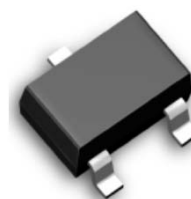


SOT-23

Features

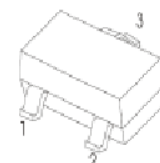
- ◇ Epitaxial planar die construction
- ◇ Surface device type mounting
- ◇ Moisture sensitivity level 1
- ◇ Driver Transistor
- ◇ Pb free version and RoHS compliant
- ◇ Green compound (Halogen free) with suffix "G" on packing code and prefix "G" on date code



Mechanical Data

- ◇ Case: SOT-23 small outline plastic package per MIL-STD-202, Method 208 guaranteed
- ◇ High temperature soldering guaranteed: 260°C/10s
- ◇ Weight: 7.888mg

SOT-23



1. BASE
 2. EMITTER
 3. COLLECTOR

Ordering Information (example)

| Part No. | Package | Packing | Packing code | Packing code (Green) | Marking | Manufacture code |
|----------|---------|--------------|--------------|----------------------|---------|------------------|
| MMBTA05 | SOT-23 | 3K / 7" Reel | RU | RUG | 1H | M0 |

Note : Detail please see "Ordering Information(detail, example)" below.

Maximum Ratings and Electrical Characteristics

Absolute Maximum Ratings (T_A=25°C)

| Parameter | Symbol | Value | Units |
|-------------------------------|------------------|---------------|-------|
| Collector Base Voltage | V _{CB0} | 60 | V |
| Collector Emitter Voltage | V _{CEO} | 60 | V |
| Emitter Base Voltage | V _{EBO} | 4 | V |
| Collector Current- Continuous | I _C | 0.5 | A |
| Collector Power Dissipation | P _C | 300 | mW |
| Junction Temperature | T _J | 150 | °C |
| Storage Temperature Range | T _{STG} | - 55 to + 150 | °C |

Characteristics at T_A=25°C

| Parameter | Symbol | Min. | Typ. | Max. | Units |
|---|----------------------|------|------|------|-------|
| Collector Base Breakdown Voltage at I _C =100uA, I _E =0 | V _{(BR)CBO} | 60 | - | - | V |
| Collector Emitter Breakdown Voltage at I _C =1mA, I _B =0 | V _{(BR)CEO} | 60 | - | - | V |
| Emitter Base Breakdown Voltage at I _E =100uA, I _C =0 | V _{(BR)EBO} | 4 | - | - | V |
| Collector Cutoff Current at V _{CB} =60V, I _E =0 | I _{CBO} | - | - | 0.1 | uA |
| Collector Cutoff Current at V _{CE} =60V, I _B =0 | I _{CEO} | - | - | 0.1 | uA |
| Emitter Cutoff Current at V _{EB} =3V, I _C =0 | I _{EBO} | - | - | 0.1 | uA |
| DC Current Gain at V _{CE} =1V, I _C =10mA | h _{FE} | 100 | - | 400 | |
| | h _{FE} | 100 | - | - | |
| Collector Emitter Saturation Voltage at I _C =50mA, I _B =5mA | V _{CE(sat)} | - | - | 0.25 | V |
| Base-emitter Voltage at V _{CE} =1V, I _C =100mA | V _{BE} | - | - | 1.2 | V |
| Transition Frequency at V _{CE} =2V, I _C =10mA, f=100MHz | f _T | 100 | - | - | MHz |

Small Signal Product

FIG.1 Static Characteristic

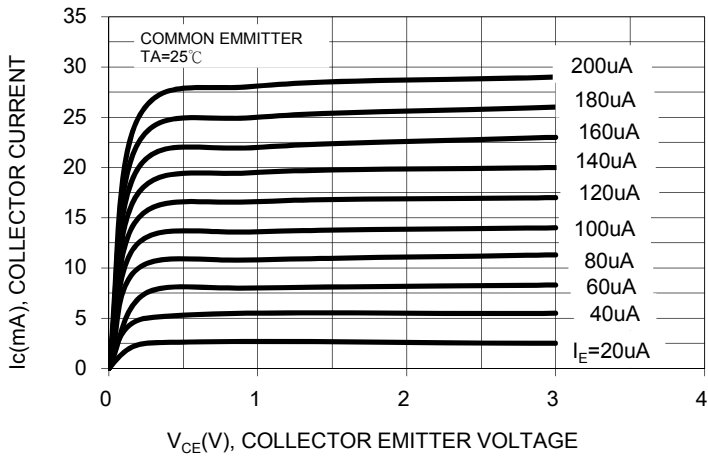


FIG. 2 $h_{FE} - I_C$

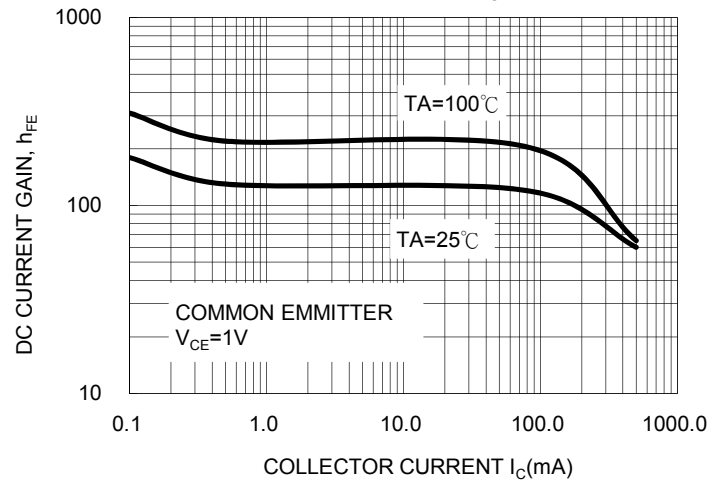


FIG. 3 $V_{BE(sat)} - I_C$

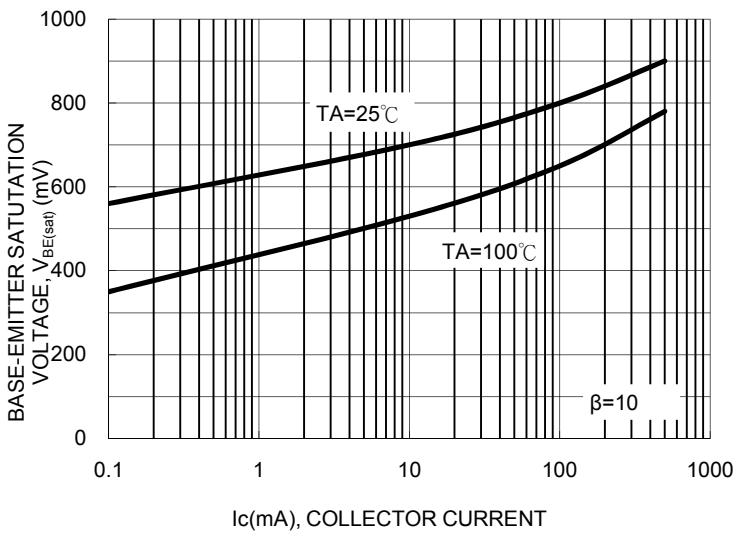


FIG. 4 $V_{CE(sat)} - I_C$

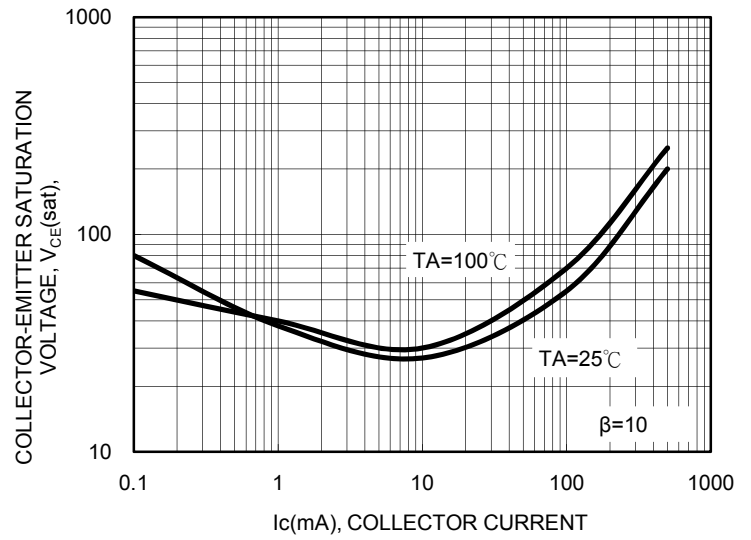


FIG. 5 $I_C - V_{BE}$

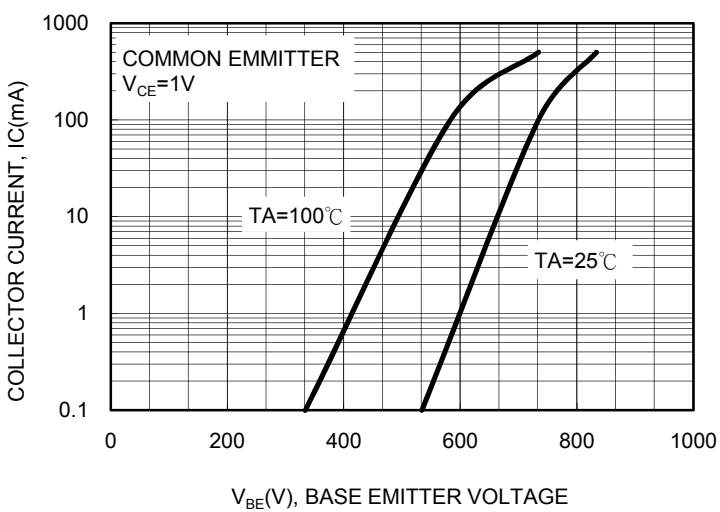
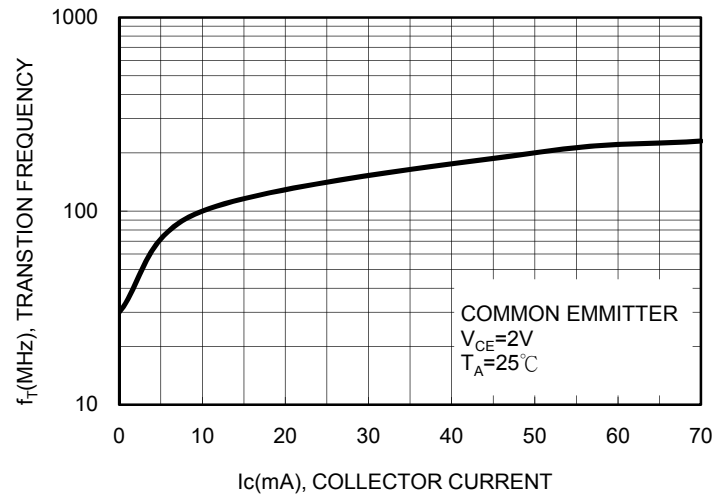


FIG. 6 $f_T - I_C$



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FIG. 7 Cob/Cib - V_{CB}/V_{EB}

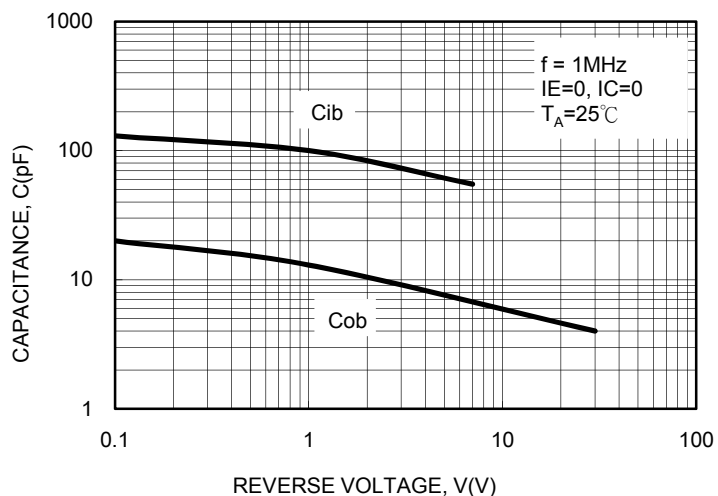
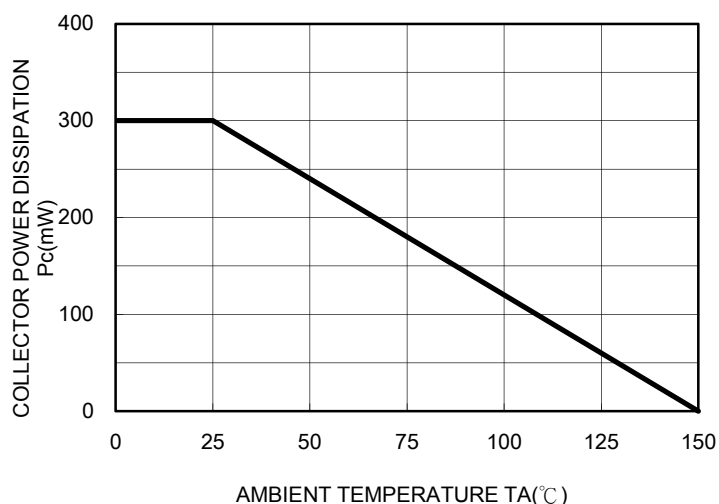


FIG. 8 $P_C - T_A$

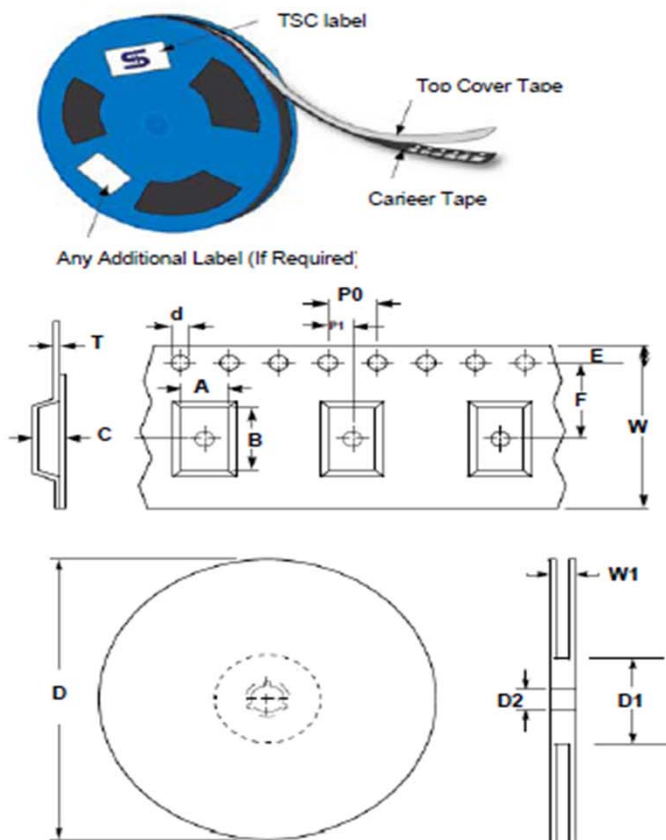


Ordering information (Detail, example)

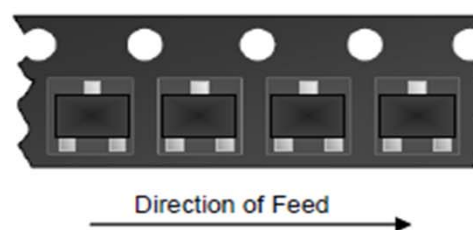
| Part No. | Package | Packing | Packing code | Packing code (Green) | Marking | Manufacture code |
|----------|---------|--------------|--------------|----------------------|---------|------------------|
| MMBTA05 | SOT-23 | 3K / 7" Reel | RU | RUG | 1H | (Note) |
| MMBTA05 | SOT-23 | 3K / 7" Reel | RU | RUG | 1H | |
| MMBTA05 | SOT-23 | 3K / 7" Reel | RU | RUG | 1H | M0 |

Note : Manufacture special control, if empty means no special control requirement.

Tape and Reel specification

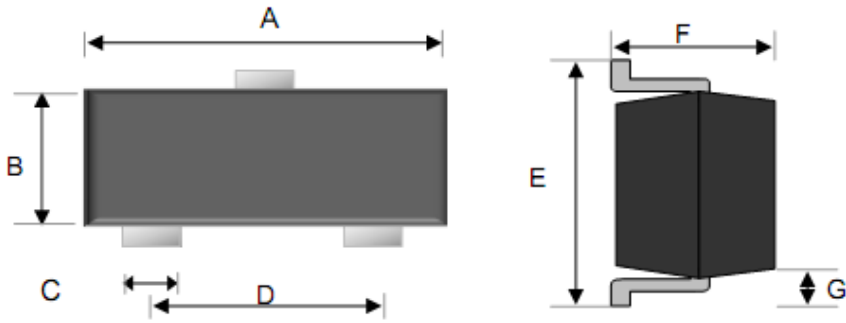


| Item | Symbol | Dimension(mm) |
|------------------------|--------|---------------|
| Carrier width | A | 3.15 ±0.10 |
| Carrier length | B | 2.77 ±0.10 |
| Carrier depth | C | 1.22 ±0.10 |
| Sprocket hole | d | 1.50 ± 0.10 |
| Reel outside diameter | D | 178 ± 1 |
| Reel inner diameter | D1 | 55 Min |
| Feed hole width | D2 | 13.0 ± 0.20 |
| Sprocket hole position | E | 1.75 ±0.10 |
| Punch hole position | F | 3.50 ±0.05 |
| Sprocket hole pitch | P0 | 4.00 ±0.10 |
| Embossment center | P1 | 2.00 ±0.05 |
| Overall tape thickness | T | 0.229 ±0.013 |
| Tape width | W | 8.10 ±0.20 |
| Reel width | W1 | 12.30 ±0.20 |



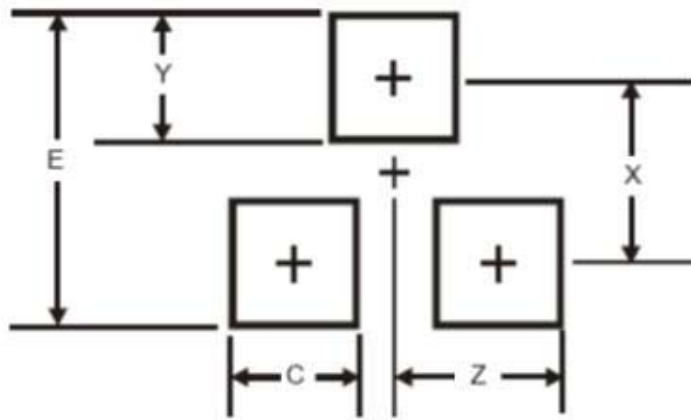
Small Signal Product

Dimensions



| DIM. | Unit(mm) | | Unit(inch) | |
|------|----------|------|------------|-------|
| | Min | Max | Min | Max |
| A | 2.80 | 3.04 | 0.110 | 0.120 |
| B | 1.20 | 1.40 | 0.047 | 0.055 |
| C | 0.30 | 0.51 | 0.012 | 0.020 |
| D | 1.78 | 2.04 | 0.070 | 0.080 |
| E | 2.25 | 2.55 | 0.089 | 0.100 |
| F | 0.89 | 1.20 | 0.035 | 0.047 |
| G | 0.55 REF | | 0.022 REF | |

Suggested PAD Layout



| Symbol | Unit(mm) |
|--------|----------|
| Z | 1.35 |
| X | 2.0 |
| Y | 0.9 |
| C | 0.8 |
| E | 2.9 |