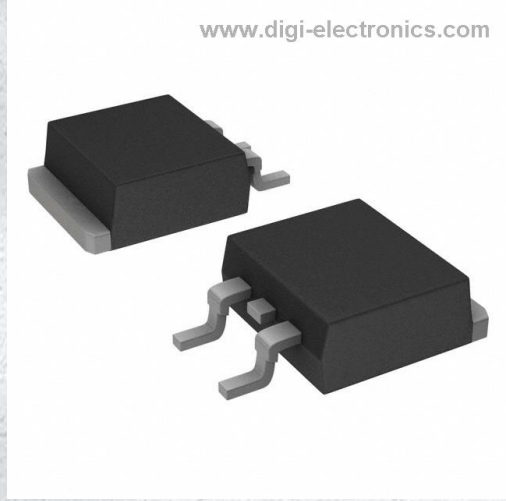
# FJB3307DTM Datasheet




https://www.DiGi-Electronics.com

| | |
|---|---|
| DiGi Electronics Part Number | FJB3307DTM-DG |
| Manufacturer | onsemi |
| Manufacturer Product Number | FJB3307DTM |
| Description | TRANS NPN 400V 8A D2PAK |
| Detailed Description | Bipolar (BJT) Transistor NPN 400 V 8 A 1.72 W Surface Mount TO-263 (D2PAK) |

Tel: +00 852-30501935

RFQ Email: Info@DiGi-Electronics.com

## Purchase and inquiry

| Manufacturer Product Number: | Manufacturer: |
| --- | --- |
| FJB3307DTM | onsemi |
| Series: | Product Status: |
| - | Obsolete |
| Transistor Type: | Current - Collector (Ic) (Max): |
| NPN | 8 A |
| Voltage - Collector Emitter Breakdown (Max): | Vce Saturation (Max) @ Ib, Ic: |
| 400 V | 3V @ 2A, 8A |
| Current - Collector Cutoff (Max): | DC Current Gain (hFE) (Min) @ Ic, Vce: |
| - | 5 @ 5A, 5V |
| Power - Max: | Frequency - Transition: |
| 1.72 W | - |
| Operating Temperature: | Mounting Type: |
| 150°C (TJ) | Surface Mount |
| Package / Case: | Supplier Device Package: |
| TO-263-3, D2PAK (2 Leads + Tab), TO-263AB | TO-263 (D2PAK) |
| Base Product Number: | |
| FJB3307 | |

## Environmental & Export classification

| Moisture Sensitivity Level (MSL): | REACH Status: |
| --- | --- |
| 1 (Unlimited) | REACH Unaffected |
| ECCN: | HTSUS: |
| EAR99 | 8541.29.0095 |

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FAIRCHILD SEMICONDUCTOR®

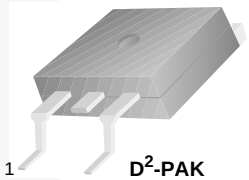
July 2013

# FJB3307D

## High-Voltage Fast-Switching NPN Power Transistor

### Features

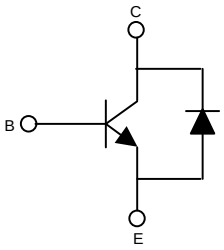
- Built-in Diode between Collector and Emitter
- Suitable for Electronic Ballast and Switch-Mode Power Supplies



1 $D^2$-PAK

1.Base 2.Collector 3.Emitter

Internal Schematic Diagram




### Ordering Information

| Part Number | Marking | Package | Packing Method |
|---|---|---|---|
| FJB3307DTM | J3307D | $D^2$-PAK | Tape and Reel |

### Absolute Maximum Ratings

Stresses exceeding the absolute maximum ratings may damage the device. The device may not function or be operable above the recommended operating conditions and stressing the parts to these levels is not recommended. In addition, extended exposure to stresses above the recommended operating conditions may affect device reliability. The absolute maximum ratings are stress ratings only. Values are at $T_A$ = 25°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) | 8 | A |
| $I_{CP}$(1) | Collector Current (Pulse) | 16 | A |
| $I_B$ | Base Current (DC) | 4 | A |
| $I_{BP}$(1) | Base Current (Pulse) | 8 | A |
| $T_J$ | Junction Temperature | 150 | °C |
| $T_{STG}$ | Storage Temperature | -55 to 150 | °C |

**Note:**

1. Pulse test: pulse width = 300μs, duty cycle = 2% pulsed.

## Thermal Characteristics

| Symbol | Parameter | | Value | Units |
|---|---|---|---|---|
| $P_D$ | Total Device Dissipation | $T_A$ = 25°C | 1.72 | W |
| | | $T_C$ = 25°C | 80 | W |
| $R_{\theta ja}$ | Thermal Resistance, Junction to Ambient | | 72.5 | °C/W |
| $R_{\theta jc}$ | Thermal Resistance, Junction to Case | | 1.56 | °C/W |

## Electrical Characteristics(2)

Values are at $T_A$ = 25°C unless otherwise noted.

| Symbol | Parameter | Conditions | Min. | Typ. | Max. | Units |
|---|---|---|---|---|---|---|
| $BV_{CBO}$ | Collector-Base Breakdown Voltage | $I_C$ = 500 μA, $I_E$ = 0 | 700 | | | V |
| $BV_{CEO}$ | Collector-Emitter Breakdown Voltage | $I_C$ = 5 mA, $I_B$ = 0 | 400 | | | V |
| $BV_{EBO}$ | Emitter-Base Breakdown Voltage | $I_E$ = 500 μA, $I_C$ = 0 | 9 | | | V |
| $I_{EBO}$ | Emitter Cut-Off Current | $V_{EB}$ = 9 V, $I_C$ = 0 | | | 1 | mA |
| $h_{FE1}$ | DC Current Gain | $V_{CE}$ = 5 V, $I_C$ = 2 A | 8 | | 40 | |
| $h_{FE2}$ | | $V_{CE}$ = 5 V, $I_C$ = 5 A | 5 | | 30 | |
| $V_{CE(sat)}$ | Collector-Emitter Saturation Voltage | $I_C$ = 2 A, $I_B$ = 0.4 A | | | 1 | V |
| | | $I_C$ = 5 A, $I_B$ = 1 A | | | 2 | V |
| | | $I_C$ = 5 A, $I_B$ = 1 A, $T_A$ = 100°C | | | 3 | V |
| | | $I_C$ = 8 A, $I_B$ = 2 A | | | 3 | V |
| $V_{BE(sat)}$ | Base-Emitter Saturation Voltage | $I_C$ = 2 A, $I_B$ = 0.4 A | | | 1.2 | V |
| | | $I_C$ = 5 A, $I_B$ = 1 A | | | 1.6 | V |
| | | $I_C$ = 5 A, $I_B$ = 1 A, $T_A$ = 100°C | | | 2.0 | V |
| $V_F$ | Diode Forward Voltage | $I_C$ = 3 A | | | 2.5 | V |
| $C_{ob}$ | Output Capacitance | $V_{CB}$ = 10 V, $I_E$ = 0, f = 1 MHz | | 60 | | pF |
| $t_{STG}$ | Storage Time | $V_{CC}$ = 125 V, $I_C$ = 5 A, $I_{B1}$ = -$I_{B2}$ = 1 A, $R_L$ = 50 Ω | | | 3.0 | μs |
| $t_F$ | Fall Time | | | | 0.7 | μs |
| $t_{STG}$ | Storage Time | $V_{CC}$ = 30 V, $I_C$ = 5 A, L=200 μH $I_{B1}$=1 A, $R_{BB}$ = 0 Ω, $V_{BE(OFF)}$= -5 V, $V_{CLAMP}$ = 250 V | | | 2.3 | μs |
| $t_F$ | Fall Time | | | | 150 | ns |

**Note:**

2. Pulse test: pw = 300 μs, duty cycle = 2%.

## $h_{FE}$ Classification

| Classification | H1 | H2 |
|---|---|---|
| $h_{FE1}$ | 15 ~ 28 | 26 ~ 39 |

## Typical Performance Characteristics

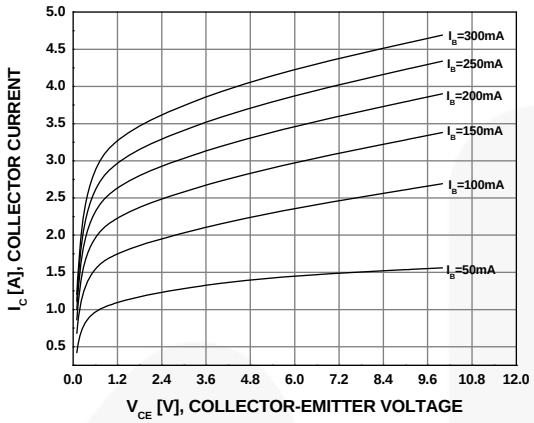



**Figure 1. Static Characteristic**

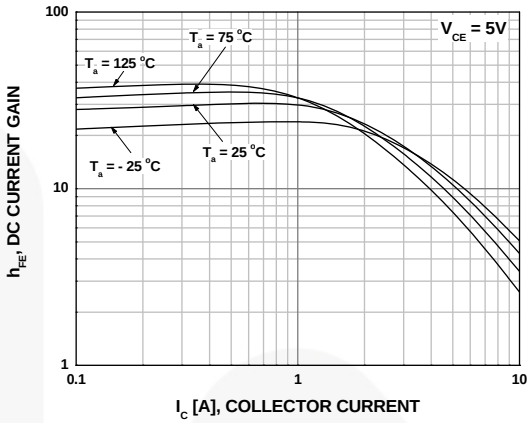



**Figure 2. DC Current Gain**

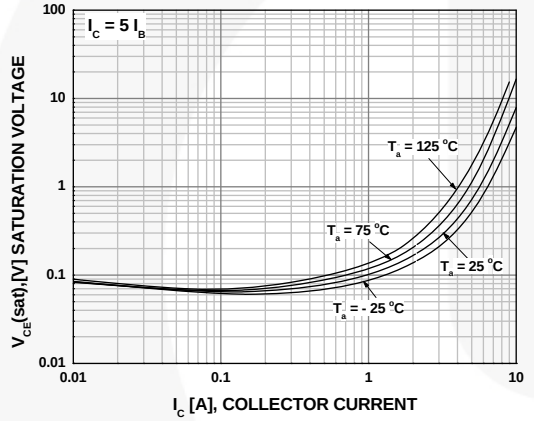



**Figure 3. Collector-Emitter Saturation Voltage**

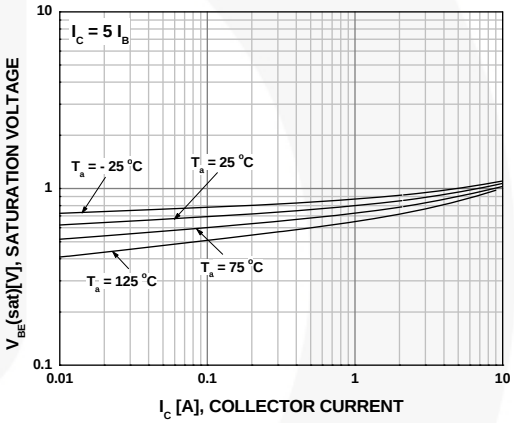



**Figure 4. Base-Emitter Saturation Voltage**

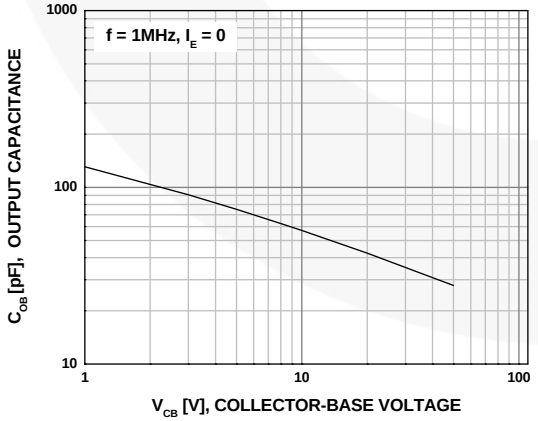



**Figure 5. Collector Output Capacitance**

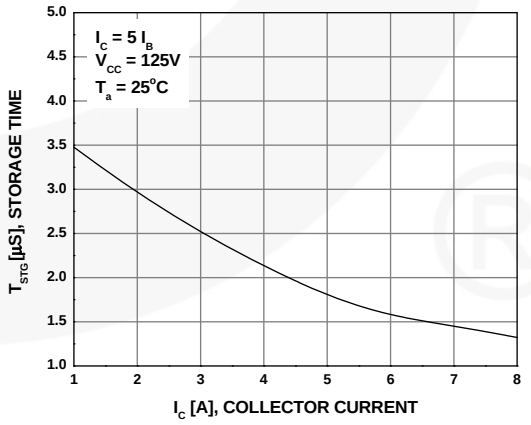



**Figure 6. Storage Time (Resistive Load)**

## Typical Performance Characteristics (Continued)

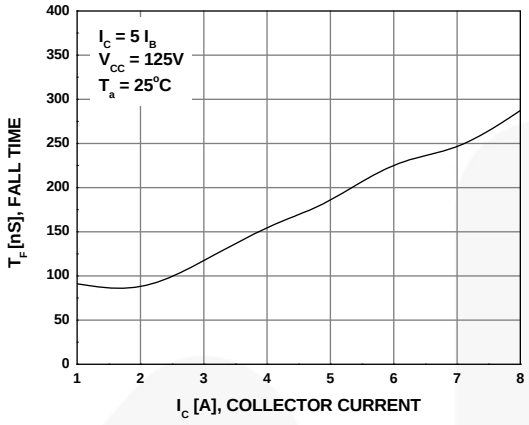



Figure 7. Fall Time (Resistive Load)

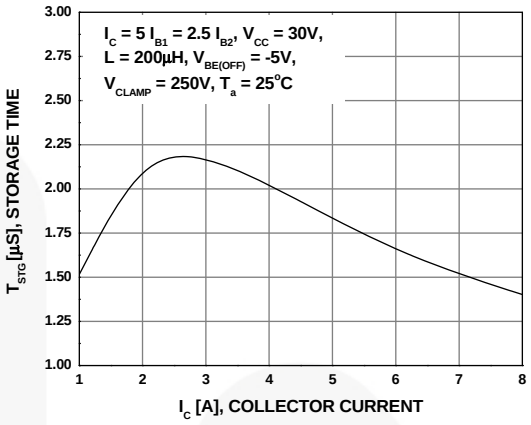



Figure 8. Storage Time (Inductive Load)

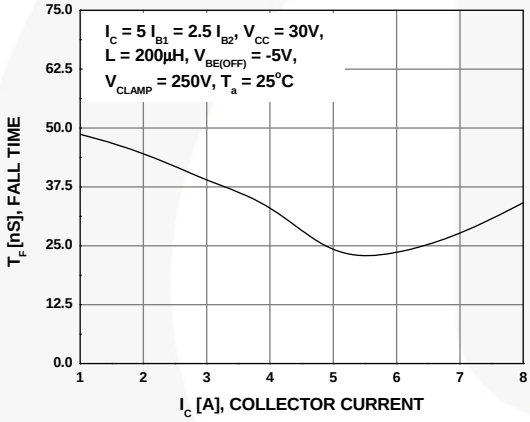



Figure 9. Fall Time (Inductive Load)

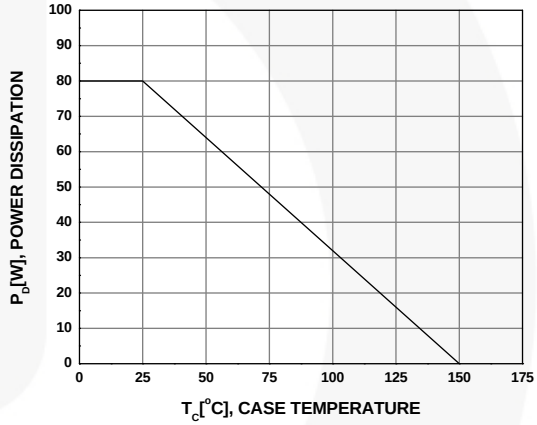



Figure 10. Power Derating

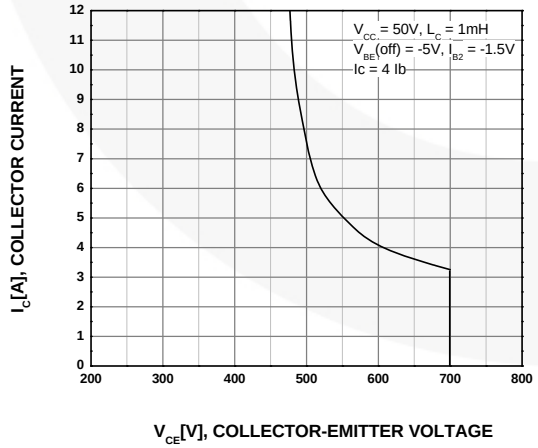



Figure 11. Reverse Bias Safe Operating Area

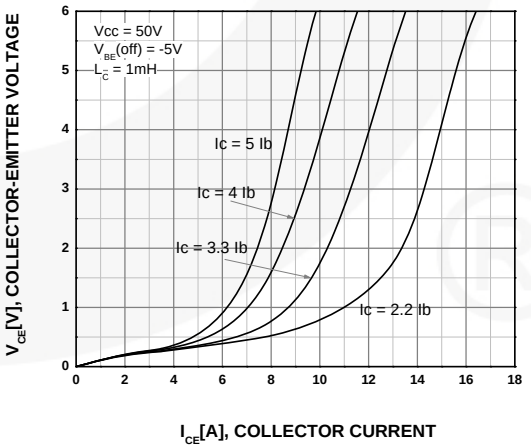



Figure 12. RBSOA Saturation

## Typical Performance Characteristics (Continued)

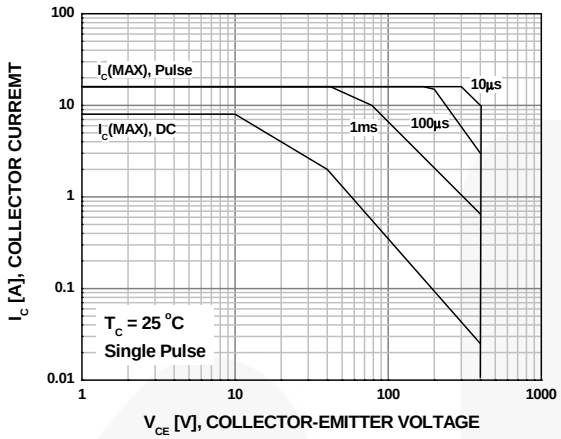



**Figure 13. Forward Biased Safe Operating Area**

## Physical Dimensions

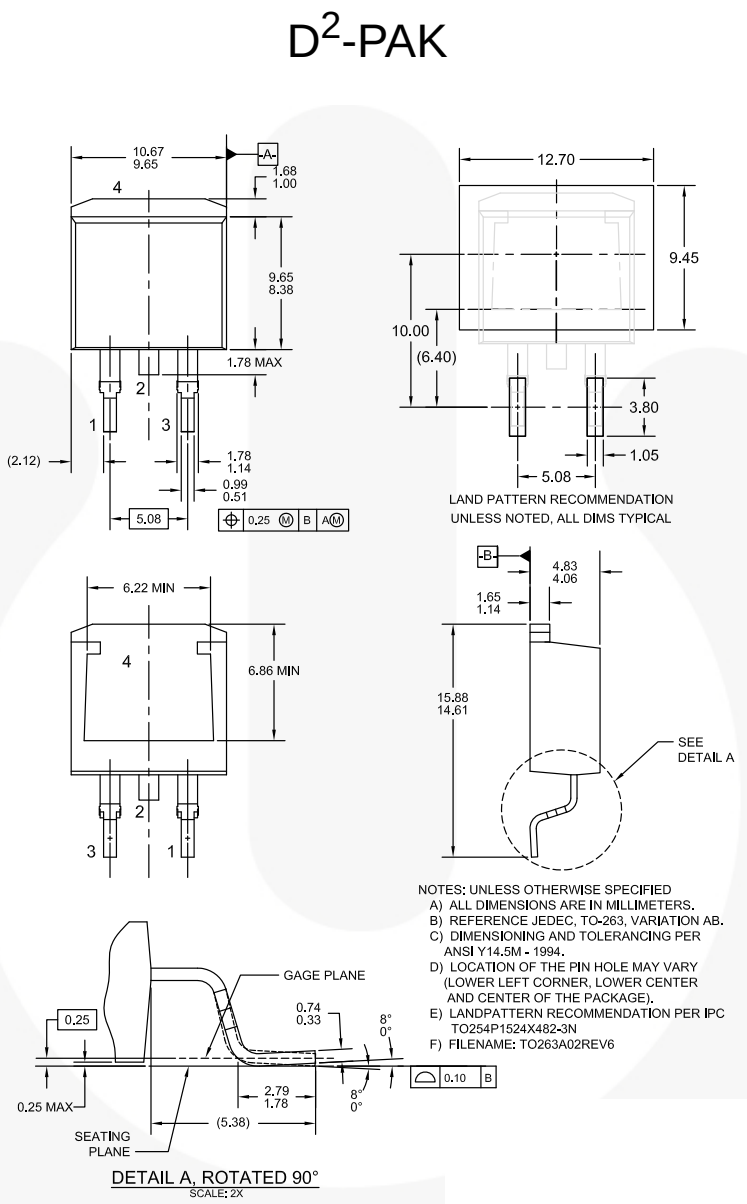



**Figure 14. 2-LEAD, JEDEC TO263, VARIATION AB, SURFACE MOUNT (Active)**

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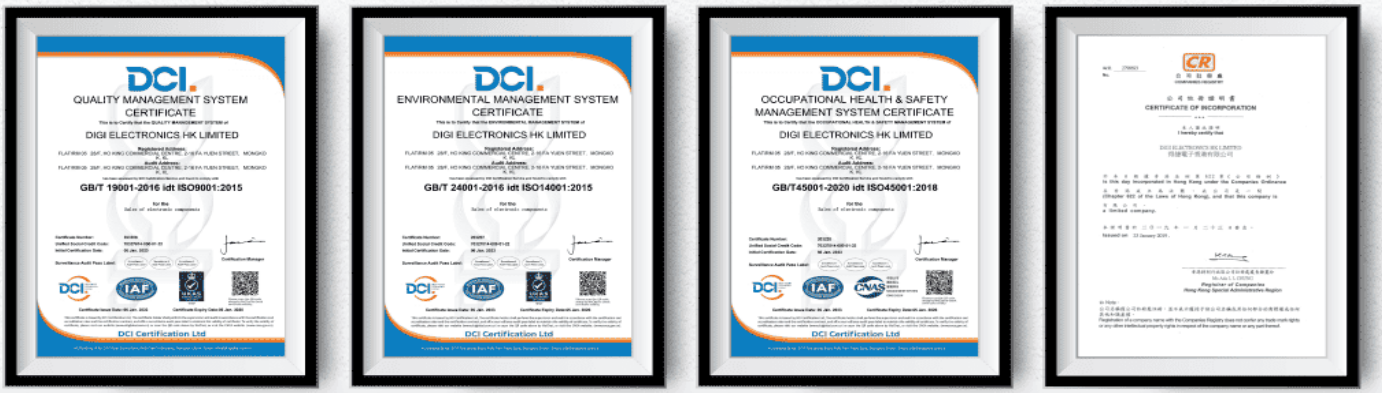



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