HXMC65N100M3

N-Channel SiC Power MOSFET

■ Features

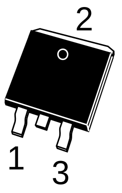
- Wide Bandgap SiC MOSFET Technology.
- Low On-Resistance with High Blocking Voltage.
- Low Capacitances with High-Speed Switching.
- Low Reverse Recovery (Qrr).
- Easy to Parallel and Simple to Drive.
- Robust against Parasitic Turn on Even 0V Turn off Gate Voltage.

G3 MOSFET Technology

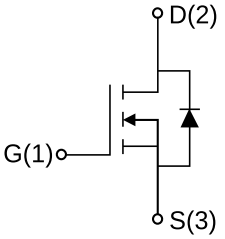
Parameter	Value	Unit
V_{DS}	650	V
$R_{DS(on)\_typ@VGS=18V}$	100	mΩ
$I_{D@VGS=18V,TC=25°C}$	28	A

■ Benefits

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



TO-263M-2L



■ Application

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

RoHS Reach

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/+23	V
Recommended Operation Voltage of Gate to Source	$V_{GS.op}$	Recommended Operational Values	-5…0/+15…+18	V
Continuous Drain Current	I_D	VGS=15V,TC=25°C	25	A
		VGS=15V,TC=100°C	18	A
Continuous Drain Current		VGS=18V,TC=25°C	28	A
		VGS=18V,TC=100°C	20	A
Pulsed Drain Current	$I_{D(pulsed)}$	VGS=15V,TC=25°C	64.8	A
Power Dissipation	P_{tot}	TC=25°C,Tj=175°C	75	W
Operating and Storage Temperature	T_j,T_{stg}	—	-55 to+175	°C
Solder Temperature, 1.6mm from case for 10s	T_L	—	260	°C

Thermal Characteristics

Parameter	Symbol	Value			Unit
		Min	Typ	Max	
Thermal Resistance from Junction to Case	$R_{\theta JC}$	—	2	—	°C/W

Electrical Characteristics

Static Characteristics

Parameter	Symbol	Test Condition	Value			Unit
			Min	Typ	Max	
Gate Threshold Voltage	$V_{GS(th)}$	VGS=VDS,ID=4mA, Tj=25°C	2.4	3.2	4	V
		VGS=VDS,ID=4mA, Tj=175°C	—	2.4	—	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=23V,VDS=0V, Tj=25°C	—	—	100	nA
	I_{GSS-}	VGS=-10V,VDS=0V, Tj=25°C	—	—	-100	nA
Drain to Source on Resistance	$R_{DS(on)}$	VGS=15V,ID=12A, Tj=25°C	—	130	200	mΩ
		VGS=15V,ID=12A, Tj=175°C	—	156	—	mΩ
		VGS=18V,ID=12A, Tj=25°C	—	100	150	mΩ
		VGS=18V,ID=12A, Tj=175°C	—	120	—	mΩ
Transconductance	g_{fs}	VDS=20V, IDS=12A, Tj=25°C	—	9	—	S
		VDS=20V, IDS=12A, Tj=175°C	—	8.2	—	S

Electrical Characteristics

Dynamic Characteristics

Parameter	Symbol	Test Condition	Value			Unit
			Min	Typ	Max	
Input Capacitance	C_{iss}	VGS=0V,VDS=400V, f=1MHz,VAC=25mV	—	522	—	pF
Output Capacitance	C_{oss}		—	44	—	pF
Reverse Transfer Capacitance	C_{rss}		—	2	—	pF
Reverse Transfer Capacitance	E_{oss}		—	3.5	—	μJ
Gate-Source Charge	Q_{gs}	VGS=0/15V,VDS=400V, ID=12A,Tj=25°C	—	7	—	nC
Gate-Drain Charge	Q_{gd}		—	5.7	—	nC
Total Gate Charge	Q_g		—	18.9	—	nC
Gate Resistance	R_g	VAC=25mV,f=1MHz	—	5.5	—	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=12A, RG(ext)=2.5Ω, RL=80Ω	—	8	—	ns
Rise Time	t_r		—	12	—	ns
Turn-Off Delay Time	$t_{d(off)}$		—	20	—	ns
Fall Time	t_f		—	8	—	ns
Turn-On Switching Energy	E_{on}	VDS=400V,VGS=0V/15V ID=12A,RG(ext)=2.5Ω,L=100μH	—	35	—	μJ
Turn-Off Switching Energy	E_{off}		—	23	—	μJ

Reverse Diode Characteristics

Parameter	Symbol	Test Condition	Value			Unit
			Min	Typ	Max	
Diode Forward Voltage	V_{SD}	VGS=-5V,ISD=6A, Tj=25°C	—	4.2	—	V
		VGS=-5V,ISD=6A, Tj=175°C	—	3.6	—	V
Continuous Diode Forward Current	I_S	VGS=0V,Tj=25°C	—	—	28	A
Reverse Recovery Time	t_{rr}	VGS=0V,ISD=6A, VR=400V,Tj=25°C	—	6	—	ns
Reverse Recovery Charge	Q_{rr}		—	40	—	nC
Peak Reverse Recovery Current	I_{rrm}		—	2	—	A

Typical Performance

Fig1. Output Characteristics Tj=-55°C

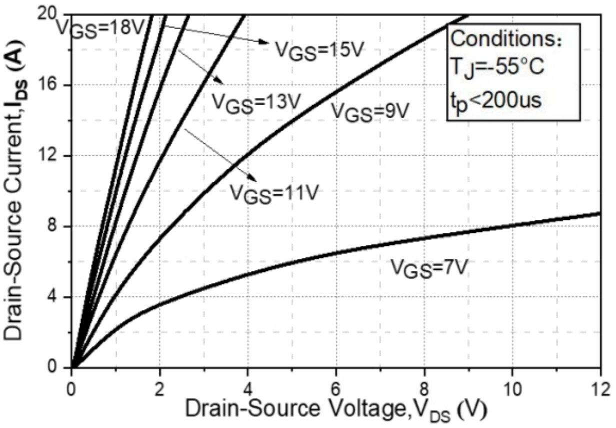


Fig2. Output Characteristics Tj=25°C

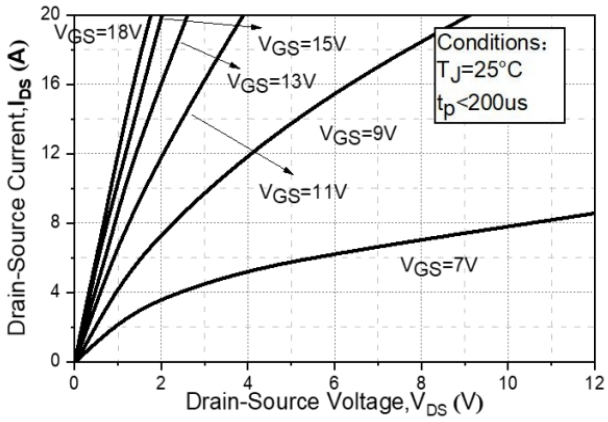


Fig3. Output Characteristics Tj=175°C

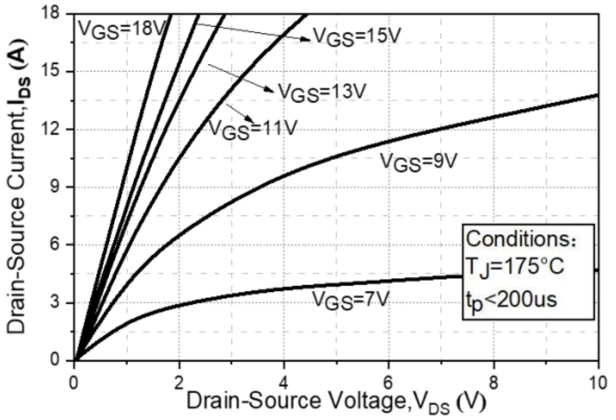


Fig4. Normalized On-Resistance vs. Temperature

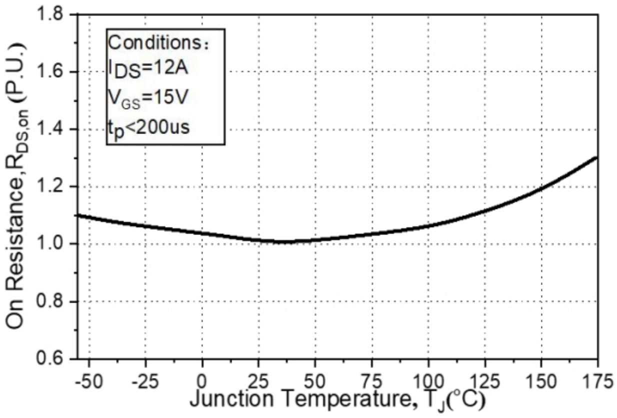


Fig5. On-Resistance vs. Drain Current For Various Temperatures

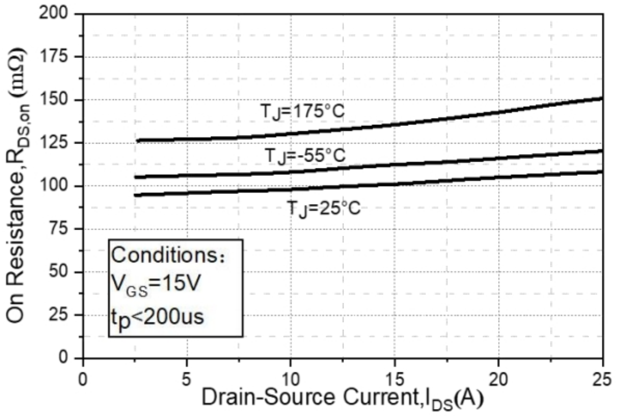
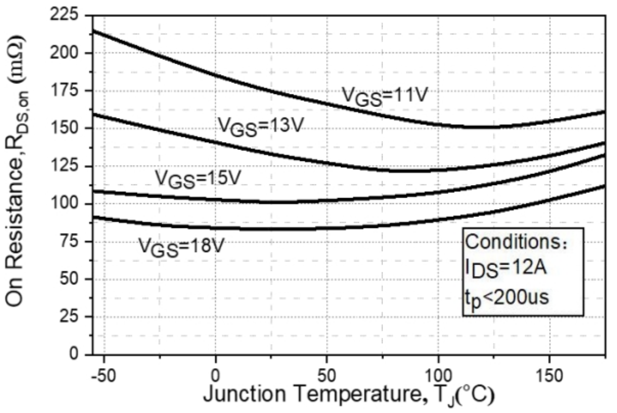


Fig6. On-Resistance vs. Temperature For Various Gate Voltage



Typical Performance

Fig7. Transfer Characteristic for Various Junction Temperatures

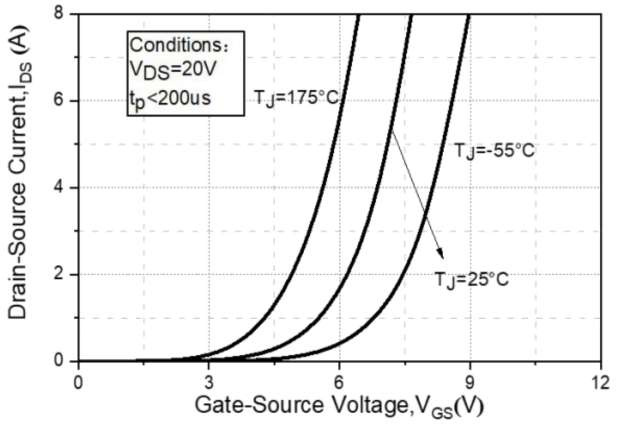


Fig8. Body Diode Characteristic at -55°C

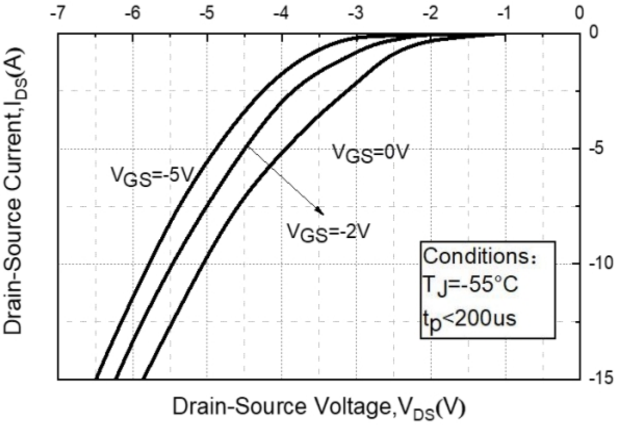


Fig9. Body Diode Characteristic at 25°C

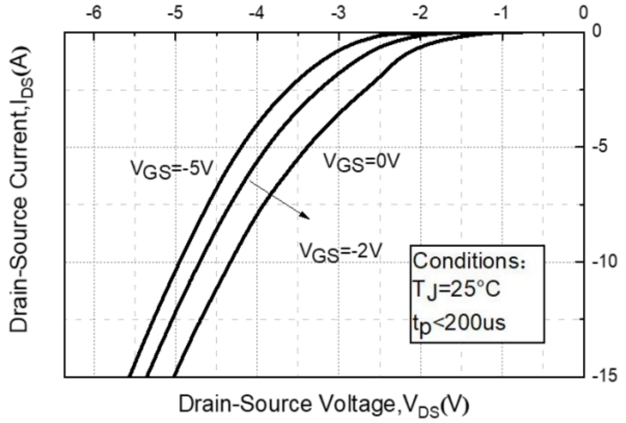


Fig10. Body Diode Characteristic at 175°C

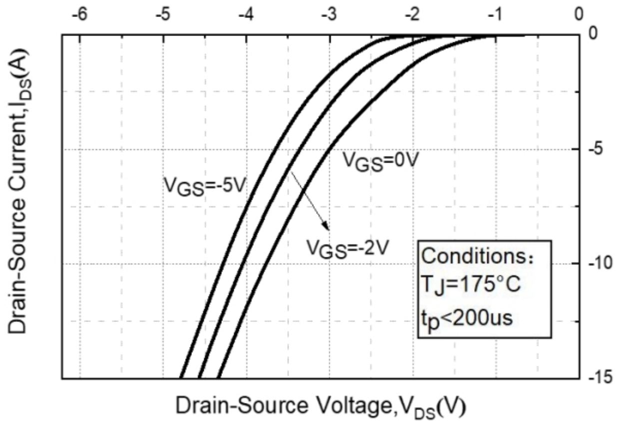


Fig11. Threshold Voltage vs. Temperature

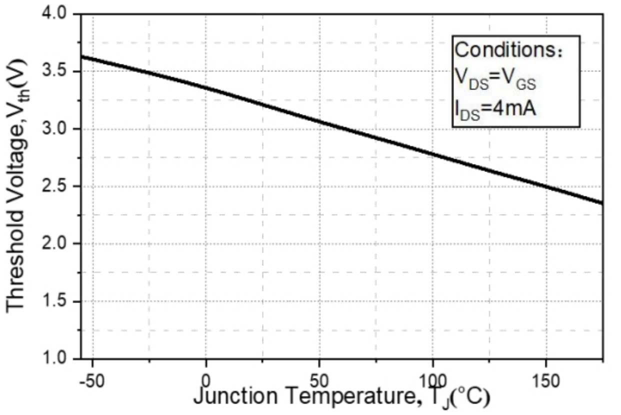
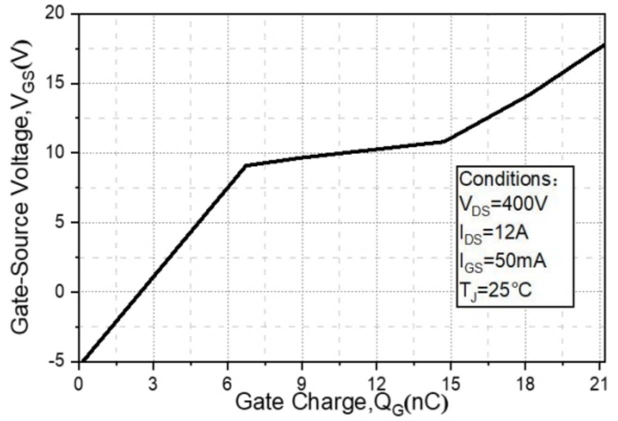


Fig12. Gate Charge Characteristics



Typical Performance

Fig13. 3rd Quadrant Characteristic at -55°C

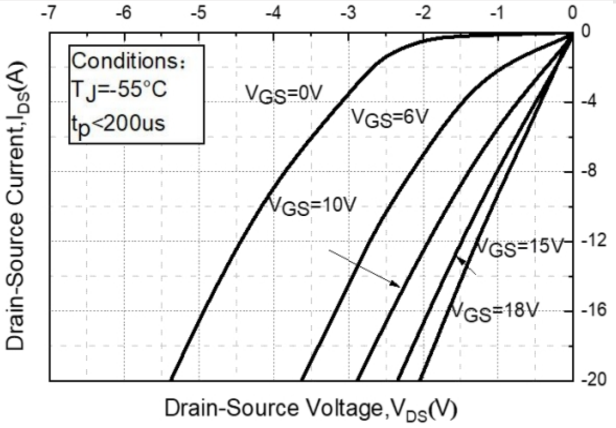


Fig14. 3rd Quadrant Characteristic at 25°C

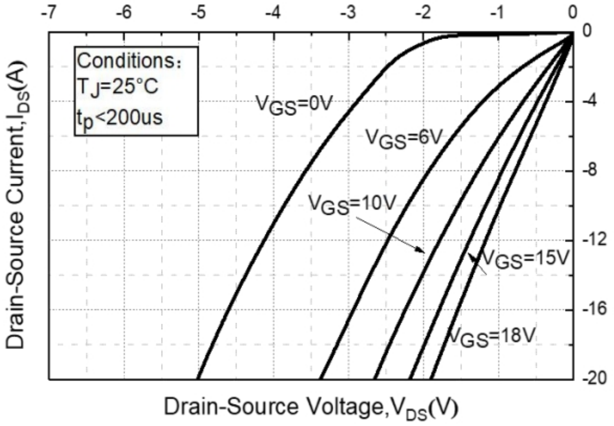


Fig15. 3rd Quadrant Characteristic at 175°C

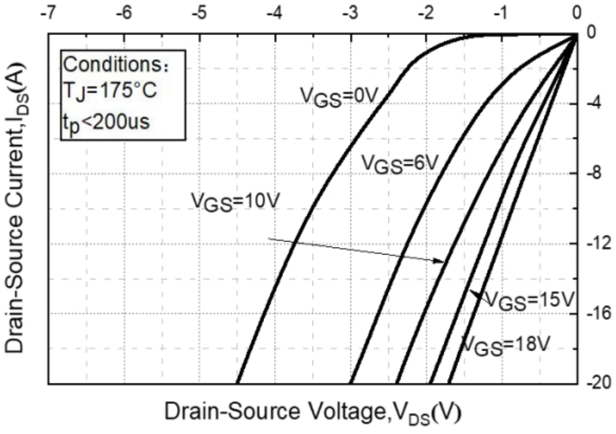


Fig16. Output Capacitor Stored Energy

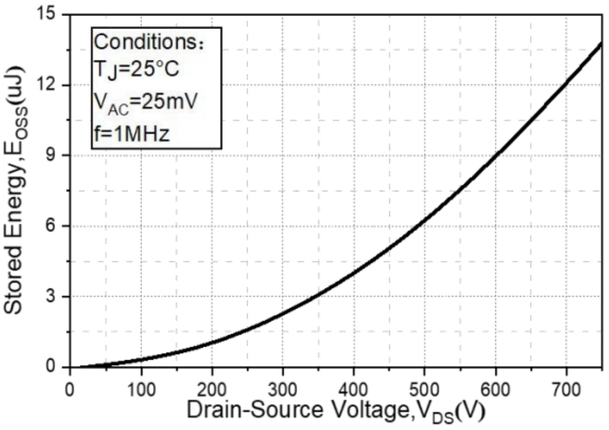


Fig17. Capacitances vs. Drain-Source Voltage (0-200V)

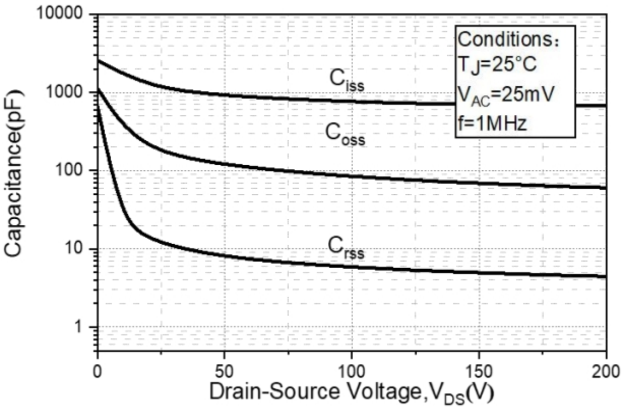
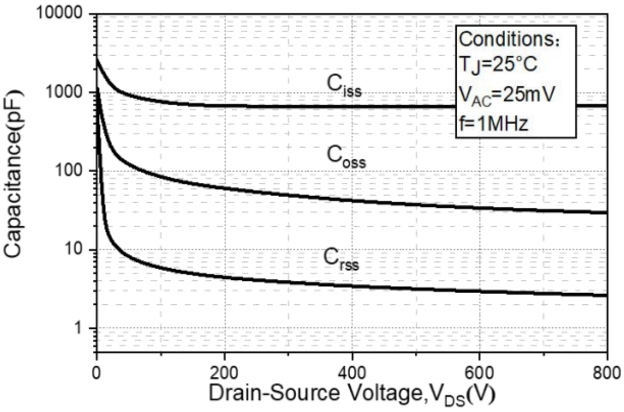


Fig18. Capacitances vs. Drain-Source Voltage (0-800V)



Typical Performance

Fig19.Continuous Drain Current vs. Case Temperature

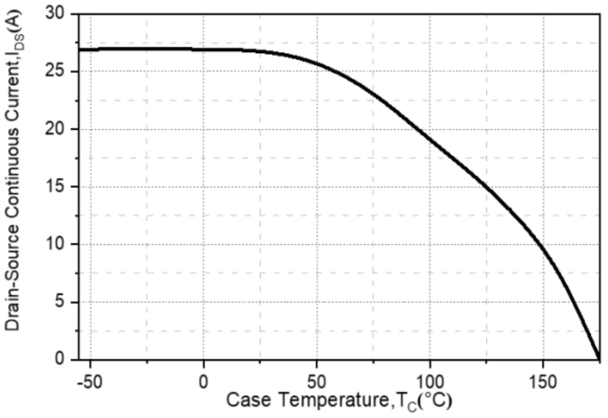
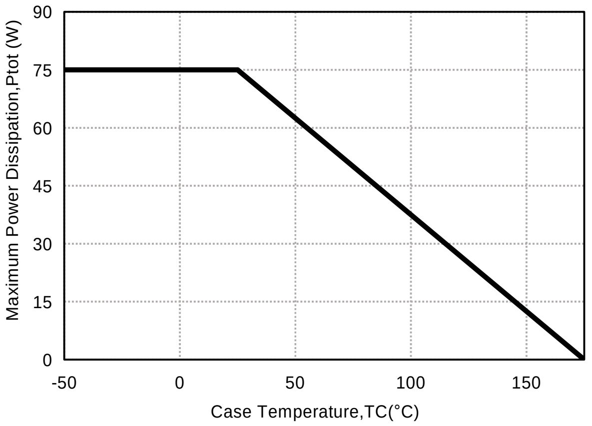
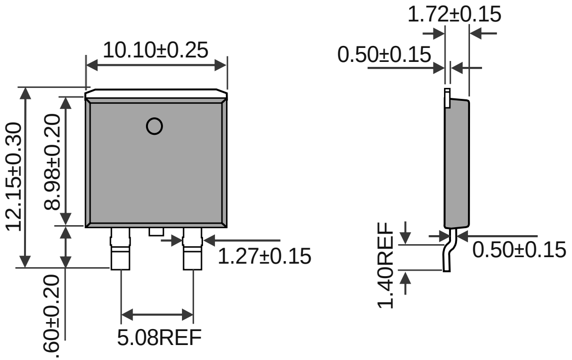


Fig20.Maximum Power Dissipation vs. Case Temperature



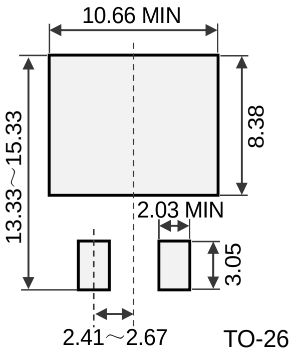
Package Outline Dimensions & Suggested Solder Pad Layout

Package Outline Dimensions



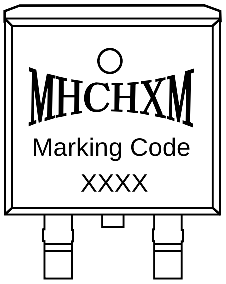
TO-263M-2L
Unit:mm

Suggested Solder Pad Layout



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

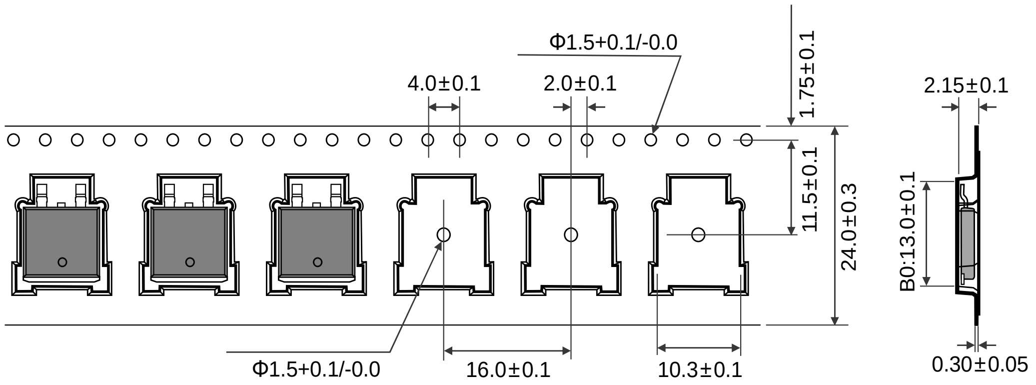
Marking Information



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

Marking Code	Part Number
C65N100M3	HXMC65N100M3

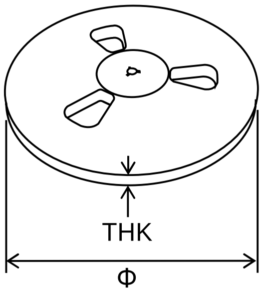
Reel Tape Dimensions (Dimensions in mm)



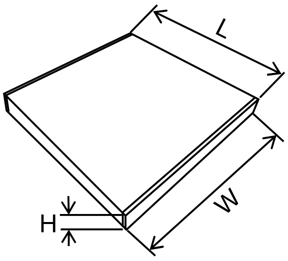
Packing Information

Packaging	Part Number	Quantity(pcs)	Size(mm)
Reel	Reel	1500	Φ330×THK25
	Inner Box	1500	L355×W335×H35
	Outer Box	15000	L385×W365×H365

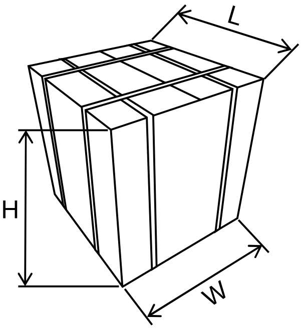
Packaging:Reel



Reel



Reel Inner Box



Reel Outer Box

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