-20V P-CHANNEL ENHANCEMENT MODE MOSFET

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)\ max}$	I_D $T_A = 25°C$
-20V	35mΩ @ V_{GS} = -4.5V	-6.0A
	45mΩ @ V_{GS} = -2.5V	-5.2A

Features and Benefits

- Low Input Capacitance
- Low On-Resistance
- Fast Switching Speed
- ESD protected Up To 3KV
- **Lead, Halogen, and Antimony Free, RoHS Compliant (Note 1)**
- **"Green" Device (Note 2)**
- **Qualified to AEC-Q101 Standards for High Reliability**

Description and Applications

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.

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

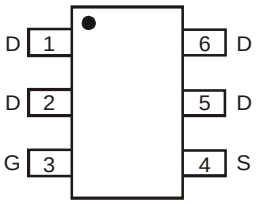
Mechanical Data

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

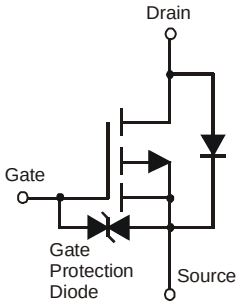
ESD PROTECTED TO 3kV

TSOT26

Top View



Top View
Pin-Out



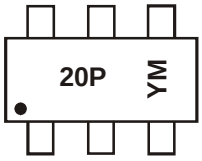
Equivalent Circuit

Ordering Information (Note 3)

Part Number	Case	Packaging
DMP2035UVT-7	TSOT26	3,000/Tape & Reel
DMP2035UVT-13	TSOT26	10,000/Tape & Reel

Notes:
1. EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant. No purposely added lead. Halogen and Antimony free.
2. Diodes Inc.'s "Green" policy can be found on our website at http://www.diodes.com.
3. For packaging details, go to our website at http://www.diodes.com.

Marking Information



20P = 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	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	Units
Drain-Source Voltage			V_{DSS}	-20	V
Gate-Source Voltage			V_{GSS}	±12	V
Continuous Drain Current (Note 5) V_{GS} = -4.5V	Steady State	T_A = 25°C T_A = 70°C	I_D	-6.0 -4.8	A
	t<10s	T_A = 25°C T_A = 70°C	I_D	-7.2 -5.7	A
Continuous Drain Current (Note 5) V_{GS} = -2.5V	Steady State	T_A = 25°C T_A = 70°C	I_D	-5.2 -4.1	A
	t<10s	T_A = 25°C T_A = 70°C	I_D	-6.2 -4.9	A
Maximum Continuous Body Diode Forward Current (Note 5)			I_S	-2.0	A
Pulsed Drain Current (10µs pulse, duty cycle = 1%)			I_{DM}	-24	A

Thermal Characteristics @T_A = 25°C unless otherwise specified

Characteristic		Symbol	Value	Units
Total Power Dissipation (Note 4)		P_D	1.2	W
Thermal Resistance, Junction to Ambient (Note 4)	Steady State	$R_{\theta JA}$	106	°C/W
	t<10s		74	
Total Power Dissipation (Note 5)		P_D	2.0	W
Thermal Resistance, Junction to Ambient (Note 5)	Steady State	$R_{\theta JA}$	65	°C/W
	t<10s		46	
Thermal Resistance, Junction to Case (Note 5)	Steady State	$R_{\theta JC}$	11.8	
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 6)						
Drain-Source Breakdown Voltage	BV_{DSS}	-20	—	—	V	V_{GS} = 0V, I_D = -250µA
Zero Gate Voltage Drain Current	I_{DSS}	—	—	-1	µA	V_{DS} = -20V, V_{GS} = 0V
Gate-Source Leakage	I_{GSS}	—	—	±10	µA	V_{GS} = ±8V, V_{DS} = 0V
ON CHARACTERISTICS (Note 6)						
Gate Threshold Voltage	$V_{GS(th)}$	-0.4	-0.7	-1.5	V	V_{DS} = V_{GS}, I_D = -250µA
Gate Threshold Voltage Temperature Coefficient	$\triangle V_{GS(th)}/\triangle T_J$	—	2.5	—	mV/°C	I_D = -250µA , Referenced to 25°C
Static Drain-Source On-Resistance	$R_{DS\ (ON)}$	—	23	35	mΩ	V_{GS} = -4.5V, I_D = -4.0A
		—	30	45		V_{GS} = -2.5V, I_D = -4.0A
		—	41	62		V_{GS} = -1.8V, I_D = -2.0A
Forward Transfer Admittance	$\|Y_{fs}\|$	—	18	—	S	V_{DS} = -5V, I_D = -5.5A
Diode Forward Voltage (Note 5)	V_{SD}	—	-0.7	-1.0	V	V_{GS} = 0V, I_S = -1A
DYNAMIC CHARACTERISTICS (Note 7)						
Input Capacitance	C_{iss}	—	1610	2400	pF	V_{DS} = -10V, V_{GS} = 0V f = 1.0MHz
Output Capacitance	C_{oss}	—	157	210		
Reverse Transfer Capacitance	C_{rss}	—	145	200		
Gate Resistance	R_G	—	9.4	14.1	Ω	V_{DS} = 0V, V_{GS} = 0V, f = 1.0MHz
Total Gate Charge	Q_g	—	15.4	23.1	nC	V_{DS} = -10V, V_{GS} = -4.5V I_D = -4A
Gate-Source Charge	Q_{gs}	—	2.5	—		
Gate-Drain Charge	Q_{gd}	—	3.3	—		
Turn-On Delay Time	$t_{D(on)}$	—	17	33	ns	V_{GS} = -4.5V, V_{DS} = -10V, R_G = 6Ω, I_D = -1A, R_L = 10Ω
Turn-On Rise Time	t_r	—	12	19		
Turn-Off Delay Time	$t_{D(off)}$	—	94	150		
Turn-Off Fall Time	t_f	—	42	64		
Reverse Recovery Time	t_{rr}	—	14	25	ns	I_F =-4.5A, di/dt=100A/µS
Reverse Recovery Charge	Q_{rr}	—	4	8	nC	

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

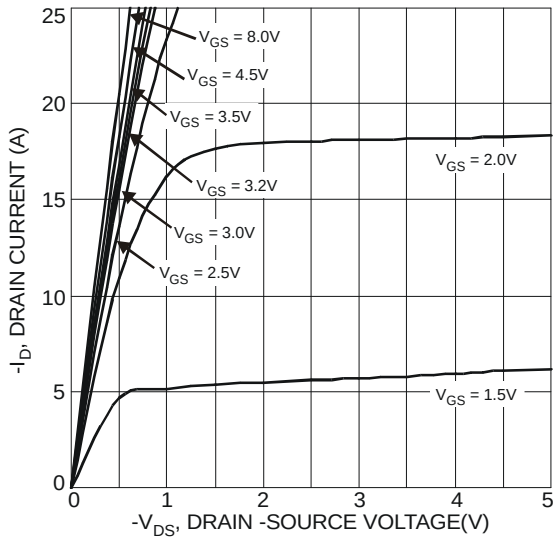


Fig. 1 Typical Output Characteristics

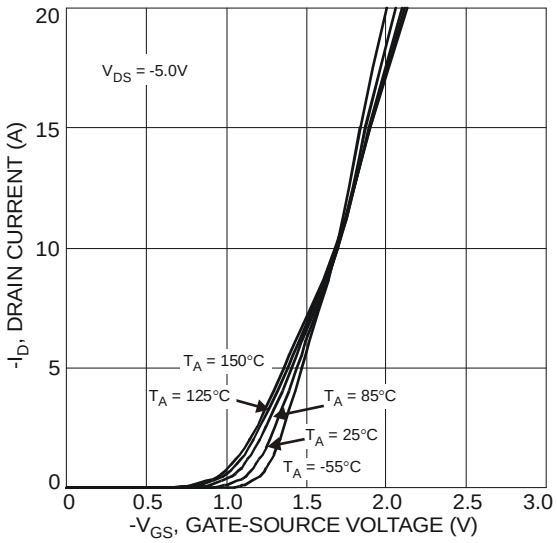


Fig. 2 Typical Transfer Characteristics

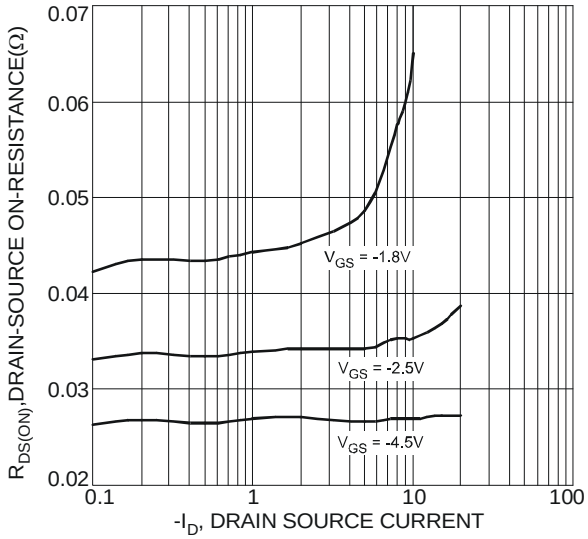


Fig. 3 Typical On-Resistance vs. Drain Current and Gate Voltage

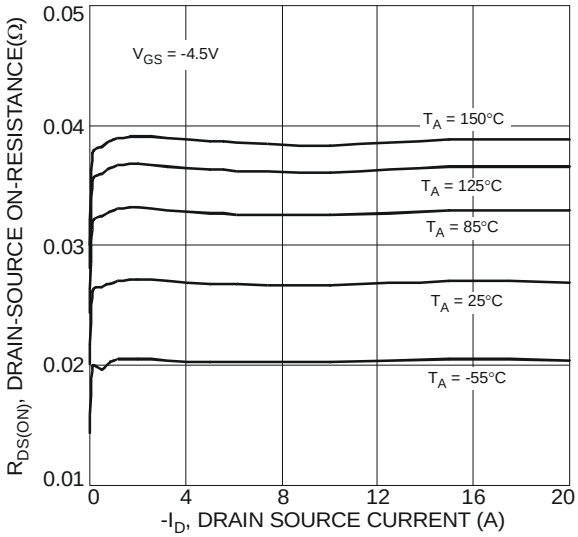


Fig. 4 Typical On-Resistance vs. Drain Current and Temperature

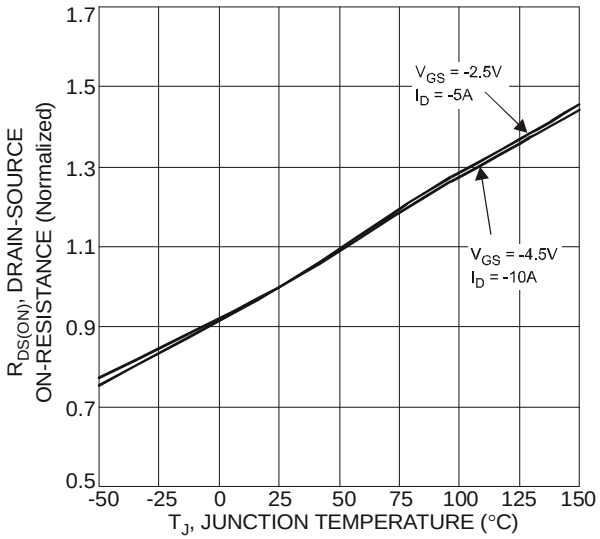


Fig. 5 On-Resistance Variation with Temperature

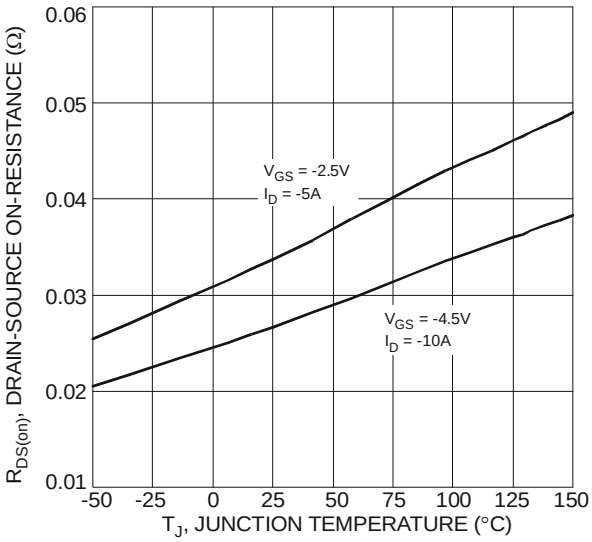


Fig. 6 On-Resistance Variation with Temperature

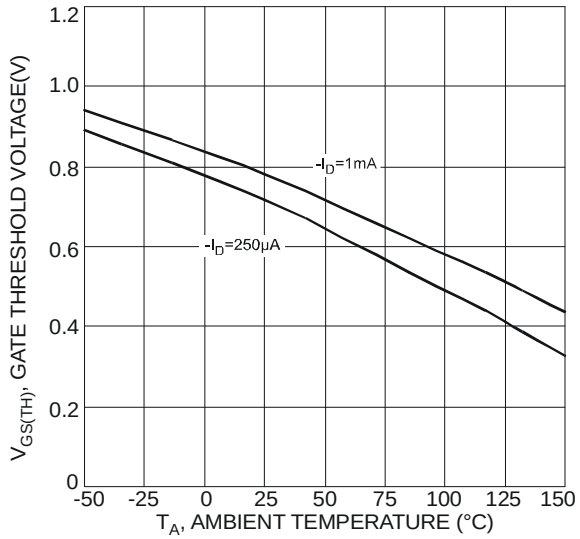


Fig. 7 Gate Threshold Variation vs. Ambient Temperature

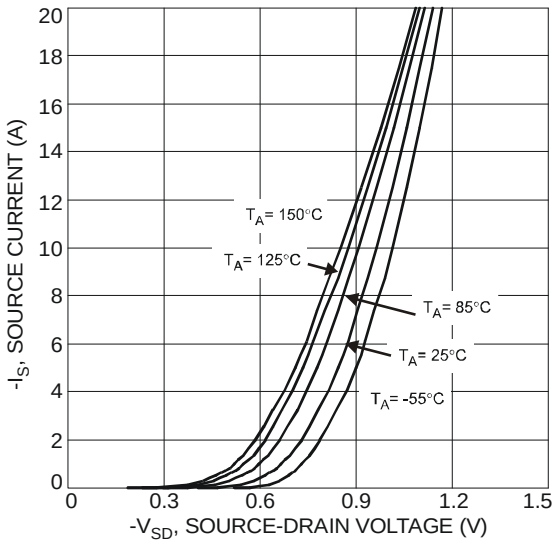


Fig. 8 Diode Forward Voltage vs. Current

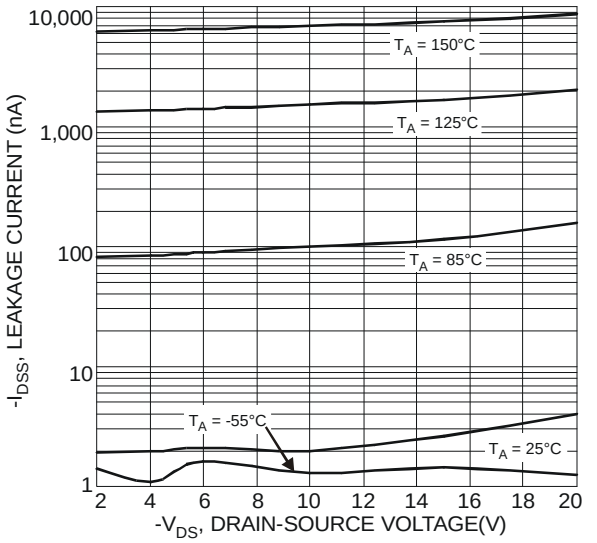


Fig. 9 Typical Drain-Source Leakage Current vs. Voltage

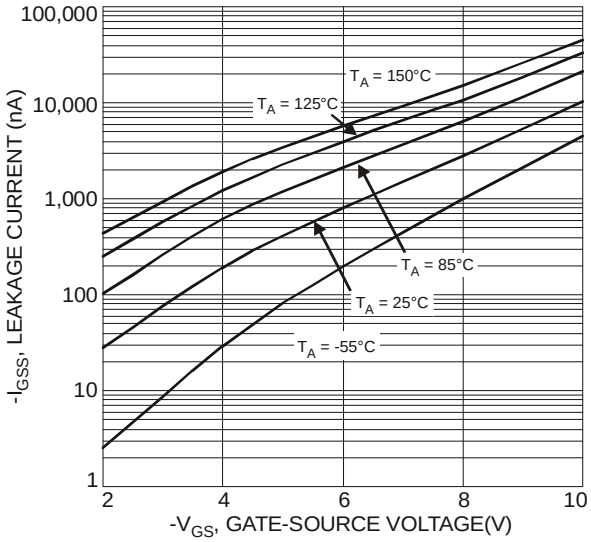


Fig. 10 Typical Gate-Source Leakage Current vs. Voltage

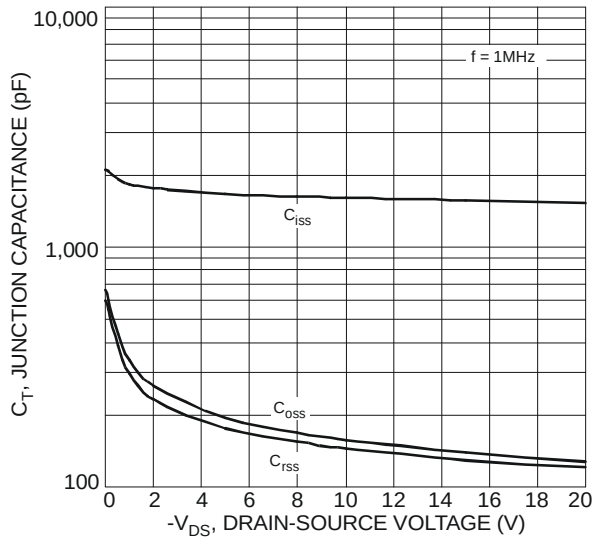


Fig. 11 Typical Junction Capacitance

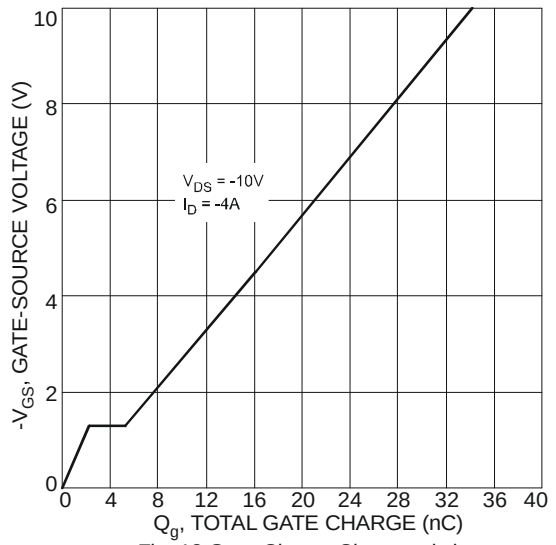


Fig. 12 Gate-Charge Characteristics

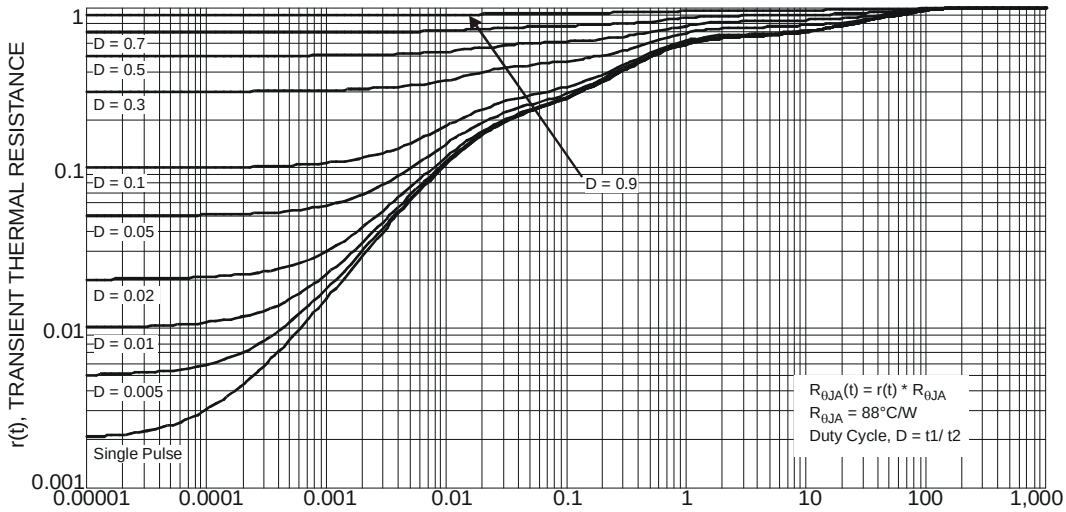
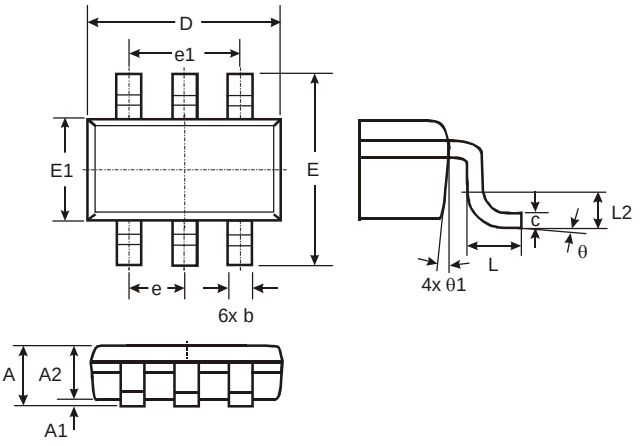


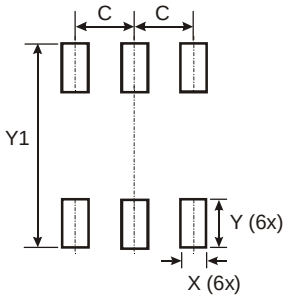
Fig. 13 Transient Thermal Resistance

Package Outline Dimensions



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



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

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