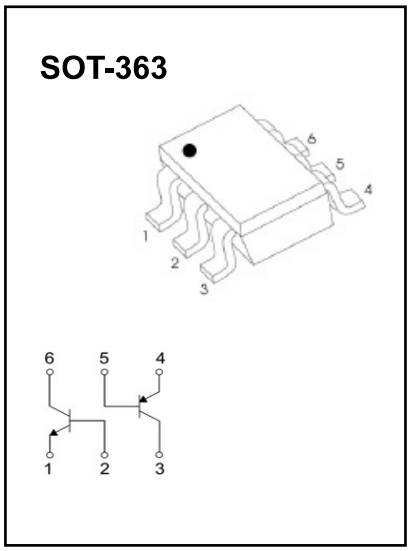
DONGGUAN NANJING ELECTRONICS LTD.,

# SOT-363 Plastic-Encapsulate Transistors

## BC846PN DUAL TRANSISTOR (NPN+PNP)




### FEATURES

- Epitaxial Die Construction
- Two isolated NPN/PNP(BC846W+BC856W) Transistors in one package

### MAKING: BB

### MAXIMUM RATINGS TR1 ($T_a$=25℃ unless otherwise noted)

| Symbol | Parameter | Value | Units |
|---|---|---|---|
| $V_{CBO}$ | Collector-Base Voltage | 80 | V |
| $V_{CEO}$ | Collector-Emitter Voltage | 65 | V |
| $V_{EBO}$ | Emitter-Base Voltage | 6 | V |
| $I_C$ | Collector Current –Continuous | 0.1 | A |
| $P_C$ | Collector Power Dissipation | 200 | mW |
| $T_J$ | Junction Temperature | 150 | ℃ |
| $T_{stg}$ | Storage Temperature | -55-150 | ℃ |

### CHARACTERISTICS of TR1 (NPN Transistor) (Ta=25℃ unless otherwise specified)

| Parameter | Symbol | Test conditions | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|
| **Collector-base breakdown voltage** | $V_{(BR)CBO}$ | $I_C$=10μA,$I_E$=0 | 80 | | | V |
| **Collector-emitter breakdown voltage** | $V_{(BR)CEO}$ | $I_C$=10mA,$I_B$=0 | 65 | | | V |
| **Emitter-base breakdown voltage** | $V_{(BR)EBO}$ | $I_E$=1μA,$I_C$=0 | 6 | | | V |
| **Collector cut-off current** | $I_{CBO}$ | $V_{CB}$=30V,$I_E$=0 | | | 15 | nA |
| **Emitter cut-off current** | $I_{EBO}$ | $V_{EB}$=5V,$I_C$=0 | | | 15 | nA |
| **DC current gain** | $h_{FE}$ | $V_{CE}$=5V,$I_C$=2mA | 200 | | 450 | |
| **Collector-emitter saturation voltage** | $V_{CE(sat)}$ | $I_C$=10mA,$I_B$=0.5mA | | | 0.25 | V |
| | $V_{CE(sat)}$ | $I_C$=100mA,$I_B$=5mA | | | 0.6 | V |
| **Base-emitter saturation voltage** | $V_{BE(sat)}$ | $I_C$=10mA,$I_B$=0.5mA | | 0.7 | | V |
| | $V_{BE(sat)}$ | $I_C$=100mA,$I_B$=5mA | | 0.9 | | V |
| **Base-emitter voltage** | $V_{BE(on)}$ | $V_{CE}$=5V,$I_C$=2mA | 0.58 | | 0.7 | V |
| | $V_{BE(on)}$ | $V_{CE}$=5V,$I_C$=10mA | | | 0.72 | V |
| **Collector output capacitance** | $C_{ob}$ | $V_{CB}$=10V,$I_E$=0,f=1MHz | | | 6.0 | pF |
| **Transition frequency** | $f_T$ | $V_{CE}$=5V,$I_C$=10mA,f=100MHz | 100 | | | MHz |
| **Noise figure** | NF | $V_{CE}$=5V,$I_c$=0.2mA, f=1kHz,Rg=2KΩ,Δf=200Hz | | | 10 | dB |

# SOT-363 Plastic-Encapsulate Transistors

## BC846PN DUAL TRANSISTOR (NPN+PNP)

**MAXIMUM RATINGS TR2 ($T_a$=25℃ unless otherwise noted)**

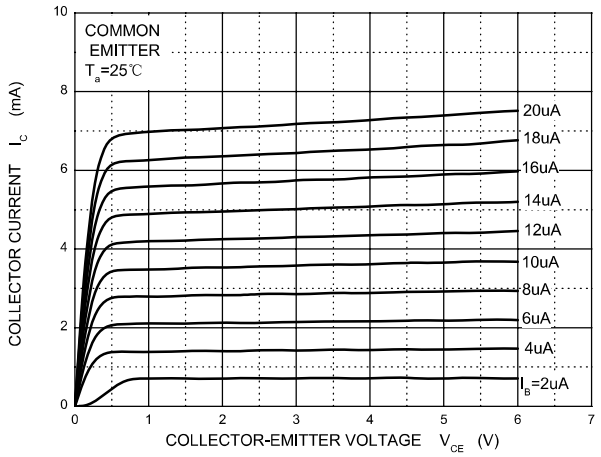
| Symbol | Parameter | Value | Units |
|---|---|---|---|
| $V_{CBO}$ | Collector-Base Voltage | -80 | V |
| $V_{CEO}$ | Collector-Emitter Voltage | -65 | V |
| $V_{EBO}$ | Emitter-Base Voltage | -5 | V |
| $I_C$ | Collector Current –Continuous | -0.1 | A |
| $P_{C*}$ | Collector Power Dissipation | 200 | mW |
| $T_J$ | Junction Temperature | 150 | ℃ |
| $T_{stg}$ | Storage Temperature | -55-150 | ℃ |

**CHARACTERISTICS of TR2 (PNP Transistor) (Ta=25℃ unless otherwise specified)**

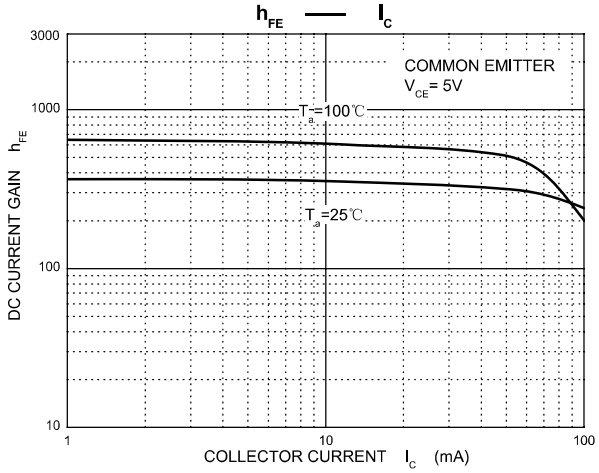
| Parameter | Symbol | Test conditions | MIN | TYP | MAX | UNIT |
|---|---|---|---|---|---|---|
| **Collector-base breakdown voltage** | $V_{(BR)CBO}$ | $I_C$=-10μA,$I_E$=0 | -80 | | | V |
| **Collector-emitter breakdown voltage** | $V_{(BR)CEO}$ | $I_C$=-10mA,$I_B$=0 | -65 | | | V |
| **Emitter-base breakdown voltage** | $V_{(BR)EBO}$ | $I_E$=-1μA,$I_C$=0 | -5 | | | V |
| **Collector cut-off current** | $I_{CBO}$ | $V_{CB}$=-30V,$I_E$=0 | | | -15 | nA |
| **Emitter cut-off current** | $I_{EBO}$ | $V_{EB}$=-5V,$I_C$=0 | | | -15 | nA |
| **DC current gain** | $h_{FE1}$ | $V_{CE}$=-5V,$I_C$=-2mA | 220 | | 475 | |
| **Collector-emitter saturation voltage** | $V_{CE(sat)}$ | $I_C$=-10mA,$I_B$=-0.5mA | | | -0.3 | V |
| | $V_{CE(sat)}$ | $I_C$=-100mA,$I_B$=-5mA | | | -0.65 | V |
| **Base-emitter saturation voltage** | $V_{BE(sat)}$ | $I_C$=-10mA,$I_B$=-0.5mA | | -0.7 | | V |
| | $V_{BE(sat)}$ | $I_C$=-100mA,$I_B$=-5mA | | | -0.95 | V |
| **Base-emitter voltage** | $V_{BE(on)}$ | $V_{CE}$=-5V,$I_C$=-2mA | -0.6 | | -0.75 | V |
| | $V_{BE(on)}$ | $V_{CE}$=-5V,$I_C$=-10mA | | | -0.82 | V |
| **Collector output capacitance** | $C_{ob}$ | $V_{CB}$=-10V,$I_E$=0,f=1MHz | | | 4.5 | pF |
| **Transition frequency** | $f_T$ | $V_{CE}$=-5V,$I_C$=-10mA,f=100MHz | 100 | | | MHz |
| **Noise figure** | NF | $V_{CE}$=-5V,$I_c$=-0.2mA, f=1kHz,Rg=2KΩ, △f=200Hz | | | 10 | dB |

# Typical Characteristics

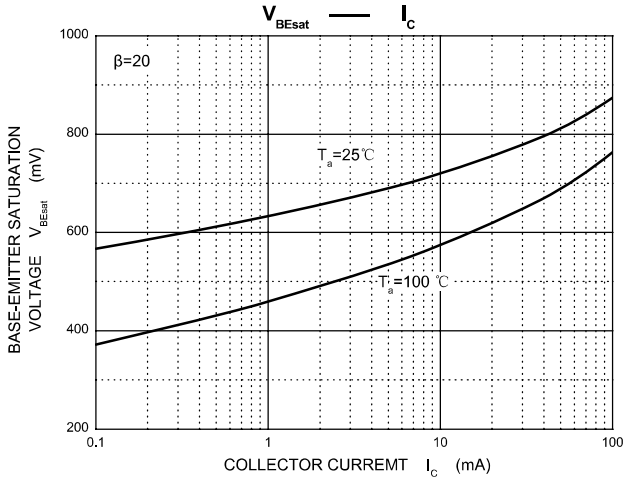
**Static Characteristic**



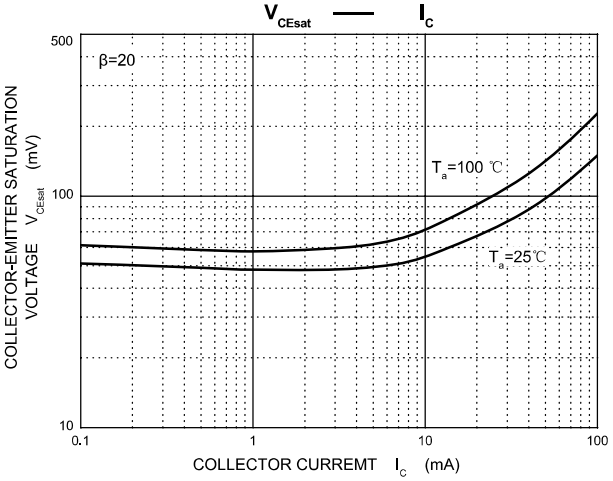

**$h_{FE}$ — $I_C$**



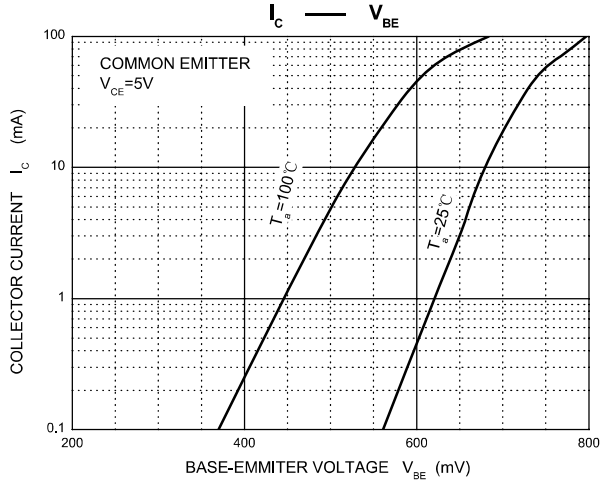

**$V_{BEsat}$ — $I_C$**



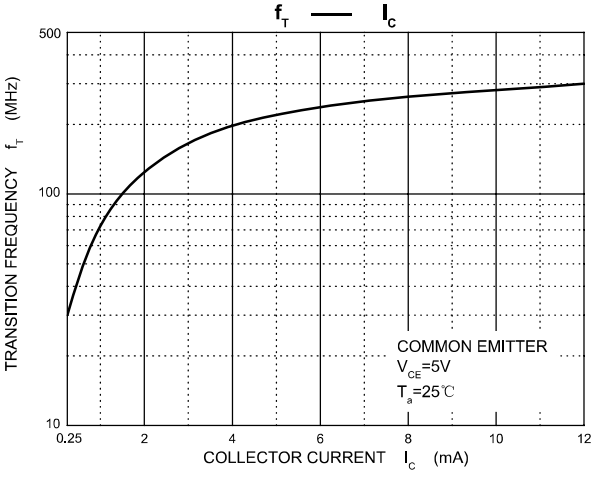

**$V_{CEsat}$ — $I_C$**



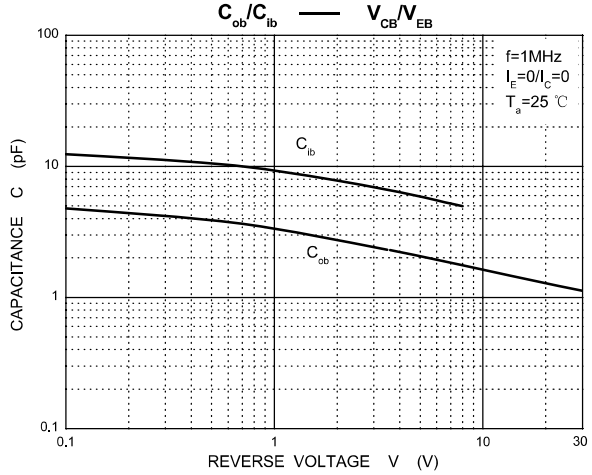

**$I_C$ — $V_{BE}$**



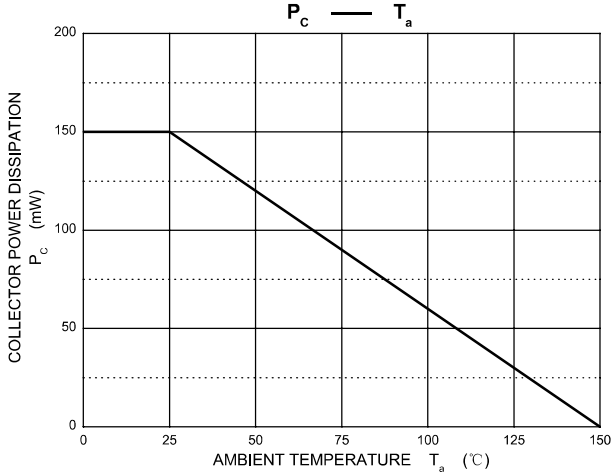

**$f_T$ — $I_C$**

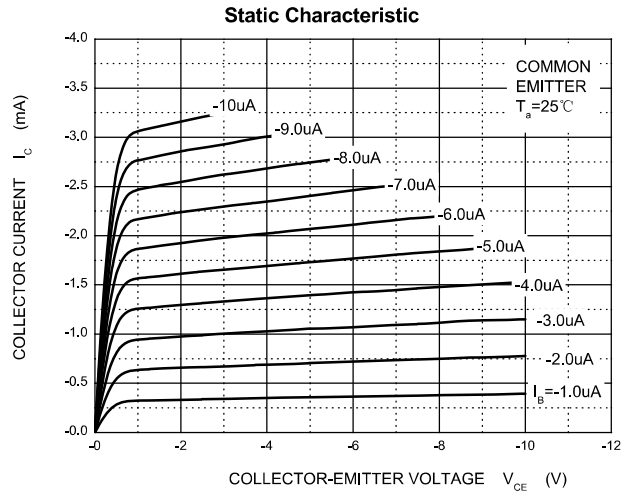


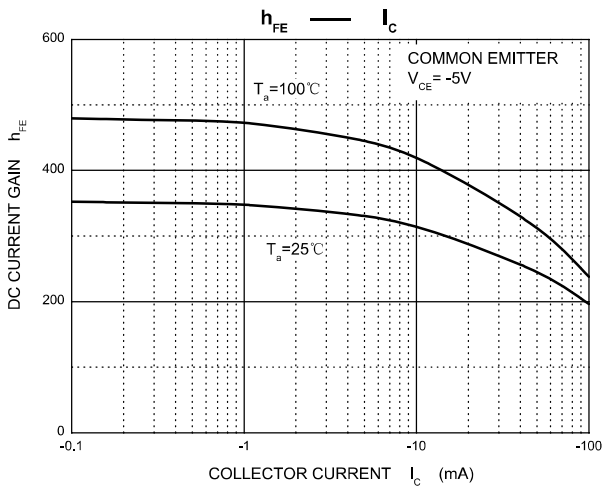

**$C_{ob}/C_{ib}$ — $V_{CB}/V_{EB}$**

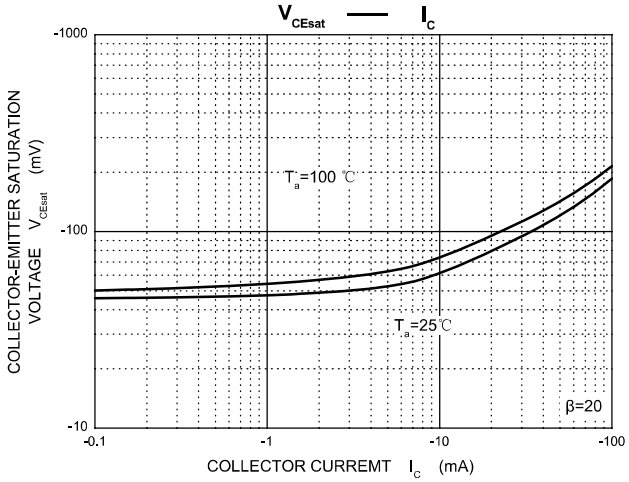


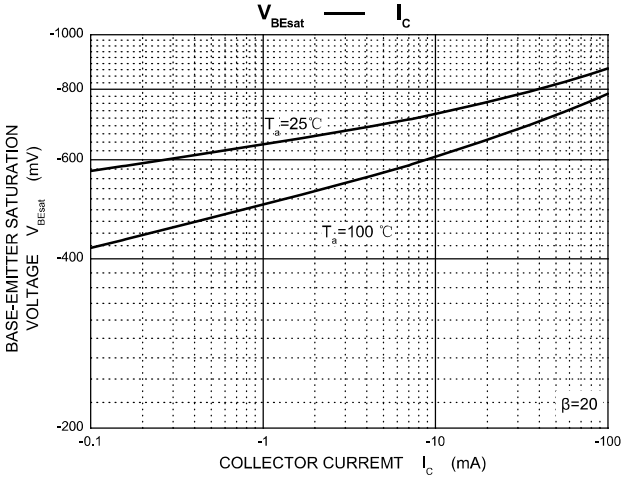

**$P_C$ — $T_a$**

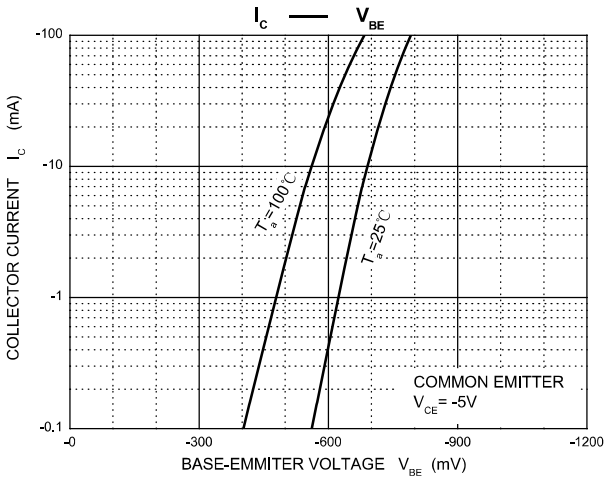


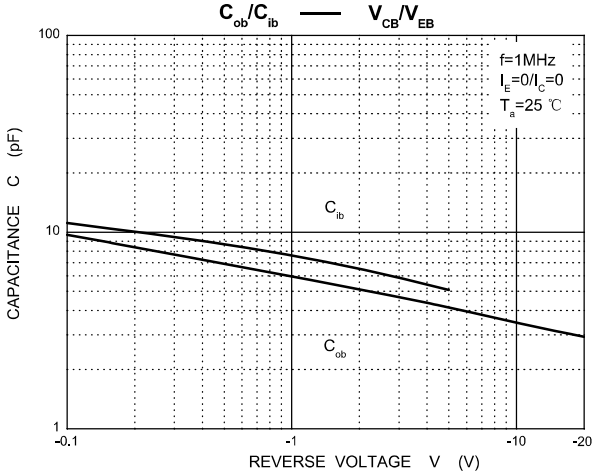


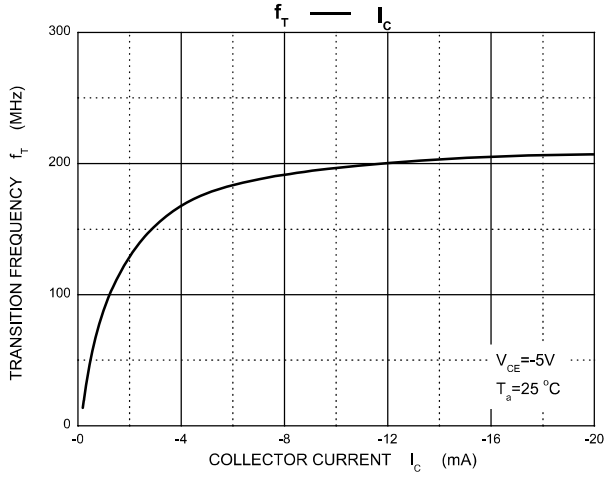



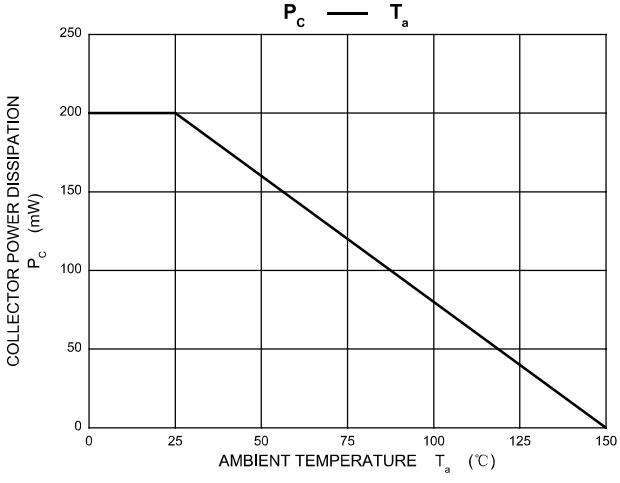



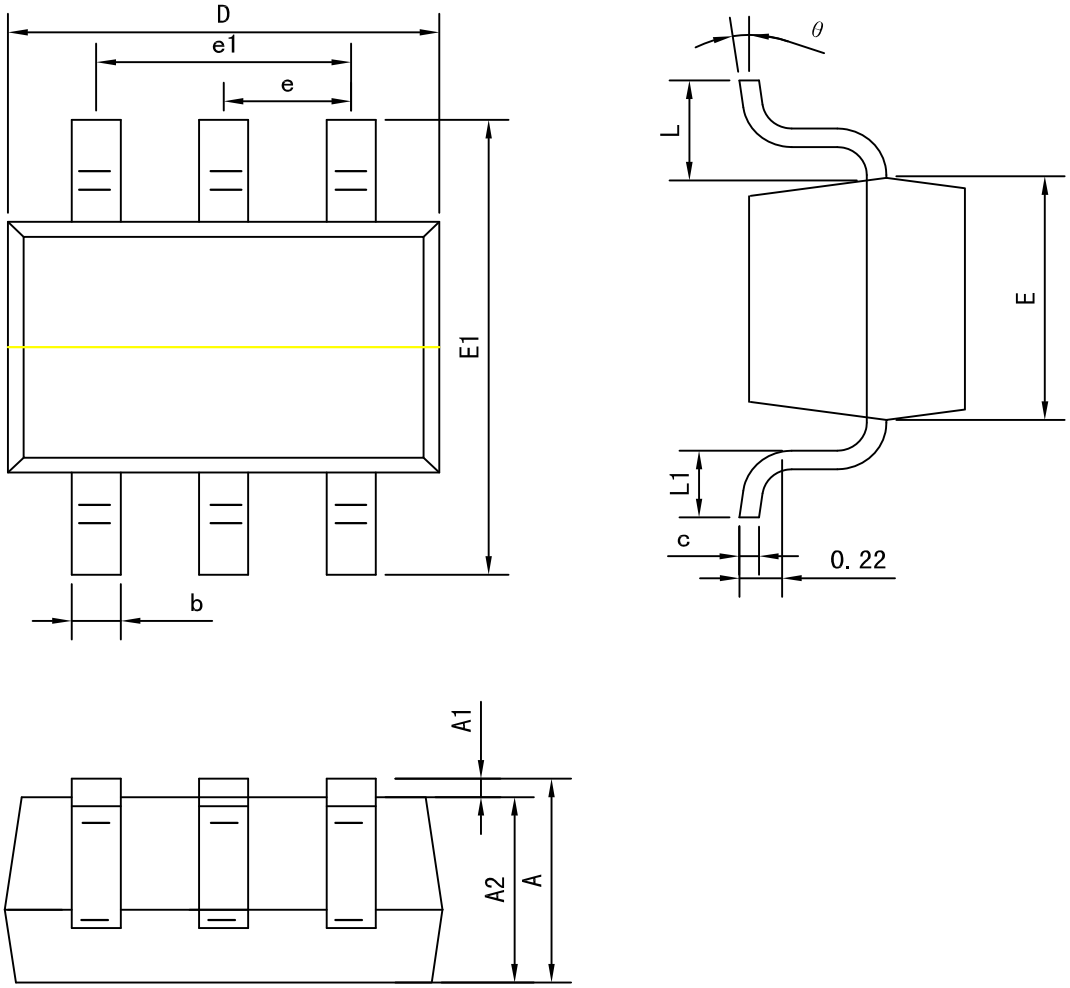



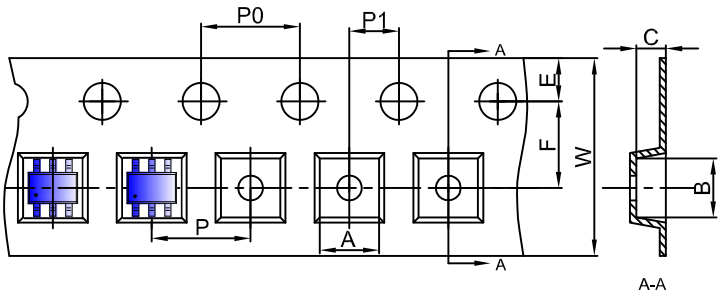
## Package outline dimensions

## SOT-363




| 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

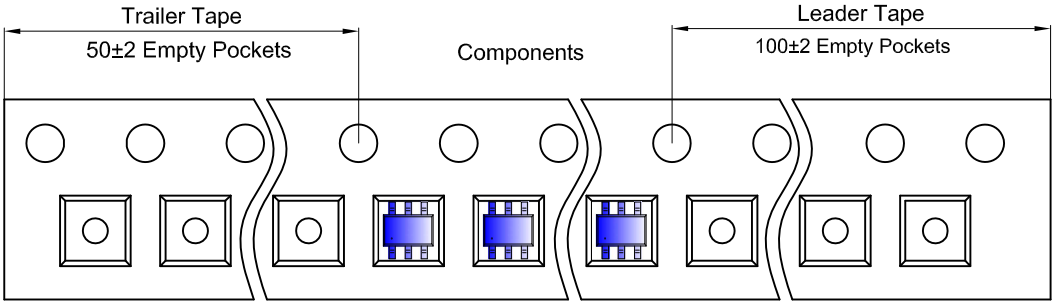



Packaging Description:

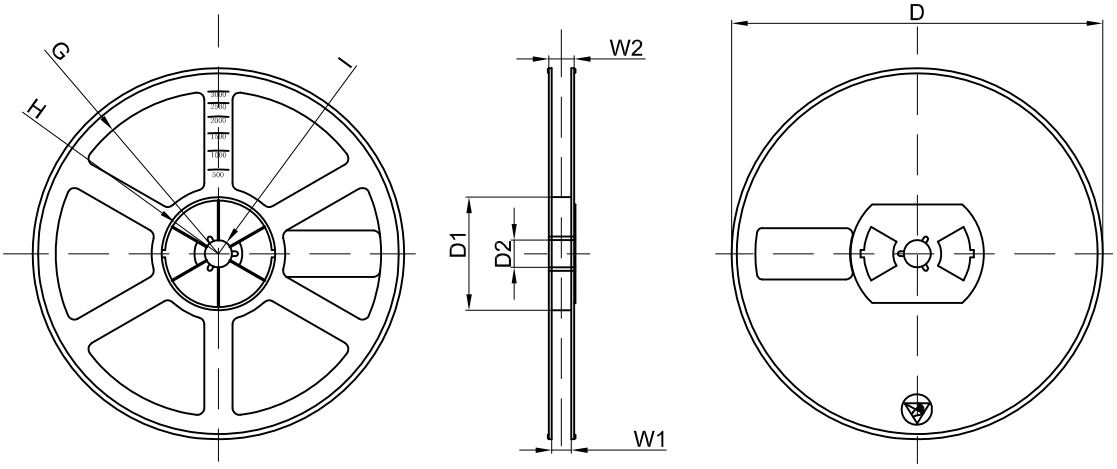
SOT-363 parts are shipped in tape. The carrier tape is made from a dissipative (carbon filled) polycarbonate resin. The cover tape is a multilayer film (Heat Activated Adhesive in nature) primarily composed of polyester film, adhesive layer, sealant, and anti-static sprayed agent. These reeled parts 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




## SOT-363 Reel




| Dimensions are in millimeter | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Reel Option | D | D1 | D2 | G | H | I | W1 | W2 |
| 7"Dia | Ø178.00 | 54.40 | 13.00 | R78.00 | R25.60 | R6.50 | 9.50 | 12.30 |

| REEL | Reel Size | Box | Box Size(mm) | Carton | Carton Size(mm) | G.W.(kg) |
|---|---|---|---|---|---|---|
| 3000 pcs | 7 inch | 45,000 pcs | 203×203×195 | 180,000 pcs | 438×438×220 | |