Product Summary

$V_{(BR)DSS}$	$R_{DS(ON)}$	I_D T_A = 25°C
30V	38mΩ @ V_{GS} = -10V	5.8A
	64mΩ @ V_{GS} = -4.5V	4.5A

Features and Benefits

- Low On-Resistance:
- Low Gate Threshold Voltage
- Low Input Capacitance
- Fast Switching Speed
- Low Input/Output Leakage
- **Lead-Free Finish; RoHS compliant (Note 1)**
- **Halogen and Antimony Free. "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.

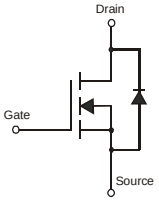
- Load Switch
- DC-DC Converters
- Power management functions

Mechanical Data

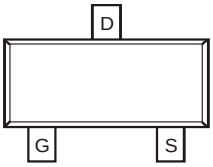
- Case: SOT23
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish – Matte Tin annealed over Copper leadframe. Solderable per MIL-STD-202, Method 208
- Terminal Connections: See Diagram
- Weight: 0.008 grams (approximate)

SOT23

Top View



Equivalent Circuit



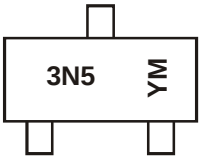
Top View

Ordering Information (Note 3)

Part Number	Case	Packaging
DMN3051L-7	SOT23	3000/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



3N5 = Product Type Marking Code
YM = Date Code Marking
Y = Year (ex: U = 2007)
M = Month (ex: 9 = September)

Date Code Key

Year	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Code	U	V	W	X	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}	30	V
Gate-Source Voltage			V_{GSS}	±20	V
Continuous Drain Current (Note 5) V_{GS} = 10V	Steady State	T_A = 25°C T_A = 70°C	I_D	4.5 3.5	A
	t<5s	T_A = 25°C T_A = 70°C	I_D	5.8 4.9	A
Pulsed Drain Current (10µs pulse, duty cycle = 1%)			I_{DM}	20	A
Maximum Body Diode Forward Current (Note 5)			I_S	2	A

Thermal Characteristics

Characteristic		Symbol	Value	Units
Total Power Dissipation (Note 4)	T_A = 25°C	P_D	0.7	W
	T_A = 70°C		0.44	
Thermal Resistance, Junction to Ambient (Note 4)	Steady state	$R_{\theta JA}$	182	°C/W
	t < 5s		109	
Total Power Dissipation (Note 5)	T_A = 25°C	P_D	1.4	W
	T_A = 70°C		0.85	
Thermal Resistance, Junction to Ambient (Note 5)	Steady state	$R_{\theta JA}$	94	°C/W
	t < 5s		56	
Thermal Resistance, Junction to Case (Note 5)		$R_{\theta JC}$	25	
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}	30	—	—	V	V_{GS} = 0V, I_D = 250µA
Zero Gate Voltage Drain Current	I_{DSS}	—	—	800	nA	V_{DS} = 28V, V_{GS} = 0V
Gate-Body Leakage	I_{GSS}	—	—	±80 ±800	nA	V_{GS} = ±12V, V_{DS} = 0V V_{GS} = ±20V, V_{DS} = 0V
ON CHARACTERISTICS (Note 6)						
Gate Threshold Voltage	$V_{GS(th)}$	1.3	1.9	2.2	V	V_{DS} = V_{GS}, I_D = 250µA
Static Drain-Source On-Resistance	$R_{DS\ (ON)}$	— —	33 54	38 64	mΩ	V_{GS} = 10V, I_D = 5.8A V_{GS} = 4.5V, I_D = 5.0A
Forward Transconductance	$\|Y_{fs}\|$	—	5	—	S	V_{DS} = 5V, I_D = 3.1A
Source-Drain Diode Forward Voltage	V_{SD}	—	0.78	1.16	V	V_{GS} = 0V, I_S = 2.0A
DYNAMIC CHARACTERISTICS (Note 7)						
Input Capacitance	C_{iss}	—	424	—	pF	V_{DS} = 5V, V_{GS} = 0V f = 1.0MHz
Output Capacitance	C_{oss}	—	115	—	pF	
Reverse Transfer Capacitance	C_{rss}	—	81	—	pF	
Gate Resistance	R_g	-	1.51	-	Ω	V_{DS} = 0V, V_{GS} = 0V, f = 1MHz
Total Gate Charge	Q_g	-	9.0	-	nC	V_{GS} = 10V, V_{DS} = 15V, I_D = 5.8A
Gate-Source Charge	Q_{gs}	-	1.3	-	nC	
Gate-Drain Charge	Q_{gd}	-	1.3	-	nC	
Turn-On Delay Time	$t_{D(on)}$	-	3.4	-	ns	V_{DD} = 15V, V_{GS} = 10V, R_L = 2.6Ω, R_G = 3Ω
Turn-On Rise Time	t_r	-	6.2	-	ns	
Turn-Off Delay Time	$t_{D(off)}$	-	13.9	-	ns	
Turn-Off Fall Time	t_f	-	2.8	-	ns	

Notes:
4. Device mounted on FR-4 PCB with minimum recommended pad layout, single sided.
5. Device mounted on 1" x 1" FR-4 PCB with high coverage 2 oz. Copper, single sided.
6. Short duration pulse test used to minimize self-heating effect.
7. Guaranteed by design. Not subject to production testing.

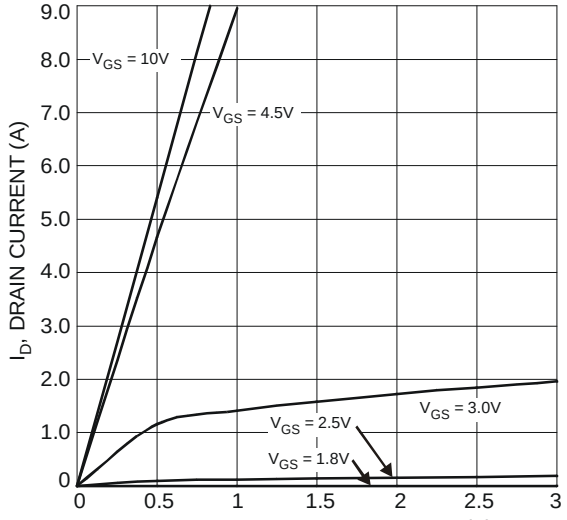


Fig. 1 Typical Output Characteristics

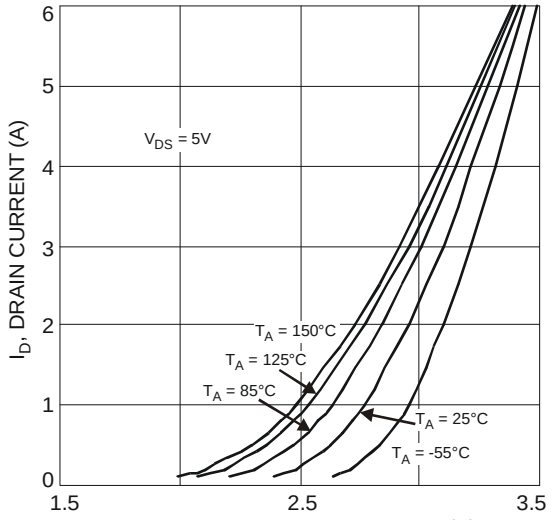


Fig. 2 Typical Transfer Characteristics

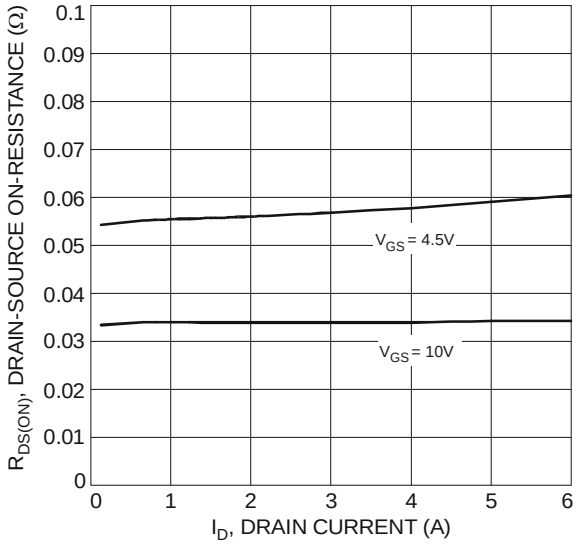


Fig. 3 Typical On-Resistance
vs. Drain Current and Gate Voltage

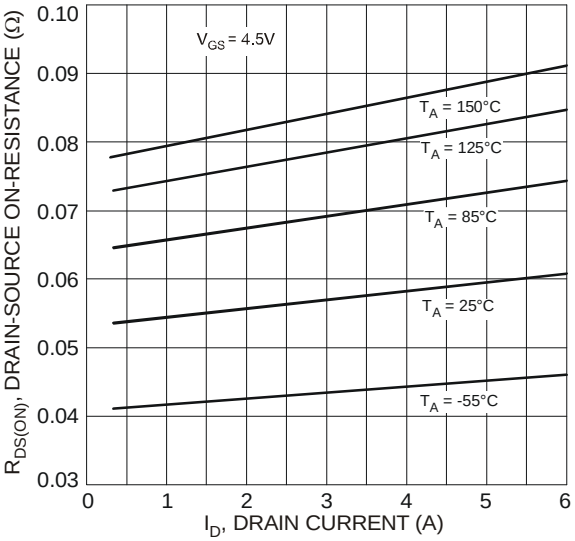


Fig. 4 Typical Drain-Source On-Resistance
vs. Drain Current and Temperature

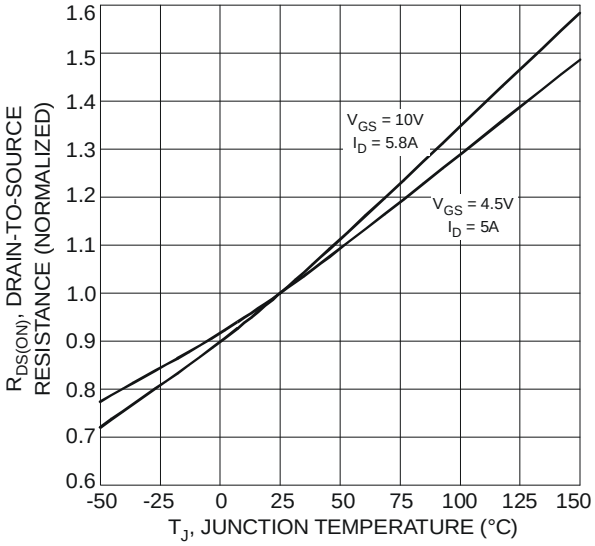


Fig. 5 On-Resistance Variation with Temperature

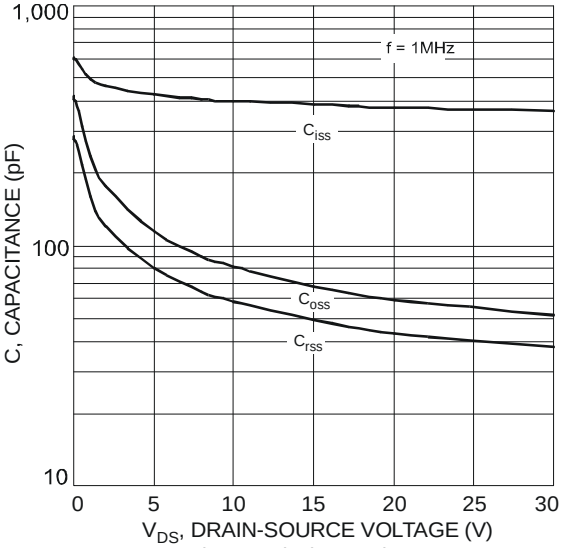


Fig. 6 Typical Capacitance

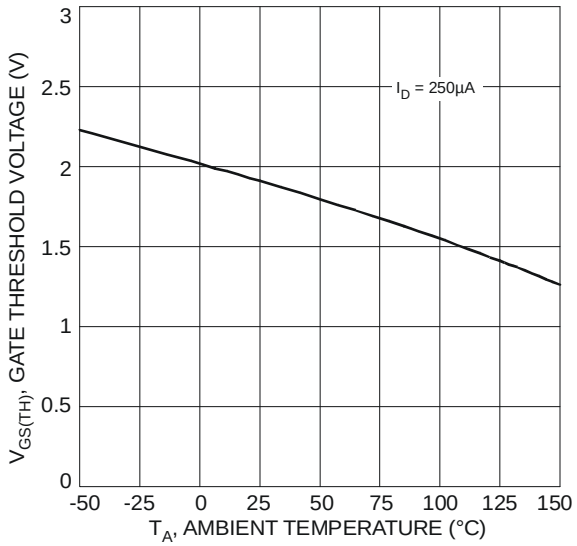


Fig. 7 Gate Threshold Variation vs. Ambient Temperature

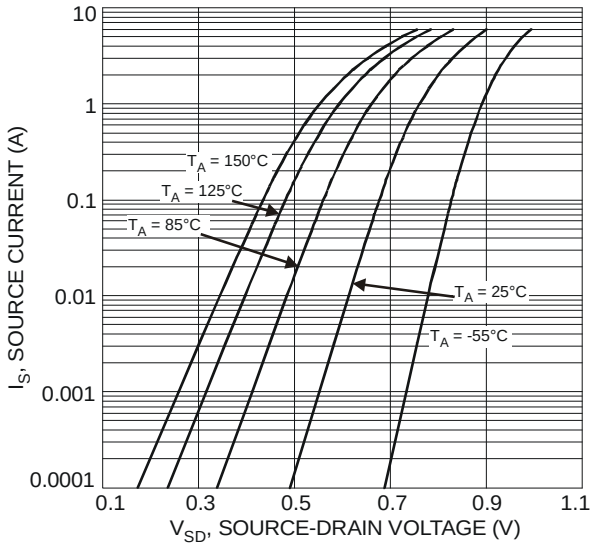


Fig. 8 Diode Forward Voltage vs. Current

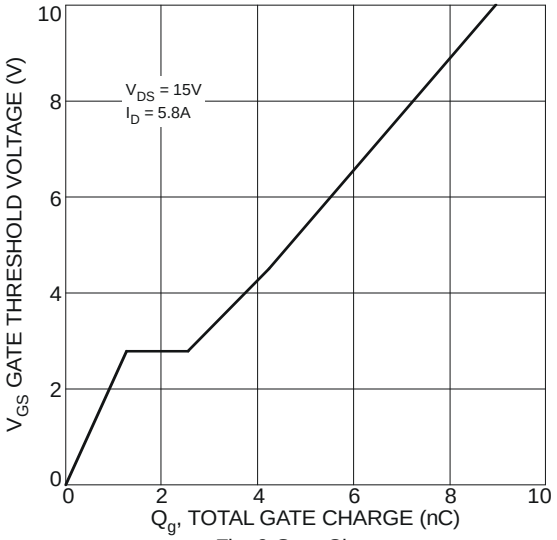


Fig. 9 Gate Charge

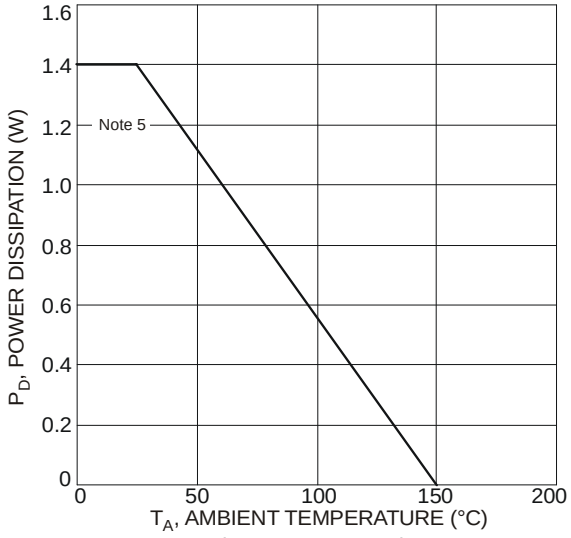


Fig. 10 Power Derating

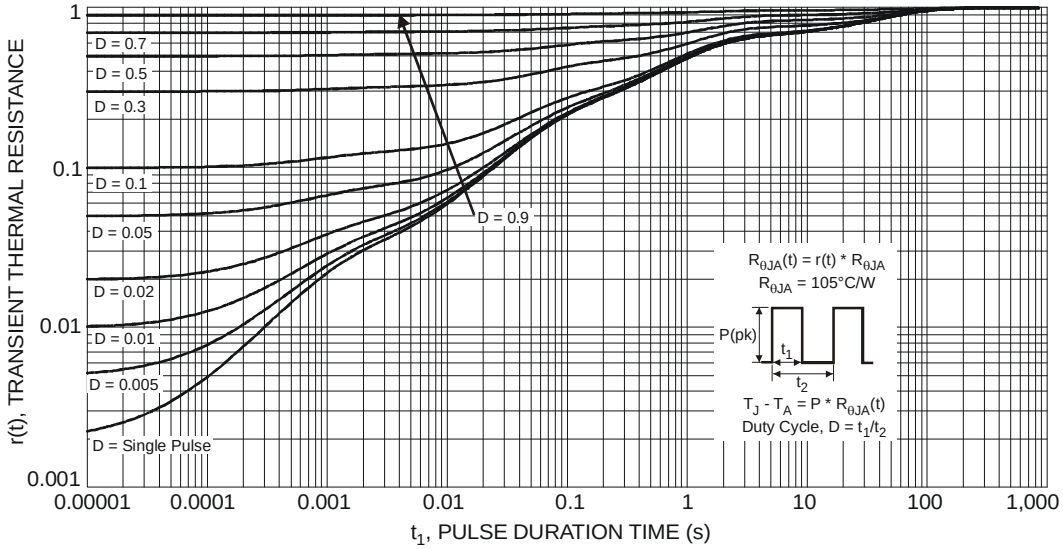
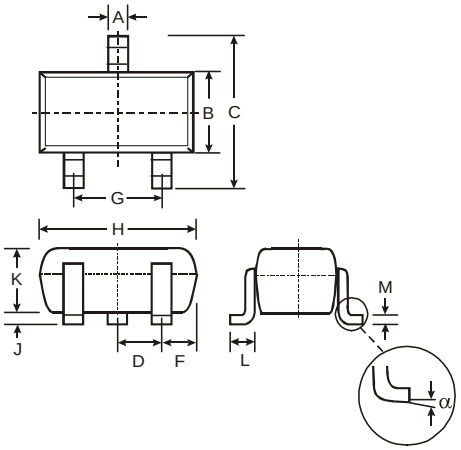


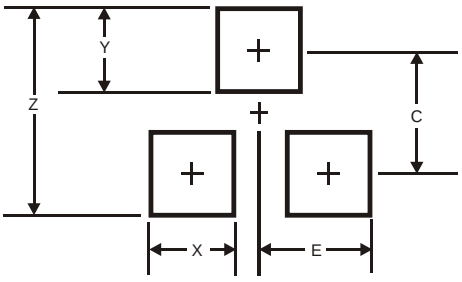
Fig. 11 Transient Thermal Response

Package Outline Dimensions



SOT23		
Dim	**Min**	**Max**
A	0.37	0.51
B	1.20	1.40
C	2.30	2.50
D	0.89	1.03
F	0.45	0.60
G	1.78	2.05
H	2.80	3.00
J	0.013	0.10
K	0.903	1.10
L	0.45	0.61
M	0.085	0.180
α	0°	8°
All Dimensions in mm		

Suggested Pad Layout



Dimensions	Value (in mm)
Z	2.9
X	0.8
Y	0.9
C	2.0
E	1.35

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