

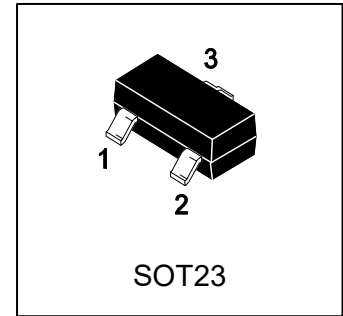
MBT5401

S-MBT5401

High Voltage Transistor

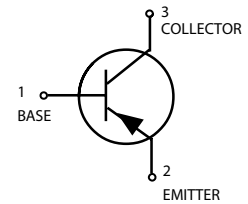
1. FEATURES

- We declare that the material of product compliance with RoHS requirements and Halogen Free.
- S- prefix for automotive and other applications requiring unique site and control change requirements; AEC-Q101 qualified and PPAP capable.



2. DEVICE MARKING AND ORDERING INFORMATION

| Device | Marking | Shipping |
|---------|---------|----------------|
| MBT5401 | 2L | 3000/Tape&Reel |



3. MAXIMUM RATINGS(Ta = 25°C)

| Parameter | Symbol | Limits | Unit |
|--------------------------------|--------|--------|------|
| Collector-Emitter Voltage | VCEO | -150 | V |
| Collector-Base voltage | VCBO | -160 | V |
| Emitter-Base Voltage | VEBO | -5 | V |
| Collector current — Continuous | IC | -500 | mA |

4. THERMAL CHARACTERISTICS

| Parameter | Symbol | Limits | Unit |
|--|---------|------------|-------------|
| Total Device Dissipation, FR-5 Board (Note 1) @ TA = 25°C Derate above 25°C | PD | 225 1.8 | mW mW/°C |
| Thermal Resistance, Junction-to-Ambient | ROJA | 556 | °C/W |
| Total Device Dissipation, Alumina Substrate, (Note 2)@ TA = 25°C Derate above 25°C | PD | 300 2.4 | mW mW/°C |
| Thermal Resistance, Junction-to-Ambient | ROJA | 417 | °C/W |
| Junction and Storage temperature | TJ,Tstg | -55~+150 | °C |

1. FR-5 = 1.0×0.75×0.062 in.

2. Alumina = 0.4 x 0.3 x 0.024 in. 99.5% alumina.



5. ELECTRICAL CHARACTERISTICS (Ta= 25°C)

OFF CHARACTERISTICS

| Characteristic | Symbol | Min. | Typ. | Max. | Unit |
|--|----------|------|------|------|----------|
| Collector-Emitter Breakdown Voltage (IC = -1.0mA, IB=0) | V(BR)CEO | -150 | - | - | V |
| Collector-Base Breakdown voltage (IC = -100μA, IE=0) | V(BR)CBO | -160 | - | - | V |
| Emitter-Base Breakdown Voltage (IE = -10μA, IC=0) | V(BR)EBO | -5 | - | - | V |
| Collector Cutoff Current (VCB = -120 V, IE=0) (VCB = -120 V, IE=0, TA=100°C) | ICBO | - | - | -50 | nA μA |
| Emitter-Base cut-off current (IC = 0, VEB=-5.0V) | IEBO | - | - | -50 | nA |
| Collector-Emitter cutoff Current (VCE = -150V, IB=0) | ICEO | - | - | -10 | μA |

ON CHARACTERISTICS

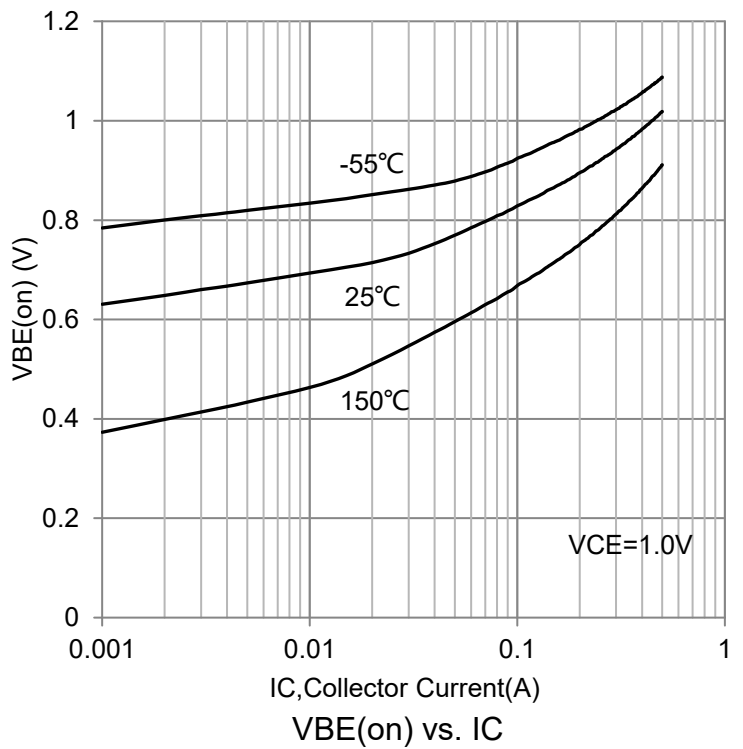
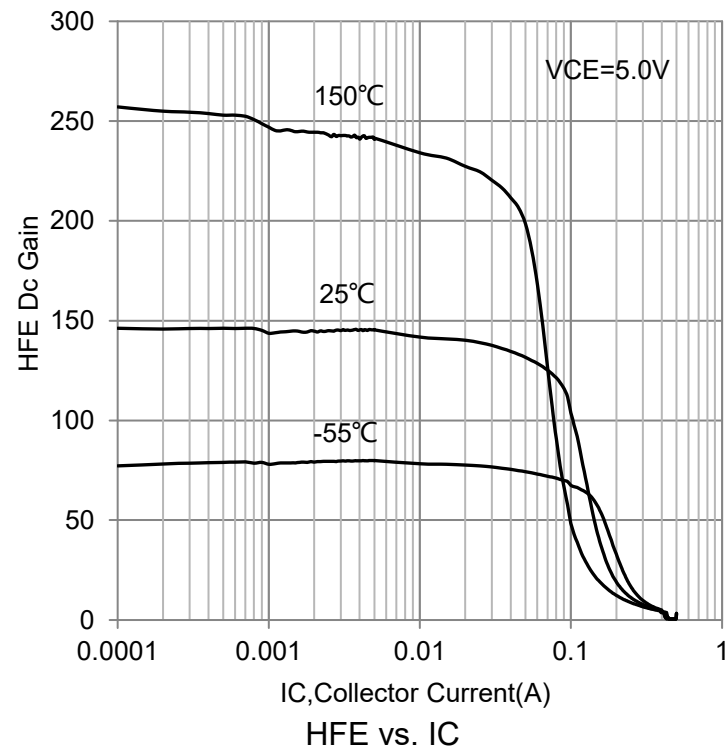
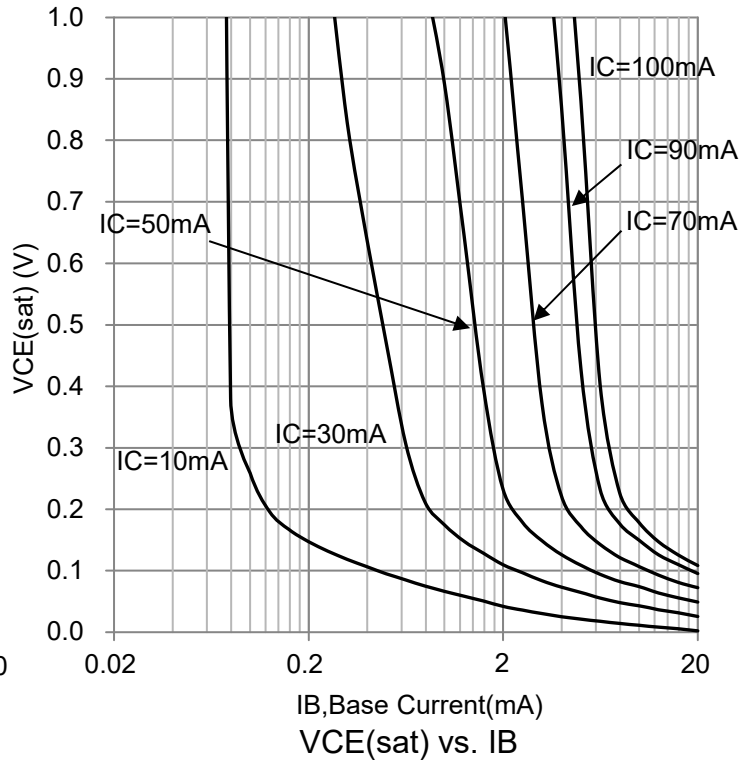
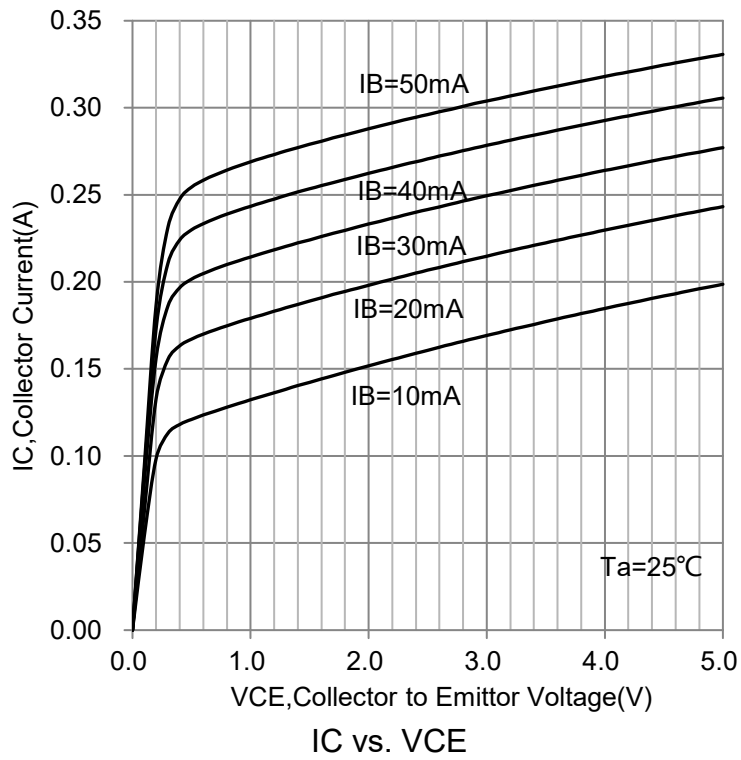
| | | | | | |
|--|--------|----------------|-------------|---------------|---|
| DC Current Gain (IC = -1.0mA, VCE = -5.0 V) (IC = -10 mA, VCE = -5.0 V) (IC = -50 mA, VCE = -5.0 V) | HFE | 50 60 50 | - - - | - 240 - | |
| Collector-Emitter Saturation Voltage (IC = -10 mA, IB = -1.0 mA) (IC = -50 mA, IB = -5.0 mA) | VCE(S) | - - | - - | -0.2 -0.5 | V |
| Base-Emitter Saturation Voltage (IC = -10 mA, IB = -1.0 mA) (IC = -50 mA, IB = -5.0 mA) | VBE(S) | - - | - - | -1 -1 | V |

SMALL-SIGNAL CHARACTERISTICS

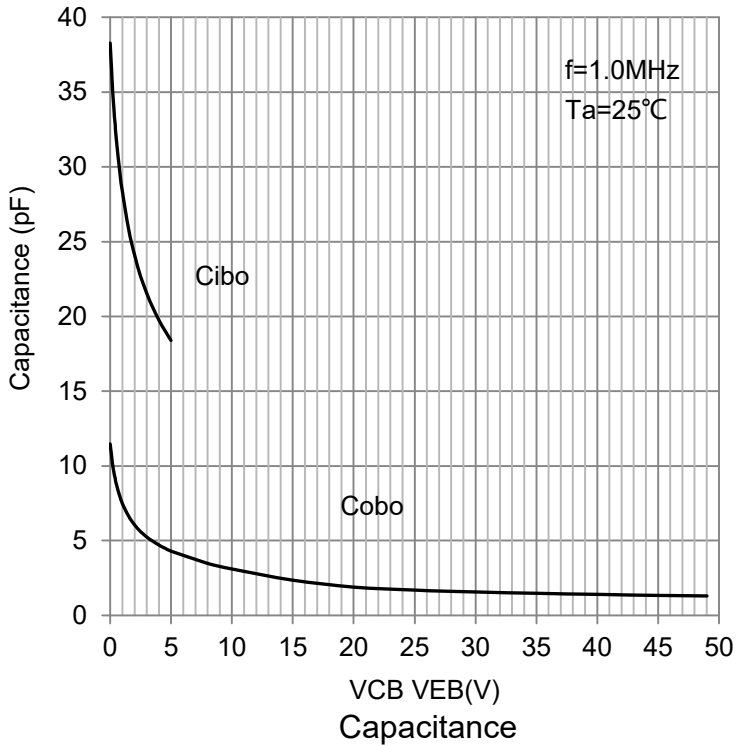
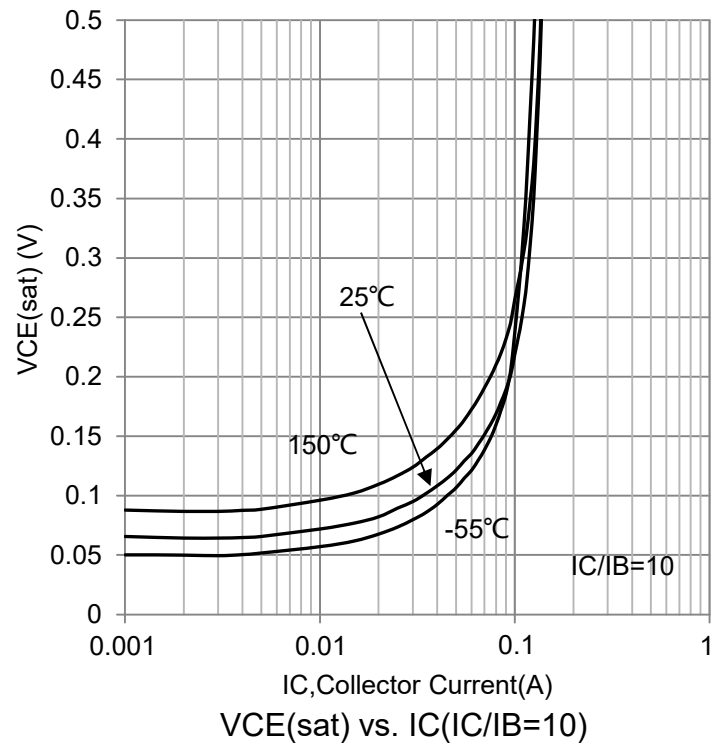
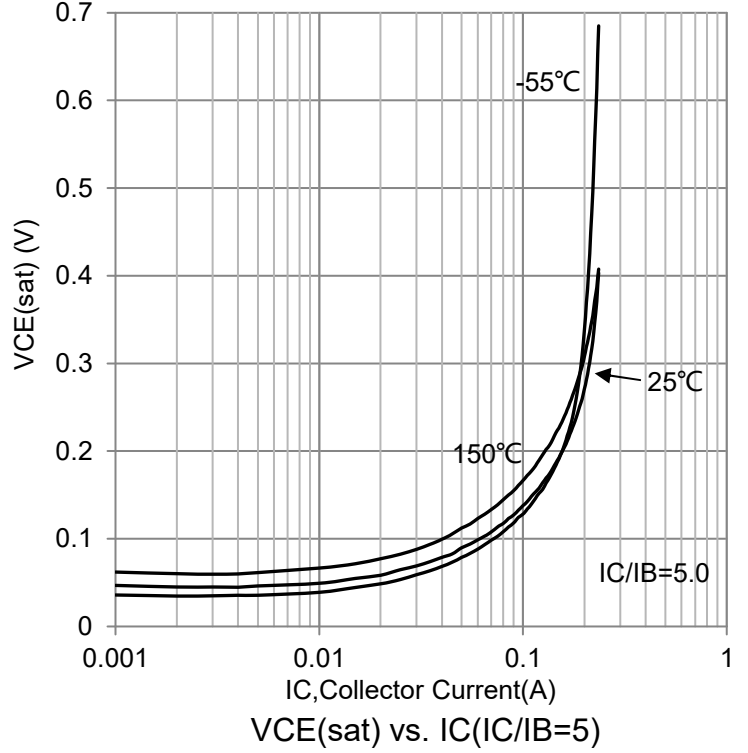
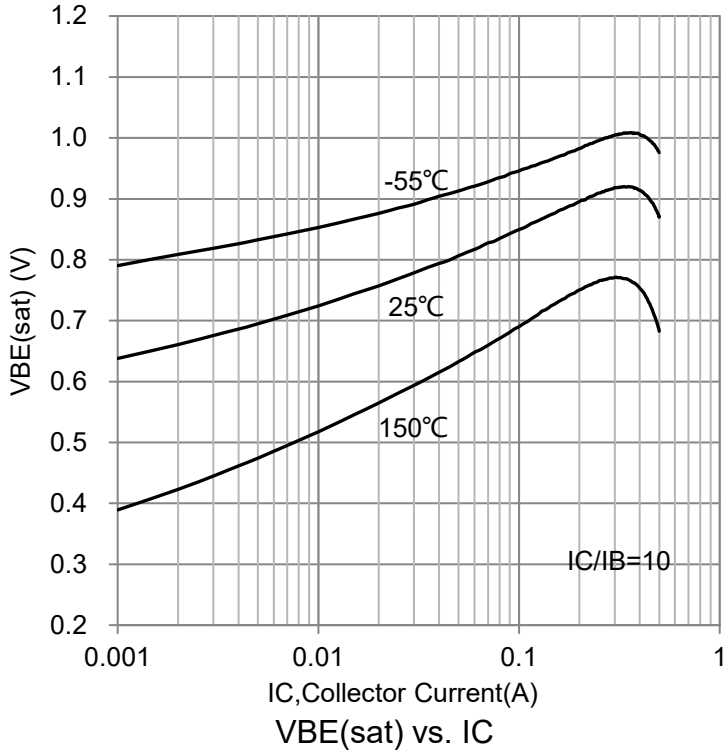
| | | | | | |
|---|------|-----|---|-----|-----|
| Current-Gain — Bandwidth Product (IC = -10 mA, VCE = -10 V, f = 100 MHz) | fT | 100 | - | 300 | MHz |
| Output Capacitance (VCB = -10 V, IE = 0, f = 1.0 MHz) | Cobo | - | - | 6 | PF |
| Small-Signal Current Gain (IC = -1.0mA, VCE = -10V, f = 1.0 kHz) | hfe | 40 | - | 200 | |
| Noise Figure (IC = -200 μA, VCE = -5.0 V, Rs=10Ω, f=1.0 kHz) | NF | - | - | 8 | dB |



6.ELECTRICAL CHARACTERISTICS CURVES



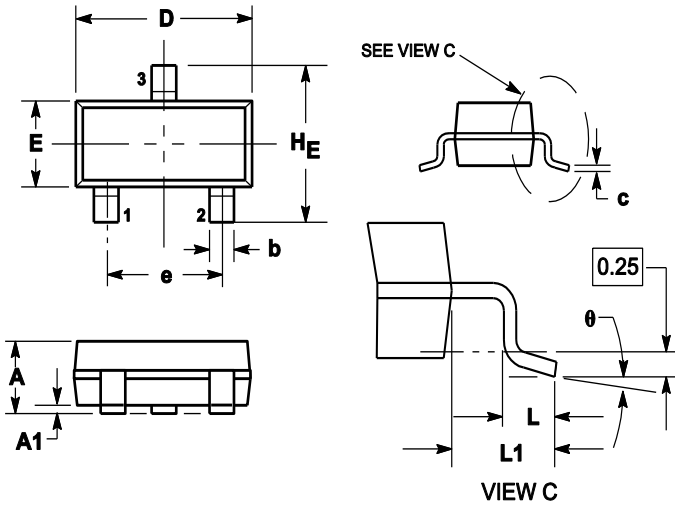
6.ELECTRICAL CHARACTERISTICS CURVES(Con.)



7.OUTLINE AND DIMENSIONS

Notes:

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: MILLIMETERS.
3. MAXIMUM LEAD THICKNESS INCLUDES LEAD FINISH. MINIMUM LEAD THICKNESS IS THE MINIMUM THICKNESS OF BASE MATERIAL.
4. DIMENSIONS D AND E DO NOT INCLUDE MOLD FLASH, PROTRUSIONS OR GATE BURRS.



| DIM | MILLIMETERS | | | INCHES | | |
|----------------|-------------|------|------|--------|-------|-------|
| | MIN | NOM | MAX | MIN | NOM | MAX |
| A | 0.89 | 1 | 1.11 | 0.035 | 0.04 | 0.044 |
| A1 | 0.01 | 0.06 | 0.1 | 0.001 | 0.002 | 0.004 |
| b | 0.37 | 0.44 | 0.5 | 0.015 | 0.018 | 0.02 |
| c | 0.09 | 0.13 | 0.18 | 0.003 | 0.005 | 0.007 |
| D | 2.80 | 2.9 | 3.04 | 0.11 | 0.114 | 0.12 |
| E | 1.20 | 1.3 | 1.4 | 0.047 | 0.051 | 0.055 |
| e | 1.78 | 1.9 | 2.04 | 0.07 | 0.075 | 0.081 |
| L | 0.10 | 0.2 | 0.3 | 0.004 | 0.008 | 0.012 |
| L1 | 0.35 | 0.54 | 0.69 | 0.014 | 0.021 | 0.029 |
| H _E | 2.10 | 2.4 | 2.64 | 0.083 | 0.094 | 0.104 |
| θ | 0° | --- | 10° | 0° | --- | 10° |

8.SOLDERING FOOTPRINT

