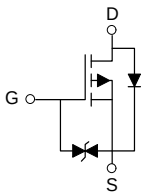
EFMICRO
Semiconductor Limited Company

EFM3139K

P-Channel Advanced Power MOSFET

• Product Summary

Part #	V_{DS}	$R_{DS(on).typ}$ ($@V_{GS}$=4.5V)	$R_{DS(on).typ}$ ($@V_{GS}$=2.5V)	I_D
EFM3139K	-20V	430mΩ	500mΩ	-0.66A



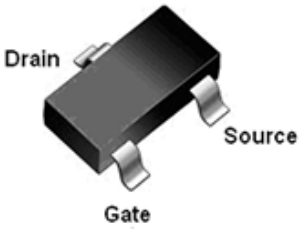
P-Channel MOSFET

• Features

- High-Side Switching
- Low On-Resistance
- Low Threshold
- Fast Switching Speed

•Application

- Drivers:Relays, Solenoids, Lamps, Hammers, Displays, Memories
- Battery Operated Systems
- Power Supply Converter Circuits
- Load/Power Switching Cell Phones, Pagers



SOT-723

RoHS

HF

•Ordering Information:

Part NO.	EFM3139K
Marking	KD
Packing Information	REEL TAPE
Basic ordering unit (pcs)	8000

•Absolute Maximum Ratings (T_C=25℃)

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DS}	-20	V
Gate-Source Voltage	V_{GS}	±12	V
Drain Current-Continuous	I_D	-0.66	A
Drain Current-Pulsed (Note 1)	I_{DM}	-1.2	A
Maximum Power Dissipation	P_D	0.15	W
Operating Junction and Storage Temperature Range	T_J,T_{STG}	-55 To 150	℃

•Thermal Characteristic

Thermal Resistance,Junction-to-Ambient (Note 2)	$R_{\theta JA}$	833	℃/W

● Static Electrical Characteristics @ T_J = 25°C (unless otherwise stated)

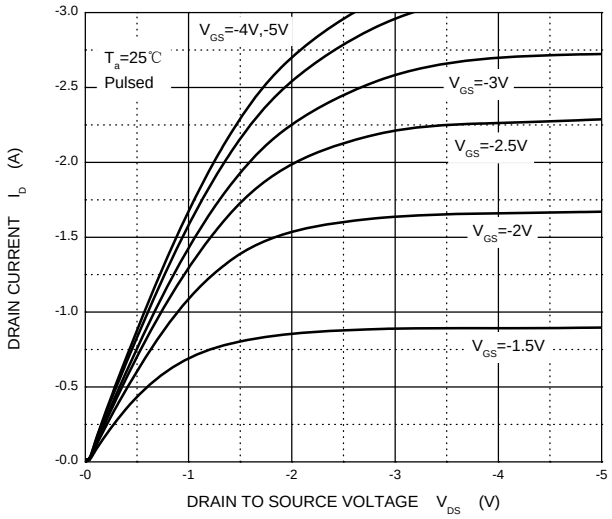
Parameter	Symbol	Condition	Min	Typ	Max	Unit
Off Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V I_D=-250uA	-20	--	--	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=-20V V_{GS}=0V	--	--	-1	uA
Gate-Body Leakage Current	I_{GSS}	V_{GS}=±10V V_{DS}=0V	--	--	±100	nA
On Characteristics (Note 3)						
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS} I_D=-250uA	-0.35	-0.54	-1.0	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	V_{GS}=-4.5V I_D=-1A	--	430	520	mΩ
		V_{GS}=-2.5V I_D=-0.8A	--	500	610	mΩ
Dynamic Characteristics (Note4)						
Input Capacitance	C_{lss}	V_{DS}=-16V V_{GS}=0V F=1.0MHz	--	113	--	PF
Output Capacitance	C_{oss}		--	15	--	PF
Reverse Transfer Capacitance	C_{rss}		--	9	--	PF
Switching Characteristics (Note 4)						
Turn-on Delay Time	$t_{d(on)}$	V_{DD}=-10V I_D=-0.2A V_{GS}=-4.5V R_G=10Ω,	--	9	--	nS
Turn-on Rise Time	t_r		--	5.8	--	nS
Turn-Off Delay Time	$t_{d(off)}$		--	32.7	--	nS
Turn-Off Fall Time	t_f		--	20.3	--	nS
Drain-Source Diode Characteristics						
Diode Forward Voltage (Note 3)	V_{SD}	V_{GS}=0V I_S=-1A	--	-0.84	-1.2	V
Diode Forward Current (Note 2)	I_S		--	--	-1	A

Notes :

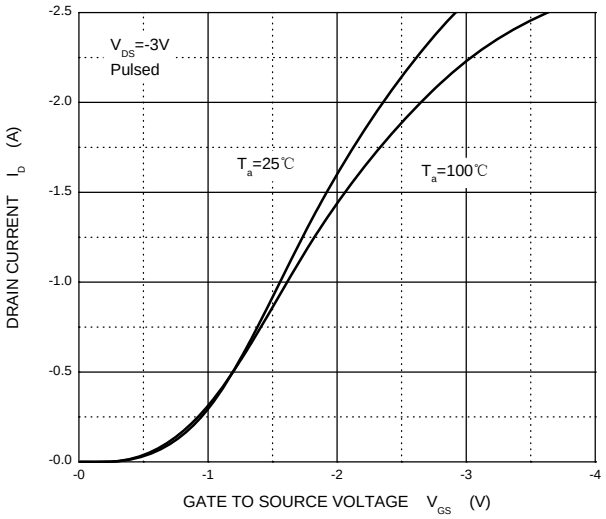
1. Surface mounted on FR4 board using the minimum recommended pad size.
2. Pulse Test : Pulse Width=300μs, Duty Cycle=2%.
3. Switching characteristics are independent of operating junction temperatures.
4. Guaranteed by design, not subject to producting.

• Typical Characteristics

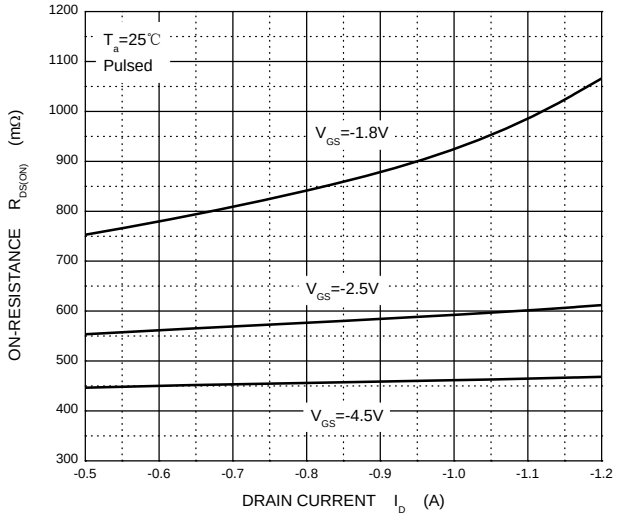
Output Characteristics



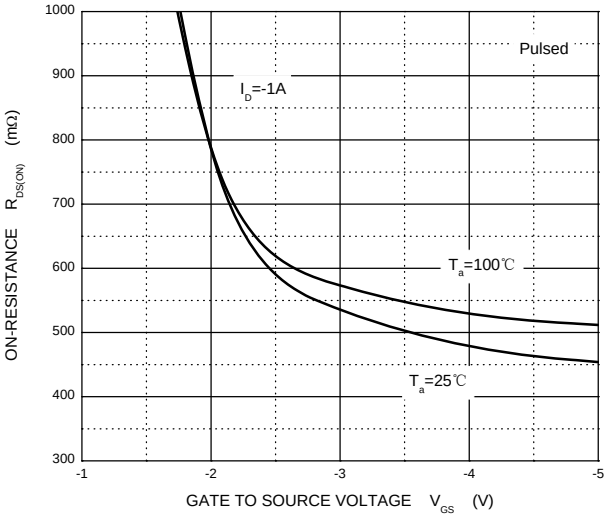
Transfer Characteristics



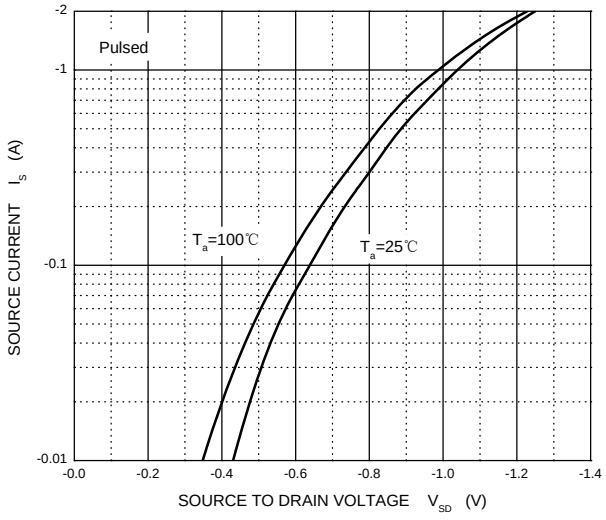
$R_{DS(ON)}$ — I_D



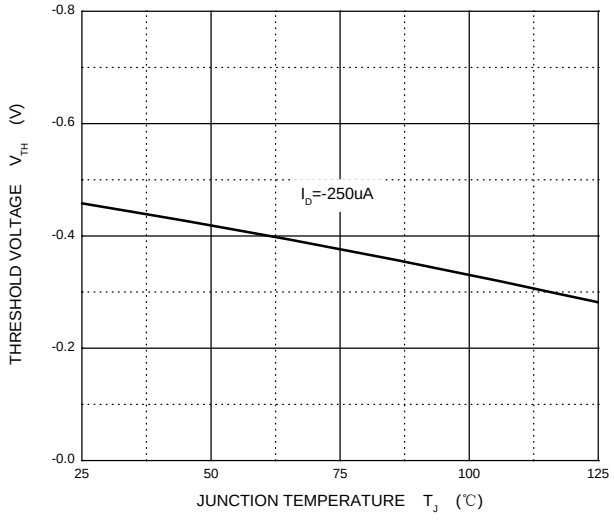
$R_{DS(ON)}$ — V_{GS}



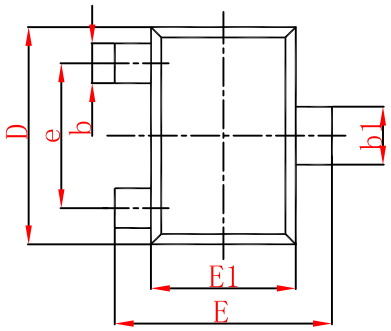
I_S — V_{SD}

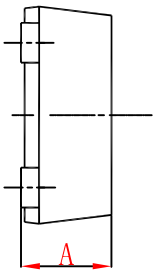


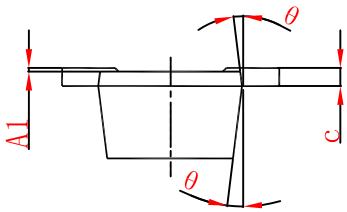
Threshold Voltage



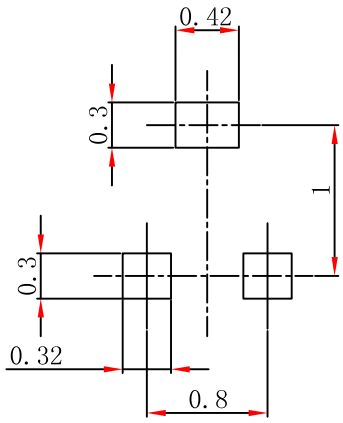
SOT-723 Package Outline Dimensions







Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.430	0.500	0.017	0.020
A1	0.000	0.050	0.000	0.002
b	0.170	0.270	0.007	0.011
b1	0.270	0.370	0.011	0.015
c	0.080	0.150	0.003	0.006
D	1.150	1.250	0.045	0.049
E	1.150	1.250	0.045	0.049
E1	0.750	0.850	0.030	0.033
e	0.800TYP.		0.031TYP.	
θ	7° REF.		7° REF.	



Note:
1.Controlling dimension:in millimeters.
2.General tolerance:± 0.05mm.
3.The pad layout is for reference purposes only.