

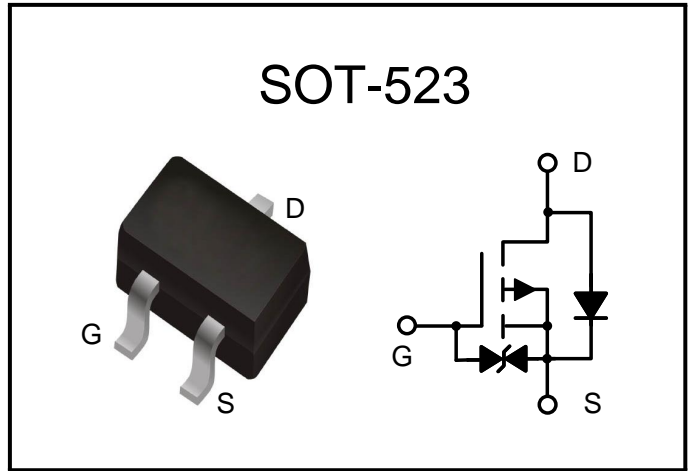
BM3139KT

-20V P-Channel MOSFET

Features

- $V_{DS} = -20V$
- $I_D = -0.5A$
- $R_{DS(ON)} @ V_{GS} = -4.5V, TYP = 530m\Omega$
- $R_{DS(ON)} @ V_{GS} = -2.5V, TYP = 750m\Omega$
- $R_{DS(ON)} @ V_{GS} = -1.8V, TYP = 1100m\Omega$
- Trench Technology Power MOSFET
- Low $R_{DS(ON)}$
- Low Gate Charge
- ESD Protected

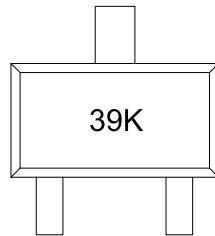
Package



Application

- Load Switching
- Low Current DC/DC Converters
- Low Current Inverters

Marking



Ordering information

Order code	Package	Marking	Base qty	Delivery mode
BM3139KT	SOT-523	39K	3K	Tape and reel

Absolute Maximum Ratings (@ $T_A = 25^\circ C$ unless otherwise noted)

Symbol	Parameter	Value	Unit
V_{DS}	Drain-Source Voltage	-20	V
V_{GS}	Gate-Source Voltage	± 12	V
I_D	Continuous Drain Current ^(1,5)	$T_A = 25^\circ C$ -0.5	A
P_D	Maximum Power Dissipation ^(4,5)	$T_A = 25^\circ C$ 0.2	W
$R_{\theta JA}$	Junction-to-Ambient Thermal Resistance ⁽⁵⁾	883	$^\circ C/W$
T_J	Junction Temperature Range	150	$^\circ C$
T_{stg}	Storage Temperature Range	-55 to + 150	$^\circ C$



Electrical Characteristics @T_J=25°C unless otherwise noted

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
Off Characteristics						
BV _{DS}	Drain-Source Breakdown Voltage	V _{GS} = 0V, I _D = -250uA	-20	-24	-	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} = -20V, V _{GS} = 0V	-	-	-0.3	uA
I _{GSS}	Gate Body Leakage	V _{GS} = ±10V, V _{DS} = 0V	-	±2	±10	uA
On Characteristics⁽³⁾						
V _{GS(th)}	Gate Threshold Voltage	V _{DS} = V _{GS} , I _D = -250uA	-0.35	-0.62	-1.2	V
R _{DS(on)}	Drain-Source On-State Resistance	V _{GS} = -4.5V, I _D = -0.5A	-	530	790	mΩ
		V _{GS} = -2.5V, I _D = -0.3A	-	750	1000	
		V _{GS} = -1.8V, I _D = -0.2A	-	1100	1700	
Dynamic Characteristics						
C _{iss}	Input Capacitance	V _{DS} = -16V, V _{GS} = 0V, f = 1.0MHZ	-	113	170	pF
C _{oss}	Output Capacitance		-	15	25	
C _{rss}	Reverse Transfer Capacitance		-	9	15	
Switching Characteristics						
t _{d(on)}	Turn-On Delay Time	V _{DS} = -10V, I _D = -200mA, V _{GS} = -4.5V, R _G = 10Ω	-	9	-	ns
t _r	Turn-On Rise Time		-	5.8	-	
t _{d(off)}	Turn-Off Delay Time		-	32.7	-	
t _f	Turn-Off Fall Time		-	20.3	-	
Source Drain Diode Characteristics						
V _{SD}	Diode Forward Voltage ⁽³⁾	I _S = -0.5A, V _{GS} = 0V	-	-	-1.2	V

Note(1) :The maximum current rating is limited by package.

(2) :Repetitive rating:pulse width limited by T_{J(MAX)} = 150°C.

(3) :Pulse Test : Pulse Width ≤ 300μs, duty cycle ≤ 2%.

(4) :The power dissipation PD is limited by T_{J(MAX)} = 150°C.

(5) :Device mounted on 1in² FR-4 board with 2oz. Copper, in a still air environment with T_A =25°C.



Typical Performance Characteristics ($T_J = 25^\circ\text{C}$, unless otherwise noted)

Figure 1 : Typical Output Characteristics

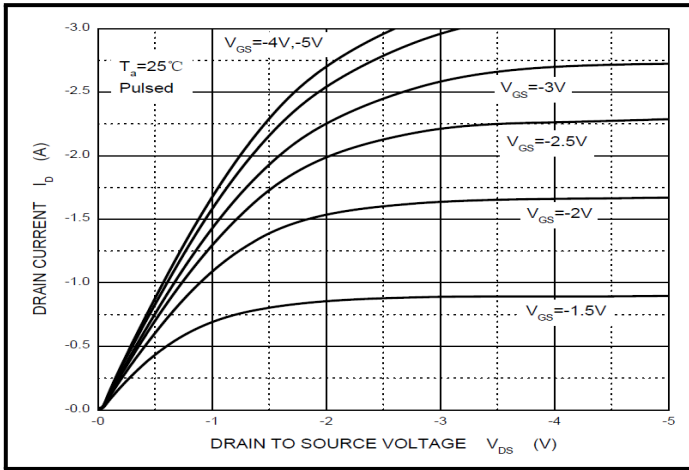


Figure 2 : Transfer Characteristics

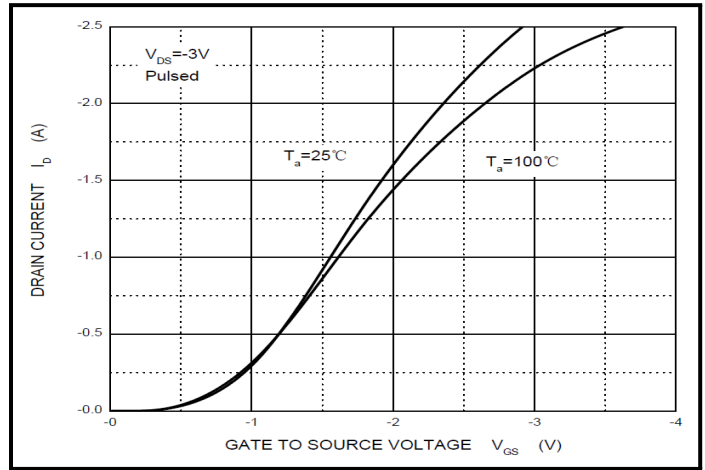


Figure 3 : $R_{DS(ON)}$ vs. I_D

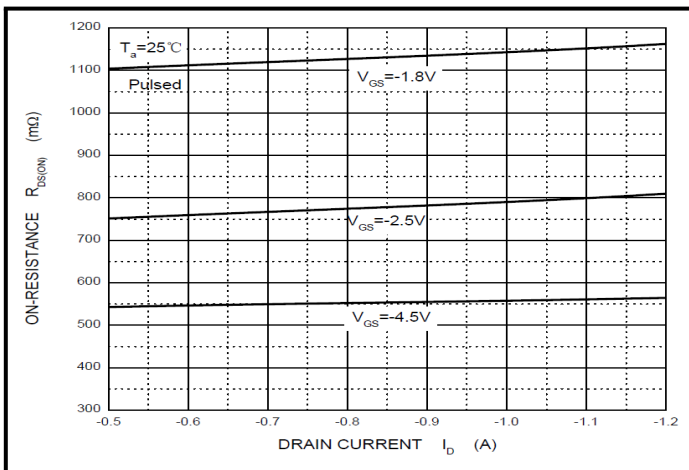


Figure 4 : $R_{DS(ON)}$ vs. V_{GS}

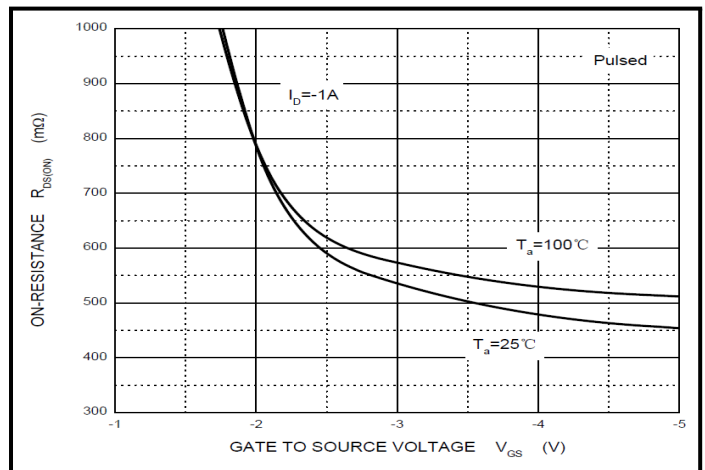


Figure 5 : I_S vs. V_{SD}

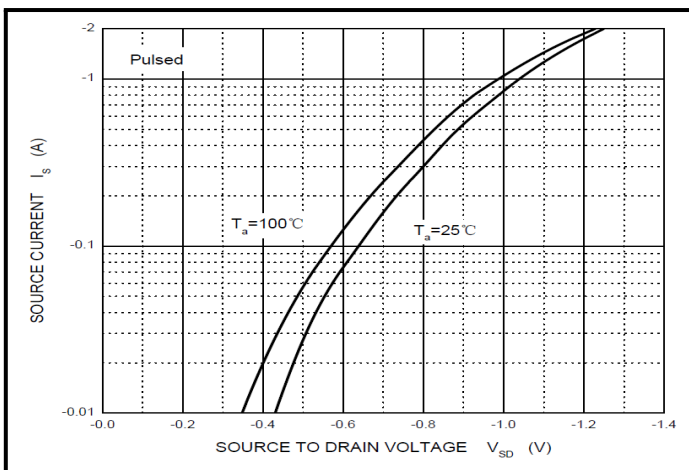
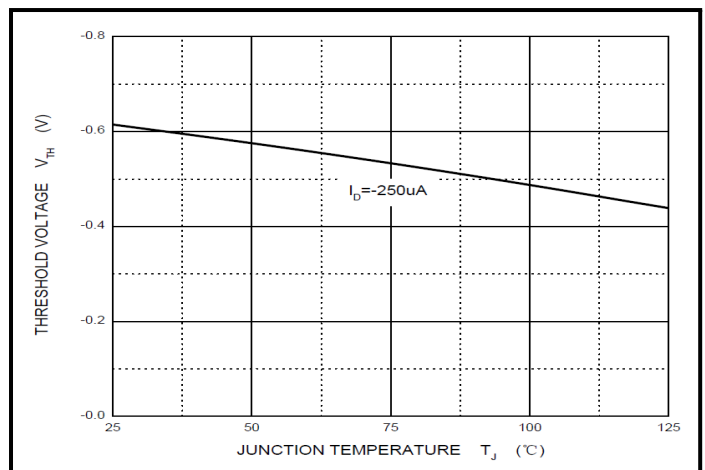


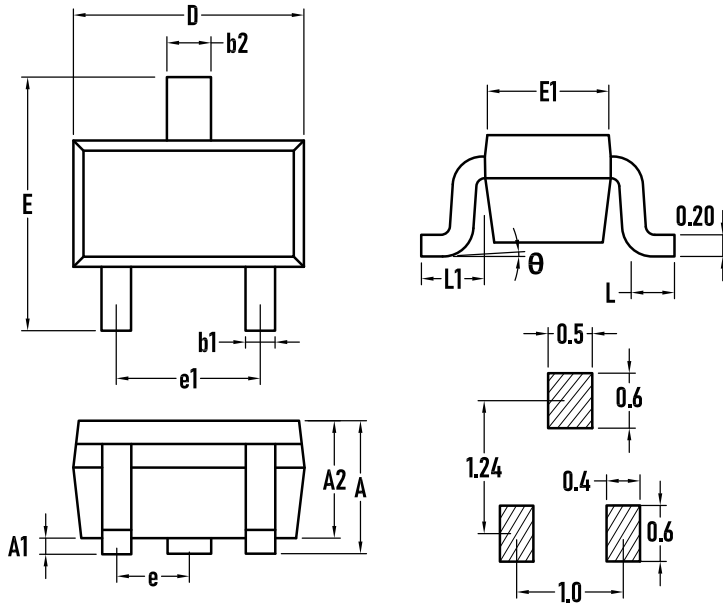
Figure 6 : Threshold Voltage



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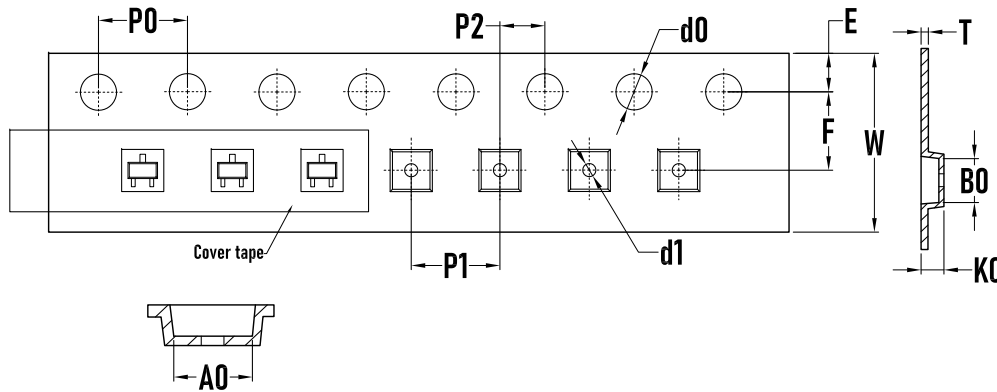
-20V P-Channel MOSFET

Outline Drawing – SOT-523



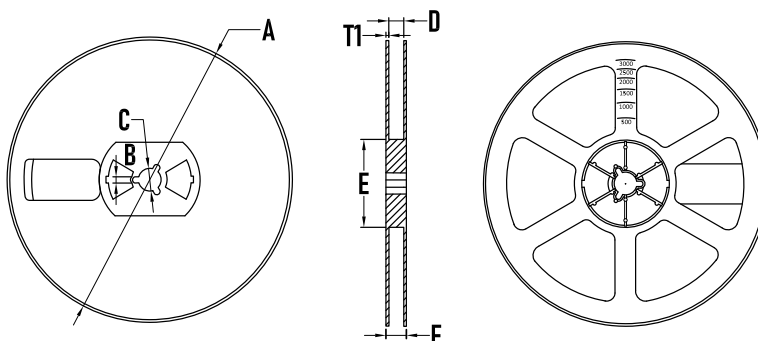
SYMBOL	MILLIMETER		
	MIN	TYP	MAX
A	0.70	0.80	0.90
A1	0.00	0.05	0.10
A2	0.70	0.75	0.80
b1	0.15	0.22	0.29
b2	0.25	0.32	0.39
D	1.50	1.60	1.70
E	1.45	1.60	1.75
E1	0.70	0.80	0.90
e	0.50(TPY.)		
e1	0.90	1.00	1.10
L	0.26	0.36	0.46
L1	0.40(REF)		
θ	0°	4°	8°

Packaging Tape - SOT-523



SYMBOL	MILLIMETER
A0	1.78±0.05
B0	1.78±0.05
d0	1.50±0.10
d1	0.50±0.10
E	1.75±0.10
F	3.50±0.05
K0	0.69±0.05
P0	4.00±0.10
P1	4.00±0.10
P2	2.00±0.10
W	8.00±0.20
T	0.20±0.02

Packaging Reel



SYMBOL	MILLIMETER
A	177.8±0.2
B	2.7±0.2
C	13.5±0.2
D	9.6±0.3
E	54.5±0.2
F	12.3±0.3
T1	1.0±0.2
Quantity	3000PCS

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Specifications are subject to change without notice.

Please refer to <http://www.born-tw.com> for current information.

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