



N-CHANNEL ENHANCEMENT MODE MOSFET

Product Summary

V _{(BR)DSS}	R _{DS(ON)}	I _D T _A = +25°C
130V	0.75Ω @ V _{GS} = 10V	1.0A
130 V	0.85Ω @ $V_{GS} = 6.0V$	0.9A

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

- DC-DC Converters
- Power Management Functions
- Battery Operated Systems and Solid-State Relays
- Drivers: Relays, Solenoids, Lamps, Hammers, Displays, Memories, Transistors, etc.

Features and Benefits

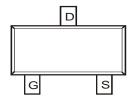
- Low Gate Threshold Voltage
- Low Input Capacitance
- Fast Switching Speed
- Small Surface Mount Package
- Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)
- Halogen and Antimony Free. "Green" Device (Note 3)

Mechanical Data

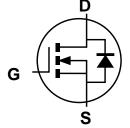
- Case: SOT23
- Case Material: Molded Plastic. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Solderable per MIL-STD-202, Method 208 (e3)
- Lead Free Plating (Matte Tin Finish Annealed over Alloy 42 Leadframe)
- Terminal Connections: See Diagram
- Weight: 0.006 grams (Approximate)







Top View Pin Configuration



Equivalent Circuit

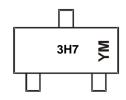
Ordering Information (Note 4)

Part Number	Case	Packaging
DMN13H750S-7	SOT23	3,000/Tape & Reel
DMN13H750S-13	SOT23	10,000/Tape & Reel

Notes:

- 1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant.
- 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



3H7 = Product Type Marking Code YM = Date Code Marking Y or Y = Year (ex: C = 2015) M = Month (ex: 9 = September)

Date Code Key

Year	2014		2015	2016		2017	2018		2019	2020		2021
Code	В		С	D		Е	F		G	Н		1
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



Maximum Ratings (@T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Unit		
Drain-Source Voltage	V_{DSS}	130	V		
Gate-Source Voltage	V_{GSS}	±20	V		
Continuous Davis Courset (Note C) V	Steady State	$T_A = +25^{\circ}C$ $T_A = +70^{\circ}C$	I _D	1.0 0.8	А
Continuous Drain Current (Note 6) V _{GS} = 10V	t<10s	$T_A = +25$ °C $T_A = +70$ °C	ID	1.2 1.0	А
Pulsed Drain Current (10µs Pulse, Duty Cycle ≦1%)	I _{DM}	3.3	Α		
Maximum Body Diode Continuous Current (Note 6)	I _S	1.2	А		

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

Characteristic	Symbol	Value	Units		
Total Dawer Dissination	(Note 5)	_	0.77	۱۸/	
Total Power Dissipation	(Note 6)	P_D	1.26	W	
Thermal Decistores, Junction to Ambient (Note 5)	Steady state	Б	163		
Thermal Resistance, Junction to Ambient (Note 5)	t<10s	$R_{\theta JA}$	115		
Thermal Decistores, Junction to Ambient (Note 6)	Steady state	Б	99	°C/W	
Thermal Resistance, Junction to Ambient (Note 6)	t<10s	$R_{\theta JA}$	70		
Thermal Resistance, Junction to Case	(Note 6)	$R_{\theta JC}$	17.3		
Operating and Storage Temperature Range		T _{J,} T _{STG}	-55 to +150	°C	

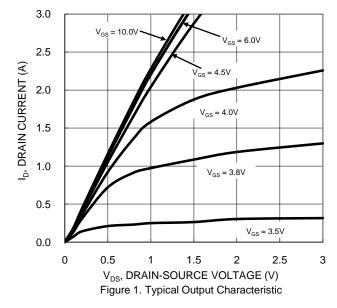
Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)

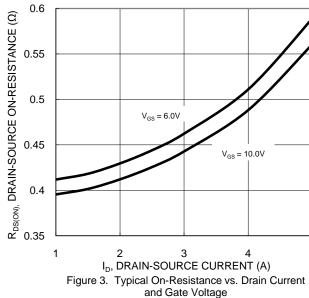
Characteristic	Symbol	Min	Тур	Max	Unit	Test Condition		
OFF CHARACTERISTICS (Note 7)								
Drain-Source Breakdown Voltage	BV _{DSS}	130	_	_	>	$V_{GS} = 0V, I_D = 250\mu A$		
Zero Gate Voltage Drain Current	I _{DSS}	_	_	100	nΑ	$V_{DS} = 120V, V_{GS} = 0V$		
Gate-Body Leakage	I _{GSS}	_	_	±100	nΑ	$V_{GS} = \pm 20V, V_{DS} = 0V$		
ON CHARACTERISTICS (Note 7)								
Gate Threshold Voltage	V _{GS(TH)}	2.0	2.7	4.0	>	$V_{DS} = V_{GS}, I_D = 250 \mu A$		
Static Drain-Source On-Resistance	D	_	0.41	0.75	Ω	$V_{GS} = 10V, I_D = 2.0A$		
Static Drain-Source On-Resistance	R _{DS (ON)}	_	0.43	0.85	52	$V_{GS} = 6.0V, I_D = 2.0A$		
Diode Forward Voltage	V_{SD}	_	0.8	1.2	V	$V_{GS} = 0V, I_{S} = 1.0A$		
DYNAMIC CHARACTERISTICS (Note 8)								
Input Capacitance	Ciss	_	231			$V_{DS} = 25V, V_{GS} = 0V,$ f = 1.0MHz		
Output Capacitance	Coss	_	19		pF			
Reverse Transfer Capacitance	C_{rss}	_	11			1 = 1.01/11/12		
Gate Resistance	R_{G}	_	2.3	_	Ω	$V_{DS} = 0V$, $V_{GS} = 0V$, $f = 1.0MHz$		
Total Gate Charge	Qg	_	5.6	_		10.41/ 1/ 101/		
Gate-Source Charge	Q_{gs}		0.8	_	nC	$V_{DS} = 104V, V_{GS} = 10V,$		
Gate-Drain Charge	Q _{gd}	_	2.0	_		$I_D = 2.0A$		
Turn-On Delay Time	t _{D(ON)}		2.3	_				
Turn-On Rise Time	t _R	_	1.7	_	20	$V_{DS} = 65V, I_{D} = 2.0A,$		
Turn-Off Delay Time	t _{D(OFF)}	_	6.6	_	ns	$V_{GS} = 10V$, $R_G = 6.0\Omega$		
Turn-Off Fall Time	t _F		1.7					
Reverse Recovery Time	t _{RR}	_	26	_	ns	\/ 100\/		
Reverse Recovery Charge	Q_{RR}		21	_	nC	$V_R = 100V$, $I_F=1.0A$, $di/dt=100A/\mu s$		

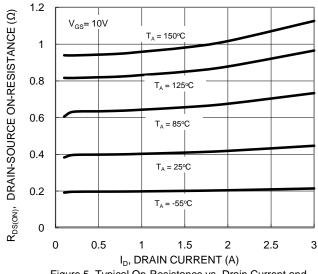
Notes:

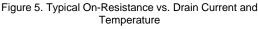
- 5. Device mounted on FR-4 PC board, with minimum recommended pad layout, single sided.
 6. Device mounted on FR-4 substrate PC board, 2oz copper, with 1inch square copper pad layout.
 7 .Short duration pulse test used to minimize self-heating effect.
 8. Guaranteed by design. Not subject to production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

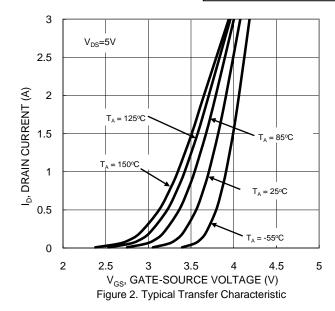


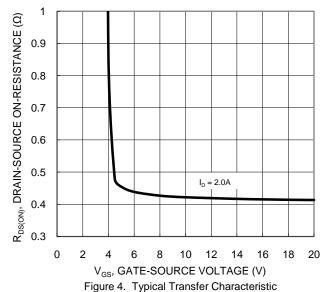












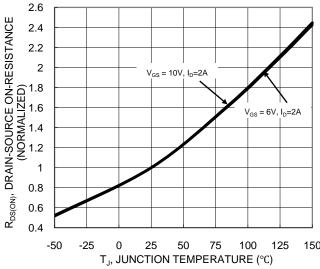


Figure 6. On-Resistance Variation with Temperature

 $I_D = 1 \text{mA}$

100

125

150

75



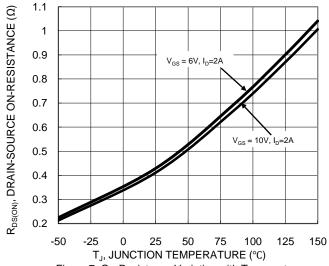
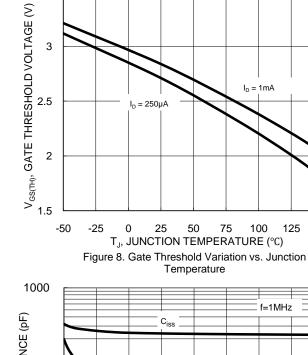


Figure 7. On-Resistance Variation with Temperature



3.5

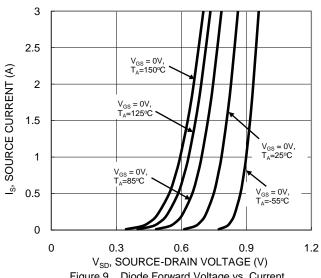
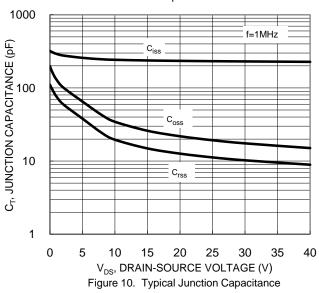
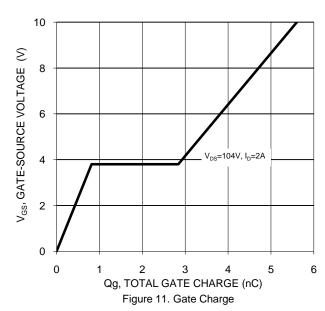
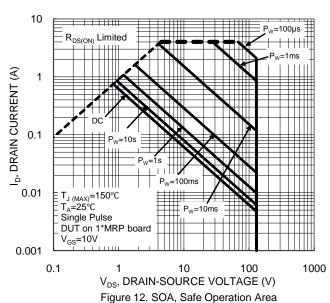


Figure 9. Diode Forward Voltage vs. Current









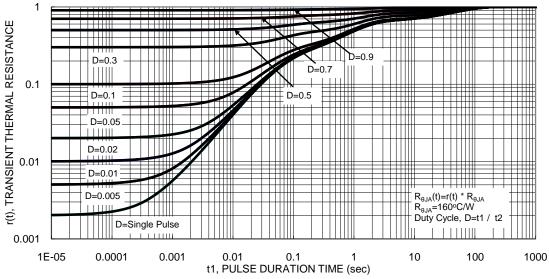
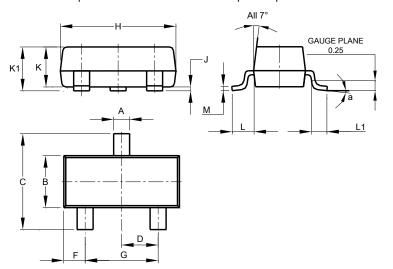


Figure 13. Transient Thermal Resistance

Package Outline Dimensions

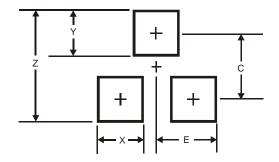
Please see AP02002 at http://www.diodes.com/datasheets/ap02002.pdf for the latest version.



SOT23							
Dim	Min	Max	Тур				
Α	0.37	0.51	0.40				
В	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				
Η	2.80	3.00	2.90				
7	0.013	0.10	0.05				
K	0.890	1.00	0.975				
K 1	0.903	1.10	1.025				
٦	0.45	0.61	0.55				
L1	0.25	0.55	0.40				
М	0.085	0.150	0.110				
а	a 8°						
All Dimensions in mm							

Suggested Pad Layout

Please see AP02001 at http://www.diodes.com/datasheets/ap02001.pdf for the latest version.



Dimensions	Value (in mm)
Z	2.9
Х	0.8
Y	0.9
С	2.0
E	1.35



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