

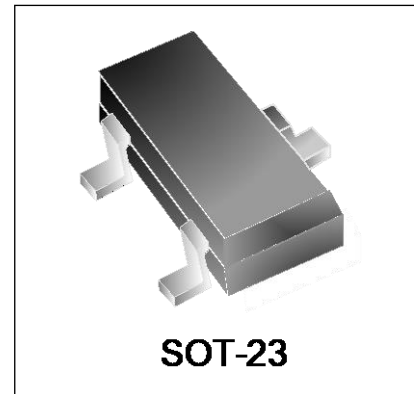
NPN Silicon Transistor

Features

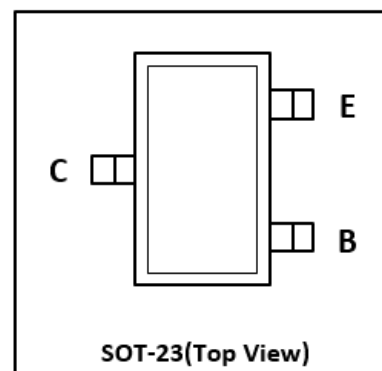
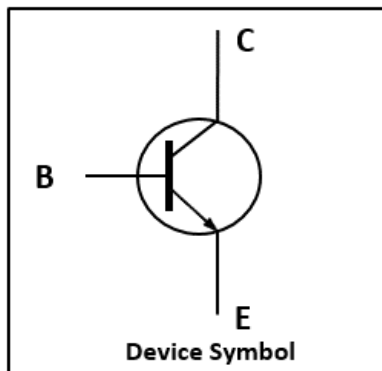
- Complementary to WT3906

Mechanical Characteristics

- SOT-23 Package
- Marking : Making Code
- RoHS Compliant



Schematic & PIN Configuration



Absolute Maximum Rating

| Parameter | Symbol | Value | Unit |
|---|-----------------|-----------|------|
| Collector Base Voltage | V_{CBO} | 60 | V |
| Collector Emitter Voltage | V_{CEO} | 40 | V |
| Emitter Base Voltage | V_{EBO} | 6 | V |
| Collector Current | I_C | 200 | mA |
| Collector Power Dissipation | P_C | 235 | mW |
| Junction Temperature | T_j | 150 | °C |
| Storage Temperature | T_{stg} | -55 ~ 150 | °C |
| Thermal Resistance, Junction to Ambient | $R_{\theta JA}$ | 532 | °C/W |

Electrical Characteristics (T_{amb}=25°C unless otherwise specified)

| Parameter | Symbol | Test Conditions | Min. | Typ. | Max. | Unit |
|--------------------------------------|----------------------|--|------|------|------|------|
| Collector-Base Breakdown Voltage | V _{(BR)CBO} | I _C = 10μA, I _E = 0 | 60 | - | - | V |
| Collector-Emitter Breakdown Voltage | V _{(BR)CEO} | I _C = 1mA, I _B = 0 | 40 | - | - | V |
| Emitter-Base Breakdown Voltage | V _{(BR)EBO} | I _E = 10μA, I _C = 0 | 6 | - | - | V |
| Collector Cut-off Current | I _{CBO} | V _{CB} = 60V, I _E = 0 | - | - | 100 | nA |
| Collector Cut-off Current | I _{CEX} | V _{CE} = 30V, V _{EB(off)} = 3V | - | - | 50 | nA |
| Emitter Cut-off Current | I _{BEO} | V _{EB} = 5V, I _C = 0 | - | - | 100 | nA |
| DC Current Gain | h _{FE(1)} | V _{CE} = 1V, I _C = 10mA | 100 | - | 300 | - |
| | h _{FE(2)} | V _{CE} = 1V, I _C = 50mA | 60 | - | - | - |
| | h _{FE(3)} | V _{CE} = 1V, I _C = 100mA | 30 | - | - | - |
| Collector-Emitter Saturation Voltage | V _{CE(sat)} | I _C = 50mA, I _B = 5mA | - | - | 0.3 | V |
| Base-Emitter Saturation Voltage | V _{BE(sat)} | I _C = 50mA, I _B = 5mA | - | - | 0.95 | V |
| Transition Frequency | f _T | V _{CE} = 20V, I _C = 10mA, f = 100MHz | 300 | - | - | MHz |
| Output Capacitance | C _{obo} | V _{CB} = 5V, I _E = 0, f = 1MHz | - | 3.5 | - | pF |
| Input Capacitance | C _{ibo} | V _{EB} = 0.5V, I _C = 0, f = 1MHz | - | 7 | - | pF |
| Delay Time | t _d | V _{CC} = 3V, V _{BE(off)} = -0.5V, I _C = 10mA, I _{B1} = 1mA | - | 30 | - | ns |
| Rise Time | t _r | | - | 30 | - | ns |
| Storage Time | t _s | V _{CC} = 3V, I _C = 10mA, I _{B1} = I _{B2} = 1mA | - | 185 | - | ns |
| Fall Time | t _f | | - | 45 | - | ns |

Typical Characteristics

Figure 1. Static Characteristics

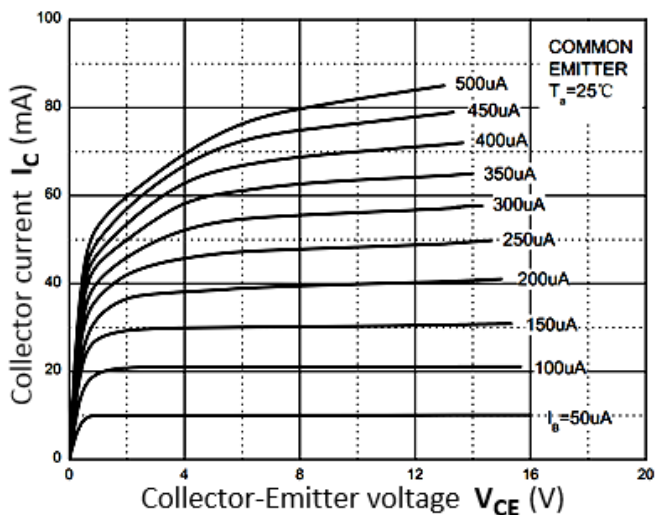


Figure 2. h_{FE} vs. I_C

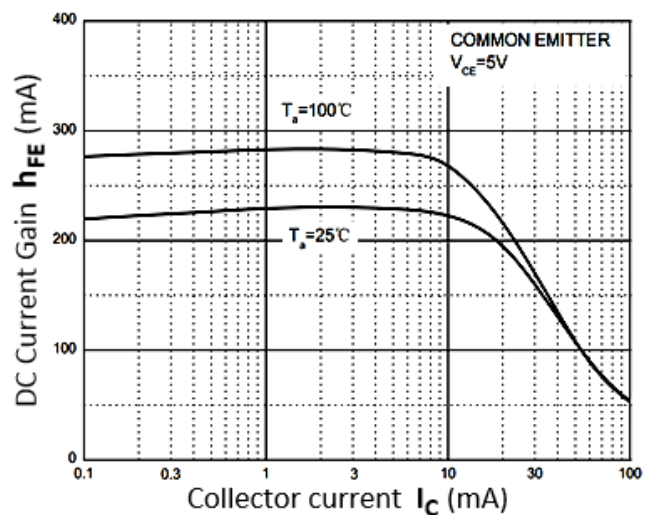


Figure 3. $V_{BE(sat)}$ vs. I_C

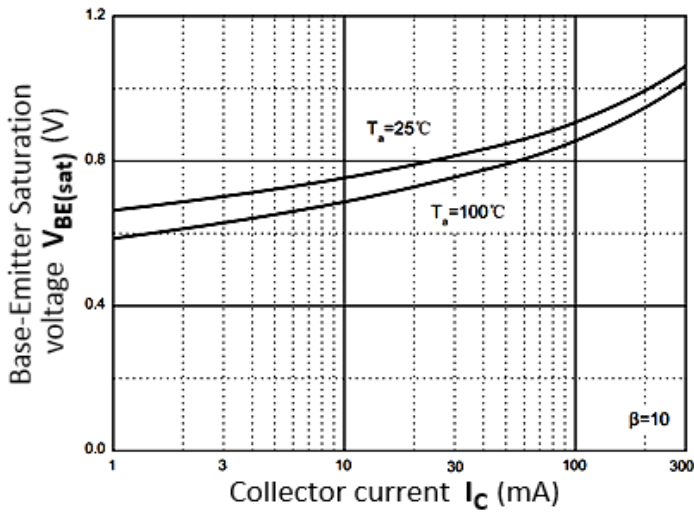


Figure 4. $V_{CE(sat)}$ vs. I_C

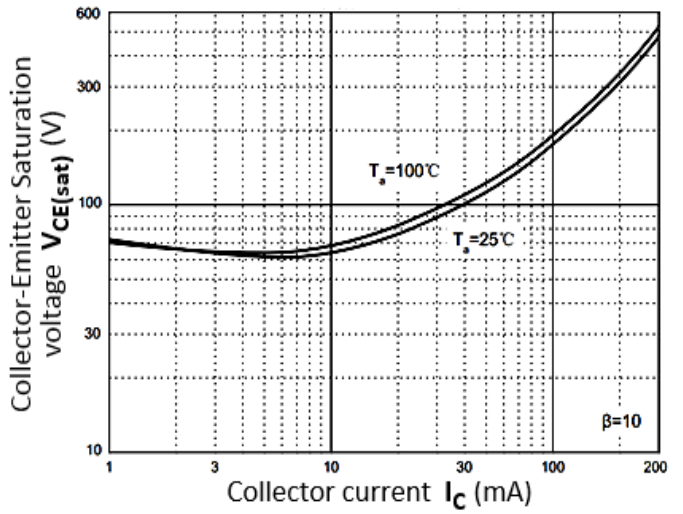


Figure 5. I_C vs. V_{BE}

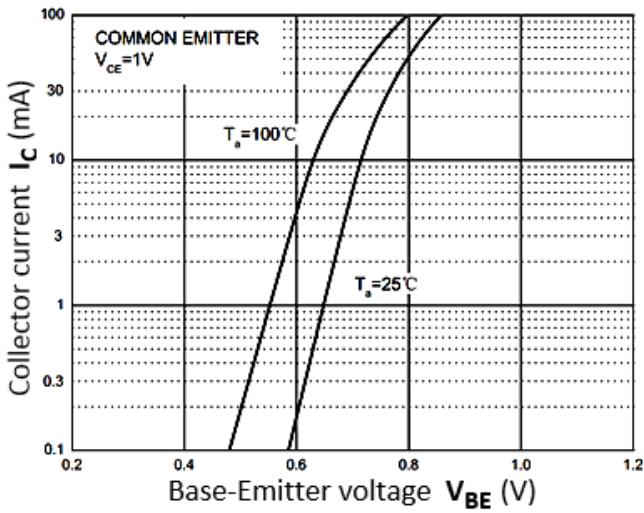


Figure 6. C_{ob} / C_{ib} vs. V_{CB} / V_{EB}

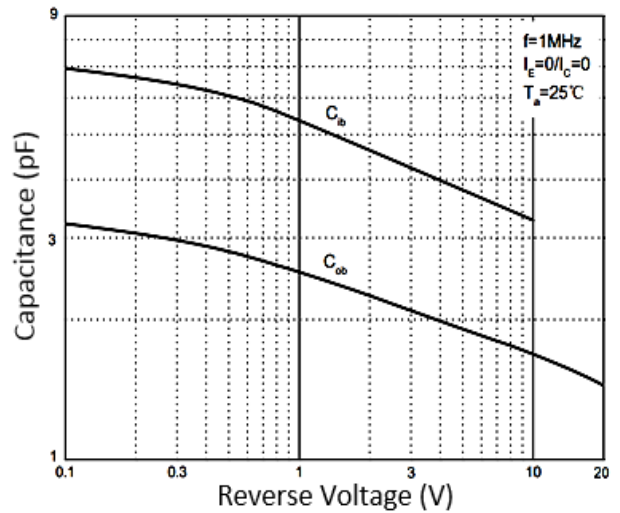


Figure 7. f_T vs. I_C

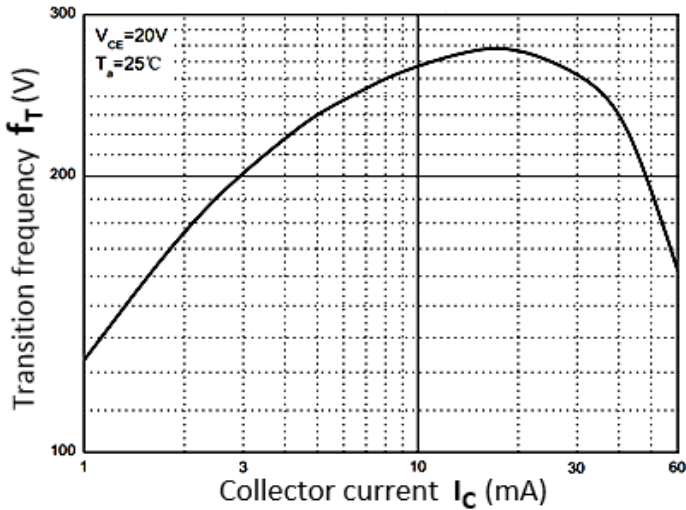
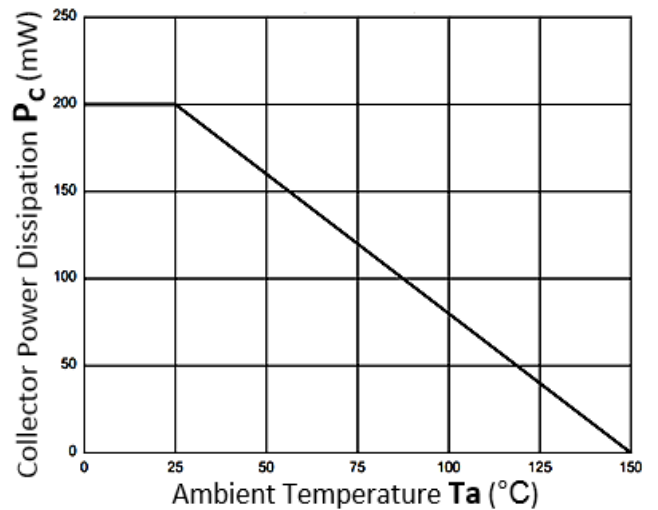


Figure 8. P_C vs. T_a



Outline Drawing – SOT-23

PACKAGE OUTLINE

SOT-23

| DIMENSIONS | | | | |
|------------|------------|------|------------|-------|
| SYMBOL | MILLIMETER | | INCHES | |
| | MIN | MAX | MIN | MAX |
| A | 0.90 | 1.15 | 0.035 | 0.045 |
| A1 | 0.00 | 0.10 | 0.000 | 0.004 |
| b | 0.30 | 0.50 | 0.012 | 0.020 |
| c | 0.08 | 0.15 | 0.003 | 0.006 |
| D | 2.80 | 3.00 | 0.110 | 0.118 |
| E | 2.25 | 2.55 | 0.089 | 0.100 |
| E1 | 1.20 | 1.40 | 0.047 | 0.055 |
| e | 0.95 BSC | | 0.0374 BSC | |
| e1 | 1.80 | 2.00 | 0.071 | 0.079 |
| L | 0.30 | 0.50 | 0.012 | 0.020 |
| θ | 0 | 8° | 0 | 8° |

| DIMENSIONS | | |
|------------|-----------|-------------|
| DIM | INCHES | MILLIMETERS |
| M | 0.0795 | 2.02 |
| C | 0.0315 | 0.80 |
| Z | 0.111 | 2.82 |
| e | 0.037 BSC | 0.95 BSC |
| e1 | 0.075 BSC | 1.9 BSC |
| b | 0.0315 | 0.80 |

Notes

1. Dimensioning and tolerances per ANSI Y14.5M, 1985.
2. Controlling Dimension: Inches
3. Pin 3 is the cathode (Unidirectional Only).
4. Dimensions are exclusive of mold flash and metal burrs.

Marking Codes

| | |
|--------------|--------|
| Part Number | WT3904 |
| Marking Code | |

Package Information

Qty: 3k/Reel

CONTACT INFORMATION

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Specifications are subject to change without notice.
 The device characteristics and parameters in this data sheet can and do vary in different applications and actual device performance may vary over time.
 Users should verify actual device performance in their specific applications.