

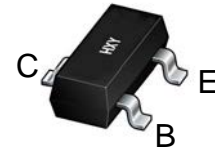


Features

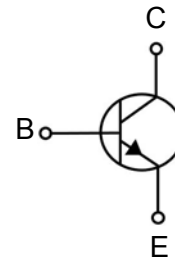
- Collector Current: $I_C=0.2A$
- Power Dissipation of 150mw

Package Marking and Ordering Information

| Product ID | Pack | Marking | Qty(PCS) |
|------------|----------------------|---------|----------|
| MMBT3904T | SOT-523 (SOT-416) | 1N | 3000 |



SOT-523
(SOT-416)



Maxmim Ratings (Ta=25 unless otherwise noted)

| Parameter | Symbol | Limit | 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 | 150 | mW |
| Thermal Resistance From Junction To Ambient | $R_{\theta JA}$ | 833 | $^{\circ}CW$ |
| Junction Temperature | T_j | 150 | $^{\circ}C$ |
| Storage Temperature | T_{stg} | -55~+150 | $^{\circ}C$ |

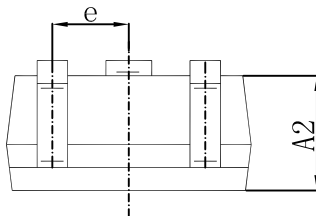
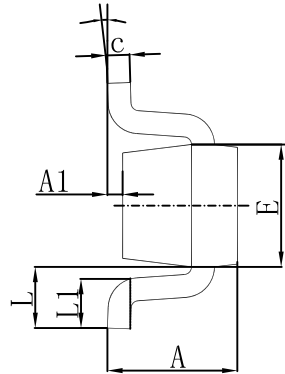
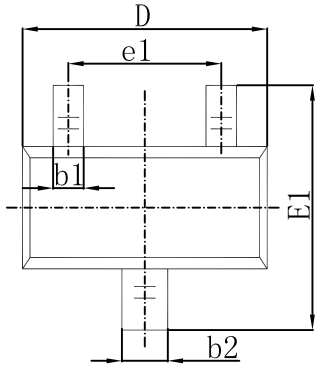


Electrcal Charcteristics (Ta=25 unless otherwise specified)

| Parameter | Symbol | Test conditions | Min | Typ | Max | Unit |
|--------------------------------------|---------------|--|------|-----|------|------|
| Collector-base breakdown voltage | $V_{(BR)CBO}$ | $I_C=10\mu A, I_E=0$ | 60 | | | V |
| Collector-emitter breakdown voltage | $V_{(BR)CEO}$ | $I_C=1mA, I_B=0$ | 40 | | | V |
| Emitter-base breakdown voltage | $V_{(BR)EBO}$ | $I_E=10\mu A, I_C=0$ | 6 | | | V |
| Collector cut-off current | I_{CEX} | $V_{CE}=30V, V_{EB(off)}=3V$ | | | 50 | nA |
| Emitter cut-off current | I_{EBO} | $V_{EB}=5V, I_C=0$ | | | 100 | nA |
| DC current gain | $h_{FE(1)}$ | $V_{CE}=1V, I_C=0.1mA$ | 40 | | | |
| | $h_{FE(2)}$ | $V_{CE}=1V, I_C=1mA$ | 70 | | | |
| | $h_{FE(3)}$ | $V_{CE}=1V, I_C=10mA$ | 100 | | 300 | |
| | $h_{FE(4)}$ | $V_{CE}=1V, I_C=50mA$ | 60 | | | |
| Collector-emitter saturation voltage | $V_{CE(sat)}$ | $I_C=10mA, I_B=1mA$ | | | 0.2 | V |
| | | $I_C=50mA, I_B=5mA$ | | | 0.3 | V |
| Collector-emitter saturation voltage | $V_{BE(sat)}$ | $I_C=10mA, I_B=1mA$ | 0.65 | | 0.85 | V |
| | | $I_C=50mA, I_B=5mA$ | | | 0.95 | V |
| Transition frequency | f_T | $V_{CE}=20V, I_C=10mA, f=100MHz$ | 300 | | | MHz |
| Collector output capacitance | C_{ob} | $V_{CB}=5V, I_E=0, f=1MHz$ | | | 4 | pF |
| Base input capacitance | C_{ib} | $V_{EB}=0.5V, I_C=0, f=1MHz$ | | | 8 | pF |
| Delay time | t_d | $V_{CC}=3V, V_{BE(off)}=-0.5V, I_C=10mA, I_{B1}=1mA$ | | | 35 | ns |
| Rise time | t_r | $V_{CC}=3V, V_{BE(off)}=-0.5V, I_C=10mA, I_{B1}=1mA$ | | | 35 | ns |
| Storage time | t_s | $V_{CC}=3V, I_C=10mA, I_{B1}=I_{B2}=1mA$ | | | 200 | ns |
| Fall time | t_f | $V_{CC}=3V, I_C=10mA, I_{B1}=I_{B2}=1mA$ | | | 50 | ns |

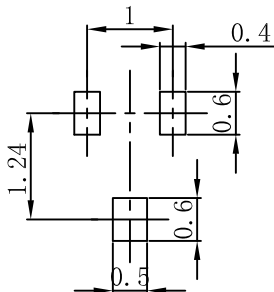


SOT-523(SOT-416) Package Information



| Symbol | Dimensions In Millimeters | | Dimensions In Inches | |
|--------|---------------------------|-------|----------------------|-------|
| | Min. | Max. | Min. | Max. |
| A | 0.700 | 0.900 | 0.028 | 0.035 |
| A1 | 0.000 | 0.100 | 0.000 | 0.004 |
| A2 | 0.700 | 0.800 | 0.028 | 0.031 |
| b1 | 0.150 | 0.250 | 0.006 | 0.010 |
| b2 | 0.250 | 0.350 | 0.010 | 0.014 |
| c | 0.100 | 0.200 | 0.004 | 0.008 |
| D | 1.500 | 1.700 | 0.059 | 0.067 |
| E | 0.700 | 0.900 | 0.028 | 0.035 |
| E1 | 1.450 | 1.750 | 0.057 | 0.069 |
| e | 0.500 TYP. | | 0.020 TYP. | |
| e1 | 0.900 | 1.100 | 0.035 | 0.043 |
| L | 0.400 REF. | | 0.016 REF. | |
| L1 | 0.260 | 0.460 | 0.010 | 0.018 |
| θ | 0° | 8° | 0° | 8° |

SOT-523(SOT-416) 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.



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