

PM028N100CM

100V 40A 28mΩ Single N channel Trench MOSFET with Normal Diode

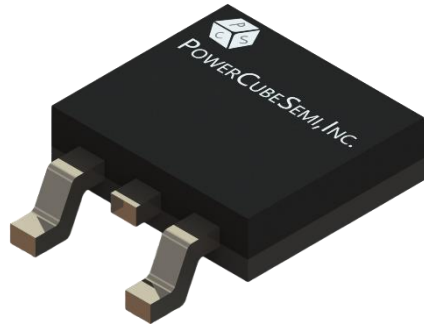
Features

Si Single N channel Trench MOSFET

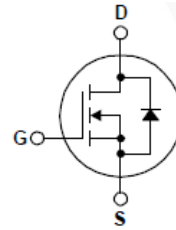
- Rated to 100V at 40Amps @ $T_j = 25^\circ\text{C}$
- Max $R_{DS(on)} = 28\text{ m}\Omega$
- Typ $R_{DS(on)} = 21\text{ m}\Omega$
- Gate Charge(Typ. $Q_g=39.8\text{ nC}$)

Application

- DC/DC Converter
- General purpose applications



PKG type : TO-252(DPAK)



Description

PM028N100CM uses advanced PowerCubeSemi's MOSFET technology, which provides high performance in on-state resistance, fast switching performance and excellent quality. PM028N100CM is suitable device for DC/DC converters and 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	$T_c=25^\circ\text{C}$	40	A
I_{DM}	Pulsed Drain Current	Pulse width limited by junction temperature	80	A
V_{GS}	Gate-Source Voltage		± 20	V
E_{AS}	Single Pulsed Avalanche Energy	$I_{AS}=20A, V_{GS}=10V$ $V_{DD}=50V, L=1.0mH$	200	mJ
P_d	Power Dissipation	$T_c=25^\circ\text{C}$	83	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
PM028N100CM	PM028N100	TO-252	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	$V_{DS} = 80V, V_{GS} = 0V$	-	-	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	3	4	V
$R_{DS(ON)}$	Static Drain-Source on state resistance	$V_{GS} = 10V, I_D = 20A$	-	21	28	m Ω
g_{FS}	Forward Transconductance	$V_{DS} = 5V, I_D = 20A$	-	55	-	S
$t_{d(on)}$	Turn-on Delay time	$V_{DS} = 50V, R_L = 3.2\Omega, V_{GS} = 10V, R_{GEN} = 3.2\Omega$	-	10.5	-	ns
T_r	Turn-on Rise time		-	27.5	-	
$t_{d(off)}$	Turn-off Delay time		-	38.5	-	
T_f	Turn-off Fall time		-	14	-	



Electrical Characteristics of Si MOSFET

Symbol	Parameter	Test Condition	Numerical		Unit
			Typ.	Max.	
$R_{\theta JC}$	Thermal Resistance, Junction to Case		1.5	-	$^{\circ}\text{C}/\text{W}$
R_g	Gate Resistance	$V_{GS} = 0\text{V}, f = 1.0\text{MHz}$	2.1	2.5	Ω
C_{iss}	Input Capacitance	$V_{DS} = 25\text{V}, V_{GS} = 0\text{V}, f = 1.0\text{MHz}$	2087	2505	pF
C_{oss}	Output Capacitance		82	-	
C_{rss}	Reverse Transfer Capacitance		230	-	
$Q_{g(\text{tot})}$	Total Gate Charge at 10V	$V_{DS} = 50\text{V}, I_D = 20\text{A}$ $V_{GS(\text{on})} = 10\text{V}$	39.8	48	nC
Q_{gs}	Gate to Source Gate Charge		11	-	
Q_{gd}	Gate to Drain "Miller" Charge		11.2	-	

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		-	80	A
V_{SD}	Drain to Source Diode Forward Voltage	$I_S = 1\text{A}, V_{GS} = 0\text{V}$	0.7	1.2	V
T_{rr}	Reverse Recovery Time	$I_F = 20\text{A}, dI_F/dt = 100\text{A}/\mu\text{s}$	63	76	ns
Q_{rr}	Reverse Recovery Charge		145	-	nC

Typical Characteristics

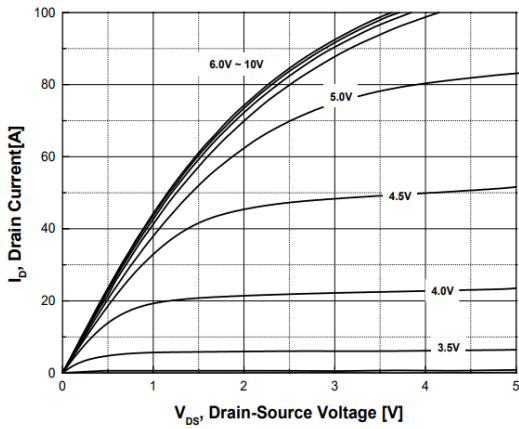


Figure 1. On-Region Characteristics

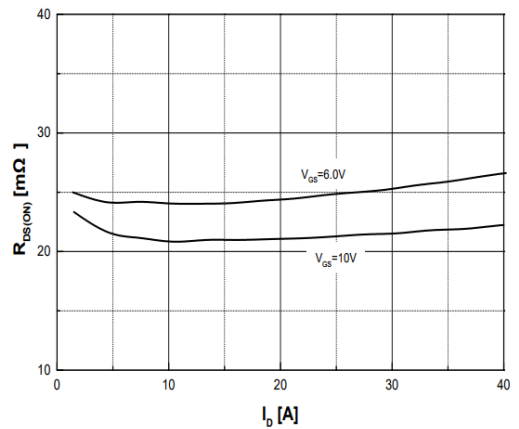


Figure 2. On-Resistance vs. Drain Current and Gate Voltage

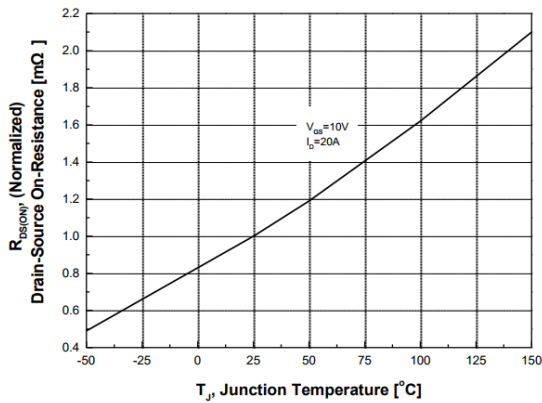


Figure 3. On Resistance vs. Junction Temperature

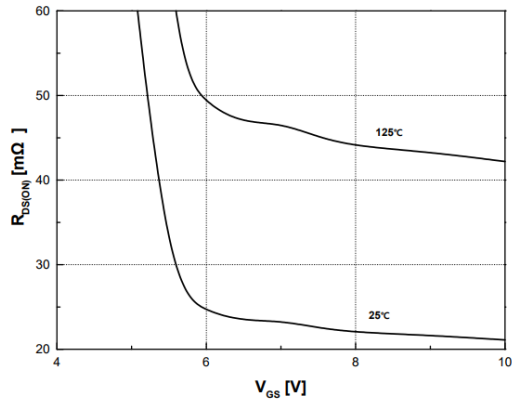


Figure 4. On-Resistance vs. Gate to Source Voltage

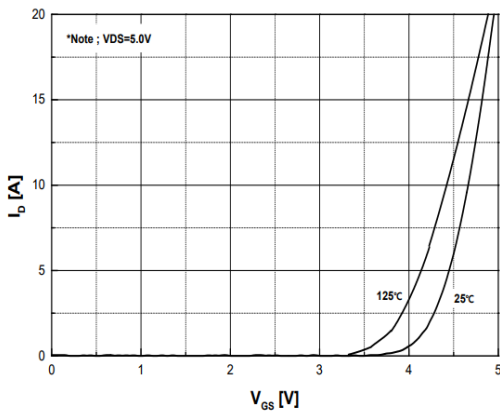


Figure 5. Transfer Characteristics

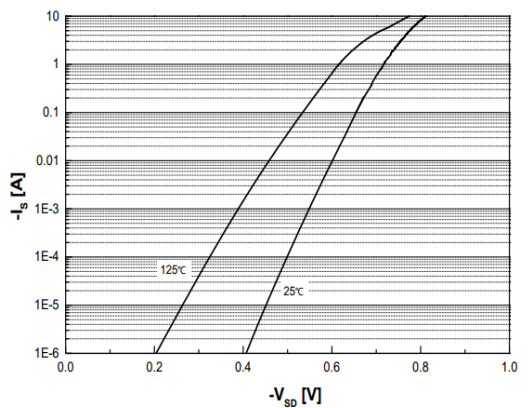


Figure 6. Source to Drain Diode Forward Voltage

Typical Characteristics

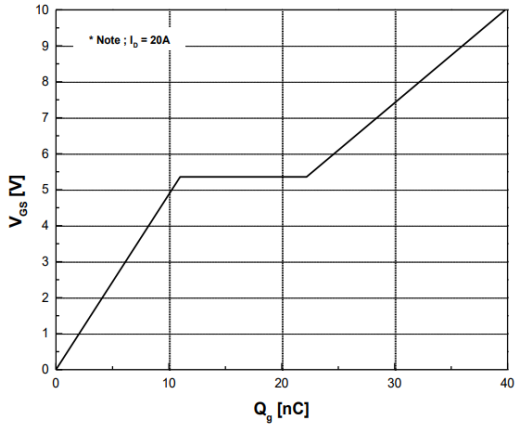


Figure 7. Gate Charge Characteristics

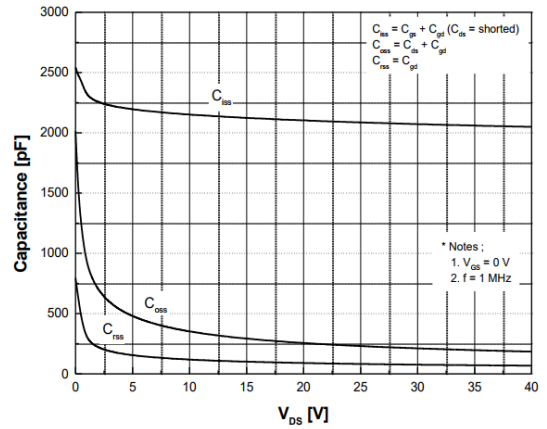


Figure 8. Capacitance Characteristics

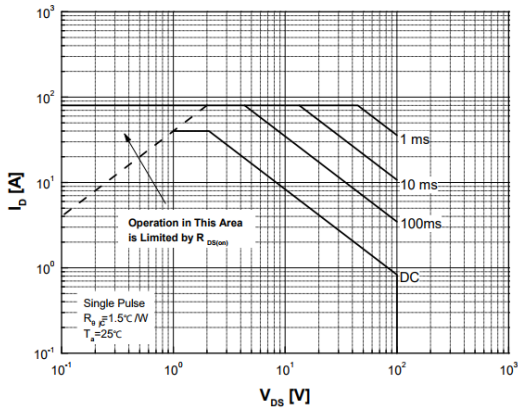


Figure 9. Maximum Safe Operating Area

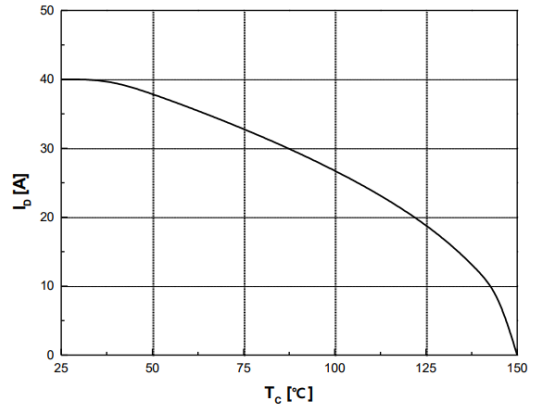


Figure 10. Maximum Drain Current vs. Case Temperature

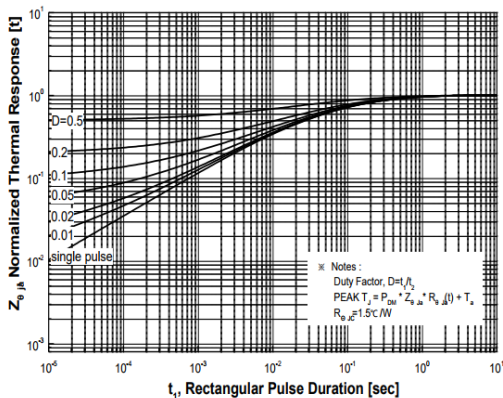
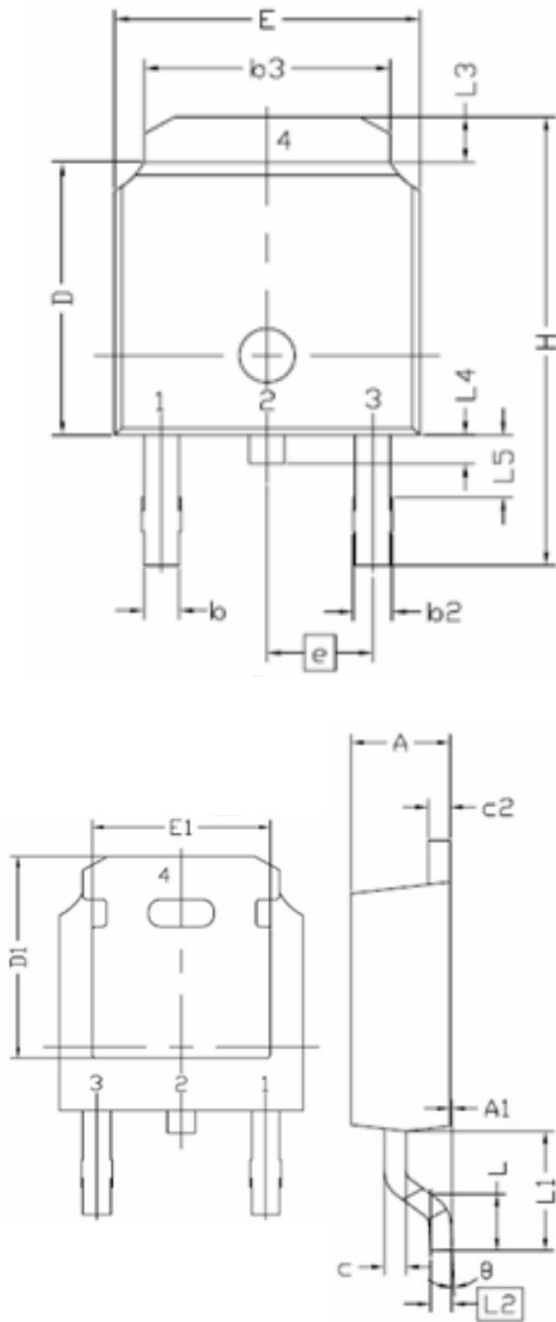


Figure 11. Transient Thermal Impedance, Junction to Ambient

Package Outline

Unit : mm



SYMBOL	DIMENSIONS			NOTES
	MIN	NOM	MAX	
E	6.34	6.54	6.74	
L	1.30	1.60	1.90	
L1	2.60	2.90	3.20	
L2	0.5 BSC			
L3	0.82	1.02	1.22	
L4	0.80	1.00	1.20	
L5	2.60	2.90	3.20	
D	5.80	6.10	6.40	
H	8.40	9.00	9.60	
b	1.42	1.52	1.62	
b2	2.35	2.55	2.75	
b3	5.20	5.30	5.40	
e	4.58 BSC			
A	2.08	2.28	2.48	
A1	0.00	0.15	-	
c	0.40	0.50	0.60	
c2	0.40	0.50	0.60	
D1	-	5.25	-	
E1	-	4.8	-	
θ	0.00°	10.00°		