Prisemi®

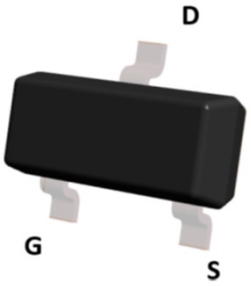
PNMT7002E

N-Channel MOSFET

Description

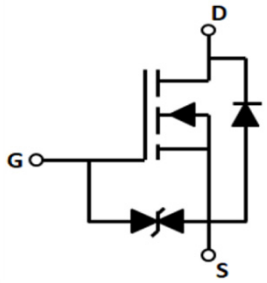
The MOSFET provide the best combination of fast switching , low on-resistance and cost-effectiveness.

- Trench Power MV MOSFET technology
- Voltage controlled small signal switch
- Low input Capacitance
- Fast Switching Speed
- Low Input / Output Leakage



Top View

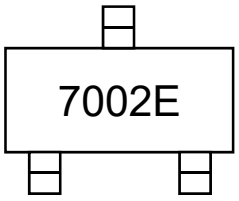
MOSFET Product Summary		
V_{DS}(V)	$R_{DS(on)}$(Ω)	I_D(mA)
60	3.0@V_{GS} = 10V	300
	4.0@V_{GS} = 4.5V	



Circuit Diagram

Applications

- Battery operated systems
- Solid-state relays
- Direct logic-level interface: TTL/CMOS



Marking (Top View)

Absolute maximum rating@25℃

Rating		Symbol	Value	Units
Drain-source Voltage		V_{DS}	60	V
Gate-source Voltage		V_{GS}	±20	V
Drain Current[1]	T_A=25℃	I_D	300	mA
	T_A=70℃		220	
Pulsed Drain Current[2]		I_{DM}	1.2	A
Total Power Dissipation[4]	T_A=25℃	P_D	340	mW
	T_A=70℃		220	
Thermal Resistance Junction-to-Ambient[3]		$R_{\theta JA}$	365	℃/W
Junction and Storage Temperature Range		T_J,T_{STG}	-55~+150	℃

Notes:
1. Pulse width limited by maximum junction temperature.
2. Pulse test : Pulse width ≤ 300μs, duty cycle ≤ 2%.
3. Device surface mounted on FR4 PCB measured at steady state.
4. Measured under pulsed conditions. Pulse width ≤ 300μs, duty cycle ≤ 2%.

Electrical characteristics per line@25℃ (unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Units
Static Parameter						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS} = 0V, I_D = 250μA	60	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 60V,V_{GS} = 0V	-	-	1.0	μA
Gate-Body Leakage Current	I_{GSS}	V_{GS} = ±20V, V_{DS} = 0V	-	-	±10	μA
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250μA	1.0	1.5	2.5	V
Static Drain-Source On-Resistance	$R_{DS(ON)}$	V_{GS} = 10V, I_D = 300mA	-	-	3.0	Ω
		V_{GS} = 4.5V, I_D = 200mA	-	-	4.0	
Diode Forward Voltage	V_{SD}	I_S = 300mA,V_{GS} = 0V	-	0.9	1.2	V
Dynamic Parameters[5)]						
Input Capacitance	C_{iss}	V_{DS} = 25V,V_{GS} = 0V, f = 1MHz	-	27	-	pF
Output Capacitance	C_{oss}		-	10	-	
Reverse Transfer Capacitance	C_{rss}		-	4.3	-	
Switching Parameters[5)]						
Turn-on Delay Time	$t_{d(on)}$	V_{DS} = 30V, V_{GS} = 10V, R_G = 6Ω,I_D = 0.3A	-	2.2	-	ns
Turn-on Rise Time	t_r		-	14	-	
Turn-Off Delay Time	$t_{d(off)}$		-	7.0	-	
Turn-Off Fall Time	t_f		-	18	-	
Total Gate Charge	Q_g	V_{DS}= 10V,I_D= 0.3A, V_{GS}= 4.5V	-	1.8	-	nC
Gate-Source Charge	Q_{gs}		-	0.3	-	
Gate-Drain Charge	Q_{gd}		-	0.6	-	
Gate Resistance	R_g	V_{GS}=0V, V_{DS}=0V,f=1MHz	-	135	-	Ω
Drain-Source Diode Characteristics[5)]						
Maximum Pulsed Drain to Source Diode Forward Current	I_{SM}	-	-	-	1.2	A
Diode Forward Current	I_S	-	-	-	0.3	A

Notes:
5. Guaranteed by design, not subject to production.

Typical Characteristics

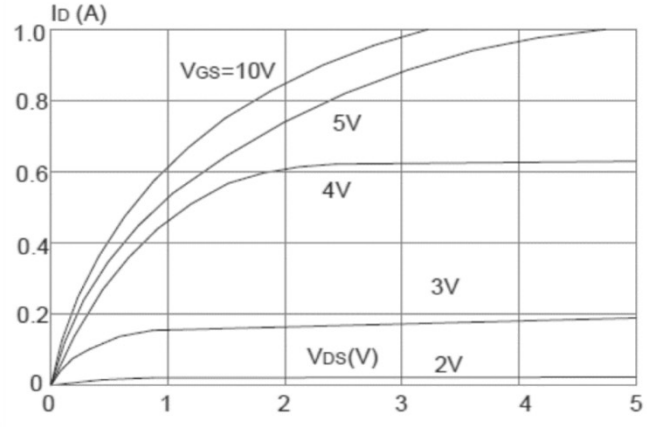


Figure1: Output Characteristics

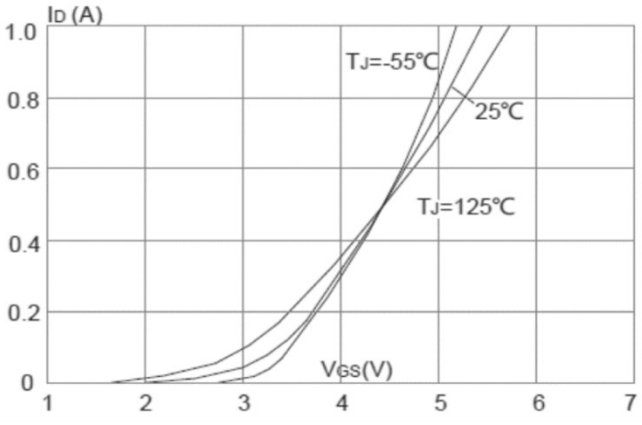


Figure 2: Typical Transfer Characteristics

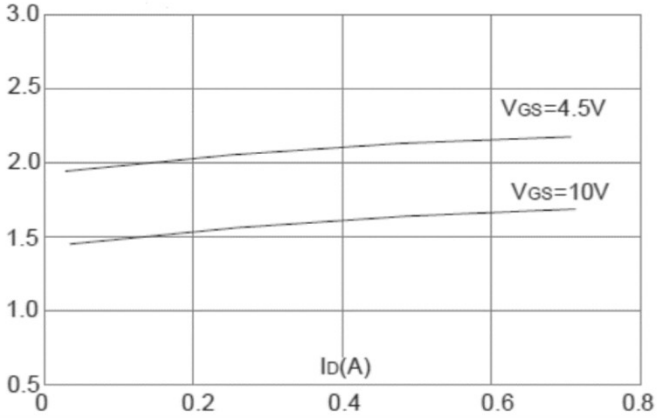


Figure 3: On-resistance vs. Drain Current

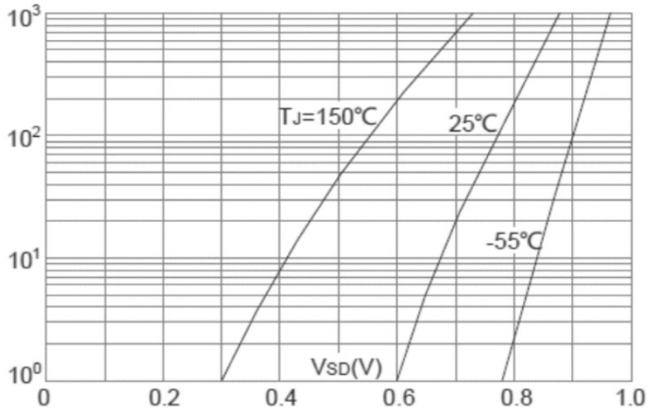


Figure 4: Body Diode Characteristics

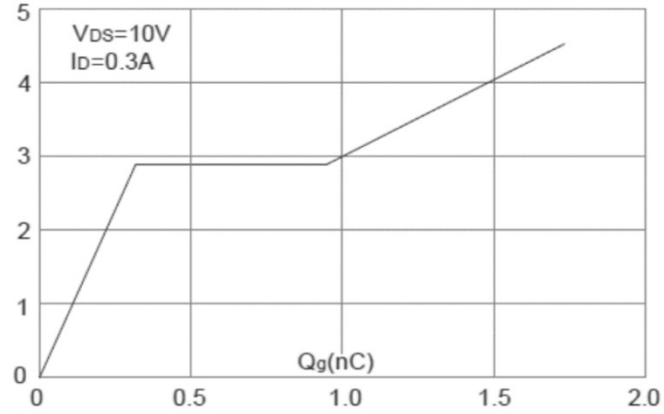


Figure 5: Gate Charge Characteristics

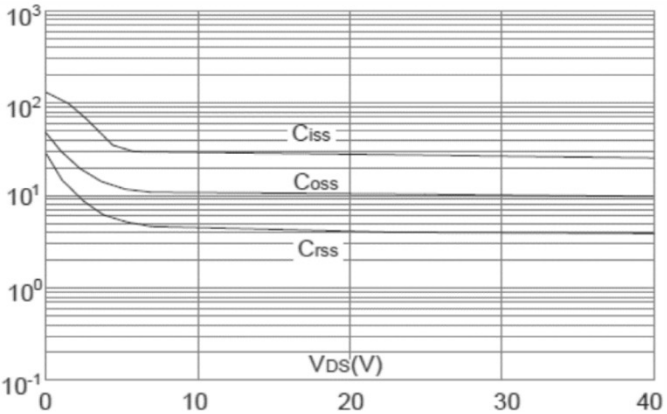


Figure 6: Capacitance Characteristics

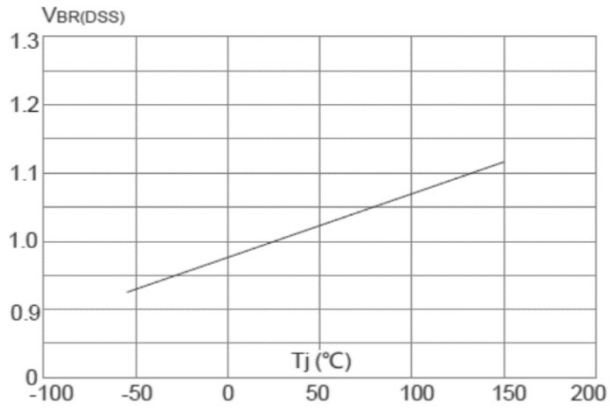


Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

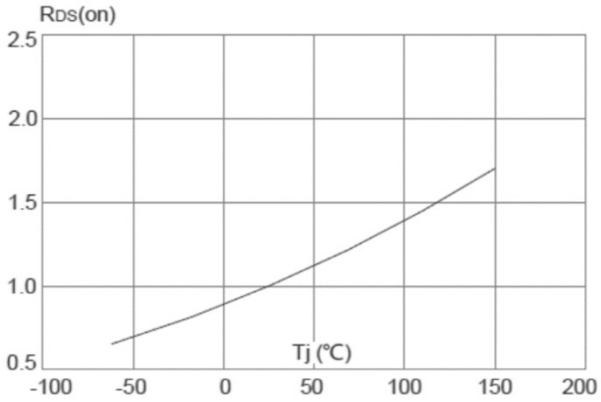


Figure 8: Normalized on Resistance vs. Junction Temperature

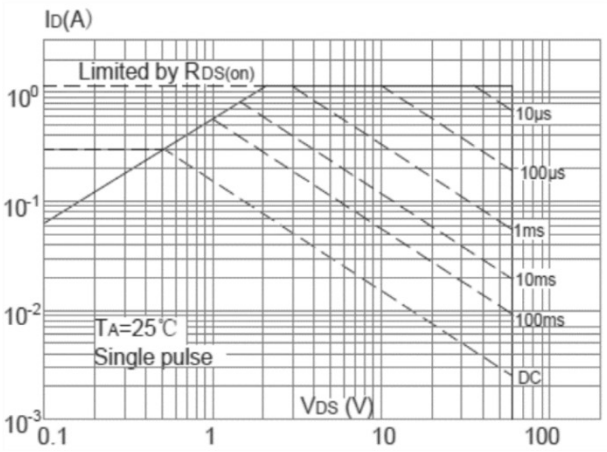


Figure 9: Maximum Safe Operating Area

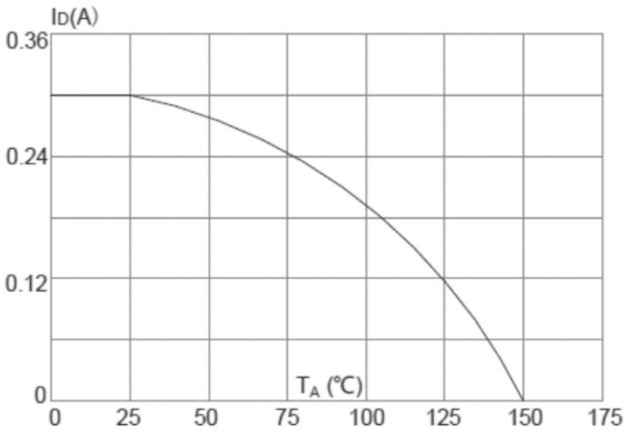


Figure 10: Maximum Continuous Drain Current vs. Ambient Temperature

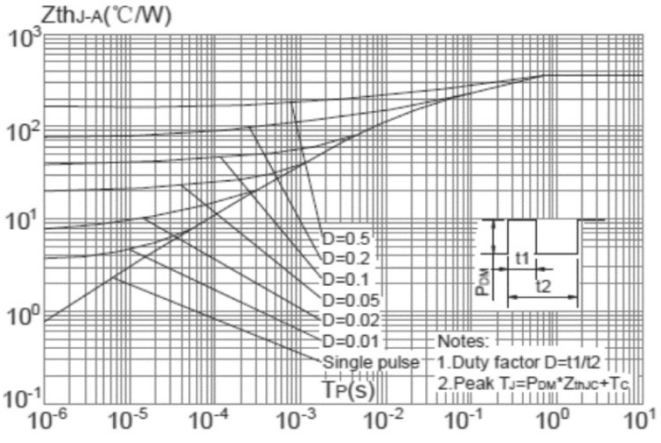
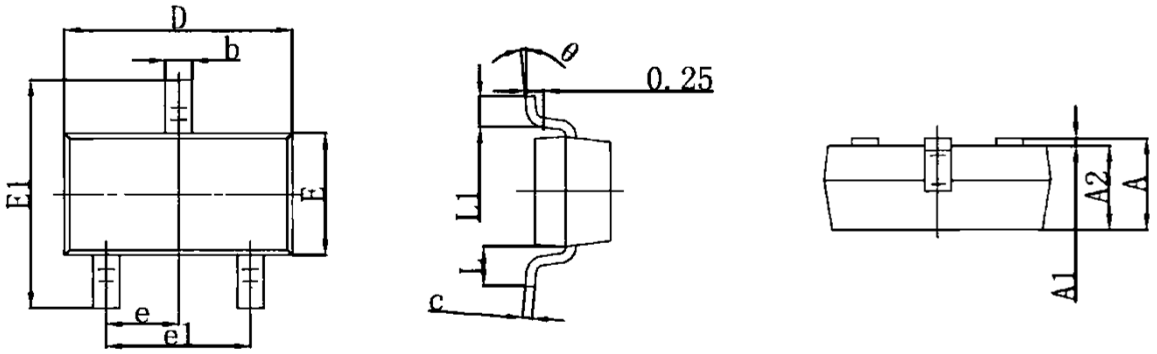
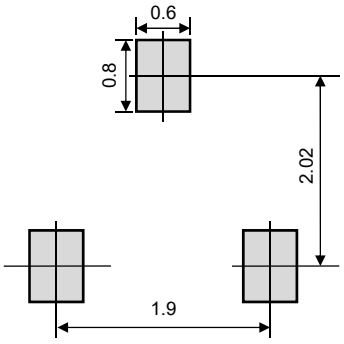


Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Ambient

Product dimension (SOT-23)



Dim	Millimeters		Inches	
	Min	Max	Min	Max
A	-	1.50	-	0.059
A1	0.04	0.15	0.002	0.006
A2	-	1.35	-	0.053
b	0.30	0.50	0.012	0.020
c	0.08	0.21	0.003	0.008
D	2.72	3.12	0.107	0.123
E	1.10	1.50	0.043	0.059
E1	2.10	2.64	0.083	0.104
e	0.95 Typ.		0.037 Typ.	
e1	1.80	2.00	0.071	0.079
L	0.65 Ref.		0.026 Ref.	
L1	0.20	0.60	0.008	0.024
θ	0°	8°	0°	8°



Suggested PCB Layout

Unit:mm

Ordering information

Device	Package	Reel	Shipping
PNMT7002E	SOT-23	7"	3000 / Tape & Reel

IMPORTANT NOTICE

and Prisemi® are registered trademarks of **Prisemi Electronics Co., Ltd** (Prisemi**),** Prisemi reserves the right to make changes without further notice to any products herein. Prisemi makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does Prisemi assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation special, consequential or incidental damages. “Typical” parameters which may be provided in Prisemi data sheets and/or specifications can and do vary in different applications and actual performance may vary over time. All operating parameters, including “Typicals” must be validated for each customer application by customer’s technical experts. Prisemi does not convey any license under its patent rights nor the rights of others. The products listed in this document are designed to be used with ordinary electronic equipment or devices, Should you intend to use these products with equipment or devices which require an extremely high level of reliability and the malfunction of with would directly endanger human life (such as medical instruments, aerospace machinery, nuclear-reactor controllers, fuel controllers and other safety devices), please be sure to consult with our sales representative in advance.

Website: http://www.prisemi.com
For additional information, please contact your local Sales Representative.