P-Channel Enhancement Mode Field Effect Transistor

- **Features**

V_{DS} (V) = -40V

I_D = -6.5A

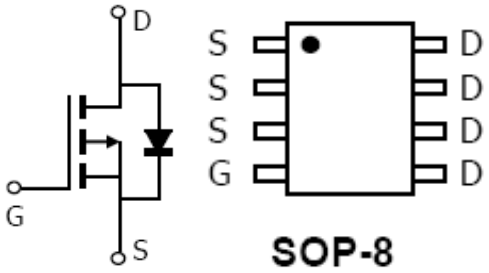
$R_{DS(ON)}$ = 29mΩ (V_{GS} = -10V)

$R_{DS(ON)}$ = 38mΩ (V_{GS} = -4.5V)

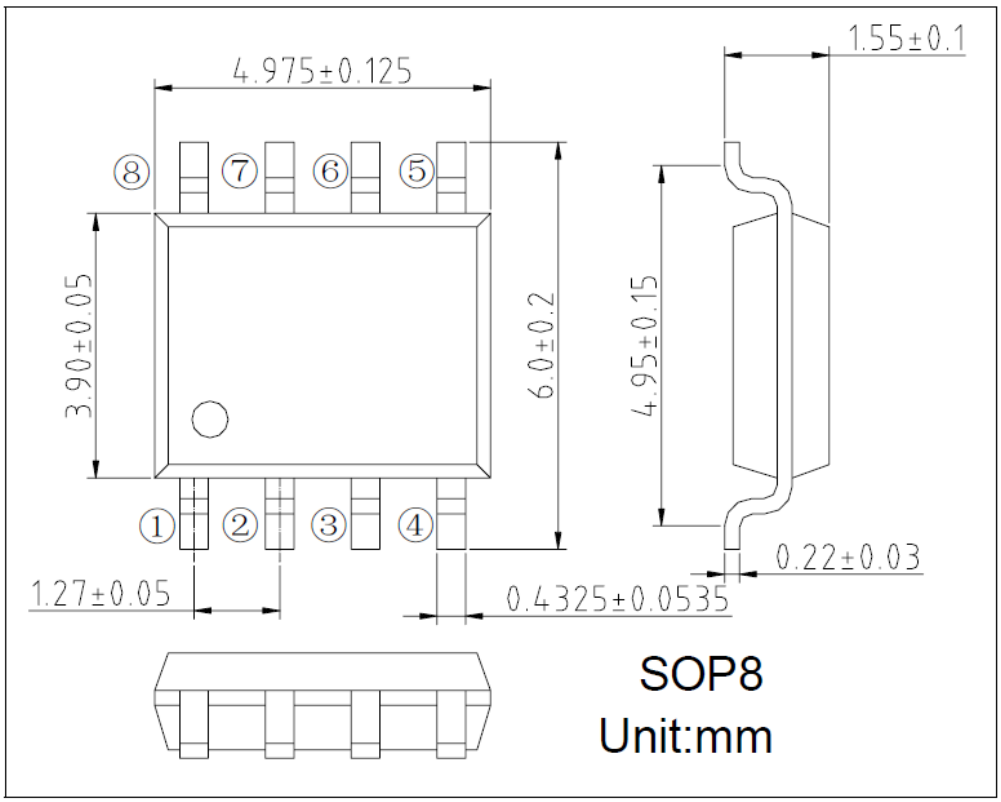
- **General Description**

The HX4430 uses advanced trench technology to provide excellent $R_{DS(ON)}$ with low gate charge. It can be used in a wide variety of applications.

- **Pin Configurations**



- **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	-6.5	A
	T_A=100°C		-4.5	
Drain Current (Pulse) *B		I_{DM}	-30	A
Power Dissipation	T_A=25°C	P_D	2.2	W
	T_A=100°C		1.5	
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} = -32 V, V_{GS} = 0V	--	--	-1	μ A
Gate Threshold Voltage	$V_{GS(TH)}$	V_{GS} = V_{DS}, I_{DS} = -250μ A	-1	-1.7	-2.5	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 = -6A	--	29	38	mΩ
		V_{GS} = -2.5V, I_D = -5A	--	38	50	mΩ
Forward Transconductance	g_{FS}	V_{DS} = -5V, I_D= -5A	15	--	--	S
Diode Forward Voltage	V_{SD}	I_{SD} =-6A , V_{GS}=0V	--	--	-1.2	V
Switching						
Total Gate Charge	Q_g	V_{GS}=-10V, V_{DS}=-20V, I_D=-5A	--	19	--	nC
Gate-Source Charge	Q_{gs}		--	4.4	--	nC
Gate-Drain Charge	Q_{gd}		--	4.2	--	nC
Turn-on Delay Time	$t_{d\ (on)}$	V_{GS}=-10V, V_{DS}=-20V, R_L=2Ω,R_{GEN}=3Ω	--	6.2	--	ns
Turn-on Rise Time	t_r		--	8.4	--	ns
Turn-off Delay Time	$t_{d(off)}$		--	28	--	ns
Turn-off Fall Time	t_f		--	10	--	ns
Dynamic						
Input Capacitance	Ciss	V_{GS}=0V, V_{DS}=-20V, f=1MHz	--	1150	--	pF
Output Capacitance	Coss		--	97	--	pF
Reverse Transfer Capacitance	Crss		--	72	--	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**

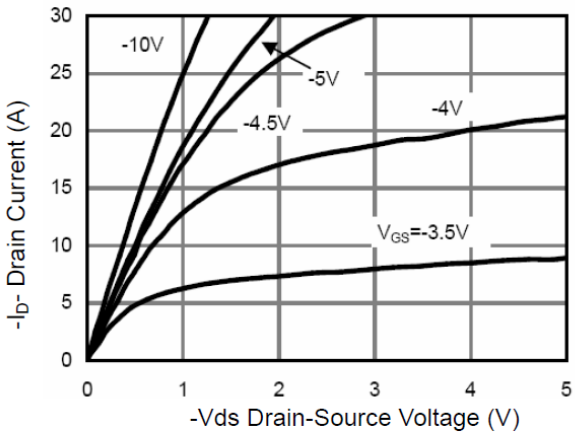


Figure 1 Output Characteristics

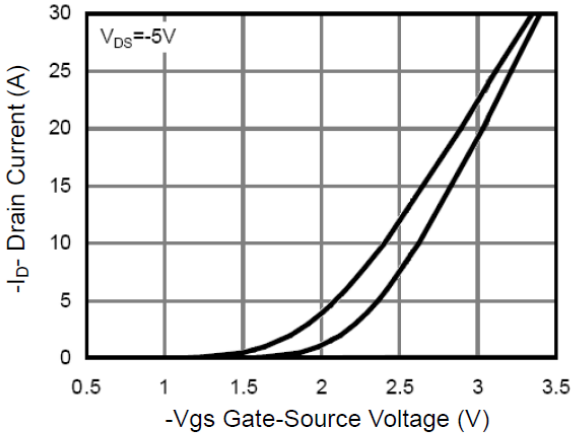


Figure 2 Transfer Characteristics

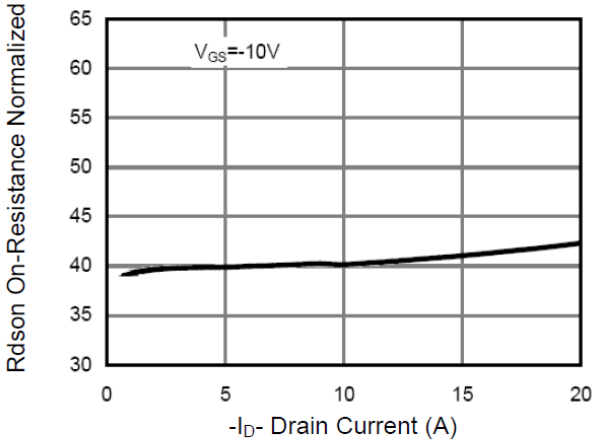


Figure 3 Rdson- Drain Current

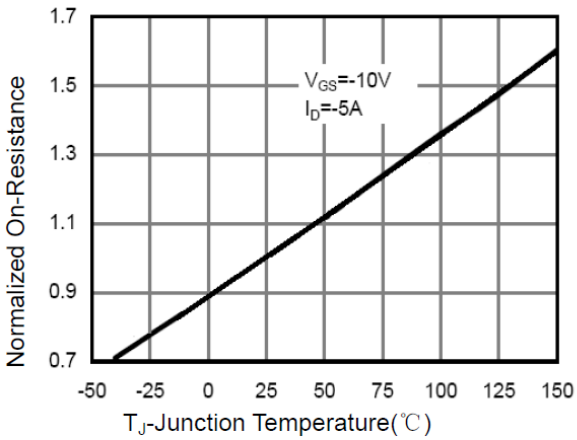


Figure 4 Rdson-Junction Temperature

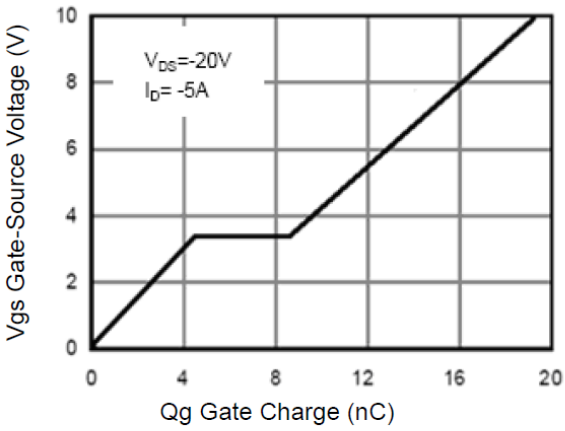


Figure 5 Gate Charge

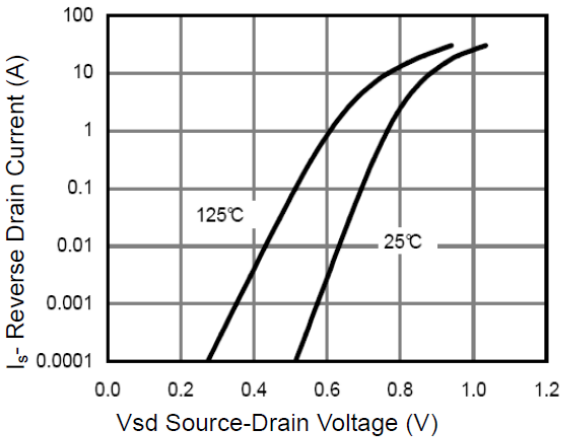


Figure 6 Source- Drain Diode Forward

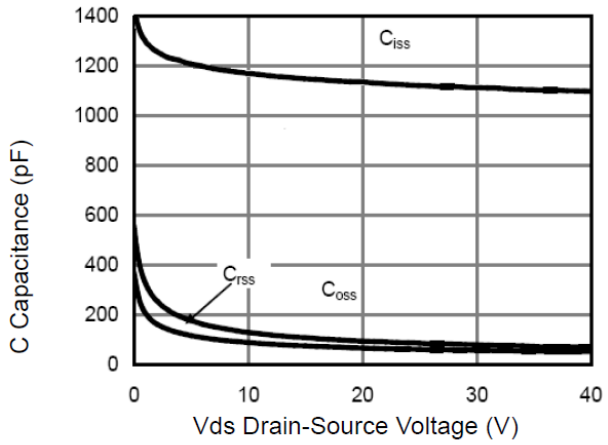


Figure 7 Capacitance vs Vds

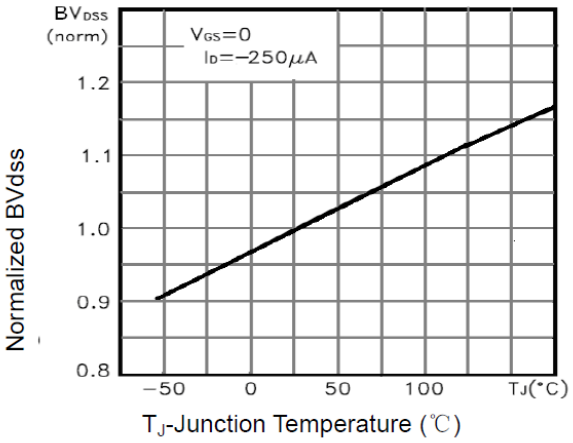


Figure 9 BV_{DSS} vs Junction Temperature

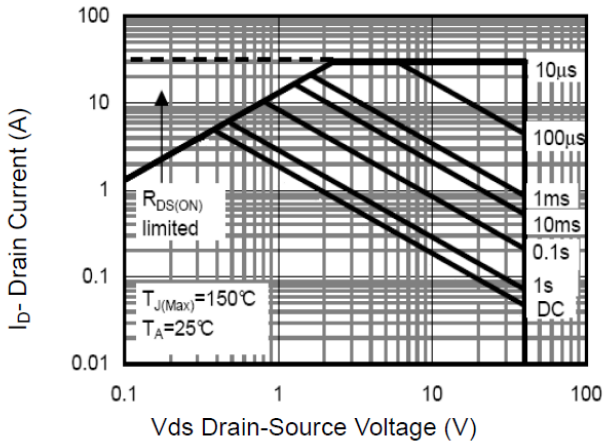


Figure 8 Safe Operation Area

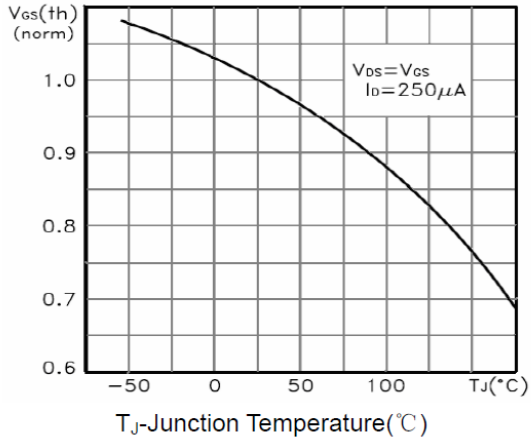


Figure 10 $V_{GS(th)}$ vs Junction Temperature

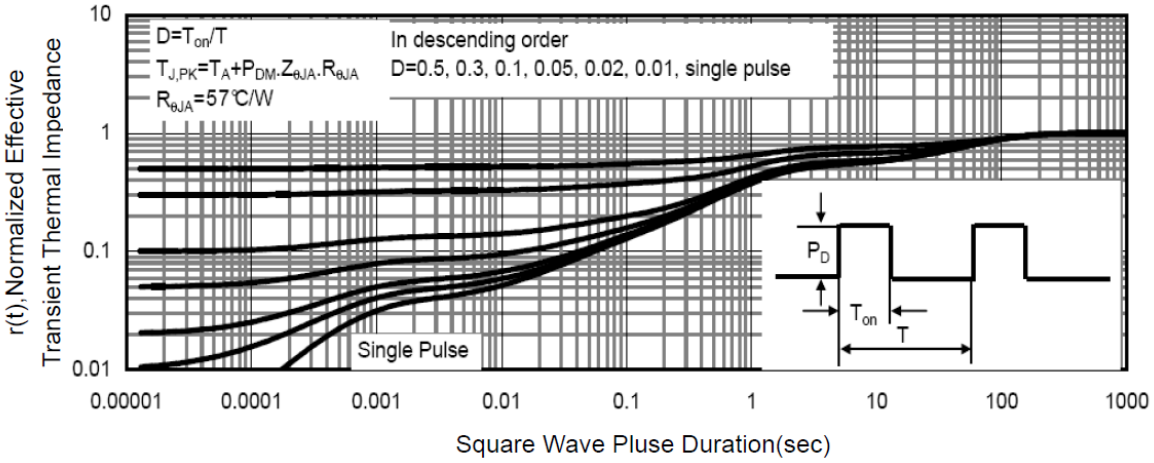


Figure 11 Normalized Maximum Transient Thermal Impedance

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