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A Product Line of
 Diodes Incorporated



DMP2305UVT

20V P-CHANNEL ENHANCEMENT MODE MOSFET

Product Summary

$V_{(BR)DSS}$	Max $R_{DS(on)}$ (Note 6)	Max I_D $T_A = 25^\circ C$
-20V	60m Ω @ $V_{GS} = -4.5V$	-4.23A
	90m Ω @ $V_{GS} = -2.5V$	-3.49A
	113m Ω @ $V_{GS} = -1.8V$	-3.11A

Description

This new generation 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

- DC-DC Converters
- Motor Control
- Power management functions
- Analog Switch

Features

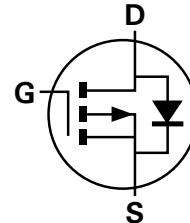
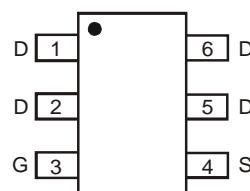
- Low Input Capacitance
- Low On-Resistance
- Fast Switching Speed
- Totally Lead-Free & Fully RoHS compliant (Notes 1 & 2)**
- Halogen and Antimony Free. "Green" Device (Note 3)
- Qualified to AEC-Q101 Standards for High Reliability

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
- Finish – Matte Tin annealed over Copper leadframe. Solderable per MIL-STD-202, Method 208 (E3)
- Weight: 0.0013 grams (approximate)



Top View



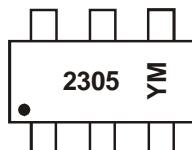
Ordering Information (Note 4)

Part Number	Marking	Reel size (inches)	Tape width (mm)	Quantity per reel
DMP2305UVT-7	2305	7	8	3,000
DMP2305UVT-13	2305	13	8	10,000

Notes:

- No purposely added lead. Fully EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant.
- See <http://www.diodes.com> for more information about Diodes Incorporated's definitions of Halogen- and Antimony-free, "Green" and Lead-free.
- Halogen- and Antimony-free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
- For packaging details, go to our website at <http://www.diodes.com>.

Marking Information



2305 = Product Type Marking Code
 YM = Date Code Marking
 Y = Year (ex: Y = 2011)
 M = Month (ex: 9 = September)

Date Code Key

Year	2011	2012	2013	2014	2015	2016	2017
Code	Y	Z	A	B	C	D	E
Month	Jan	Feb	Mar	Apr	May	Jun	Jul
Code	1	2	3	4	5	6	7

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

Characteristic			Symbol	Value	Units
Drain-Source Voltage			V_{DSS}	-20	V
Gate-Source Voltage			V_{GSS}	± 8	V
Continuous Drain Current (Note 6) $V_{GS} = -4.5\text{V}$	Steady State	$T_A = +25^\circ\text{C}$ $T_A = +70^\circ\text{C}$	I_D	-4.23 -2.98	A
Continuous Drain Current (Note 6) $V_{GS} = -2.5\text{V}$	Steady State	$T_A = +25^\circ\text{C}$ $T_A = +70^\circ\text{C}$	I_D	-3.49 -2.79	A
Maximum Continuous Body Diode Forward Current (Note 6)			I_S	-4.23	A
Pulsed Drain Current (10 μs pulse, duty cycle = 1%)			I_{DM}	-16	A

Thermal Characteristics (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)

Characteristic		Symbol	Value	Units
Total Power Dissipation	(Note 5)	P_D	1.25	W
	(Note 6)		1.64	
Thermal Resistance, Junction to Ambient	(Note 5)	R_{0JA}	100	°C/W
	(Note 6)		76	
Thermal Resistance, Junction to Case	(Note 6)	R_{0JC}	14	
Operating and Storage Temperature Range		T_J, T_{STG}	-55 to 150	°C

Notes: 5. Device mounted on FR-4 substrate PC board, 2oz copper, with minimum recommended pad layout.
 6. Device mounted on FR-4 substrate PC board, 2oz copper, with 1inch square copper plate.

Thermal Characteristics (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)

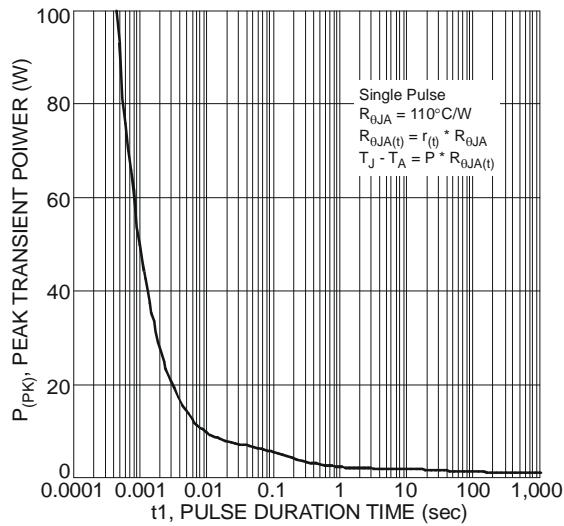


Figure 1 Single Pulse Maximum Power Dissipation

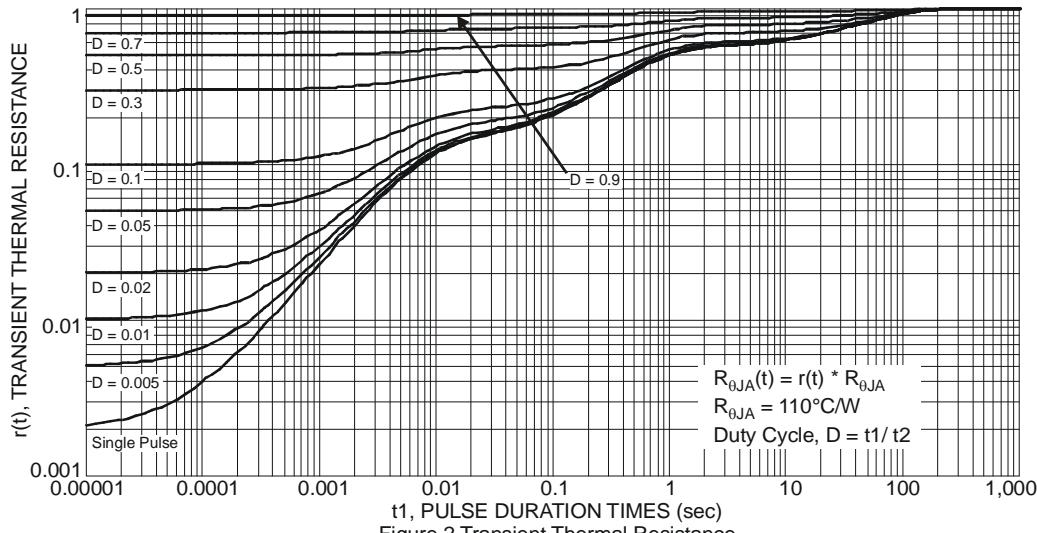


Figure 2 Transient Thermal Resistance


Electrical Characteristics @ $T_A = 25^\circ\text{C}$ unless otherwise specified

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 7)						
Drain-Source Breakdown Voltage	BV_{DSS}	-20	—	—	V	$\text{V}_{\text{GS}} = 0\text{V}$, $\text{I}_{\text{D}} = -250\mu\text{A}$
Zero Gate Voltage Drain Current	I_{DSS}	—	—	-1	μA	$\text{V}_{\text{DS}} = -20\text{V}$, $\text{V}_{\text{GS}} = 0\text{V}$
Gate-Source Leakage	I_{GSS}	—	—	± 100	nA	$\text{V}_{\text{GS}} = \pm 8\text{V}$, $\text{V}_{\text{DS}} = 0\text{V}$
ON CHARACTERISTICS (Note 7)						
Gate Threshold Voltage	$\text{V}_{\text{GS}(\text{th})}$	-0.5	—	-0.9	V	$\text{V}_{\text{DS}} = \text{V}_{\text{GS}}$, $\text{I}_{\text{D}} = -250\mu\text{A}$
Static Drain-Source On-Resistance	$\text{R}_{\text{DS}(\text{ON})}$	—	45	60	$\text{m}\Omega$	$\text{V}_{\text{GS}} = -4.5\text{V}$, $\text{I}_{\text{D}} = -4.2\text{A}$
		—	60	90		$\text{V}_{\text{GS}} = -2.5\text{V}$, $\text{I}_{\text{D}} = -3.4\text{A}$
		—	87	113		$\text{V}_{\text{GS}} = -1.8\text{V}$, $\text{I}_{\text{D}} = -2.0\text{A}$
Forward Transfer Admittance	$ \text{Y}_{\text{fs}} $	—	9	—	S	$\text{V}_{\text{DS}} = -5\text{V}$, $\text{I}_{\text{D}} = -4\text{A}$
DYNAMIC CHARACTERISTICS (Note 8)						
Input Capacitance	C_{iss}	—	727	—	pF	$\text{V}_{\text{DS}} = -20\text{V}$, $\text{V}_{\text{GS}} = 0\text{V}$ $f = 1.0\text{MHz}$
Output Capacitance	C_{oss}	—	69	—		
Reverse Transfer Capacitance	C_{rss}	—	64	—		
Gate Resistance	R_{G}	—	23	—	Ω	$\text{V}_{\text{GS}} = 0\text{V}$, $\text{V}_{\text{DS}} = 0\text{V}$, $f = 1.0\text{MHz}$
Total Gate Charge	Q_{g}	—	7.6	—	nC	$\text{V}_{\text{GS}} = -4.5\text{V}$, $\text{V}_{\text{DS}} = -4\text{V}$, $\text{I}_{\text{D}} = -3.5\text{A}$
Gate-Source Charge	Q_{gs}	—	1.4	—		
Gate-Drain Charge	Q_{gd}	—	1.2	—		
Turn-On Delay Time	$\text{t}_{\text{D}(\text{on})}$	—	14.0	—	ns	$\text{V}_{\text{DS}} = -4\text{V}$, $\text{V}_{\text{GS}} = -4.5\text{V}$, $\text{R}_{\text{L}} = 4\Omega$, $\text{R}_{\text{G}} = 6\Omega$, $\text{I}_{\text{D}} = -1\text{A}$
Turn-On Rise Time	t_{r}	—	13.0	—		
Turn-Off Delay Time	$\text{t}_{\text{D}(\text{off})}$	—	53.8	—		
Turn-Off Fall Time	t_{f}	—	23.2	—		

Notes: 7. Short duration pulse test used to minimize self-heating effect.

8. Guaranteed by design. Not subject to product testing.

DMP2305UVT

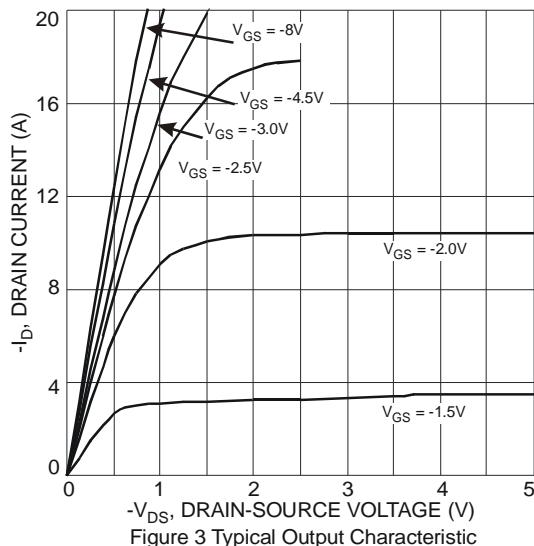


Figure 3 Typical Output Characteristic

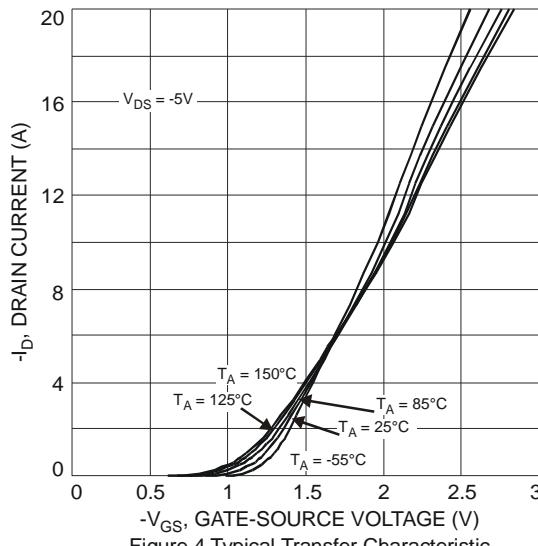


Figure 4 Typical Transfer Characteristic

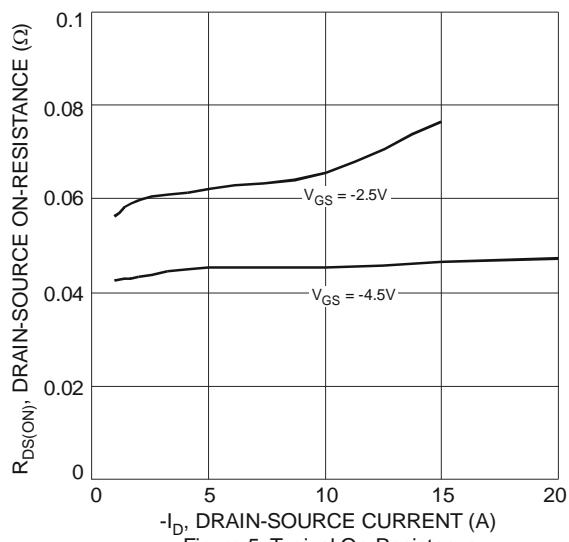


Figure 5 Typical On-Resistance
vs. Drain Current and Gate Voltage

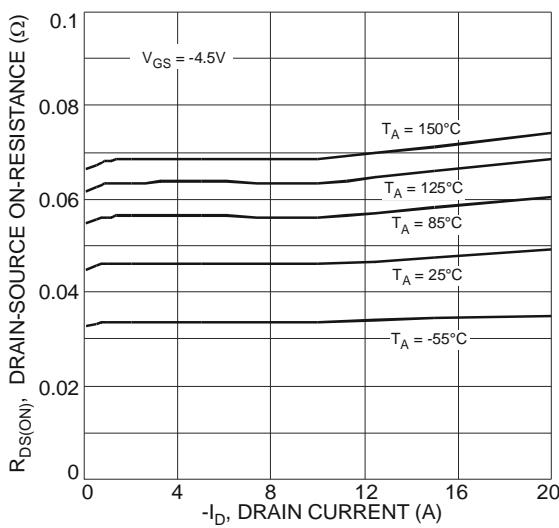


Figure 6 Typical On-Resistance
vs. Drain Current and Temperature

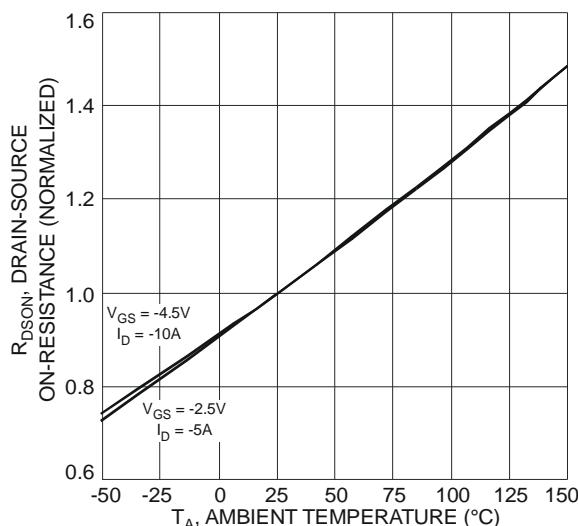


Figure 7 On-Resistance Variation with Temperature

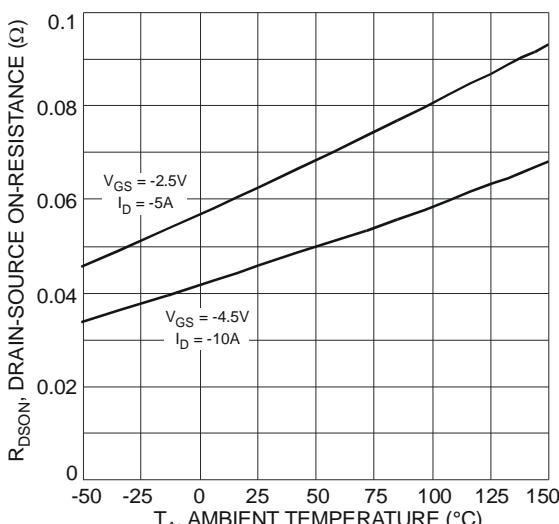


Figure 8 On-Resistance Variation with Temperature

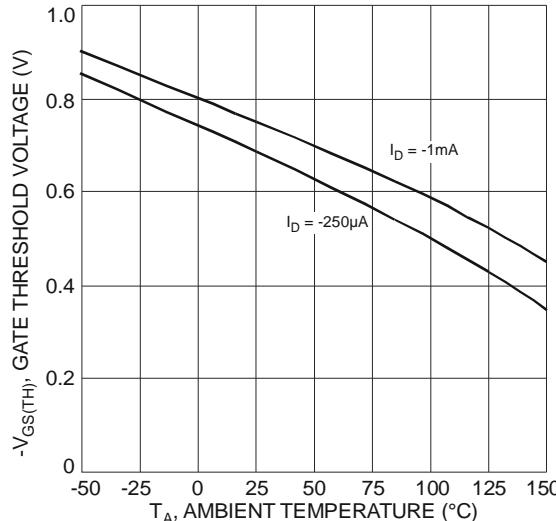


Figure 9 Gate Threshold Variation vs. Ambient Temperature

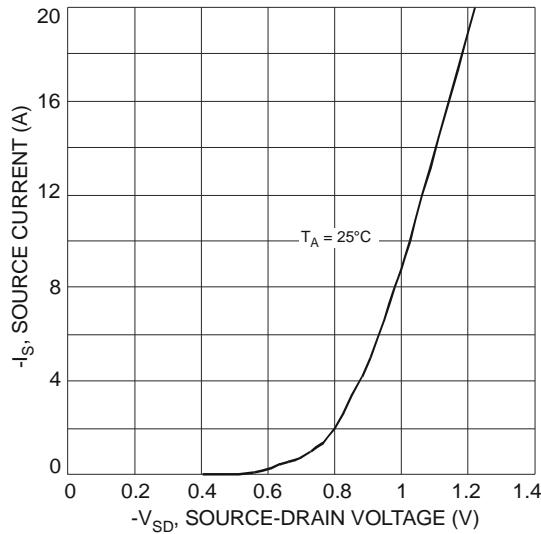


Figure 10 Diode Forward Voltage vs. Current

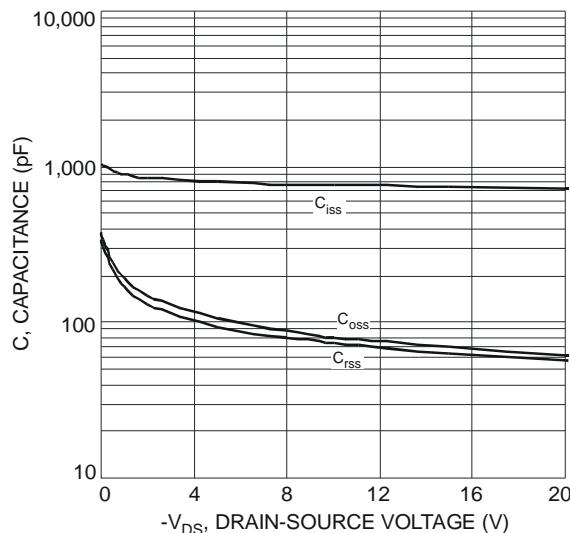


Figure 11 Typical Total Capacitance

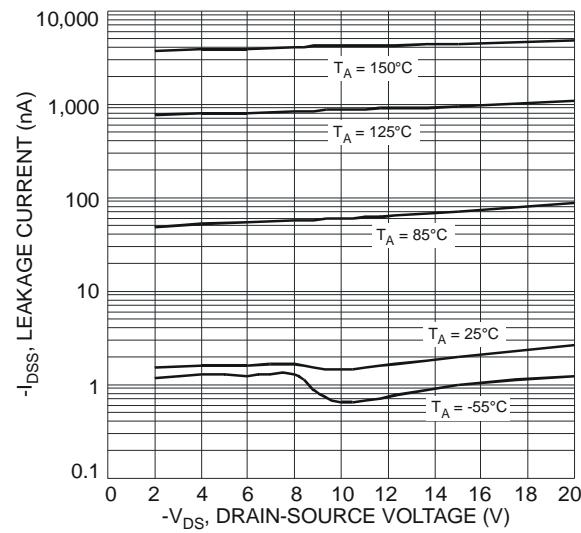
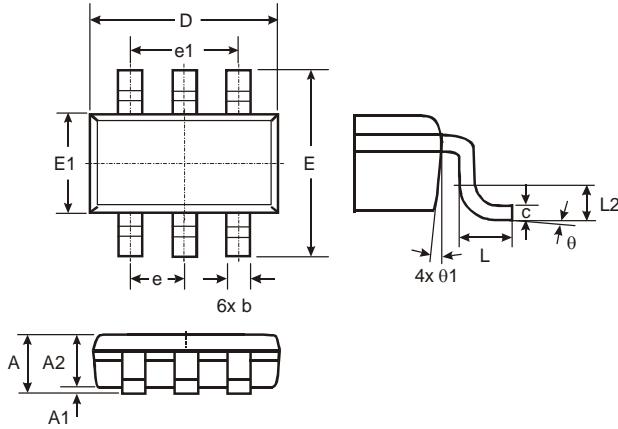


Figure 12 Typical Leakage Current vs. Drain-Source Voltage

Package Outline Dimensions

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

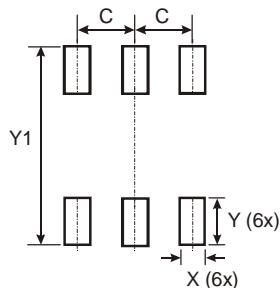


TSOT26			
Dim	Min	Max	Typ
A	—	1.00	—
A1	0.01	0.10	—
A2	0.84	0.90	—
D	—	—	2.90
E	—	—	2.80
E1	—	—	1.60
b	0.30	0.45	—
c	0.12	0.20	—
e	—	—	0.95
e1	—	—	1.90
L	0.30	0.50	—
L2	—	—	0.25
θ	0°	8°	4°
θ1	4°	12°	—

All Dimensions in mm

Suggested Pad Layout

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



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

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