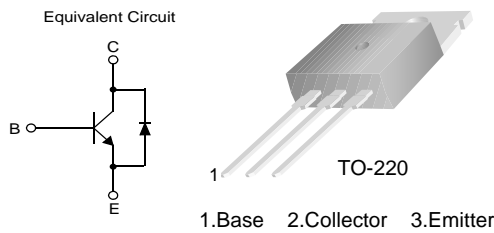


FJP5304D

NPN Silicon Transistor

High Voltage High Speed Power Switch Application

- Wide Safe Operating Area
- Built-in Free Wheeling diode Suitable for Electronic Ballast Application
- Suitable for Electronic Ballast Application
- Small Variance in Storage Time



Absolute Maximum Ratings $T_C=25^\circ\text{C}$ unless otherwise noted

| Symbol | Parameter | Value | Units |
|-----------|--|------------|------------------|
| V_{CBO} | Collector-Base Voltage | 700 | V |
| V_{CEO} | Collector-Emitter Voltage | 400 | V |
| V_{EBO} | Emitter-Base Voltage | 12 | V |
| I_C | Collector Current (DC) | 4 | A |
| I_{CP} | * Collector Current (Pulse) | 8 | A |
| I_B | Base Current (DC) | 2 | A |
| I_{BP} | * Base Current (Pulse) | 4 | A |
| P_C | Collector Dissipation ($T_C=25^\circ\text{C}$) | 70 | W |
| T_{STG} | Storage Temperature | - 65 ~ 150 | $^\circ\text{C}$ |

* Pulse Test Pulse Width = 5ms, Duty Cycle \geq 1.0%

Electrical Characteristics $T_C=25^\circ\text{C}$ unless otherwise noted

| Symbol | Parameter | Test Condition | Min. | Typ. | Max. | Units |
|------------|-------------------------------------|------------------------------------|------|------|------|-------|
| BV_{CBO} | Collector-Base Breakdown Voltage | $I_C = 1\text{mA}, I_E = 0$ | 700 | | | V |
| BV_{CEO} | Collector-Emitter Breakdown Voltage | $I_C = 5\text{mA}, I_B = 0$ | 400 | | | V |
| BV_{EBO} | Emitter-Base Breakdown Voltage | $I_E = 1\text{mA}, I_C = 0$ | 12 | | | V |
| I_{CES} | Collector Cut-off Current | $V_{CE} = 700\text{V}, V_{EB} = 0$ | | | 100 | mA |
| I_{CEO} | Collector Cut-off Current | $V_{CE} = 400\text{V}, I_B = 0$ | | | 250 | mA |
| I_{EBO} | Emitter Cut-off Current | $V_{EB} = 12\text{V}, I_C = 0$ | | | 100 | mA |

| | | | | | | |
|--|--------------------------------------|--|---------|-----|-------------------|---------|
| h_{FE} | DC Current Gain | $V_{CE} = 5V, I_C = 10mA$ $V_{CE} = 5V, I_C = 2A$ | 10 8 | | 40 | |
| $V_{CE(sat)}$ | Collector-Emitter Saturation Voltage | $I_C = 0.5A, I_B = 0.1A$ $I_C = 1A, I_B = 0.2A$ $I_C = 2.5A, I_B = 0.5A$ | | | 0.7 1.0 1.5 | V |
| $V_{BE(sat)}$ | Base-Emitter Saturation Voltage | $I_C = 0.5A, I_B = 0.1A$ $I_C = 1A, I_B = 0.2A$ $I_C = 2.5A, I_B = 0.5A$ | | | 1.1 1.2 1.3 | V |
| V_f | Internal Diode Forward Voltage Drop | $I_F = 2A$ | | | 2.5 | V |
| Inductive Load Switching ($V_{CC} = 200V$) | | | | | | |
| t_{stg} | Storage Time | $I_C = 2A, I_{B1} = 0.4A$ $V_{BE(off)} = -5V, L = 200\mu H$ | | 0.6 | | μs |
| t_f | Fall Time | | | 0.1 | | |
| Resistive Load Switching ($V_{CC} = 250V$) | | | | | | |
| t_{stg} | Storage Time | $I_C = 2A, I_{B1} = I_{B2} = 0.4A$ $T_P = 30\mu s$ | | | 2.9 | μs |
| t_f | Fall Time | | | 0.2 | | |

* Pulse test: $PW \leq 300\mu s$, Duty cycle $\leq 2\%$

Thermal Characteristics

| Symbol | Parameter | Max. | Units |
|-----------------|---|------|---------------|
| $R_{\theta JC}$ | Thermal Resistance, Junction to Case | 1.78 | $^{\circ}C/W$ |
| $R_{\theta JA}$ | Thermal Resistance, Junction to Ambient | 62.5 | $^{\circ}C/W$ |

Typical Characteristics

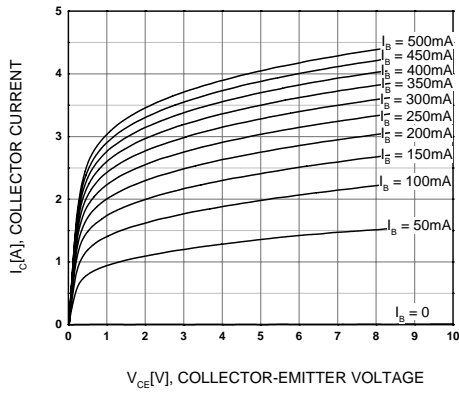


Figure 1. Static Characteristic

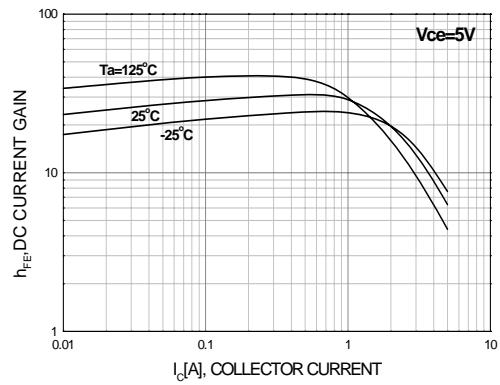


Figure 2. DC Current Gain

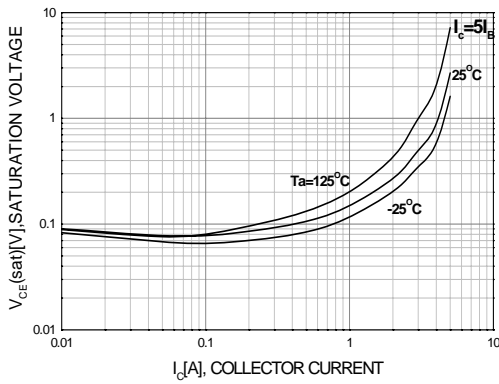


Figure 3. Collector-Emitter Saturation Voltage

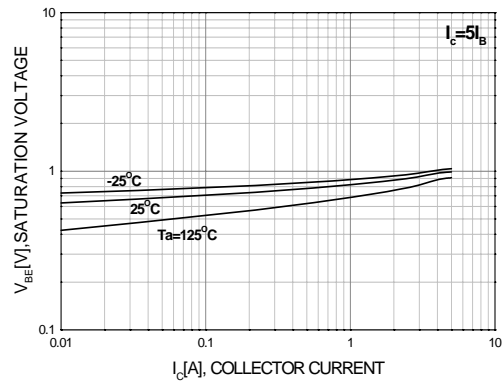


Figure 4. Base-Emitter Saturation Voltage

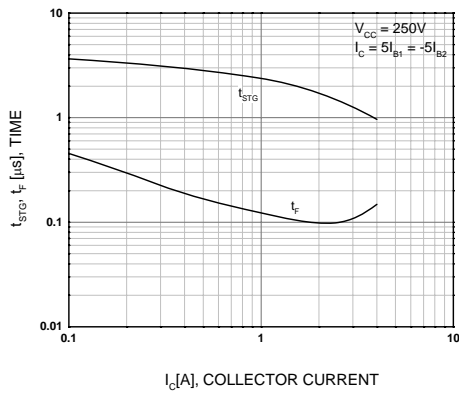


Figure 5. Resistive Load Switching Time

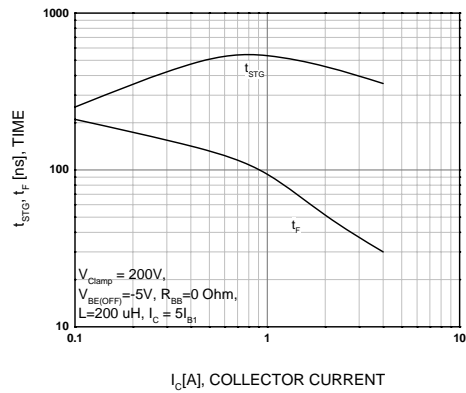


Figure 6. Inductive Load Switching Time

Typical Characteristics (Continued)

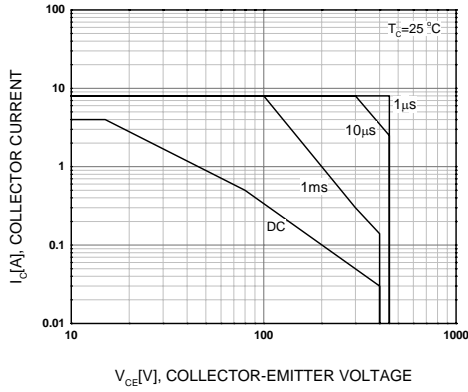


Figure 1. Forward Bias Safe Operating Area

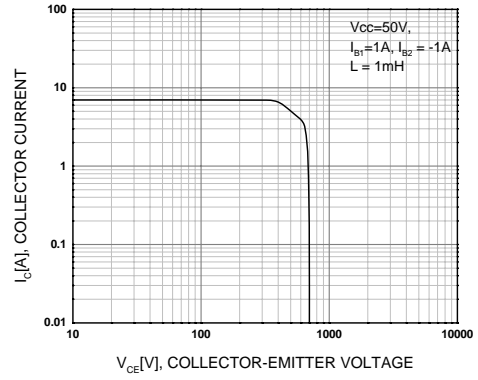


Figure 2. Reverse Bias Safe Operating Area

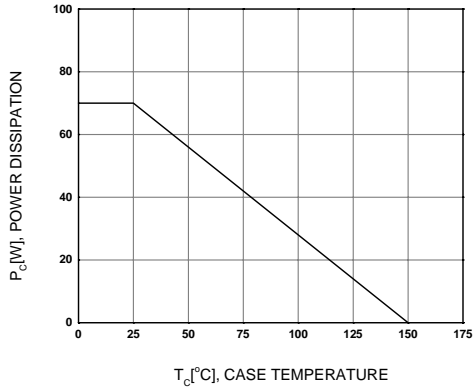
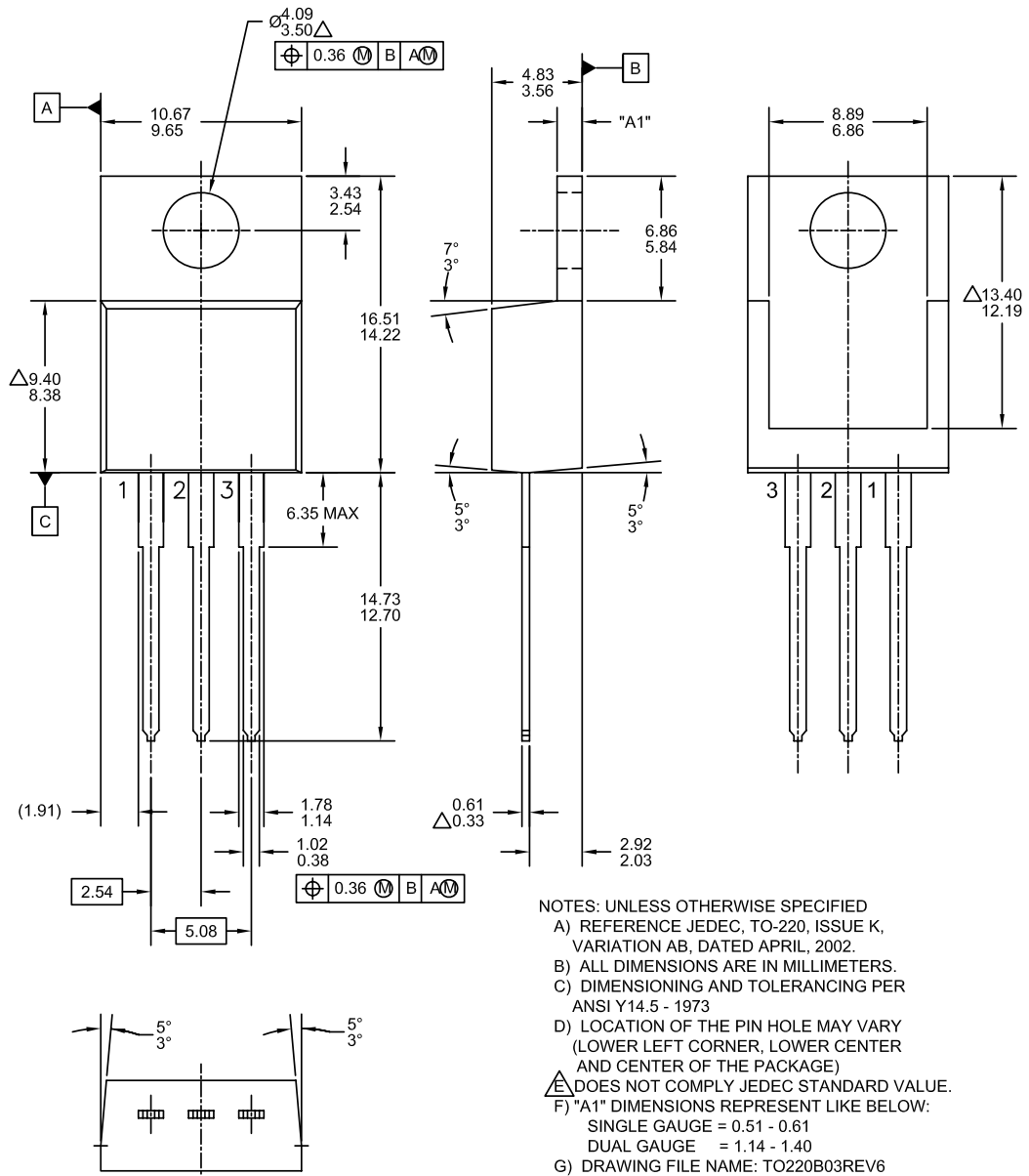


Figure 3. Power Derating

Mechanical Dimensions

TO220





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Rev. 135



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