PSM10065C

650V 10A 360mΩ Si Super junction MOSFET with Normal Diode

PowerCubeSemi, Inc.
Potential · Convergence · Smart

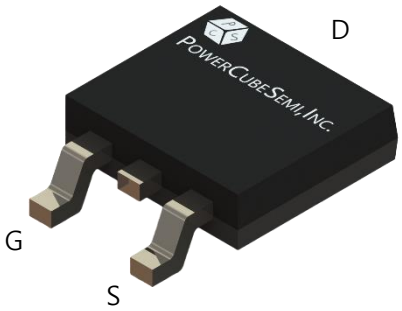
Features

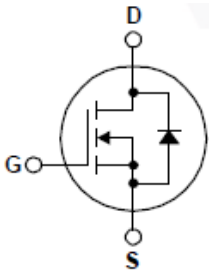
Si Super junction MOSFET

- Rated to 650V at 10Amps @T_C = 25℃
- Max $R_{DS(on)}$ = 360 mΩ
- Typ $R_{DS(on)}$ = 340 mΩ
- Gate Charge(Typ. Q_g=20 nC)
- Low power loss by high speed switching and low on-resistance
- 100% Avalanche Tested

Application

- PFC Power Supply Stages
- Switching Applications
- Adapter





Halogen-Free

RoHS

PKG type : DPAK (TO-252)

Description

PSM10065C 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=1㎃	650	V
I_D	Drain Current	T_c=25℃	10	A
I_{DM}	Pulsed Drain Current	Pulse width limited by junction temperature	20	A
V_{GS}	Gate-Source Voltage		±30	V
E_{AS}	Single Pulsed Avalanche Energy		170	mJ
P_d	Power Dissipation	T_C=25℃	83.3	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
PSM10065C	PSM10065	TO-252	REEL	-	2500

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=1㎃, T_C=25°C	650	-	-	V
I_{DSS}	Zero gate voltage drain current	V_{DS}=650V, 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=1㎃	3	-	5	V
$R_{DS(ON)}$	Static drain-source on state resistance	V_{GS}=10V, I_D=5A	-	340	360	mΩ
$t_{d(on)}$	Turn-on Delay time	V_{DS}=380V, I_D=5A, V_{GS}=10V, R_G=4.7Ω	-	15	-	ns
T_r	Turn-on Rise time		-	9	-	
$t_{d(off)}$	Turn-off Delay time		-	59	-	
T_f	Turn-off Fall time		-	10	-	

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}=380V, V_{GS}=0V, f=1㎒	800	-	pF
C_{oss}	Output capacitance		23	-	
C_{rss}	Reverse transfer capacitance		1.5	-	
$Q_{g(tot)}$	Total gate charge at 10V	V_{DS}=380V, I_D=10A $V_{GS(on)}$=10V	20	-	nC
Q_{gs}	Gate to source gate charge		5	-	
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		-	10	A
I_{SM}	Maximum pulsed drain to source diode forward current		-	20	A
V_{SD}	Drain to source diode forward voltage	I_{SD}=10A, V_{GS}=0V	-	1.1	V
T_{rr}	Reverse recovery time	I_{SD}=5A, V_{DD}=400V, dI_F/dt=100A/㎲	265	-	ns
Q_{rr}	Reverse recovery charge		2.9	-	μC
I_{rrm}	Reverse recovery current		22	-	A

Typical Characteristics

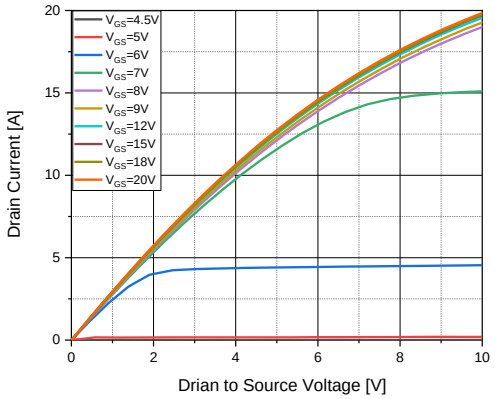


Figure 1. On-state characteristics

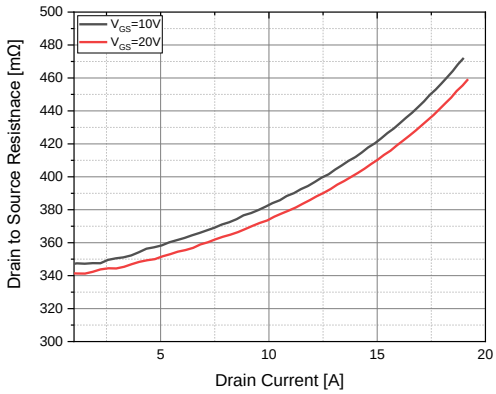


Figure 2. On resistance variation vs Drain current and gate voltage

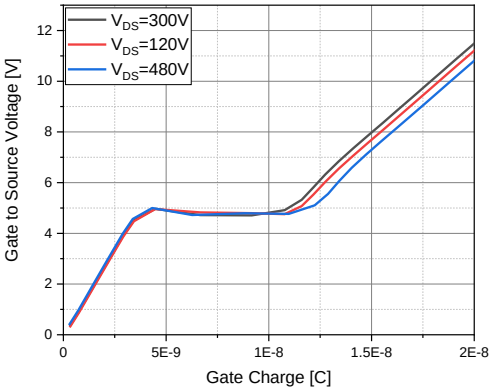


Figure 3. Gate charge characteristics

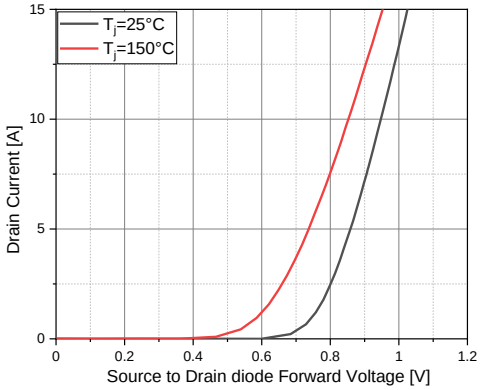


Figure 4. On-state current vs Diode forward voltage

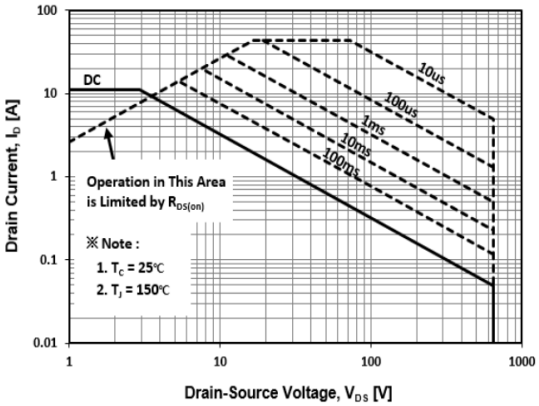


Figure 5. Maximum safe operating area

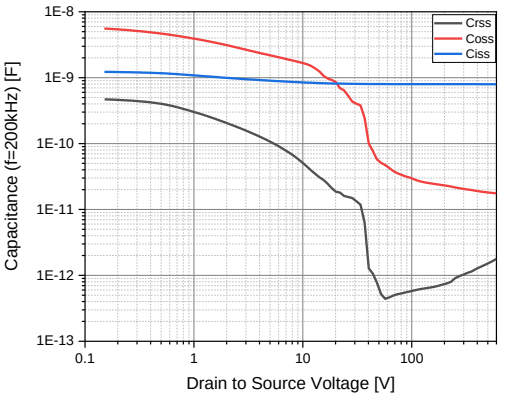


Figure 6. Capacitance characteristics

Typical Characteristics

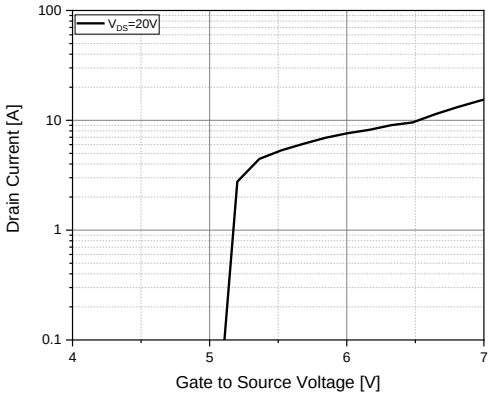


Figure 7. Transfer characteristics

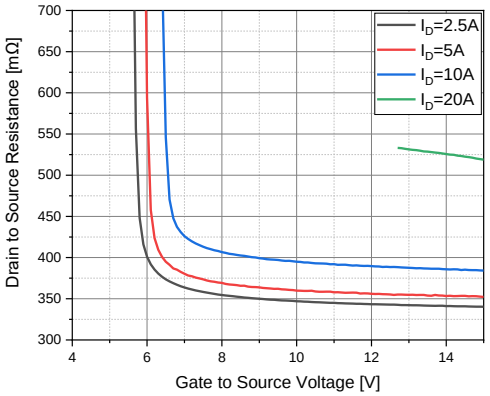


Figure 8. Drain to source resistance vs Gate to source voltage

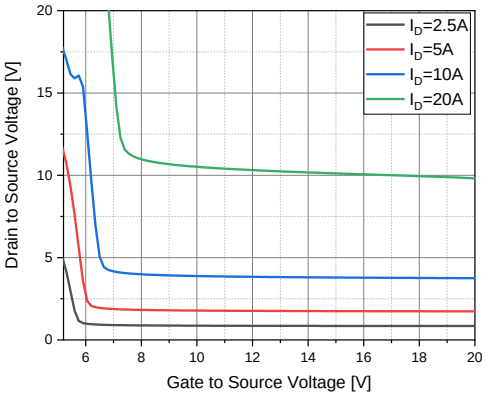


Figure 9. Drain to source voltage vs Gate to Source voltage

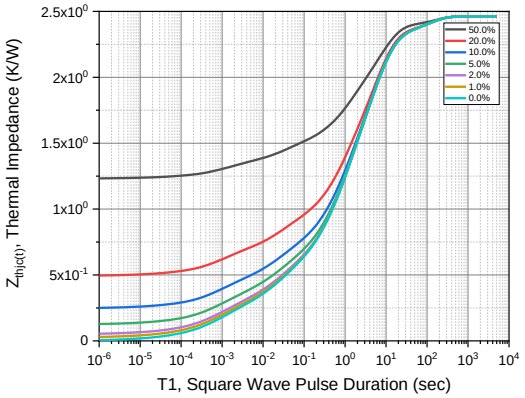
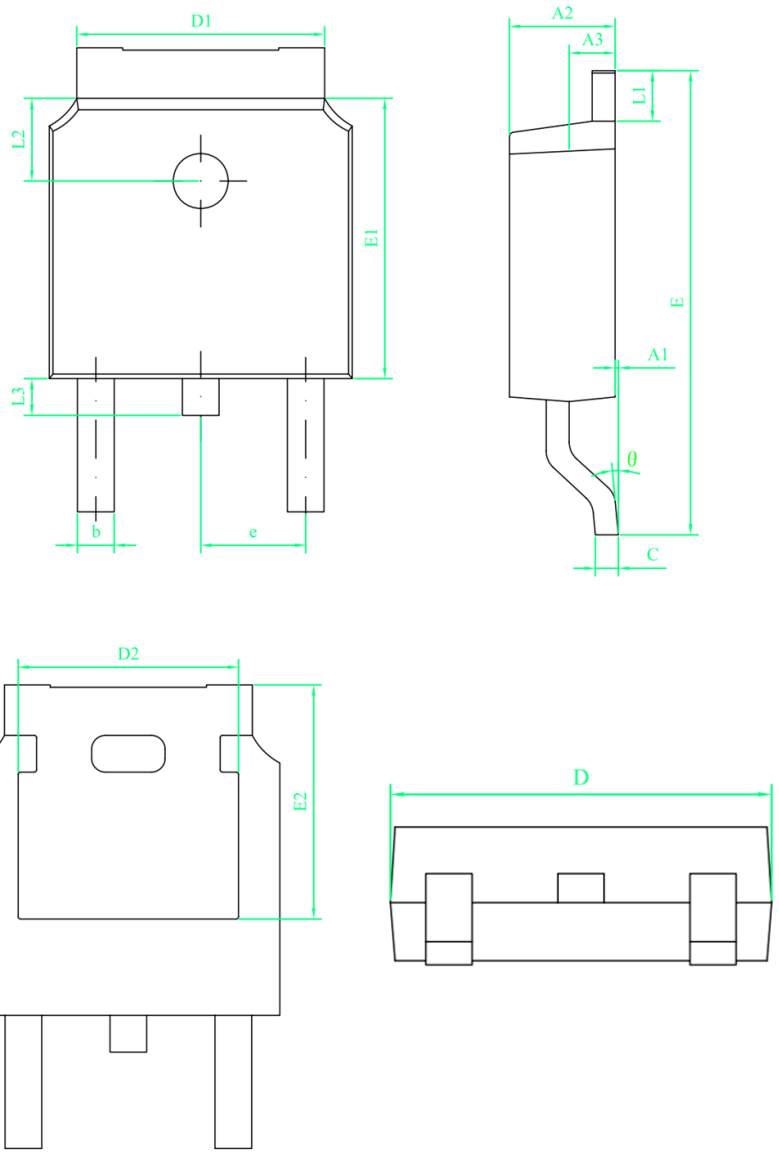


Figure 10. Transient thermal response curve

Package Outline

Unit : mm



SYMBOL	DIMENSIONS	
	MIN	MAX
A1	0.00	0.13
A2	2.18	2.39
A3	0.90	1.10
b	0.65	0.85
c	0.46	0.61
D	6.35	6.73
D1	4.95	5.46
D2	4.32	-
E	9.40	10.41
E1	5.97	6.22
E2	5.21	-
e	2.286 BSC	
L1	0.89	1.27
L2	1.70	1.90
L3	0.60	1.00
θ	0.00	8.00