

PSZ17080H

800V 17A 210mΩ Si Super junction MOSFET with Zener Diode

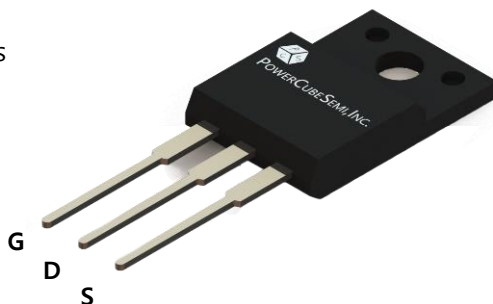
Features

Si Super junction MOSFET

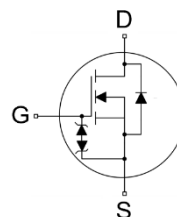
- Rated to 800V at 17Amps @ $T_J = 25^{\circ}\text{C}$
- Max $R_{DS(on)} = 210\text{ m}\Omega$
- Typ $R_{DS(on)} = 185\text{ m}\Omega$
- Improved dv/dt Capability
- 100% Avalanche Tested
- Excellent ESD robustness

Application

- PV Inverters
- LED Lighting



PKG type : TO-220F



Description

PSZ17080H is PowerCubeSemi's second generation of high voltage Super Junction MOSFET that is utilizing charge balance technology for outstanding low on-resistance and lower gate charge performance. This advanced technology is tailored to minimize conduction loss, provide superior switching performance, and withstand extreme dv/dt rate and higher avalanche energy. Consequently, the combination of Super Junction MOSFET is suitable for PV inverters and LED Lighting.

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	$T_C=25^{\circ}\text{C}$	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		95.4	mJ
P_d	Power Dissipation	$T_C=25^{\circ}\text{C}$	51	W
T_J	Operating Junction Temperature		150	$^{\circ}\text{C}$
T_{stg}	Storage Temperature		-55 to 150	$^{\circ}\text{C}$

Package Marking and Ordering Information

Device Marking	Device	Package	Packing Method	Tape width	Quantity
PSZ17080H	PSZ17080	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	$V_{GS} = 0V, I_D = 1mA, T_J = 25^\circ C$	800	-	-	V
I_{DSS}	Zero gate voltage drain current	$V_{DS} = 800V, V_{GS} = 0V$	-	-	1	μA
I_{GSS}	Gate-source leakage current	$V_{GS} = \pm 30V, V_{DS} = 0V$	-	-	± 10	μA
$V_{GS(th)}$	Gate threshold voltage	$V_{DS} = V_{GS}, I_D = 1mA$	2.4	-	3.6	V
$R_{DS(ON)}$	Static drain-source on state resistance	$V_{GS} = 10V, I_D = 8.5A$	-	185	210	m Ω
$t_{d(on)}$	Turn-on Delay time	$V_{DS} = 400V, I_D = 8.5A, V_{GS} = 10V, R_G = 4.7\Omega$	-	119.6	-	ns
T_r	Turn-on Rise time		-	84.2	-	
$t_{d(off)}$	Turn-off Delay time		-	162.7	-	
T_f	Turn-off Fall time		-	52.8	-	



Electrical Characteristics of Si MOSFET

Symbol	Parameter	Test Condition	Numerical		Unit
			Typ.	Max.	
$R_{\theta JC}$	Thermal resistance, Junction to case		2.45	-	K/W
R_g	Gate resistance	$V_{GS} = 0V, f = 1.0MHz$	4	-	Ω
C_{iss}	Input capacitance	$V_{DS} = 380V, V_{GS} = 0V, f = 400kHz$	2200	-	pF
C_{oss}	Output capacitance		48	-	
C_{rss}	Reverse transfer capacitance		3	-	
$Q_{g(tot)}$	Total gate charge at 10V	$V_{DS} = 380V, I_D = 11A, V_{GS(on)} = 10V$	50	-	nC
Q_{gs}	Gate to source gate charge		8	-	
Q_{gd}	Gate to drain "Miller" charge		4	-	μC

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	$I_{SD} = 8.5A, V_{GS} = 0V$	-	1.08	V
T_{rr}	Reverse recovery time	$I_{SD} = 8.5A, V_{DD} = 100V, di_F/dt = 100A/\mu s$	221	-	ns
Q_{rr}	Reverse recovery charge		3.8	-	μC
I_{rrm}	Reverse recovery current		35	-	A

Typical Characteristics

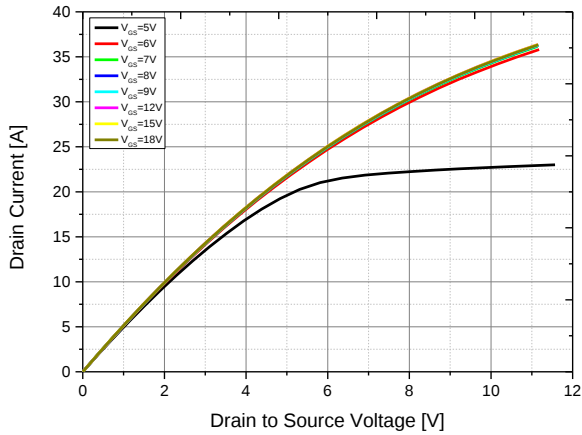


Figure 1. On-state characteristics

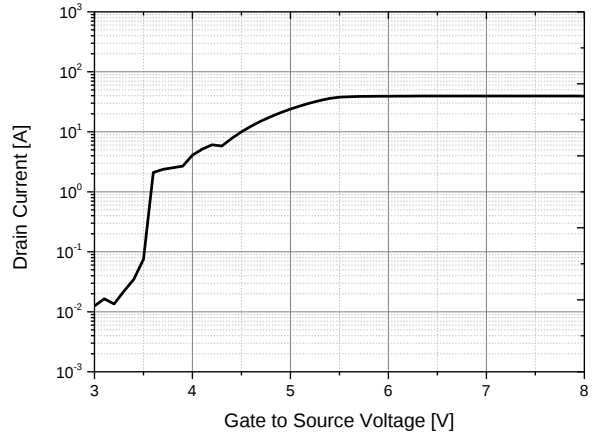


Figure 2. Transfer Characteristics

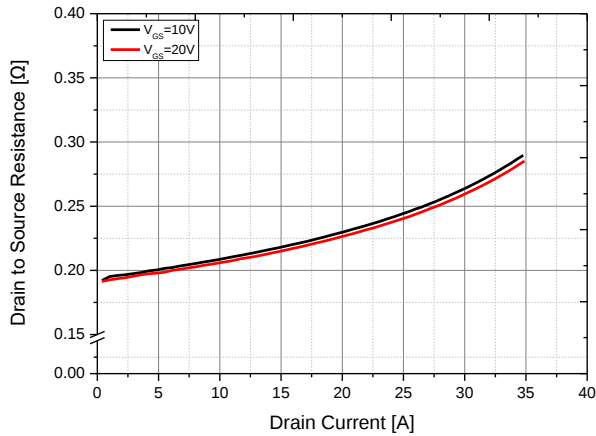


Figure 3. Drain to Source Resistance vs Drain Current

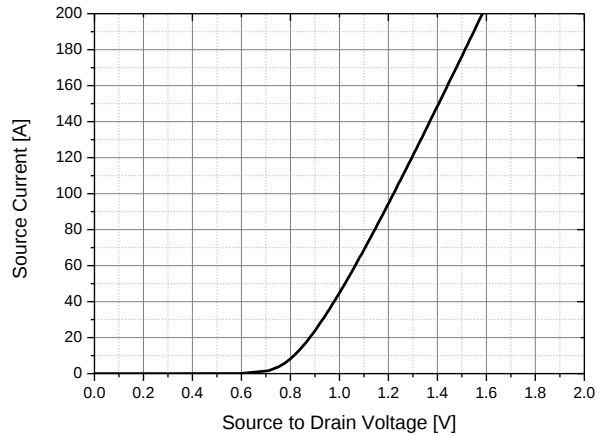


Figure 4. Body Forward Voltage Variation vs Source Current and Temperature

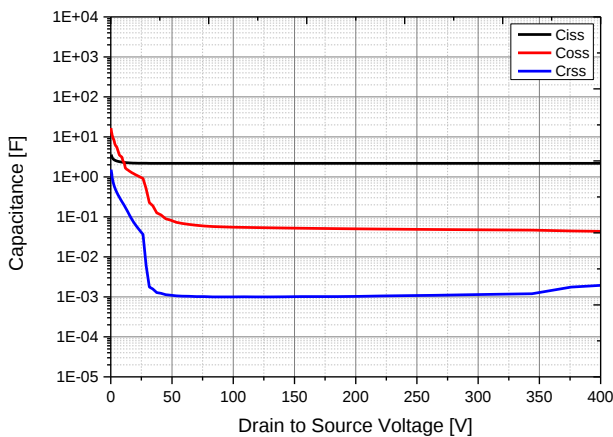


Figure 5. Capacitance Characteristics

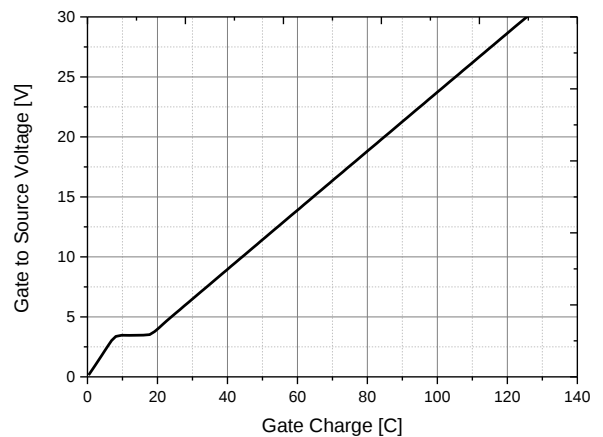


Figure 6. Gate Charge Characteristics

Typical Characteristics

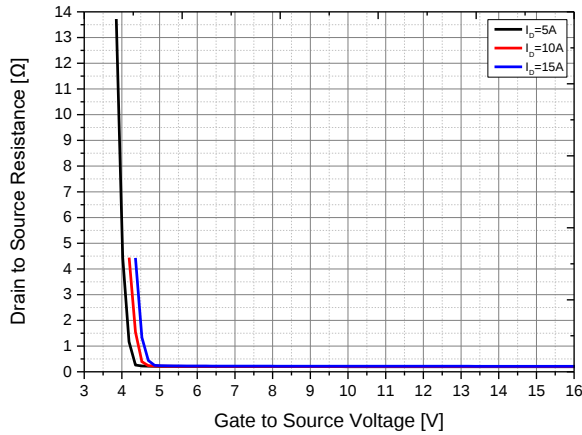


Figure 7. Drain to Source Resistance vs Gate to Source Voltage

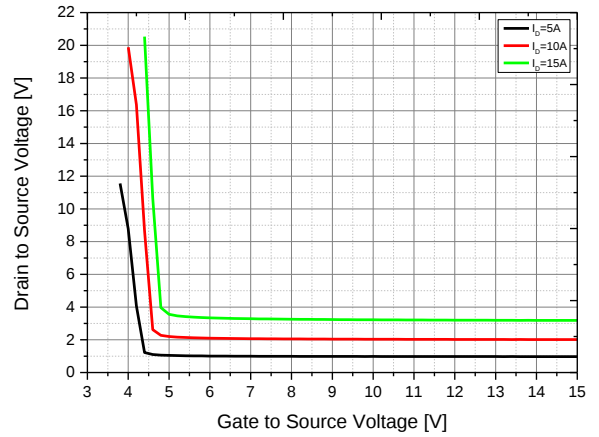


Figure 8. Drain to Source Voltage vs Gate to Source Voltage

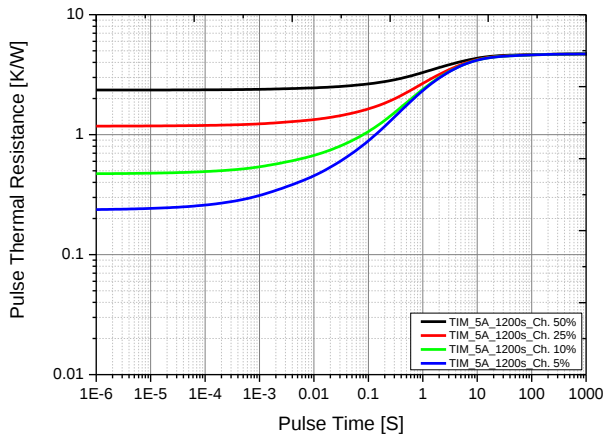
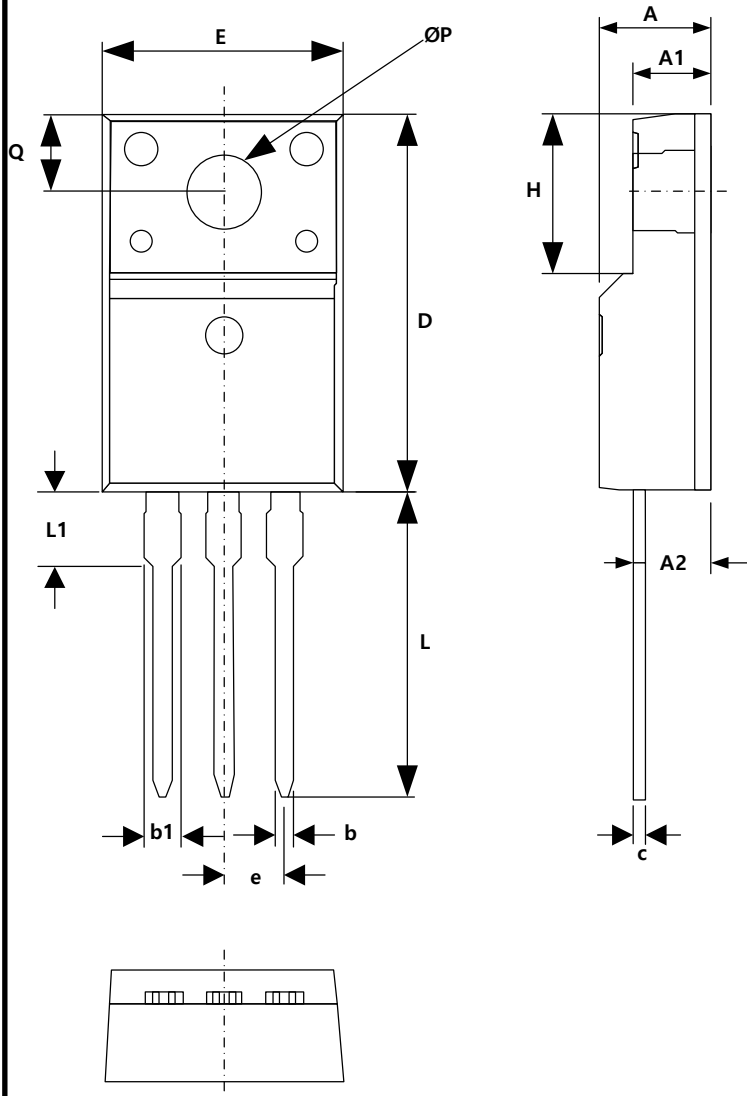


Figure 9. Transient Thermal Response Curve

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	

Revision History

Version	Data of release	Description of changes
pre	2023-12-20	Preliminary Datasheet
1.0	2024-01-03	Final Datasheet
1.1	2024-01-04	Update Thermal Resistance Graph