





N-CHANNEL ENHANCEMENT MODE MOSFET

Product Summary

V _{(BR)DSS}	R _{DS(ON)}	I _D T _A = 25°C
2011	38mΩ @ V _{GS} = -10V	5.8A
30V	64mΩ @ V _{GS} = -4.5V	4.5A

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

Features and Benefits

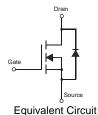
- Low On-Resistance:
- Low Gate Threshold Voltage
- Low Input Capacitance
- Fast Switching Speed
- Low Input/Output Leakage
- Lead-Free Finish; RoHS compliant (Note 1)
- Halogen and Antimony Free. "Green" Device (Note 2)
- Qualified to AEC-Q101 Standards for High Reliability

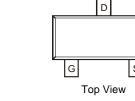
Mechanical Data

- 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)









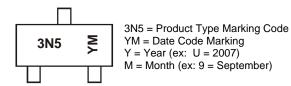
Ordering Information (Note 3)

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



Date Code Key

Year	2007	2008	2009	2010	201	1 20)12	2013	2014	2015	2016	2017
Code	U	V	W	X	Y		Z	Α	В	С	D	Е
Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Code	1	2	3	4	5	6	7	8	9	0	N	D

April 2012

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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 Dunin Compant (Nata E) V	Steady State	$T_A = 25$ °C $T_A = 70$ °C	I _D	4.5 3.5	А	
Continuous Drain Current (Note 5) V _{GS} = 10V	t<5s	$T_A = 25$ °C $T_A = 70$ °C	I _D	5.8 4.9	А	
Pulsed Drain Current (10µs pulse, duty cycle = 1%)	I _{DM}	20	Α			
Maximum Body Diode Forward Current (Note 5)	I _S	2	Α			

Thermal Characteristics

Characteristic	Symbol	Value	Units		
Total Power Discipation (Note 4)	T _A = 25°C	Р	0.7	W	
Total Power Dissipation (Note 4)	T _A = 70°C	P_{D}	0.44	VV	
Thermal Resistance, Junction to Ambient (Note 4)	Steady state	D	182	°C/W	
Thermal Resistance, Junction to Ambient (Note 4)	t < 5s	$R_{\theta JA}$	109	C/VV	
Total Dower Dissipation (Note 5)	$T_A = 25$ °C	0	1.4	W	
Total Power Dissipation (Note 5)	$T_A = 70^{\circ}C$	P_D	0.85		
Thermal Decistores, Junction to Ambient (Note 5)	Steady state	Б	94	°C/W	
Thermal Resistance, Junction to Ambient (Note 5)	t < 5s	$R_{\theta JA}$	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	

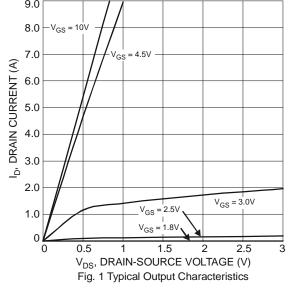
Electrical Characteristics @TA = 25°C unless otherwise specified

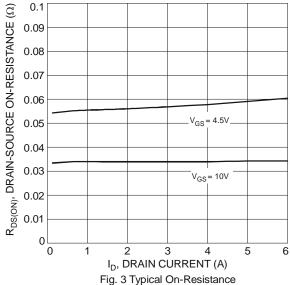
Characteristic	Symbol	Min	Тур	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 6)						
Drain-Source Breakdown Voltage	BV _{DSS}	30	_	_	V	$V_{GS} = 0V, I_D = 250 \mu A$
Zero Gate Voltage Drain Current	I _{DSS}		_	800	nA	$V_{DS} = 28V, V_{GS} = 0V$
Gate-Body Leakage	I _{GSS}		_	±80 ±800	nA	$V_{GS} = \pm 12V, V_{DS} = 0V$ $V_{GS} = \pm 20V, V_{DS} = 0V$
ON CHARACTERISTICS (Note 6)						
Gate Threshold Voltage	V _{GS(th)}	1.3	1.9	2.2	V	$V_{DS} = V_{GS}, I_D = 250 \mu A$
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	., 5,,,,,
Output Capacitance	Coss		115	_	pF	$V_{DS} = 5V, V_{GS} = 0V$ -f = 1.0MHz
Reverse Transfer Capacitance	C _{rss}		81	_	pF	1 = 1.000112
Gate Resistance	R_{g}	ı	1.51	-	Ω	$V_{DS} = 0V$, $V_{GS} = 0V$, $f = 1MHz$
Total Gate Charge	Qg	-	9.0	-	nC	
Gate-Source Charge	Q _{gs}	-	1.3	-	nC	$V_{GS} = 10V, V_{DS} = 15V, I_D = 5.8A$
Gate-Drain Charge	Q_{gd}	-	1.3	-	nC	
Turn-On Delay Time	t _{D(on)}	-	3.4	-	ns	
Turn-On Rise Time	t _r	-	6.2	-	ns	$V_{DD} = 15V, V_{GS} = 10V,$
Turn-Off Delay Time	t _{D(off)}	-	13.9	-	ns	$R_L = 2.6\Omega$, $R_G = 3\Omega$
Turn-Off Fall Time	t _f	-	2.8	-	ns	

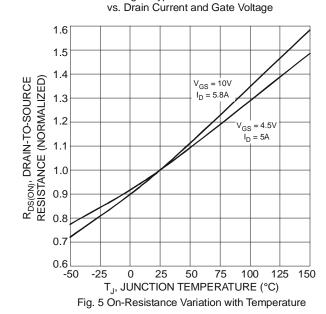
Notes:

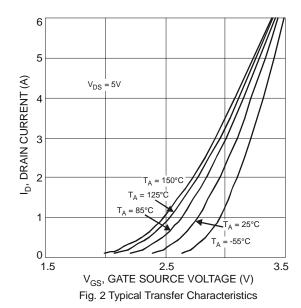
- Device mounted on FR-4 PCB with minimum recommended pad layout, single sided.
 Device mounted on 1" x 1" FR-4 PCB with high coverage 2 oz. Copper, single sided.
 Short duration pulse test used to minimize self-heating effect.
 Guaranteed by design. Not subject to production testing.











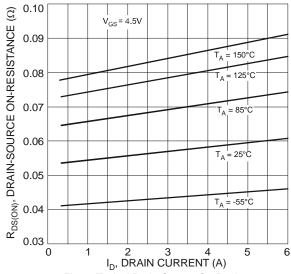
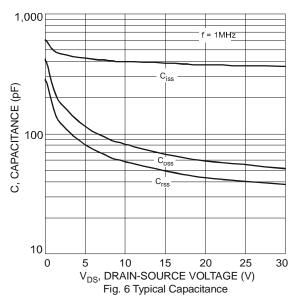


Fig. 4 Typical Drain-Source On-Resistance vs. Drain Current and Temperature





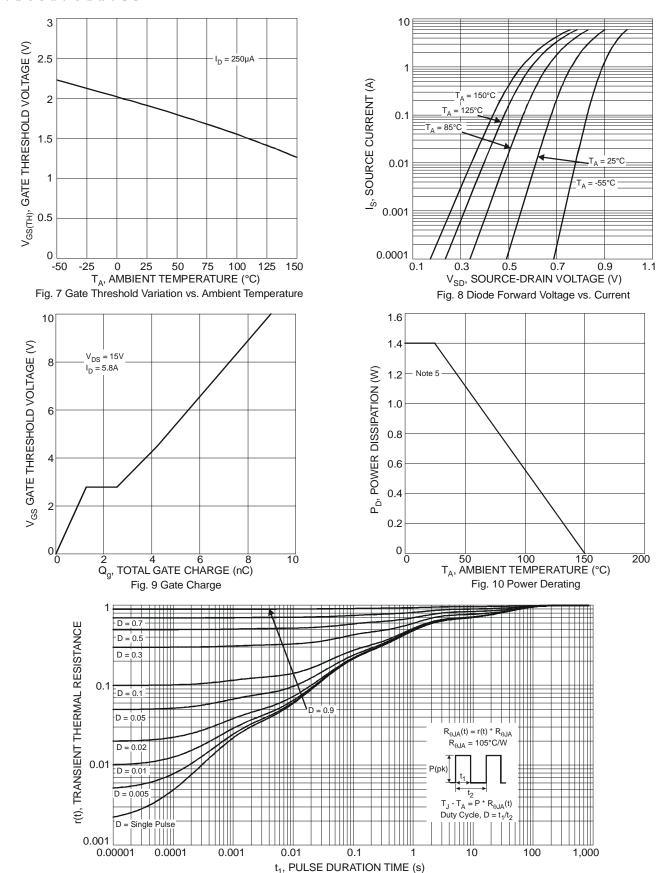
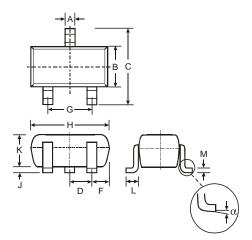


Fig. 11 Transient Thermal Response

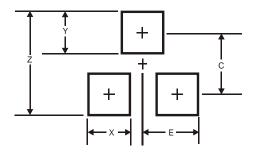


Package Outline Dimensions



SOT23						
Dim	Min	Max				
Α	0.37	0.51				
В	1.20	1.40				
С	2.30	2.50				
D	0.89	1.03				
F	0.45	0.60				
G	1.78	2.05				
Н	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
Х	0.8
Y	0.9
С	2.0
E	1.35



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