

P-CHANNEL ENHANCEMENT MODE MOSFET

Product Summary

BV _{DSS}	R _{DS(ON) Max}	I _D T _A = +25°C
2014	$38m\Omega @ V_{GS} = -4.5V$	-5.5A
-20V	52mΩ @ V _{GS} = -2.5V	-5.0A

Description and Applications

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.

- DC-DC Converters
- Motor Control
- Power Management Functions
- Analog Switch

Features and Benefits

- Low Input Capacitance
- Low On-Resistance
- Fast Switching Speed
- Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)
- Halogen and Antimony Free. "Green" Device (Note 3)

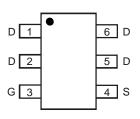
Mechanical Data

- 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 Matte Tin Annealed over Copper Leadframe;
 Solderable per MIL-STD-202, Method 208 (3)
- Weight: 0.013 grams (Approximate)

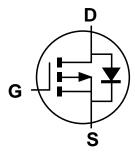
TSOT26



Top View



Top View Pin-Out



Equivalent Circuit

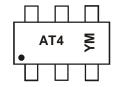
Ordering Information (Note 4)

Part Number	Case	Packaging
DMP2040UVT-7	TSOT26	3,000/Tape & Reel
DMP2040UVT-13	TSOT26	10,000/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 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



AT4 = Product Type Marking Code YM = Date Code Marking Y or \overline{Y} = Year (ex: E = 2017) M = Month (ex: 9 = September)

Date Code Key

Year	2017	2018	20	019	2020	2021		2022	2023	202	24	2025
Code	E	F		G	Н			J	K	L		M
Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Code	1	2	3	4	5	6	7	8	9	0	N	D



Maximum Ratings (@ $T_A = +25^{\circ}C$, unless otherwise specified.)

Characteristic	Symbol	Value	Unit	
Drain-Source Voltage	V_{DSS}	-20	V	
Gate-Source Voltage		V_{GSS}	±12	V
Continuous Drain Current (Note 6) V _{GS} = -4.5V	I _D	-5.5 -4.5	А	
Continuous Drain Current (Note 7) V _{GS} = -4.5V	I _D	-13 -10	А	
Pulsed Drain Current (10µs Pulse, Duty Cycle = 1%)	I _{DM}	-40	А	
Continuous Source-Drain Diode Current (Note 6)	Is	-2.2	Α	
Avalanche Current (Note 8) L = 0.1mH	I _{AS}	-16	Α	
Avalanche Energy (Note 8) L = 0.1mH		E _{AS}	13.5	mJ

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

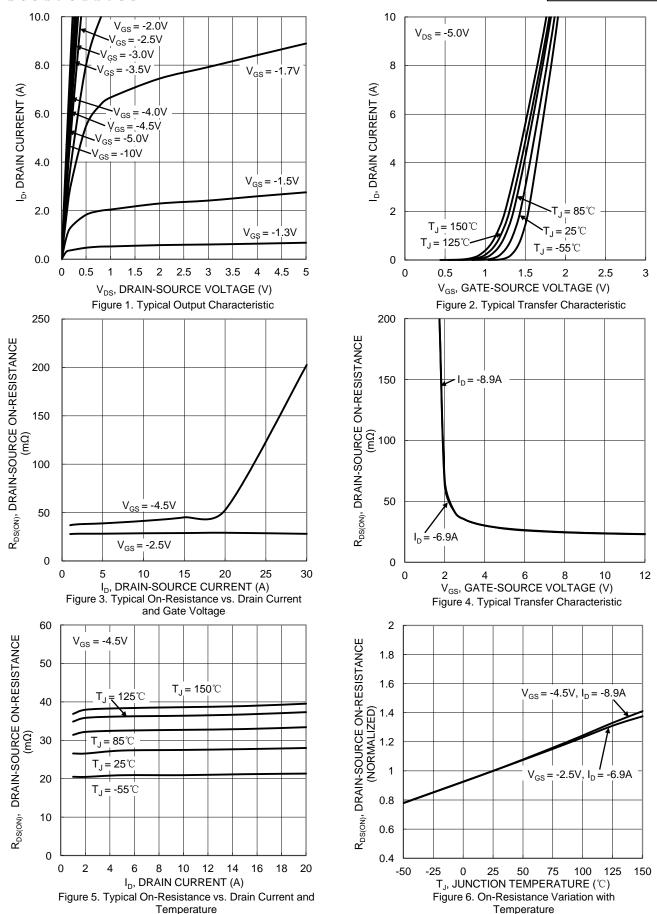
Characteristic		Symbol	Value	Unit
Total Power Dissipation (Note 5)	$T_A = +25^{\circ}C$	P_{D}	1.2	W
Thermal Resistance, Junction to Ambient (Note 5)	Steady State	$R_{\theta JA}$	105	°C/W
Total Power Dissipation (Note 6)	$T_A = +25^{\circ}C$	P _D	1.5	W
Thermal Resistance, Junction to Ambient (Note 6)	Steady State	$R_{\theta JA}$	80	°C/W
Thermal Resistance, Junction to Case (Note 7)	Steady State	R _{0JC}	16	°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	Тур	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 9)	Symbol	IVIIII	тур	IVIAA	Offic	rest condition
Drain-Source Breakdown Voltage	D\/	-20	l		V	\/ 0\/ 1 050A
	BV _{DSS}				_	$V_{GS} = 0V, I_D = -250\mu A$
Zero Gate Voltage Drain Current	I _{DSS}	_	_	-1	μA	$V_{DS} = -16V$, $V_{GS} = 0V$
Gate-Source Leakage	I _{GSS}		_	±100	nA	$V_{GS} = \pm 12V$, $V_{DS} = 0V$
ON CHARACTERISTICS (Note 9)						
Gate Threshold Voltage	V _{GS(TH)}	-0.6	_	-1.5	V	$V_{DS} = V_{GS}, I_{D} = -250 \mu A$
Static Drain-Source On-Resistance	Danie i	1	27	38	mΩ	$V_{GS} = -4.5V$, $I_D = -8.9A$
Static Drain-Source On-Nesistance	R _{DS(ON)}	1	38	52	11152	$V_{GS} = -2.5V$, $I_D = -6.9A$
Diode Forward Voltage	V_{SD}	_	-0.7	-1.2	V	$V_{GS} = 0V, I_{S} = -2.9A$
DYNAMIC CHARACTERISTICS (Note 10)						
Input Capacitance	C _{iss}	_	834	_		101/11/
Output Capacitance	Coss	_	133	_	pF	$V_{DS} = -10V, V_{GS} = 0V,$ f = 1.0MHz
Reverse Transfer Capacitance	C _{rss}	_	105	_		1 = 1.0IVII 12
Gate Resistance	R _G	_	4.9	_	Ω	$V_{DS} = 0V, V_{GS} = 0V, f = 1.0MHz$
Total Gate Charge (V _{GS} = -4.5V)	Qg	_	8.6	_		
Total Gate Charge (V _{GS} = -8V)	Qg	_	19	_	nC	V CV I 0.0A
Gate-Source Charge	Q _{gs}	_	1.5	_	IIC	$V_{DS} = -6V, I_{D} = -8.9A$
Gate-Drain Charge	Q_{gd}	_	2.5	_		
Turn-On Delay Time	t _{D(ON)}	_	5.8	_		
Turn-On Rise Time	t _R	_	7.7	_		$V_{DD} = -6V, R_L = 6\Omega$
Turn-Off Delay Time	t _{D(OFF)}	-	28.1	_	ns	$V_{GS} = -4.5V, R_G = 6\Omega, I_D = -1A$
Turn-Off Fall Time	t _F	_	14.6	_		
Body Diode Reverse Recovery Time	t _{RR}	_	9.8	_	ns	I _F = -8.9A, di/dt = -100A/μs
Body Diode Reverse Recovery Charge	Q_{RR}	_	2.7	_	nC	$I_F = -8.9A$, $di/dt = -100A/\mu s$

- 5. Device mounted on FR-4 PC board, with minimum recommended pad layout, single sided.
- 6. Device mounted on FR-4 substrate PC board, 2oz copper, with thermal bias to bottom layer 1inch square copper plate.
- 7. Thermal resistance from junction to soldering point (on the exposed drain pad).
- I_{AS} and E_{AS} ratings are based on low frequency and duty cycles to keep T_J = +25°C.
 Short duration pulse test used to minimize self-heating effect.
 Guaranteed by design. Not subject to product testing.









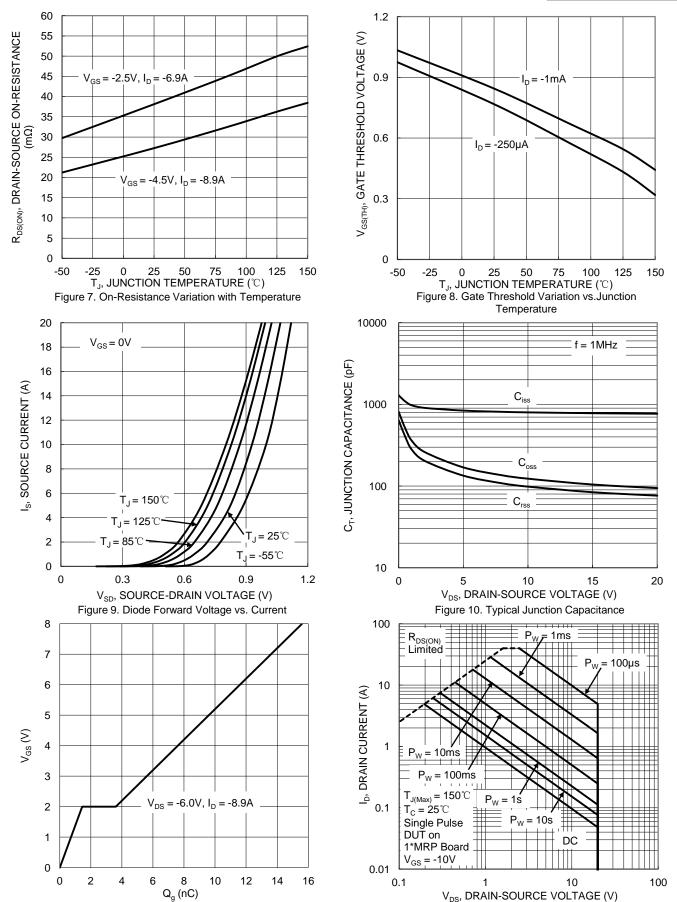


Figure 11. Gate Charge

Figure 12. SOA, Safe Operation Area



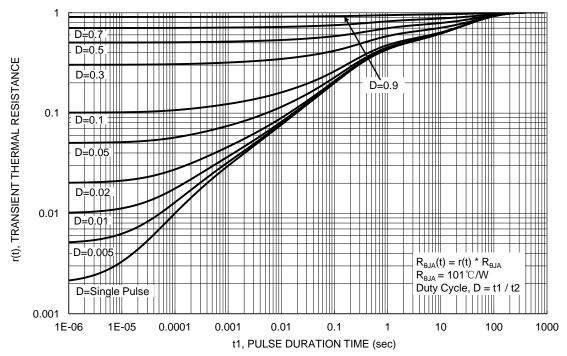


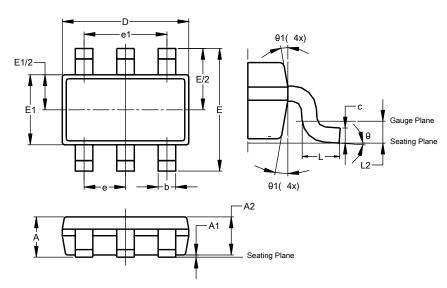
Figure 13. Transient Thermal Resistance



Package Outline Dimensions

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

TSOT26

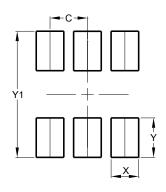


TSOT26							
Dim	Min	Max	Тур				
Α	-	1.00	-				
A1	0.010	0.100	_				
A2	0.840	0.900	_				
D	2.800	3.000	2.900				
Е	2	.800 BS	C				
E1	1.500	1.700	1.600				
b	0.300	0.450	_				
С	0.120	0.200	1				
е	0.950 BSC						
e1	1	.900 BS	C				
L	0.30	0.50	_				
L2	0.250 BSC						
θ	0°	8°	4°				
θ1	4°	12°	-				
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
Х	0.700
Υ	1.000
Y1	3.199



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