

## Features

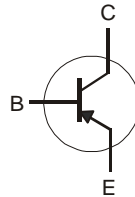
- Epitaxial Planar Die Construction
- Ideal for Low Power Amplification and Switching
- Complementary NPN Type Available (DSS8110Y)
- Ultra Small Surface Mount Package
- **“Lead Free”, RoHS Compliant (Note 1)**
- **Halogen and Antimony Free “Green” Device (Note 2)**
- **ESD rating: 400V-MM, 8KV-HBM**

## Mechanical Data

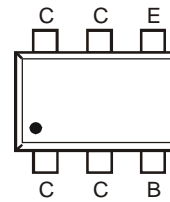
- Case: SOT-363
- Case Material: Molded Plastic, “Green” Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish - Matte Tin annealed over Alloy 42 leadframe. Solderable per MIL-STD-202, Method 208
- Weight: 0.006 grams (approximate)



Top View



Device Symbol



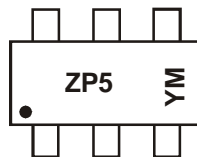
Top View  
Pin Out Configuration

## Ordering Information (Note 3)

| Product    | Marking | Reel size (inches) | Tape width (mm) | Quantity per reel |
|------------|---------|--------------------|-----------------|-------------------|
| DSS9110Y-7 | ZP5     | 7                  | 8mm             | 3,000             |

- 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



ZP5 = 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 | 2016 | 2017 |
|------|------|------|------|------|------|------|------|------|
| Code | X    | Y    | Z    | A    | B    | C    | D    | E    |

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

| Characteristic                 | Symbol    | Value | Unit |
|--------------------------------|-----------|-------|------|
| Collector-Base Voltage         | $V_{CBO}$ | -120  | V    |
| Collector-Emitter Voltage      | $V_{CEO}$ | -100  | V    |
| Emitter-Base Voltage           | $V_{EBO}$ | -5    | V    |
| Collector Current - Continuous | $I_C$     | -1    | A    |
| Peak Pulse Collector Current   | $I_{CM}$  | -3    | A    |
| Base Current – Continuous      | $I_B$     | -0.3  | A    |

**Thermal Characteristics**

| Characteristic  | Symbol          | Value       | Unit               |
|---|-----------------|-------------|--------------------|
| Power Dissipation (Note 4) @ $T_A = 25^\circ\text{C}$                       | $P_D$           | 625         | mW                 |
| Thermal Resistance, Junction to Ambient (Note 4) @ $T_A = 25^\circ\text{C}$ | $R_{\theta JA}$ | 200         | $^\circ\text{C/W}$ |
| Operating and Storage Temperature Range                                     | $T_J, T_{STG}$  | -55 to +150 | $^\circ\text{C}$   |

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

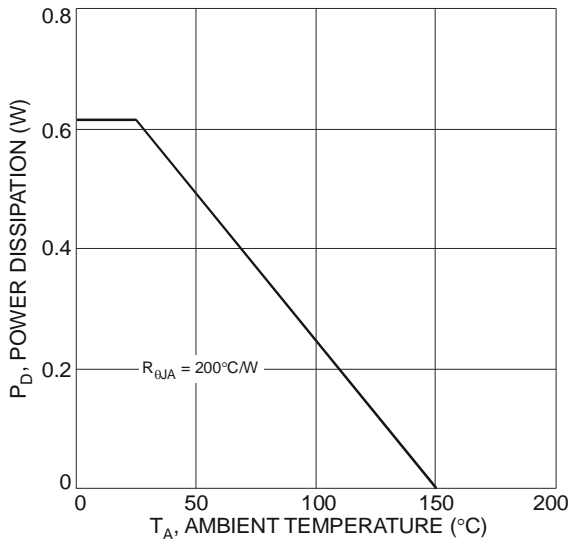


Fig. 1 Power Dissipation vs. Ambient Temperature

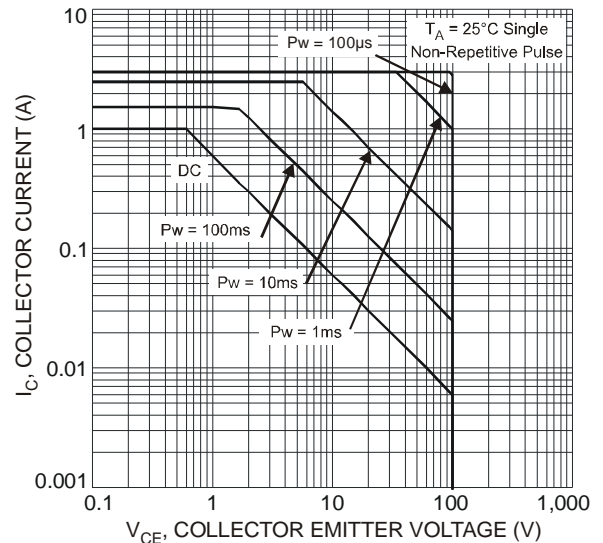


Fig. 2 Safe Operating Area

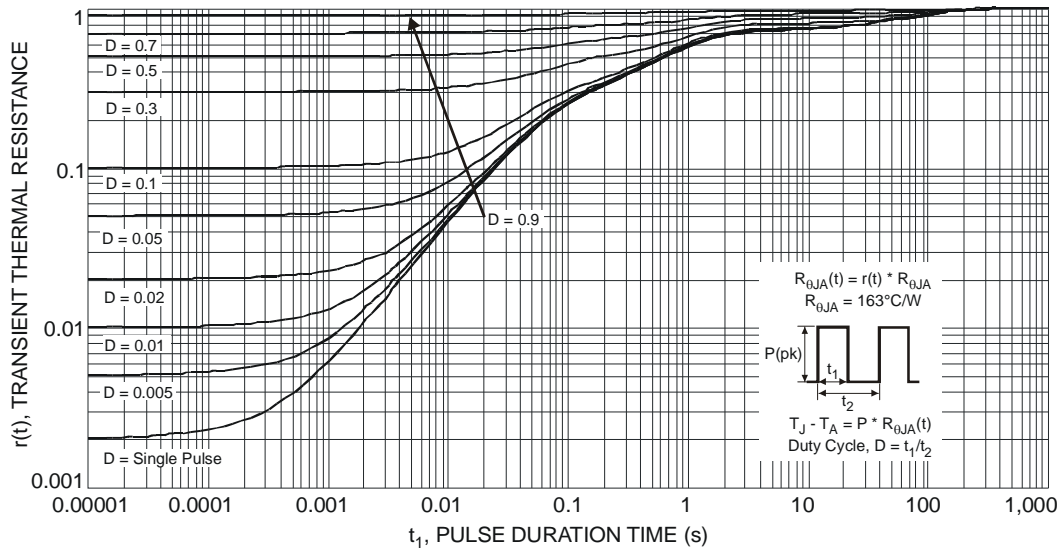


Fig. 3 Transient Thermal Response

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

| Characteristic                                | Symbol               | Min  | Typ | Max                  | Unit     | Test Condition  |
|---|----------------------|------|-----|----------------------|----------|---|
| Collector-Base Breakdown Voltage              | BV <sub>CB0</sub>    | -120 | —   | —                    | V        | I <sub>C</sub> = -100μA, I <sub>E</sub> = 0   |
| Collector-Emitter Breakdown Voltage (Note 5)  | BV <sub>CEO</sub>    | -100 | —   | —                    | V        | I <sub>C</sub> = -10mA, I <sub>B</sub> = 0  |
| Emitter-Base Breakdown Voltage                | BV <sub>EBO</sub>    | -5   | —   | —                    | V        | I <sub>E</sub> = -100μA, I <sub>C</sub> = 0   |
| Collector Cutoff Current                      | I <sub>CBO</sub>     | —    | —   | -100<br>-50          | nA<br>μA | V <sub>CB</sub> = -80V, I <sub>E</sub> = 0<br>V <sub>CB</sub> = -80V, I <sub>E</sub> = 0, T <sub>A</sub> = 150°C                                    |
| Collector Cutoff Current                      | I <sub>CES</sub>     | —    | —   | -100                 | nA       | V <sub>CE</sub> = -80V, V <sub>BE</sub> = 0   |
| Emitter Cutoff Current                        | I <sub>EBO</sub>     | —    | —   | -100                 | nA       | V <sub>EB</sub> = -4V, I <sub>C</sub> = 0   |
| DC Current Gain (Note 5)                      | h <sub>FE</sub>      | 150  | —   | —                    | V        | V <sub>CE</sub> = -5V, I <sub>C</sub> = -1mA  |
|   |                      | 150  | —   | —                    |          | V <sub>CE</sub> = -5V, I <sub>C</sub> = -250mA  |
|   |                      | 150  | —   | 450                  |          | V <sub>CE</sub> = -5V, I <sub>C</sub> = -500mA  |
|   |                      | 125  | —   | —                    |          | V <sub>CE</sub> = -5V, I <sub>C</sub> = -1A   |
| Collector-Emitter Saturation Voltage (Note 5) | V <sub>CE(sat)</sub> | —    | —   | -120<br>-180<br>-320 | mV       | I <sub>C</sub> = -250mA, I <sub>B</sub> = -25mA<br>I <sub>C</sub> = -500mA, I <sub>B</sub> = -50mA<br>I <sub>C</sub> = -1A, I <sub>B</sub> = -100mA |
| Collector-Emitter Saturation Resistance       | R <sub>CE(sat)</sub> | —    | —   | 320                  | mΩ       | I <sub>C</sub> = -1A, I <sub>B</sub> = -100mA   |
| Base-Emitter Saturation Voltage               | V <sub>BE(sat)</sub> | —    | —   | -1.1                 | V        | I <sub>C</sub> = -1A, I <sub>B</sub> = -100mA   |
| Base-Emitter Turn On Voltage                  | V <sub>BE(on)</sub>  | —    | —   | -1                   | V        | V <sub>CE</sub> = -5V, I <sub>C</sub> = -1A   |
| Output Capacitance                            | C <sub>obo</sub>     | —    | 16  | —                    | pF       | V <sub>CB</sub> = -10V, f = 1.0MHz  |
| Current Gain-Bandwidth Product                | f <sub>T</sub>       | 100  | —   | —                    | MHz      | V <sub>CE</sub> = -10V, I <sub>C</sub> = -50mA, f = 100MHz  |
| Delay Time                                    | t <sub>d</sub>       | —    | 27  | —                    | ns       | V <sub>CC</sub> = -10V, I <sub>C</sub> = -1A,<br>I <sub>B1</sub> = -I <sub>B2</sub> = -50mA   |
| Rise Time                                     | t <sub>r</sub>       | —    | 230 | —                    | ns       |   |
| Storage Time                                  | t <sub>s</sub>       | —    | 165 | —                    | ns       |   |
| Fall Time                                     | t <sub>f</sub>       | —    | 160 | —                    | ns       |   |

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

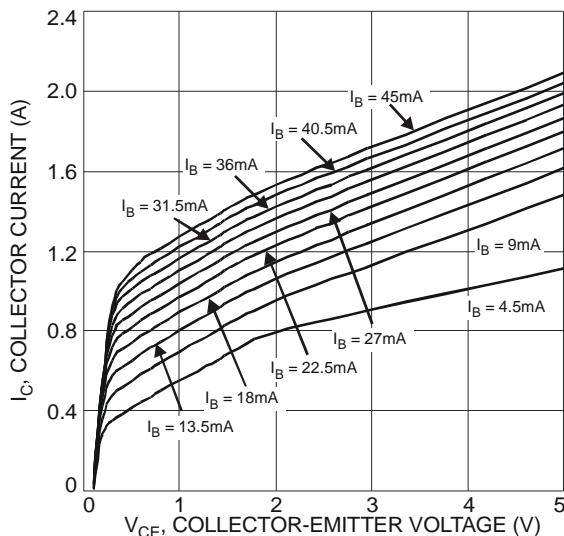


Fig. 4 Typical Collector Current vs. Collector-Emitter Voltage

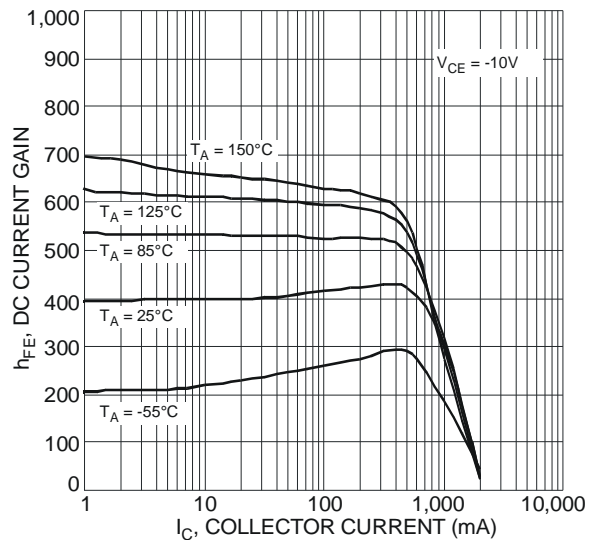


Fig. 5 Typical DC Current Gain vs. Collector Current

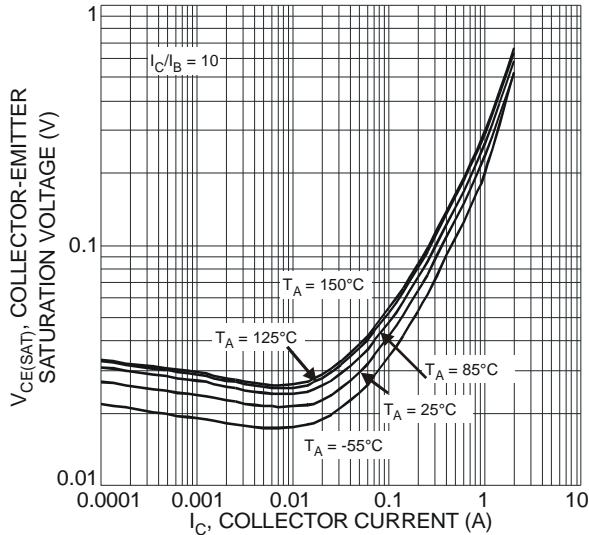


Fig. 6 Typical Collector-Emitter Saturation Voltage vs. Collector Current

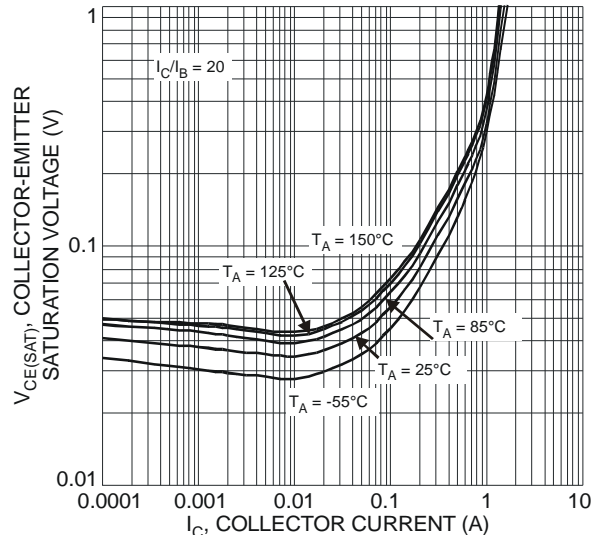


Fig. 7 Typical Collector-Emitter Saturation Voltage vs. Collector Current

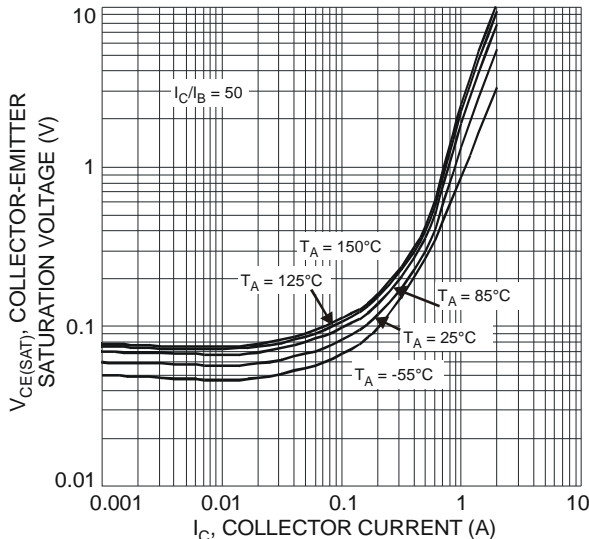


Fig. 8 Typical Collector-Emitter Saturation Voltage vs. Collector Current

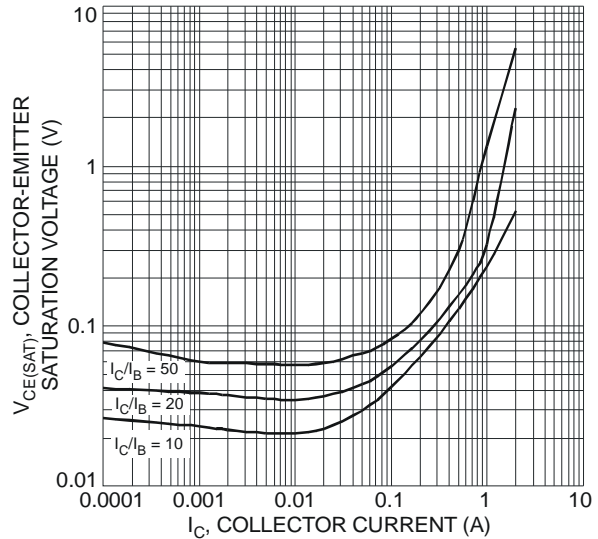


Fig. 9 Typical Collector-Emitter Saturation Voltage vs. Collector Current

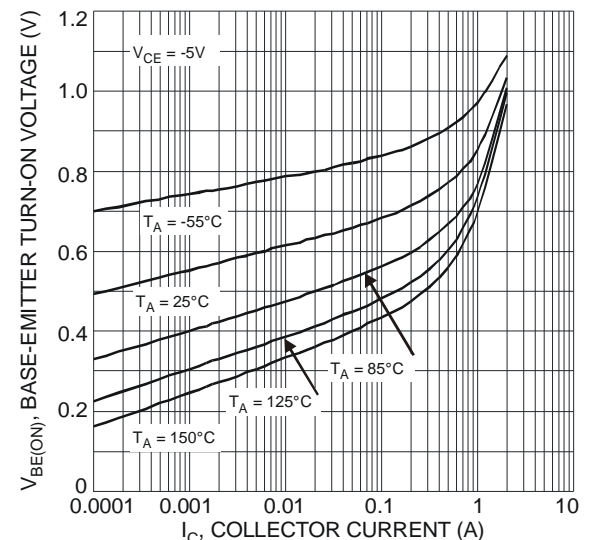


Fig. 10 Typical Base-Emitter Turn-On Voltage vs. Collector Current

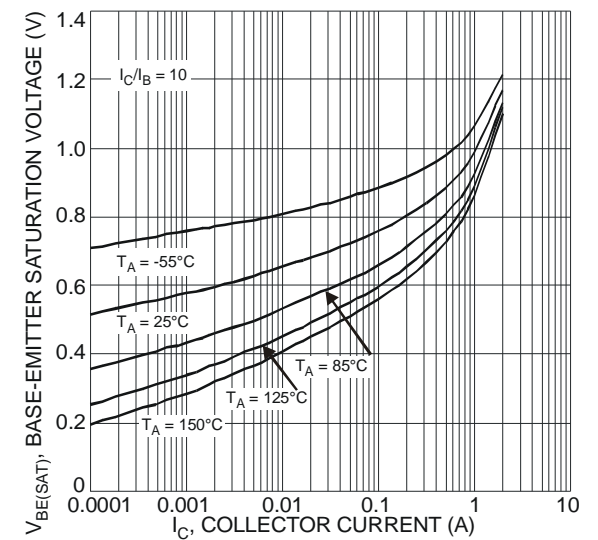
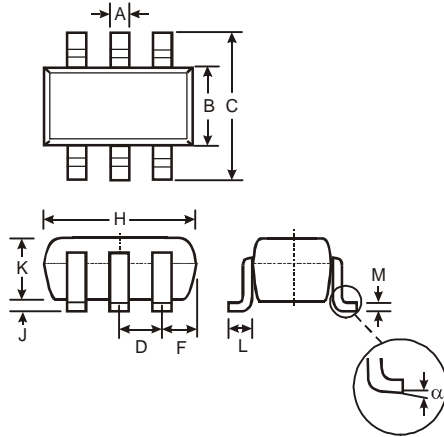


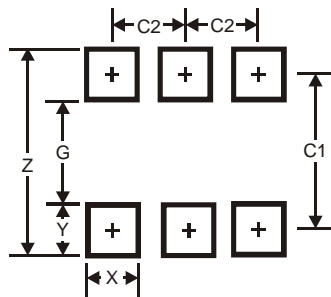
Fig. 11 Typical Base-Emitter Saturation Voltage vs. Collector Current

**Package Outline Dimensions**



| SOT-363              |          |      |
|----------------------|----------|------|
| 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 |
| α                    | 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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