PM012N100HG

PowerCubeSemi, Inc.
Potential · Convergence · Smart

100V 45A 12mΩ Si Single N-ch Enhancement Mode Power MOSFET with Normal Diode

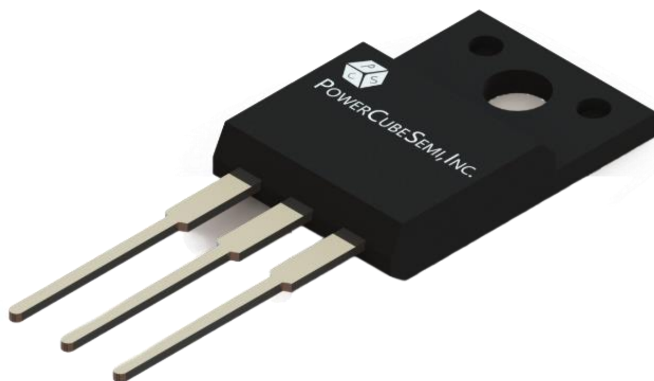
Features

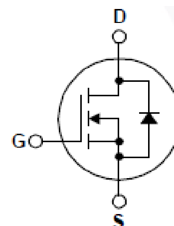
Si Single N-ch Enhancement Mode Power MOSFET

- Rated to 100V at 45Amps @T_J = 25℃
- Max $R_{DS(on)}$ = 12 mΩ
- Gate Charge(Typ. Q_g=18 nC)
- 100% Avalanche Tested

Application

- Power switch
- DC/DC Converter





PKG type : TO-220F

Description

The PM012N100HG 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	100	V
I_D	Drain Current	T_c=25℃	45	A
I_{DM}	Pulsed Drain Current	Pulse width limited by junction temperature	180	A
V_{GS}	Gate-Source Voltage		±20	V
E_{AS}	Single Pulsed Avalanche Energy	V_{DD}=50V, V_{GS}=10V, L=0.5mH, R_G=25Ω	43	mJ
P_d	Power Dissipation	T_C=25℃	41.7	W
T_j	Operating Junction Temperature		150	℃
T_{stg}	Storage Temperature		-55 to 150	℃

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Package Marking and Ordering Information

Device Marking	Device	Package	Packing Method	Tape width	Quantity
PM012N100HG	PM012N100	TO-220F	TUBE	-	50 ea

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	100	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS} = 100V, 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	2.0	3.0	4.0	V
$R_{DS(ON)}$	Static Drain-Source on state resistance	V_{GS} = 10V, I_D = 20A	-	9.8	12	mΩ
$t_{d(on)}$	Turn-on Delay time	V_{DD} = 50 V, I_D = 20A, R_G = 1.6Ω	-	8	-	ns
T_r	Turn-on Rise time		-	14	-	
$t_{d(off)}$	Turn-off Delay time		-	12	-	
T_f	Turn-off Fall time		-	3	-	

Electrical Characteristics of Si MOSFET

Symbol	Parameter	Test Condition	Numerical		Unit
			Typ.	Max.	
$R_{\theta JC}$	Thermal Resistance, Junction to Case		3	-	℃/W
C_{iss}	Input Capacitance	V_{DS} = 50V, V_{GS} = 0V, f = 1.0㎒	1215	-	pF
C_{oss}	Output Capacitance		469	-	
C_{rss}	Reverse Transfer Capacitance		23	-	
$Q_{g(tot)}$	Total Gate Charge at 10V	V_{DD} = 50V, I_D = 20A $V_{GS(on)}$ = 10V	18	-	nC
Q_{gs}	Gate to Source Gate Charge		6	-	
Q_{gd}	Gate to Drain "Miller" Charge		3.8	-	

Electrical Characteristics of Si Diode

Symbol	Parameter	Test Condition	Numerical		Unit
			Typ.	Max.	
I_S	Maximum Continuous Drain to Source Diode Forward Current		-	45	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 = 20A, dI_F/dt=500A/㎲	24	-	ns
Q_{rr}	Reverse Recovery Charge		128	-	nC

Typical Characteristics

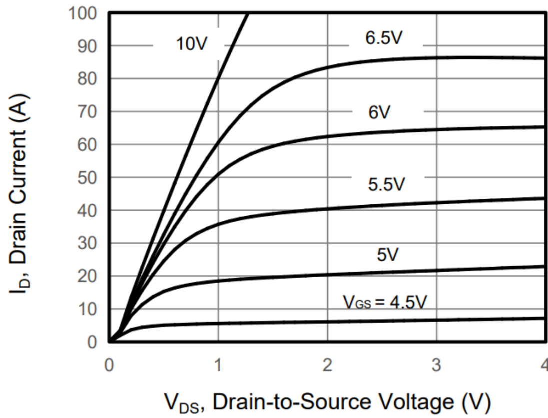


Figure 1. Output Characteristics

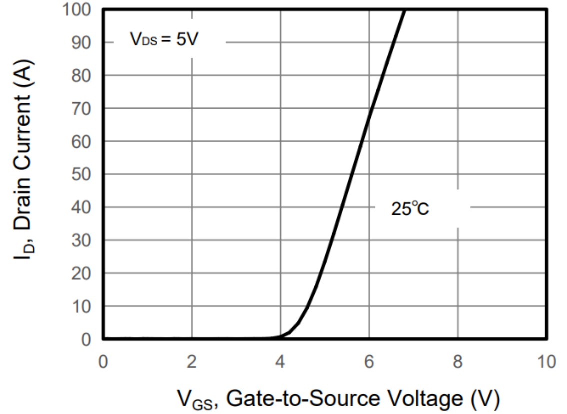


Figure 2. Transfer Characteristics

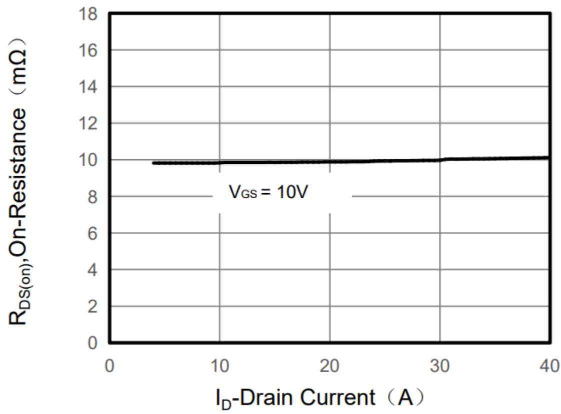


Figure 3. Drain to Source On-Resistance

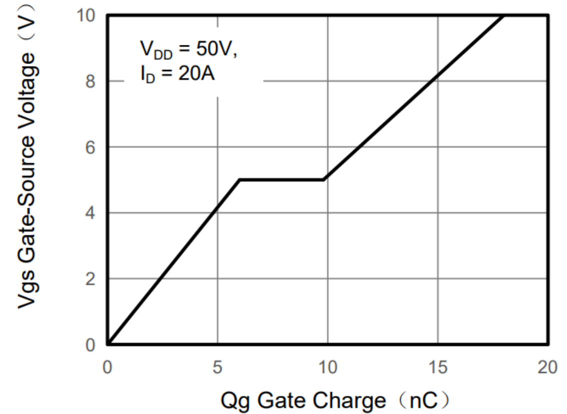


Figure 4. Gate Charge

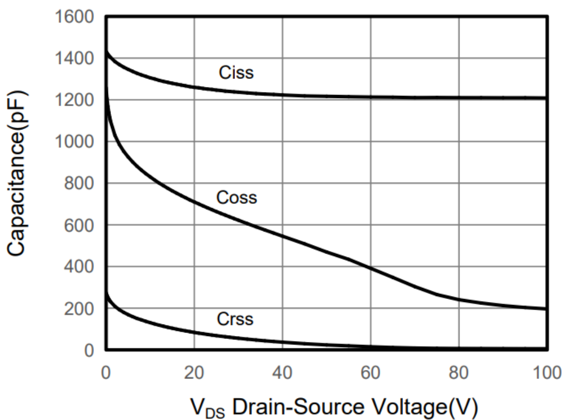


Figure 5. Capacitance Characteristics

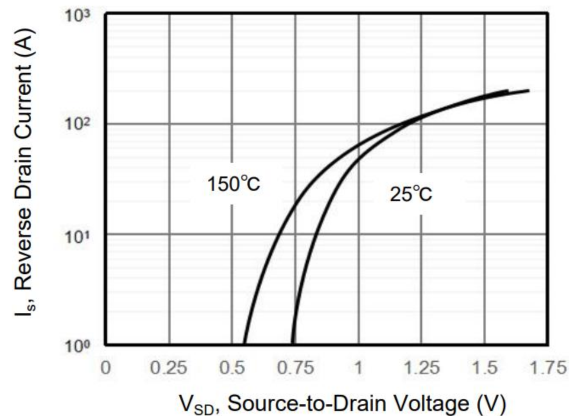


Figure 6. Source to Drain Diode Forward

Typical Characteristics

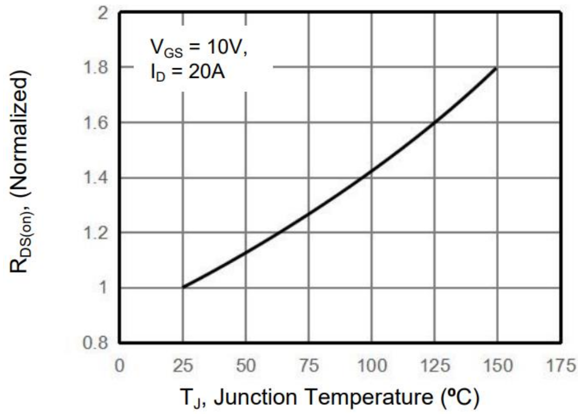


Figure 7. Drain to Source On-Resistance

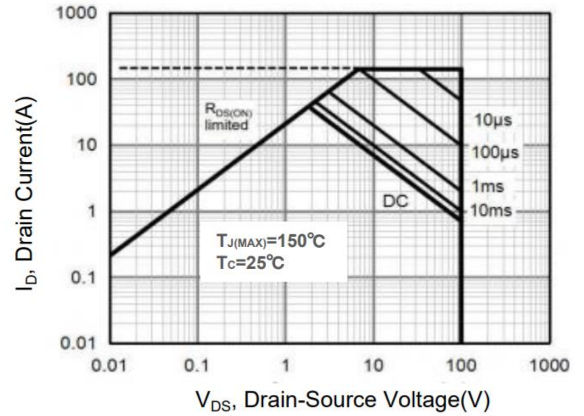


Figure 8. Safe Operation Area

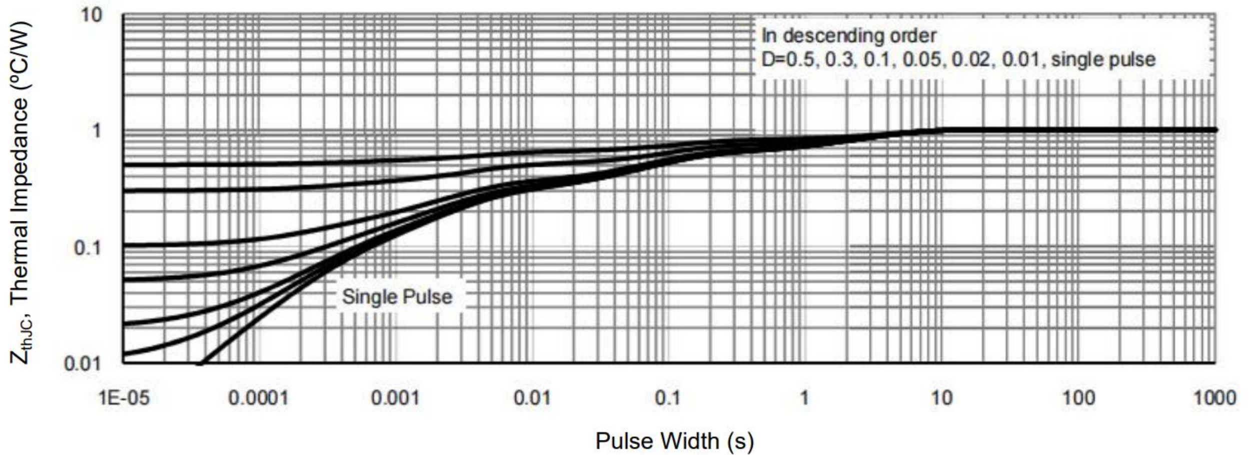
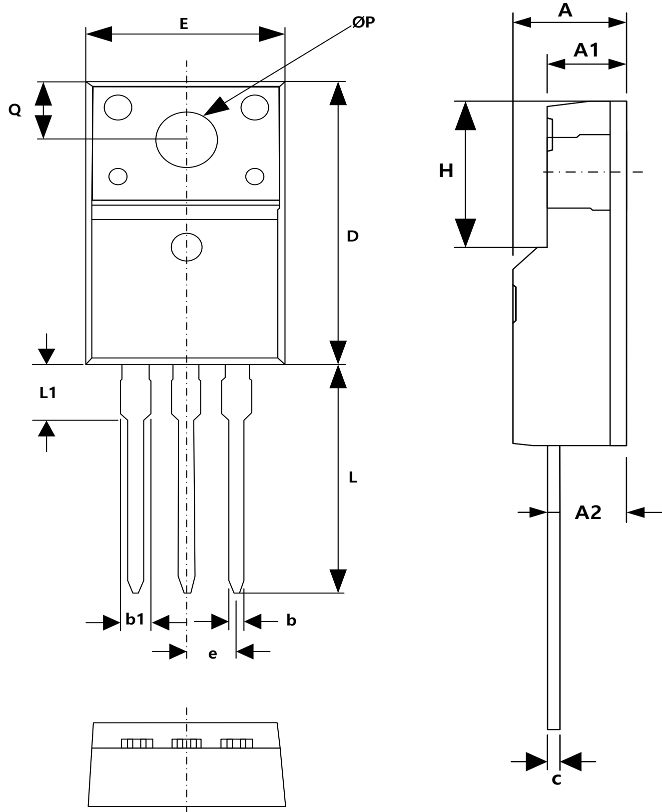


Figure 9. Normalized Maximum Transient Thermal Impedance

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