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X I N B O L E

Product Specification

DMTH4008LPS-13

N-Channel Enhancement Mode MOSFET

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Descriptions

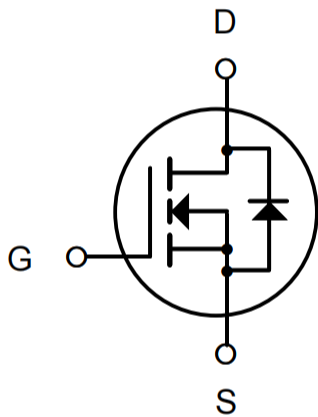
The DMTH4008LPS-13 uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with gate voltages as low as 4.5V. This device is suitable for use as a Battery protection or in other Switching application.

Features

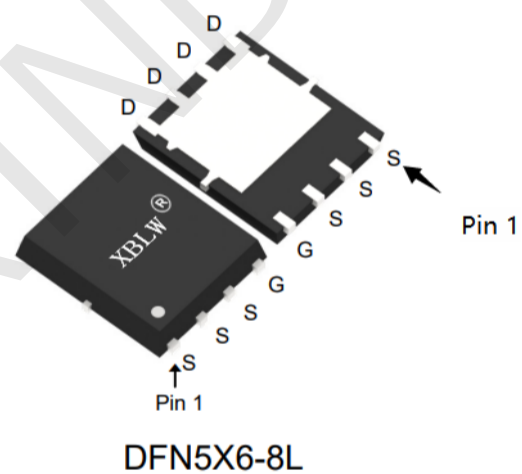
- $V_{DS} = 40V, I_D = 60A$
- $R_{DS(ON)} < 8.5m\Omega @ V_{GS} = 10V$

Applications

- Battery protection
- Load switch
- Uninterruptible power supply



N-Channel MOSFET



DFN5X6-8L

Ordering Information

Product Model	Package Type	Marking	Packing	Packing Qty
DMTH4008LPS-13	DFN5X6-8L	H4008LP	Tape	5000Pcs/Reel

Absolute Maximum Ratings ($T_C=25\text{ }^\circ\text{C}$ unless otherwise specified)

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	40	V
V_{GS}	Gate-Source Voltage	± 20	V
$I_D@T_C=25\text{ }^\circ\text{C}$	Continuous Drain Current, V_{GS} @ 10V ¹	60	A
$I_D@T_C=100\text{ }^\circ\text{C}$	Continuous Drain Current, V_{GS} @ 10V ¹	35	A
I_{DM}	Pulsed Drain Current ²	105	A
EAS	Single Pulse Avalanche Energy ³	48	mJ
I_{AS}	Avalanche Current	35	A
$P_D@T_C=25\text{ }^\circ\text{C}$	Total Power Dissipation ⁴	39	W
T_{STG}	Storage Temperature Range	-55 to 150	$^\circ\text{C}$
T_J	Operating Junction Temperature Range	-55 to 150	$^\circ\text{C}$
$R_{\theta JA}$	Thermal Resistance Junction-ambient (Steady State) ¹	62	$^\circ\text{C}/\text{W}$
$R_{\theta JC}$	Thermal Resistance Junction-Case ¹	3.2	$^\circ\text{C}/\text{W}$

Electrical Characteristics (T_J=25°C unless otherwise specified)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V , I _D =250uA	40	---	---	V
R _{DS(ON)}	Static Drain-Source On-Resistance ²	V _{GS} =10V , I _D =10A	---	7	8.5	mΩ
		V _{GS} =4.5V , I _D =5A	---	10	15	
V _{GS(th)}	Gate Threshold Voltage	V _{GS} =V _{DS} , I _D =250uA	1.0	1.7	3	V
I _{DSS}	Drain-Source Leakage Current	V _{DS} =32V , V _{GS} =0V , T _J =25°C	---	---	1	uA
		V _{DS} =32V , V _{GS} =0V , T _J =55°C	---	---	5	
I _{GSS}	Gate-Source Leakage Current	V _{GS} = ±20V , V _{DS} =0V	---	---	±100	nA
g _{fs}	Forward Transconductance	V _{DS} =10V , I _D =5A	---	27	---	S
Q _g	Total Gate Charge (4.5V)	V _{DS} =20V , V _{GS} =4.5V , I _D =10A	---	20	---	nC
Q _{gs}	Gate-Source Charge		---	5.8	---	
Q _{gd}	Gate-Drain Charge		---	9.5	---	
T _{d(on)}	Turn-On Delay Time	V _{DD} =15V , V _{GS} = 10V R _G =3.3 Ω I _D =1A	---	15.2	---	ns
T _r	Rise Time		---	8.8	---	
T _{d(off)}	Turn-Off Delay Time		---	74	---	
T _f	Fall Time		---	7	---	
C _{iss}	Input Capacitance	V _{DS} =15V , V _{GS} =0V , f=1MHz	---	690	---	pF
C _{oss}	Output Capacitance		---	193	---	
C _{rss}	Reverse Transfer Capacitance		---	38	---	
I _S	Continuous Source Current ^{1,5}	V _G =V _D =0V , Force Current	---	---	60	A
V _{SD}	Diode Forward Voltage ²	V _{GS} =0V , I _S =1A , T _J =25°C	---	---	1	V

Note :

- 1.The data tested by surface mounted on a 1 inch² FR-4 board with 2OZ copper.
- 2.The data tested by pulsed , pulse width ≤ 300us , duty cycle ≤ 2%.
- 3.The EAS data shows Max. rating . The test condition is V_{DD}=-25V,V_{GS}=10V,L=0.1mH,I_{AS}=47A.
- 4.The power dissipation is limited by 150°C junction temperature.
- 5.The data is theoretically the same as I_D and I_{DM} , in real applications , should be limited by total power dissipation.

Typical Characteristics

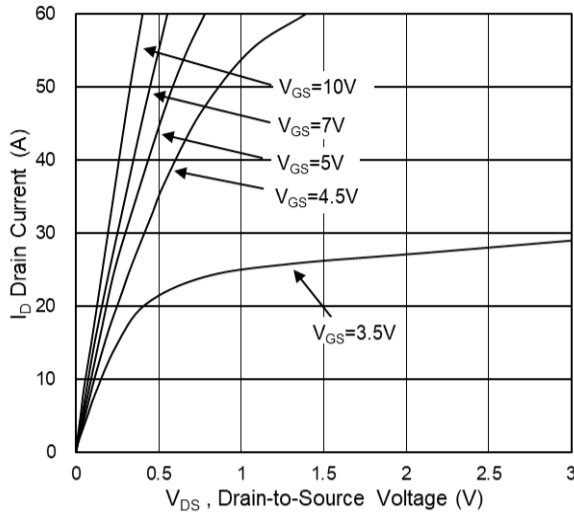


Fig 1. Typical Output Characteristics

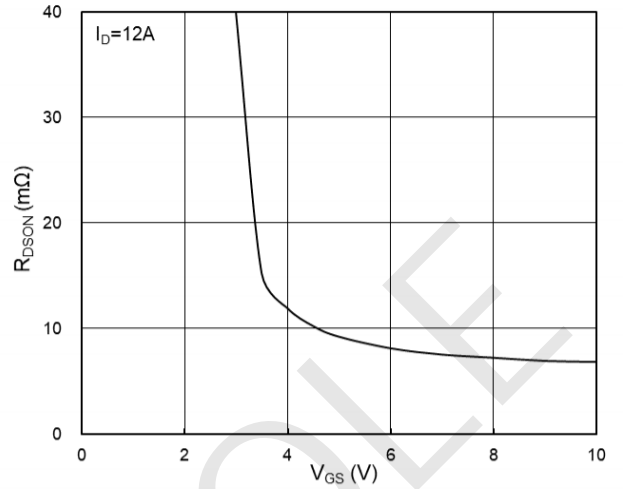


Fig 2. On-Resistance vs. G-S Voltage

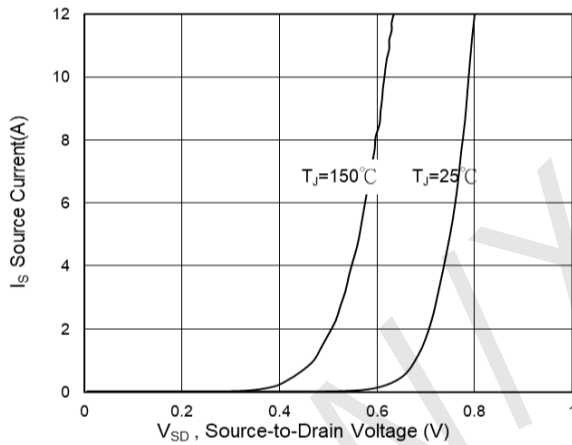


Fig.3 Source Drain Forward Characteristics

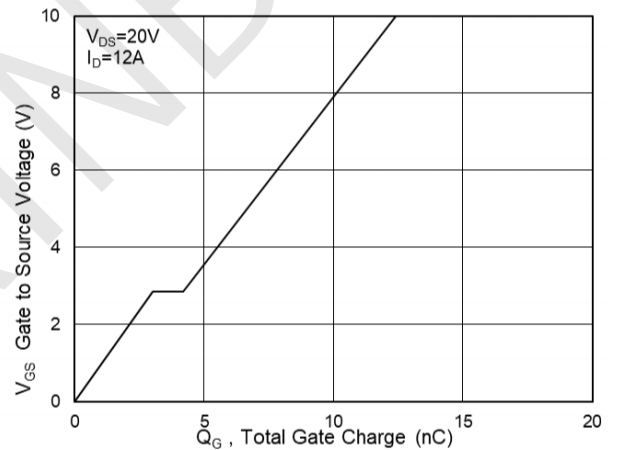


Fig 4. Gate-Charge Characteristics

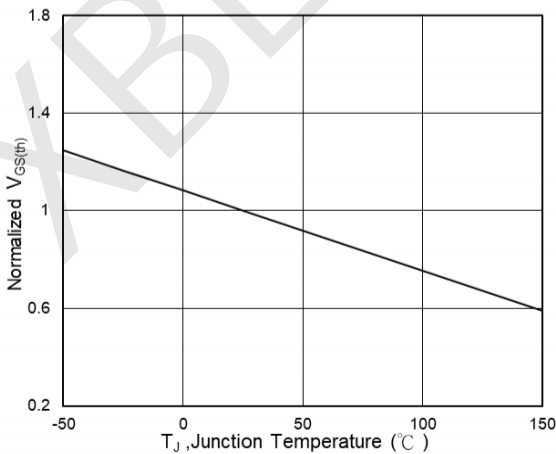


Fig 5. Normalized $V_{GS(th)}$ vs. T_J

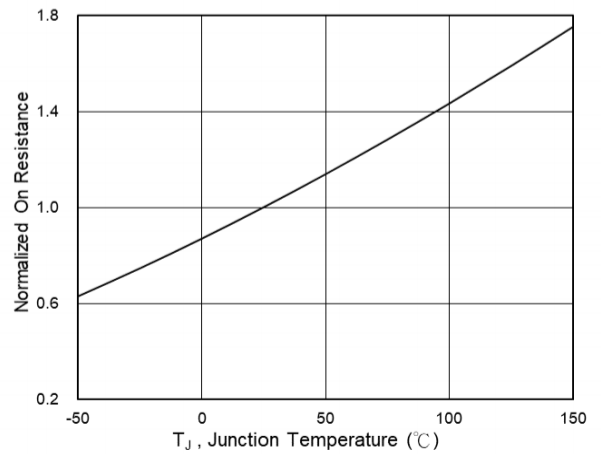


Fig 6. Normalized $R_{DS(on)}$ vs T_J

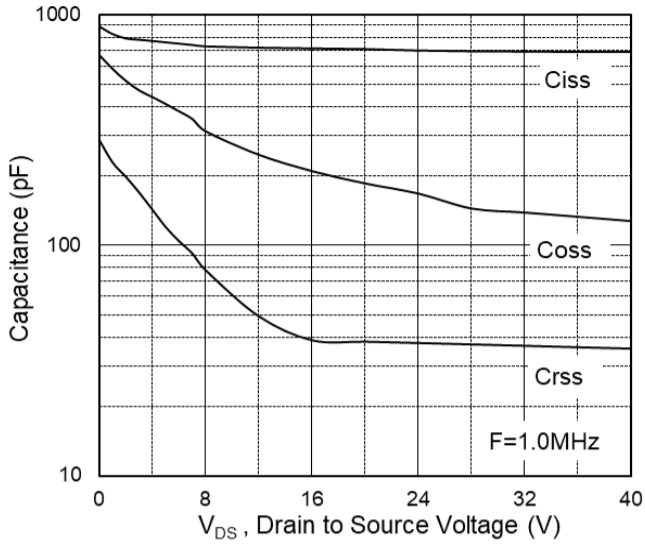


Fig 7. Capacitance

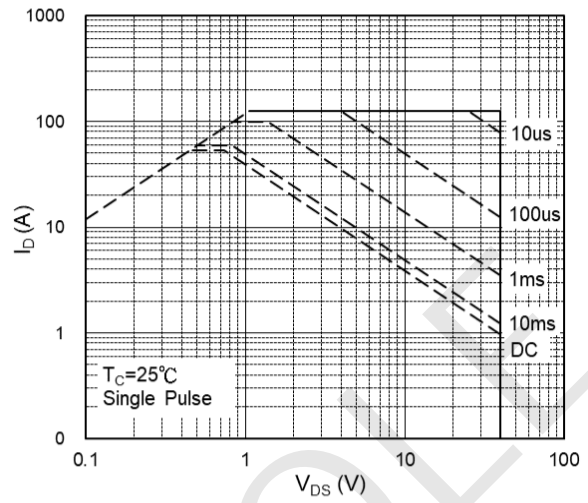


Fig 8. Safe Operating Area

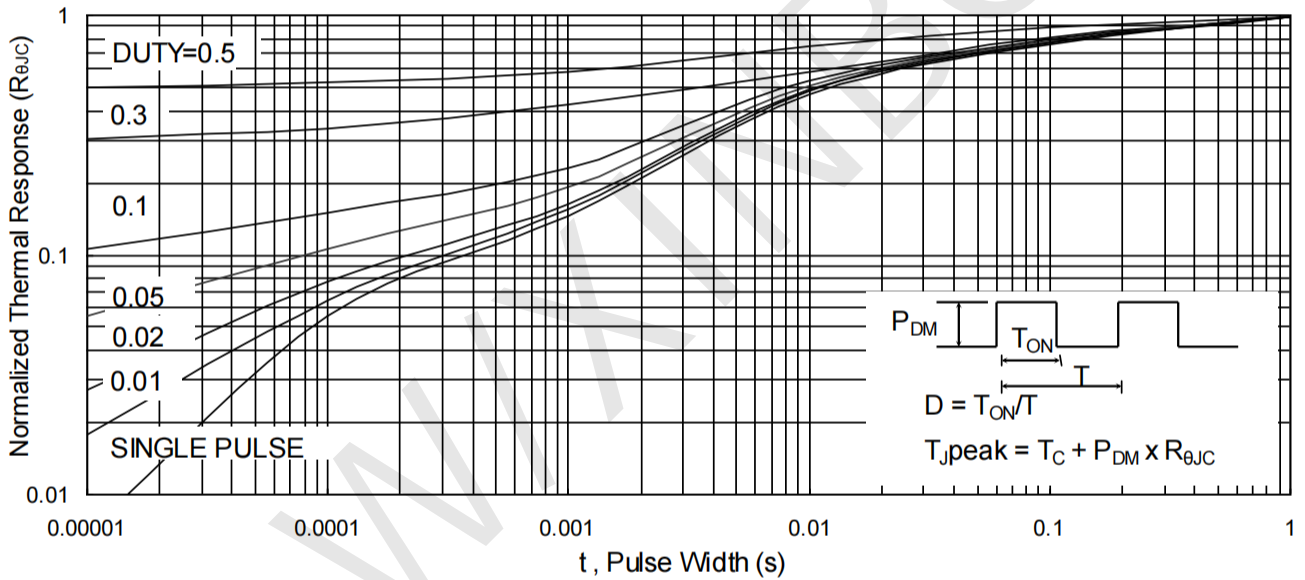


Fig 9. Normalized Maximum Transient Thermal Impedance

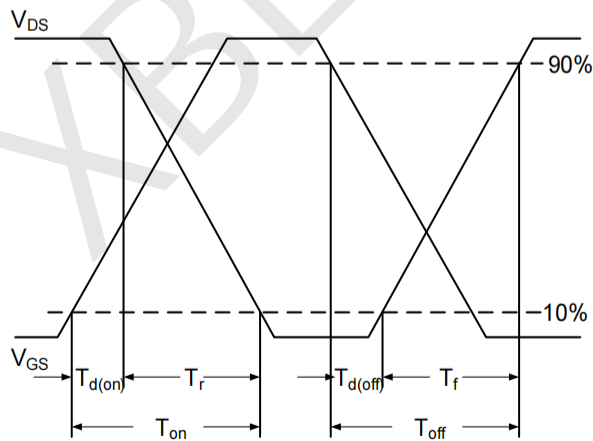


Fig 10. Switching Time Waveform

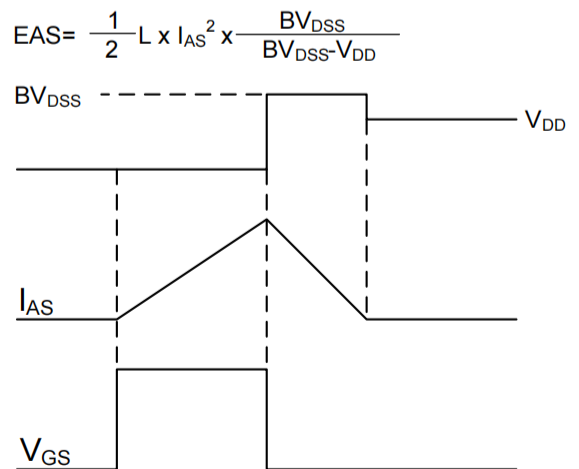
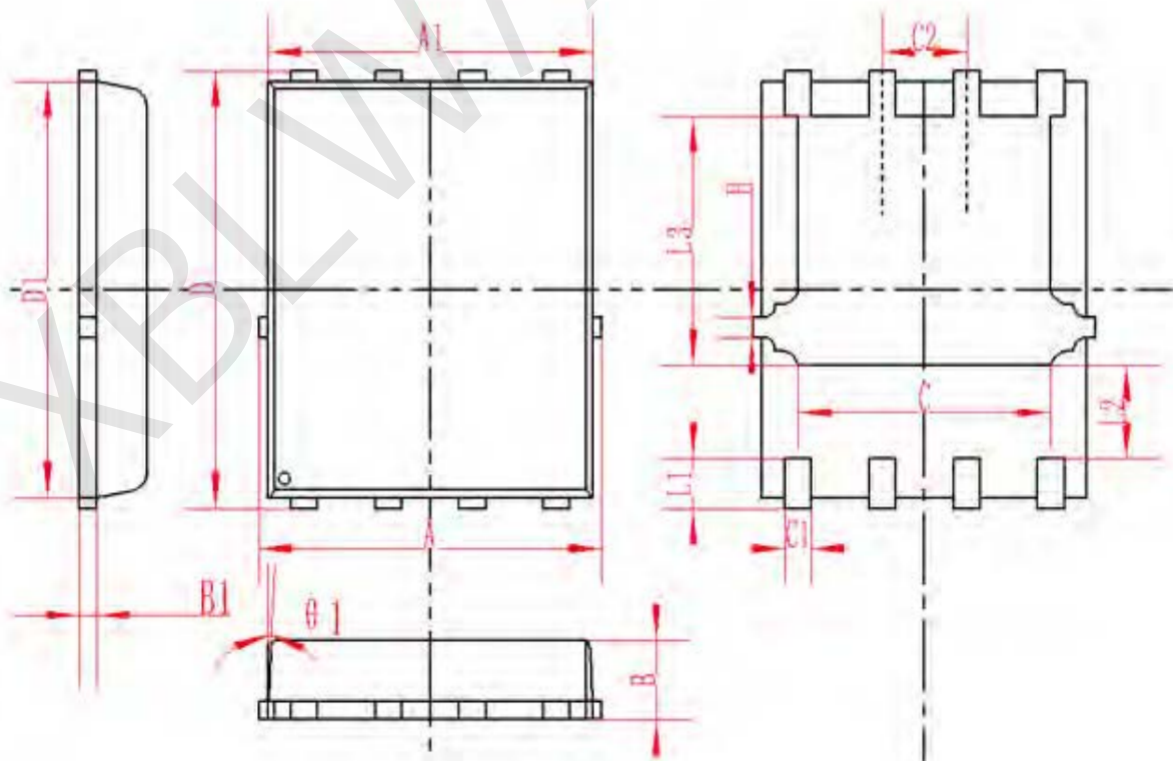


Fig 11. Unclamped Inductive Waveform

Package Information

DFN5X6-8L

SYMBOL	MM			INCH		
	MIN	NOM	MAX	MIN	NOM	MAX
A	4.95	5	5.05	0.195	0.197	0.199
A1	4.82	4.9	4.98	0.190	0.193	0.196
D	5.98	6	6.02	0.235	0.236	0.237
D1	5.67	5.75	5.83	0.223	0.226	0.230
B	0.9	0.95	1	0.035	0.037	0.039
B1	0.254REF			0.010REF		
C	3.95	4	4.05	0.156	0.157	0.159
C1	0.35	0.4	0.45	0.014	0.016	0.018
C2	1.27TYP			0.5TYP		
$\theta 1$	8°	10°	12°	8°	10°	12°
L1	0.63	0.64	0.65	0.025	0.025	0.026
L2	1.2	1.3	1.4	0.047	0.051	0.055
L3	3.415	3.42	3.425	0.134	0.135	0.135
H	0.24	0.25	0.26	0.009	0.010	0.010



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