

Product Summary

$V_{(BR)DSS}$	$R_{DS(ON)}$ max	I_D max $T_A = 25^\circ\text{C}$
20V	18.5m Ω @ $V_{GS} = 10\text{V}$	5.4 A
	21m Ω @ $V_{GS} = 4.5\text{V}$	5.0 A
	24m Ω @ $V_{GS} = 2.5\text{V}$	4.6 A
	31m Ω @ $V_{GS} = 1.8\text{V}$	3.5 A

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

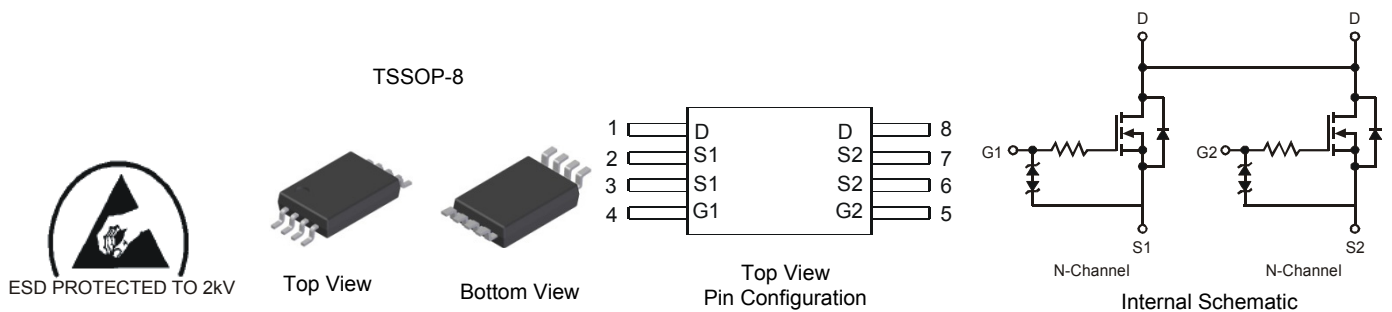
- Power management functions
- Load Switch

Features

- Low On-Resistance
- Low Input Capacitance
- Fast Switching Speed
- ESD Protected up to 2KV**
- 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: TSSOP-8
- 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 Below
- Weight: 0.039 grams (approximate)

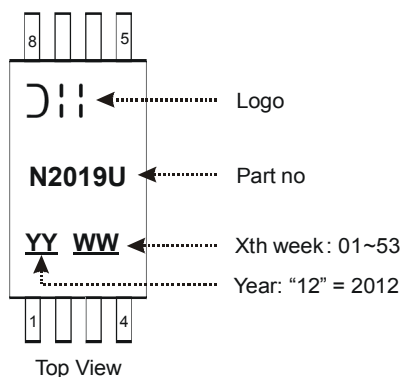


Ordering Information (Note 4)

Part Number	Case	Packaging
DMN2019UTS-13	TSSOP-8	2500/Tape & Reel

- 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



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} = 10V	Steady State	T _A = +25°C	I _D	5.4	A
			T _A = +70°C		4.3	
Continuous Drain Current (Note 5)	V _{GS} = 2.5V	Steady State	T _A = +25°C	I _D	4.6	A
			T _A = +70°C		3.7	
Continuous Body Diode Forward Current (Note 5)		Steady Stat	T _A = +25°C	I _S	0.9	A
Pulsed Drain Current (Note 5) 10μs pulse, duty cycle = 1%				I _{DM}	30	A

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

Characteristic	Symbol	Value	Units
Total Power Dissipation (Note 5)	P _D	0.78	W
Thermal Resistance, Junction to Ambient (Note 5)	R _{θJA}	161	°C/W
Thermal Resistance, Junction to Case (Note 5)	R _{θJC}	26	°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 6)						
Drain-Source Breakdown Voltage	BV _{DSS}	20	-	-	V	V _{GS} = 0V, I _D = 250μA
Zero Gate Voltage Drain Current	I _{DSS}	-	-	1.0	μA	V _{DS} = 20V, V _{GS} = 0V
Gate-Source Leakage	I _{GSS}	-	-	10	μA	V _{GS} = ±10V, V _{DS} = 0V
Gate-Source Breakdown Voltage	BV _{SGS}	±12	-	-	V	V _{DS} = 0V, I _G = ±250μA
ON CHARACTERISTICS (Note 6)						
Gate Threshold Voltage	V _{GS(th)}	0.35	-	0.95	V	V _{DS} = V _{GS} , I _D = 250μA
Static Drain-Source On-Resistance	R _{DS(on)}	-	15.5	18.5	mΩ	V _{GS} = 10V, I _D = 7A
		-	16.5	21		V _{GS} = 4.5V, I _D = 7A
		-	17	21.5		V _{GS} = 4.0V, I _D = 7A
		-	17.5	22.5		V _{GS} = 3.6V, I _D = 6.5A
		-	18	23		V _{GS} = 3.1V, I _D = 6.5A
		-	19	24		V _{GS} = 2.5V, I _D = 5.5A
		-	24	31		V _{GS} = 1.8V, I _D = 3.5A
		-	-	-		-
Forward Transfer Admittance	Y _{fs}	-	13	-	S	V _{DS} = 5V, I _D = 5A
Diode Forward Voltage	V _{SD}	-	0.7	1.0	V	V _{GS} = 0V, I _S = 1A
DYNAMIC CHARACTERISTICS (Note 7)						
Input Capacitance	C _{iss}	-	143	-	pF	V _{DS} = 10V, V _{GS} = 0V, f = 1.0MHz
Output Capacitance	C _{oss}	-	74	-	pF	
Reverse Transfer Capacitance	C _{rss}	-	29	-	pF	
Gate Resistance	R _g	-	202	-	Ω	V _{DS} = 0V, V _{GS} = 0V, f = 1MHz
Total Gate Charge	Q _g	-	8.8	-	nC	V _{GS} = 4.5V, V _{DS} = 10V, I _D = 6.5A
Gate-Source Charge	Q _{gs}	-	1.4	-	nC	
Gate-Drain Charge	Q _{gd}	-	3.0	-	nC	
Turn-On Delay Time	t _{D(on)}	-	53	-	ns	V _{DD} = 10V, V _{GS} = 4.5V, R _L = 10Ω, R _G = 6Ω
Turn-On Rise Time	t _r	-	78	-	ns	
Turn-Off Delay Time	t _{D(off)}	-	562	-	ns	
Turn-Off Fall Time	t _f	-	234	-	ns	

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

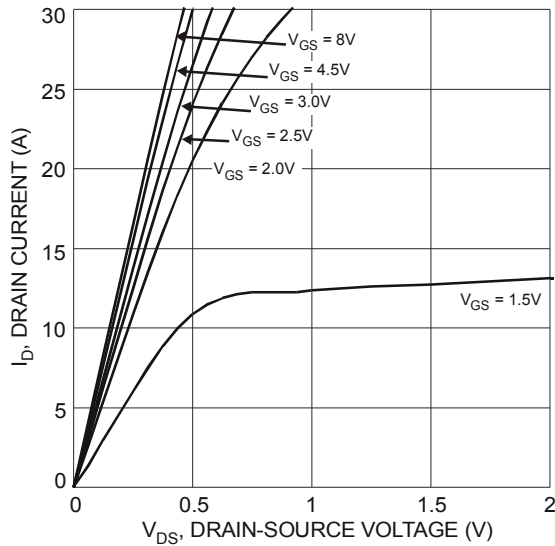


Fig. 1 Typical Output Characteristic

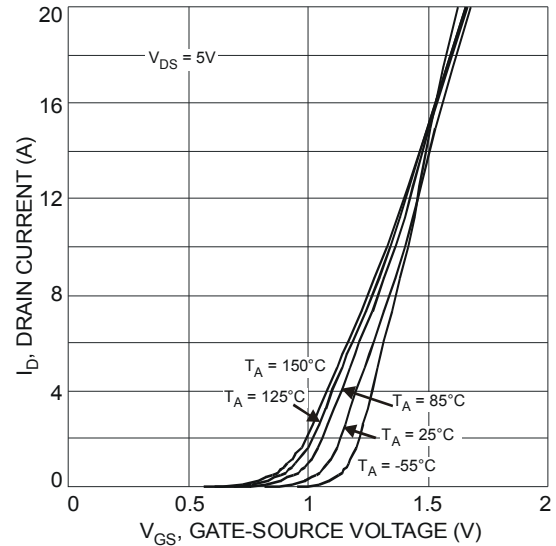


Fig. 2 Typical Transfer Characteristic

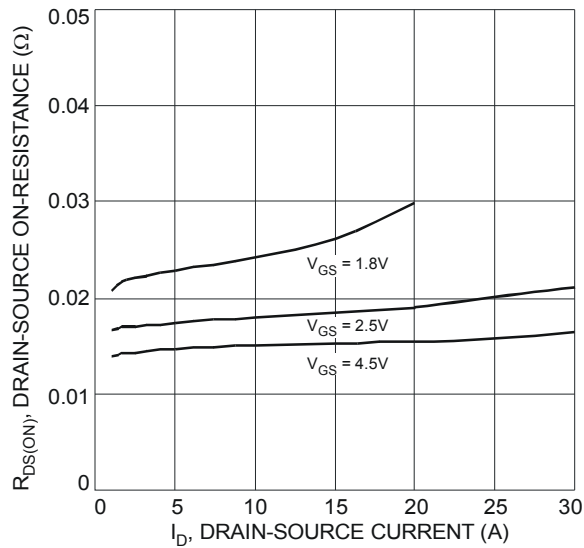


Fig. 3 Typical On-Resistance vs. Drain Current and Gate Voltage

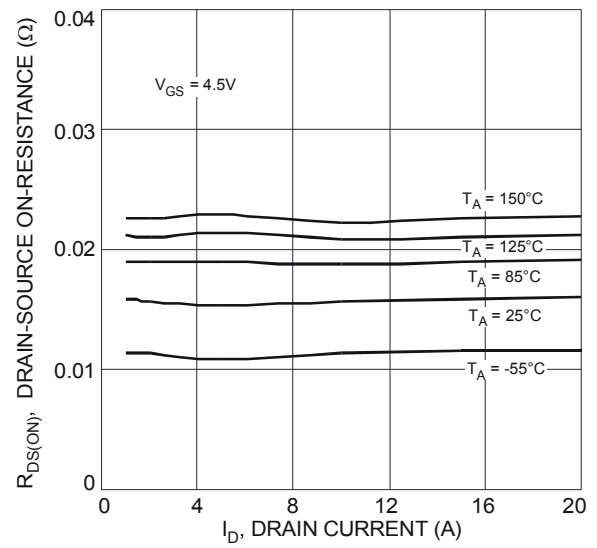


Fig. 4 Typical On-Resistance vs. Drain Current and Temperature

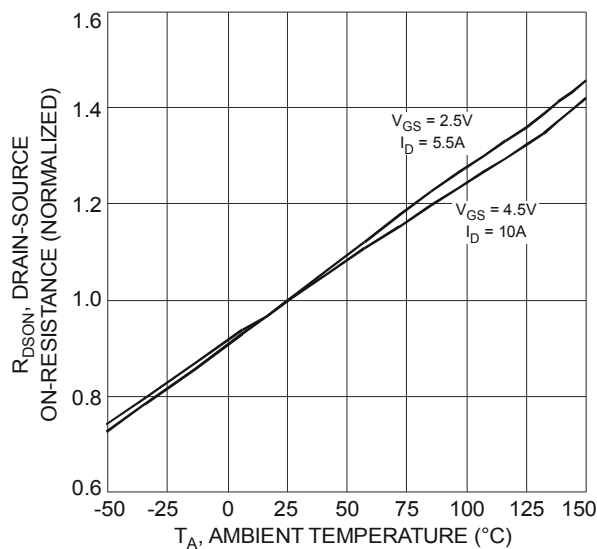


Fig. 5 On-Resistance Variation with Temperature

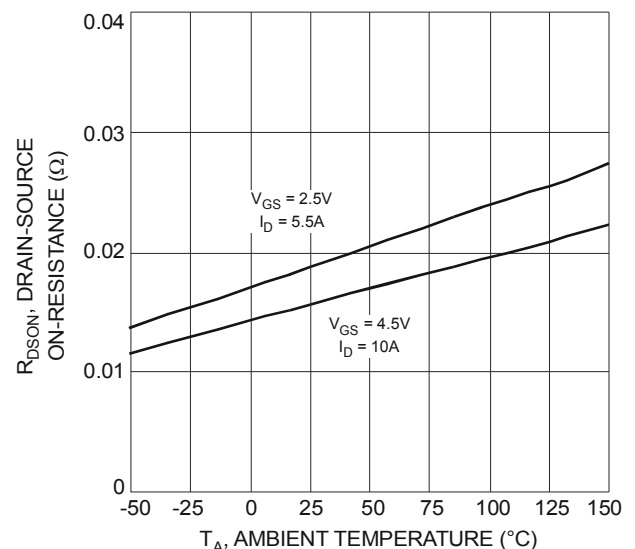


Fig. 6 On-Resistance Variation with Temperature

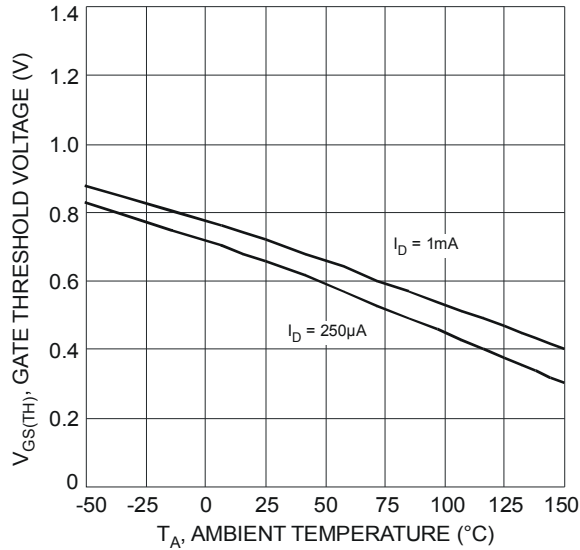


Fig. 7 Gate Threshold Variation vs. Ambient Temperature

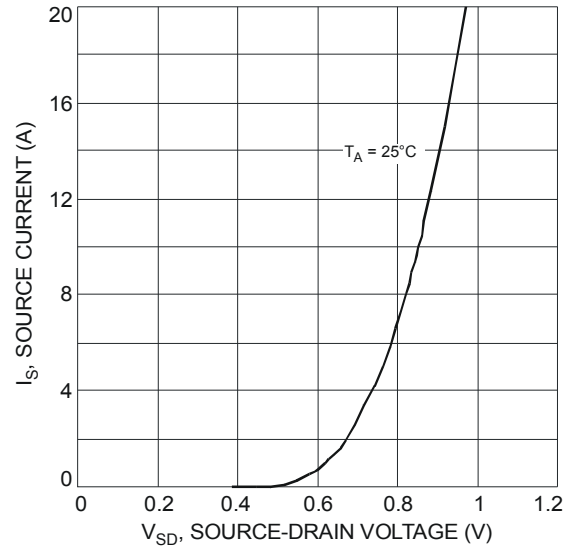


Fig. 8 Diode Forward Voltage vs. Current

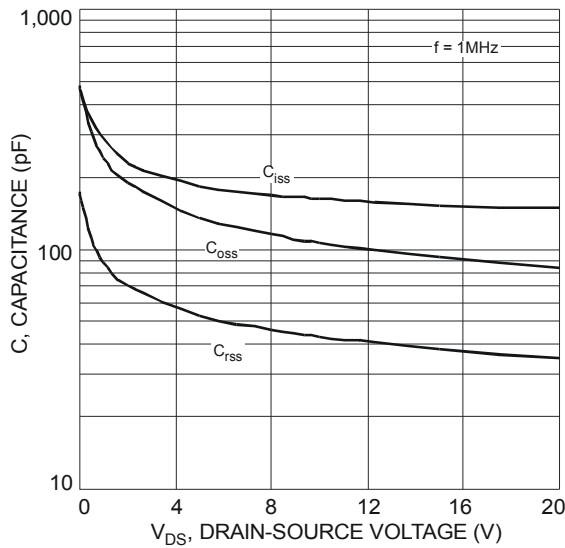


Fig. 9 Typical Total Capacitance

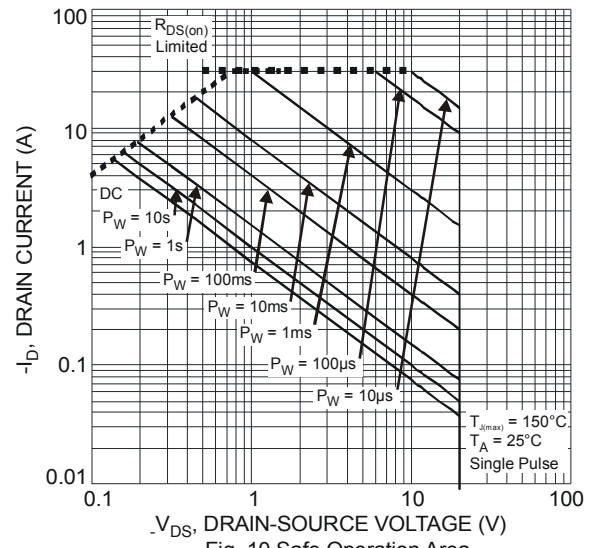


Fig. 10 Safe Operation Area

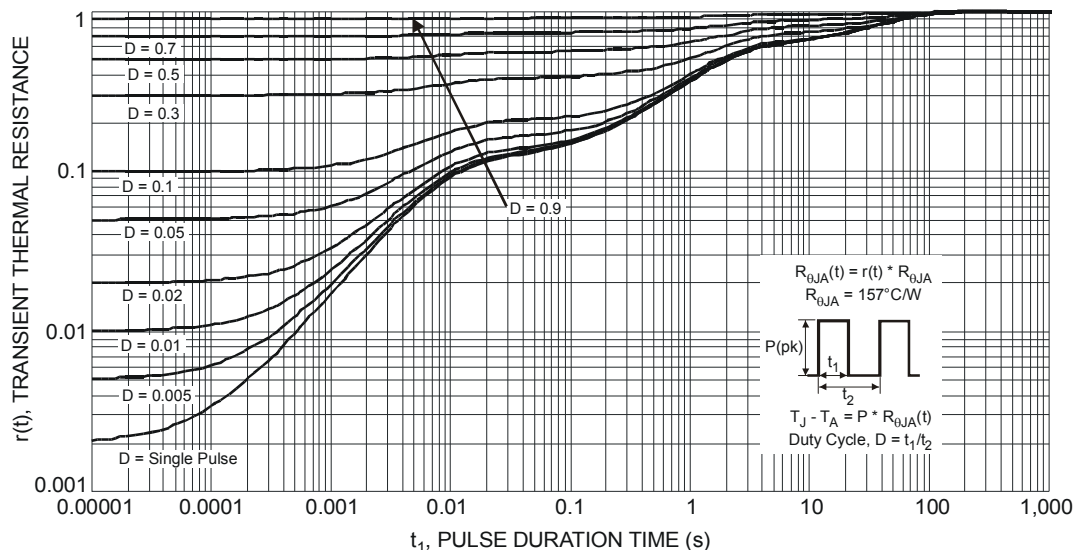
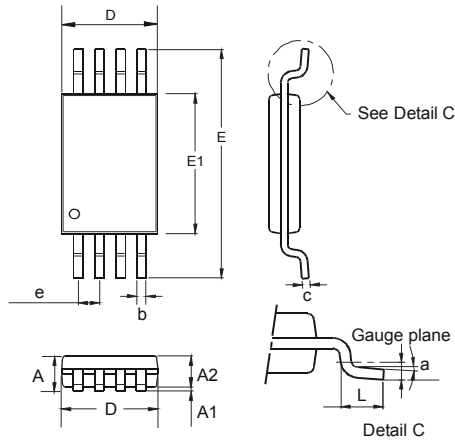


Fig. 11 Transient Thermal Response

Package Outline Dimensions

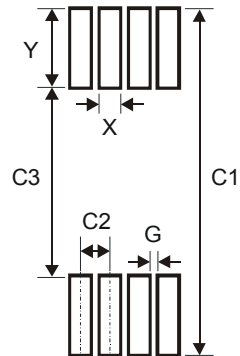
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for latest version.



TSSOP-8			
Dim	Min	Max	Typ
a	0.09	—	—
A	—	1.20	—
A1	0.05	0.15	—
A2	0.825	1.025	0.925
b	0.19	0.30	—
c	0.09	0.20	—
D	2.90	3.10	3.025
e	—	—	0.65
E	—	—	6.40
E1	4.30	4.50	4.425
L	0.45	0.75	0.60
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)
X	0.45
Y	1.78
C1	7.72
C2	0.65
C3	4.16
G	0.20

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