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Product Specification

DMTH43M8LPSQ

N-Channel Enhancement Mode MOSFET

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Descriptions

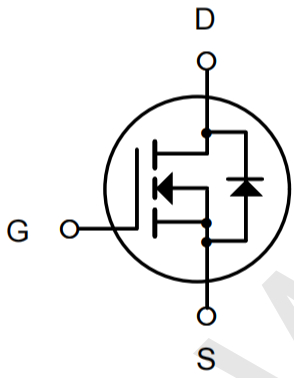
The DMTH43M8LPSQ uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with gate voltages as low as 4.5V. This device is suitable for use as a Battery protection or in other Switching application.

Features

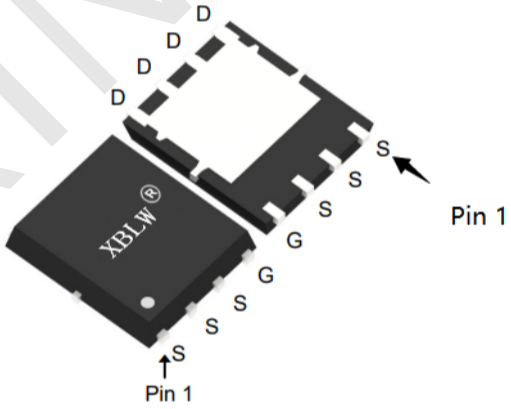
- V_{DS} = 40V,I_D =130A
- $R_{DS(ON)}$ <3.5mΩ V_{GS}= 10V

Applications

- Battery protection
- Load switch
- Uninterruptible power supply



N-Channel MOSFET



DFN5X6-8L

Ordering Information

Product Model	Package Type	Marking	Packing	Packing Qty
DMTH43M8LPSQ	DFN5X6-8L	DMTH43M8LP	Tape	5000Pcs/Reel

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Absolute Maximum Ratings at T_C=25℃ unless otherwise noted

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	40	V
V_{GS}	Gate-Source Voltage	±20	V
I_D@T_C=25℃	Continuous Drain Current, V_{GS} @ 10V [1]	130	A
I_D@T_C=100℃	Continuous Drain Current, V_{GS} @ 10V [1]	65	A
I_{DM}	Pulsed Drain Current[2]	400	A
EAS	Single Pulse Avalanche Energy[3]	150	mJ
T_{STG}	Storage Temperature Range	-55 to 175	℃
T_J	Operating Junction Temperature Range	-55 to 175	℃

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Electrical Characteristics (T_C=25℃ unless otherwise specified)

Parameter	Symbol	condition	Min.	Typ.	Max.	Units
Off Characteristic						
Drain-source Breakdown voltage	BV_{DSS}	V_{GS}=0V, I_D=250μA	40	-	-	V
zero Gate voltage Drain current	I_{DSS}	V_{DS}=40V,V_{GS}=OV	-	-	1	μA
Gate-Body Leakage current	I_{GSS}	V_{GS}=±20V,V_{DS}=0V	-	-	±100	nA
On Characteristics(Note 3)						
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS} I_D=250UA	1	1.6	2.5	V
Drain-Source On-State Resistance	$R_{DS(on)}$	V_{GS}= 10V, I_D=30A	-	2.8	3.5	mΩ
Forward Transconductance	g_{FS}	V_{DS}=5V,I_D=20A	50	-	-	S
Dynamic Characteristics(Note4)						
Input capacitance	C_{iss}	V_{DS}=25V, V_{GS}=0V, F=1.0MHz	-	5584	-	pF
output capacitance	C_{oss}		-	410	-	pF
Reverse Transfer capacitance	C_{rss}		-	338	-	pF
Switching Characteristics(Note4)						
Turn-on Delay Time	$t_{d(on)}$	V_{DD}=20V, I_D=20A, R_L=1Ω, V_{GS}=10V, R_{GEN}=3Ω	-	11	-	ns
Turn-on Rise Time	t_r		-	15	-	ns
Turn-off Delay Time	$t_{d(off)}$		-	38	-	ns
Turn-off Fall Time	t_f		-	14	-	ns
Total Gate charge	Q_g	V_{DS}=30V, I_D=30A, V_{GS}=10V		64		nc
Gate-source charge	Q_{gs}			12.4		nc
Gate-Drain charge	Q_{gd}			14		nc
Drain-Source Diode Characteristics						
Diode Forward Voltage (Note 3)	V_{SD}	V_{GS}=0V, Is=30A			1.2	V
Diode Forward Current (Note 2)	I_S				130	A
Reverse Recovery Time	t_{rr}	T_J= 25°C , I_F=30A di/dt=100A/μs(Note 3)		22		ns
Reverse Recovery charge	Q_{rr}			11		nc
Forward Turn-on Time	t_{or}	Intrinsic turn-on time is negligible (turn-on is dominated by LS+LD)				

Notes:
1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. Surface Mounted on FR4 Board, t ≤ 10 sec.
3. Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.
4. Guaranteed by design, not subject to production.
5. E_{AS} condition: T_j=25℃, V_{DD}=30V, V_G=10V,L=0.5mH, Rg=25Ω.

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Typical Characteristics

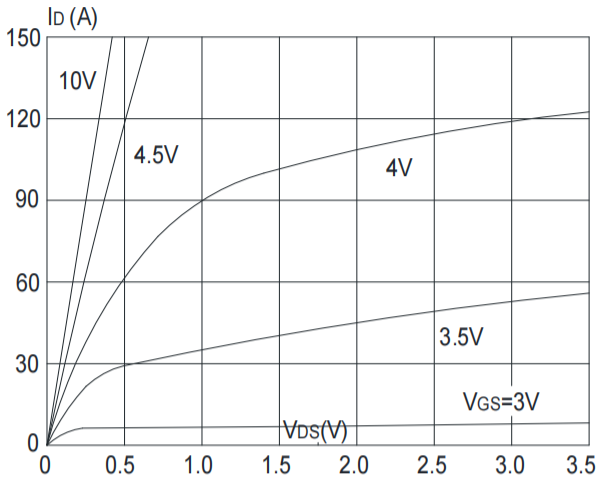

Fig 1. Output Characteristics

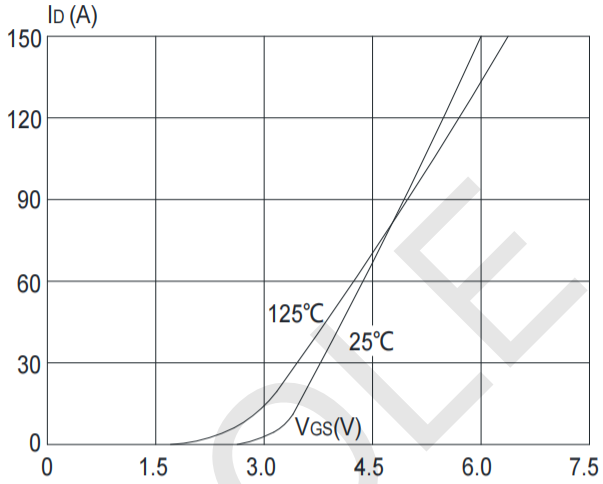

Fig 2. Typical Transfer Characteristics

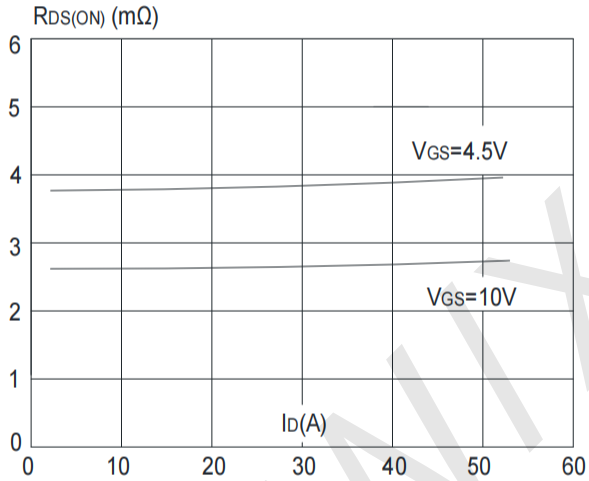

Fig 3. On-resistance vs. Drain Current

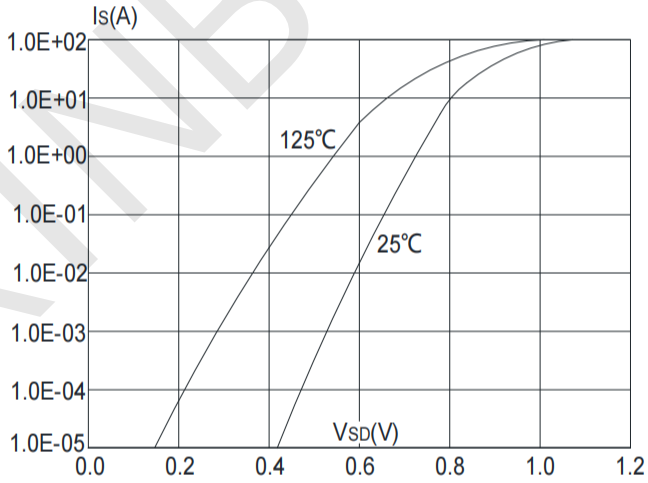

Fig 4. Body Diode Characteristics

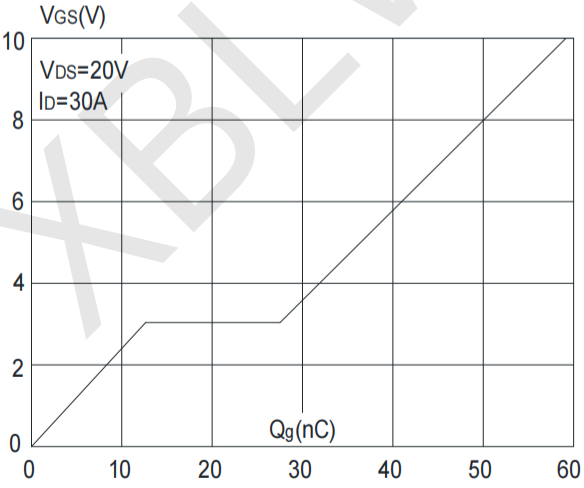

Fig 5.Gate Charge Characteristics

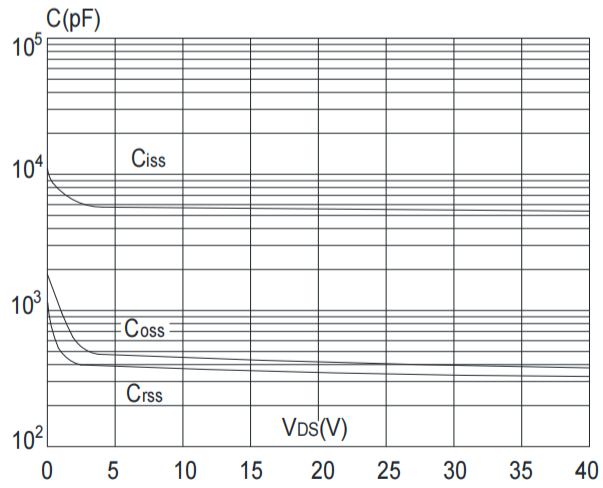

Fig 6. Capacitance Characteristics

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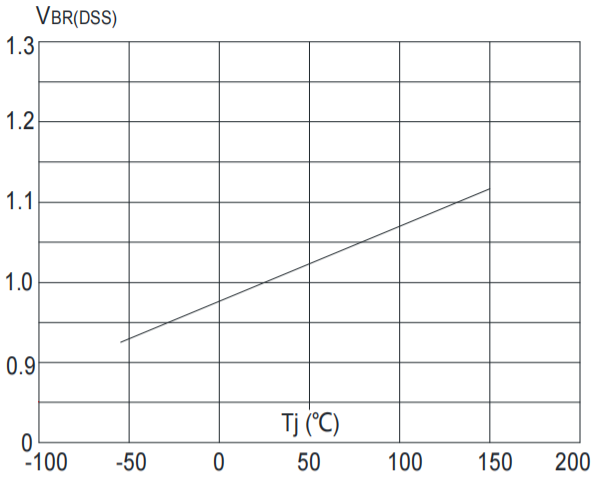


Fig 7. Normalized Breakdown voltage vs. Junction Temperature

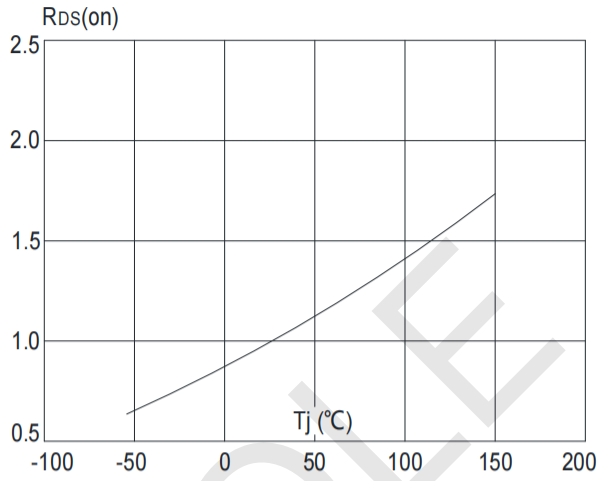


Fig 8. Normalized on Resistance vs. Junction Temperature

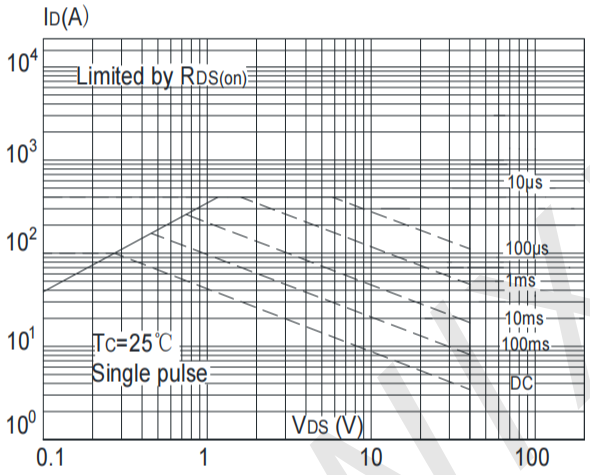
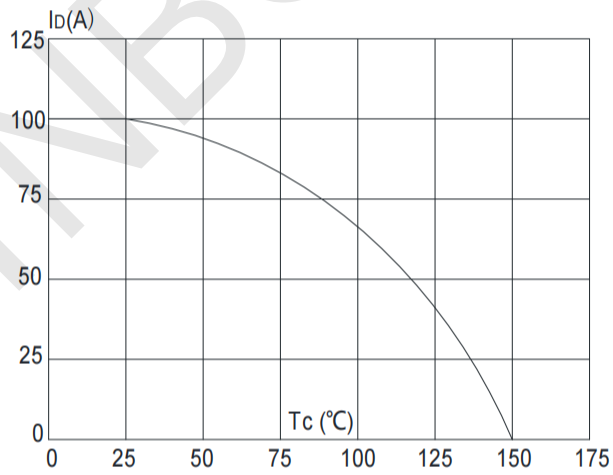


Fig 9. Maximum Safe Operating Area



Fie 10: Maximum Continuous Drian Current vs. Case Temperature

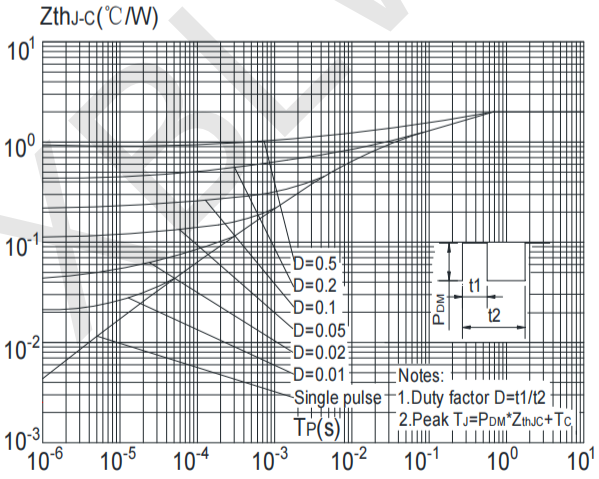


Fig 11. Maximum Effective Transient Thermal Impedance, Junction-to-Case

Package Information

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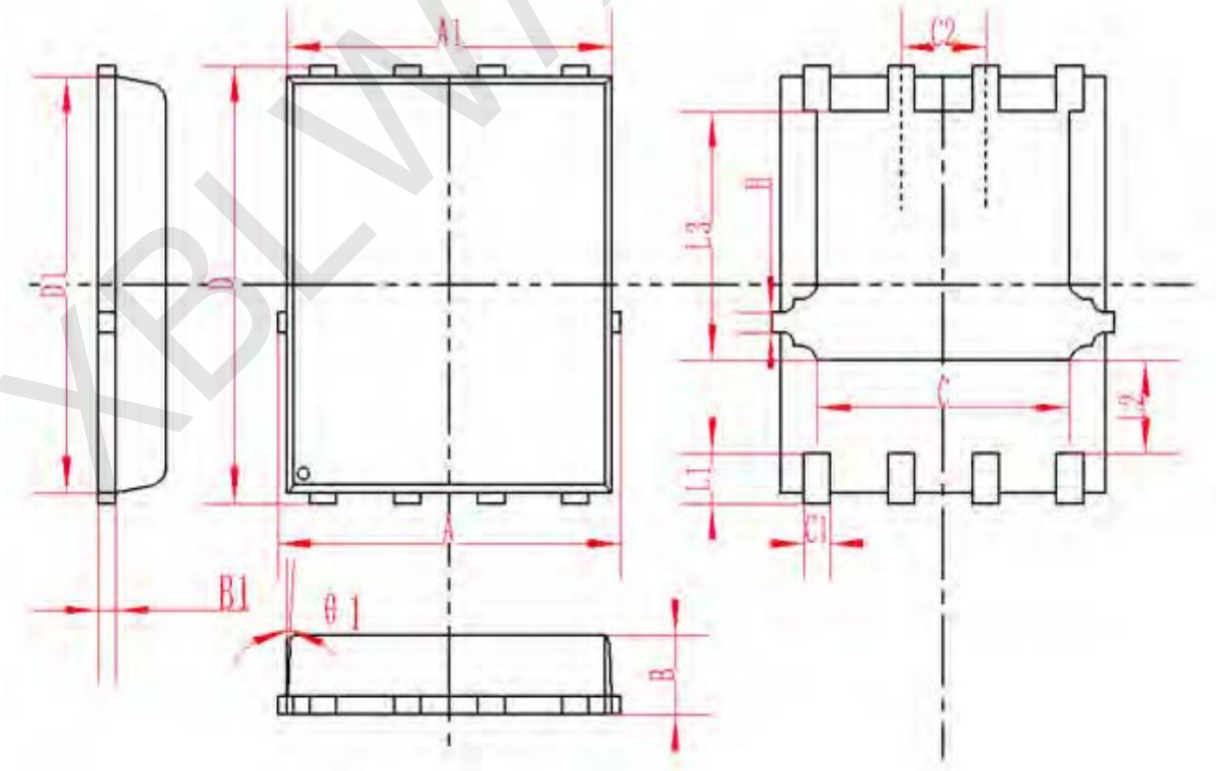
SYMBOL	MM			INCH		
	MIN	NOM	MAX	MIN	NOM	MAX
A	4.95	5	5.05	0.195	0.197	0.199
A1	4.82	4.9	4.98	0.190	0.193	0.196
D	5.98	6	6.02	0.235	0.236	0.237
D1	5.67	5.75	5.83	0.223	0.226	0.230
B	0.9	0.95	1	0.035	0.037	0.039
B1		0.254REF			0.010REF	
C	3.95	4	4.05	0.156	0.157	0.159
C1	0.35	0.4	0.45	0.014	0.016	0.018
C2		1.27TYP			0.5TYP	
θ1	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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