HXMS100N30HMC

100V N-Channel Power MOSFET

www.jshxm.com

Product Summary

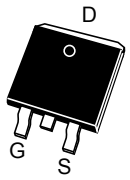
V_{DS}	$R_{DS(ON)\_MAX}$	I_{D_MAX}
100 V	4.3 mΩ @V_{GS} = 10V	173 A

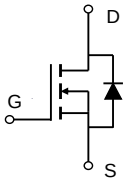
Features

- Low On-Resistance
- Excellent FoM (figure of merit)
- 100% UIS and R_g tested

RoHS Reach

TO-263M-2L





Schematic Diagram

Applications

- DC/DC in Telecoms and Inductrial
- Synchronous Rectification in SMPS
- Hard Switching and High Speed Circuit

Mechanical Data

- Green Molding Compound
- Moisture Sensitivity: Level 1 per J-STD-020
- UL Flammability Classification Rating 94V-0

Ordering Information

Orderable Part Number	Package Type	Device Marking	Form	Quantity (pcs)
HXMS100N30HMC	TO-263M-2L	S100N30HMC	Reel	1500

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

Parameter		Symbol	Value	Unit
Drain - Source Voltage		V_{DS}	100	V
Gate - Source Voltage		V_{GS}	±20	V
Continuous Drain Current (V_{GS} = 10V) (1)	T_C = 25°C	I_D	173	A
	T_C = 100°C		122	A
Pulsed Drain Current (2)		I_{DM}	691	A
Single Pulse Avalanche Energy (3)		E_{AS}	960	mJ
Single Pulse Avalanche Current (L= 0.1mH)		I_{AS}	74	A
Power Dissipation	T_C = 25°C	P_D	254	W
	T_C = 100°C		127	W
Junction & Storage Temperature Range		T_J, T_{STG}	-55 ~ +175	°C

Thermal Characteristics

Parameter	Symbol	Typ.	Max.	Unit
Thermal Resistance, Junction-to-Ambient (4)	$R_{\theta JA}$	30	35	°C/W
Thermal Resistance, Junction-to-Case (5)	$R_{\theta JC}$	0.45	0.59	°C/W

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

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Off Characteristics (6)						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS} = 0V, I_D = 250μA	100	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 100V, V_{GS} = 0V	-	-	1.0	μA
		T_J = 125°C	-	-	100	μA
Gate-Source Leakage Current	I_{GSS}	V_{GS} = ±20V, V_{DS} = 0V	-	-	±100	nA
On Characteristics (6)						
Gate Threshold Voltage	$V_{GS(th)}$	V_{GS} = V_{DS}, I_D = 250μA	2.0	3.0	4.0	V
Static Drain-Source On-Resistance	$R_{DS(ON)}$	V_{GS} = 10V, I_D = 20A	-	3.6	4.3	mΩ
Forward Transconductance	g_{fs}	V_{DS} = 5.0V, I_D = 20A	-	50	-	S
Diodes Forward Voltage	V_{SD}	I_S = 2.0A, V_{GS} = 0V	-	0.7	1.2	V
Dynamic Characteristics (7)						
Input Capacitance	C_{iss}	V_{DS} = 50V, V_{GS} = 0V, f = 1MHz	-	2212	-	pF
Output Capacitance	C_{oss}		-	1790	-	pF
Reverse Transfer Capacitance	C_{rss}		-	15	-	pF
Gate Resistance	R_g	V_{GS} = 0V, V_{DS} = 0V, f = 1MHz	-	3.3	-	Ω
Switching Characteristics (7)						
Turn-On DelayTime	$t_{d(on)}$	V_{GS} = 10V, V_{DS} = 50V I_D = 20A, R_{GEN} = 3.0Ω	-	8.6	-	ns
Rise Time	t_r		-	19	-	ns
Turn-Off DelayTime	$t_{d(off)}$		-	29	-	ns
Fall Time	t_f		-	28	-	ns
Gate Charge Characteristics (7)						
Total Gate Charge (V_{GS} = 10V)	Q_g	V_{DS} = 50V, I_D = 20A V_{GS} = 10V	-	33	-	nC
Total Gate Charge (V_{GS} = 6.0V)	Q_g		-	21	-	nC
Gate-Source Charge	Q_{gs}		-	8.7	-	nC
Gate-Drain Charge	Q_{gd}		-	6.5	-	nC
Gate Plateau Voltage	$V_{plateau}$		-	4.2	-	V
Drain-Source Diode Characteristics (7)						
Body Diode Reverse Recovery Time	t_{rr}	I_F = 20A, dI/dt = 100A/μs, T_J = 25°C	-	112	-	ns
Body Diode Reverse Recovery Charge	Q_{rr}		-	280	-	nC
Diode Forward Current	I_S	T_C = 25°C	-	-	173	A

Notes:

1. This current is chip limited, whiich is calculated based on Rthjc.
2. This current is calculated on single pulse with 10μs Pulse & Duty Cycle = 1%.
3. Defined by design, not subject to production test, E_{AS} condition: T_J=25°C, V_{DD}=50V, V_{GS}=10V, L=1.0mH.
4. Device mounted on FR-4 substrate PC board with 2oz copper in 1inch square cooling area.
5. Thermal resistance from junction to soldering point (on the exposed drain pad).
6. Short duration pulse test used to minimize self-heating effect.
7. Defined by design, not subject to production.

Typical Electrical and Thermal Characteristics

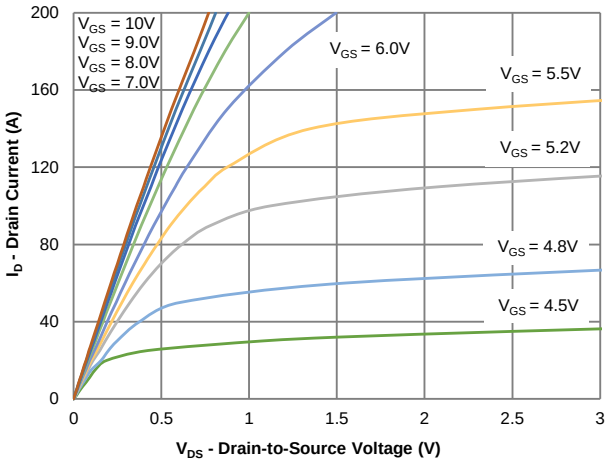


Figure 1: Output Characteristics

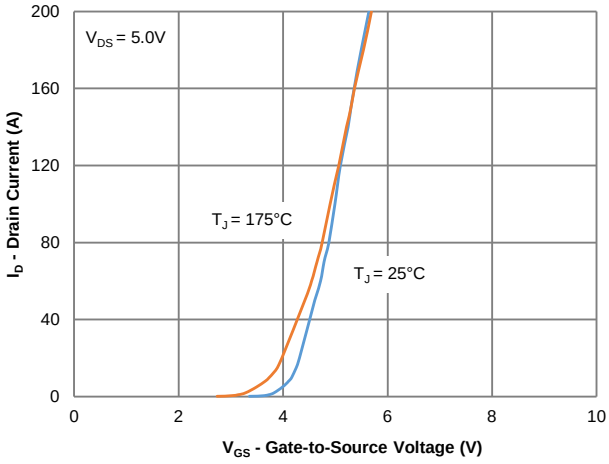


Figure 2: Transfer Characteristics

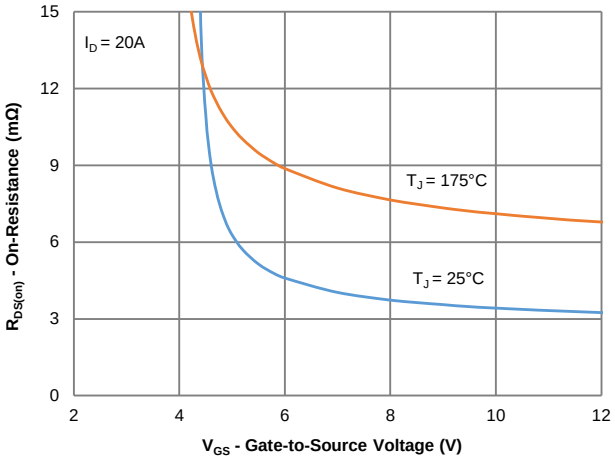


Figure 3: On-Resistance vs. Gate-Source Voltage

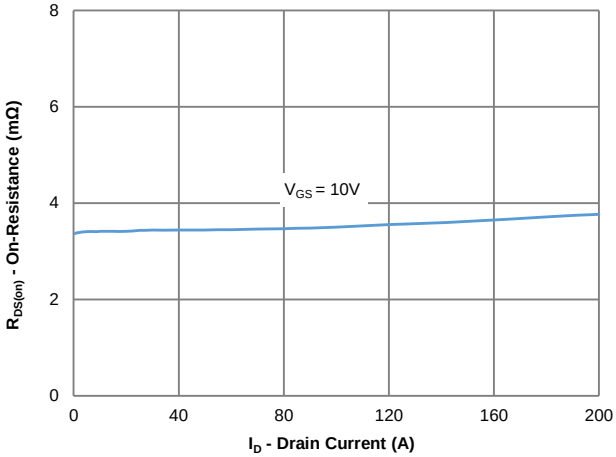


Figure 4: On-Resistance vs. Gate-Source Voltage

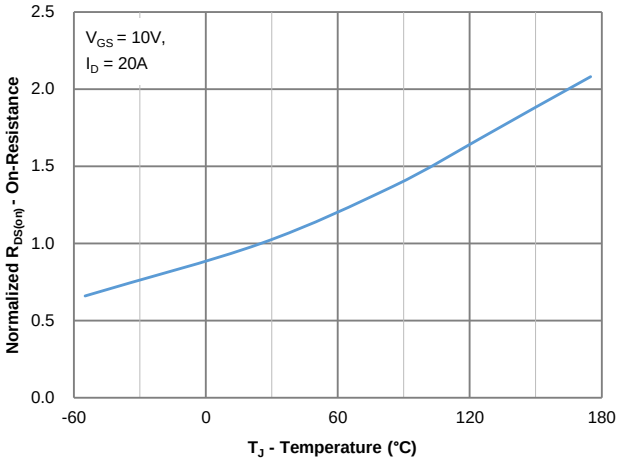


Figure 5: On-Resistance vs. Junction Temperature

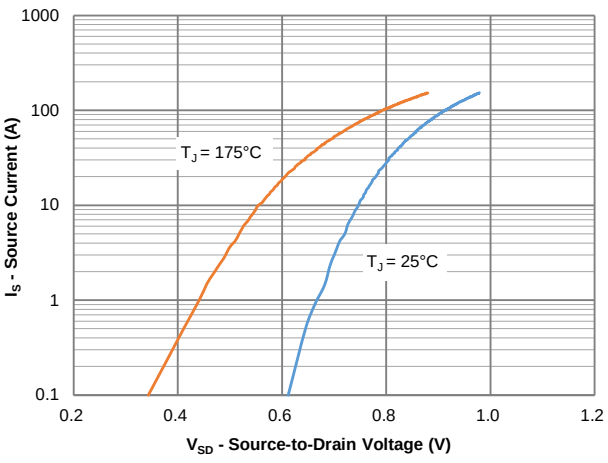


Figure 6: Source-Drain Diode Forward Voltage

Typical Electrical and Thermal Characteristics

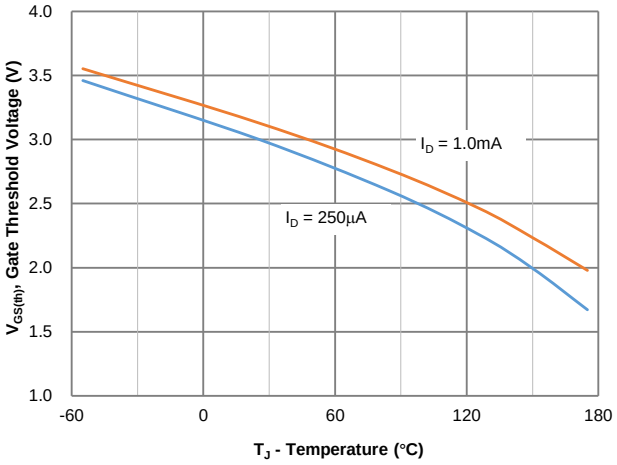


Figure 7: Gate Threshold Variation vs. Junction Temperature

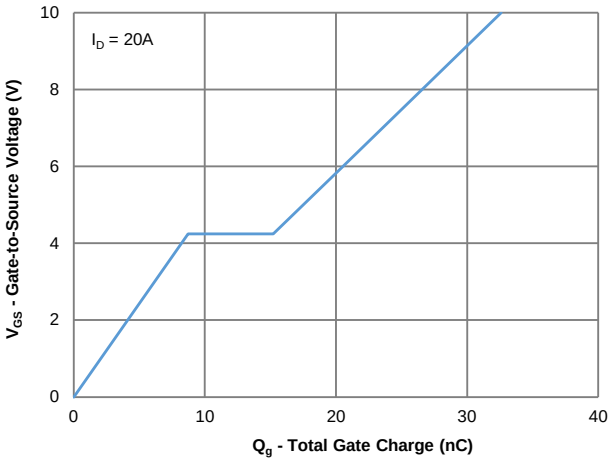


Figure 8: Gate Charge Characteristics

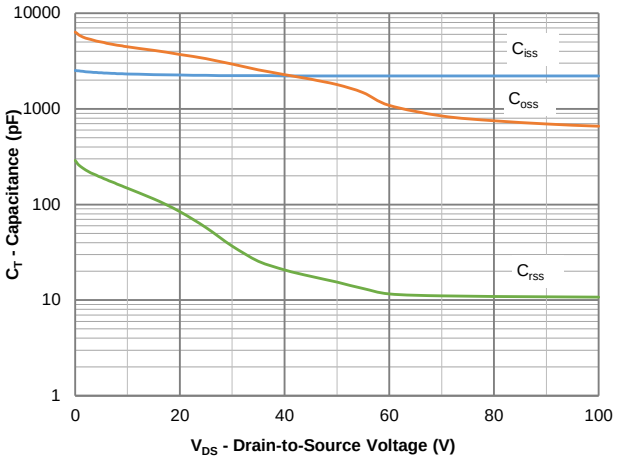


Figure 9: Capacitance Characteristics

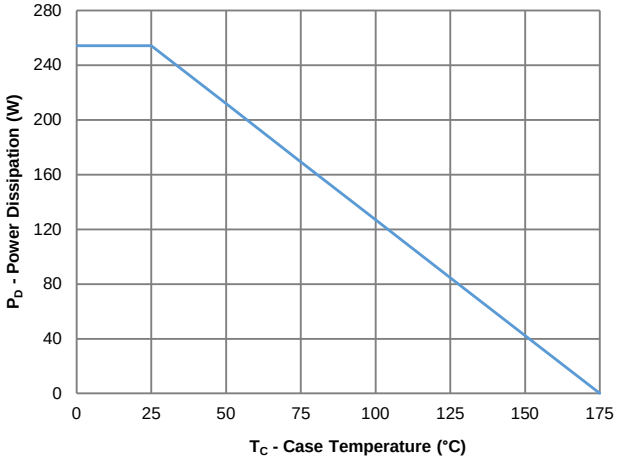


Figure 10: Power Derating

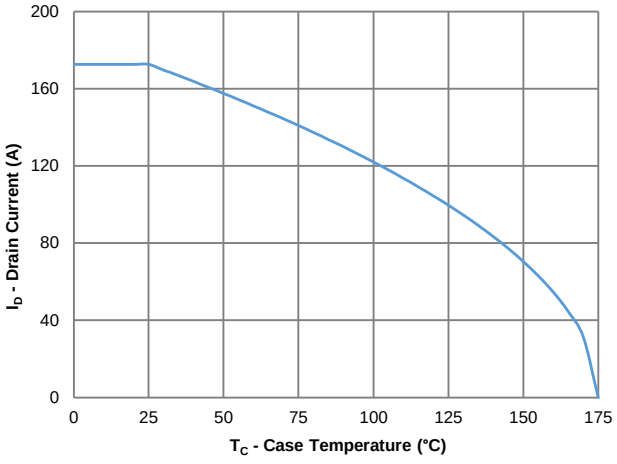


Figure 11: Current Derating

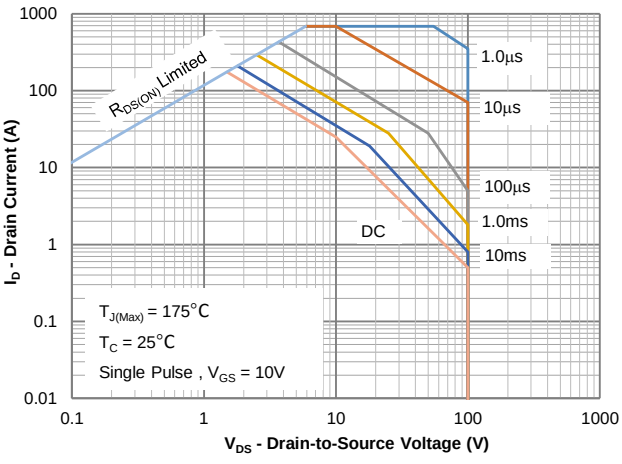


Figure 12: Safe Operating Area

Typical Electrical and Thermal Characteristics

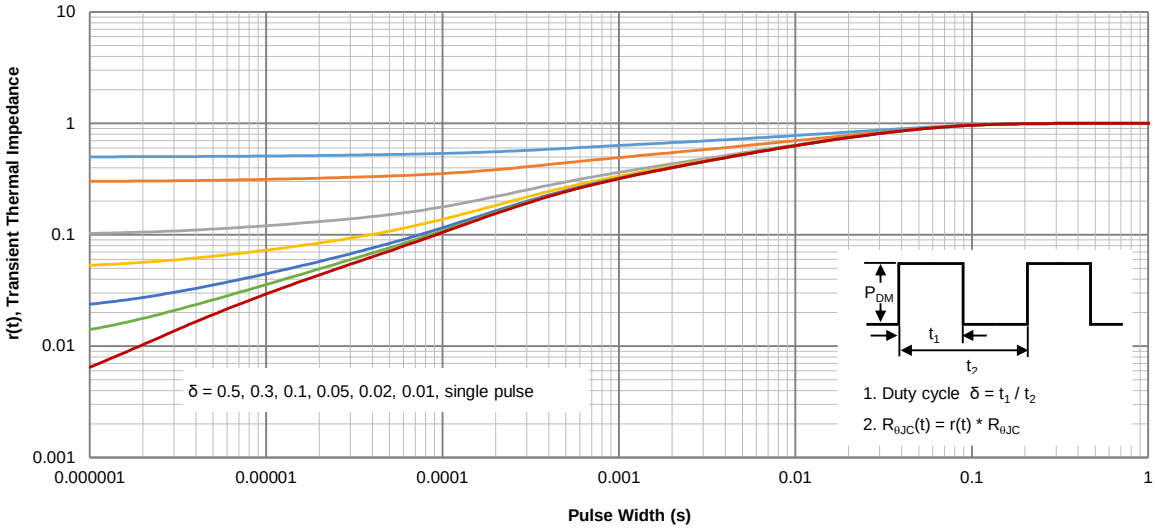
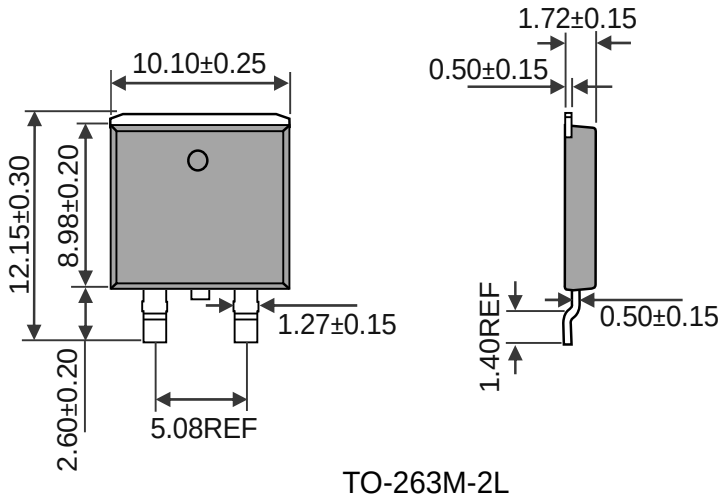


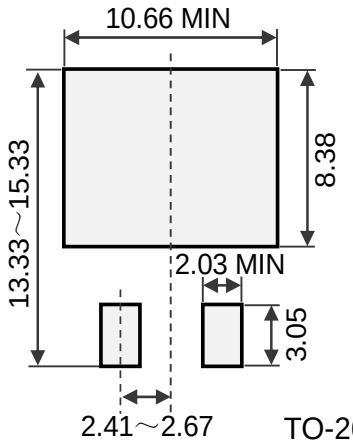
Figure 13: Normalized Maximum Transient Thermal Impedance

Package Outline Dimensions



TO-263M-2L
Unit:mm

Suggested Solder Pad Layout



TO-263M-2L
Unnoted Tolerance:±0.05
Unit:mm

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.