PM170N200HR

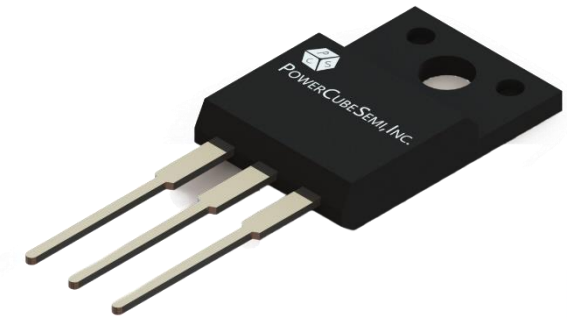
200V 18A 170mΩ N Channel Enhancement Mode MOSFET with Normal Diode

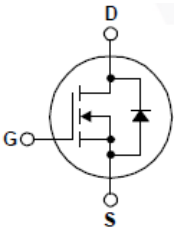
PowerCubeSemi, Inc.
Potential · Convergence · Smart

Features

Si N channel Enhancement Mode MOSFET

- Rated to 200V at 18Amps @T_J = 25℃
- Max $R_{DS(on)}$ = 170 mΩ
- Gate Charge(Typ. Q_g=45 nC)
- Super low gate charge
- Green device available
- Advanced high cell density trench technology





Halogen-Free

RoHS

PKG type : TO-220F

Absolute Maximum Ratings

Symbol	Parameter	Test Condition	Value	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V, I_D=250μA	200	V
I_D	Drain Current	T_c=25℃	18	A
I_{DM}	Pulsed Drain Current	Pulse width limited by junction temperature	40	A
V_{GS}	Gate-Source Voltage		±20	V
E_{AS}	Single Pulsed Avalanche Energy	V_{DD}=25V, V_{GS}=10V, L=0.1mH	15	mJ
P_d	Power Dissipation	T_C=25℃	34	W
T_j	Operating Junction Temperature		150	℃
T_{stg}	Storage Temperature		-55 to 150	℃

Package Marking and Ordering Information

Device Marking	Device	Package	Packing Method	Tape width	Quantity
PM170N200HR	PM170N200	TO-220F	Tube	-	50 unit

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	200	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS} = 200V, 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	-	2.5	V
$R_{DS(ON)}$	Static Drain-Source on state resistance	V_{GS} = 10V, I_D = 8A	-	-	170	mΩ
$t_{d(on)}$	Turn-on Delay time	V_{DD} = 100 V, I_D = 9A, V_{GS} = 10 V, R_G = 3Ω	-	13	-	ns
T_r	Turn-on Rise time		-	8.2	-	
$t_{d(off)}$	Turn-off Delay time		-	25	-	
T_f	Turn-off Fall time		-	11	-	

Electrical Characteristics of Si MOSFET

Symbol	Parameter	Test Condition	Numerical		Unit
			Typ.	Max.	
$R_{\theta JC}$	Thermal Resistance, Junction to Case		3.7	-	℃/W
C_{iss}	Input Capacitance	V_{DS} = 25V, V_{GS} = 0V, f = 1.0㎒	2047	-	pF
C_{oss}	Output Capacitance		109	-	
C_{rss}	Reverse Transfer Capacitance		70	-	
$Q_{g(tot)}$	Total Gate Charge at 10V	V_{DD} = 80V, I_D = 9A $V_{GS(on)}$ = 10V	45	-	nC
Q_{gs}	Gate to Source Gate Charge		9	-	
Q_{gd}	Gate to Drain "Miller" Charge		10.5	-	

Electrical Characteristics of Si Diode

Symbol	Parameter	Test Condition	Numerical		Unit
			Typ.	Max.	
I_S	Maximum Continuous Drain to Source Diode Forward Current		-	18	A
I_{SM}	Maximum Pulsed Drain to Source Diode Forward Current		-	40	A
V_{SD}	Drain to Source Diode Forward Voltage	I_{SD} = 9A, V_{GS} = 0V	-	1.2	V
T_{rr}	Reverse Recovery Time	I_F = 9A, dI_F/dt=100A/㎲	37	-	ns
Q_{rr}	Reverse Recovery Charge		103	-	nC

Typical Characteristics

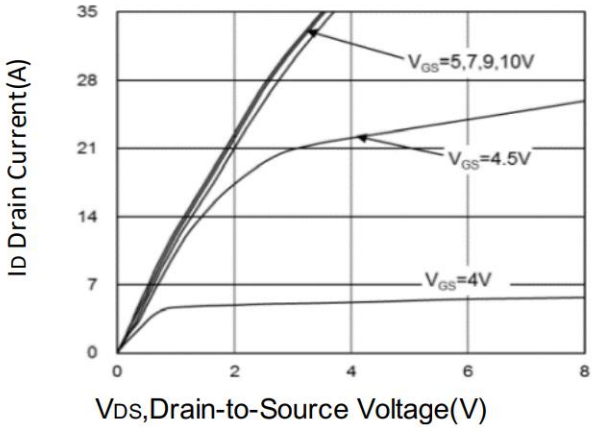


Figure 1. Typical Output Characteristics

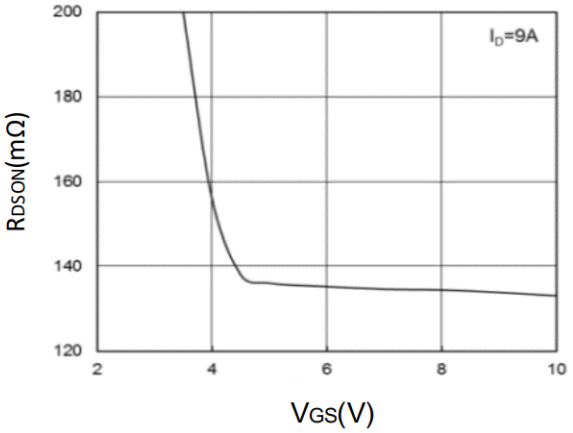


Figure 2. On-Resistance vs. Gate-Source Voltage

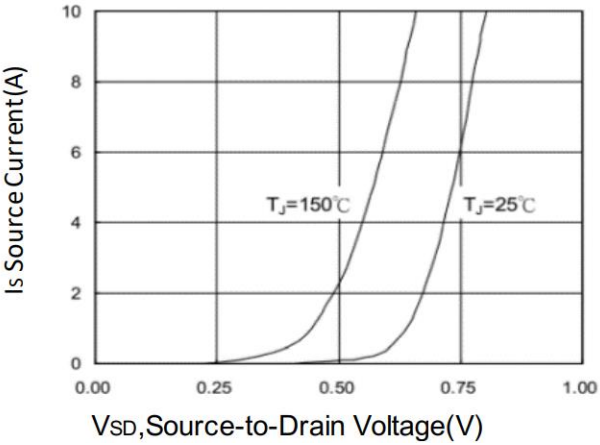


Figure 3. Forward Characteristics of Reverse diode

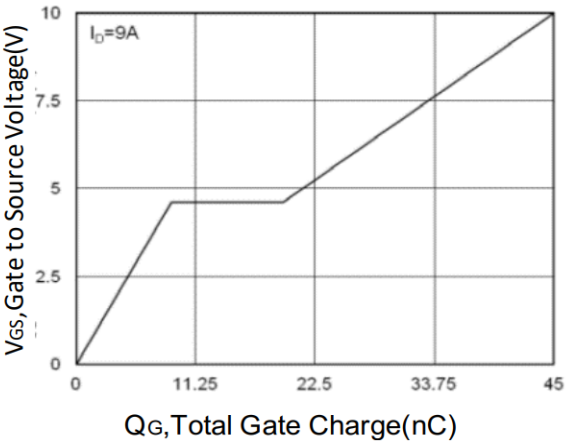


Figure 4. Gate Charge Characteristics

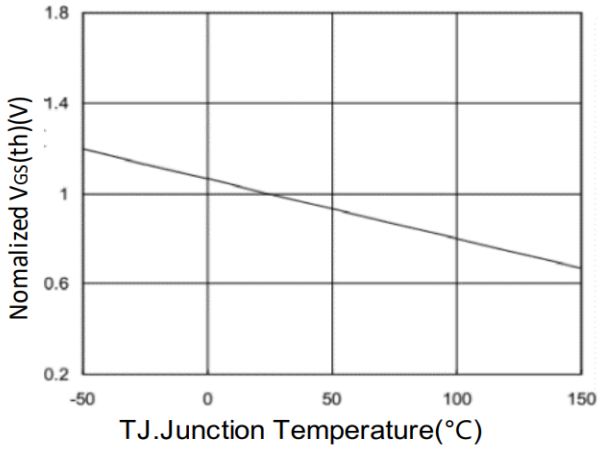


Figure 5. Normalized $V_{GS(th)}$ vs. T_J

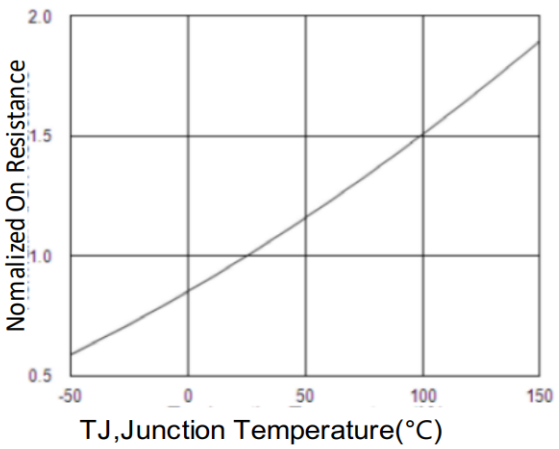


Figure 6. Normalized $R_{DS(ON)}$ vs. T_J

Typical Characteristics

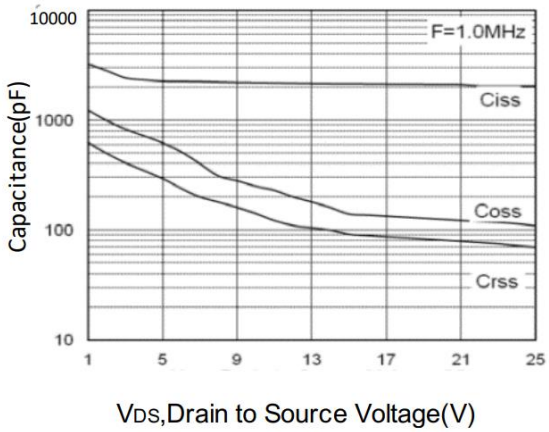


Figure 7. Capacitance Characteristics

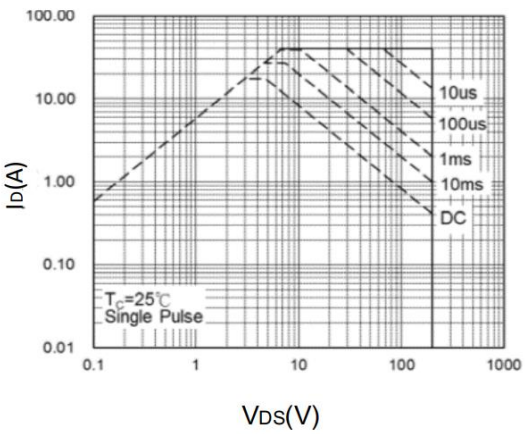
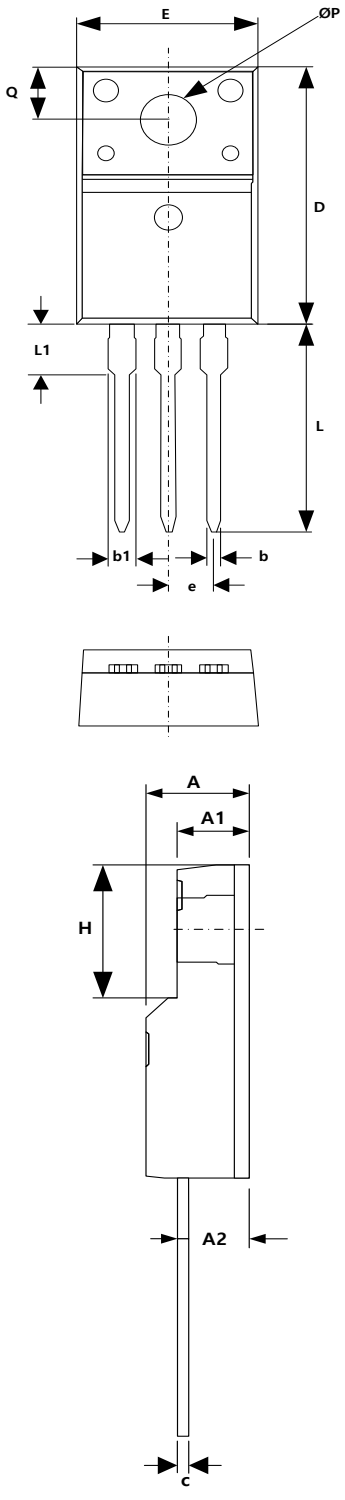


Figure 8. Safe Operating Area

Package Outline

Unit : mm



SYMBOL	DIMENSIONS			NOTES
	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	