COMPLEX ARRAY FOR VOLTAGE REGULATORS

Features

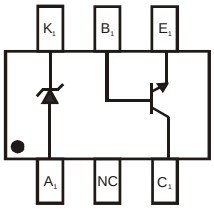
- Epitaxial Planar Die Construction
- Selectively Paired NPN Transistors & Zener Diodes for Series Pass Voltage Regulator Circuits
- Ideally Suited for Automated Assembly Processes
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**

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



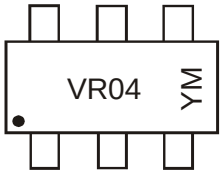
Top View
Pin Configuration

Ordering Information (Note 4)

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

Notes:
1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant.
2. See https://www.diodes.com/quality/lead-free/ for more information about Diodes Incorporated's definitions of Halogen- and Antimony-free, "Green" and Lead-free.
3. Halogen- and Antimony-free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
4. 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: G = 2019
M = Month ex: 9 = September

Date Code Key

Year	2004	2005	2006	2007	2008	…	2018	2019	2020	2021	2022	2023
Code	R	S	T	U	V	…	F	G	H	I	J	K

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 5)	P_d	200	mW
Thermal Resistance, Junction to Ambient	(Note 5)	$R_{\Theta JA}$	625	°C/W
Operating and Storage Temperature Range		T_j, T_{STG}	-55 to +150	°C

Maximum Ratings, NPN Transistor @T_A = 25°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 (with Forced Air Cooling)	(Note 5)	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 6)					
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 6)					
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 7)				Maximum Reverse Leakage Current (Note 6)	
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: 5. Part mounted on FR-4 substrate PC board, with 1 inch square, 2oz copper pad layout.
6. Short duration pulse test used to minimize self-heating effect.
7. Nominal Zener voltage is measured with the device junction in thermal equilibrium at T_T = 30°C ±1°C.

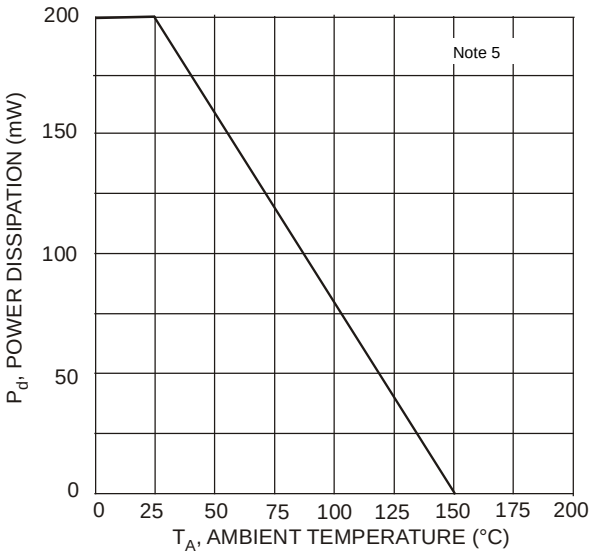


Fig. 1 Max Power Dissipation vs. Ambient Temperature (Total Device)

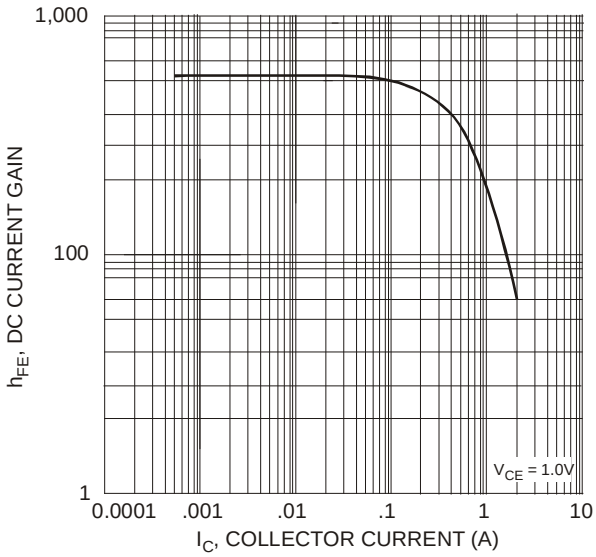


Fig. 2 Typical DC Current Gain vs. Collector Current (NPN Transistor)

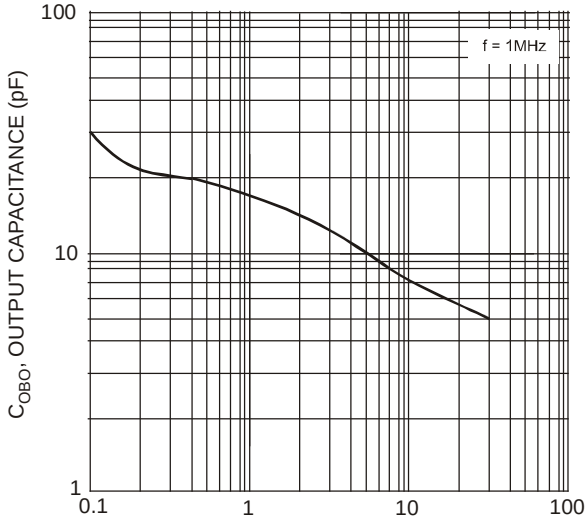


Fig. 3 Typical Output Capacitance vs. Collector-Base Voltage (NPN Transistor)

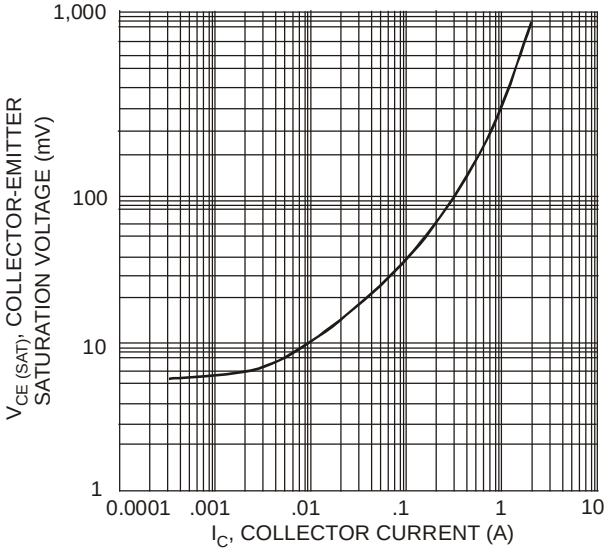


Fig. 4 Typical Collector Saturation Voltage vs. Collector Current (NPN Transistor)

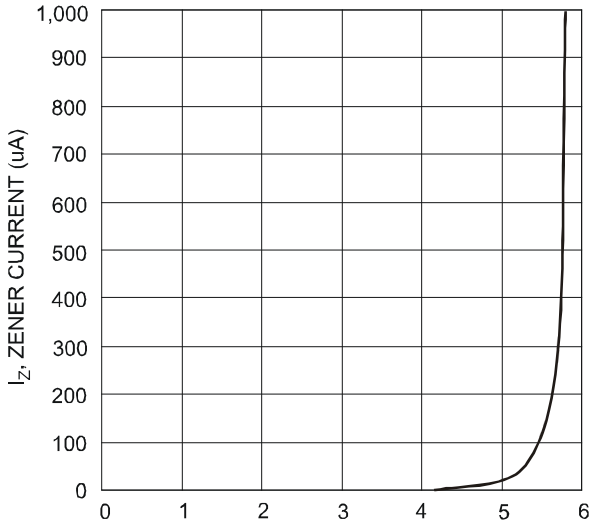
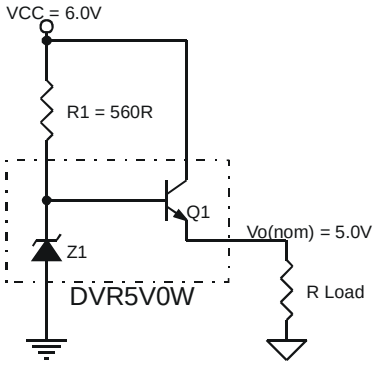


Fig. 5 Typical Zener Breakdown Characteristics

Sample Applications



Sample Application for DVR5V0W:
V_{CC} = 6.0V R1= 560Ω
Vo(nom) = 5.0V I_O = 100mA
Iq(typical) = 0.5mA @ I_O = 0mA
Typical Vreg(load) = 0.2V from Io = 100mA to 0mA

Notes:
8. Resistor R1 not included.
9. Typical performance shown is under setup and operating conditions specified in the sample applications.
10. Recommended V_{CC}(min) ~ Vo(nom) + 1V.

Package Outline Dimensions

Please see http://www.diodes.com/package-outlines.html for the latest version.

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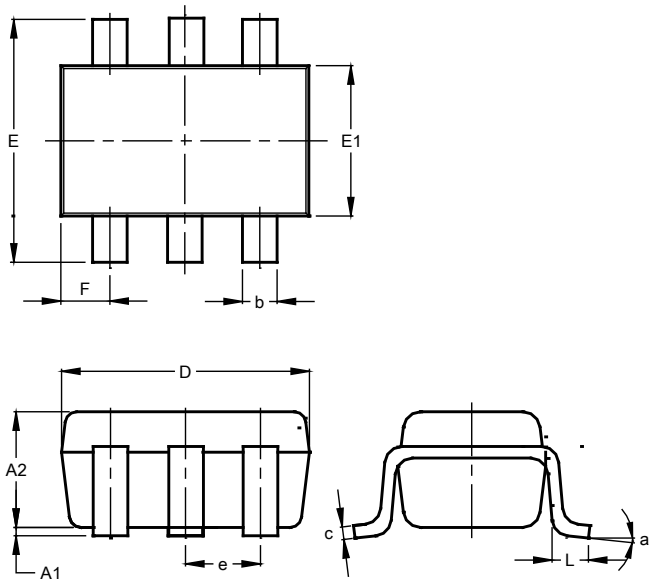

SOT363			
Dim	**Min**	**Max**	**Typ**
A1	0.00	0.10	0.05
A2	0.90	1.00	0.95
b	0.10	0.30	0.25
c	0.10	0.22	0.11
D	1.80	2.20	2.15
E	2.00	2.20	2.10
E1	1.15	1.35	1.30
e	0.650 BSC		
F	0.40	0.45	0.425
L	0.25	0.40	0.30
a	0°	8°	--
All Dimensions in mm			

Suggested Pad Layout

Please see http://www.diodes.com/package-outlines.html for the latest version.

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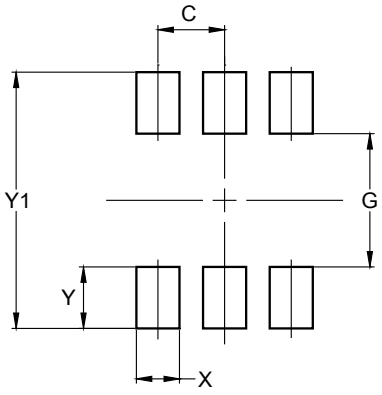

Dimensions	Value (in mm)
C	0.650
G	1.300
X	0.420
Y	0.600
Y1	2.500

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