

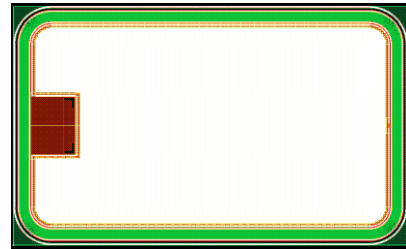
PM130N120LB(Bare Chip) / PM130N120LW(Wafer)

1,200V 20A 130mΩ Silicon Carbide MOSFET

Features

- Low On-Resistance
- High-Speed Switching
- High-Frequency Operation
- Fast Reverse Recovery
- Easy to Parallel & Simple to Drive
- Halogen Free, RoHS Compliant

Chip Outline



Applications

- Switch Mode Power Supplies
- Solar Inverters
- DC/DC Converters
- Battery Chargers
- Motor Drives
- Induction Heating

- Wafer Size	100mm
- Thickness	370±25 um
- Chip Size	3,600um X 2,200um
- Gate Pad Size	400um X 520um
- Source Pad Size	2,500um X 1,500um
- Front Metalization	Al 3um
- Back Metalization	Ni/Ag 0.5um

Absolute Maximum Ratings

$T_C = 25^\circ\text{C}$ unless otherwise noted

Symbol	Parameter	Value	Units
V_{DSS}	Drain-Source Voltage	1200	V
I_D	Drain Current - Continuous ($T_C = 25^\circ\text{C}$)	20	A
	- Continuous ($T_C = 100^\circ\text{C}$)	16	A
I_{DM}	Drain Current - Pulsed	40	A
V_{GSS_surge}	Gate-Source Voltage ($t_{surge} < 300\text{ns}$)	-7 / +24	V
V_{GSS}	Gate-Source Voltage (DC)	-5 / +20	V
T_J, T_{STG}	Operating and Storage Temperature Range	-55 to +175	$^\circ\text{C}$

Electrical Characteristics $T_C = 25^\circ\text{C}$ unless otherwise noted

Symbol	Parameter	Test Conditions	Min	Typ	Max	Units
Off Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS} = 0\text{ V}, I_D = 250\text{ }\mu\text{A}$	1200	--	--	V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS} = 1200\text{ V}, V_{GS} = 0\text{ V}$	--	--	200	μA
I_{GSS}	Gate-Body Leakage Current	$V_{GS} = 20\text{ V}, V_{DS} = 0\text{ V}$	--	--	250	nA
On Characteristics						
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS} = V_{GS}, I_D = 2.5\text{ mA}$	1.5	--	4.0	V
$R_{DS(on)}$	Static Drain-Source On-Resistance	$V_{GS} = 20\text{ V}, I_D = 10\text{ A}$	--	130	160	m Ω
Dynamic Characteristics						
C_{iss}	Input Capacitance	$V_{DS} = 800\text{ V}, V_{GS} = 0\text{ V},$ $f = 1.0\text{ MHz}$	--	1000	--	pF
C_{oss}	Output Capacitance		--	70	--	pF
C_{rss}	Reverse Transfer Capacitance		--	15	--	pF
Switching Characteristics						
$t_{d(on)}$	Turn-On Delay Time	$V_{DD} = 600\text{ V}, V_{GS} = -5 / 20\text{ V},$ $I_D = 20\text{ A},$ $R_L = 30\text{ }\Omega, R_G = 4.7\text{ }\Omega$	--	22	--	ns
t_r	Turn-On Rise Time		--	22	--	
$t_{d(off)}$	Turn-Off Delay Time		--	20	--	
t_f	Turn-Off Fall Time		--	17	--	
E_{on}	Turn-On Switching loss	$V_{DD} = 600\text{ V}, V_{GS} = -5 / 20\text{ V}$ $L = 0.3\text{ mH}, R_G = 4.7\text{ }\Omega$	--	120	--	μJ
E_{off}	Turn-Off Switching loss		--	85	--	
Q_g	Total Gate Charge	$V_{DS} = 600\text{ V}, I_D = 20\text{ A},$ $V_{GS} = -5 / 20\text{ V}$	--	62	--	nC
Q_{gs}	Gate-Source Charge		--	18	--	
Q_{gd}	Gate-Drain Charge		--	27	--	
Drain-Source Diode Characteristics and Maximum Ratings						
I_S	Maximum Continuous Drain-Source Diode Forward Current		--	--	20	A
I_{SM}	Maximum Pulsed Drain-Source Diode Forward Current		--	--	40	A
V_{SD}	Diode Forward Voltage	$V_{GS} = 0\text{ V}, I_S = 10\text{ A}$	--	4.5	--	V
t_{rr}	Reverse Recovery Time	$V_R = 600\text{ V}, V_{GS} = -5 / 20\text{ V},$ $I_S = 20\text{ A}, di_F / dt = 1000\text{ A}/\mu\text{s}$	--	50	--	ns
Q_{rr}	Reverse Recovery Charge		--	120	--	nC

Note. Electrical characteristics are based on the package device, PM130N120LH/PM130N120LH_G.

Typical Characteristics

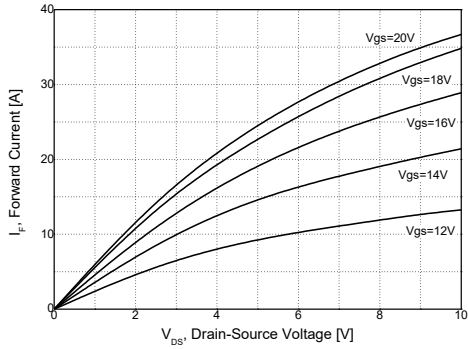


Figure 1. On-State Characteristics

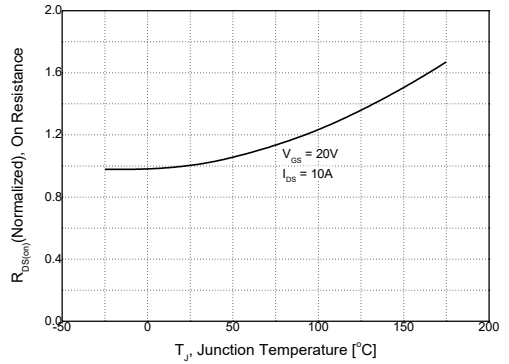


Figure 2. On Resistance Variation vs. Junction Temperature

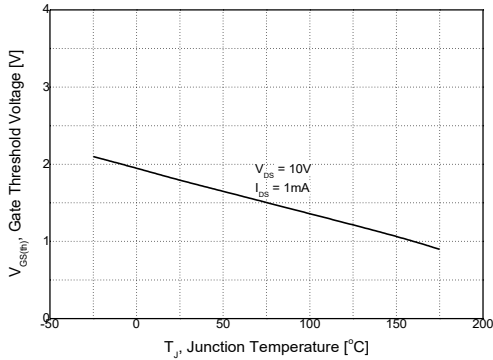


Figure 3. Gate Threshold Voltage vs. Junction Temperature

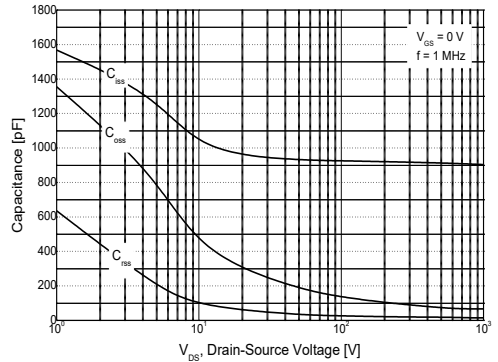


Figure 4. Capacitance Characteristics

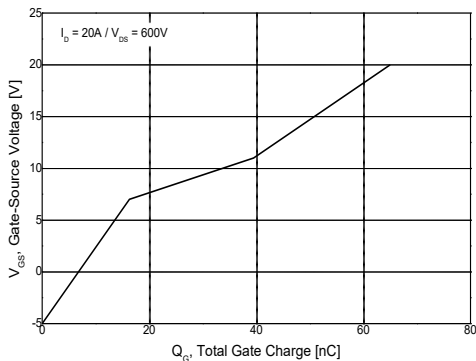
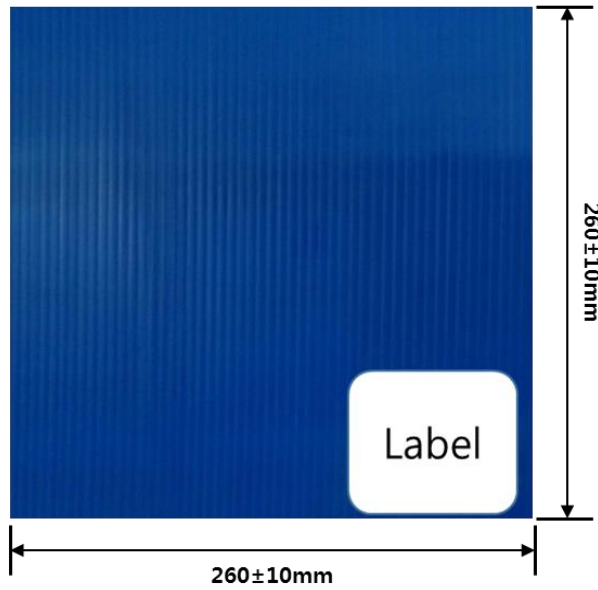


Figure 5. Gate Charge Characteristics

Packing Information

Inner : Plastic PVC Sheet (Dicing Wafer)



* Label information

Product Code	PMXXXXXXXXLB
Chip [ea]	XXX
Date	20XX . XX . XX .

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Outer Box



Notes

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