

## Features

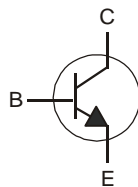
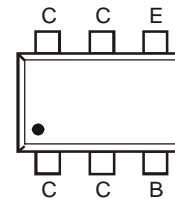
- Epitaxial Planar Die Construction
- Ideal for Low Power Amplification and Switching
- Complementary PNP Type Available (DSS5240Y)
- Ultra Small Surface Mount Package
- **“Lead Free”, RoHS Compliant (Note 1)**
- **Halogen and Antimony Free "Green" Device (Note 2)**
- **ESD rating: 400V-MM, 8KV-HBM**
- **Qualified to AEC-Q101 Standards for High Reliability**

## Mechanical Data

- Case: SOT363
- Case Material: Molded Plastic, “Green” Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish - Matte Tin annealed over Copper Plated Alloy 42 leadframe. Solderable per MIL-STD-202, Method 208
- Weight: 0.006 grams (approximate)



Top View

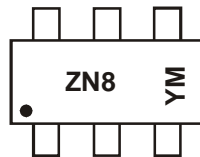

 Top View  
Device Schematic

 Top View  
Pin Out Configuration

## Ordering Information (Note 3)

| Product    | Marking | Reel size (inches) | Tape width (mm) | Quantity per reel |
|------------|---------|--------------------|-----------------|-------------------|
| DSS4240Y-7 | ZN8     | 7                  | 8mm             | 3,000             |

- Notes:
1. No purposefully added lead.
  2. Diode's 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



ZN8 = Product Type Marking Code  
 YM = Date Code Marking  
 Y = Year (ex: V = 2008)  
 M = Month (ex: 9 = September)

### Date Code Key

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

| 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** @T<sub>A</sub> = 25°C unless otherwise specified

| Characteristic                 | Symbol           | Value | Unit |
|--------------------------------|------------------|-------|------|
| Collector-Base Voltage         | V <sub>CB0</sub> | 40    | V    |
| Collector-Emitter Voltage      | V <sub>CEO</sub> | 40    | V    |
| Emitter-Base Voltage           | V <sub>EBO</sub> | 5     | V    |
| Collector Current - Continuous | I <sub>C</sub>   | 2     | A    |
| Peak Pulse Collector Current   | I <sub>CM</sub>  | 3     | A    |
| Peak Base Current              | I <sub>BM</sub>  | 0.3   | A    |

**Thermal Characteristics**

| Characteristic   | Symbol                            | Value       | Unit |
|--|-----------------------------------|-------------|------|
| Power Dissipation (Note 4) @ T <sub>A</sub> = 25°C                       | P <sub>D</sub>                    | 625         | mW   |
| Thermal Resistance, Junction to Ambient (Note 4) @ T <sub>A</sub> = 25°C | R <sub>θJA</sub>                  | 200         | °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.

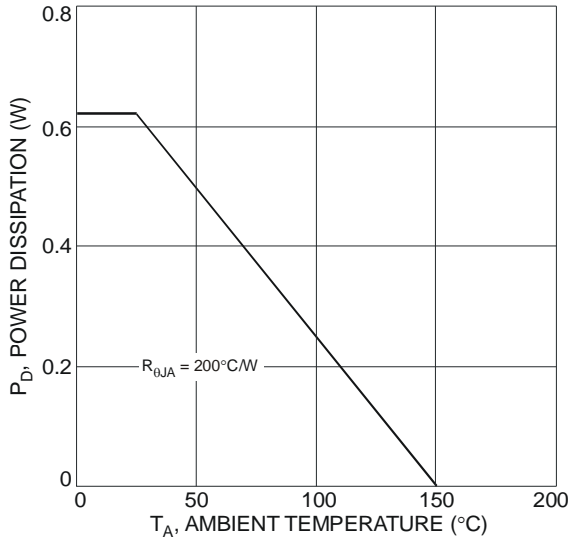


Fig. 1 Power Dissipation vs. Ambient Temperature (Note 3)

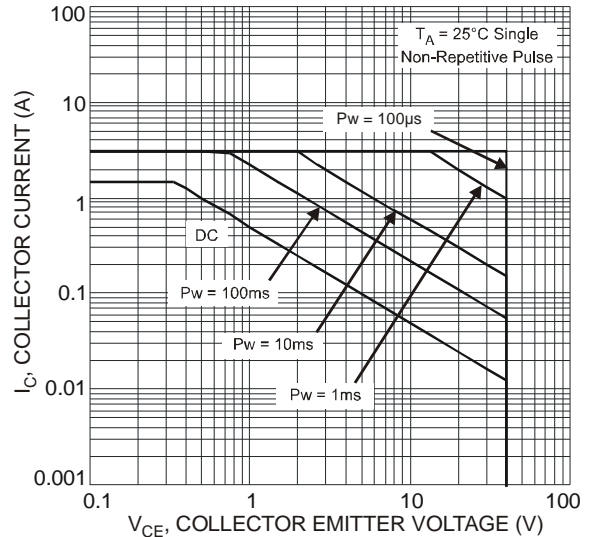


Fig. 2 Safe Operating Area

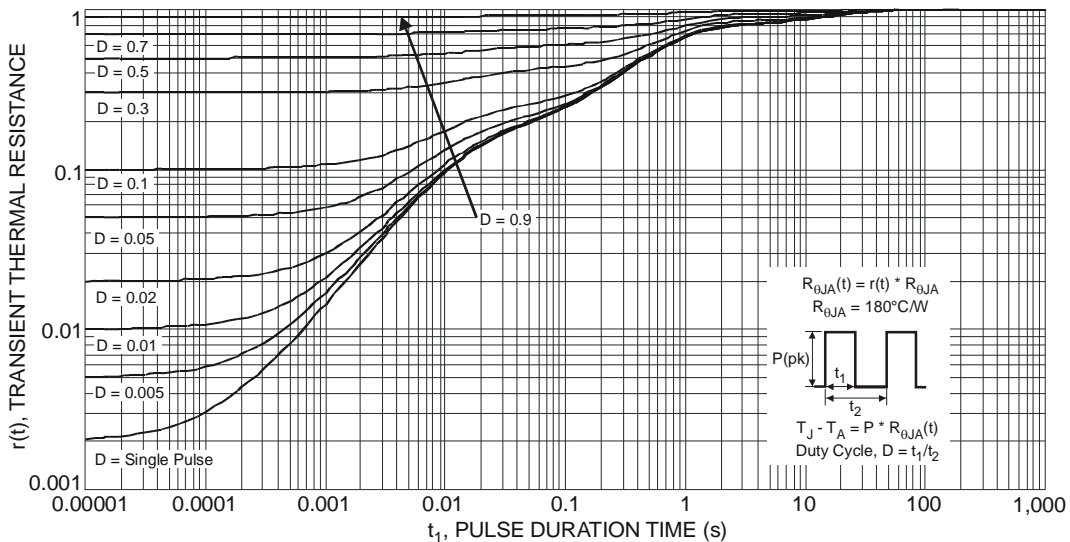


Fig. 3 Transient Thermal Response

**Electrical Characteristics** @ $T_A = 25^\circ\text{C}$  unless otherwise specified

| Characteristic                                | Symbol        | Min                      | Typ                           | Max                            | Unit                | Test Condition  |
|---|---------------|--------------------------|-------------------------------|--------------------------------|---------------------|---|
| Collector-Base Breakdown Voltage              | $BV_{CBO}$    | 40                       | 150                           | —                              | V                   | $I_C = 100\mu\text{A}, I_E = 0$   |
| Collector-Emitter Breakdown Voltage (Note 5)  | $BV_{CEO}$    | 40                       | 55                            | —                              | V                   | $I_C = 10\text{mA}, I_B = 0$  |
| Emitter-Base Breakdown Voltage                | $BV_{EBO}$    | 5                        | 8.5                           | —                              | V                   | $I_E = 100\mu\text{A}, I_C = 0$   |
| Collector Cutoff Current                      | $I_{CBO}$     | —                        | —                             | 100<br>50                      | nA<br>$\mu\text{A}$ | $V_{CB} = 30\text{V}, I_E = 0$<br>$V_{CB} = 30\text{V}, I_E = 0, T_A = 150^\circ\text{C}$   |
| Emitter Cutoff Current                        | $I_{EBO}$     | —                        | —                             | 100                            | nA                  | $V_{EB} = 4\text{V}, I_C = 0$   |
| DC Current Gain (Note 5)                      | $h_{FE}$      | 350<br>300<br>300<br>150 | —<br>—<br>—<br>—              | —<br>—<br>—<br>—               | —                   | $V_{CE} = 2\text{V}, I_C = 100\text{mA}$<br>$V_{CE} = 2\text{V}, I_C = 500\text{mA}$<br>$V_{CE} = 2\text{V}, I_C = 1\text{A}$<br>$V_{CE} = 2\text{V}, I_C = 2\text{A}$  |
| Collector-Emitter Saturation Voltage (Note 5) | $V_{CE(sat)}$ | —<br>—<br>—<br>—<br>—    | 45<br>52<br>100<br>105<br>190 | 70<br>100<br>180<br>180<br>320 | mV                  | $I_C = 100\text{mA}, I_B = 1\text{mA}$<br>$I_C = 500\text{mA}, I_B = 50\text{mA}$<br>$I_C = 750\text{mA}, I_B = 15\text{mA}$<br>$I_C = 1\text{A}, I_B = 50\text{mA}$<br>$I_C = 2\text{A}, I_B = 200\text{mA}$ |
| Collector-Emitter Saturation Resistance       | $R_{CE(sat)}$ | —                        | 105                           | 200                            | m $\Omega$          | $I_C = 500\text{mA}, I_B = 50\text{mA}$   |
| Base-Emitter Saturation Voltage               | $V_{BE(sat)}$ | —                        | —                             | 1.1                            | V                   | $I_C = 2\text{A}, I_B = 200\text{mA}$   |
| Base-Emitter Turn On Voltage                  | $V_{BE(on)}$  | —                        | —                             | 0.75                           | V                   | $V_{CE} = 2\text{V}, I_C = 100\text{mA}$  |
| Output Capacitance                            | $C_{obo}$     | —                        | —                             | 20                             | pF                  | $V_{CB} = 10\text{V}, f = 1.0\text{MHz}$  |
| Current Gain-Bandwidth Product                | $f_T$         | 100                      | 250                           | —                              | MHz                 | $V_{CE} = 10\text{V}, I_C = 50\text{mA}, f = 100\text{MHz}$   |
| Turn-On Time                                  | $t_{on}$      | —                        | 64                            | —                              | ns                  | $V_{CC} = 10\text{V}$<br>$I_C = 1\text{A}, I_{B1} = -I_{B2} = 50\text{mA}$  |
| Delay Time                                    | $t_d$         | —                        | 20                            | —                              | ns                  |   |
| Rise Time                                     | $t_r$         | —                        | 44                            | —                              | ns                  |   |
| Turn-Off Time                                 | $t_{off}$     | —                        | 315                           | —                              | ns                  |   |
| Storage Time                                  | $t_s$         | —                        | 275                           | —                              | ns                  |   |
| Fall Time                                     | $t_f$         | —                        | 40                            | —                              | ns                  |   |

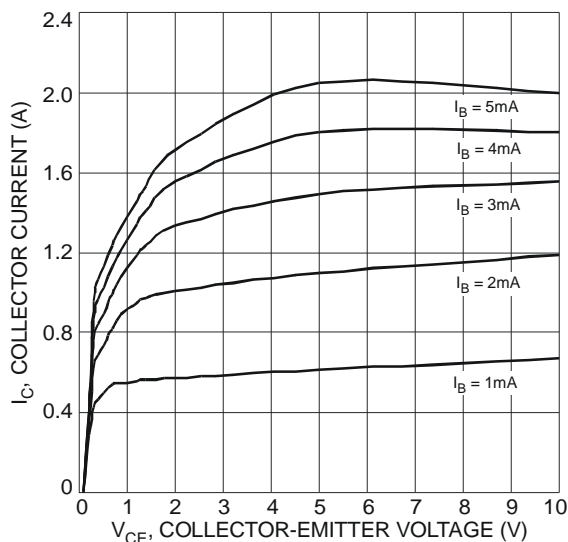
 Notes: 5. Measured under pulsed conditions. Pulse width = 300 $\mu\text{s}$ . Duty cycle  $\leq 2\%$ .


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

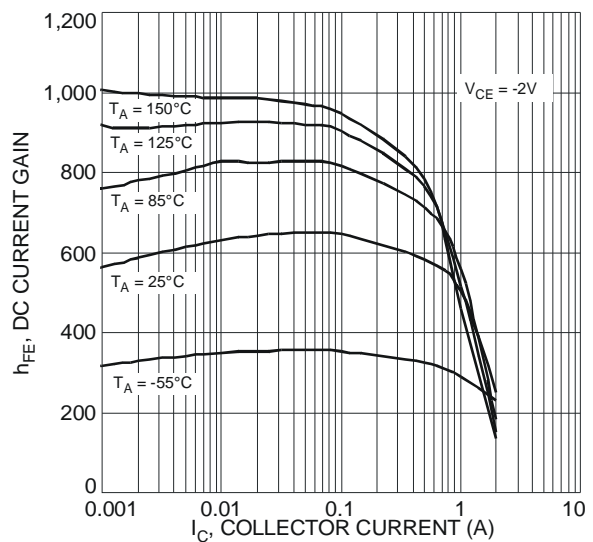


Fig. 5 Typical DC Current Gain vs. Collector Current

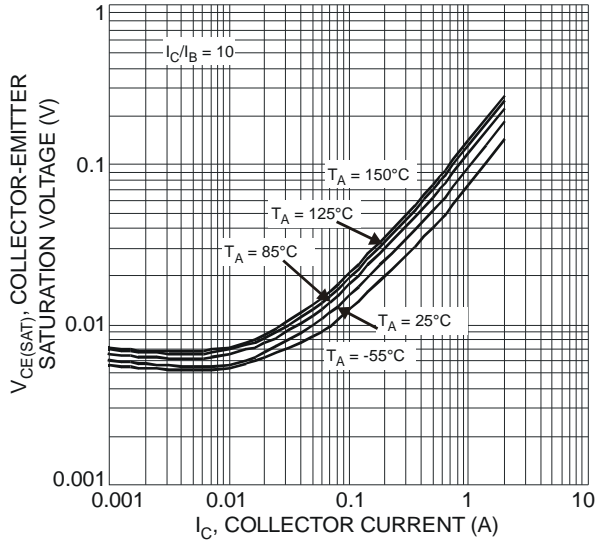


Fig. 6 Typical Collector-Emitter Saturation Voltage vs. Collector Current

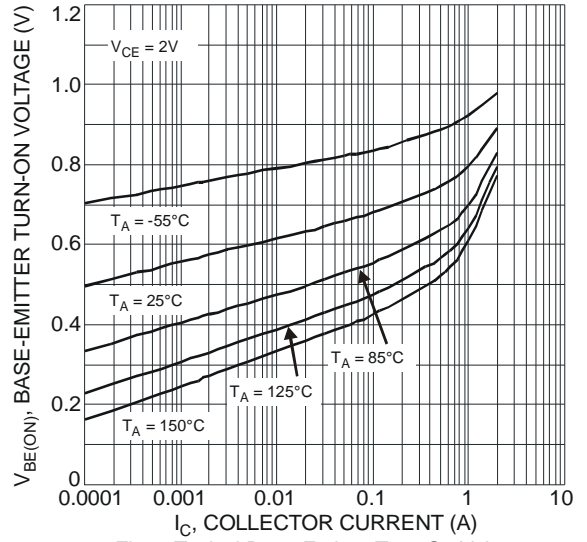


Fig. 7 Typical Base-Emitter Turn-On Voltage vs. Collector Current

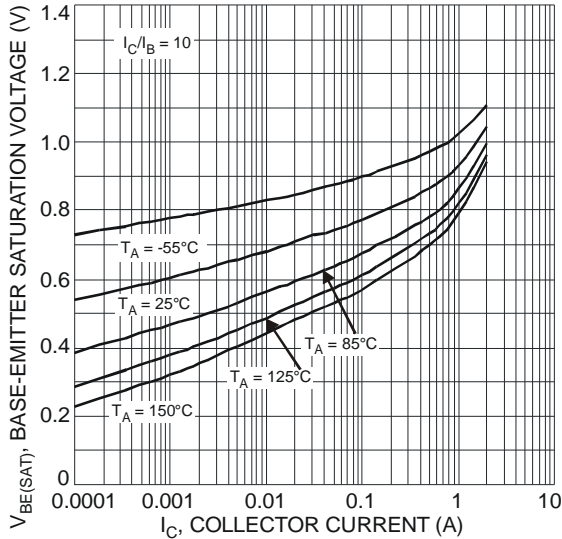


Fig. 8 Typical Base-Emitter Saturation Voltage vs. Collector Current

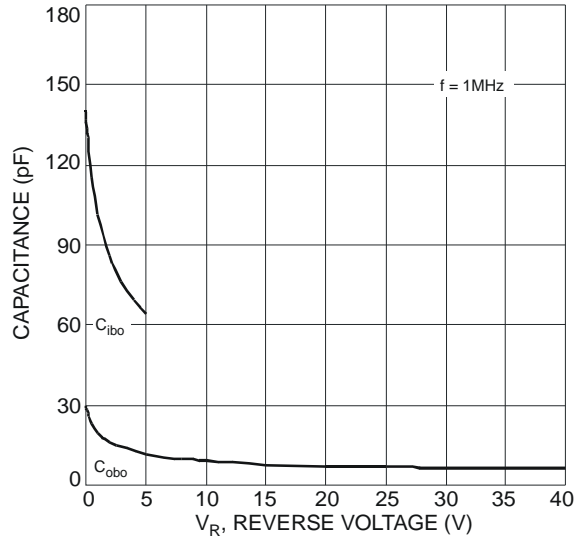
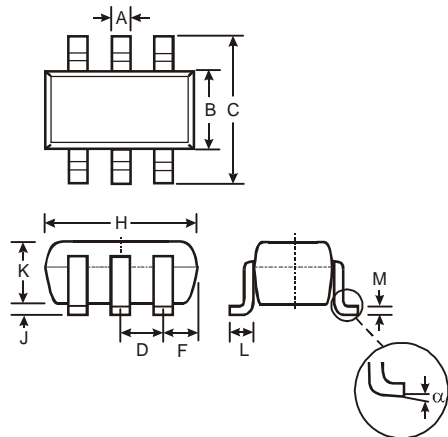


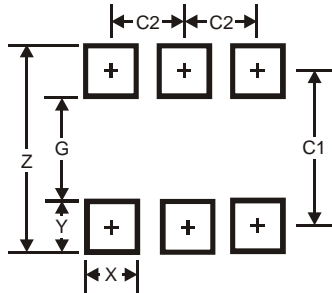
Fig. 9 Typical Capacitance Characteristics

**Package Outline Dimensions**



| SOT363               |          |      |
|----------------------|----------|------|
| Dim                  | Min      | Max  |
| A                    | 0.10     | 0.30 |
| B                    | 1.15     | 1.35 |
| C                    | 2.00     | 2.20 |
| D                    | 0.65 Typ |      |
| F                    | 0.40     | 0.45 |
| H                    | 1.80     | 2.20 |
| J                    | 0        | 0.10 |
| K                    | 0.90     | 1.00 |
| L                    | 0.25     | 0.40 |
| M                    | 0.10     | 0.22 |
| $\alpha$             | 0°       | 8°   |
| All Dimensions in mm |          |      |

## Suggested Pad Layout



| Dimensions | Value (in mm) |
|------------|---------------|
| Z          | 2.5           |
| G          | 1.3           |
| X          | 0.42          |
| Y          | 0.6           |
| C1         | 1.9           |
| C2         | 0.65          |

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