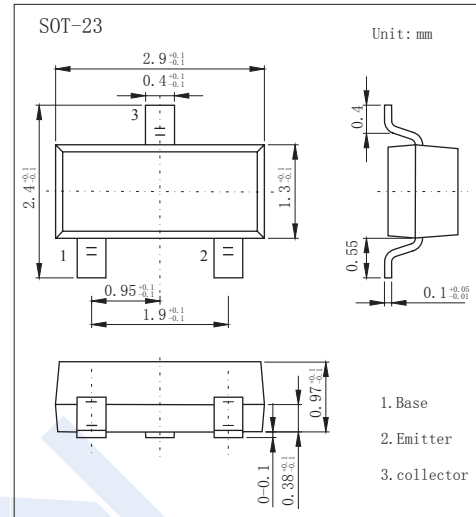


NPN Transistors

MMBT5089 (KMBT5089)

■ Features

- Collector Current Capability $I_c=100\text{mA}$
- Collector Emitter Voltage $V_{CE0}=25\text{V}$



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

| Parameter | Symbol | Rating | Unit |
|---|-----------------|------------|---------------------------|
| Collector - Base Voltage | V_{CBO} | 30 | V |
| Collector - Emitter Voltage | V_{CEO} | 25 | |
| Emitter - Base Voltage | V_{EBO} | 4.5 | |
| Collector Current - Continuous | I_c | 100 | mA |
| Collector Power Dissipation | P_C | 350 | mW |
| Derate above 25°C | | 2.8 | mw/ $^\circ\text{C}$ |
| Thermal Resistance, Junction to Ambient | $R_{\theta JA}$ | 357 | $^\circ\text{C}/\text{W}$ |
| Junction Temperature | T_J | 150 | $^\circ\text{C}$ |
| Storage Temperature Range | T_{stg} | -55 to 150 | |

NPN Transistors

MMBT5089 (KMBT5089)

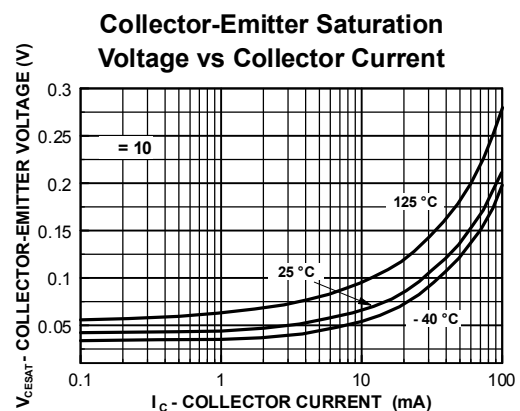
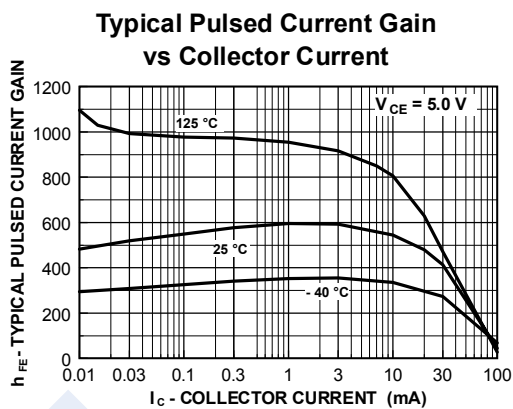
■ Electrical Characteristics $T_a = 25^\circ\text{C}$

| Parameter | Symbol | Test Conditions | Min | Typ | Max | Unit |
|--------------------------------------|---------------|---|-----|-----|------|------|
| Collector- base breakdown voltage | V_{CB0} | $I_c = 100 \mu\text{A}, I_E = 0$ | 30 | | | V |
| Collector- emitter breakdown voltage | V_{CE0} | $I_c = 1 \text{ mA}, I_B = 0$ | 25 | | | |
| Emitter - base breakdown voltage | V_{EB0} | $I_E = 100 \mu\text{A}, I_c = 0$ | 5 | | | |
| Collector-base cut-off current | I_{CB0} | $V_{CB} = 15 \text{ V}, I_E = 0$ | | | 50 | nA |
| Emitter cut-off current | I_{EBO} | $V_{EB} = 3 \text{ V}, I_c = 0$ | | | 50 | |
| | | $V_{EB} = 4.5 \text{ V}, I_c = 0$ | | | 100 | |
| Collector-emitter saturation voltage | $V_{CE(sat)}$ | $I_c = 10 \text{ mA}, I_B = 1 \text{ mA}$ | | | 0.5 | V |
| Base - emitter saturation voltage | $V_{BE(sat)}$ | $I_c = 10 \text{ mA}, I_B = 1 \text{ mA}$ | | | 1.2 | |
| Base-Emitter On Voltage | $V_{BE(on)}$ | $V_{CE} = 5 \text{ V}, I_c = 10 \text{ mA}$ | | | 0.8 | |
| DC current gain | $h_{FE(1)}$ | $V_{CE} = 5 \text{ V}, I_c = 0.1 \text{ mA}$ | 400 | | 1200 | |
| | $h_{FE(2)}$ | $V_{CE} = 5 \text{ V}, I_c = 1 \text{ mA}$ | 450 | | | |
| | $h_{FE(3)}$ | $V_{CE} = 5 \text{ V}, I_c = 10 \text{ mA}$ | 400 | | | |
| Small-Signal Current Gain | h_{fe} | $I_c = 1 \text{ mA}, V_{CE} = 5 \text{ V}, f = 1 \text{ kHz}$ | 450 | | 1800 | |
| Noise Figure | NF | $I_c = 100 \mu\text{A}, V_{CE} = 5.0 \text{ V}, R_s = 10 \text{ k}\Omega, f = 10 \text{ Hz to } 15.7 \text{ kHz}$ | | | 2 | dB |
| Collector-Base Capacitance | C_{cb} | $V_{CB} = 5 \text{ V}, I_E = 0, f = 100 \text{ kHz}$ | | | 4 | pF |
| Emitter-Base Capacitance | C_{eb} | $V_{BE} = 0.5 \text{ V}, I_c = 0, f = 100 \text{ kHz}$ | | | 10 | |
| Transition frequency | f_T | $V_{CE} = 5 \text{ V}, I_c = 0.5 \text{ mA}, f = 20 \text{ MHz}$ | 50 | | | MHz |

■ Marking

| | |
|---------|----|
| Marking | 1R |
|---------|----|

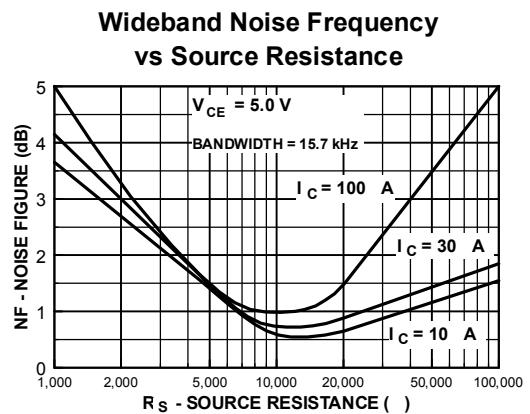
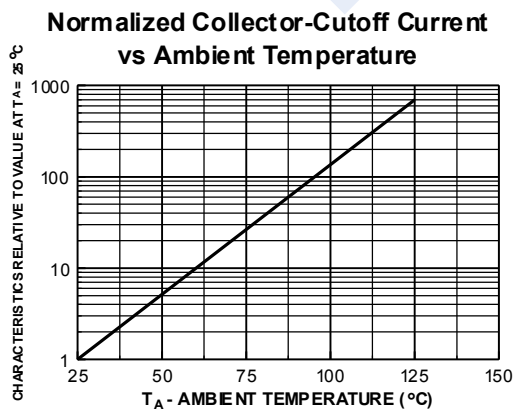
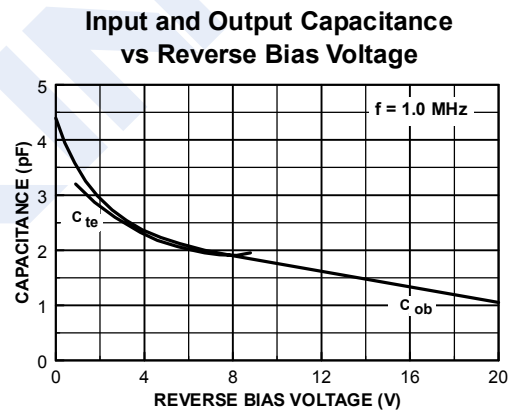
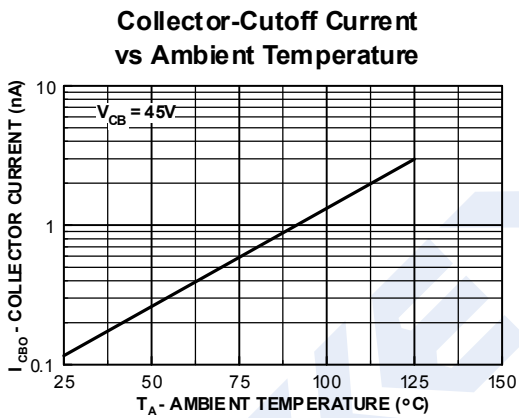
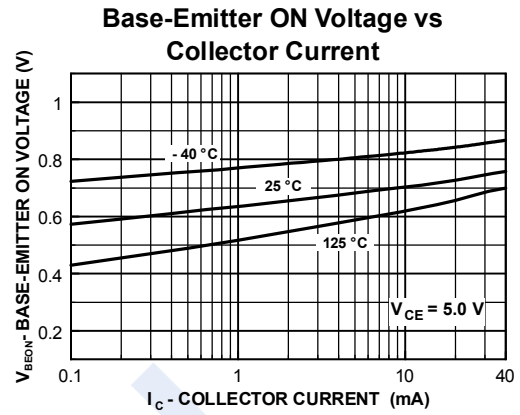
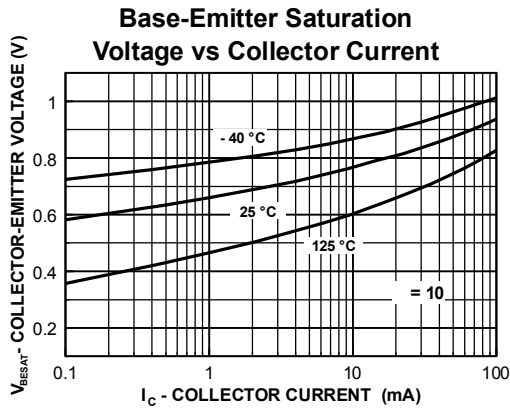
■ Typical Characteristics



NPN Transistors

MMBT5089 (KMBT5089)

■ Typical Characteristics

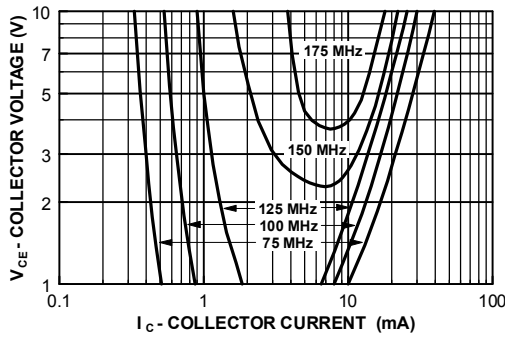


NPN Transistors

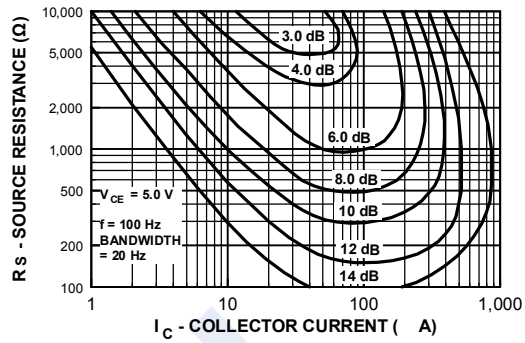
MMBT5089 (KMBT5089)

■ Typical Characteristics

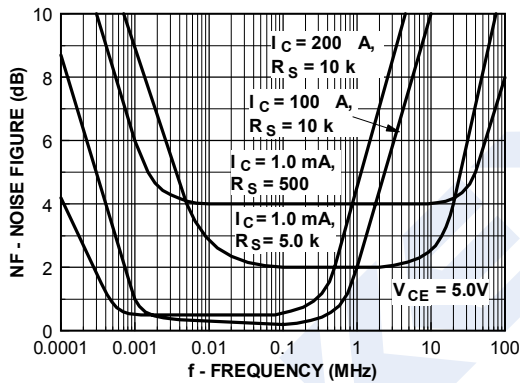
Contours of Constant Bandwidth Product (f_T)



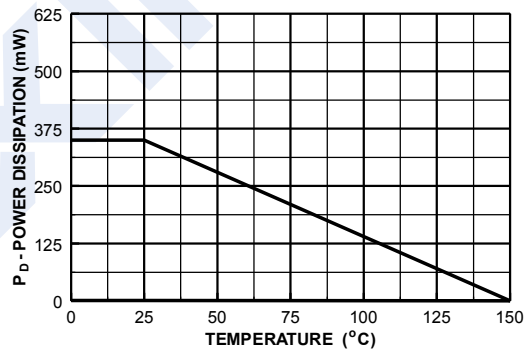
Contours of Constant Narrow Band Noise Figure



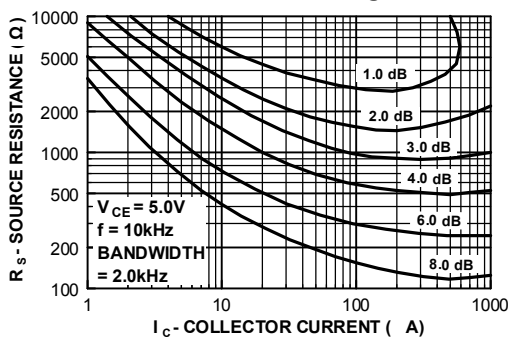
Noise Figure vs Frequency



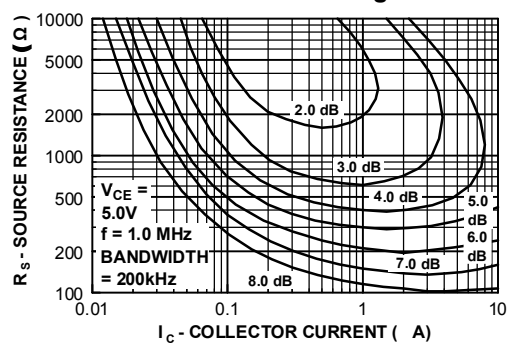
Power Dissipation vs Ambient Temperature



Contours of Constant Narrow Band Noise Figure



Contours of Constant Narrow Band Noise Figure

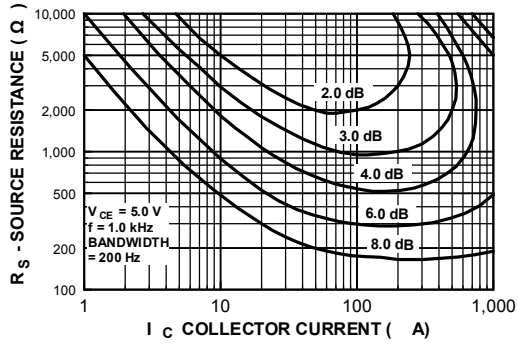


NPN Transistors

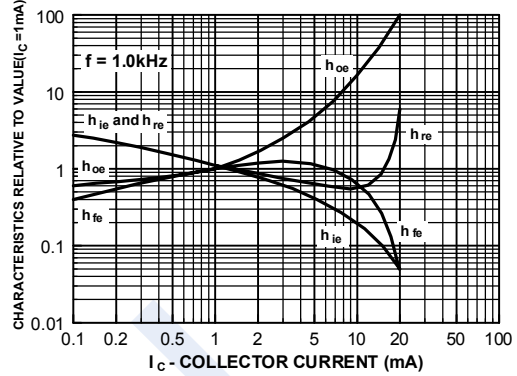
MMBT5089 (KMBT5089)

■ Typical Characteristics

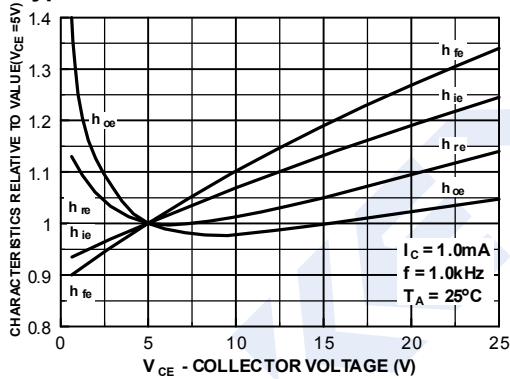
Contours of Constant Narrow Band Noise Figure



Typical Common Emitter Characteristics



Typical Common Emitter Characteristics



Typical Common Emitter Characteristics

