

## Product Summary

$V_{(BR)DSS}$	$R_{DS(ON)} \text{ Max}$	$I_D \text{ Max}$ $T_A = +25^\circ\text{C}$
-20V	0.9Ω @ $V_{GS} = -4.5\text{V}$	-0.53A
	1.4Ω @ $V_{GS} = -2.5\text{V}$	-0.44A

## Description

This MOSFET is 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

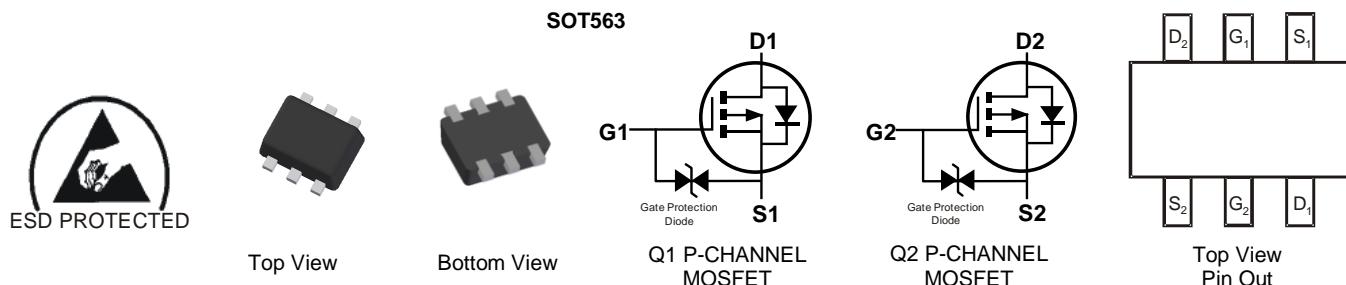
- Battery Charging
- Power Management Functions
- DC-DC Converters
- Portable Power Adaptors

## Features

- Dual P-Channel MOSFET
- Low On-Resistance
- Very Low Gate Threshold Voltage  $V_{GS(TH)} < 1\text{V}$
- Low Input Capacitance
- Fast Switching Speed
- Low Input/Output Leakage
- ESD Protected Gate
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**

## Mechanical Data

- Case: SOT563
- Case Material: Molded Plastic, "Green" Molding Compound; UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminal Connections: See Diagram
- Terminals: Finish – Matte Tin Annealed over Copper Leadframe. Solderable per MIL-STD-202, Method 208 (E3)
- Weight: 0.006 grams (Approximate)



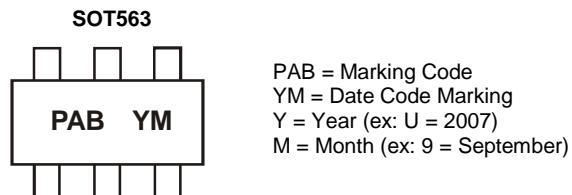
## Ordering Information (Note 4)

Part Number	Case	Packaging
DMP2004VK-7	SOT563	3,000/Tape & Reel

Notes:

1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant.
2. See [http://www.diodes.com/quality/lead\\_free.html](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



### Date Code Key

Year	2007	....	2015	2016	2017	2018	2019	2020	2021			
Code	U	....	C	D	E	F	G	H	I			
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** (@ $T_A = +25^\circ\text{C}$ , unless otherwise specified.)

Characteristic			Symbol	Value	Units
Drain-Source Voltage			$V_{DSS}$	-20	V
Gate-Source Voltage			$V_{GSS}$	$\pm 8$	V
Continuous Drain Current (Note 5) $V_{GS} = -4.5\text{V}$	Steady State	$T_A = +25^\circ\text{C}$ $T_A = +70^\circ\text{C}$	$I_D$	-0.53 -0.44	A
Continuous Drain Current (Note 5) $V_{GS} = -2.5\text{V}$	Steady State	$T_A = +25^\circ\text{C}$ $T_A = +70^\circ\text{C}$	$I_D$	-0.44 -0.35	A
Pulsed Drain Current (Note 6)			$I_{DM}$	-1.8	A

**Thermal Characteristics**

Characteristic	Symbol	Value	Units
Total Power Dissipation (Note 5)	$P_D$	400	mW
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	312	°C/W
Operating and Storage Temperature Range	$T_J, T_{STG}$	-65 to +150	°C

**Electrical Characteristics** (@ $T_A = +25^\circ\text{C}$ , unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
<b>OFF CHARACTERISTICS (Note 7)</b>						
Drain-Source Breakdown Voltage	$BV_{DSS}$	-20	—	—	V	$V_{GS} = 0\text{V}, I_D = -250\mu\text{A}$
Zero Gate Voltage Drain Current	$I_{DSS}$	—	—	-1.0	$\mu\text{A}$	$V_{DS} = -20\text{V}, V_{GS} = 0\text{V}$
Gate-Source Leakage	$I_{GSS}$	—	—	$\pm 1.0$	$\mu\text{A}$	$V_{GS} = \pm 4.5\text{V}, V_{DS} = 0\text{V}$
<b>ON CHARACTERISTICS (Note 7)</b>						
Gate Threshold Voltage	$V_{GS(th)}$	-0.5	—	-1.0	V	$V_{DS} = V_{GS}, I_D = -250\mu\text{A}$
Static Drain-Source On-Resistance	$R_{DS(ON)}$	—	0.7 1.1 1.7	0.9 1.4 2.0	$\Omega$	$V_{GS} = -4.5\text{V}, I_D = -430\text{mA}$ $V_{GS} = -2.5\text{V}, I_D = -300\text{mA}$ $V_{GS} = -1.8\text{V}, I_D = -150\text{mA}$
Forward Transfer Admittance	$ Y_{fs} $	200	—	—	$\text{mS}$	$V_{DS} = -10\text{V}, I_D = -0.2\text{A}$
Diode Forward Voltage (Note 5)	$V_{SD}$	-0.5	—	-1.2	V	$V_{GS} = 0\text{V}, I_S = 115\text{mA}$
<b>DYNAMIC CHARACTERISTICS (Note 8)</b>						
Input Capacitance	$C_{iss}$	—	—	175	$\text{pF}$	$V_{DS} = -16\text{V}, V_{GS} = 0\text{V}$ $f = 1.0\text{MHz}$
Output Capacitance	$C_{oss}$	—	—	30	$\text{pF}$	
Reverse Transfer Capacitance	$C_{rss}$	—	—	20	$\text{pF}$	

Notes:

5. Device mounted on FR-4 PCB, with minimum recommended pad layout.
6. Device mounted on minimum recommended pad layout test board, 10 $\mu\text{s}$  pulse duty cycle = 1%.
7. Short duration pulse test used to minimize self-heating effect.
8. Guaranteed by design. Not subject to product testing.

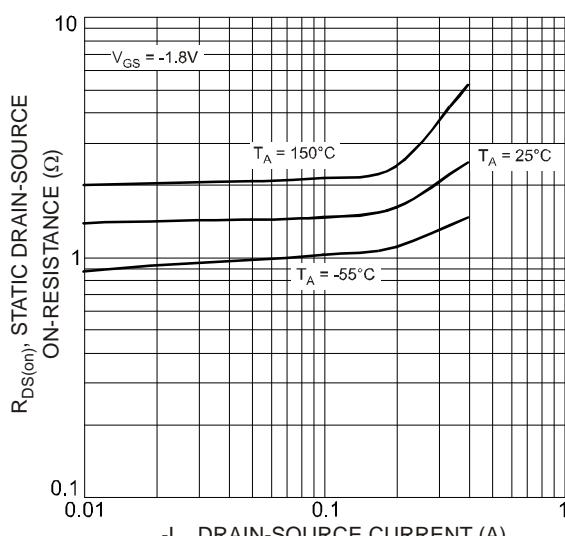
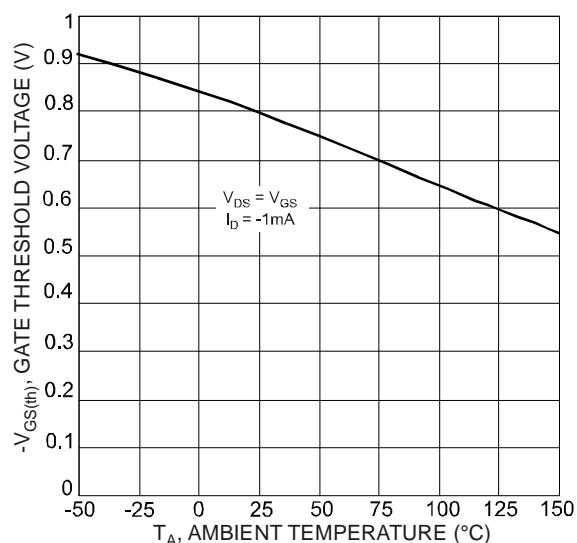
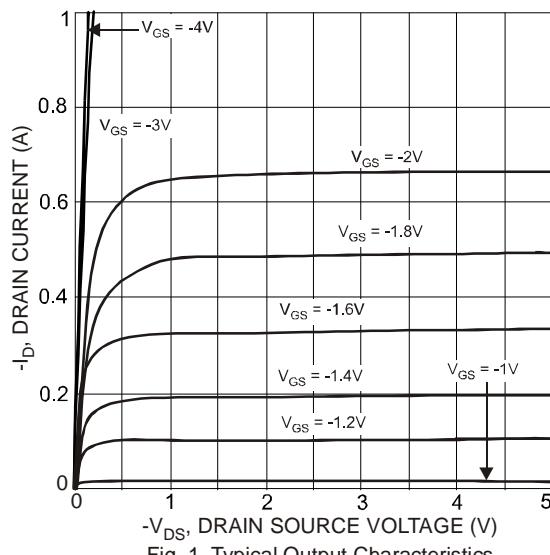
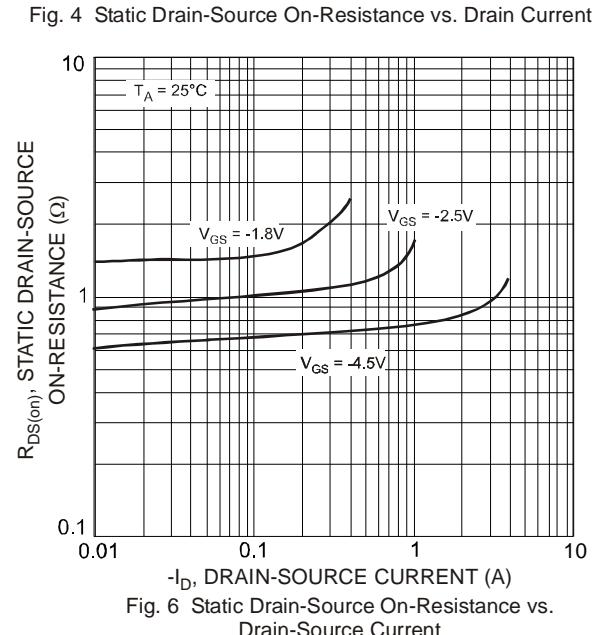
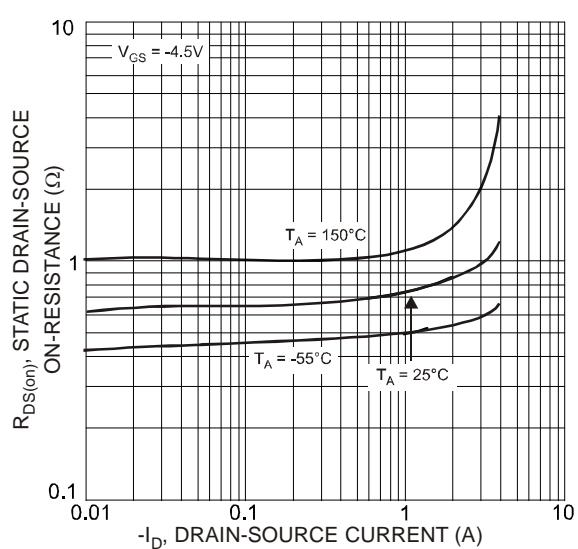
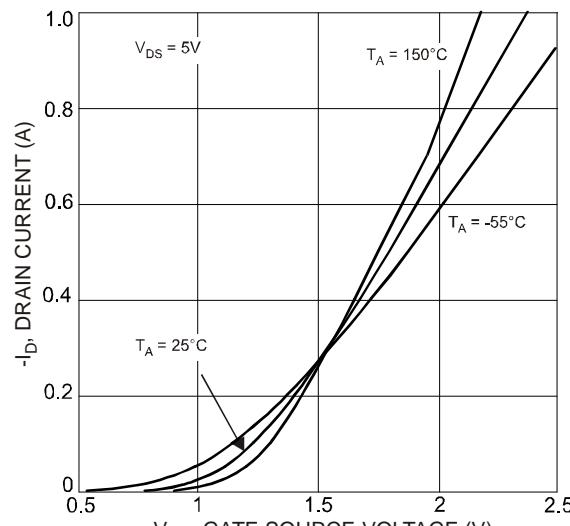


Fig. 5 Static Drain-Source On-Resistance vs. Drain Current



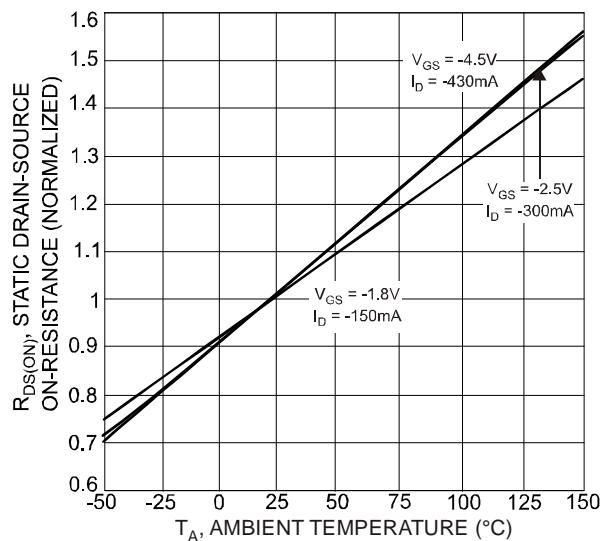


Fig. 7 Static Drain-Source On-State Resistance vs. Ambient Temperature

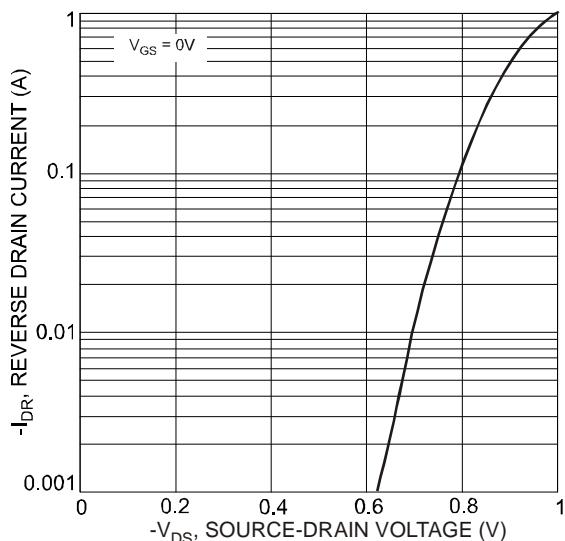


Fig. 8 Reverse Drain Current vs. Source-Drain Voltage

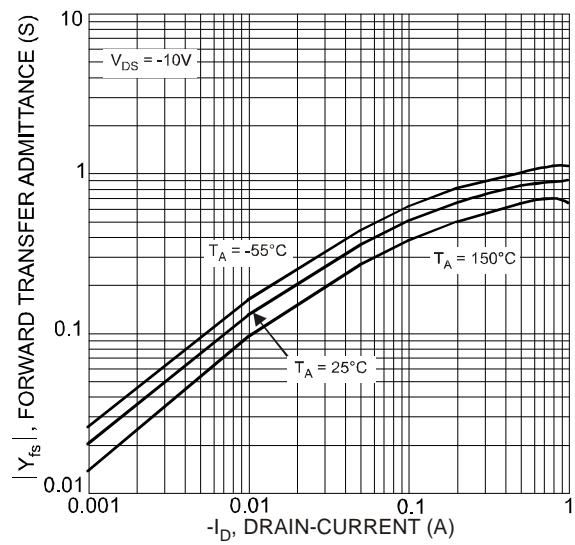


Fig. 9 Forward Transfer Admittance vs. Drain-Current

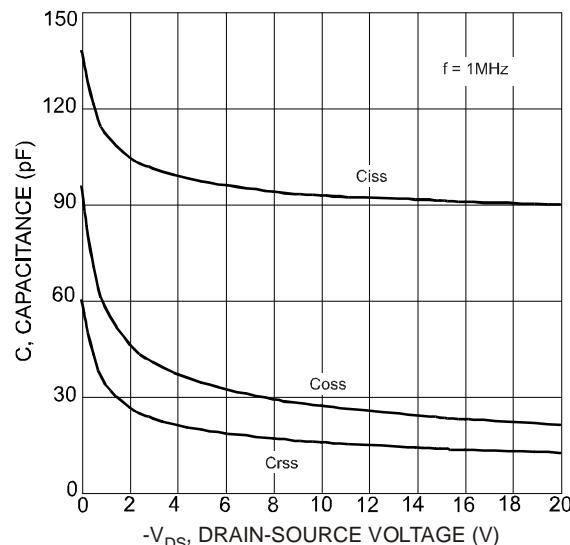
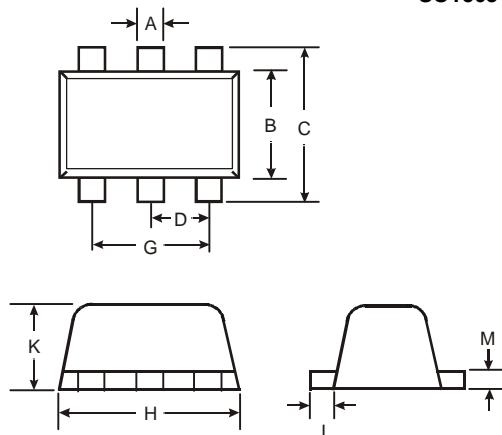


Fig. 10 Typical Capacitance

## Package Outline Dimensions

Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for the latest version.

**SOT563**



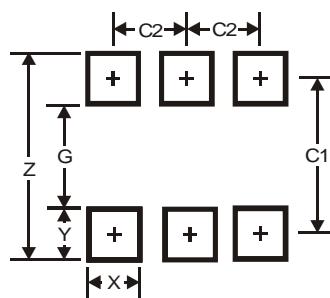
<b>SOT563</b>			
<b>Dim</b>	<b>Min</b>	<b>Max</b>	<b>Typ</b>
A	0.15	0.30	0.20
B	1.10	1.25	1.20
C	1.55	1.70	1.60
D	-	-	0.50
G	0.90	1.10	1.00
H	1.50	1.70	1.60
K	0.55	0.60	0.60
L	0.10	0.30	0.20
M	0.10	0.18	0.11

**All Dimensions in mm**

## Suggested Pad Layout

Please see AP02001 at <http://www.diodes.com/datasheets/ap02001.pdf> for the latest version.

**SOT563**



<b>Dimensions</b>	<b>Value (in mm)</b>
Z	2.2
G	1.2
X	0.375
Y	0.5
C1	1.7
C2	0.5

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