

SOT-523 Plastic-Encapsulate MOSFETS

TW3139KT P-Channel

MOSFET

$$V_{DS} = -20V \quad I_D = -0.66A$$

$$R_{DS(ON)} \text{ MAX} = 700m\Omega @ V_{GS} = -2.5V$$

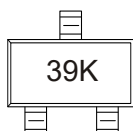
Features

- Surface Mount Package
- P-Channel Switch with Low RDS(on)
- Operated at Low Logic Level Gate Drive
- ESD Protected

Application

- Load/Power Switching
- Interfacing, Logic Switching
- Battery Management for Ultra Small Portable Electronics

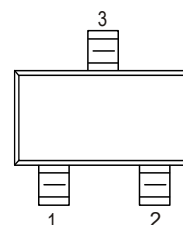
Marking



39K=Device code

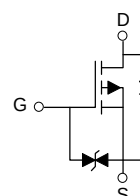
SOT-523

ROHS
COMPLIANT



1. GATE
2. SOURCE
3. DRAIN

Equivalent Circuit



Absolute Maximum Ratings (TA=25°C unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	-20	V
Typical Gate-Source Voltage	V_{GS}	±12	V
Continuous Drain Current (note 1)	I_D	-0.66	A
Pulsed Drain Current ($t_p=10\mu s$)	I_{DM}	-1.2	A
Power Dissipation (note 1)	P_D	150	mW
Thermal Resistance from Junction to Ambient (note 1)	$R_{\theta JA}$	833	°C/W
Operation Junction and Storage Temperature Range	T_J, T_{STG}	-55~+150	°C
Lead Temperature for Soldering Purposes(1/8" from case for 10 s)	T_L	260	°C

Electrical Characteristics ($T_A=25^{\circ}\text{C}$ unless otherwise noted)

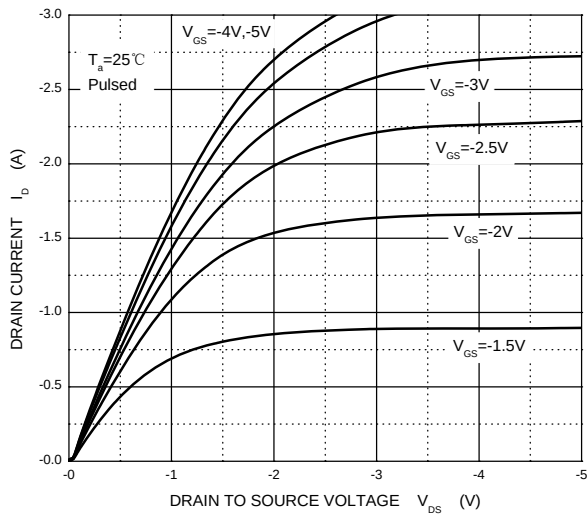
Parameter	Symbol	Condition	Min	Typ	Max	Unit
Off Characteristics						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=-250\mu A$	-20	-	-	V
Drain-Source Leakage Current	I_{DSS}	$V_{DS}=-20V, V_{GS}=0V$	-	-	-1	μA
Gate-Body Leakage Current	I_{GSS}	$V_{GS}=\pm 20V, V_{DS}=0V$	-	-	± 20	μA
On Characteristics (Note 3)						
Gate Threshold Voltage (Note2)	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	-0.35	-	-1.1	V
Drain-Source On-State Resistance (Note2)	$R_{DS(ON)}$	$V_{GS}=-4.5V, I_D=-1A$	-	450	520	m Ω
		$V_{GS}=-2.5V, I_D=-0.8A$	-	570	700	m Ω
		$V_{GS}=-1.8V, I_D=-0.5A$	-	950	-	m Ω
Forward Transconductance	g_{FS}	$V_{DS}=-10V, I_D=-0.54A$	-	1.2	-	S
Dynamic Characteristics (Note4)						
Input Capacitance	C_{iss}	$V_{DS}=-16V, V_{GS}=0V,$ $F=1.0MHz$	-	113	170	pF
Output Capacitance	C_{oss}		-	15	25	pF
Reverse Transfer Capacitance	C_{rss}		-	9	15	pF
Switching Characteristics (Note 4)						
Turn-on Delay Time	$t_{d(on)}$	$V_{GS}=-4.5V, I_D=-200mA$ $V_{DS}=-10V, R_G=10\Omega$	-	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}	$V_{GS}=0V, I_S=0.5A$	-	-	1.2	V

Notes:

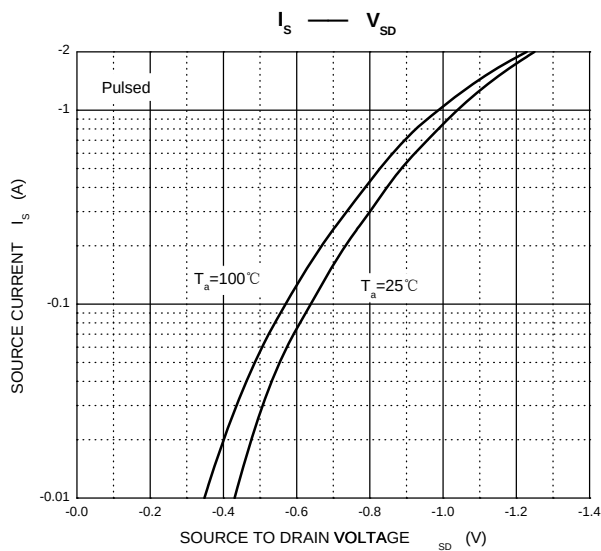
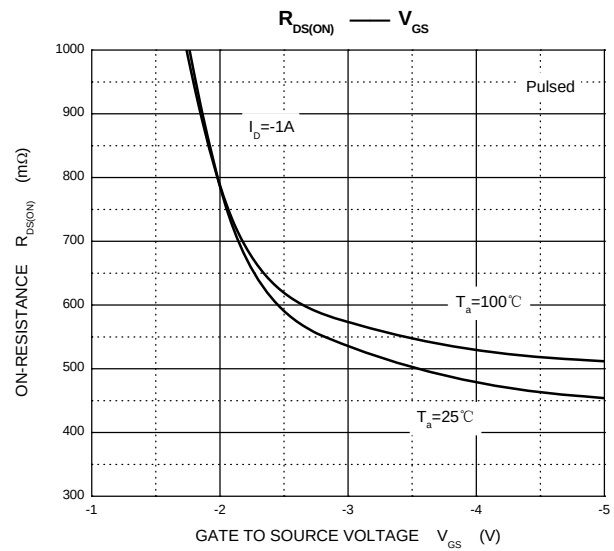
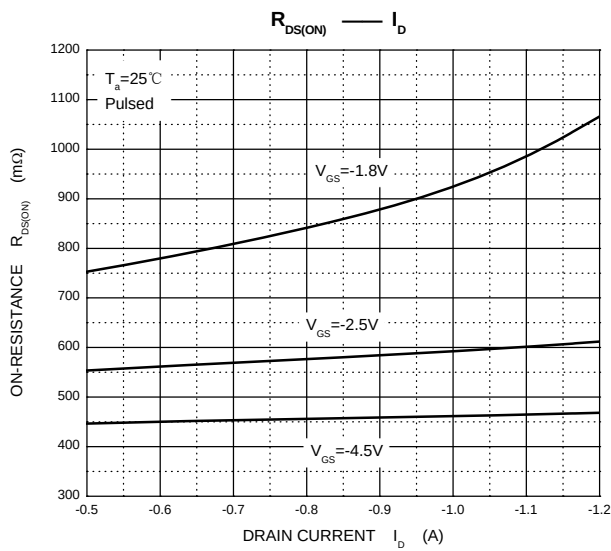
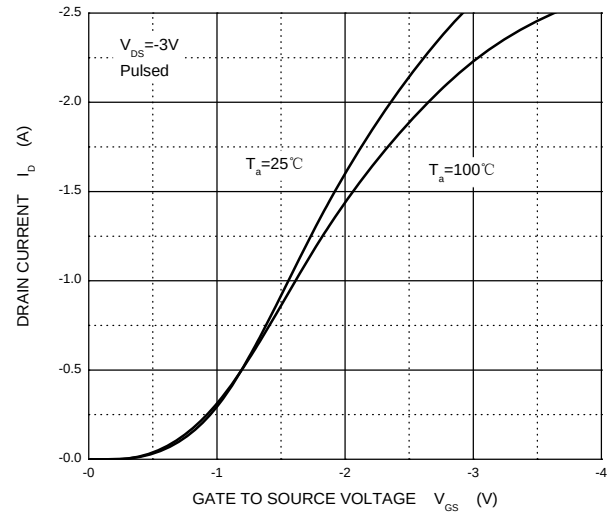
1. Surface mounted on FR4 board using the minimum recommended pad size.
2. Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2\%$.
3. Switching characteristics are independent of operating junction temperatures
4. Guaranteed by design, not subject to production

Typical Electrical and Thermal Characteristics

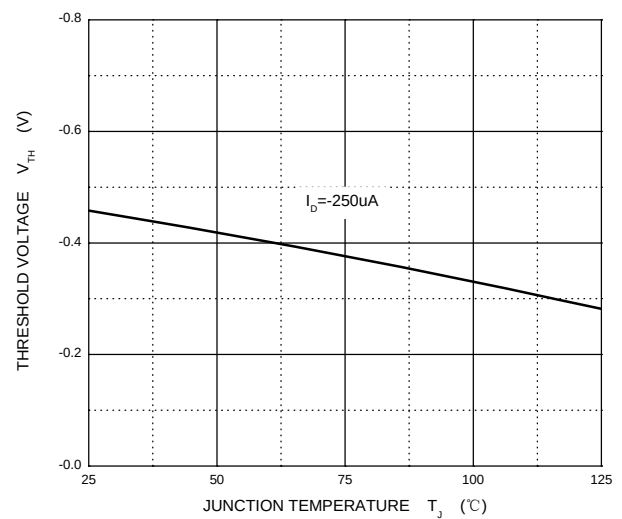
Output Characteristics



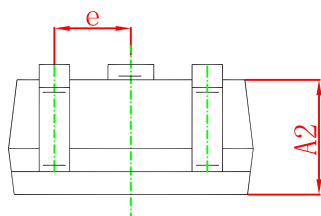
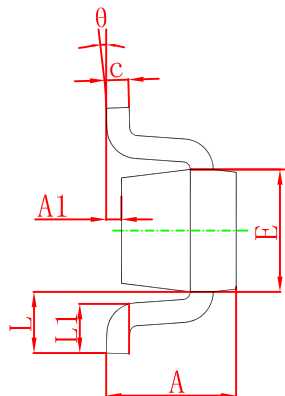
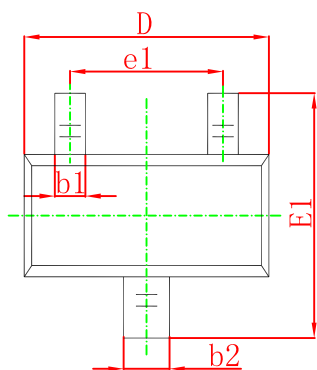
Transfer Characteristics



Threshold Voltage

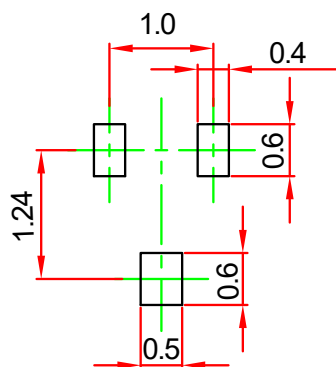


SOT-523 Package Outline Dimensions



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.600	0.950	0.024	0.037
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	0.150	0.350	0.006	0.014
c	0.100	0.250	0.004	0.010
D	1.400	1.800	0.055	0.071
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	0.150	0.450	0.006	0.018
θ	0°	8°	0°	8°

SOT-523 Suggested Pad Layout



Note:

1. Controlling dimension: in/millimeters.
2. General tolerance: $\pm 0.05\text{mm}$.
3. The pad layout is for reference purposes only.

Package and Ordering Information

Package	Outline	Reel Size	Reel DIA. (mm)	Q'TY/Reel (pcs)
SOT-523	TAPING	7"	330	3000