

## PW2300

### 20V N-Channel MOSFET

4.5A 20V;  $R_{DS(ON)typ}=18m\Omega@4.5V$ ,  $R_{DS(ON)typ}=22m\Omega@2.5V$ ,  
 $R_{DS(ON)typ}=44m\Omega@1.8V$

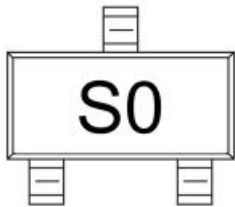
#### FEATURE

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

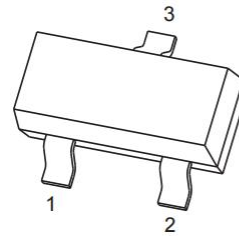
#### Application

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

#### MARKING:

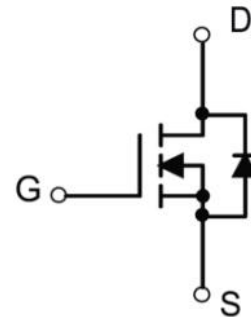


#### SOT-23



1. GATE
2. SOURCE
3. DRAIN

#### Schematic diagram



#### 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	$V_{GS}$	$\pm 12$	V
Continuous Drain Current <sup>1,5</sup>	$I_D$	4.5	A
Pulsed Drain Current <sup>2</sup>	$I_{DM}$	18	A
Power Dissipation <sup>4,5</sup>	$P_D$	1.4	W
Thermal Resistance from Junction to Ambient <sup>5</sup>	$R_{\theta JA}$	89	$^{\circ}C/W$
Junction and Storage Temperature Range	$T_J, T_{STG}$	-55~+150	$^{\circ}C$

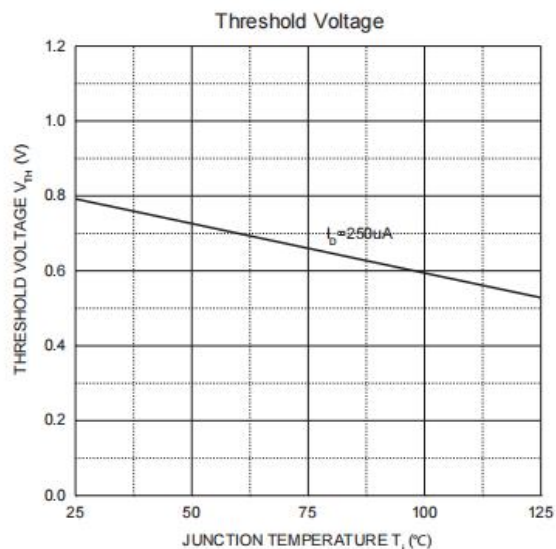
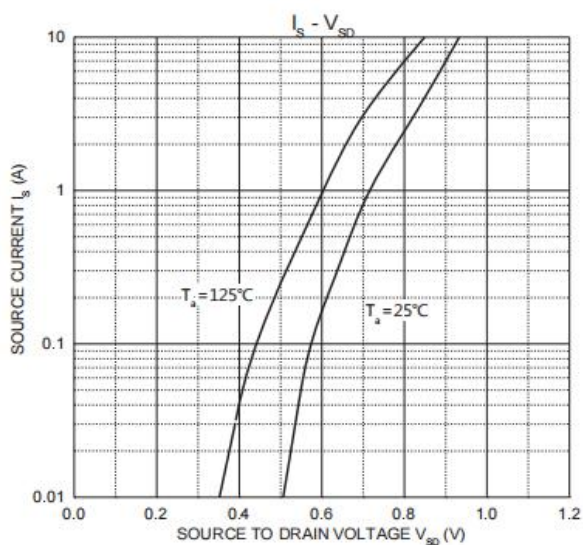
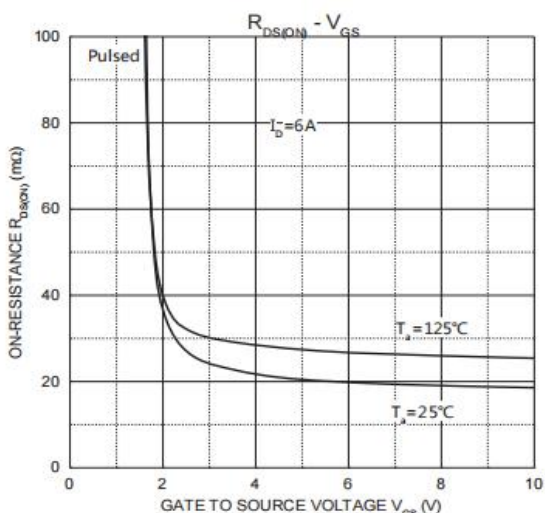
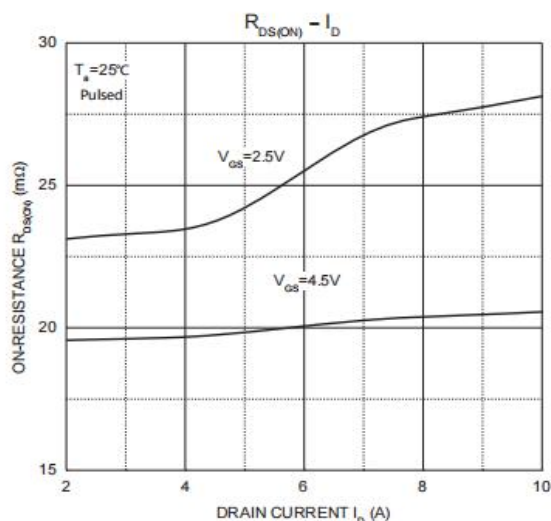
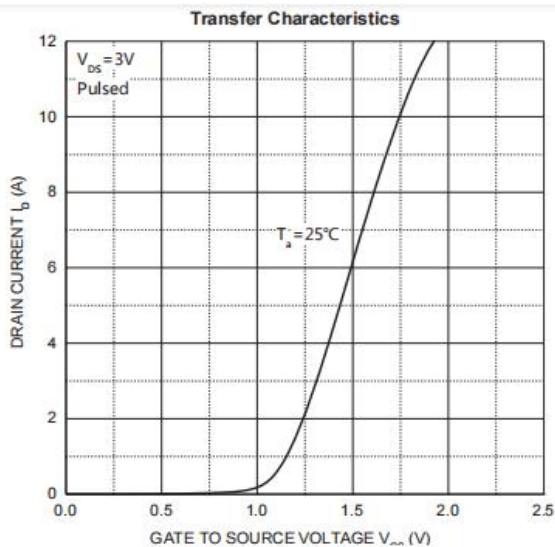
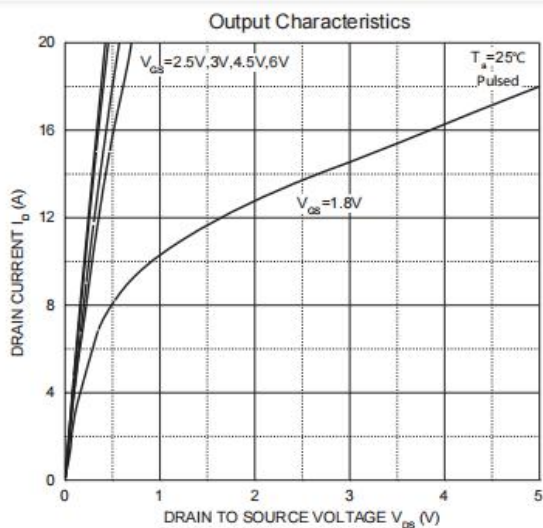
**MOSFET ELECTRICAL CHARACTERISTICS(T<sub>a</sub>=25°C unless otherwise noted)**

Parameter	Symbol	Test Condition	Min	Type	Max	Unit
<b>STATIC CHARACTERISTICS</b>						
Drain-source breakdown voltage	V <sub>(BR)DSS</sub>	V <sub>GS</sub> = 0V, I <sub>D</sub> = 250μA	20			V
Zero gate voltage drain current	I <sub>DSS</sub>	V <sub>DS</sub> = 20V, V <sub>GS</sub> = 0V			1	μA
Gate-body leakage current	I <sub>GSS</sub>	V <sub>GS</sub> = ±12V, V <sub>DS</sub> = 0V			±100	nA
Gate threshold voltage <sup>3</sup>	V <sub>GS(th)</sub>	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 250μA	0.4	0.7	1	V
Drain-source on-resistance <sup>3</sup>	R <sub>DS(on)</sub>	V <sub>GS</sub> = 4.5V, I <sub>D</sub> = 3A		18	27	mΩ
		V <sub>GS</sub> = 2.5V, I <sub>D</sub> = 2A		22	35	
		V <sub>GS</sub> = 1.8V, I <sub>D</sub> = 2A		44	62	
Forward tranconductance <sup>3</sup>	g <sub>FS</sub>	V <sub>DS</sub> = 10V, I <sub>D</sub> = 6A		5		S
<b>DYNAMIC CHARACTERISTICS</b>						
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> = 8V, V <sub>GS</sub> = 0V, f = 1MHz		523		pF
Output Capacitance	C <sub>oss</sub>			99		
Reverse Transfer Capacitance	C <sub>rss</sub>			75		
<b>SWITCHING CHARACTERISTICS</b>						
Turn-on delay time	t <sub>d(on)</sub>	V <sub>GS</sub> = 4.5V, V <sub>DS</sub> = 10V, I <sub>D</sub> = 1A, R <sub>GEN</sub> = 6Ω		10.5	21	ns
Turn-on rise time	t <sub>r</sub>			4.5	9	
Turn-off delay time	t <sub>d(off)</sub>			27.5	55	
Turn-off fall time	t <sub>f</sub>			4.3	8.6	
Total gate charge	Q <sub>g</sub>	V <sub>DS</sub> = 10V, V <sub>GS</sub> = 4.5V, I <sub>D</sub> = 6A		6.4	8.2	nC
Gate-source charge	Q <sub>gs</sub>			1.8	2.3	
Gate-drain charge	Q <sub>gd</sub>			1.3	1.9	
<b>SOURCE-DRAIN DIODE CHARACTERISTICS</b>						
Body Diode Voltage <sup>3</sup>	V <sub>SD</sub>	I <sub>S</sub> = 1.7A, V <sub>GS</sub> = 0V		0.8	1.2	V
Continuous Source-Drain Diode Current	I <sub>S</sub>	T <sub>C</sub> = 25°C			1.7	A

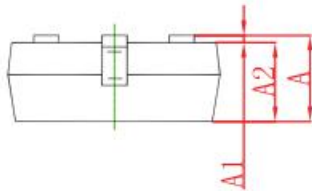
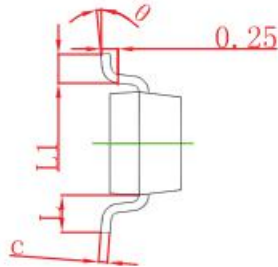
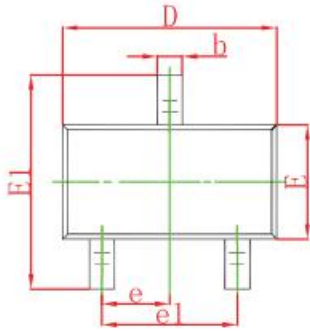
**Notes:**

1. The maximum current rating is limited by package.
2. Pulse Test : Pulse Width ≤ 10μs, duty cycle ≤ 1%.
3. Pulse Test : Pulse Width ≤ 300μs, duty cycle ≤ 2%.
4. The power dissipation P<sub>D</sub> is limited by T<sub>J(MAX)</sub> = 150°C.
5. Device mounted on 1in<sup>2</sup> FR-4 board with 2oz. Copper, in a still air environment with T<sub>A</sub> = 25°C.

**Typical Electrical and Thermal Characteristics**



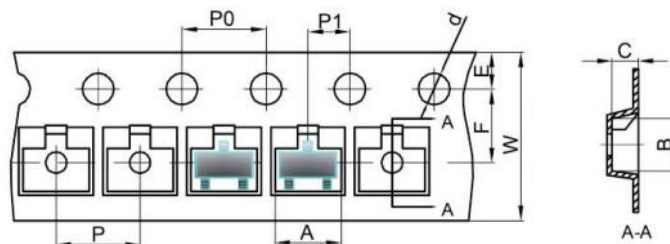
## SOT-23 Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	0.900	1.150	0.035	0.045
A1	0.000	0.100	0.000	0.004
A2	0.900	1.050	0.035	0.041
b	0.300	0.500	0.012	0.020
c	0.080	0.150	0.003	0.006
D	2.800	3.000	0.110	0.118
E	1.200	1.400	0.047	0.055
E1	2.250	2.550	0.089	0.100
e	0.950 TYP		0.037 TYP	
e1	1.800	2.000	0.071	0.079
L	0.550 REF		0.022 REF	
L1	0.300	0.500	0.012	0.020
$\theta$	0°	8°	0°	8°

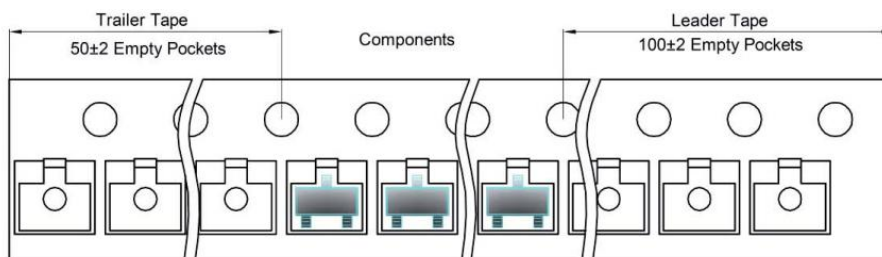
SOT-23 Tape and Reel

SOT-23 Embossed Carrier Tape

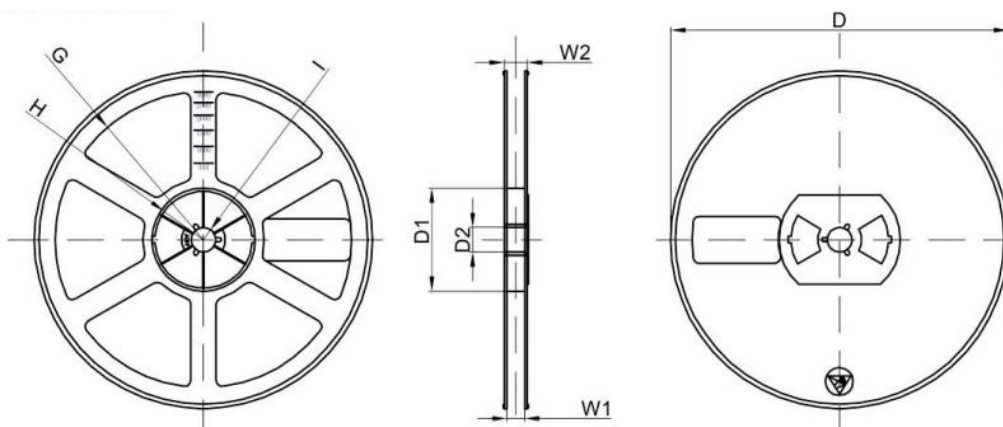


Dimensions are in millimeter										
Pkg type	A	B	C	d	E	F	P0	P	P1	W
SOT-23	3.15	2.77	1.22	Ø1.50	1.75	3.50	4.00	4.00	2.00	8.00

SOT-23 Tape Leader and Trailer



SOT-23 Reel



Dimensions are in millimeter								
Reel Option	D	D1	D2	G	H	I	W1	W2
7" Dia	Ø178.00	54.40	13.00	R78.00	R25.60	R6.50	9.50	12.30

REEL	Reel Size	Box	Box Size(mm)	Carton	Carton Size(mm)	G.W.(kg)
3000 pcs	7 inch	30,000 pcs	203×203×195	120,000 pcs	438×438×220	