

Product Summary

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

Description

This new generation MOSFET is 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

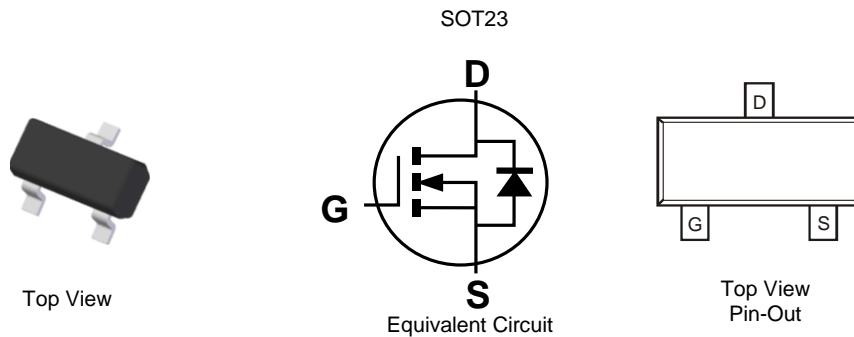
- Load Switch
- DC-DC Converters
- Power Management Functions

Features and Benefits

- Low On-Resistance
- Low Gate Threshold Voltage
- Low Input Capacitance
- Fast Switching Speed
- Low Input/Output Leakage
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**

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)

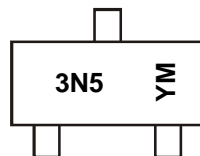


Ordering Information (Note 4)

Part Number	Case	Packaging
DMN3051L-7	SOT23	3000/Tape & Reel

- Notes:
1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant.
 2. See <https://www.diodes.com/quality/lead-free/> 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 <https://www.diodes.com/design/support/packaging/diodes-packaging/>.

Marking Information



3N5 = Product Type Marking Code
 YM = Date Code Marking
 Y or Ȳ = Year (ex: G = 2019)
 M = Month (ex: 9 = September)

Date Code Key

Year	2007	~	2019	2020	2021	2022	2023	2024	2025
Code	U	~	G	H	I	J	K	L	M

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	Unit
Drain-Source Voltage		V _{DSS}	30	V
Gate-Source Voltage		V _{GSS}	±20	V
Continuous Drain Current (Note 6) V _{GS} = 10V	Steady State	T _A = +25°C	4.5	A
		T _A = +70°C	3.5	
	t < 5s	T _A = +25°C	5.8	A
		T _A = +70°C	4.9	
Pulsed Drain Current (10µs Pulse, Duty Cycle = 1%)		I _{DM}	20	A
Maximum Body Diode Forward Current (Note 6)		I _S	2	A

Thermal Characteristics

Characteristic		Symbol	Value	Unit
Total Power Dissipation (Note 5)	T _A = +25°C	P _D	0.7	W
	T _A = +70°C		0.44	
Thermal Resistance, Junction to Ambient (Note 5)	Steady State	R _{θJA}	182	°C/W
	t < 5s		109	
Total Power Dissipation (Note 6)	T _A = +25°C	P _D	1.4	W
	T _A = +70°C		0.85	
Thermal Resistance, Junction to Ambient (Note 6)	Steady State	R _{θJA}	94	°C/W
	t < 5s		56	
Thermal Resistance, Junction to Case (Note 6)		R _{θJC}	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 7)						
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	nA	V _{GS} = ±12V, V _{DS} = 0V
				±800		
ON CHARACTERISTICS (Note 7)						
Gate Threshold Voltage	V _{GS(TH)}	1.3	1.9	2.2	V	V _{DS} = V _{GS} , I _D = 250 µA
Static Drain-Source On-Resistance	R _{DS(ON)}	—	33	38	mΩ	V _{GS} = 10V, I _D = 5.8A
			54	64		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 8)						
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:
- 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.

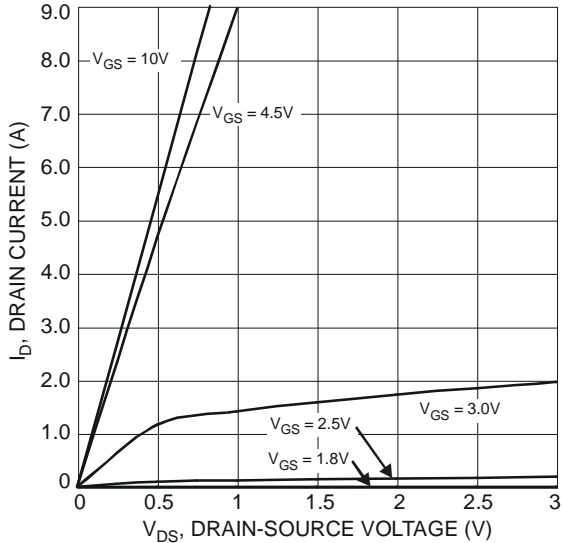


Fig. 1 Typical Output Characteristics

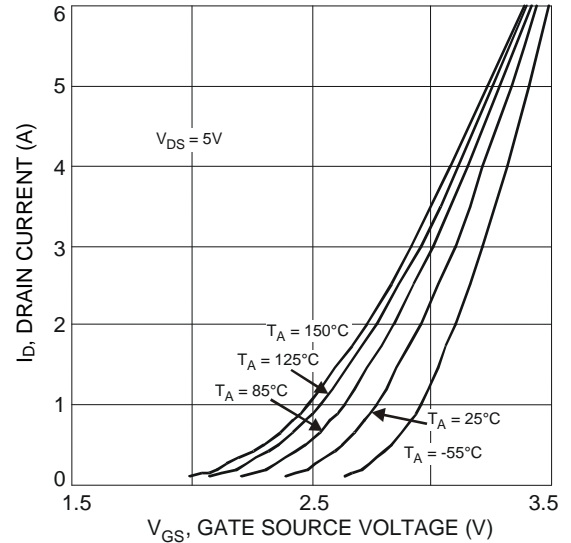


Fig. 2 Typical Transfer Characteristics

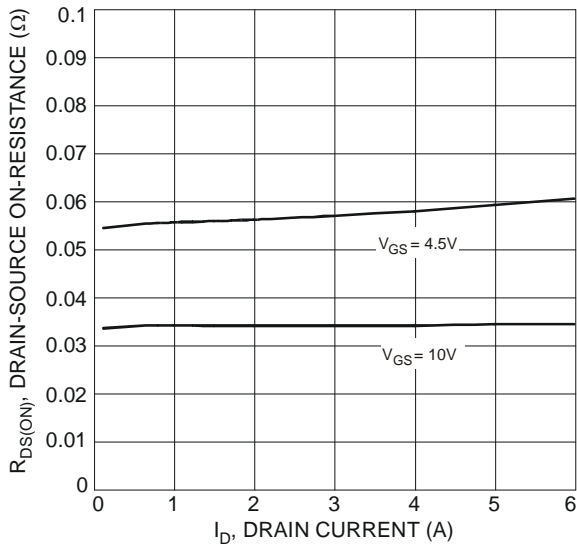


Fig. 3 Typical On-Resistance vs. Drain Current and Gate Voltage

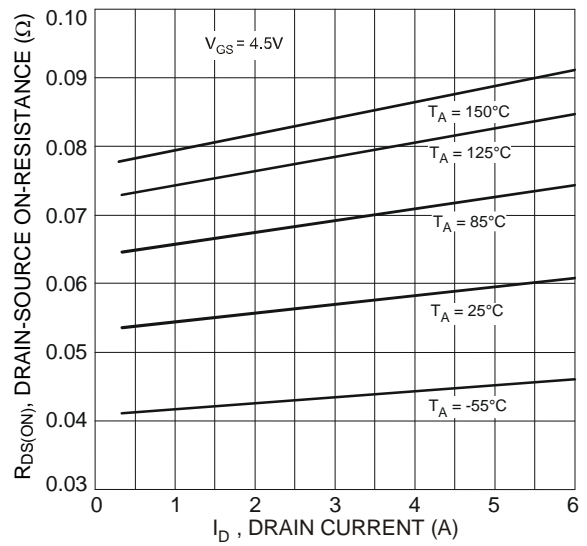


Fig. 4 Typical Drain-Source On-Resistance vs. Drain Current and Temperature

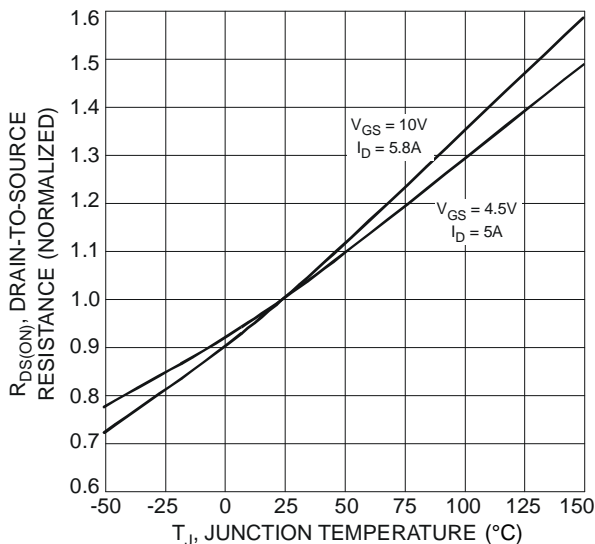


Fig. 5 On-Resistance Variation with Temperature

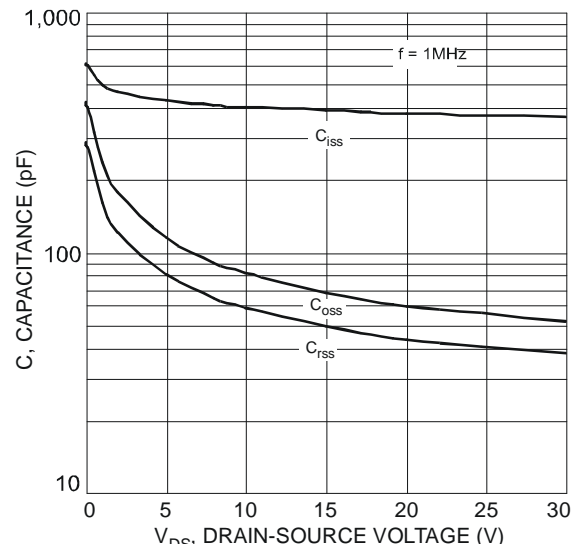


Fig. 6 Typical Capacitance

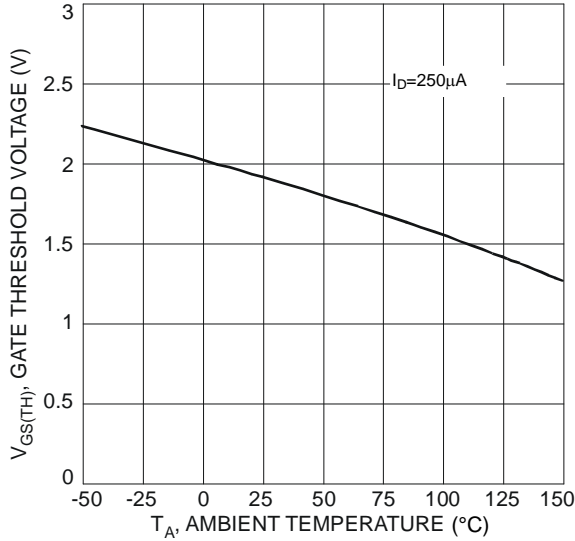


Fig. 7 Gate Threshold Variation vs. Ambient Temperature

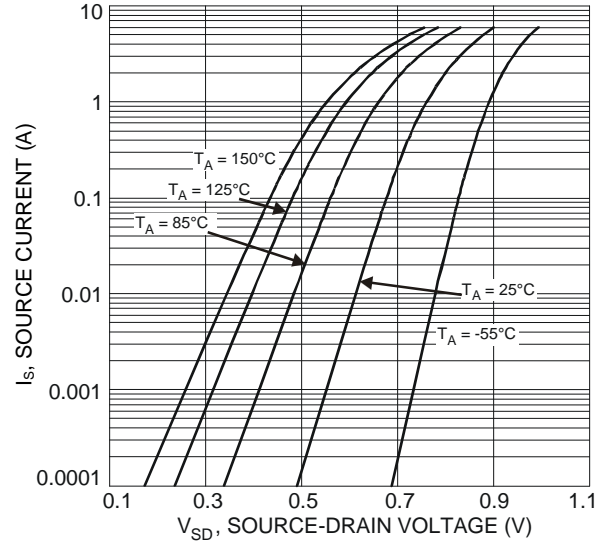


Fig. 8 Diode Forward Voltage vs. Current

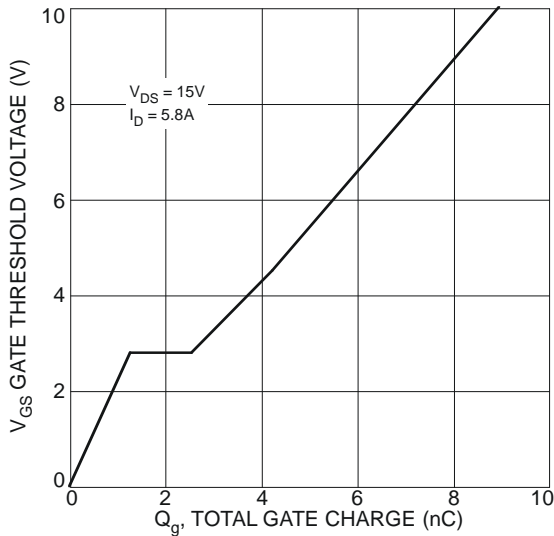


Fig. 9 Gate Charge

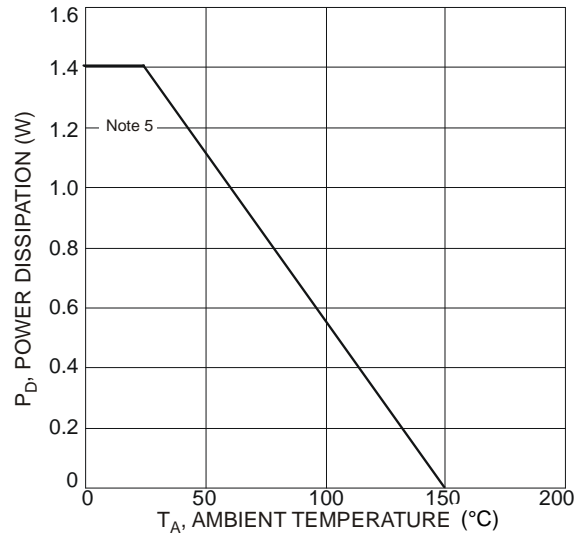


Fig. 10 Power Derating

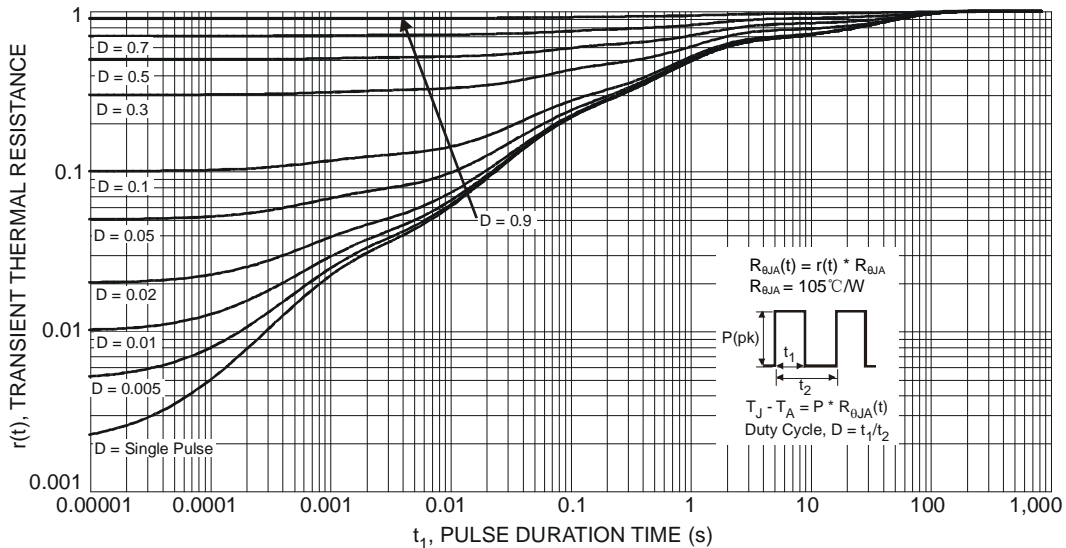
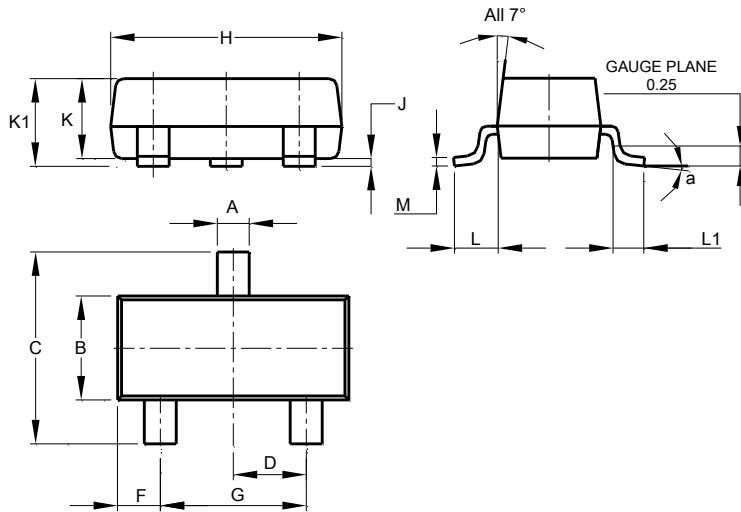


Fig. 11 Transient Thermal Response

Package Outline Dimensions

Please see <http://www.diodes.com/package-outlines.html> for the latest version.

SOT23

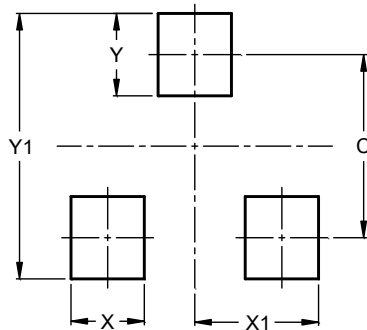


SOT23			
Dim	Min	Max	Typ
A	0.37	0.51	0.40
B	1.20	1.40	1.30
C	2.30	2.50	2.40
D	0.89	1.03	0.915
F	0.45	0.60	0.535
G	1.78	2.05	1.83
H	2.80	3.00	2.90
J	0.013	0.10	0.05
K	0.890	1.00	0.975
K1	0.903	1.10	1.025
L	0.45	0.61	0.55
L1	0.25	0.55	0.40
M	0.085	0.150	0.110
a	0°	8°	--
All Dimensions in mm			

Suggested Pad Layout

Please see <http://www.diodes.com/package-outlines.html> for the latest version.

SOT23



Dimensions	Value (in mm)
C	2.0
X	0.8
X1	1.35
Y	0.9
Y1	2.9

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