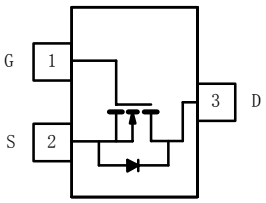
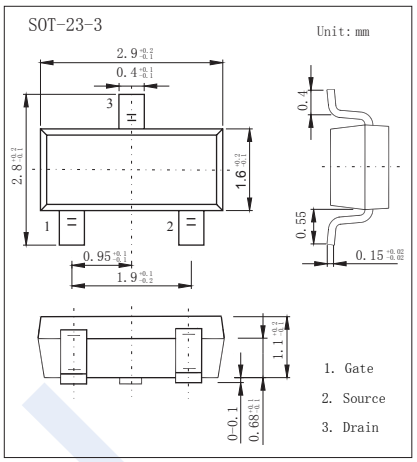
N-Channel Enhancement MOSFET

SI2312 (KI2312)

■ Features

- $V_{DS\,(V)}$ = 20V
- I_D = 4.9 A (V_{GS} =4.5V)
- $R_{DS(ON)}$ < 33mΩ (V_{GS} = 4.5V)
- $R_{DS(ON)}$ < 40mΩ (V_{GS} = 2.5V)
- $R_{DS(ON)}$ < 51mΩ (V_{GS} = 1.8V)





■ Absolute Maximum Ratings Ta = 25℃

Parameter		Symbol	5 sec	Steady State	Unit
Drain-Source Voltage		V_{DS}	20		V
Gate-Source Voltage		V_{GS}	±8		
Continuous Drain Current T_J=150℃*1	Ta=25℃	I_D	4.9	3.77	A
	Ta=70℃		3.9	3.0	
Pulsed Drain Current *2		I_{DM}	15		
Avalanche Current *2	L=0.1mH	I_{AS}	15		
Single Avalanche Energy		E_{AS}	11.25		mJ
Power Dissipation *1	Ta=25℃	P_D	1.25	0.75	W
	Ta=70℃		0.8	0.48	
Thermal Resistance.Junction- to-Ambient *1 t≤5 sec		R_{thJA}	100		℃/W
Steady State			166		
Thermal Resistance.Junction-to-Foot		R_{thJF}	50		
Junction Temperature		T_J	150		℃
Storage Temperature Range		T_{stg}	-55 to 150		

*1 Surface Mounted on 1” x 1” FR4 Board.

*2 Pulse width limited by maximum junction temperature

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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	20			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=20V, V_{GS}=0V			1	μA
		V_{DS}=20V, V_{GS}=0V, Ta=70℃			75	
Gate-Body Leakage Current	I_{GSS}	V_{DS}=0V, V_{GS}=±8V			±100	nA
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS} , I_D=250μA	0.45	0.65	0.85	V
On-State Drain Current *1	$I_{D(on)}$	V_{DS} ≥ 10 V, V_{GS} = 4.5 V	15			A
Static Drain-Source On-Resistance *1	$R_{DS(on)}$	V_{GS}=4.5V, I_D=5.0A		27	33	mΩ
		V_{GS}=2.5V, I_D=4.5A		33	40	
		V_{GS}=1.8V, I_D=4.0A		42	51	
Forward Transconductance *1	g_{FS}	V_{DS}=15V, I_D=5.0A		40		S
Total Gate Charge	Q_g	V_{GS}=4.5V, V_{DS}=10V, I_D=5.0A		11.2	14	nC
Gate Source Charge	Q_{gs}			1.4		
Gate Drain Charge	Q_{gd}			2.2		
Turn-On DelayTime	$t_{d(on)}$	I_D=1.0A, V_{DS}=10V, ,V_{GEN}=4.5V R_L=10Ω,R_G=6Ω		15	25	ns
Turn-On Rise Time	t_r			40	60	
Turn-Off DelayTime	$t_{d(off)}$			48	70	
Turn-Off Fall Time	t_f			31	45	
Body Diode Reverse Recovery Time	t_{rr}	I_F= 1.0A, di/dt= 100A/μs		13	25	
Maximum Body-Diode Continuous Current	I_S				1.0	A
Diode Forward Voltage	V_{SD}	I_S=1.0A,V_{GS}=0V		0.8	1.2	V

*1 Pulse test: PW ≤ 300us duty cycle≤ 2%.

■ Marking

Marking	AE9T

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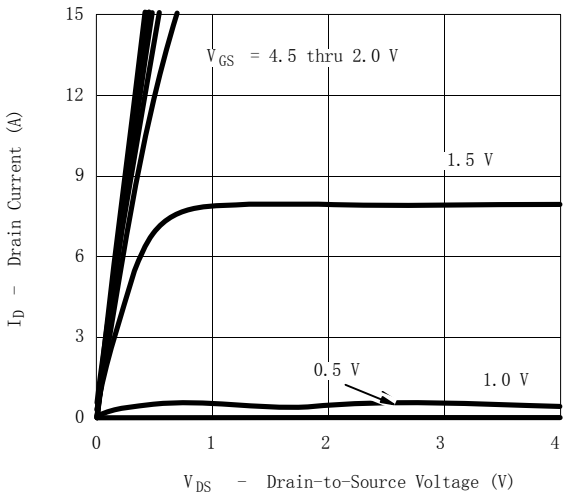
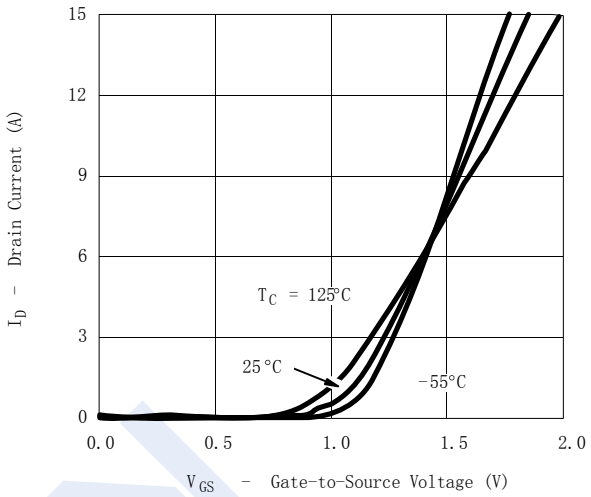
■ Typical Characterisitics

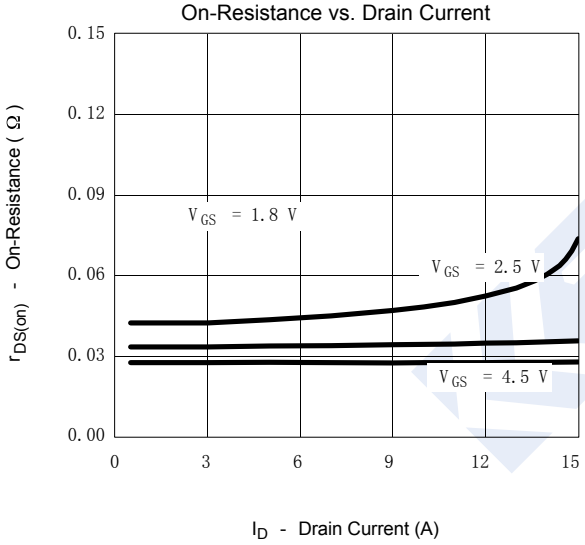
Output Characteristics



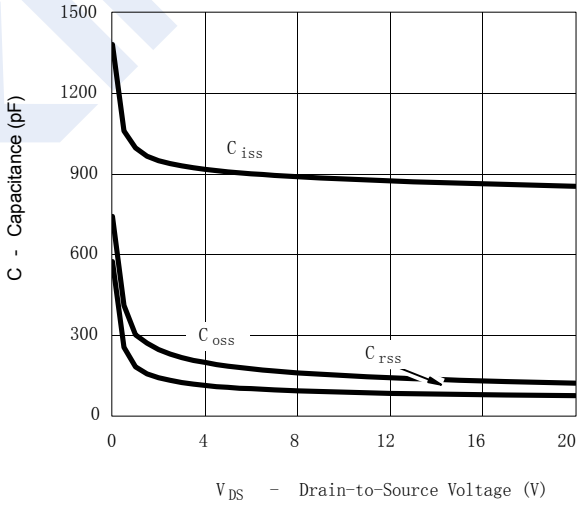
Transfer Characteristics



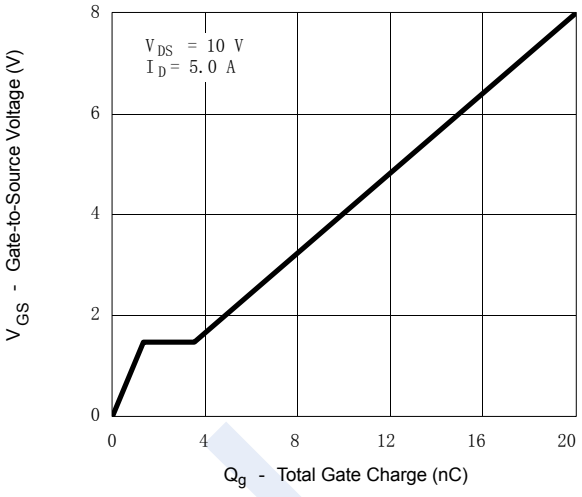
On-Resistance vs. Drain Current



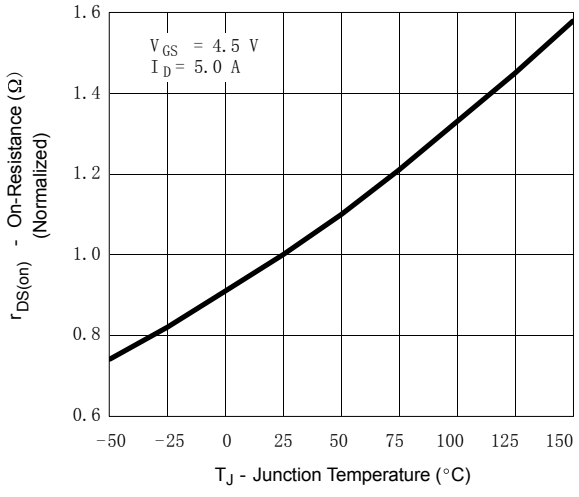
Capacitance



Gate Charge



On-Resistance vs. Junction Temperature



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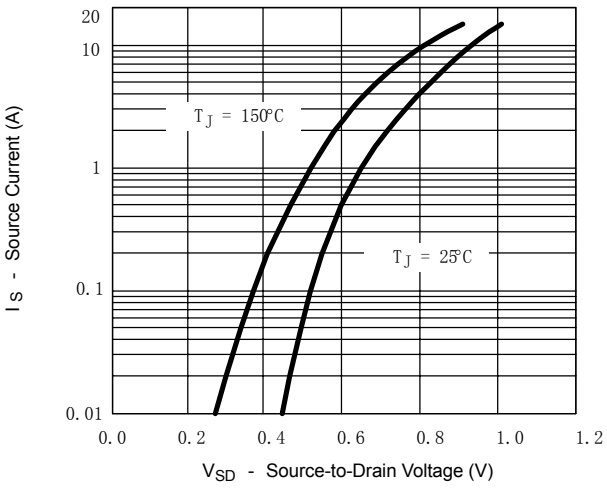
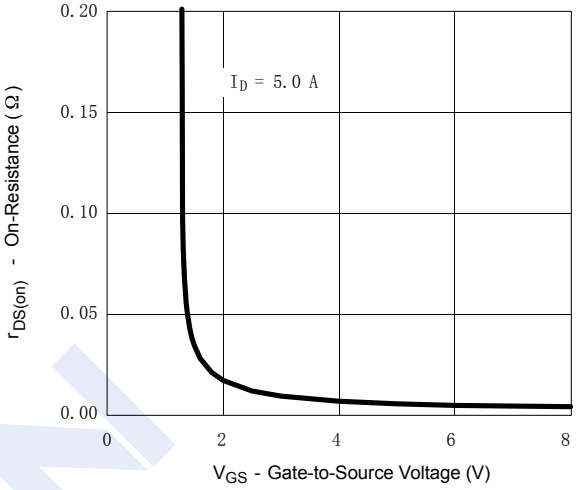
■ Typical Characterisitics

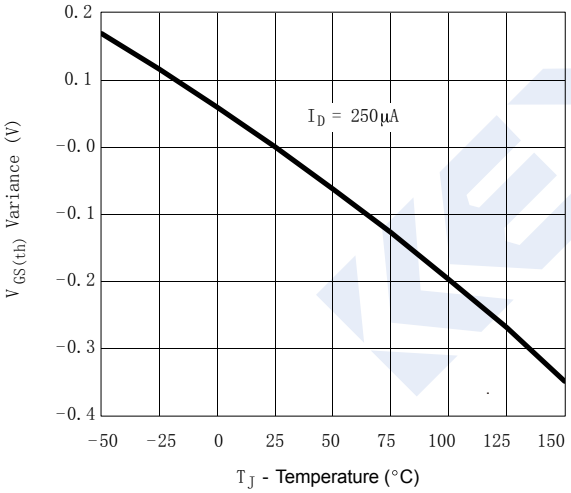
Source-Drain Diode Forward Voltage



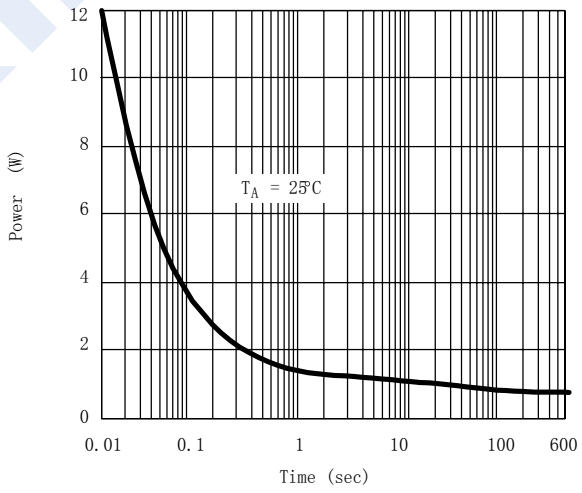
On-Resistance vs. Gate-to-Source Voltage



Threshold Voltage



Single Pulse Power



Normalized Thermal Transient Impedance, Junction-to-Ambient