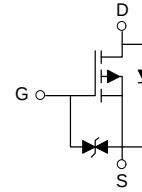


• Product Summary

Part #	V_{DS}	$R_{DS(on).typ}$ (@ $V_{GS}=4.5V$)	$R_{DS(on).typ}$ (@ $V_{GS}=2.5V$)	I_D
EFM3139W	-20V	430m Ω	500m Ω	-0.66A



• Features

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

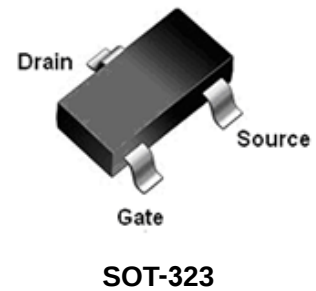
• Application

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

• Ordering Information:

Part NO.	EFM3139W
Marking	39K
Packing Information	REEL TAPE
Basic ordering unit (pcs)	3000

P-Channel MOSFET



• 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}	-3	A
Maximum Power Dissipation	P_D	0.2	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)	$R_{\theta JA}$	625	$^{\circ}C/W$
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• Static Electrical Characteristics @ T_J = 25°C (unless otherwise stated)

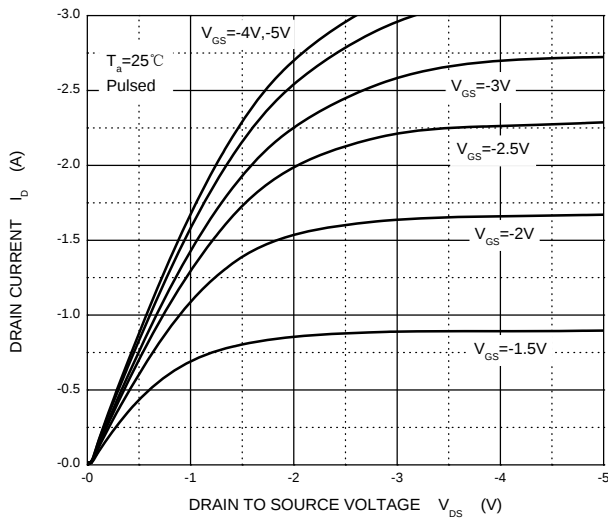
Parameter	Symbol	Condition	Min	Typ	Max	Unit
Off Characteristics						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} =0V I _D =-250uA	-20	--	--	V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =-20V V _{GS} =0V	--	--	-1	uA
Gate-Body Leakage Current	I _{GSS}	V _{GS} =±10V V _{DS} =0V	--	--	±100	nA
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 _{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 =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:

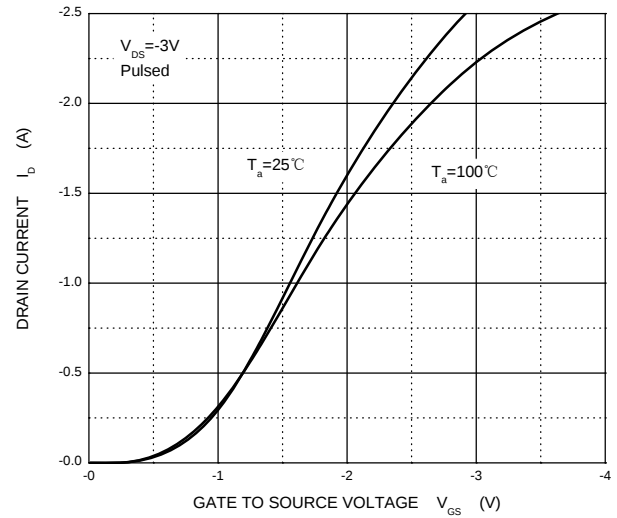
1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. This test is performed with no heat sink at T_a=25°C.
3. Pulse Test : Pulse Width≤300μs, Duty Cycle≤0.5%.
4. These parameters have no way to verify.

• Typical Characteristics

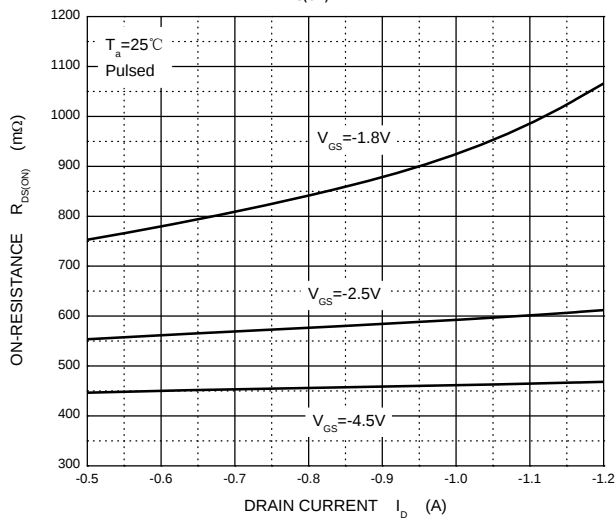
Output Characteristics



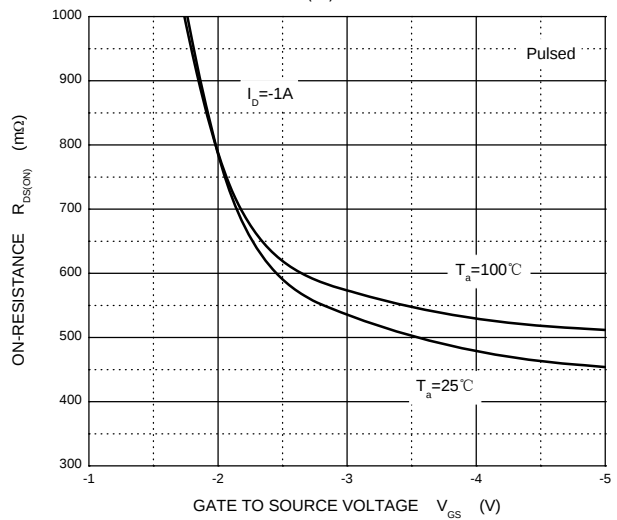
Transfer Characteristics



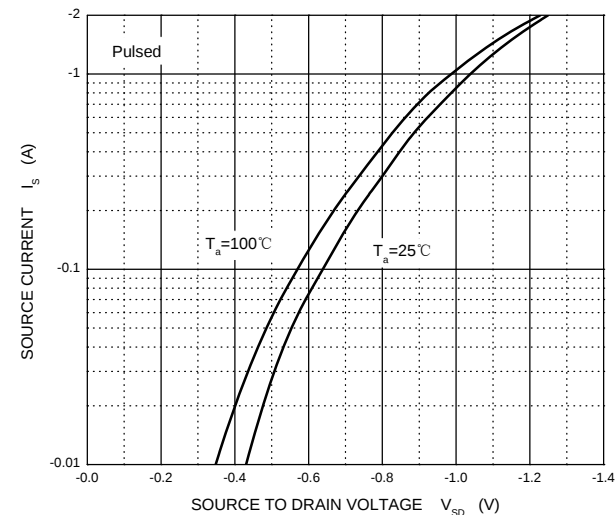
$R_{DS(ON)}$ — I_D



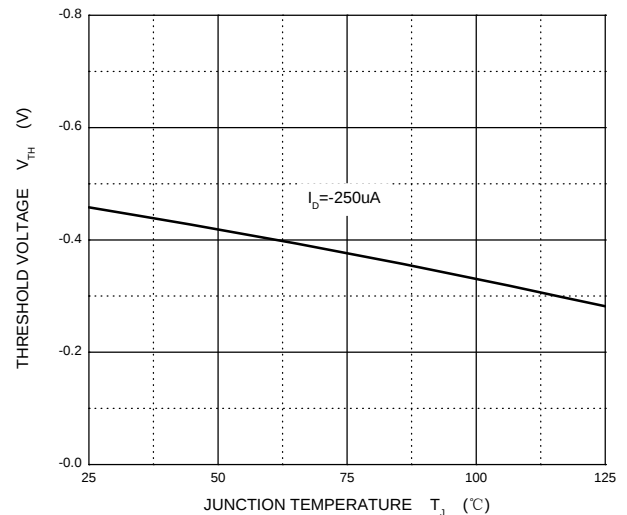
$R_{DS(ON)}$ — V_{GS}



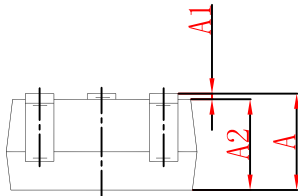
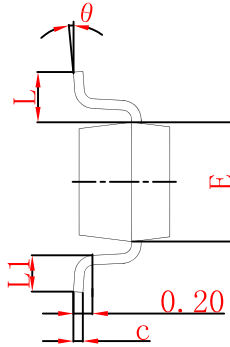
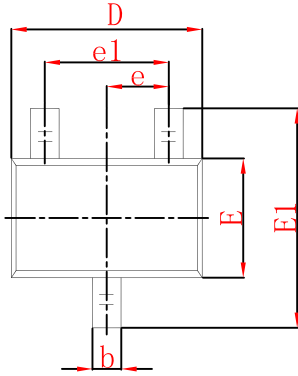
I_S — V_{SD}



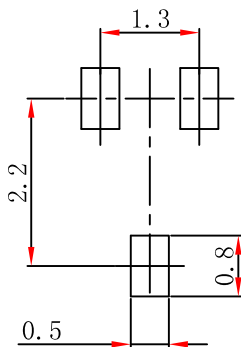
Threshold Voltage



SOT-323 Package Outline Dimensions



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	0.900	1.100	0.035	0.043
A1	0.000	0.100	0.000	0.004
A2	0.900	1.000	0.035	0.039
b	0.200	0.400	0.008	0.016
c	0.080	0.150	0.003	0.006
D	2.000	2.200	0.079	0.087
E	1.150	1.350	0.045	0.053
E1	2.150	2.450	0.085	0.096
e	0.650 TYP		0.026 TYP	
e1	1.200	1.400	0.047	0.055
L	0.525 REF		0.021 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.