

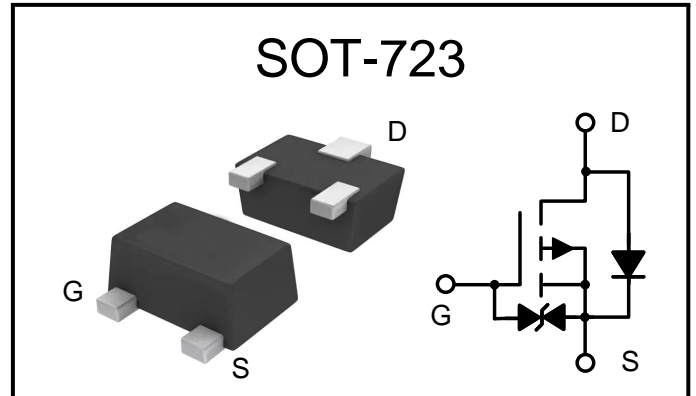
BM3139KE

-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

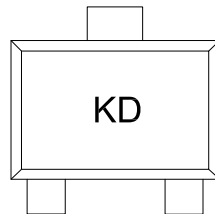
Package



Application

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

Marking



Ordering information

Order code	Package	Marking	Base qty	Delivery mode
BM3139KE	SOT-723	KD	8K	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	$^\circ C$



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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	–	–	1	uA
I _{GSS}	Gate Body Leakage	V _{GS} = ±10V, V _{DS} = 0V	–	–	±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

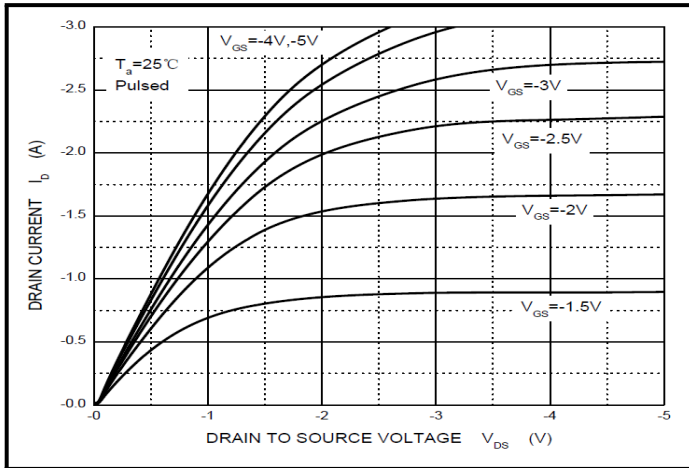


Figure 2 :Transfer Characteristics

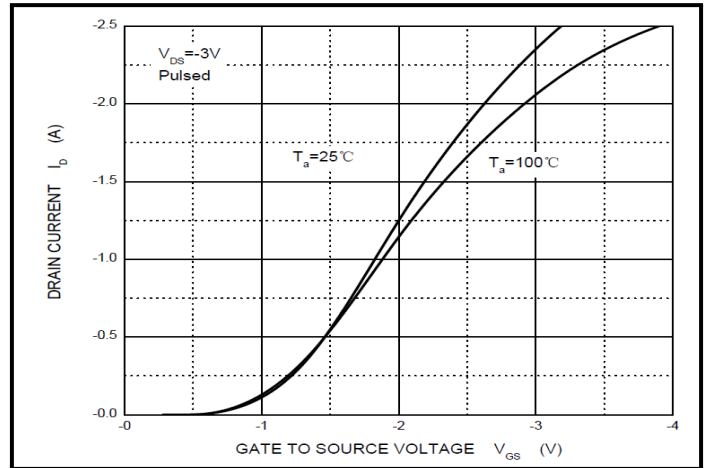


Figure 3 : $R_{DS(ON)}$ vs. I_D

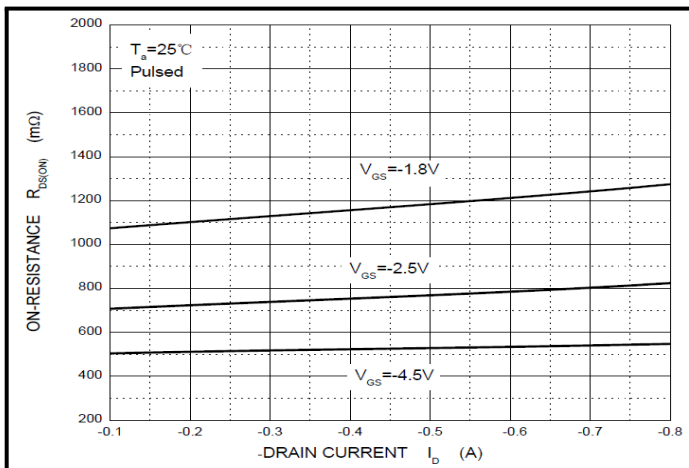


Figure 4 : $R_{DS(ON)}$ vs. V_{GS}

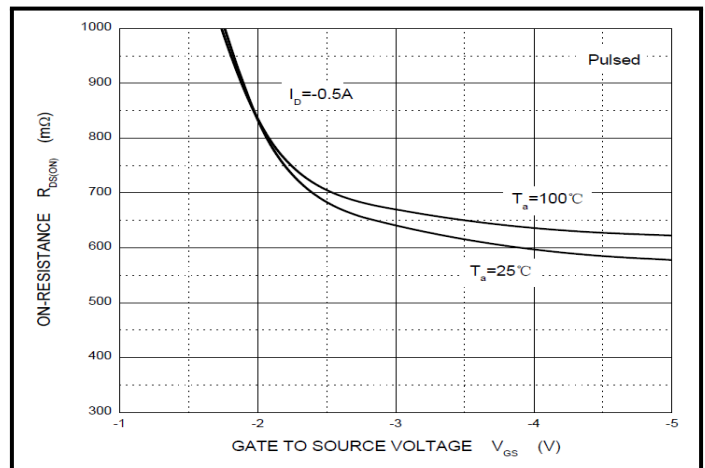


Figure 5 : I_S vs. V_{SD}

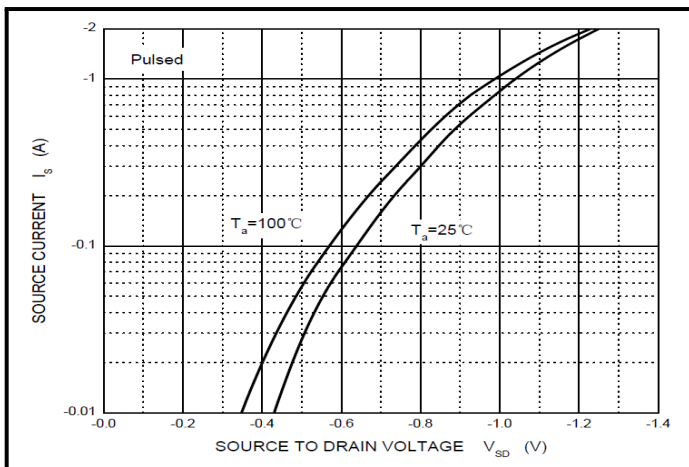
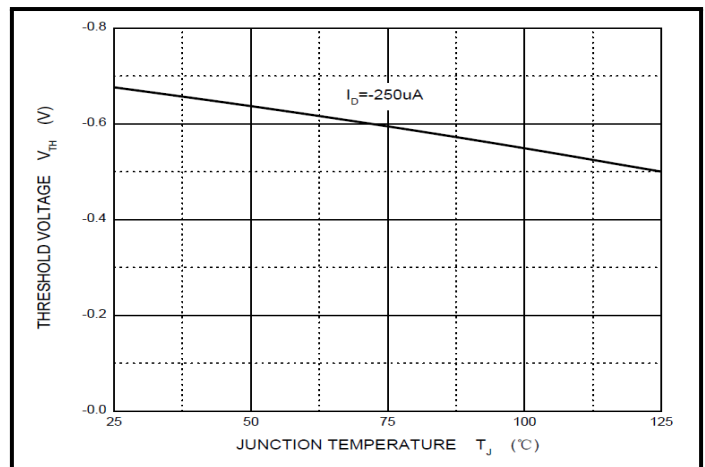


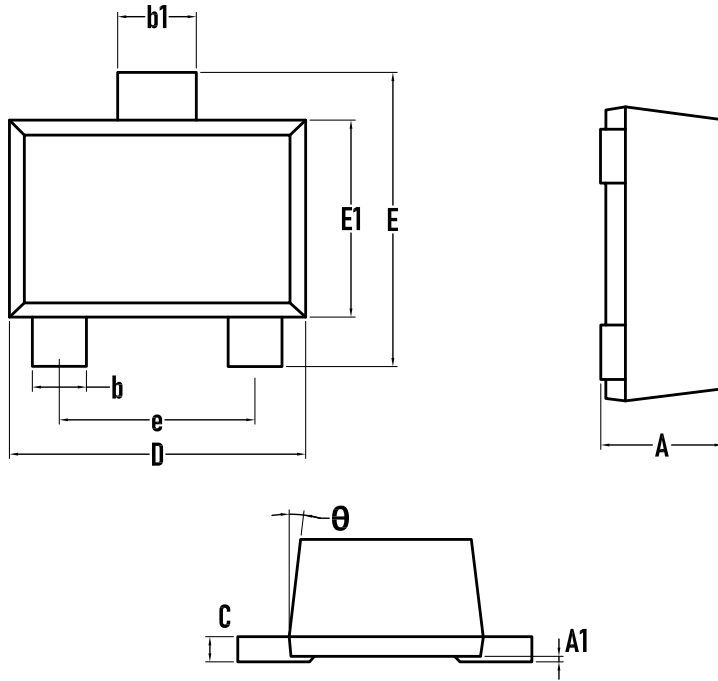
Figure 6 : Threshold Voltage



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Outline Drawing – SOT-723



SYMBOL	MILLIMETER		
	MIN.	Typ.	MAX.
A	0.350	–	0.490
A1	0.000	–	0.100
b	0.170	0.220	0.270
b1	0.225	–	0.370
C	0.080	–	0.150
D	1.150	–	1.250
E	1.150	–	1.250
E1	0.750	–	0.850
e	0.800TYP.		
θ	0°	–	7°

