

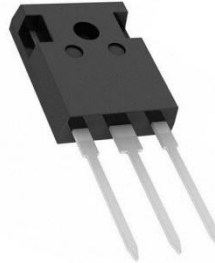
PM130N120LH_G

1,200V 20A 130mΩ Silicon Carbide MOSFET

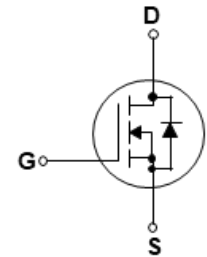
Features

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

Package Outline



Gate Drain Source



Applications

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

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
P_D	Power Dissipation ($T_C = 25^\circ\text{C}$)	115	W
	- Derate above 25°C	0.77	W/ $^\circ\text{C}$
T_J, T_{STG}	Operating and Storage Temperature Range	-55 to +175	$^\circ\text{C}$
T_L	Maximum lead temperature for soldering purposes, 1/8" from case for 5 seconds	260	$^\circ\text{C}$

Thermal Characteristics

Symbol	Parameter	Value	Units
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case	1.3	$^\circ\text{C}/\text{W}$
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient	40	$^\circ\text{C}/\text{W}$

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

Typical Characteristics

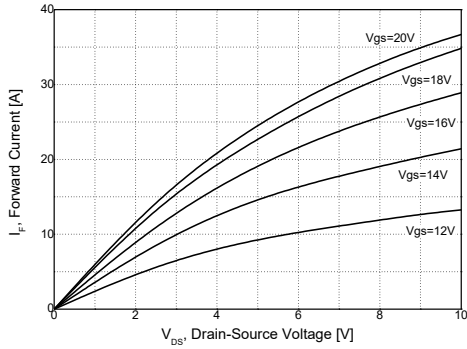


Figure 1. On-State Characteristics

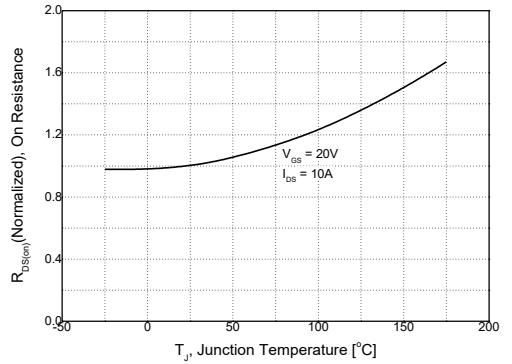


Figure 2. On Resistance Variation vs. Junction Temperature

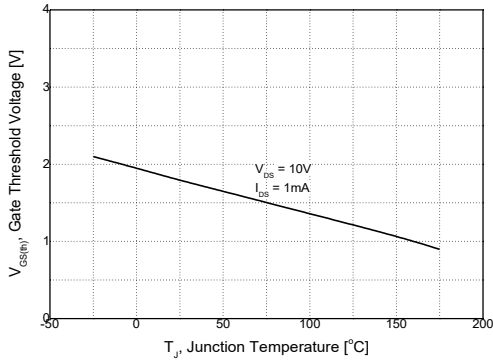


Figure 3. Gate Threshold Voltage vs. Junction Temperature

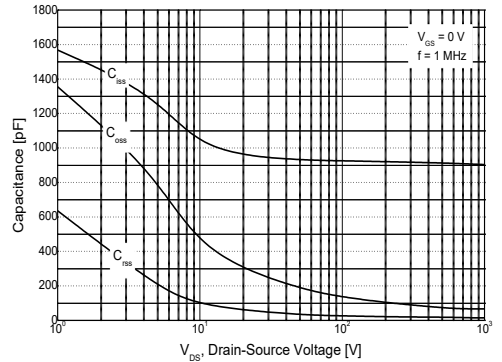


Figure 4. Capacitance Characteristics

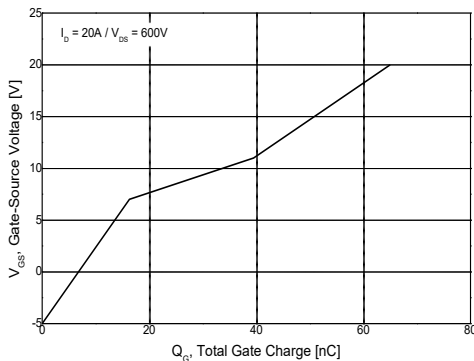


Figure 5. Gate Charge Characteristics

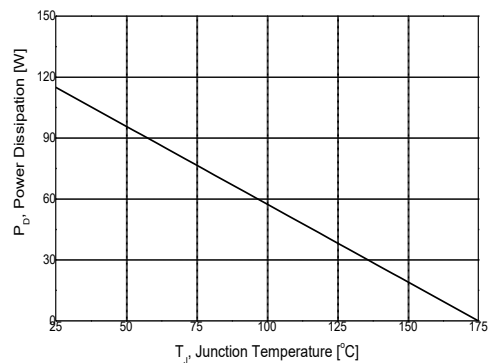


Figure 6. Power Dissipation

Typical Characteristics

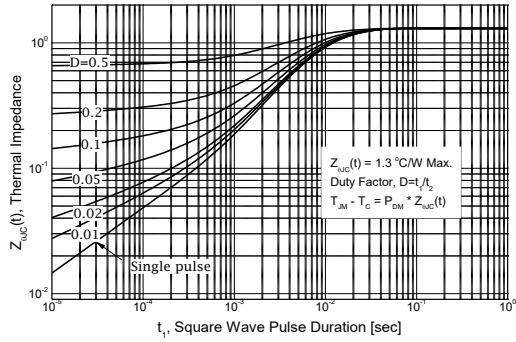


Figure 7. Transient Thermal Response

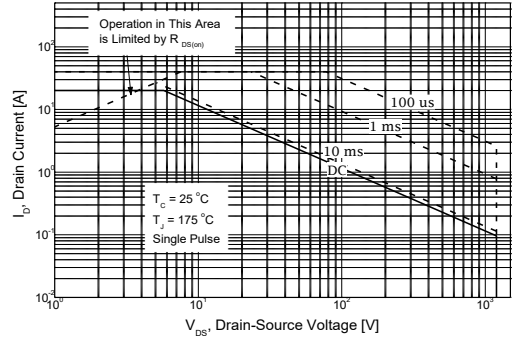
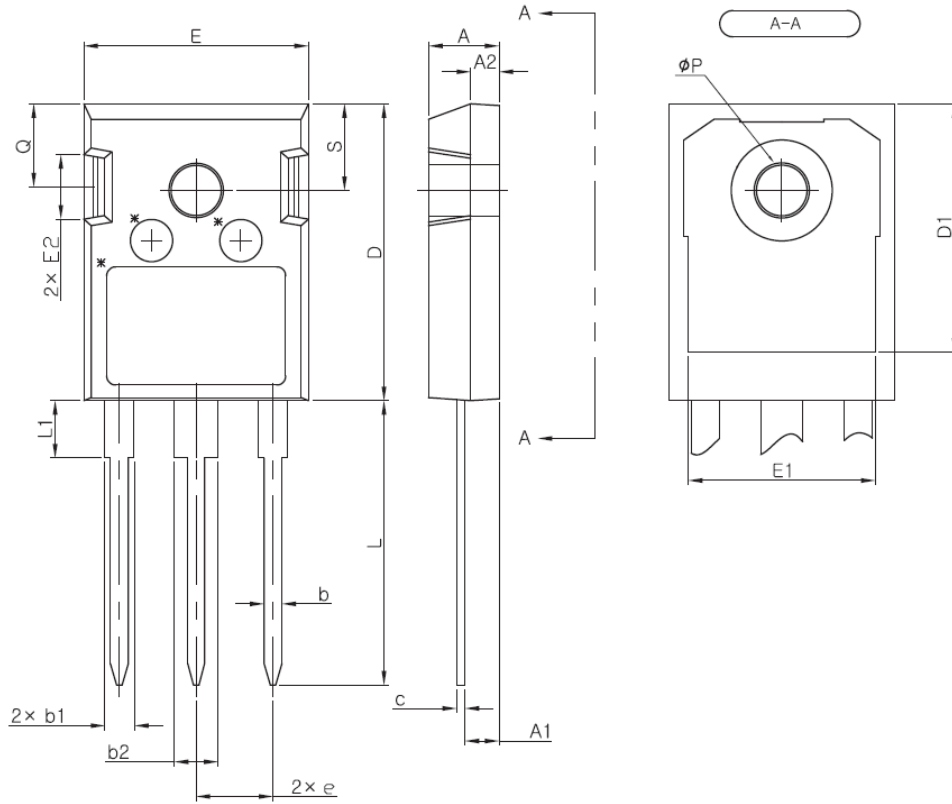


Figure 8. Maximum Safe Operating Area

Package Information



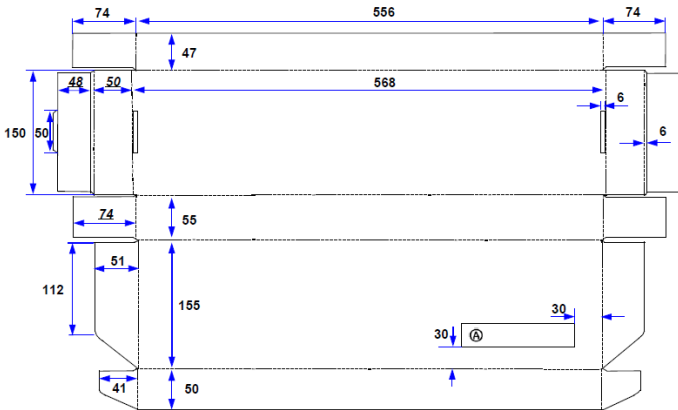
SYMBOL	MIN	NOM	MAX
A	4.80	5.00	5.20
A1	2.29	2.41	2.54
A2	1.90	2.00	2.10
b	1.10	1.20	1.30
b1	1.91	2.10	2.20
b2	2.92	3.10	3.20
c	0.50	0.60	0.70
D	20.80	21.07	21.34
D1	17.43	17.63	17.83
E	15.75	15.94	16.13
E1	13.06	13.26	13.46
E2	4.32	4.58	4.83
e	5.45 BSC		
L	19.81	20.19	20.57
L1	3.81	4.07	4.32
phi P	3.55	3.60	3.65
Q	5.59	5.90	6.20
S	6.15 BSC		

NOTE

1. THESE DIMENSION DO NOT INCLUDE MOLD PROTRUSION

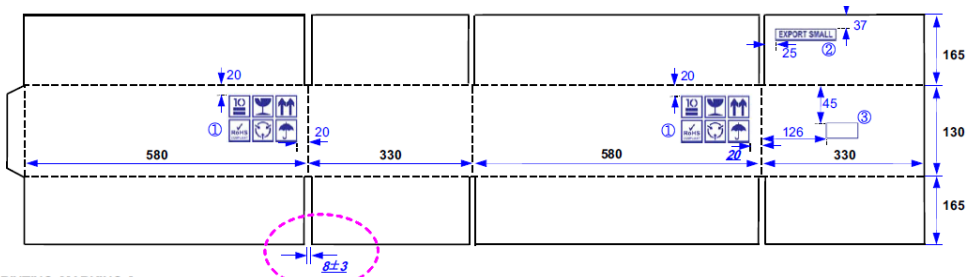
Packing Information

Inner Box



PART ID PMXXXXXXXXLX_G	PKG Type XX-XXXX-XX
LOT No. XXXXXXXXXXXXXX	QTY X,XXX ea
DATE: XXXX.XX.XX	

Outer Box



[BOX PRINTING MARKING]



MARKING SIZE (Each Symbol 30*30)
COLOR (DARK BLUE)

- ② EXPORT SMALL
MARKING SIZE (112*20)
COLOR (DARK BLUE)
- ③
LABEL MARKING SIZE (75*35)
COLOR (DARK BLUE)

[NOTE]

1. MATERIAL : KLB175*K180*KLB175*K180*KLB175
(SUK175*K200*K200*K200*SUK175)
2. NAIL QTY : 3 PCS
3. PRINTING TOLERANCE : MARKING SIZE(±3)
MARKING POSITION(±5)

PART ID : PMXXXXXXXXLX_G
LOT NO : XXXXXXXXXXXX
QTY : XX,XXXX ea
DATE : XXXX.XX.XX

Notes

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