

20V N-Channel MOSFET

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	I_D
20V	32m Ω @4.5V	4.5A
	40m Ω @2.5V	
	70m Ω @1.8V	

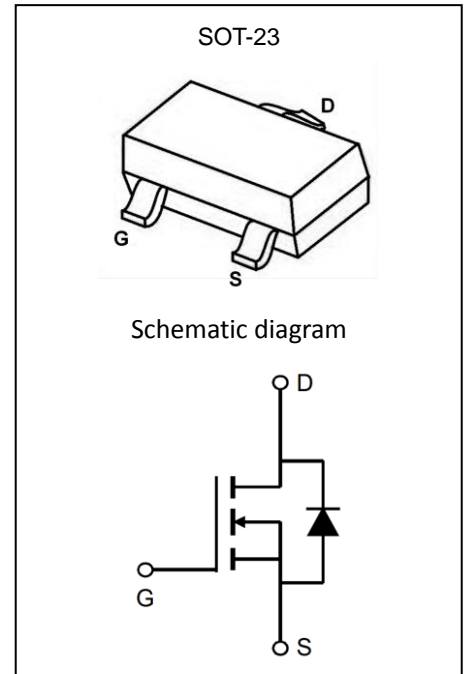
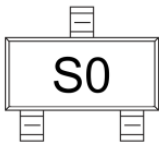
Feature

- TrenchFET Power MOSFET
- Excellent $R_{DS(on)}$ and Low Gate Charge
- AEC-Q101 qualified (Automotive grade with suffix "Q.")
- Exsemi technology

Application

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

MARKING:

ABSOLUTE MAXIMUM RATINGS ($T_a=25^\circ\text{C}$ unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	20	V
Gate-Source Voltage	V_{GS}	± 12	V
Continuous Drain Current	I_D	4.5	A
Pulsed Drain Current ⁽¹⁾	I_{DM}	18	A
Power Dissipation	P_D	0.35	W
Thermal Resistance from Junction to Ambient ⁽²⁾	$R_{\theta JA}$	357	$^\circ\text{C/W}$
Junction Temperature	T_J	150	$^\circ\text{C}$
Storage Temperature	T_{STG}	-55~ +150	$^\circ\text{C}$

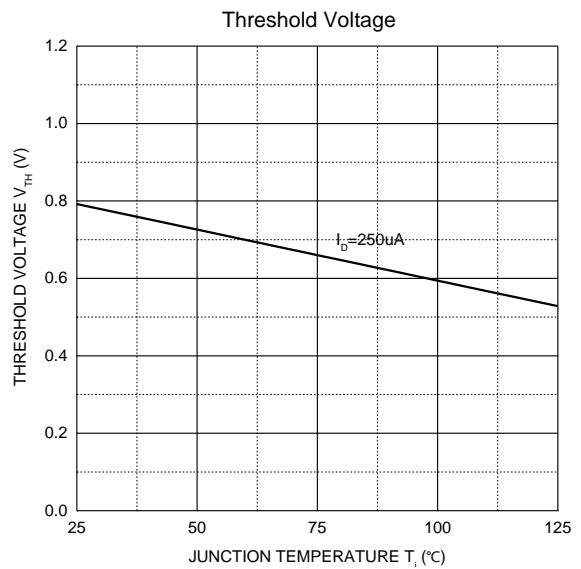
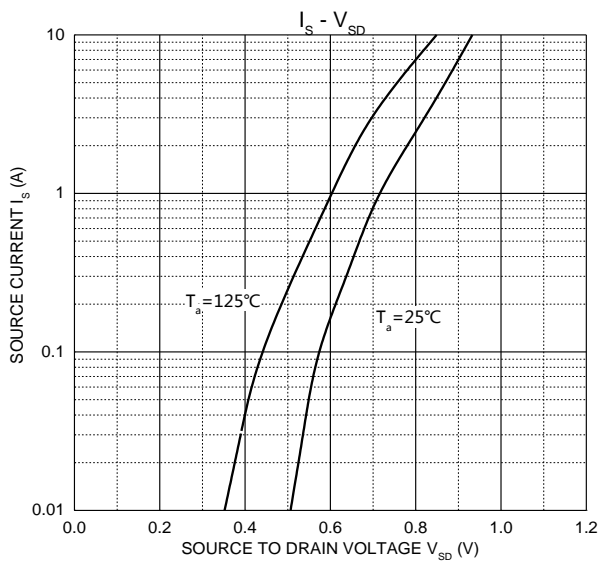
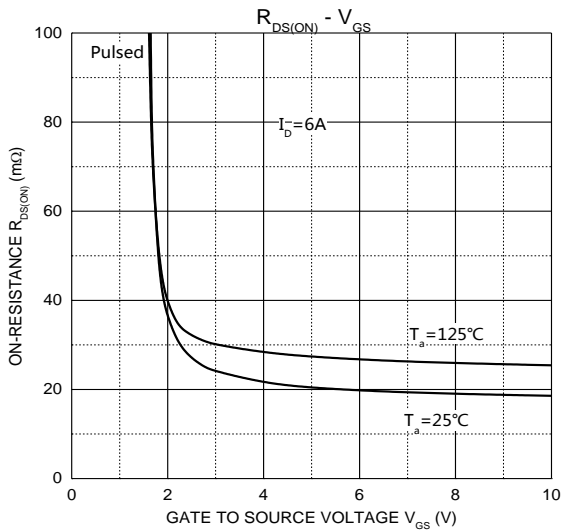
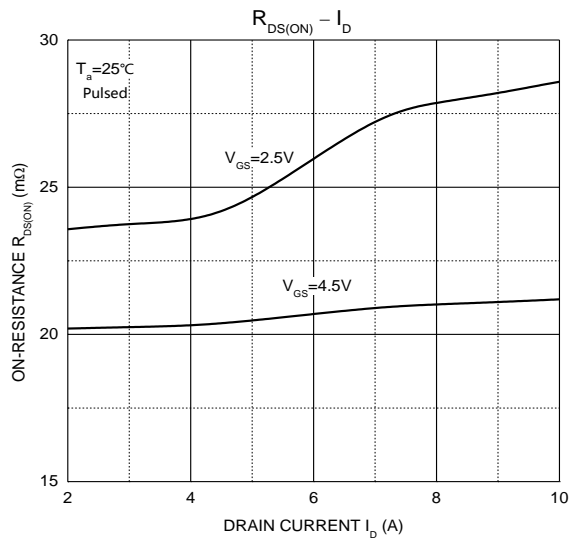
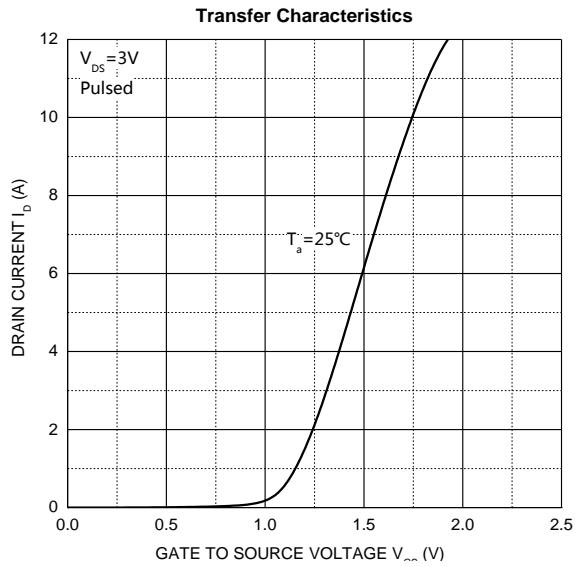
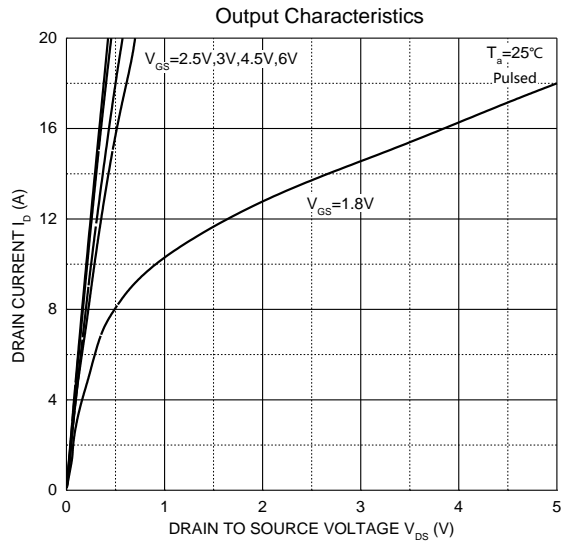
MOSFET ELECTRICAL CHARACTERISTICS($T_a=25^\circ\text{C}$ unless otherwise noted)

Parameter	Symbol	Test Condition	Min	Type	Max	Unit
STATIC CHARACTERISTICS						
Drain-source breakdown voltage	$V_{(BR)DSS}$	$V_{GS} = 0V, I_D = 250\mu A$	20			V
Zero gate voltage drain current	I_{DSS}	$V_{DS} = 20V, V_{GS} = 0V$			1	μA
Gate-body leakage current	I_{GSS}	$V_{GS} = \pm 12V, V_{DS} = 0V$			± 100	nA
Gate threshold voltage ⁽³⁾	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\mu A$	0.45	0.7	1	V
Drain-source on-resistance ⁽³⁾	$R_{DS(on)}$	$V_{GS} = 4.5V, I_D = 3A$		21	32	m Ω
		$V_{GS} = 2.5V, I_D = 2A$		27	40	
		$V_{GS} = 1.8V, I_D = 2A$		44	70	
Forward transconductance ⁽³⁾	g_{FS}	$V_{DS} = 10V, I_D = 6A$		5		S
DYNAMIC CHARACTERISTICS ⁽⁴⁾						
Input Capacitance	C_{iss}	$V_{DS} = 8V, V_{GS} = 0V, f = 1MHz$		523		pF
Output Capacitance	C_{oss}			99		
Reverse Transfer Capacitance	C_{rss}			75		
SWITCHING CHARACTERISTICS ⁽⁴⁾						
Turn-on delay time	$t_{d(on)}$	$V_{GS} = 4.5V, V_{DS} = 10V,$ $I_D = 1A, R_{GEN} = 6\Omega$		10.5	21	ns
Turn-on rise time	t_r			4.5	9	
Turn-off delay time	$t_{d(off)}$			27.5	55	
Turn-off fall time	t_f			4.3	8.6	
Total gate charge	Q_g	$V_{DS} = 10V, V_{GS} = 4.5V, I_D = 6A$		6.4	8.2	nC
Gate-source charge	Q_{gs}			1.8	2.3	
Gate-drain charge	Q_{gd}			1.3	1.9	
SOURCE-DRAIN DIODE CHARACTERISTICS						
Body Diode Voltage ⁽³⁾	V_{SD}	$I_S = 1.7A, V_{GS} = 0V$		0.8	1.2	V
Continuous Source-Drain Diode Current	I_S	$T_C = 25^\circ\text{C}$			1.7	A

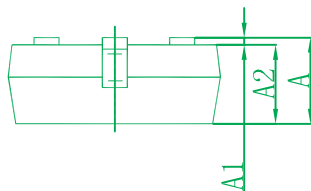
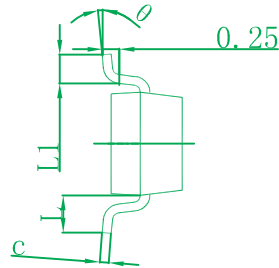
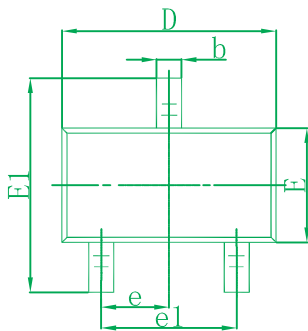
Notes:

1. Repetitive rating : Pulse width limited by junction temperature.
2. Surface mounted on FR4 board , $t \leq 10s$.
3. Pulse Test : Pulse Width $\leq 80\mu s$, Duty Cycle $\leq 0.5\%$.
4. Guaranteed by design, not subject to producing.

Typical Electrical and Thermal Characteristics

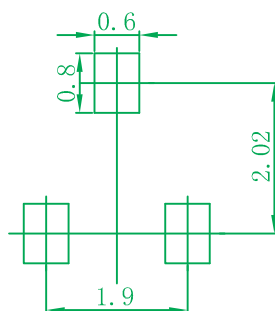


SOT-23 Package Information



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	1.150	0.035	0.045
b	0.300	0.500	0.012	0.020
c	0.080	0.150	0.003	0.006
D	2.800	3.050	0.110	0.120
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	0.360 REF		0.014 REF	
θ	0°	8°	0°	8°

SOT-23 Suggested Pad Layout



- Note:
1. Controlling dimension: in millimeters.
 2. General tolerance: ± 0.05 mm.
 3. The pad layout is for reference purposes only.

Ordering information

Device	Package	Shipping
EP2300	SOT-23	3000/Tape&Reel(7inches)