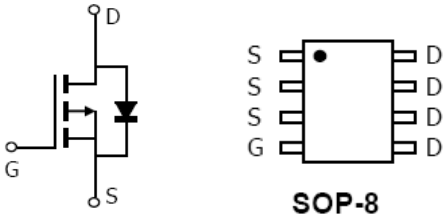
P-Channel Enhancement Mode Field Effect Transistor

Features

V_{DS}	$R_{DS(ON)max}$	I_D
-30V	13 mΩ@-20V	-12A
	15 mΩ@-10V	
	18 mΩ@-5V	

Pin Configurations



SOP-8

General Description

The HG12P30SA uses advanced trench technology to provide excellent $R_{DS(ON)}$, and ultra-low low gate charge with a 25V gate rating. This device is suitable for use as a load switch or in PWM applications.

-RoHS Compliant

-Halogen Free

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}	±25	V
Drain Current (Continuous) *AC	T_A=25°C	I_D	-12	A
	T_A=70°C		-10	
Drain Current (Pulse) *B		I_{DM}	-60	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	-1.6	-2.0	-3	V
Gate Leakage Current	I_{GSS}	V_{GS} =±25V, V_{DS}=0V	--	--	100	nA
Drain-Source On-state Resistance	$R_{DS(on)}$	V_{GS} = -20V, I_D = -10A	--	10	13	mΩ
		V_{GS} = -10V, I_D = -10A	--	11	15	mΩ
		V_{GS} = -5V, I_D = -10A	--	15	18	mΩ
Forward Transconductance	g_{FS}	V_{DS} = -5V, I_D = -10A	--	26	--	S
Diode Forward Voltage	V_{SD}	I_{SD} = -1A , V_{GS}=0V	--	-0.72	-1.0	V
Maximum Body-Diode Continuous Current	I_S		--	--	-4.2	A
Switching						
Total Gate Charge	Q_g	V_{GS}= -10V, V_{DS}= -15V, I_D= -12A	--	46.64	60.63	nC
Gate-Source Charge	Q_{gs}		--	7.84	10.2	nC
Gate-Drain Charge	Q_{gd}		--	9.96	12.95	nC
Turn-on Delay Time	$t_{d\ (on)}$	V_{GS}=-10V,V_{DS}= -15V, R_L=1.25Ω, R_{GEN}=3Ω	--	19.24	38.48	ns
Turn-on Rise Time	t_r		--	8.56	17.12	ns
Turn-off Delay Time	$t_{d(off)}$		--	69.8	139.6	ns
Turn-off Fall Time	t_f		--	18.52	37.04	ns
Dynamic						
Input Capacitance	C_{iss}	V_{GS}=0V, V_{DS}= -15V, f=1MHz	--	2777.96	--	pF
Output Capacitance	C_{oss}		--	380.67	--	pF
Reverse Transfer Capacitance	C_{rss}		--	217.7	--	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

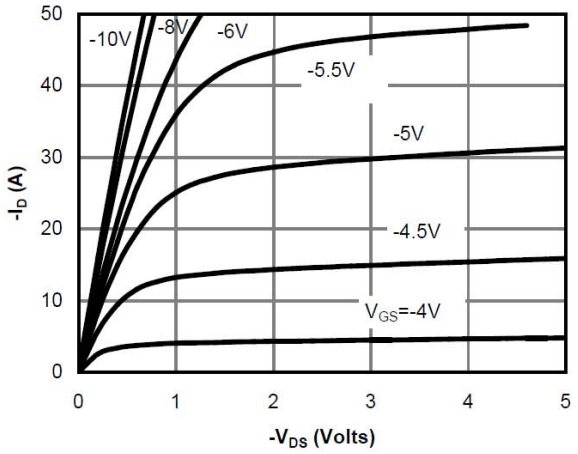


Fig 1: On-Region Characteristics

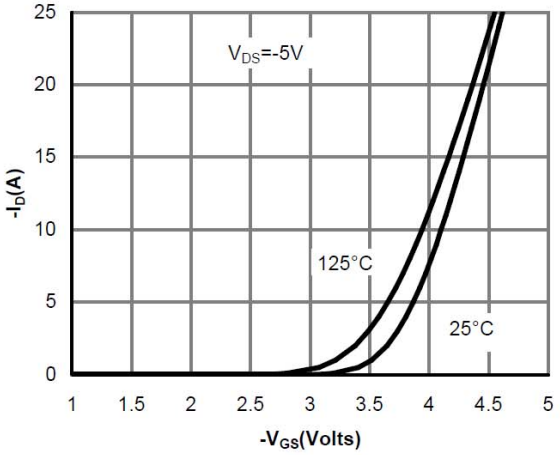


Figure 2: Transfer Characteristics

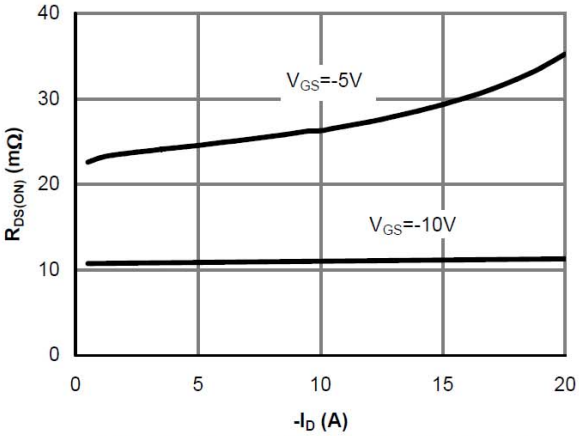


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

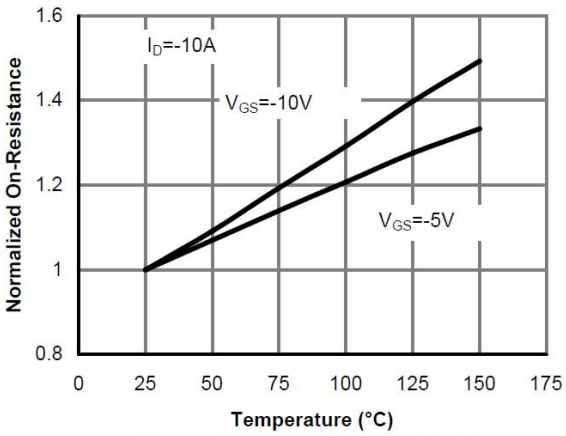


Figure 4: On-Resistance vs. Junction Temperature

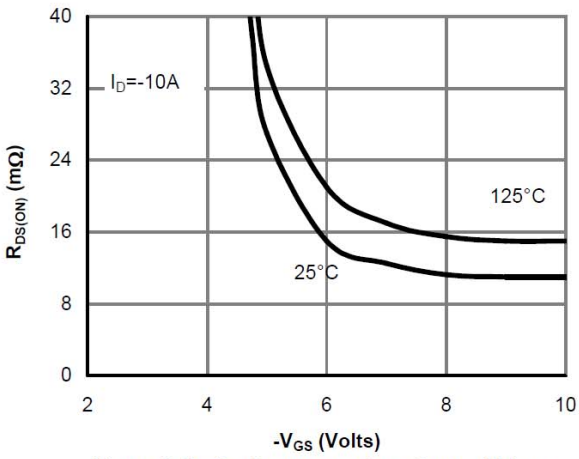


Figure 5: On-Resistance vs. Gate-Source Voltage

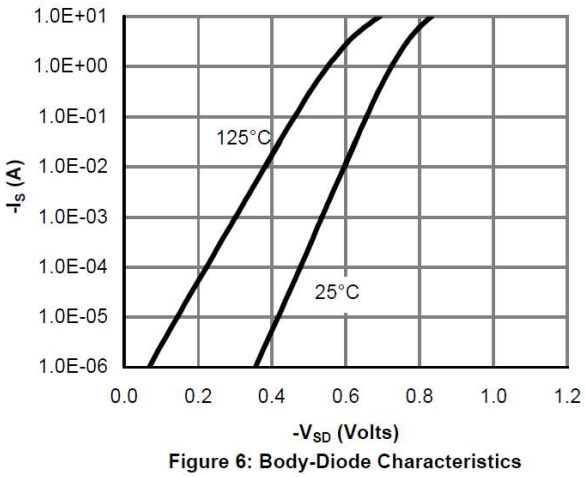


Figure 6: Body-Diode Characteristics

Typical Electrical and Thermal Characteristics

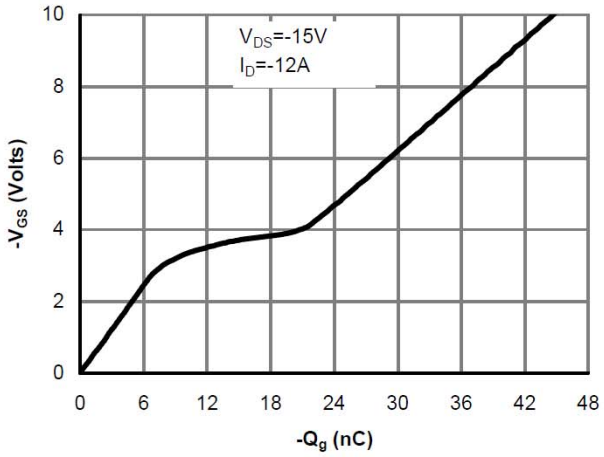


Figure 7: Gate-Charge Characteristics

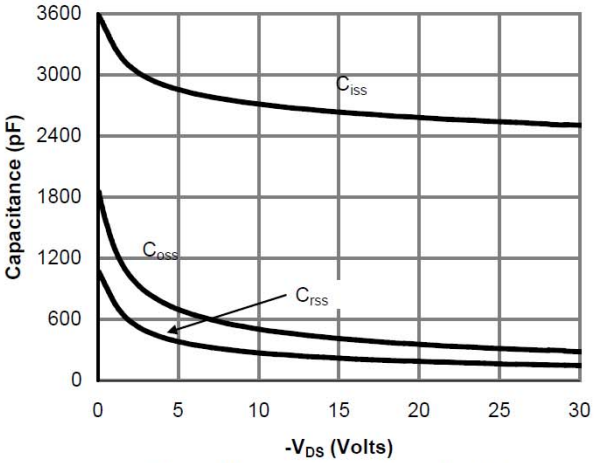


Figure 8: Capacitance Characteristics

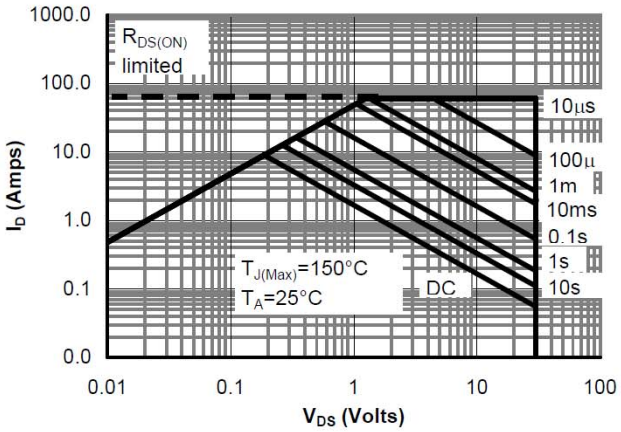


Figure 9: Maximum Forward Biased Safe Operating Area

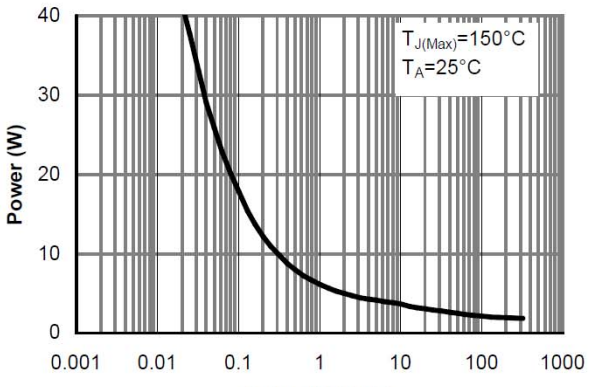


Figure 10: Single Pulse Power Rating Junction-to-Ambient

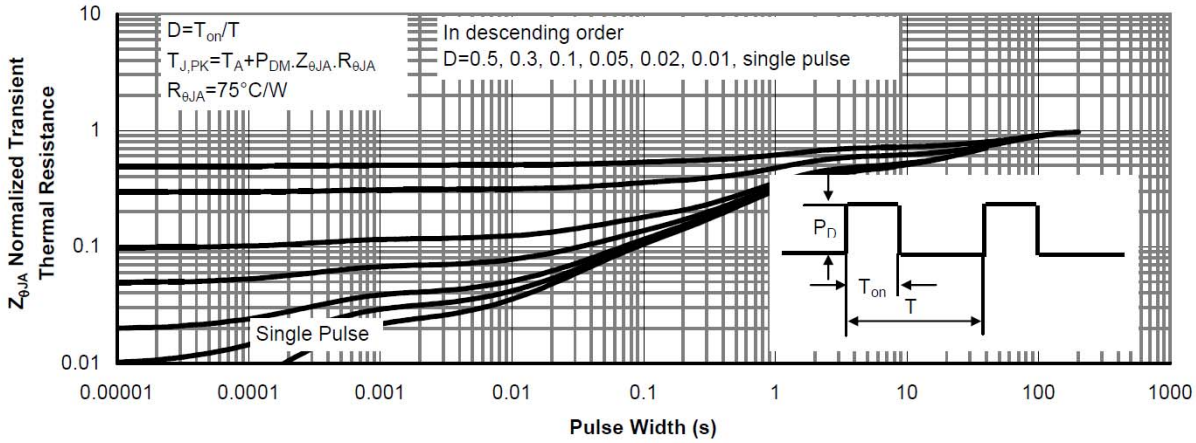


Figure 11: Normalized Maximum Transient Thermal Impedance

Package Information