PM018N100GM

100V 40A 18mΩ Single N channel Trench MOSFET with Normal Diode

POWERCUBESEMI, INC.
Potential · Convergence · Smart

Features

Si Single N channel Trench MOSFET

- Rated to 100V at 40Amps @T_J = 25℃
- Max $R_{DS(on)}$ = 18 mΩ
- Typ $R_{DS(on)}$ = 15 mΩ
- Gate Charge(Typ. Q_g=30.8 nC)
- 100% UIL Tested
- 100% Rg Tested
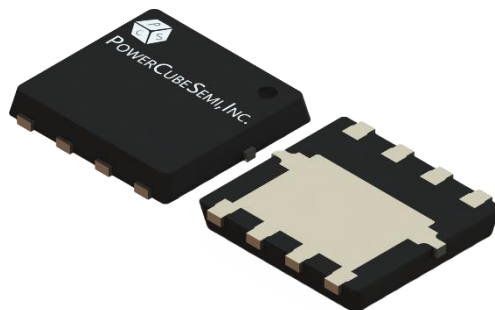
Application

- Synchronous Rectification
- Server
- General Purpose applications

PKG type : PDFN56
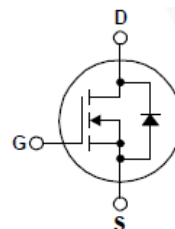
Description

PM018N100GM uses advanced PowerCubeSemi's MOSFET technology, which provides high performance in on-state resistance, fast switching performance and excellent quality. PM018N100GM is suitable device for Synchronous Rectification for server and general purpose applications.

Absolute Maximum Ratings

Symbol	Parameter	Test Condition	Value	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V, I_D=250μA	100	V
I_D	Drain Current	T_c=25℃	40	A
I_{DM}	Pulsed Drain Current	Pulse width limited by junction temperature	160	A
V_{GS}	Gate-Source Voltage		±20	V
E_{AS}	Single Pulsed Avalanche Energy	I_{AS}=10A, V_{GS}=10V, L=1.0mH	50	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
PN018N100GM	PN018N100	PDFN56	Tape & Reel	-	-

Electrical Characteristics of Si MOSFET

Symbol	Parameter	Test Condition	Numerical			Unit
			Min	Typ.	Max.	
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS} = 0V$, $I_D = 250\mu A$, $T_J = 25°C$	100	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS} = 100V$, $V_{GS} = 0V$	-	-	1	μA
I_{GSS}	Gate-Source Leakage Current	$V_{GS} = \pm00V$, $V_{DS} = 0V$	-	-	±100	nA
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS} = V_{GS}$, $I_D = 250\mu A$	1.0	1.5	2.0	V
$R_{DS(ON)}$	Static Drain-Source on state resistance	$V_{GS} = 10V$, $I_D = 20A$ Pulse width = $200\mu s$	-	15	18	$m\Omega$
g_{FS}	Forward Transconductance	$V_{DS} = 10V$, $I_D = 20A$	-	45	-	S
$t_{d(on)}$	Turn-on Delay time	$V_{DD} = 50$ V, $I_D = 20A$, $V_{GS} = 10$ V, $R_G = 3\Omega$	-	8.0	-	ns
T_r	Turn-on Rise time		-	10.5	-	
$t_{d(off)}$	Turn-off Delay time		-	26.3	-	
T_f	Turn-off Fall time		-	7.4	-	

Electrical Characteristics of Si MOSFET

Symbol	Parameter	Test Condition	Numerical		Unit
			Typ.	Max.	
$R_{\theta JC}$	Thermal Resistance, Junction to Case		1.5	-	℃/W
R_g	Gate Resistance	V_{GS} = 0V, f = 1.0MHz	1.0	-	Ω
C_{iss}	Input Capacitance		1995	-	
C_{oss}	Output Capacitance	V_{DS} = 40V, V_{GS} = 0V, f = 1.0MHz	253	-	pF
C_{rss}	Reverse Transfer Capacitance		18	-	
$Q_{g(tot)}$	Total Gate Charge at 10V		30.8	-	
Q_{gs}	Gate to Source Gate Charge	V_{DD} = 50V, I_D = 20A $V_{GS(on)}$ = 10V	6.0	-	nC
Q_{gd}	Gate to Drain "Miller" Charge		5.1	-	

Electrical Characteristics of Si Diode

Symbol	Parameter	Test Condition	Numerical		Unit
			Typ.	Max.	
I_S	Maximum Continuous Drain to Source Diode Forward Current		-	40	A
I_{SM}	Maximum Pulsed Drain to Source Diode Forward Current		-	160	A
V_{SD}	Drain to Source Diode Forward Voltage	I_{SD} = 20A, V_{GS} = 0V	0.8	1.2	V
T_{rr}	Reverse Recovery Time	I_F = 20A, V_{GS} = 0V, dI_F/dt=100A/μs	54	-	ns
Q_{rr}	Reverse Recovery Charge		120	-	nC

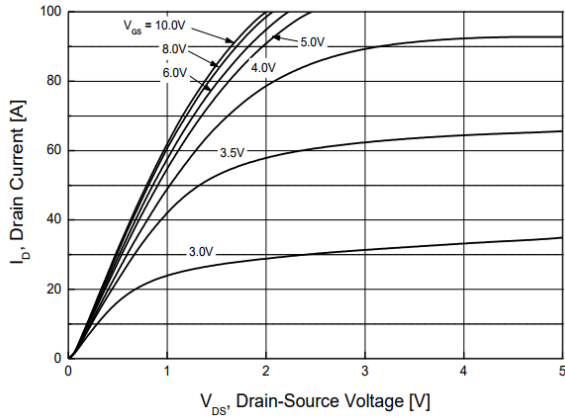# Typical Characteristics

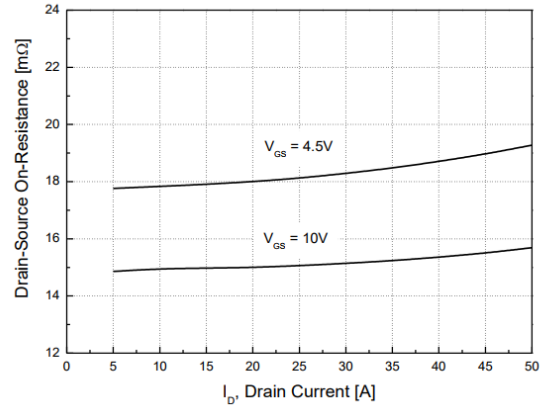Figure 1. On-Region Characteristics

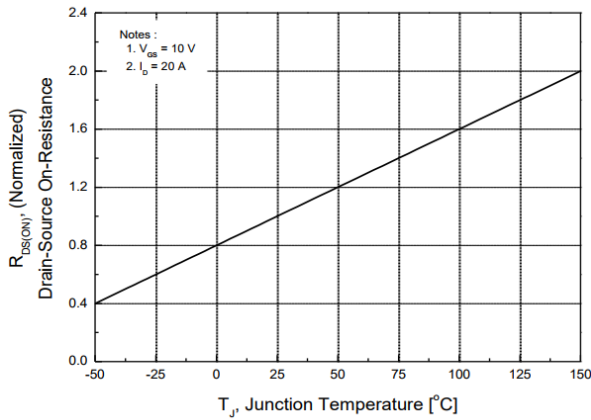Figure 2. On-Resistance vs. Drain Current and Gate Voltage

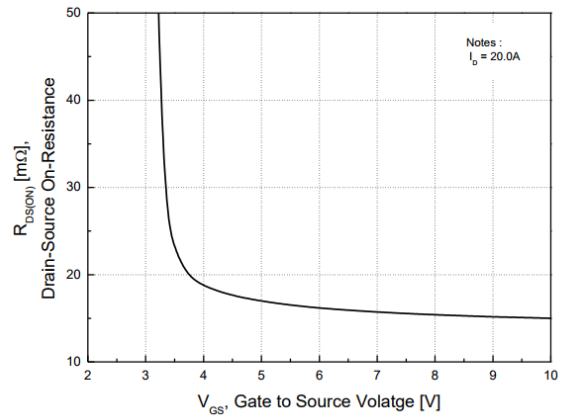Figure 3. On Resistance vs. Junction Temperature

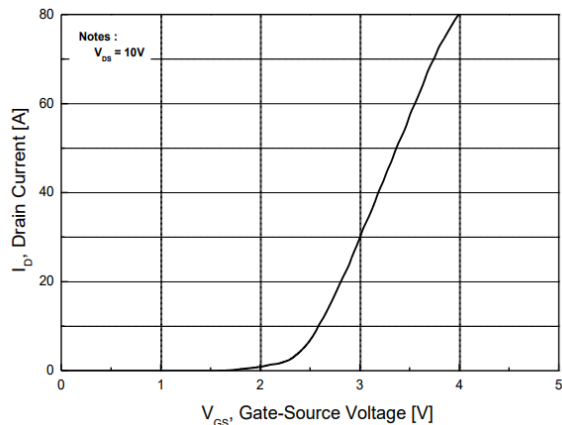

Figure 4. On-Resistance vs. Gate to Source Voltage

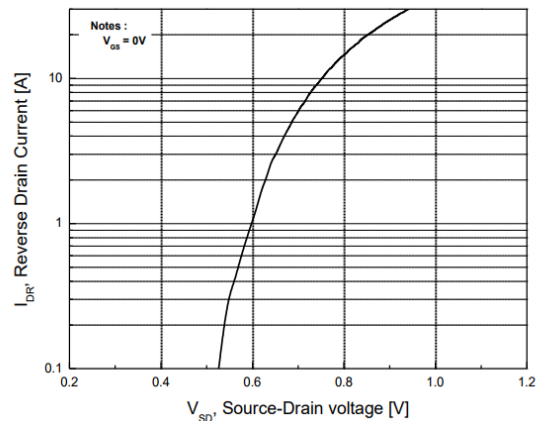Figure 5. Transfer Characteristics

Figure 6. Source to Drain Diode Forward Voltage
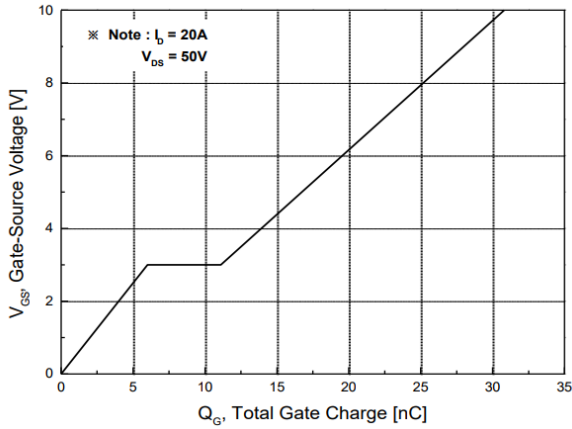
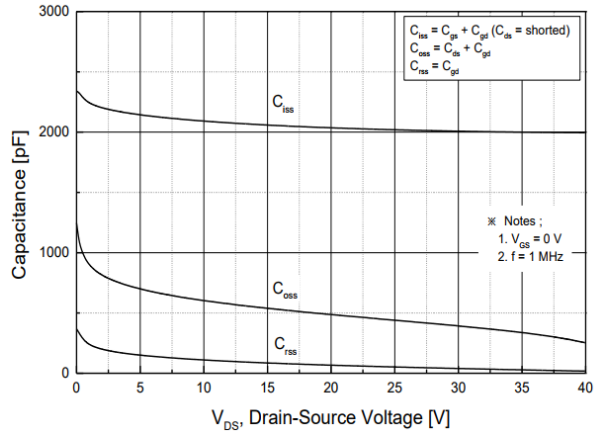# Typical Characteristics

Figure 7. Gate Charge Characteristics
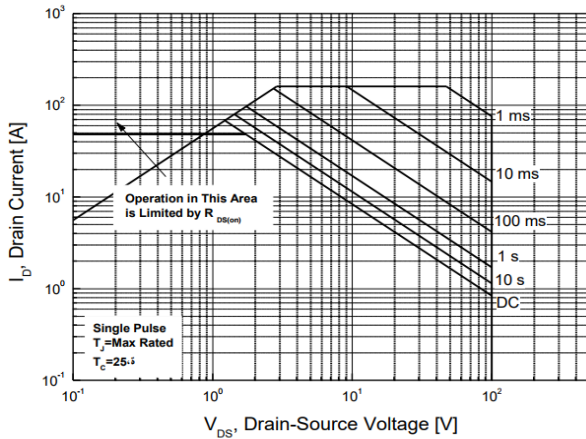

Figure 8. Capacitance Characteristics

Figure 9. Maximum Safe Operating Area
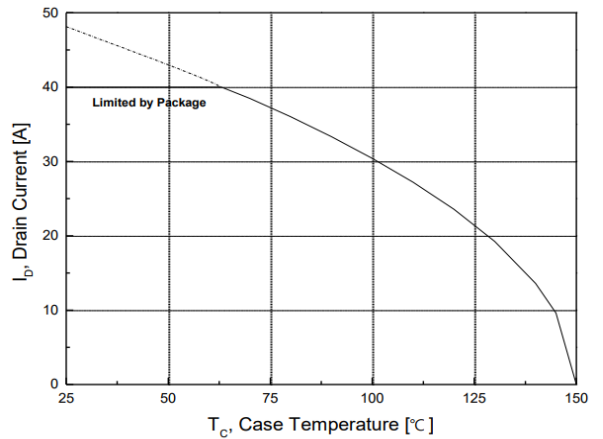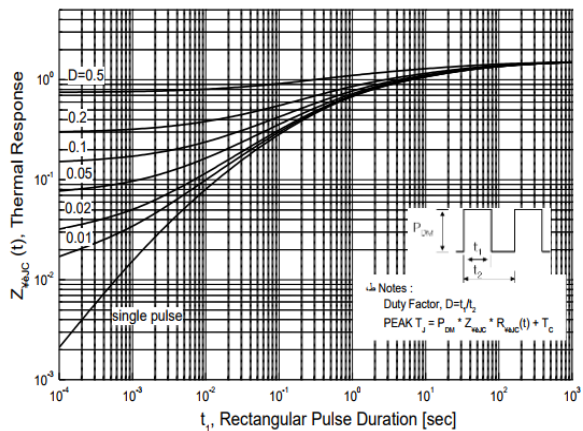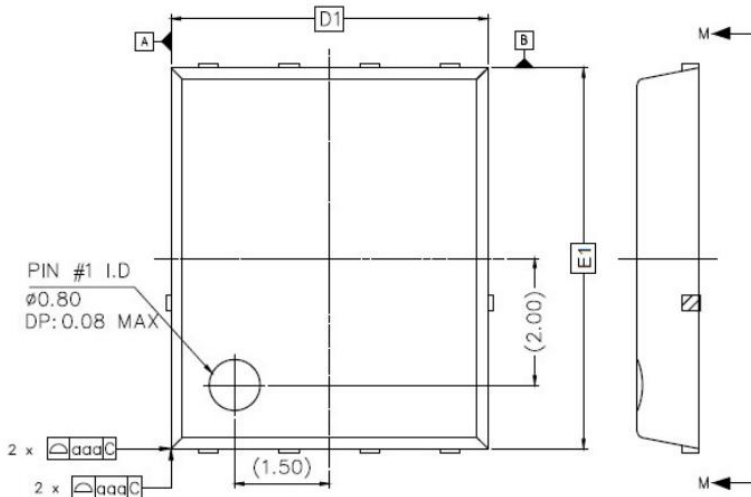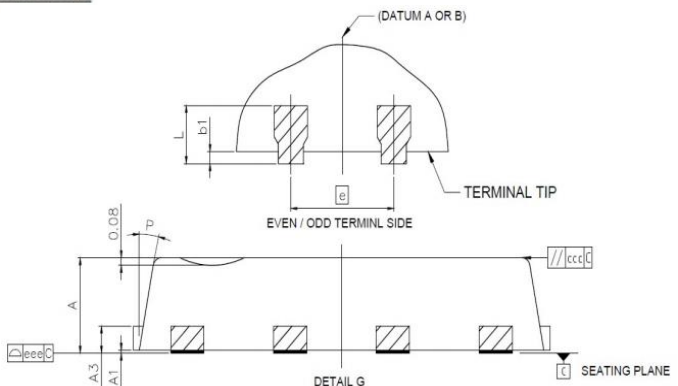

Figure 10. Maximum Drain Current vs. Case Temperature

Figure 11. Transient Thermal Impedance, Junction to Ambient

Package Outline
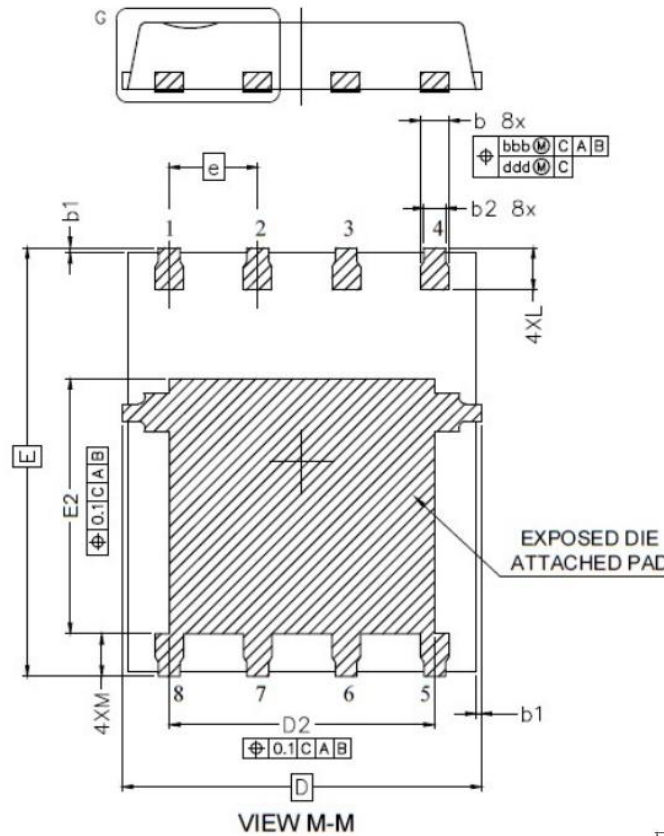
SYMBOL	DIMENSION		NOTES
	MIN	MAX	
A	0.95	1.05	
A1	0.00	0.05	
A3	0.254 REF		
b	0.31	0.51	
b1	0.03	0.13	
b2	0.21	0.41	
D	5.15 BSC		
D1	5.00 BSC		
D2	3.70	3.90	
E	6.15 BSC		
E1	6.00 BSC		
E2	3.56	3.76	
e	1.27 BSC		
L	0.51	0.71	
M	0.51	0.71	
P	10°	12°	
aaa	0.10		
bbb	0.10		
ccc	0.10		
ddd	0.05		
eee	0.08		

VIEW M-M

EXPOSED DIE ATTACHED PAD

(DATUM A OR B)

TERMINAL TIP

EVEN / ODD TERMINL SIDE

DETAIL G

SEATING PLANE