

• Product Summary

Part #	V _{DS}	R _{DS(on)} .typ (@V _{GS} =4.5V)	R _{DS(on)} .typ (@V _{GS} =2.5V)	I _D
EFM450P02R	-20V	45mΩ	52mΩ	-5A

• Features

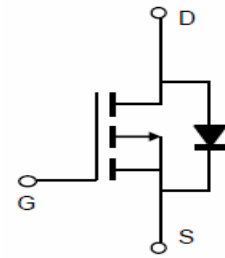
- Low R_{DS(on)} @V_{GS}=-4.5V
- -2.5V Logic Level Control
- PChannelSOT89 Package
- Pb-Free, RoHS Compliant

• Application

- High-side Load Switch
- Switching Circuits
- High Speed line Driver

• Ordering Information:

Part NO.	EFM450P02R
Marking	450P02R
Packing Information	REEL TAPE
Basic ordering unit (pcs)	1000



P-Channel MOSFET



SOT-89-3L



• 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	-5	A
Drain Current-Pulsed ^(Note 1)	I _{DM}	-15	A
Maximum Power Dissipation	P _D	1.2	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}	100	°C/W
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• Static Electrical Characteristics @ $T_J = 25^{\circ}\text{C}$ (unless otherwise stated)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Off Characteristics						
Drain-Source Breakdown Voltage	BV_{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
On Characteristics (Note 3)						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}$ $I_D=250\mu A$	-0.4	-0.6	-1.0	V
Drain-Source On-State Resistance	$R_{DS(on)}$	$V_{GS}=4.5V$ $I_D=-5A$	--	45	50	m Ω
		$V_{GS}=2.5V$ $I_D=-3A$	--	52	65	m Ω

Dynamic Characteristics (Note4)						
Input Capacitance	C _{Iss}	V _{DS} =-10V V _{GS} =0V F=1.0MHz	--	330	--	PF
Output Capacitance	C _{Oss}		--	50	--	PF
Reverse Transfer Capacitance	C _{rss}		--	45	--	PF
Switching Characteristics (Note 4)						
Turn-on Delay Time	t _{d(on)}	V _{DD} =-10V I _D =-3A V _{GS} =-4.5V R _G =3.3Ω,	--	11	--	nS
Turn-on Rise Time	t _r		--	12	--	nS
Turn-Off Delay Time	t _{d(off)}		--	18	--	nS
Turn-Off Fall Time	t _f		--	30	--	nS
Total Gate Charge	Q _g	V _{DS} =-10V I _D =-3A V _{GS} =-4.5V	--	6.6	--	nC
Gate-Source Charge	Q _{gs}		--	0.8	--	nC
Gate-Drain Charge	Q _{gd}		--	1.4	--	nC
Drain-Source Diode Characteristics						
Diode Forward Voltage (Note 3)	V _{SD}	V _{GS} =0V I _S =-5A	--	-0.85	-1.2	V
Diode Forward Current (Note 2)	I _S		--	--	-5	A

Notes:

- ① Pulse width limited by maximum allowable junction temperature
 ② Pulse test ; Pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.

• Typical Characteristics

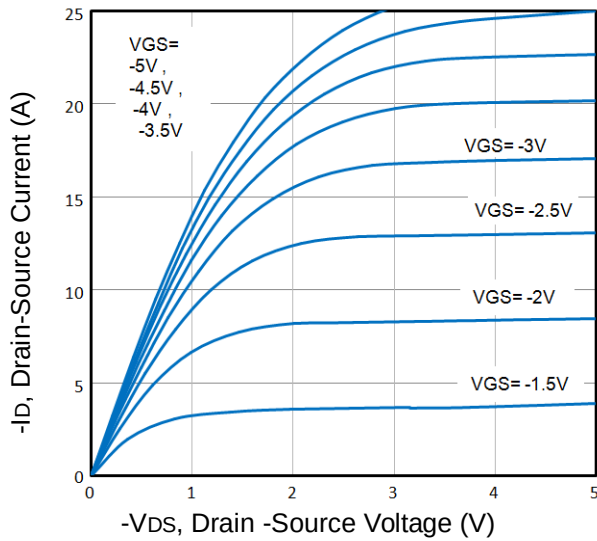


Fig1. Typical Output Characteristics

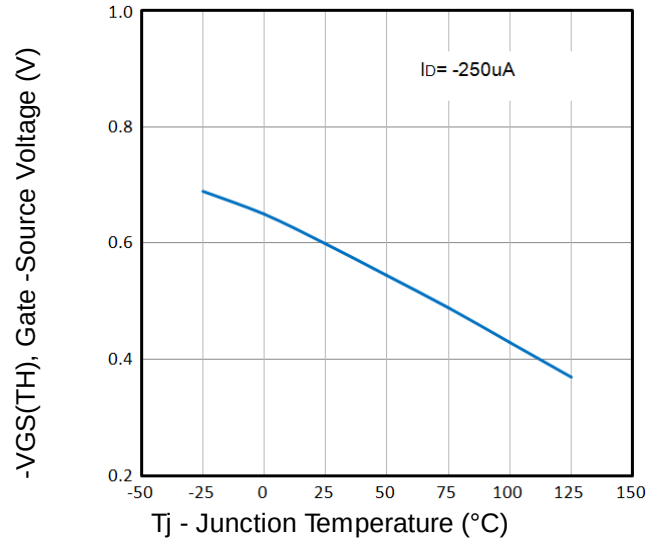


Fig2. Normalized Threshold Voltage Vs. Temperature

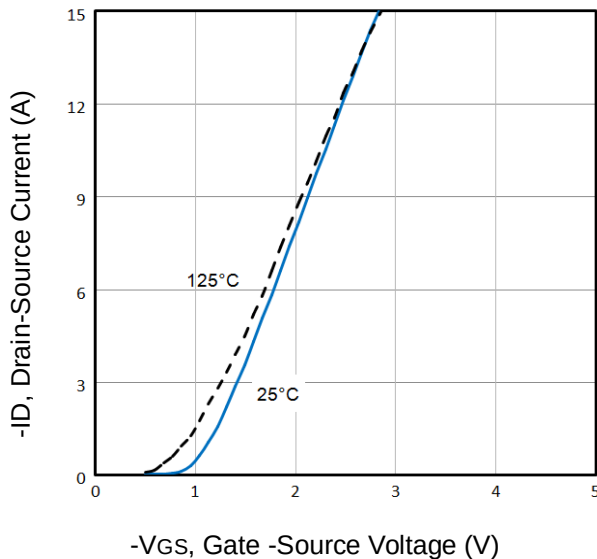


Fig3. Typical Transfer Characteristics

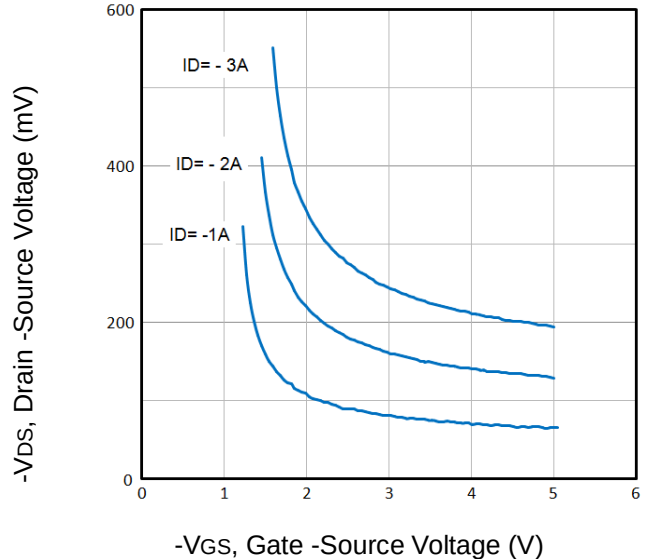


Fig4. Drain-Source Voltage vs Gate-Source Voltage

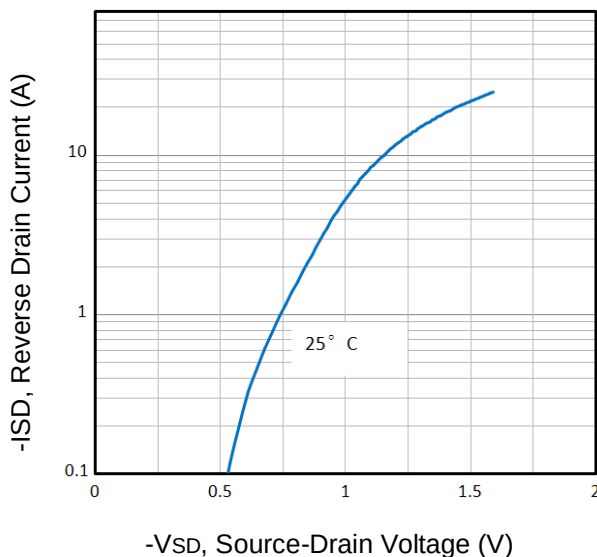


Fig5. Typical Source-Drain Diode Forward Voltage

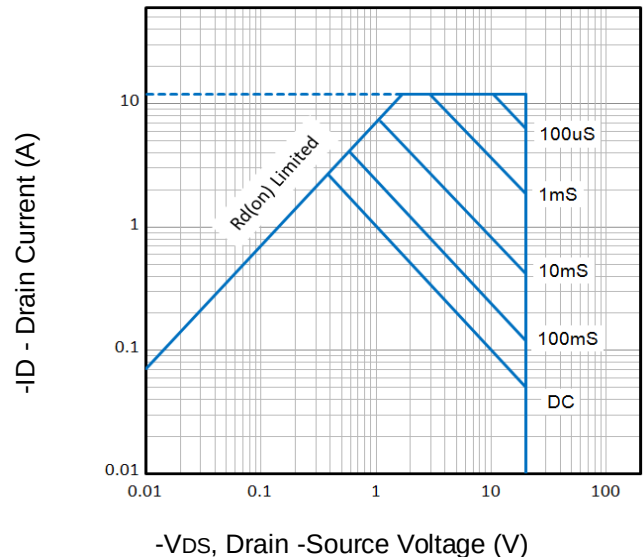


Fig6. Maximum Safe Operating Area

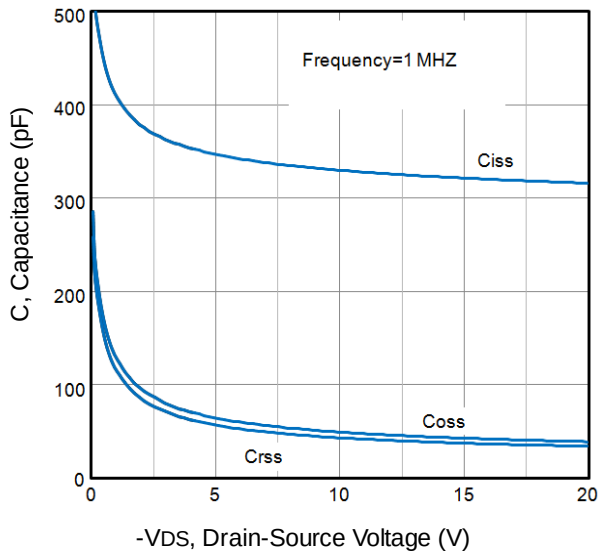


Fig7. Typical Capacitance Vs. Drain-Source Voltage

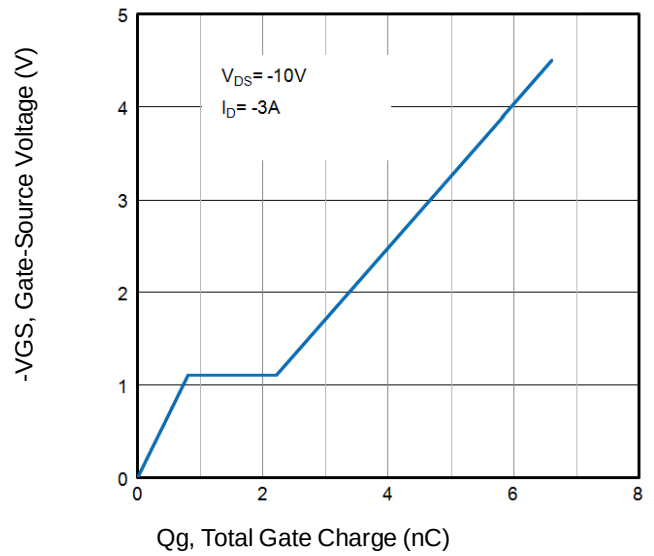


Fig8. Typical Gate Charge Vs. Gate-Source Voltage

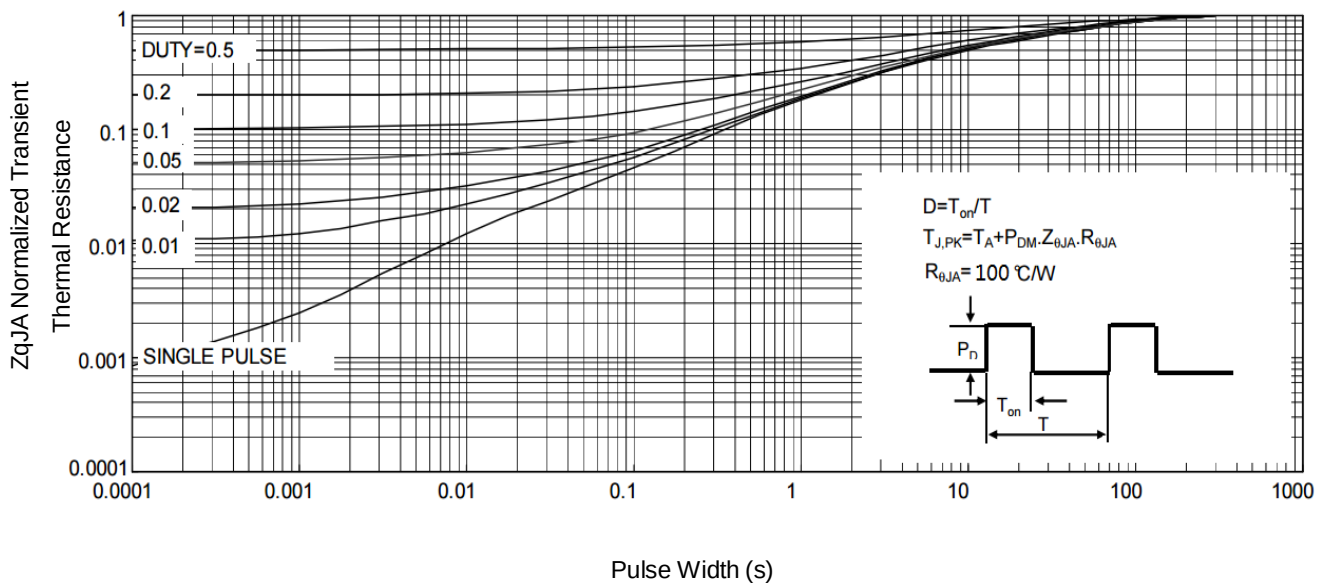


Fig9. Normalized Maximum Transient Thermal Impedance

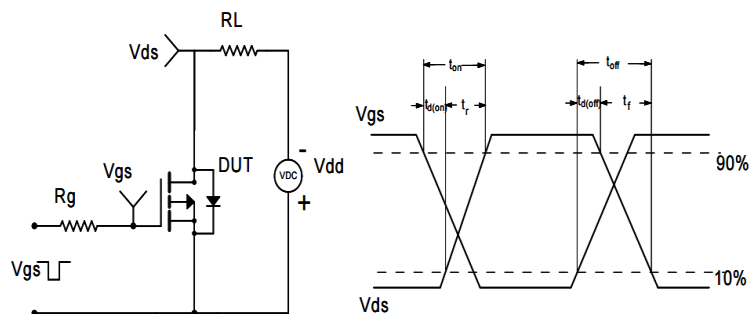
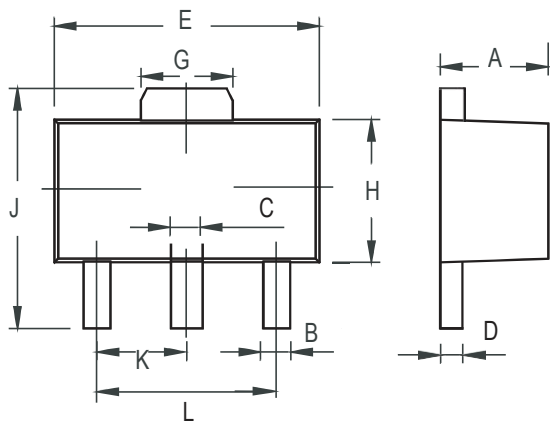


Fig10. Switching Time Test Circuit and waveforms

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