

FM2A030065K

N-Channel SiC Power MOSFET

V_{DS}	=	650	V
$R_{DS(on)}$	=	30	m Ω
$I_D@25^\circ C$	=	55	A

Features

- 2nd Generation SiC MOSFET Technology
- High Blocking Voltage with Low On-Resistance
- High Speed Switching with Low Capacitance
- Fast Intrinsic Diode with Low Reverse Recovery (Qrr)

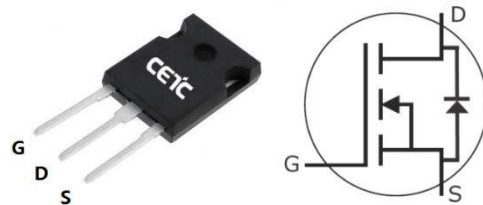
Benefits

- Higher System Efficiency
- Reduced Cooling Requirements
- Increased Power Density
- Increased System Switching Frequency
- Easy to Parallel and Simple to Drive
- Enable Totem-Pole PFC Topologies

Applications

- EV Charging
- Server Power Supplies
- Solar PV Inverters
- UPS
- DC/DC Converters

Package



TO-247-3

Part Number	Package	Marking
FM2A030065K	TO-247-3	FM2A030065K

Maximum Ratings ($T_c=25^\circ C$ unless otherwise specified)

Symbol	Parameter	Value	Unit	Test Conditions	Note
V_{DSmax}	Drain-Source Voltage, $T_c=25^\circ C$	650	V	$V_{GS}=0V, I_D=100\mu A$	
V_{GSmax}	Gate-Source Voltage	-8/+22	V	Absolute maximum values	
V_{GSop}	Gate-Source Voltage	-5/+18	V	Recommended operational values	
I_D	Continuous Drain Current	55	A	$V_{GS}=18V, T_c=25^\circ C$	
		39		$V_{GS}=18V, T_c=100^\circ C$	
$I_{D(pulse)}$	Pulsed Drain Current	197	A	Pulse width t_p limited by T_{Jmax}	
P_D	Power Dissipation	187	W	$T_c=25^\circ C, T_J=175^\circ C$	
T_J, T_{STG}	Operating Junction and Storage Temperature	-55 to +175	$^\circ C$		



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Electrical Characteristics (T_C=25°C unless otherwise specified)

Symbol	Parameter	Min.	Typ.	Max.	Unit	Test Conditions	Note
V _{(BR)DSS}	Drain-Source Breakdown Voltage	650	/	/	V	V _{GS} =0V, I _D =1mA	
V _{GS(th)}	Gate Threshold Voltage	1.8	2.6	4.3	V	V _{DS} =V _{GS} , I _D =10mA	
I _{DSS}	Zero Gate Voltage Drain Current	/	1	50	μA	V _{DS} =650V, V _{GS} =0V	
I _{GSS}	Gate-Source Leakage Current	/	10	250	nA	V _{DS} =0V, V _{GS} =22V	
R _{DS(on)}	Drain-Source On-State Resistance	/	30	50	mΩ	V _{GS} =18V, I _D =25A	
		/	42	/		V _{GS} =18V, I _D =25A, T _J =175°C	
C _{iss}	Input Capacitance	/	1850	/	pF	V _{GS} =0V, V _{DS} =400V f=1MHz, V _{AC} =25mV	
C _{oss}	Output Capacitance	/	160	/			
C _{rss}	Reverse Transfer Capacitance	/	15	/			
E _{ON}	Turn-On Switching Energy	/	50	/	μJ	V _{DS} =400V, V _{GS} = -5V/18V I _D =25A, R _{G(ext)} =2.5Ω, L=100μH	
E _{OFF}	Turn-Off Switching Energy	/	65	/			
t _{d(on)}	Turn-On Delay Time	/	14	/	ns	V _{DS} =400V, V _{GS} = -5V/18V, I _D =25A R _{G(ext)} =2.5Ω, R _L =16Ω	
t _r	Rise Time	/	15	/			
t _{d(off)}	Turn-Off Delay Time	/	28	/			
t _f	Fall Time	/	8	/			
R _{G(int)}	Internal Gate Resistance	/	3	/	Ω	f=1MHz, V _{AC} =25mV	
Q _{GS}	Gate to Source Charge	/	30	/	nC	V _{DS} =400V V _{GS} = -5V/18V I _D =25A	
Q _{GD}	Gate to Drain Charge	/	32	/			
Q _G	Total Gate Charge	/	110	/			

Reverse Diode Characteristics

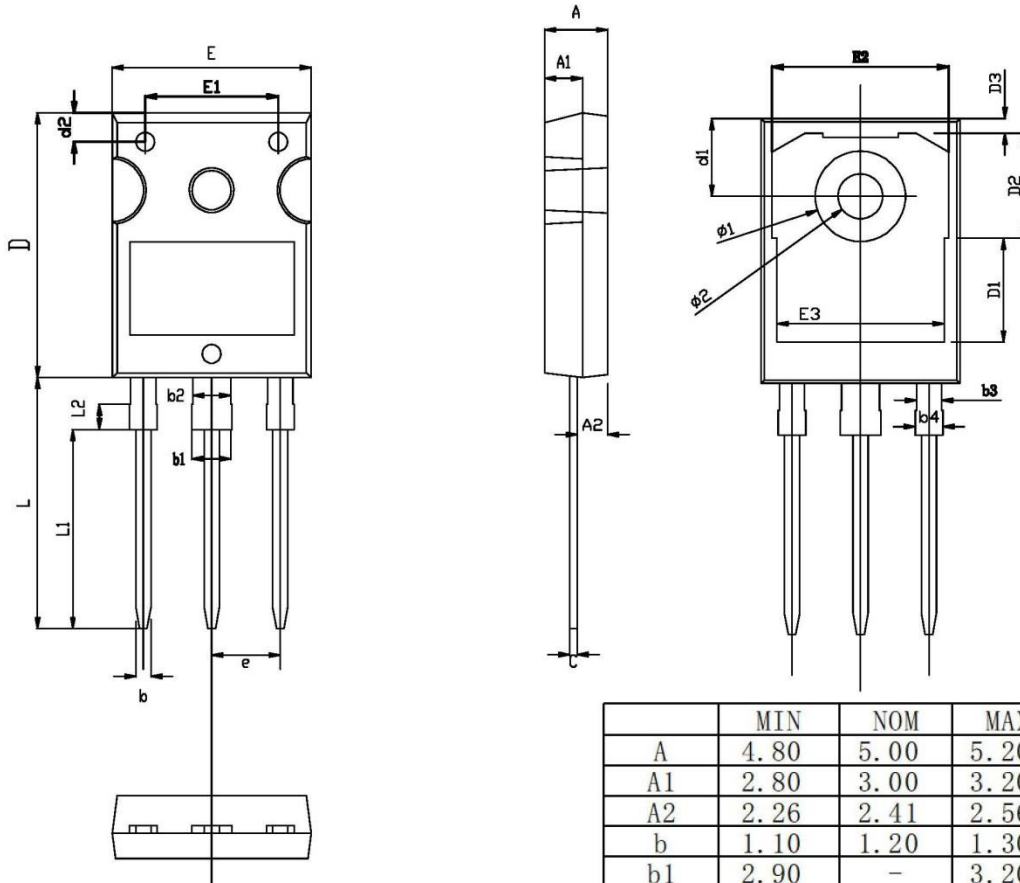
Symbol	Parameter	Typ.	Max.	Unit	Test Conditions	Note
V _{SD}	Diode Forward Voltage	4.2	/	V	V _{GS} = -5V, I _{SD} =12.5A	
		3.8	/		V _{GS} = -5V, I _{SD} =12.5A, T _J =175°C	
I _S	Continuous Diode Forward Current	/	45	A	V _{GS} = -5V, T _C =25°C	
t _{rr}	Reverse Recover Time	25	/	ns	V _R =400V, I _{SD} =25A	
Q _{rr}	Reverse Recovery Charge	100	/	nC		
I _{rrm}	Peak Reverse Recovery Current	5	/	A		

Thermal Characteristics

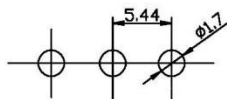
Symbol	Parameter	Typ.	Max.	Unit	Test Conditions	Note
R _{θJC}	Thermal Resistance from Junction to Case	/	0.8	°C/W		
R _{θJA}	Thermal Resistance from Junction to Ambient	/	40			

Package Dimensions

Package TO-247-3



RECOMMENDED LAND PATTERN



UNIT: mm

	MIN	NOM	MAX
A	4.80	5.00	5.20
A1	2.80	3.00	3.20
A2	2.26	2.41	2.56
b	1.10	1.20	1.30
b1	2.90	-	3.20
b2	2.90	3.00	3.10
b3	1.90	2.00	2.10
b4	2.00	-	2.20
c	0.50	0.60	0.70
D	20.80	21.00	21.20
D1		8.23	
D2		8.32	
D3		1.17	
d1	6.00	6.15	6.30
d2	2.20	2.30	2.40
E	15.60	15.80	16.00
E1		10.50	
E2		14.02	
E3		13.50	
e	5.34	5.44	5.54
L	19.72	19.92	20.12
L1		15.79	
L2		1.98	
$\phi 1$	7.10	7.19	7.30
$\phi 2$	3.50	3.60	3.70