PSM15080HM

800V 15A 290mΩ Si Super junction MOSFET with Normal body diode

PowerCubeSemi, Inc.
Potential · Convergence · Smart

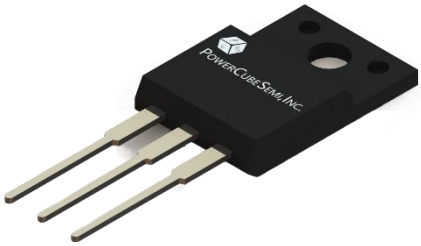
Features

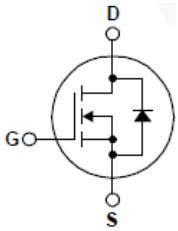
Si Super junction MOSFET

- Rated to 800V at 15Amps @T_J = 25℃
- Max $R_{DS(on)}$ = 290 mΩ
- Typ $R_{DS(on)}$ = 250 mΩ
- Gate Charge(Typ. Q_g=39 nC)
- 100% Avalanche Tested

Application

- Flyback power supply stages
- Adapter
- Lighting
- Switching applications





PKG type : TO-220F

Description

PSM15080HM is power MOSFET using PowerCubeSemi's advanced super junction technology that can realize very low on-resistance and gate charge. It will provide much high efficiency by using optimized charge coupling technology. These user-friendly devices give an advantage of low EMI to designers as well as low switching loss.

Absolute Maximum Ratings

Symbol	Parameter	Test Condition	Value	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V, I_D=1mA	800	V
I_D	Drain Current	T_c=25℃	17	A
I_{DM}	Pulsed Drain Current	Pulse width limited by junction temperature	51	A
V_{GS}	Gate-Source Voltage		±30	V
E_{AS}	Single Pulsed Avalanche Energy		600	mJ
P_d	Power Dissipation	T_C=25℃	43.6	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
PSM15080HM	PSM15080	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 = 1mA, T_J = 25°C	800	-	-	V
I_{DSS}	Zero gate voltage drain current	V_{DS} = 800V, V_{GS} = 0V	-	-	1	μA
I_{GSS}	Gate-source leakage current	V_{GS} = ±30V, V_{DS} = 0V	-	-	±100	nA
$V_{GS(th)}$	Gate threshold voltage	V_{DS} = V_{GS}, I_D = 250μA	2	3	4	V
$R_{DS(ON)}$	Static drain-source on state resistance	V_{GS} = 10V, I_D = 11A	-	0.25	0.29	Ω
$t_{d(on)}$	Turn-on Delay time	V_{DD} = 400 V, I_D = 17A, V_{GS} = 10 V, R_G = 25Ω	-	28	-	ns
T_r	Turn-on Rise time		-	50	-	
$t_{d(off)}$	Turn-off Delay time		-	129	-	
T_f	Turn-off Fall time		-	44	-	

Electrical Characteristics of Si MOSFET

Symbol	Parameter	Test Condition	Numerical		Unit
			Typ.	Max.	
$R_{\theta JC}$	Thermal resistance, Junction to case		2.87	-	℃/W
R_g	Gate resistance	V_{GS} = 0V, f = 1㎒	5.3	-	Ω
C_{iss}	Input capacitance	V_{DS} = 400V, V_{GS} = 0V, f = 400㎑	1414	-	pF
C_{oss}	Output capacitance		29.7	-	
C_{rss}	Reverse transfer capacitance		3.8	-	
$Q_{g(tot)}$	Total gate charge	V_{DS} = 640V, I_D = 17A $V_{GS(on)}$ = 10V	39	-	nC
Q_{gs}	Gate to source gate charge		7.3	-	
Q_{gd}	Gate to drain "Miller" charge		19.2	-	

Electrical Characteristics of Si Diode

Symbol	Parameter	Test Condition	Numerical		Unit
			Typ.	Max.	
I_S	Maximum continuous drain to source diode forward current		-	17	A
I_{SM}	Maximum pulsed drain to source diode forward current		-	51	A
V_{SD}	Drain to source diode forward voltage	I_{SD} = 17A, V_{GS} = 0V	-	1.4	V
T_{rr}	Reverse recovery time	I_{SD} = 17A, V_{DD} = 100V, dI_F/dt=100A/㎲	466	-	ns
Q_{rr}	Reverse recovery charge		7.6	-	μC
I_{rrm}	Reverse recovery current		32.5	-	A

Typical Characteristics

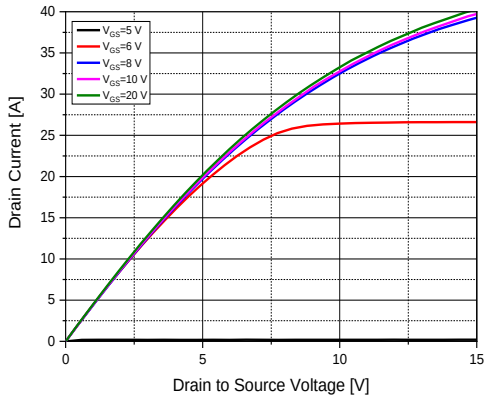


Figure 1. On-state characteristics

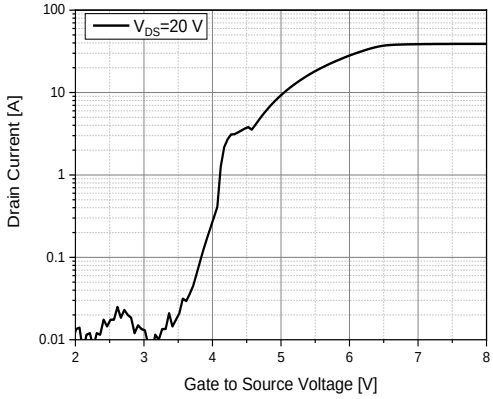


Figure 2. Transfer Characteristics

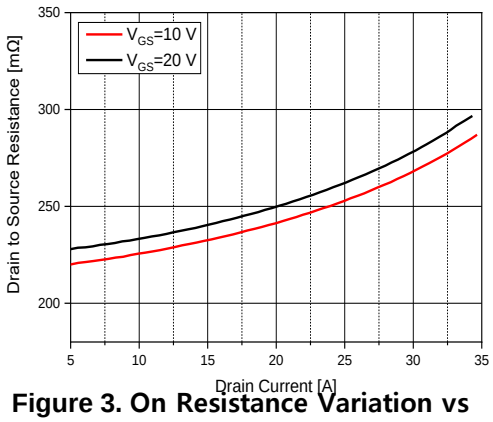


Figure 3. On Resistance Variation vs Drain Current and Gate Voltage

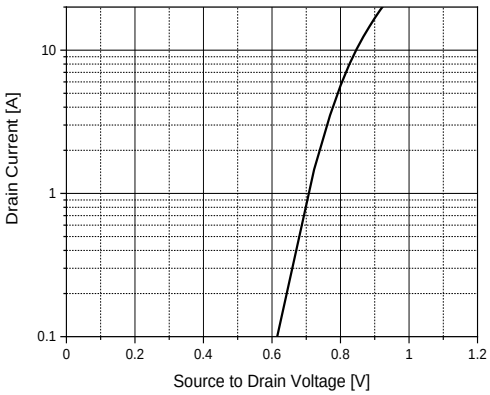


Figure 4. On-state current vs Diode forward voltage

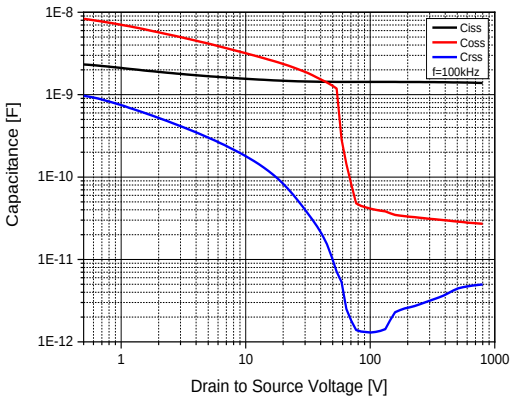


Figure 5. Capacitance Characteristics

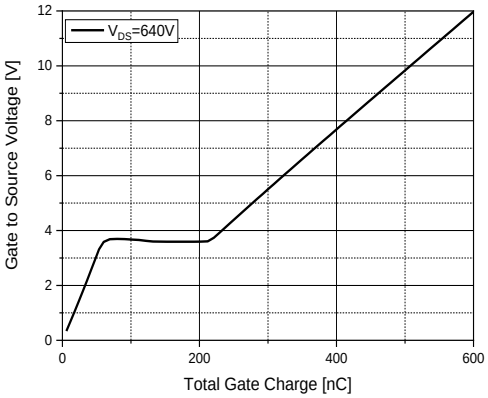


Figure 6. Gate Charge Characteristics

Typical Characteristics

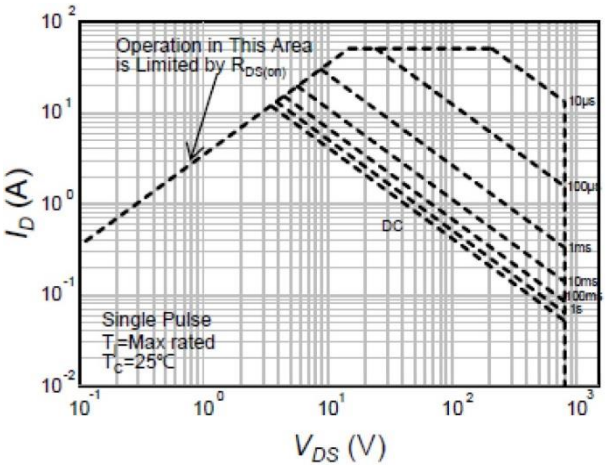


Figure 7. Maximum safe operating area

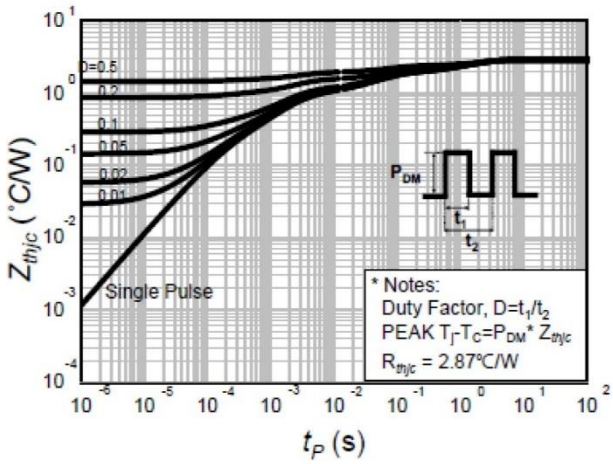
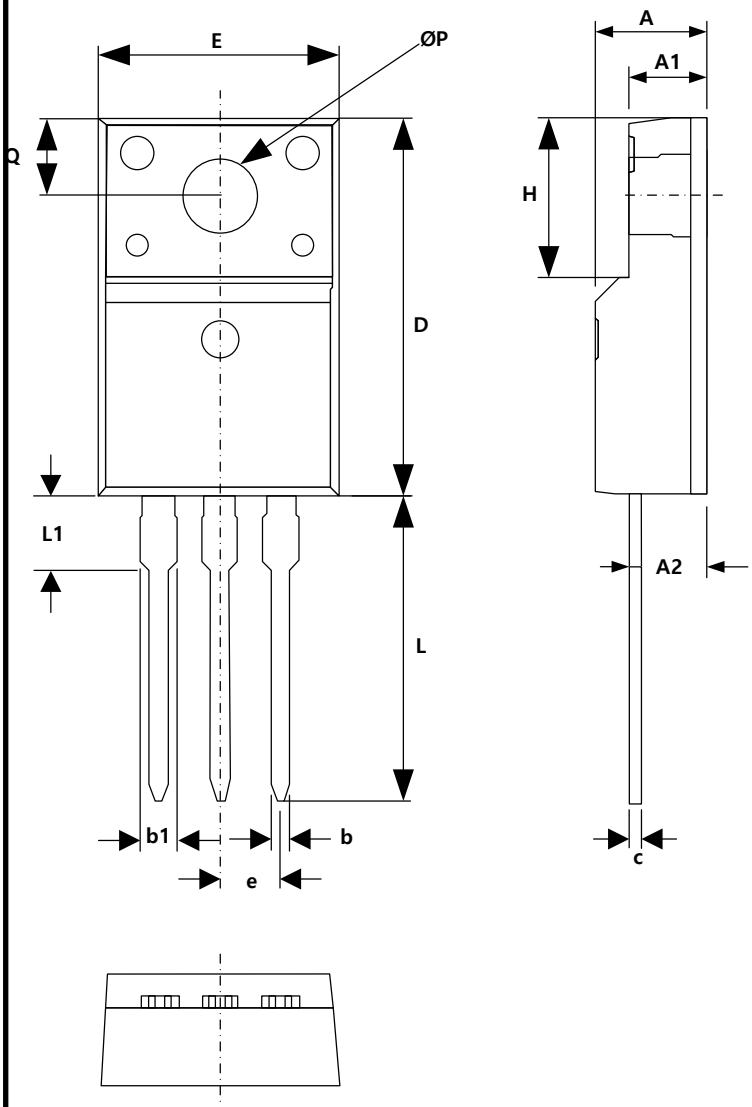


Figure 8. Transient thermal response curve

Package Outline



[Unit : mm]

SYMBOL	DIMENSIONS		NOTES
	MIN	MAX	
A	4.50	4.90	
A1	2.34	2.74	
A2	2.56	2.96	
b	0.70	0.90	
b1	1.27	1.47	
c	0.45	0.60	
D	15.67	16.07	
E	9.96	10.36	
e	2.54 BSC		
H	6.48	6.88	
L	12.68	13.28	
L1	3.03	3.43	
ϕP	3.08	3.28	
Q	3.20	3.40	