N-Channel Enhancement Mode Field Effect Transistor

- **Features**

V_{DS} (V) = 60V

I_D = 6A (V_{GS} = 10V)

$R_{DS(ON)}$ < 35mΩ (V_{GS} = 10V)

$R_{DS(ON)}$ < 40mΩ (V_{GS} = 4.5V)

- **General Description**

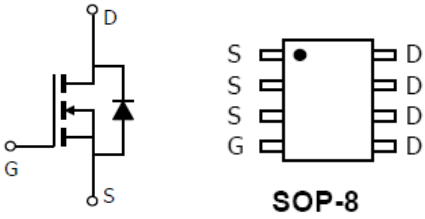
The HX4440SQ/L uses advanced trench technology to provide excellent $R_{DS(ON)}$ and low gate charge. This device is suitable for use as a load switch or in PWM applications. The source leads are separated to allow a Kelvin connection to the source, which may be used to bypass the source inductance.

HX4440SQ and HX4440SQL are electrically identical.

-RoHS Compliant

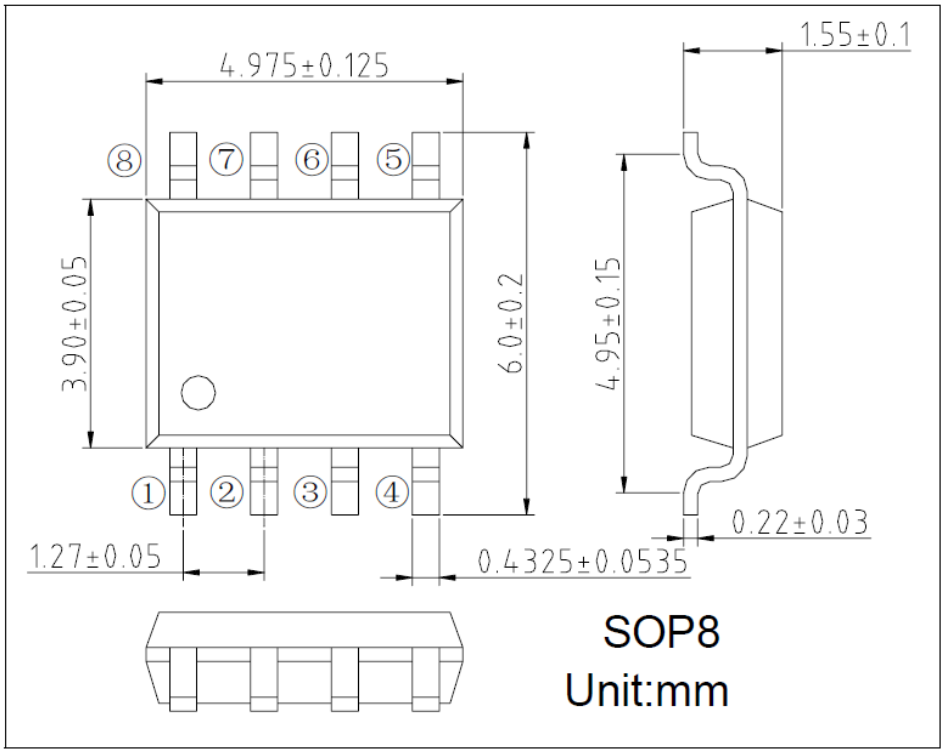
-HX4440SQL is Halogen Free

- **Pin Configurations**



SOP-8

- **Package Information**



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

Parameter		Symbol	Ratings	Unit
Drain-Source Voltage		V_{DSS}	60	V
Gate-Source Voltage		V_{GSS}	±20	V
Drain Current (Continuous) *AC	T_A=25°C	I_D	6	A
	T_A=70°C		4.8	
Drain Current (Pulse) *B		I_{DM}	30	A
Power Dissipation	T_A=25°C	P_D	3	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 = 250μA	60	--	--	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 60 V, V_{GS} = 0V	--	--	1	μA
Gate Threshold Voltage	$V_{GS(TH)}$	V_{GS} = V_{DS}, I_{DS} = 250μA	1	1.4	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 = 5A	--	26	35	mΩ
		V_{GS} = 4.5V, I_D = 4A	--	31	40	mΩ
Forward Transconductance	g_{FS}	V_{DS} = 15V, I_D= 5.3A	--	24	--	S
Diode Forward Voltage	V_{SD}	I_{SD} =1A , V_{GS}=0V	--	0.75	1.0	V
Maximum Body-Diode Continuous Current	I_S		--	--	3.1	A
Switching						
Total Gate Charge	Q_g	V_{GS}=5V, V_{DS}=30V, I_D=5.3A	--	11.26	14.64	nC
Gate-Source Charge	Q_{gs}		--	3.77	4.9	nC
Gate-Drain Charge	Q_{gd}		--	4.08	5.3	nC
Turn-on Delay Time	$t_{d\ (on)}$	V_{GS}=4.5V, V_{DS}=30V, R_L=6.8Ω,R_{GEN}=1Ω	--	18.12	36.24	ns
Turn-on Rise Time	t_r		--	17.68	35.36	ns
Turn-off Delay Time	$t_{d(off)}$		--	25	50	ns
Turn-off Fall Time	t_f		--	8.92	17.84	ns
Dynamic						
Input Capacitance	Ciss	V_{GS}=0V, V_{DS}=30V, f=1MHz	--	1062.8	--	pF
Output Capacitance	Coss		--	157.26	--	pF
Reverse Transfer Capacitance	Crss		--	56.56	--	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**

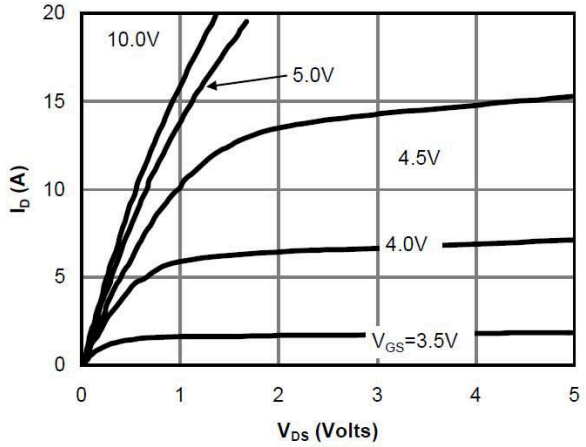


Fig 1: On-Region Characteristics

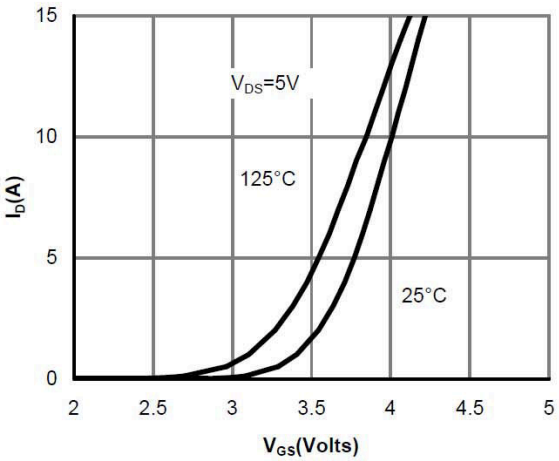


Figure 2: Transfer Characteristics

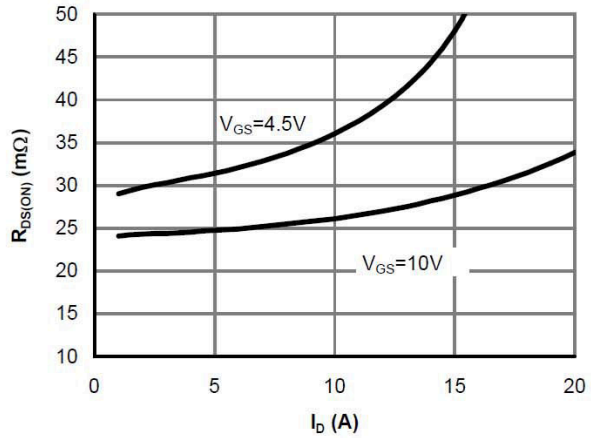


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

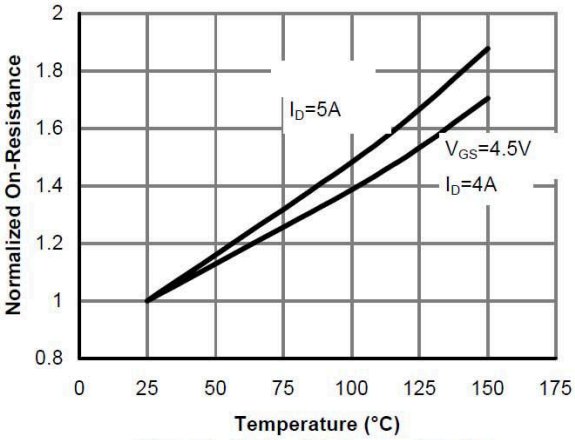


Figure 4: On-Resistance vs. Junction Temperature

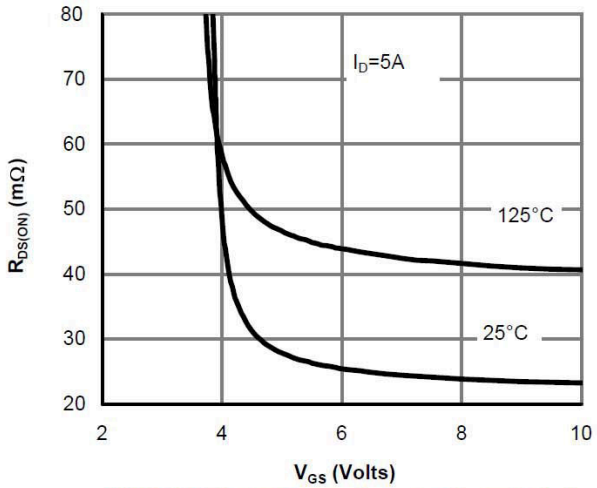


Figure 5: On-Resistance vs. Gate-Source Voltage

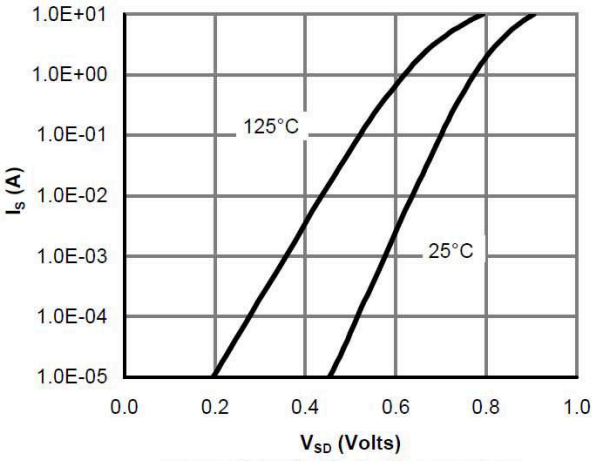


Figure 6: Body-Diode Characteristics

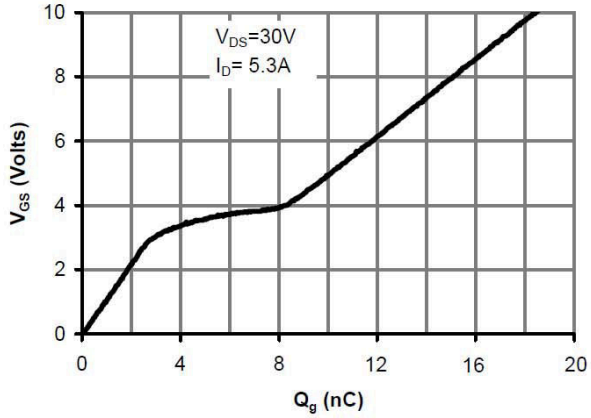


Figure 7: Gate-Charge Characteristics

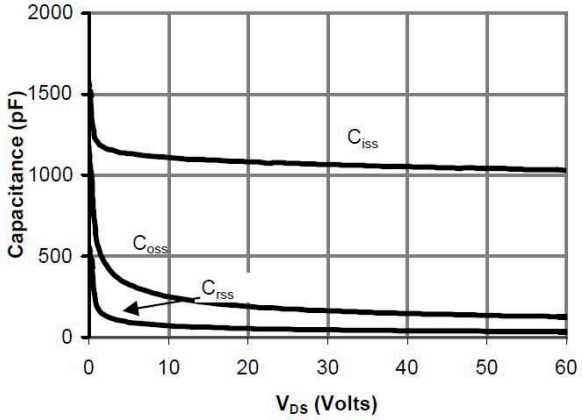


Figure 8: Capacitance Characteristics

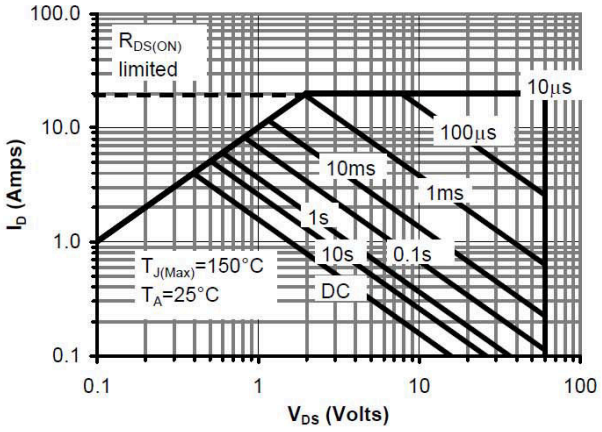


Figure 9: Maximum Forward Biased Safe Operating Area (Note E)

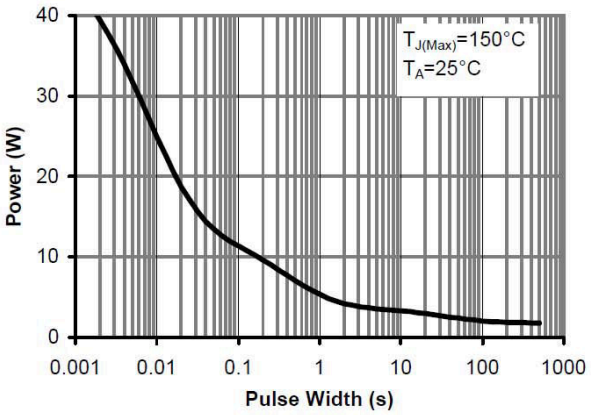


Figure 10: Single Pulse Power Rating Junction-to-Ambient (Note E)

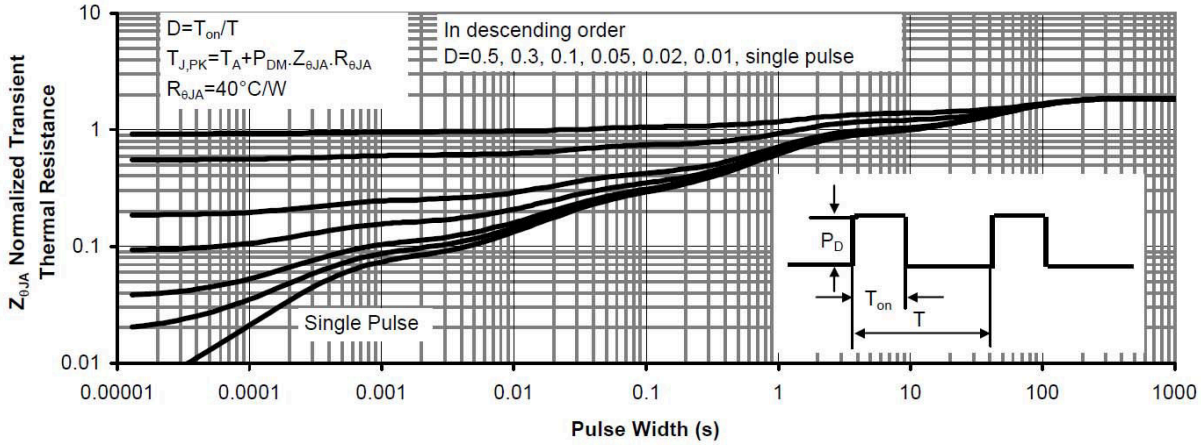


Figure 11: Normalized Maximum Transient Thermal Impedance

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