

Product Summary

V _{DS}	R _{DS(ON)_MAX}	I _{D_MAX}	
150 V	4.8 mΩ @V _{GS} = 10V	176 A	

TO-263M-2L





Schematic Diagram

Features

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



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)
HXMS150N40HMA	TO-263M-2L	S150N40HMA	Reel	1500

Maximum Ratings (@ $T_c = 25^{\circ}C$, unless otherwise specified.)

Parameter		Symbol	Value	Unit
Drain - Source Voltage		V _{DS}	150	V
Gate - Source Voltage		V _{GS}	±20	V
	$T_{C} = 25^{\circ}C$		176	А
Continuous Drain Current ($V_{GS} = 10V$)	$T_{\rm C} = 100^{\circ}{\rm C}$	D	125	А
Pulsed Drain Current ⁽²⁾		I _{DM}	705	А
Single Pulse Avalanche Energy ⁽³⁾		E _{AS}	1796	mJ
Single Pulse Avalanche Current (L= 0.1mH)		I _{AS} 110		А
Rower Dissipation	$T_{C} = 25^{\circ}C$	D	333	W
	$T_{\rm C} = 100^{\circ}{\rm C}$	' D	167	W
Junction & Storage Temperature Range		T _J , T _{STG}	-55 ~ +175	°C

Thermal Characteristics

Parameter	Symbol	Тур.	Max.	Unit
Thermal Resistance, Junction-to-Ambient ⁽⁴⁾	$R_{ heta JA}$	25	31	°C/W
Thermal Resistance, Junction-to-Case ⁽⁵⁾	$R_{ ext{ heta}JC}$	0.35	0.45	°C/W



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Electrical Characteristics (@ $T_J = 25^{\circ}C$, unless otherwise specified.)

Parameter	Symbol	Test Condition	Min.	Тур.	Max.	Unit
Off Characteristics (6)		1				
Drain-Source Breakdown Voltage	V _{(BR)DSS}	$V_{GS} = 0V, I_{D} = 250 \mu A$	150	-	-	V
	I _{DSS}	V _{DS} = 150V, V _{GS} = 0V	-	-	1.0	μA
Zero Gate Voltage Drain Current		T _J = 125°C	-	-	100	μA
Gate-Source Leakage Current	I _{GSS}	$V_{GS} = \pm 20V, V_{DS} = 0V$	-	-	±100	nA
On Characteristics ⁽⁶⁾						L
Gate Threshold Voltage	V _{GS(th)}	$V_{GS} = V_{DS}, I_D = 250 \mu A$	2.5	3.4	4.5	V
Static Drain-Source On-Resistance	R _{DS(ON)}	V _{GS} = 10V, I _D = 20A	-	4.0	4.8	mΩ
Forward Transconductance	g _{fs}	V _{DS} = 5.0V, I _D = 20A	-	58	-	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}		-	6238	-	pF
Output Capacitance	C _{oss}	$V_{DS} = 75V, V_{GS} = 0V, f = 1MHz$	-	783	-	pF
Reverse Transfer Capacitance	C _{rss}		-	23	-	pF
Gate Resistance	R _g	$V_{GS} = 0V, V_{DS} = 0V, f = 1MHz$	-	2.2	-	Ω
Switching Characteristics ⁽⁷⁾						L
Turn-On DelayTime	t _{d(on)}		-	20	-	ns
Rise Time	t _r	V _{GS} = 10V, V _{DS} = 75V	-	41	-	ns
Turn-Off DelayTime	t _{d(off)}	$I_D = 20A, R_{GEN} = 3.0\Omega$	-	58	-	ns
Fall Time	t _f		-	44	-	ns
Gate Charge Characteristics (7)						
Total Gate Charge (V _{GS} = 10V)	Qg		-	91	-	nC
Total Gate Charge (V _{GS} = 6.0V)	Qg		-	59	-	nC
Gate-Source Charge	Q_gs	$V_{DS} = 75V, I_D = 20A$ $V_{CS} = 10V$	-	26	-	nC
Gate-Drain Charge	Q_{gd}	VGS - · · ·	-	21	-	nC
Gate Plateau Voltage	V _{plateau}		-	4.5	-	V
Drain-Source Diode Characteristics ⁽⁷)					L
Body Diode Reverse Recovery Time	t _{rr}	$I_F = 20A, dI/dt = 100A/\mu s,$	-	103	-	ns
Body Diode Reverse Recovery Charge	Q _{rr}	$T_J = 25^{\circ}C$	-	431	-	nC
Diode Forward Current	۱ _s	$T_{\rm C} = 25^{\circ}{\rm C}$	-	-	176	А

Notes:

1. This current is chip limited, whiich is calculated based on Rthjc.

2. This current is calculated on single pulse with 10μ s Pulse & Duty Cycle = 1%.

3. Defined by design, not subject to production test, E_{AS} condition: T_J =25°C, V_{DD} =75V, 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





HXMS150N40HMA **150V N-Channel Power MOSFET**

Typical Electrical and Thermal Characteristics



Figure 7: Gate Threshold Variation vs. Junction Temperature



Figure 9: Capacitance Characteristics



Figure 8: Gate Charge Characteristics







Figure 11: Current Derating



Figure 12: Safe Operating Area





Typical Electrical and Thermal Characteristics



Figure 13: Normalized Maximum Transient Thermal Impedance





Package Outline Dimensions



Suggested Solder Pad Layout







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