

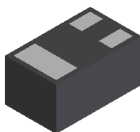
## Features

- Low Collector-Emitter Saturation Voltage,  $V_{CE(sat)}$
- Ultra-Small Leadless Surface Mount Package
- ESD: HBM 8kV, MM 400V
- Complementary NPN Type Available (DSS2540M)
- **"Lead Free", RoHS Compliant (Note 1)**
- **Halogen and Antimony Free, "Green" Device (Note 2)**

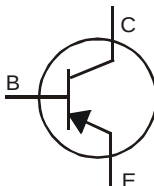
## Mechanical Data

- Case: DFN1006-3
- 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 leadframe. Solderable per MIL-STD-202, Method 208
- Weight: 0.0009 grams (Approximate)

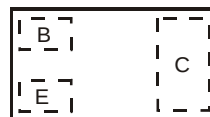
DFN1006-3



Bottom View



Device Symbol



Top View  
Device Schematic

## Ordering Information (Note 3)

| Product     | Marking | Reel size (inches) | Tape width (mm) | Quantity per reel |
|-------------|---------|--------------------|-----------------|-------------------|
| DSS3540M-7  | TD      | 7                  | 8mm             | 3,000             |
| DSS3540M-7B | TD      | 7                  | 8mm             | 10,000            |

- Notes:
1. No purposefully added lead.
  2. Diodes Inc's "Green" policy can be found on our website at <http://www.diodes.com>
  3. For packaging details, go to our website at <http://www.diodes.com>.

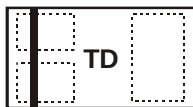
## Marking Information

DSS3540M-7



Top View  
Dot Denotes Collector Side

DSS3540M-7B



Top View  
Bar Denotes Base and Emitter Side

TD = Product Type Marking Code

# Maximum Ratings @T<sub>A</sub> = 25°C unless otherwise specified

| Characteristic                 | Symbol           | Value | Unit |
|--------------------------------|------------------|-------|------|
| Collector-Base Voltage         | V <sub>CBO</sub> | -40   | V    |
| Collector-Emitter Voltage      | V <sub>CEO</sub> | -40   | V    |
| Emitter-Base Voltage           | V <sub>EBO</sub> | -6    | V    |
| Collector Current - Continuous | I <sub>C</sub>   | -500  | mA   |
| Peak Pulse Collector Current   | I <sub>CM</sub>  | -1    | A    |
| Peak Base Current              | I <sub>BM</sub>  | -100  | mA   |

# Thermal Characteristics

| Characteristic                                                           | Symbol                            | Value       | Unit |
|--------------------------------------------------------------------------|-----------------------------------|-------------|------|
| Power Dissipation (Note 4) @ T <sub>A</sub> = 25°C                       | P <sub>D</sub>                    | 250         | mW   |
| Thermal Resistance, Junction to Ambient (Note 4) @ T <sub>A</sub> = 25°C | R <sub>θJA</sub>                  | 500         | °C/W |
| Operating and Storage Temperature Range                                  | T <sub>J</sub> , T <sub>STG</sub> | -55 to +150 | °C   |

Notes: 4. Device mounted on FR-4 PCB with minimum recommended pad layout.

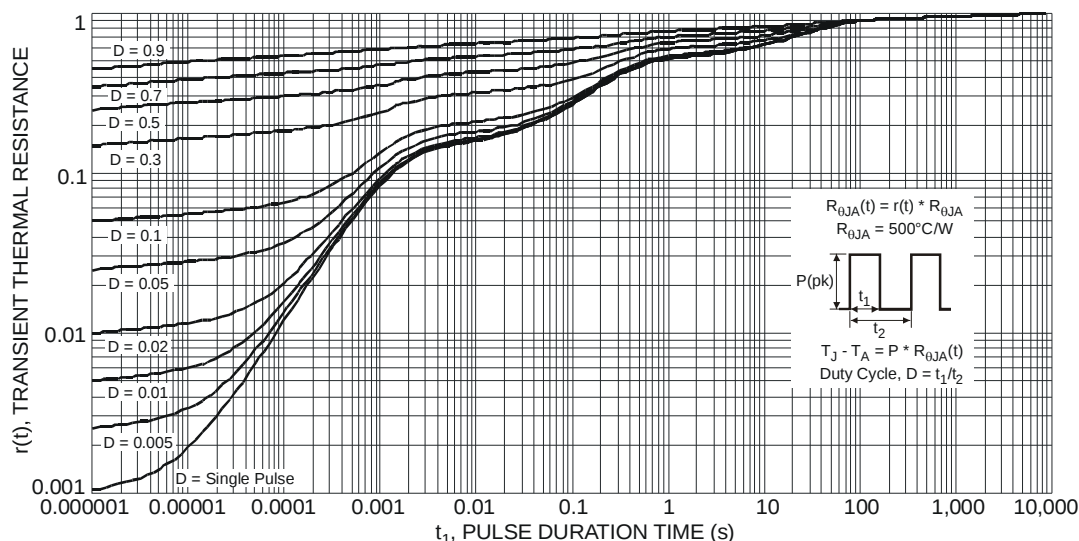


Fig. 1 Transient Thermal Response

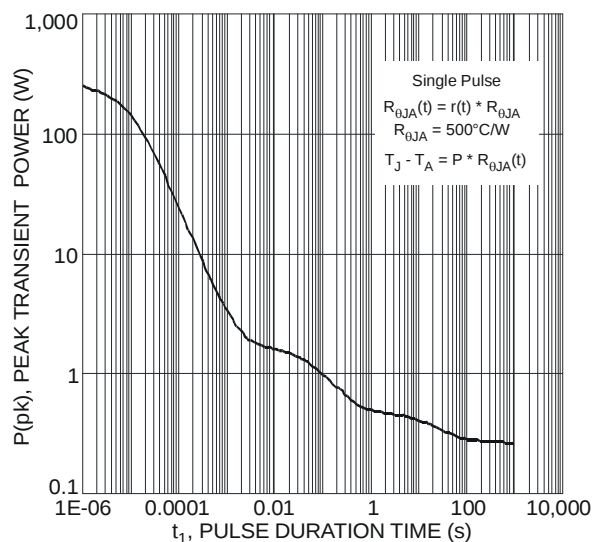


Fig. 2 Single Pulse Maximum Power Dissipation

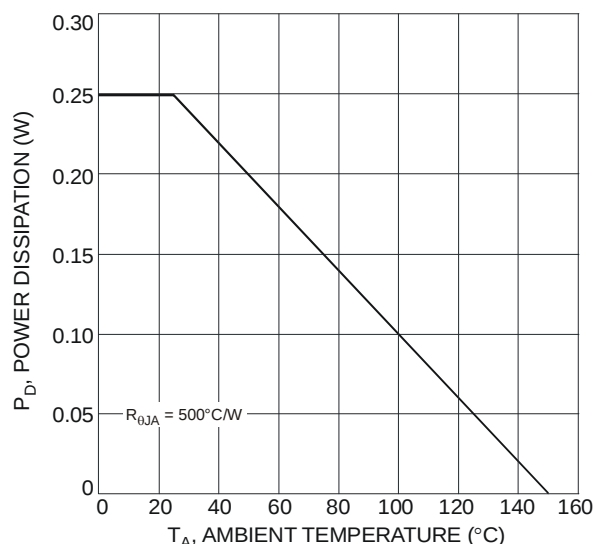


Fig. 3 Power Dissipation vs. Ambient Temperature (Note 4)

# Electrical Characteristics @T<sub>A</sub> = 25°C unless otherwise specified

| Characteristic                               | Symbol               | Min              | Typ              | Max                         | Unit | Test Condition                                                                                                                                                                                          |
|----------------------------------------------|----------------------|------------------|------------------|-----------------------------|------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>OFF CHARACTERISTICS</b>                   |                      |                  |                  |                             |      |                                                                                                                                                                                                         |
| Collector-Base Breakdown Voltage             | BV <sub>CBO</sub>    | -40              | —                | —                           | V    | I <sub>C</sub> = -100μA, I <sub>E</sub> = 0                                                                                                                                                             |
| Collector-Emitter Breakdown Voltage (Note 5) | BV <sub>CEO</sub>    | -40              | —                | —                           | V    | I <sub>C</sub> = -10mA, I <sub>B</sub> = 0                                                                                                                                                              |
| Emitter-Base Breakdown Voltage               | BV <sub>EBO</sub>    | -6               | —                | —                           | V    | I <sub>E</sub> = -100μA, I <sub>C</sub> = 0                                                                                                                                                             |
| Collector Cutoff Current                     | I <sub>CBO</sub>     | —                | —                | -100                        | nA   | V <sub>CB</sub> = -30V, I <sub>E</sub> = 0                                                                                                                                                              |
| Emitter Cutoff Current                       | I <sub>EBO</sub>     | —                | —                | -100                        | nA   | V <sub>CB</sub> = -30V, I <sub>E</sub> = 0, T <sub>A</sub> = 150°C                                                                                                                                      |
| <b>ON CHARACTERISTICS (Note 5)</b>           |                      |                  |                  |                             |      |                                                                                                                                                                                                         |
| DC Current Gain                              | h <sub>FE</sub>      | 200<br>150<br>40 | —<br>—<br>—      | —<br>—<br>—                 | —    | V <sub>CE</sub> = -2V, I <sub>C</sub> = -10mA<br>V <sub>CE</sub> = -2V, I <sub>C</sub> = -100mA<br>V <sub>CE</sub> = -2V, I <sub>C</sub> = -500mA                                                       |
| Collector-Emitter Saturation Voltage         | V <sub>CE(sat)</sub> | —<br>—<br>—<br>— | —<br>—<br>—<br>— | -50<br>-130<br>-200<br>-350 | mV   | I <sub>C</sub> = -10mA, I <sub>B</sub> = -0.5mA<br>I <sub>C</sub> = -100mA, I <sub>B</sub> = -5mA<br>I <sub>C</sub> = -200mA, I <sub>B</sub> = -10mA<br>I <sub>C</sub> = -500mA, I <sub>B</sub> = -50mA |
| Collector-Emitter Saturation Resistance      | R <sub>CE(sat)</sub> | —                | —                | 700                         | mΩ   | I <sub>C</sub> = -500mA, I <sub>B</sub> = -50mA                                                                                                                                                         |
| Base-Emitter Saturation Voltage              | V <sub>BE(sat)</sub> | —                | —                | -1.2                        | V    | I <sub>C</sub> = -500mA, I <sub>B</sub> = -50mA                                                                                                                                                         |
| Base-Emitter Turn On Voltage                 | V <sub>BE(on)</sub>  | —                | —                | -1.1                        | V    | V <sub>CE</sub> = -2V, I <sub>C</sub> = -100mA                                                                                                                                                          |
| <b>SMALL SIGNAL CHARACTERISTICS</b>          |                      |                  |                  |                             |      |                                                                                                                                                                                                         |
| Output Capacitance                           | C <sub>obo</sub>     | —                | —                | 10                          | pF   | V <sub>CB</sub> = -10V, f = 1.0MHz                                                                                                                                                                      |
| Current Gain-Bandwidth Product               | f <sub>T</sub>       | 100              | —                | —                           | MHz  | V <sub>CE</sub> = -5V, I <sub>C</sub> = -100mA, f = 100MHz                                                                                                                                              |

Notes: 5. Measured under pulsed conditions. Pulse width = 300μs. Duty cycle ≤2%.

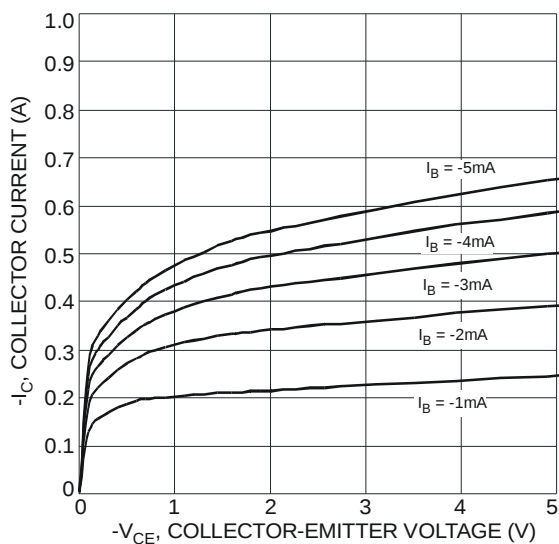


Fig. 4 Typical Collector Current vs. Collector-Emitter Voltage

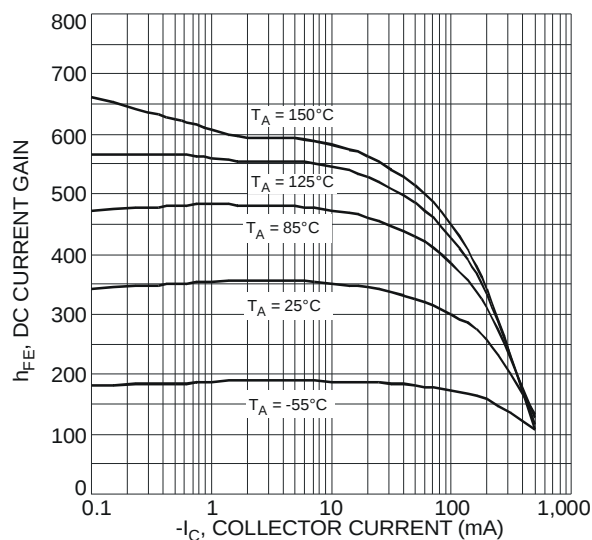


Fig. 5 Typical DC Current Gain vs. Collector Current

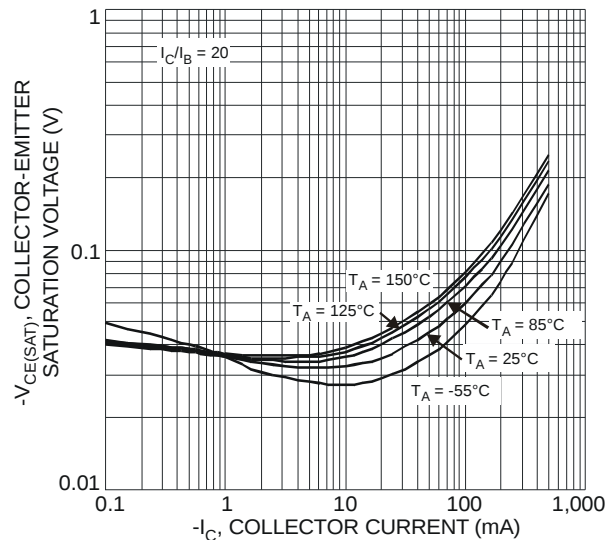


Fig. 6 Typical Collector-Emitter Saturation Voltage vs. Collector Current

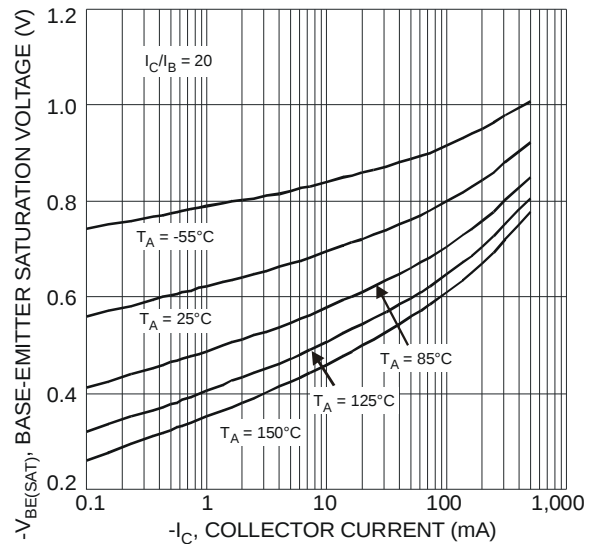


Fig. 7 Typical Base-Emitter Saturation Voltage vs. Collector Current

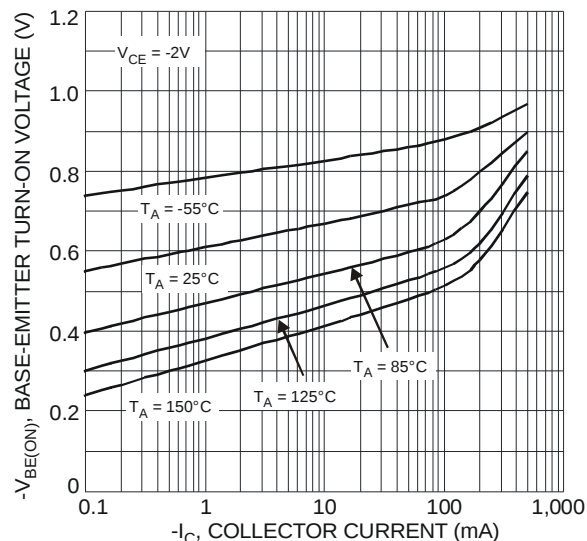


Fig. 8 Typical Base-Emitter Turn-On Voltage vs. Collector Current

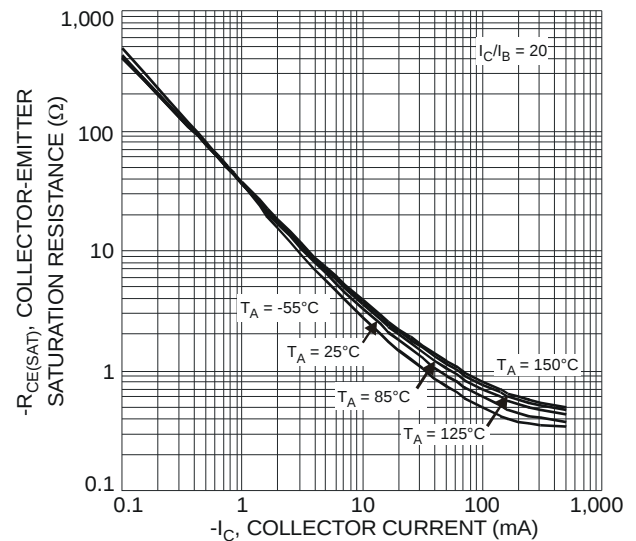
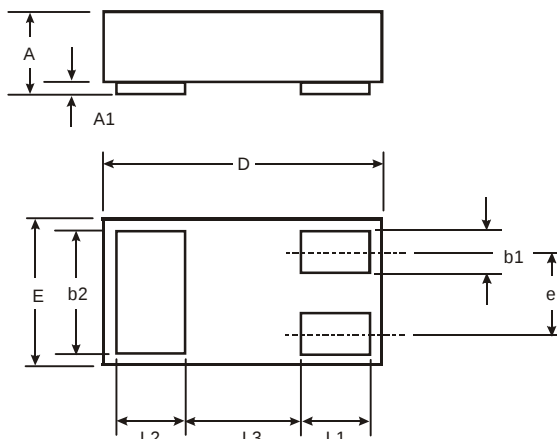


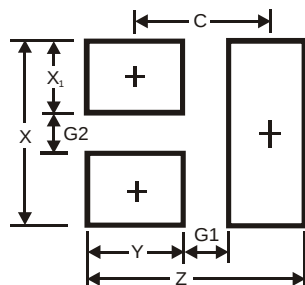
Fig. 9 Typical Collector-Emitter Saturation Resistance vs. Collector Current

## Package Outline Dimensions



| DFN1006-3            |      |       |      |
|----------------------|------|-------|------|
| Dim                  | Min  | Max   | Typ  |
| A                    | 0.47 | 0.53  | 0.50 |
| A1                   | 0    | 0.05  | 0.03 |
| b1                   | 0.10 | 0.20  | 0.15 |
| b2                   | 0.45 | 0.55  | 0.50 |
| D                    | 0.95 | 1.075 | 1.00 |
| E                    | 0.55 | 0.675 | 0.60 |
| e                    | —    | —     | 0.35 |
| L1                   | 0.20 | 0.30  | 0.25 |
| L2                   | 0.20 | 0.30  | 0.25 |
| L3                   | —    | —     | 0.40 |
| All Dimensions in mm |      |       |      |

## Suggested Pad Layout



| Dimensions | Value (in mm) |
|------------|---------------|
| Z          | 1.1           |
| G1         | 0.3           |
| G2         | 0.2           |
| X          | 0.7           |
| X1         | 0.25          |
| Y          | 0.4           |
| C          | 0.7           |

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