

Product Summary

$V_{(BR)DSS}$	$R_{DS(ON)}$	I_D $T_A = +25^\circ C$
30V	45m Ω @ $V_{GS} = 10V$	4.0 A
	50m Ω @ $V_{GS} = 4.5V$	3.5A

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

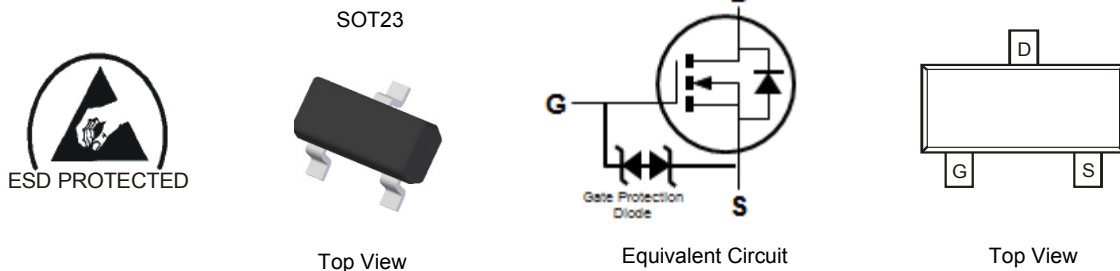
- Load Switch
- DC-DC Converters
- Power management functions

Features and Benefits

- Low On-Resistance
- Low Gate Threshold Voltage
- Low Input Capacitance
- Fast Switching Speed
- Low Input/Output Leakage
- ESD Protected Gate
- **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: 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 e3
- Terminal Connections: See Diagram
- Weight: 0.008 grams (approximate)

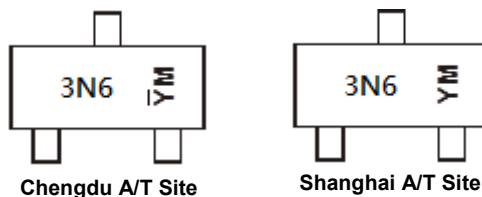


Ordering Information (Note 4)

Part Number	Case	Packaging
DMN3053L-7	SOT23	3000/Tape & Reel
DMN3053L-13	SOT23	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



3N6 = Product Type Marking Code
 YM = Date Code Marking for SAT (Shanghai Assembly/ Test site)
 ȲM = Date Code Marking for CAT (Chengdu Assembly/ Test site)
 Y or Ȳ = Year (ex: A = 2013)
 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}	±12	V
Continuous Drain Current (Note 6) V _{GS} = 10V	Steady State	T _A = +25°C	I _D	4.0	A
		T _A = +70°C		3.5	
Pulsed Drain Current (10µs pulse, duty cycle = 1%)			I _{DM}	35	A
Maximum Body Diode Forward Current (Note 6)			I _S	1.5	A

Thermal Characteristics

Characteristic		Symbol	Value	Units
Total Power Dissipation (Note 5)	T _A = +25°C	P _D	0.76	W
	T _A = +70°C		0.48	
Thermal Resistance, Junction to Ambient (Note 5)	Steady state	R _{θJA}	165	°C/W
	t < 10s	R _{θJA}	114	°C/W
Total Power Dissipation (Note 6)	T _A = +25°C	P _D	1.2	W
	T _A = +70°C		0.8	
Thermal Resistance, Junction to Ambient (Note 6)	Steady state	R _{θJA}	100	°C/W
	t < 10s	R _{θJA}	69	°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}	30	—	—	V	V _{GS} = 0V, I _D = 250µA
Zero Gate Voltage Drain Current	I _{DSS}	—	—	1	µA	V _{DS} = 30V, V _{GS} = 0V
Gate-Body Leakage	I _{GSS}	—	—	±10	µA	V _{GS} = ±10V, V _{DS} = 0V
ON CHARACTERISTICS (Note 7)						
Gate Threshold Voltage	V _{GS(th)}	0.6	—	1.4	V	V _{DS} = V _{GS} , I _D = 250µA
Static Drain-Source On-Resistance	R _{DS(on)}	—	36	45	mΩ	V _{GS} = 10V, I _D = 4.0A V _{GS} = 4.5V, I _D = 3.5A V _{GS} = 3.0V, I _D = 3.0A V _{GS} = 2.5V, I _D = 2.8A
			38	50		
			42	53		
			44	55		
Source-Drain Diode Forward Voltage	V _{SD}	—	0.7	1.2	V	V _{GS} = 0V, I _S = 1.25A
DYNAMIC CHARACTERISTICS (Note 8)						
Input Capacitance	C _{iss}	—	676	—	pF	V _{DS} = 15V, V _{GS} = 0V f = 1.0MHz
Output Capacitance	C _{oss}	—	54	—	pF	
Reverse Transfer Capacitance	C _{rss}	—	42	—	pF	
Gate Resistance	R _g	—	15.5	—	Ω	V _{DS} = V _{GS} = 0V, f = 1.0MHz
Total Gate Charge (V _{GS} = 4.5V)	Q _g	—	7.3	—	nC	V _{DS} = 15V, I _D = 4A
Total Gate Charge (V _{GS} = 10V)	Q _g	—	17.2	—	nC	
Gate-Source Charge	Q _{gs}	—	1.2	—	nC	
Gate-Drain Charge	Q _{gd}	—	0.9	—	nC	
Turn-On Delay Time	t _{D(on)}	—	2.0	—	ns	
Turn-On Rise Time	t _r	—	5.5	—	ns	V _{DD} = 15V, V _{GS} = 10V, R _L = 15Ω, R _G = 6Ω
Turn-Off Delay Time	t _{D(off)}	—	152	—	ns	
Turn-Off Fall Time	t _f	—	32	—	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.

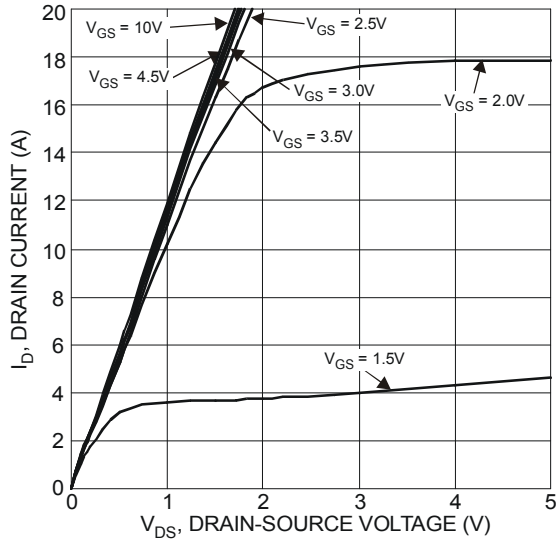


Figure 1 Typical Output Characteristics

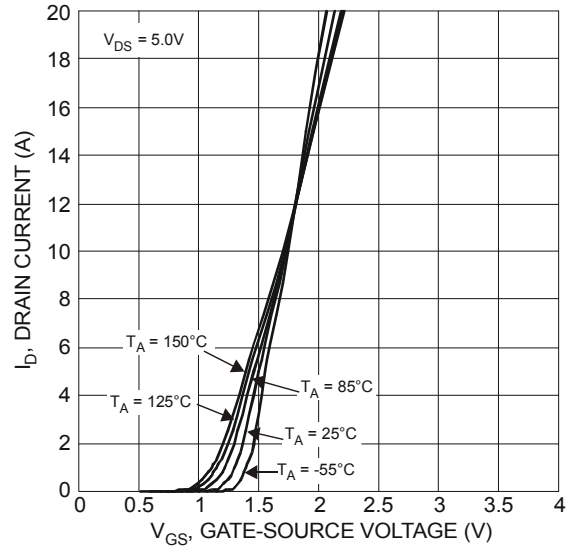


Figure 2 Typical Transfer Characteristics

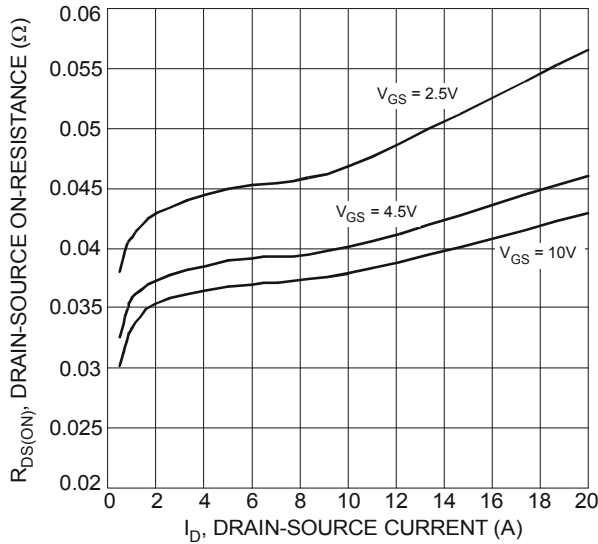


Figure 3 Typical On-Resistance vs. Drain Current and Gate Voltage

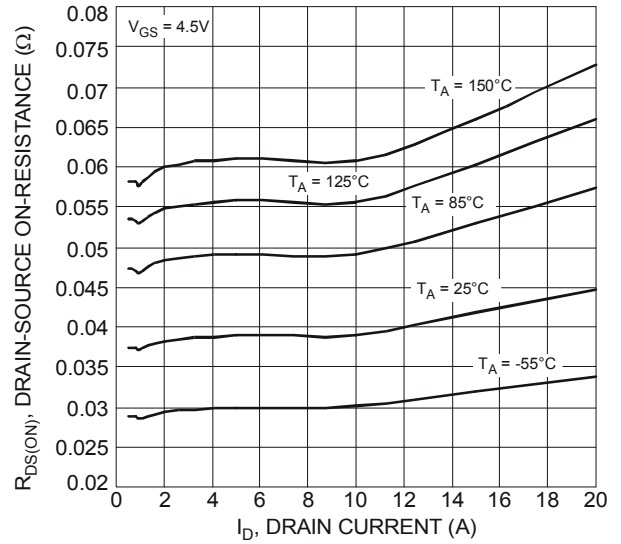


Figure 4 Typical On-Resistance vs. Drain Current and Temperature

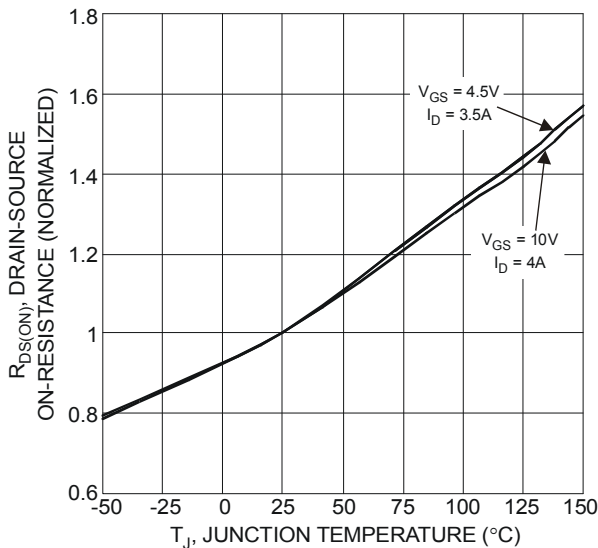


Figure 5 On-Resistance Variation with Temperature

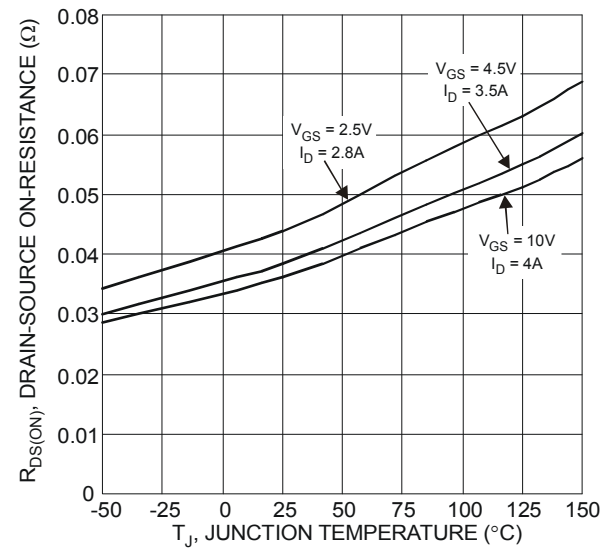


Figure 6 On-Resistance Variation with Temperature

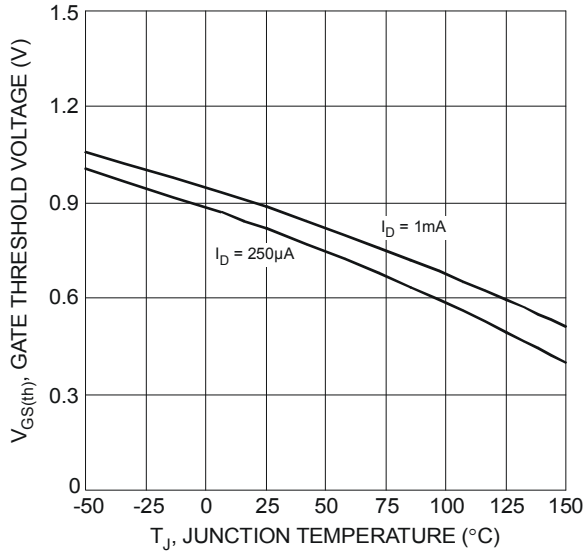


Figure 7 Gate Threshold Variation vs. Ambient Temperature

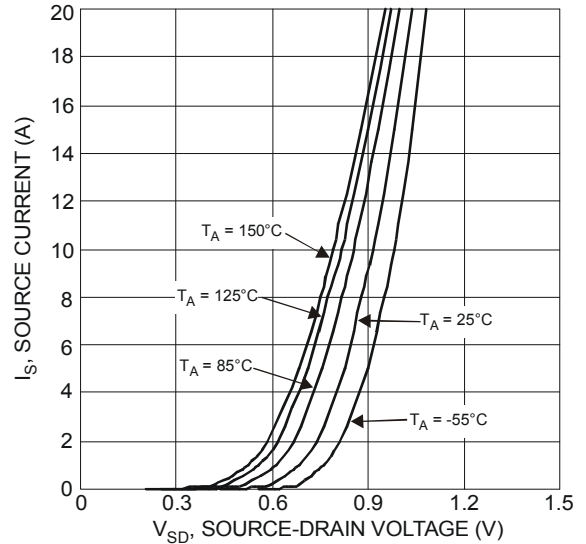


Figure 8 Diode Forward Voltage vs. Current

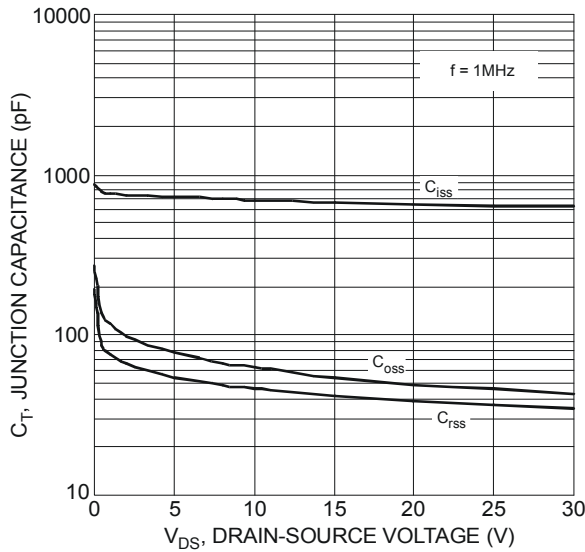


Figure 9 Typical Junction Capacitance

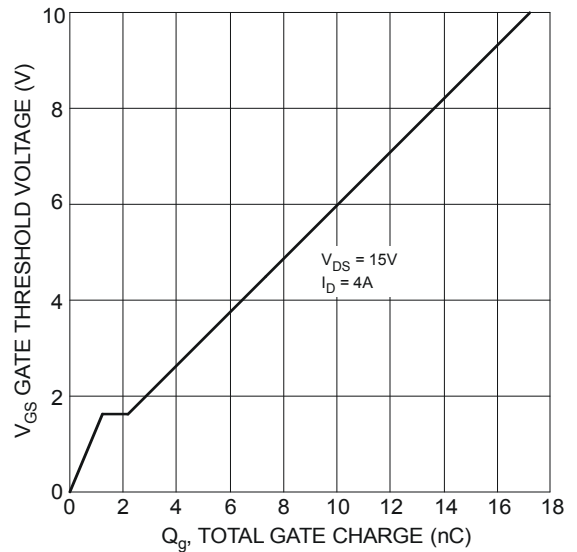


Figure 10 Gate Charge

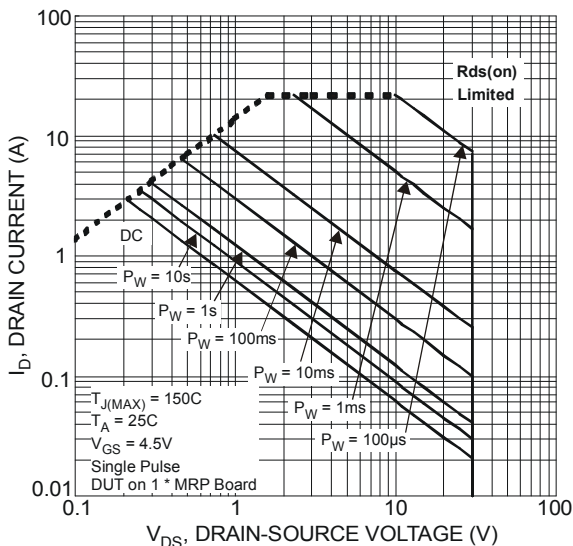
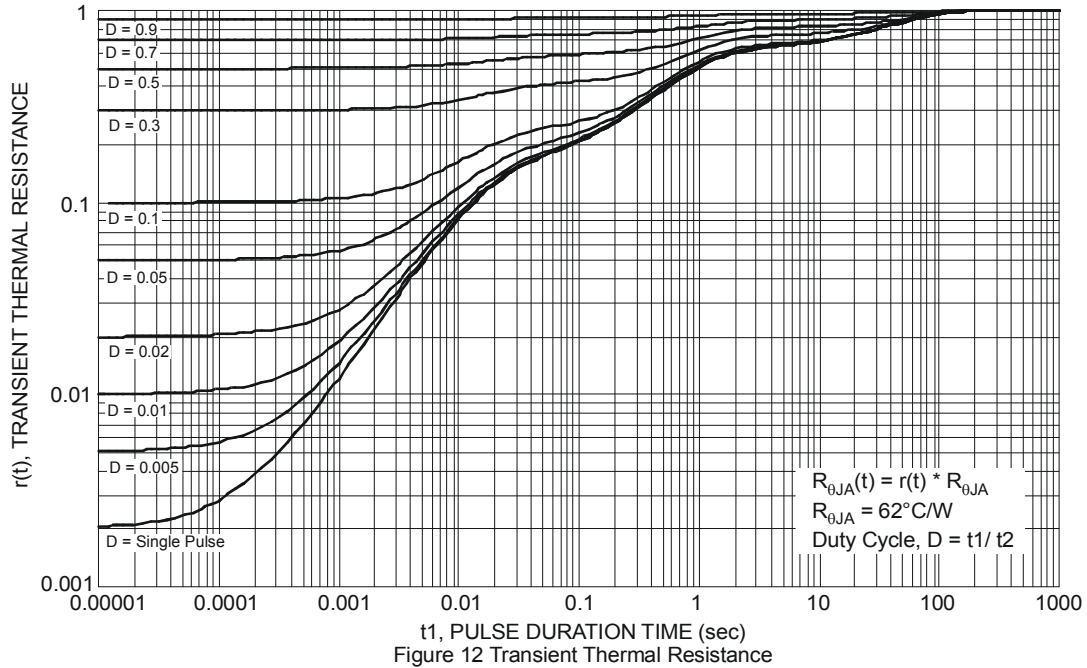
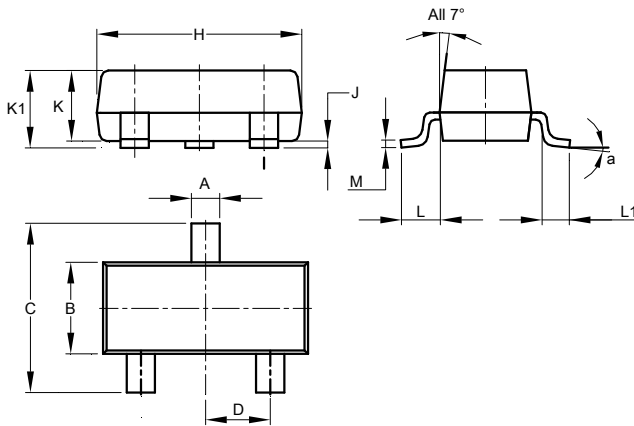


Figure 11 SOA, Safe Operation Area



Package Outline Dimensions

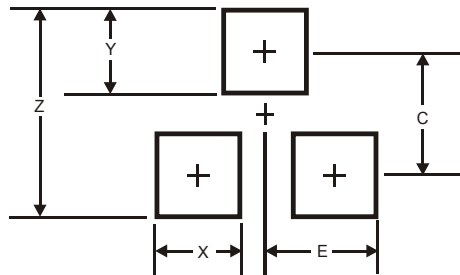
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for latest version.



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	8°		
All Dimensions in mm			

Suggested Pad Layout

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



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

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