

SQH12N90

900V 12A N-channel Enhancement Mode Power MOSFET

Features

- Typical on-Resistance: $R_{DS(on)}=0.72\Omega$
- High Blocking Voltage
- 100% Avalanche Test
- Good Stability and Uniformity with High E_{AS}

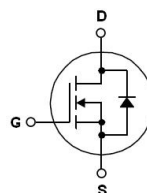
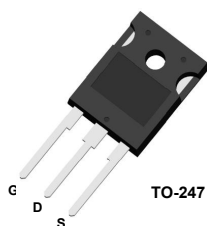
Description

The SQH12N90 is an high blocking voltage N-Channel power MOSFET. This device provide excellent performance for high voltage power supplies or pulse circuits.

Applications

- High Voltage Power Supplies
- Capacitor Discharge Applications
- Pulse Circuits

Package Type & Internal Circuit



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

Symbol	Parameter		Ratings	Unit
V_{DSS}	Drain to Source Voltage		900	V
V_{GSS}	Gate to Source Voltage		± 30	V
I_D	Drain Current	$T_C=25^\circ\text{C}$	12	A
		$T_C=100^\circ\text{C}$	7	A
I_{DM}	Pulsed Drain Current	(Note1)	44	A
P_D	Maximum Power Dissipation	$T_C=25^\circ\text{C}$	230	W
	Derate above 25°C		1.85	W/ $^\circ\text{C}$
E_{AS}	Single Pulsed Avalanche Energy	(Note 2)	860	mJ
T_J	Operating Junction Temperature Range		$-50\sim+150$	$^\circ\text{C}$
T_{STG}	Storage Temperature Range		$-50\sim+150$	$^\circ\text{C}$

Thermal Characteristics

Symbol	Parameter	Ratings	Unit
$R_{th(J-C)}$	Thermal Resistance, Junction to case	0.54	$^\circ\text{C/W}$
$R_{th(J-A)}$	Thermal Resistance, Junction to Ambient	50	$^\circ\text{C/W}$

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 =250uA	900	-	-	V
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =250uA	3.0	3.5	4.0	V
R _{DS(on)}	Static Drain-Source On-Resistance	V _{GS} =10V, I _D =6A	-	0.72	0.8	Ω
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =V _{DSS} , V _{GS} =0V	-	-	10	uA
I _{GSS}	Gate to Source Leakage Current	V _{GS} =V _{GSS} , V _{DS} =0V	-	-	±100	nA

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

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I _S	Maximum Drain to Source Diode Forward Current		-	-	12.0	A
V _{SD}	Drain-Source Diode Forward Voltage	V _{GS} =0V, I _S =12A	-	0.8	1.6	V
t _{rr}	Reverse Recovery Time	V _{GS} =0V, I _S =12A, di/dt=-100A/us	-	730	-	ns
Q _{rr}	Reverse Recovery Charge		-	8	-	uC

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 =12A , V _{DD} =450V, R _G =25Ω (Note 3)	-	32	140	ns
t _r	Turn-on Rise Time		-	23	280	ns
t _{d(off)}	Turn-off Delay Time		-	90	260	ns
t _f	Turn-off Fall Time		-	60	190	ns
C _{iss}	Input Capacitance	V _{GS} =0V, V _{DS} =25V, f=1.0MHz	-	3500	4000	pF
C _{oss}	Output Capacitance		-	290	310	pF
C _{rss}	Reverse Transfer Capacitance		-	60	80	pF
Q _g	Total Gate Charge	I _D =12A, V _{DD} =720V V _{GS} =10V (Note 3)	-	115	152	nC
Q _{ge}	Gate to Emitter Charge		-	20	-	nC
Q _{gc}	Gate to Collector Charge		-	65	-	nC

Note:

1. Repetitive rating: pulse-width limited by maximum junction temperature
2. V_{DD}=50V, L=12mH, V_{clamp}=1100V, V_G=10V, I_D=12A
3. Essentially independent of operating temperature typical characteristics

Typical Performance Characteristics

Fig. 1. Typical on-Resistance Characteristics

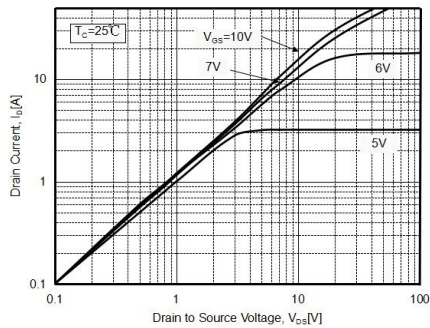


Fig. 2. Typical Transfer Characteristics

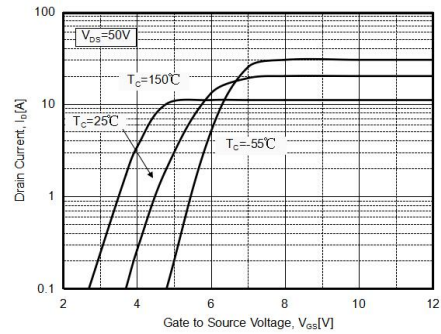


Fig. 3. Static on-Resistance vs. I_D

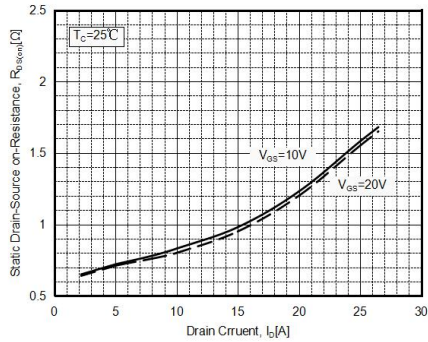


Fig. 4. Body Diode Forward Voltage vs. I_{DR}

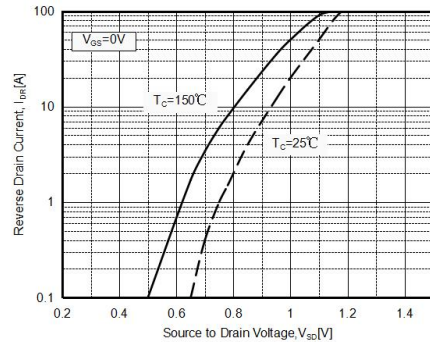


Fig. 5. Capacitance Characteristics

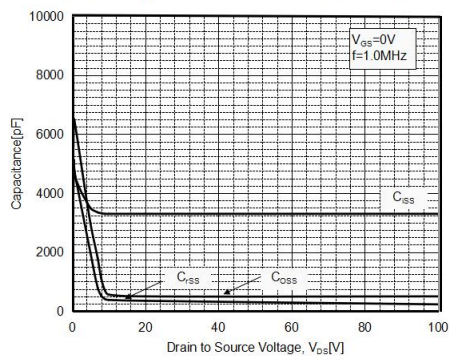
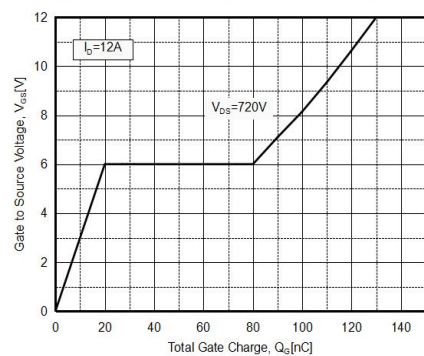


Fig. 6. Gate Charge Characteristics



Typical Performance Characteristics

Fig. 7. Breakdown Voltage vs. Temperature

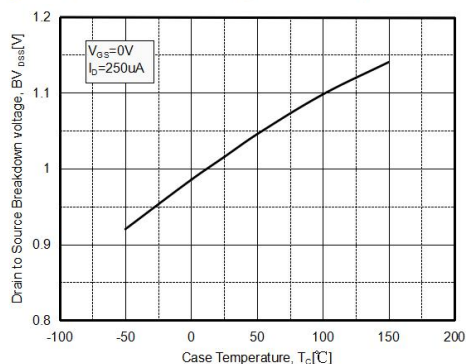


Fig. 8. Static on-Resistance vs. Temperature

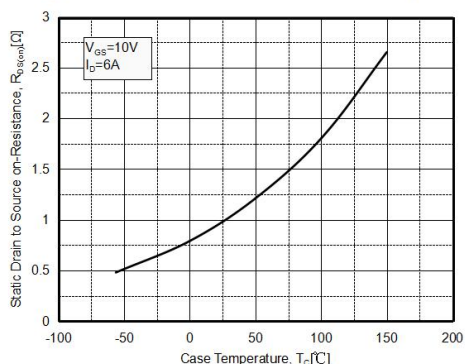


Fig. 9. Maximum Safe Operating Area

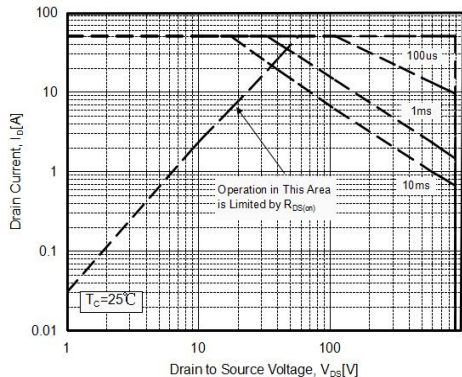
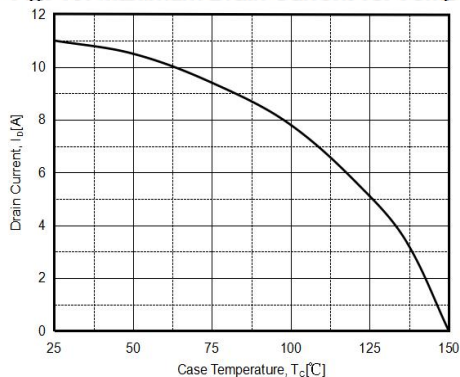


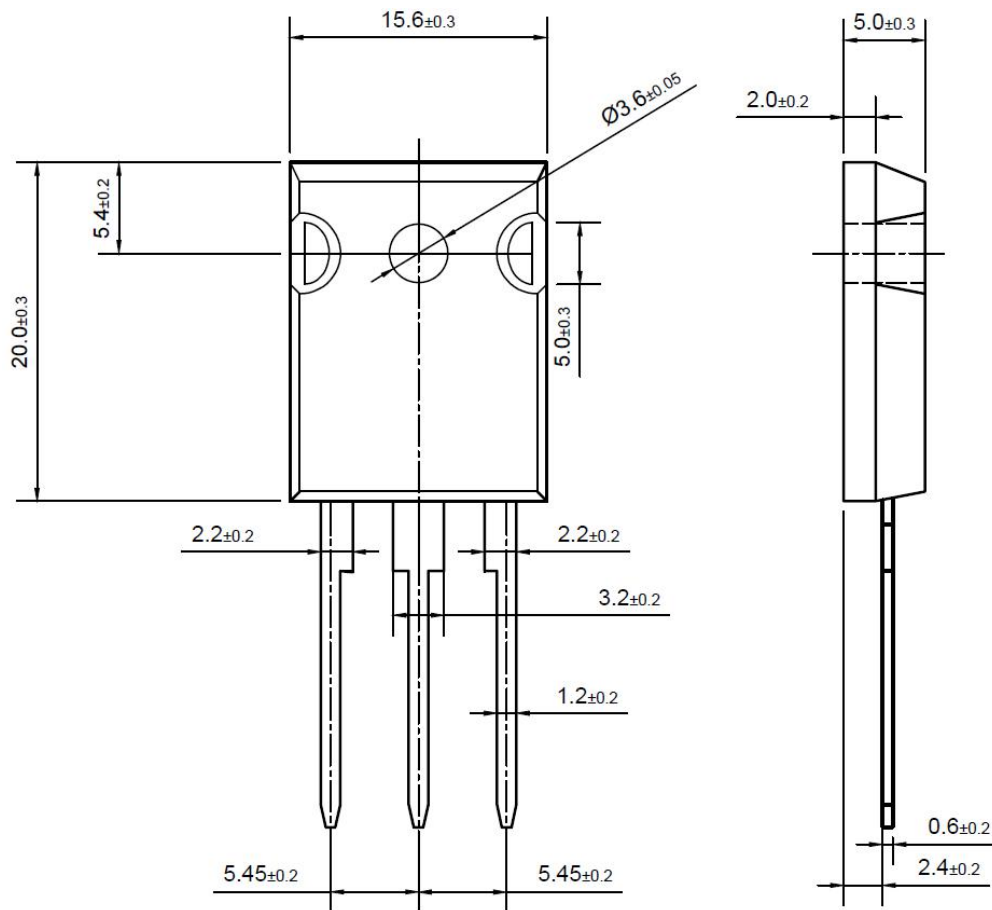
Fig. 10. Maximum Drain Current vs. Temperature



Package Dimensions

TO-247

(Dimensions in Millimeters)



DISCLAIMER:

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