PM007P040HG

PowerCubeSemi, Inc.
Potential · Convergence · Smart

-40V -68A 7.5mΩ Si Single P-ch Enhancement Mode MOSFET with Normal Diode

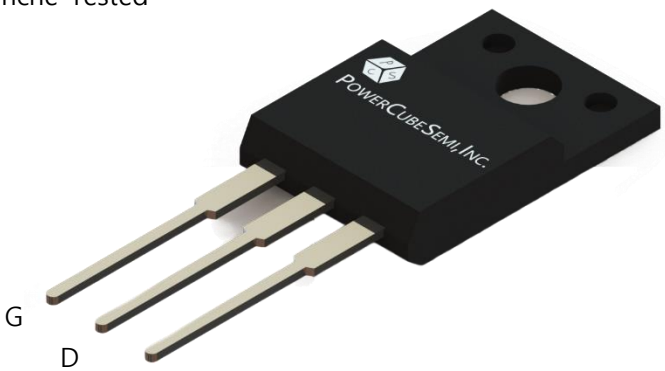
Features

Si P-Ch Enhancement Mode Power MOSFET

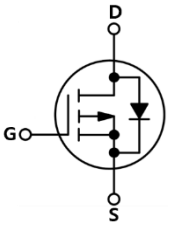
- Rated to -40V at -68Amps @T_J = 25℃
- Max $R_{DS(on)}$ = 7.5 mΩ
- Typ $R_{DS(on)}$ = 6 mΩ
- Gate Charge(Typ. Q_g=42 nC)
- 100% Avalanche Tested

Application

- Power switch
- DC/DC converters



PKG type : TO-220F



Halogen-Free

RoHS

Description

The PM007P040HG uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge. It can be used in a wide variety of applications.

Absolute Maximum Ratings

Symbol	Parameter	Test Condition	Value	Unit
BV_{DSS}	Drain-source breakdown Voltage	V_{GS}=0V, I_D=-250μA	-40	V
I_D	Drain current	T_c=25℃	-68	A
I_{DM}	Drain current	Pulse width limited by junction temperature	-272	A
V_{GS}	Gate-source voltage		±20	V
E_{AS}	Single pulsed avalanche energy	V_{GS}=-10V, R_G=25Ω V_{DD}=-40V, L=0.5mH	306	mJ
P_d	Power dissipation	T_C=25℃	83	W
T_j	Operating junction		150	℃
T_{stg}	Storage temperature		-55 to 150	℃

Package Marking and Ordering Information

Device Marking	Device	Package	Packing Method	Tape width	Quantity
PM007P040HG	PM007P040	TO-220F	TUBE	-	50

Electrical Characteristics of Si MOSFET

Symbol	Parameter	Test Condition	Numerical			Unit
			Min	Typ.	Max.	
BV_{DSS}	Drain-source breakdown voltage	V_{GS} = 0V, I_D = -250μA, T_J = 25°C	-40	-	-	V
I_{DSS}	Zero gate voltage drain current	V_{DS} = -40V, V_{GS} = 0V	-	-	-1	μA
I_{GSS}	Gate-source leakage current	V_{GS} = ±20V, V_{DS} = 0V	-	-	±100	nA
$V_{GS(th)}$	Gate threshold voltage	V_{DS} =V_{GS}, I_D = -250μA	-1.2	-1.5	-2.5	V
$R_{DS(ON)}$	Static drain-source on state resistance	V_{GS} = -10V, I_D = -20A	-	6	7.5	mΩ
		V_{GS} = -4.5V, I_D = -15A	-	8	10	
g_{FS}	Forward transconductance	V_{DS} = -5V, I_D = -20A	-	34	-	S
$t_{d(on)}$	Turn-on Delay time	V_{DD} = -20V, I_D = -34A, R_G = 3Ω	-	10	-	ns
t_r	Turn-on Rise time		-	18	-	
$t_{d(off)}$	Turn-off Delay time		-	38	-	
t_f	Turn-off Fall time		-	24	-	

Electrical Characteristics of Si MOSFET

Symbol	Parameter	Test Condition	Numerical		Unit
			Typ.	Max.	
$R_{\theta JC}$	Thermal resistance, Junction to case		1.5	-	℃/W
C_{iss}	Input capacitance	V_{DS} = -20V, V_{GS} = 0V, f = 1.0㎒	6371	-	pF
C_{oss}	Output capacitance		676	-	
C_{rss}	Reverse transfer capacitance		605	-	
$Q_{g(tot)}$	Total gate charge at 10V	V_{DD} = -20V, I_D = -34A V_{GS} = -10V	42	-	nC
Q_{gs}	Gate to source gate charge		7	-	
Q_{gd}	Gate to drain "Miller" charge		10	-	

Electrical Characteristics of Si Diode

Symbol	Parameter	Test Condition	Numerical		Unit
			Typ.	Max.	
I_S	Maximum continuous drain to source diode forward current	T_c=25℃	-	-68	A
V_{SD}	Drain to source diode forward voltage	I_{SD} = -20A, V_{GS} = 0V	-	-1.2	V
T_{rr}	Reverse recovery time	I_F = -12A, V_{GS} = 0V, dI_F/dt=100A/㎲	40	-	ns
Q_{rr}	Reverse recovery charge		42	-	nC

Typical Characteristics

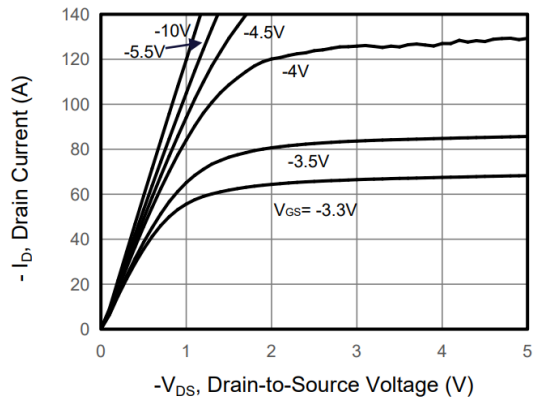


Figure 1. Output Characteristics

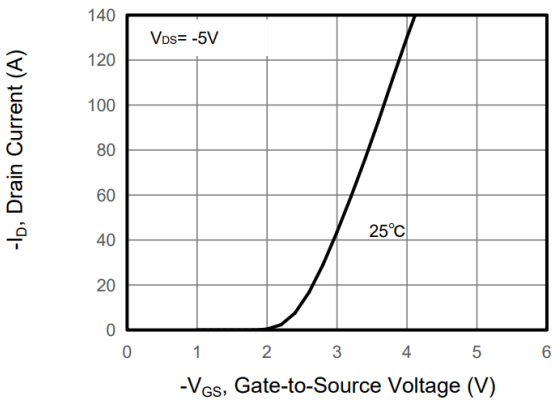


Figure 2. Transfer Characteristics

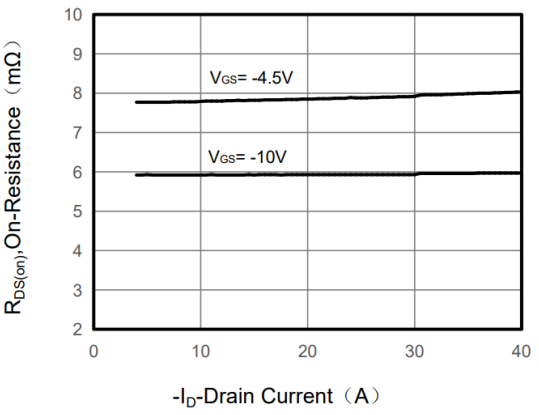


Figure 3. Drain Source On Resistance

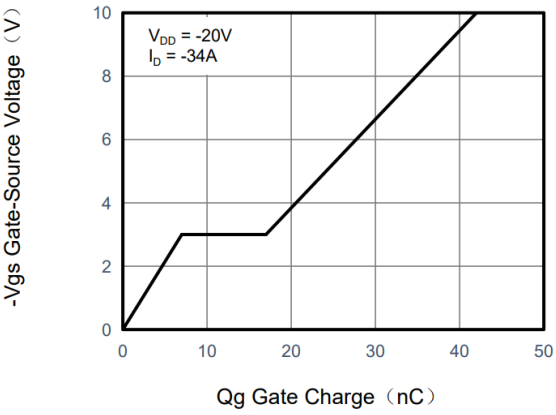


Figure 4. Gate Charge

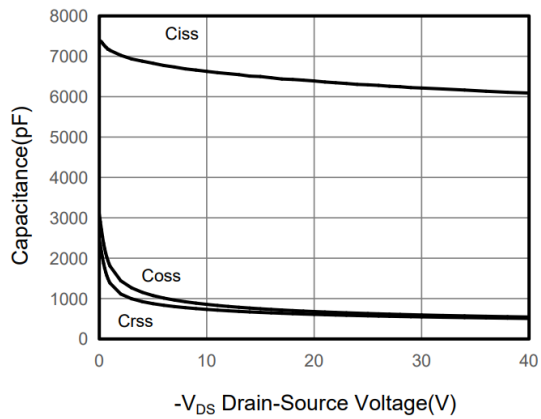


Figure 5. Capacitance

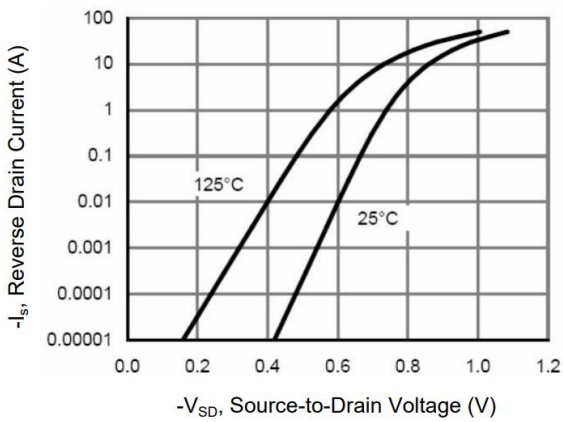


Figure 6. Source-Drain Diode Forward

Typical Characteristics

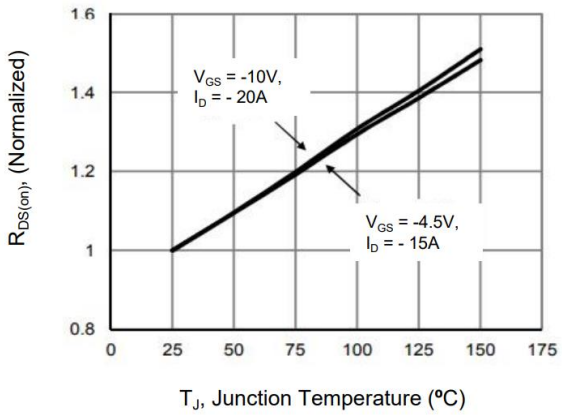


Figure 7. Drain-Source On-Resistance

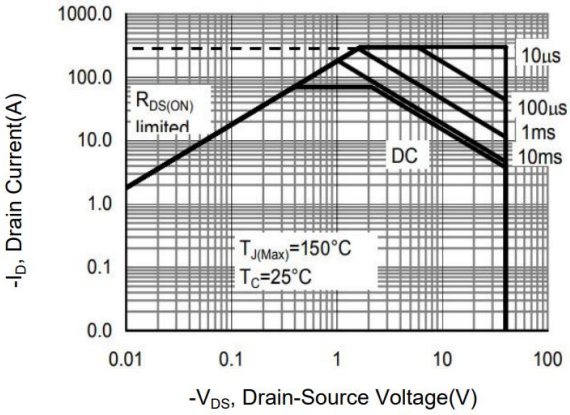


Figure 8. Safe Operation Area

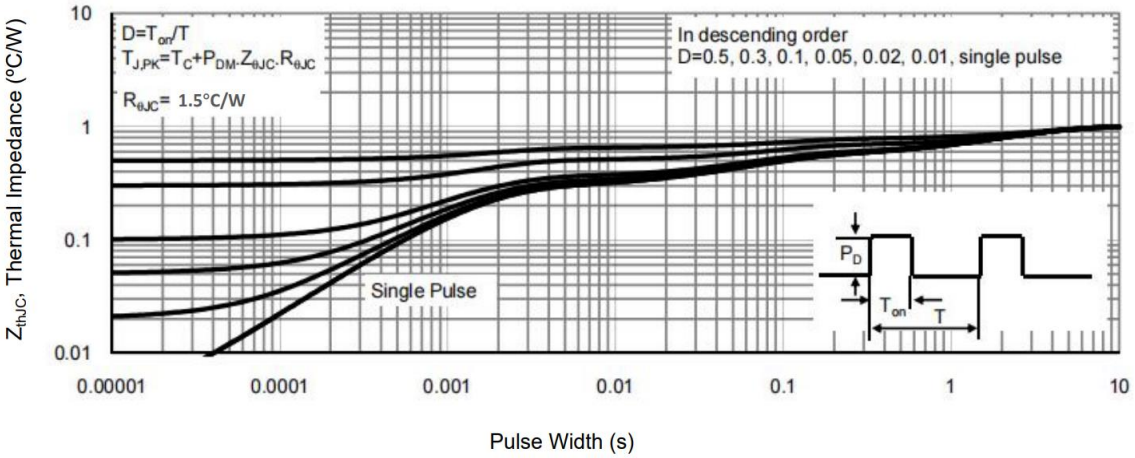
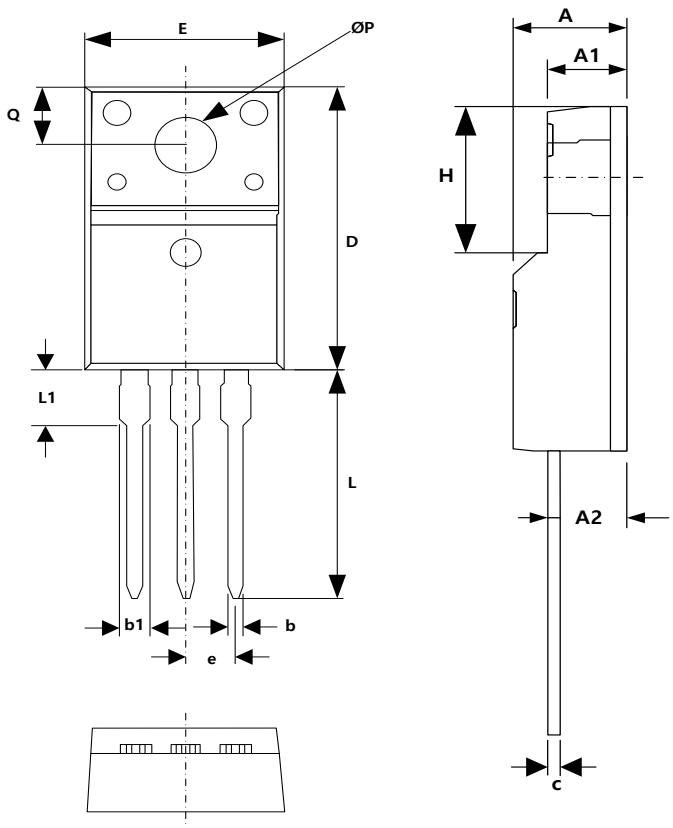


Figure 9. Normalized Maximum Transient Thermal Impedance

Package Outline

Unit : mm



SYMBOL	DIMENSIONS		
	MIN	NOM	MAX
A	4.60	4.70	4.80
A1	2.44	2.54	2.64
A2	2.15	2.45	2.75
b	0.70	0.80	0.90
b1	1.15	1.35	1.55
c	0.50	0.60	0.70
D	15.30	15.80	16.30
E	9.90	10.10	10.30
e	4.98	5.08	5.18
H	6.40	6.60	6.80
L	13.05	13.55	14.05
L1	3.00	3.30	3.60
ØP	3.00	3.20	3.40
Q	3.10	3.30	3.50