

P-Channel Enhancement Mode Field Effect Transistor

- Features

V_{DS}	$R_{DS(ON)MAX}$	I_D
-30V	40 mΩ@-10V	-5.1A
	44 mΩ@-4.5V	

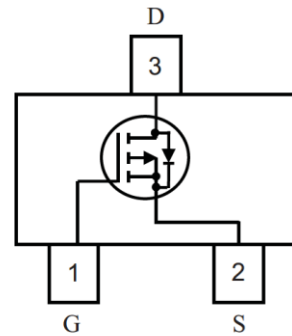
- General Description

The HG5P30MB uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge and operation gate voltages as low as 2.5V. This device is suitable for use as a load switch or other general applications

- Absolute Maximum Ratings @ $T_A=25^{\circ}C$ 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	$T_C=25^{\circ}C$	I_D	-5.1	A
	$T_C=70^{\circ}C$		-4.1	
Drain Current (Pulse) *B		I_{DM}	-40	A
Power Dissipation	$T_C=25^{\circ}C$	P_D	1.4	W
Operating Temperature/ Storage Temperature		T_J/T_{STG}	-55~150	$^{\circ}C$

- Pin Configurations



Electrical Characteristics

$T_A=25^\circ\text{C}$ unless otherwise noted

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
ON/OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS} = 0V, I_D = -250\mu A$	-30	--	--	V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = -30V, V_{GS} = 0V$	--	--	-1	μA
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{GS} = V_{DS}, I_{DS} = -250\mu A$	-0.7	-1.3	-1.6	V
Gate Leakage Current	I_{GSS}	$V_{GS} = \pm 20V, V_{DS} = 0V$	--	--	± 100	nA
Drain-Source On-state Resistance	$R_{DS(on)}$	$V_{GS} = -10V, I_D = -4.2A$	--	31	40	m Ω
		$V_{GS} = -4.5V, I_D = -4A$	--	38	44	m Ω
Forward Transconductance	g_{FS}	$V_{DS} = -5V, I_D = -4A$	--	15	--	S
Diode Forward Voltage	V_{SD}	$I_{SD} = -1A, V_{GS} = 0V$	--	-0.78	-1.0	V
Switching CHARACTERISTICS						
Total Gate Charge	Q_g	$V_{GS} = -10V, V_{DS} = -15V,$ $I_D = -4.9A$	--	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	$t_{d(on)}$	$V_{DD} = -15V, R_L = 15\Omega$ $I_D = -1A, V_{GEN} = -10V$ $R_G = 6\Omega$	--	12.4	24.8	ns
Turn-on Rise Time	t_r		--	8.5	17	ns
Turn-off Delay Time	$t_{d(off)}$		--	41.1	82.2	ns
Turn-off Fall Time	t_f		--	6.9	13.8	ns
Dynamic CHARACTERISTICS						
Input Capacitance	C_{iss}	$V_{GS} = 0V, V_{DS} = -15V,$ $f = 1.0MHz$	--	971.5	--	pF
Output Capacitance	C_{oss}		--	235.1	--	pF
Reverse Transfer Capacitance	C_{rss}		--	82.7	--	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 $T_A=25^\circ\text{C}$. 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 $t \leq 10s$ junction to ambient thermal resistance rating.

Typical Electrical and Thermal Characteristics

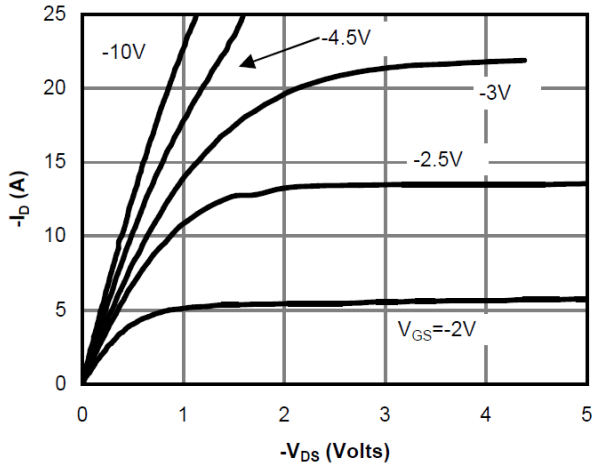


Figure 1: On-Region Characteristics

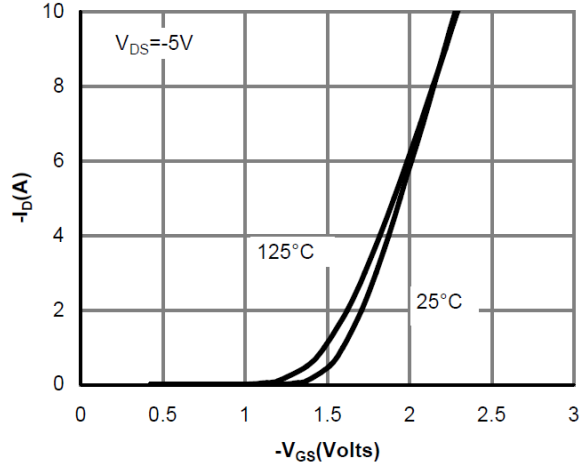


Figure 2: Transfer Characteristics

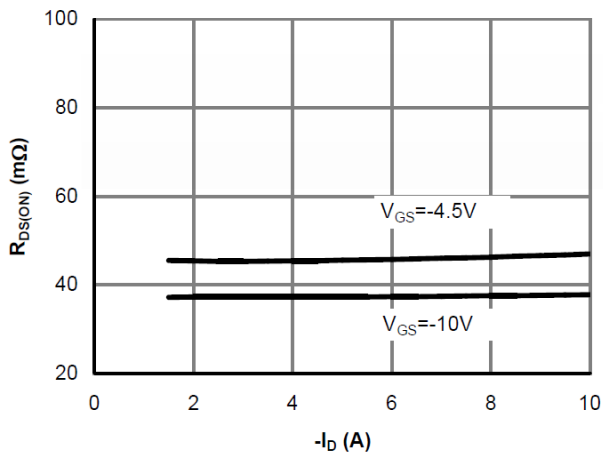


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

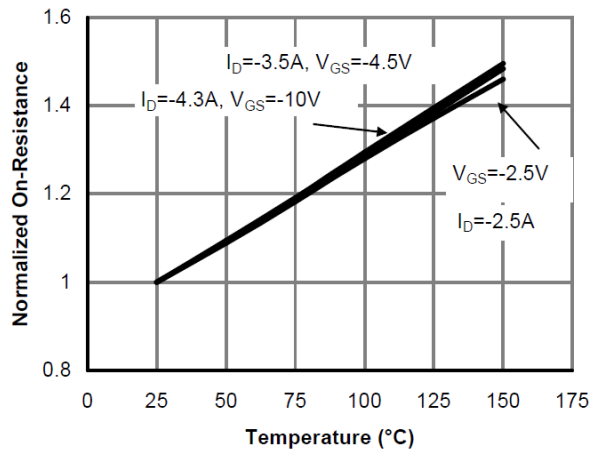


Figure 4: On-Resistance vs. Junction Temperature

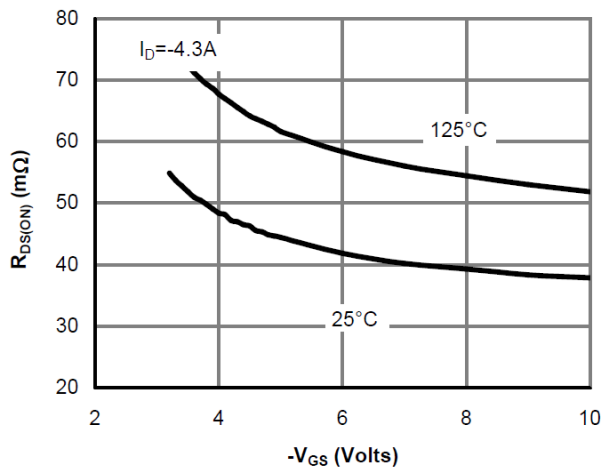


Figure 5: On-Resistance vs. Gate-Source Voltage

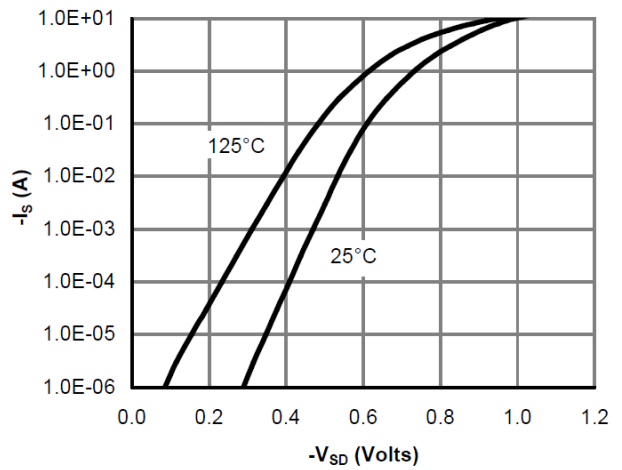


Figure 6: Body-Diode Characteristics

Typical Electrical and Thermal Characteristics

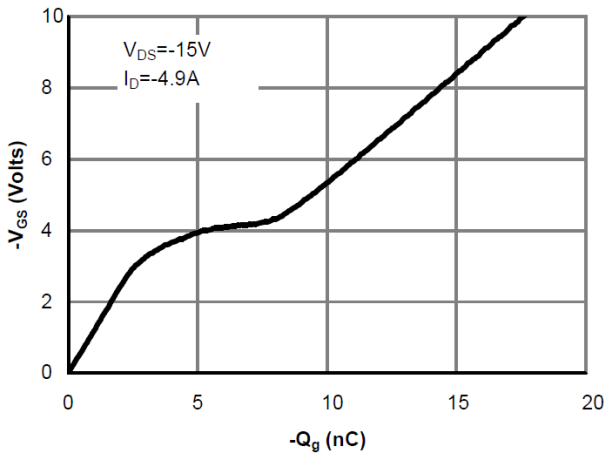


Figure 7: Gate-Charge Characteristics

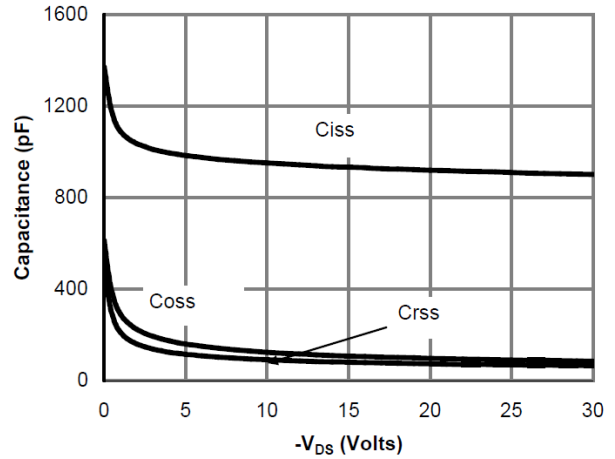


Figure 8: Capacitance Characteristics

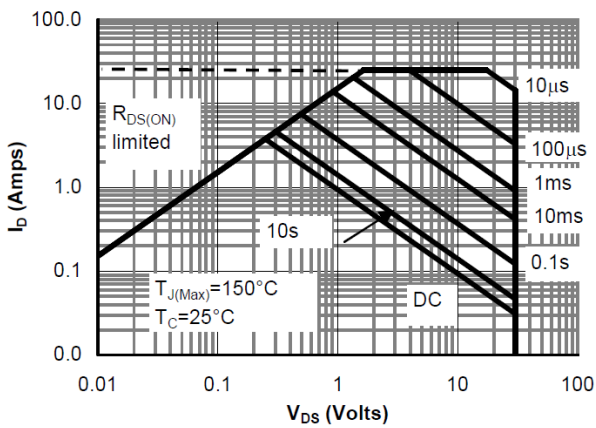


Figure 9: Maximum Forward Biased Safe Operating Area

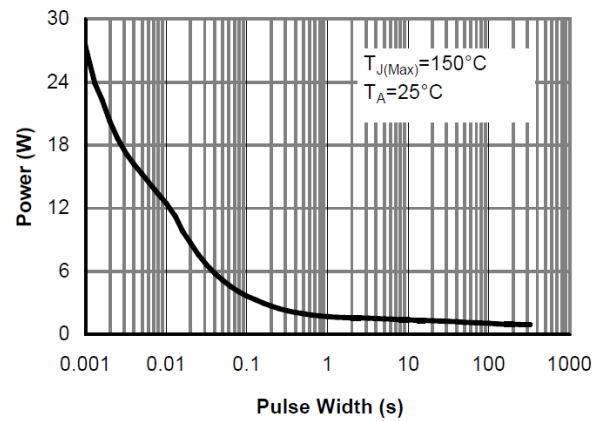


Figure 10: Single Pulse Power Rating Junction-to-Ambient

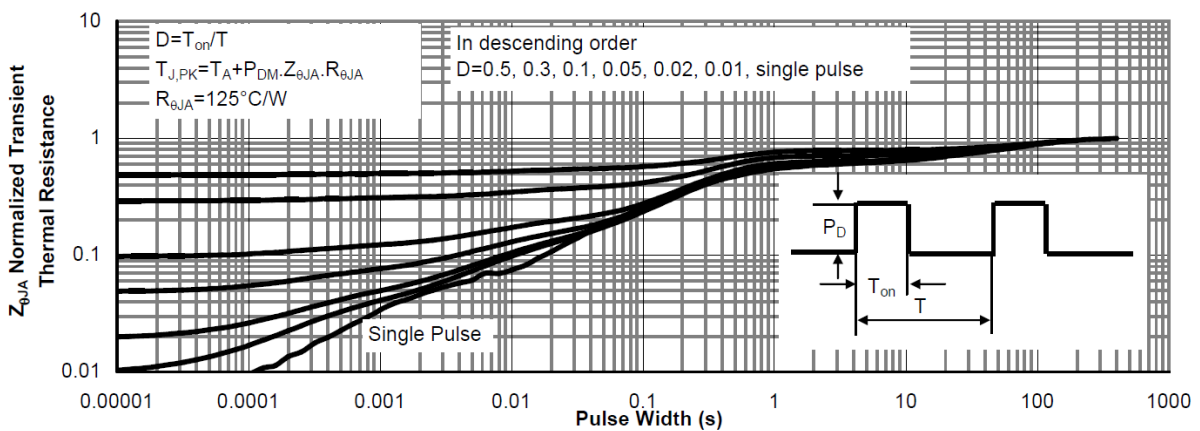


Figure 11: Normalized Maximum Transient Thermal Impedance

Package Information

