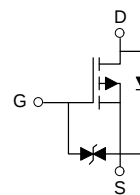


• Product Summary

Part #	V_{DS}	$R_{DS(on).typ}$ (@ $V_{GS}=4.5V$)	$R_{DS(on).typ}$ (@ $V_{GS}=2.5V$)	I_D
EFM3139WT	-20V	430m Ω	500m Ω	-0.66A



• Features

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

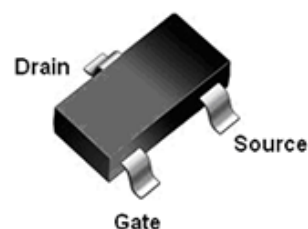
• Application

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

• Ordering Information:

Part NO.	EFM3139WT
Marking	39K
Packing Information	REEL TAPE
Basic ordering unit (pcs)	3000

P-Channel MOSFET



SOT-523



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

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	$^{\circ}C$

• Thermal Characteristic

Thermal Resistance, Junction-to-Ambient ^(Note 2)	$R_{\theta JA}$	833	$^{\circ}C/W$
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• Static Electrical Characteristics @ $T_J = 25^{\circ}\text{C}$ (unless otherwise stated)

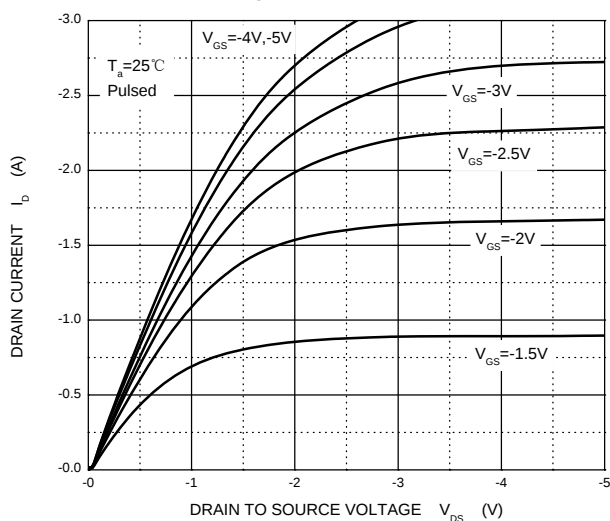
Parameter	Symbol	Condition	Min	Typ	Max	Unit
Off Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V$ $I_D=-250\mu A$	-20	--	--	V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=-20V$ $V_{GS}=0V$	--	--	-1	μA
Gate-Body Leakage Current	I_{GSS}	$V_{GS}=\pm 10V$ $V_{DS}=0V$	--	--	± 100	nA
On Characteristics (Note 3)						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}$ $I_D=-250\mu A$	-0.35	-0.54	-1.0	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	$V_{GS}=-4.5V$ $I_D=-1A$	--	430	520	m Ω
		$V_{GS}=-2.5V$ $I_D=-0.8A$	--	500	610	m Ω
Dynamic Characteristics (Note4)						
Input Capacitance	C_{ISS}	$V_{DS}=-16V$ $V_{GS}=0V$ 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	$t_{d(on)}$	$V_{DD}=-10V$ $I_D=-0.2A$ $V_{GS}=-4.5V$ $R_G=10\Omega$,	--	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 :

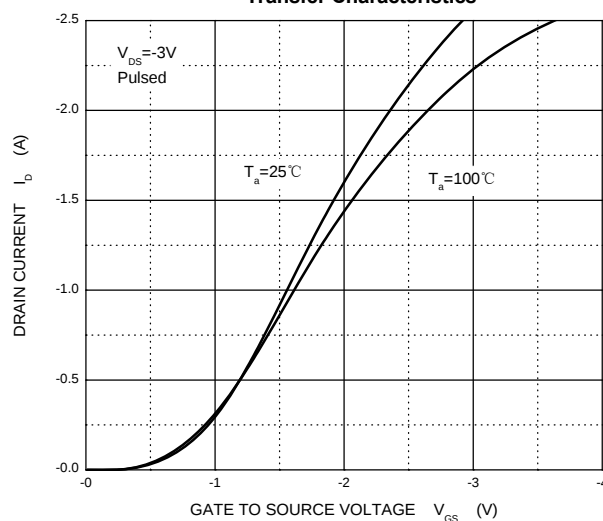
1. Surface mounted on FR4 board using the minimum recommended pad size.
2. Pulse Test : Pulse Width=300 μs , Duty Cycle=2%.
3. Switching characteristics are independent of operating junction temperatures.
4. Guaranteed by design, not subject to producing.

• Typical Characteristics

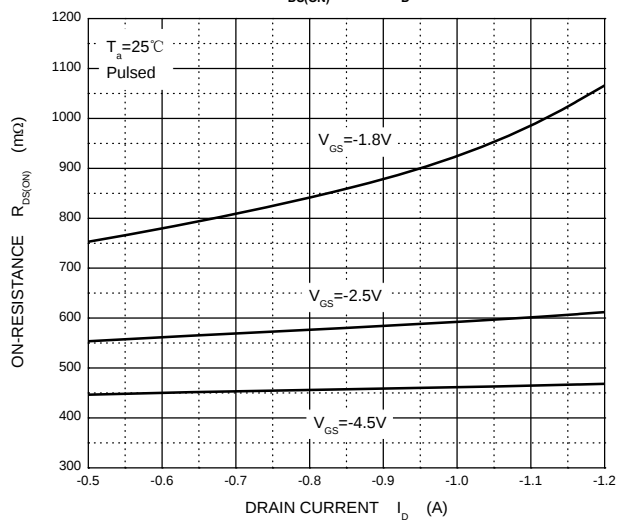
Output Characteristics



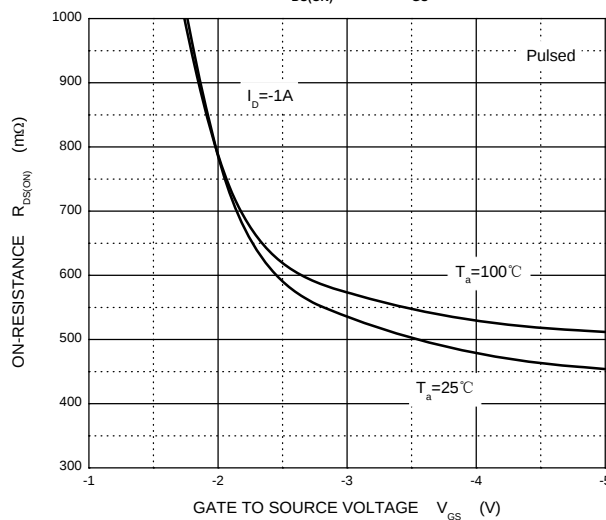
Transfer Characteristics



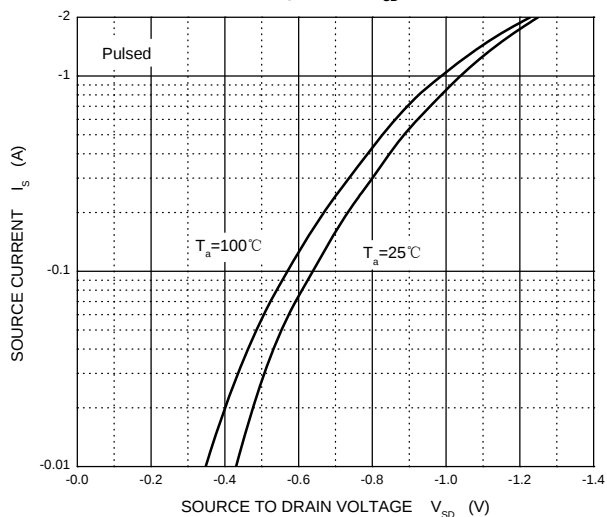
$R_{DS(ON)}$ — I_D



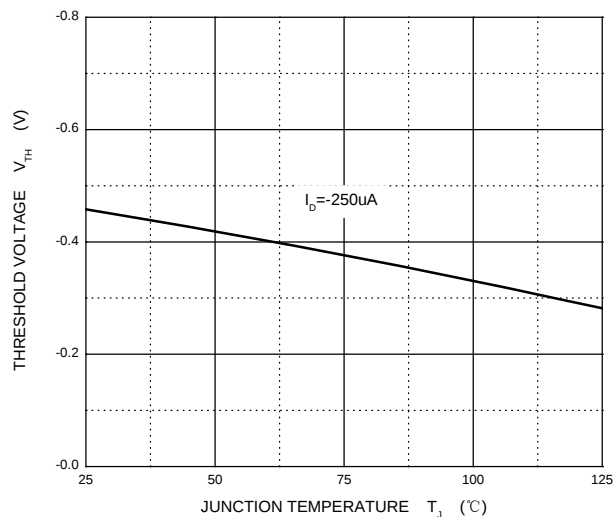
$R_{DS(ON)}$ — V_{GS}



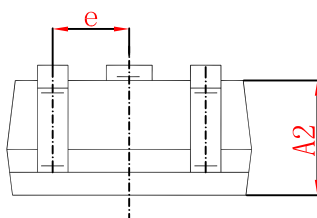
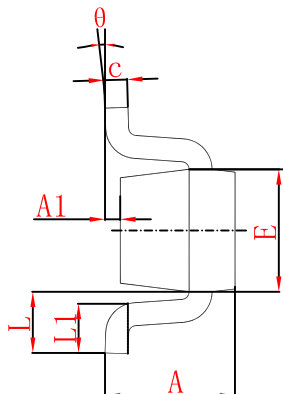
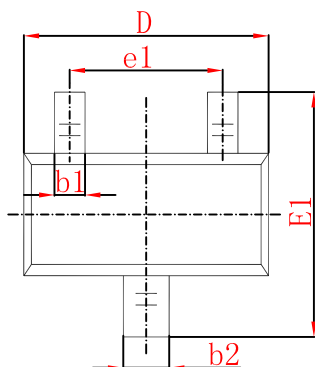
I_S — V_{SD}



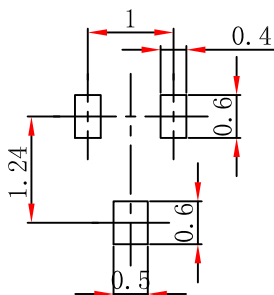
Threshold Voltage



SOT-523 Package Outline Dimensions



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.700	0.900	0.028	0.035
A1	0.000	0.100	0.000	0.004
A2	0.700	0.800	0.028	0.031
b1	0.150	0.250	0.006	0.010
b2	0.250	0.350	0.010	0.014
c	0.100	0.200	0.004	0.008
D	1.500	1.700	0.059	0.067
E	0.700	0.900	0.028	0.035
E1	1.450	1.750	0.057	0.069
e	0.500 TYP.		0.020 TYP.	
e1	0.900	1.100	0.035	0.043
L	0.400 REF.		0.016 REF.	
L1	0.260	0.460	0.010	0.018
θ	0°	8°	0°	8°



Note:

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