



**THE DATASHEET OF  
DMP3099L-7**



## Product Summary

$V_{(BR)DSS}$	$R_{DS(on)}$ max	$I_D$ max $T_A = +25^\circ\text{C}$
-30V	65m $\Omega$ @ $V_{GS} = -10\text{V}$	-3.8A
	99m $\Omega$ @ $V_{GS} = -4.5\text{V}$	-3.0A

## Description

This 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

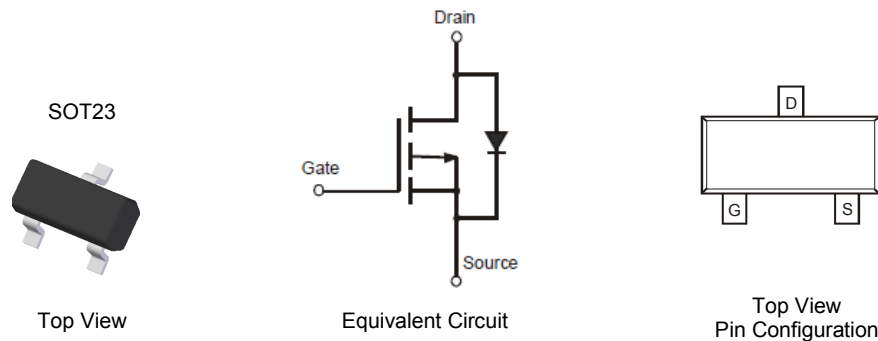
- Backlighting
- Power Management Functions
- DC-DC Converters

## Features and Benefits

- Low Gate Threshold Voltage
- Low Input Capacitance
- Fast Switching Speed
- Low Input/Output Leakage
- **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-Q100/101/200, PPAP capable, and manufactured in IATF 16949 certified facilities), please [contact us](mailto:contact@diodes.com) or your local Diodes representative. <https://www.diodes.com/quality/product-definitions/>**

## Mechanical Data

- Case: SOT23 (Standard)
- Case 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  $\text{e3}$
- Terminal Connections: See Diagram
- Weight: 0.008 grams (approximate)

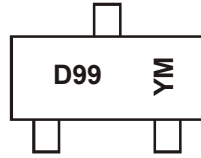


## Ordering Information (Note 4)

Part Number	Compliance	Case	Packaging
DMP3099L-7	Standard	SOT23 (Standard)	3000/Tape & Reel
DMP3099L-13	Standard	SOT23 (Standard)	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



D99= Product Type Marking Code  
 YM = Date Code Marking  
 Y = Year (ex: I = 2021)  
 M = Month (ex: 9 = September)

### Date Code Key

Year	2008	.....	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Code	V	.....	I	J	K	L	M	N	O	P	R	S
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>	-30	V
Gate-Source Voltage			V <sub>GSS</sub>	±20	V
Drain Current (Note 5) V <sub>GS</sub> = -10V	Steady State	T <sub>A</sub> = +25°C	I <sub>D</sub>	-3.8	A
		T <sub>A</sub> = +70°C		-2.9	
Pulsed Drain Current (Note 6)			I <sub>DM</sub>	-11	A

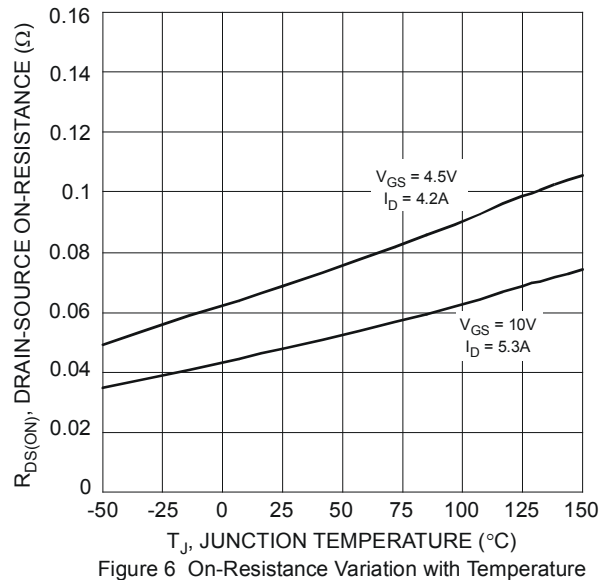
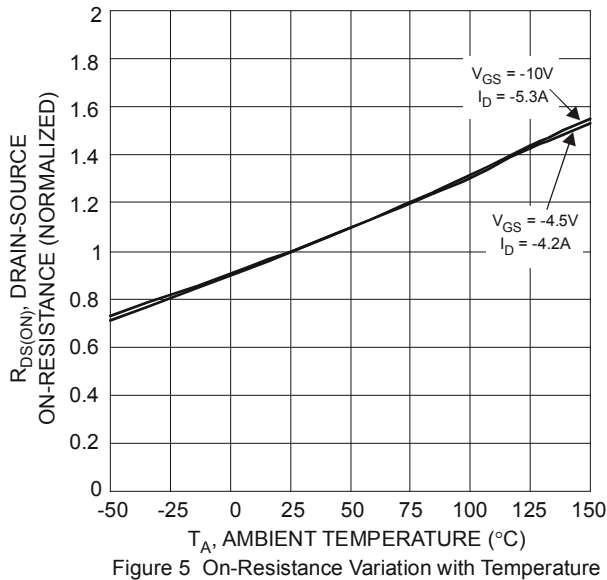
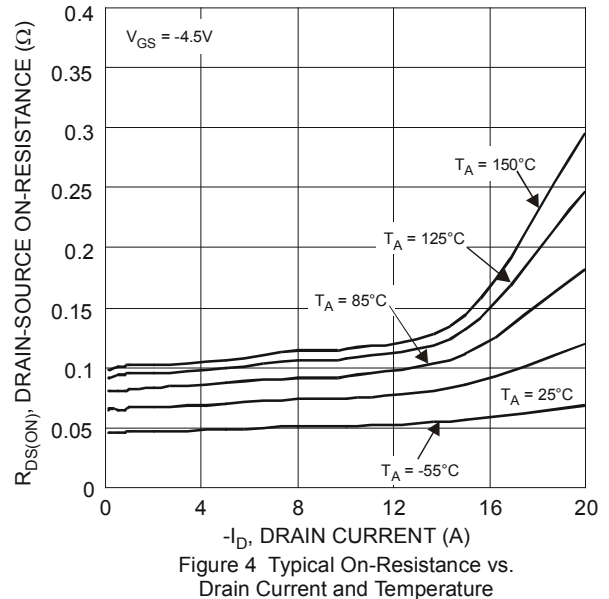
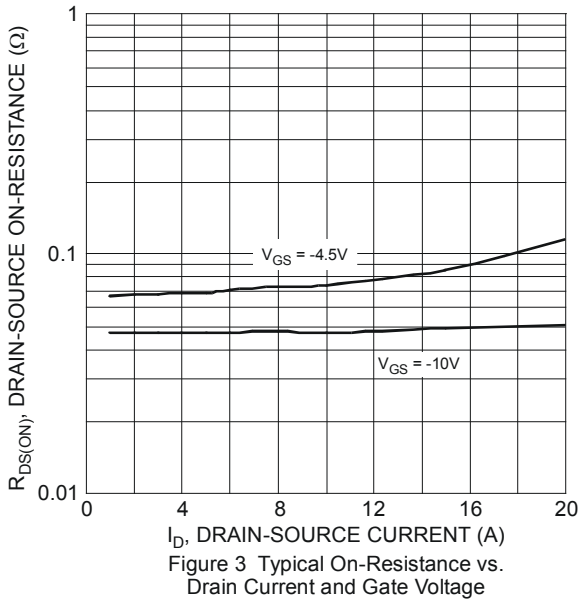
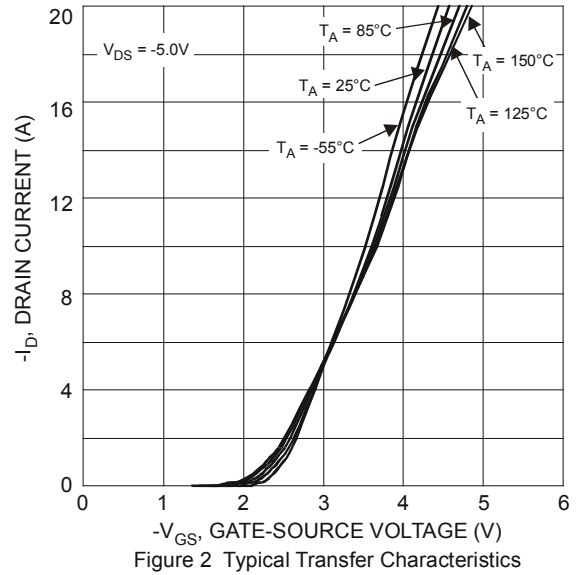
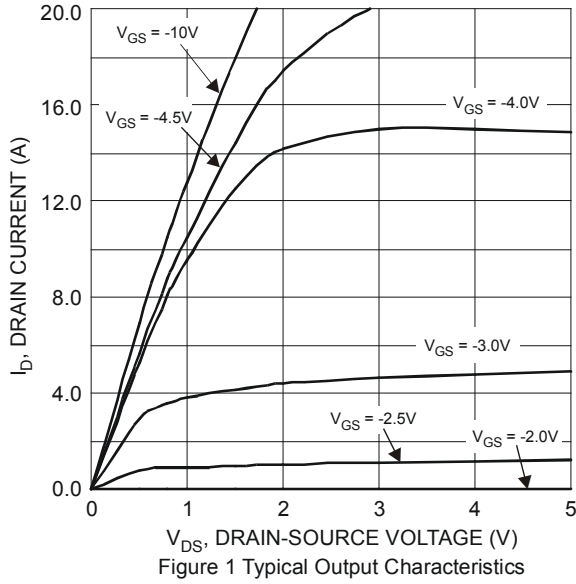
## Thermal Characteristics

Characteristic	Symbol	Value	Units
Total Power Dissipation (Note 5)	P <sub>D</sub>	1.08	W
Thermal Resistance, Junction to Ambient @T <sub>A</sub> = +25°C (Note 5)	R <sub>θJA</sub>	115	°C/W
Operating and Storage Temperature Range	T <sub>J</sub> , T <sub>STG</sub>	-55 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	$BV_{DSS}$	-30	—	—	V	$V_{GS} = 0V, I_D = -250\mu A$
Zero Gate Voltage Drain Current	$I_{DSS}$	—	—	-800	nA	$V_{DS} = -30V, V_{GS} = 0V$
Gate-Source Leakage	$I_{GSS}$	—	—	$\pm 100$	nA	$V_{GS} = \pm 20V, V_{DS} = 0V$
<b>ON CHARACTERISTICS (Note 7)</b>						
Gate Threshold Voltage	$V_{GS(th)}$	-1.0	—	-2.1	V	$V_{DS} = V_{GS}, I_D = -250\mu A$
Static Drain-Source On-Resistance	$R_{DS(on)}$	—	—	65	m $\Omega$	$V_{GS} = -10V, I_D = -3.8A$
				99		$V_{GS} = -4.5V, I_D = -3.0A$
Forward Transfer Admittance	$ Y_{fs} $	—	3.6	—	S	$V_{DS} = -5V, I_D = -2.7A$
Diode Forward Voltage (Note 6)	$V_{SD}$	—	—	-1.26	V	$V_{GS} = 0V, I_S = -2.7A$
<b>DYNAMIC CHARACTERISTICS (Note 8)</b>						
Input Capacitance	$C_{iss}$	—	563	—	pF	$V_{DS} = -25V, V_{GS} = 0V,$ $f = 1.0MHz$
Output Capacitance	$C_{oss}$	—	48	—	pF	
Reverse Transfer Capacitance	$C_{rss}$	—	41	—	pF	
Gate Resistance	$R_G$	—	10.3	—	$\Omega$	$V_{GS} = 0V, V_{DS} = 0V, f = 1MHz$
<b>SWITCHING CHARACTERISTICS (Note 8)</b>						
Total Gate Charge	$Q_g$	—	5.2	—	nC	$V_{DS} = -15V, V_{GS} = -4.5V,$ $I_D = -3.8A$
			11			
Gate-Source Charge	$Q_{gs}$	—	1.7	—		ns
Gate-Drain Charge	$Q_{gd}$	—	1.9	—		
Turn-On Delay Time	$t_{d(on)}$	—	4.8	—	ns	$V_{DS} = -15V, V_{GS} = -10V,$ $I_D = -1A, R_G = 6.0\Omega$
Rise Time	$t_r$	—	5.0	—		
Turn-Off Delay Time	$t_{d(off)}$	—	31	—		
Fall Time	$t_f$	—	15	—		

- Notes:
- Device mounted on FR-4 PCB on 2 oz., 0.5 in.<sup>2</sup> copper pads and  $t \leq 5$  sec.
  - Pulse width  $\leq 10\mu\text{s}$ , Duty Cycle  $\leq 1\%$ .
  - Short duration pulse test used to minimize self-heating effect.
  - Guaranteed by design. Not subject to production testing.



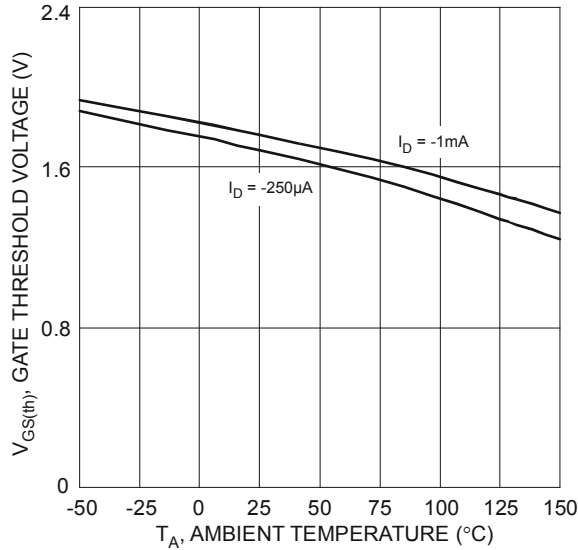


Figure 7 Gate Threshold Variation vs. Ambient Temperature

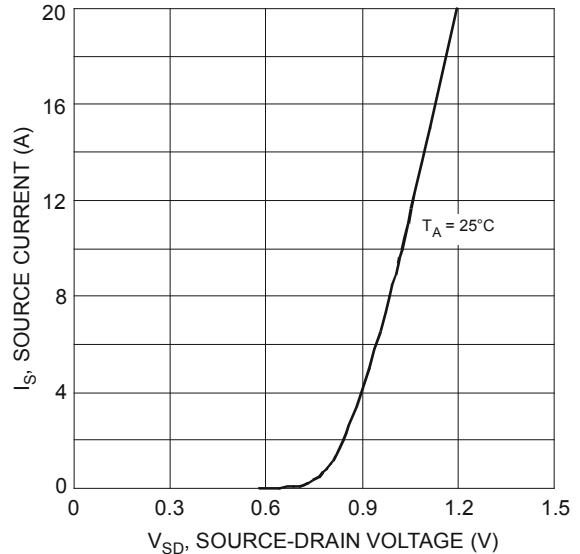


Figure 8 Diode Forward Voltage vs. Current

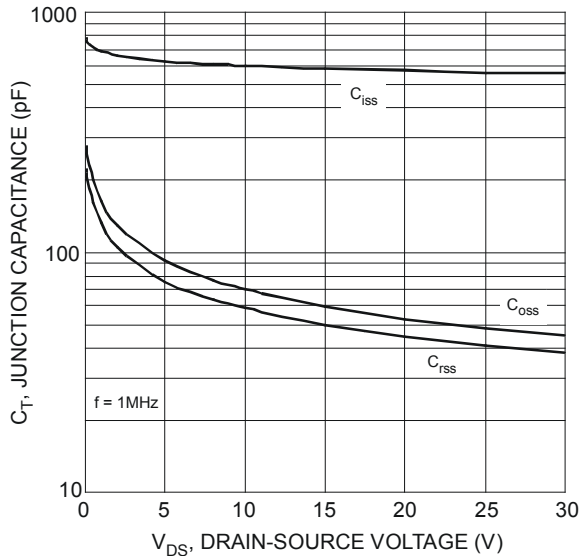


Figure 9 Typical Junction Capacitance

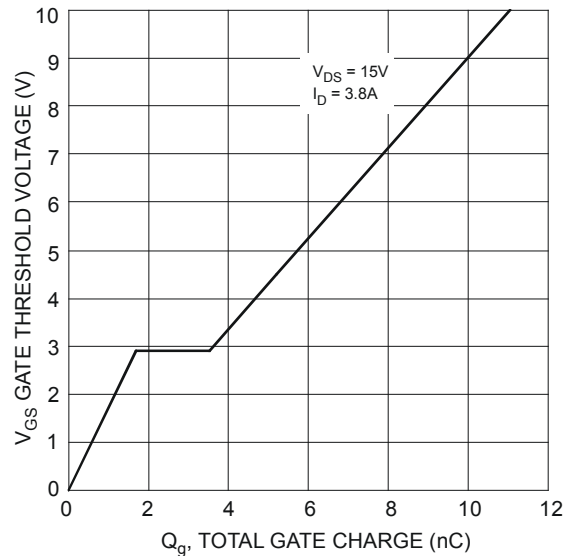
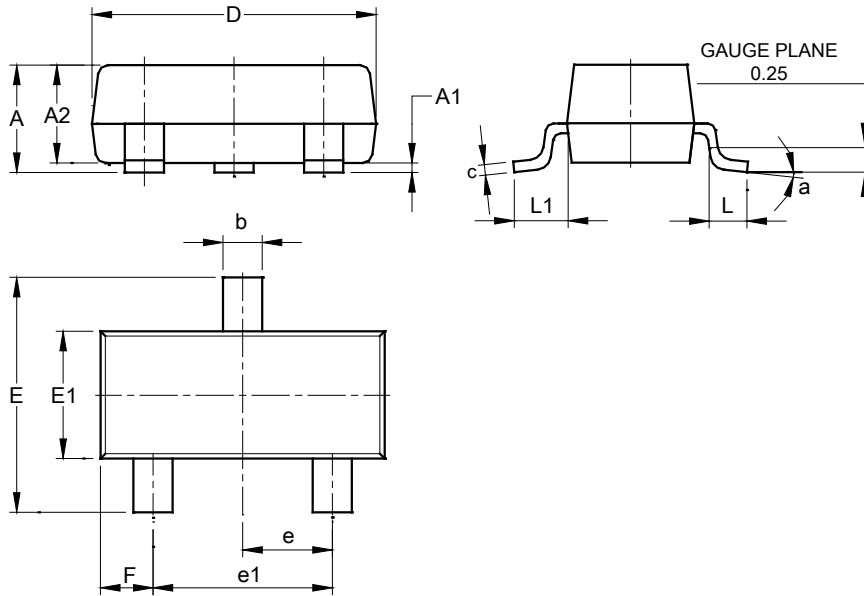


Figure 10 Gate Charge

**Package Outline Dimensions**

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

**SOT23 (Standard)**

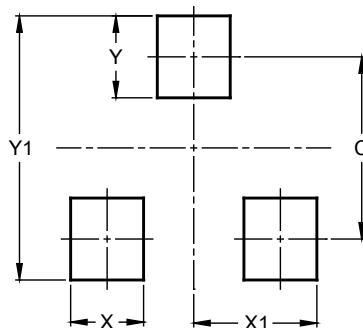


SOT23 (Standard)			
Dim	Min	Max	Typ
A	0.90	1.15	1.025
A1	0.00	0.10	0.05
A2	0.85	1.10	0.975
b	0.30	0.51	0.40
c	0.080	0.202	0.11
D	2.80	3.00	2.90
E	2.25	2.55	2.40
E1	1.20	1.40	1.30
e	0.89	1.03	0.915
e1	1.78	2.05	1.83
F	0.40	0.60	0.535
L1	0.45	0.61	0.55
L	0.25	0.55	0.40
a	0°	8°	--
All Dimensions in mm			

**Suggested Pad Layout**

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

**SOT23 (Standard)**



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

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