

PRODUCT FEATURES

- ☐ High Speed Switching
- ☐ Low Switching Losses
- ☐ High Blocking Voltage with Low On-resistance
- ☐ Temperature Independent Trun-off Switching Losses
- ☐ Low Inductive Design

APPLICATIONS

- ☐ DC/DC Converter
- ☐ EV Chargers
- ☐ UPS
- ☐ High Frequency Switching Application



Half-Bridge

MODULE CHARACTERISTICS($T_{vj}=25^{\circ}\text{C}$ unless otherwise specified)

Symbol	Parameter/Test Conditions		Values	Unit
V_{isol}	Isolation test voltage	RMS, f = 50 Hz, t = 1 min	3.0	KV
Internal isolation	basic insulation		ALN	
CTI	Comparative tracking index		> 200	
RTI	Relative thermal index (electrical)	housing	120	$^{\circ}\text{C}$
T_{stg}	Storage Temperature		-40~125	$^{\circ}\text{C}$
F	Mounting Force Per Clamp		20-50	N
L_{sCE}	Stray inductance module		9.1	nH
G	Weight		23.3	g

MacMic Science & Technology Co., Ltd.

Add: #18, Hua Shan Zhong Lu, New District, Changzhou City, Jiangsu Province, P. R. of China
Tel.: +86-519-85163708 Fax: +86-519-85162291 Post Code: 213022 Website: www.macmicst.com

MMN7CB120BA6BS

MOSFET

ABSOLUTE MAXIMUM RATINGS($T_{vj}=25^{\circ}\text{C}$ unless otherwise specified)

Symbol	Parameter/Test Conditions		Values	Unit
V_{DSS}	Drain - source voltage		1200	V
I_{DDC}	Continuous DC Drain Current	$V_{GS}=18\text{V}, T_H=105^{\circ}\text{C}, T_{vj}=175^{\circ}\text{C}$	100	A
I_{DRM}	Repetitive Peak Drain Current	tp limited by T_{vjmax}	300	A
V_{GSS}	Gate-source voltage, max.transient voltage	250 hours over lifetime tp<1 μs	-10/+23	V
V_{GSS}	Gate-source voltage, max.static voltage		-5.5/+20	V
$V_{GSop,on}$	Recommended Operation Values of Gate-to-Source Voltage	turn-on	15...18	V
$V_{GSop,off}$	Recommended Operation Values of Gate-to-Source Voltage	turn-off	-5...0	V
V_{GSS}	Crosstalk Peak Voltage	tp<10nS	2.8...6.0	V

ELECTRICAL CHARACTERISTICS ($T_{vj}=25^{\circ}\text{C}$ unless otherwise specified)

Symbol	Parameter/Test Conditions		Min.	Typ.	Max.	Unit
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_C=40\text{mA}, T_{vj}=25^{\circ}\text{C}$ (tested after 1ms pulse at $V_{GS}=+20\text{V}$)	2.8	4.1	6.0	V
$R_{DS(on)}$	Static drain-source on-state resistance	$I_D=100\text{A}, V_{GS}=18\text{V}, T_{vj}=25^{\circ}\text{C}$		6.8		m Ω
		$I_D=100\text{A}, V_{GS}=18\text{V}, T_{vj}=125^{\circ}\text{C}$		10.7		
		$I_D=100\text{A}, V_{GS}=18\text{V}, T_{vj}=150^{\circ}\text{C}$		12.6		
		$I_D=100\text{A}, V_{GS}=15\text{V}, T_{vj}=25^{\circ}\text{C}$		7.8		
I_{DSS}	Reverse Bias Drain Current	$V_{DS}=1200\text{V}, V_{GS}=0\text{V}$		2	100	μA
I_{GSS}	Gate-Source Leakage Current	$V_{DS}=0\text{V}, V_{GS}=20\text{V}$			400	nA
Q_G	Gate Charge	$V_{DS}=850\text{V}, V_{GS}=-5/18\text{V}$		0.35		μC
C_{iss}	Input Capacitance	$V_{DS}=800\text{V}, V_{GS}=0\text{V}, f=100\text{kHz}$		7730		pF
C_{oss}	Output Capacitance			440		
C_{rss}	Reverse Transfer Capacitance			26		
$R_{G(int)}$	Internal Gate Resistance	f = 1MHz		4.7		Ω
$t_{d(on)}$	Turn on Delay Time	$V_{DS}=600\text{V}, I_D=100\text{A}$ $R_{Gon}=20\Omega$ $R_{Goff}=3.6\Omega$ $V_{GS}=-3/18\text{V}$	$T_{vj}=25^{\circ}\text{C}$	175		ns
			$T_{vj}=150^{\circ}\text{C}$	140		
t_r	Rise Time		$T_{vj}=25^{\circ}\text{C}$	103		
			$T_{vj}=150^{\circ}\text{C}$	93		
$t_{d(off)}$	Turn off Delay Time		$T_{vj}=25^{\circ}\text{C}$	87		
			$T_{vj}=150^{\circ}\text{C}$	110		
t_f	Fall Time		$T_{vj}=25^{\circ}\text{C}$	25		
			$T_{vj}=150^{\circ}\text{C}$	25		
E_{on}	Turn on Energy	$di/dt=2400\text{A}/\mu\text{s}$ $dv/dt=25000\text{V}/\mu\text{s}$ ($T_{vj}=150^{\circ}\text{C}$)	$T_{vj}=25^{\circ}\text{C}$	5.2		mJ
			$T_{vj}=150^{\circ}\text{C}$	4.7		
E_{off}	Turn off Energy		$T_{vj}=25^{\circ}\text{C}$	1.2		
			$T_{vj}=150^{\circ}\text{C}$	1.23		
I_{SC}	Short Circuit Current	$V_{GS}=-5/15\text{V}$ $V_{DD}=800\text{V}$ $V_{DSmax}<V_{DSS}$ $R_G=40\Omega$	tpsc $\leq 2\mu\text{s}$, $T_J=25^{\circ}\text{C}$	2150		A
			tpsc $\leq 2\mu\text{s}$, $T_J=150^{\circ}\text{C}$	1900		
R_{thJC}	Junction to Case Thermal Resistance			0.241		K /W
R_{thJH}	Junction to Heat sink Thermal Resistance, $\lambda_{Grease} = 6\text{ W}/(\text{m}\cdot\text{K})$			0.335		K /W
T_{Jop}	Operating Temperature		-40		150	$^{\circ}\text{C}$
T_{Jmax}	Max. Junction Temperature				175	$^{\circ}\text{C}$

MMN7CB120BA6BS

Body DIODE

ABSOLUTE MAXIMUM RATINGS ($T_{vj}=25^{\circ}\text{C}$ unless otherwise specified)

Symbol	Parameter/Test Conditions		Values	Unit
I_{SD}	DC Body Diode Forward Current	$V_{GS}=-3\text{V}, T_H=105^{\circ}\text{C}, T_{vj}=175^{\circ}\text{C}$	55	A
I_{SM}	Peak reverse drain current	$V_{GS}=0\text{V}$, tp limited by Tvjmax, $T_{vj}=175^{\circ}\text{C}$	70	A
$I_{SM,plus}$	Plus peak reverse drain current	$V_{GS}=0\text{V}$, tp limited by Tvjmax, $T_{vj}=175^{\circ}\text{C}$	300	A

ELECTRICAL CHARACTERISTICS ($T_{vj}=25^{\circ}\text{C}$ unless otherwise specified)

Symbol	Parameter/Test Conditions		Min.	Typ.	Max.	Unit
V_{SD}	Diode Forward Voltage	$I_{SD}=100\text{A}, V_{GS}=-3\text{V}, T_{vj}=25^{\circ}\text{C}$		4.2	5.35	V
		$I_{SD}=100\text{A}, V_{GS}=-3\text{V}, T_{vj}=125^{\circ}\text{C}$		3.9		
		$I_{SD}=100\text{A}, V_{GS}=-3\text{V}, T_{vj}=150^{\circ}\text{C}$		3.8		

NTC CHARACTERISTICS ($T_F=25^{\circ}\text{C}$ unless otherwise specified)

Symbol	Parameter/Test Conditions		Min.	Typ.	Max.	Unit
R_{25}	Resistance	$T_{NTC}=25^{\circ}\text{C}$		5		k Ω
$B_{25/50}$	$R_2 = R_{25} \exp [B_{25/50}(1/T_2 - 1/(298.15 \text{ K}))]$			3375		K
$\Delta R/R$	$T_{NTC}=100^{\circ}\text{C}, R_{100}=493\Omega$		-5		5	%

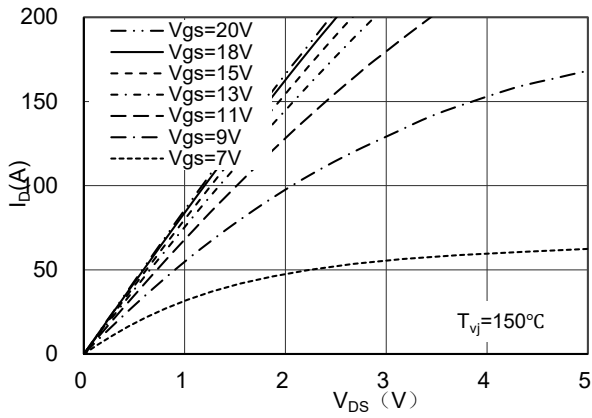


Figure 1. Typical Output Characteristics

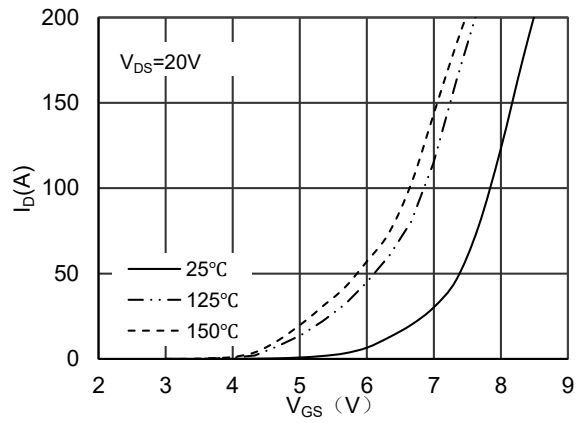


Figure 2. Typical Transfer characteristics

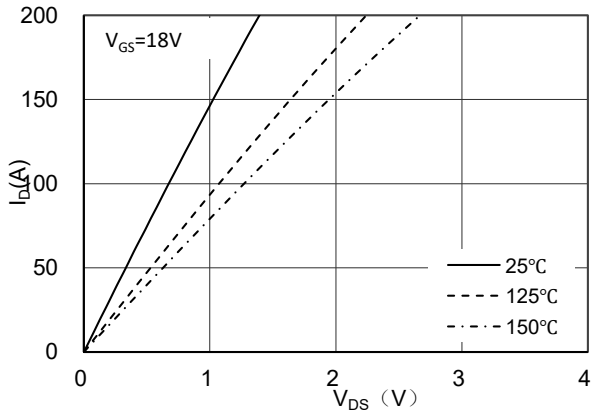


Figure 3. Typical Output Characteristics

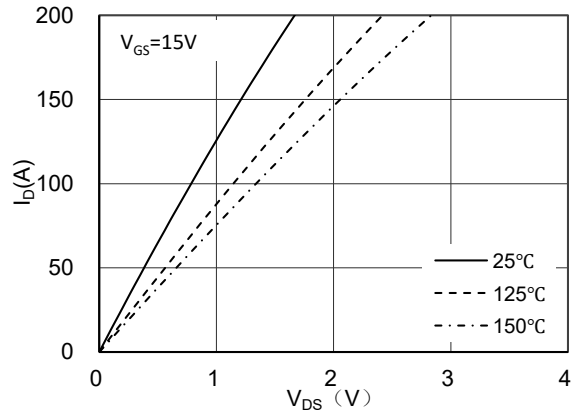


Figure 4. Typical Output Characteristics

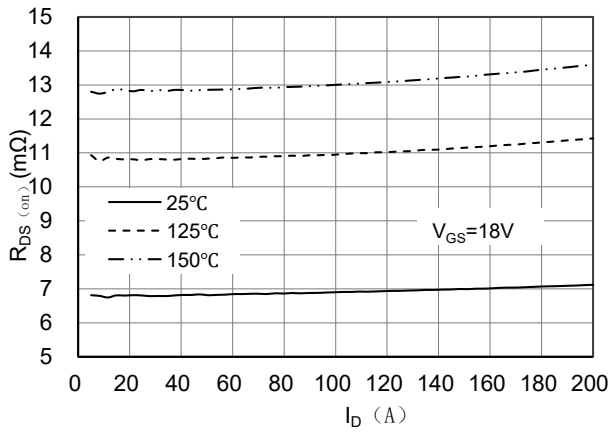


Figure 5. Typical Drain source on-resistance

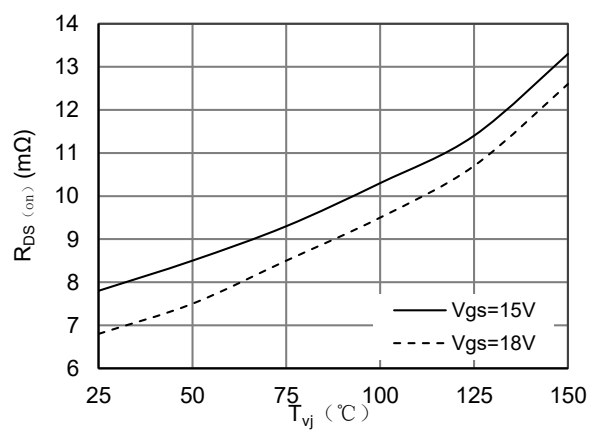


Figure 6. Typical Drain source on-resistance

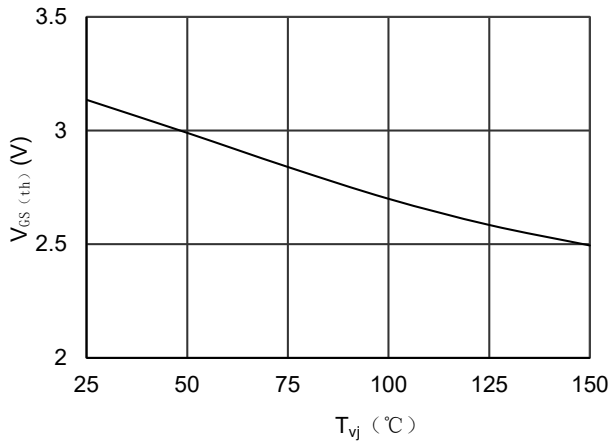


Figure 7. Typical Gate-source threshold voltage

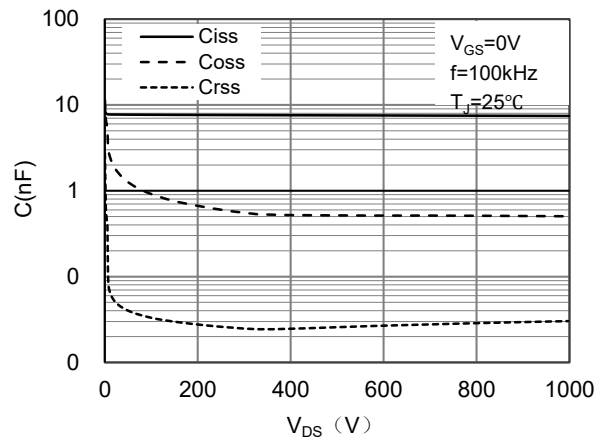


Figure 8. Typical capacitance

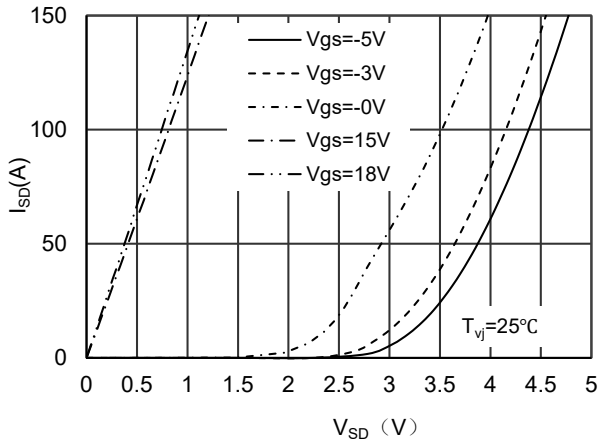


Figure 9. Typical Body Diode Forward

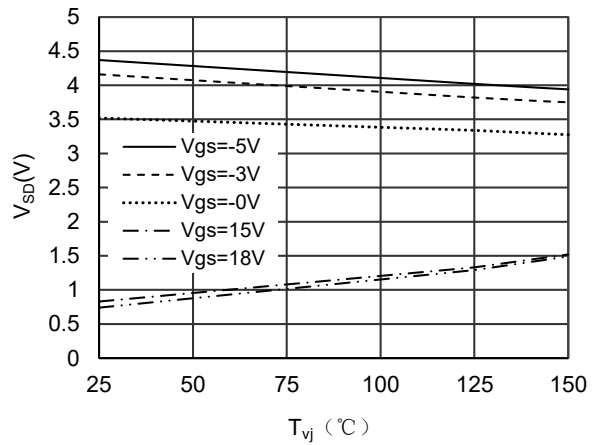


Figure 10. Typical Body Diode Forward Voltage

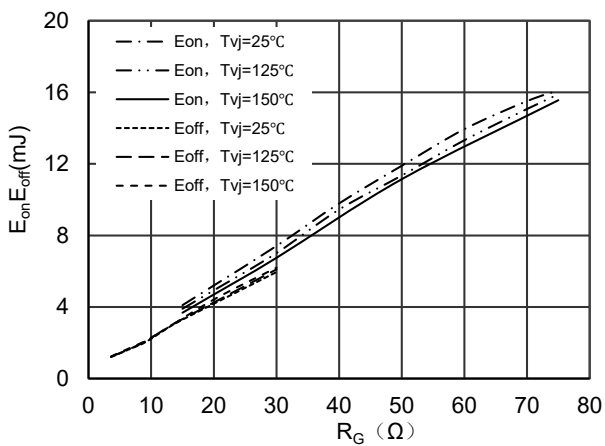


Figure 11. Typical Switching Energy

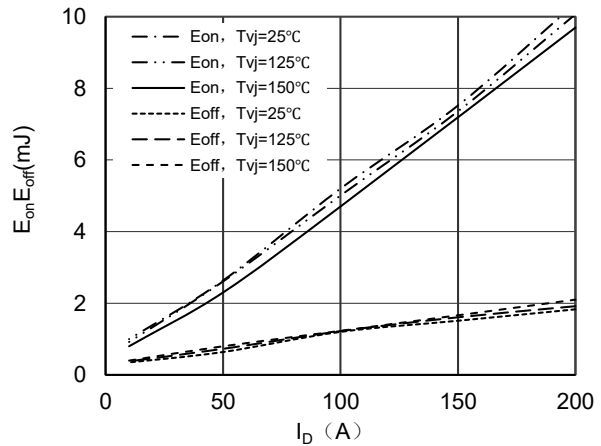
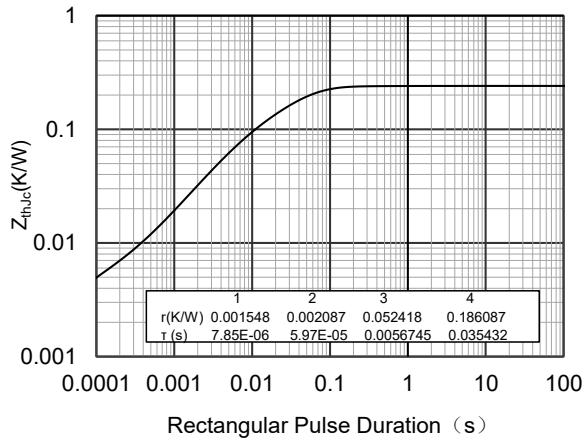
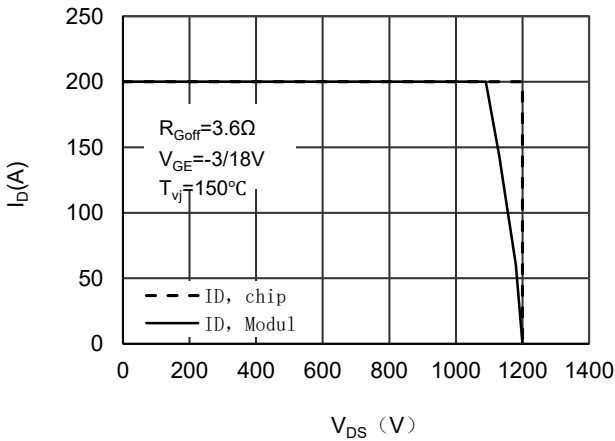
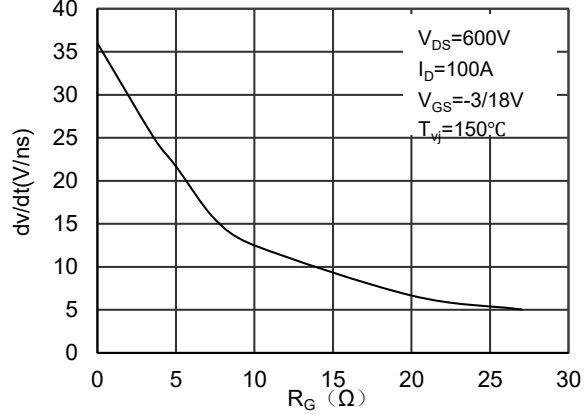
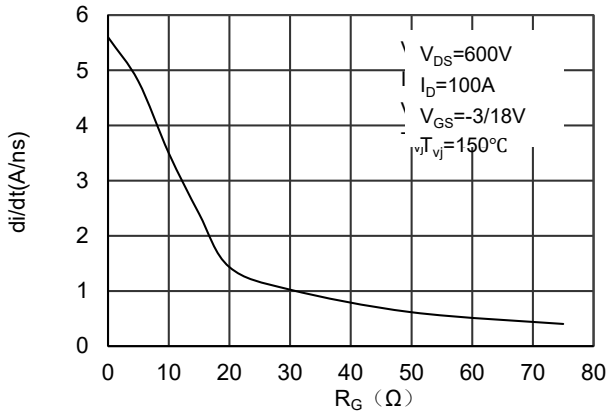
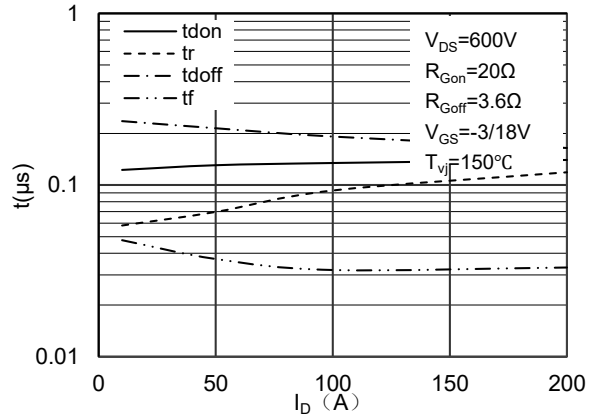
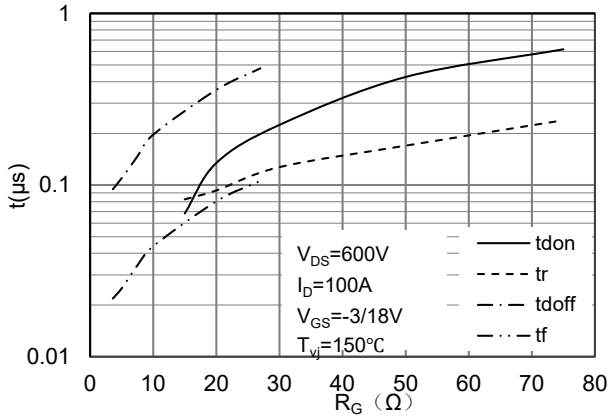


Figure 12. Typical Switching Energy



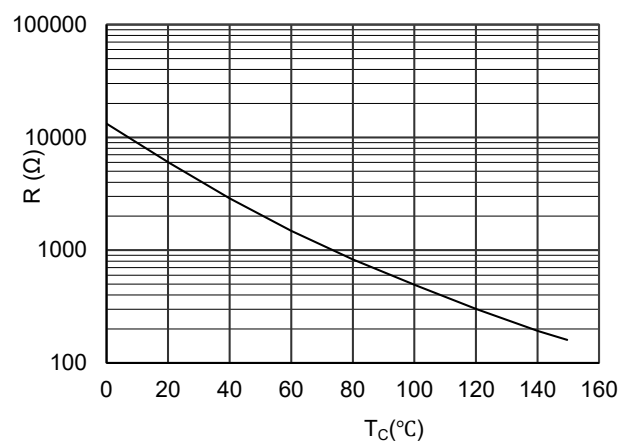


Figure 19. NTC Characteristics

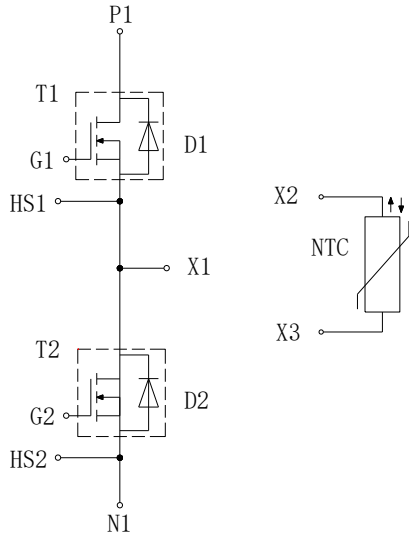
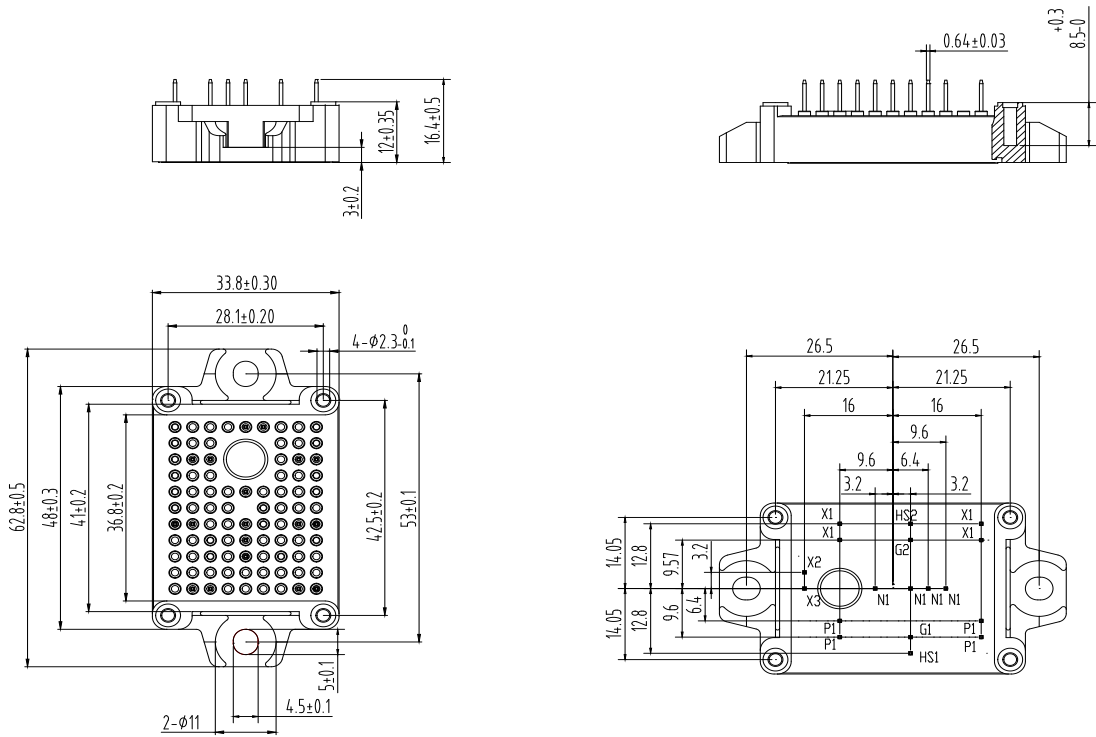


Figure 20. Circuit Diagram



Dimensions in (mm)
Figure 21. Package Outline

MMN7CB120BA6BS

Marking				
part1	Logo			
part2	Specifications of the products			
part3	Weekly batch number （with BOM version number）			
part4	DMcode （specifications_lot number_）			
	Code Cont	cont	digit	example
		specifications of the products	1-14	MMN7CB120BA6BS
		separator	15	_
		Production site	16	X—xinzhu null—huashan
		product type	17	P—project V—verify null—mass
		Packaging type	18-20	NCB
		production year	21-22	25
		lot number	23-26	0001
		serial number	27-29	001
part5	Lot number+serial number			
part6	UL mark			

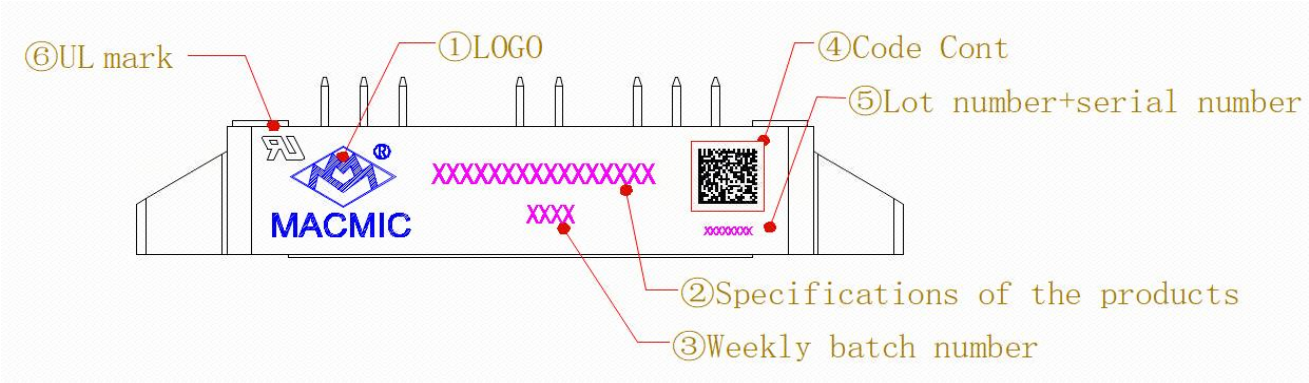


Figure 22. Marking instructions