



MJE13005D

Preliminary

NPN SILICON TRANSISTOR

HIGH VOLTAGE FAST-SWITCHING NPN POWER TRANSISTOR

DESCRIPTION

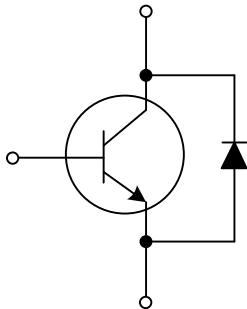
The UTC **MJE13005D** is a high voltage fast-switching NPN power transistor. It is characterized by high breakdown voltage, high current capability, high switching speed and high reliability.

The UTC **MJE13005D** is intended to be used in energy-saving light, electronic ballast, high frequency switching power supply, high frequency power transform or common power amplifier, etc.

FEATURES

- * High Breakdown Voltage
- * High Current Capability
- * High Switching Speed
- * High Reliability
- * RoHS-Compliant Product

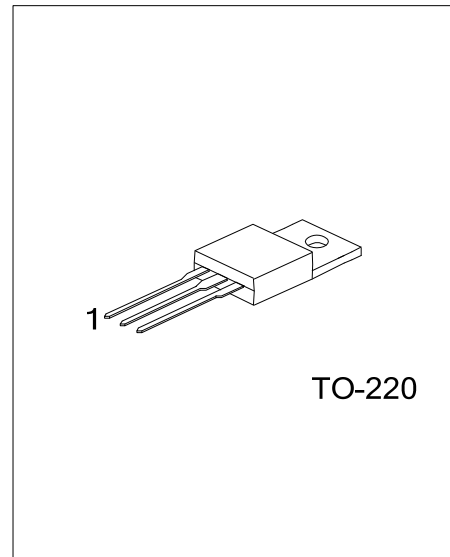
INTERNAL SCHEMATIC DIAGRAM



ORDERING INFORMATION

| Ordering Number | | Package | Pin Assignment | | | Packing |
|------------------|------------------|---------|----------------|---|---|---------|
| Lead Free | Halogen Free | | 1 | 2 | 3 | |
| MJE13005DL-TA3-T | MJE13005DG-TA3-T | TO-220 | B | C | E | Tube |

| | |
|---|---|
| <p>MJE13005DL-TA3-T</p> <ul style="list-style-type: none"> (1) Packing Type (2) Package Type (3) Lead Free | <ul style="list-style-type: none"> (1) T: Tube (2) TA3: TO-220 (3) G: Halogen Free, L: Lead Free |
|---|---|



■ ABSOLUTE MAXIMUM RATING ($T_C=25^\circ\text{C}$)

| PARAMETER | | SYMBOL | RATING | UNIT |
|---|-------|-----------|------------|------------------|
| Collector- Emitter Voltage ($V_{BE}=0$) | | V_{CES} | 700 | V |
| Collector-Emitter Voltage ($I_B=0$) | | V_{CEO} | 400 | V |
| Emitter-Base Voltage | | V_{EBO} | 9 | V |
| Collector Current | DC | I_C | 4 | A |
| | Pulse | I_{CP} | 8 | A |
| Base Current | DC | I_B | 2 | A |
| | Pulse | I_{BP} | 4 | A |
| Power Dissipation | | P_D | 75 | W |
| Storage Temperature | | T_{STG} | -55 ~ +150 | $^\circ\text{C}$ |

Notes: 1. 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.

2. Pulse Test: Pulse Width = 5.0 ms, Duty Cycle < 10%.

■ THERMAL DATA

| PARAMETER | SYMBOL | RATING | UNIT |
|---------------------|---------------|--------|--------------------|
| Junction to Ambient | θ_{JA} | 62.5 | $^\circ\text{C/W}$ |
| Junction to Case | θ_{JC} | 1.67 | $^\circ\text{C/W}$ |

■ ELECTRICAL CHARACTERISTICS

| PARAMETER | | SYMBOL | TEST CONDITIONS | MIN | TYP | MAX | UNIT |
|--------------------------------------|--------------|---------------|--|-----|-----|-----|---------------|
| Collector-Emitter Breakdown Voltage | | BV_{CEO} | $I_C=10\text{mA}, I_B=0$ | 400 | | | V |
| Collector -Base Breakdown Voltage | | BV_{CBO} | $I_C=1\text{mA}, I_B=0$ | 700 | | | V |
| Emitter-Base Breakdown Voltage | | BV_{EBO} | $I_E=1\text{mA}, I_C=0$ | 9 | | | V |
| Collect Cut-off Current | | I_{CBO} | $V_{CB}=700\text{V}, I_E=0$ | | | 100 | μA |
| Collect Cut-off Current | | I_{CEO} | $V_{CE}=400\text{V}, I_B=0$ | | | 50 | μA |
| Emitter Cut-off Current | | I_{EBO} | $V_{EB}=9\text{V}, I_C=0$ | | | 10 | μA |
| DC Current Gain | | h_{FE1} | $V_{CE}=5\text{V}, I_C=500\text{mA}$ | 8 | | 50 | |
| | | h_{FE2} | $V_{CE}=5\text{V}, I_C=2\text{A}$ | 5 | | | |
| Collector-Emitter Saturation Voltage | | V_{CE} | $I_C=1\text{A}, I_B=0.2\text{A}$ | | | 0.5 | V |
| | | | $I_C=2\text{A}, I_B=0.5\text{A}$ | | | 0.6 | |
| | | | $I_C=4\text{A}, I_B=1\text{A}$ | | | 1 | |
| | | | $I_C=2\text{A}, I_B=0.5\text{A}, T_C=100^\circ\text{C}$ | | | 1 | |
| Base-Emitter Saturation Voltage | | $V_{BE(SAT)}$ | $I_C=2\text{A}, I_B=0.5\text{A}$ | | | 1.6 | V |
| Resistive Load | Fall Time | t_F | $V_{CC}=24\text{V}, I_C=2\text{A}, I_{B1}=-I_{B2}=0.4\text{A}$ | | | 0.7 | μs |
| | Storage Time | t_S | | | | 4 | μs |
| Current Gain Bandwidth Product | | f_T | $V_{CE}=10\text{V}, I_C=0.5\text{A}$ | 4 | | | MHz |

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