



**THE DATASHEET OF  
DMP32D4S-13**



## Product Summary

BV <sub>DSS</sub>	R <sub>DS(on)</sub> Max	I <sub>D</sub> Max @T <sub>A</sub> = +25°C
-30V	2.4Ω @ V <sub>GS</sub> = -10V	-300mA
	4Ω @ V <sub>GS</sub> = -4.5V	-250mA

## Description

This MOSFET has been 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.

## Applications

- Load switches
- Portable applications
- Power management functions

## Features

- Low On-Resistance
- ESD Protected Gate
- **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 refer to the related automotive grade (Q-suffix) part. A listing can be found at <https://www.diodes.com/products/automotive/automotive-products/>.**
- **This part is qualified to JEDEC standards (as references in AEC-Q) for High Reliability. <https://www.diodes.com/quality/product-definitions/>**

## Mechanical Data

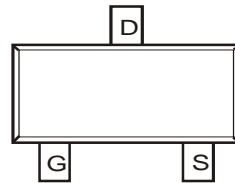
- Package: SOT23
- Package Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Lead Free Plating (Matte Tin Finish Annealed over Alloy 42 Leadframe). Ⓔ<sup>3</sup>
- Weight: 0.006 grams (Approximate)



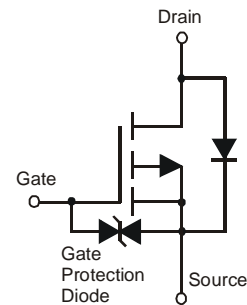
SOT23



Top View



Top View  
Pin-Out



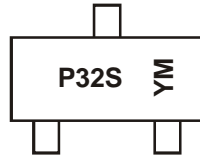
Equivalent Circuit

## Ordering Information (Note 4)

Part Number	Package	Packing	
		Qty.	Carrier
DMP32D4S-7	SOT23	3,000	Tape & Reel
DMP32D4S-13	SOT23	10,000	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



P32S = Product Type Marking Code  
 YM = Date Code Marking  
 Y = Year (ex: J = 2022)  
 M = Month (ex: 9 = September)

### Date Code Key

Year	2012	...	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Code	Z	...	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	Unit
Drain-Source Voltage			V <sub>DSS</sub>	-30	V
Gate-Source Voltage			V <sub>GSS</sub>	±20	V
Continuous Drain Current (Note 6)	V <sub>GS</sub> = -10V	T <sub>A</sub> = +25°C	I <sub>D</sub>	-300	mA
		T <sub>A</sub> = +70°C		-250	
Pulsed Drain Current (Note 6)			I <sub>DM</sub>	-1	A

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

Characteristic		Symbol	Value	Unit
Total Power Dissipation	(Note 5)	P <sub>D</sub>	370	mW
	(Note 6)		540	
Thermal Resistance, Junction to Ambient	(Note 5)	R <sub>θJA</sub>	348	°C/W
	(Note 6)		241	
Thermal Resistance, Junction to Case	(Note 6)	R <sub>θJC</sub>	91	
Operating and Storage Temperature Range		T <sub>J</sub> , T <sub>STG</sub>	-55 to +150	°C

- Notes:
- Device mounted on FR-4 PC board, with minimum recommended pad layout, single sided.
  - Device mounted on FR-4 substrate PC board, 2oz copper, with 1inch square copper pad layout.

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

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
<b>OFF CHARACTERISTICS (Note 7)</b>						
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	-30	—	—	V	V <sub>GS</sub> = 0V, I <sub>D</sub> = -1mA
Zero Gate Voltage Drain Current, T <sub>J</sub> = +25°C	I <sub>DSS</sub>	—	—	-1	μA	V <sub>DS</sub> = -30V, V <sub>GS</sub> = 0V
Gate-Source Leakage	I <sub>GSS</sub>	—	—	±10	μA	V <sub>GS</sub> = ±16V, V <sub>DS</sub> = 0V
<b>ON CHARACTERISTICS (Note 7)</b>						
Gate Threshold Voltage	V <sub>GS(TH)</sub>	-1.4 -1.2	—	-2.4 -2.0	V	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = -250μA V <sub>DS</sub> = -5V, I <sub>D</sub> = -1μA
Static Drain-Source On-Resistance	R <sub>DS(ON)</sub>	—	—	2.4 4	Ω	V <sub>GS</sub> = -10V, I <sub>D</sub> = -0.3A V <sub>GS</sub> = -4.5V, I <sub>D</sub> = -0.25A
Forward Transfer Admittance	Y <sub>fs</sub>	—	6	—	S	V <sub>DS</sub> = -10V, I <sub>D</sub> = -400mA
Diode Forward Voltage	V <sub>SD</sub>	—	-0.8	-1.2	V	V <sub>GS</sub> = 0V, I <sub>S</sub> = -300mA
<b>DYNAMIC CHARACTERISTICS (Note 8)</b>						
Input Capacitance	C <sub>iss</sub>	—	51.16	—	pF	V <sub>DS</sub> = -15V, V <sub>GS</sub> = 0V, f = 1.0MHz
Output Capacitance	C <sub>oss</sub>	—	10.85	—	pF	
Reverse Transfer Capacitance	C <sub>riss</sub>	—	8.88	—	pF	
Gate Resistance	R <sub>g</sub>	—	275	—	Ω	V <sub>DS</sub> = 0V, V <sub>GS</sub> = 0V, f = 1MHz
Total Gate Charge	Q <sub>g</sub>	—	0.6	—	nC	V <sub>GS</sub> = -4.5V
Total Gate Charge	Q <sub>g</sub>	—	1.2	—	nC	V <sub>GS</sub> = -10V V <sub>DS</sub> = -10V, I <sub>D</sub> = -1A
Gate-Source Charge	Q <sub>gs</sub>	—	0.2	—	nC	
Gate-Drain Charge	Q <sub>gd</sub>	—	0.3	—	nC	
Turn-On Delay Time	t <sub>D(on)</sub>	—	9.86	—	ns	
Turn-On Rise Time	t <sub>r</sub>	—	11.5	—	ns	V <sub>DS</sub> = -15V, I <sub>D</sub> = -1A V <sub>GS</sub> = -10V, R <sub>G</sub> = 6Ω
Turn-Off Delay Time	t <sub>D(off)</sub>	—	31.8	—	ns	
Turn-Off Fall Time	t <sub>f</sub>	—	21.9	—	ns	

Notes: 7. Short duration pulse test used to minimize self-heating effect.  
8. Guaranteed by design. Not subject to production testing.

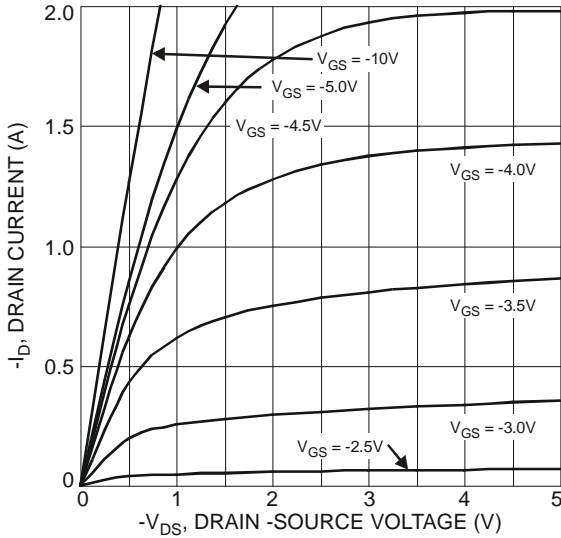


Figure 1 Typical Output Characteristics

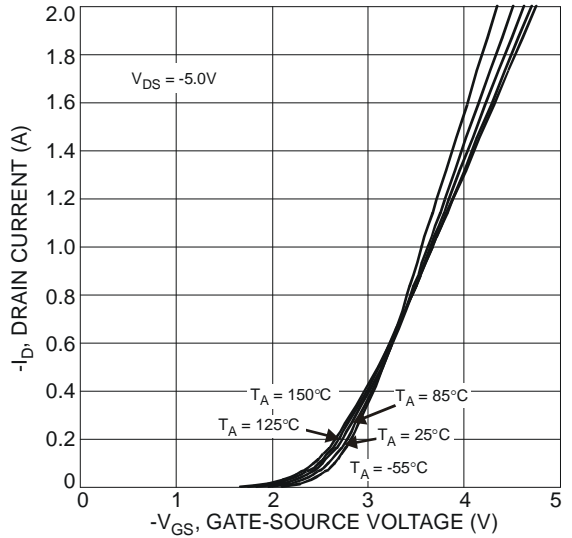


Figure 2 Typical Transfer Characteristics

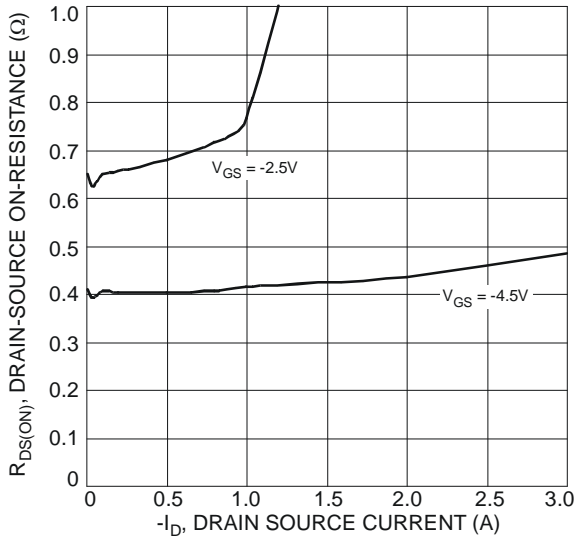


Figure 3 Typical On-Resistance vs. Drain Current and Gate Voltage

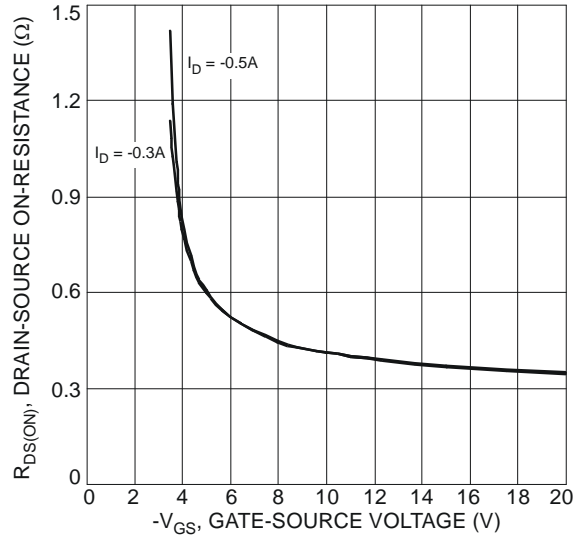


Figure 4 Typical Drain-Source On-Resistance vs. Gate-Source Voltage

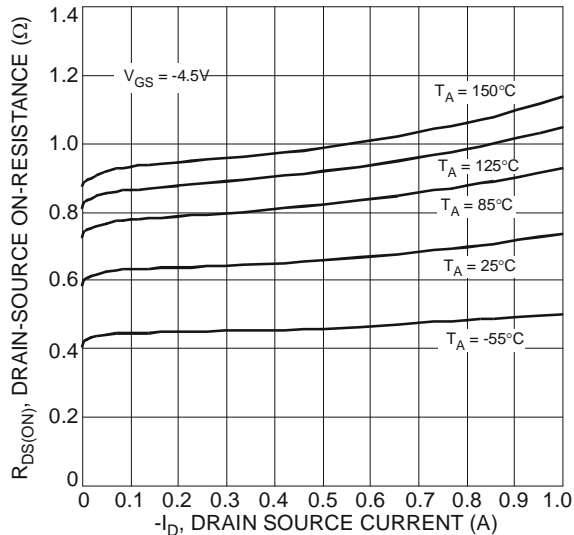


Figure 5 Typical On-Resistance vs. Drain Current and Temperature

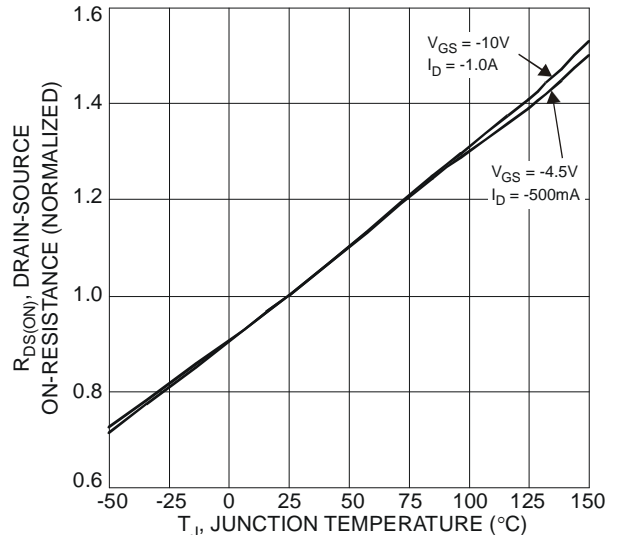


Figure 6 On-Resistance Variation with Temperature

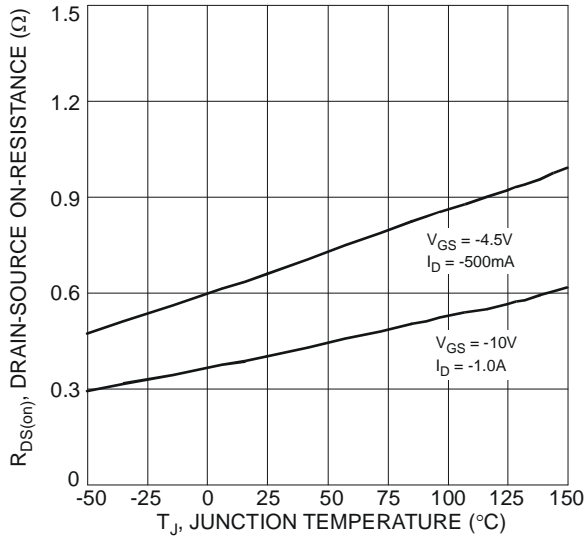


Figure 7 On-Resistance Variation with Temperature

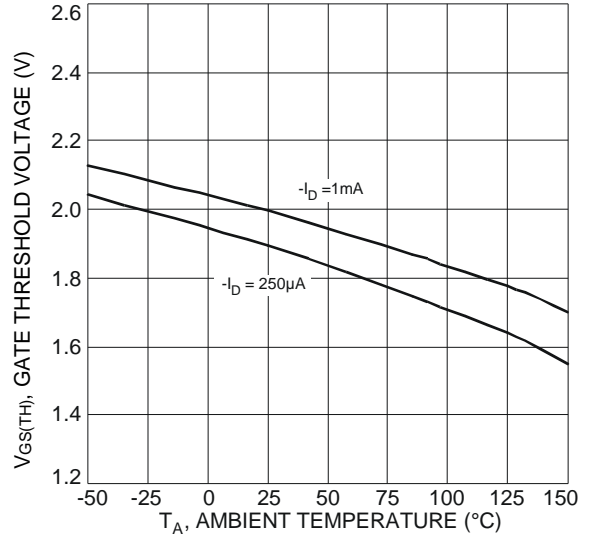


Figure 8 Gate Threshold Variation vs. Ambient Temperature

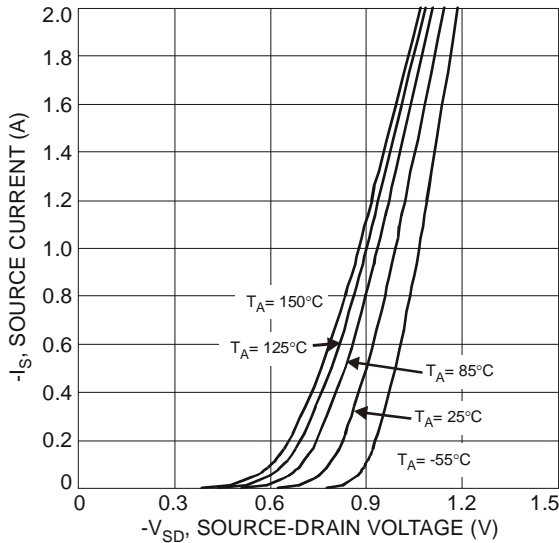


Figure 9 Diode Forward Voltage vs. Current

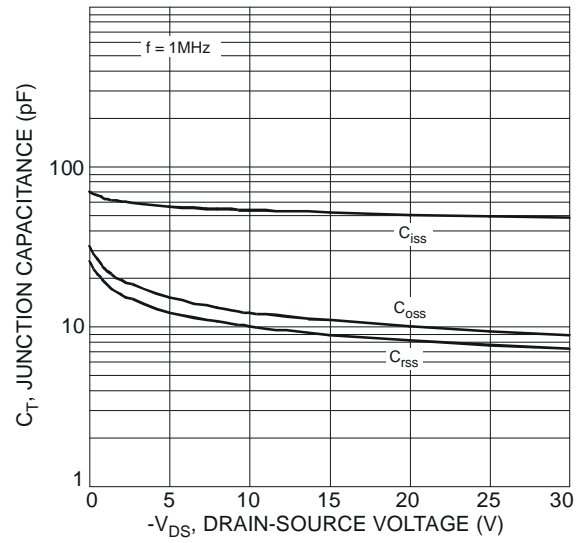


Figure 10 Typical Junction Capacitance

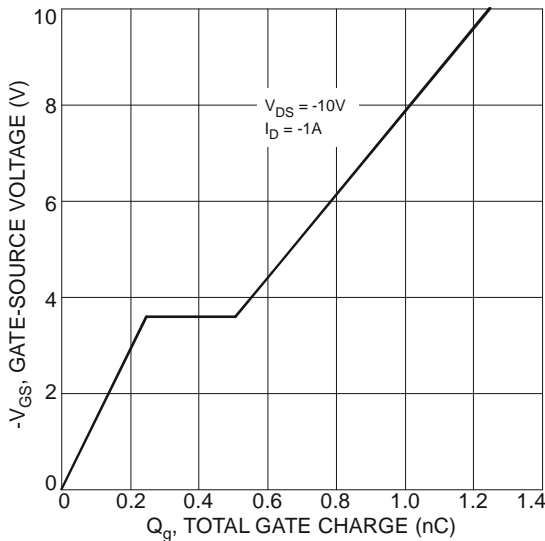
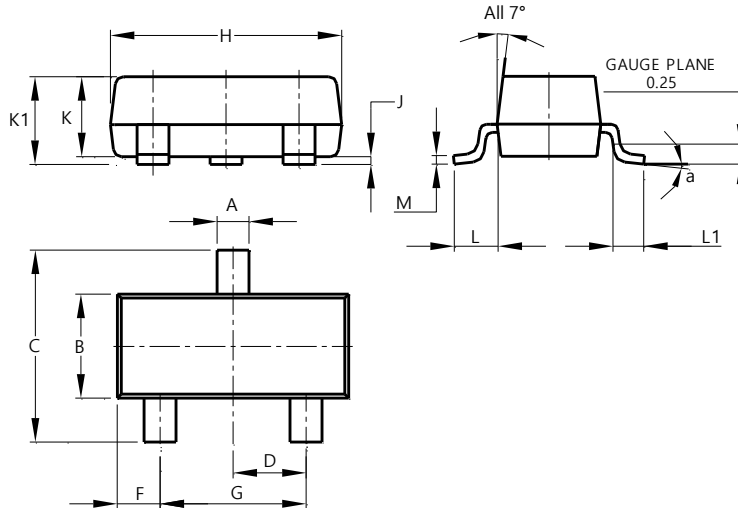


Figure 11 Gate-Charge Characteristics

## Package Outline Dimensions

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

**SOT23**

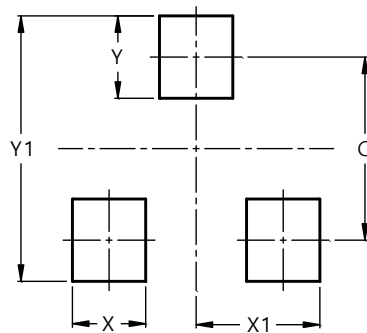


SOT23			
Dim	Min	Max	Typ
A	0.37	0.51	0.40
B	1.20	1.40	1.30
C	2.30	2.50	2.40
D	0.89	1.03	0.915
F	0.45	0.60	0.535
G	1.78	2.05	1.83
H	2.80	3.00	2.90
J	0.013	0.10	0.05
K	0.890	1.00	0.975
K1	0.903	1.10	1.025
L	0.45	0.61	0.55
L1	0.25	0.55	0.40
M	0.085	0.150	0.110
a	0°	8°	--
All Dimensions in mm			

## Suggested Pad Layout

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

**SOT23**



Dimensions	Value (in mm)
C	2.0
X	0.8
X1	1.35
Y	0.9
Y1	2.9

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