

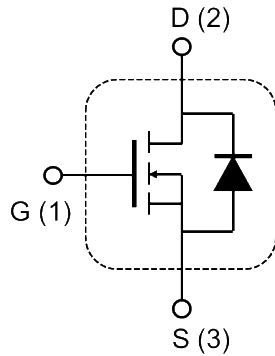
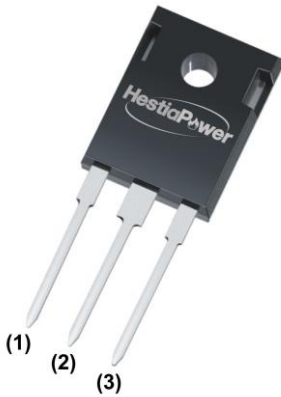
H1M120F030

Silicon Carbide Power MOSFET

N-CHANNEL ENHANCEMENT MODE

TO-247-3L

Inner Circuit



Product Summary

V_{DS}	1200V
$I_D(@25^{\circ}C)$	84A
$R_{DS(on)}$	30mΩ



Features

- ◆ Low On-Resistance
- ◆ Low Capacitance
- ◆ Avalanche Ruggedness
- ◆ Pb-free lead plating

Applications

- ◆ SMPS
- ◆ DC/DC Converters
- ◆ UPS

Benefits

- ◆ Higher System Efficiency
- ◆ Parallel Device Convenience
- ◆ High Temperature Application
- ◆ High Frequency Operation

- ◆ Power Inverters
- ◆ Motor Drives
- ◆ Solar/ Wind Renewable Energy

Maximum Ratings ($T_c=25^{\circ}C$)

Parameter	Symbol	Test Conditions	Value	Unit
Continuous Drain Current*	I_{DS}	$V_{GS}=20V, T_C=25^{\circ}C$	84	A
		$V_{GS}=20V, T_C=75^{\circ}C$	64	A
		$V_{GS}=20V, T_C=100^{\circ}C$	50	A
Gate Source Voltage	V_{GS}		-5/+25	V
Junction Temperature	T_j		-55/+150	$^{\circ}C$
Storage Temperature	T_{stg}		-55/+150	$^{\circ}C$
Soldering Temperature	T_L		260	$^{\circ}C$

Electrical Characteristics (T_j=25°C)

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Drain-Source Breakdown Voltage	V _{(BR)DSS}	V _{GS} =0V, I _{DS} =100μA	1200			V
Gate Threshold Voltage	V _{GS(th)}	V _{DS} =10V, I _{DS} =20mA		2.4		V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =1200V, V _{GS} =0V		2	100	μA
		V _{DS} =1200V, V _{GS} =0V T _j =150°C		10	200	
Gate-Source Leakage Current	I _{GSS}	V _{GS} =20V, V _{DS} =0V			250	nA
Drain-Source On-State Resistance	R _{DS(on)}	V _{GS} =20V, I _{DS} =20A		30	40	mΩ
		V _{GS} =20V, I _{DS} =20A, T _j =100°C		45		
Input Capacitance*	C _{iss}	V _{GS} =0V, V _{DS} =800V f=1MHz, V _{AC} =25mV		3050		pF
Output Capacitance*	C _{oss}			184		
Reverse Transfer Capacitance*	C _{rss}			40		
Turn On Delay Time*	t _{d(on)}	V _{DS} =800V, V _{GS} =0/20V, I _D =16A, R _L =50Ω		<50		ns
Rise Time*	t _r			<50		
Turn Off Delay Time*	t _{d(off)}			<50		
Fall Time*	t _f			<50		
Gate Resistance*	R _G	f=1MHz, V _{AC} =25mV		2.5		Ω

*by estimation

Built-in SiC Diode Characteristics (T_j=25°C)

Parameter	Symbol	Test Conditions	Typ.	Unit
Inverse Diode Forward Voltage	V _{SD}	V _{GS} =0V, I _{SD} =15A	5	V
Reverse Recovery Time*	t _{rr}	V _{GS} =0V,	50	ns
Reverse Recovery Charge*	Q _{rr}	I _{SD} =5A, V _{DS} =400V,	200	nC
Peak Reverse Recovery Current*	I _{rrm}	di/dt=300A/μs	4	A

*by estimation

Gate Charge Characteristics (T_j=25°C)

Parameter	Symbol	Test Conditions	Value	Unit
Gate to Source Charge*	Q _{GS}	V _{DS} =800V, V _{GS} =0/20V I _D =20A	24	nC
Gate to Drain Charge*	Q _{GD}		48	
Total Gate Charge*	Q _G		212	

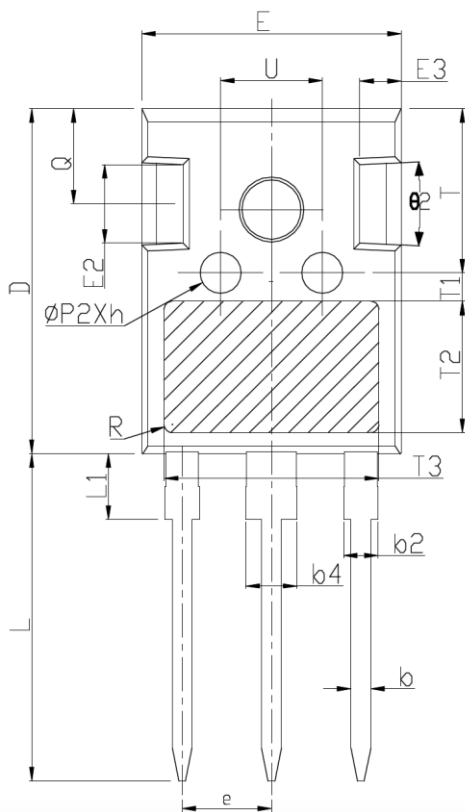
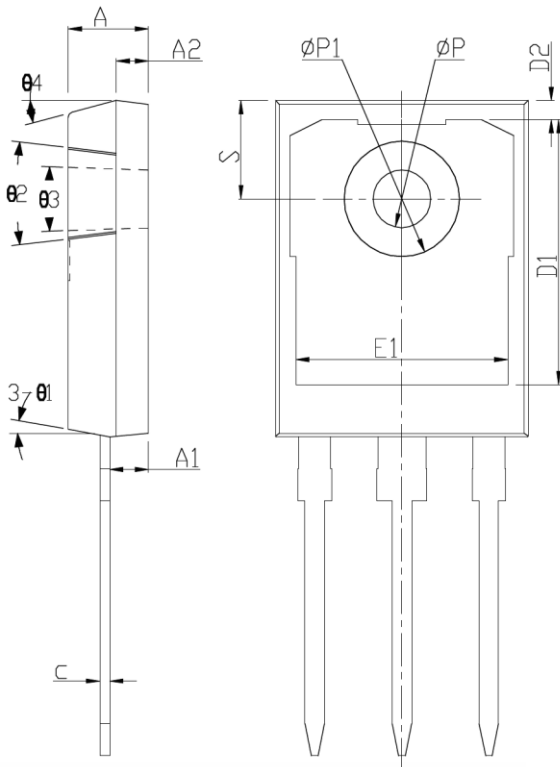
*by estimation

Thermal Resistance

Parameter	Symbol	Value	Unit
Thermal Resistance, Junction to Case	$R_{\theta,JC}$	TBD	K/W
Thermal Resistance, Junction to Ambient	$R_{\theta,JA}$	TBD	

(1) The information provided herein is subject to change without notice.

Mechanical Parameters



SYMBOL	DIMENSIONS IN MILLIMETERS		
	MIN	NOM	MAX
A	4.75	5.00	5.25
A1	2.16	2.41	2.66
A2	1.85	2.00	2.15
b	1.11	1.21	1.35
b2	1.90	2.01	2.25
b4	2.90	3.01	3.25
c	0.51	0.61	0.75
D	20.60	21.00	21.40
D1	16.15	16.55	16.95
D2	1.00	1.20	1.40
E	15.50	15.80	16.10
E1	13.00	13.30	13.60
E2	4.70	5.00	5.30
E3	2.25	2.50	2.75
e	5.44BSC		
h	0.00	0.10	0.25
L	19.52	19.92	20.32
L1	-	-	4.30
ϕP	3.35	3.60	3.85
$\phi P1$	-	-	7.30
$\phi P2$	2.25	2.50	2.75
Q	5.50	5.80	6.10
S	6.15BSC		
R	0.50REF		
T	9.70	-	10.30
T1	1.65REF		
T2	8.00REF		
T3	12.80REF		
U	5.90	-	6.50
θ_1	4°	7°	10°
θ_2	2°	5°	8°
θ_3	1°	-	2°
θ_4	10°	15°	20°

NOTES:
 1.All dimensions are in mm.
 2.Tolerance: $\pm 0.05\text{mm}$.

