DUAL P-CHANNEL ENHANCEMENT MODE MOSFET

Product Summary

$V_{(BR)DSS}$	$R_{DS(ON)}$	I_D T_A = +25°C
-50V	6Ω @ V_{GS} = -4 V	-160mA
	8Ω @ V_{GS} = -2.5V	-120mA

Descriptions

This new generation MOSFET has been designed to minimize the on-state resistance ($R_{DS(on)}$) and yet maintain superior switching performance, making it ideal for high efficiency power management applications.

Applications

- DC-DC Converters
- Power Management Functions
- Battery Operated Systems and Solid-State Relays

Features and Benefits

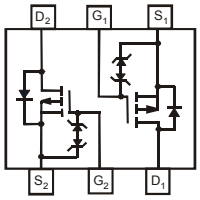
- Low On-Resistance
- ESD Protected Gate
- Low Input Capacitance
- Fast Switching Speed
- **Lead-Free Finish; RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **Qualified to AEC-Q101 Standards for High Reliability**

Mechanical Data

- Case: SOT563
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020D
- Terminals: Finish — Matte Tin annealed over Copper leadframe. Solderable per MIL-STD-202, Method 208 e3
- Weight: 0.006 grams (approximate)

SOT563

TOP VIEW



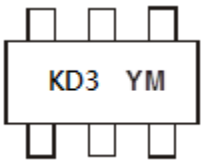
TOP VIEW
Internal Schematic

Ordering Information (Note 4)

Part Number	Case	Packaging
DMP56D0UV -7	SOT563	3000/Tape & Reel
DMP56D0UV -13	SOT563	10000/Tape & Reel

Notes:
1. EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant. All applicable RoHS exemptions applied.
2. See http://www.diodes.com/quality/lead_free.html 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/products/packages.html.

Marking Information



KD3 = Product Type Marking Code
YM = Date Code Marking
Y = Year (ex: V = 2008)
M = Month (ex: 9 = September)

Date Code Key

Year	2008	2009	2010	2011	2012	2013	2014	2015
Code	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 (@T_A = +25°C, unless otherwise specified.)

Characteristic		Symbol	Value	Units
Drain-Source Voltage		V_{DSS}	-50	V
Gate-Source Voltage	Continuous	V_{GSS}	±8	V
Drain Current (Note 5)	Continuous	I_D	-160	mA
Pulsed Drain Current (10µs pulse, duty cycle = 1%)		I_{DM}	-700	mA

Thermal Characteristics (@T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Units
Total Power Dissipation (Note 5)	P_D	400	mW
Thermal Resistance, Junction to Ambient (Note 5)	$R_{\theta JA}$	313	°C/W
Operating and Storage Temperature Range	T_J, T_{STG}	-55 to +150	°C

Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 6)						
Drain-Source Breakdown Voltage	BV_{DSS}	-50	—	—	V	V_{GS} = 0V, I_D = -250µA
Zero Gate Voltage Drain Current	I_{DSS}	—	—	-10	µA	V_{DS} = -50V, V_{GS} = 0V
Gate-Body Leakage	I_{GSS}	—	—	±1	µA	V_{GS} = ±8V, V_{DS} = 0V
ON CHARACTERISTICS (Note 6)						
Gate Threshold Voltage	$V_{GS(th)}$	-0.5	—	-1.2	V	V_{DS} = V_{GS}, I_D = -250µA
Static Drain-Source On-Resistance	$R_{DS\ (ON)}$	— —	4.6 6.0	6 8	Ω	V_{GS} = -4V, I_D = -100mA V_{GS} = -2.5V, I_D = -80mA
Forward Transfer Admittance	$\|Y_{fs}\|$	100	—	—	mS	V_{DS} = -5V, I_D = -100mA
Diode Forward Voltage	V_{SD}	—	—	-1.2	V	V_{GS} = 0V, I_S = -100mA
DYNAMIC CHARACTERISTICS (Note 7)						
Input Capacitance	C_{iss}	—	50.54	—	pF	V_{DS} = -25V, V_{GS} = 0V, f = 1.0MHz
Output Capacitance	C_{oss}	—	3.49	—	pF	
Reverse Transfer Capacitance	C_{rss}	—	2.42	—	pF	
Gate Resistance	R_G	—	201	—	Ω	V_{DS} = 0V, V_{GS} = 0V, f = 1.0MHz
Total Gate Charge V_{GS} = 4.5V	Q_g	—	0.58	—	nC	V_{GS} = -4V, V_{DS} = -25V, I_D = -100mA
Gate-Source Charge	Q_{gs}	—	0.09	—	nC	
Gate-Drain Charge	Q_{gd}	—	0.14	—	nC	
Turn-On Delay Time	$t_{D(on)}$	—	4.46	—	nS	V_{DD} = -30V, I_D = -0.27A, V_{GEN} = -4V, R_{GEN} = 6Ω
Turn-On Rise Time	t_r	—	6.63	—	nS	
Turn-Off Delay Time	$t_{D(off)}$	—	21.9	—	nS	
Turn-Off Fall Time	t_f	—	15.0	—	nS	

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

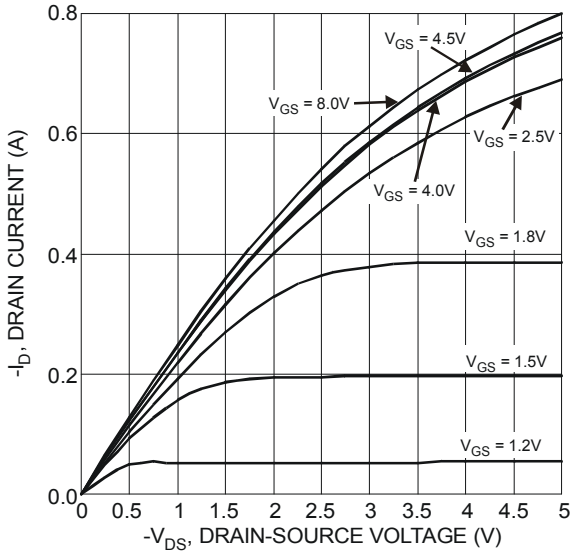


Figure 1 Typical Output Characteristics

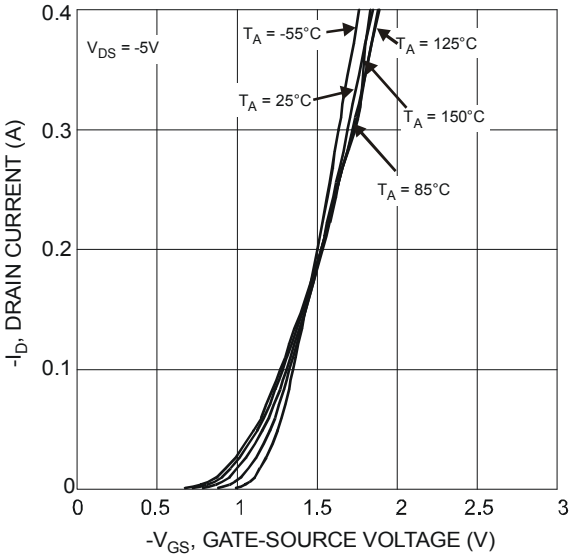


Figure 2 Typical Transfer Characteristics

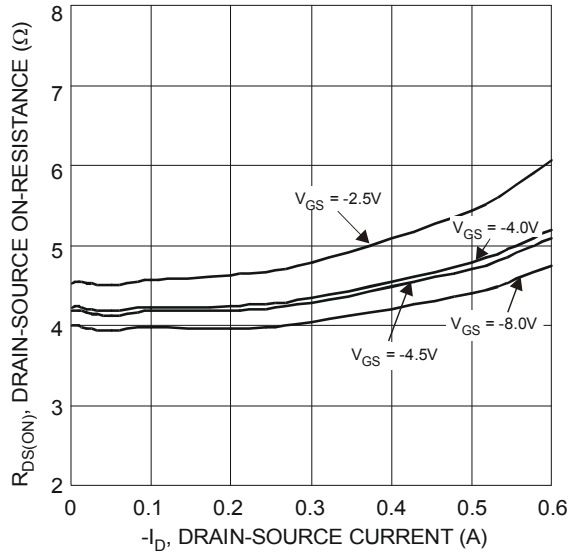


Figure 3 Typical On-Resistnace vs. Drain Current and Gate Voltage

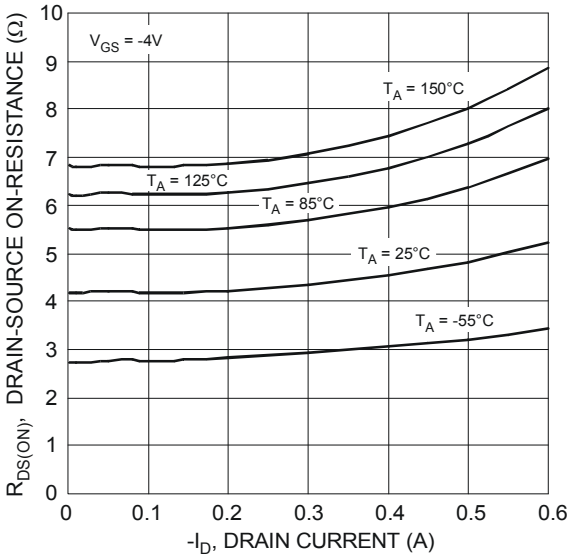


Figure 4 Typical On-Resistance vs. Drain Current and Temperature

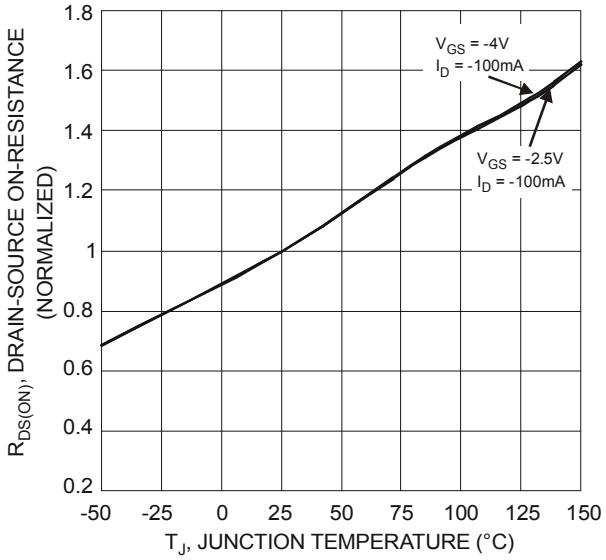


Figure 5 On-Resistance Variation with Temperature

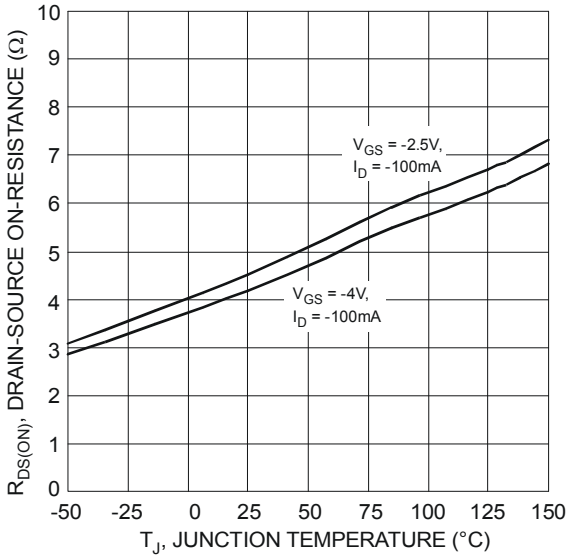


Figure 6 On-Resistance Variation with Temperature

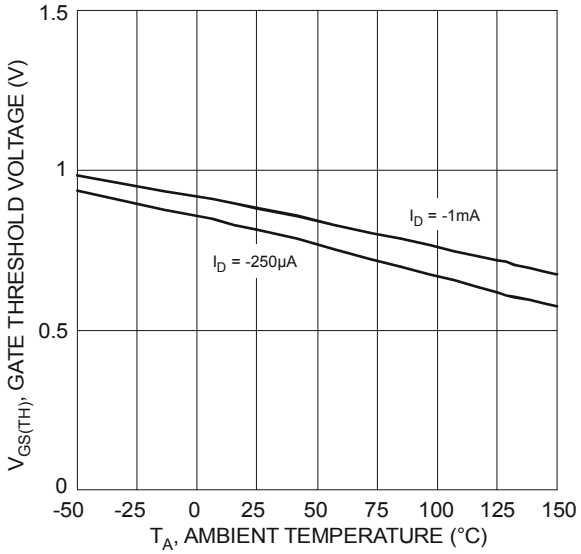


Figure 7 Gate Threshold Variation vs. Ambient Temperature

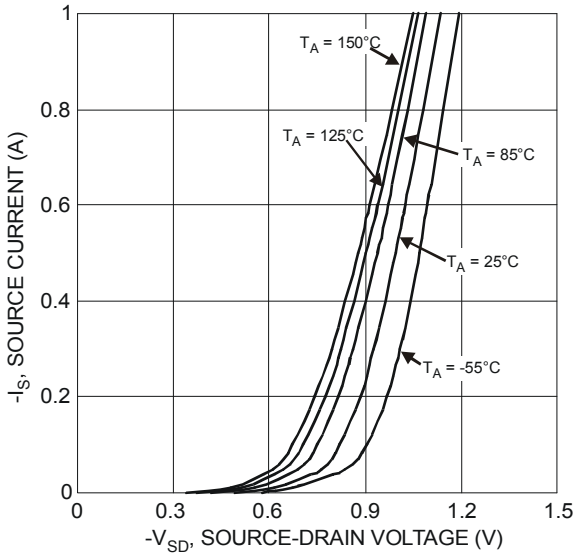


Figure 8 Diode Forward Voltage vs. Current

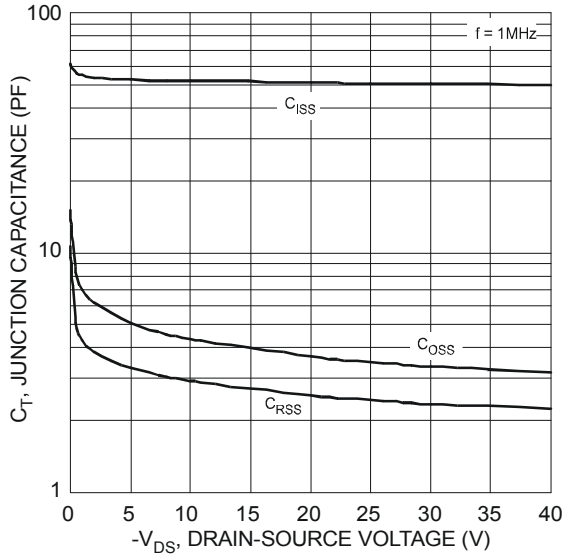


Figure 9 Typical Junction Capacitance

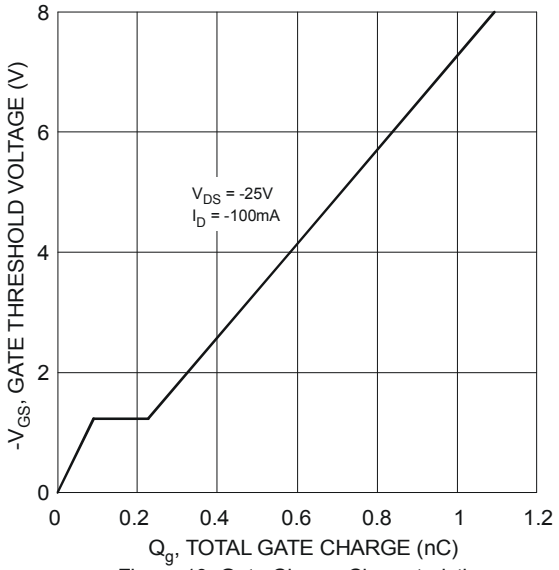
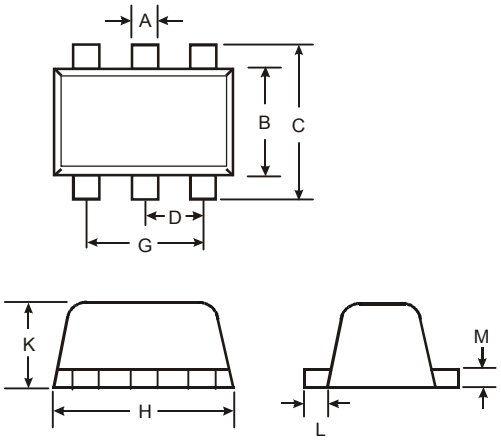


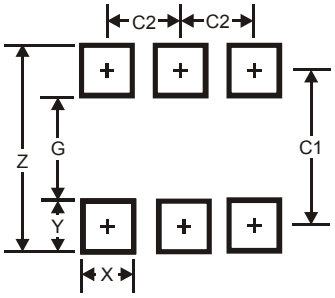
Figure 10 Gate Charge Characteristics

Package Outline Dimensions



SOT563			
Dim	**Min**	**Max**	**Typ**
A	0.15	0.30	0.20
B	1.10	1.25	1.20
C	1.55	1.70	1.60
D	-	-	0.50
G	0.90	1.10	1.00
H	1.50	1.70	1.60
K	0.55	0.60	0.60
L	0.10	0.30	0.20
M	0.10	0.18	0.11
All Dimensions in mm			

Suggested Pad Layout



Dimensions	Value (in mm)
Z	2.2
G	1.2
X	0.375
Y	0.5
C	1.7
E	0.5

Mouser Electronics

Authorized Distributor

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