

## Product Summary

$V_{(BR)DSS}$	$R_{DS(ON) \max}$	$I_D \max$ $T_A = +25^\circ\text{C}$
-20V	150m $\Omega$ @ $V_{GS} = -4.5\text{V}$	-1.9A
	200m $\Omega$ @ $V_{GS} = -2.5\text{V}$	-1.7A

## 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

- Backlighting
- Power Management Functions
- DC-DC Converters
- Motor Control

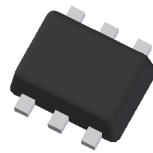
## Features

- Very Low On-Resistance
- Very Low Gate Threshold Voltage
- Low Input Capacitance
- Fast Switching Speed
- Low Input/Output Leakage
- Ultra-Small Surface Mount Package
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **Qualified to AEC-Q101 Standards for High Reliability**

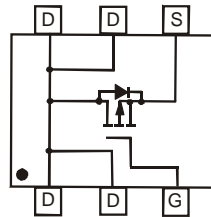
## Mechanical Data

- Case: SOT-563
- 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 (3)
- Weight: 0.006 grams (Approximate)

SOT-563



Top View



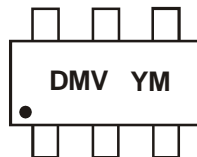
Top View  
Internal Schematic

## Ordering Information (Note 4)

Part Number	Case	Packaging
DMP2104V-7	SOT-563	3000/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



DMV = Marking Code  
 YM = Date Code Marking  
 Y = Year (ex: T = 2006)  
 M = Month (ex: 9 = September)

### Date Code Key

Year	2006	2007	...	2014	2015	2016	2017	2018	2019	2020	2021
Code	T	U	...	B	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<sub>A</sub> = +25°C unless otherwise specified.)

Characteristic			Symbol	Value	Units
Drain-Source Voltage			V <sub>DSS</sub>	-20	V
Gate-Source Voltage			V <sub>GSS</sub>	±12	V
Continuous Drain Current (Note 5) V <sub>GS</sub> = -4.5V	Steady State	T <sub>A</sub> = +25°C T <sub>A</sub> = +70°C	I <sub>D</sub>	-1.9 -1.5	A
Continuous Drain Current (Note 5) V <sub>GS</sub> = -4.5V	t ≤ 5s	T <sub>A</sub> = +25°C T <sub>A</sub> = +70°C	I <sub>D</sub>	-2.1 -1.65	A
Continuous Drain Current (Note 5) V <sub>GS</sub> = -2.5V	Steady State	T <sub>A</sub> = +25°C T <sub>A</sub> = +70°C	I <sub>D</sub>	-1.7 -1.3	A
Pulsed Drain Current	t <sub>p</sub> = 10μs		I <sub>DM</sub>	-4.0	A

**Thermal Characteristics**

Characteristic	Symbol	Value	Units
Power Dissipation (Note 5)	P <sub>D</sub>	0.85	W
Thermal Resistance, Junction to Ambient @T <sub>A</sub> = +25°C (Note 5)	R <sub>θJA</sub>	146	°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>	-20	—	—	V	V <sub>GS</sub> = 0V, I <sub>D</sub> = -250μA
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	—	—	-1.0 -5.0	μA	V <sub>DS</sub> = -20V, V <sub>GS</sub> = 0V
Gate-Source Leakage	I <sub>GSS</sub>	—	—	±100	nA	V <sub>GS</sub> = ±12V, V <sub>DS</sub> = 0V
<b>ON CHARACTERISTICS (Note 6)</b>						
Gate Threshold Voltage	V <sub>GS(th)</sub>	-0.45	—	-1.0	V	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = -250μA
Static Drain-Source On-Resistance	R <sub>DS(on)</sub>	—	92	150	mΩ	V <sub>GS</sub> = -4.5V, I <sub>D</sub> = -950mA
			134	200		V <sub>GS</sub> = -2.5V, I <sub>D</sub> = -670mA
			180	240		V <sub>GS</sub> = -1.8V, I <sub>D</sub> = -200mA
Forward Transconductance	g <sub>FS</sub>	—	3.1	—	S	V <sub>DS</sub> = -10V, I <sub>D</sub> = -810mA
Diode Forward Voltage (Note 6)	V <sub>SD</sub>	—	—	-0.9	V	V <sub>GS</sub> = 0V, I <sub>S</sub> = -360mA
<b>DYNAMIC CHARACTERISTICS</b>						
Input Capacitance	C <sub>ISS</sub>	—	320	—	pF	V <sub>DS</sub> = -16V, V <sub>GS</sub> = 0V f = 1.0MHz
Output Capacitance	C <sub>OSS</sub>	—	80	—	pF	
Reverse Transfer Capacitance	C <sub>RSS</sub>	—	60	—	pF	

- Notes: 5. Device mounted on FR-4 PCB with 1 inch square pads.  
6. Short duration pulse test used to minimize self-heating effect.

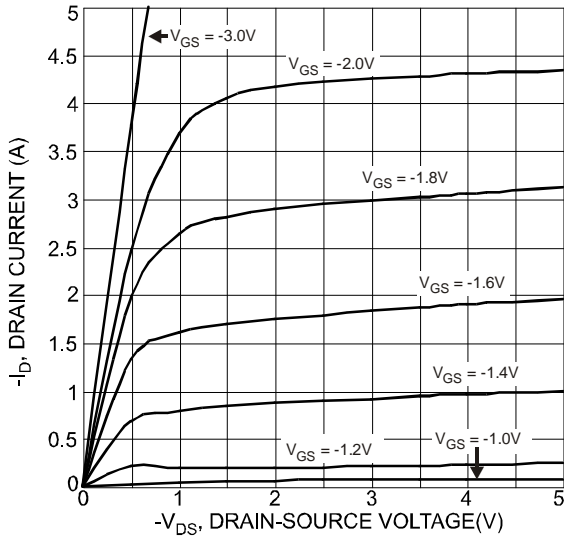


Fig. 1 Typical Output Characteristics

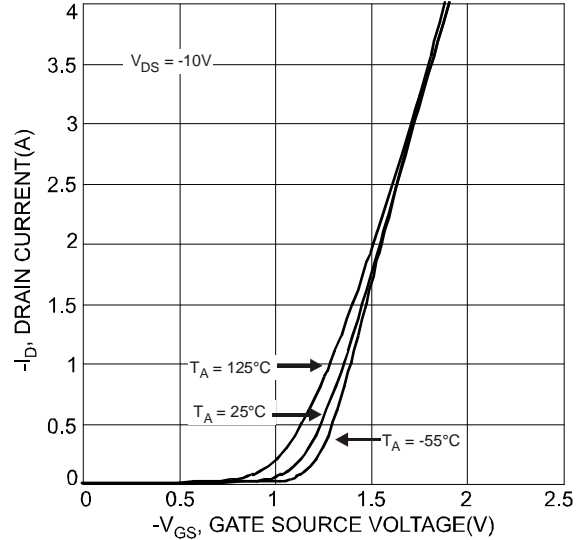


Fig. 2 Typical Transfer Characteristics

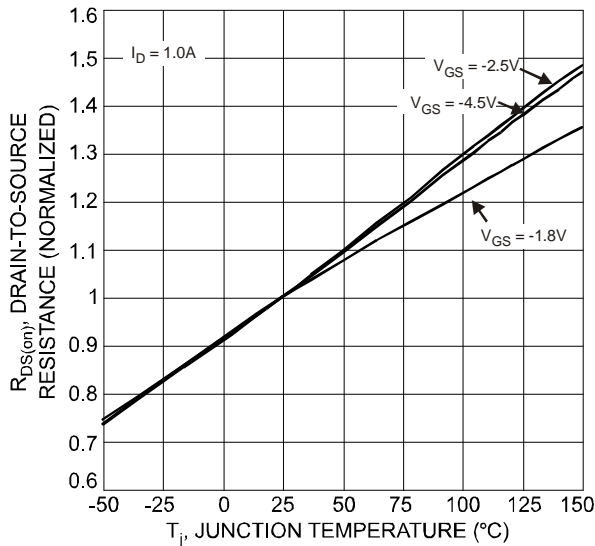


Fig. 3 On-Resistance Variation with Temperature

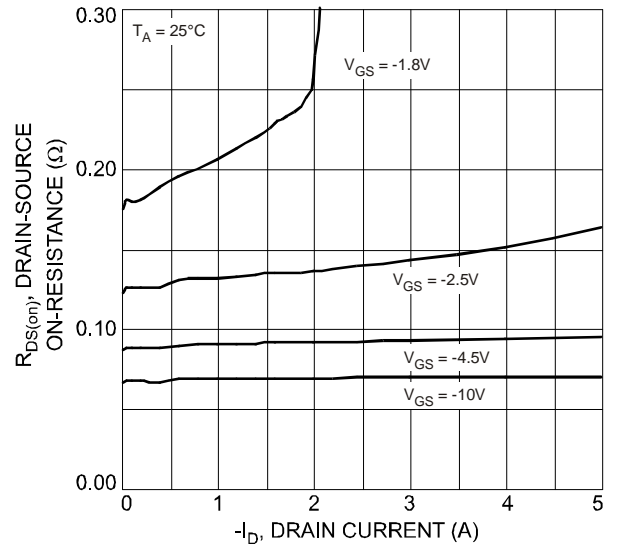


Fig. 4 On-Resistance vs. Drain Current and Gate Voltage

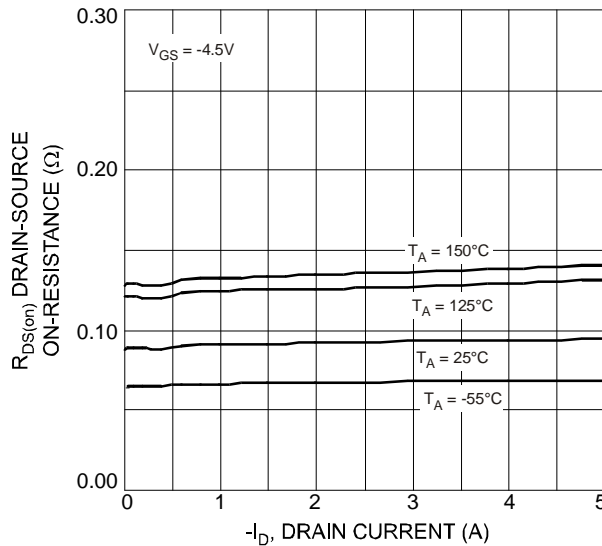


Fig. 5 Drain-Source On-Resistance vs. Drain Current and Temperature

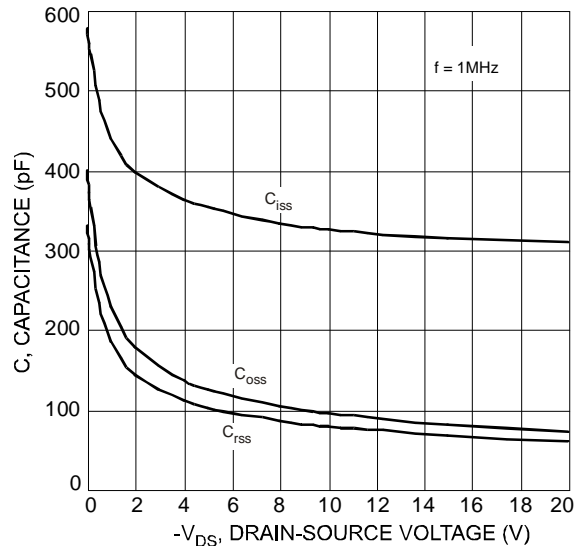


Fig. 6 Typical Capacitance

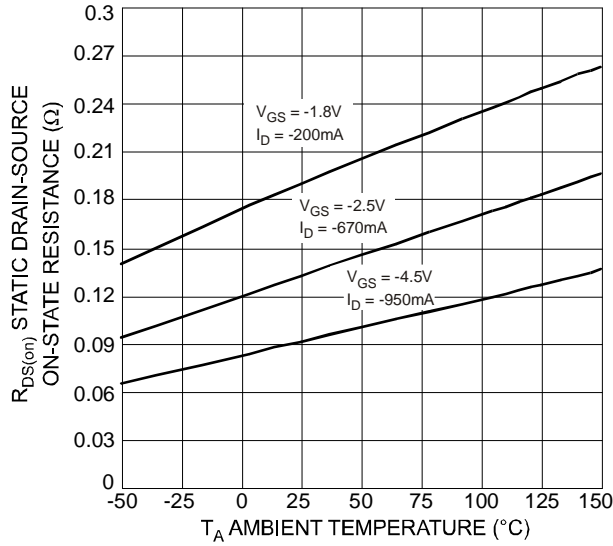


Fig. 7 Static Drain-Source On-State Resistance vs. Ambient Temperature

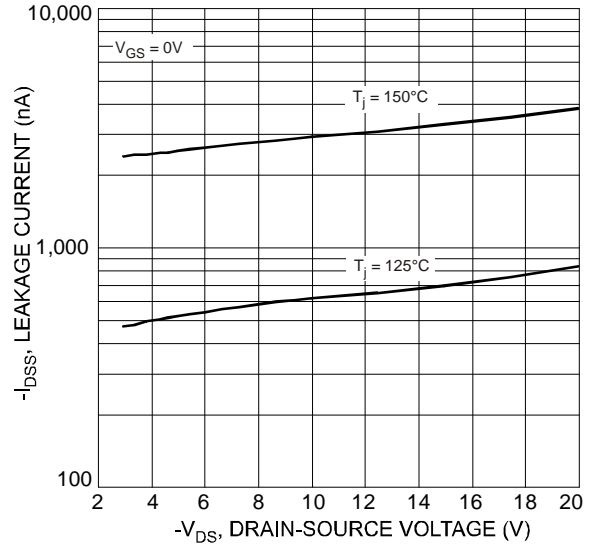


Fig. 8 Drain-Source Leakage Current vs. Voltage

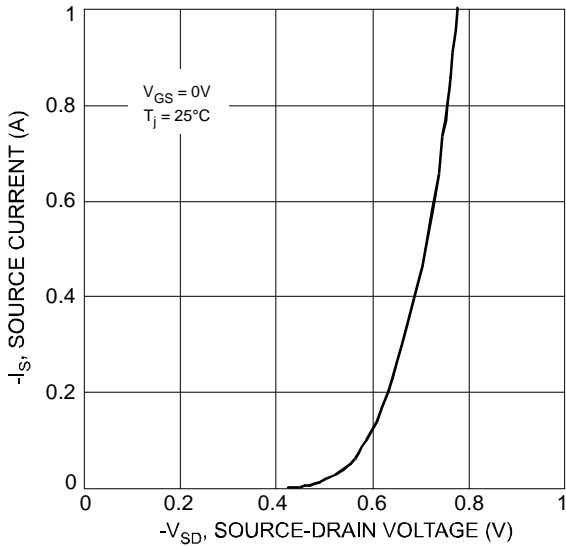


Fig. 9 Diode Forward Voltage vs. Current

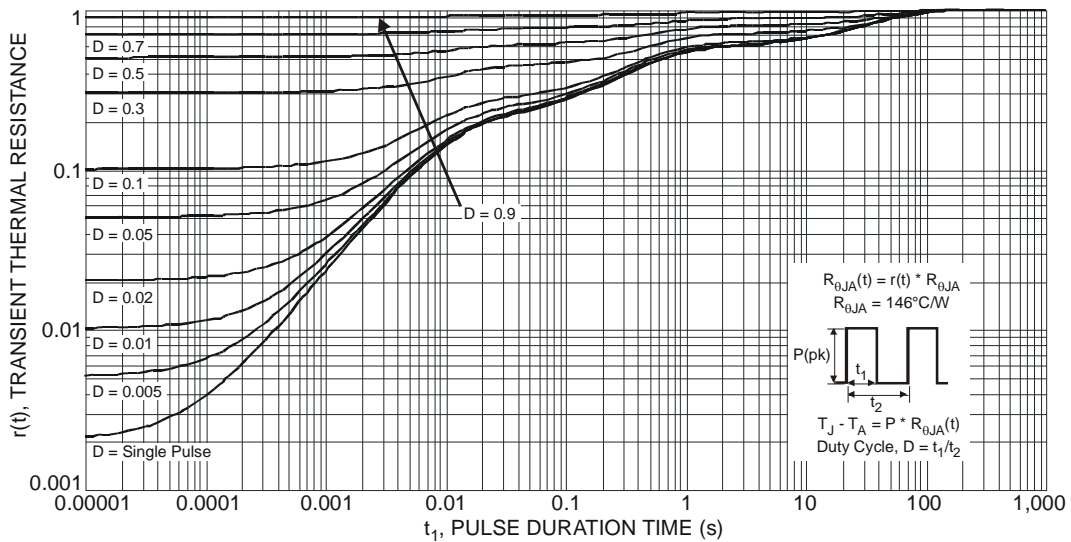
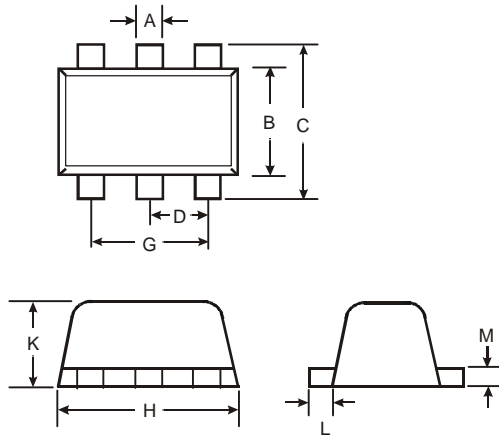


Fig. 10 Transient Thermal Response

**Package Outline Dimensions**

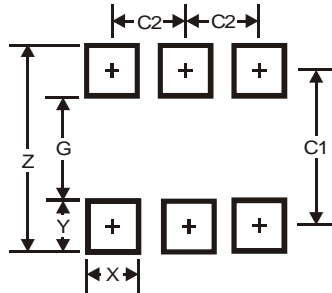
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for latest version.



SOT-563			
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**

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



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

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