MHCHXM®

www.jshxm.com

HXMS40N12LNA

N-Channel Enhancement Mode Power MOSFET

Features

- Uses MHCHXM advanced PerfectMOS technology
- Extremely low on-resistance $R_{DS(on)}$
- Excellent Q_gx$R_{DS(on)}$ product(FOM)
- Excellent Low Ciss
- Qualified according to JEDEC criteria

Applications

- Switching application
- Li-battery protection
- DC-DC

Benefits

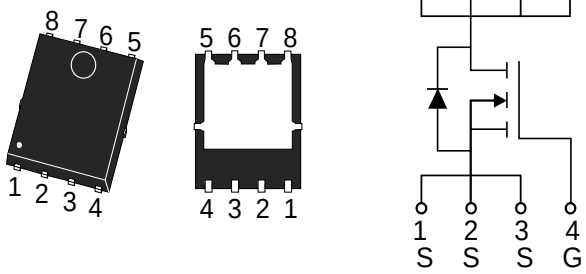
- High robustness and reliability
- Increases maximum current capability
- Low power loss, high power density
- Easy paralleling

Product Summary

V_{DS}	40V
$R_{DS(on)@10V\ typ}$	1.12mΩ
I_D	260A

RoHS Reach

PDFN5060-8L



Absolute Maximum Ratings (T_C=25℃ unless otherwise noted)

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DS}	40	V
Gate-Source Voltage	V_{GS}	±20	V
Drain Current-Continuous	I_D	260	A
Drain Current-Continuous(T_C=100℃)	I_D (100℃)	210	A
Pulsed Drain Current	I_{DM}	380	A
Maximum Power Dissipation	P_D	200	W
Single pulse avalanche energy	E_{AS}	272	mJ
Operating Junction and Storage Temperature Range	T_J,T_{STG}	-55 To 175	℃

EAS condition : Tj=25℃,VD=32V,VG=10V,L=0.5mH,Rg=25Ω,IAS=33A

Thermal Characteristic

Parameter	Symbol	Limit	Unit
Thermal Resistance,Junction-to-Case	$R_{\theta JC}$	0.4	℃/W

Electrical Characteristics (T_C=25℃ unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Off Characteristics						
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}=0V	-	-	1	μA
Gate-Body Leakage Current	I_{GSS}	V_{GS}=±20V,V_{DS}=0V	-	-	±100	nA
On Characteristics						
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS},I_D=250μA	1.1	1.7	2.4	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	V_{GS}=10V, I_D=50A	-	1.12	1.25	mΩ
Forward Transconductance	g_{FS}	V_{DS}=5V,I_D=115A		70	-	S
Dynamic Characteristics						
Input Capacitance	C_{lss}	V_{DS}=20V,V_{GS}=0V, F=1MHz	-	6200	-	PF
Output Capacitance	C_{oss}		-	2600	-	PF
Reverse Transfer Capacitance	C_{rss}		-	140	-	PF
Gate resistance	Rg	VGS=0V,f=1MHz	-	2.5		Ω
Switching Characteristics						
Turn-on Delay Time	$t_{d(on)}$	V_{DD}=20V,I_D=20A V_{GS}=10V,R_G=1.6Ω	-	30	-	nS
Turn-on Rise Time	t_r		-	42	-	nS
Turn-Off Delay Time	$t_{d(off)}$		-	80	-	nS
Turn-Off Fall Time	t_f		-	31	-	nS
Total Gate Charge	Q_g	V_{DS}=20V,I_D=20A, V_{GS}=10V	-	125	-	nC
Gate-Source Charge	Q_{gs}		-	30		nC
Gate-Drain Charge	Q_{gd}		-	32		nC
Drain-Source Diode Characteristics						
Diode Forward Voltage	V_{SD}	V_{GS}=0V,I_S=50A	-		1.2	V
Diode Forward Current	I_S		-	-	260	A
Reverse Recovery Time	t_{rr}	T_J = 25°C, I_F =20A di/dt = 100A/μs	-	99	-	nS
Reverse Recovery Charge	Qrr		-	62	-	nC

Typical Electrical and Thermal Characteristics

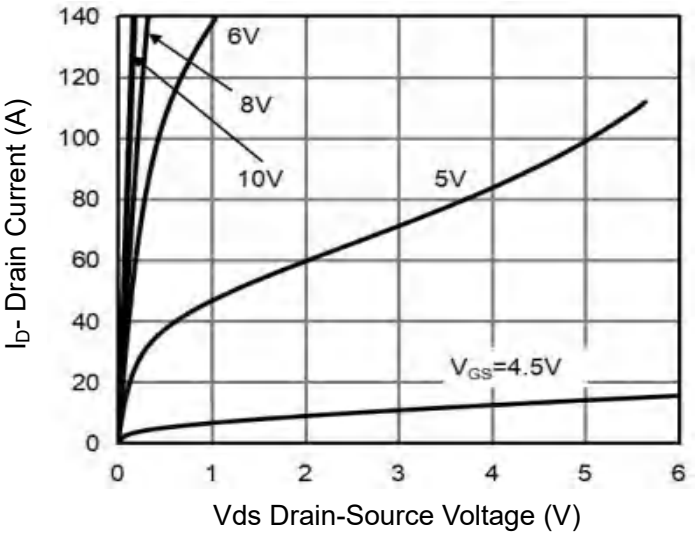


Figure 1 Output Characteristics

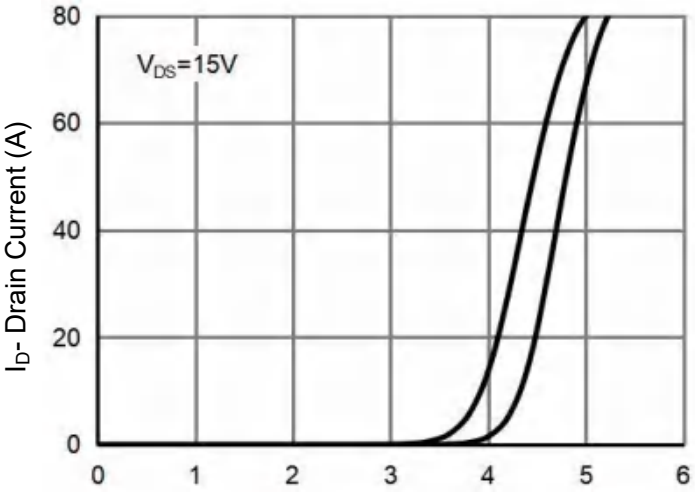


Figure 2 Transfer Characteristics

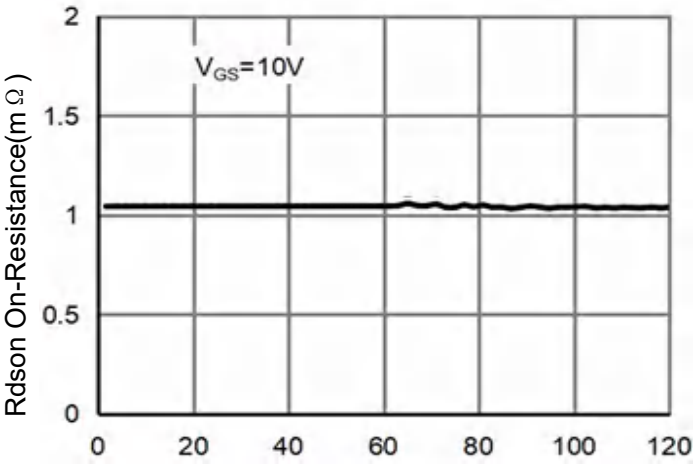


Figure 3 Rdson- Drain Current

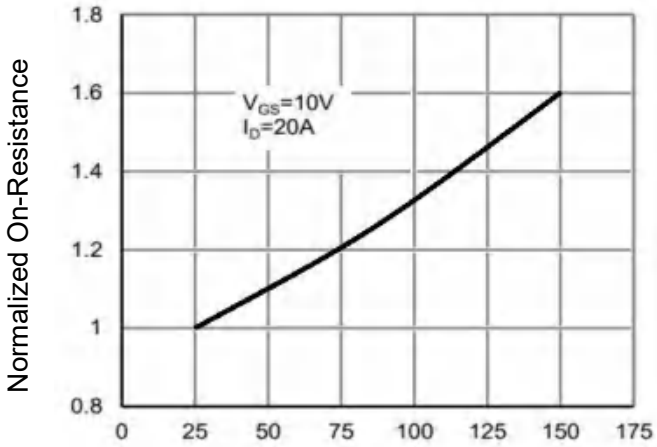


Figure 4 Rdson-Junction Temperature

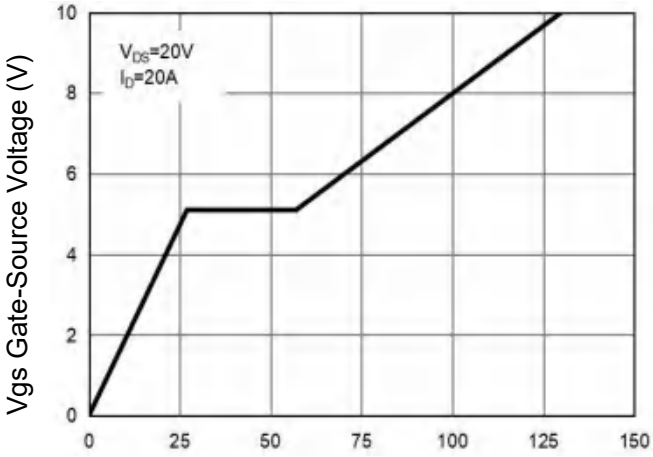


Figure 5 Gate Charge

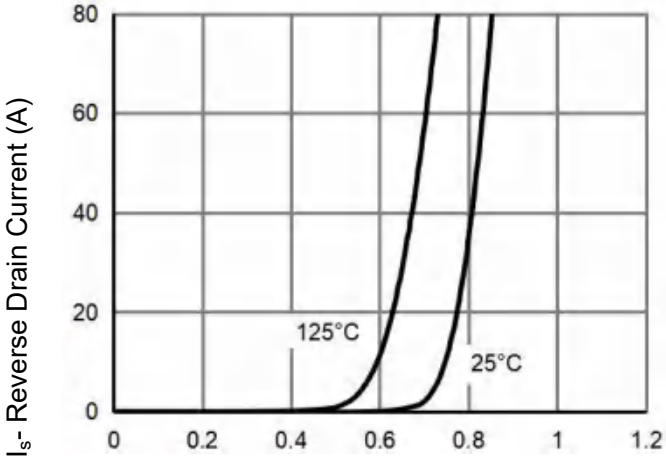


Figure 6 Source- Drain Diode Forward

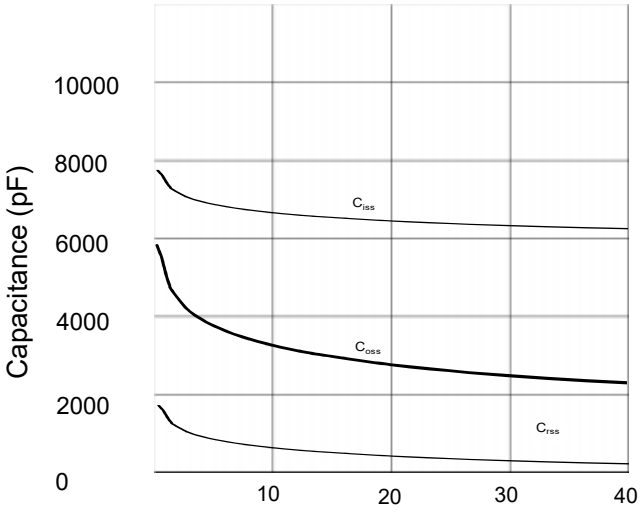


Figure 7 Capacitance vs Vds

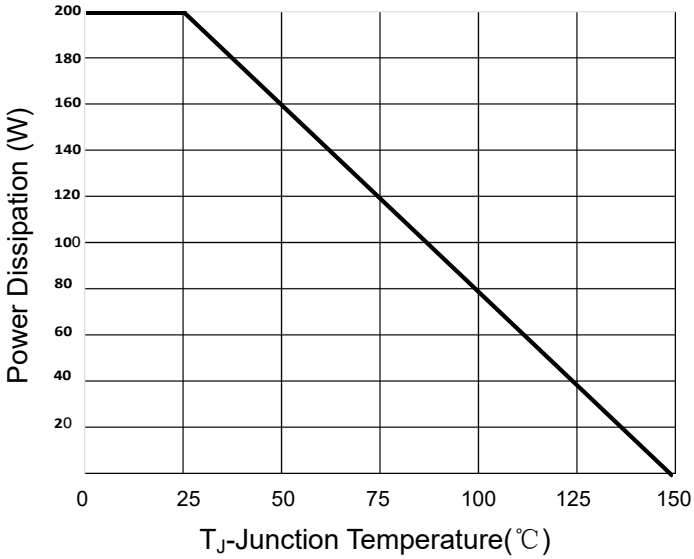


Figure 9 Power De-rating

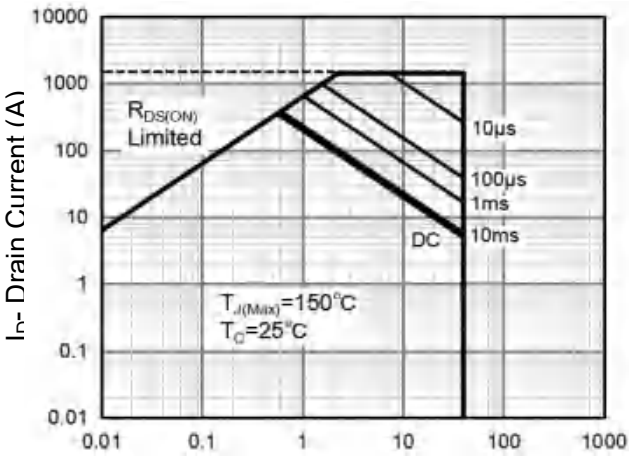


Figure 8 Safe Operation Area

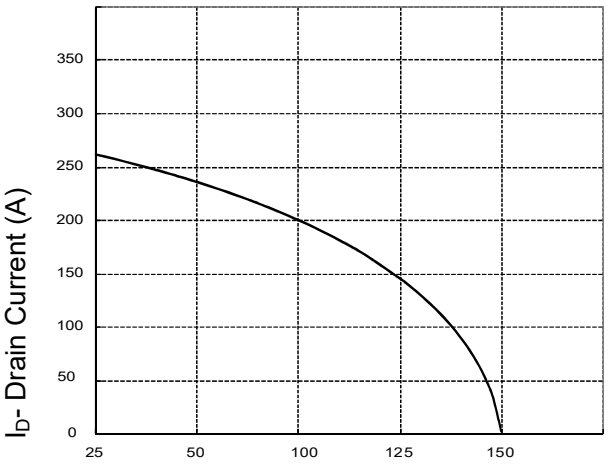


Figure 10 Current De-rating

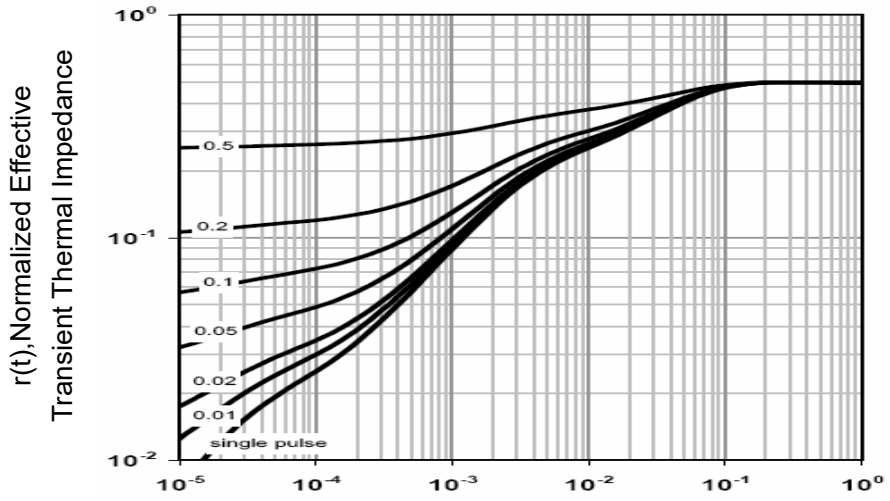
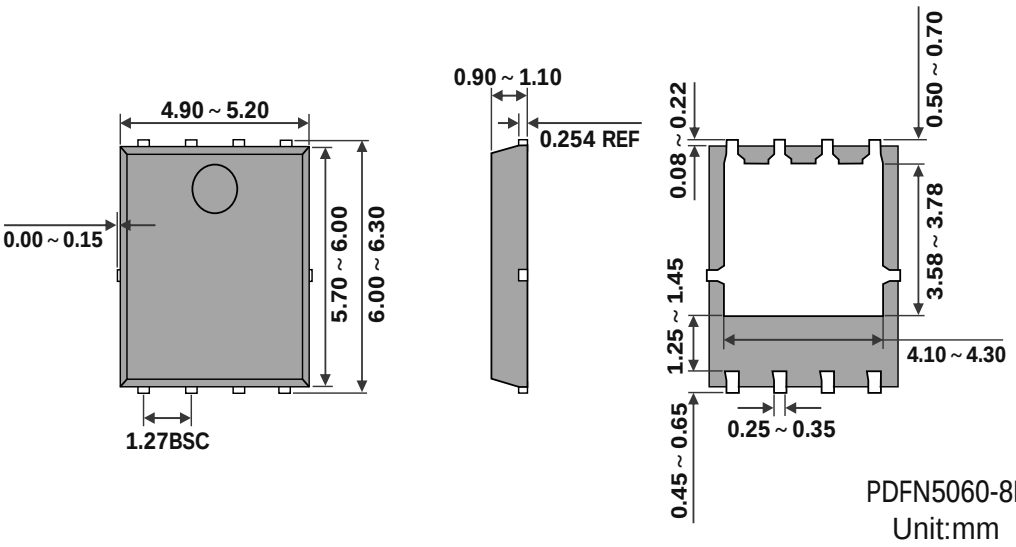


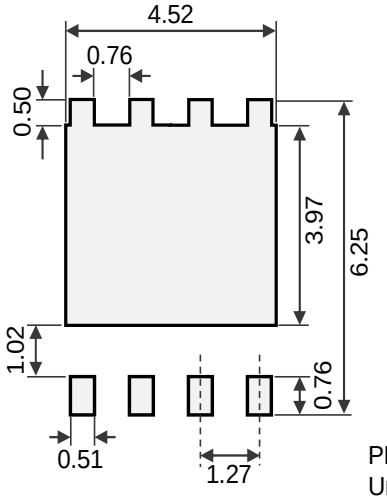
Figure 11 Normalized Maximum Transient Thermal Impedance

Package Outline Dimensions



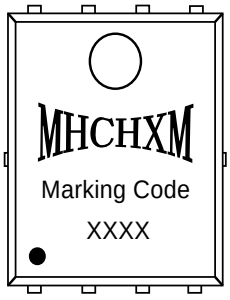
PDFN5060-8L
Unit:mm

Suggested Solder Pad Layout



PDFN5060-8L
Unnoted Tolerance:±0.05
Unit:mm

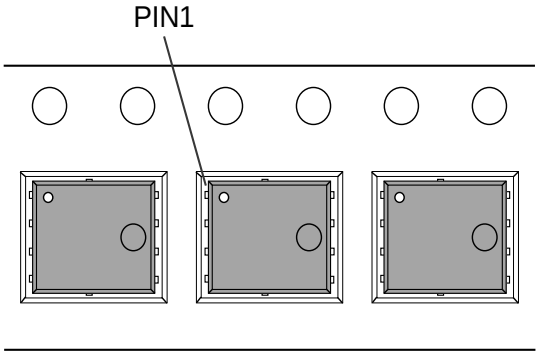
Marking Information



"MHCHXM" = Product Logo
"Marking Code" = The Following
"XXXX" = Date Code Marking

Marking Code	Part Number
S40N12LNA	HXMS40N12LNA

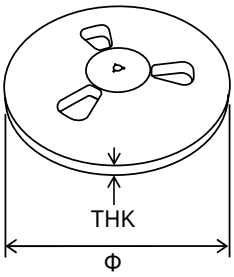
The Orientation Of The Product In The Carrier Tape



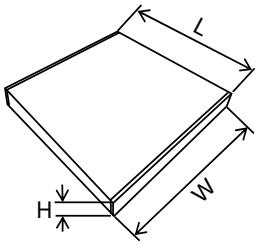
Packing Information

Packaging	Part Number	Quantity(pcs)	Size(mm)
Reel	Reel	5000	Φ330×THK15
	Inner Box	10000	L355×W335×H48
	Outer Box	80000	L415×W375×H360

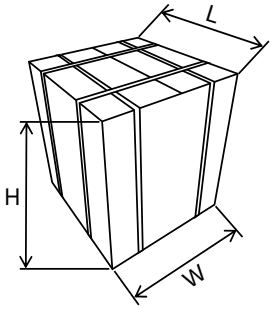
Packaging:Reel



Reel



Reel Inner Box



Reel Outer Box

DISCLAIMER

1.Above specification may be changed without notice. MHCHXM will reserve authority on material change for above specification.

2.The graphs shown in this datasheet are representing typical data only and do not show guaranteed values.

3.When using this product, please observe the absolute maximum ratings and the instructions for use outlined in these specification sheets. MHCHXM assumes no responsibility for any damage resulting from use of the product which does not comply with the absolute maximum ratings and the instructions included in these specification sheets.

4.These specification sheets include materials protected under copyright of MHCHXM. Reproduction in any form is prohibited without the specific consent of MHCHXM.

5.This product is not intended to be used for military, aircraft, automotive, medical, life sustaining or life saving applications or any other application which can result in human injury or death. Please contact authorized MHCHXM sales agent for special application request.

6.Statements regarding the suitability of products for certain types of applications are based on MHCHXM's knowledge of typical requirements that are often placed on MHCHXM products in generic applications. Such statements are not binding statements about the suitability of products for a particular application. It is the customer's responsibility to validate that a particular product with the properties described in the product specification is suitable for use in a particular application. Parameters provided in datasheets and/or specifications may vary in different applications and performance may vary over time. All operating parameters, including typical parameters, must be validated for each customer application by the customer's technical experts. Product specifications do not expand or otherwise modify MHCHXM's terms and conditions of purchase, including but not limited to the warranty expressed therein.

7.This publication supersedes & replaces all information previously supplied. For additional application information, please visit our website **http://www.jshxm.com** , or consult your nearest MHCHXM's sales office for further assistance.