

RoHS Compliant Product
A suffix of "-C" specifies halogen and lead free

FEATURES

- Low $V_{CE(sat)}$ and $R_{CE(sat)}$
- High Collector Current
- High DC Current Gain
- Fast Switching Time
- Complement of the MMBT356-C

APPLICATION

- Various Drivers
- LF Amplifiers
- Muting Circuit
- DC/DC Convertors
- Battery Chargers
- Supply Line Switching

MARKING

357

PACKAGE INFORMATION

| Package | MPQ | Leader Size |
|---------|-----|-------------|
| SOT-23 | 3K | 7 inch |

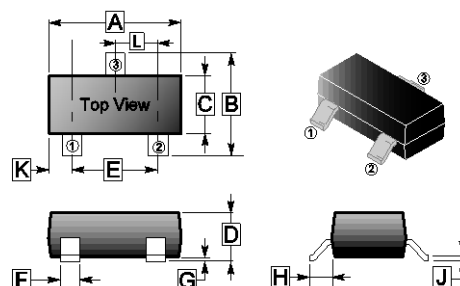
ORDER INFORMATION

| Part Number | Type |
|-------------|---------------------------------|
| MMBT357-C | Lead (Pb)-free and Halogen-free |

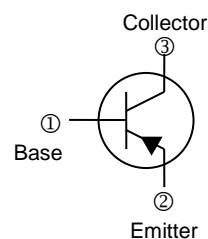
ABSOLUTE MAXIMUM RATINGS ($T_A=25^\circ\text{C}$ unless otherwise noted)

| Parameter | Symbol | Ratings | Unit |
|---|--------------------|--------------------|--------------------|
| Collector-Base Voltage | V_{CB0} | -50 | V |
| Collector-Emitter Voltage | V_{CEO} | -50 | V |
| Emitter-Base Voltage | V_{EBO} | -5 | V |
| Collector Current | I_C | DC | -3 |
| | | Pulse ¹ | -5 |
| Collector Power Dissipation | P_C ² | 0.4 | W |
| | P_C ³ | 1 | |
| Junction, Storage Temperature Range | T_J, T_{STG} | -55~150 | $^\circ\text{C}$ |
| Thermal Data | | | |
| Thermal Resistance from Junction-Ambient ³ | $R_{\theta JA}$ | Steady State, 125 | $^\circ\text{C/W}$ |
| Thermal Resistance from Junction-Ambient ² | | 313 | |

SOT-23



| REF. | Millimeter | | REF. | Millimeter | |
|------|------------|------|------|------------|-------|
| | Min. | Max. | | Min. | Max. |
| A | 2.70 | 3.10 | G | 0.10 REF. | |
| B | 2.10 | 3.00 | H | 0.40 REF. | |
| C | 1.20 | 1.70 | J | 0.047 | 0.207 |
| D | 0.89 | 1.40 | K | 0.50 REF. | |
| E | 2.00 TYP. | | L | 0.95 REF. | |
| F | 0.30 | 0.50 | | | |



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

| Parameter | Symbol | Min. | Typ. | Max. | Unit | Test Conditions |
|---|---------------|------|------|------|------------|--|
| Collector-Base Breakdown Voltage | $V_{(BR)CBO}$ | -50 | - | - | V | $I_C = -100\mu\text{A}, I_E = 0$ |
| Collector-Emitter Breakdown Voltage | $V_{(BR)CEO}$ | -50 | - | - | | $I_C = -10\text{mA}, I_B = 0$ |
| Emitter-Base Breakdown Voltage | $V_{(BR)EBO}$ | -5 | - | - | | $I_E = -100\mu\text{A}, I_C = 0$ |
| Collector Cut-off Current | I_{CBO} | - | - | -100 | nA | $V_{CB} = -50\text{V}, I_E = 0$ |
| Collector Cut-off Current | I_{CES} | - | - | -100 | | $V_{CE} = -50\text{V}$ |
| Emitter Cut-off Current | I_{EBO} | - | - | -100 | | $V_{EB} = -5\text{V}, I_C = 0$ |
| DC Current Gain | h_{FE} | 200 | - | - | | $V_{CE} = -2\text{V}, I_C = -100\text{mA}$ |
| | | 200 | - | 450 | | $V_{CE} = -2\text{V}, I_C = -1\text{A}$ |
| | | 130 | - | - | | $V_{CE} = -2\text{V}, I_C = -2\text{A}$ |
| | | 80 | - | - | | $V_{CE} = -2\text{V}, I_C = -3\text{A}$ |
| Collector-Emitter Saturation Voltage ¹ | $V_{CE(sat)}$ | - | - | -90 | mV | $I_C = -0.5\text{A}, I_B = -50\text{mA}$ |
| | | - | - | -320 | | $I_C = -2\text{A}, I_B = -100\text{mA}$ |
| | | - | - | -390 | | $I_C = -3\text{A}, I_B = -300\text{mA}$ |
| Equivalent On-Resistance ¹ | $R_{CE(sat)}$ | - | 75 | 130 | m Ω | $I_C = -3\text{A}, I_B = -300\text{mA}$ |
| Base-Emitter Saturation Voltage ¹ | $V_{BE(sat)}$ | - | - | -1.1 | V | $I_C = -2\text{A}, I_B = -100\text{mA}$ |
| | | - | - | -1.2 | | $I_C = -3\text{A}, I_B = -300\text{mA}$ |
| Base-Emitter Voltage ¹ | $V_{BE(ON)}$ | - | - | -1.1 | V | $I_C = -1\text{A}, V_{CE} = -2\text{V}$ |
| Collector Output Capacitance | C_{ob} | - | 35 | - | pF | $V_{CB} = -10\text{V}, I_E = 0, f = 1\text{MHz}$ |
| Transition Frequency | f_T | - | 100 | - | MHz | $V_{CE} = -5\text{V}, I_C = -100\text{mA}$ |

Notes:

1. Pulse test: pulse width $\leq 100\mu\text{s}$, duty cycle $\leq 2\%$.
2. When mounted on Min. copper pad.
3. Surface Mounted on 1" x 1" FR4 Board with 2OZ copper.

TYPICAL CHARACTERISTICS

Fig.1 I_C - $V_{BE(on)}$

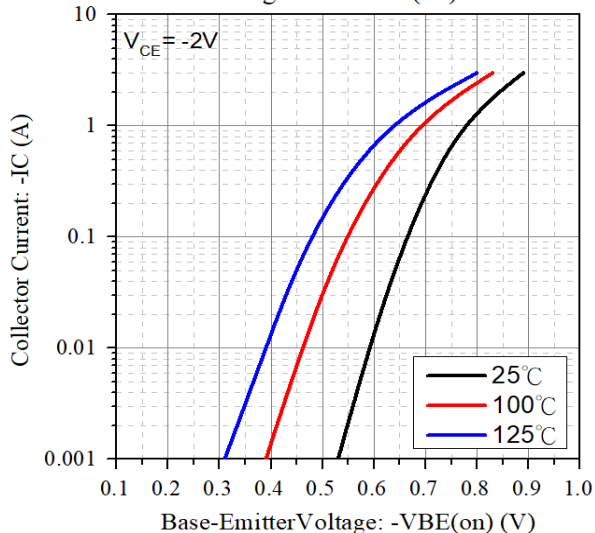


Fig.2 h_{FE} - I_C

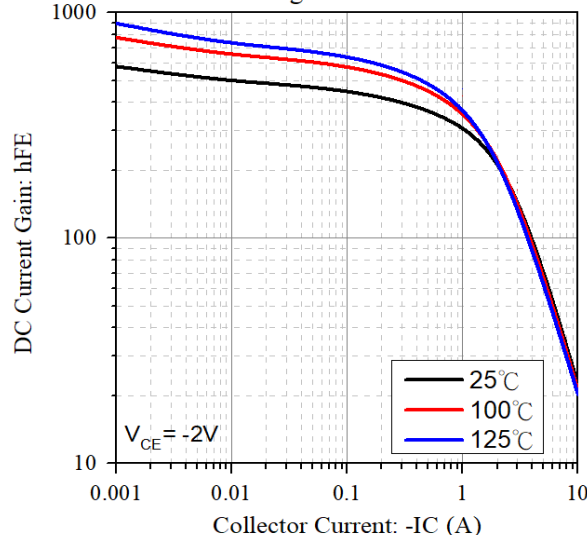


Fig.3 $V_{CE(sat)}$ - I_C

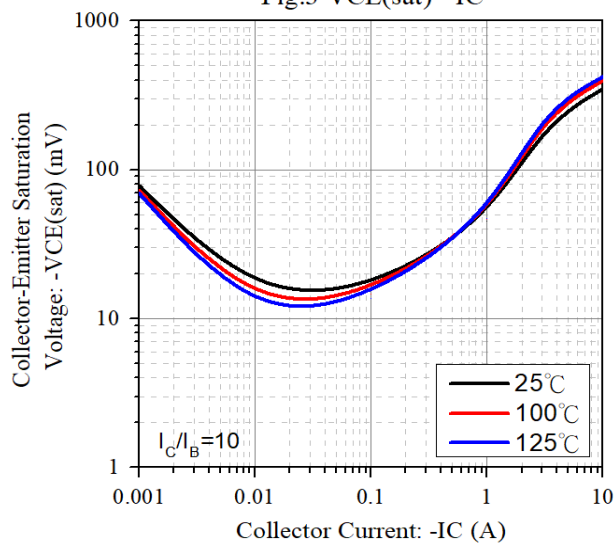


Fig.4 $V_{CE(sat)}$ - I_C

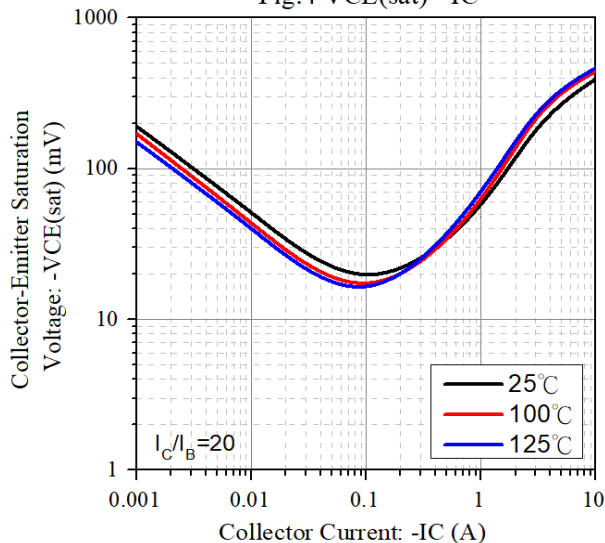


Fig.5 $V_{BE(sat)}$ - I_C

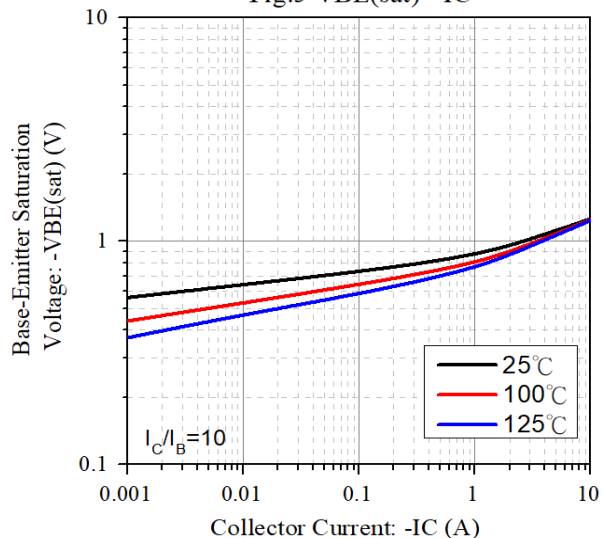
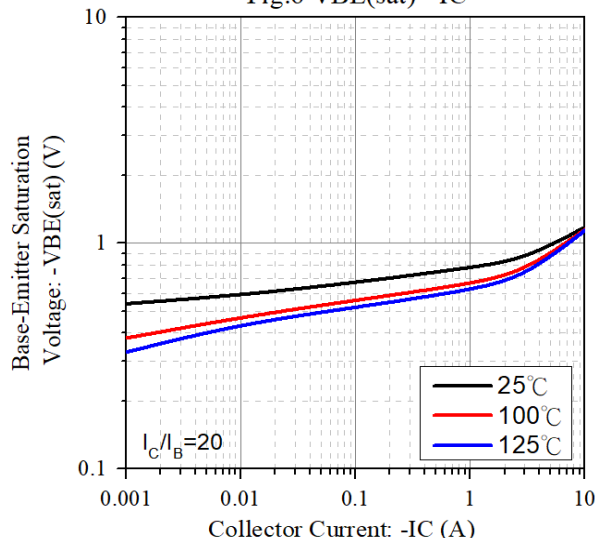


Fig.6 $V_{BE(sat)}$ - I_C



TYPICAL CHARACTERISTICS

Fig.7 f_T - IE

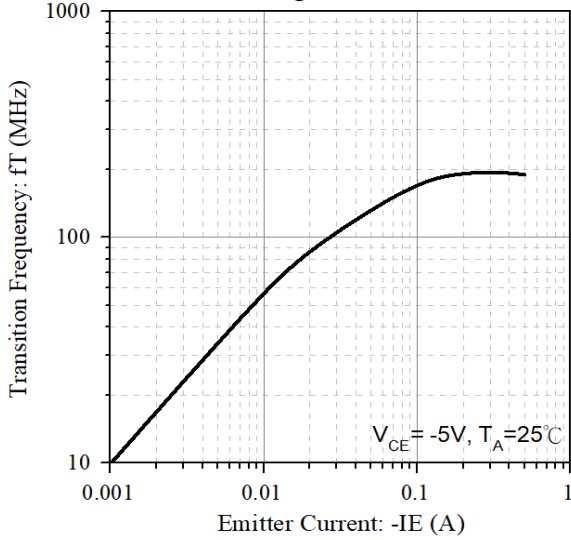


Fig.8 C_{ob} - VCB

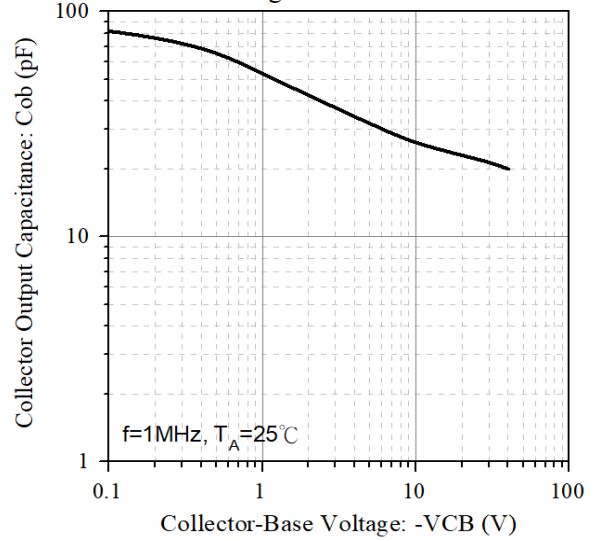


Fig.9 C_{ib} - VEB

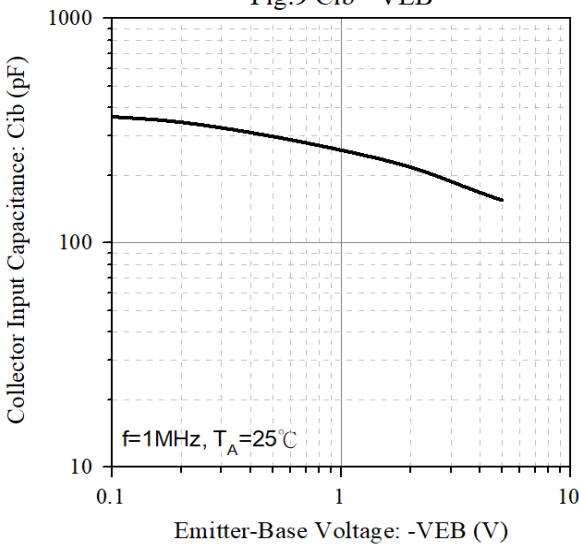


Fig.10 Mounting Pad Layout

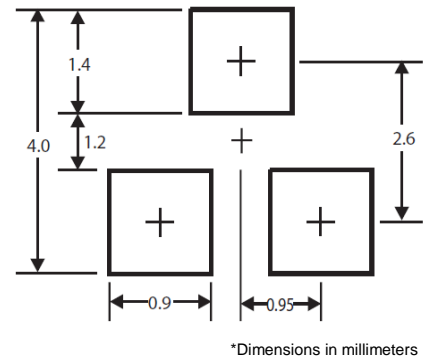


Fig.11 $R_{CE(sat)}$ - IC

