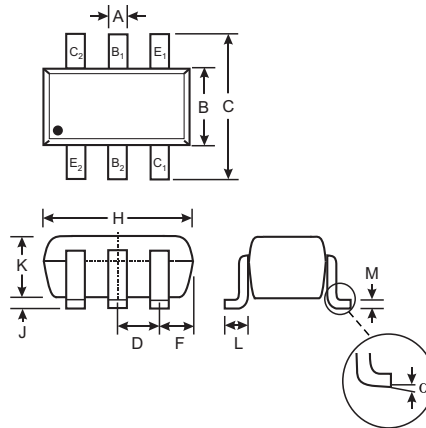


Features

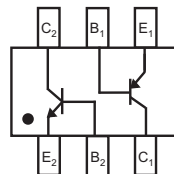
- Complementary Pair
- Epitaxial Planar Die Construction
- One 2222A Type (NPN),
- One 2907A Type (PNP)
- Ideal for Low Power Amplification and Switching
- Lead Free By Design/RoHS Compliant (Note 2)**
- "Green Device" (Note 3)**

Mechanical Data

- Case: SOT-26
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020C
- Terminals: Finish - Matte Tin annealed over Copper leadframe. Solderable per MIL-STD-202, Method 208
- Terminal Connections: See Diagram
- Ordering & Date Code Information: See Page 3
- Marking (See Page 3): K27
- Weight: 0.006 grams (approximate)



Note: E1, B1, and C1 = 2907A Type (PNP),
E2, B2, and C2 = 2222A Type (NPN).
Type marking indicates orientation.



| SOT-26 | | | |
|-----------------------------|-------|------|------|
| Dim | Min | Max | Typ |
| A | 0.35 | 0.50 | 0.38 |
| B | 1.50 | 1.70 | 1.60 |
| C | 2.70 | 3.00 | 2.80 |
| D | | | 0.95 |
| F | | | 0.55 |
| H | 2.90 | 3.10 | 3.00 |
| J | 0.013 | 0.10 | 0.05 |
| K | 1.00 | 1.30 | 1.10 |
| L | 0.35 | 0.55 | 0.40 |
| M | 0.10 | 0.20 | 0.15 |
| | 0 | 8 | |
| All Dimensions in mm | | | |

Maximum Ratings, 2222A Type (NPN)

@ T_A = 25 C unless otherwise specified

| Characteristic | Symbol | 2222A (NPN) | Unit |
|--------------------------------|------------------|-------------|------|
| Collector-Base Voltage | V _{CBO} | 75 | V |
| Collector-Emitter Voltage | V _{CEO} | 40 | V |
| Emitter-Base Voltage | V _{EBO} | 6.0 | V |
| Collector Current - Continuous | I _C | 600 | mA |

Maximum Ratings, 2907A Type (PNP)

@ T_A = 25 C unless otherwise specified

| Characteristic | Symbol | 2907A (PNP) | Unit |
|--------------------------------|------------------|-------------|------|
| Collector-Base Voltage | V _{CBO} | -60 | V |
| Collector-Emitter Voltage | V _{CEO} | -60 | V |
| Emitter-Base Voltage | V _{EBO} | -5.0 | V |
| Collector Current - Continuous | I _C | -600 | mA |

Maximum Ratings, Total

@ T_A = 25 C unless otherwise specified

| Characteristic | Symbol | Value | Unit |
|--|-----------------------------------|-------------|------|
| Total Power Dissipation (Note 1) | P _d | 300 | mW |
| Thermal Resistance, Junction to Ambient (Note 1) | R _{JA} | 417 | C/W |
| Operating and Storage Temperature Range | T _J , T _{STG} | -55 to +150 | C |

- Note:
- 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>.
 - No purposefully added lead.
 - Diodes Inc.'s "Green" policy can be found on our website at http://www.diodes.com/products/lead_free/index.php.

Electrical Characteristics, 2222A Type (NPN)

 @ $T_A = 25\text{ C}$ unless otherwise specified

| Characteristic | Symbol | Min | Max | Unit | Test Condition |
|--------------------------------------|---------------|---|------------|---------|---|
| OFF CHARACTERISTICS (Note 4) | | | | | |
| Collector-Base Breakdown Voltage | $V_{(BR)CBO}$ | 75 | | V | $I_C = 10\text{ A}, I_E = 0$ |
| Collector-Emitter Breakdown Voltage | $V_{(BR)CEO}$ | 40 | | V | $I_C = 10\text{ mA}, I_B = 0$ |
| Emitter-Base Breakdown Voltage | $V_{(BR)EBO}$ | 6.0 | | V | $I_E = 10\text{ A}, I_C = 0$ |
| Collector Cutoff Current | I_{CBO} | | 10 | nA A | $V_{CB} = 60\text{ V}, I_E = 0$ $V_{CB} = 60\text{ V}, I_E = 0, T_A = 150\text{ C}$ |
| Collector Cutoff Current | I_{CEX} | | 10 | nA | $V_{CE} = 60\text{ V}, V_{EB(OFF)} = 3.0\text{ V}$ |
| Emitter Cutoff Current | I_{EBO} | | 10 | nA | $V_{EB} = 3.0\text{ V}, I_C = 0$ |
| Base Cutoff Current | I_{BL} | | 20 | nA | $V_{CE} = 60\text{ V}, V_{EB(OFF)} = 3.0\text{ V}$ |
| ON CHARACTERISTICS (Note 4) | | | | | |
| DC Current Gain | h_{FE} | 35 50 75 100 40 50 35 | 300 | | $I_C = 100\text{ A}, V_{CE} = 10\text{ V}$ $I_C = 1.0\text{ mA}, V_{CE} = 10\text{ V}$ $I_C = 10\text{ mA}, V_{CE} = 10\text{ V}$ $I_C = 150\text{ mA}, V_{CE} = 10\text{ V}$ $I_C = 500\text{ mA}, V_{CE} = 10\text{ V}$ $I_C = 10\text{ mA}, V_{CE} = 10\text{ V}, T_A = -55\text{ C}$ $I_C = 150\text{ mA}, V_{CE} = 1.0\text{ V}$ |
| Collector-Emitter Saturation Voltage | $V_{CE(SAT)}$ | | 0.3 1.0 | V | $I_C = 150\text{ mA}, I_B = 15\text{ mA}$ $I_C = 500\text{ mA}, I_B = 50\text{ mA}$ |
| Base-Emitter Saturation Voltage | $V_{BE(SAT)}$ | 0.6 | 1.2 2.0 | V | $I_C = 150\text{ mA}, I_B = 15\text{ mA}$ $I_C = 500\text{ mA}, I_B = 50\text{ mA}$ |
| SMALL SIGNAL CHARACTERISTICS | | | | | |
| Output Capacitance | C_{obo} | | 8 | pF | $V_{CB} = 10\text{ V}, f = 1.0\text{ MHz}, I_E = 0$ |
| Input Capacitance | C_{ibo} | — | 25 | pF | $V_{EB} = 0.5\text{ V}, f = 1.0\text{ MHz}, I_C = 0$ |
| Current Gain-Bandwidth Product | f_T | 300 | | MHz | $V_{CE} = 20\text{ V}, I_C = 20\text{ mA},$ $f = 100\text{ MHz}$ |
| SWITCHING CHARACTERISTICS | | | | | |
| Delay Time | t_d | | 10 | ns | $V_{CC} = 30\text{ V}, I_C = 150\text{ mA},$ $V_{BE(off)} = -0.5\text{ V}, I_{B1} = 15\text{ mA}$ |
| Rise Time | t_r | | 25 | ns | |
| Storage Time | t_s | | 225 | ns | $V_{CC} = 30\text{ V}, I_C = 150\text{ mA},$ $I_{B1} = I_{B2} = 15\text{ mA}$ |
| Fall Time | t_f | | 60 | ns | |

 Note: 4. Pulse test: Pulse width 300 μ s, duty cycle 2%.

Electrical Characteristics, 2907A Type (PNP) @ $T_A = 25\text{ C}$ unless otherwise specified

| Characteristic | Symbol | Min | Max | Unit | Test Condition |
|--------------------------------------|---------------|-------------------------------|--------------|---------|--|
| OFF CHARACTERISTICS (Note 5) | | | | | |
| Collector-Base Breakdown Voltage | $V_{(BR)CBO}$ | -60 | | V | $I_C = -10\text{ A}, I_E = 0$ |
| Collector-Emitter Breakdown Voltage | $V_{(BR)CEO}$ | -60 | | V | $I_C = -10\text{mA}, I_B = 0$ |
| Emitter-Base Breakdown Voltage | $V_{(BR)EBO}$ | -5.0 | | V | $I_E = -10\text{ A}, I_C = 0$ |
| Collector Cutoff Current | I_{CBO} | | -10 | nA A | $V_{CB} = -50\text{V}, I_E = 0$ $V_{CB} = -50\text{V}, I_E = 0, T_A = 125\text{ C}$ |
| Collector Cutoff Current | I_{CEX} | | -50 | nA | $V_{CE} = -30\text{V}, V_{EB(OFF)} = -0.5\text{V}$ |
| Base Cutoff Current | I_{BL} | | -50 | nA | $V_{CE} = -30\text{V}, V_{EB(OFF)} = -0.5\text{V}$ |
| ON CHARACTERISTICS (Note 5) | | | | | |
| DC Current Gain | h_{FE} | 75 100 100 100 50 | 300 | | $I_C = -100\mu\text{A}, V_{CE} = -10\text{V}$ $I_C = -1.0\text{mA}, V_{CE} = -10\text{V}$ $I_C = -10\text{mA}, V_{CE} = -10\text{V}$ $I_C = -150\text{mA}, V_{CE} = -10\text{V}$ $I_C = -500\text{mA}, V_{CE} = -10\text{V}$ |
| Collector-Emitter Saturation Voltage | $V_{CE(SAT)}$ | | -0.4 -1.6 | V | $I_C = -150\text{mA}, I_B = -15\text{mA}$ $I_C = -500\text{mA}, I_B = -50\text{mA}$ |
| Base-Emitter Saturation Voltage | $V_{BE(SAT)}$ | | -1.3 -2.6 | V | $I_C = 150\text{mA}, I_B = 15\text{mA}$ $I_C = 500\text{mA}, I_B = 50\text{mA}$ |
| SMALL SIGNAL CHARACTERISTICS | | | | | |
| Output Capacitance | C_{obo} | | 8.0 | pF | $V_{CB} = -10\text{V}, f = 1.0\text{MHz}, I_E = 0$ |
| Input Capacitance | C_{ibo} | — | 30 | pF | $V_{EB} = -2.0\text{V}, f = 1.0\text{MHz}, I_C = 0$ |
| Current Gain-Bandwidth Product | f_T | 200 | | MHz | $V_{CE} = -20\text{V}, I_C = -50\text{mA}, f = 100\text{MHz}$ |
| SWITCHING CHARACTERISTICS | | | | | |
| Turn-On Time | t_{on} | | 45 | ns | $V_{CC} = -30\text{V}, I_C = -150\text{mA}, I_{B1} = -15\text{mA}$ |
| Delay Time | t_d | | 10 | ns | |
| Rise Time | t_r | | 40 | ns | |
| Turn-Off Time | t_{off} | | 100 | ns | $V_{CC} = -6.0\text{V}, I_C = -150\text{mA}, I_{B1} = I_{B2} = -15\text{mA}$ |
| Storage Time | t_s | | 80 | ns | |
| Fall Time | t_f | | 30 | ns | |

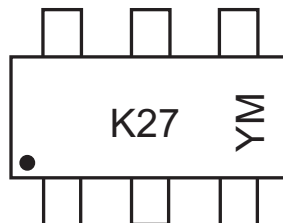
Note: 5. Short duration pulse test used to minimize self-heating effect.

Ordering Information (Note 6)

| Device | Packaging | Shipping |
|-------------|-----------|------------------|
| MMDT2227M-7 | SOT-26 | 3000/Tape & Reel |

Note: 6. For Packaging Details, go to our website at <http://www.diodes.com/datasheets/ap02007.pdf>.

Marking Information



K27 = Product Type Marking Code
 YM = Date Code Marking
 Y = Year ex: S = 2005
 M = Month ex: 9 = September

Date Code Key

| Year | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 |
|------|------|------|------|------|------|------|------|------|
| Code | S | T | U | V | W | X | Y | Z |

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

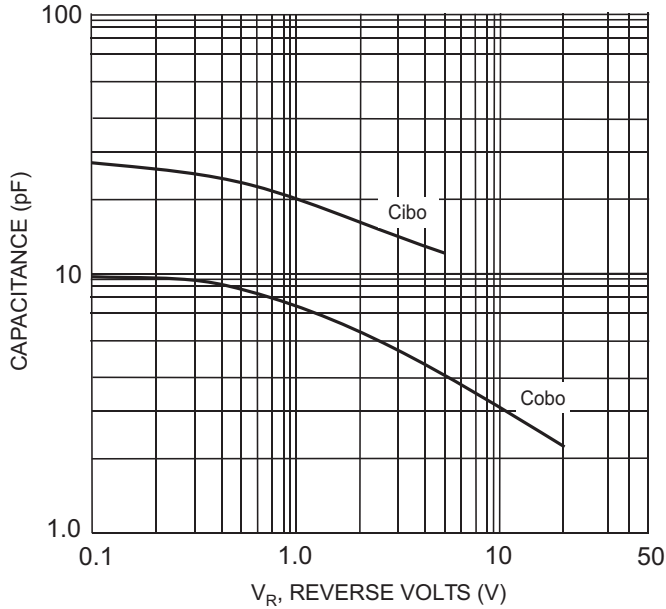


Fig. 1 (2222A) Typical Capacitance

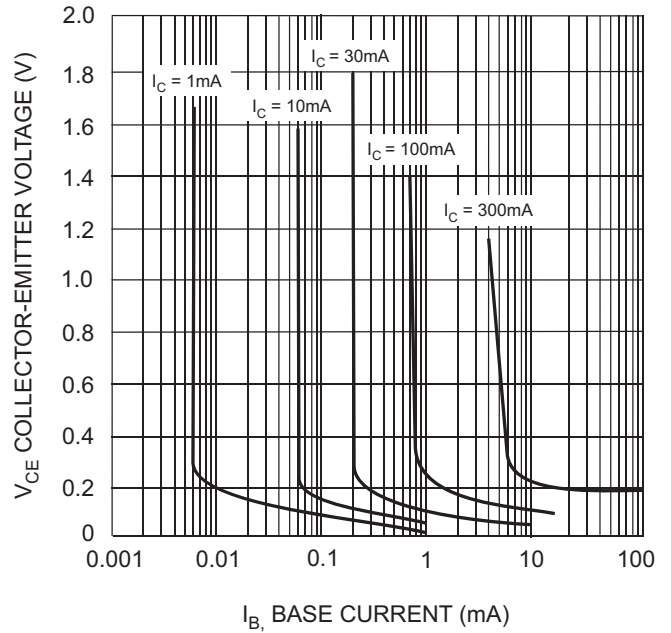


Fig. 2 (2222A) Typical Collector Saturation Region

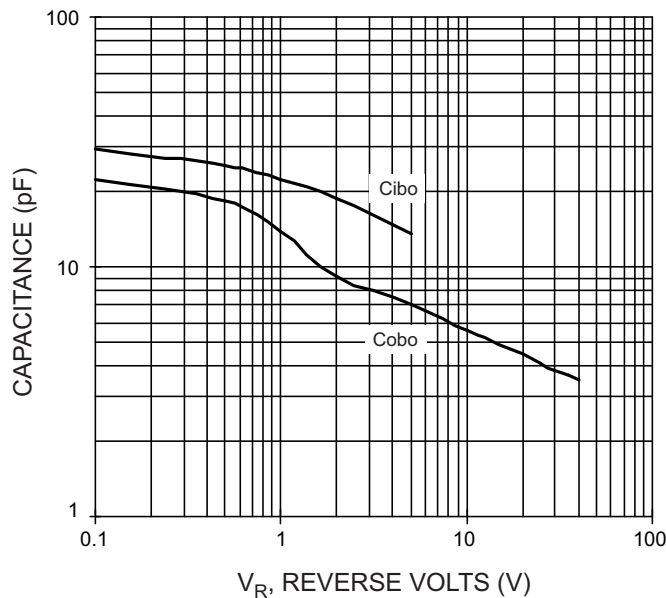


Fig. 3 (2907A) Typical Capacitance

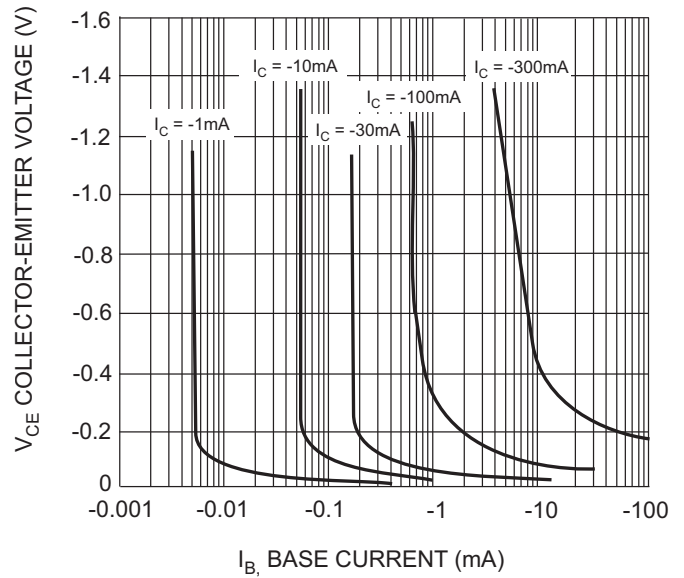


Fig. 4 (2907A) Typical Collector Saturation Region

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