N-Channel Enhancement Mode Field Effect Transistor

- **Features**

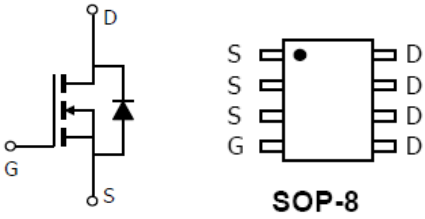
V_{DS} (V) = 40V

I_D = 8A (V_{GS} = 10V)

$R_{DS(ON)}$ < 30mΩ (V_{GS} = 10V)

$R_{DS(ON)}$ < 40mΩ (V_{GS} = 4.5V)

- **Pin Configurations**



SOP-8

- **General Description**

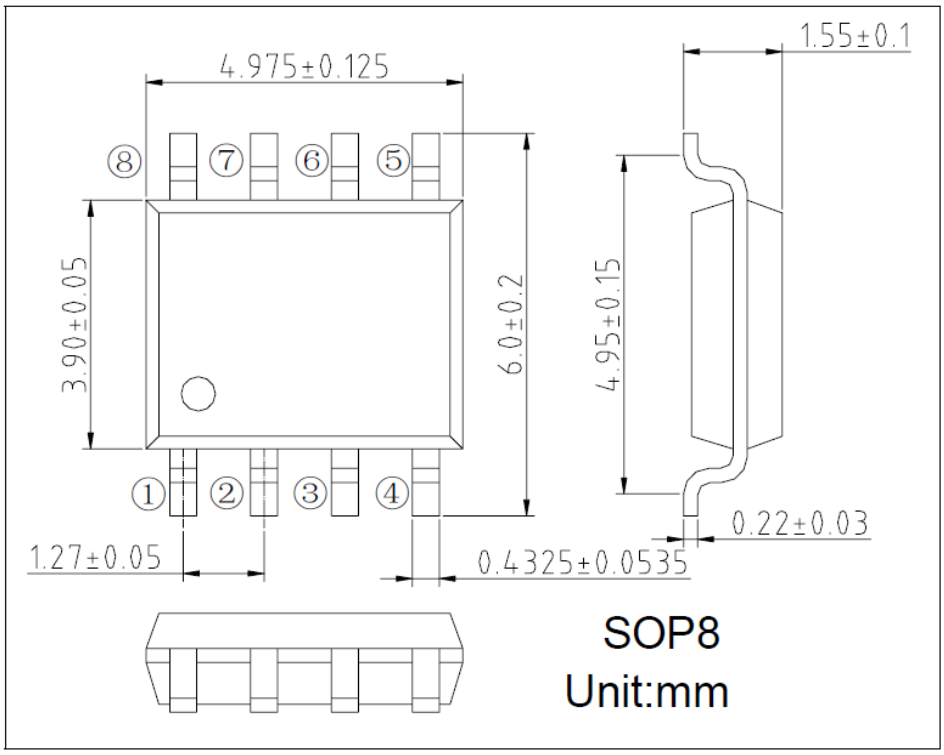
The HX4445SQ/L uses advanced trench technology to provide excellent $R_{DS(ON)}$ and low gate charge. This device is suitable for use as a load switch or in PWM applications. The source leads are separated to allow a Kelvin connection to the source, which may be used to bypass the source inductance.

HX4445SQ and HX4445SQL are electrically identical.

-RoHS Compliant

-HX4445SQL is Halogen Free

- **Package Information**



- **Absolute Maximum Ratings** @T_A=25℃ unless otherwise noted

Parameter		Symbol	Ratings	Unit
Drain-Source Voltage		V_{DSS}	40	V
Gate-Source Voltage		V_{GSS}	±20	V
Drain Current (Continuous) *AC	T_A=25°C	I_D	8	A
	T_A=70°C		6	
Drain Current (Pulse) *B		I_{DM}	30	A
Power Dissipation	T_A=25°C	P_D	2.5	W
	T_A=70°C		2	
Operating Temperature/ Storage Temperature		T_J/T_{STG}	-55~150	℃

- **Electrical Characteristics** @T_A=25℃ unless otherwise noted

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Static						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS} = 0V, I_D = 250μ A	40	--	--	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 40V, V_{GS} = 0V	--	--	1	μ A
Gate Threshold Voltage	$V_{GS(TH)}$	V_{GS} = V_{DS}, I_{DS} = 250μ A	1	1.8	3	V
Gate Leakage Current	I_{GSS}	V_{GS} =±20V, V_{DS} = 0V	--	--	100	nA
Drain-Source On-state Resistance	$R_{DS(on)}$	V_{GS} = 10V, I_D = 8A	--	21	30	mΩ
		V_{GS} = 4.5V, I_D = 6A	--	29	40	mΩ
Forward Transconductance	g_{FS}	V_{DS} =5V, I_D=8A	--	16	--	S
Diode Forward Voltage	V_{SD}	I_{SD} =1A , V_{GS}=0V	--	0.7	1.1	V
Maximum Body-Diode Continuous Current	I_S		--	--	4.3	A
Switching						
Total Gate Charge	Q_g	V_{GS}=10V, V_{DS}=20V, I_D=8A	--	14.68	--	nC
Gate-Source Charge	Q_{gs}		--	2.16	--	nC
Gate-Drain Charge	Q_{gd}		--	2.47	--	nC
Turn-on Delay Time	$t_{d(on)}$	V_{GS}=10V, V_{DS}=20V, R_L=2.5Ω,R_{GEN}=3Ω	--	9.55	--	ns
Turn-on Rise Time	t_r		--	3.22	--	ns
Turn-off Delay Time	$t_{d(off)}$		--	26.14	--	ns
Turn-off Fall Time	t_f		--	2.73	--	ns
Dynamic						
Input Capacitance	C_{iss}	V_{GS}=0V, V_{DS}=20V, f=1MHz	--	799.16	--	pF
Output Capacitance	C_{oss}		--	105.93	--	pF
Reverse Transfer Capacitance	C_{rss}		--	67.61	--	pF

A: The value of $R_{\theta JA}$ is measured with the device mounted on 1in² FR-4 board with 2oz. Copper, in a still air environment with T_A=25°C. The value in any given application depends on the user's specific board design.

B: Repetitive rating, pulse width limited by junction temperature.

C: The current rating is based on the t≤ 10s junction to ambient thermal resistance rating.

- **TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS**

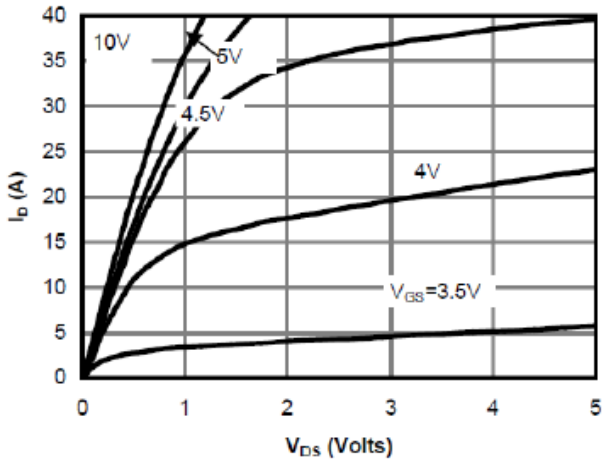


Fig 1: On-Region Characteristics

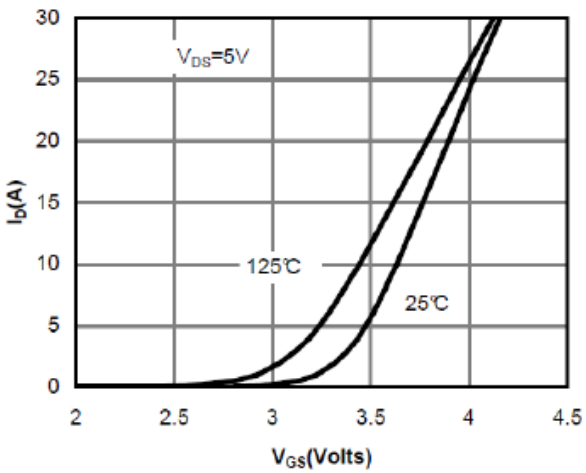


Figure 2: Transfer Characteristics

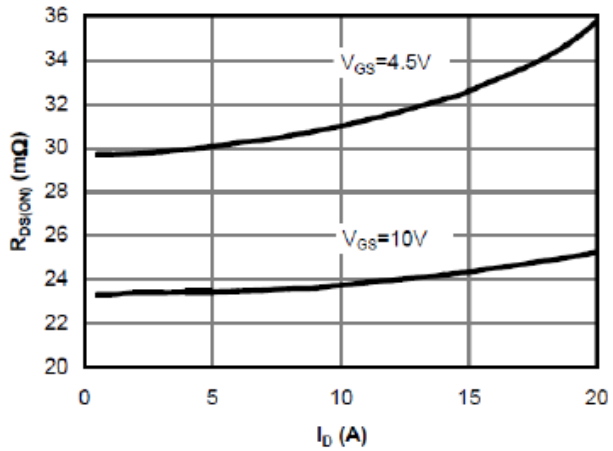


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

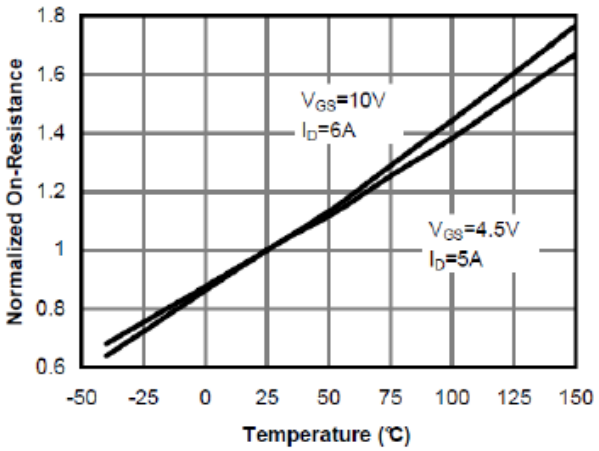


Figure 4: On-Resistance vs. Junction Temperature

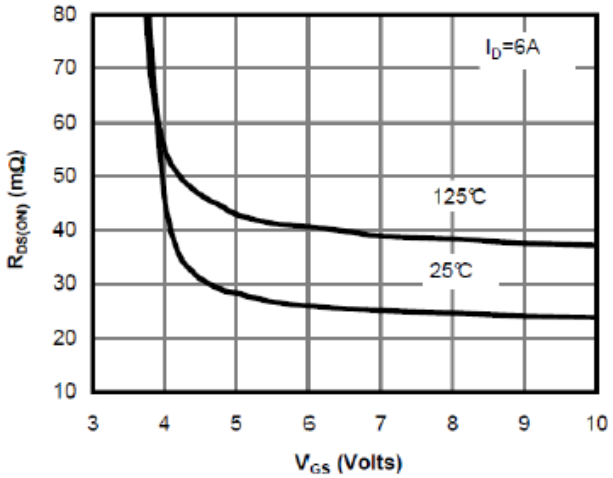


Figure 5: On-Resistance vs. Gate-Source Voltage

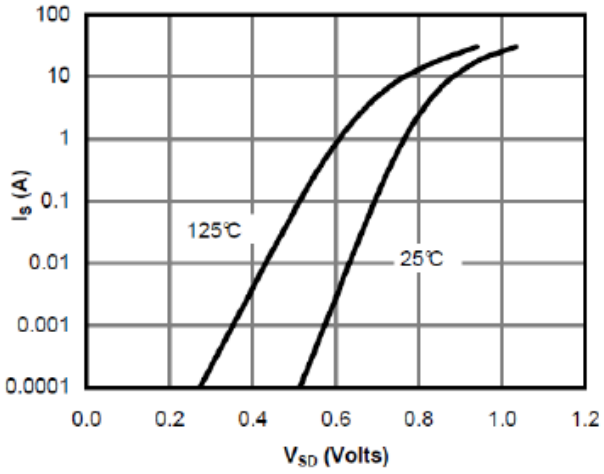


Figure 6: Body-Diode Characteristics

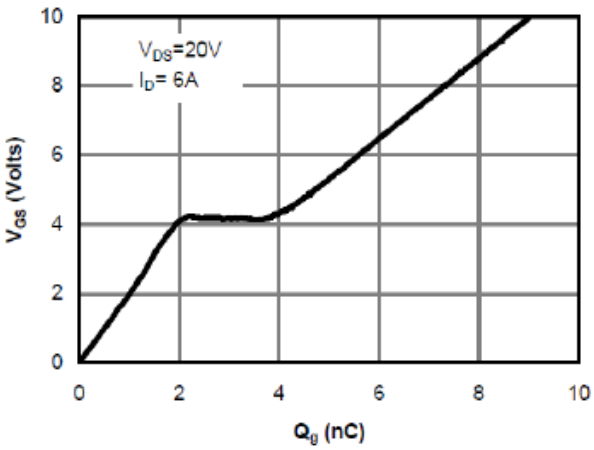


Figure 7: Gate-Charge Characteristics

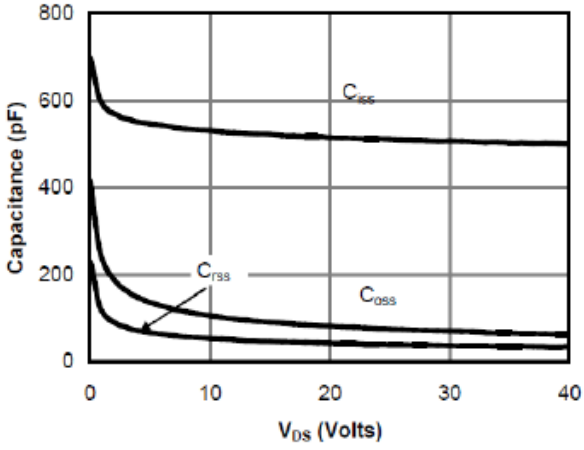


Figure 8: Capacitance Characteristics

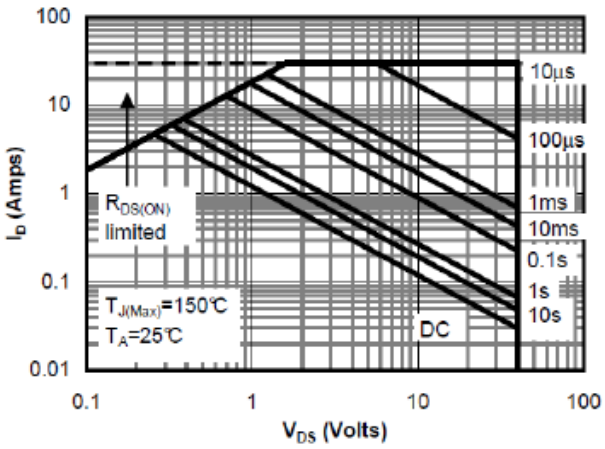


Figure 9: Maximum Forward Biased Safe Operating Area (Note E)

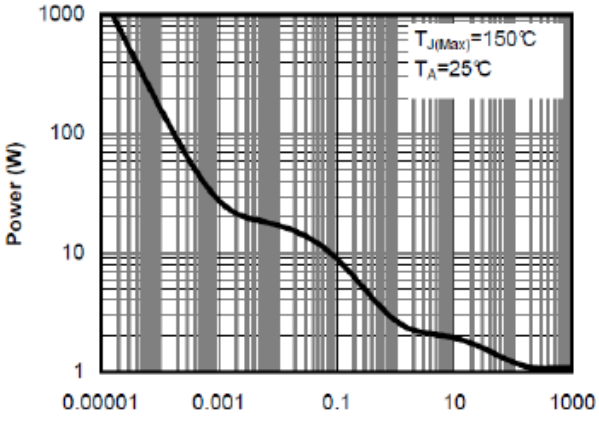


Figure 10: Single Pulse Power Rating Junction-to-Ambient (Note E)

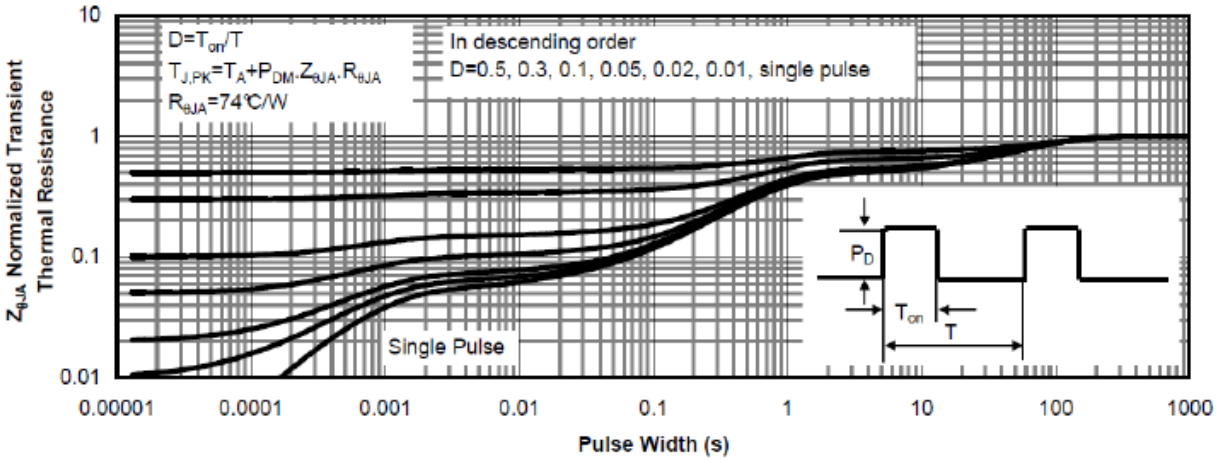


Figure 11: Normalized Maximum Transient Thermal Impedance

DISCLAIMER

HUAXIN SEMICONDUCTOR RESERVES THE RIGHT TO MAKE CHANGES WITHOUT FURTHER NOTICE TO ANY PRODUCTS HEREIN TO IMPROVE RELIABILITY, FUNCTION OR DESIGN. HUAXIN DOES NOT ASSUME ANY LIABILITY ARISING OUT OF THE APPLICATION OR USE OF ANY PRODUCT OR CIRCUIT DESCRIBED HEREIN; NEITHER DOES IT CONVEY ANY LICENCE UNDER ITS PATENT RIGHTS, NOR THE RIGHTS OF OTHERS.