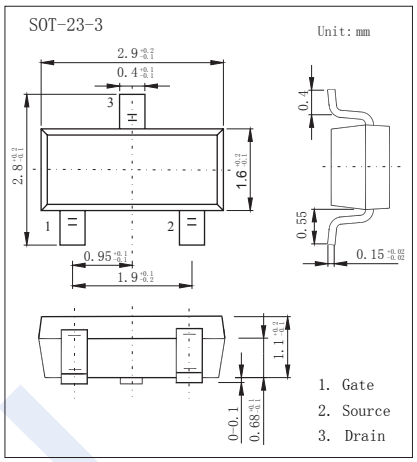
N-Channel MOSFET

KI138K



■ Features

- $V_{DS\ (V)}$ = 50V
- I_D = 500 mA (V_{GS} = 10V)
- $R_{DS(ON)}$ < 1.6Ω (V_{GS} = 10V)
- $R_{DS(ON)}$ < 2.5Ω (V_{GS} = 4.5V)
- $R_{DS(ON)}$ < 4.5Ω (V_{GS} = 2.5V)
- ESD Protected 1.5KV HBM

■ Absolute Maximum Ratings Ta = 25℃

Parameter		Symbol	Rating	Unit
Drain-Source Voltage		V_{DS}	50	V
Gate-Source Voltage		V_{GS}	±20	
Continuous Drain Current		I_D	500	mA
Pulsed Drain Current		I_{DM}	1200	
Power Dissipation	Ta = 25℃	P_D	500	mW
	Derate above 25℃		4	mW/℃
Thermal Resistance.Junction- to-Ambient		R_{thJA}	250	℃/W
Junction Temperature		T_J	150	℃
Storage Temperature Range		T_{stg}	-55 to 150	

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■ Electrical Characteristics Ta = 25℃

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	V_{DSS}	I_D=250μA, V_{GS}=0V	50			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=50V, V_{GS}=0V			1	μA
Gate-Body Leakage Current	I_{GSS}	V_{DS}=0V, V_{GS}=±20V			±10	uA
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS} , I_D=250μA	0.8		1.5	V
Static Drain-Source On-Resistance	$R_{DS(ON)}$	V_{GS}=10V, I_D=500mA			1.6	Ω
		V_{GS}=4.5V, I_D=200mA			2.5	
		V_{GS}=2.5V, I_D=100mA			4.5	
Input Capacitance	C_{iss}	V_{GS}=0V, V_{DS}=2.5V, f=1MHz		40.6	48	pF
Output Capacitance	C_{oss}			2.5	9	
Reverse Transfer Capacitance	C_{rss}			2.7	5	
Total Gate Charge	Q_g	V_{GS}=4.5V, V_{DS}=25V, I_D=250mA		0.6	1	nC
Gate Source Charge	Q_{gs}			0.18		
Gate Drain Charge	Q_{gd}			0.21		
Turn-On DelayTime	$t_{d(on)}$	V_{GS}=10V, V_{DS}=25V, I_D=500mA,R_G=6Ω (Note.1 & 2)		2.1	4.8	ns
Turn-On Rise Time	t_r			18.2	36	
Turn-Off DelayTime	$t_{d(off)}$			6	11	
Turn-Off Fall Time	t_f			21	48	
Maximum Body-Diode Continuous Current	I_S				500	mA
Diode Forward Voltage	V_{SD}	I_S=500mA,V_{GS}=0V		0.86	1.5	V

Note.1: Pulse width ≤ 300us,Duty cycle≤ 2%

Note.2: Essentially independent of operating temperature typical characteristics.

■ Marking

Marking	8K3

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■ Typical Characterisitics

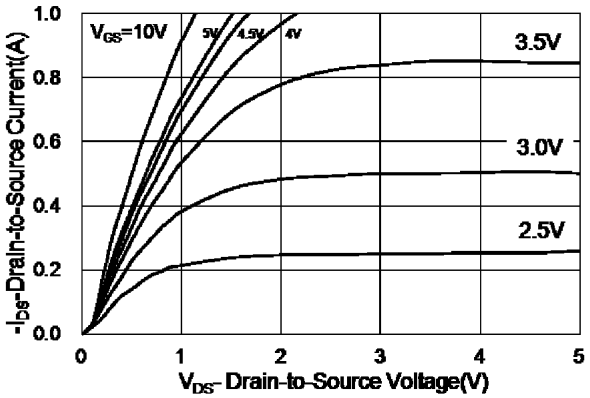

Fig.1 On-Region Characteristics

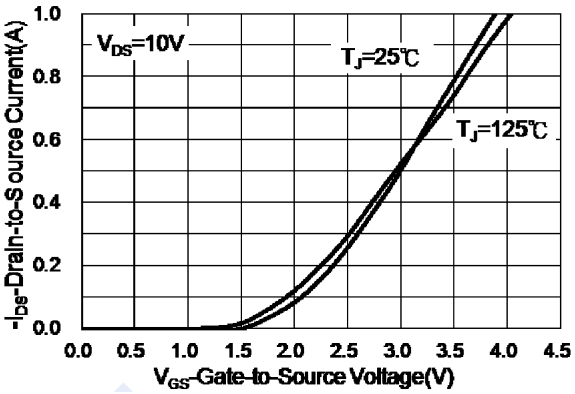

Fig.2 Transfer Characteristics

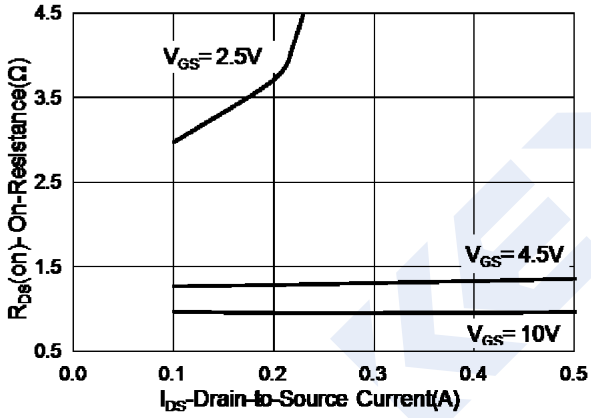

Fig.3 On-Resistance vs. Drain Current

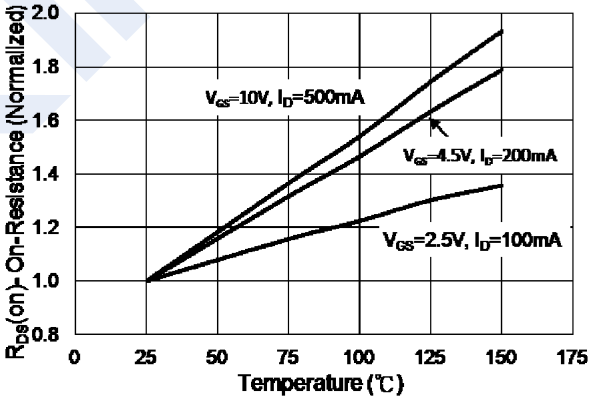

Fig.4 On-Resistance vs. Junction temperature

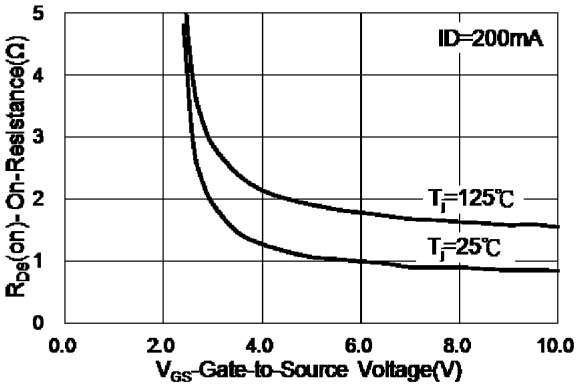

Fig.5 On-Resistance Variation with VGS.

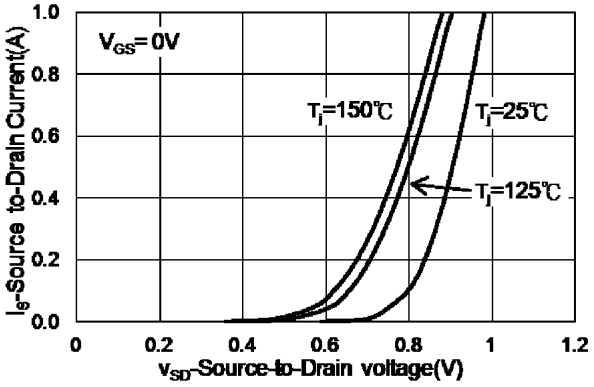

Fig.6 Body Diode Characterlsics

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■ Typical Characterisitics

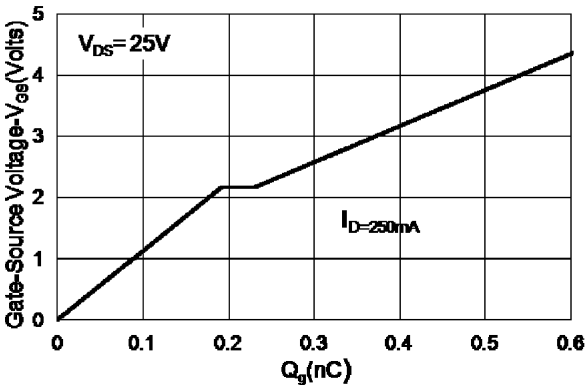

Fig.7 Gate-Charge Characteristics

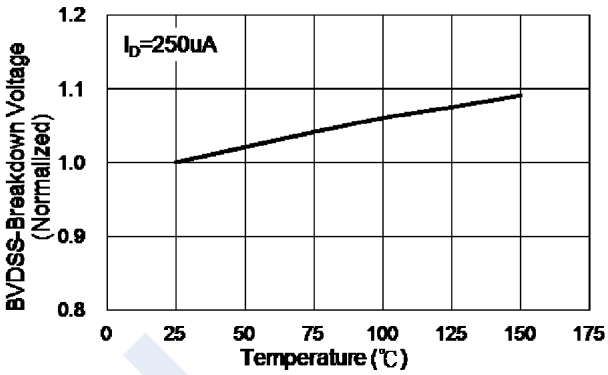

Fig.8 Breakdown Voltage Variation vs. Temperature

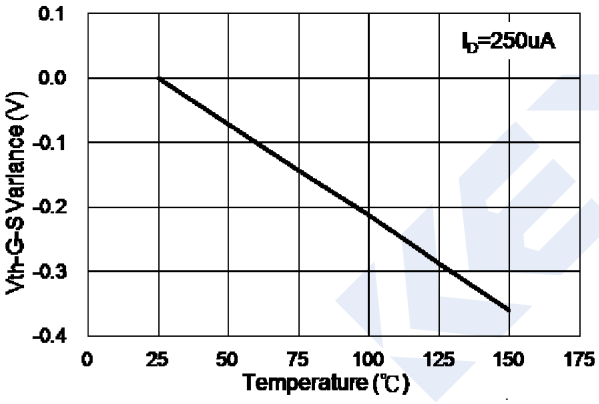

Fig.9 Threshold Voltage Variation with Temperature.