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DATA SHEET
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# Power Transistor 80 V, 8 A Dual General Purpose NPN

# MJK44H11

Designed for general purpose power and switching applications such as regulators, converters and power amplifiers. Housed in advanced LFPAK package (5 x 6 mm) with excellent thermal conduction. Automotive end applications include air bag deployment, power train control units, and instrument clusters.

### Features

- Complementary NPN: MJK45H11
- NJV Prefix for Automotive and Other Applications Requiring Unique Site and Control Change Requirements; AEC−Q101 Qualified and PPAP Capable
- These Devices are Pb−Free, Halogen Free/BFR Free and are RoHS Compliant

### MAXIMUM RATINGS ($T_A$ = 25°C)

| Rating | Symbol | Value | Unit |
|---|---|---|---|
| Collector−Emitter Voltage | $V_{CEO}$ | 80 | Vdc |
| Emitter−Base Voltage | $V_{EBO}$ | 5 | Vdc |
| Collector Current − Continuous | $I_C$ | 8 | A |
| Collector Current − Peak | $I_{CM}$ | 16 | A |
| Junction and Storage Temperature Range | $T_J$, $T_{stg}$ | −65 to +150 | °C |

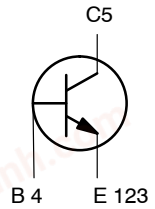
Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

### THERMAL CHARACTERISTICS

| Characteristics | Symbol | Max | Unit |
|---|---|---|---|
| Thermal Resistance, Junction−to−Ambient per Device (Note 1) | $R_{\theta JC}$ | 6 | °C/W |
| Thermal Resistance, Junction−to−Ambient per Device (Note 1) | $R_{\theta JA}$ | 70 | °C/W |
| Total Power Dissipation per Device @ $T_A$ = 25°C (Note 1) | $P_D$ | 20 | W |

1. Surface−mounted on FR4 board using a 1in$^2$, 2 oz. Cu pad

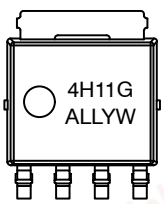
## NPN TRANSISTOR
## 80 V, 8 A






**LFPAK4 5x6**
**CASE 760AB**

### MARKING DIAGRAM




| | |
|---|---|
| 4H11G | = Specific Device Code |
| A | = Assembly Location |
| LL | = Wafer Lot |
| Y | = Year |
| W | = Work Week |

### ORDERING INFORMATION

| Device | Package | Shipping† |
|---|---|---|
| MJK44H11TWG | LFPAK4 5x6 (Pb−Free) | 3000 / Tape & Reel |
| NJVMJK44H11TWG | LFPAK4 5x6 (Pb−Free) | 3000 / Tape & Reel |

†For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specification Brochure, BRD8011/D.

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**ELECTRICAL CHARACTERISTICS** ($T_A$ = 25°C unless otherwise noted)

| Characteristic | Symbol | Min | Typ | Max | Unit |
|---|---|---|---|---|---|
| **OFF CHARACTERISTICS** | | | | | |
| Collector−Emitter Sustaining Voltage ($I_C$ = 30 mA, $I_B$ = 0) | $V_{CEO(sus)}$ | 80 | – | – | Vdc |
| Collector Cutoff Current ($V_{CE}$ = Rated $V_{CEO}$, $V_{BE}$ = 0) | $I_{CES}$ | – | – | 1.0 | μA |
| Emitter Cutoff Current ($V_{EB}$ = 5 Vdc) | $I_{EBO}$ | – | – | 1.0 | μA |
| **ON CHARACTERISTICS** | | | | | |
| Collector−Emitter Saturation Voltage ($I_C$ = 8 Adc, $I_B$ = 0.4 Adc) | $V_{CE(sat)}$ | – | – | 1.0 | Vdc |
| Base−Emitter Saturation Voltage ($I_C$ = 8 Adc, $I_B$ = 0.8 Adc) | $V_{BE(sat)}$ | – | – | 1.5 | Vdc |
| DC Current Gain ($V_{CE}$ = 1 Vdc, $I_C$ = 2 Adc) ($V_{CE}$ = 1 Vdc, $I_C$ = 4 Adc) | $h_{FE}$ | 60<br>40 | –<br>– | –<br>– | – |
| **DYNAMIC CHARACTERISTICS** | | | | | |
| Collector Capacitance ($V_{CB}$ = 10 Vdc, $f_{test}$ = 1 MHz) | $C_{cb}$ | – | – | 45 | pF |
| Gain Bandwidth Product ($I_C$ = 0.5 Adc, $V_{CE}$ = 10 Vdc, f = 20 MHz) | $f_T$ | – | 85 | – | MHz |

Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

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## TYPICAL CHARACTERISTICS

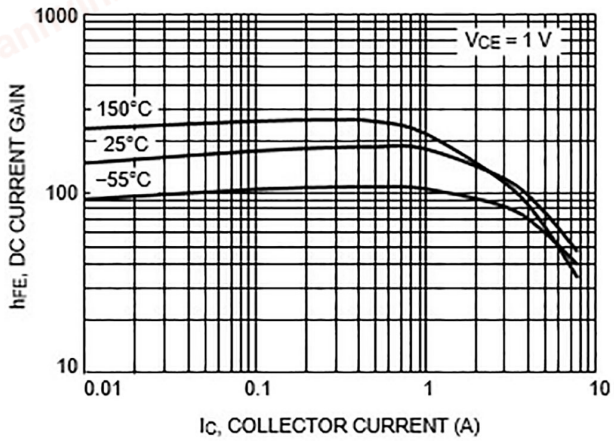



Figure 1. DC Current Gain

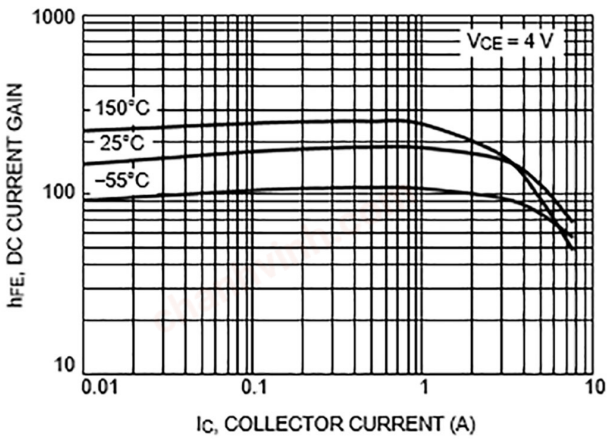



Figure 2. DC Current Gain

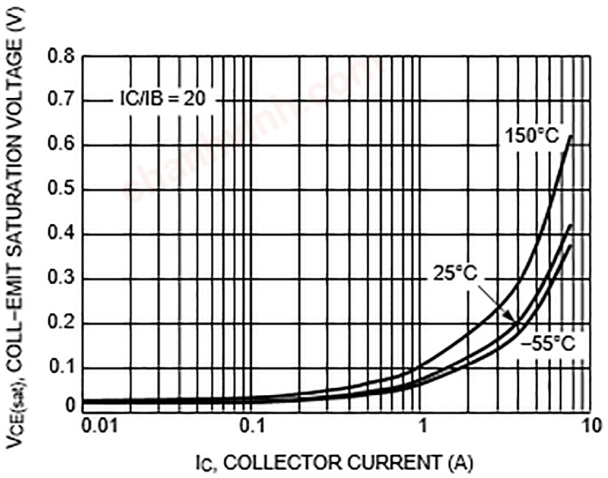



Figure 3. Saturation Voltage $V_{CE(sat)}$

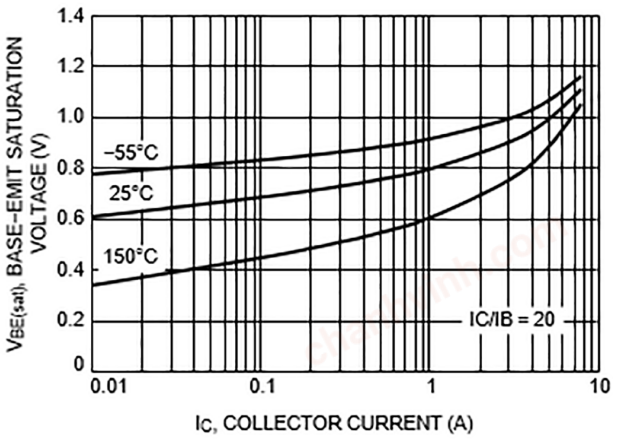



Figure 4. Saturation Voltage $V_{BE(sat)}$

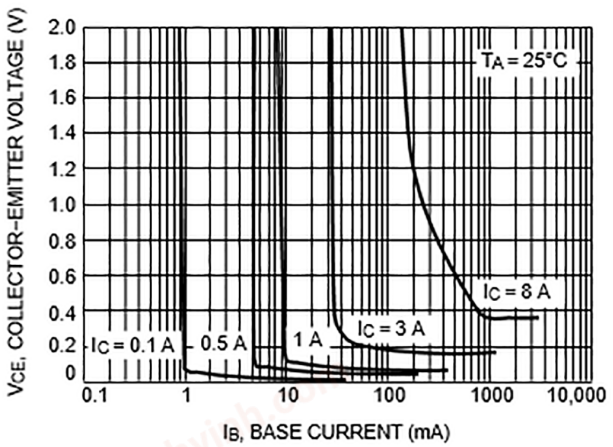



Figure 5. Collector Saturation Region

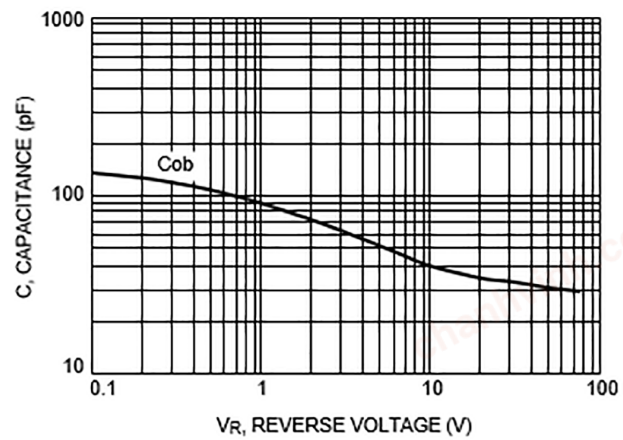



Figure 6. Capacitance

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## TYPICAL CHARACTERISTICS (CONTINUED)

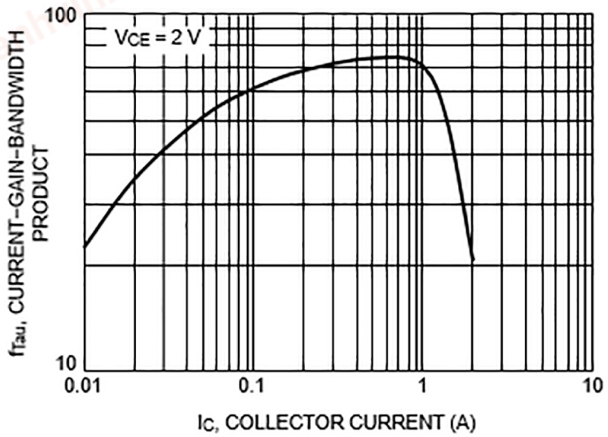



Figure 7. Current−Gain−Bandwidth Product

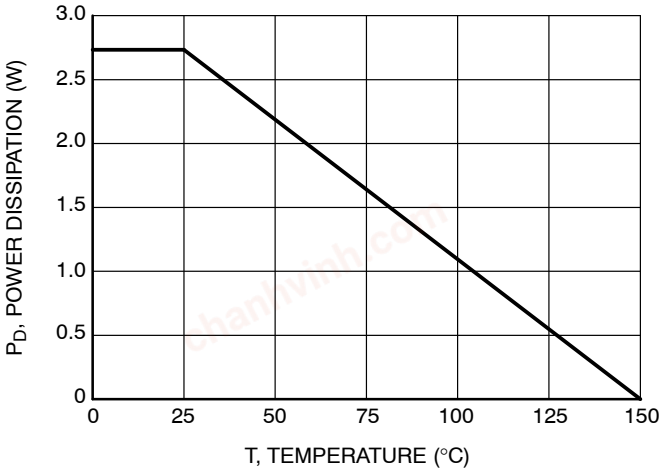



Figure 8. Power Derating

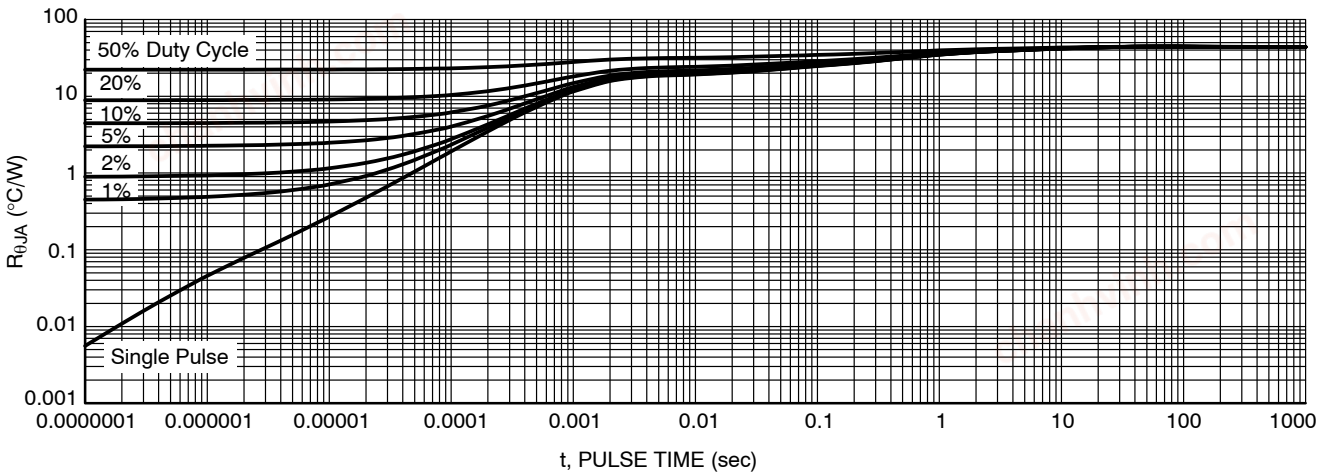


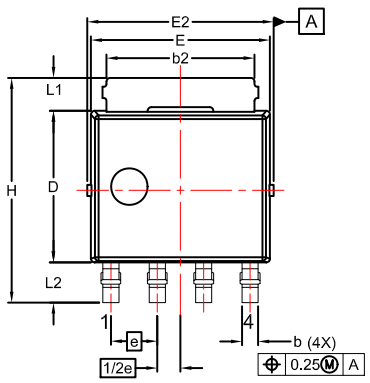

Figure 9. Typical Transient Thermal Response, Junction−to−Case

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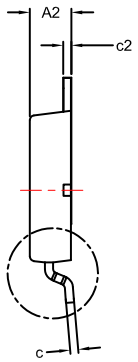
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## PACKAGE DIMENSIONS

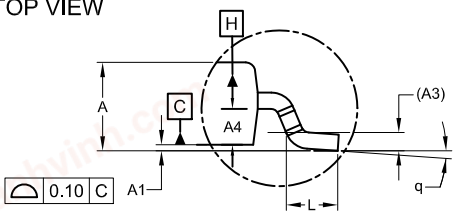
**LFPAK4 5x6**
CASE 760AB
ISSUE C

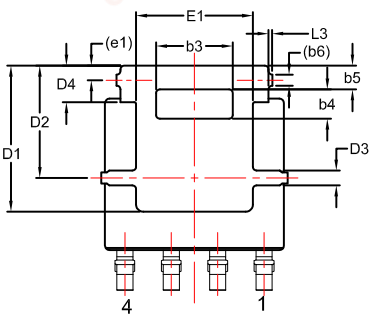



TOP VIEW



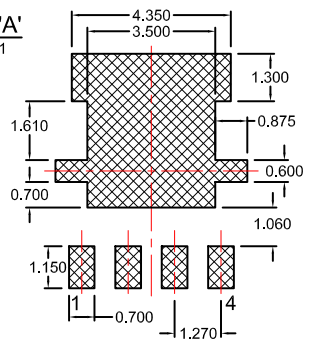

SIDE VIEW




BOTTOM VIEW

DETAIL 'A'
SCALE: 2:1




RECOMMENDED LAND PATTERN

*FOR ADDITIONAL INFORMATION ON OUR PB-FREE STRATEGY AND SOLDERING DETAILS, PLEASE DOWNLOAD THE ON SEMICONDUCTOR SOLDERING AND MOUNTING TECHNIQUES REFERENCE MANUAL, SOLDERRM/D.

NOTES:
1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994.
2. CONTROLLING DIMENSION: MILLIMETERS.
3. DIMENSIONS D AND E DO NOT INCLUDE MOLD FLASH, PROTRUSIONS, OR BURRS. MOLD FLASH PROTRUSIONS OR GATE BURRS SHALL NOT EXCEED 0.150mm PER SIDE.
4. DIMENSIONS D AND E ARE DETERMINED AT THE OUTERMOST EXTREMES OF THE PLASTIC BODY.
5. DATUMS A AND B ARE DETERMINED AT DATUM PLANE H.

| UNIT IN MILLIMETER | | | |
|---|---|---|---|
| DIM | MIN | NOM | MAX |
| A | 1.10 | 1.20 | 1.30 |
| A1 | 0.00 | 0.08 | 0.15 |
| A2 | 1.10 | 1.15 | 1.20 |
| A3 | | 0.25 REF | |
| A4 | 0.45 | 0.50 | 0.55 |
| b | 0.40 | 0.45 | 0.50 |
| b2 | 3.80 | 4.10 | 4.40 |
| b3 | 2.00 | 2.10 | 2.20 |
| b4 | 0.70 | 0.80 | 0.90 |
| b5 | 0.55 | 0.65 | 0.75 |
| b6 | | 0.31 REF | |
| c | 0.19 | 0.22 | 0.25 |
| c2 | 0.19 | 0.22 | 0.25 |
| D | 4.05 | 4.15 | 4.25 |
| D1 | 3.80 | 4.00 | 4.20 |
| D2 | 3.00 | 3.10 | 3.20 |
| D3 | 0.30 | 0.40 | 0.50 |
| D4 | 0.90 | 1.00 | 1.10 |
| E | 4.80 | 4.90 | 5.00 |
| E1 | 3.10 | 3.20 | 3.30 |
| E2 | 5.00 | 5.15 | 5.30 |
| e | | 1.27 BSC | |
| 1/2e | | 0.635 BSC | |
| e1 | | 0.40 REF | |
| H | 6.00 | 6.15 | 6.30 |
| L | 0.40 | 0.65 | 0.85 |
| L1 | 0.80 | 0.90 | 1.00 |
| L2 | 0.90 | 1.10 | 1.30 |
| L3 | 0.00 | 0.10 | 0.20 |
| q | 0° | 4° | 8° |

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