

SCQH045N170

1700V 45mΩ N-Channel SiC Power MOSFET

Features

- Typical on-Resistance: $R_{DS(on)}=45m\Omega$ (typ.)
- High Blocking Voltage
- 100% Avalanche Test
- Good Stability and Uniformity with High E_{AS}

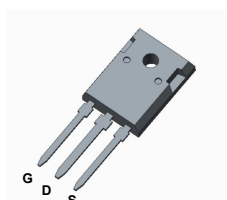
Description

The SCQH045N170 is a high blocking voltage N-Channel SiC power MOSFET. This device provide excellent performance for high voltage power supplies or pulse circuits.

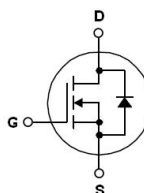
Applications

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

Package Type & Internal Circuit



TO-247



Absolute Maximum Ratings @ $T_C=25^\circ\text{C}$ unless otherwise noted

Symbol	Parameter		Ratings	Unit
V _{DSS}	Drain to Source Voltage		1700	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°C	72	A
		T _C =100°C	48	A
I _{DM}	Pulsed Drain Current (Note1)		160	A
P _D	Maximum Power Dissipation	T _C =25°C	462	W
	Derate above 25°C		3.7	W/°C
T _J	Operating Junction Temperature Range		-40~+150	°C
T _{STG}	Storage Temperature Range		-40~+150	°C

Thermal Characteristics

Symbol	Parameter	Ratings	Unit
$R_{th(J-C)}$	Thermal Resistance, Junction to case	0.27	$^\circ\text{C/W}$
$R_{th(J-A)}$	Thermal Resistance, Junction to Ambient	40	$^\circ\text{C/W}$

Electrical Characteristics @T_c=25 °C unless otherwise noted

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV _{DSS}	Drain to Source Breakdown Voltage	V _{GS} =0V, I _D =100uA	1700	-	-	V
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =18mA	2.0	2.6	4.0	V
R _{DS(on)}	Static Drain-Source On-Resistance	V _{GS} =20V, I _D =50A	-	45	80	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	-	-	±250	nA

D-S Diode Characteristics and Maximum Rating @T_c=25 °C unless otherwise noted

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
V _{SD}	Drain-Source Diode Forward Voltage	V _{GS} =-5V, I _S =25A	-	3.6	-	V
t _{rr}	Reverse Recovery Time	V _{GS} =0V, I _S =25A, di/dt=-290A/us	-	55	-	ns
Q _{rr}	Reverse Recovery Charge		-	220	-	nC

Switching Characteristics @T_c=25 °C unless otherwise noted

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
t _{d(on)}	Turn-on Delay Time	I _D =30A , V _{DD} =1200V, R _G =2.5Ω V _{GS} = -5/20V, (Note 3)	-	27	-	ns
t _r	Turn-on Rise Time		-	32	-	ns
t _{d(off)}	Turn-off Delay Time		-	36	-	ns
t _f	Turn-off Fall Time		-	10	-	ns
C _{iss}	Input Capacitance	V _{GS} =0V, V _{DS} =1000V, f=1.0MHz	-	3550	-	pF
C _{oss}	Output Capacitance		-	165	-	pF
C _{rss}	Reverse Transfer Capacitance		-	6.1	-	pF
Q _g	Total Gate Charge	I _D =50A, V _{DD} =1200V V _{GS} =-5V/20V (Note 3)	-	193	-	nC
Q _{gs}	Gate to Source Charge		-	54	-	nC
Q _{gd}	Gate to Drain Charge		-	25	-	nC

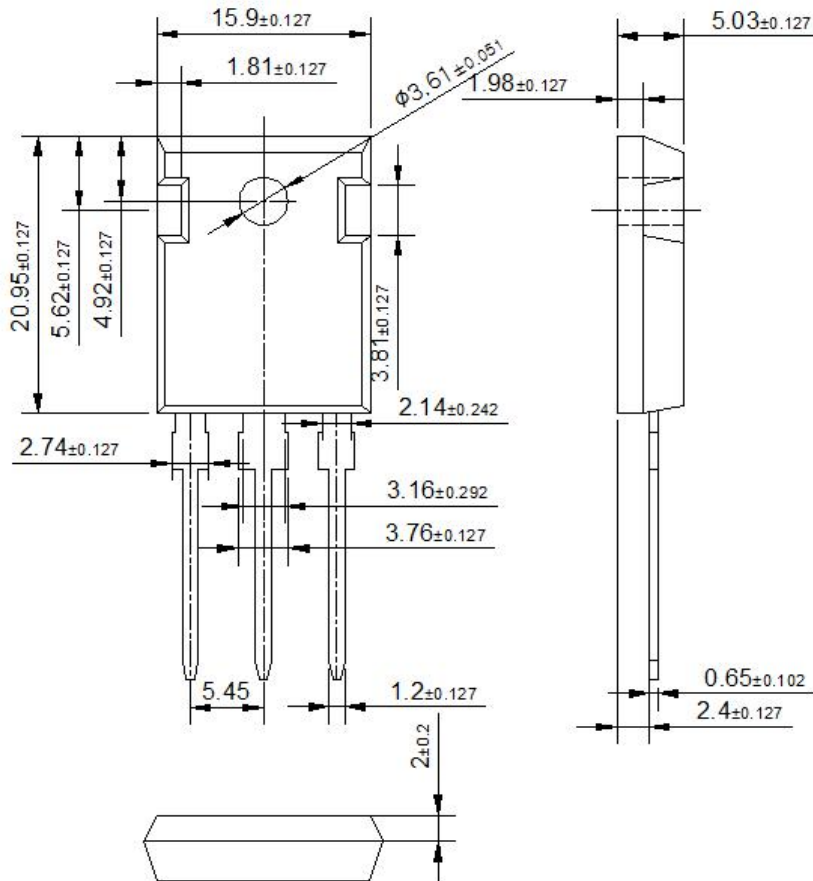
Note:

1. Repetitive rating: pulse-width limited by maximum junction temperature
2. V_{DD}=100V, L=1mH, V_G=10V, I_D=15A
3. Essentially independent of operating temperature typical characteristics

Package Dimensions

TO-247

(Dimensions in Millimeters)



DISCLAIMER:

The products are not designed for use in hostile environments, including, without limitation, aircraft, nuclear power generation, medical appliances, and devices or systems in which malfunction of any product can reasonably be expected to result in a personal injury. Seller's customers using or selling seller's products for use in such applications do so at their own risk and agree to fully defend and indemnify Seller.

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