

N-CHANNEL ENHANCEMENT MODE FIELD EFFECT TRANSISTOR
Product Summary

BV _{DSS}	R _{DS(ON)}	Package	I _{D max} T _A = +25°C
30V	52mΩ @ V _{GS} = 10V	SOT323	4A
	65mΩ @ V _{GS} = 4.5V		
	85mΩ @ V _{GS} = 2.5V		

Features

- 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)**
- **Qualified to AEC-Q101 Standards for High Reliability**

Applications

- DC-DC Converters
- Power Management Functions
- Battery Operated Systems and Solid-State Relays

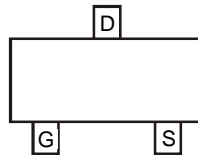
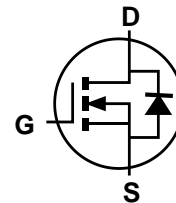
Mechanical Data

- Case: SOT323
- 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 Alloy 42 Leadframe. Solderable per MIL-STD-202, Method 208 ^(e3)
- Terminal Connections: See Diagram
- Weight: 0.006 grams (Approximate)

SOT323



Top View

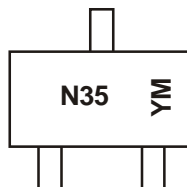

 Pin Configuration
Top View


Equivalent Circuit

Ordering Information (Note 4)

Part Number	Case	Packaging
DMN3065LW-7	SOT323	3000/Tape & Reel
DMN3065LW-13	SOT323	10000/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


N35 = Product Type Marking Code
 YM = Date Code Marking
 Y = Year (ex: G = 2019)
 M = Month (ex: 9 = September)

Date Code Key

Year	2018	2019	2020	2021	2022	2023	2024	2025	2026
Code	F	G	H	I	J	K	L	M	N

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}	±12	V
Drain Current (Note 5)	I _D	4	A
Body-Diode Continuous Current (Note 5)	I _S	1	A

Thermal Characteristics

Characteristic	Symbol	Value	Unit
Total Power Dissipation (Note 5)	P _D	770	mW
Thermal Resistance, Junction to Ambient @T _A = +25°C (Note 5)	R _{θJA}	162	°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}	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}	—	—	±100	nA	V _{GS} = ±12V, V _{DS} = 0V
ON CHARACTERISTICS (Note 6)						
Gate Threshold Voltage	V _{GS(TH)}	0.5	—	1.5	V	V _{DS} = V _{GS} , I _D = 250μA
Static Drain-Source On-Resistance	R _{DS(ON)}	—	—	52 65 85	mΩ	V _{GS} = 10V, I _D = 4A V _{GS} = 4.5V, I _D = 3A V _{GS} = 2.5V, I _D = 2A
Source-Drain Diode Forward Voltage	V _{SD}	—	—	1.2	V	V _{GS} = 0V, I _S = 2.0A
DYNAMIC CHARACTERISTICS (Note 7)						
Input Capacitance	C _{ISS}	—	465	—	pF	V _{DS} = 15V, V _{GS} = 0V, f = 1.0MHz
Output Capacitance	C _{OSS}	—	49.5	—	pF	
Reverse Transfer Capacitance	C _{RSS}	—	43.8	—	pF	
Gate Resistance	R _g	—	2.3	—	Ω	V _{DS} = 0V, V _{GS} = 0V, f = 1MHz
Total Gate Charge (V _{GS} = 10V)	Q _g	—	11.7	—	nC	V _{DS} = 15V, I _D = 4A
Total Gate Charge (V _{GS} = 4.5V)	Q _g	—	5.5	—	nC	V _{DS} = 15V, I _D = 4A
Gate-Source Charge	Q _{gs}	—	1.1	—	nC	
Gate-Drain Charge	Q _{gd}	—	1.8	—	nC	
Turn-On Delay Time	t _{D(ON)}	—	1.9	—	ns	V _{DD} = 15V, V _{GEN} = 10V, R _{GEN} = 3Ω, R _L = 3.75Ω
Turn-On Rise Time	t _R	—	1.6	—	ns	
Turn-Off Delay Time	t _{D(OFF)}	—	10.3	—	ns	
Turn-Off Fall Time	t _F	—	2.0	—	ns	

- Notes: 5. Device mounted on FR-4 substrate PC board, 2oz copper, with 1inch square copper pad layout.
6. Short duration pulse test used to minimize self-heating effect.
7. Guaranteed by design. Not subject to production testing.

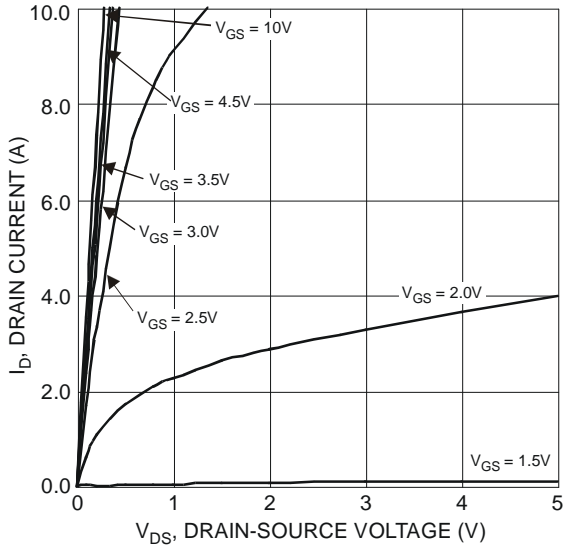


Figure 1 Typical Output Characteristics

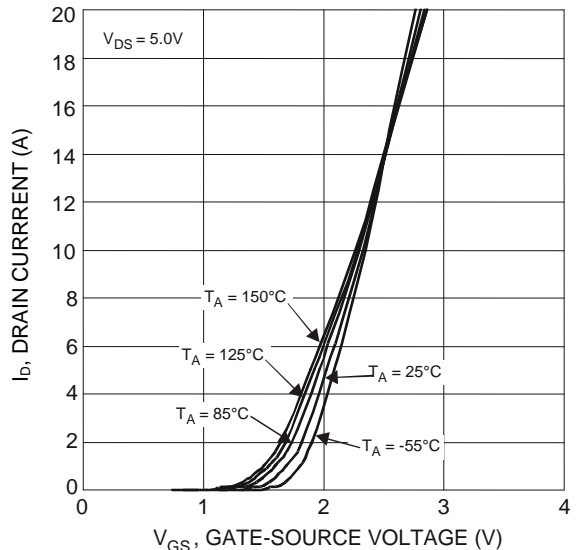


Figure 2 Typical Transfer Characteristics

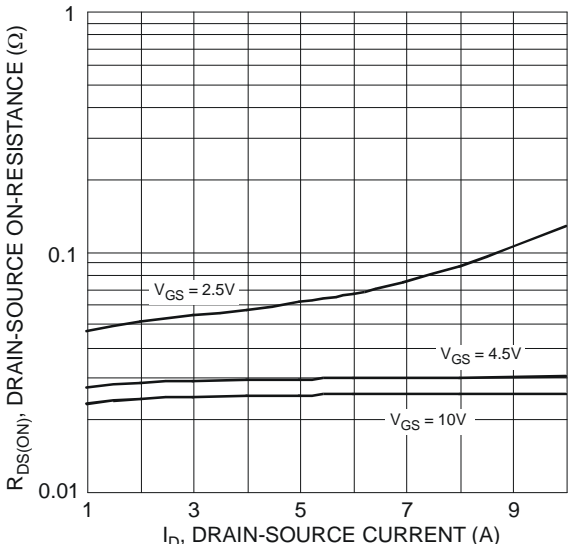


Figure 3 Typical On-Resistance vs. Drain Current and Gate Voltage

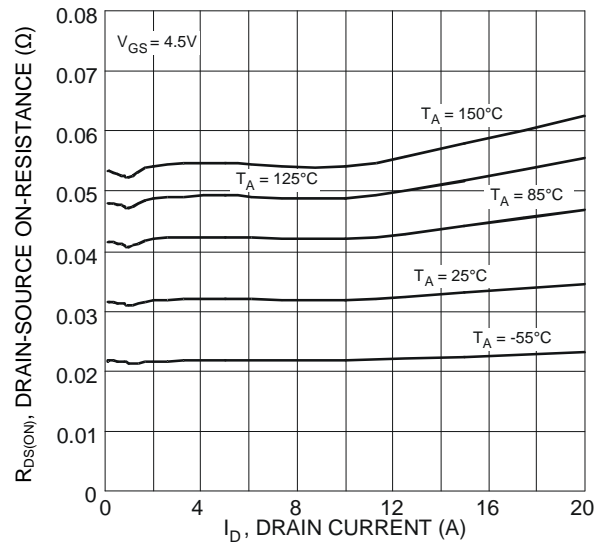


Figure 4 Typical On-Resistance vs. Drain Current and Temperature

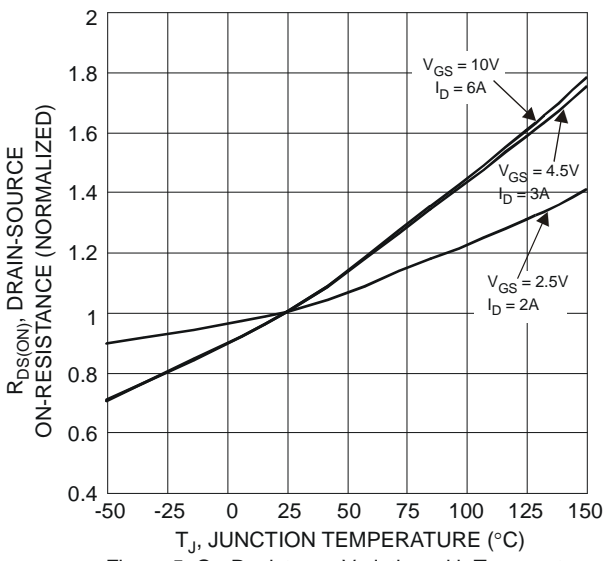


Figure 5 On-Resistance Variation with Temperature

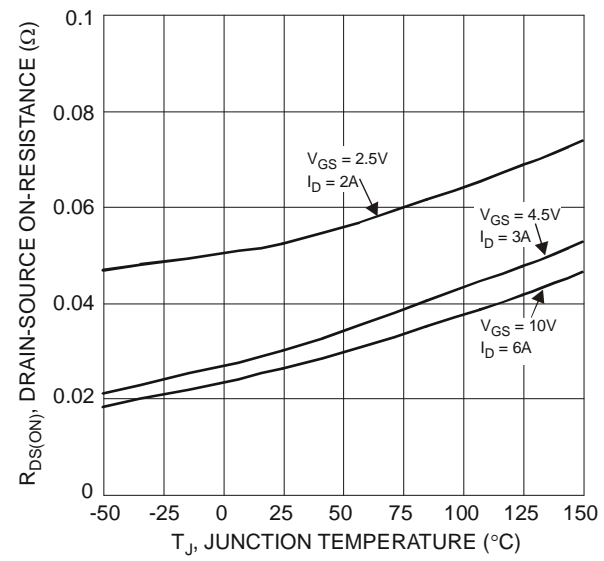


Figure 6 On-Resistance Variation with Temperature

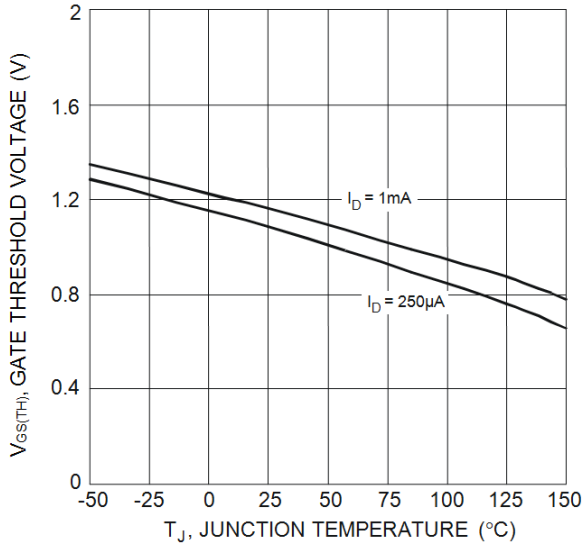


Figure 7 Gate Threshold Variation vs. Junction Temperature

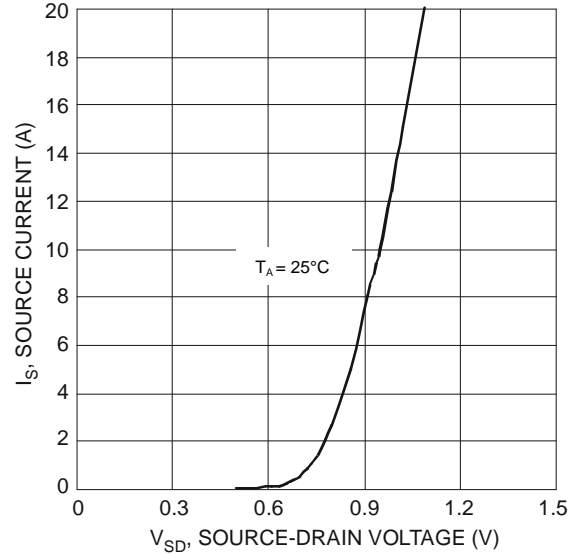


Figure 8 Diode Forward Voltage vs. Current

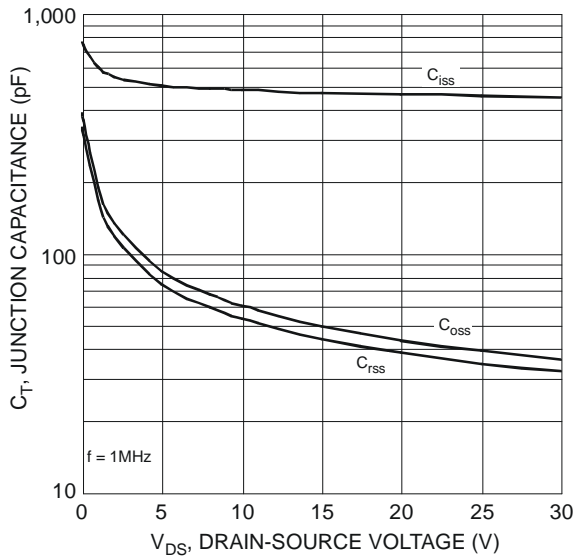


Figure 9 Typical Junction Capacitance

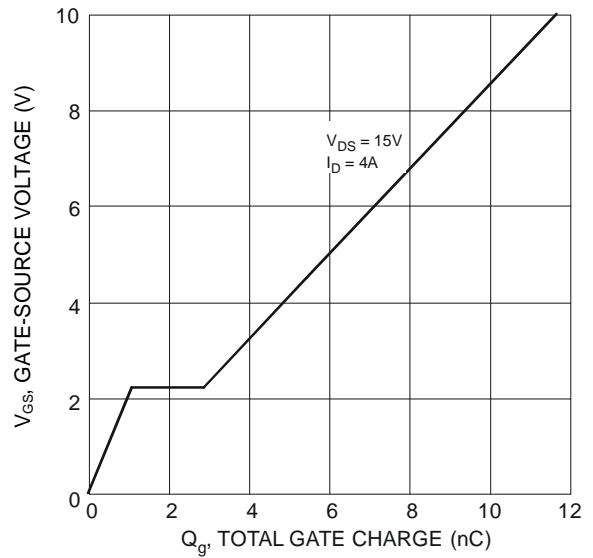


Figure 10 Gate Charge

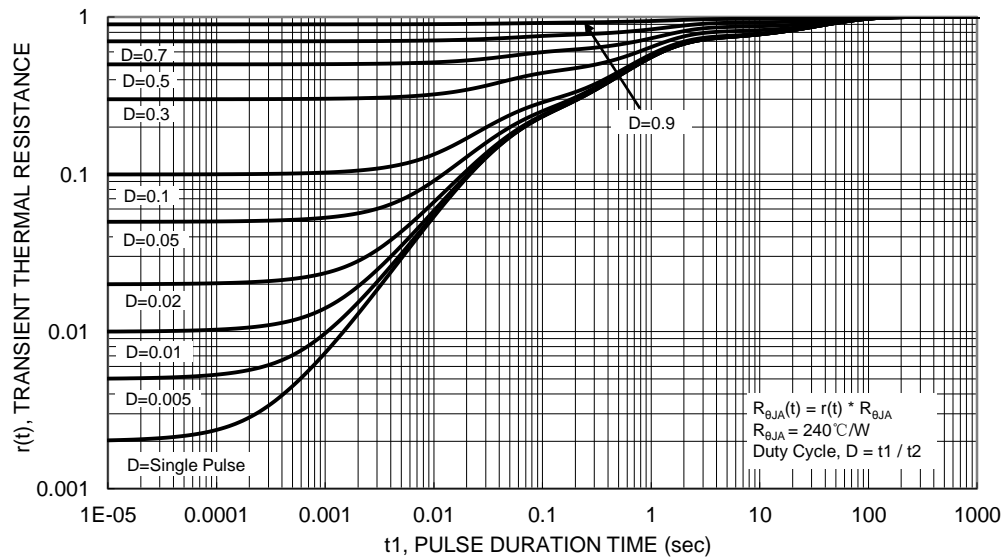


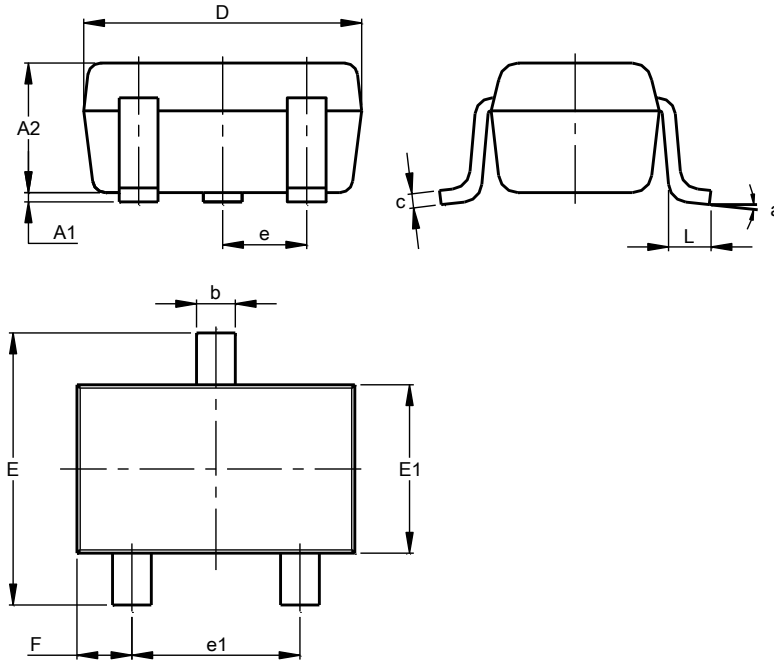
Figure 11. Transient Thermal Resistance

$R_{\theta JA}(t) = r(t) * R_{\theta JA}$
 $R_{\theta JA} = 240^{\circ}\text{C/W}$
 Duty Cycle, $D = t_1 / t_2$

Package Outline Dimensions

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

SOT323

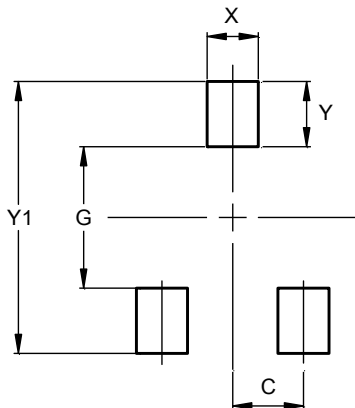


SOT323			
Dim	Min	Max	Typ
A1	0.00	0.10	0.05
A2	0.90	1.00	0.95
b	0.25	0.40	0.30
c	0.10	0.18	0.11
D	1.80	2.20	2.15
E	2.00	2.20	2.10
E1	1.15	1.35	1.30
e	0.650 BSC		
e1	1.20	1.40	1.30
F	0.375	0.475	0.425
L	0.25	0.40	0.30
a	0°	8°	--
All Dimensions in mm			

Suggested Pad Layout

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

SOT323



Dimensions	Value (in mm)
C	0.650
G	1.300
X	0.470
Y	0.600
Y1	2.500

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