

-300V P-Channel Enhancement Mode MOSFET

Description

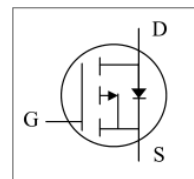
The HM02P30PR uses advanced trench technology

to provide excellent $R_{DS(ON)}$, low gate charge and

operation with gate voltages as low as 4.5V. This

device is suitable for use as a

Battery protection or in other Switching application.



General Features

$V_{DS} = -300V$ $I_D = -0.2 A$

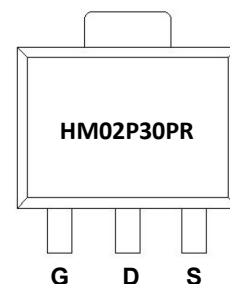
$R_{DS(ON)} < 17m\Omega$ @ $V_{GS}=10V$

Application

Battery protection

Load switch

Uninterruptible power supply



Marking and pin assignment

Package Marking and Ordering Information

Product ID	Pack	Marking	Qty(PCS)
HM02P30PR	SOT-89	HM02P30PR	3000

Absolute Maximum Ratings ($T_c=25^{\circ}C$ unless otherwise noted)

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	-300	V
V_{GS}	Gate-Source Voltage	± 20	V
$I_D @ T_A=25^{\circ}C$	Continuous Drain Current, $V_{GS} @ -10V^1$	-0.2	A
$I_D @ T_A=70^{\circ}C$	Continuous Drain Current, $V_{GS} @ -10V^1$	-0.14	A
I_{DM}	Pulsed Drain Current ²	-0.6	A
$P_D @ T_A=25^{\circ}C$	Total Power Dissipation ³	1	W
T_{STG}	Storage Temperature Range	-55 to 150	$^{\circ}C$
T_J	Operating Junction Temperature Range	-55 to 150	$^{\circ}C$
$R_{\theta JA}$	Thermal Resistance Junction-ambient ¹	125	$^{\circ}C/W$
$R_{\theta JC}$	Thermal Resistance Junction-Case ¹	80	$^{\circ}C/W$

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Electrical Characteristics (T_J=25°C, unless otherwise noted)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BVDSS	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =-250uA	-300	---	---	V
ΔBVDSS/ΔT _J	BVDSS Temperature Coefficient	Reference to 25°C, I _D =-1mA	---	-0.0624	---	V/°C
RDS(ON)	Static Drain-Source On-Resistance ²	V _{GS} =-10V, I _D =-0.2A	---	---	17	mΩ
		V _{GS} =-4.5V, I _D =-0.2A	---	---	---	
VGS(th)	Gate Threshold Voltage		-1.7		-2.55	V
ΔVGS(th)	VGS(th) Temperature Coefficient	V _{GS} =V _{DS} , I _D =-250uA	---	4.5	---	mV/°C
IDSS	Drain-Source Leakage Current	V _{DS} =-80V, V _{GS} =0V, T _J =25°C	---	---	10	uA
		V _{DS} =-80V, V _{GS} =0V, T _J =55°C	---	---	100	
IGSS	Gate-Source Leakage Current	V _{GS} =±20V, V _{DS} =0V	---	---	±100	nA
gfs	Forward Transconductance	V _{DS} =-5V, I _D =-0.8A	---	3	---	S
R _g	Gate Resistance	V _{DS} =0V, V _{GS} =0V, f=1MHz	---	16	32	Ω
Q _g	Total Gate Charge (-4.5V)	V _{DS} =-15V, V _{GS} =-4.5V, I _D =-0.5A	---	4.5	---	nC
Q _{gs}	Gate-Source Charge		---	1.14	---	
Q _{gd}	Gate-Drain Charge		---	1.5	---	
Td(on)	Turn-On Delay Time	V _{DD} =-50V, V _{GS} =-10V, R _G =3.3Ω, I _D =-0.5A	---	13.6	---	ns
T _r	Rise Time		---	6.8	---	
Td(off)	Turn-Off Delay Time		---	34	---	
T _f	Fall Time		---	3	---	
Ciss	Input Capacitance	V _{DS} =-15V, V _{GS} =0V, f=1MHz	---	553	---	pF
Coss	Output Capacitance		---	29	---	
Crss	Reverse Transfer Capacitance		---	20	---	
IS	Continuous Source Current ^{1,4}	V _G =V _D =0V, Force Current	---	---	-0.9	A
ISM	Pulsed Source Current ^{2,4}		---	---	-1.8	A
VSD	Diode Forward Voltage ²	V _{GS} =0V, I _S =-1A, T _J =25°C	---	---	-1.2	V

Note :

- 1.The data tested by surface mounted on a 1 inch²FR-4 board with 2OZ copper.
- 2.The data tested by pulsed , pulse width ≤ 300us , duty cycle ≤ 2%
- 3.The power dissipation is limited by 150°C junction temperature
- 4 .The data is theoretically the same as I_D and I_{DM} , in real applications , should be limited by total power dissipation.

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Typical Characteristics

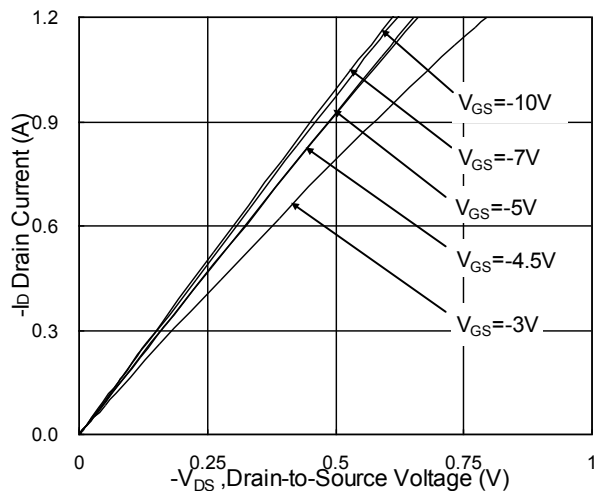


Fig.1 Typical Output Characteristics

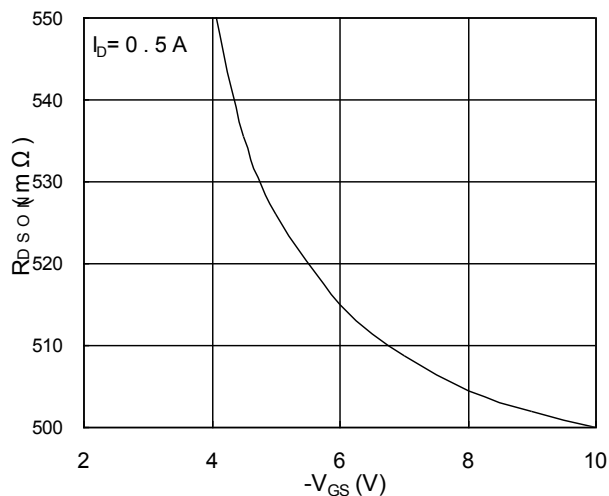


Fig.2 On-Resistance vs. Gate-Source

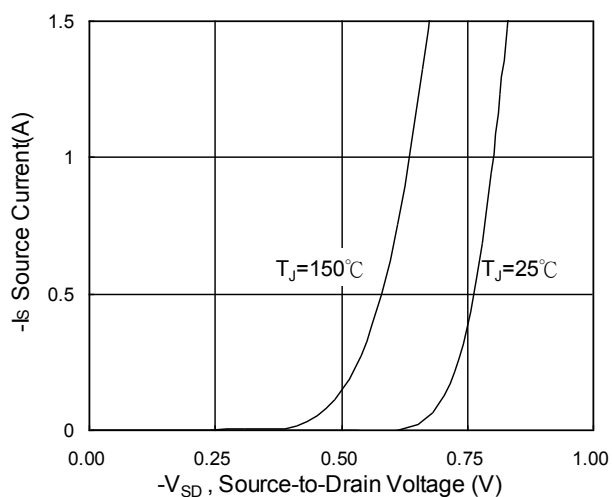


Fig.3 Forward Characteristics Of Reverse

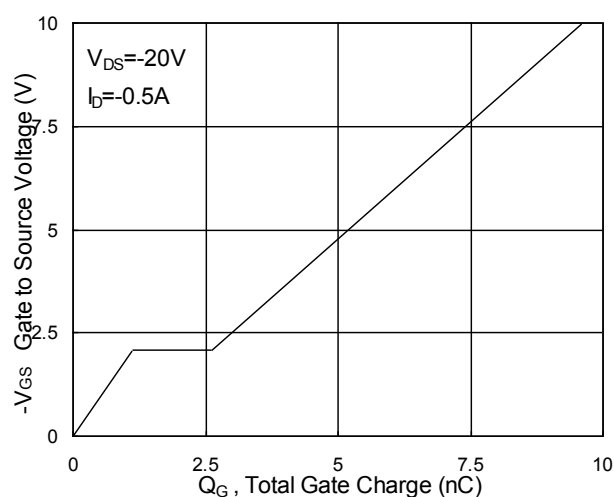


Fig.4 Gate-Charge Characteristics

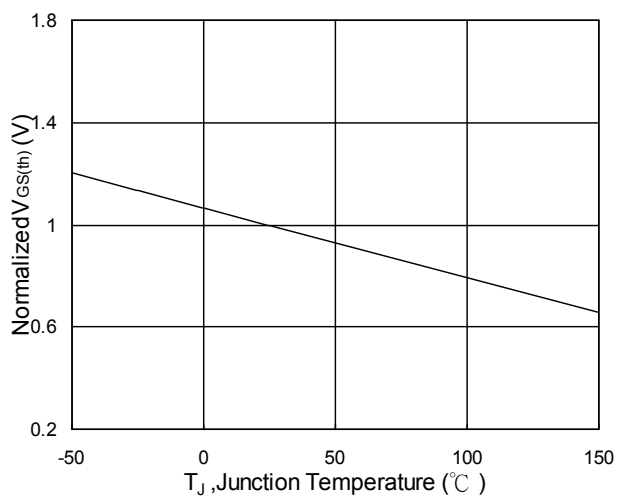


Fig.5 Normalized $V_{GS(th)}$ vs. T_J

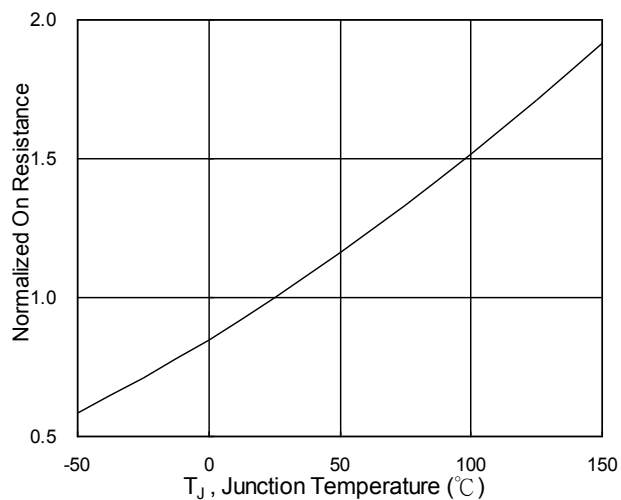


Fig.6 Normalized $R_{DS(on)}$ vs. T_J

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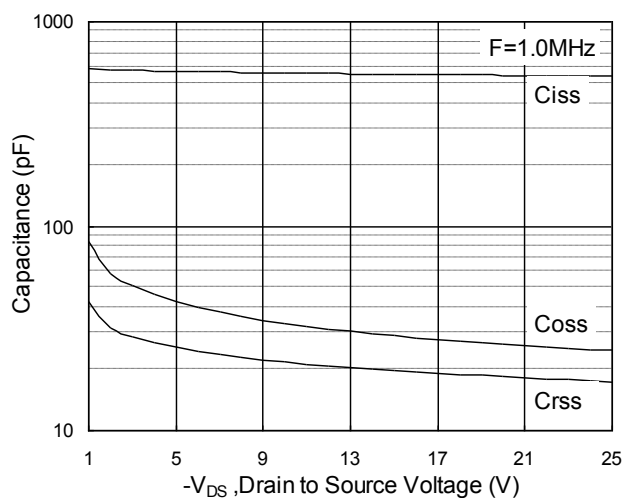


Fig.7 Capacitance

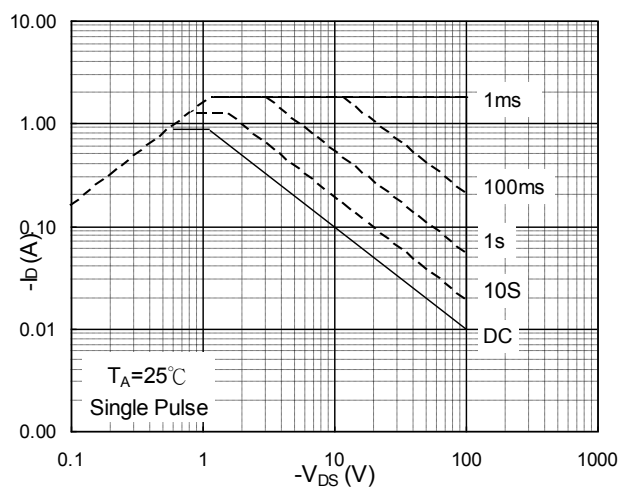


Fig.8 Safe Operating Area

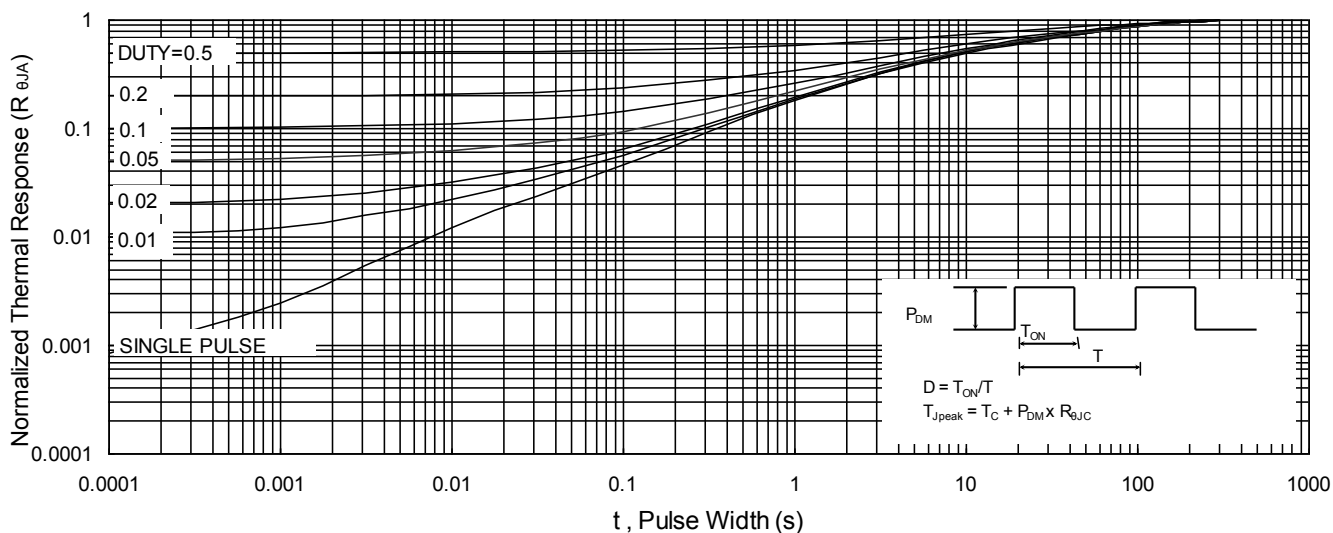


Fig.9 Normalized Maximum Transient Thermal Impedance

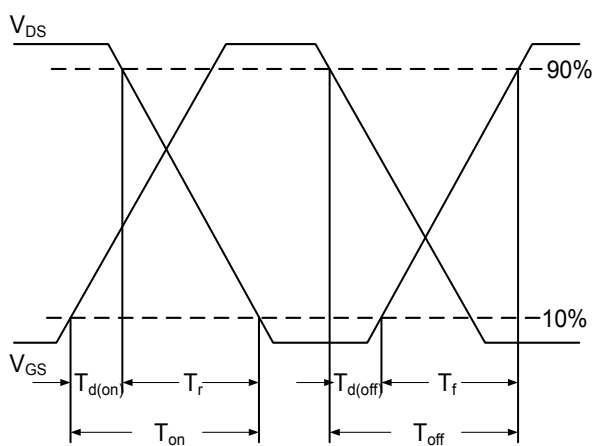


Fig.10 Switching Time Waveform

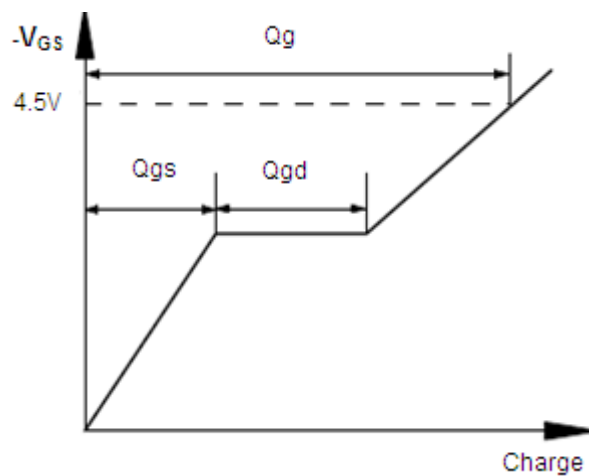
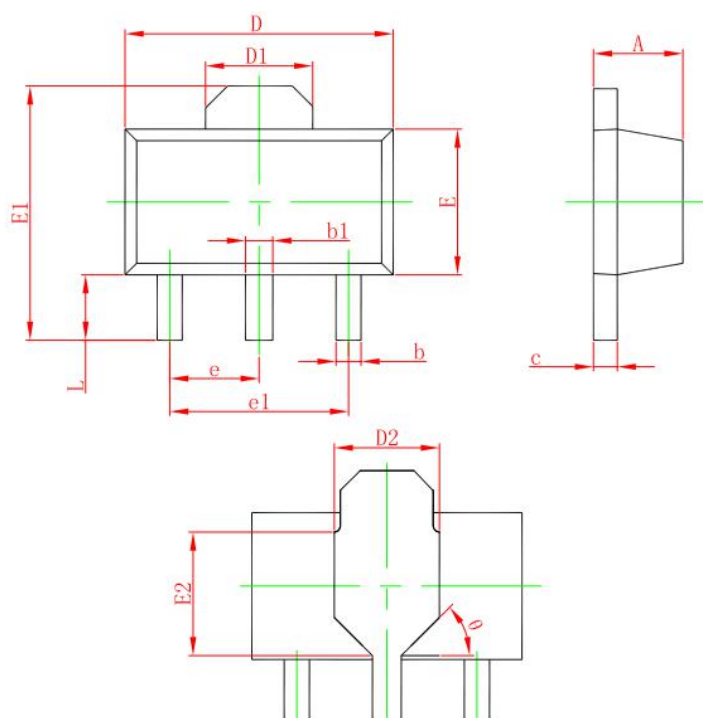


Fig.11 Gate Charge Waveform

Package Information:



Symbol	Dimensions in millimeters		Dimensions in Inches	
	Min	Max	Min	Max
A	1.400	1.600	0.055	0.063
b	0.320	0.520	0.013	0.020
b1	0.400	0.580	0.016	0.023
c	0.350	0.440	0.014	0.017
D	4.400	4.600	0.173	0.181
D1	1.550REF		0.061REF	
D2	1.750 REF		0.069REF	
E	2.300	2.600	0.091	0.102
E1	3.940	4.250	0.155	0.167
E2	1.900REF		0.075REF	
e	1.500TYP		0.060TYP	
e1	3.000TYP		0.118TYP	
L	0.900	1.200	0.035	0.047
θ	45°		45°	

SOT-89 Package