

Product Summary

$V_{(BR)DSS}$	$R_{DS(ON) \max}$	I_D $T_A = +25^\circ\text{C}$
-20V	65mΩ @ $V_{GS} = -4.5\text{V}$	-4.2A
	100mΩ @ $V_{GS} = -2.5\text{V}$	-3.4A

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
- Motor Control

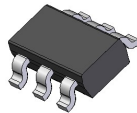
Features

- Low On-Resistance
- Low Input Capacitance
- 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**

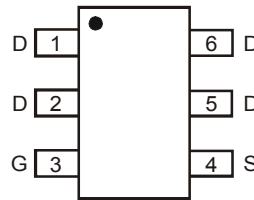
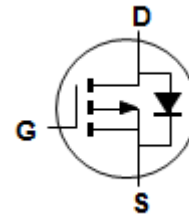
Mechanical Data

- Case: TSOT26
- Case Material: Molded Plastic, "Green" Molding Compound.
UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminal Connections: See Diagram
- Terminals: Finish – Matte Tin annealed over Copper leadframe.
Solderable per MIL-STD-202, Method 208 **(e3)**
- Weight: 0.0013 grams (approximate)

TSOT26



Top View


 Top View
Pin-Out


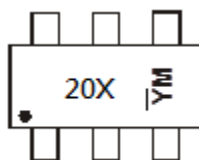
Internal Schematic

Ordering Information (Note 4)

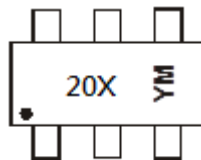
Part Number	Case	Packaging
DMP2033UVT-7	TSOT26	3000/Tape & Reel
DMP2033UVT -13	TSOT26	10000/Tape & Reel

- 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 <http://www.diodes.com/products/packages.html>.

Marking Information



Chengdu A/T Site



Shanghai A/T Site

20X = Product Type Marking Code
 YM = Date Code Marking for SAT (Shanghai Assembly/ Test site)
 $\overline{Y}M$ = Date Code Marking for CAT (Chengdu Assembly/ Test site)
 Y or $\overline{Y}$ = Year (ex: A = 2013)
 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}	±8	V
Continuous Drain Current (Note 6)	Steady State	T _A = +25°C	I _D	-4.2	A
		T _A = +70°C		-3.4	
Pulsed Drain Current (Note 6)			I _{DM}	-10	A

Thermal Characteristics

Characteristic		Symbol	Value	Units
Total Power Dissipation (Note 5)		P _D	1.2	W
Thermal Resistance, Junction to Ambient (Note 5)	Steady State	R _{θJA}	100	°C/W
Total Power Dissipation (Note 6)		P _D	1.7	W
Thermal Resistance, Junction to Ambient (Note 6)	Steady State	R _{θJA}	74	°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} = -20V, 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)}	-0.5	—	-0.9	V	V _{DS} = V _{GS} , I _D = -250μA
Static Drain-Source On-Resistance	R _{DS(ON)}	—	45	65	mΩ	V _{GS} = -4.5V, I _D = -4.2A
			57	100		V _{GS} = -2.5V, I _D = -3.4A
			80	200		V _{GS} = -1.8V, I _D = -2A
Forward Transfer Admittance	Y _{fs}	—	9	—	S	V _{DS} = -5V, I _D = -4A
DYNAMIC CHARACTERISTICS (Note 8)						
Input Capacitance	C _{iss}	—	845	—	pF	V _{DS} = -15V, V _{GS} = 0V f = 1.0MHz
Output Capacitance	C _{oss}	—	72	—	pF	
Reverse Transfer Capacitance	C _{rss}	—	63	—	pF	
SWITCHING CHARACTERISTICS (Note 8)						
Total Gate Charge	Q _g	—	10.4	—	nC	V _{GS} = -4.5V, V _{DS} = -4V, I _D = -3.5A
Gate-Source Charge	Q _{gs}	—	1.5	—	nC	
Gate-Drain Charge	Q _{gd}	—	1.9	—	nC	
Turn-On Delay Time	t _{D(on)}	—	6.5	—	ns	V _{DS} = -4V, V _{GS} = -4.5V, R _G = 6Ω, I _D = -1A
Turn-On Rise Time	t _r	—	13.4	—	ns	
Turn-Off Delay Time	t _{D(off)}	—	51.5	—	ns	
Turn-Off Fall Time	t _f	—	21.8	—	ns	

- 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.
 7. Short duration pulse test used to minimize self-heating effect.
 8. Guaranteed by design. Not subject to product testing.

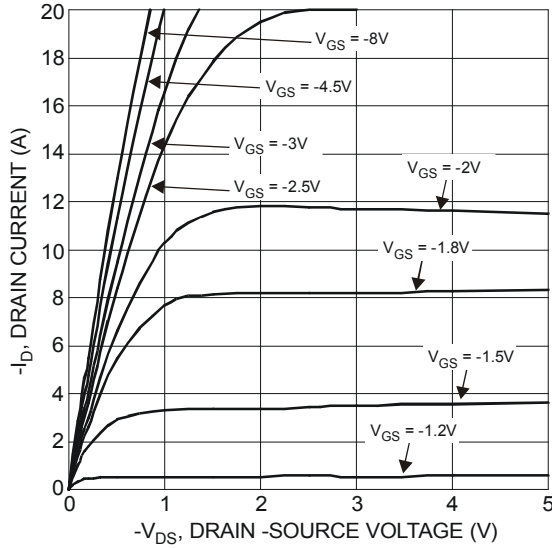


Figure 1 Typical Output Characteristics

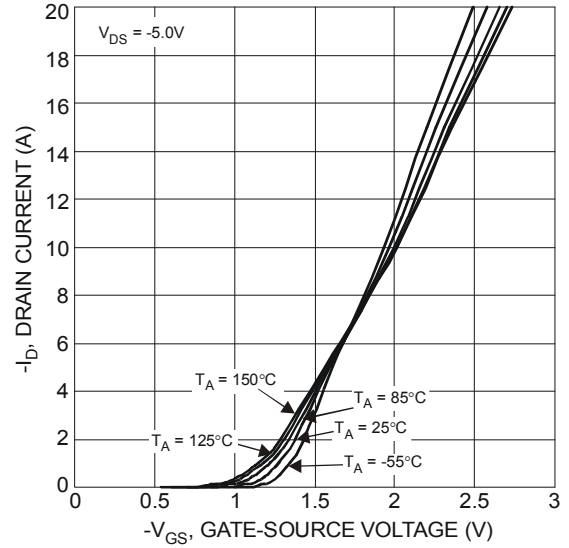


Figure 2 Typical Transfer Characteristics

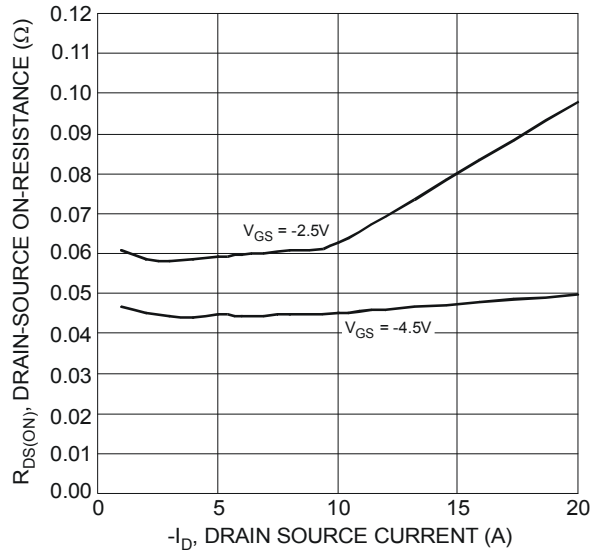


Figure 3 Typical On-Resistance vs. Drain Current and Gate Voltage

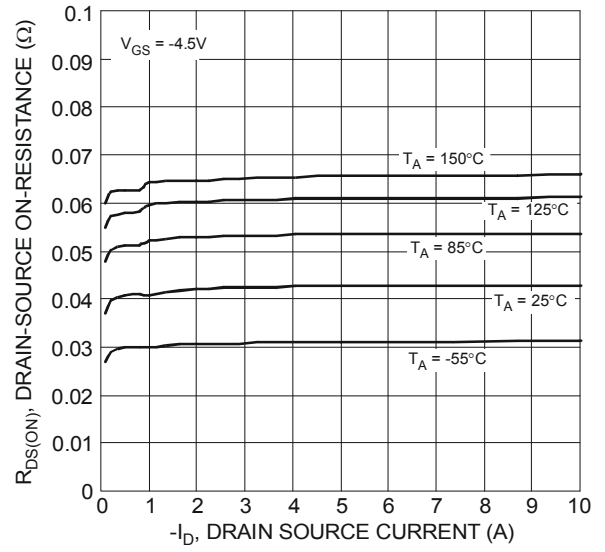


Figure 4 Typical On-Resistance vs. Drain Current and Temperature

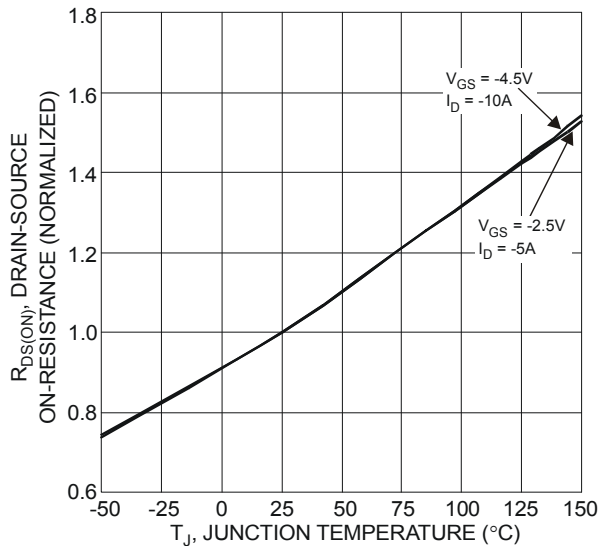


Figure 5 On-Resistance Variation with Temperature

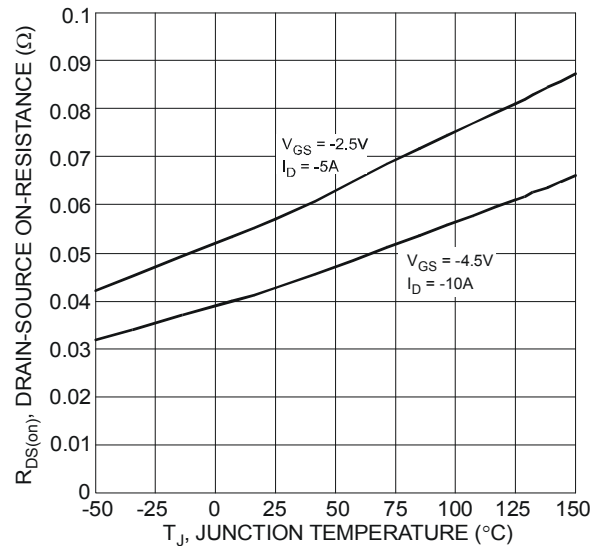


Figure 6 On-Resistance Variation with Temperature

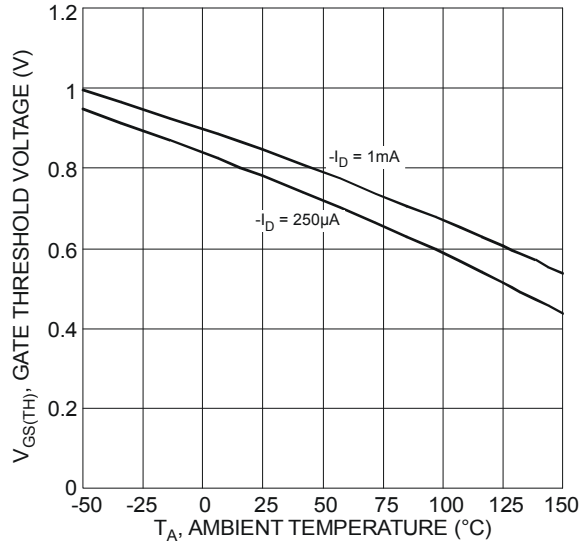


Figure 7 Gate Threshold Variation vs. Ambient Temperature

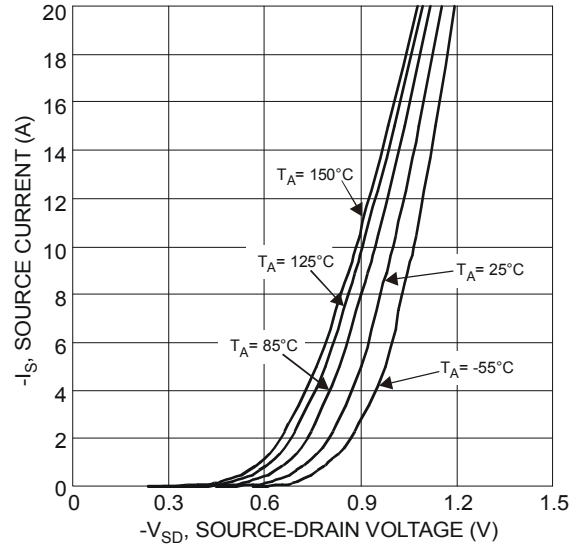


Figure 8 Diode Forward Voltage vs. Current

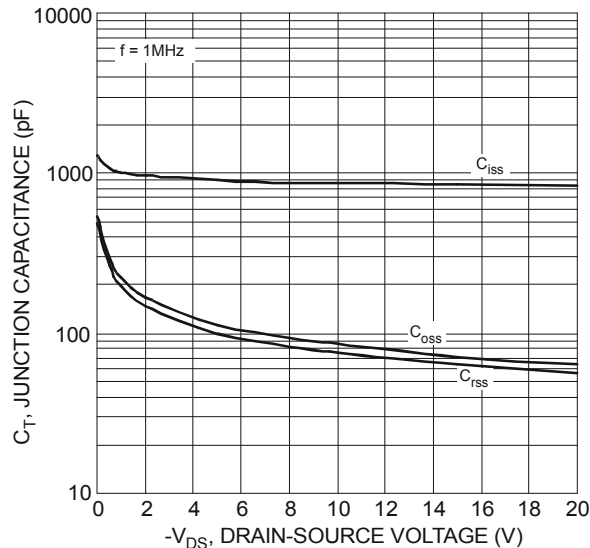


Figure 9 Typical Junction Capacitance

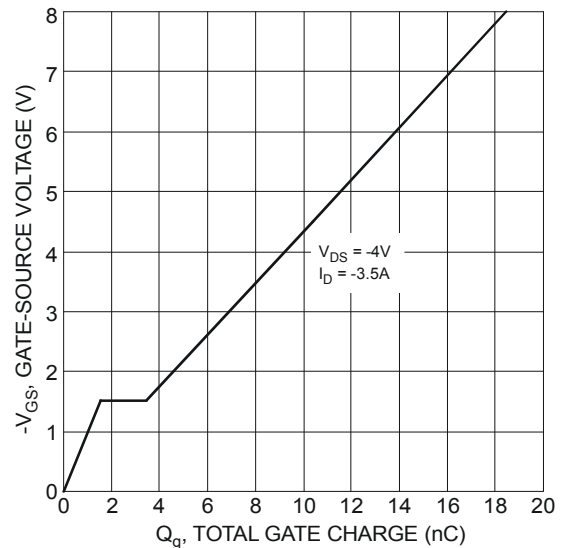
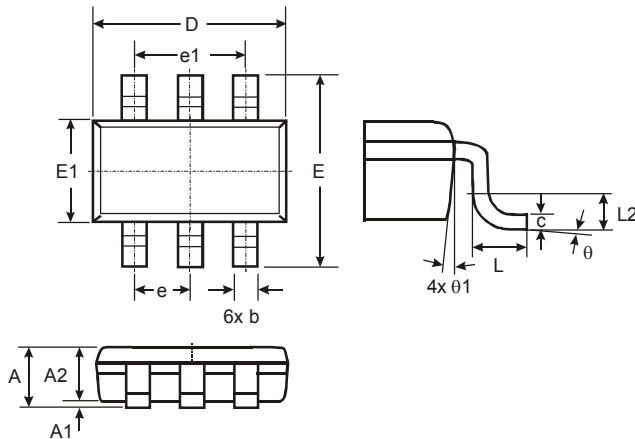


Figure 10 Gate-Charge Characteristics

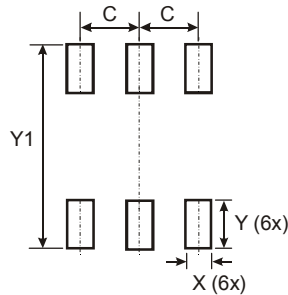
Package Outline Dimensions

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