

20V N-Channel MOSFET

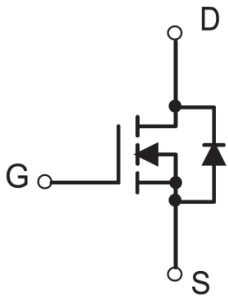
Description

The PM2302 uses advanced Trench technology and designs to provide excellent $R_{DS(ON)}$ with low gate charge. This device is suitable for use in PWM, load switching and general purpose applications.

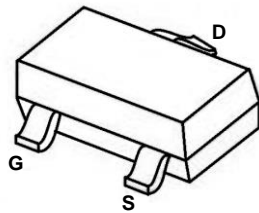
Features

- Trench Power MOSFET
- Excellent $R_{DS(on)}$ and Low Gate Charge

Dimensions and Pin Configuration



Circuit diagram

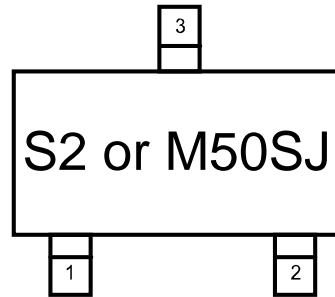


SOT-23

Applications

- DC/DC Converter
- Load Switch for Portable Devices
- Battery Switch

Marking Information



S2 or M50SJ= Device Marking Code

MOSFET Product Summary

V_{DSS}	$R_{DS(ON)}$ @ $V_{GS} = 4.5V$	$R_{DS(ON)}$ @ $V_{GS} = 2.5V$	I_D
20V	43m Ω	55m Ω	2.3A

Absolute Maximum Ratings ($T_A=25^\circ C$ unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	20	V
Gate-Source Voltage	V_{GS}	± 10	V
Continuous Drain Current	I_D	2.3	A
Plused Drain Current	I_{DM}	10	A
Continuous Source-Drain Current(Diode Conduction)	I_S	0.6	A
Power Dissipation	P_D	0.35	W
Thermal Resistance from Junction to Ambient	$R_{\theta JA}$	357	$^\circ C/W$
Junction Temperature	T_J	150	$^\circ C$
Storage Temperature	T_{STG}	-55~ +150	$^\circ C$

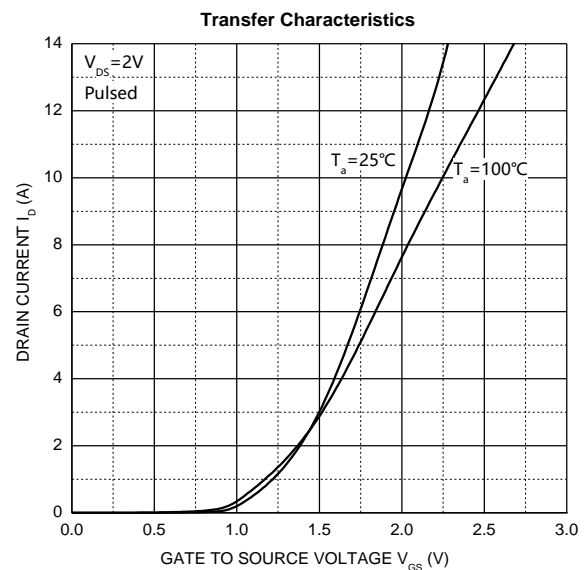
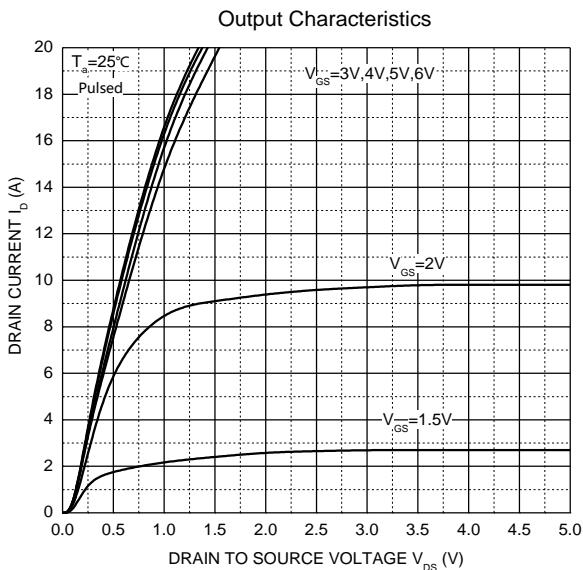
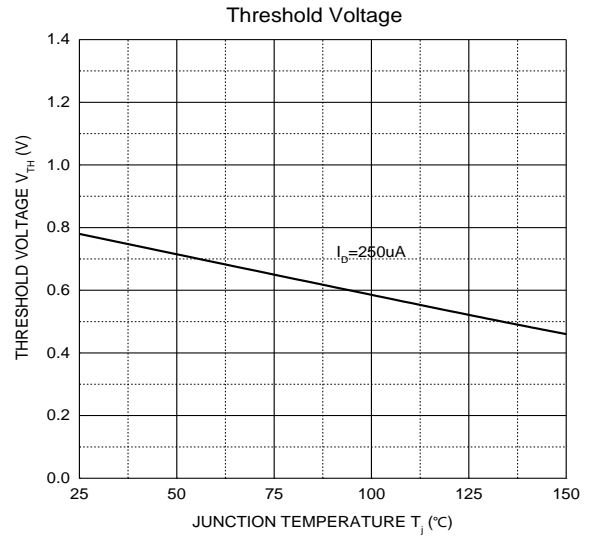
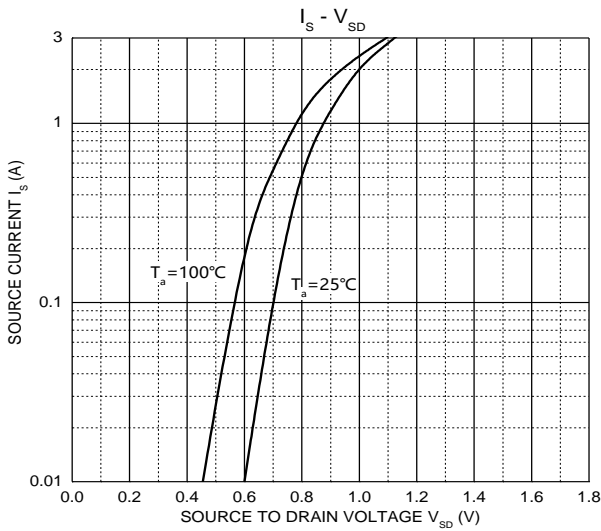
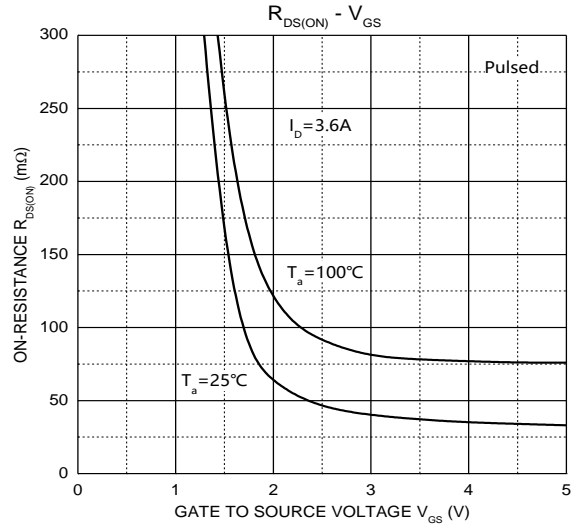
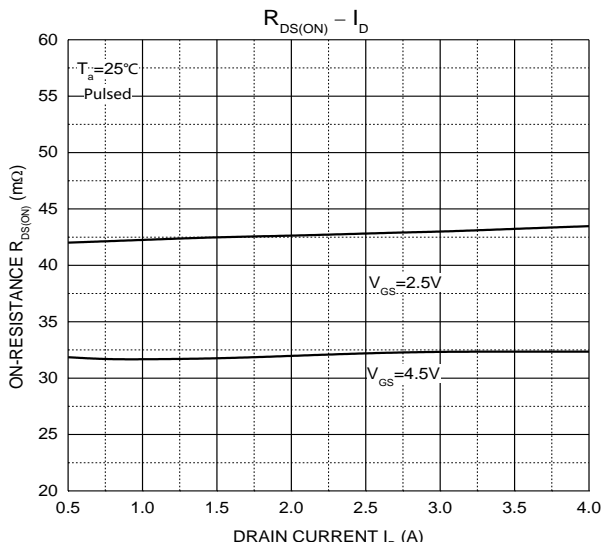
Electrical Characteristics ($T_A = 25^\circ\text{C}$ unless otherwise noted)

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Static Characteristics						
Drain-source breakdown voltage	$V_{(BR)DSS}$	$V_{GS} = 0V, I_D = 250\mu A$	20	22		V
Zero gate voltage drain current	I_{DSS}	$V_{DS} = 20V, V_{GS} = 0V$			1	μA
Gate-body leakage current	I_{GSS}	$V_{GS} = \pm 8V, V_{DS} = 0V$			± 0.1	μA
Gate threshold voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\mu A$	0.4	0.65	1.0	V
Drain-source on-resistance ¹⁾	$R_{DS(on)}$	$V_{GS} = 4.5V, I_D = 2A$		43	56	m Ω
		$V_{GS} = 2.5V, I_D = 1.5A$		55	78	
Forward transconductance ¹⁾	g_{FS}	$V_{DS} = 5V, I_D = 3.6A$	8			S
Dynamic characteristics						
Input Capacitance ²⁾	C_{iss}	$V_{DS} = 10V, V_{GS} = 0V, f = 1MHz$		260		pF
Output Capacitance ²⁾	C_{oss}			48		pF
Reverse Transfer Capacitance ²⁾	C_{rss}			27		pF
Total gate charge	Q_g	$V_{DS} = 10V, V_{GS} = 4.5V, I_D = 3.0A$		2.9	5	nC
Gate-source charge	Q_{gs}			0.4		nC
Gate-drain charge	Q_{gd}			0.6		nC
Switching Characteristics²⁾						
Turn-on delay time	$t_{d(on)}$	$V_{DD} = 10V, R_L = 3.3\Omega, V_{GEN} = 4.5V, R_g = 6\Omega$		2.5		ns
Turn-on rise time	t_r			3.2		ns
Turn-off delay time	$t_{d(off)}$			21		ns
Turn-off fall time	t_f			3		ns
Source-Drain Diode characteristics						
Diode Forward voltage	V_{DS}	$V_{GS} = 0V, I_S = 0.94A$		0.7	1.2	V

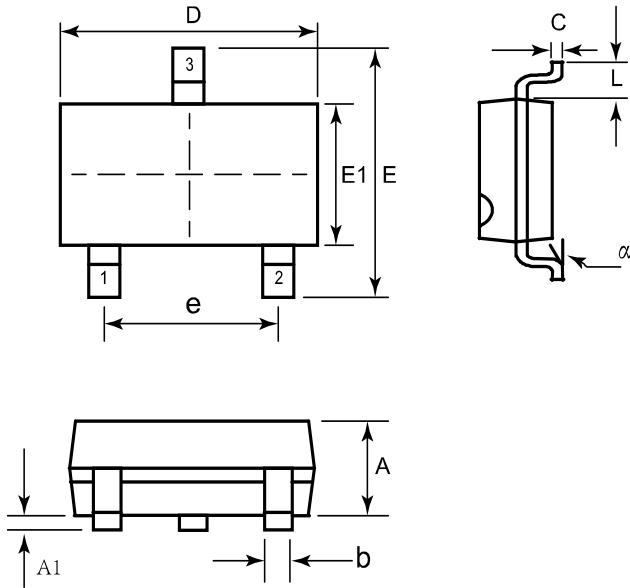
Notes:

- 1) Pulse Test: Pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.
- 2) These parameters have no way to verify.

Typical Characteristics

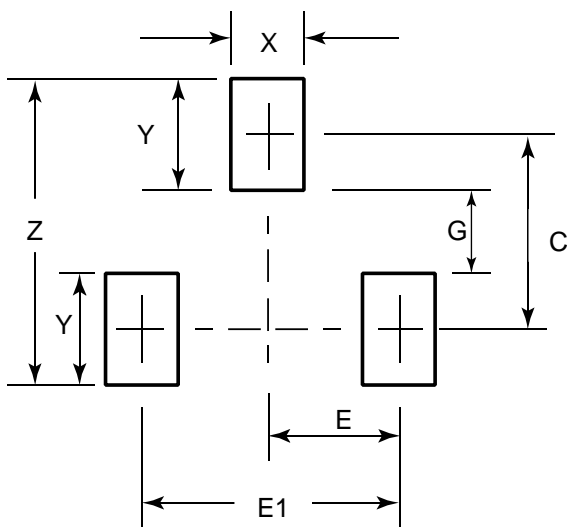


SOT-23 Package Outline Drawing



SYM	DIMENSIONS					
	INCHES			MILLIMETERS		
	MIN	NOM	MAX	MIN	NOM	MAX
A	0.035	0.037	0.040	0.88	0.95	1.02
A1	0.000	-	0.004	0.01	-	0.10
b	0.012	-	0.020	0.30	-	0.51
C	0.003	-	0.007	0.08	-	0.18
D	0.110	0.114	0.120	2.80	2.90	3.04
E	0.082	0.093	0.104	2.10	2.37	2.64
E1	0.047	0.051	0.055	1.20	1.30	1.40
e	0.075 BSC			1.90 BSC		
L	0.022 BSC			0.55 BSC		
α	0°		8°	0°		8°

Suggested Land Pattern



SYM	DIMENSIONS	
	MILLIMETERS	INCHES
C	2.20	0.087
E	0.95	0.037
E1	1.90	0.075
G	0.80	0.031
X	1.00	0.039
Y	1.40	0.055
Z	3.60	0.141