

N-CHANNEL ENHANCEMENT MODE FIELD EFFECT TRANSISTOR

Product Summary

BV _{DSS}	R _{DS(ON)}	I _D T _A = +25°C
50V	1.6Ω @ V _{GS} = 10V	350mA
507	2.5Ω @ V _{GS} = 4.5V	200mA

Description and Applications

This MOSFET has been designed to minimize the on-state resistance (RDS(ON)) and yet maintain superior switching performance, making it ideal for high efficiency power management applications.

- Motor Driving
- Power Management Functions
- Load Switching

Features and Benefits

- N-Channel MOSFET
- Low On-Resistance
- Very Low Gate Threshold Voltage
- Low Input Capacitance
- Fast Switching Speed
- Low Input/ Output Leakage
- Ultra-Small Surface Mount Package
- ESD Protected to 2kV
- Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)
- Halogen and Antimony Free. "Green" Device (Note 3)
- For automotive applications requiring specific change control (i.e. parts qualified to AEC-Q100/101/200, PPAP capable, and manufactured in IATF 16949 certified facilities), please contact us or your local Diodes representative.

https://www.diodes.com/quality/product-definitions/

Mechanical Data

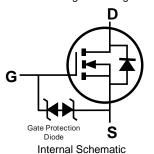
- Case: SOT523
- Case Material: Molded Plastic. "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Matte Tin Finish Annealed over Alloy 42 Leadframe (Lead Free Plating). Solderable per MIL-STD-202, Method 208 (3)
- Terminal Connections: See Diagram
- Weight: 0.002 grams (Approximate)

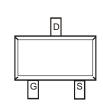




SOT523

Top View





Top View

Ordering Information (Note 4)

Part Number	Case	Packaging
DMN53D0LT-7	SOT523	3000/Tape & Reel
DMN53D0LT-13	SOT523	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.

- 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



T53 = Product Type Marking Code YM = Date Code Marking Y or \overline{Y} = Year (ex: H = 2020) M = Month (ex: 9 = September)

Date Code Key

Year	2014		2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Code	В		Н	I	J	K	L	М	N	0	Р	R
	1	I	I	I	1	1			_			
Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec



Characteristic	Symbol	Value	Unit
Drain Source Voltage	V _{DSS}	50	V
Gate-Source Voltage	Vgss	±20	V
Drain Current (Note 5)	I _D	350	mA

Thermal Characteristics (@TA = +25°C, unless otherwise specified.)

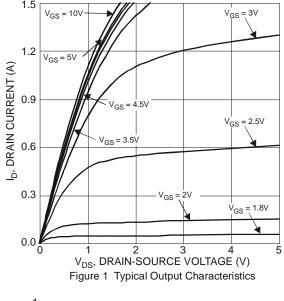
Characteristic	Symbol	Value	Unit
Total Power Dissipation (Note 5)	P _D	300	mW
Thermal Resistance, Junction to Ambient (Note 5)	$R_{ heta JA}$	420	°C/W
Operating and Storage Temperature Range	T _J , T _{STG}	-55 to +150	°C

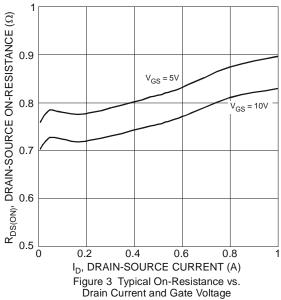
Electrical Characteristics (@TA = +25°C, unless otherwise specified.)

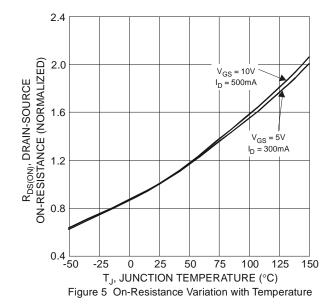
Characteristic	Symbol	Min	Тур	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 6)						
Drain-Source Breakdown Voltage	BVDSS	50	_	_	V	$V_{GS} = 0V$, $I_{D} = 250 \mu A$
Zero Gate Voltage Drain Current	IDSS	_	_	1.0	μA	V _{DS} = 50V, V _{GS} = 0V
Gate-Body Leakage	Igss	_	_	_	μA	$V_{GS} = \pm 20V$, $V_{DS} = 0V$
ON CHARACTERISTICS (Note 6)						
Gate Threshold Voltage	Vgs(TH)	0.8		1.5	V	$V_{DS} = V_{GS}$, $I_D = 250 \mu A$
Static Drain-Source On-Resistance	R _{DS(ON)}	_	1.08 1.09 1.45	1.6 2.5 4.5	Ω	$V_{GS} = 10V, I_D = 500mA$ $V_{GS} = 4.5V, I_D = 200mA$ $V_{GS} = 2.5V, I_D = 100mA$
Source-Drain Diode Forward Voltage	VsD	_	0.88	1.4	V	Vgs = 0V, Is = 500mA
DYNAMIC CHARACTERISTICS (Note 7)						
Input Capacitance	Ciss	_	46	_	pF	.,
Output Capacitance	Coss	_	5.3	_	pF	V _{DS} = 25V, V _{GS} = 0V f = 1.0MHz
Reverse Transfer Capacitance	C _{rss}	_	4.0	_	pF	1 - 1.0WH2
Total Gate Charge	Q_g	_	0.6	_	nC	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \
Gate-Source Charge	Qgs	_	0.2	_	nC	Vgs = 4.5V, Vps = 10V, In = 250mA
Gate-Drain Charge	Q_{gd}	_	0.1	_	nC	ID = 250IIIA
Turn-On Delay Time	t _D (ON)	_	2.7	_	ns	
Turn-On Rise Time	tR	_	2.5		ns	$V_{DD} = 30V, V_{GS} = 10V,$
Turn-Off Delay Time	tD(OFF)		19		ns	$R_G = 25\Omega$, $I_D = 200mA$
Turn-Off Fall Time	tF	_	11	_	ns	

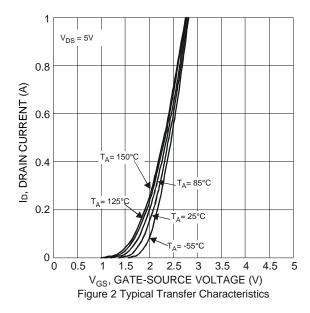
5. Device mounted on FR-4 substrate PC board, 2oz copper, with thermal vias to bottom layer 1inch square copper plate.6. Short duration pulse test used to minimize self-heating effect.7. Guaranteed by design. Not subject to product testing. Notes:

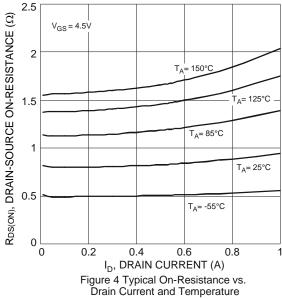












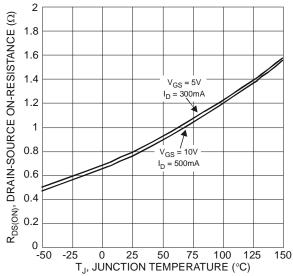
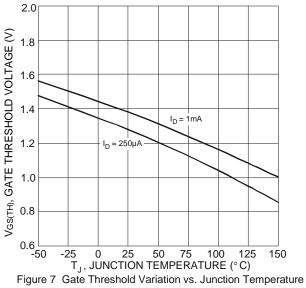
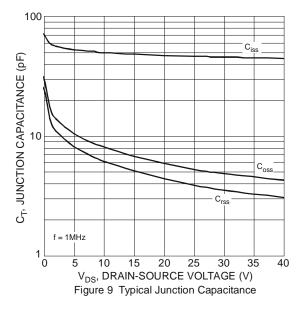
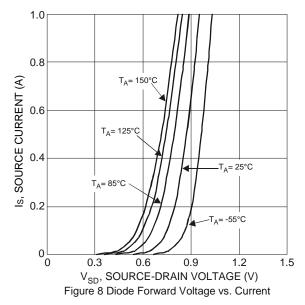


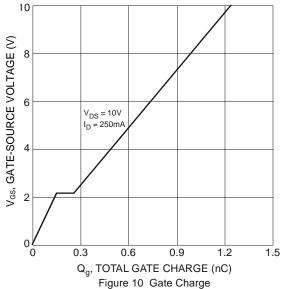
Figure 6 On-Resistance Variation with Temperature









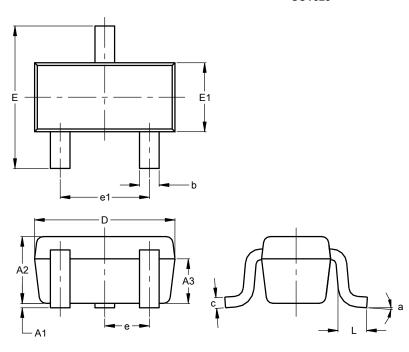




Package Outline Dimensions

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

SOT523

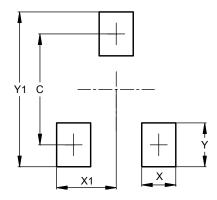


SOT523							
Dim	Min	Max	Тур				
A 1	0.00	0.10	0.05				
A2	0.60	0.80	0.75				
A3	0.45	0.65	0.50				
b	0.15	0.30	0.22				
С	0.10	0.20	0.12				
D	1.50	1.70	1.60				
Е	1.45	1.75	1.60				
E1	0.75	0.85	0.80				
е	0.50 BSC						
e1	0.90	1.10	1.00				
Г	0.20	0.40	0.33				
а	0°		8°				
Al	I Dimen						

Suggested Pad Layout

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

SOT523



Dimensions	Value (in mm)
С	1.29
Х	0.40
X1	0.70
Y	0.51
Y1	1.80



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