

■ 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.

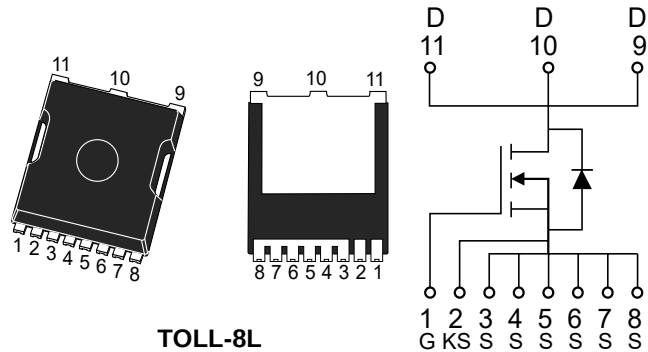
Parameter	Value	Unit
V_{DS}	650	V
$R_{DS(on)}_{typ@VGS=18V}$	20	mΩ
$I_{D@VGS=18V,TC=25^{\circ}C}$	120	A

■ Benefits

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

■ Application

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



TOLL-8L



Maximum ratings($T_j=25^{\circ}C$, Unless otherwise specified)

Parameter	Symbol	Test Condition	Value	Unit
Drain to Source Voltage	$V_{DS,max}$	$V_{GS}=0V, I_D=500\mu A$	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	$V_{GS}=18V, TC=25^{\circ}C$	120	A
		$V_{GS}=18V, TC=100^{\circ}C$	100	A
Pulsed Drain Current	$I_{D(pulsed)}$	$V_{GS}=18V, TC=25^{\circ}C$	240	A
Power Dissipation	P_{tot}	$TC=25^{\circ}C, T_j=175^{\circ}C$	333	W
Operating and Storage Temperature	T_j, T_{stg}	—	-55 to +175	$^{\circ}C$



Thermal Characteristics

Parameter	Symbol	Value			Unit
		Min	Typ	Max	
Thermal Resistance from Junction to Case	$R_{\theta JC}$	—	0.45	—	°C/W

Electrical Characteristics

Static Characteristics

Parameter	Symbol	Test Condition	Value			Unit
			Min	Typ	Max	
Gate Threshold Voltage	$V_{GS(th)}$	$V_{GS}=V_{DS}, I_D=23mA, T_j=25^{\circ}C$	2.7	—	4.5	V
Drain to Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=500\mu A$	650	—	—	V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{GS}=0V, V_{DS}=650V, T_j=25^{\circ}C$	—	—	10	μA
Gate to Source Leakage Current	I_{GSS+}	$V_{GS}=22V, V_{DS}=0V, T_j=25^{\circ}C$	—	—	250	nA
	I_{GSS-}	$V_{GS}=-10V, V_{DS}=0V, T_j=25^{\circ}C$	—	—	-250	nA
Drain to Source on Resistance	$R_{DS(on)}$	$V_{GS}=15V, I_D=60A, T_j=25^{\circ}C$	—	30	50	m Ω
		$V_{GS}=18V, I_D=60A, T_j=25^{\circ}C$	—	20	30	m Ω
		$V_{GS}=18V, I_D=60A, T_j=175^{\circ}C$	—	23	—	m Ω



Electrical Characteristics

Dynamic Characteristics

Parameter	Symbol	Test Condition	Value			Unit
			Min	Typ	Max	
Input Capacitance	C_{iss}	VGS=0V, VDS=500V, f=100KHz, Tj=25°C	—	3200	—	pF
Output Capacitance	C_{oss}		—	230	—	pF
Reverse Transfer Capacitance	C_{rss}		—	20	—	pF
Gate-Source Charge	Q_{gs}	VGS=0/18V, VDS=500V, ID=60A, Tj=25°C	—	35	—	nC
Gate-Drain Charge	Q_{gd}		—	17	—	nC
Total Gate Charge	Q_g		—	125	—	nC
Gate Resistance	R_g	VAC=25mV, f=1MHz	—	1.3	—	Ω

Switching Characteristics

Parameter	Symbol	Test Condition	Value			Unit
			Min	Typ	Max	
Turn-On Delay Time	$t_{d(on)}$	VGS=0/18V, VDD=500V, ID=20A, Rg=10Ω	—	21	—	ns
Rise Time	t_r		—	76	—	ns
Turn-Off Delay Time	$t_{d(off)}$		—	70	—	ns
Fall Time	t_f		—	37	—	ns

Reverse Diode Characteristics

Parameter	Symbol	Test Condition	Value			Unit
			Min	Typ	Max	
Diode Forward Voltage	V_{SD}	VGS=0V, ISD=30A, Tj=25°C	—	4	—	V
Continuous Diode Forward Current	I_S	VGS=0V, Tj=25°C	—	120	—	A
Reverse Recovery Time	t_{rr}	VGS=0V, ISD=60A, VR=500V, di/dt=400A/us, Tj=25°C	—	35	—	ns
Reverse Recovery Charge	Q_{rr}		—	130	—	nC
Peak Reverse Recovery Current	I_{rrm}		—	6	—	A



Typical Performance

Fig1. Output Characteristics $T_j=25^{\circ}\text{C}$

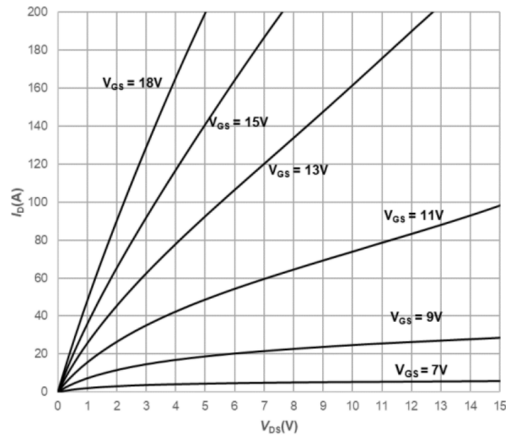


Fig2. Output Characteristics $T_j=175^{\circ}\text{C}$

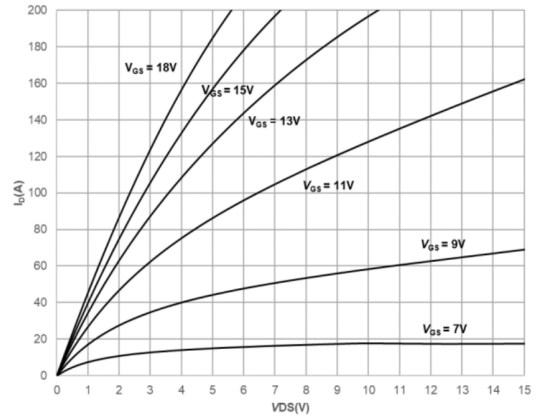


Fig3. Output Characteristics $T_j=-40^{\circ}\text{C}$

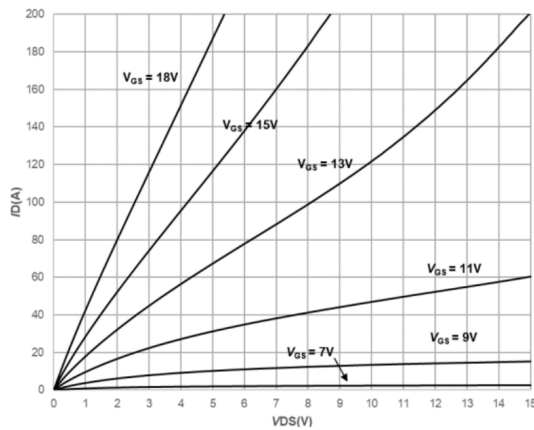


Fig4. Typical Transfer Characteristics

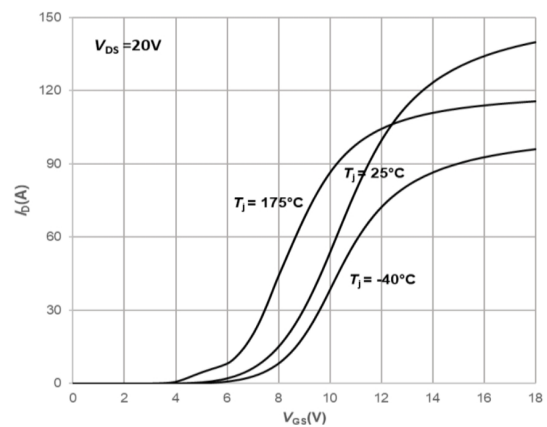


Fig5. Normalized On-Resistance vs. Temperature

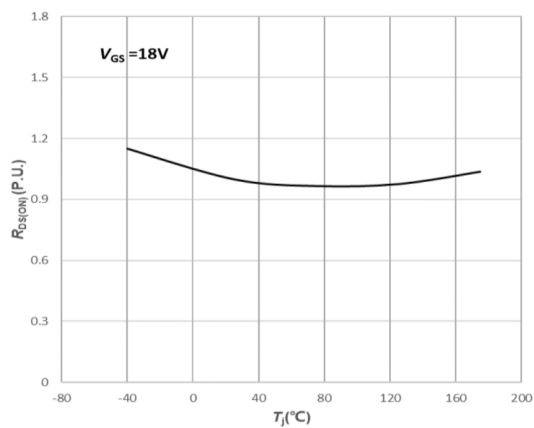
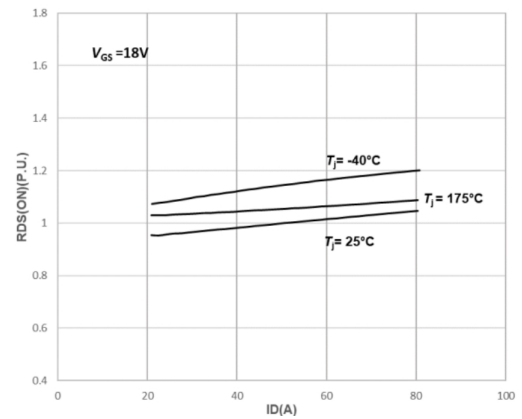


Fig6. Normalized On-Resistance vs. Drain Current For Various Temperatures



Typical Performance

Fig7. Capacitances vs. Drain-Source Voltage (0-200V)

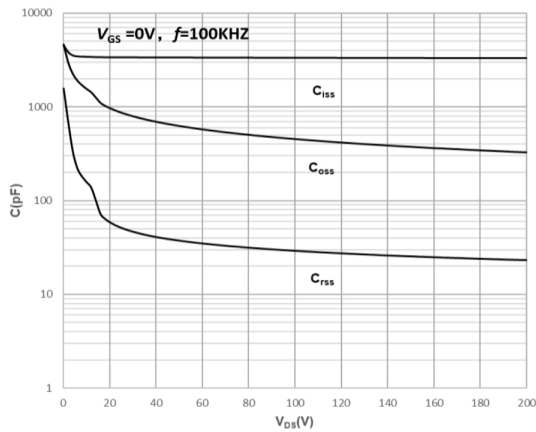


Fig8. Capacitances vs. Drain-Source Voltage (0-600V)

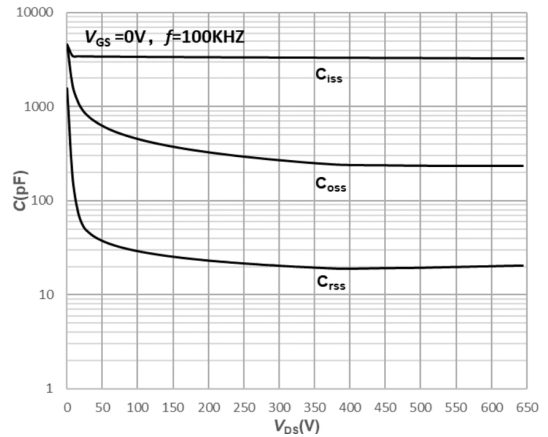


Fig9. Body Diode Characteristics

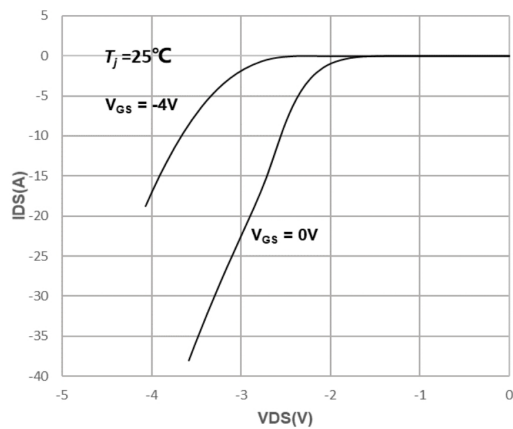


Fig10. Normalized Threshold Voltage vs. Temperature

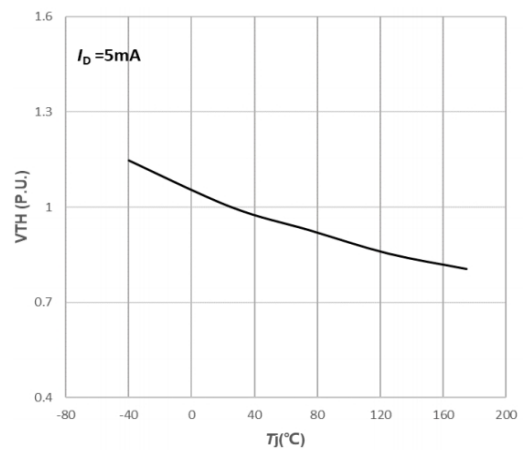
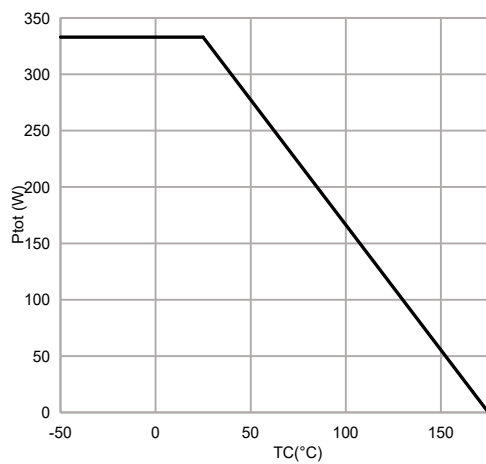
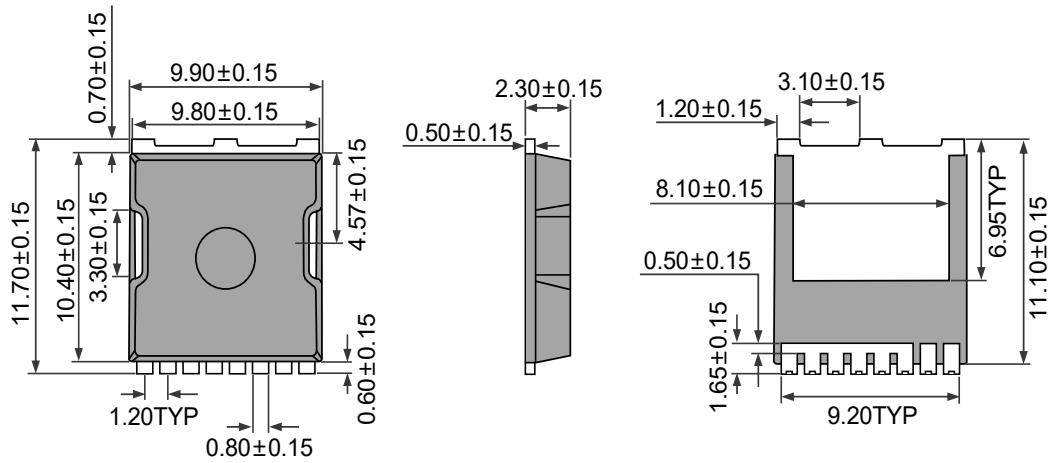


Fig11. Maximum Power Dissipation vs. Case Temperature



Package Outline Dimensions



TOLL-8L
Unit: mm

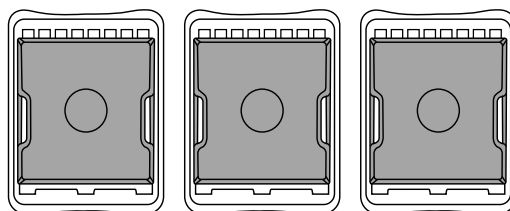
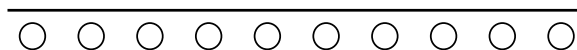
Marking Information



“MHCHXM”= Product Logo
 “Marking Code”= The Following
 “XXXX”= Date Code Marking

Marking Code	Part Number
C65N20T1	HXMC65N20T1

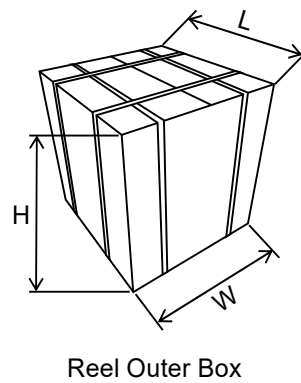
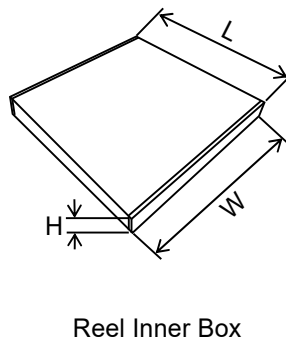
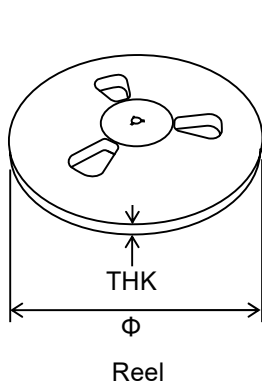
The Orientation Of The Product In The Carrier Tape



Packing Information

Packaging	Part Number	Quantity(pcs)	Size(mm)
Reel	Reel	2000	Φ330×THK24
	Inner Box	2000	L354×W345×H52
	Outer Box	12000	L390×W345×H365

Packaging:Reel



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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.
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