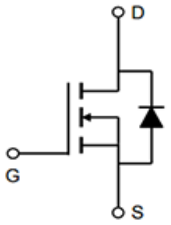
EFMICRO
Semiconductor Limited Company

EFM3400R

N-Channel Advanced Power MOSFET

• Product Summary

Part #	V_{DS}	$R_{DS(on).typ}$ ($@V_{GS}$=10V)	$R_{DS(on).typ}$ ($@V_{GS}$=4.5V)	I_D
EFM3400R	30V	20mΩ	25mΩ	6A



N-Channel MOSFET

• Features

- *Low $R_{DS(on)}$ @V_{GS}=10V*
- *4.5V Logic Level Control*
- *N Channel SOT89-3L Package*
- *Pb−Free, RoHS Compliant*

SOT-89-3L

RoHS

HF

•Application

- Charging switch for portable devices
- Small brushless DC motor drive
- Load Switch for PWM
- DC-to-DC converters

•Ordering Information:

Part NO.	EFM3400R
Marking	3400
Packing Information	REEL TAPE
Basic ordering unit (pcs)	1000

•Absolute Maximum Ratings (T_C=25℃)

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DS}	30	V
Gate-Source Voltage	V_{GS}	±12	V
Drain Current-Continuous	I_D	6	A
Drain Current-Pulsed (Note 1)	I_{DM}	23	A
Maximum Power Dissipation	P_D	2.5	W
Operating Junction and Storage Temperature Range	T_J,T_{STG}	-55 To 150	℃

•Thermal Characteristic

Thermal Resistance,Junction-to-Ambient (Note 2)	$R_{\theta JA}$	100	℃/W

● 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}=±12V V_{DS}=0V	--	--	±100	nA
On Characteristics (Note 3)						
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS} I_D=250uA	0.4	0.8	1.5	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	V_{GS}=10V I_D=5.8A	--	20	26	mΩ
		V_{GS}=4.5V I_D=5A	--	25	33	mΩ
Dynamic Characteristics (Note4)						
Input Capacitance	C_{lss}	V_{DS}=15V V_{GS}=0V F=1.0MHz	--	650	--	PF
Output Capacitance	C_{oss}		--	54	--	PF
Reverse Transfer Capacitance	C_{rss}		--	47	--	PF
Switching Characteristics (Note 4)						
Turn-on Delay Time	$t_{d(on)}$	V_{DD}=15V I_D=5A V_{GS}=4.5V R_G=3.3Ω,	--	7.5	--	nS
Turn-on Rise Time	t_r		--	18	--	nS
Turn-Off Delay Time	$t_{d(off)}$		--	36	--	nS
Turn-Off Fall Time	t_f		--	5	--	nS
Total Gate Charge	Q_g	V_{DS}=15V I_D=5A V_{GS}=4.5V	--	6.2	--	nC
Gate-Source Charge	Q_{gs}		--	1.2	--	nC
Gate-Drain Charge	Q_{gd}		--	1.9	--	nC
Drain-Source Diode Characteristics						
Diode Forward Voltage (Note 3)	V_{SD}	V_{GS}=0V I_S=2A	--	0.83	1.2	V
Diode Forward Current (Note 2)	I_S		--	--	1.5	A

Notes:

① Pulse width limited by maximum allowable junction temperature

②Pulse test ; Pulse width≤300μs, duty cycle≤2%.

• Typical Characteristics

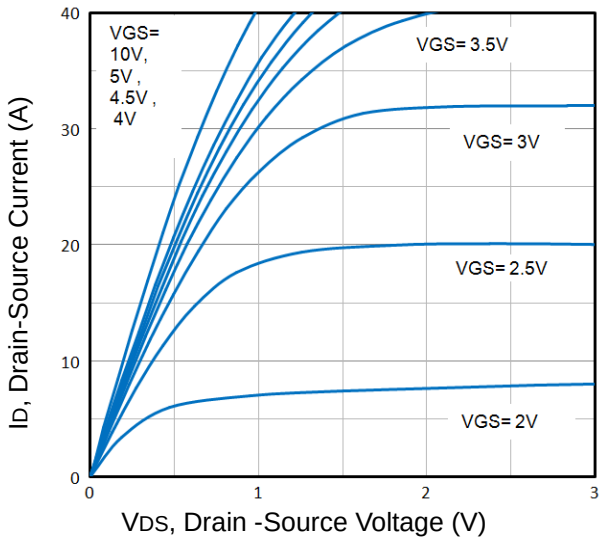


Fig1. Typical Output Characteristics

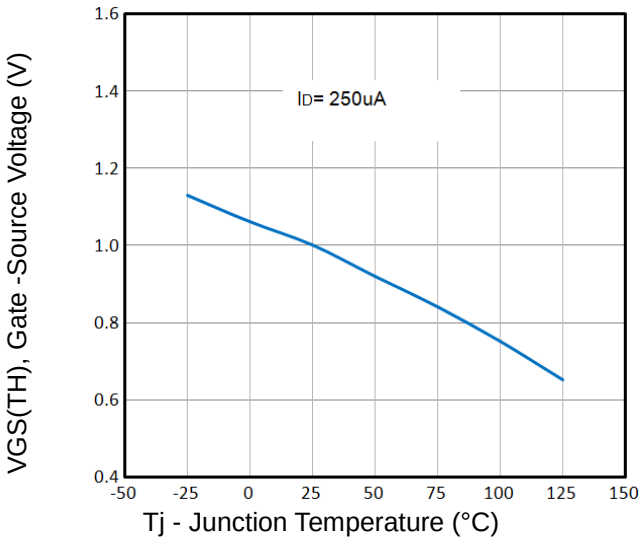


Fig2. Normalized Threshold Voltage Vs. Temperature

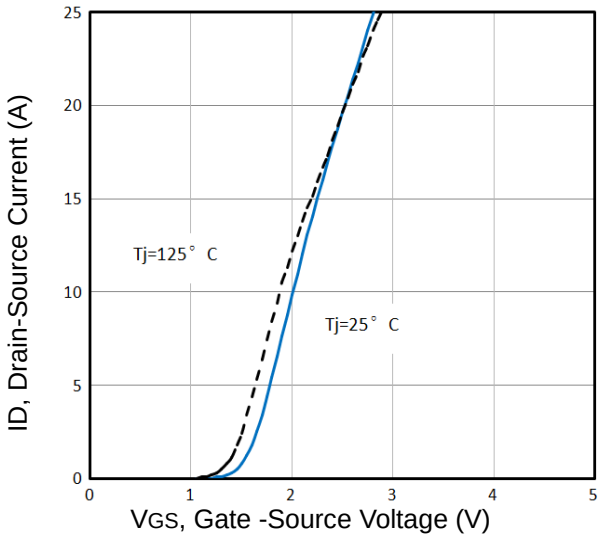


Fig3. Typical Transfer Characteristics

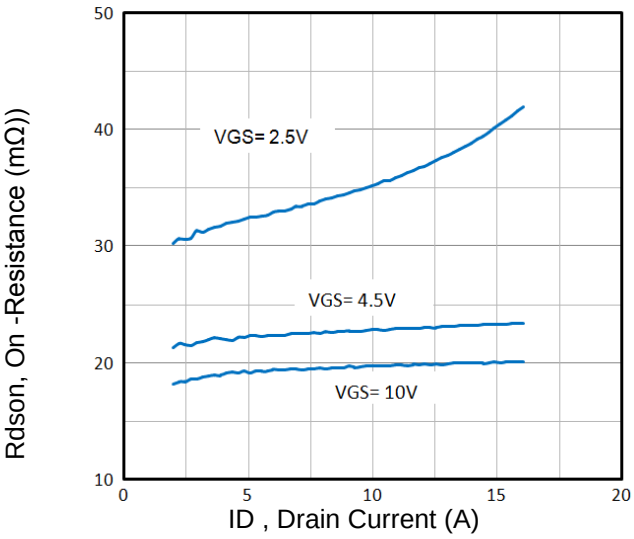


Fig4. On-Resistance vs. Drain Current and VGS

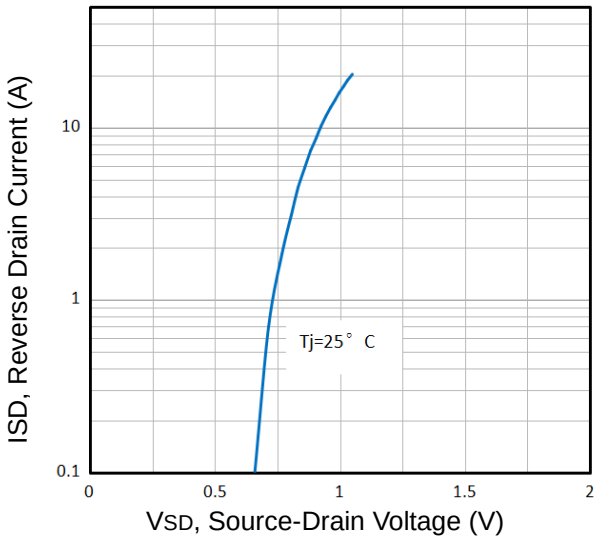


Fig5. Typical Source-Drain Diode Forward Voltage

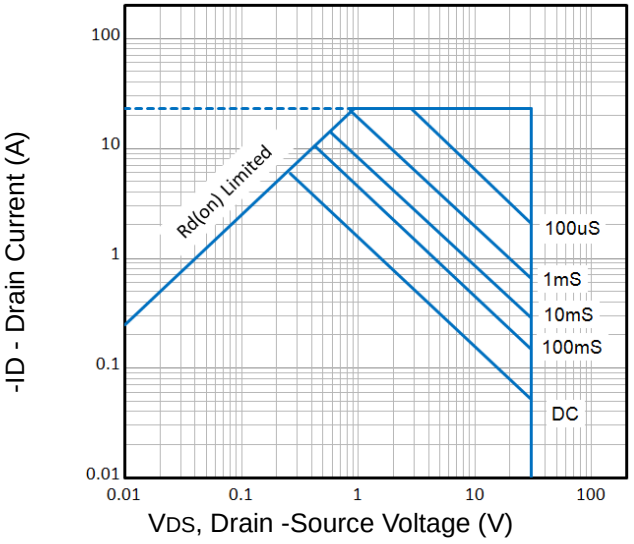


Fig6. Maximum Safe Operating Area

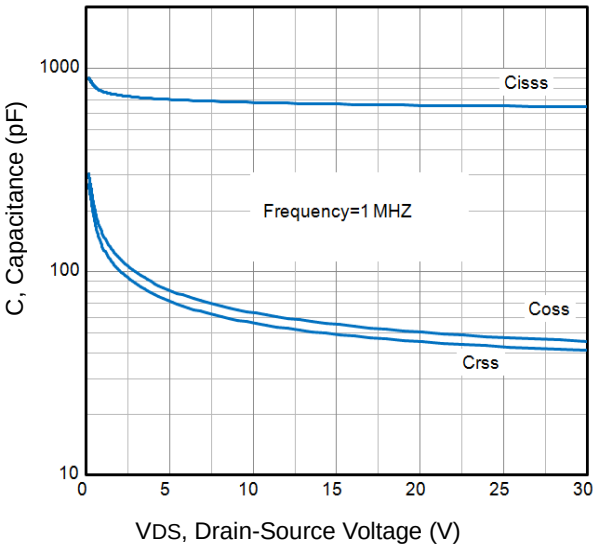


Fig7. Typical Capacitance Vs. Drain-Source Voltage

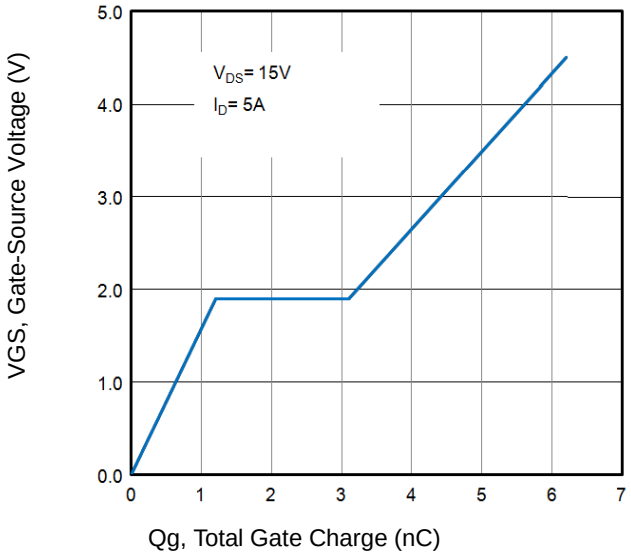


Fig8. Typical Gate Charge Vs. Gate-Source Voltage

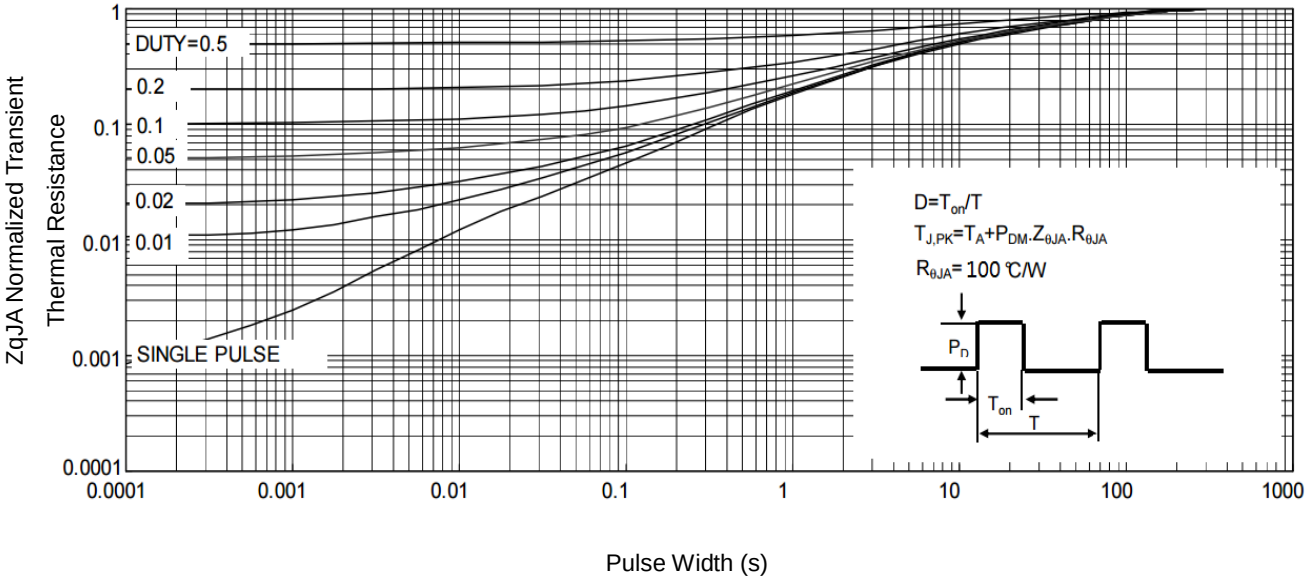


Fig9. Normalized Maximum Transient Thermal Impedance

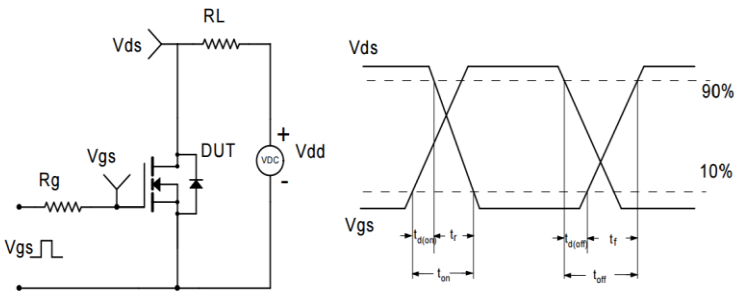
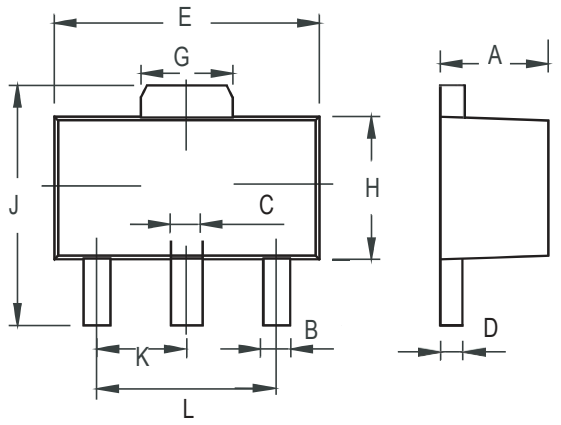


Fig10. Switching Time Test Circuit and waveforms

SOT-89-3L Package Outline Dimensions

unit:mm



SOT-89		
Dim	Min	Max
A	1.400	1.600
B	0.320	0.520
C	0.360	0.560
D	0.350	0.440
E	4.400	4.600
G	1.400	1.800
H	2.300	2.600
J	3.940	4.250
K	1.500TYP	
L	2.900	3.100