



MMBT6427

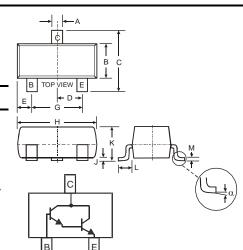
NPN SURFACE MOUNT DARLINGTON TRANSISTOR

Features

- **Epitaxial Planar Die Construction**
- Ideal for Low Power Amplification and Switching
- High Current Gain
- Lead, Halogen and Antimony Free, RoHS Compliant "Green" Device (Notes 1 and 4)

Mechanical Data

- Case: SOT-23
- Case Material: Molded Plastic. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020D
- Terminals: Solderable per MIL-STD-202, Method 208
- Lead Free Plating (Matte Tin Finish annealed over Alloy 42 leadframe).
- Terminal Connections: See Diagram
- Marking (See Page 3): K1D
- Ordering & Date Code Information: See Page 3
- Weight: 0.008 grams (approximate)



| | SOT-23 | | | |
|---------|----------|-------|--|--|
| Dim | Min | Max | | |
| Α | 0.37 | 0.51 | | |
| В | 1.20 | 1.40 | | |
| С | 2.30 | 2.50 | | |
| D | 0.89 | 1.03 | | |
| Е | 0.45 | 0.60 | | |
| G | 1.78 | 2.05 | | |
| Н | 2.80 | 3.00 | | |
| J | 0.013 | 0.10 | | |
| K | 0.903 | 1.10 | | |
| L | 0.45 | 0.61 | | |
| M | 0.085 | 0.180 | | |
| α | 0° | 8° | | |
| All Din | nensions | in mm | | |

Maximum Ratings @T_A = 25°C unless otherwise specified

| Characteristic | Symbol | Value | Unit |
|--------------------------------|-----------|-------|------|
| Collector-Base Voltage | V_{CBO} | 40 | V |
| Collector-Emitter Voltage | V_{CEO} | 40 | V |
| Emitter-Base Voltage | V_{EBO} | 12 | V |
| Collector Current - Continuous | Ic | 500 | mA |

Thermal Characteristics

| Characteristic | Symbol | Value | Unit |
|---|-----------------------------------|-------------|------|
| Power Dissipation (Note 2) @ T _A = 25°C | P _D | 300 | mW |
| Thermal Resistance, Junction to Ambient (Note 2)@ T _A = 25°C | $R_{	heta JA}$ | 417 | °C/W |
| Operating and Storage Temperature Range | T _J , T _{STG} | -55 to +150 | °C |

Electrical Characteristics @TA = 25°C unless otherwise specified

| Characteristic | Symbol | Min | Max | Unit | Test Condition |
|--------------------------------------|----------------------|----------------------------|-------------------------------|------|---|
| OFF CHARACTERISTICS (Note 3) | | | | | |
| Collector-Base Breakdown Voltage | V _{(BR)CBO} | 40 | _ | V | $I_C = 100 \mu A, I_E = 0$ |
| Collector-Emitter Breakdown Voltage | V _{(BR)CEO} | 40 | _ | V | $I_C = 10 \text{mA}, I_B = 0$ |
| Emitter-Base Breakdown Voltage | V _{(BR)EBO} | 12 | _ | V | $I_E = 10\mu A, I_C = 0$ |
| Collector Cutoff Current | I _{CBO} | _ | 50 | nA | $V_{CB} = 30V, I_{E} = 0$ |
| Collector Cutoff Current | ICEO | _ | 1.0 | μΑ | $V_{CE} = 25V, I_B = 0$ |
| Emitter Cutoff Current | I _{EBO} | | 50 | nA | $V_{EB} = 10V, I_C = 0$ |
| ON CHARACTERISTICS (Note 3) | | | | | |
| DC Current Gain | h _{FE} | 10,000 20,000 14,000 | 100,000 200,000 140,000 | _ | $I_C = 10mA, V_{CE} = 5.0V$ $I_C = 100mA, V_{CE} = 5.0V$ $I_C = 500mA, V_{CE} = 5.0V$ |
| Collector-Emitter Saturation Voltage | | _ | 1.2 1.5 | V | $I_C = 50$ mA, $I_B = 0.5$ mA $I_C = 500$ mA, $I_B = 0.5$ mA |
| Base-Emitter Saturation Voltage | V _{BE(SAT)} | _ | 2.0 | V | $I_C = 500 \text{mA}, I_B = 0.5 \text{mA}$ |
| Base-Emitter On Voltage | V _{BE(ON)} | _ | 1.75 | V | $I_C = 50 \text{mA}, V_{CE} = 5.0 \text{V}$ |
| SMALL SIGNAL CHARACTERISTICS | | | | | |
| Output Capacitance | Cobo | 8.0 Typical | | pF | $V_{CB} = 10V, f = 1.0MHz, I_{E} = 0$ |
| Input Capacitance | C _{ibo} | 15 T | ypical | pF | $V_{EB} = 0.5V$, $f = 1.0MHz$, $I_{C} = 0$ |

Notes:

- 1. No purposefully added lead. Halogen and Antimony Free.
- Device mounted on FR-4 PCB, 1 inch x 0.85 inch x 0.062 inch; pad layout as shown on Diodes Inc. suggested pad layout document AP02001, which can be found on our website at http://www.diodes.com/datasheets/ap02001.pdf.
- Short duration pulse test used to minimize self-heating effect.
- Product manufactured with Data Code V9 (week 33, 2008) and newer are built with Green Molding Compound. Product manufactured prior to Date Code V9 are built with Non-Green Molding Compound and may contain Halogens or Sb₂O₃ Fire Retardants.



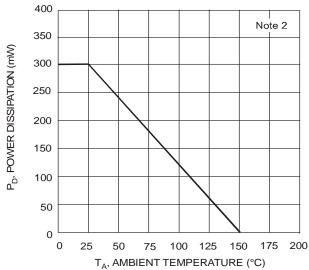
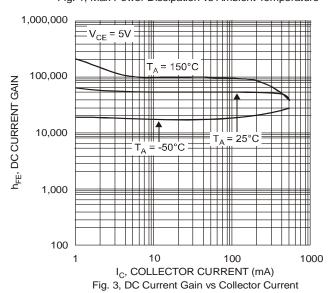


Fig. 1, Max Power Dissipation vs Ambient Temperature



1000 $V_{CE} = 5V$ f_T, GAIN BANDWIDTH PRODUCT (MHz) 100 10 1 10 100 I_C, COLLECTOR CURRENT (mA) Fig. 5, Gain Bandwidth Product vs Collector Current

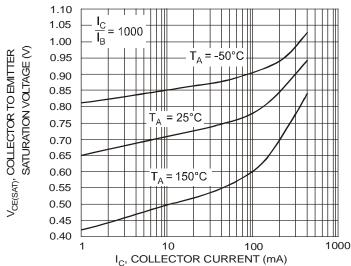


Fig. 2, Collector Emitter Saturation Voltage vs. Collector Current

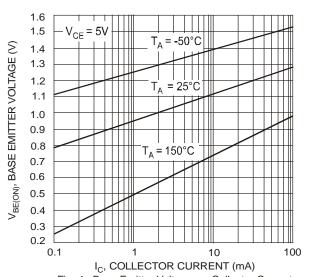


Fig. 4, Base Emitter Voltage vs. Collector Current

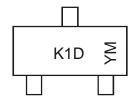


Ordering Information (Note 5)

| Device | Packaging | Shipping |
|--------------|-----------|------------------|
| MMBT6427-7-F | SOT-23 | 3000/Tape & Reel |

Notes: 5. For packaging details, go to our website at http://www.diodes.com/datasheets/ap02007.pdf.

Marking Information



K1D = Product Type Marking Code YM = Date Code Marking Y = Year ex: N = 2002 M = Month ex: 9 = September

Date Code Kev

| Year | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 |
|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| Code | J | K | Г | М | Ν | Р | R | S | Т | U | V | W | Х | Υ | Z |

| Month | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
|-------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Code | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | N | D |

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