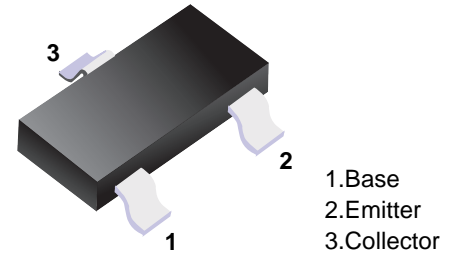


MMBTH10

NPN Transistors

■ Features

- Collector Current Capability $I_C=0.05A$
- Collector Emitter Voltage $V_{CE0}=25V$



■ Simplified outline(SOT-23)

■ Classification of hfe

| | |
|---------|-----|
| Marking | 3EM |
|---------|-----|

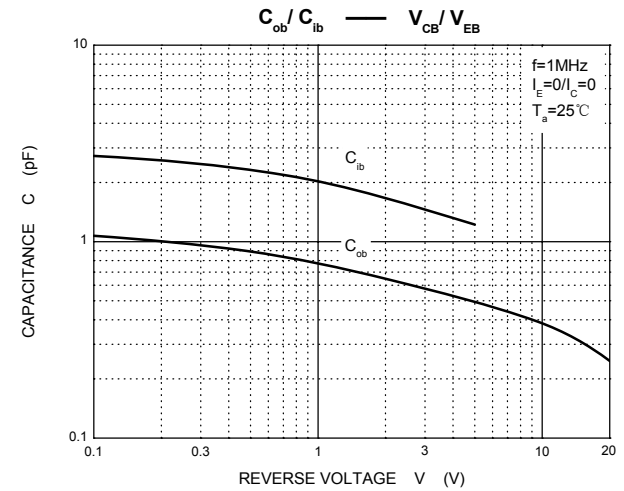
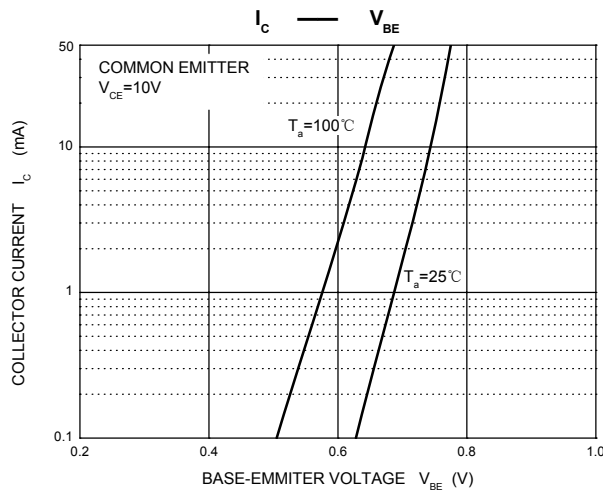
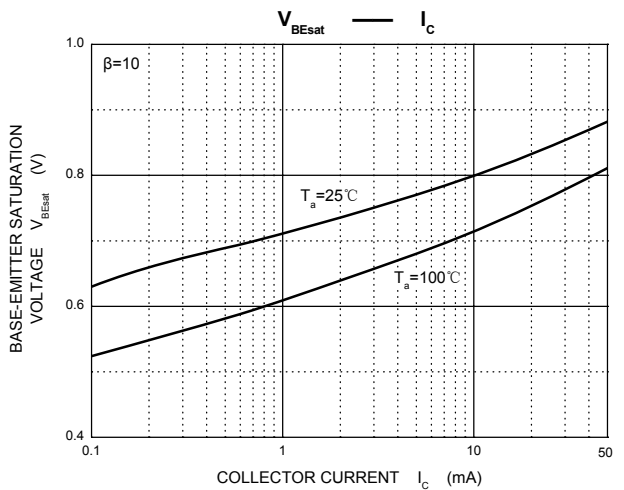
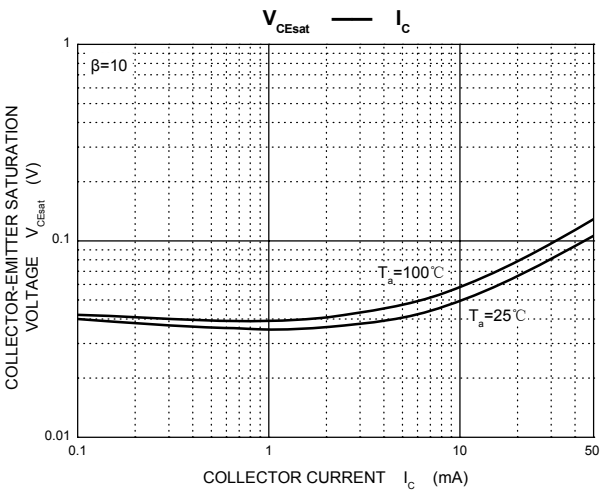
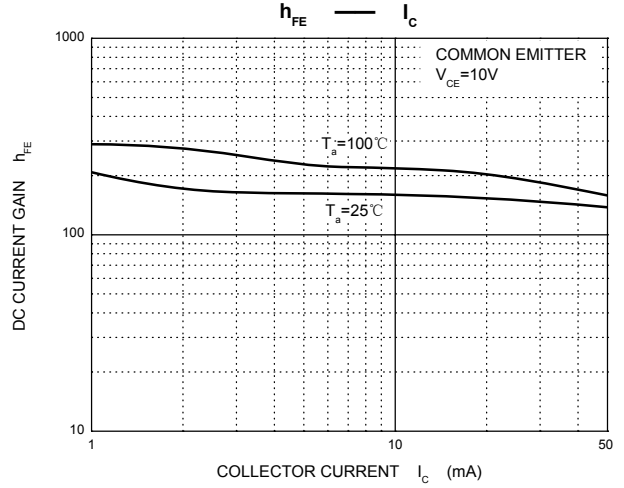
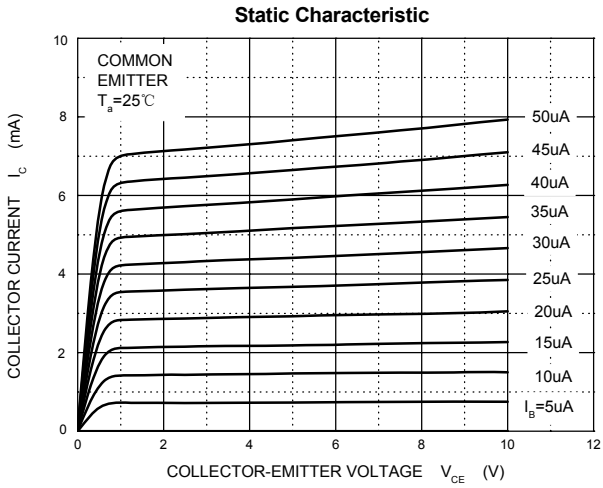
■ Absolute Maximum Ratings $T_a = 25^\circ C$

| Parameter | Symbol | Rating | Unit |
|--|-----------------|-------------|--------------|
| Collector - Base Voltage | V_{CBO} | 30 | V |
| Collector - Emitter Voltage | V_{CEO} | 25 | |
| Emitter - Base Voltage | V_{EBO} | 3 | |
| Collector Current - Continuous | I_C | 0.05 | A |
| Collector Power Dissipation | P_C | 225 | mW |
| Thermal Resistance Junction to Ambient | $R_{\theta JA}$ | 556 | $^\circ C/W$ |
| Junction Temperature | T_J | 150 | $^\circ C$ |
| Storage Temperature Range | T_{stg} | -55 to +150 | |

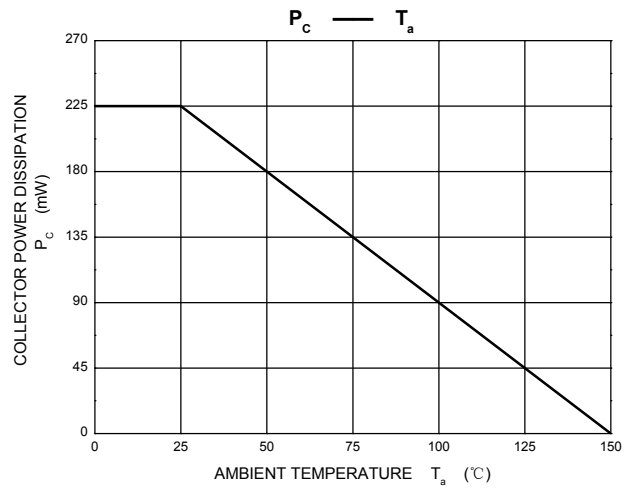
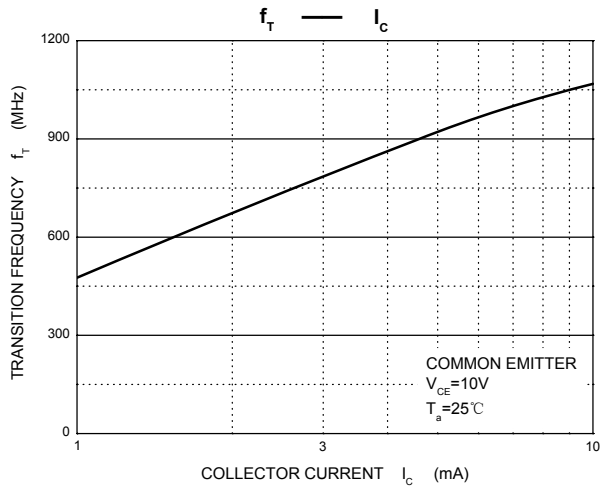
■ Electrical Characteristics $T_a = 25^\circ C$

| Parameter | Symbol | Test Conditions | Min | Typ | Max | Unit |
|--------------------------------------|---------------|-----------------------------------|-----|-----|------|------|
| Collector- base breakdown voltage | V_{CBO} | $I_C= 100 \mu A, I_E= 0$ | 30 | | | V |
| Collector- emitter breakdown voltage | V_{CEO} | $I_C= 1 mA, I_B= 0$ | 25 | | | |
| Emitter - base breakdown voltage | V_{EBO} | $I_E= 10 \mu A, I_C= 0$ | 3 | | | |
| Collector-base cut-off current | I_{CBO} | $V_{CB}=25 V, I_E= 0$ | | | 100 | nA |
| Emitter cut-off current | I_{EBO} | $V_{EB}= 2V, I_C=0$ | | | 100 | |
| Collector-emitter saturation voltage | $V_{CE(sat)}$ | $I_C=4 mA, I_B=0.4mA$ | | | 0.5 | V |
| Base - emitter saturation voltage | $V_{BE(sat)}$ | $I_C=4 mA, I_B=0.4mA$ | | | 1.2 | |
| Base - emitter saturation voltage | V_{BE} | $V_{CE}=10V, I_C= 4 mA$ | | | 0.95 | |
| DC current gain | h_{FE} | $V_{CE}= 10V, I_C= 4mA$ | 60 | | | |
| Collector output capacitance | C_{ob} | $V_{CB}= 10V, I_E= 0, f=1MHz$ | | | 0.7 | pF |
| Transition frequency | f_T | $V_{CE}= 10V, I_C= 4mA, f=100MHz$ | 650 | | | MHz |

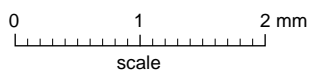
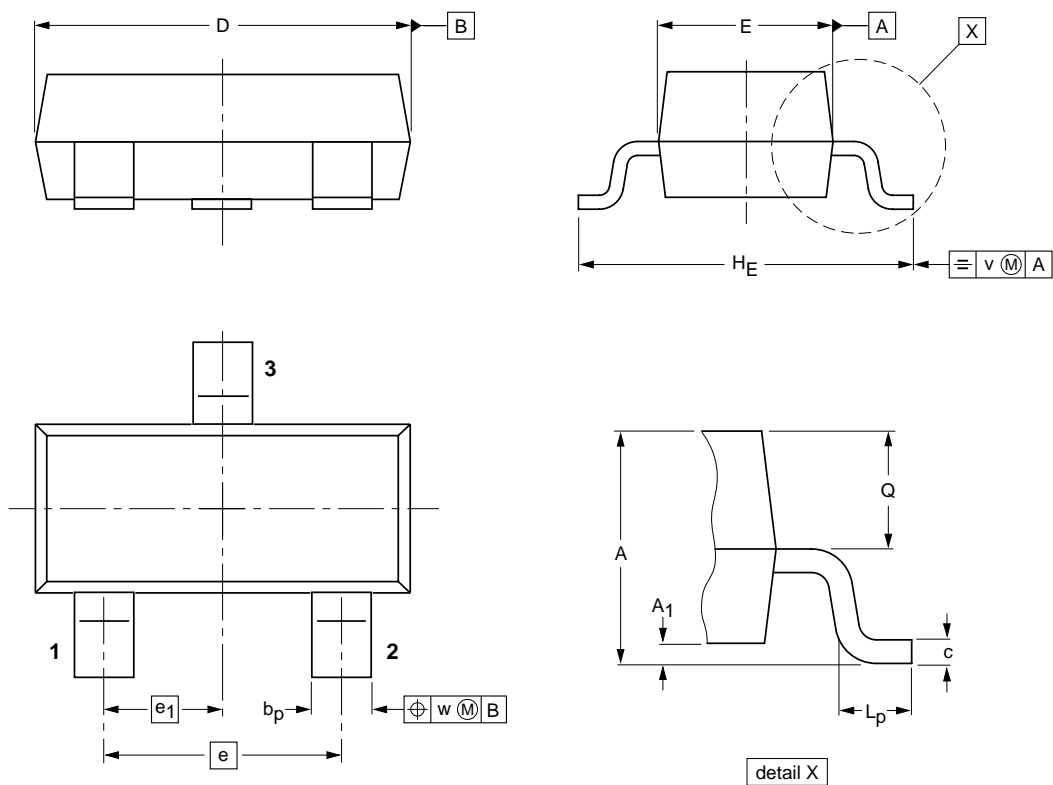
■ Typical Characteristics



■ Typical Characteristics



■ SOT-23



DIMENSIONS (mm are the original dimensions)

| UNIT | A | A ₁ max. | b _p | c | D | E | e | e ₁ | H _E | L _p | Q | v | w |
|------|------------|------------------------|----------------|--------------|------------|------------|-----|----------------|----------------|----------------|--------------|-----|-----|
| mm | 1.1 0.9 | 0.1 | 0.48 0.38 | 0.15 0.09 | 3.0 2.8 | 1.4 1.2 | 1.9 | 0.95 | 2.5 2.1 | 0.45 0.15 | 0.55 0.45 | 0.2 | 0.1 |