

## 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)**

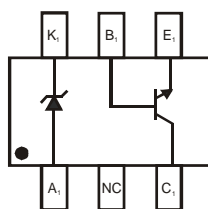
## Mechanical Data

- 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

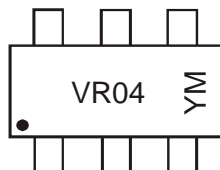

 Top View  
 Pin Configuration

## 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](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<sub>A</sub> = 25°C unless otherwise specified

Characteristic	Symbol	Value	Unit
Power Dissipation (Note 4)	P <sub>d</sub>	200	mW
Thermal Resistance, Junction to Ambient (Note 4)	R <sub>θJA</sub>	625	°C/W
Operating and Storage Temperature Range	T <sub>j</sub> , T <sub>STG</sub>	-55 to +150	°C

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

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V <sub>CBO</sub>	45	V
Collector-Emitter Voltage	V <sub>CEO</sub>	18	V
Emitter-Base Voltage	V <sub>EBO</sub>	5	V
Collector Current - Continuous (Note 4)	I <sub>C</sub>	1	A

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

Characteristic	Symbol	Value	Unit
Forward Voltage @ I <sub>F</sub> = 10mA	V <sub>F</sub>	0.9	V

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

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

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

Zener Voltage Range (Note 6)				Maximum Reverse Leakage Current (Note 5)	
V <sub>Z</sub> @ I <sub>ZT</sub>			I <sub>ZT</sub>	I <sub>R</sub> @ V <sub>R</sub>	
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<sub>J</sub> = 30°C ± 1°C.

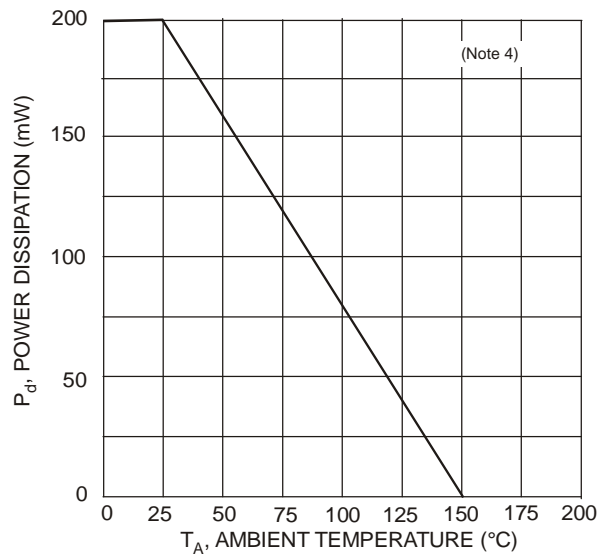


Fig. 1 Max Power Dissipation vs. Ambient Temperature (Total Device)

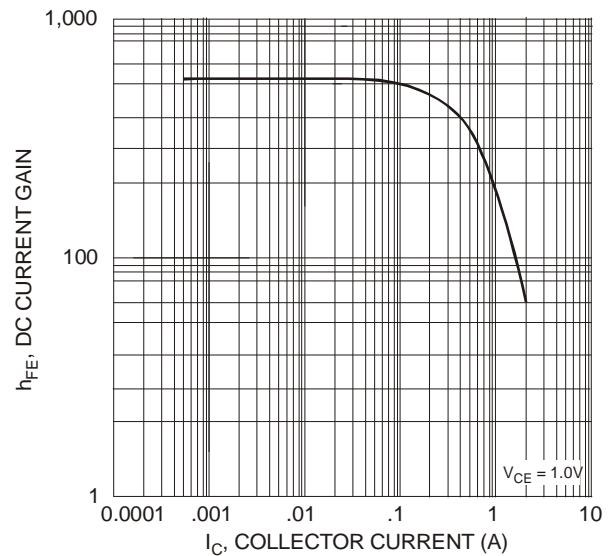


Fig. 2 Typical DC Current Gain vs. Collector Current (NPN Transistor)

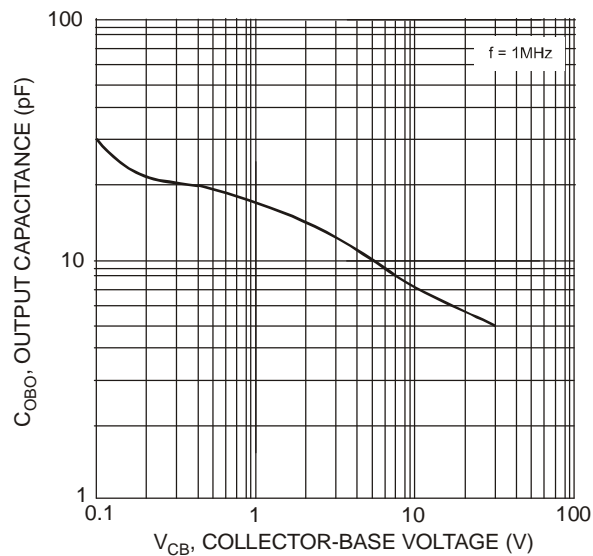


Fig. 3 Typical Output Capacitance vs. Collector-Base Voltage (NPN Transistor)

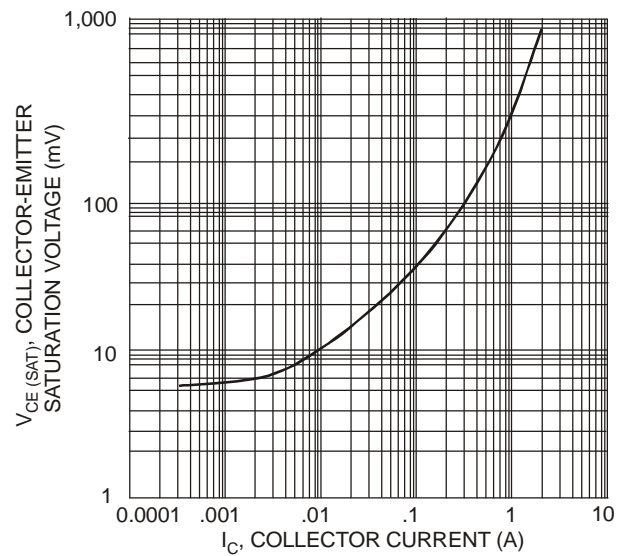


Fig. 4 Typical Collector Saturation Voltage vs. Collector Current (NPN Transistor)

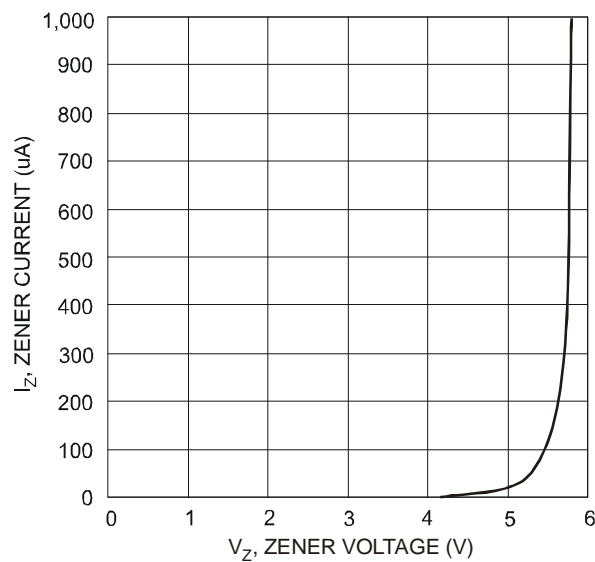
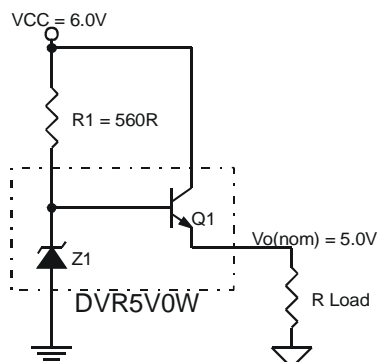


Fig. 5 Typical Zener Breakdown Characteristics

## Sample Applications

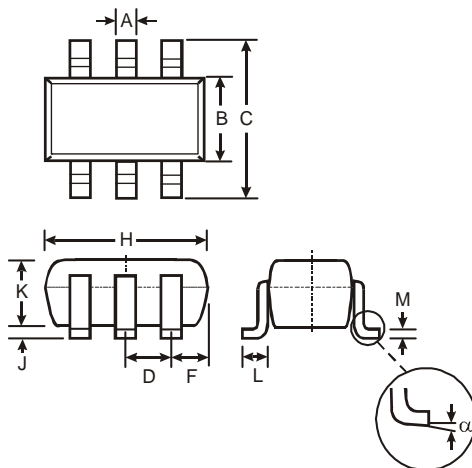


Sample Application for DVR5V0W:

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

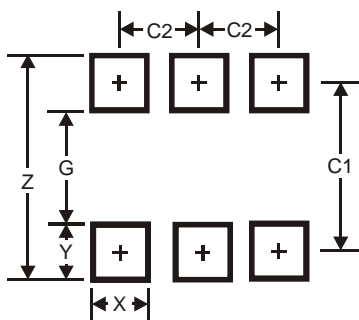
- Notes:
7. Resistor R1 not included.
  8. Typical performance shown is under setup and operating conditions specified in the sample applications.
  9. Recommended  $V_{CC}(\text{min}) \sim V_o(\text{nom}) + 1V$ .

## 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
$\alpha$	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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