



ZXTP26020DMF

20V LOW $V_{CE(SAT)}$ PNP SURFACE MOUNTED TRANSISTOR

Features

- Epitaxial Planar Die Construction
- Complementary NPN Type Available (ZXTN26020DMF)
- Low Collector-Emitter Saturation Voltage, $V_{CE(SAT)}$
- High Current Gain (h_{FE}) at High I_C
- Surface Mount Package Suited for Automated Assembly
- Ultra-Small Surface Mount Package
- **Qualified to AEC-Q101 Standards for High Reliability**
- **Lead, Halogen and Antimony Free, RoHS Compliant (Note 1)**
- **“Green” Device (Note 2)**
- **ESD rating: 400V-MM, 8KV-HBM**

Mechanical Data

- Case: DFN1411-3
- Case Material: Molded Plastic, “Green” Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish – NiPdAu over Copper lead frame. Solderable per MIL-STD-202, Method 208
- Weight: 0.003 grams (approximate)

Applications

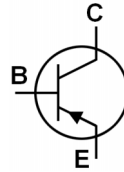
- MOSFET and IGBT gate driving
- DC-DC conversion
- Interface between low voltage IC and Load
- Load disconnect switch



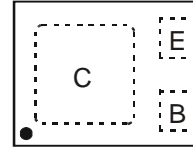
Top view



Bottom view



Device Symbol



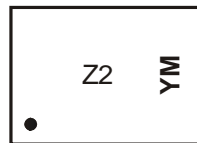
Pin-Out Top view

Ordering Information

| Product | Reel size (inches) | Tape width (mm) | Quantity per reel |
|----------------|--------------------|-----------------|-------------------|
| ZXTP26020DMFTA | 7 | 8 | 3000 |

- Notes: 1. No purposefully added lead. Halogen and Antimony Free.
2. Diodes Inc's "Green" Policy can be found on our website at <http://www.diodes.com>

Marking Information



Z2= Product Type Marking Code
YM = Date Code Marking
Y = Year (ex: W = 2009)
M = Month (ex: 9 = September)

Date Code Key

| Year | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 |
|------|------|------|------|------|------|------|------|------|
| Code | W | X | Y | Z | A | B | C | D |

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

Maximum Ratings

| Characteristic | Symbol | Value | Unit |
|------------------------------|-----------|-------|------|
| Collector-Base Voltage | V_{CBO} | -20 | V |
| Collector-Emitter Voltage | V_{CEO} | -20 | V |
| Emitter-Base Voltage | V_{EBO} | -7 | V |
| Continuous Collector Current | I_C | -1.25 | A |
| Peak Pulse Current | I_{CM} | -4 | A |
| Base Current(DC) | I_B | -0.3 | A |
| Peak Base Current | I_{BM} | -0.6 | A |

Thermal Characteristics

| Characteristic | Symbol | Value | Unit |
|---|-----------------|-------------|--------------------|
| Power Dissipation (Note 3) | P_D | 1 | W |
| Power Dissipation (Note 4) | P_D | 380 | mW |
| Thermal Resistance, Junction to Ambient (Note 3) @ $T_A = 25^\circ\text{C}$ | $R_{\theta JA}$ | 125 | $^\circ\text{C/W}$ |
| Thermal Resistance, Junction to Ambient (Note 4) @ $T_A = 25^\circ\text{C}$ | $R_{\theta JA}$ | 330 | $^\circ\text{C/W}$ |
| Operating and Storage Temperature Range | T_J, T_{STG} | -55 to +150 | $^\circ\text{C}$ |

- Notes:
3. Device mounted on FR-4 PCB with 1inch square pads.
 4. Device mounted on FR-4 PCB with minimum recommended pad layout

Electrical Characteristics (at $T_A = 25^\circ\text{C}$ unless otherwise specified)

| Characteristic | Symbol | Min | Typ | Max | Unit | Test Condition |
|---|---------------|--------------------------|------------------|-----------------------------|----------------------|---|
| Collector-Base Breakdown Voltage | $V_{(BR)CBO}$ | -20 | — | — | V | $I_C = -100\mu\text{A}, I_E = 0\text{A}$ |
| Collector-Emitter Breakdown Voltage (Note 5) | $V_{(BR)CEO}$ | -20 | — | — | V | $I_C = -10\text{mA}, I_B = 0\text{A}$ |
| Emitter-Base Breakdown Voltage | $V_{(BR)EBO}$ | -7 | — | — | V | $I_E = -100\mu\text{A}, I_C = 0\text{A}$ |
| Collector Cutoff Current | I_{cbo} | — | — | -100 -0.5 | nA μA | $V_{CB} = -20\text{V}, I_E = 0\text{A}$ $V_{CB} = -20\text{V}, I_E = 0\text{A}, T_A = 125^\circ\text{C}$ |
| Emitter Cutoff Current | I_{ces} | — | — | -100 | nA | $V_{CE} = -20\text{V}, V_{BE} = 0\text{V}$ |
| Base Cutoff Current | I_{ebo} | — | — | -50 | nA | $V_{BE} = -6\text{V}, I_C = 0\text{A}$ |
| DC Current Gain (Note 5) | h_{FE} | 300 235 175 140 | — — — — | — — — — | — | $V_{CE} = -2\text{V}, I_C = -100\text{mA}$ $V_{CE} = -2\text{V}, I_C = -0.5\text{A}$ $V_{CE} = -2\text{V}, I_C = -1\text{A}$ $V_{CE} = -2\text{V}, I_C = -1.5\text{A}$ |
| Collector-Emitter Saturation Voltage (Note 5) | $V_{CE(SAT)}$ | — — — — | — — — — | -80 -100 -155 -235 | mV mV mV mV | $I_C = -100\text{mA}, I_B = -1\text{mA}$ $I_C = -500\text{mA}, I_B = -50\text{mA}$ $I_C = -1\text{A}, I_B = -50\text{mA}$ $I_C = -1.25\text{A}, I_B = -62.5\text{mA}$ |
| Equivalent On-Resistance | $R_{CE(SAT)}$ | — | 125 | — | m Ω | $I_C = -1\text{A}, I_B = -50\text{mA}$ |
| Base-Emitter Turn-On Voltage | $V_{BE(ON)}$ | — | — | -1.1 | V | $V_{CE} = -5\text{V}, I_C = -1\text{A}$ |
| Base-Emitter Saturation Voltage | $V_{BE(SAT)}$ | — | — | -1.15 | V | $I_C = -1\text{A}, I_B = -50\text{mA}$ |
| Output Capacitance (Note 5) | C_{obo} | — | — | 20 | pF | $V_{CB} = -10\text{V}, f = 1.0\text{MHz}$ |
| Current Gain-Bandwidth Product | f_T | 200 | — | — | MHz | $V_{CE} = -10\text{V}, I_C = -50\text{mA}, f = 100\text{MHz}$ |
| Turn-On Time | t_{on} | — | 60 | — | ns | $V_{CC} = -10\text{V}, I_C = -1\text{A}$ $I_{B2} = -I_{B1} = -50\text{mA}$ |
| Delay Time | t_d | — | 20 | — | ns | |
| Rise Time | t_r | — | 40 | — | ns | |
| Turn-Off Time | t_{off} | — | 167 | — | ns | |
| Storage Time | t_s | — | 140 | — | ns | |
| Fall Time | t_f | — | 27 | — | ns | |

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

ZXTP26020DMF

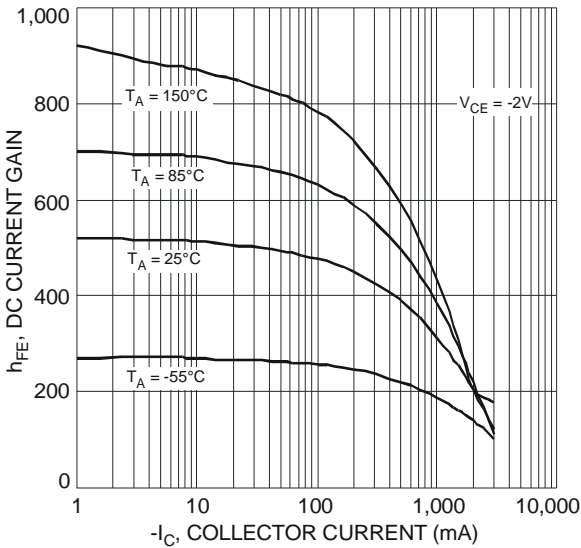


Fig. 1 Typical DC Current Gain vs. Collector Current

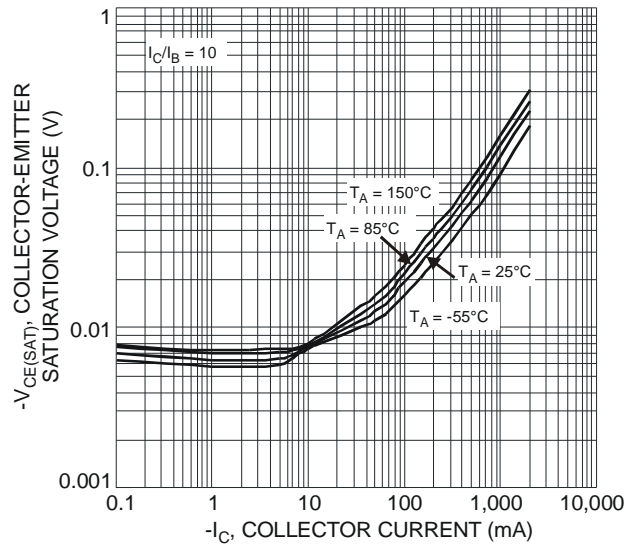


Fig. 2 Typical Collector-Emitter Saturation Voltage vs. Collector Current

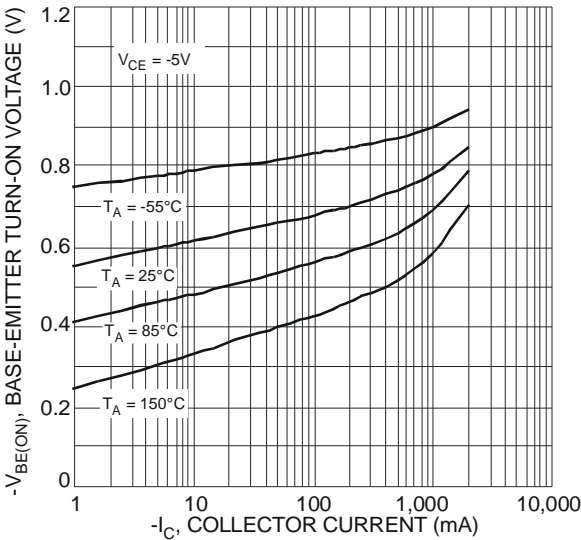


Fig. 3 Typical Base-Emitter Turn-On Voltage vs. Collector Current

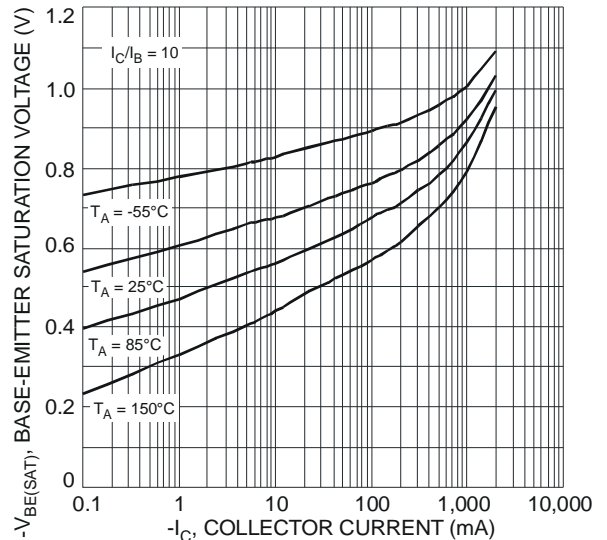


Fig. 4 Typical Base-Emitter Saturation Voltage vs. Collector Current

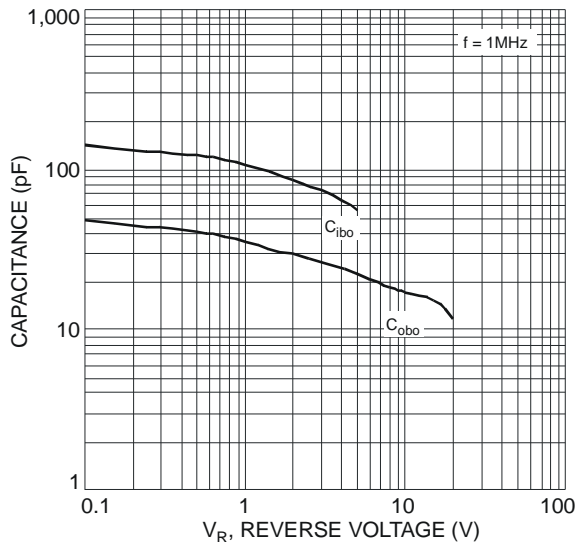
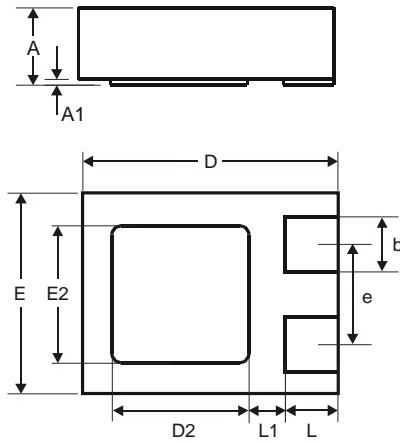


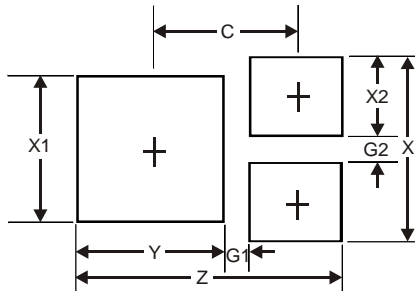
Fig. 5 Typical Capacitance Characteristics

Package Outline Dimensions



| DFN1411-3 | | | |
|----------------------|-------|-------|-------|
| Dim | Min | Max | Typ |
| A | 0.47 | 0.53 | 0.50 |
| A1 | 0 | 0.05 | 0.02 |
| b | 0.25 | 0.35 | 0.30 |
| D | 1.35 | 1.475 | 1.40 |
| D2 | 0.65 | 0.85 | 0.75 |
| E | 1.05 | 1.18 | 1.10 |
| E2 | 0.65 | 0.85 | 0.75 |
| e | — | — | 0.55 |
| L | 0.225 | 0.325 | 0.275 |
| L1 | — | — | 0.20 |
| All Dimensions in mm | | | |

Suggested Pad Layout



| Dimensions | Value (in mm) |
|------------|---------------|
| Z | 1.38 |
| G1 | 0.15 |
| G2 | 0.15 |
| X | 0.95 |
| X1 | 0.75 |
| X2 | 0.40 |
| Y | 0.75 |
| C | 0.76 |

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