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## 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)

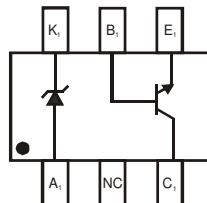
## Mechanical Data

- 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

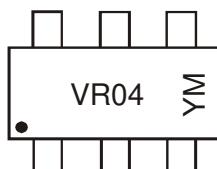
## Ordering Information (Note 3)

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

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

Characteristic	Symbol	Value	Unit
Power Dissipation (Note 4)	$P_d$	200	mW
Thermal Resistance, Junction to Ambient (Note 4)	$R_{\theta JA}$	625	°C/W
Operating and Storage Temperature Range	$T_j, T_{STG}$	-55 to +150	°C

## Maximum Ratings, NPN Transistor

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

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	$V_{CBO}$	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

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

Characteristic	Symbol	Value	Unit
Forward Voltage @ $I_F = 10\text{mA}$	$V_F$	0.9	V

## Electrical Characteristics, NPN Transistor

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

Characteristic	Symbol	Min	Max	Unit	Test Condition
<b>OFF CHARACTERISTICS (Note 5)</b>					
Collector-Base Breakdown Voltage	$V_{(BR)CBO}$	45	—	V	$I_C = 100\mu\text{A}, I_E = 0$
Collector-Emitter Breakdown Voltage	$V_{(BR)CEO}$	18	—	V	$I_C = 1\text{mA}, I_B = 0$
Emitter-Base Breakdown Voltage	$V_{(BR)EBO}$	5	—	V	$I_E = 100\mu\text{A}, I_C = 0$
Collector Cutoff Current	$I_{CBO}$	—	1	$\mu\text{A}$	$V_{CB} = 40\text{V}, I_E = 0$
Emitter Cutoff Current	$I_{EBO}$	—	1	$\mu\text{A}$	$V_{EB} = 4\text{V}, I_C = 0$
<b>ON CHARACTERISTICS (Note 5)</b>					
DC Current Gain	$h_{FE}$	150	800	—	$I_C = 100\text{mA}, V_{CE} = 1\text{V}$
Collector-Emitter Saturation Voltage	$V_{CE(\text{SAT})}$	—	0.5	V	$I_C = 300\text{mA}, I_B = 30\text{mA}$
<b>SMALL SIGNAL CHARACTERISTICS</b>					
Output Capacitance	$C_{obo}$	—	8	pF	$V_{CB} = 10\text{V}, f = 1.0\text{MHz}, I_E = 0$
Current Gain-Bandwidth Product	$f_T$	100	—	MHz	$V_{CB} = 10\text{V}, I_E = 50\text{mA}, f = 100\text{MHz}$

## Electrical Characteristics, Zener Element

@ $T_A = 25^\circ\text{C}$  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	$\mu\text{A}$	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  $T_T = 30^\circ\text{C} \pm 1^\circ\text{C}$ .

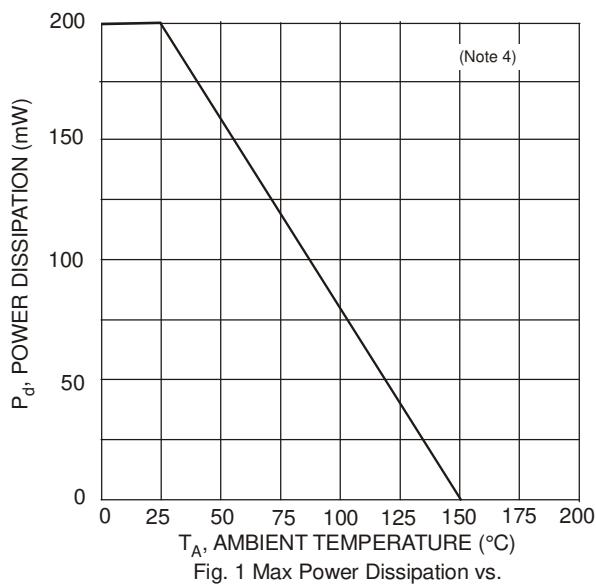


Fig. 1 Max Power Dissipation vs.  
Ambient Temperature (Total Device)

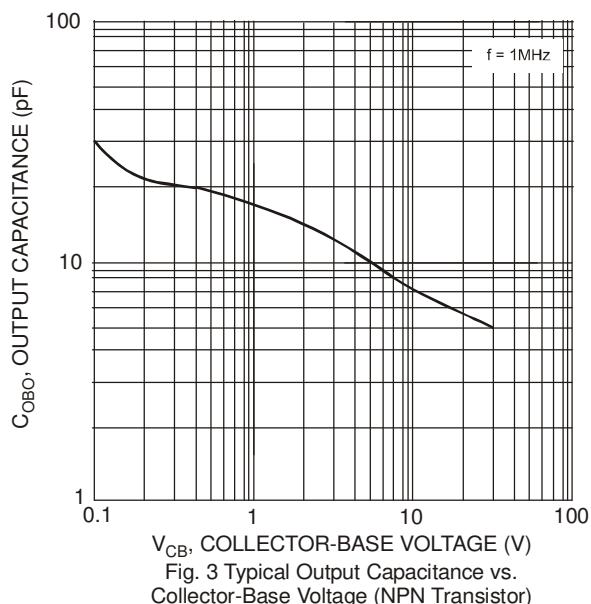


Fig. 3 Typical Output Capacitance vs.  
Collector-Base Voltage (NPN Transistor)

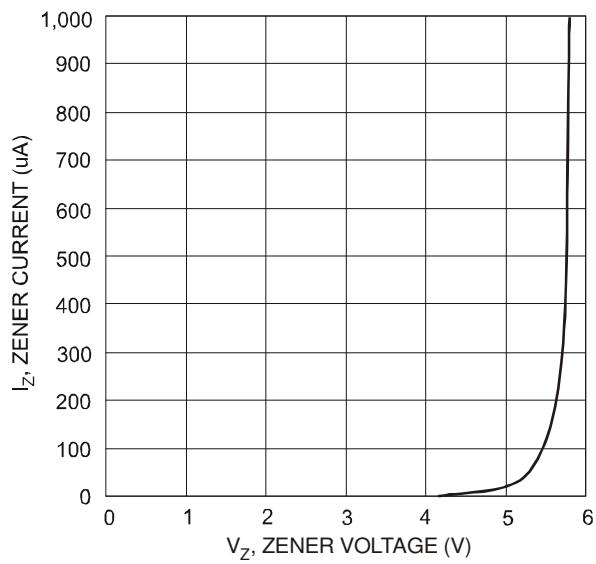


Fig. 5 Typical Zener Breakdown Characteristics

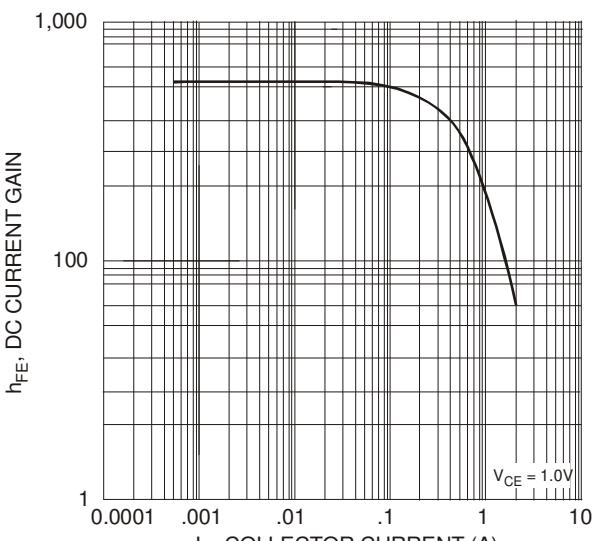


Fig. 2 Typical DC Current Gain vs.  
Collector Current (NPN Transistor)

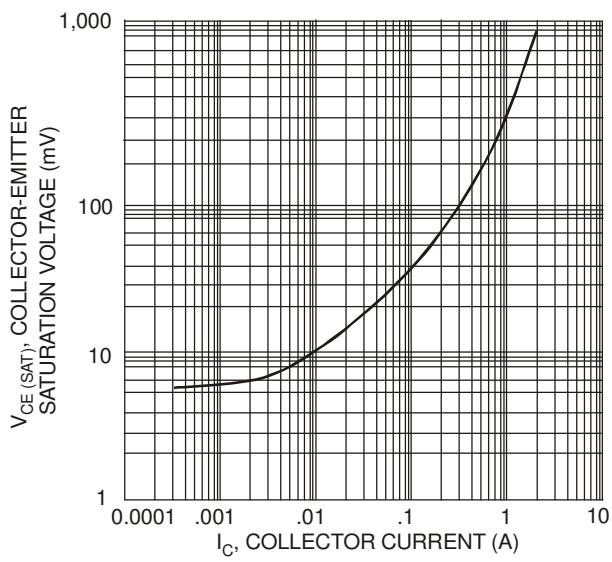
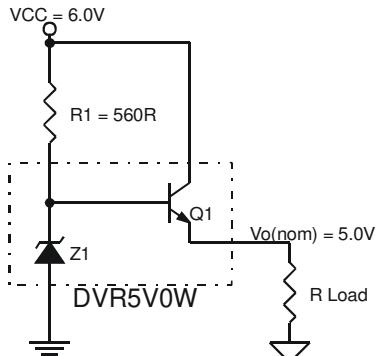


Fig. 4 Typical Collector Saturation Voltage vs.  
Collector Current (NPN Transistor)

## Sample Applications



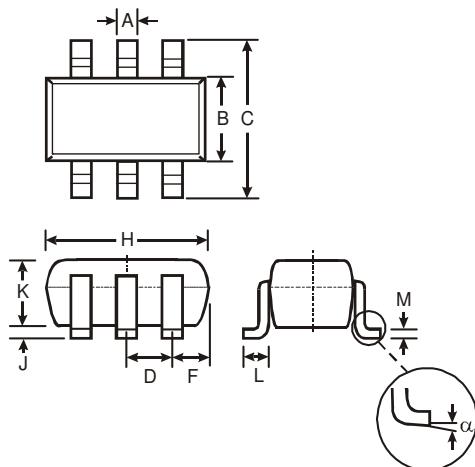
### Sample Application for DVR5V0W:

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

Notes:

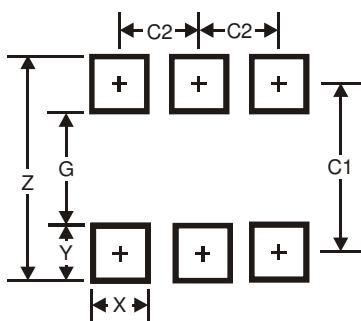
7. Resistor R1 not included.
8. Typical performance shown is under setup and operating conditions specified in the sample applications.
9. Recommended  $V_{CC}(\text{min}) \sim Vo(\text{nom}) + 1V$ .

## 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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