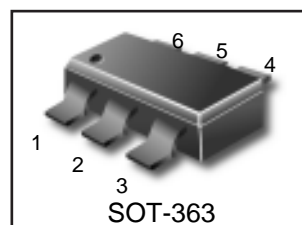


Dual General Purpose Transistors

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.

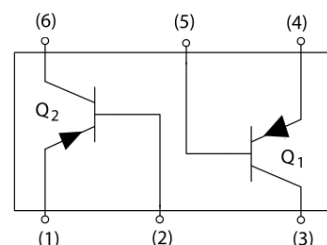
We declare that the material of product compliance with RoHS requirements and Halogen Free.



- 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 |



THERMAL CHARACTERISTICS

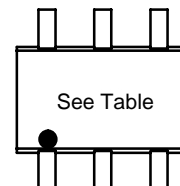
| Characteristic | Symbol | Max | Unit |
|---|------------------------------------|-------------|--------------|
| Total Device Dissipation FR-4 Board (Note 1.) Derate Above 25°C | P_D | 250 2.0 | mW mW/°C |
| Thermal Resistance, Junction to Ambient Junction to Case | $R_{\theta JA}$ $R_{\theta JC}$ | 500 370 | °C/W °C/W |
| Junction and Storage Temperature Range | T_J, T_{stg} | -55 to +150 | °C |

1.30.0mmx25.0mmx1.6mm(FR4)

ORDERING INFORMATION

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

DEVICE MARKING



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

ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$ unless otherwise noted)

| Characteristic | Symbol | Min | Typ | Max | Unit | |
|---|--|---------------|----------------------|-------------------|-------------------|---------------------|
| OFF CHARACTERISTICS | | | | | | |
| Collector–Emitter Breakdown Voltage ($I_C = -10\text{ mA}$) | LBC856 Series LBC857 Series LBC858 Series | $V_{(BR)CEO}$ | -65 -45 -30 | - | - | V |
| Collector–Emitter Breakdown Voltage ($I_C = -10\text{ }\mu\text{A}$, $V_{EB} = 0$) | LBC856 Series LBC857 Series LBC858 Series | $V_{(BR)CES}$ | -80 -50 -30 | - | - | V |
| Collector–Base Breakdown Voltage ($I_C = -10\text{ }\mu\text{A}$) | LBC856 Series LBC857 Series LBC858 Series | $V_{(BR)CBO}$ | -80 -50 -30 | - | - | V |
| Emitter–Base Breakdown Voltage ($I_E = -1.0\text{ }\mu\text{A}$) | LBC856 Series LBC857 Series LBC858 Series | $V_{(BR)EBO}$ | -5.0 -5.0 -5.0 | - | - | V |
| Collector Cutoff Current ($V_{CB} = -30\text{ V}$) ($V_{CB} = -30\text{ V}$, $T_A = 150^\circ\text{C}$) | | I_{CBO} | - | - | -15 -4.0 | nA μA |
| ON CHARACTERISTICS | | | | | | |
| DC Current Gain ($I_C = -10\text{ }\mu\text{A}$, $V_{CE} = -5.0\text{ V}$) | LBC856A LBC856B, LBC857B, LBC858B LBC857C, LBC858C | h_{FE} | - | 90 150 270 | - | - |
| ($I_C = -2.0\text{ mA}$, $V_{CE} = -5.0\text{ V}$) | LBC856A LBC856B, LBC857B, LBC858B LBC857C, LBC858C | | 125 220 420 | 180 290 520 | 250 475 800 | |
| Collector–Emitter Saturation Voltage ($I_C = -10\text{ mA}$, $I_B = -0.5\text{ mA}$) ($I_C = -100\text{ mA}$, $I_B = -5.0\text{ mA}$) | | $V_{CE(sat)}$ | - | - | -0.3 -0.65 | V |
| Base–Emitter Saturation Voltage ($I_C = -10\text{ mA}$, $I_B = -0.5\text{ mA}$) ($I_C = -100\text{ mA}$, $I_B = -5.0\text{ mA}$) | | $V_{BE(sat)}$ | - | -0.7 -0.9 | - | V |
| Base–Emitter On Voltage ($I_C = -2.0\text{ mA}$, $V_{CE} = -5.0\text{ V}$) ($I_C = -10\text{ mA}$, $V_{CE} = -5.0\text{ V}$) | | $V_{BE(on)}$ | -0.6 - | - | -0.75 -0.82 | V |
| SMALL–SIGNAL CHARACTERISTICS | | | | | | |
| Current–Gain – Bandwidth Product ($I_C = -10\text{ mA}$, $V_{CE} = -5.0\text{ Vdc}$, $f = 100\text{ MHz}$) | | f_T | 100 | - | - | MHz |
| Output Capacitance ($V_{CB} = -10\text{ V}$, $f = 1.0\text{ MHz}$) | | C_{ob} | - | - | 4.5 | pF |
| Noise Figure ($I_C = -0.2\text{ mA}$, $V_{CE} = -5.0\text{ Vdc}$, $R_S = 2.0\text{ k}\Omega$, $f = 1.0\text{ kHz}$, $BW = 200\text{ Hz}$) | | NF | - | - | 10 | dB |

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

TYPICAL CHARACTERISTICS – LBC856

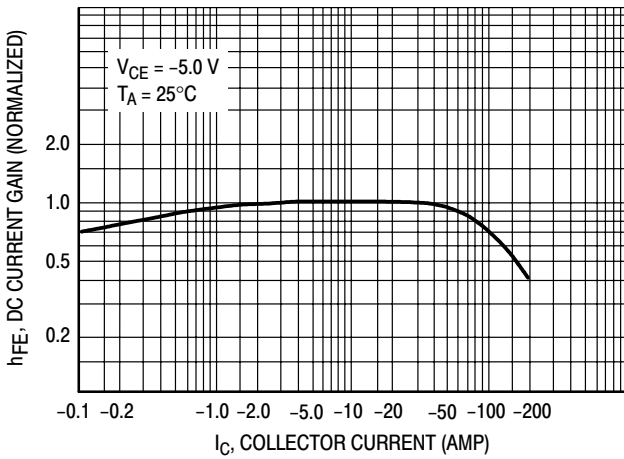


Figure 1. DC Current Gain

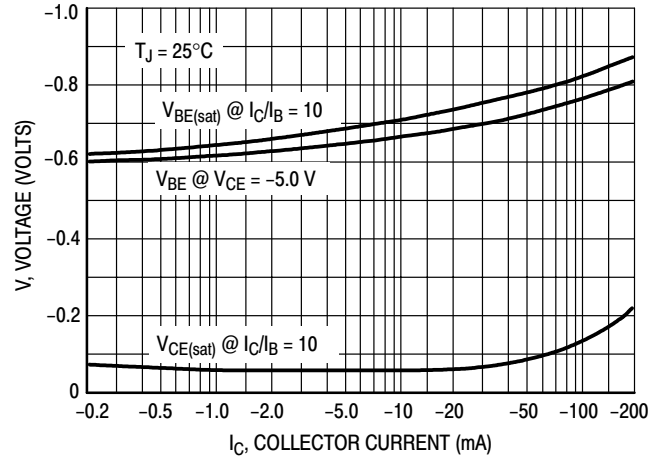


Figure 2. "On" Voltage

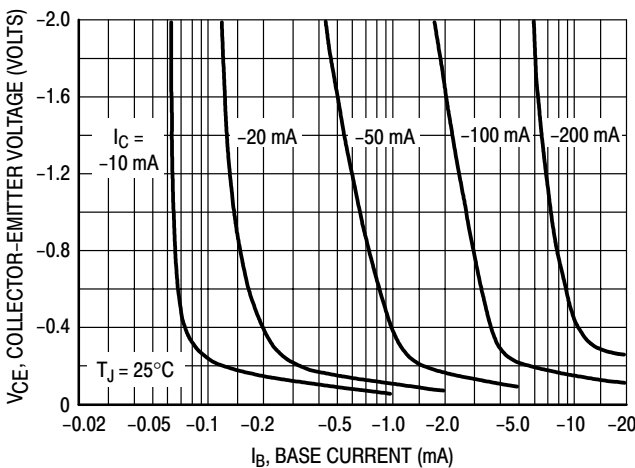


Figure 3. Collector Saturation Region

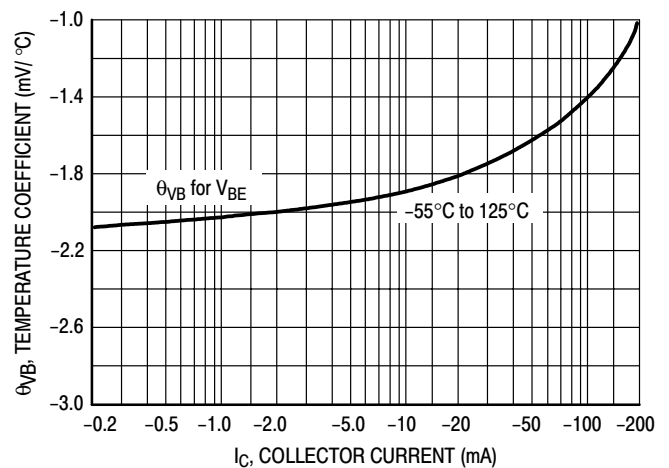


Figure 4. Base-Emitter Temperature Coefficient

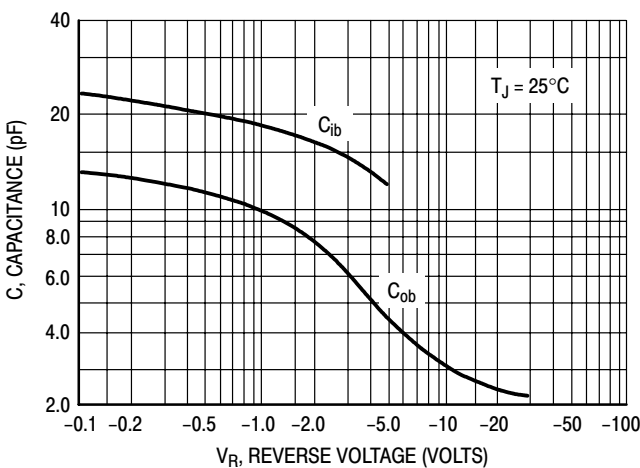


Figure 5. Capacitance

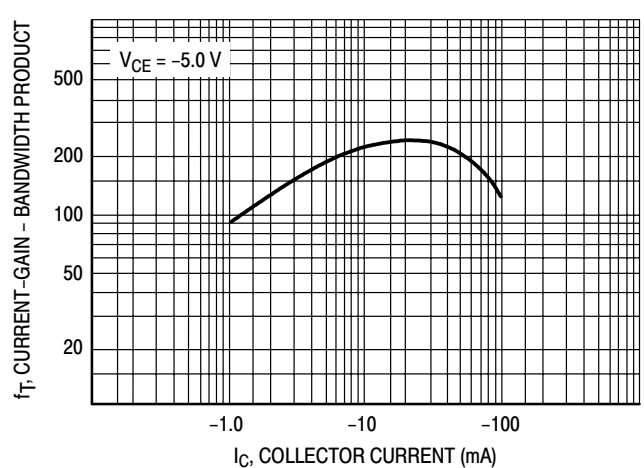


Figure 6. Current-Gain - Bandwidth Product

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

TYPICAL CHARACTERISTICS – LBC857/LBC858

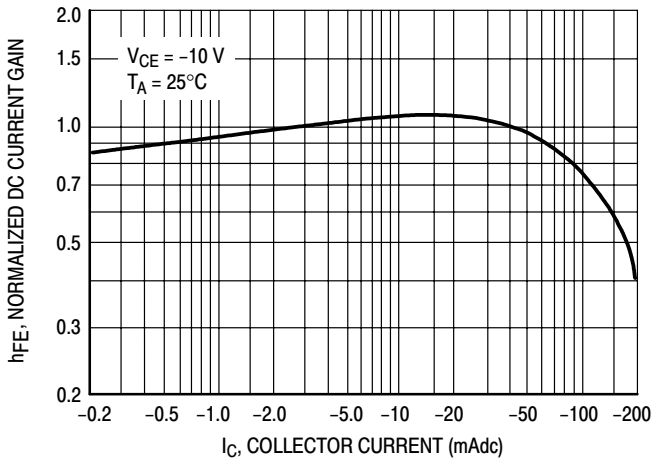


Figure 7. Normalized DC Current Gain

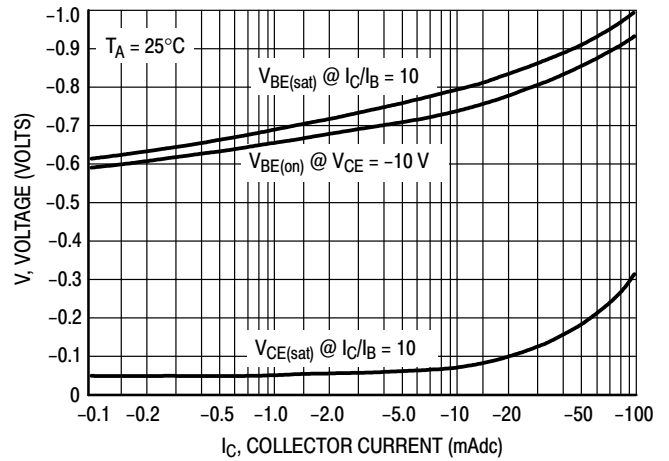


Figure 8. “Saturation” and “On” Voltages

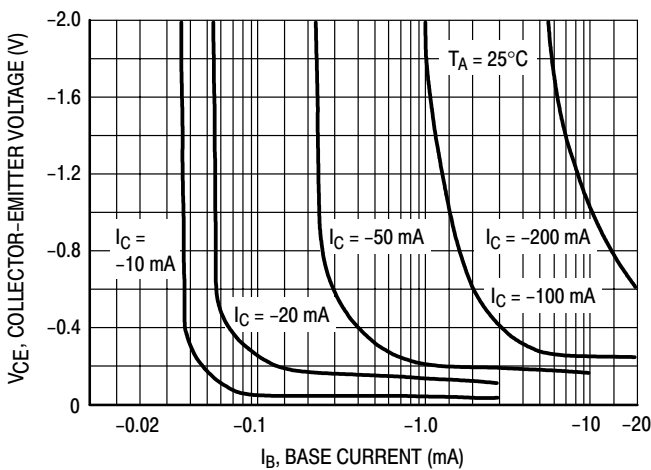


Figure 9. Collector Saturation Region

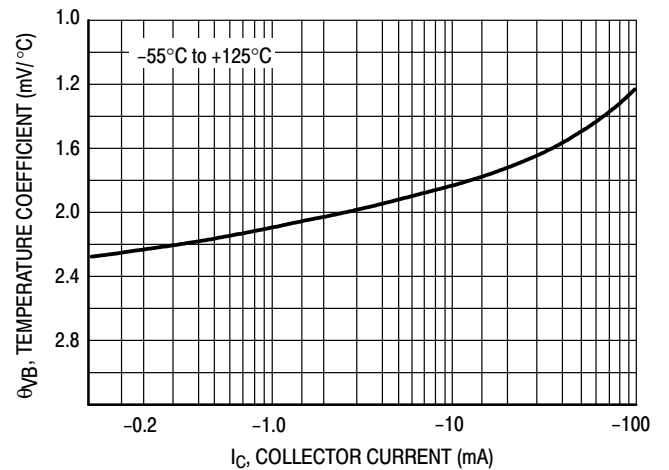


Figure 10. Base-Emitter Temperature Coefficient

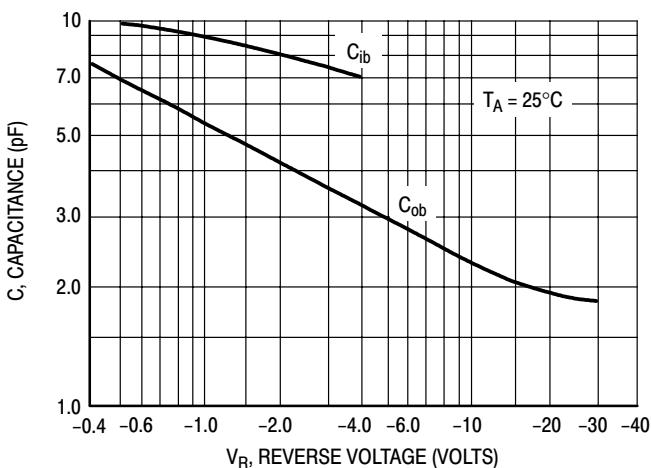


Figure 11. Capacitances

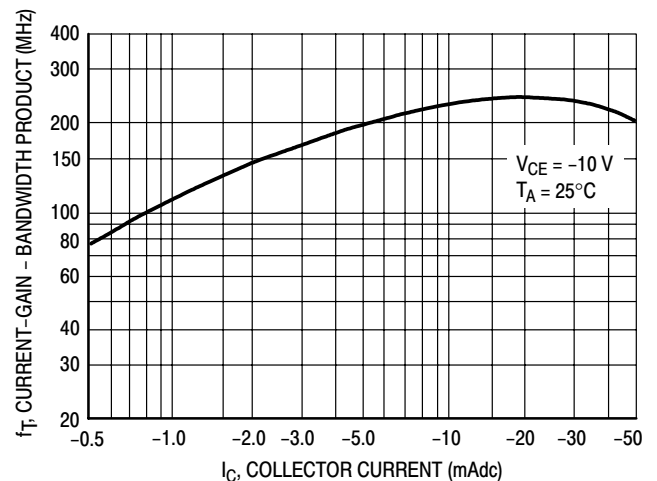


Figure 12. Current-Gain – Bandwidth Product

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

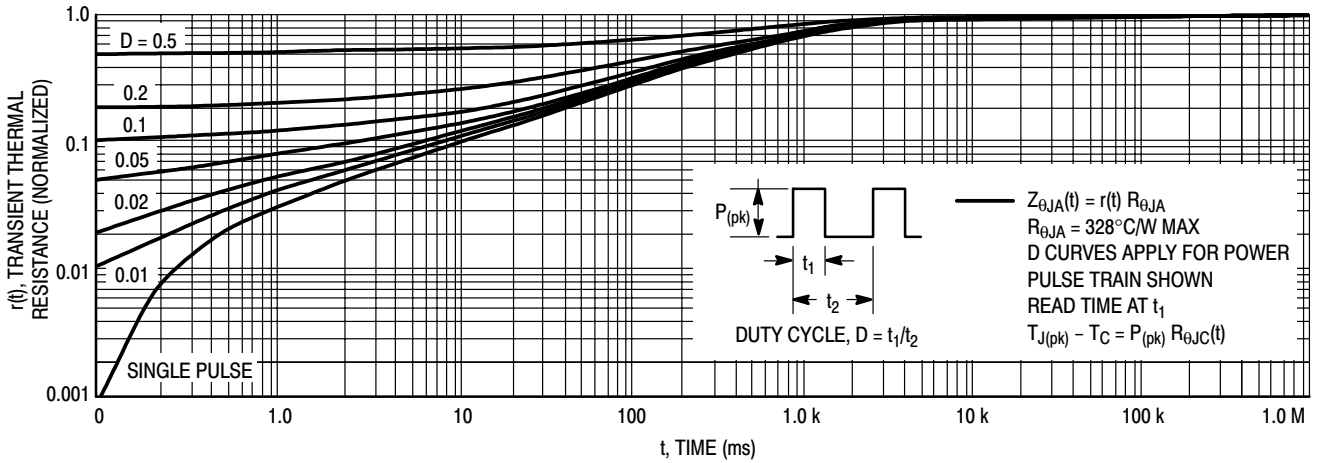


Figure 13. Thermal Response

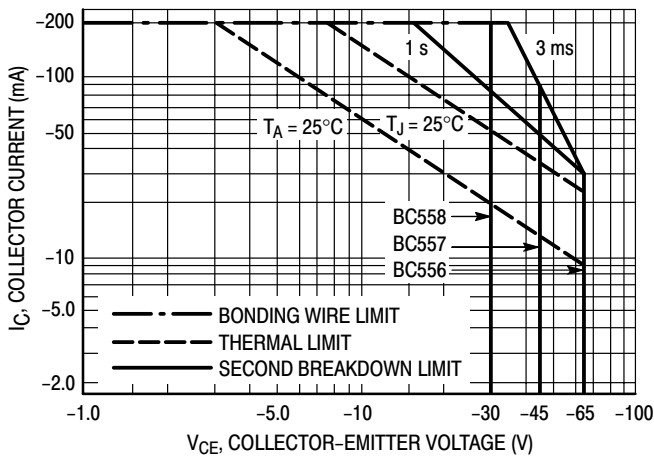


Figure 14. Active Region Safe Operating Area

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.

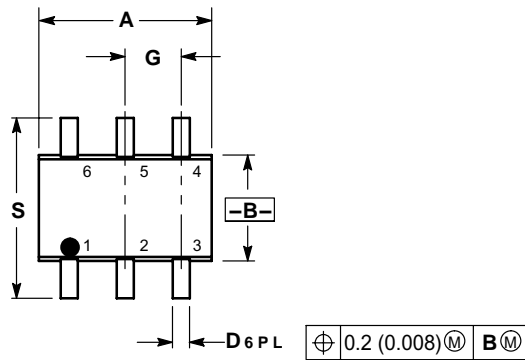
The data of Figure 14 is based upon $T_{J(pk)} = 150^\circ\text{C}$; T_C or T_A is variable depending upon conditions. Pulse curves are valid for duty cycles to 10% provided $T_{J(pk)} \leq 150^\circ\text{C}$. $T_{J(pk)}$ may be calculated from the data in Figure 13. At high case or ambient temperatures, 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

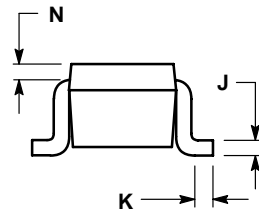
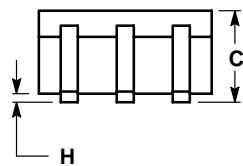
SC-88/SOT-363

NOTES:

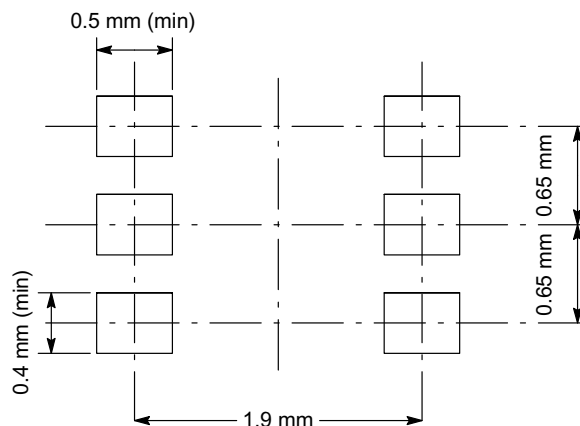
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.



| 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



DISCLAIMER

- Curve guarantee in the specification. The curve of test items with electric parameter is used as quality guarantee. The curve of test items without electric parameter is used as reference only.
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