

Features

- Epitaxial Planar Die Construction
- Selectively Paired NPN Transistors & Zener Diodes for Series Pass Voltage Regulator Circuits
- Ideally Suited for Automated Assembly Processes
- **Lead, Halogen and Antimony Free, RoHS Compliant (Note 1)**
- **"Green" Device (Note 2)**

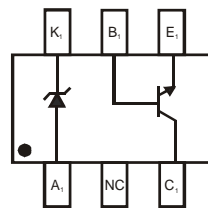
Mechanical Data

- Case: SOT363
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Matte Tin Finish annealed over Alloy 42 leadframe (Lead Free Plating). Solderable per MIL-STD-202, Method 208
- Terminal Connections: See Diagram
- Weight: 0.006 grams (approximate)

SOT363



Top View



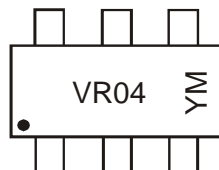
Top View
Pin Configuration

Ordering Information (Note 3)

| Device | Packaging | Shipping |
|-----------|-----------|------------------|
| DVR5V0W-7 | SOT363 | 3000/Tape & Reel |

- Notes:
1. No purposefully added lead.
 2. Diodes Inc's "Green" policy can be found on our website at http://www.diodes.com/products/lead_free/index.php.
 3. For packaging details, go to our website at <http://www.diodes.com/datasheets/ap02007.pdf>.

Marking Information



VR04 = Product Type Marking Code
 YM = Date Code Marking
 Y = Year ex: Y = 2011
 M = Month ex: 9 = September

Date Code Key

| Year | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 |
|------|------|------|------|------|------|------|------|------|------|------|------|------|
| Code | R | S | T | U | V | W | 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, Total Device @T_A = 25°C unless otherwise specified

| Characteristic | Symbol | Value | Unit |
|--|-----------------------------------|-------------|------|
| Power Dissipation (Note 4) | P _d | 200 | mW |
| Thermal Resistance, Junction to Ambient (Note 4) | R _{θJA} | 625 | °C/W |
| Operating and Storage Temperature Range | T _j , T _{STG} | -55 to +150 | °C |

Maximum Ratings, NPN Transistor @T_A = 25°C unless otherwise specified

| Characteristic | Symbol | Value | Unit |
|---|------------------|-------|------|
| Collector-Base Voltage | V _{CB0} | 45 | V |
| Collector-Emitter Voltage | V _{CEO} | 18 | V |
| Emitter-Base Voltage | V _{EBO} | 5 | V |
| Collector Current - Continuous (Note 4) | I _C | 1 | A |

Maximum Ratings, Zener Element @T_A = 25°C unless otherwise specified

| Characteristic | Symbol | Value | Unit |
|---|----------------|-------|------|
| Forward Voltage @ I _F = 10mA | V _F | 0.9 | V |

Electrical Characteristics, NPN Transistor @T_A = 25°C unless otherwise specified

| Characteristic | Symbol | Min | Max | Unit | Test Condition |
|--------------------------------------|----------------------|-----|-----|------|--|
| OFF CHARACTERISTICS (Note 5) | | | | | |
| Collector-Base Breakdown Voltage | V _{(BR)CBO} | 45 | — | V | I _C = 100μA, I _E = 0 |
| Collector-Emitter Breakdown Voltage | V _{(BR)CEO} | 18 | — | V | I _C = 1mA, I _B = 0 |
| Emitter-Base Breakdown Voltage | V _{(BR)EBO} | 5 | — | V | I _E = 100μA, I _C = 0 |
| Collector Cutoff Current | I _{CBO} | — | 1 | μA | V _{CB} = 40V, I _E = 0 |
| Emitter Cutoff Current | I _{EBO} | — | 1 | μA | V _{EB} = 4V, I _C = 0 |
| ON CHARACTERISTICS (Note 5) | | | | | |
| DC Current Gain | h _{FE} | 150 | 800 | — | I _C = 100mA, V _{CE} = 1V |
| Collector-Emitter Saturation Voltage | V _{CE(SAT)} | — | 0.5 | V | I _C = 300mA, I _B = 30mA |
| SMALL SIGNAL CHARACTERISTICS | | | | | |
| Output Capacitance | C _{obo} | — | 8 | pF | V _{CB} = 10V, f = 1.0MHz, I _E = 0 |
| Current Gain-Bandwidth Product | f _T | 100 | — | MHz | V _{CB} = 10V, I _E = 50mA, f = 100MHz |

Electrical Characteristics, Zener Element @T_A = 25°C unless otherwise specified

| Zener Voltage Range (Note 6) | | | | Maximum Reverse Leakage Current (Note 5) | |
|----------------------------------|---------|---------|-----------------|--|---|
| V _Z @ I _{ZT} | | | I _{ZT} | I _R @ V _R | |
| Nom (V) | Min (V) | Max (V) | mA | μA | V |
| 5.1 | 4.85 | 5.36 | 0.05 | 5 | 3 |

- Notes:
- Part mounted on FR-4 board with recommended pad layout, which can be found on our website at <http://www.diodes.com/datasheets/ap02001.pdf>.
 - Short duration pulse test used to minimize self-heating effect.
 - Nominal Zener voltage is measured with the device junction in thermal equilibrium at T_T = 30°C ±1°C.

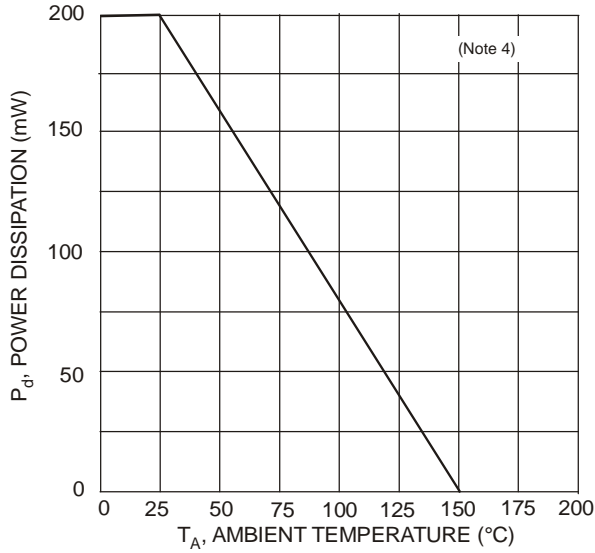


Fig. 1 Max Power Dissipation vs. Ambient Temperature (Total Device)

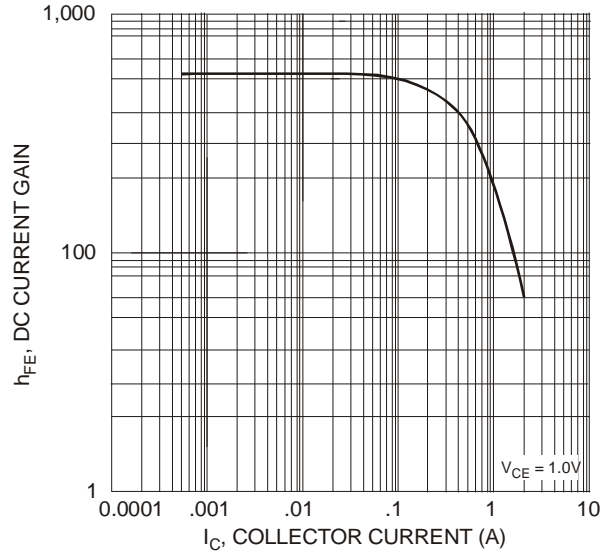


Fig. 2 Typical DC Current Gain vs. Collector Current (NPN Transistor)

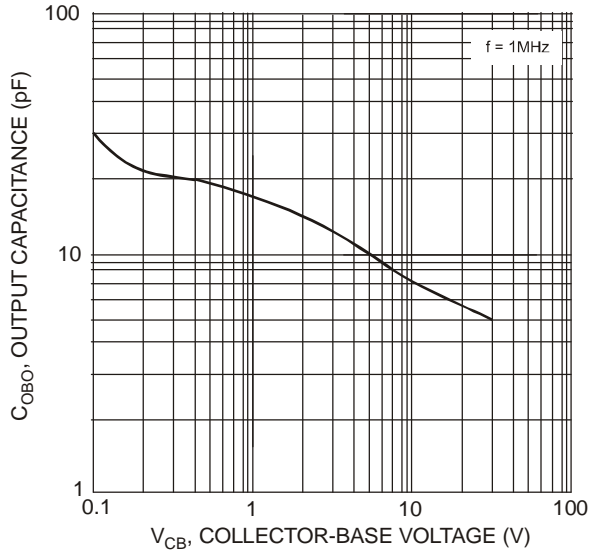


Fig. 3 Typical Output Capacitance vs. Collector-Base Voltage (NPN Transistor)

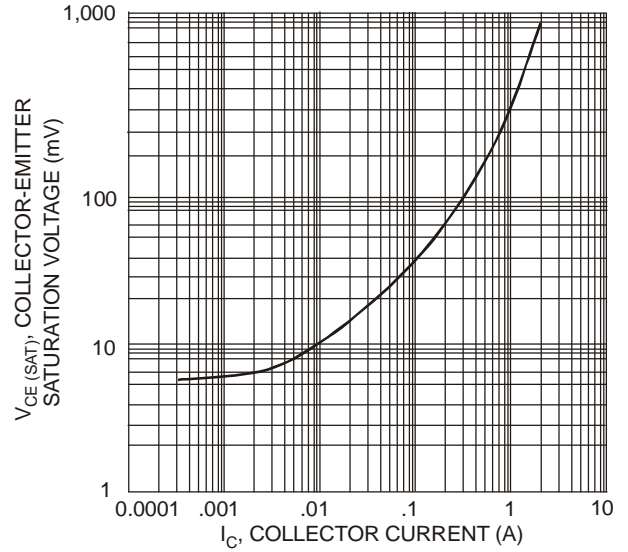


Fig. 4 Typical Collector Saturation Voltage vs. Collector Current (NPN Transistor)

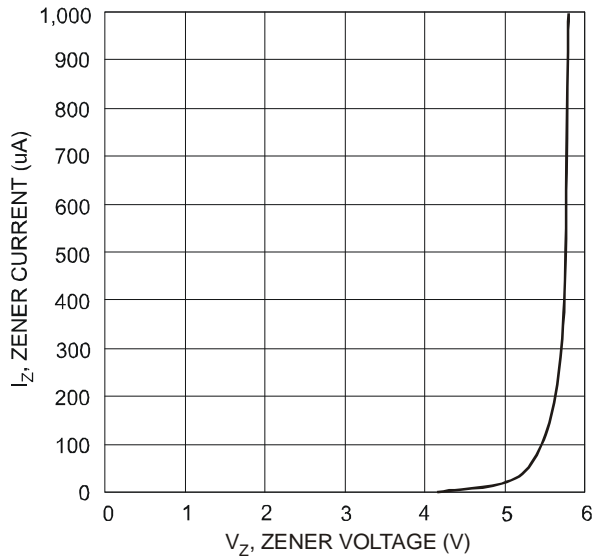
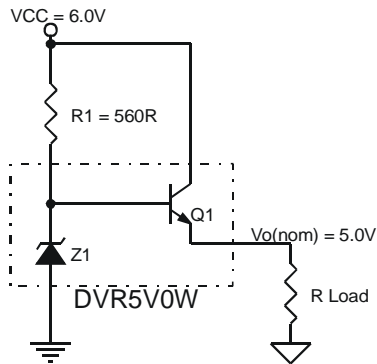


Fig. 5 Typical Zener Breakdown Characteristics

Sample Applications

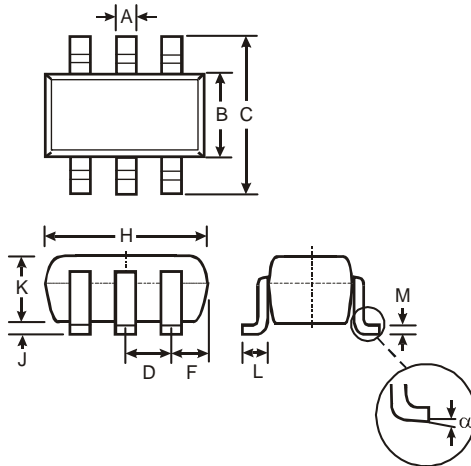


Sample Application for DVR5V0W:

$V_{CC} = 6.0V$ $R1 = 560\Omega$
 $V_o(\text{nom}) = 5.0V$ $I_o = 100\text{mA}$
 $I_q(\text{typical}) = 0.5\text{mA}$ @ $I_o = 0\text{mA}$
 Typical $V_{\text{reg}}(\text{load}) = 0.2V$ from $I_o = 100\text{mA}$ to 0mA

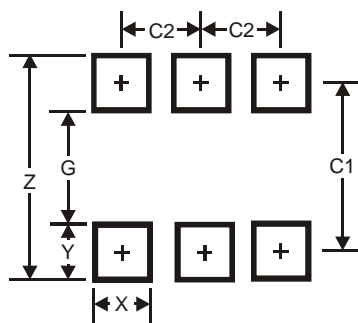
- Notes:
7. Resistor R1 not included.
 8. Typical performance shown is under setup and operating conditions specified in the sample applications.
 9. Recommended $V_{CC}(\text{min}) - V_o(\text{nom}) + 1V$.

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 |
| 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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