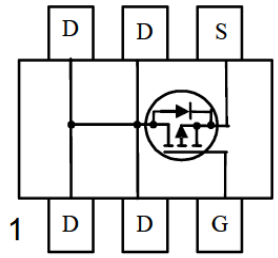
P-Channel Enhancement Mode Field Effect Transistor

Features

V_{DS}	$R_{DS(ON)max}$	I_D
-20V	55 mΩ@-10V	-4.8A
	66 mΩ@-4.5V	
	120 mΩ@-2.5V	

Pin Configurations



Top View

General Description

The HG5P20MDuses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with gate voltages as low as 2.5V while retaining a 12V $V_{GS(MAX)}$ rating.

This device is suitable for use as a uni-directional or bi-directional load switch.

Absolute Maximum Ratings @T_A=25℃ unless otherwise noted

Parameter		Symbol	Ratings	Unit
Drain-Source Voltage		V_{DSS}	20	V
Gate-Source Voltage		V_{GSS}	±12	V
Drain Current (Continuous) *AC	T_C=25°C	I_D	-4.8	A
	T_C=70°C		-4	
Drain Current (Pulse) *B		I_{DM}	-20	A
Power Dissipation	T_C=25°C	P_D	1.25	W
Operating Temperature/ Storage Temperature		T_J/T_{STG}	-55~150	℃

Thermal Data

Parameter	Symbol	Value	Unit
Thermal Resistance Junction-ambient	Rthj-amb	65	℃/W

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	-20	--	--	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = -20 V, V_{GS} = 0V	--	--	-1	μA
Gate Threshold Voltage	$V_{GS(TH)}$	V_{GS} =V_{DS} , I_{DS}=-250μA	-0.7	-1	-1.3	V
Gate Leakage Current	I_{GSS}	V_{GS}= ± 12V, V_{DS}=0V	--	--	100	nA
Drain-Source On-state Resistance	$R_{DS(on)}$	V_{GS} = -10V, I_D = -4.2A	--	--	55	mΩ
		V_{GS} = - 4.5V, I_D = -4A	--	--	66	mΩ
		V_{GS} = -2.5V, I_D = -1A	--	--	120	mΩ
Forward Transconductance	g_{FS}	V_{DS}=-5V, I_D=-2A	--	9	--	S
Diode Forward Voltage	V_{SD}	I_{SD}=-1A, V_{GS}=0V	--	-0.78	-1	V
Reverse Recovery Time	trr	I_S = -4A,V_{GS}= 0V,	--	25	--	ns
Reverse Recovery Charge	Qrr	dI/dt=100A/μs	--	17	--	nC
Switching						
Total Gate Charge	Q_g	V_{GS}=-4.5V, V_{DS}=-10V, I_D=-4A	--	11.3	--	nC
Gate-Source Charge	Q_{gs}		--	1.7	--	nC
Gate-Drain Charge	Q_{gd}		--	4.2	--	nC
Turn-on Delay Time	$t_{d(on)}$	V_{DS} = -10V, I_D = -4A, V_{GS} = -10V, R_G = 6Ω	--	6.5	--	ns
Turn-on Rise Time	tr		--	3.5	--	ns
Turn-off Delay Time	$t_{d(off)}$		--	40	--	ns
Turn-off Fall Time	tf		--	13	--	ns
Dynamic						
Input Capacitance	C_{iss}	V_{DS} = -10V, V_{GS} = 0V,f = 1.0MHz	--	675	--	pF
Output Capacitance	C_{oss}		--	85	--	pF
Reverse Transfer Capacitance	C_{rss}		--	62	--	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

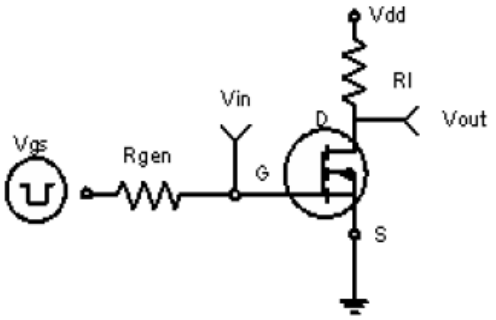


Figure 1:Switching Test Circuit

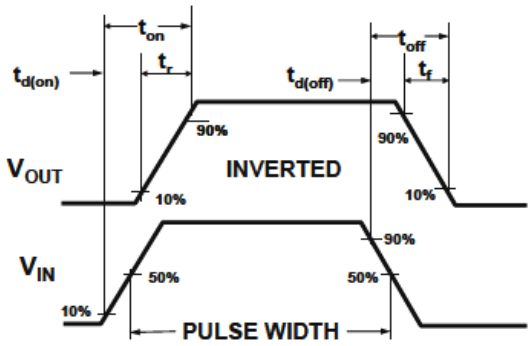
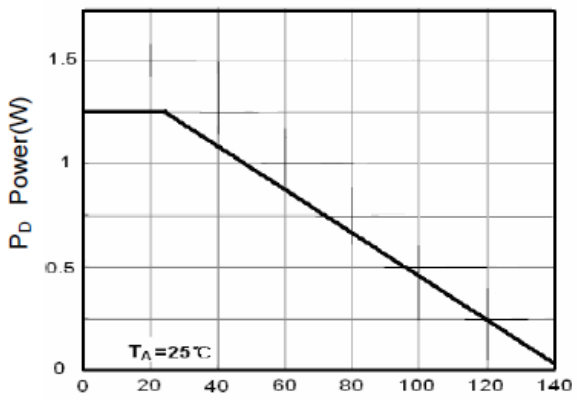
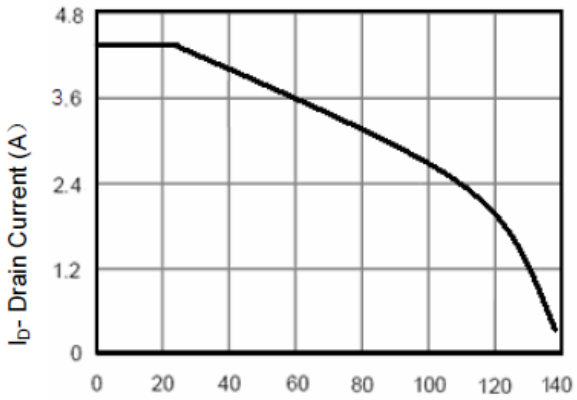


Figure 2:Switching Waveforms



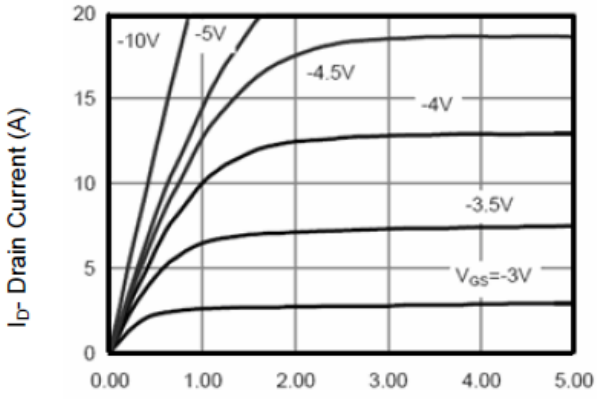
T_J-Junction Temperature(℃)

Figure 3 Power Dissipation



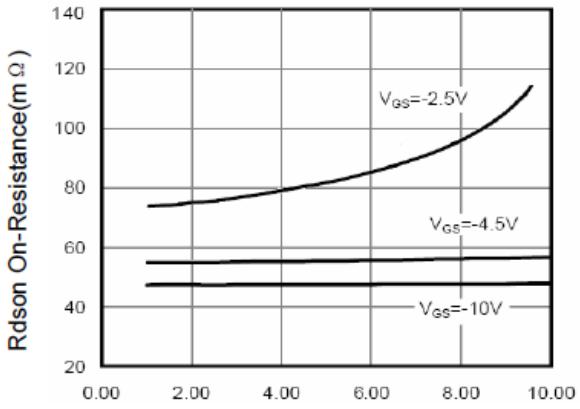
T_J-Junction Temperature(℃)

Figure 4 Drain Current



Vds Drain-Source Voltage (V)

Figure 5 Output Characteristics



I_D- Drain Current (A)

Figure 6 Drain-Source On-Resistance

Typical Electrical and Thermal Characteristics

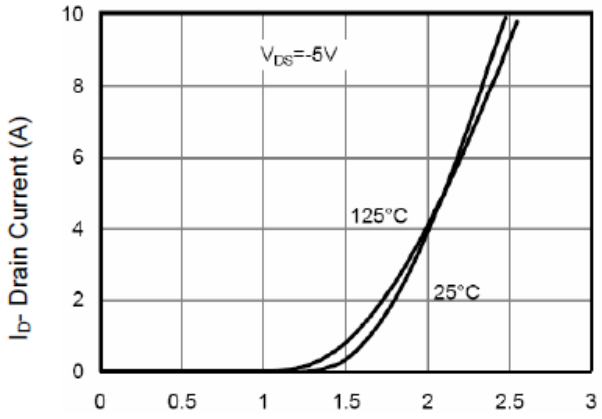


Figure 7 Transfer Characteristics

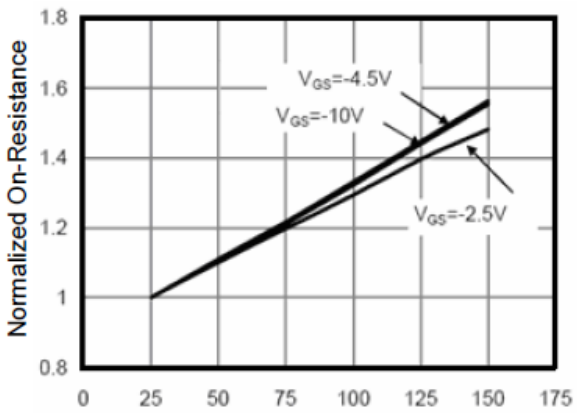


Figure 8 Drain-Source On-Resistance

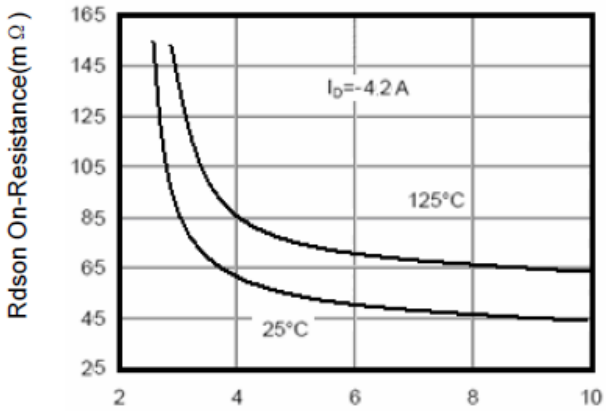


Figure 9 Rdson vs Vgs

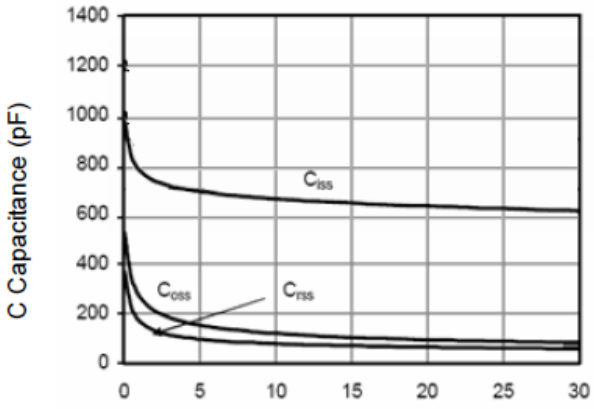


Figure 10 Capacitance vs Vds

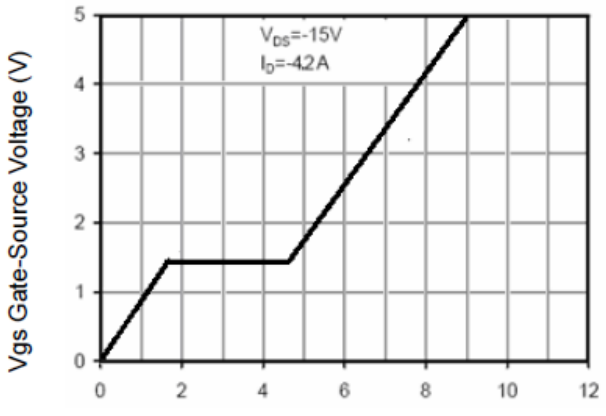


Figure 11 Gate Charge

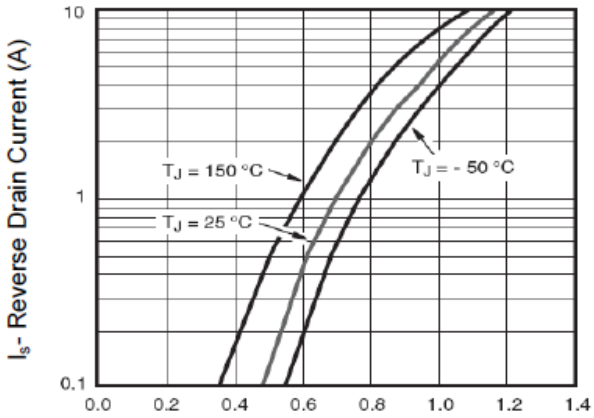


Figure 12 Source- Drain Diode Forward

Typical Electrical and Thermal Characteristics

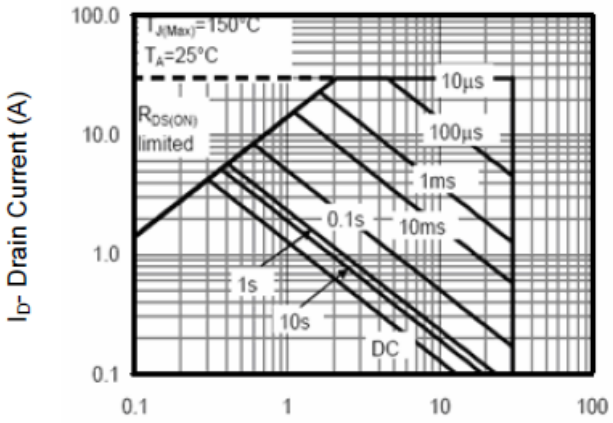


Figure 13 Safe Operation Area

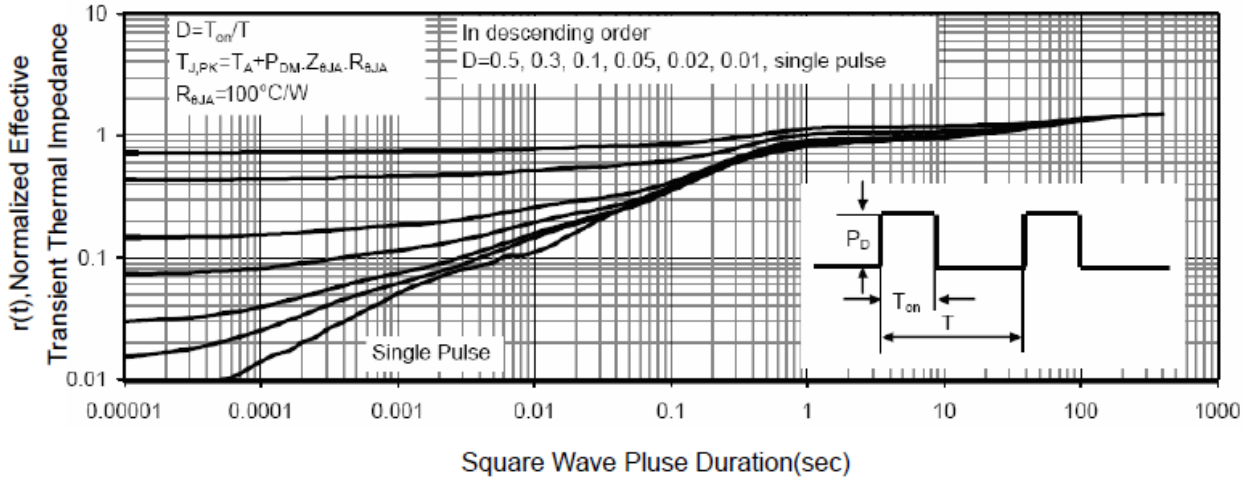


Figure 14 Normalized Maximum Transient Thermal Impedance

Package Information