P-Channel Enhancement Mode Field Effect Transistor

- **Features**

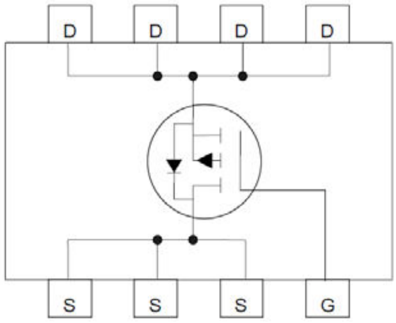
V_{DS} (V) = -30V

I_D = -6.5A (VGS = -10V)

$R_{DS(ON)}$ < 40mΩ (VGS = -10V)

$R_{DS(ON)}$ < 50mΩ (VGS = -4.5V)

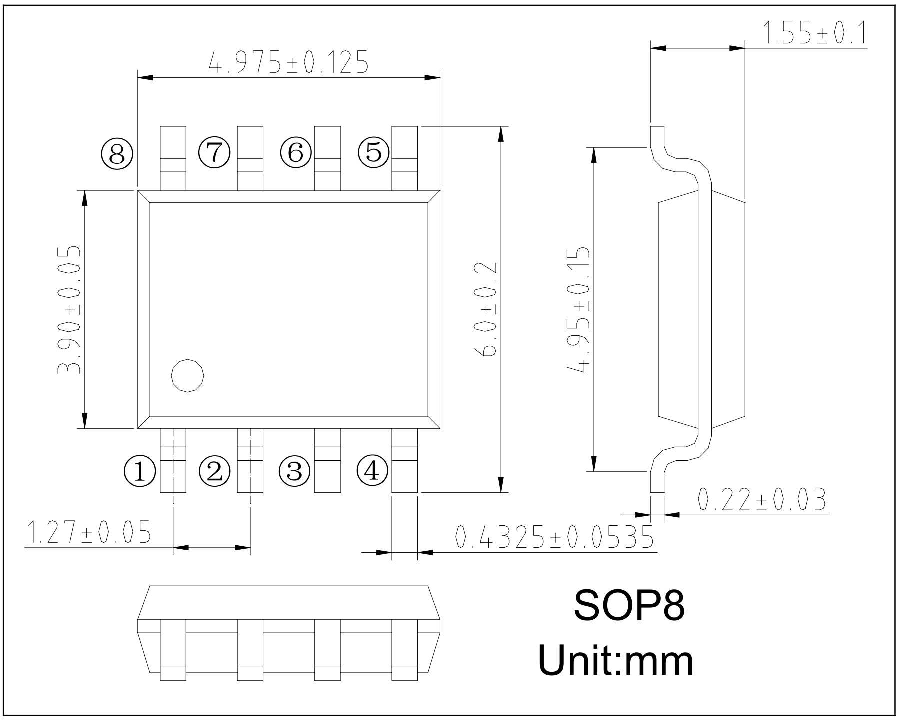
- **Pin Configurations**



- **General Description**

The HX4435 uses advanced trench technology to provide excellent $R_{DS(ON)}$, and ultra-low low gate charge. This device is suitable for use as a load switch or in PWM applications. Standard Product HX4435 is Pb-free.

- **Package Information**



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

Parameter		Symbol	Ratings	Unit
Drain-Source Voltage		V_{DSS}	-30	V
Gate-Source Voltage		V_{GSS}	±20	V
Drain Current (Continuous) *AC	T_A=25°C	I_D	-6.5	A
	T_A=70°C		-5.3	

Drain Current (Pulse) *B		I_{DM}	-30	A
Power Dissipation	T_A=25°C	P_D	3	W
	T_A=70°C		2.1	
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	-30	--	--	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = -30 V, V_{GS} = 0V	--	--	-1	μA
Gate Threshold Voltage	$V_{GS(TH)}$	V_{GS} = V_{DS}, I_{DS}= -250μA	-1.2	-1.4	-2.7	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 = -5.7A	--	30	40	mΩ
		V_{GS} = -4.5V, I_D = -4.4A	--	38	50	mΩ
Forward Transconductance	g_{FS}	V_{DS}= -5V, I_D= -5.7A	--	11	--	S
Diode Forward Voltage	V_{SD}	I_{SD}= -2.3A , V_{GS}=0V	--	-0.82	-1.2	V
Maximum Body-Diode Continuous Current	Is		--	--	-2.3	A
Switching						
Total Gate Charge	Q_g	V_{GS}= -10V, V_{DS}= -15V, I_D= -6A	--	18.3	23.79	nC
Gate-Source Charge	Q_{gs}		--	2.4	3.12	nC
Gate-Drain Charge	Q_{gd}		--	3.1	4.03	nC
Turn-on Delay Time	$t_{d(on)}$	V_{GS}= -10V, V_{DS}= -15V, R_L=15Ω, R_{GEN}=6Ω	--	12.4	24.8	ns
Turn-off Delay Time	$t_{d(off)}$		--	41.1	82.2	ns
Dynamic						
Input Capacitance	C_{iss}	V_{GS}=0V, V_{DS}= -15V, f=1MHz	--	971.5	--	pF
Output Capacitance	C_{oss}		--	235.1	--	pF
Reverse Transfer Capacitance	C_{rss}		--	82.7	--	pF

A: The value of $R_{θJA}$ 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**

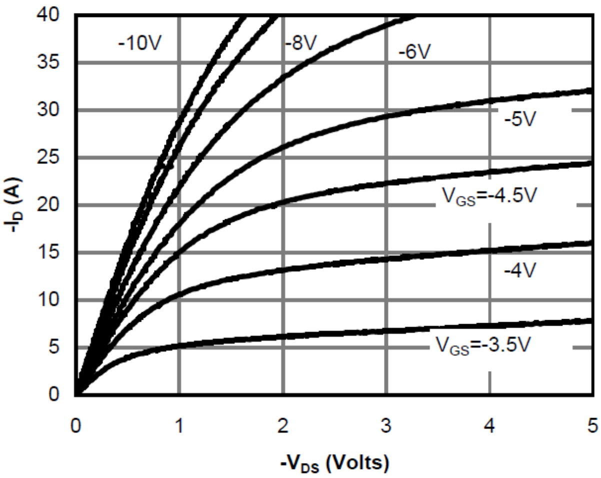


Fig 1: On-Region Characteristics

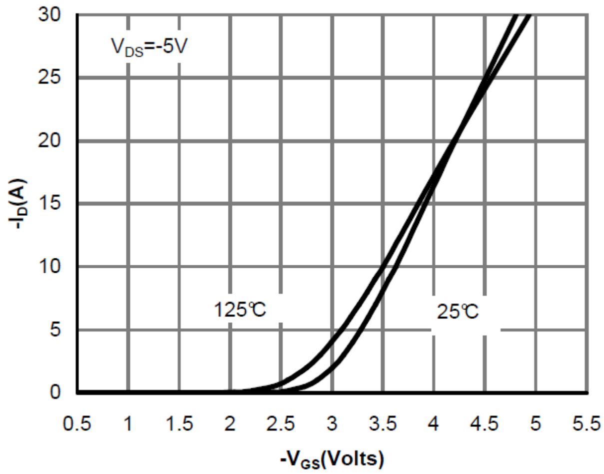


Figure 2: Transfer Characteristics

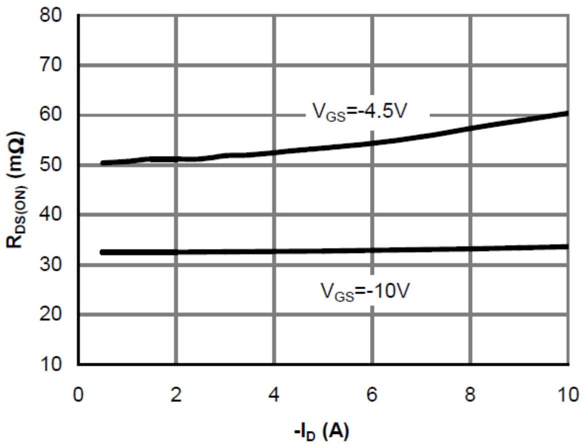


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

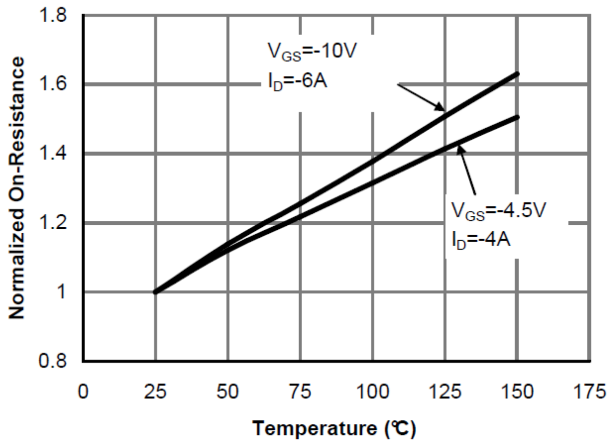


Figure 4: On-Resistance vs. Junction Temperature

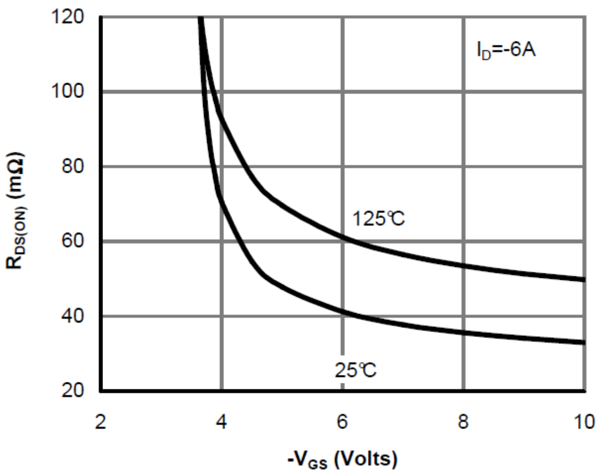


Figure 5: On-Resistance vs. Gate-Source Voltage

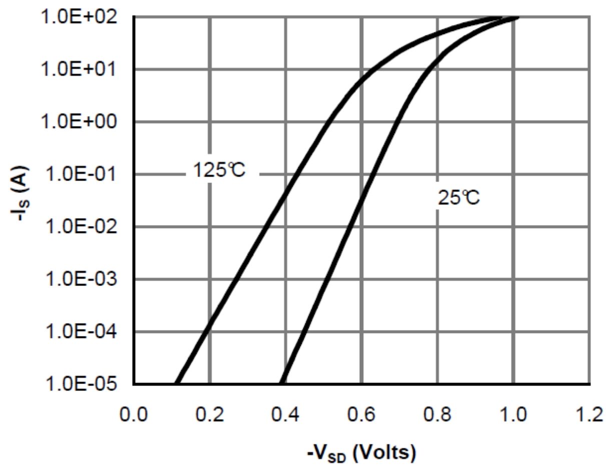


Figure 6: Body-Diode Characteristics

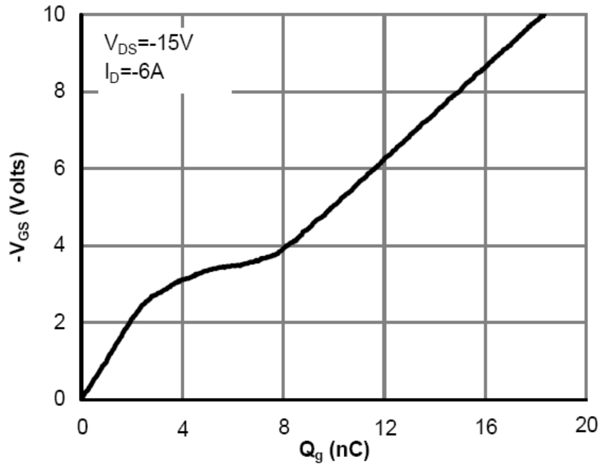


Figure 7: Gate-Charge Characteristics

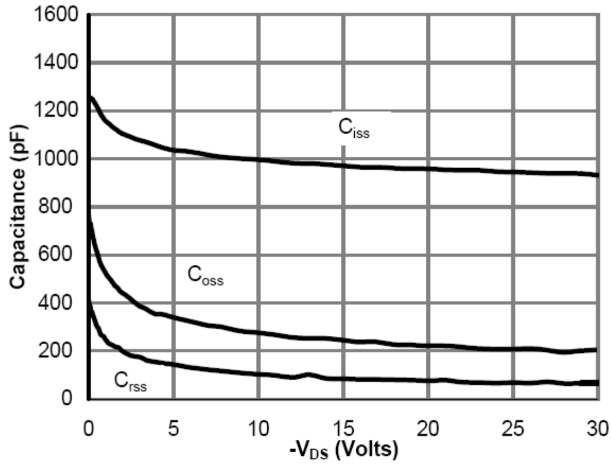


Figure 8: Capacitance Characteristics

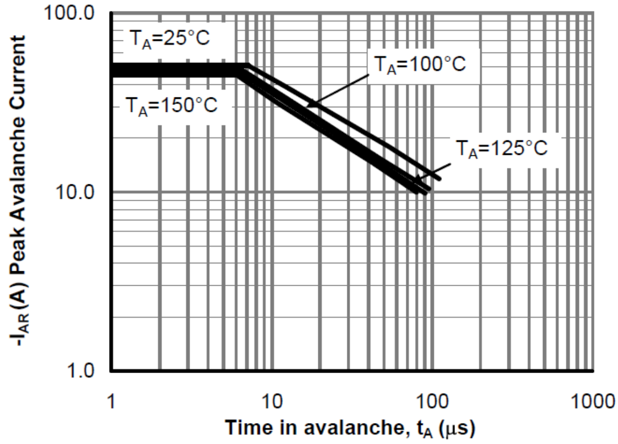


Figure 9: Single Pulse Avalanche capability

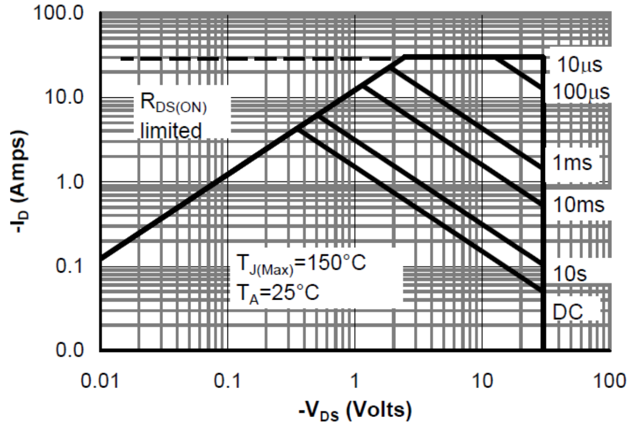


Figure 10: Maximum Forward Biased Safe Operating Area

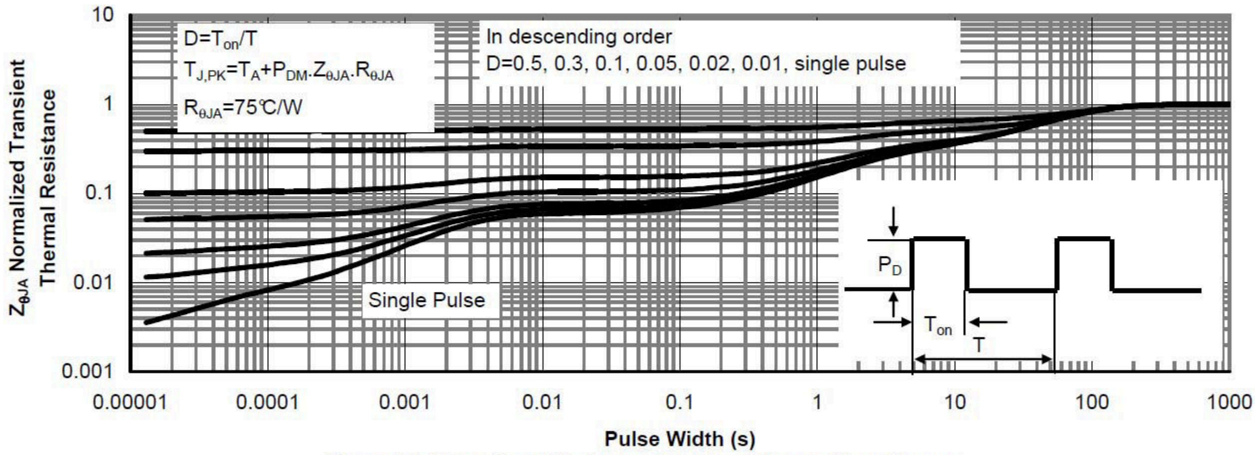


Figure 11: Normalized Maximum Transient Thermal Impedance

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