10 μA)	LBC856 Series		–80	–	–	
	LBC857 Series		–50	–	–	
	LBC858 Series		–30	–	–	
Emitter–Base Breakdown Voltage		$V_{(BR)EBO}$				V
(I_E = –1.0 μA)	LBC856 Series		–5.0	–	–	
	LBC857 Series		–5.0	–	–	
	LBC858 Series		–5.0	–	–	
Collector Cutoff Current (V_{CB} = –30 V)		I_{CBO}	–	–	–15	nA
(V_{CB} = –30 V, T_A = 150°C)			–	–	–4.0	μA
ON CHARACTERISTICS						
DC Current Gain	LBC856A	h_{FE}	–	90	–	–
(I_C = –10 μA, V_{CE} = –5.0 V)	LBC856B, LBC857B, LBC858B		–	150	–	
	LBC857C, LBC858C		–	270	–	
(I_C = –2.0 mA, V_{CE} = –5.0 V)	LBC856A		125	180	250	
	LBC856B, LBC857B, LBC858B		220	290	475	
	LBC857C, LBC858C		420	520	800	
Collector–Emitter Saturation Voltage		$V_{CE(sat)}$				V
(I_C = –10 mA, I_B = –0.5 mA)			–	–	–0.3	
(I_C = –100 mA, I_B = –5.0 mA)			–	–	–0.65	
Base–Emitter Saturation Voltage		$V_{BE(sat)}$				V
(I_C = –10 mA, I_B = –0.5 mA)			–	–0.7	–	
(I_C = –100 mA, I_B = –5.0 mA)			–	–0.9	–	
Base–Emitter On Voltage		$V_{BE(on)}$				V
(I_C = –2.0 mA, V_{CE} = –5.0 V)			–0.6	–	–0.75	
(I_C = –10 mA, V_{CE} = –5.0 V)			–	–	–0.82	
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		C_{ob}	–	–	4.5	pF
(V_{CB} = –10 V, f = 1.0 MHz)						
Noise Figure		NF	–	–	10	dB
(I_C = –0.2 mA, V_{CE} = –5.0 Vdc, R_S = 2.0 kΩ, f = 1.0 kHz, BW = 200 Hz)						

LBC856ADW1T1G,LBC856BDW1T1G,LBC857BDW1T1G
LBC857CDW1T1G, LBC858BDW1T1G,LBC858CDW1T1G
S-LBC856ADW1T1G,S-LBC856BDW1T1G,S-LBC857BDW1T1G
S-LBC857CDW1T1G, S-LBC858BDW1T1G,S-LBC858CDW1T1G

TYPICAL CHARACTERISTICS – LBC856

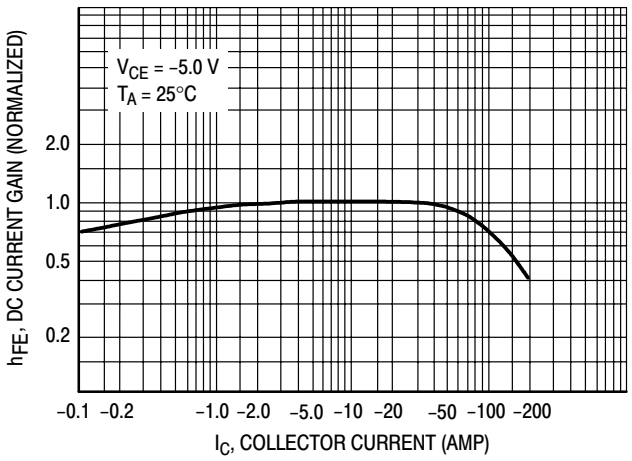


Figure 1. DC Current Gain

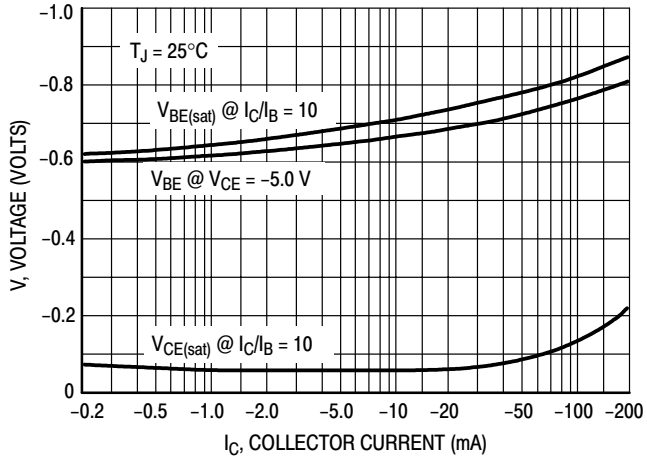


Figure 2. “On” Voltage

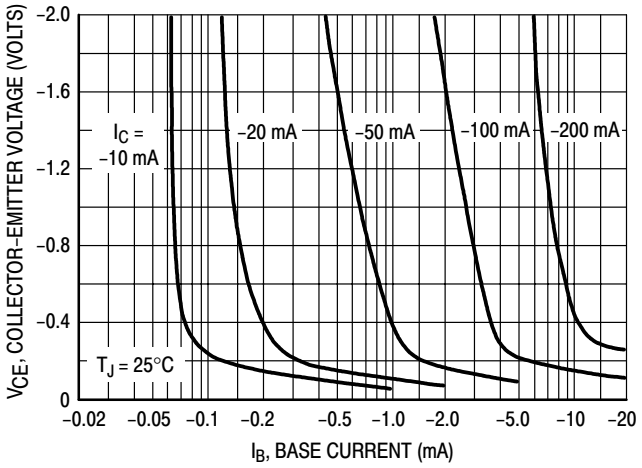


Figure 3. Collector Saturation Region

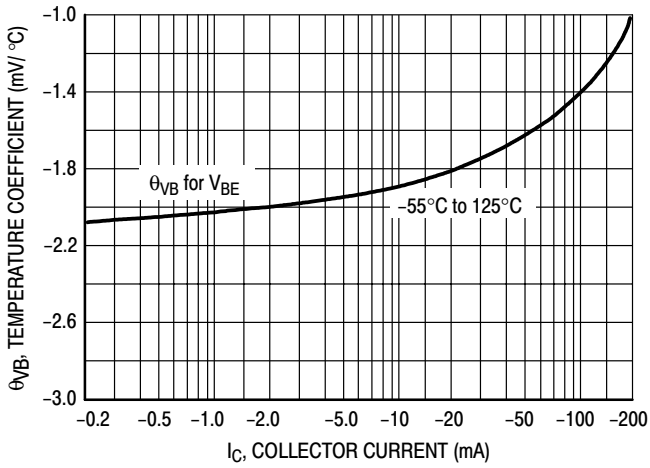


Figure 4. Base–Emitter Temperature Coefficient

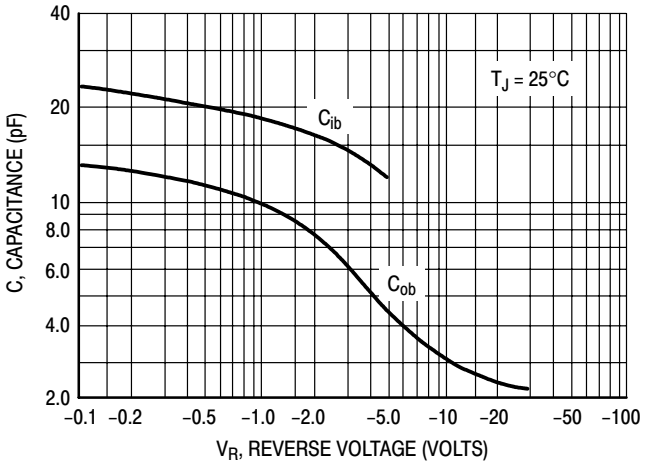


Figure 5. Capacitance

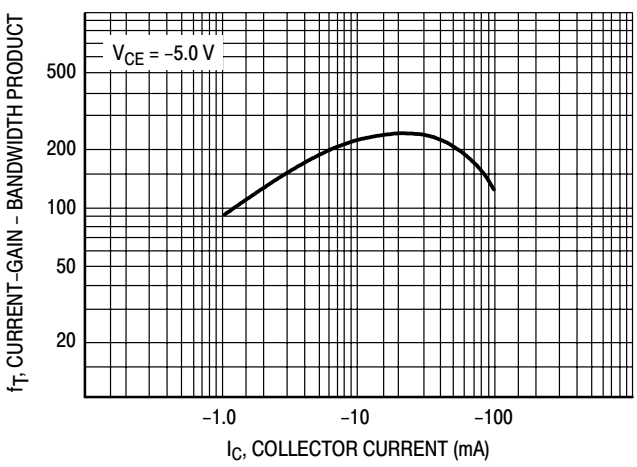


Figure 6. Current–Gain – Bandwidth Product

LBC856ADW1T1G,LBC856BDW1T1G,LBC857BDW1T1G
LBC857CDW1T1G, LBC858BDW1T1G,LBC858CDW1T1G
S-LBC856ADW1T1G,S-LBC856BDW1T1G,S-LBC857BDW1T1G
S-LBC857CDW1T1G, S-LBC858BDW1T1G,S-LBC858CDW1T1G

TYPICAL CHARACTERISTICS – LBC857/LBC858

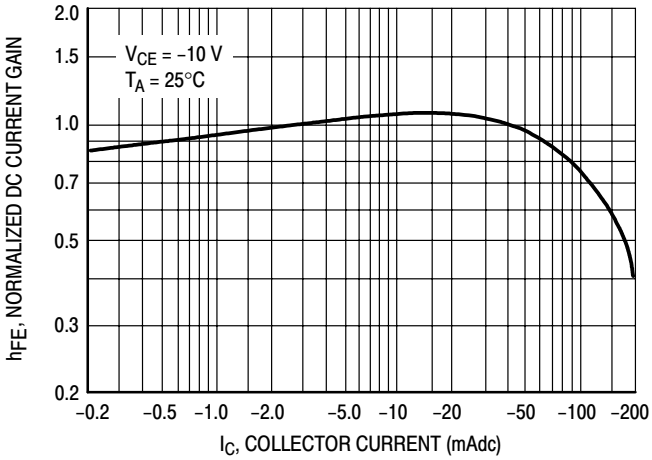


Figure 7. Normalized DC Current Gain

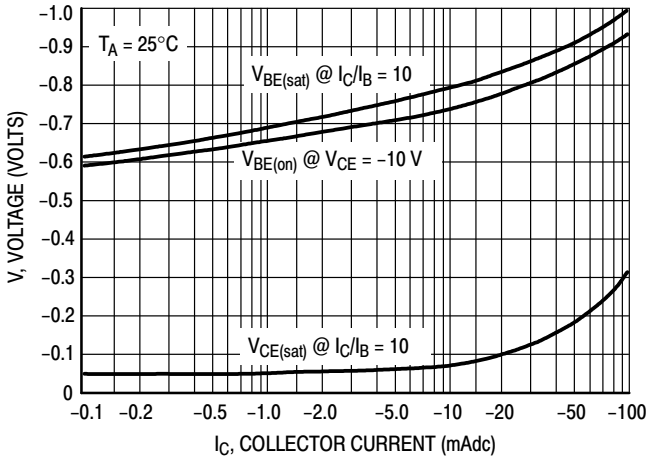


Figure 8. "Saturation" and "On" Voltages

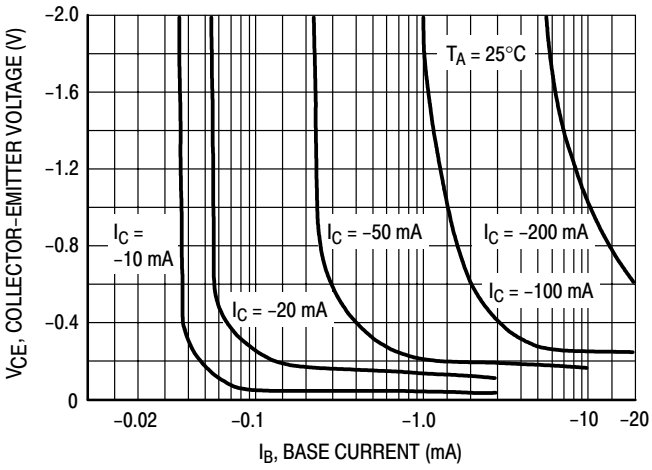


Figure 9. Collector Saturation Region

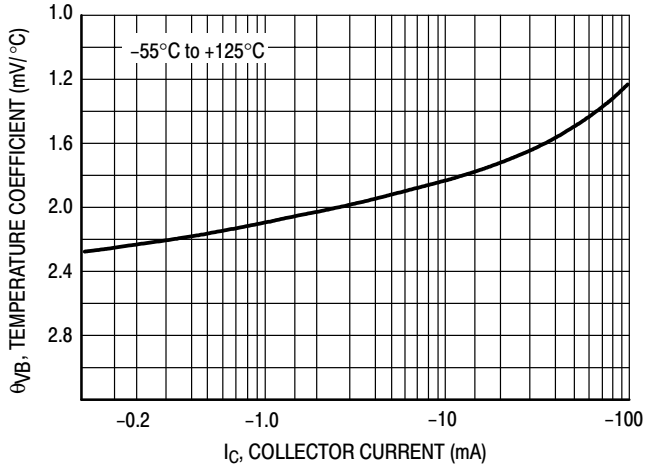


Figure 10. Base–Emitter Temperature Coefficient

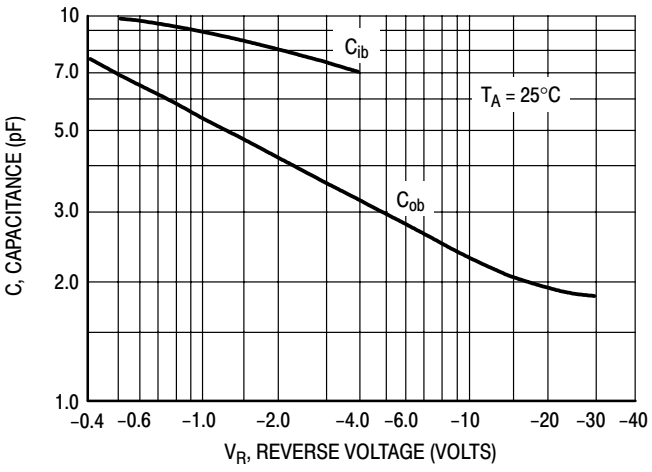


Figure 11. Capacitances

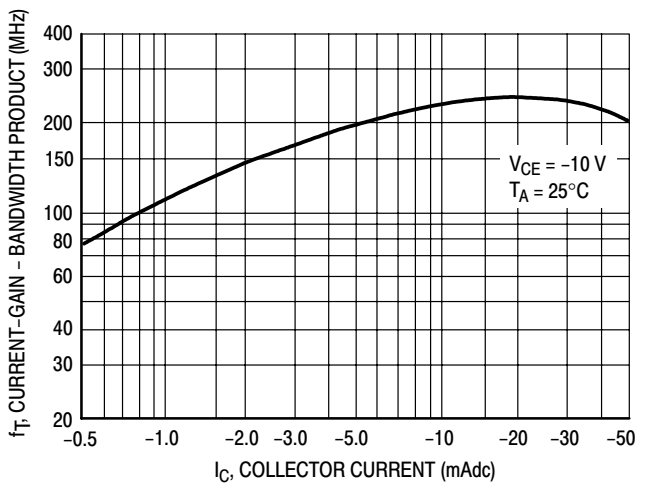


Figure 12. Current–Gain – Bandwidth Product

LBC856ADW1T1G,LBC856BDW1T1G,LBC857BDW1T1G
LBC857CDW1T1G, LBC858BDW1T1G,LBC858CDW1T1G
S-LBC856ADW1T1G,S-LBC856BDW1T1G,S-LBC857BDW1T1G
S-LBC857CDW1T1G, S-LBC858BDW1T1G,S-LBC858CDW1T1G

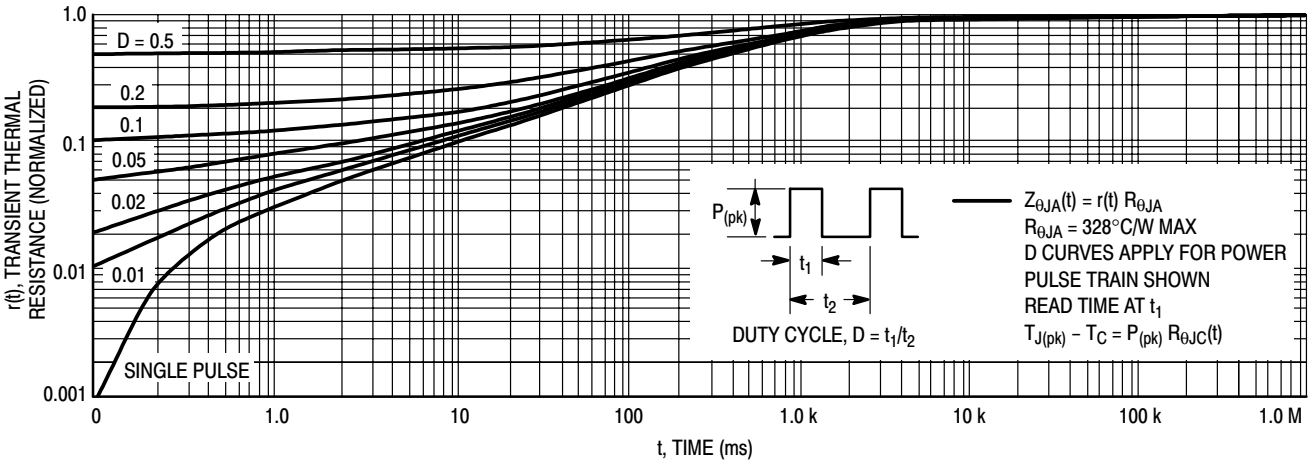


Figure 13. Thermal Response

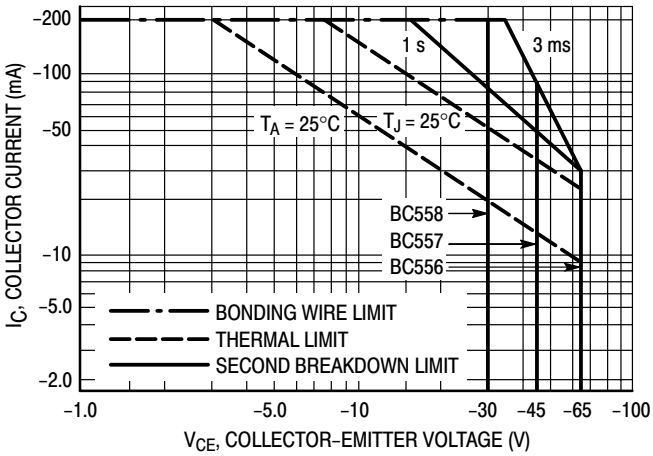


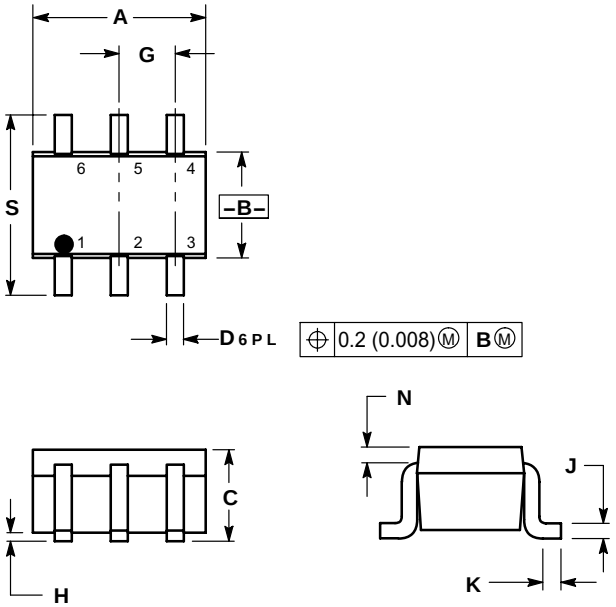
Figure 14. Active Region Safe Operating Area

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 14 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 13. 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.

LBC856ADW1T1G,LBC856BDW1T1G,LBC857BDW1T1G
LBC857CDW1T1G, LBC858BDW1T1G,LBC858CDW1T1G
S-LBC856ADW1T1G,S-LBC856BDW1T1G,S-LBC857BDW1T1G
S-LBC857CDW1T1G, S-LBC858BDW1T1G,S-LBC858CDW1T1G

SC-88/SOT–363



NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.

DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.071	0.087	1.80	2.20
B	0.045	0.053	1.15	1.35
C	0.031	0.043	0.80	1.10
D	0.004	0.012	0.10	0.30
G	0.026 BSC		0.65 BSC	
H	---	0.004	---	0.10
J	0.004	0.010	0.10	0.25
K	0.004	0.012	0.10	0.30
N	0.008 REF		0 .20 REF	
S	0.079	0.087	2.00	2.20

PIN 1. EMITTER 2
2. BASE 2
3. COLLECTOR 1
4. EMITTER 1
5. BASE 1
6. COLLECTOR 2