

• Product Summary

Part #	V _{DS}	R _{DS(on)} .typ (@V _{GS} =4.5V)	R _{DS(on)} .typ (@V _{GS} =2.5V)	I _D
EFM2300A	20V	21mΩ	30mΩ	6A

• Features

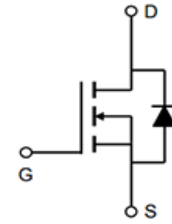
- Low R_{DS(on)} @V_{GS}=-4.5V
- 2.5V Logic Level Control
- N Channel SOT23-3L Package
- Pb-Free, RoHS Compliant

• Application

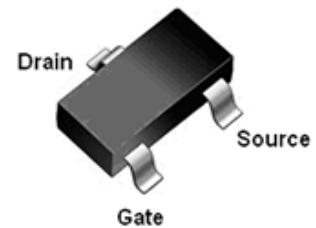
- Load Switch
- DC/DC Converter
- Switching Circuits
- Power Management

• Ordering Information:

Part NO.	EFM2300A
Marking	2300
Packing Information	REEL TAPE
Basic ordering unit (pcs)	3000



N-Channel MOSFET



SOT23-3L



• Absolute Maximum Ratings (T_C=25°C)

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V _{DS}	20	V
Gate-Source Voltage	V _{GS}	±12	V
Drain Current-Continuous	I _D	6	A
Drain Current-Pulsed ^(Note 1)	I _{DM}	24.8	A
Maximum Power Dissipation	P _D	1.56	W
Operating Junction and Storage Temperature Range	T _J , T _{STG}	-55 To 150	°C

• Thermal Characteristic

Thermal Resistance, Junction-to-Ambient ^(Note 2)	R _{θJA}	80	°C/W
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• Static Electrical Characteristics @ T_J = 25°C (unless otherwise stated)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Off Characteristics						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} =0V I _D =250uA	20	--	--	V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =16V V _{GS} =0V	--	--	1	nA
Gate-Body Leakage Current	I _{GSS}	V _{GS} =±12V V _{DS} =0V	--	--	±100	nA
On Characteristics ^(Note 3)						
Gate Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} I _D =250uA	0.45	0.6	1.0	V
Drain-Source On-State Resistance	R _{DS(ON)}	V _{GS} =4.5V I _D =6A	--	21	27	mΩ
		V _{GS} =2.5V I _D =5A	--	30	36	mΩ
Dynamic Characteristics ^(Note4)						
Input Capacitance	C _{ISS}	V _{DS} =10V V _{GS} =0V F=1.0MHz	--	457	--	PF
Output Capacitance	C _{OSS}		--	71	--	PF
Reverse Transfer Capacitance	C _{RSS}		--	68	--	PF
Gate Resistance	R _g	F=1.0MHz	--	7.8	--	Ω
Switching Characteristics ^(Note 4)						
Turn-on Delay Time	t _{d(on)}	V _{DD} =10V I _D =1A V _{GS} =4.5V R _G =3.3Ω,	--	4.1	--	nS
Turn-on Rise Time	t _r		--	11.6	--	nS
Turn-Off Delay Time	t _{d(off)}		--	24	--	nS
Turn-Off Fall Time	t _f		--	7.6	--	nS
Total Gate Charge	Q _g	V _{DS} =10V I _D =4A V _{GS} =4.5V	--	6.6	--	nC
Gate-Source Charge	Q _{gs}		--	0.4	--	nC
Gate-Drain Charge	Q _{gd}		--	2	--	nC
Drain-Source Diode Characteristics						
Diode Forward Voltage ^(Note 3)	V _{SD}	V _{GS} =0V I _S =4A	--	0.79	1.2	V
Diode Forward Current ^(Note 2)	I _S		--	--	2	A

Notes:

- ① Pulse width limited by maximum allowable junction temperature
 ② Pulse test ; Pulse width≤300μs, duty cycle≤2%.

• Typical Characteristics

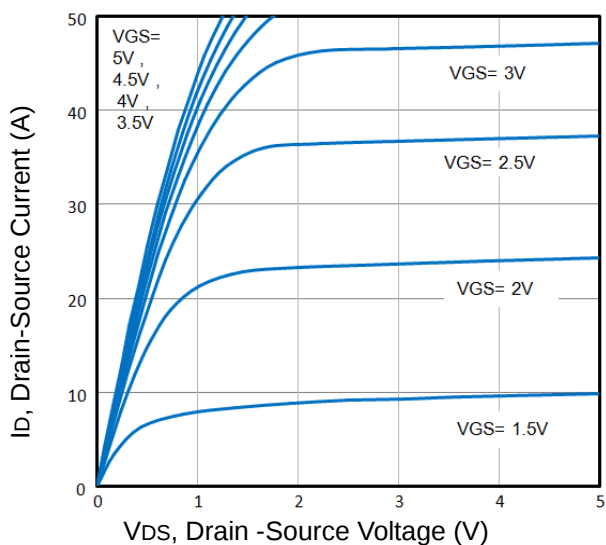


Fig1. Typical Output Characteristics

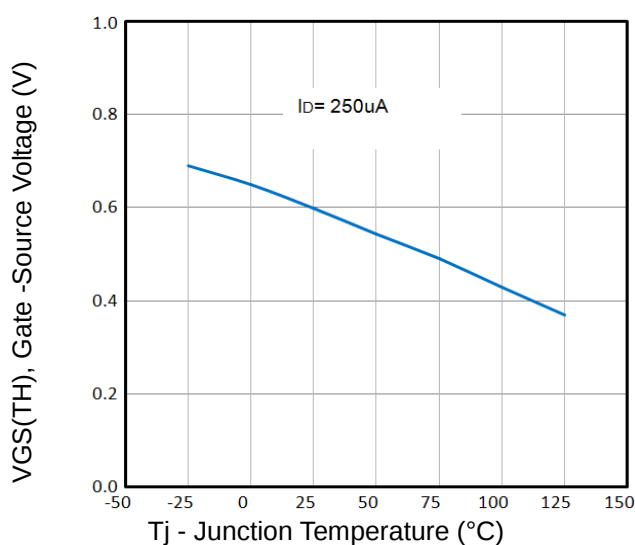


Fig2. VGS(TH) Voltage Vs. Temperature

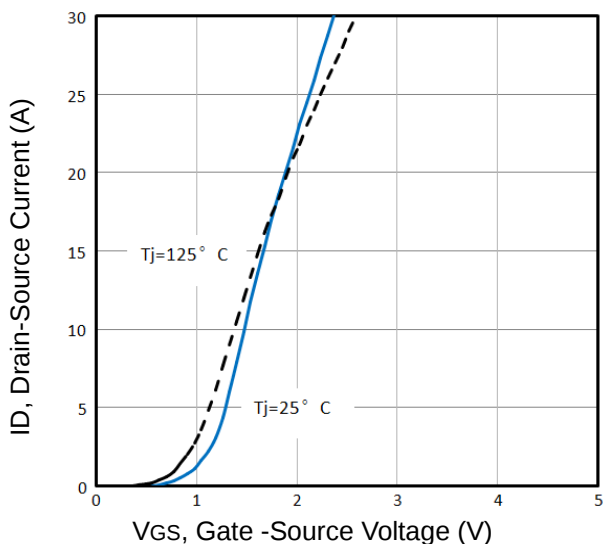


Fig3. Typical Transfer Characteristics

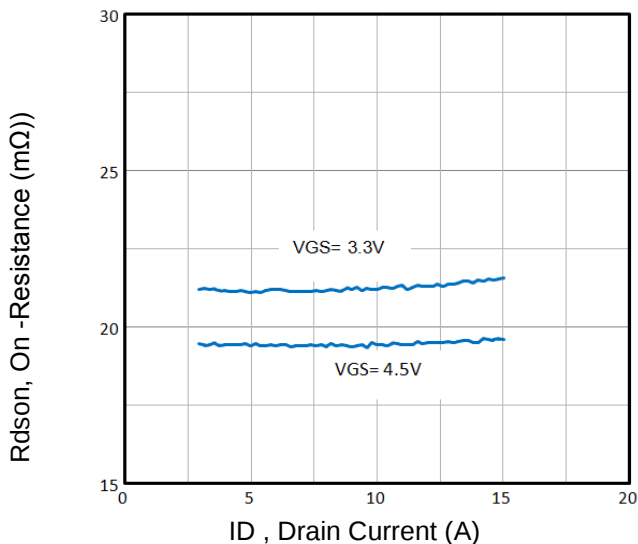


Fig4. On-Resistance vs. Drain Current and Gate

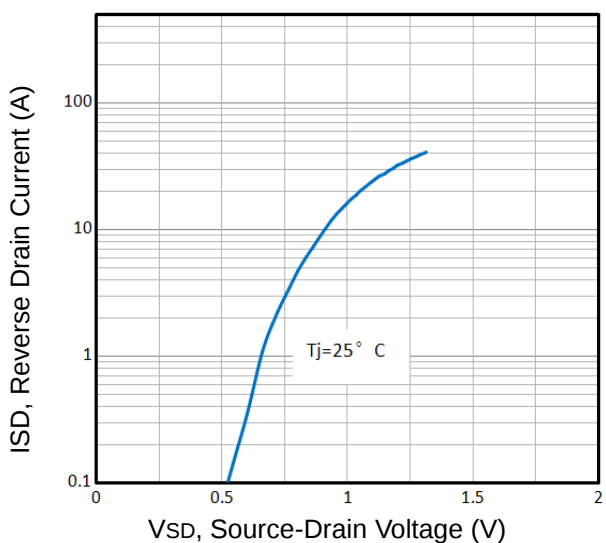


Fig5. Typical Source-Drain Diode Forward Voltage

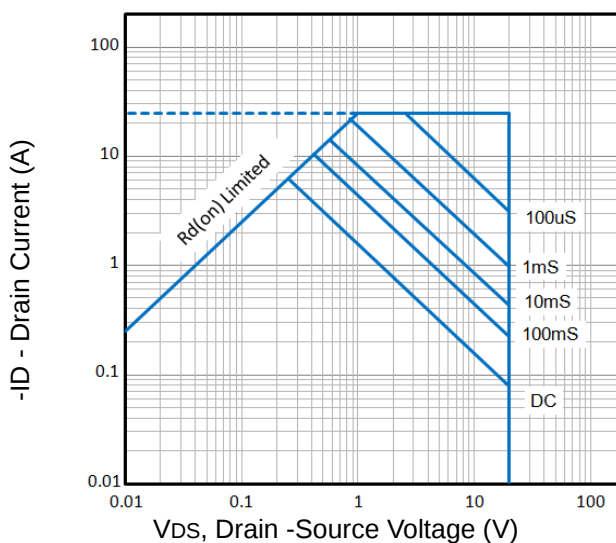


Fig6. Maximum Safe Operating Area

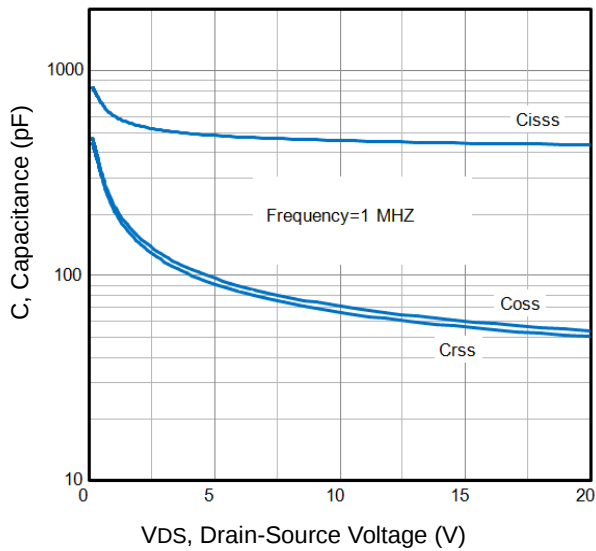


Fig7. Typical Capacitance Vs. Drain-Source Voltage

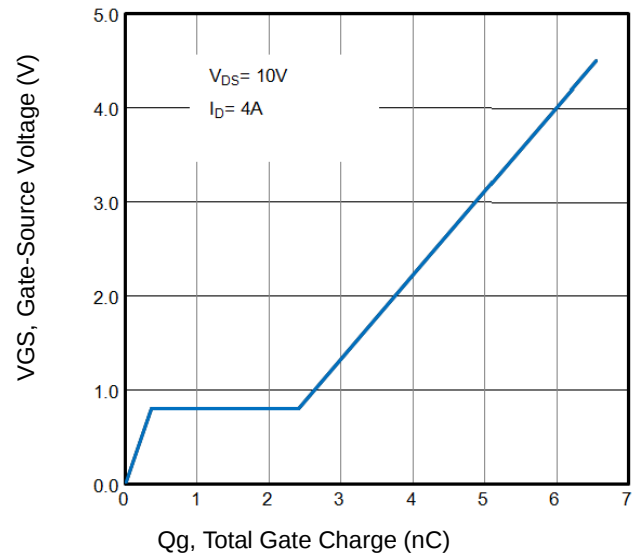


Fig8. Typical Gate Charge Vs. Gate-Source Voltage

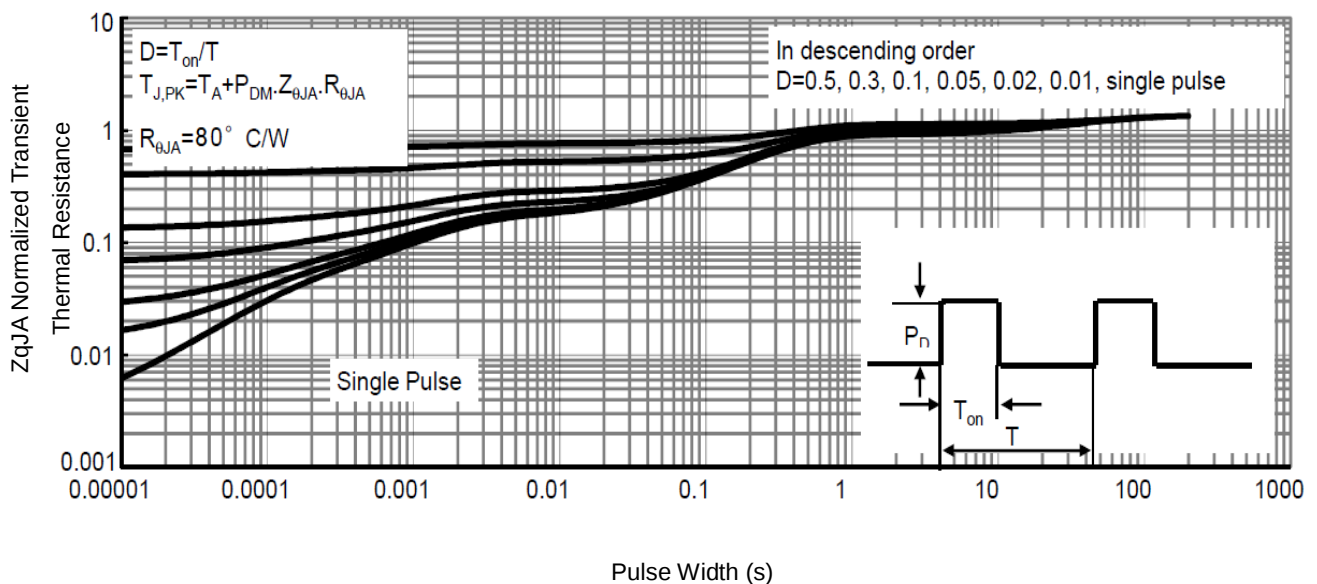


Fig9. Normalized Maximum Transient Thermal Impedance

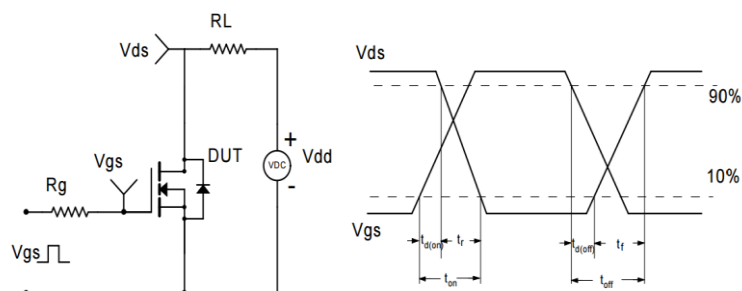
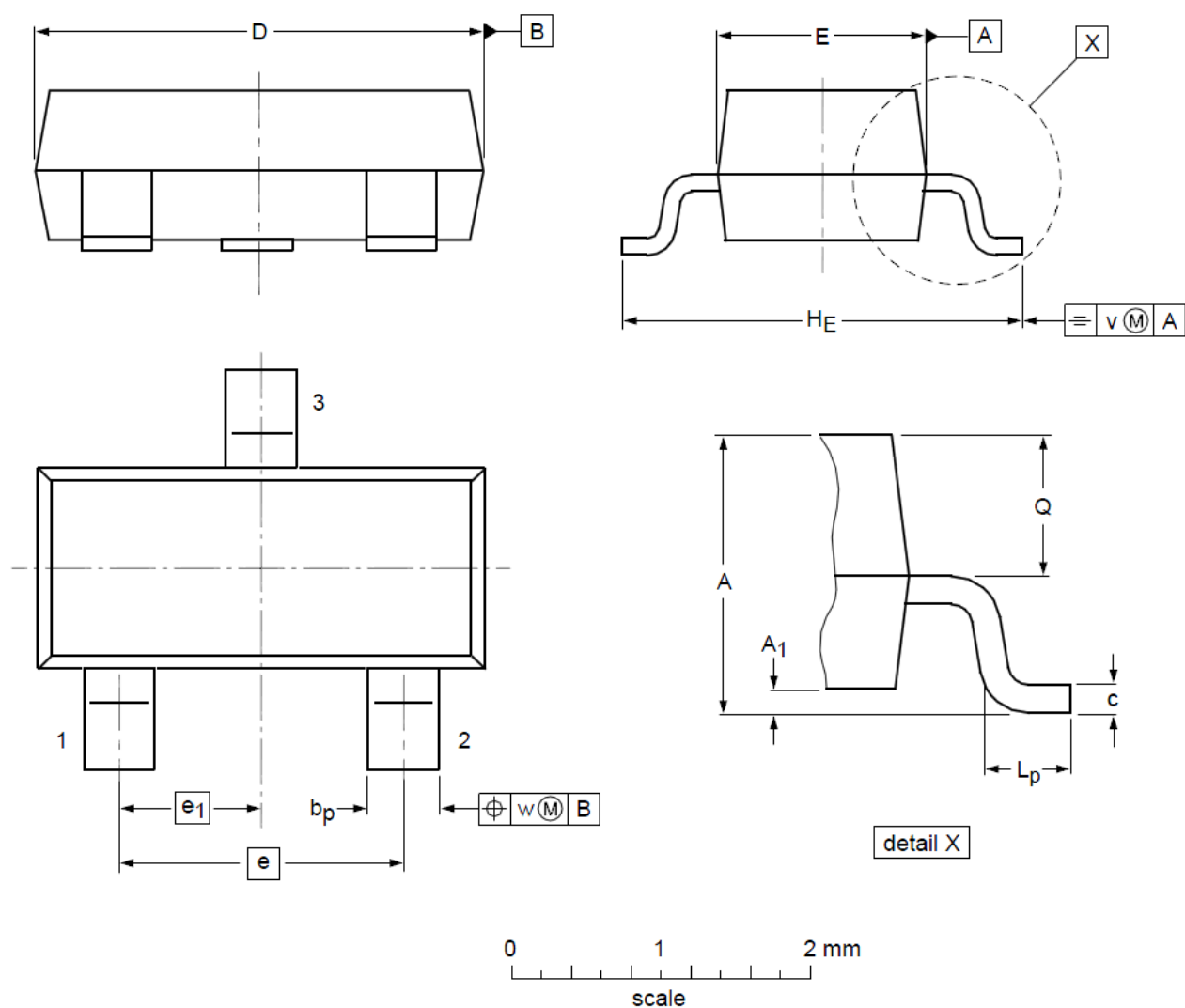


Fig10. Switching Time Test Circuit and waveforms

SOT23-3L Package Outline Dimensions



DIMENSIONS (unit : mm)

Symbol	Min	Typ	Max	Symbol	Min	Typ	Max
A	1.00	1.17	1.30	A ₁	0.01	0.05	0.10
b _p	0.35	0.39	0.50	c	0.10	0.20	0.26
D	2.70	2.90	3.10	E	1.30	1.58	1.70
e	--	1.90	--	e ₁	--	0.95	--
H _E	2.50	2.78	3.00	L _p	0.20	0.32	0.60
Q	0.23	0.27	0.33	v	--	0.20	--
w	--	0.20	--				