

## Product Summary

BV <sub>DSS</sub>	R <sub>DS(ON)</sub>	I <sub>D</sub> T <sub>A</sub> = +25°C
-50V	6Ω @ V <sub>GS</sub> = -4V	-160mA
	8Ω @ V <sub>GS</sub> = -2.5V	-120mA

## Descriptions and Applications

This new generation MOSFET is designed to minimize the on-state resistance (R<sub>DS(ON)</sub>) yet maintain superior switching performance, making it ideal for high-efficiency power management applications.

- DC-DC converters
- Power management functions
- Battery operated systems and solid-state relays

## Features and Benefits

- Low On-Resistance
- ESD Protected Gate
- Low Input Capacitance
- Fast Switching Speed
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **For automotive applications requiring specific change control (i.e. parts qualified to AEC-Q100/101/104/200, PPAP capable, and manufactured in IATF 16949 certified facilities), please [contact us](#) or your local Diodes representative.**

<https://www.diodes.com/quality/product-definitions/>

## Mechanical Data

- Package: SOT563
- Package 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 Copper Leadframe. Solderable per MIL-STD-202, Method 208
- Weight: 0.006 grams (Approximate)

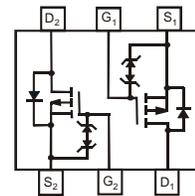
SOT563



ESD PROTECTED



TOP VIEW



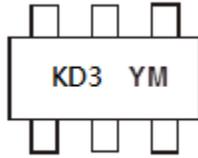
TOP VIEW  
Internal Schematic

## Ordering Information (Note 4)

Part Number	Package	Packing	
		Qty.	Carrier
DMP56D0UV-7	SOT563	3000	Tape & Reel
DMP56D0UV-13	SOT563	10000	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 <https://www.diodes.com/design/support/packaging/diodes-packaging/>.

## Marking Information



KD3 = Product Type Marking Code  
 YM = Date Code Marking  
 Y = Year (ex: J = 2022)  
 M = Month (ex: 3 = March)

### Date Code Key

Year	2013	...	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Code	A	...	J	K	L	M	N	O	P	R	S	T

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<sub>A</sub> = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Units
Drain-Source Voltage	V <sub>DSS</sub>	-50	V
Gate-Source Voltage	V <sub>GSS</sub>	±8	V
Drain Current (Note 5)	I <sub>D</sub>	-160	mA
Pulsed Drain Current (10µs pulse, duty cycle = 1%)	I <sub>DM</sub>	-700	mA

## Thermal Characteristics (@T<sub>A</sub> = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Units
Total Power Dissipation (Note 5)	P <sub>D</sub>	400	mW
Thermal Resistance, Junction to Ambient (Note 5)	R <sub>θJA</sub>	313	°C/W
Operating and Storage Temperature Range	T <sub>J</sub> , T <sub>STG</sub>	-55 to +150	°C

## Electrical Characteristics (@T<sub>A</sub> = +25°C, unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
<b>OFF CHARACTERISTICS (Note 6)</b>						
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	-50	—	—	V	V <sub>GS</sub> = 0V, I <sub>D</sub> = -250µA
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	—	—	-10	µA	V <sub>DS</sub> = -50V, V <sub>GS</sub> = 0V
Gate-Body Leakage	I <sub>GSS</sub>	—	—	±1	µA	V <sub>GS</sub> = ±8V, V <sub>DS</sub> = 0V
<b>ON CHARACTERISTICS (Note 6)</b>						
Gate Threshold Voltage	V <sub>GS(TH)</sub>	-0.5	—	-1.2	V	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = -250µA
Static Drain-Source On-Resistance	R <sub>DS(ON)</sub>	—	4.6	6	Ω	V <sub>GS</sub> = -4V, I <sub>D</sub> = -100mA V <sub>GS</sub> = -2.5V, I <sub>D</sub> = -80mA
Forward Transfer Admittance	Y <sub>fs</sub>	100	—	—	mS	V <sub>DS</sub> = -5V, I <sub>D</sub> = -100mA
Diode Forward Voltage	V <sub>SD</sub>	—	-0.8	-1.2	V	V <sub>GS</sub> = 0V, I <sub>S</sub> = -100mA
<b>DYNAMIC CHARACTERISTICS (Note 7)</b>						
Input Capacitance	C <sub>iSS</sub>	—	50.54	—	pF	V <sub>DS</sub> = -25V, V <sub>GS</sub> = 0V, f = 1.0MHz
Output Capacitance	C <sub>oss</sub>	—	3.49	—	pF	
Reverse Transfer Capacitance	C <sub>rSS</sub>	—	2.42	—	pF	
Gate Resistance	R <sub>G</sub>	—	201	—	Ω	V <sub>DS</sub> = 0V, V <sub>GS</sub> = 0V, f = 1.0MHz
Total Gate Charge V <sub>GS</sub> = 4.5V	Q <sub>g</sub>	—	0.58	—	nC	V <sub>DS</sub> = -25V, I <sub>D</sub> = -100mA
Gate-Source Charge	Q <sub>gs</sub>	—	0.09	—	nC	
Gate-Drain Charge	Q <sub>gd</sub>	—	0.14	—	nC	
Turn-On Delay Time	t <sub>D(on)</sub>	—	4.46	—	ns	V <sub>DD</sub> = -30V, I <sub>D</sub> = -0.27A, V <sub>GEN</sub> = -4V, R <sub>GEN</sub> = 6Ω
Turn-On Rise Time	t <sub>r</sub>	—	6.63	—	ns	
Turn-Off Delay Time	t <sub>D(off)</sub>	—	21.9	—	ns	
Turn-Off Fall Time	t <sub>f</sub>	—	15.0	—	ns	

- Notes:
- Device mounted on FR-4 PC board, with minimum recommended pad layout, single sided.
  - Short duration pulse test used to minimize self-heating effect.
  - Guaranteed by design. Not subject to production testing.

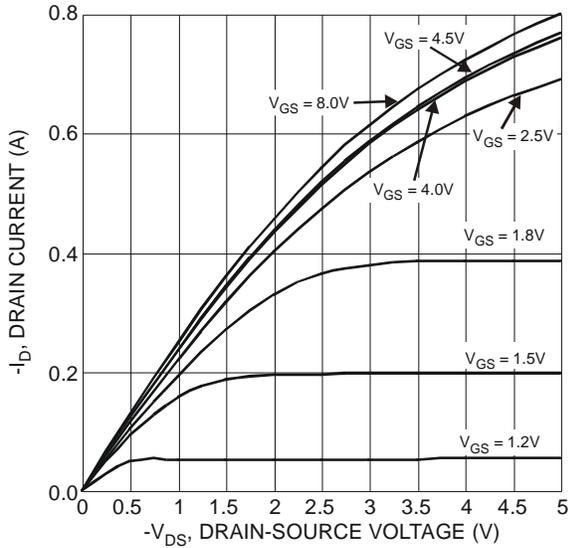


Figure 1 Typical Output Characteristics

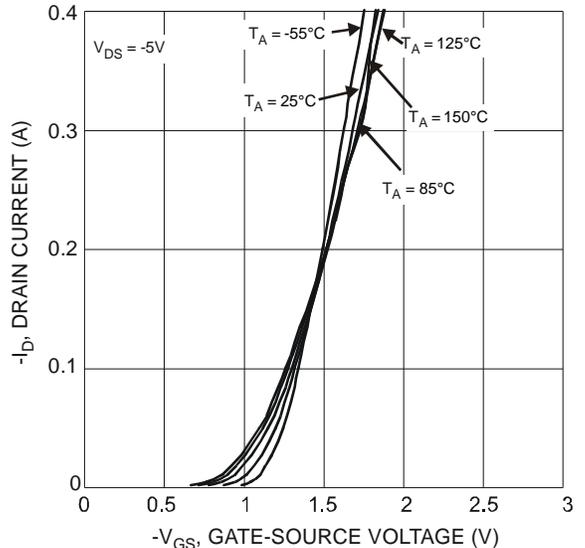


Figure 2 Typical Transfer Characteristics

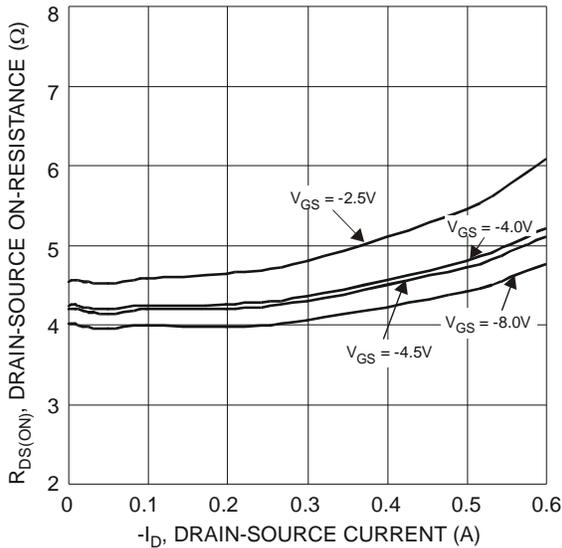


Figure 3 Typical On-Resistance vs. Drain Current and Gate Voltage

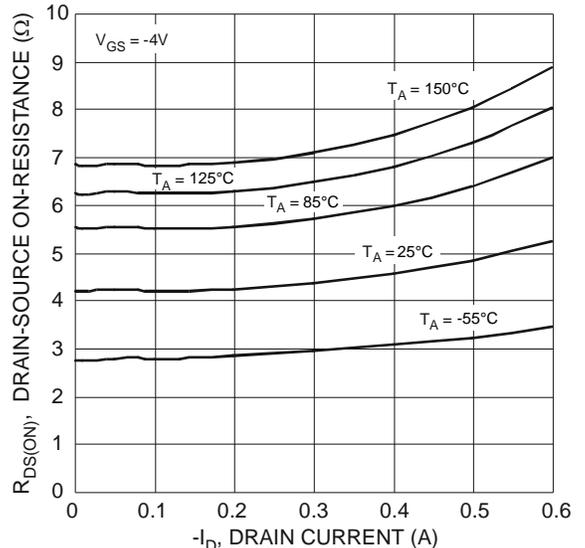


Figure 4 Typical On-Resistance vs. Drain Current and Temperature

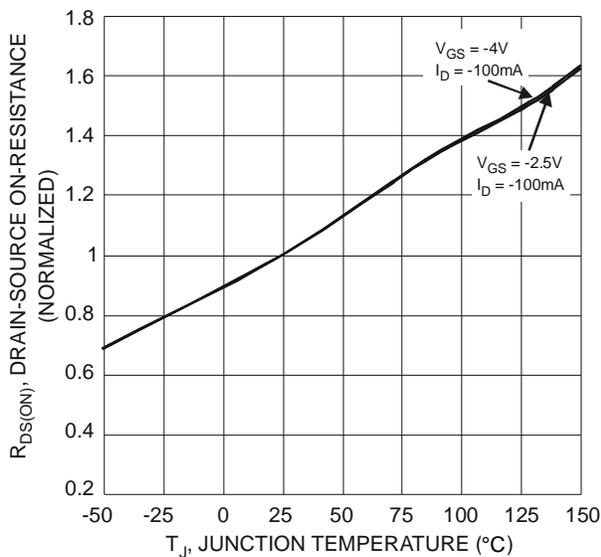


Figure 5 On-Resistance Variation with Temperature

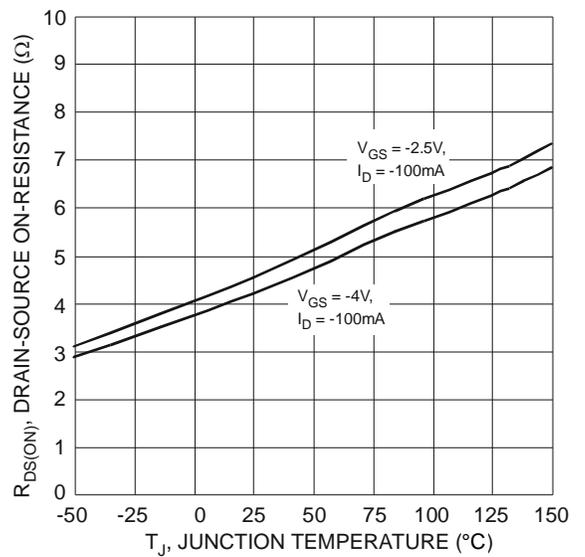


Figure 6 On-Resistance Variation with Temperature

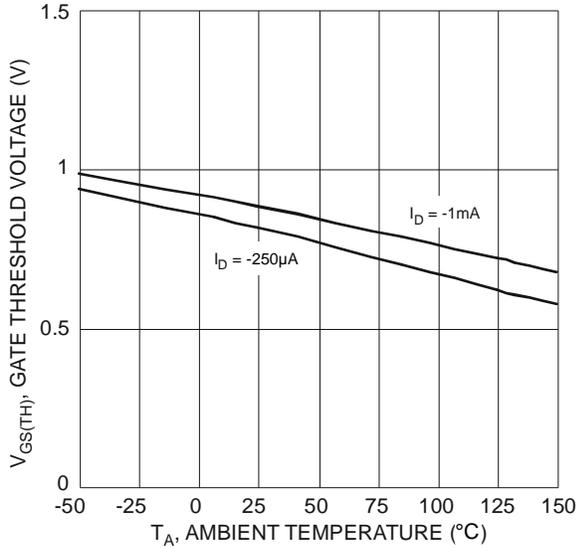


Figure 7 Gate Threshold Variation vs. Ambient Temperature

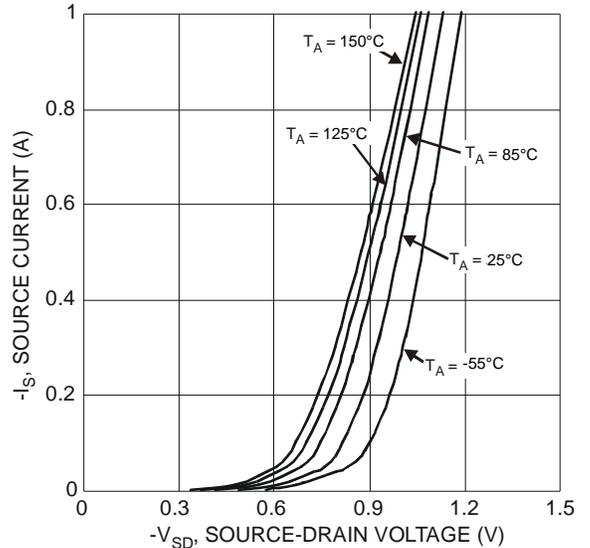


Figure 8 Diode Forward Voltage vs. Current

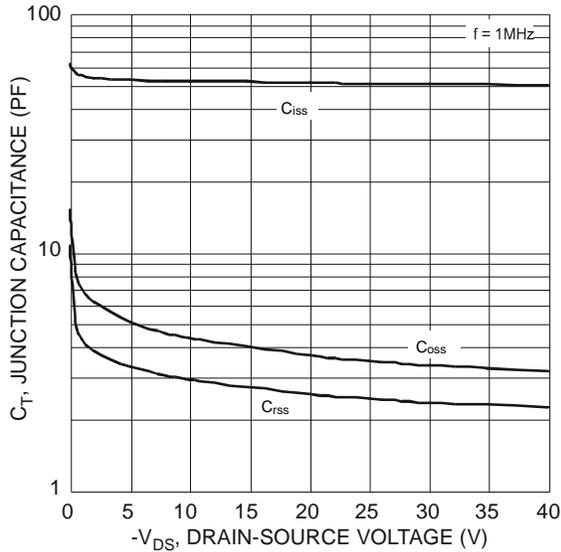


Figure 9 Typical Junction Capacitance

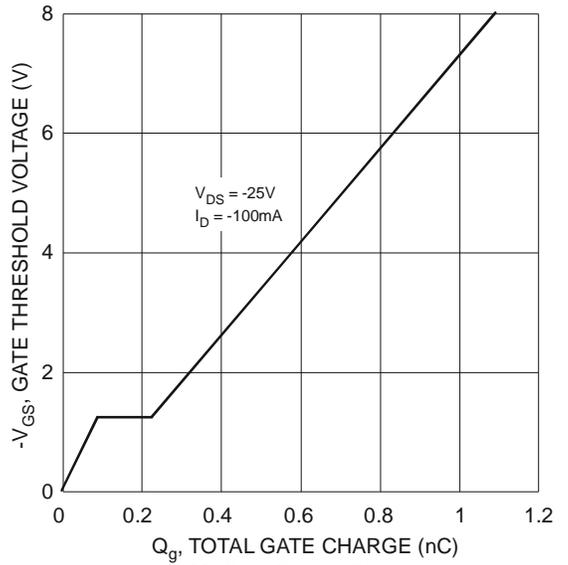
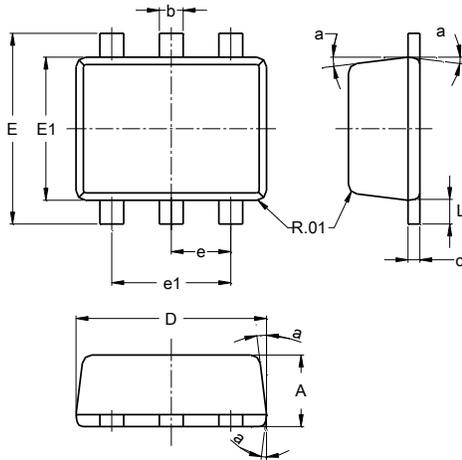


Figure 10 Gate Charge Characteristics

**Package Outline Dimensions**

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

**SOT563**

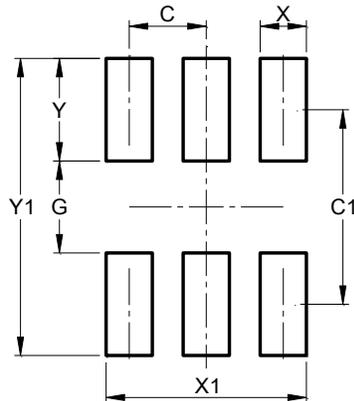


SOT563			
Dim	Min	Max	Typ
A	0.55	0.60	--
b	0.15	0.30	0.20
c	0.10	0.18	0.11
D	1.50	1.70	1.60
E	1.55	1.70	1.60
E1	1.10	1.25	1.20
e	--	--	0.50
e1	0.90	1.10	1.00
L	0.10	0.30	0.20
a	8°	9°	7°
<b>All Dimensions in mm</b>			

**Suggested Pad Layout**

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

**SOT563**



Dimensions	Value (in mm)
C	0.500
C1	1.270
G	0.600
X	0.300
X1	1.300
Y	0.670
Y1	1.940

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