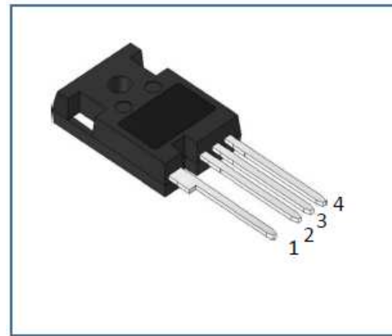
General Features

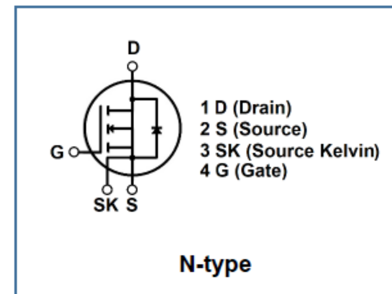
Order code	Vds	Rds(on)	Id
ECKS120M080F4	1200V	80.0 mΩ	35A

◆Robust semiconductor material – SiC
◆Very Low Switching losses
◆IGBT – compatible driving function
◆Very good temperature related stability
◆High avalanche ruggedness
◆JEDEC Qualified
◆Source Kelvin



Applications

◆Solar inverters
◆PFC
◆UPS
◆DC-DC Converter
◆Welding
◆EV Charging



General description

This Silicon Carbide Power MOSFET series realized from Tronkor to obtain higher breakdown voltage and robust gate.

Suitable for high switching frequency and high-charging efficiency systems, industrial motors driving and welding applications. It is also suitable for applications with high frequency switching and hard switching driving requirements.

Ordering code

Ordering code	Marking	Package	Packaging
TBD	**TBD**	TO 247-3L / TO 247-4L	Tube

Absolute Maximum Ratings

Symbol	Parameter		Rating	Unit
Common Ratings (TA=25°C Unless Otherwise Noted)				
V_{DSS}	Drain-Source Voltage		1200	V
V_{GSmax}	Gate-Source Voltage (Max)		-10V...+25V	
V_{GSS}	Gate-Source Voltage (Recommended)		-5V...+20V	
T_J	Maximum Junction Temperature		-55 to +175	°C
T_{STG}	Storage Temperature Range		-55 to +150	°C
I_S	Diode Continous Forward Current	T_C=25°C	40	A
Mounted on Large Heat Sink				
I_{DP}	300µs Pulse Drain Current Tested	T_C=25°C	82	A
I_D	Continuous Drain Current V_{GS} = 20V	T_C=25°C	35	A
		T_C=100°C	26	
P_D	Maximum Power Dissipation	T_C=25°C	190	W
$R_{\theta JC}$	Thermal Resistance-Junction to Case (Max)		0.80	°C/W
Avalanche Ratings				
E_{as}	Avalanche Energy	L=1mH, Ias=20A, V = 50V	205	mJ

Electrical Characteristic

Symbol	Parameter	Test Conditions	Min	TYP	Max	Unit
Static Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V, I_{DS}=1.0mA	1200	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=1200V, V_{GS}=0V	-	0.1	1.0	µA
		TJ=125°C	-	1.0	-	
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_{DS}=10mA	2.0	2.8	4.0	V
I_{GSS+}	Gate Leakage Current	V_{GS}=+20V, V_{DS}=0V	-	10	100	nA
I_{GSS-}	Gate Leakage Current	V_{GS}=-5V, V_{DS}=0V	-	10	100	nA
$R_{DS(ON)}$	Drain-Source On-state Resistance (A)	V_{GS}=20V, I_{DS}=20A V_{GS}=20V, I_{DS}=10A	-	78 72	98 92	mΩ

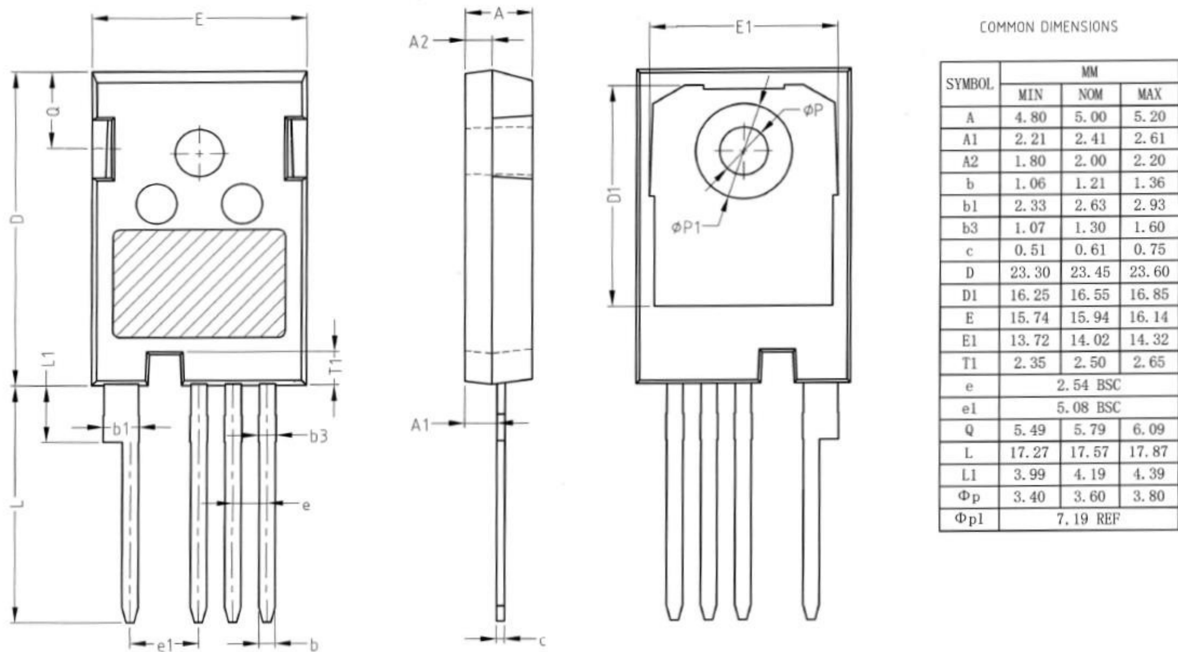
Diode Characteristics						
V_{SD}	Diode Forward Voltage (A)	I_{SD}=10A, V_{GS}=-5V	-	3.8	-	V
T_{rr}	Reverse Recovery Time	I_{SD}=20A, V_R=800V, V_{GS}=-5V dI$_{SD}$/d$_t$=3500A/µs	-	28	-	ns
Q_{rr}	Reverse Recovery Time		-	128	-	nC

Symbol	Parameter	Test Conditions	Min	TYP	Max	Unit
Dynamic Characteristics (B)						
R_G	Gate Resistance	f=1MHz, VAC=25mV, D-S Short	-	2.9	-	Ω
C_{iss}	Input Capacitance	VGS=0V	-	1370	-	pF
C_{oss}	Output Capacitance	VDS=1000V	-	60	-	
C_{rss}	Reverse Transfer Capacitance	f=200kHz. Vac=25mV	-	3	-	
$T_{d(ON)}$	Turn-on Delay Time	VDD=800V, IDS=20A, RG(ext)=2.5Ω, VGS=-5V/20V, L=975µH	-	9	-	ns
T_r	Turn-on Rise Time		-	5	-	
$T_{d(OFF)}$	Turn-off Delay Time		-	15	-	
T_F	Turn-off Fall Time		-	9	-	
E_{ON}	Turn-On Switching Energy	VDD=800V, IDS=20A, RG(ext)=2.5Ω, VGS=-5/+20V, L=975µH	-	405	-	µJ
E_{OFF}	Turn-Off Switching Energy		-	20	-	
E_{TOT}	Total Switching Energy		-	430	-	
Gate Charge Characteristics (B)						
Q_g	Total Gate Charge	VDD=800V, IDS=20A VGS=-5/20V	-	55	-	nC
Q_{gs}	Gate-Source Charge		-	15	-	
Q_{gd}	Gate-Drain Charge		-	15	-	

Note A: Pulse test; pulse width≤300µs, duty cycle≤2%.

Note B: Guaranteed by design, not subject to production testing.

Package Information



COMMON DIMENSIONS

SYMBOL	MM		
	MIN	NOM	MAX
A	4.80	5.00	5.20
A1	2.21	2.41	2.61
A2	1.80	2.00	2.20
b	1.06	1.21	1.36
b1	2.33	2.63	2.93
b3	1.07	1.30	1.60
c	0.51	0.61	0.75
D	23.30	23.45	23.60
D1	16.25	16.55	16.85
E	15.74	15.94	16.14
E1	13.72	14.02	14.32
T1	2.35	2.50	2.65
e	2.54 BSC		
e1	5.08 BSC		
Q	5.49	5.79	6.09
L	17.27	17.57	17.87
L1	3.99	4.19	4.39
Φp	3.40	3.60	3.80
Φp1	7.19 REF		