

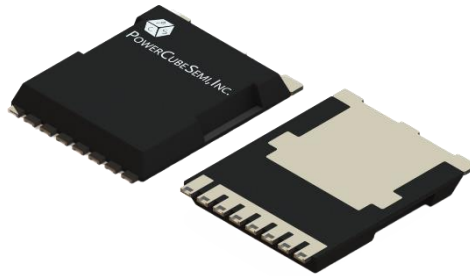
PM002N100TM

100V 300A 2.3mΩ Single N channel Trench MOSFET with Normal Diode

Features

Si Single N channel Trench MOSFET

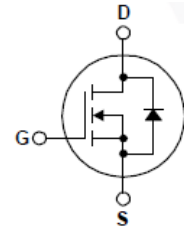
- Rated to 100V at 300Amps @ $T_j = 25^\circ\text{C}$
- Max $R_{DS(on)} = 2.3\text{ m}\Omega$
- Typ $R_{DS(on)} = 1.85\text{ m}\Omega$
- Gate Charge(Typ. $Q_g=167\text{ nC}$)
- Very low on-resistance $R_{DS(on)}$
- 100% Avalanche Tested
- 100% Rg Tested



PKG type : TOLL 8L

Application

- Motor Inverter
- Battery Management
- Power Inverter



Description

PM002N100TM uses advanced PowerCubeSemi's MOSFET technology, which provides high performance in on-state resistance, fast switching performance, and excellent quality. These devices can also be utilized in industrial applications such as high power drives of E-vehicles(E-bike), DC/DC converter and BMS, general purpose applications.

Absolute Maximum Ratings

Symbol	Parameter	Test Condition	Value	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	100	V
I_D	Drain Current	$T_c=25^\circ\text{C}$	300	A
I_{DM}	Pulsed Drain Current	Pulse width limited by junction temperature	1200	A
V_{GS}	Gate-Source Voltage		± 20	V
E_{AS}	Single Pulsed Avalanche Energy	$I_{AS}=31A, V_{GS}=10V, V_{DD}=50V, L=1.0mH$	481	mJ
P_d	Power Dissipation	$T_c=25^\circ\text{C}$	441	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
PM002N100TM	PM002N100	TOLL 8L	Tube & Reel	-	

Electrical Characteristics of Si MOSFET

Symbol	Parameter	Test Condition	Numerical			Unit
			Min	Typ.	Max.	
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS} = 0V, I_D = 250\mu A, T_J = 25^\circ C$	100	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS} = 100V, V_{GS} = 0V$	-	-	1	μA
I_{GSS}	Gate-Source Leakage Current	$V_{GS} = \pm 20V, V_{DS} = 0V$	-	-	± 100	nA
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS} = V_{GS}, I_D = 250\mu A$	2.0	2.8	4.0	V
$R_{DS(ON)}$	Static Drain-Source on state resistance	$V_{GS} = 10V, I_D = 100A$	-	1.85	2.3	m Ω
g_{FS}	Forward Transconductance	$V_{DS} = 10V, I_D = 100A$	-	130	-	S
$t_{d(on)}$	Turn-on Delay time	$V_{DD} = 50V, I_D = 100A, V_{GS} = 10V, R_G = 3\Omega$	-	33	-	ns
T_r	Turn-on Rise time		-	20	-	
$t_{d(off)}$	Turn-off Delay time		-	108	-	
T_f	Turn-off Fall time		-	40	-	



Electrical Characteristics of Si MOSFET

Symbol	Parameter	Test Condition	Numerical		Unit
			Min	Max.	
$R_{\theta JC}$	Thermal resistance, Junction to case		0.34	-	$^{\circ}\text{C}/\text{W}$
R_g	Gate resistance	$V_{GS} = 0\text{V}, f = 1.0\text{MHz}$	3.0	-	Ω
C_{iss}	Input capacitance	$V_{DS} = 50\text{V}, V_{GS} = 0\text{V}, f = 1.0\text{MHz}$	12536	-	pF
C_{oss}	Output capacitance		1367	-	
C_{rss}	Reverse transfer capacitance		36	-	
$Q_{g(\text{tot})}$	Total gate charge at 10V	$V_{DD} = 50\text{V}, I_D = 100\text{A}$ $V_{GS(\text{on})} = 10\text{V}$	167	-	nC
Q_{gs}	Gate to source gate charge		49	-	
Q_{gd}	Gate to drain "Miller" charge		33	-	

Electrical Characteristics of Si Diode

Symbol	Parameter	Test Condition	Numerical		Unit
			Typ.	Max.	
I_S	Maximum continuous drain to source diode forward current		-	300	A
I_{SM}	Maximum pulsed drain to source diode forward current		-	1200	A
V_{SD}	Drain to source diode forward voltage	$I_F = 100\text{A}, V_{GS} = 0\text{V}$	0.9	1.2	V
T_{rr}	Reverse recovery time	$I_F = 100\text{A}, V_{GS} = 0\text{V},$ $di_f/dt = 100\text{A}/\mu\text{s}$	128	-	ns
Q_{rr}	Reverse recovery charge		422	-	nC

Typical Characteristics

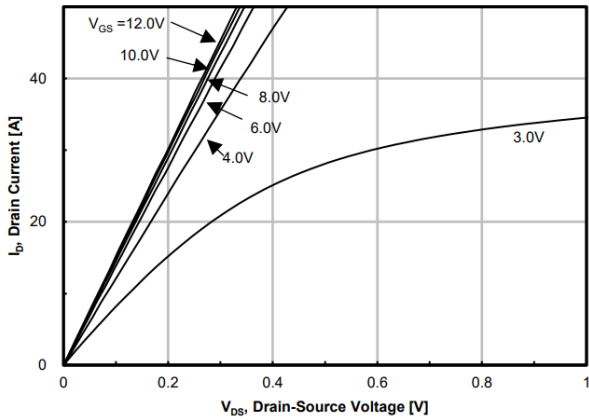


Figure 1. On-Region Characteristics

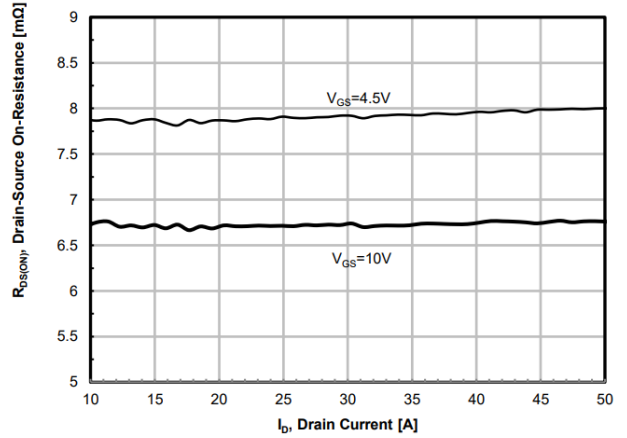


Figure 2. On-Resistance vs. Drain Current and Gate Voltage

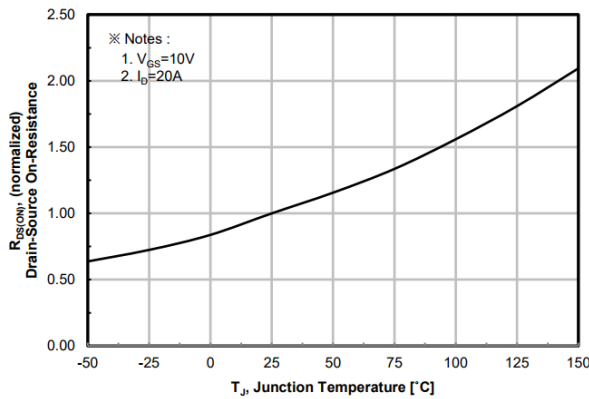


Figure 3. On Resistance vs. Junction Temperature

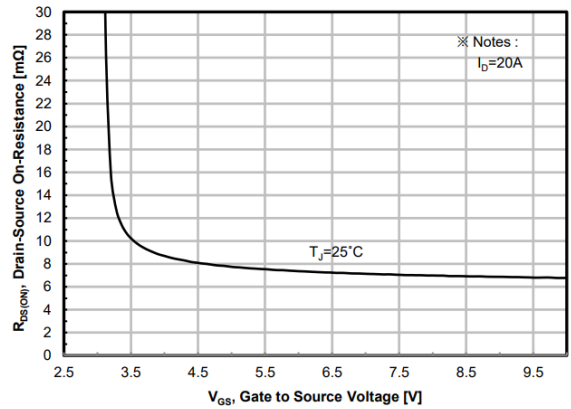


Figure 4. On-Resistance vs. Gate to Source Voltage

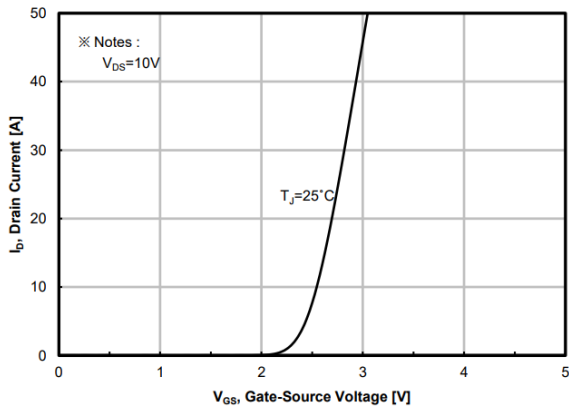


Figure 5. Transfer Characteristics

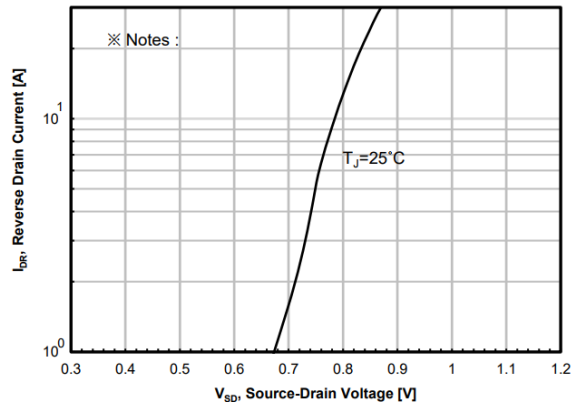


Figure 6. Source to Drain Diode Forward Voltage

Typical Characteristics

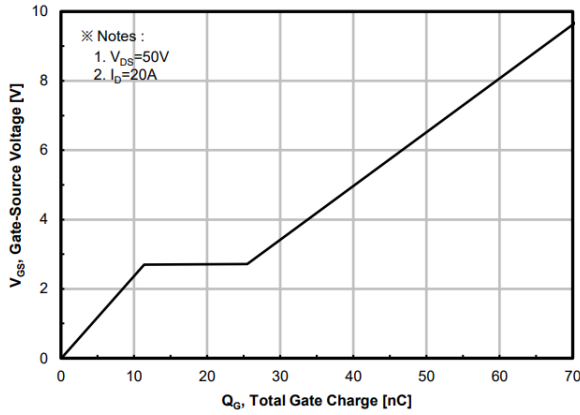


Figure 7. Gate Charge Characteristics

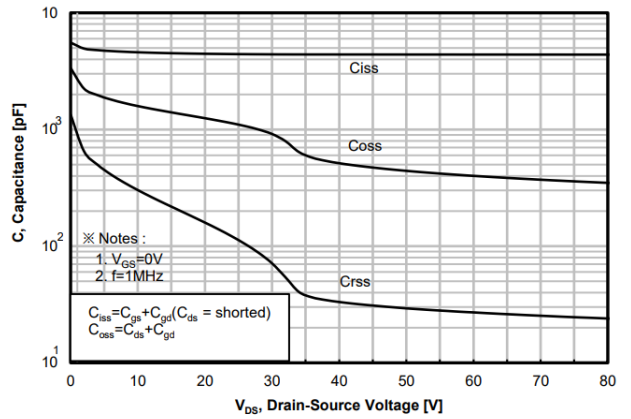


Figure 8. Capacitance Characteristics

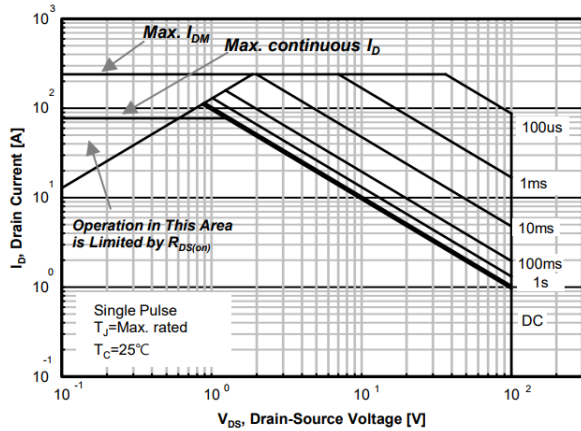


Figure 9. Maximum Safe Operating Area

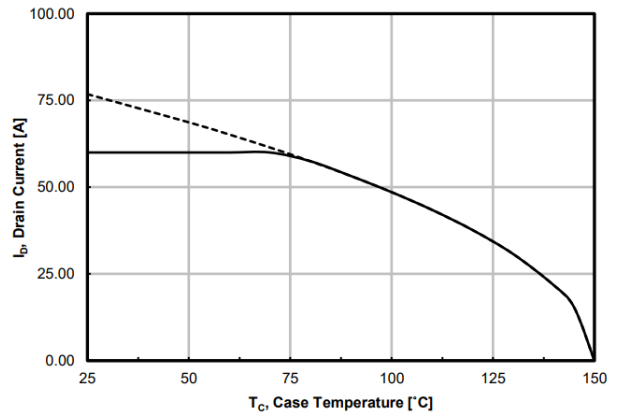


Figure 10. Maximum Drain Current vs. Case Temperature

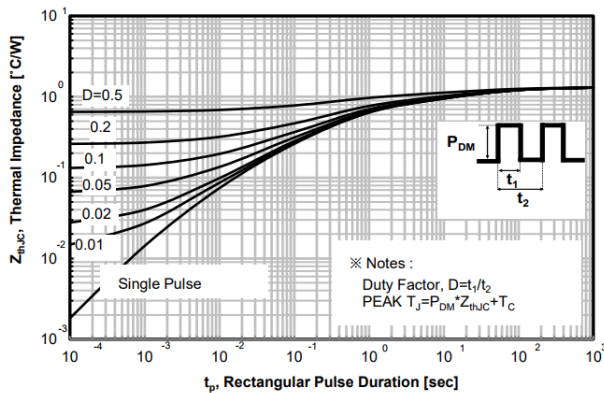
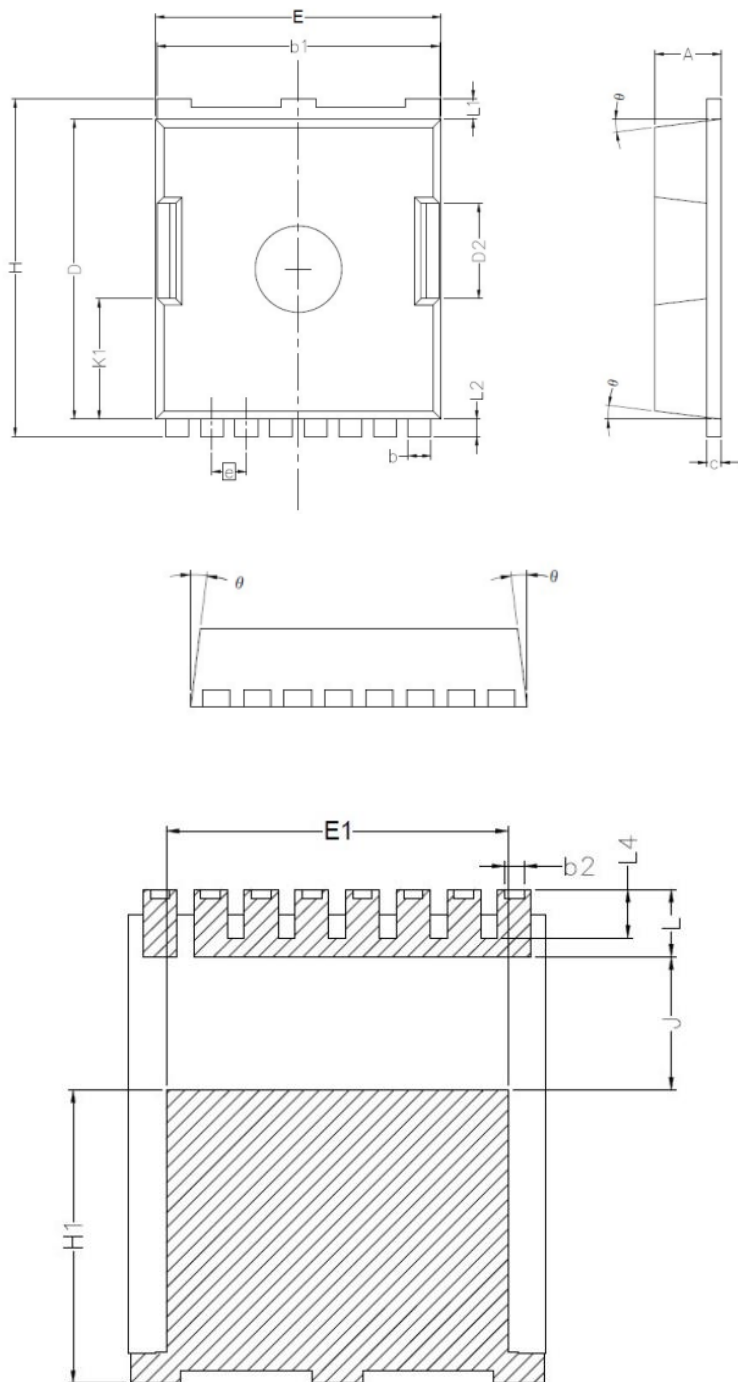


Figure 11. Transient Thermal Impedance, Junction to Ambient

Package Outline

Unit : mm



SYMBOL	DIMENSION		NOTES
	MIN	MAX	
A	2.20	2.40	
b	0.70	0.90	
b1	9.70	9.90	
b2	0.42	0.50	
c	0.40	0.60	
D	10.28	10.58	
D2	3.10	3.50	
E	9.70	10.10	
E1	7.90	8.30	
e	1.20 BSC		
H	11.48	11.88	
H1	6.75	7.15	
N	8		
J	3.00	3.30	
K1	3.98	4.38	
L	1.40	1.80	
L1	0.60	0.80	
L2	0.50	0.70	
L4	1.00	1.30	
θ	4°	10°	