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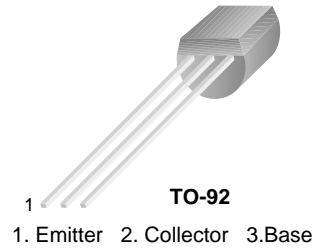


December 2009

FJN3303F High Voltage Fast-Switching NPN Power Transistor

Features

- High Voltage Capability
- High Switching Speed
- Suitable for Electronic Ballast and Charger
- Green packaging



Absolute Maximum Ratings $T_A = 25^\circ\text{C}$ 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 | 9 | V |
| I_C | Collector Current (DC) | 1.5 | A |
| I_{CP} | Collector Current (Pulse) * | 3 | A |
| I_B | Base Current (DC) | 0.75 | A |
| I_{BP} | Base Current (Pulse) * | 1.5 | A |
| T_J | Junction Temperature | 150 | $^\circ\text{C}$ |
| T_{STG} | Storage Temperature range | -65 to +150 | $^\circ\text{C}$ |

* Pulse Test: Pulse Width = 5ms, Duty Cycle \leq 10%

Thermal Characteristics $T_A = 25^\circ\text{C}$ unless otherwise noted

| Symbol | Parameter | Value | Units | |
|-----------------|-------------------------------------|--------------------------|---------------------------|----|
| P_D | Total Device Dissipation | $T_C = 25^\circ\text{C}$ | 1.1 | W |
| | | $T_A = 25^\circ\text{C}$ | 650 | mW |
| $R_{\theta JC}$ | Thermal Resistance Junction-Case | 48 | $^\circ\text{C}/\text{W}$ | |
| $R_{\theta JA}$ | Thermal Resistance Junction-Ambient | 190 | $^\circ\text{C}/\text{W}$ | |

Ordering Information

| Part Number | Marking Info. | Package | Packing Method | Remarks |
|-------------|---------------|------------------|----------------|-----------|
| FJN3303FBU | J3303F | TO-92 (Straight) | BULK | Green EMC |
| FJN3303FTA | J3303F | TO-92 (Form) | AMMO | Green EMC |

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

| Symbol | Parameter | Conditions | Min. | Typ. | Max. | Units |
|------------------------|--------------------------------------|---|---------|------|-------------------|---------------|
| BV_{CBO} | Collector-Base Breakdown Voltage | $I_C = 500\mu\text{A}, I_E = 0$ | 700 | | | V |
| BV_{CEO} | Collector-Emitter Breakdown Voltage | $I_C = 5\text{mA}, I_B = 0$ | 400 | | | V |
| BV_{EBO} | Emitter-Base Breakdown Voltage | $I_E = 500\mu\text{A}, I_C = 0$ | 9 | | | V |
| I_{CBO} | Collector Cut-off Current | $V_{CB} = 700\text{V}, I_E = 0$ | | | 10 | μA |
| I_{EBO} | Emitter Cut-off Current | $V_{EB} = 9\text{V}, I_C = 0$ | | | 10 | μA |
| h_{FE1} h_{FE2} | DC Current Gain | $V_{CE} = 2\text{V}, I_C = 0.5\text{A}$ $V_{CE} = 2\text{V}, I_C = 1.0\text{A}$ | 14 5 | | 23 | |
| $V_{CE(sat)}$ | Collector-Emitter Saturation Voltage | $I_C = 0.5\text{A}, I_B = 0.1\text{A}$ $I_C = 1.0\text{A}, I_B = 0.25\text{A}$ $I_C = 1.5\text{A}, I_B = 0.5\text{A}$ | | | 0.5 1.0 3.0 | V V V |
| $V_{BE(sat)}$ | Base-Emitter Saturation Voltage | $I_C = 0.5\text{A}, I_B = 0.1\text{A}$ $I_C = 1.0\text{A}, I_B = 0.25\text{A}$ | | | 1.0 1.2 | V V |
| f_T | Current Gain Bandwidth Product | $V_{CE} = 10\text{V}, I_C = 0.1\text{A}$ | 4 | | | MHz |
| t_{ON} | Turn On Time | $V_{CC} = 125\text{V}, I_C = 1\text{A}$ $I_{B1} = -I_{B2} = -0.2\text{A}$ $R_L = 125\Omega$ | | | 1.1 | μs |
| t_{STG} | Storage Time | | | | 4.0 | μs |
| t_F | Fall Time | | | | 0.7 | μs |

Typical Performance Characteristics

Figure 1. Static Characteristic

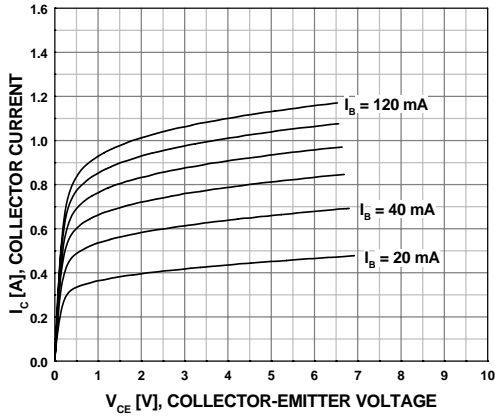


Figure 2. DC Current Gain

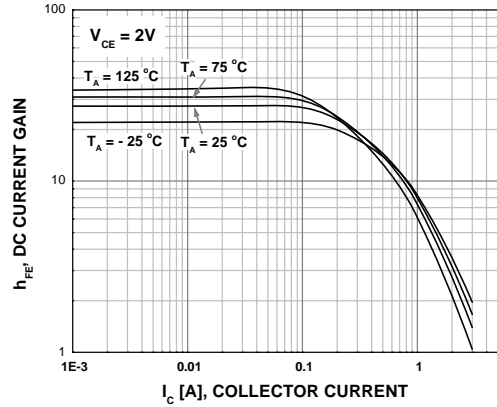


Figure 3. Collector-Emitter Saturation Voltage

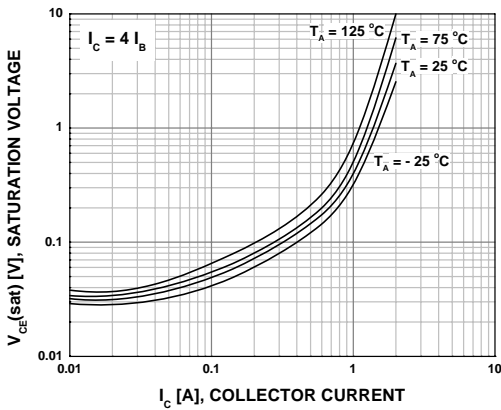


Figure 4. Base-Emitter Saturation Voltage

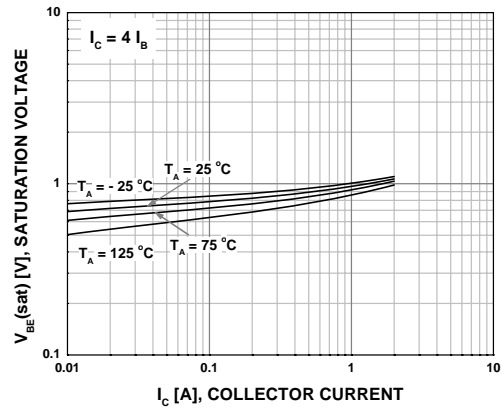


Figure 5. Resistive Load Switching Time

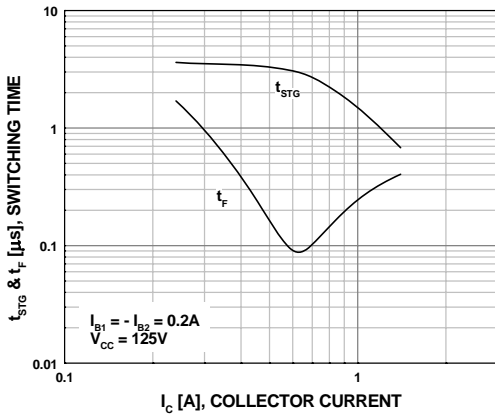
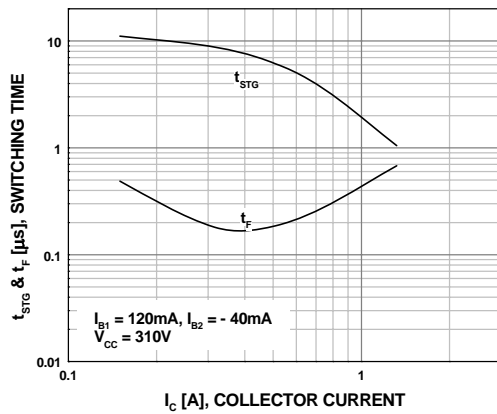


Figure 6. Resistive Load Switching Time



Typical Performance Characteristics (Continued)

Figure 7. Forward Biased Safe Operating Area

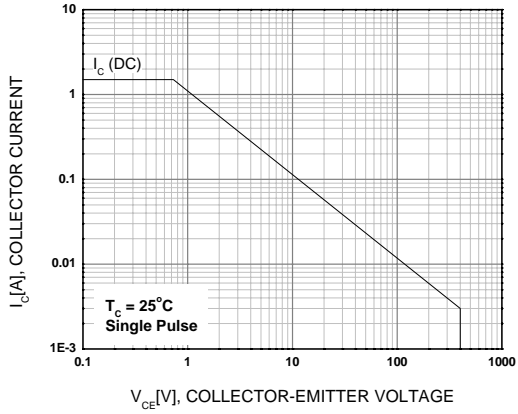


Figure 8. Reverse Biased Safe Operating Area

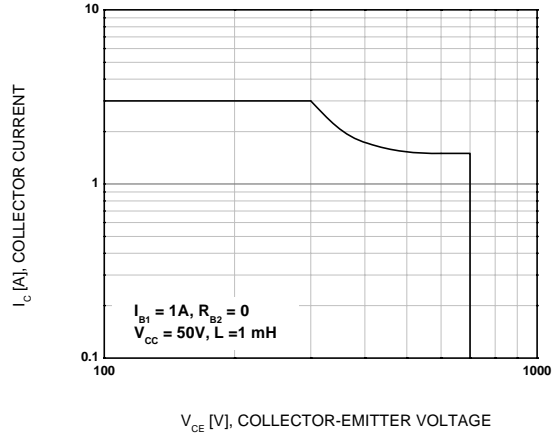
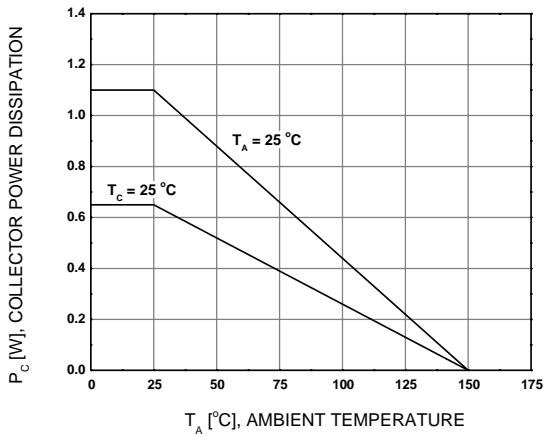
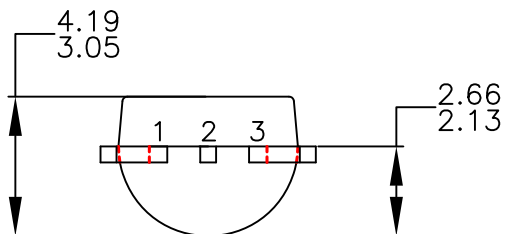
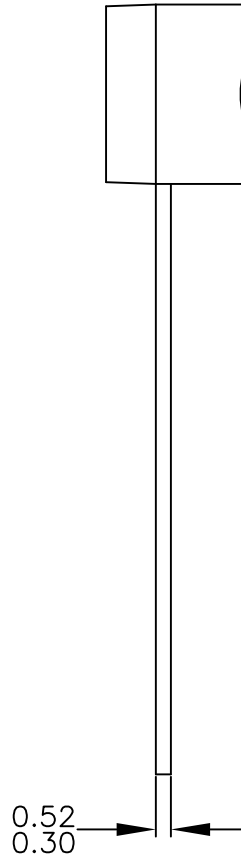
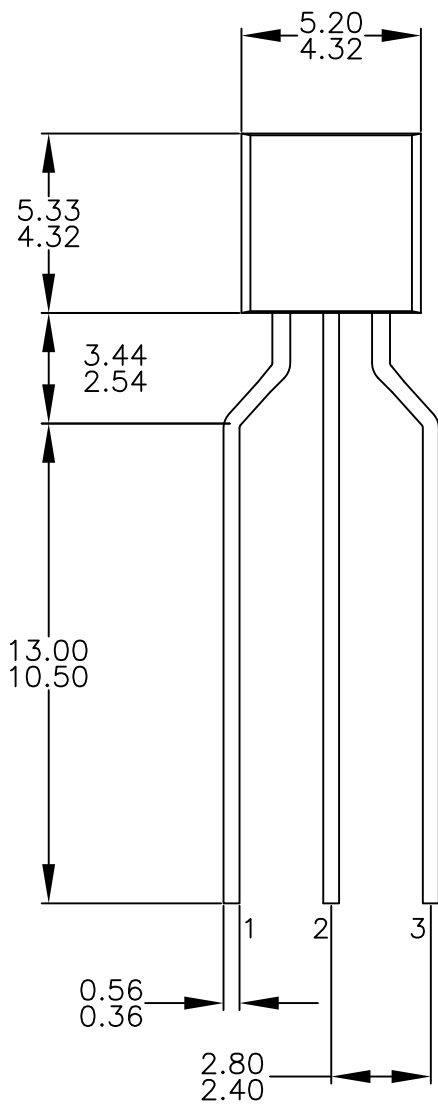


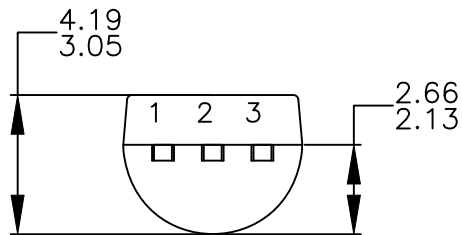
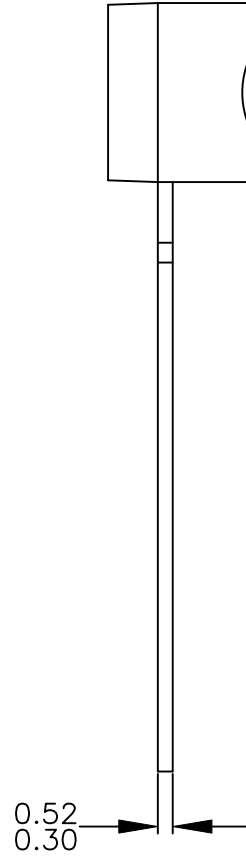
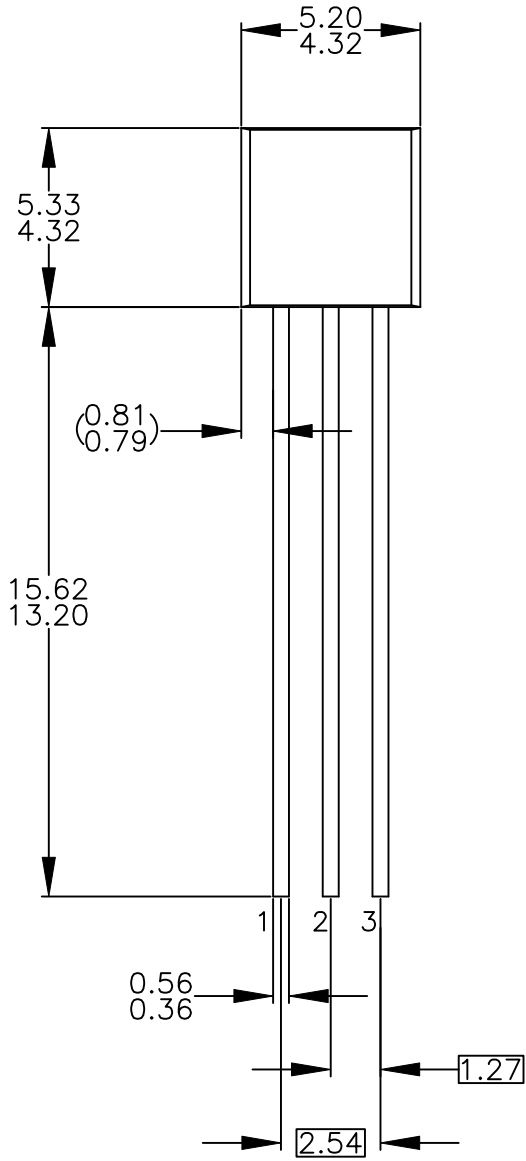
Figure 9. Power Derating





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