



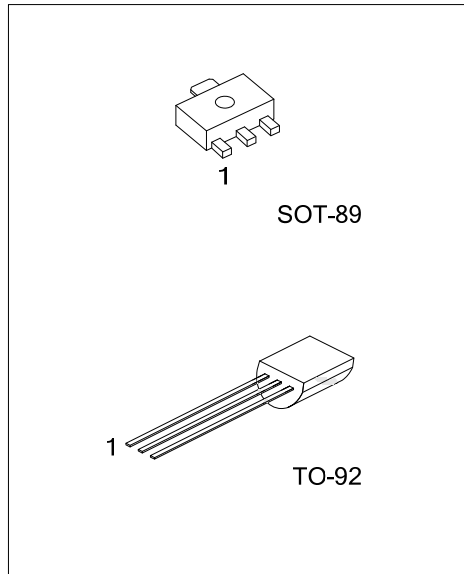
MJE13001

NPN SILICON TRANSISTOR

NPN SILICON POWER TRANSISTOR

■ **FEATURES**

- * Collector-base voltage: $V_{(BR)CBO}=600V$
- * Collector current: $I_C=0.2A$



■ **ORDERING INFORMATION**

| Ordering Number | | Package | Pin Assignment | | | Packing |
|---------------------|---------------------|---------|----------------|---|---|-----------|
| Lead Free | Halogen Free | | 1 | 2 | 3 | |
| - | MJE13001G-x-AB3-A-R | SOT-89 | E | C | B | Tape Reel |
| - | MJE13001G-x-AB3-F-R | SOT-89 | B | C | E | Tape Reel |
| MJE13001L-x-T92-B | MJE13001G-x-T92-B | TO-92 | B | C | E | Tape Box |
| MJE13001L-x-T92-K | MJE13001G-x-T92-K | TO-92 | B | C | E | Bulk |
| MJE13001L-x-T92-A-B | MJE13001G-x-T92-A-B | TO-92 | E | C | B | Tape Box |
| MJE13001L-x-T92-A-K | MJE13001G-x-T92-A-K | TO-92 | E | C | B | Bulk |

Note: Pin Assignment: C: Collector B: Base E: Emitter

| | |
|--|--|
| <p>MJE13001G-x-AB3-A-B</p> <p>(1)Packing Type (2)Pin Assignment (3)Package Type (4)Rank (5)Green Package</p> | <p>(1) B: Tape Box, K: Bulk, R: Tape Reel (2) refer to Pin Assignment (3) AB3: SOT-89, T92: TO-92 (4) x: refer to Classification of h_{FE1} (5) G: Halogen Free and Lead Free, L: Lead Free</p> |
|--|--|

■ **MARKING**

| SOT-89 | TO-92 |
|----------|--|
| <p>1</p> | <p>1</p> <p>L: Lead Free G: Halogen Free</p> |

■ ABSOLUTE MAXIMUM RATINGS

| PARAMETER | | SYMBOL | RATINGS | UNIT |
|-----------------------------|--------|-----------|------------|------|
| Collector-Emitter Voltage | | V_{CEO} | 400 | V |
| Collector-Base Voltage | | V_{CBO} | 600 | V |
| Emitter Base Voltage | | V_{EBO} | 7 | V |
| Collector Current | | I_C | 200 | mA |
| Collector Power Dissipation | SOT-89 | P_C | 550 | mW |
| | TO-92 | | 750 | |
| Junction Temperature | | T_J | +150 | °C |
| Storage Temperature | | T_{STG} | -55 ~ +150 | °C |

Note: Absolute maximum ratings are those values beyond which the device could be permanently damaged.

Absolute maximum ratings are stress ratings only and functional device operation is not implied.

■ ELECTRICAL CHARACTERISTICS ($T_A=25^\circ\text{C}$, unless otherwise specified)

| PARAMETER | SYMBOL | TEST CONDITIONS | MIN | TYP | MAX | UNIT |
|-------------------------------------|------------|-------------------------------------|-----|-----|-----|---------------|
| Collector-Base Breakdown Voltage | BV_{CBO} | $I_C=100\mu\text{A}, I_E=0$ | 600 | | | V |
| Collector-Emitter Breakdown Voltage | BV_{CEO} | $I_C=1\text{mA}, I_B=0$ | 400 | | | V |
| Emitter-Base Breakdown Voltage | BV_{EBO} | $I_E=100\mu\text{A}, I_C=0$ | 7 | | | V |
| Base-Emitter Voltage | V_{BE} | $I_E=100\text{mA}$ | | | 1.1 | V |
| Collector Cutoff Cut-Off Current | I_{CBO} | $V_{CB}=600\text{V}, I_E=0\text{A}$ | | | 100 | μA |
| Collector Emitter Cut-Off Current | I_{CEO} | $V_{CE}=400\text{V}, I_B=0$ | | | 200 | μA |
| Emitter Cutoff Cut-Off Current | I_{EBO} | $V_{EB}=7\text{V}, I_C=0\text{A}$ | | | 100 | μA |

ON CHARACTERISTICS

| | | | | | | |
|--------------------------------------|---------------|--|----|--|-----|---|
| DC Current Gain | h_{FE1}^* | $V_{CE}=20\text{V}, I_C=20\text{mA}$ | 10 | | 70 | |
| | h_{FE2} | $V_{CE}=10\text{V}, I_C=0.25\text{mA}$ | 5 | | | |
| Collector-Emitter Saturation Voltage | $V_{CE(SAT)}$ | $I_C=50\text{mA}, I_B=10\text{mA}$ | | | 0.5 | V |
| Base-Emitter Saturation Voltage | $V_{BE(SAT)}$ | $I_C=50\text{mA}, I_B=10\text{mA}$ | | | 1.2 | V |

SMALL-SIGNAL CHARACTERISTICS

| | | | | | | |
|--------------------------------|-------|---|---|--|--|-----|
| Current Gain Bandwidth Product | f_T | $I_C=20\text{mA}, V_{CE}=20\text{V}, f=1\text{MHz}$ | 8 | | | MHz |
|--------------------------------|-------|---|---|--|--|-----|

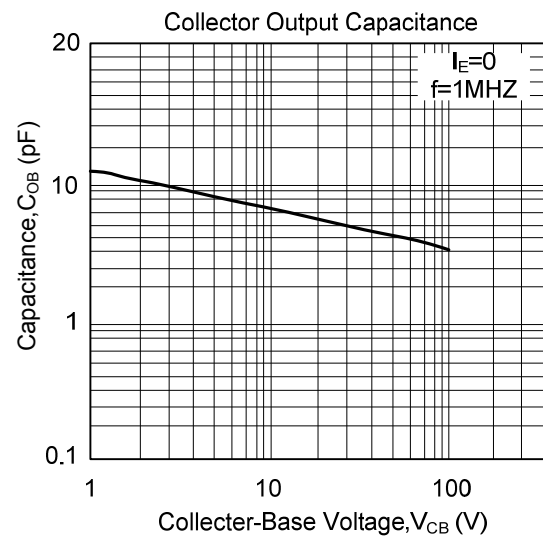
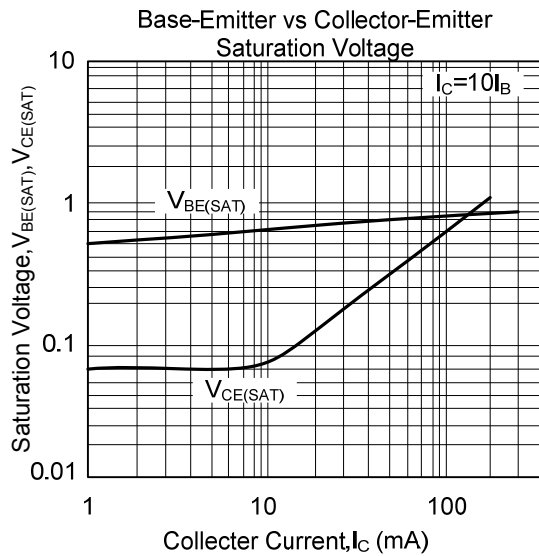
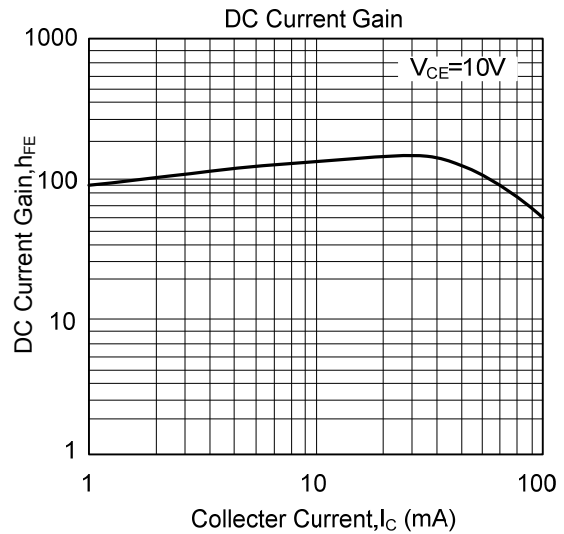
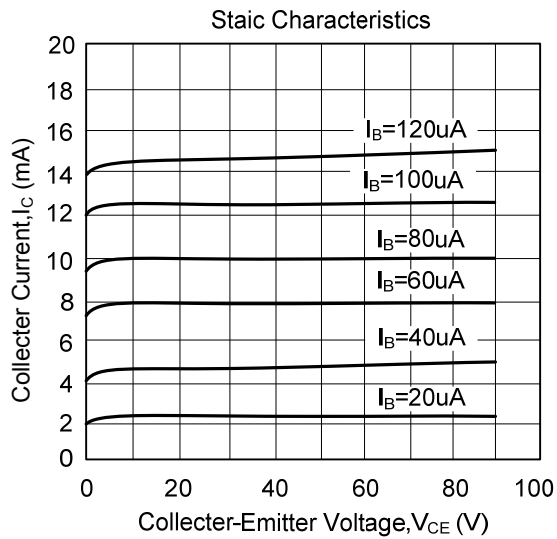
Resistive Load

| | | | | | | |
|--------------|-------|---|--|--|-----|---------------|
| Storage Time | t_s | $I_C=50\text{mA}, I_{B1}=-I_{B2}=5\text{mA},$ | | | 1.5 | μs |
| Fall Time | t_f | $V_{CC}=45\text{V}$ | | | 0.3 | μs |

■ CLASSIFICATION OF h_{FE1}^*

| RANK | A | B | C | D | E | F | G | H | I | J | K | L |
|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| RANGE | 10-15 | 15-20 | 20-25 | 25-30 | 30-35 | 35-40 | 40-45 | 45-50 | 50-55 | 55-60 | 60-65 | 65-70 |

TYPICAL CHARACTERISTICS



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