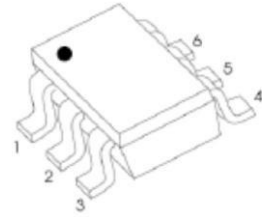
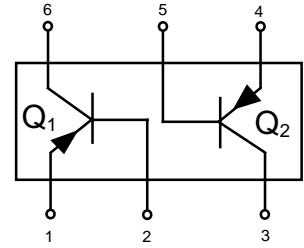




BC856/857/858 BDW/CDW Series

Dual General Purpose Transistors PNP Duals

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



SOT-363

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 | P_D | 380 | mW |
| Per Device | | 250 | mW |
| FR-5 Board, (1) $T_A = 25^\circ\text{C}$ | | | |
| Derate above 25°C | | 3.0 | mW/ $^\circ\text{C}$ |
| Thermal Resistance, Junction to Ambient | $R_{\theta JA}$ | 328 | $^\circ\text{C}/\text{W}$ |
| Junction and Storage Temperature | T_J, T_{stg} | -55 to +150 | $^\circ\text{C}$ |

1. FR-5 = 1.0 x 0.75 x 0.062 in.

Marking:

- BC856BDW : 56B
- BC857BDW : 57B
- BC857CDW : 57C
- BC858BDW : 58B
- BC858CDW : 58C



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) | V _{(BR)CEO} | | | | V |
| BC856 Series | | -65 | — | — | |
| BC857 Series | | -45 | — | — | |
| BC858 Series | | -30 | — | — | |
| Collector–Emitter Breakdown Voltage (I _C = -10 μA, V _{EB} = 0) | V _{(BR)CES} | | | | V |
| BC856 Series | | -80 | — | — | |
| BC857 Series | | -50 | — | — | |
| BC858 Series | | -30 | — | — | |
| Collector–Base Breakdown Voltage (I _C = -10 μA) | V _{(BR)CBO} | | | | V |
| BC856 Series | | -80 | — | — | |
| BC857 Series | | -50 | — | — | |
| BC858 Series | | -30 | — | — | |
| Emitter–Base Breakdown Voltage (I _E = -1.0 μA) | V _{(BR)EBO} | | | | V |
| BC856 Series | | -5.0 | — | — | |
| BC857 Series | | -5.0 | — | — | |
| BC858 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

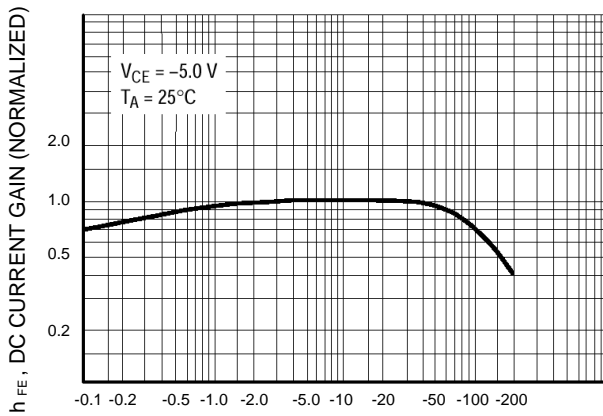
| | | | | | |
|--|----------------------|------|------|-------|---|
| DC Current Gain (I _C = -10 μA, V _{CE} = -5.0 V) | h _{FE} | | | | — |
| BC856B, BC857B, BC858B | | — | 150 | — | |
| BC857C, BC858C | | — | 270 | — | |
| (I _C = -2.0 mA, V _{CE} = -5.0 V) | | | | | |
| BC856B, BC857B, BC858B | | 220 | 290 | 475 | |
| BC857C, BC858C | | 420 | 520 | 800 | |
| Collector–Emitter Saturation Voltage (I _C = -10 mA, I _B = -0.5 mA) | V _{CE(sat)} | — | — | -0.3 | V |
| (I _C = -100 mA, I _B = -5.0 mA) | | — | — | -0.65 | |
| 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)} | -0.5 | — | -0.75 | V |
| (I _C = -10 mA, V _{CE} = -5.0 V) | | — | — | -0.82 | |

SMALL–SIGNAL CHARACTERISTICS

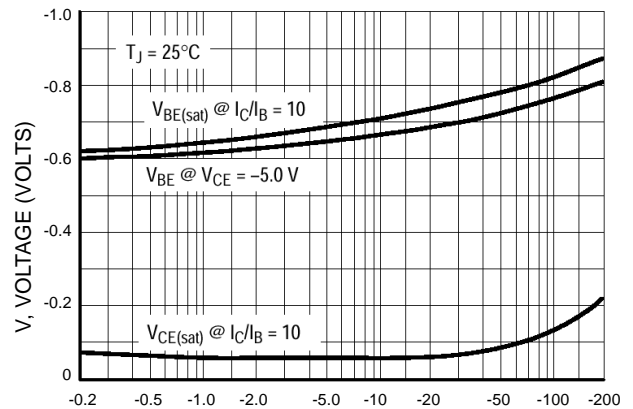
| | | | | | |
|---|------------------|-----|---|-----|-----|
| Current–Gain — Bandwidth Product (I _C = -10 mA, V _{CE} = -5.0 Vdc, f = 100 MHz) | f _T | 100 | — | — | MHz |
| Output Capacitance (V _{CB} = -10 V, f = 1.0 MHz) | C _{obo} | — | — | 4.5 | pF |
| Noise Figure (I _C = -0.2 mA, V _{CE} = -5.0 Vdc, R _S = 2.0 kΩ, f = 1.0 kHz, BW = 200 Hz) | NF | — | — | 10 | dB |



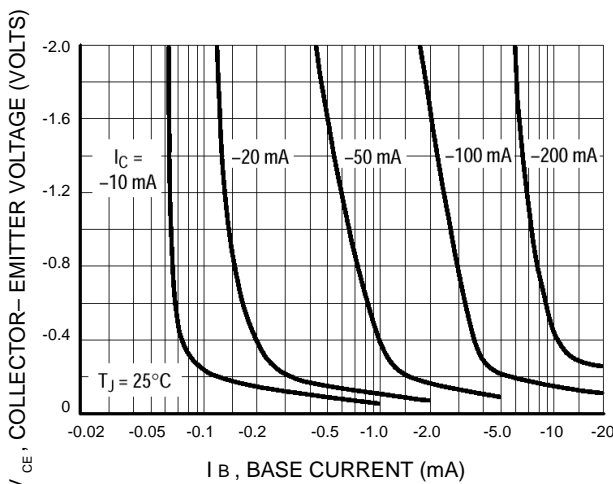
TYPICAL PNP CHARACTERISTICS — BC856



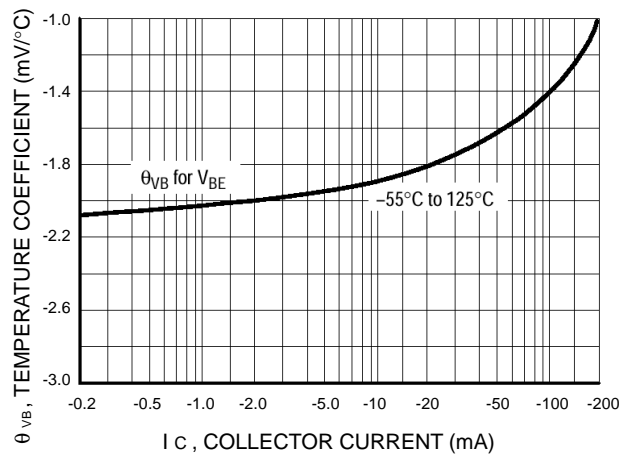
I_C , COLLECTOR CURRENT (AMP)
Figure 1. DC Current Gain



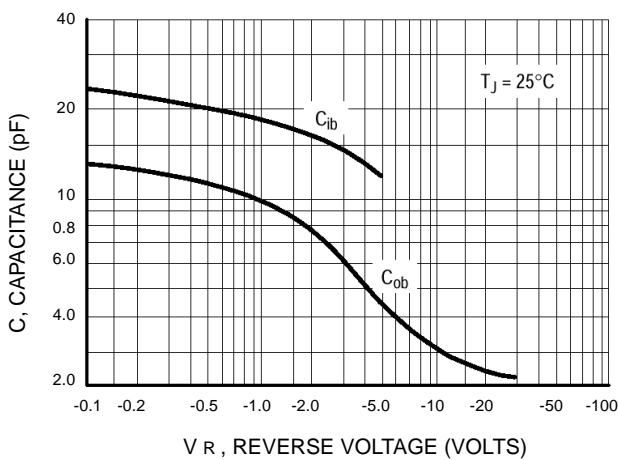
I_C , COLLECTOR CURRENT (mA)
Figure 2. "On" Voltage



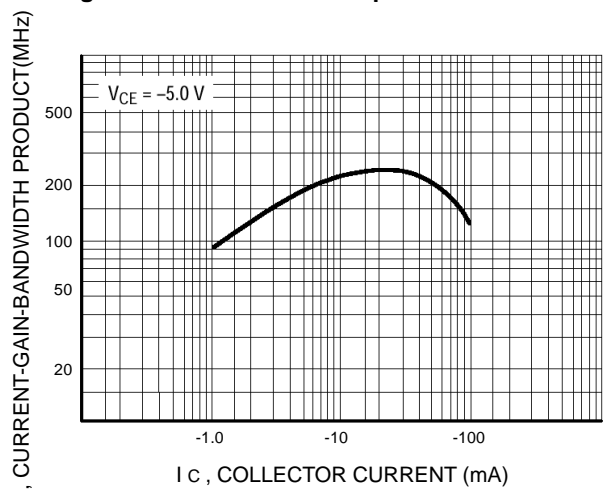
I_B , BASE CURRENT (mA)
Figure 3. Collector Saturation Region



I_C , COLLECTOR CURRENT (mA)
Figure 4. Base-Emitter Temperature Coefficient



V_R , REVERSE VOLTAGE (VOLTS)
Figure 5. Capacitance



I_C , COLLECTOR CURRENT (mA)
Figure 6. Current-Gain - Bandwidth Product



TYPICAL PNP CHARACTERISTICS — BC857/BC858

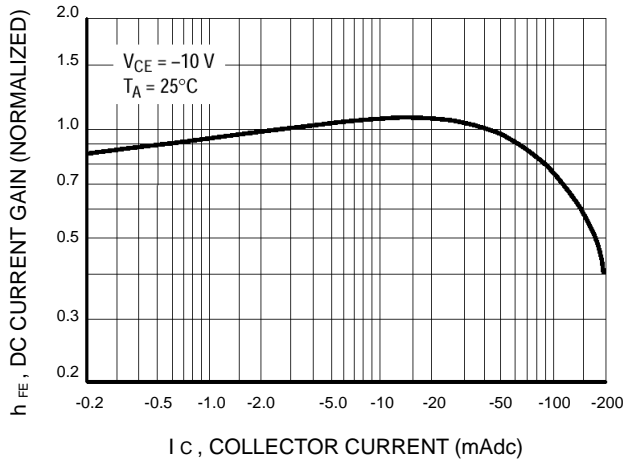


Figure 7. Normalized DC Current Gain

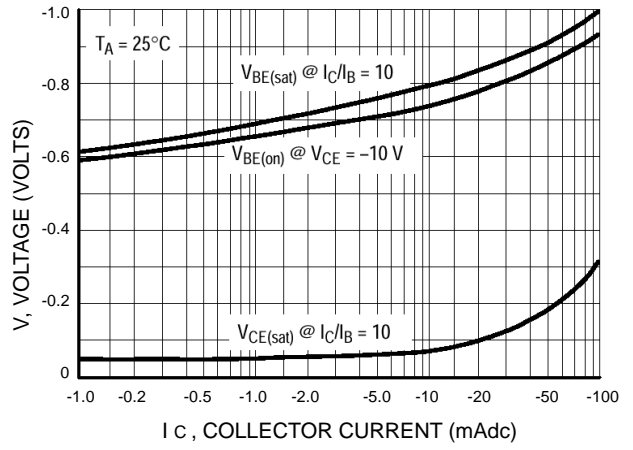


Figure 8. "Saturation" and "On" Voltages

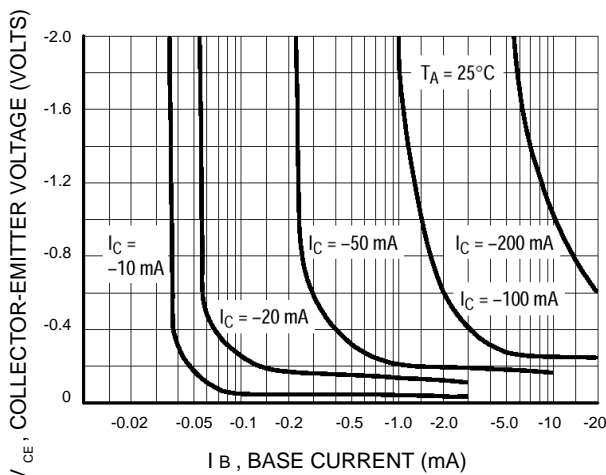


Figure 9. Collector Saturation Region

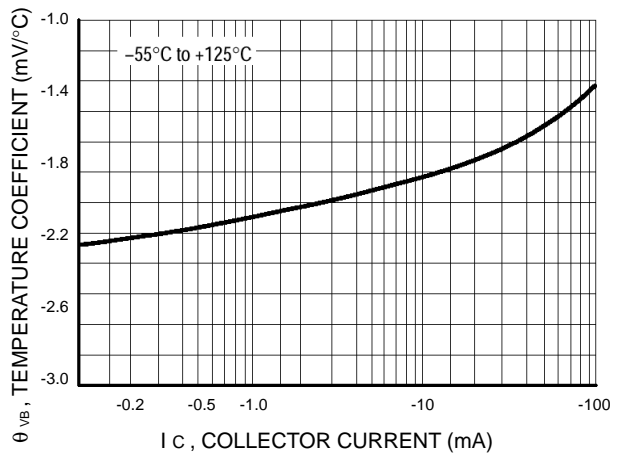


Figure 10. Base-Emitter Temperature Coefficient

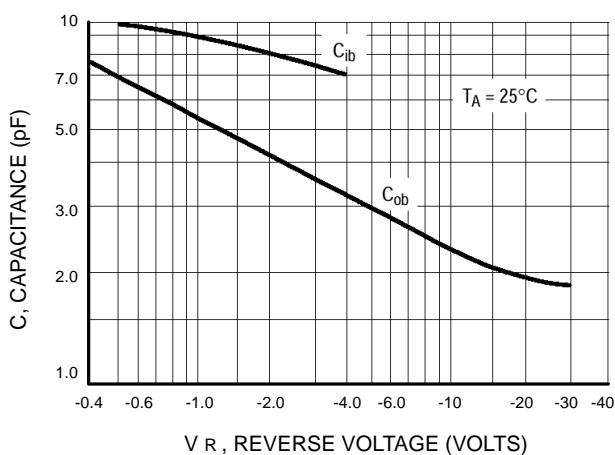


Figure 11. Capacitance

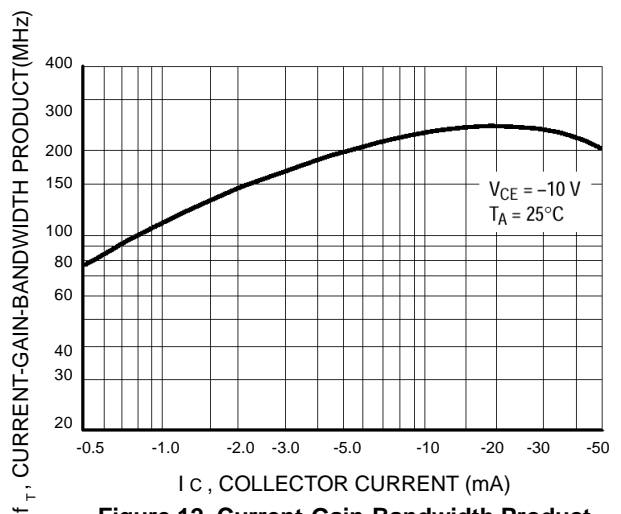


Figure 12. Current-Gain-Bandwidth Product

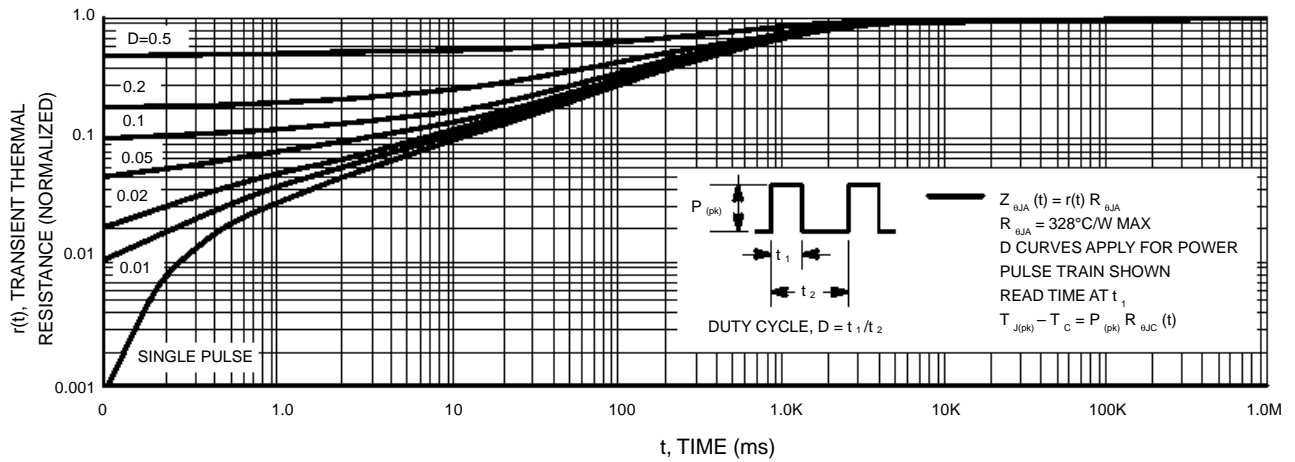


Figure 13. Thermal Response

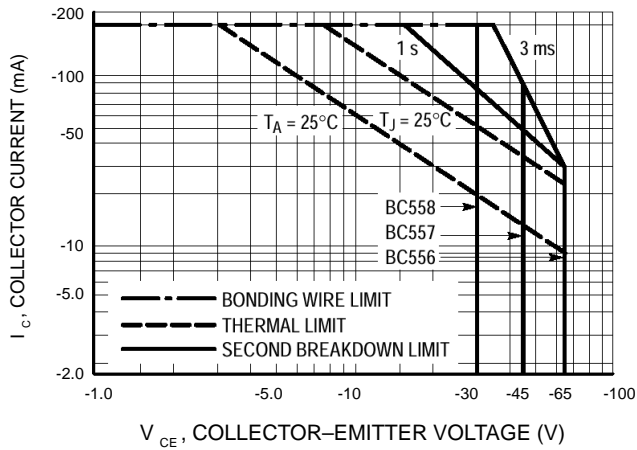


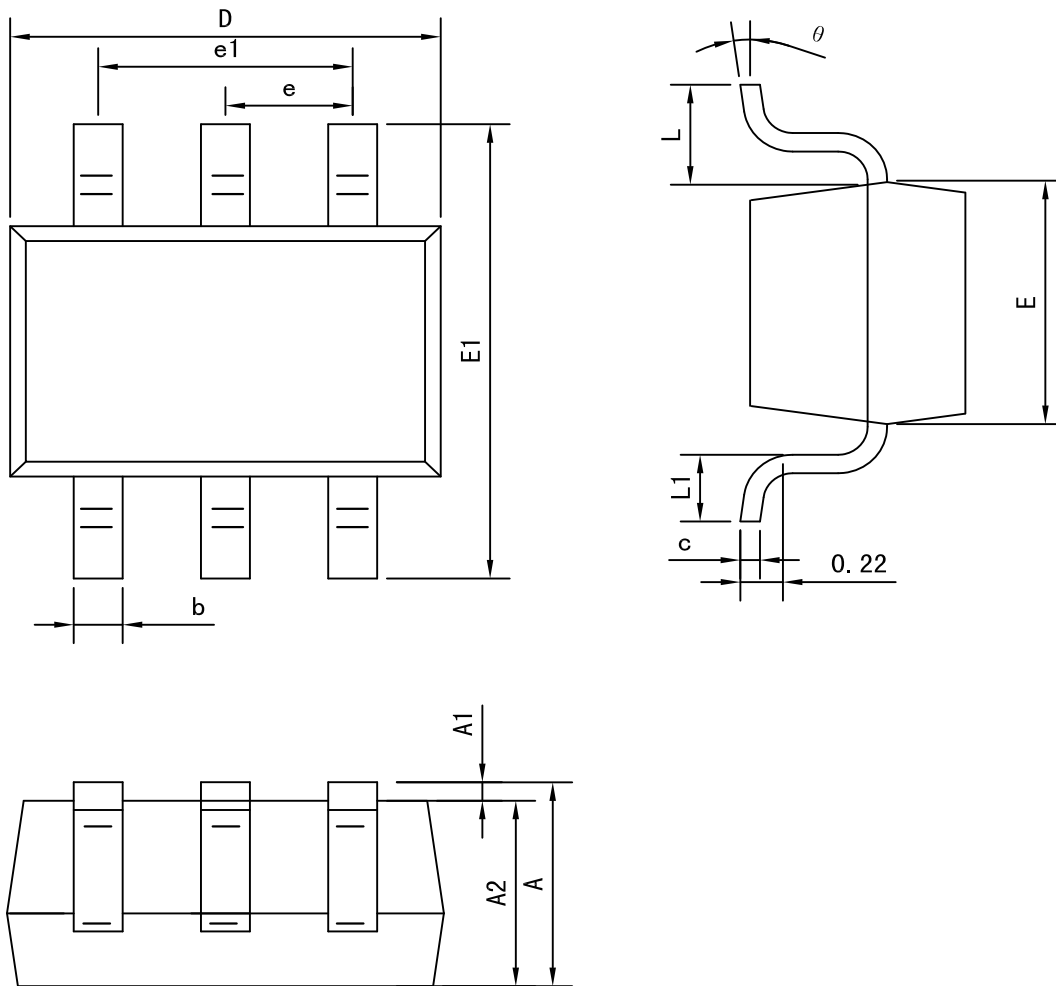
Figure 14. Active Region Safe Operating Area

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.



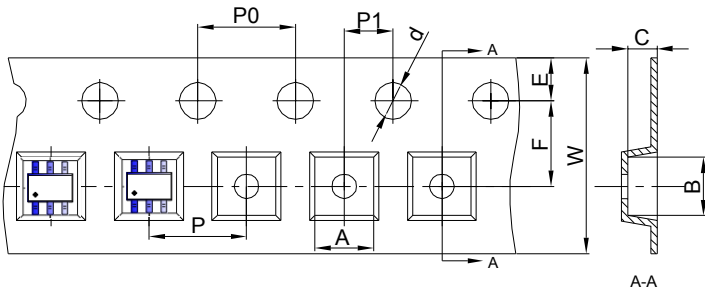
SOT-363 Package outline dimensions



| Symbol | Dimension in Millimeters | |
|----------|--------------------------|-------|
| | Min | Max |
| A | 0.900 | 1.100 |
| A1 | 0.000 | 0.100 |
| A2 | 0.900 | 1.000 |
| b | 0.150 | 0.350 |
| c | 0.080 | 0.150 |
| D | 2.000 | 2.200 |
| E | 1.150 | 1.350 |
| E1 | 2.150 | 2.450 |
| e | 0.650 TYP | |
| e1 | 1.200 | 1.400 |
| L | 0.525 REF | |
| L1 | 0.260 | 0.460 |
| θ | 0° | 8° |



SOT-363 Embossed Carrier Tape



Packaging Description:

SOT-363 parts are shipped in tape. The carrier tape is made from a dissipative (carbon filled) polycarbonate resin. The cover tape is a multilayer film (Heat Activated Adhesive in nature) primarily composed of polyester film, adhesive layer, sealant, and anti-static sprayed agent. These reeled parts in standard option are shipped with 3,000 units per 7" or 17.8cm diameter reel. The reels are clear in color and is made of polystyrene plastic (anti-static coated).

| Dimensions are in millimeter | | | | | | | | | | |
|------------------------------|------|------|------|-------|------|------|------|------|------|------|
| Pkg type | A | B | C | d | E | F | P0 | P | P1 | W |
| SOT-363 | 2.25 | 2.55 | 1.20 | Ø1.50 | 1.75 | 3.50 | 4.00 | 4.00 | 2.00 | 8.00 |

SOT-363 Tape Leader and Trailer

