

20V P-Channel MOSFET

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	I_D
-20V	45mΩ@-4.5V	-4.1A
	70mΩ@-2.5V	

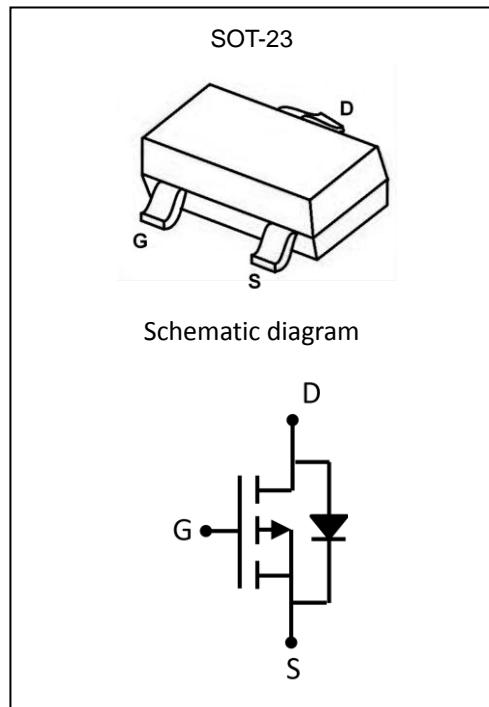
Feature

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

Application

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

MARKING: S5



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

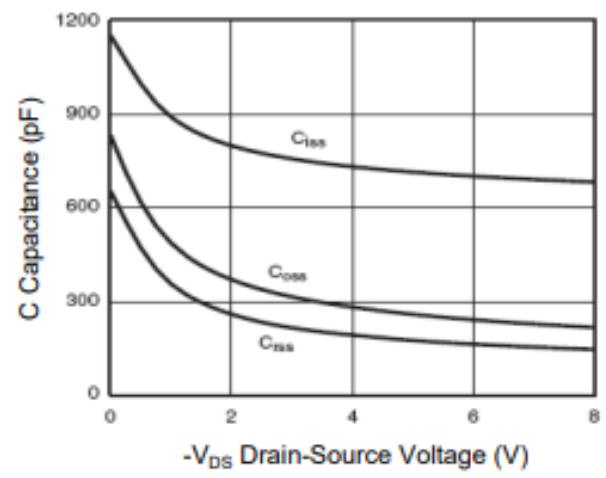
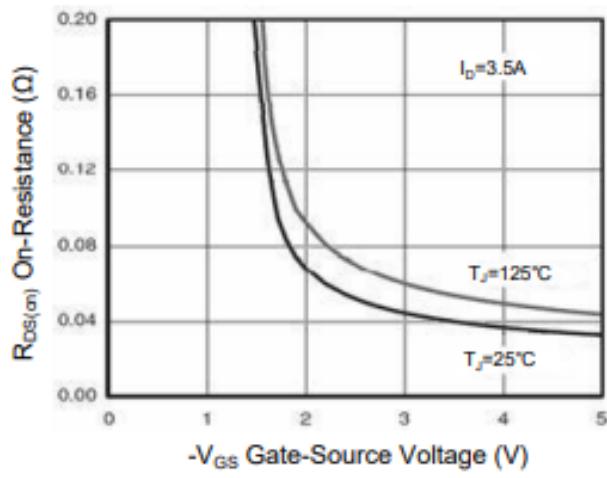
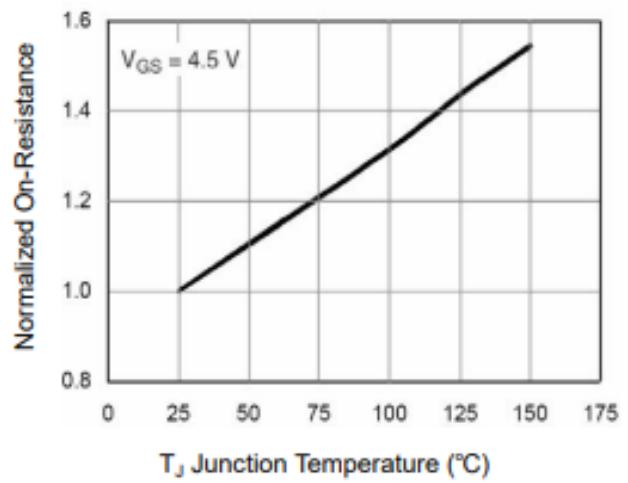
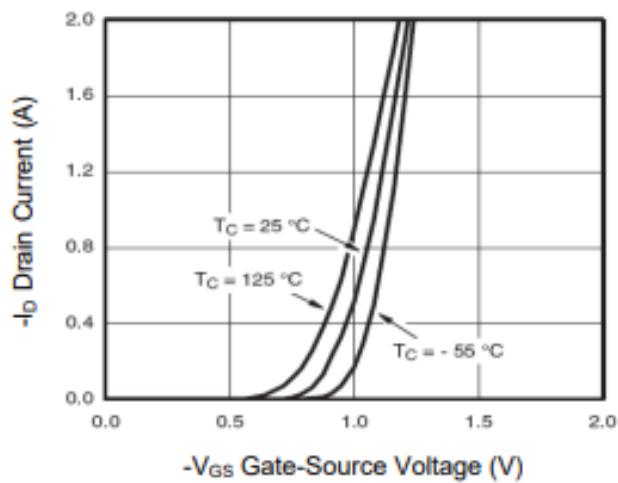
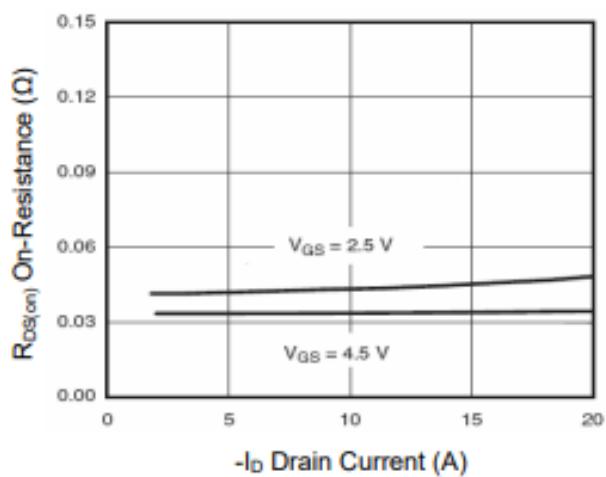
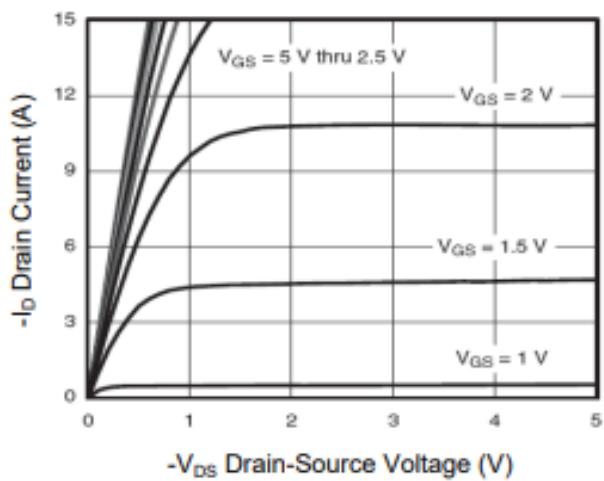
Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	-20	V
Gate-Source Voltage	V_{GS}	± 12	V
Continuous Drain Current	I_D	-4.1	A
Continuous Source-Drain Current	I_S	-4.1	A
Power Dissipation	P_D	0.9	W
Thermal Resistance from Junction to Ambient	$R_{\theta JA}$	139	°C/W
Junction Temperature	T_J	150	°C
Storage Temperature	T_{STG}	-55~+150	°C

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

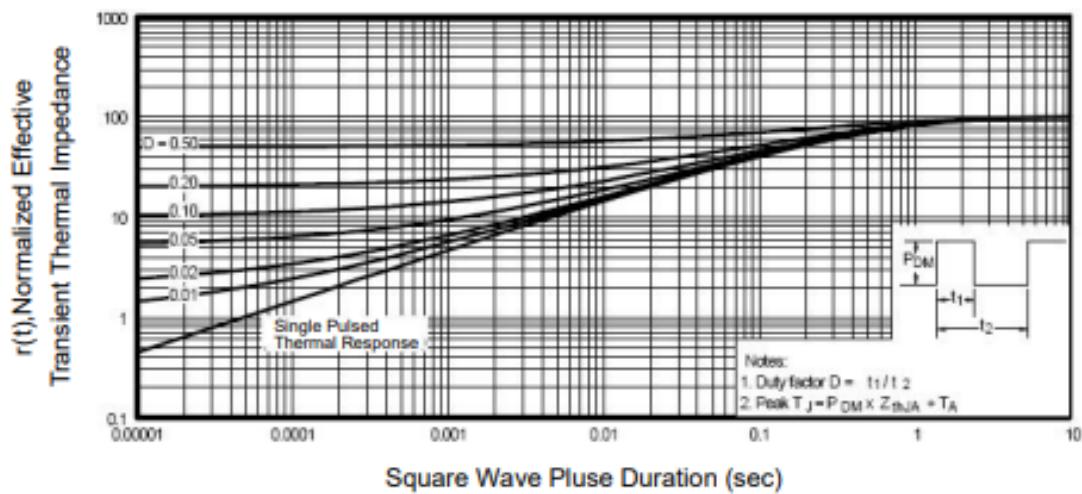
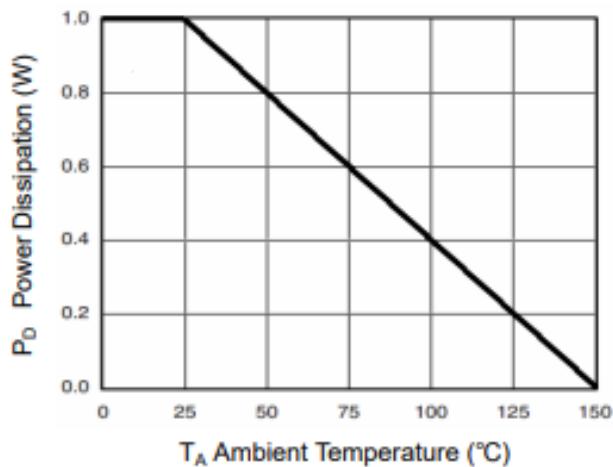
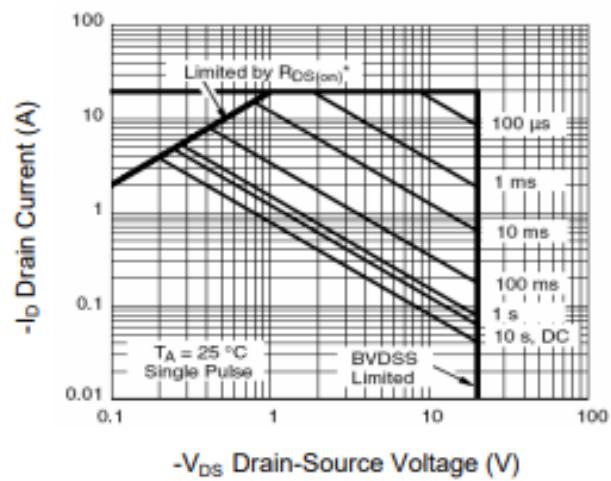
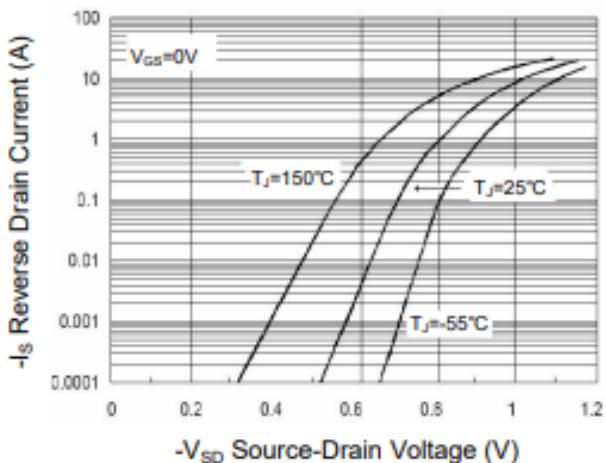
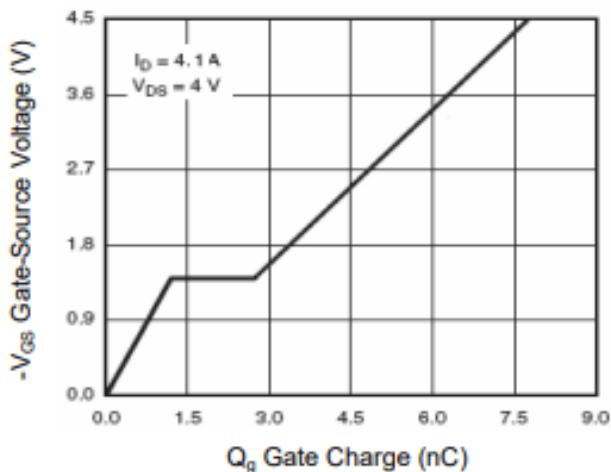
Parameter	Symbol	Test Condition	Min	Type	Max	Unit
Static Characteristics						
Drain-source breakdown voltage	$V_{(\text{BR})\text{DSS}}$	$V_{\text{GS}} = 0\text{V}, I_D = -250\mu\text{A}$	-20			V
Zero gate voltage drain current	I_{DSS}	$V_{\text{DS}} = -20\text{V}, V_{\text{GS}} = 0\text{V}$			-1	μA
Gate-body leakage current	I_{GSS}	$V_{\text{GS}} = \pm 12\text{V}, V_{\text{DS}} = 0\text{V}$			± 100	nA
Gate threshold voltage	$V_{\text{GS}(\text{th})}$	$V_{\text{DS}} = V_{\text{GS}}, I_D = -250\mu\text{A}$	-0.5	-0.7	-0.9	V
Drain-source on-resistance ^a	$R_{\text{DS}(\text{on})}$	$V_{\text{GS}} = -4.5\text{V}, I_D = -4.1\text{A}$		38	45	$\text{m}\Omega$
		$V_{\text{GS}} = -2.5\text{V}, I_D = -3\text{A}$		45	70	
Forward transconductance ^a	g_{FS}	$V_{\text{DS}} = -5\text{V}, I_D = -4.1\text{A}$		6		S
Dynamic characteristics^b						
Input Capacitance	C_{iss}	$V_{\text{DS}} = -4\text{V}, V_{\text{GS}} = 0\text{V}, f = 1\text{MHz}$		740		pF
Output Capacitance	C_{oss}			290		
Reverse Transfer Capacitance	C_{rss}			190		
Total Gate Charge	Q_g	$V_{\text{DS}} = -4\text{V}, V_{\text{GS}} = -4.5\text{V}, I_D = -4.1\text{A}$		7.8		nC
Gate-Source Charge	Q_{gs}			1.2		
Gate-Drain Charge	Q_{gd}			1.6		
Turn-on delay time	$t_{\text{d}(\text{on})}$	$V_{\text{DD}} = -4\text{V}, V_{\text{GS}} = -4.5\text{V}$ $R_L = 1.2\Omega, R_{\text{GEN}} = 1\Omega$		12		ns
Turn-on rise time	t_r			35		
Turn-off delay time	$t_{\text{d}(\text{off})}$			30		
Turn-off fall time	t_f			10		
Source-Drain Diode characteristics						
Diode Forward voltage	V_{SD}	$V_{\text{GS}} = 0\text{V}, I_S = -4.1\text{A}$			-1.2	V

Notes:

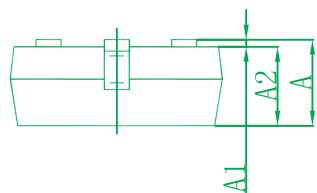
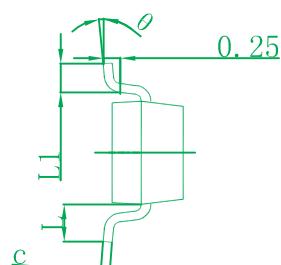
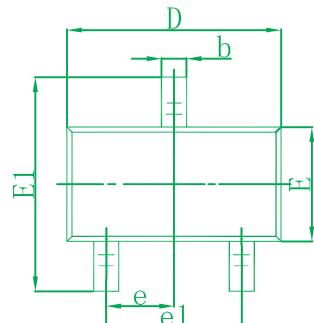
- a. Pulse Test : Pulse Width < 300 μs , Duty Cycle $\leq 2\%$.
 b. Guaranteed by design, not subject to production testing.

Typical Electrical and Thermal Characteristics


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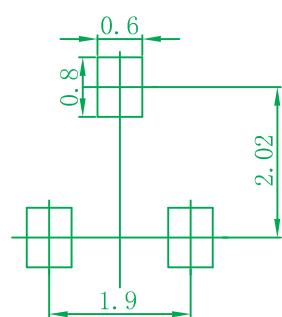


SOT-23 Package Information



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: $\pm 0.05\text{mm}$.
3. The pad layout is for reference purposes only.

Ordering information

Device	Package	Shipping
EP2305	SOT-23	3000/Tape&Reel(7inches)