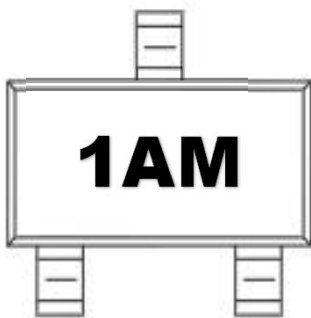


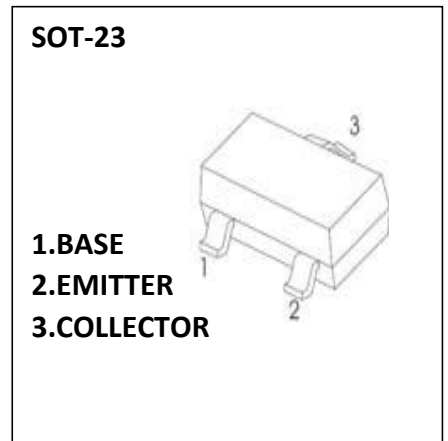
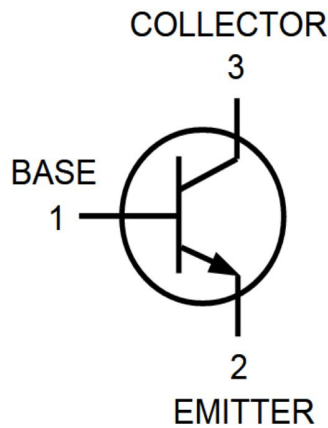
SOT-23 Plastic-Encapsulate MOSFETS

MMBT3904 TRANSISTOR (NPN)

MARKING:



Equivalent Circuit:



FEATURES:

- ※ Complimentary to MMBT3906
- ※ Collector Current: $I_c=200\text{mA}$

MAXIMUM RATINGS (Ta=25°C unless otherwise noted)

| Parameter | Symbol | Value | Unit |
|---|--------|----------|------|
| Collector-Base Voltage | VCBO | 60 | V |
| Collector-Emitter Voltage | VCEO | 40 | V |
| Emitter-Base Voltage | VEBO | 6 | V |
| Collector Current | IC | 200 | mA |
| Collector Power Dissipation | PC | 200 | mW |
| Thermal Resistance From Junction To Ambient | RθJA | 625 | °C/W |
| Junction Temperature | Tj | 150 | °C |
| Storage Temperature | Tstg | -55~+150 | °C |

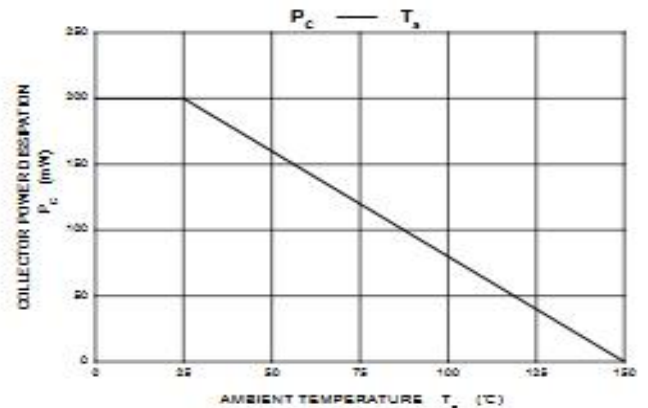
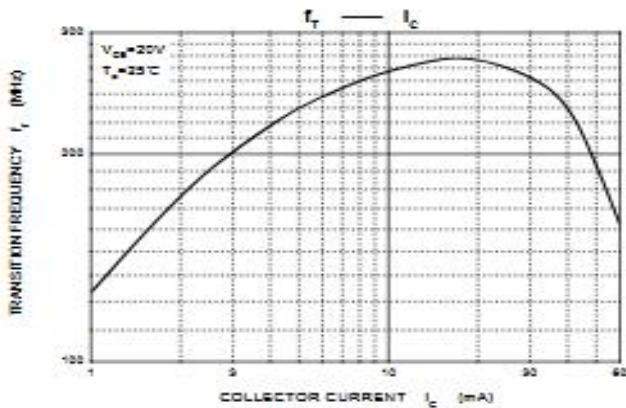
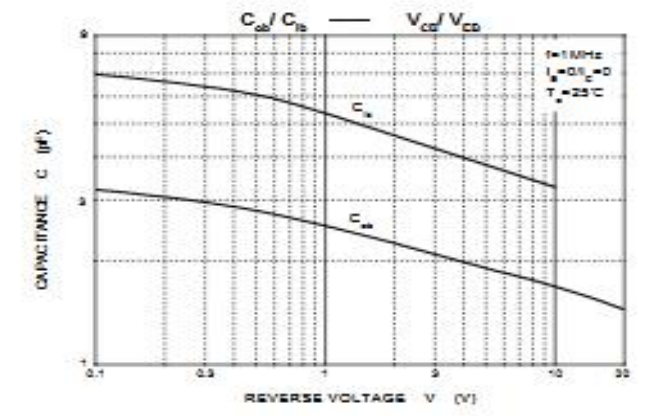
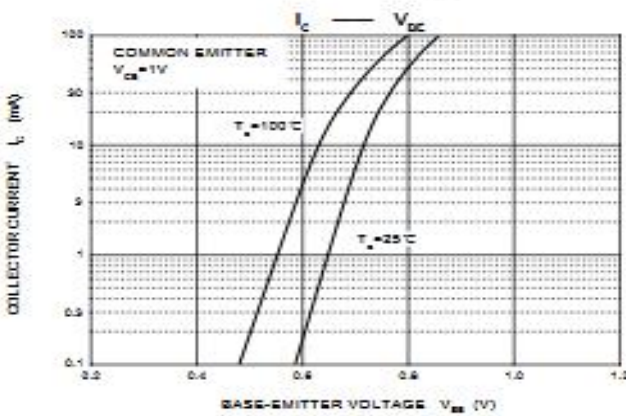
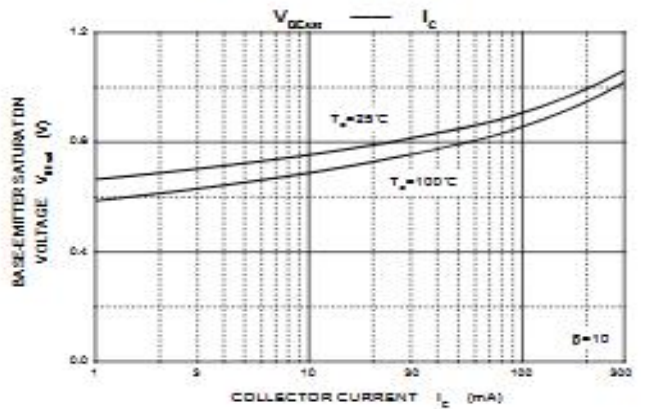
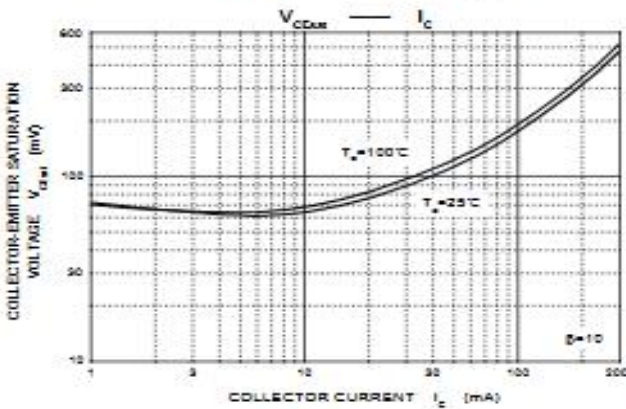
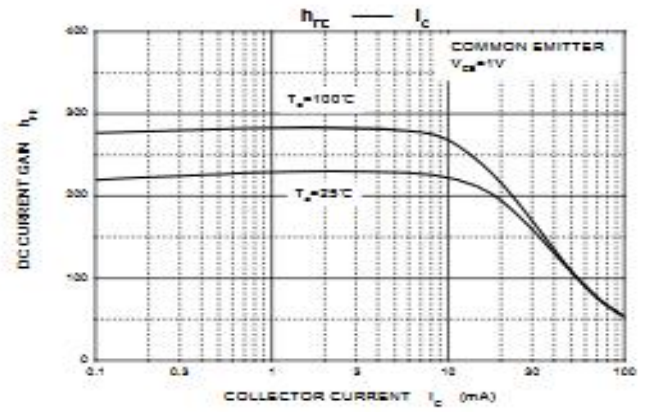
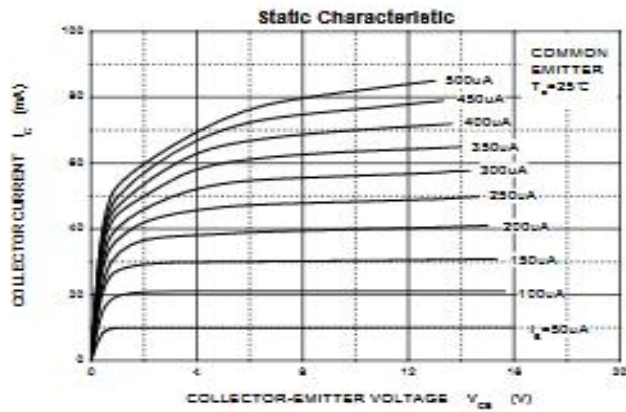
ELECTRICAL CHARACTERISTICS (Ta=25°C unless otherwise specified)

| Parameter | Symbol | Test Condition | Min | Typ | Max | Unit |
|--------------------------------------|----------|---------------------------------------|-----|-----|------|------|
| Collector-base breakdown voltage | V(BR)CBO | IC= 10μA, IE=0 | 60 | | | V |
| Collector-emitter breakdown voltage | V(BR)CEO | IC= 1mA, IB=0 | 40 | | | V |
| Emitter-base breakdown voltage | V(BR)EBO | IE= 10μA, IC=0 | 6 | | | V |
| Collector cut-off current | ICBO | VCB= 60 V , IE=0 | | | 0.1 | μA |
| Collector cut-off current | ICEO | VCE=30V, VEB(off)=3V | | | 50 | nA |
| Emitter cut-off current | IEBO | VEB= 6V , IC=0 | | | 0.1 | μA |
| DC current gain | hFE | VCE=1V, IC= 10mA | 100 | | 300 | |
| | hFE | VCE=1V, IC= 50mA | 60 | | | |
| | hFE | VCE=1V, IC= 100mA | 40 | | | |
| Collector-emitter saturation voltage | VCE(sat) | IC=50 mA, IB= 5mA | | | 0.3 | V |
| Base-emitter saturation voltage | VBE(sat) | IC=50 mA, IB= 5mA | | | 0.95 | V |
| Transition frequency | fT | VCE=20V, IC= 100mA f=100MHz | 300 | | | MHz |
| Delay time | td | VCC=3V, VBE=0.5V, IC=10mA, IB=1mA, | | | 35 | ns |
| Rise time | tr | VCC=3V, VBE=0.5V, IC=10mA, IB=1mA, | | | 35 | ns |
| Storage time | ts | VCC=3V, VBE=0.5V, IC=10mA, IB=1mA, | | | 200 | ns |
| Fall time | tf | VCC=3V, VBE=0.5V, IC=10mA, IB=1mA, | | | 50 | ns |

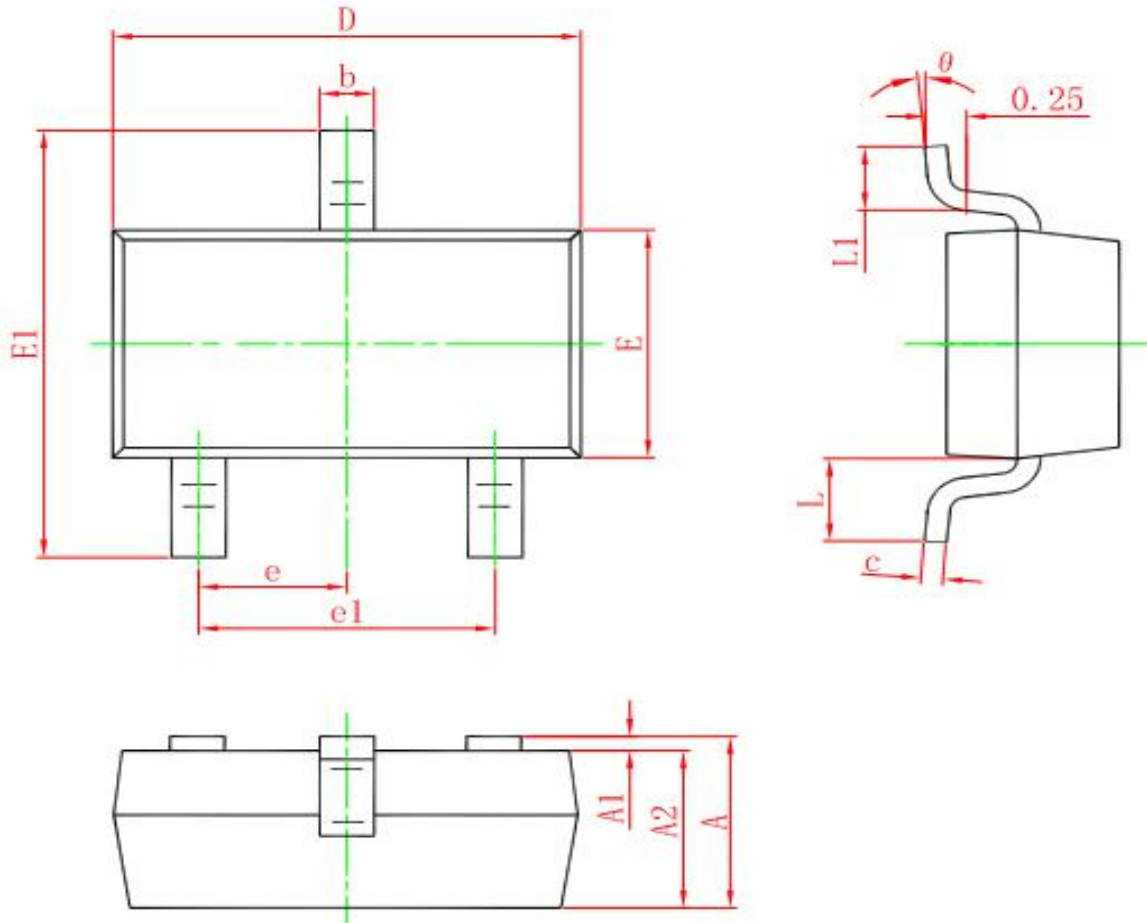
CLASSIFICATION OF HFE

| | | |
|--------------|----------------|----------------|
| HFE | 100-300 | |
| Rank | L | H |
| Range | 100-200 | 200-300 |

TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS



SOT-23 PACKAGE OUTLINE DIMENSIONS



| Symbol | Dimensions In Millimeters | | Dimensions In Inches | |
|--------|---------------------------|-------|----------------------|-------|
| | Min. | Max. | Min. | Max. |
| A | 0.900 | 1.150 | 0.035 | 0.045 |
| A1 | 0.000 | 0.100 | 0.000 | 0.004 |
| A2 | 0.900 | 1.050 | 0.035 | 0.041 |
| b | 0.300 | 0.500 | 0.012 | 0.020 |
| c | 0.080 | 0.150 | 0.003 | 0.006 |
| D | 2.800 | 3.000 | 0.110 | 0.118 |
| E | 1.200 | 1.400 | 0.047 | 0.055 |
| E1 | 2.250 | 2.550 | 0.089 | 0.100 |
| e | 0.950 TYP. | | 0.037 TYP. | |
| e1 | 1.800 | 2.000 | 0.071 | 0.079 |
| L | 0.550 REF. | | 0.022 REF. | |
| L1 | 0.300 | 0.500 | 0.012 | 0.020 |
| θ | 0° | 8° | 0° | 8° |