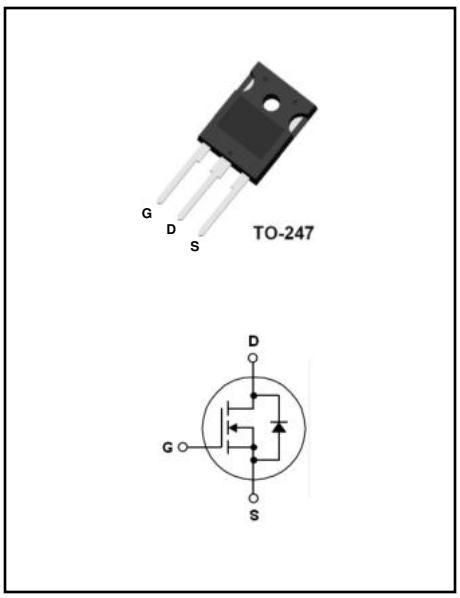
1200V 160mΩ N-Channel SiC Power MOSFET

Description

The AKCT160N120H is a high blocking voltage N-Channel SiC power MOSFET. This device provide excellent
performance for high voltage power supplies or pulse circuits.



Features

- Typical on-Resistance: $R_{DS\ (on)}$=160mΩ
- High Blocking Voltage
- 100% Avalanche Test
- Good Stability and Uniformity with High E_{AS}

Applications

- Solar Inverters
- High Voltage DC/DC Converters
- Motor Drivers
- Switch Mode Power Supplies

Absolute Maximum Ratings @T_C=25 ℃ unless otherwise noted

Symbol	Parameter		Ratings	Unit
V_{DSS}	Drain to Source Voltage		1200	V
V_{GSS}	Gate to Source Voltage		-10/+25	V
V_{GSop}	Recommended operation Values of Gate −Source Voltage		-5/+20	V
I_D	Drain Current	T_C=25℃	20	A
		T_C=100℃	10	A
I_{DM}	Pulsed Drain Current (Note1)		80	A
P_D	Maximum Power Dissipation	T_C=25℃	120	W
	Derate above 25℃		0.8	W/℃
E_{AS}	Single Pulsed Avalanche Energy (Note 2)		150	mJ
T_J	Operating Junction Temperature Range		-50~+175	℃
T_{STG}	Storage Temperature Range		-50~+175	℃

Thermal Characteristics

Symbol	Parameter	Ratings	Unit
$R_{th\ (J-C)}$	Thermal Resistance, Junction to case	1.25	℃/W
$R_{th\ (J-A)}$	Thermal Resistance, Junction to Ambient	40	℃/W

Electrical Characteristics @T_C=25 ℃ unless otherwise noted

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain to Source Breakdown Voltage	V_{GS}=0V, I_D=250uA	1200	-	-	V
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_D=5mA	2.5	3.2	4.5	V
$R_{DS(on)}$	Static Drain-Source On-Resistance	V_{GS}=20V, I_D=10A	-	160	195	mΩ
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=V_{DSS}, V_{GS}=0V	-	-	100	uA
I_{GSS}	Gate to Source Leakage Current	V_{GS}=V_{GSS}, V_{DS}=0V	-	-	±500	nA

D-S Diode Characteristics and Maximum Rating @T_C=25 ℃ unless otherwise noted

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
V_{SD}	Drain-Source Diode Forward Voltage	V_{GS}=0V, I_S=10A	-	5.6	6.5	V
t_{rr}	Reverse Recovery Time	V_{GS}=0V, I_S=10A, di/dt=-1000A/us	-	30	-	ns
Q_{rr}	Reverse Recovery Charge		-	80	-	uC

Switching Characteristics @T_C=25 ℃ unless otherwise noted

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
$t_{d(on)}$	Turn-on Delay Time	I_D=10A , V_{DD}=800V, R_G=2.5Ω V_{GS} = −5/20V, (Note 3)	-	10	15	ns
t_r	Turn-on Rise Time		-	11.5	18	ns
$t_{d(off)}$	Turn-off Delay Time		-	18	45	ns
t_f	Turn-off Fall Time		-	11.5	16	ns
C_{iss}	Input Capacitance	V_{GS}=0V, V_{DS}=800V, f=1.0MHz	-	1190	-	pF
C_{oss}	Output Capacitance		-	70	-	pF
C_{rss}	Reverse Transfer Capacitance		-	13	-	pF
Q_g	Total Gate Charge	I_D=10A, V_{DD}=800V V_{GS}=-5V/20V (Note 3)	-	66	-	nC
Q_{ge}	Gate to Emitter Charge		-	25	-	nC
Q_{gc}	Gate to Collector Charge		-	15	-	nC

Note:

1. Repetitive rating: pulse-width limited by maximum junction temperature
2. V_{DD}=50V, L=1mH, V_{clamp}=1600V, V_G=10V, I_D=17.5A
3. Essentially independent of operating temperature typical characteristics

Package Dimensions

TO-247

(Dimensions in Millimeters)