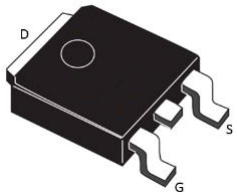
Silicon P-Channel Power MOSFET

General Description：

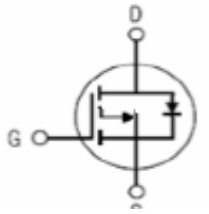
The HMR25P06 uses advanced trench technology and design to provide excellent RDS(ON) with low gate charge. It can be used in a wide variety of applications. The package form is TO-252, which accords with the RoHS standard.

V_{DSS}	-60	V
I_D	-25	A
P_D	90	W
$R_{DS(ON)}$	45	mΩ

TO-252



Inner Equivalent Principium Chart



Features：

- **Fast Switching**
- **Low Gate Charge and Rdson**
- **Low Reverse transfer capacitances**
- **100% Single Pulse avalanche energy Test**

Applications：

Power switching application
Hard switched and high frequency circuits
Uninterruptible power supply

Absolute （Tc= 25℃ unless otherwise specified）：

Symbol	Parameter	Rating	Units
V_{DSS}	Drain-to-Source Voltage	-60	V
I_D	Continuous Drain Current	-25	A
	Continuous Drain Current T_C = 100 °C	-17.7	A
I_{DM} a1	Pulsed Drain Current	-60	A
V_{GS}	Gate-to-Source Voltage	±20	V
dv/dt a3	Peak Diode Recovery dv/dt	5.0	V/ns
P_D	Power Dissipation	90	W
T_J， T_{stg}	Operating Junction and Storage Temperature Range	150，–55 to 150	℃
T_L	MaximumTemperature for Soldering	300	℃

Electrical Characteristics（Tc= 25℃ unless otherwise specified）:

OFF Characteristics						
Symbol	Parameter	Test Conditions	Rating			Unit
			Min.	Typ.	Max.	s
V_{DSS}	Drain to Source Breakdown Voltage	V_{GS}=0V, I_D=-250μA	-60	--	--	V
$\Delta BV_{DSS}/\Delta T_J$	Bvdss Temperature Coefficient	ID=-250uA,Reference25℃	--	0.15	--	V/℃
I_{DSS}	Drain to Source Leakage Current	V_{DS} = -60, V_{GS}= 0V, T_a = 25℃	--	--	-1	μA
		V_{DS} =-48V, V_{GS}= 0V, T_a = 125℃	--	--	-250	
$I_{GSS(F)}$	Gate to Source Forward Leakage	V_{GS} =+20V	--	--	1	μA
$I_{GSS(R)}$	Gate to Source Reverse Leakage	V_{GS} =-20V	--	--	-1	μA

ON Characteristics						
Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
$R_{DS(ON)}$	Drain-to-Source On-Resistance	V_{GS}=-10V,I_D=-20.0A	--	37	45	mΩ
$V_{GS(TH)}$	Gate Threshold Voltage	V_{DS} = V_{GS}, I_D = -250μA	-3.5	-2.6	-2.0	V
Pulse width tp≤380μs, δ ≤2%						

Dynamic Characteristics						
Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
g_{fs}	Forward Transconductance	V_{DS}=-10V, I_D =-10A	--	25	--	S
C_{iss}	Input Capacitance	V_{GS} = 0V V_{DS} = -25V f = 1.0MHz	--	3430	--	pF
C_{oss}	Output Capacitance		--	391	--	
C_{rss}	Reverse Transfer Capacitance		--	272	--	

Resistive Switching Characteristics						
Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
$t_{d(ON)}$	Turn-on Delay Time	R_L =-1.5 Ω V_{DD} = -30V V_{GS} = -10V R_G =1.5Ω	--	12	--	ns
tr	Rise Time		--	15	--	
$t_{d(OFF)}$	Turn-Off Delay Time		--	38	--	
t_f	Fall Time		--	15	--	
Q_g	Total Gate Charge	I_D =-20.0A V_{DD} =-30V V_{GS} = -10V	--	46	--	nC
Q_{gs}	Gate to Source Charge		--	9.5	--	
Q_{gd}	Gate to Drain (“Miller”)Charge		--	11	--	

Source-Drain Diode Characteristics						
Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
I_S	Continuous Source Current (Body Diode)		--	--	-25	A
I_{SM}	Maximum Pulsed Current (Body Diode)		--	--	-60	A
V_{SD}	Diode Forward Voltage	I_S=-25A,V_{GS}=0V	--	--	1.5	V
trr	Reverse Recovery Time	I_S=-25A,T_j = 25° C	--	50	--	ns
Qrr	Reverse Recovery Charge	dI_F/dt=100A/us, V_{GS}=0V	--	110	--	nC
Pulse width tp≤380μs, δ ≤2%						

Symbol	Parameter	Typ.	Units
$R_{\theta JA}$	Junction-to-Ambient	104	℃/W

[a1]: Repetitive rating; pulse width limited by maximum junction temperature

[a3]: I_{SD} =-25A,di/dt ≤100A/us,V_{DD}≤BV_{DS}, Start T_J=25℃

Typical Electrical and Thermal Characteristics

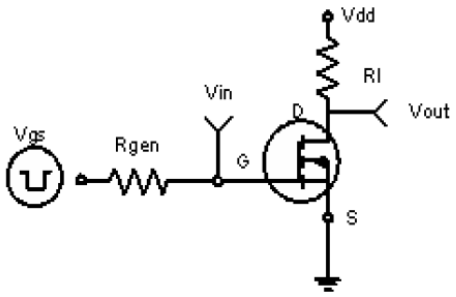


Figure 1:Switching Test Circuit

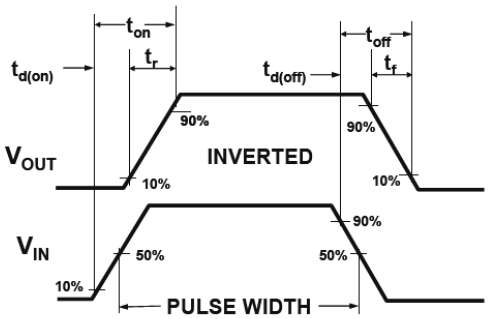


Figure 2:Switching Waveforms

Typical Electrical and Thermal Characteristics (Curves)

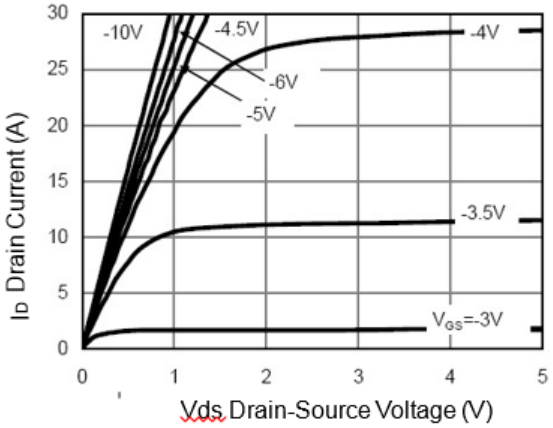


Figure 1 Output Characteristics

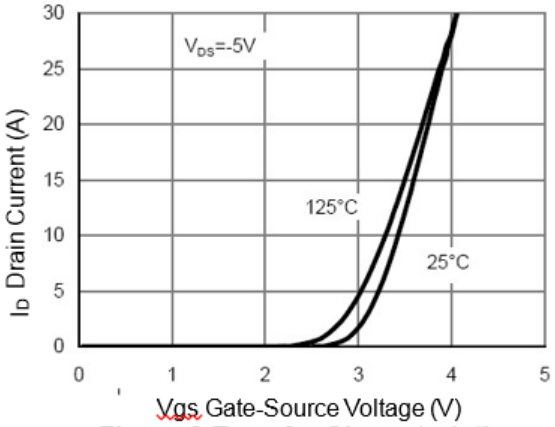


Figure 2 Transfer Characteristics

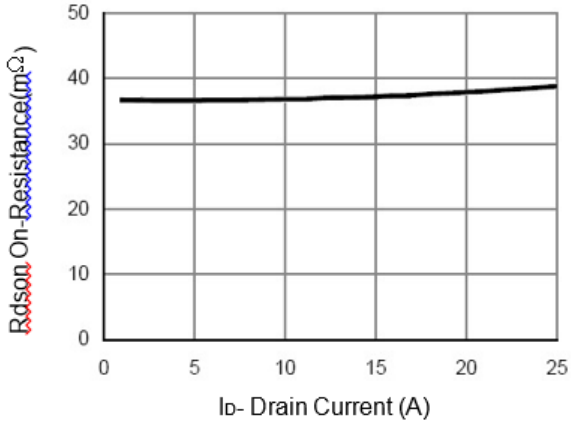


Figure 3 Rdson- Drain Current

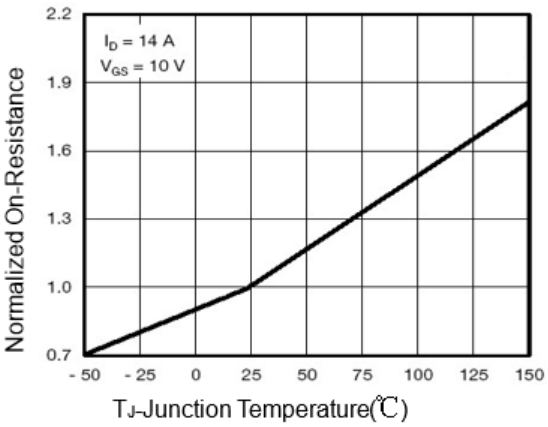


Figure 4 Rdson-Junction Temperature

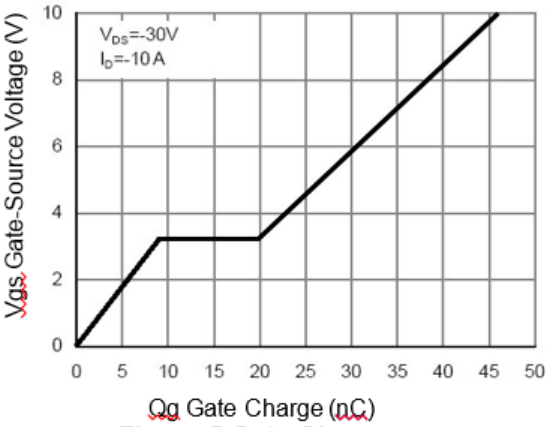


Figure 5 Gate Charge

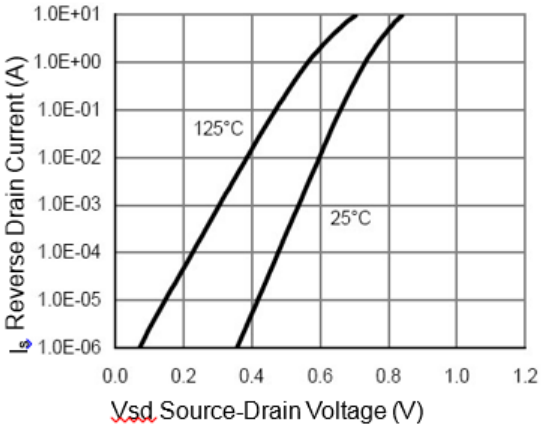


Figure 6 Source- Drain Diode Forward

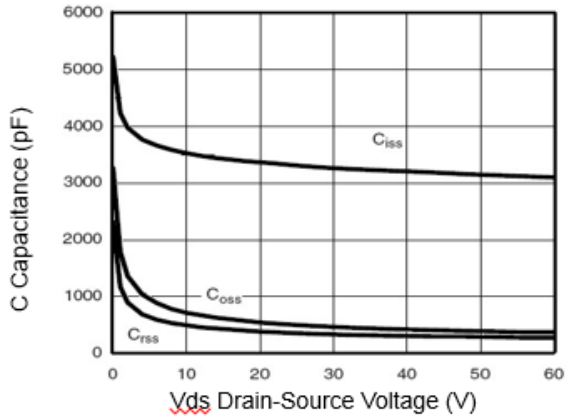


Figure 7 Capacitance vs Vds

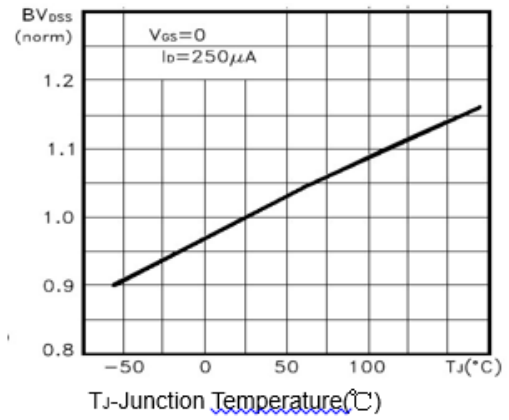


Figure 9 BV_{DSS} vs Junction Temperature

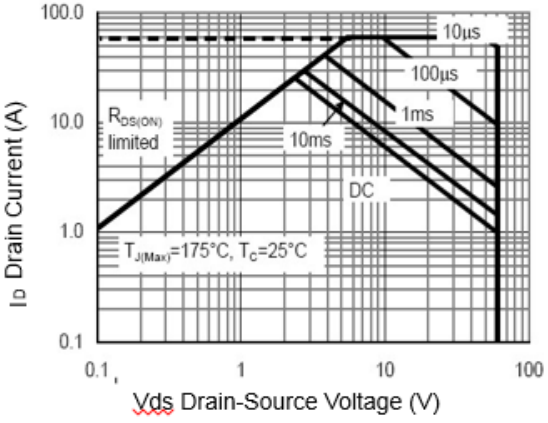


Figure 8 Safe Operation Area

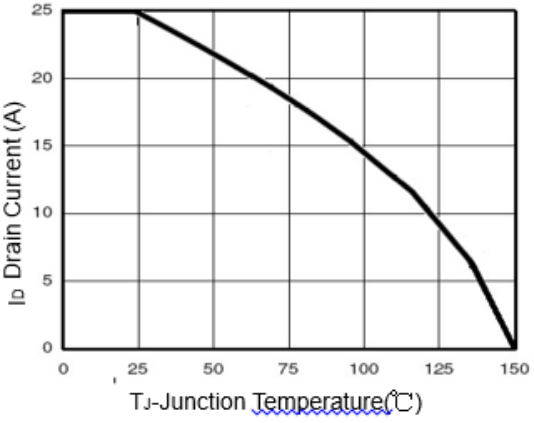


Figure 10 ID Current De-rating

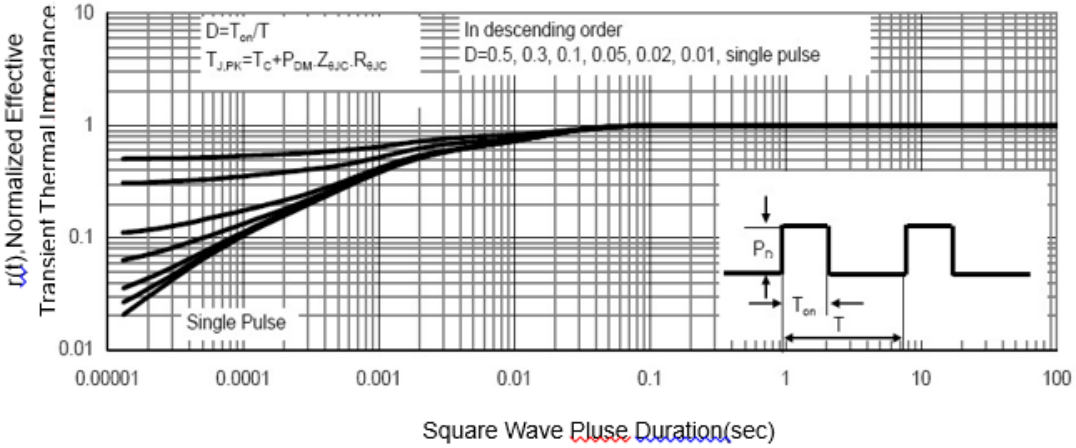


Figure 11 Normalized Maximum Transient Thermal Impedance