

Product Summary

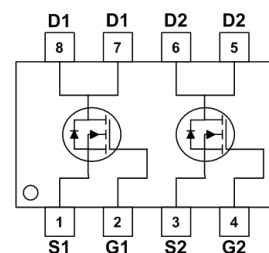
Part #	V_{DS}	$R_{DS(on).typ}$ (@ $V_{GS}=10V$)	$R_{DS(on).typ}$ (@ $V_{GS}=4.5V$)	I_D
EFM4812A	30V	15m Ω	21m Ω	8.5A

Description

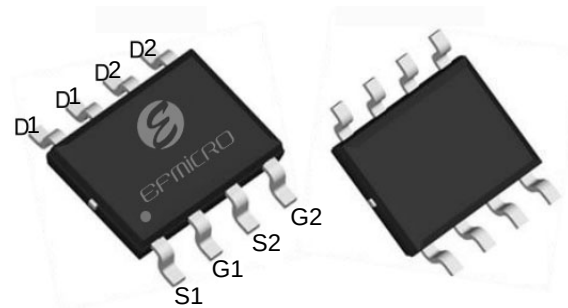
- The EFM4812A is the high cell density trench
- Dual N-ch MOSFETs which provide excellent
- RDSON and gate charge for most of the
- synchronous buck converter applications.
- The EFM4812A meet the RoHS and Green
- Product requirement, 100 % EAS guaranteed
- with full function reliability approved.

Application

- Super Low Gate Charge 100% EAS Guaranteed
- Green Device Available Excellent CdV/dt effect decline
- Advanced high cell density Trench technology



Dual N-Channel MOSFET



SOP - 8

Ordering Information:

Part NO.	EFM4812A
Marking	4812 *****
Packing Information	REEL TAPE
Basic ordering unit (pcs)	3000

Absolute Maximum Ratings ($T_C=25^{\circ}C$)

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DS}	30	V
Gate-Source Voltage	V_{GS}	± 20	V
Drain Current-Continuous	I_D	8.5	A
Drain Current-Pulsed ^(Note 1)	I_{DM}	37	A
Maximum Power Dissipation	P_D	1.5	W
Operating Junction and Storage Temperature Range	T_J, T_{STG}	-55 To 150	$^{\circ}C$

Thermal Characteristic

Thermal Resistance, Junction-to-Ambient ^(Note 2)	$R_{\theta JA}$	85	$^{\circ}C/W$
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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	30	--	--	V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =30V V _{GS} =0V	--	--	1	μA
Gate-Body Leakage Current	I _{GSS}	V _{GS} =±20V V _{DS} =0V	--	--	±100	nA
On Characteristics ^(Note 3)						
Gate Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} I _D =250uA	1.2	--	2.5	V
Drain-Source On-State Resistance	R _{DS(ON)}	V _{GS} =10V I _D =8A	--	15	18	mΩ
		V _{GS} =4.5V I _D =6A	--	21	26	mΩ
Forward Transconductance	g _{FS}	V _{DS} =5V I _D =8A	--	30	--	S
Gate Resistance	R _g	F=1.0MHz	--	2.5	--	Ω
Dynamic Characteristics ^(Note4)						
Input Capacitance	C _{Iss}	V _{DS} =15V V _{GS} =0V F=1.0MHz	--	740	--	PF
Output Capacitance	C _{Oss}		--	110	--	PF
Reverse Transfer Capacitance	C _{rss}		--	82	--	PF
Switching Characteristics ^(Note 4)						
Turn-on Delay Time	t _{d(on)}	V _{DD} =15V I _D =8A V _{GS} =10V R _G =3.3Ω,	--	2.4	--	nS
Turn-on Rise Time	t _r		--	7.8	--	nS
Turn-Off Delay Time	t _{d(off)}		--	22	--	nS
Turn-Off Fall Time	t _f		--	4	--	nS
Total Gate Charge	Q _g	V _{DS} =15V I _D =-8A V _{GS} =10V	--	6	--	nC
Gate-Source Charge	Q _{gs}		--	2.5	--	nC
Gate-Drain Charge	Q _{gd}		--	2.1	--	nC
Drain-Source Diode Characteristics						
Diode Forward Voltage ^(Note 3)	V _{SD}	V _{GS} =0V I _S =8A	--	0.85	1.2	V
Diode Forward Current ^(Note 2)	I _S		--	--	8	A

Note :

- 1.The data tested by surface mounted on a 1 inch² FR-4 board with 2OZ copper.
- 2.The data tested by pulsed , pulse width ≤ 300us , duty cycle ≤ 2%
- 3.The EAS data shows Max. rating . The test condition is V_{DD}=25V,V_{GS}=10V,L=0.1mH,I_{AS}=21A
- 4.The power dissipation is limited by 150°C junction temperature
- 5.The data is theoretically the same as I_D and I_{DM} , in real applications , should be limited by total power dissipation.

• Typical Characteristics

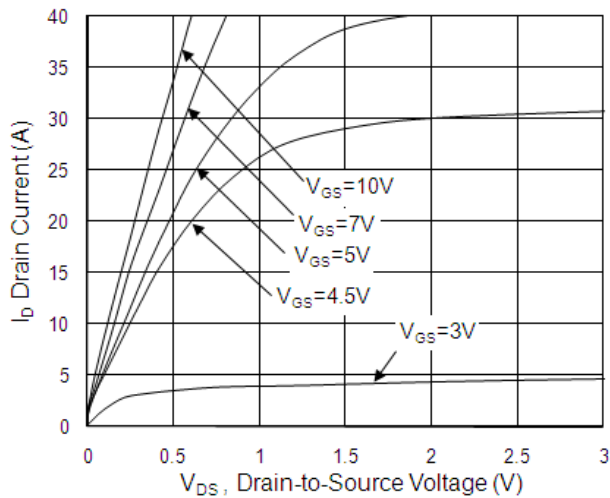


Fig.1 Typical Output Characteristics

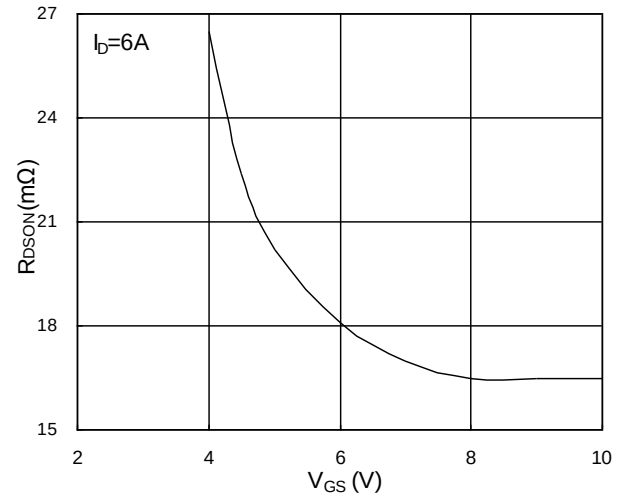


Fig.2 On-Resistance vs. G-S Voltage

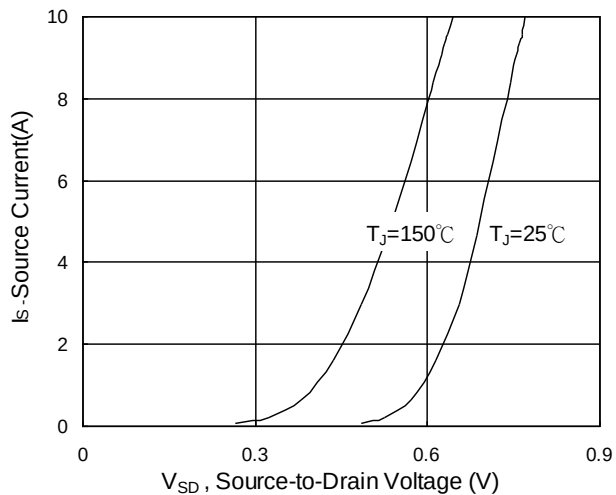


Fig.3 Forward Characteristics Of Reverse

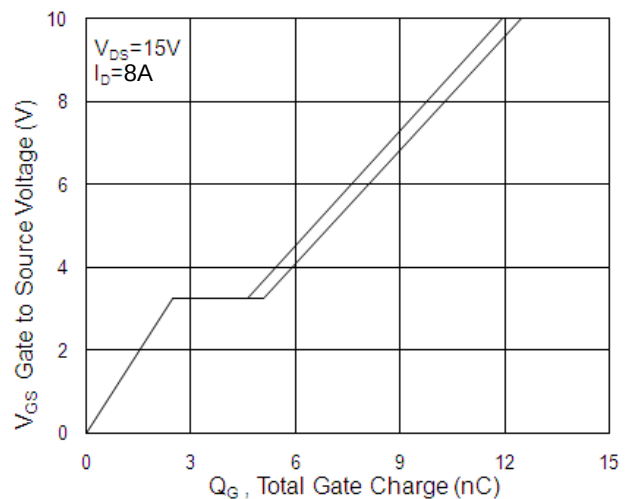


Fig.4 Gate-Charge Characteristics

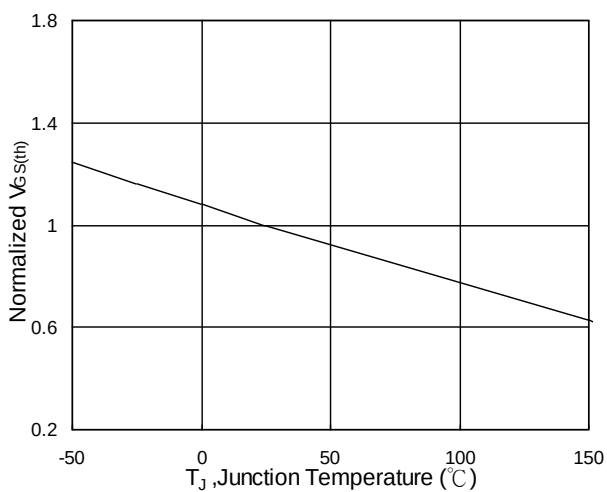


Fig.5 Normalized $V_{GS(th)}$ vs. T_J

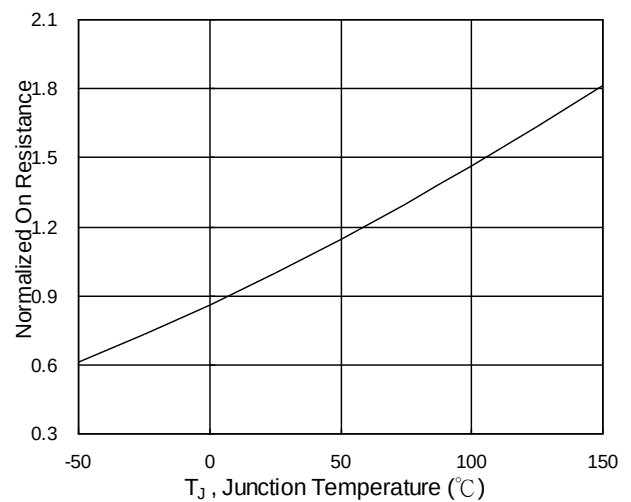


Fig.6 Normalized $R_{DS(on)}$ vs. T_J

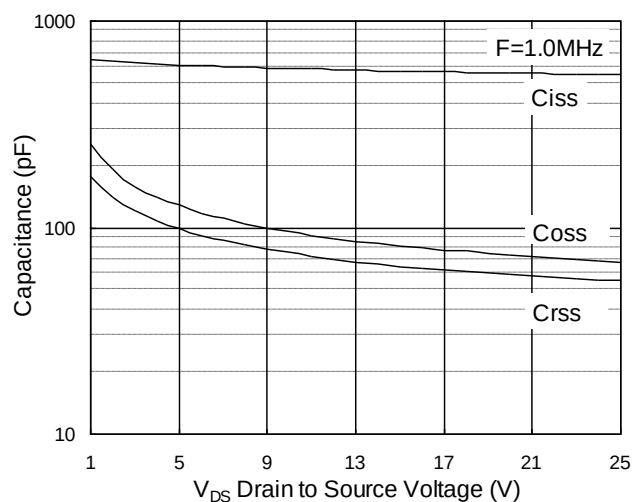


Fig.7 Capacitance

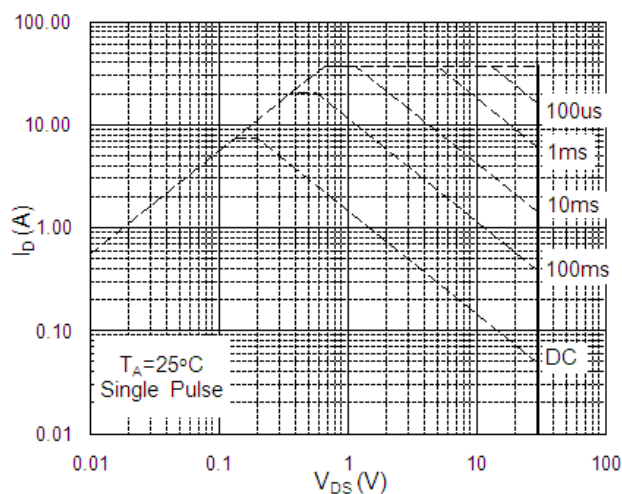


Fig.8 Safe Operating Area

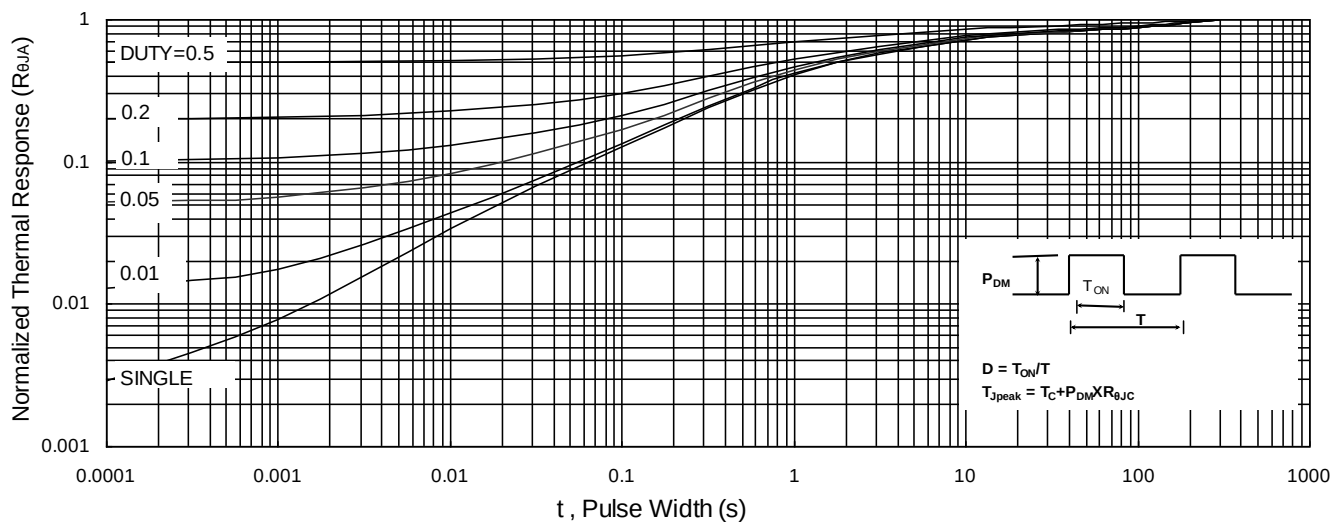


Fig.9 Normalized Maximum Transient Thermal Impedance

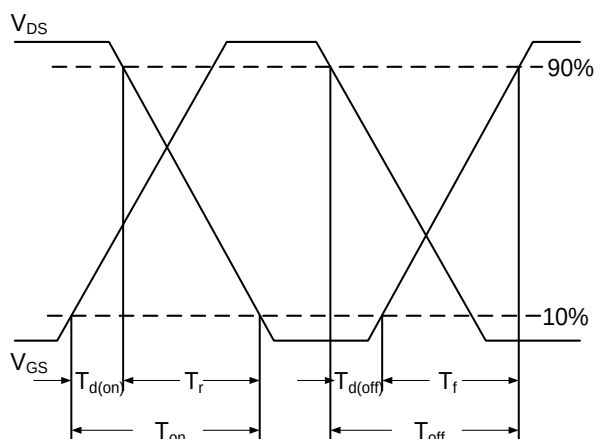


Fig.10 Switching Time Waveform

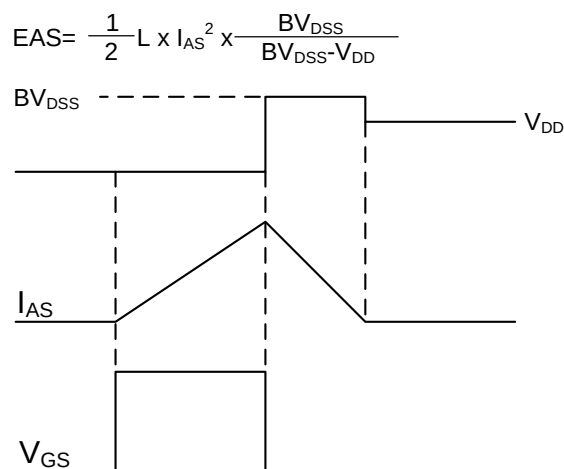
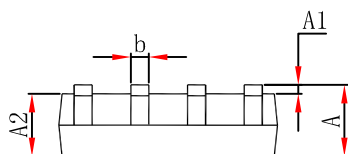
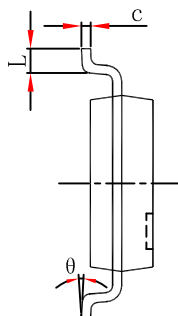
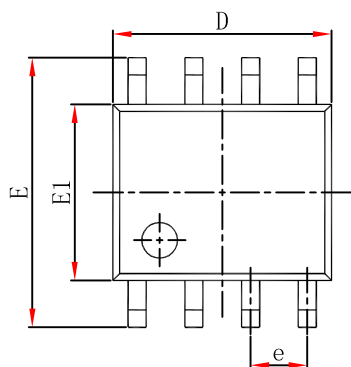
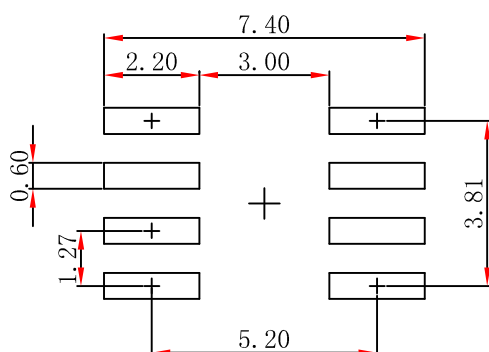


Fig.11 Unclamped Inductive Switching Waveform

SOP8 Package Outline Dimensions



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.450	1.750	0.053	0.069
A1	0.100	0.250	0.004	0.010
A2	1.350	1.550	0.053	0.061
b	0.330	0.510	0.013	0.020
c	0.170	0.250	0.007	0.010
D	4.700	5.100	0.185	0.201
e	1.270 (BSC)		0.050 (BSC)	
E	5.800	6.200	0.228	0.244
E1	3.800	4.000	0.150	0.157
L	0.400	1.270	0.016	0.050
θ	0°	8°	0°	8°



Note:

1. Controlling dimension: in millimeters.
2. General tolerance: $\pm 0.05\text{mm}$.
3. The pad layout is for reference purposes only.