HMQ**150N03**

Silicon N-Channel Power MOSFET

V$_{DSS}$	30	V
I$_D$	150	A
P$_D$	78	W
R$_{DS(ON)}$	1.9	mΩ

General Description：

The HMQ150N03 uses advanced trench technology and design to provide excellent RDS(ON) with low gate charge. It can be used in a wide variety of applications. The package form is QFN5×6, which accords with the RoHS standard.

QFN5×6
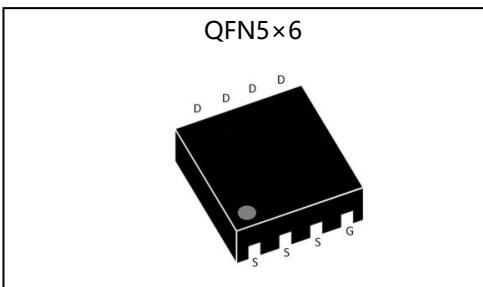
Features：

● Fast Switching

● Low Gate Charge and Rdson

● Low Reverse transfer capacitances

● 100% Single Pulse avalanche energy Test

Applications：

● Power switching application

● Hard switched and high frequency circuits

● Uninterruptible power supply

Inner Equivalent Principium Chart

Absolute （Tc= 25℃ unless otherwise specified）：

Symbol	Parameter	Rating	Units
V$_{DSS}$	Drain-to-Source Voltage	30	V
I$_D$	Continuous Drain Current	150	A
	Continuous Drain Current T$_C$ = 100 °C	90	A
I$_{DM}$	Pulsed Drain Current	480	A
V$_{GS}$	Gate-to-Source Voltage	±20	V
P$_D$	Power Dissipation	78	W
T$_J$, T$_{stg}$	Operating Junction and Storage Temperature Range	175，−55 to 150	℃
T$_L$	Maximum Temperature for Soldering	300	℃

Electrical Characteristics (Tc= 25℃ unless otherwise specified)：

OFF Characteristics

Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
V_{DSS}	Drain to Source Breakdown Voltage	V_{GS}=0V, I_D=250μA	30	--	--	V
$\Delta BV_{DSS}/\Delta T_J$	Bvdss Temperature Coefficient	I_D=250uA,Reference25℃	--	0.1	--	V/℃
I_{DSS}	Drain to Source Leakage Current	V_{DS}=30V,V_{GS}= 0V,T_a=25℃	--	--	1	μA
		V_{DS}=24V,V_{GS}=0V,T_a=125℃	--	--	250	
$I_{GSS(F)}$	Gate to Source Forward Leakage	V_{GS}=+20V	--	--	1	μA
$I_{GSS(R)}$	Gate to Source Reverse Leakage	V_{GS}=-20V	--	--	-1	μA

ON Characteristics

Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
$R_{DS(ON)}$	Drain-to-Source On-Resistance	V_{GS}=10V,I_D=15A	--	1.9	2.5	mΩ
$R_{DS(ON)}$	Drain-to-Source On-Resistance	V_{GS}=4.5V,I_D=12A	--	2.5	3.5	mΩ
$V_{GS(TH)}$	Gate Threshold Voltage	V_{DS}=V_{GS},I_D=250μA	1		3	V
Pulse width tp≤380μs,δ≤2%						

Dynamic Characteristics

Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
g_{fs}	Forward Transconductance	V_{DS}=5V,I_D=20A	15	--	--	S
C_{iss}	Input Capacitance	V_{GS}=0V,V_{DS}=10V f=1.0MHz	--	4000	--	pF
C_{oss}	Output Capacitance		--	100	--	
C_{rss}	Reverse Transfer Capacitance		--	420	--	

Resistive Switching Characteristics

Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
$t_{d(ON)}$	Turn-on Delay Time	V_{DD}=10V,I_D=25A V_{GS}=5V,R_G=1.8Ω	--	7	--	ns
t_r	Rise Time		--	18	--	
$t_{d(OFF)}$	Turn-Off Delay Time		--	30	--	
t_f	Fall Time		--	17	--	
Q_g	Total Gate Charge	V_{DD}=10V, I_D=25A V_{GS}=10V	--	28	--	nC
Q_{gs}	Gate to Source Charge		--	7	--	
Q_{gd}	Gate to Drain（"Miller"）Charge		--	6.8	--	

Source-Drain Diode Characteristics

Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
I_S	Continuous Source Current (Body Diode)		--	--	120	A
I_{SM}	Maximum Pulsed Current (Body Diode)		--	--	240	A
V_{SD}	Diode Forward Voltage	I_S=12A,V_{GS}=0V	--	--	1.5	V
t_{rr}	Reverse Recovery Time	I_S=10A,T_j = 25°C	--	30	--	ns
Q_{rr}	Reverse Recovery Charge	dI_F/dt=100A/us,V_{GS}=0V	--	44	--	nC
Pulse width tp≤380µs,δ≤2%						

Symbol	Parameter	Typ.	Units
$R_{\theta Jc}$	Junction-to-Case	1.6	°C/W

a1: Repetitive rating; pulse width limited by maximum junction temperature

Test Circuit and Waveform
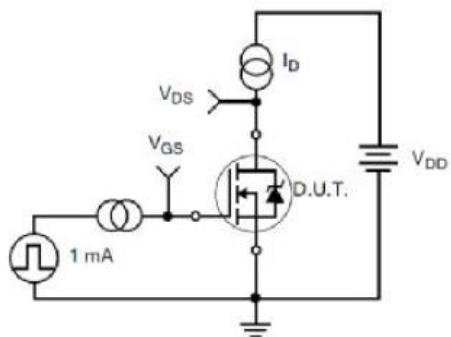
Figure 17. Gate Charge Test Circuit
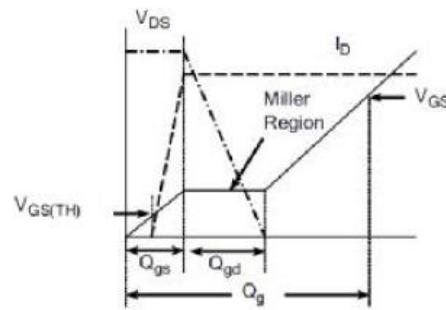
Figure 18. Gate Charge Waveform
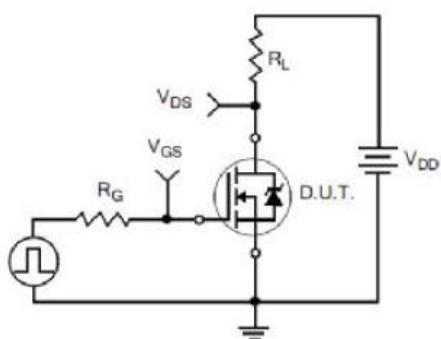
Figure 19. Resistive Switching Test Circuit
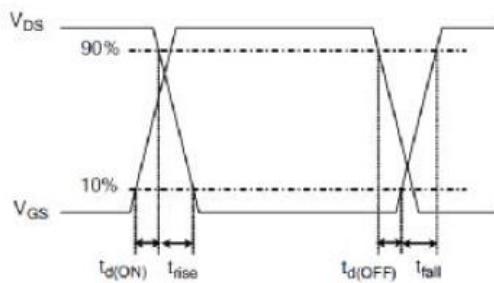
Figure 20. Resistive Switching Waveforms

Characteristics Curve：
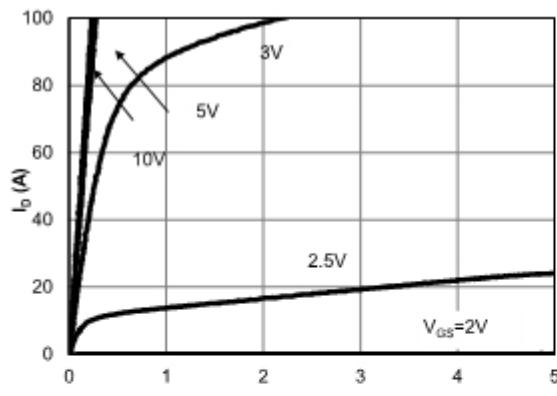
Figure 1: On-Region Characteristics (Note E)
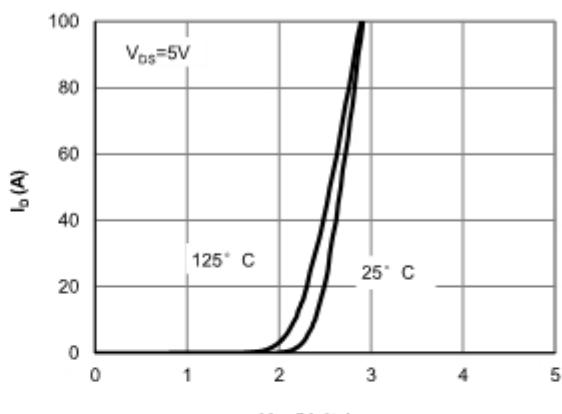
Figure 2: Transfer Characteristics (Note E)
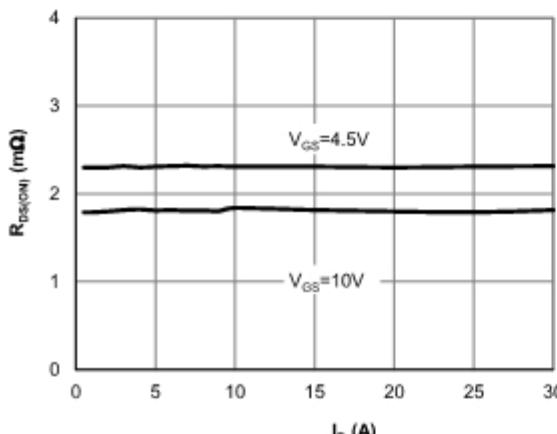
Figure 3: On-Resistance vs. Drain Current and Gate Voltage (Note E)
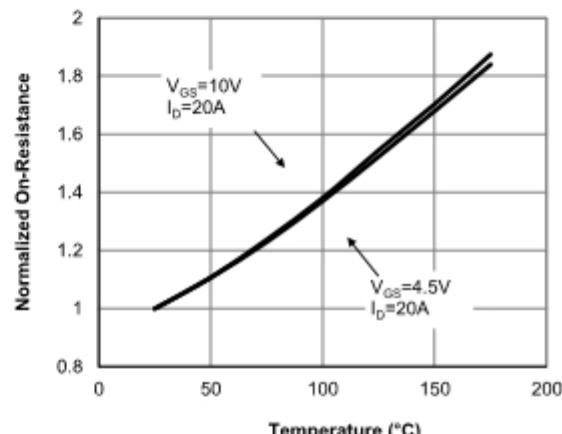
Figure 4: On-Resistance vs. Junction Temperature (Note E)
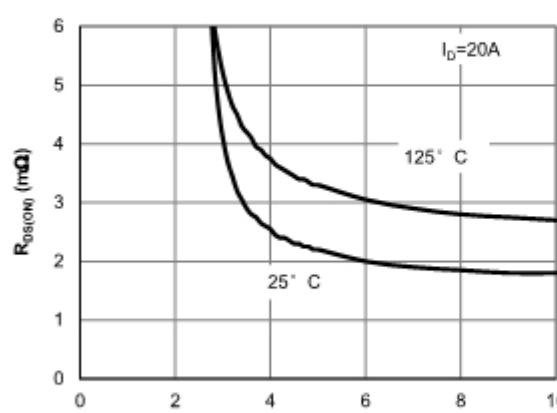
Figure 5: On-Resistance vs. Gate-Source Voltage (Note E)
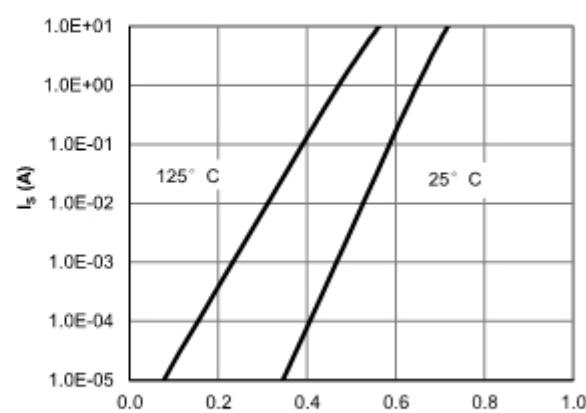
Figure 6: Body-Diode Characteristics (Note E)
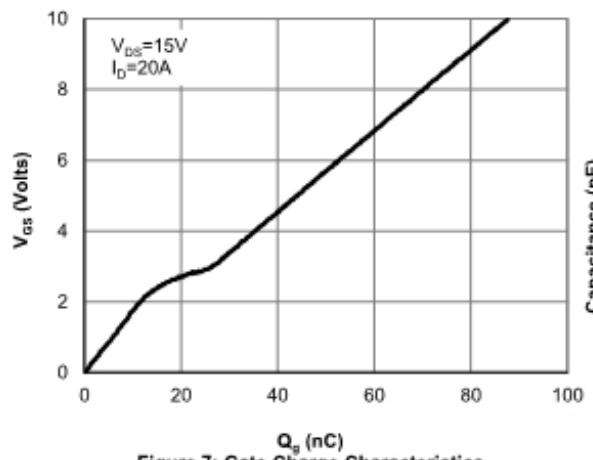
Figure 7: Gate-Charge Characteristics
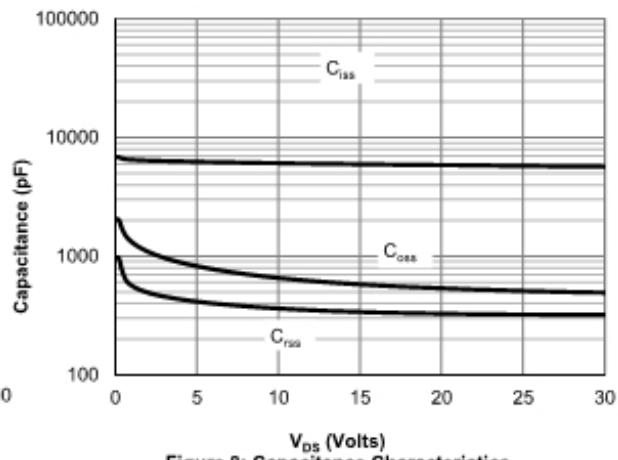

Figure 8: Capacitance Characteristics
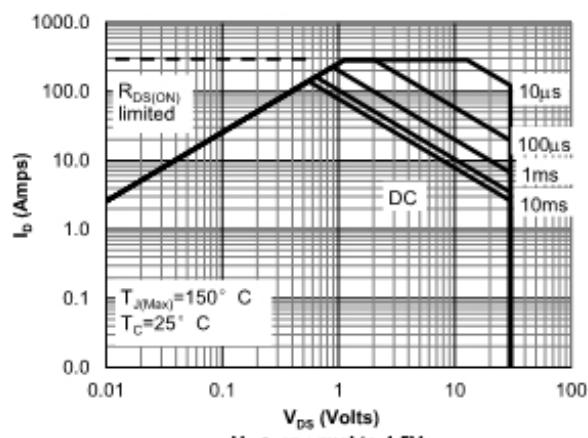
V_{GS}> or equal to 4.5V
**Figure 9: Maximum Forward Biased
Safe Operating Area (Note F)**
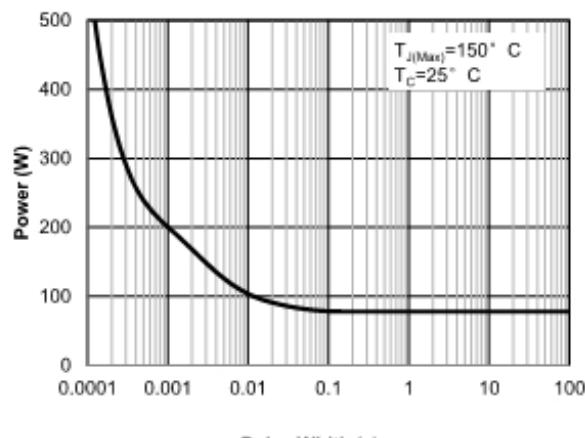
**Figure 10: Single Pulse Power Rating Junction-to-
Case (Note F)**

**Figure 11: Normalized Maximum Transient Thermal Impedance (Note F)**
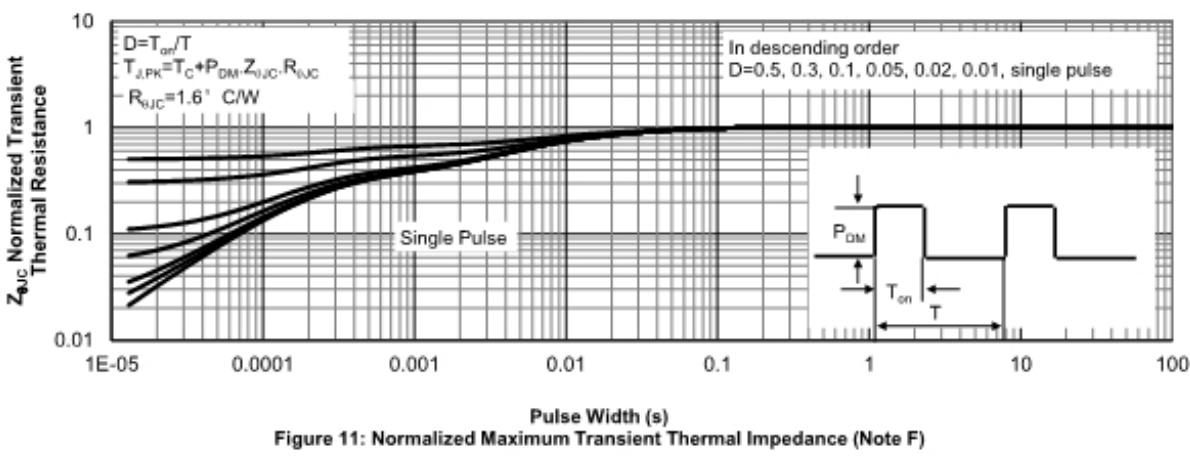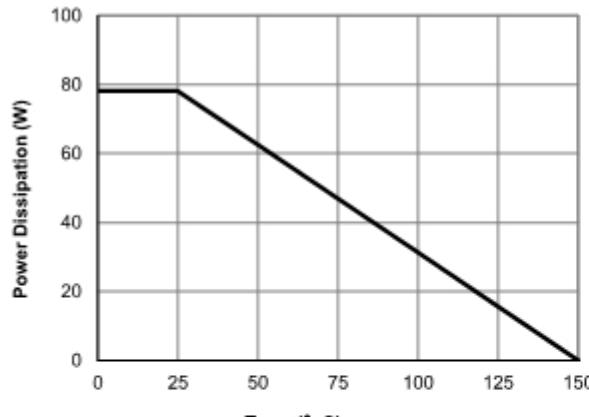
Figure 12: Power De-rating (Note F)
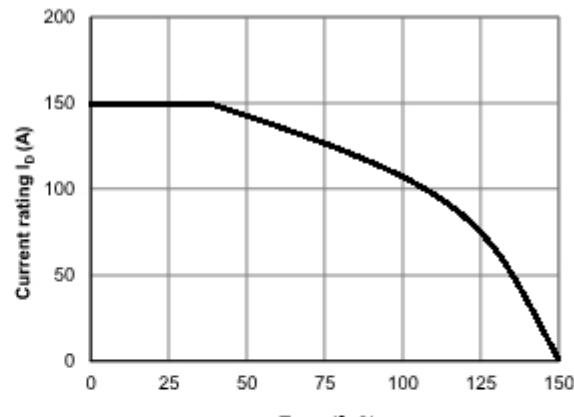

Figure 13: Current De-rating (Note F)
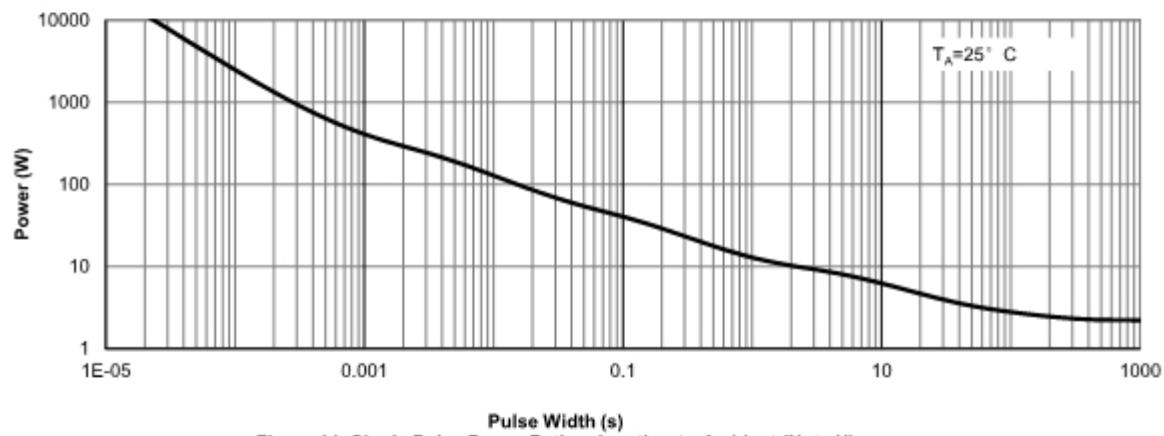
Figure 14: Single Pulse Power Rating Junction-to-Ambient (Note H)
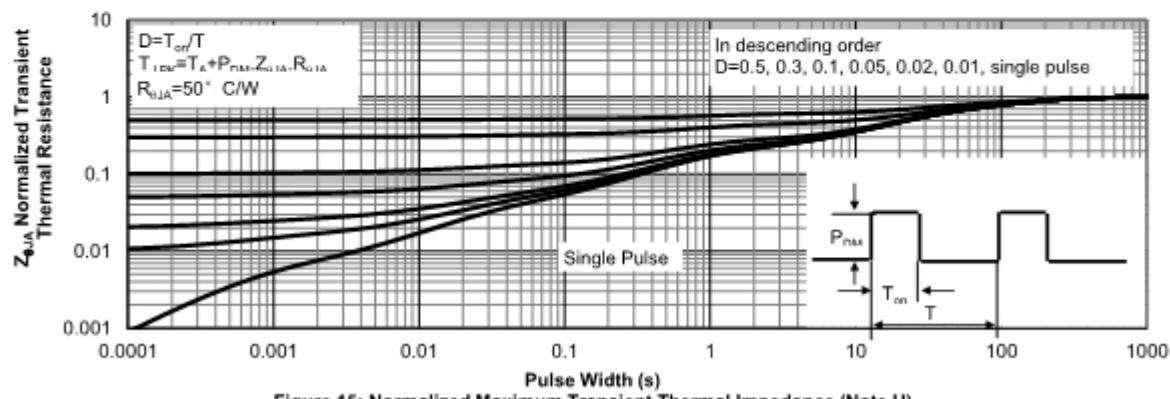
Figure 15: Normalized Maximum Transient Thermal Impedance (Note H)