MHCHXM®

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HXMC65N720S1

N-Channel SiC Power MOSFET

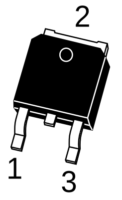
■ Features

- Wide Bandgap SiC MOSFET Technology.
- Low On-Resistance with High Blocking Voltage.
- Low Capacitances with High-Speed Switching.
- Low Reverse Recovery (Qrr).
- Easy to Parallel and Simple to Drive.
- Robust against Parasitic Turn on Even 0V Turn off Gate Voltage.

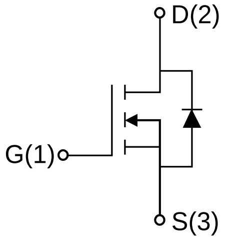
Parameter	Value	Unit
V_{DS}	650	V
$R_{DS(on)\_typ@VGS=18V}$	720	mΩ
$I_{D@VGS=15V,TC=25^\circ C}$	6.9	A

■ Benefits

- Reduced Switching Losses.
- Increased System Switching Frequency.
- Increased Power Density.
- Reduction of Heat Sink Requirements.
- Reduced EMI.



TO-252-2L



■ Application

- Switch Mode Power Supplies.
- High Voltage DC/DC Converters.
- Battery Chargers.
- Motor Drives.
- Pulsed Power Applications.

Maximum ratings(Tj=25°C, Unless otherwise specified)

Parameter	Symbol	Test Condition	Value	Unit
Drain to Source Voltage	$V_{DS,max}$	VGS=0V,ID=500μA	650	V
Gate to Source Voltage	$V_{GS,max}$	Absolute Maximum Values	-10/+22	V
Recommended Operation Voltage of Gate to Source	$V_{GS.op}$	Recommended Operational Values	0/+18	V
Continuous Drain Current	I_D	VGS=15V,TC=25°C	6.9	A
		VGS=15V,TC=100°C	4.9	A
Pulsed Drain Current	$I_{D(pulsed)}$	VGS=15V,TC=25°C	13.8	A
Power Dissipation	P_{tot}	TC=25°C,Tj=175°C	48.4	W
Operating and Storage Temperature	T_j,T_{stg}	—	-55 to+175	°C

Thermal Characteristics

Parameter	Symbol	Value			Unit
		Min	Typ	Max	
Thermal Resistance from Junction to Case	$R_{\theta JC}$	—	3.1	—	°C/W

Electrical Characteristics

Static Characteristics

Parameter	Symbol	Test Condition	Value			Unit
			Min	Typ	Max	
Gate Threshold Voltage	$V_{GS(th)}$	VGS=VDS,ID=0.65mA, Tj=25°C	2.7	—	4.5	V
Drain to Source Breakdown Voltage	$V_{(BR)DSS}$	VGS=0V,ID=500μA	650	—	—	V
Zero Gate Voltage Drain Current	I_{DSS}	VGS=0V,VDS=650V, Tj=25°C	—	—	10	μA
Gate to Source Leakage Current	I_{GSS+}	VGS=22V,VDS=0V, Tj=25°C	—	—	250	nA
	I_{GSS-}	VGS=-10V,VDS=0V, Tj=25°C	—	—	-250	nA
Drain to Source on Resistance	$R_{DS(on)}$	VGS=15V,ID=1.8A, Tj=25°C	—	1000	1300	mΩ
		VGS=15V,ID=1.8A, Tj=175°C	—	820	—	mΩ
		VGS=18V,ID=1.8A, Tj=25°C	—	720	880	mΩ
		VGS=18V,ID=1.8A, Tj=175°C	—	670	—	mΩ

Electrical Characteristics

Dynamic Characteristics

Parameter	Symbol	Test Condition	Value			Unit
			Min	Typ	Max	
Input Capacitance	C_{iss}	VGS=0V,VDS=400V, f=100KHz,Tj=25°C	—	125	—	pF
Output Capacitance	C_{oss}		—	11	—	pF
Reverse Transfer Capacitance	C_{rss}		—	1	—	pF
Gate-Source Charge	Q_{gs}	VGS=0/15V,VDS=400V, ID=2A,Tj=25°C	—	6.5	—	nC
Gate-Drain Charge	Q_{gd}		—	3.6	—	nC
Total Gate Charge	Q_g		—	16.5	—	nC
Gate Resistance	R_g	VAC=25mV,f=1MHz	—	11.8	—	Ω

Switching Characteristics

Parameter	Symbol	Test Condition	Value			Unit
			Min	Typ	Max	
Turn-On Delay Time	$t_{d(on)}$	VGS=0/15V,VDD=400V, ID=2A, Rg=5Ω,L=200uH	—	10.2	—	ns
Rise Time	t_r		—	36.5	—	ns
Turn-Off Delay Time	$t_{d(off)}$		—	14.2	—	ns
Fall Time	t_f		—	35.6	—	ns

Reverse Diode Characteristics

Parameter	Symbol	Test Condition	Value			Unit
			Min	Typ	Max	
Diode Forward Voltage	V_{SD}	VGS=0V,ISD=0.9A, Tj=25°C	—	4.5	—	V
Continuous Diode Forward Current	I_S	VGS=0V,Tj=25°C	—	4.8	—	A
Reverse Recovery Time	t_{rr}	VGS=0V,ISD=2A, VR=400V,di/dt=465A/us, Tj=25°C	—	11.6	—	ns
Reverse Recovery Charge	Q_{rr}		—	18.6	—	nC
Peak Reverse Recovery Current	I_{rrm}		—	2.8	—	A

Typical Performance

Fig1. Output Characteristics Tj=-40°C

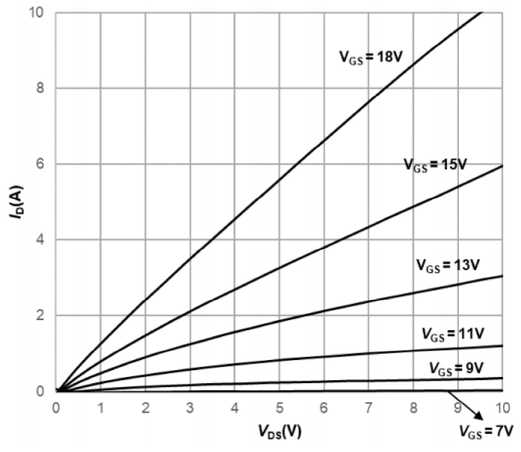


Fig2. Output Characteristics Tj=25°C

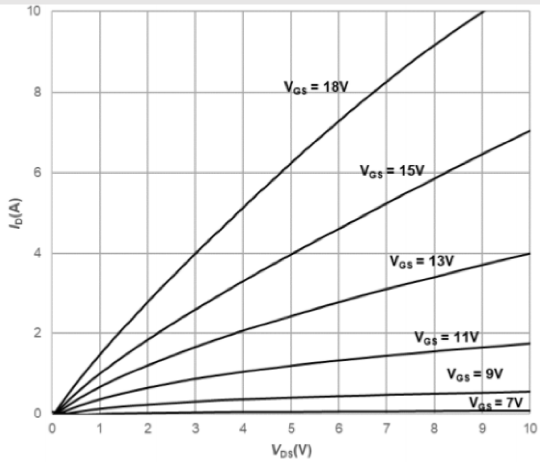


Fig3. Output Characteristics Tj=175°C

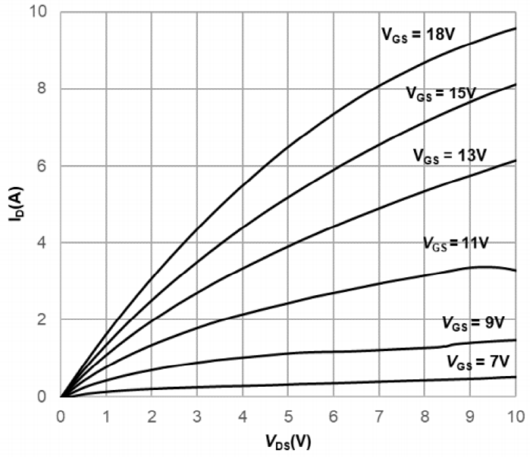


Fig4. Typical Transfer Characteristics

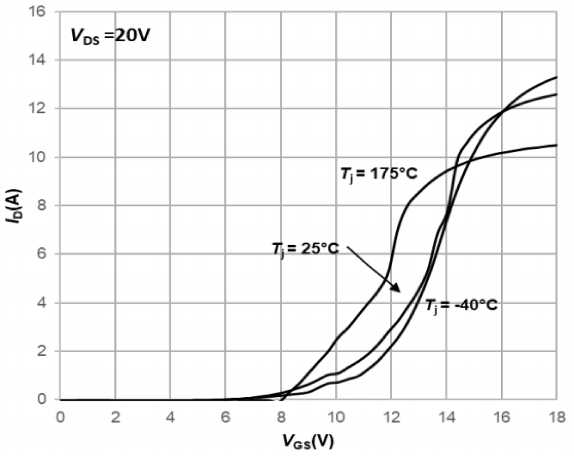


Fig5. Normalized On-Resistance vs. Temperature

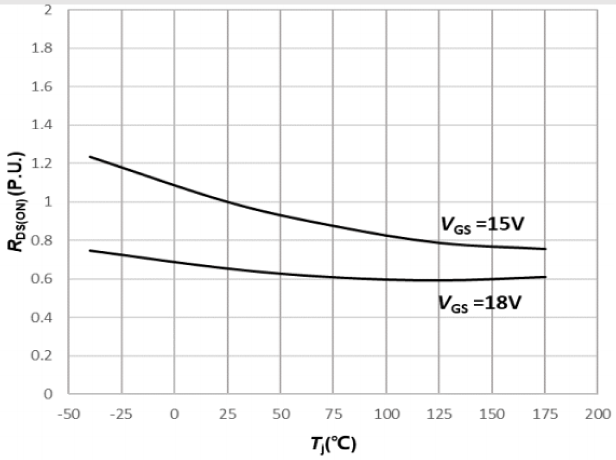
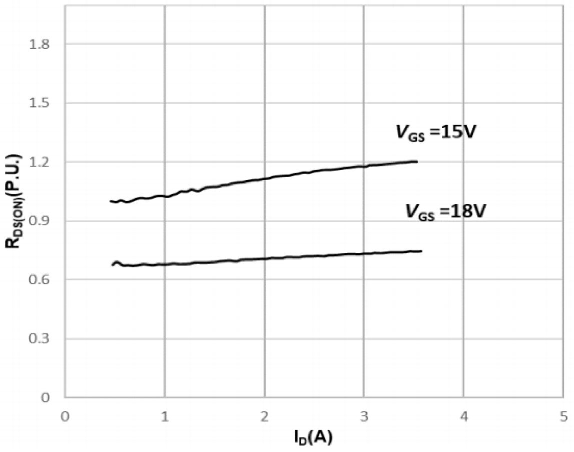


Fig6. Normalized On-Resistance vs. Drain Current For Various Temperatures



Typical Performance

Fig7. Normalized Threshold Voltage vs. Temperature

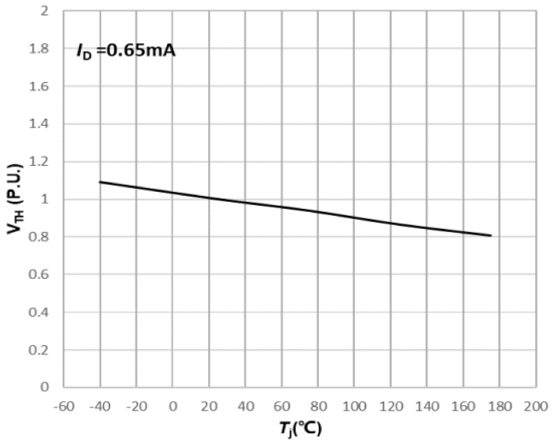


Fig8. Capacitances vs. Drain-Source Voltage (0-200V)

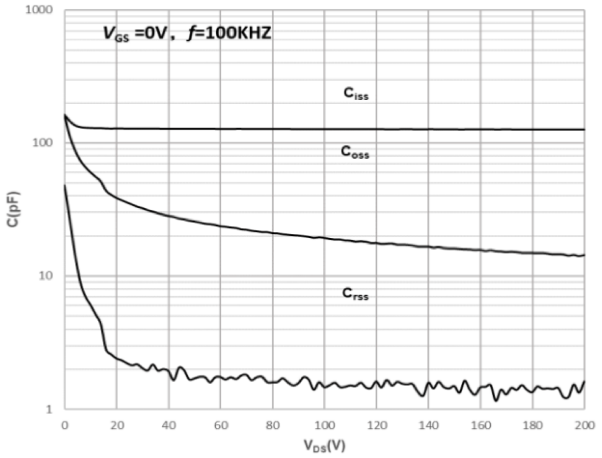


Fig9. Capacitances vs. Drain-Source Voltage (0-600V)

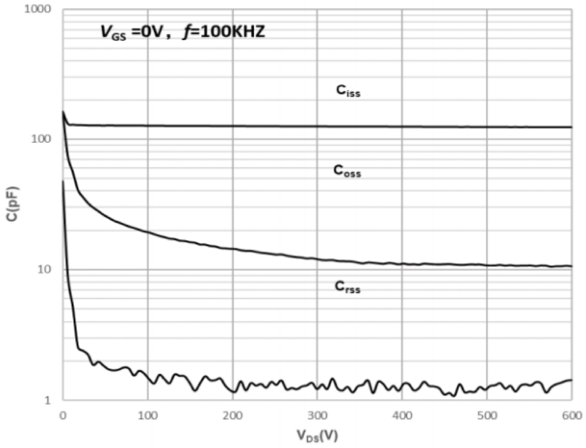


Fig10. Body Diode Characteristics

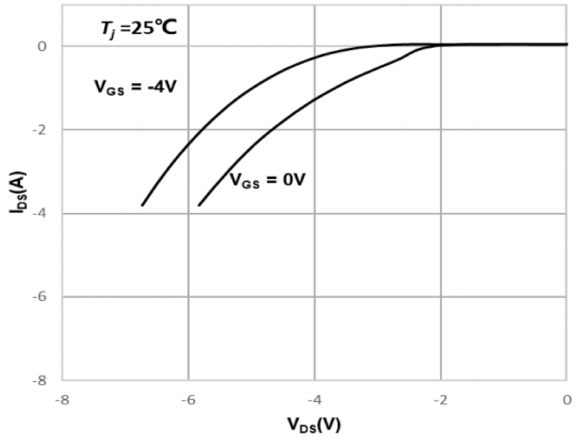


Fig11. GateChargeCharacteristic

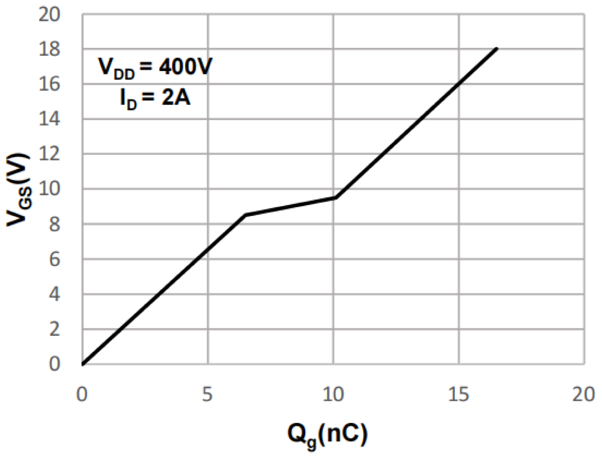
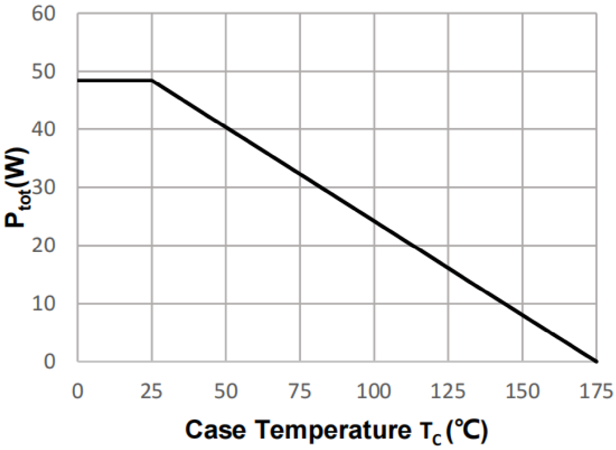
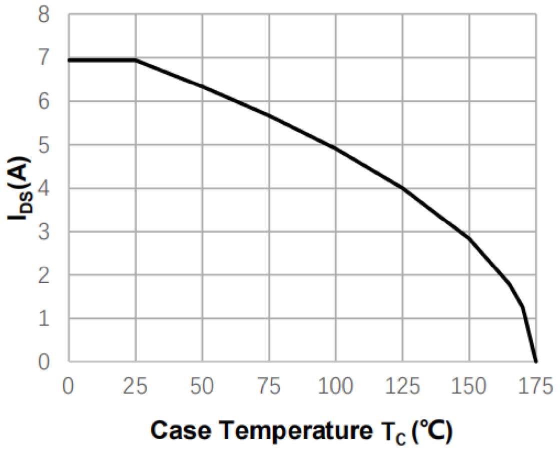


Fig12.Maximum Power Dissipation vs. Case Temperature



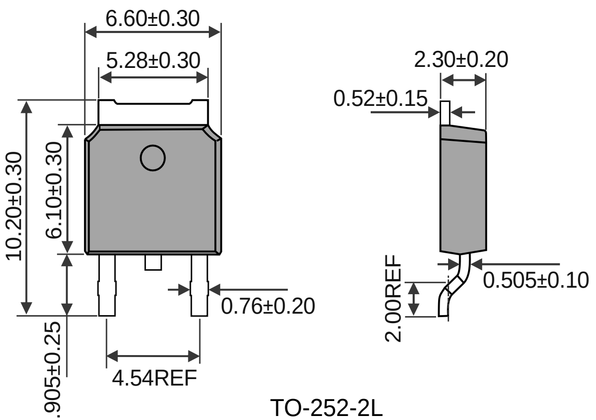
Typical Performance

Fig13. Continuous Drain Current vs. Case Temperature



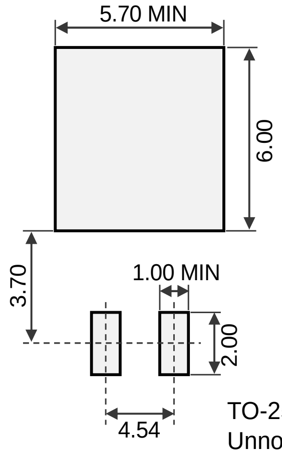
Package Outline Dimensions & Suggested Solder Pad Layout

Package Outline Dimensions



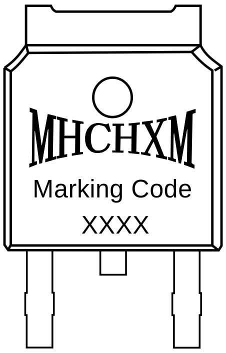
TO-252-2L
Unit:mm

Suggested Solder Pad Layout



TO-252-2L
Unnoted Tolerance:±0.05
Unit:mm

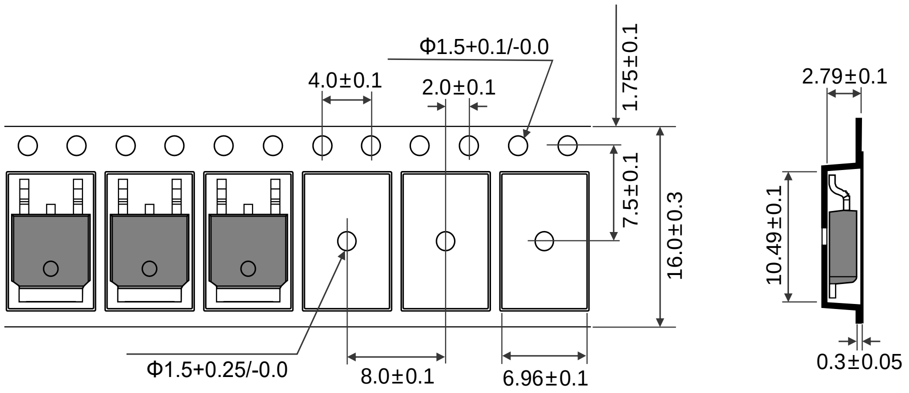
Marking Information



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

Marking Code	Part Number
C65N720S1	HXMC65N720S1

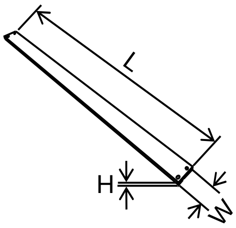
Reel Tape Dimensions (Dimensions in mm)



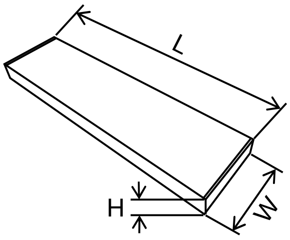
Packing Information

Packaging	Part Number	Quantity(pcs)	Size(mm)
Tube	Tube	80	L540×W20×H5
	Inner Box	4000	L570×W115×H55
	Outer Box	20000	L595×W320×H135
Reel	Reel	3000	Φ330×THK17
	Inner Box	3000	L350×W340×H25
	Outer Box	30000	L355×W300×H360

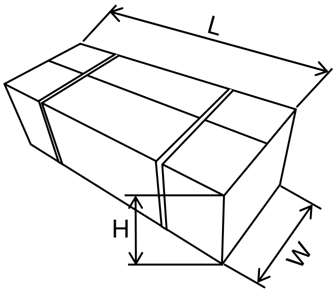
Packaging:Tube



Tube

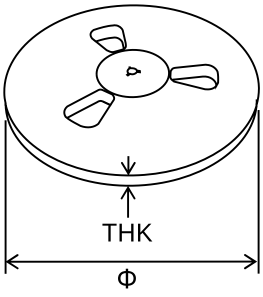


Tube Inner Box

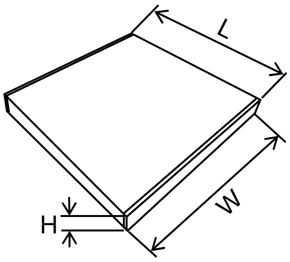


Tube Outer Box

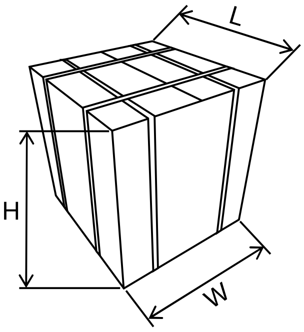
Packaging:Reel



Reel



Reel Inner Box



Reel Outer Box

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