Product Summary

BV_{DSS}	$R_{DS(ON)}$ Max	I_D Max T_A = +25°C
-20V	80mΩ @ V_{GS} = -4.5V	-3.7A
	110mΩ @ V_{GS} = -2.5V	-3.1A

Features and Benefits

- Low On-Resistance
- Low Gate Threshold Voltage
- Low Input Capacitance
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**

Description

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

Applications

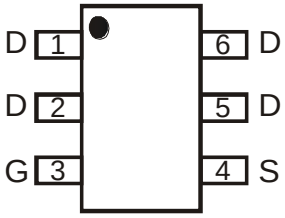
- General Purpose Interfacing Switch
- Power Management Functions

Mechanical Data

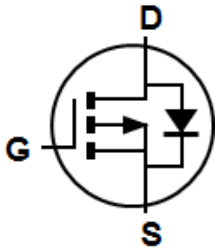
- Case: TSOT26
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminal Connections: See Diagram
- Terminals: Finish—Tin Finish Annealed over Copper Leadframe. Solderable per MIL-STD-202, Method 208 e3
- Weight: 0.013 grams (Approximate)

TSOT26

Top View



Top View
Pin Configuration



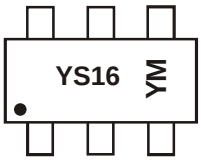
Equivalent Circuit

Ordering Information (Note 4)

Part Number	Case	Packaging
DMP2109UVT-7	TSOT26	3000/Tape & Reel
DMP2109UVT-13	TSOT26	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



YS16 = Product Type Marking Code
YM = Date Code Marking
Y or $\overline{Y}$ = Year (ex: F = 2018)
M = Month (ex: 9 = September)

Date Code Key

Year	2018	2019	2020	2021	2022	2023	2024	2025	2026
Code	F	G	H	I	J	K	L	M	N

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	Unit
Drain-Source Voltage			V_{DSS}	-20	V
Gate-Source Voltage			V_{GSS}	±10	V
Continuous Drain Current (Note 6) V_{GS} = -4.5V	Steady State	T_A = +25°C T_A = +70°C	I_D	-3.7 -2.9	A
Continuous Drain Current (Note 6) V_{GS} = -2.5V	Steady State	T_A = +25°C T_A = +70°C	I_D	-3.1 -2.5	A
Maximum Continuous Body Diode Forward Current (Note 6)			I_S	-1.2	A
Pulsed Drain Current (10µs Pulse, Duty Cycle = 1%)			I_{DM}	-20	A

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

Characteristic		Symbol	Value	Unit
Total Power Dissipation (Note 5)		P_D	1.2	W
Thermal Resistance, Junction to Ambient (Note 5)	Steady State	$R_{\Theta JA}$	105	°C/W
Total Power Dissipation (Note 6)		P_D	1.0	W
Thermal Resistance, Junction to Ambient (Note 6)	Steady State	$R_{\Theta JA}$	77	°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 7)						
Drain-Source Breakdown Voltage	BV_{DSS}	-20	—	—	V	V_{GS} = 0V, I_D = -250µA
Zero Gate Voltage Drain Current T_J = +25°C	I_{DSS}	—	—	-1.0	µA	V_{DS} = -16V, V_{GS} = 0V
Gate-Source Leakage	I_{GSS}	—	—	±100	nA	V_{GS} = ±8V, V_{DS} = 0V
ON CHARACTERISTICS (Note 7)						
Gate Threshold Voltage	$V_{GS(TH)}$	-0.45	—	-1.0	V	V_{DS} = V_{GS}, I_D = -250µA
Static Drain-Source On-Resistance	$R_{DS(ON)}$	—	54	80	mΩ	V_{GS} = -4.5V, I_D = -2.8A
			70	110		V_{GS} = -2.5V, I_D = -2.0A
Diode Forward Voltage	V_{SD}	—	-0.7	-1.0	V	V_{GS} = 0V, I_S = -1A
DYNAMIC CHARACTERISTICS (Note 8)						
Input Capacitance	C_{iss}	—	443	—	pF	V_{DS} = -10V, V_{GS} = 0V f = 1.0MHz
Output Capacitance	C_{oss}	—	59	—	pF	
Reverse Transfer Capacitance	C_{rss}	—	47	—	pF	
Gate Resistance	R_G	—	8.5	—	Ω	V_{GS} = 0V, V_{DS} = 0V, f = 1.0MHz
Total Gate Charge	Q_g	—	6.0	—	nC	V_{GS} = -4.5V, V_{DS} = -10V, I_D = -3A
Gate-Source Charge	Q_{gs}	—	0.6	—	nC	
Gate-Drain Charge	Q_{gd}	—	1.8	—	nC	
Turn-On Delay Time	$t_{D(ON)}$	—	4.0	—	ns	V_{DS} = -10V, V_{GS} = -4.5V, R_L = 10Ω, R_G = 1.0Ω, I_D = -1A
Turn-On Rise Time	t_R	—	3.7	—	ns	
Turn-Off Delay Time	$t_{D(OFF)}$	—	24.5	—	ns	
Turn-Off Fall Time	t_F	—	9.5	—	ns	
Reverse Recovery Time	t_{RR}	—	8.3	—	ns	I_F = -1.0A, di/dt = 100A/µs
Reverse Recovery Charge	Q_{RR}	—	2.0	—	nC	I_F = -1.0A, di/dt = 100A/µs

Notes: 5. Device mounted on FR-4 substrate PCB, 2oz copper, with minimum recommended pad layout.
6. Device mounted on FR-4 substrate PCB, 2oz copper, with 1inch square copper plate.
7. Short duration pulse test used to minimize self-heating effect.
8. Guaranteed by design. Not subject to product testing.

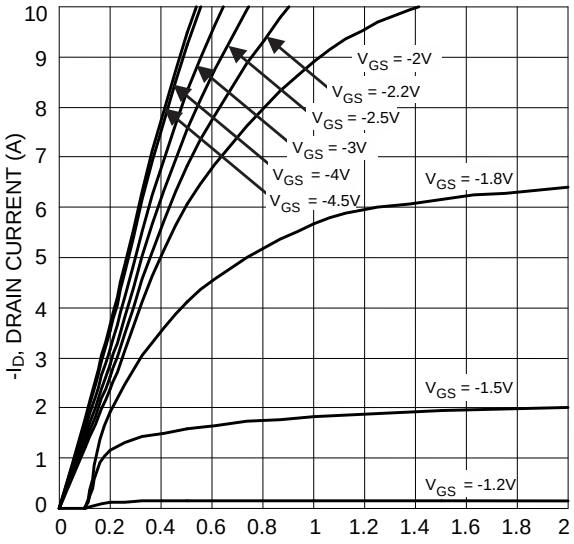


Figure 1 Typical Output Characteristics

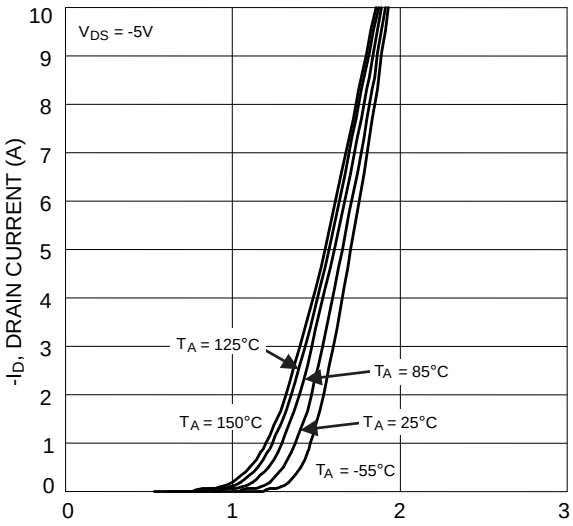


Figure 2 Typical Transfer Characteristics

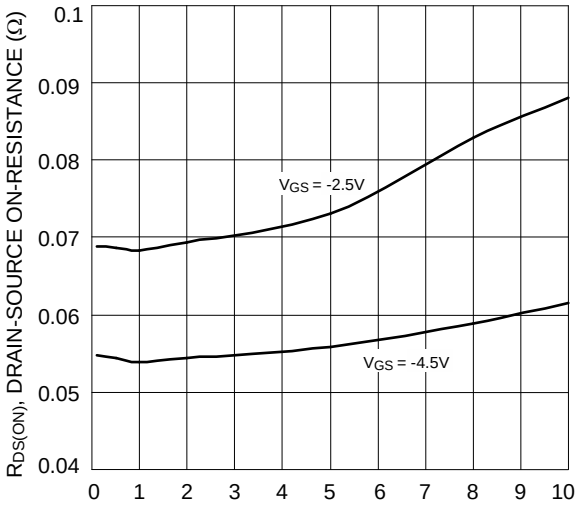


Figure 3 Typical On-Resistance vs. Drain Current and Gate Voltage

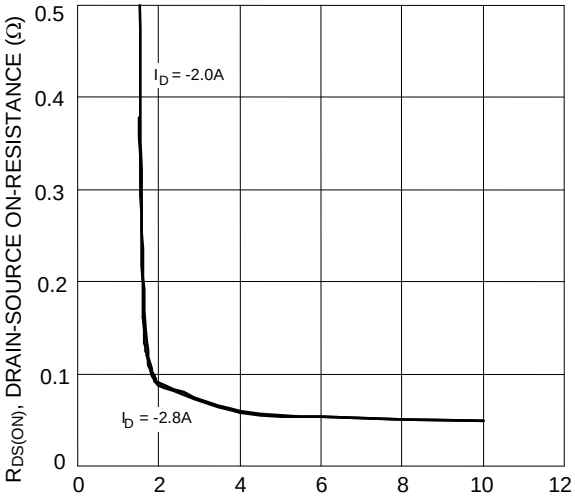


Figure 4 Typical Drain-Source On-Resistance vs. Gate-Source Voltage

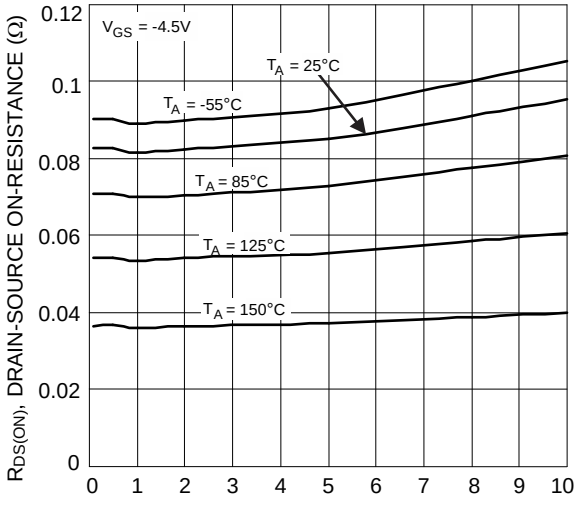


Figure 5 Typical On-Resistance vs. Drain Current and Temperature

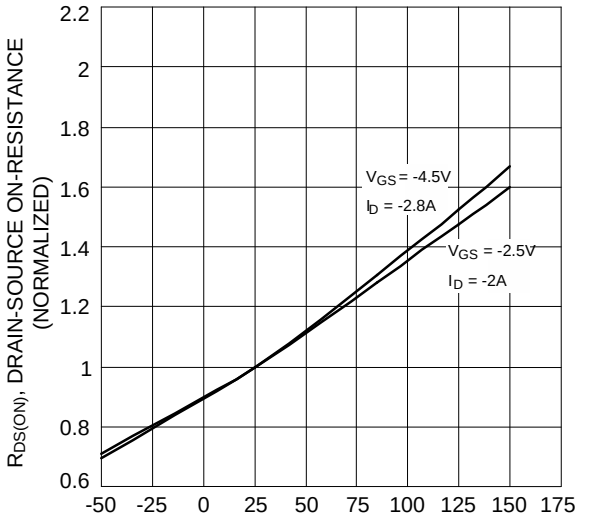


Figure 6 On-Resistance Variation with Temperature

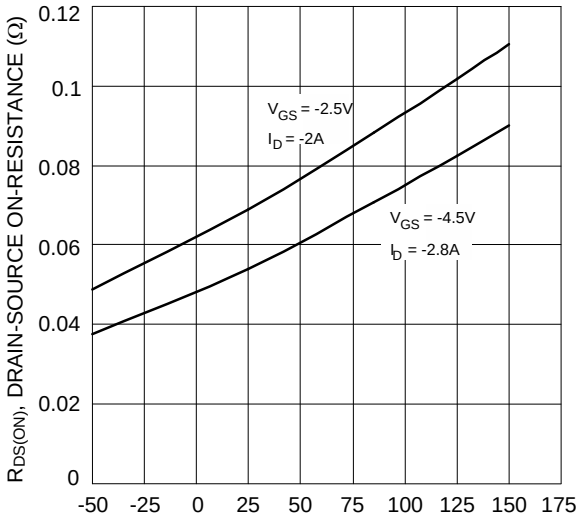


Figure 7 On-Resistance Variation with Temperature

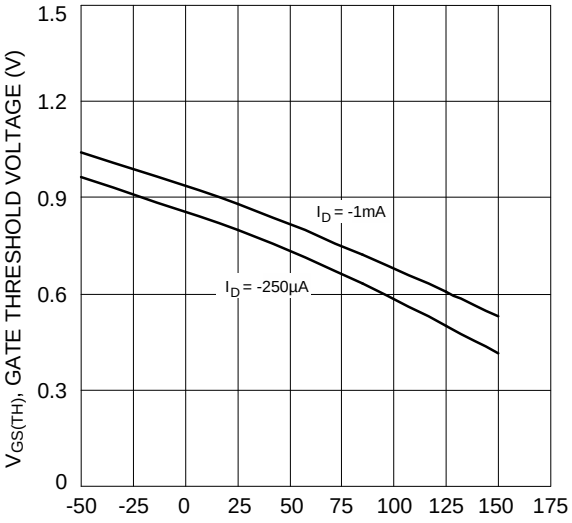


Figure 8 Gate Threshold Variation vs. Ambient Temperature

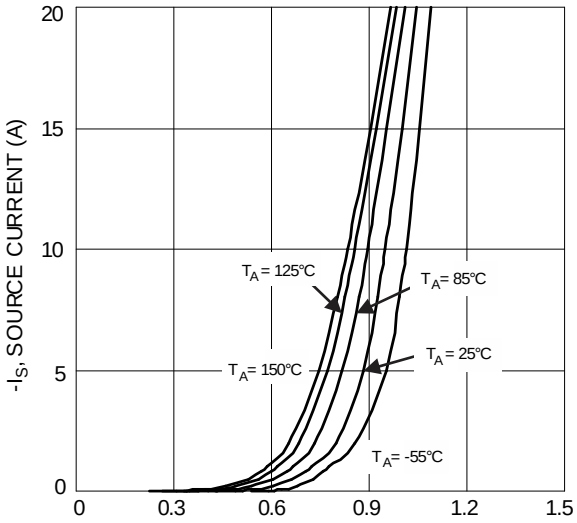


Figure 9 Diode Forward Voltage vs. Current

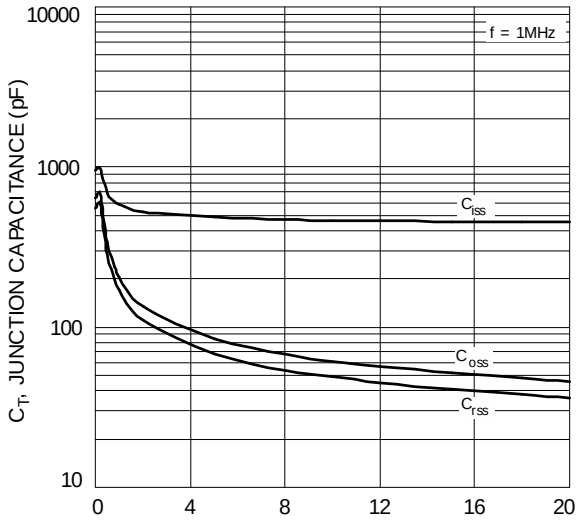


Figure 10 Typical Junction Capacitance

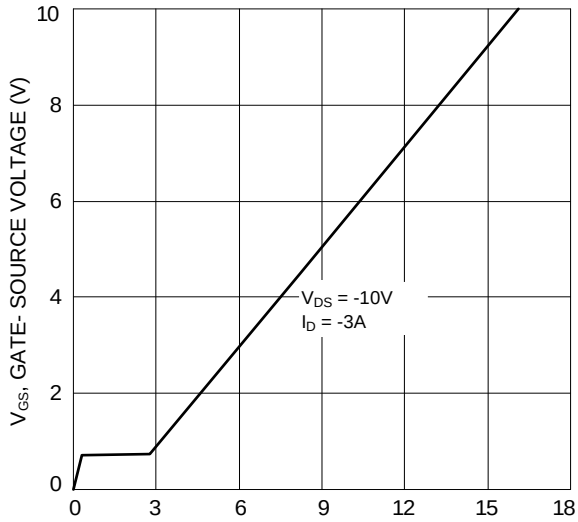


Figure 11 Gate Charge

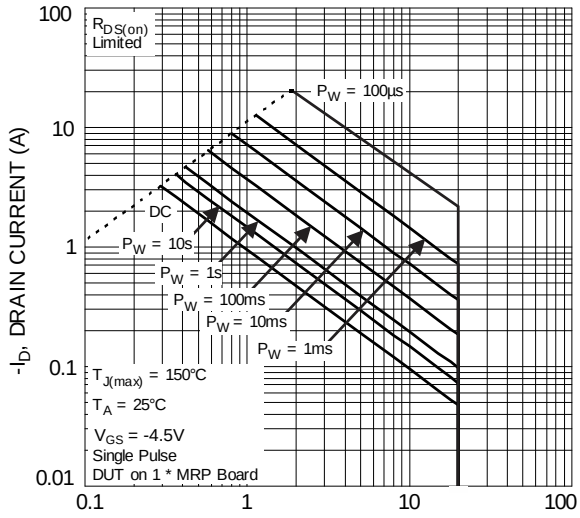


Figure 12 SOA, Safe Operation Area

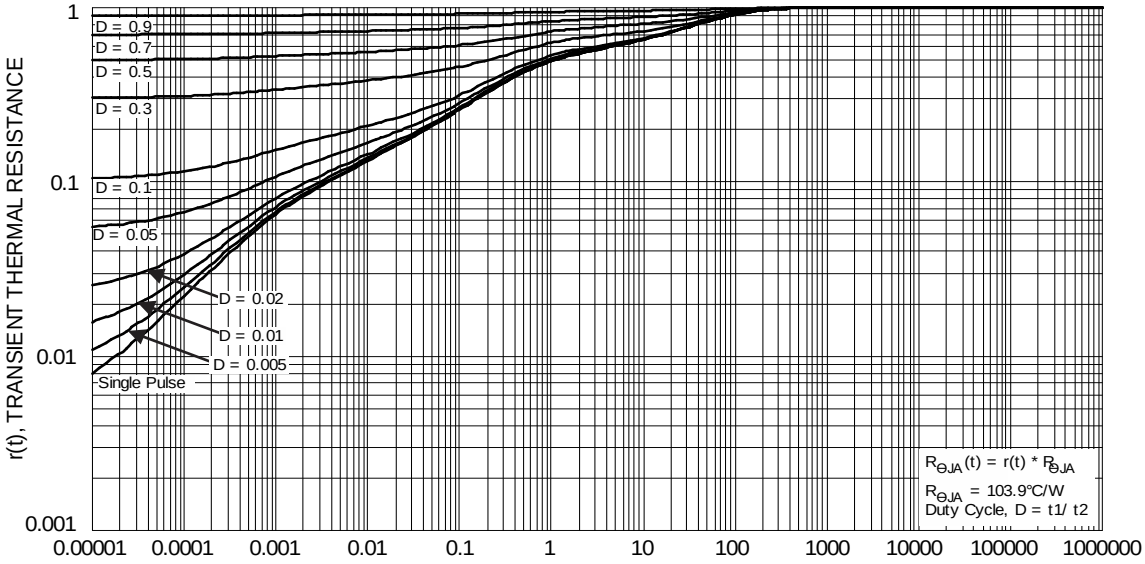
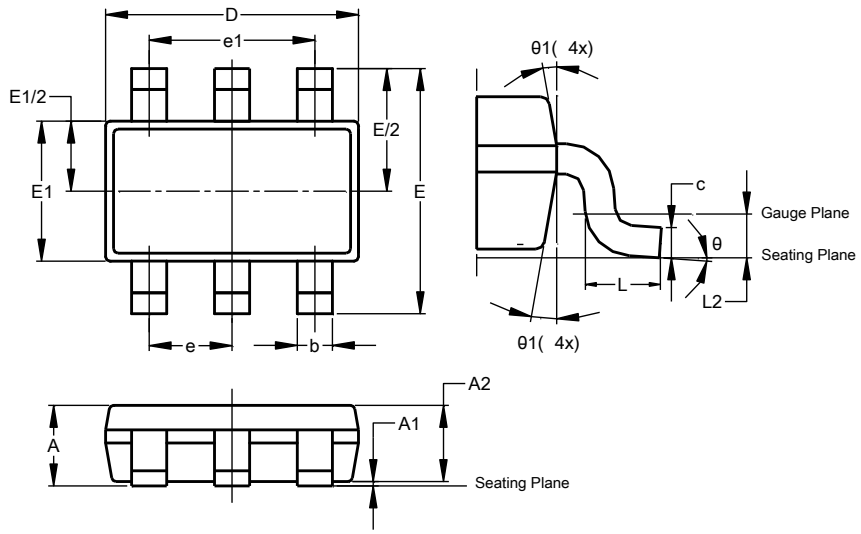


Figure 13 Transient Thermal Resistance

Package Outline Dimensions

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

TSOT26

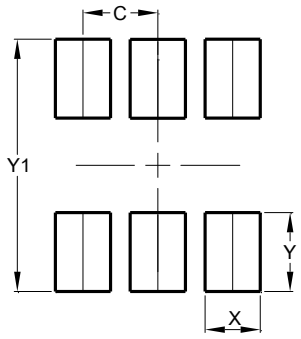


TSOT26			
Dim	**Min**	**Max**	**Typ**
A	—	1.00	—
A1	0.010	0.100	—
A2	0.840	0.900	—
D	2.800	3.000	2.900
E	2.800 BSC		
E1	1.500	1.700	1.600
b	0.300	0.450	—
c	0.120	0.200	—
e	0.950 BSC		
e1	1.900 BSC		
L	0.30	0.50	—
L2	0.250 BSC		
θ	0°	8°	4°
θ1	4°	12°	—
All Dimensions in mm			

Suggested Pad Layout

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

TSOT26



Dimensions	Value (in mm)
C	0.950
X	0.700
Y	1.000
Y1	3.199

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