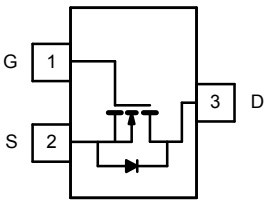
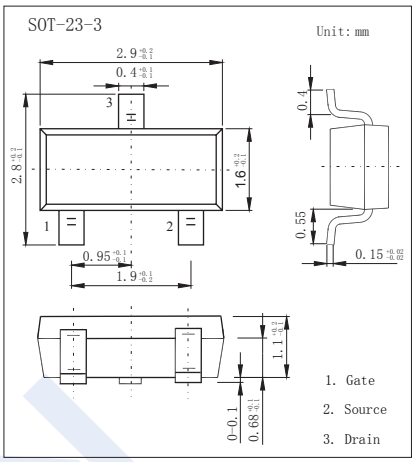
N-Channel Enhancement MOSFET

SI2304DS (KI2304DS)

■ Features

- $V_{DS\ (V)}$ = 30V
- $R_{DS(ON)}$ < 117mΩ (V_{GS} = 10V)
- $R_{DS(ON)}$ < 190mΩ (V_{GS} = 4.5V)





■ Absolute Maximum Ratings Ta = 25℃

Parameter		Symbol	Rating	Unit
Drain-Source Voltage		V_{DS}	30	V
Gate-Source Voltage		V_{GS}	±20	
Continuous Drain Current (T_J=150℃) *1	Ta=25℃	I_D	2.5	A
	Ta=70℃		2.0	
Pulsed Drain Current *2		I_{DM}	10	
Power Dissipation	Ta=25℃	P_D	1.25	W
	Ta=70℃		0.8	
Thermal Resistance.Junction- to-Ambient *1		R_{thJA}	100	℃/W
Thermal Resistance.Junction- to-Ambient *3			166	
Junction Temperature		TJ	150	℃
Storage Temperature Range		Tstg	-55 to 150	

*1 Surface Mounted on FR4 Board, t ≤ 5 sec.

*2 Pulse width limited by maximum junction temperature.

*3 Surface Mounted on FR4 Board.

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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	30			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=30V, V_{GS}=0V			0.5	μA
		V_{DS}=30V, V_{GS}=0V, Ta=55℃			10	
Gate-Body Leakage Current	I_{GSS}	V_{DS}=0V, V_{GS}=±20V			±100	nA
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS} , I_D=250μA	1.5		3	V
On-State Drain Currenta *1	$I_{D(on)}$	V_{DS} ≥ 4.5 V, V_{GS} = 10 V	6			A
		V_{DS} ≥ 4.5 V, V_{GS} = 4.5 V	4			
Static Drain-Source On-Resistance *1	$R_{DS(ON)}$	V_{GS}=10V, I_D=2.5A		92	117	mΩ
		V_{GS}=4.5V, I_D=2.0A		142	190	
Forward Transconductance *1	g_{FS}	V_{DS}=4.5V, I_D=2.5A		4.6		S
Input Capacitance	C_{iss}	V_{GS}=0V, V_{DS}=15V, f=1MHz		240		pF
Output Capacitance	C_{oss}			110		
Reverse Transfer Capacitance	C_{rss}			17		
Total Gate Charge	Q_g	V_{DS}=15V,V_{GS}=5V,I_D=2.5A		2.4	4	nC
Gate-Source Charge	Q_{gt}	V_{GS}=10V, V_{DS}=15V, I_D=2.5A		4.5	10	
Gate Source Charge	Q_{gs}			0.8		
Gate Drain Charge	Q_{gd}			1.0		
Turn-On DelayTime	$t_{d(on)}$	I_D=1A, V_{DS}=15V, ,R_{GEN}=6Ω R_L=15Ω,VGS=10V		8	20	ns
Turn-On Rise Time	t_r			12	30	
Turn-Off DelayTime	$t_{d(off)}$			17	35	
Turn-Off Fall Time	t_f			8	20	
Maximum Body-Diode Continuous Current	I_S				1.25	A
Diode Forward Voltage	V_{SD}	I_S=1.25A,V_{GS}=0V		0.77	1.2	V

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

■ Marking

Marking	A4*

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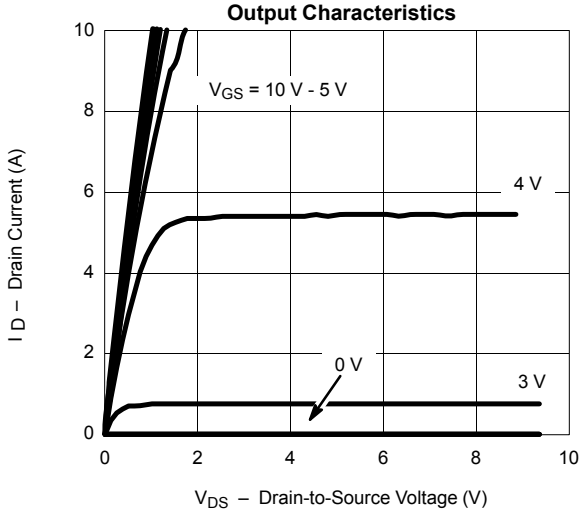
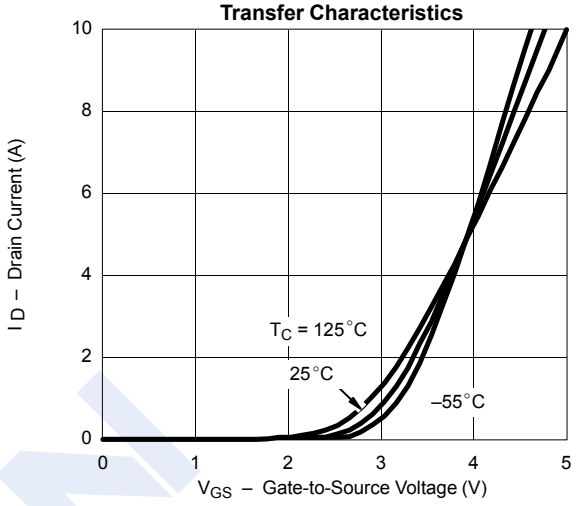
■ Typical Characterisitics

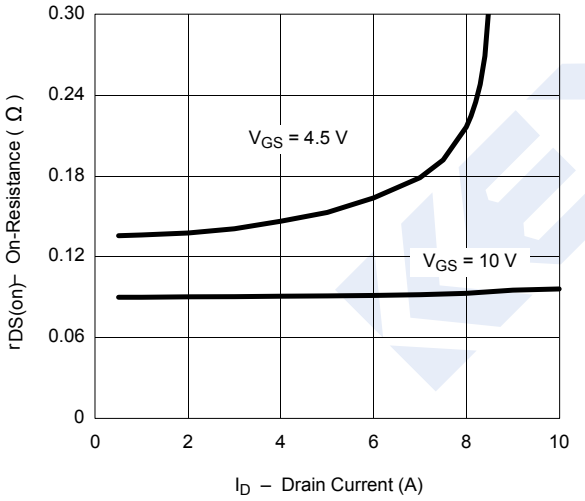
Output Characteristics



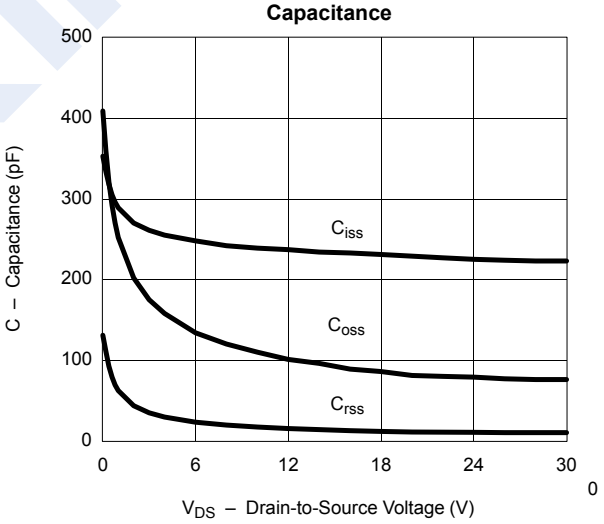
Transfer Characteristics



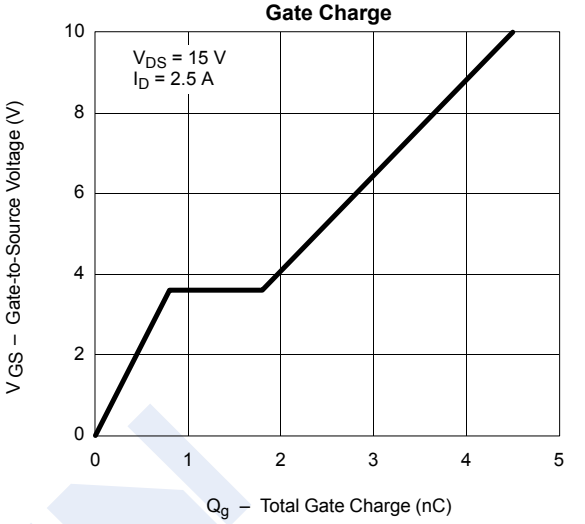
On-Resistance vs. Drain Current



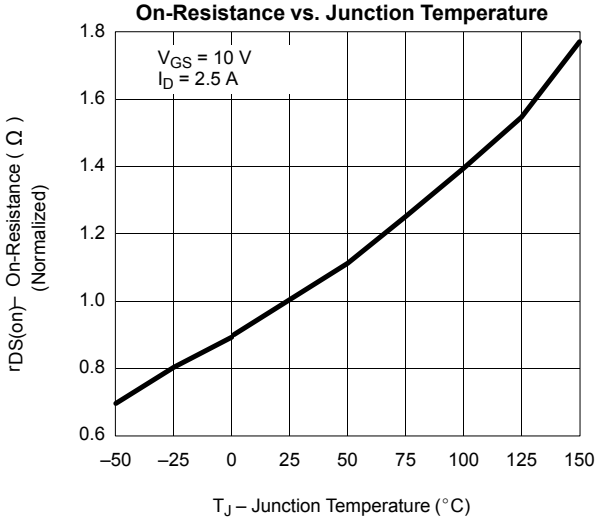
Capacitance



Gate Charge



On-Resistance vs. Junction Temperature



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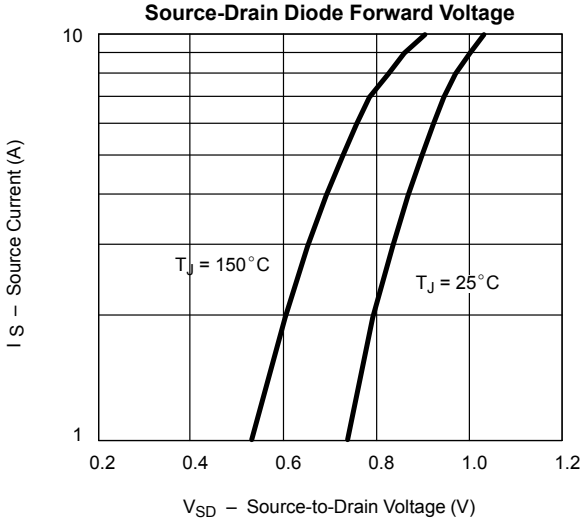
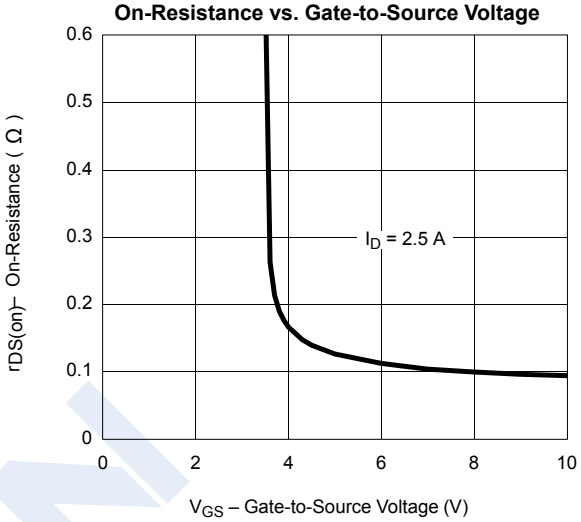
■ Typical Characterisitics

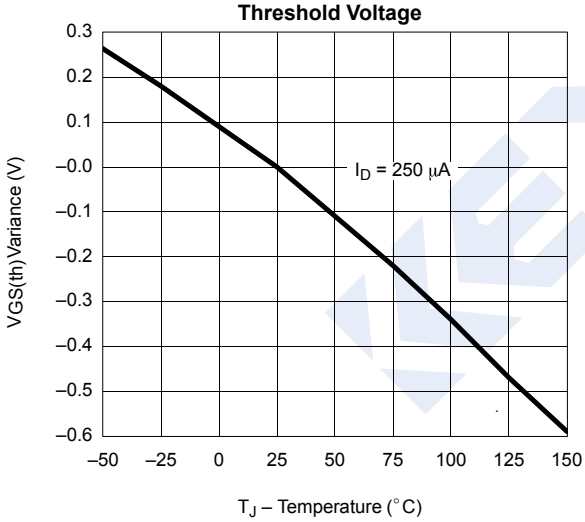
Source-Drain Diode Forward Voltage



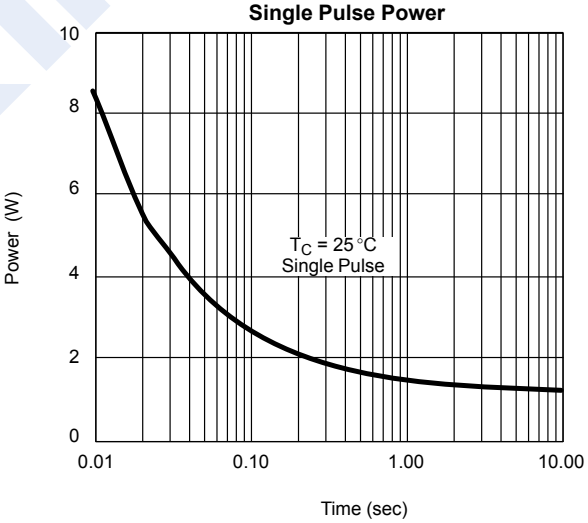
On-Resistance vs. Gate-to-Source Voltage



Threshold Voltage



Single Pulse Power



Normalized Thermal Transient Impedance, Junction-to-Ambient