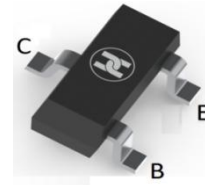
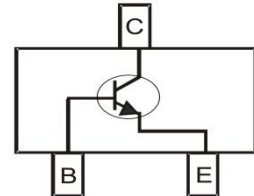


BIPOLAR TRANSISTOR (NPN)
FEATURES

- Complementary to MMBTA56
- For switching and amplifier applications
- Surface Mount device


SOT-23
MECHANICAL DATA

- Case: SOT-23
- Case Material: Molded Plastic. UL flammability
- Classification Rating: 94V-0
- Weight: 0.008 grams (approximate)


MAXIMUM RATINGS (T_A = 25°C unless otherwise noted)

| Parameter | Symbol | Value | Unit |
|---|------------------|-----------|------|
| Collector-Base Voltage | V _{CB0} | 80 | V |
| Collector-Emitter Voltage | V _{CEO} | 80 | V |
| Emitter-Base Voltage | V _{EBO} | 4 | V |
| Collector Current | I _C | 500 | mA |
| Collector Power Dissipation | P _C | 300 | mW |
| Thermal Resistance From Junction To Ambient | R _{θJA} | 416 | °C/W |
| Junction Temperature | T _J | 150 | °C |
| Storage Temperature | T _{STG} | -55 ~+150 | °C |

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

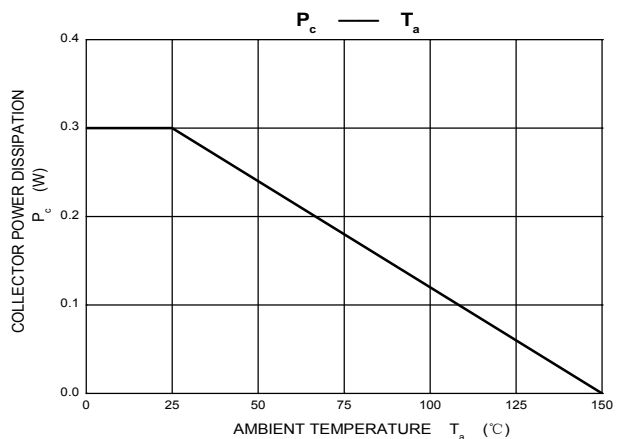
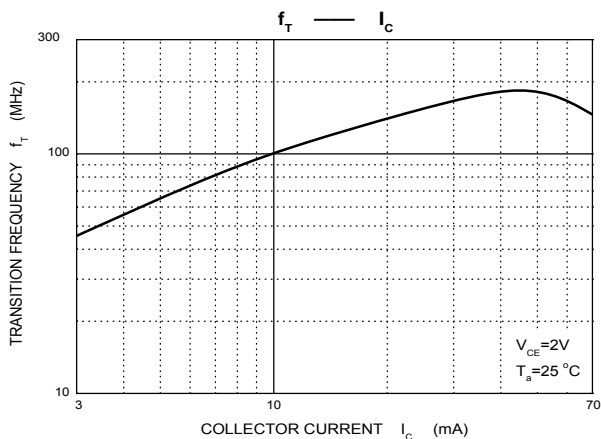
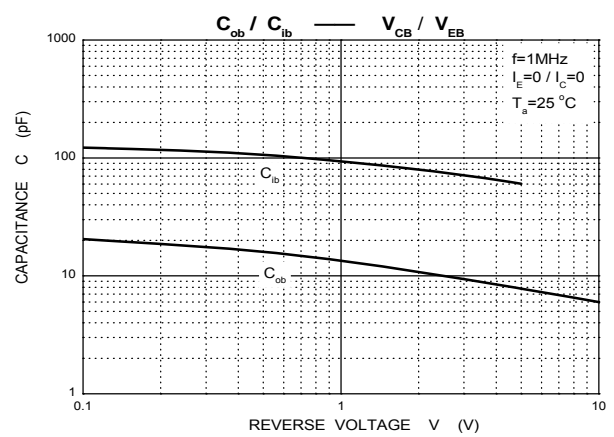
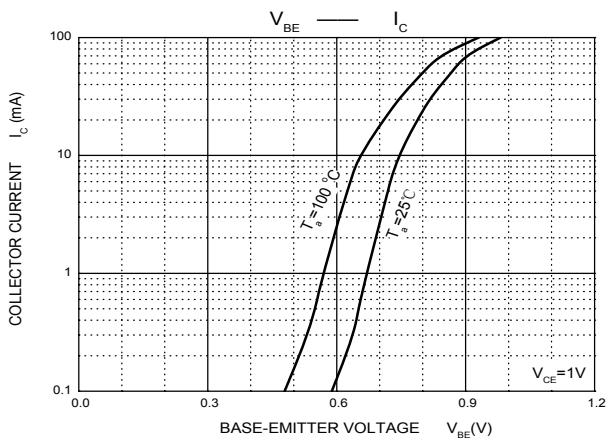
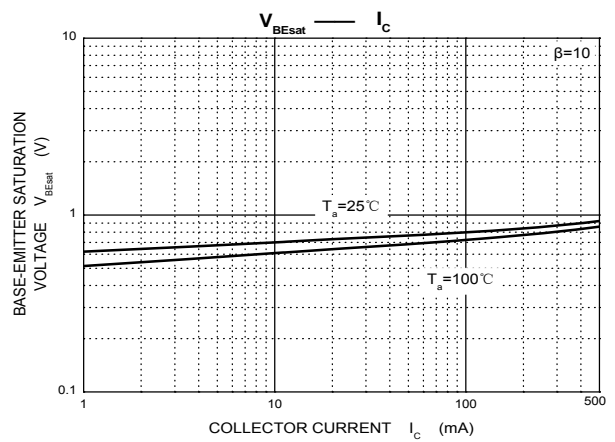
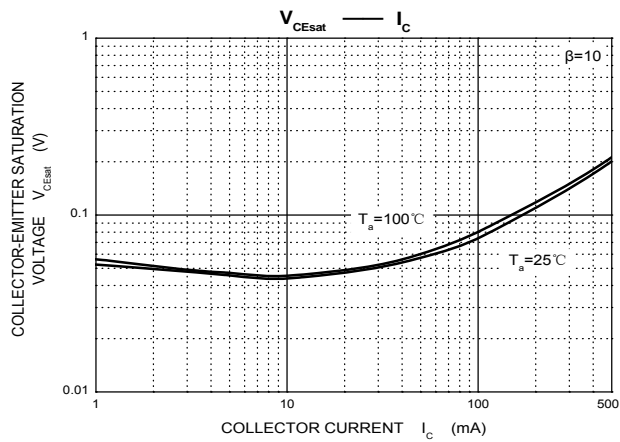
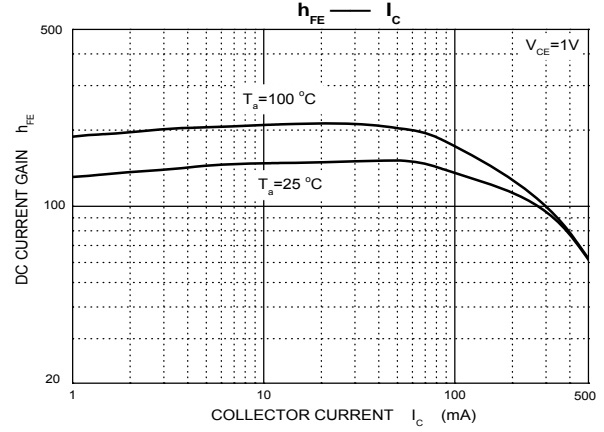
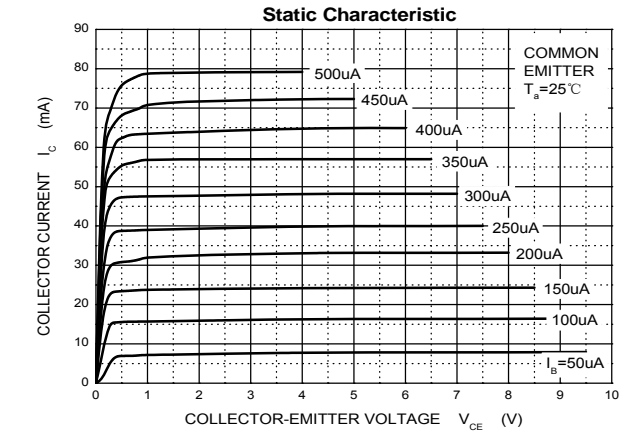
| Parameter | Symbol | Min | Typ | Max | Unit | Conditions |
|--------------------------------------|----------------------|-----|-----|------|------|---|
| Collector-base breakdown voltage | V _{(BR)CBO} | 80 | | | V | I _C =100uA, I _E =0 |
| Collector-emitter breakdown voltage | V _{(BR)CEO} | 80 | | | V | I _C =1mA, I _B =0 |
| Emitter-base breakdown voltage | V _{(BR)EBO} | 4 | | | V | I _E =100uA, I _C =0 |
| Collector cut-off current | I _{CBO} | | | 0.1 | uA | V _{CB} =80V, I _E =0 |
| Collector cut-off current | I _{CEO} | | | 1 | uA | V _{CE} =80V, I _E =0 |
| Emitter cut-off current | I _{EBO} | | | 0.1 | uA | V _{EB} =3V, I _C =0 |
| DC current gain | h _{FE1} | 100 | | 400 | | V _{CE} =1V, I _C =10mA |
| | h _{FE2} | 100 | | | | V _{CE} =1V, I _C =100mA |
| Collector-emitter saturation voltage | V _{CE(sat)} | | | 0.25 | V | I _C =100mA, I _B =10mA |
| Base-emitter saturation voltage | V _{BE(sat)} | | | 1.2 | V | I _C =100mA, I _B =10mA |
| Transition frequency | f _T | 100 | | | MHz | V _{CE} =2V, I _C =10mA, f=100MHz |

CLASSIFICATION OF h_{FE}

| | |
|---------|---------|
| Rank | |
| Range | 100-400 |
| Marking | 1GM |

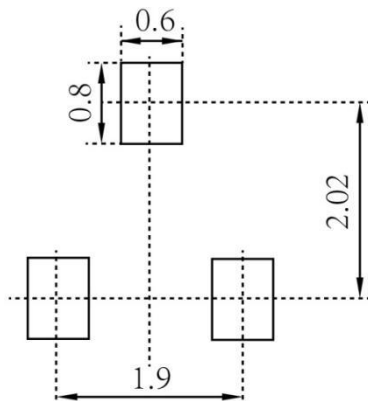
BIPOLAR TRANSISTOR (NPN)

Typical Characteristics

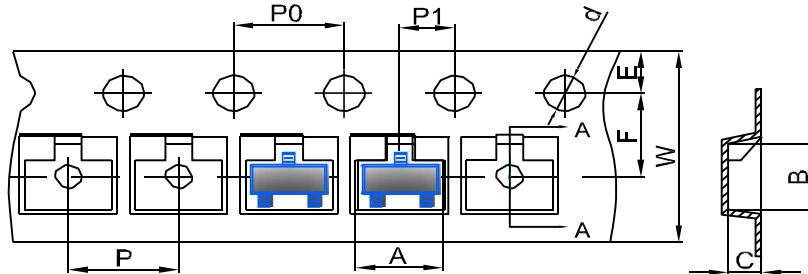


BIPOLAR TRANSISTOR (NPN)
SOT-23 Package Outline Dimensions

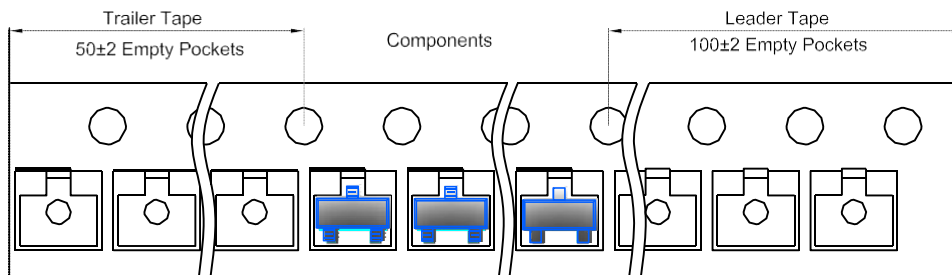
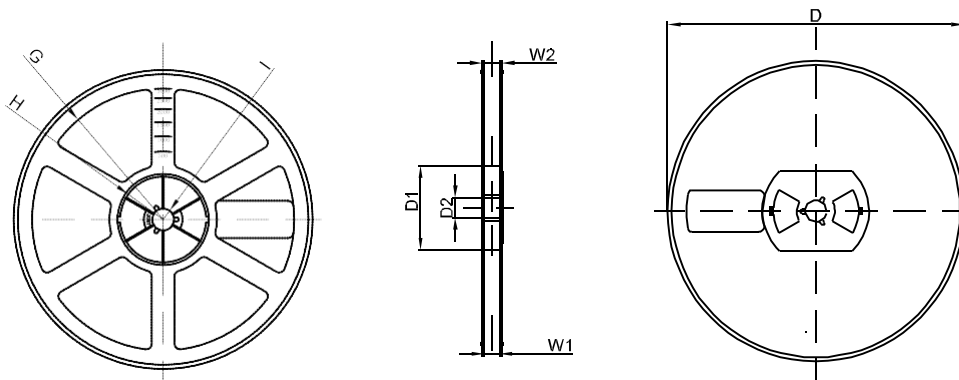

| Symbol | Dimensions In Millimeters | | Dimensions In Inches | |
|--------|---------------------------|-------|----------------------|-------|
| | Min. | Max. | Min. | Max. |
| A | 0.900 | 1.150 | 0.035 | 0.045 |
| A1 | 0.000 | 0.100 | 0.000 | 0.004 |
| A2 | 0.900 | 1.050 | 0.035 | 0.041 |
| b | 0.300 | 0.500 | 0.012 | 0.020 |
| c | 0.080 | 0.150 | 0.003 | 0.006 |
| D | 2.800 | 3.000 | 0.110 | 0.118 |
| E | 1.200 | 1.400 | 0.047 | 0.055 |
| E1 | 2.250 | 2.550 | 0.089 | 0.100 |
| e | 0.950 TYP | | 0.037 TYP | |
| e1 | 1.800 | 2.000 | 0.071 | 0.079 |
| L | 0.550 REF | | 0.022 REF | |
| L1 | 0.300 | 0.500 | 0.012 | 0.020 |
| θ | 0° | 8° | 0° | 8° |

SOT-23 Suggested Pad Layout

Note:

1. Controlling dimension: in millimeters
2. General tolerance: $\pm 0.05\text{mm}$
3. The pad layout is for reference purposes only

BIPOLAR TRANSISTOR (NPN)
SOT-23 Tape and Reel
SOT-23 Embossed Carrier Tape


| DIMENSIONS ARE IN MILLIMETER | | | | | | | | | | |
|------------------------------|------|------|------|-------|------|------|------|------|------|------|
| TYPE | A | B | C | d | E | F | P0 | P | P1 | W |
| SOT-23 | 3.15 | 2.77 | 1.22 | Ø1.50 | 1.75 | 3.50 | 4.00 | 4.00 | 2.00 | 8.00 |
| TOLERANCE | ±0.1 | ±0.1 | ±0.1 | ±0.1 | ±0.1 | ±0.1 | ±0.1 | ±0.1 | ±0.1 | ±0.1 |

SOT-23 Tape Leader and Trailer

SOT-23 Reel


| DIMENSIONS ARE IN MILLIMETER | | | | | | | | |
|------------------------------|------|-------|-------|-----|--------|-------|------|-------|
| REEL OPTION | D | D1 | D2 | G | H | I | W1 | W2 |
| 7" DIA | Ø178 | 54.40 | 13.00 | R78 | R25.60 | R6.50 | 9.50 | 12.30 |
| TOLERANCE | ±2 | ±1 | ±1 | ±1 | ±1 | ±1 | ±1 | ±1 |

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