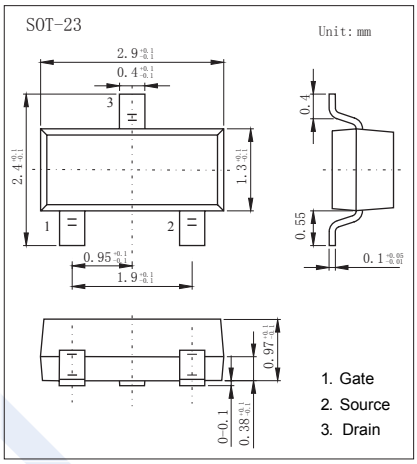
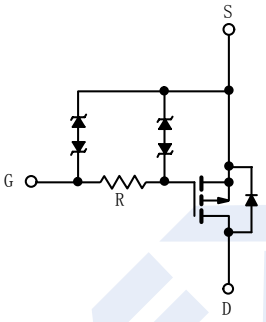
P-Channel MOSFET

SI2377EDS (KI2377EDS)



■ Features

- $V_{DS\ (V)}$ = -20V
- I_D = -4.4 A
- $R_{DS(ON)}$ < 61mΩ (V_{GS} = -4.5V)
- $R_{DS(ON)}$ < 80mΩ (V_{GS} = -2.5V)
- $R_{DS(ON)}$ < 110mΩ (V_{GS} = -1.8V)
- $R_{DS(ON)}$ < 165mΩ (V_{GS} = -1.5V)



■ Absolute Maximum Ratings Ta = 25℃

Parameter		Symbol	Rating	Unit
Drain-Source Voltage		V_{DS}	-20	V
Gate-Source Voltage		V_{GS}	±8	
Continuous Drain Current (T_J = 150℃)	Tc=25℃	I_D	-4.4	A
	Tc=70℃		-3.5	
	Ta=25℃		-3.7	
	Ta=70℃		-2.9	
Pulsed Drain Current		I_{DM}	-20	
Power Dissipation	Tc=25℃	P_D	1.8	W
	Tc=70℃		1.1	
	Ta=25℃		1.25	
	Ta=70℃		0.8	
Thermal Resistance.Junction- to-Ambient	t≤5 s	R_{thJA}	100	℃/W
Thermal Resistance.Junction- to-Foot		R_{thJF}	70	
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	-20			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=-20V, V_{GS}=0V			-1	μA
		V_{DS}=-20V, V_{GS}=0V, T_J=55℃			-10	
Gate-Body Leakage Current	I_{GSS}	V_{DS}=0V, V_{GS}=±8V			±6	μA
		V_{DS}=0V, V_{GS}=±4.5V			±0.5	
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS} , I_D=-250μA	-0.4		-1	V
Static Drain-Source On-Resistance	$R_{DS(ON)}$	V_{GS}=-4.5V, I_D=-3.2A			61	mΩ
		V_{GS}=-2.5V, I_D=-2.8A			80	
		V_{GS}=-1.8V, I_D=-1.5A			110	
		V_{GS}=-1.5V, I_D=-0.5A			165	
On State Drain Current	$I_{D(ON)}$	V_{GS}=-4.5V, V_{DS}≤-5V	-15			A
Forward Transconductance	g_{FS}	V_{DS}=-10V, I_D=-3.2A		12		S
Gate Resistance	R_g	V_{GS}=0V, V_{DS}=0V, f=1MHz	0.4	2	4	KΩ
Total Gate Charge	Q_g	V_{GS}=-8V, V_{DS}=-10V, I_D=-5.3A		14	21	nC
		V_{GS}=-4.5V, V_{DS}=-10V, I_D=-5.3A		7.6	12	
Gate Source Charge	Q_{gs}			0.8		
Gate Drain Charge	Q_{gd}			3.1		
Turn-On DelayTime	$t_{d(on)}$	V_{DD}=-10 V, R_L=2.3Ω I_D=-4.3A, V_{GEN}=-4.5V, R_g = 1Ω		0.2	0.3	ns
Turn-On Rise Time	t_r			1	1.5	
Turn-Off DelayTime	$t_{d(off)}$			4	6	
Turn-Off Fall Time	t_f			2	3	
Turn-On DelayTime	$t_{d(on)}$	V_{DD}=-10 V, R_L=2.3Ω I_D=-4.3A, V_{GEN}=-8V, R_g = 1Ω		0.09	0.14	
Turn-On Rise Time	t_r			0.4	0.6	
Turn-Off DelayTime	$t_{d(off)}$			5.2	7.8	
Turn-Off Fall Time	t_f			2.3	3.5	
Body Diode Reverse Recovery Time	t_{rr}	I_F= -3A, dI/dt= 100A/μs , T_J = 25℃		30	60	
Body Diode Reverse Recovery Charge	Q_{rr}			20	40	nC
Reverse Recovery Fall Time	t_a			13		ns
Reverse Recovery Rise Time	t_b			17		
Maximum Body-Diode Continuous Current	I_S	Tc = 25℃			-1.5	A
Pulse Diode Forward Current (t = 100 μs)	I_{SM}				-20	
Diode Forward Voltage	V_{SD}	I_S=-3A,V_{GS}=0V			-1.2	V

Note.Pulse test; pulse width≤300 μs, duty cycle≤2 %.

■ Marking

Marking	P6*

P-Channel MOSFET

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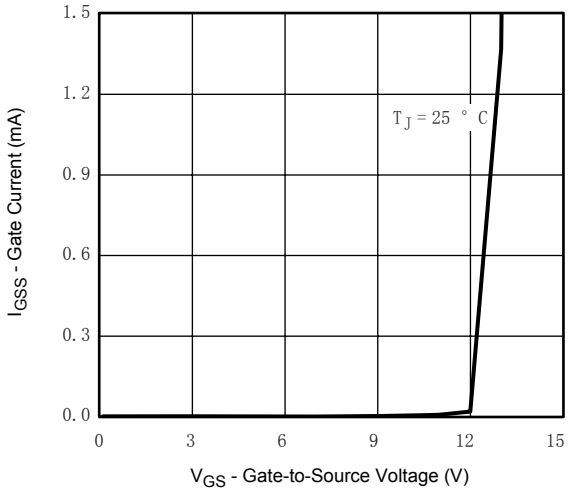
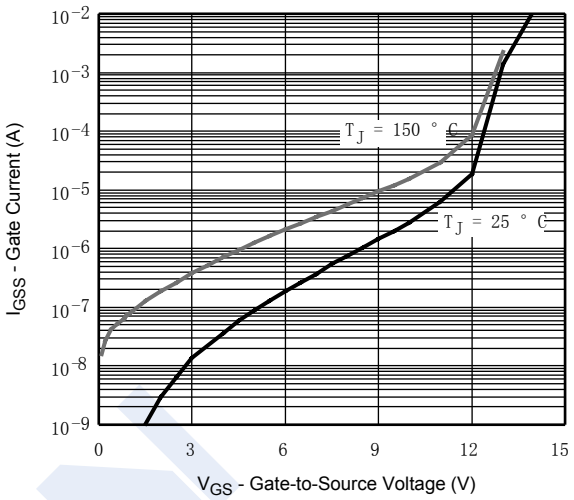
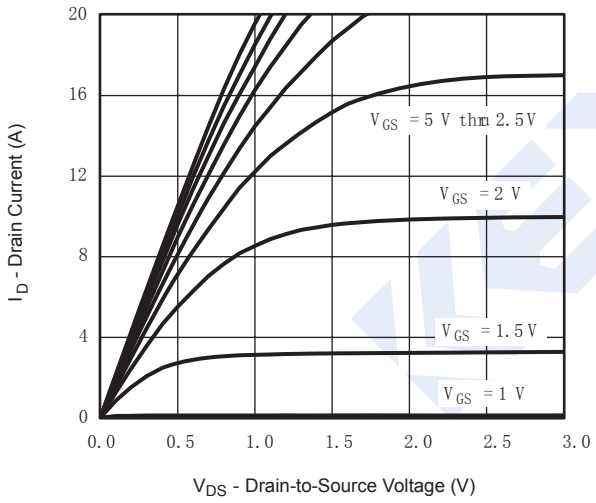
■ Typical Characterisitics



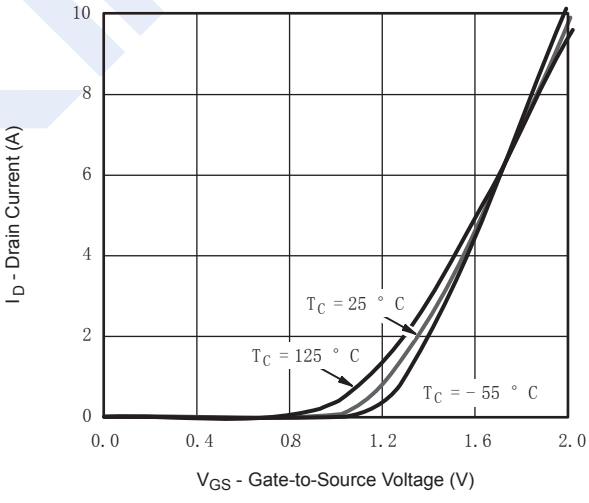
Gate Current vs. Gate-Source Voltage



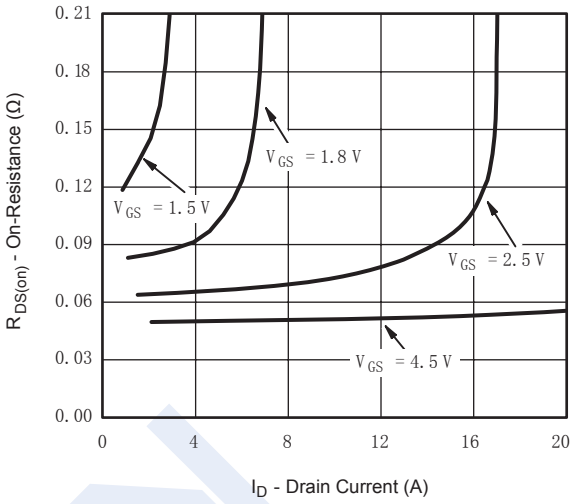
Gate Current vs. Gate-Source Voltage



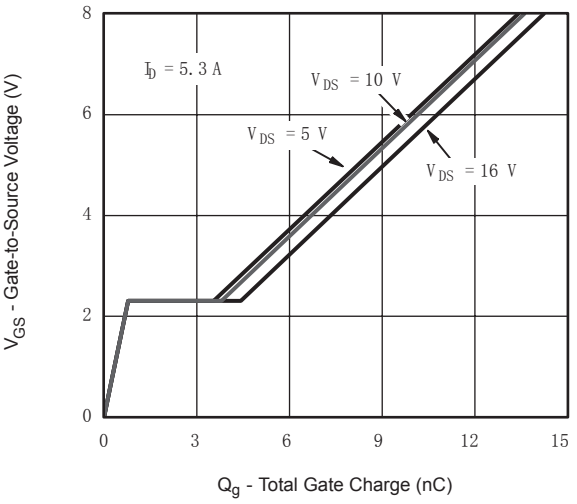
Output Characteristics



Transfer Characteristics



On-Resistance vs. Drain Current



Gate Charge

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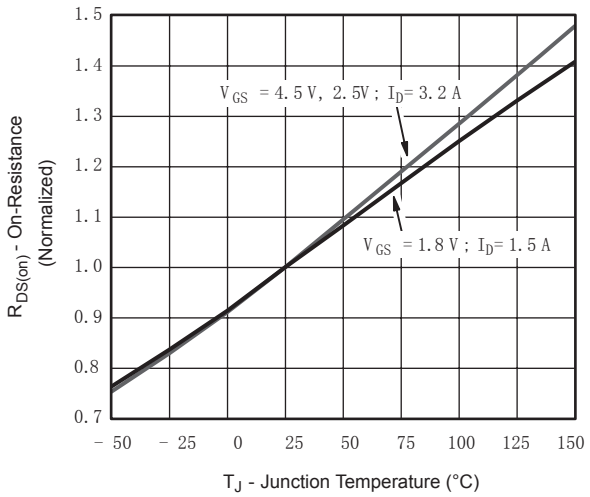
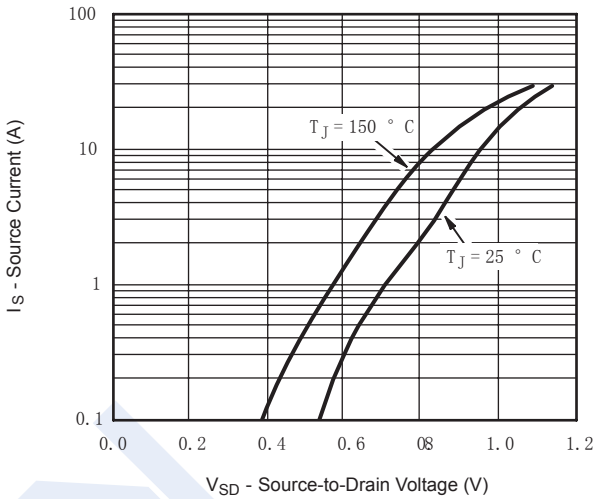
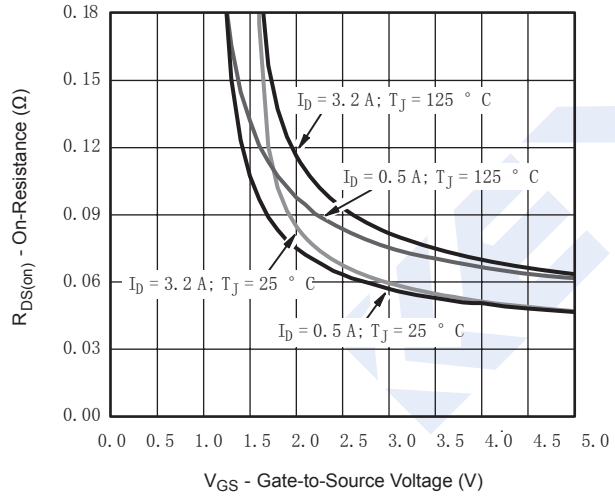
■ Typical Characterisitics



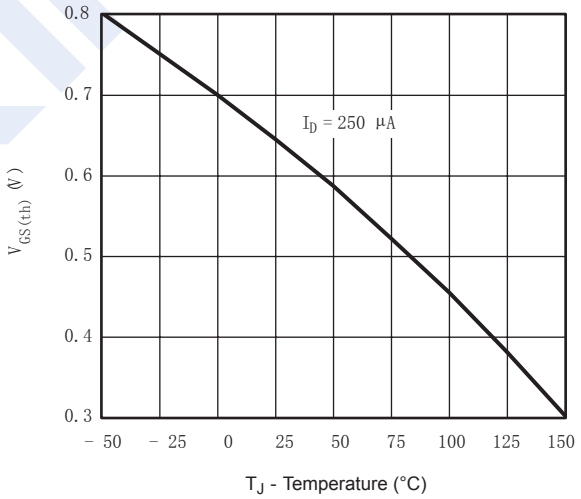
On-Resistance vs. Junction Temperature



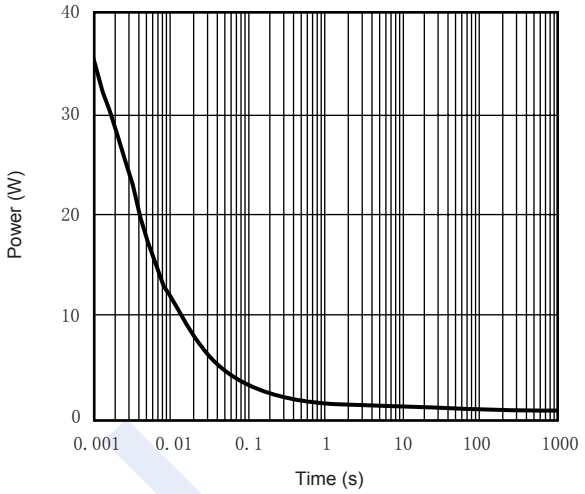
Soure-Drain Diode Forward Voltage



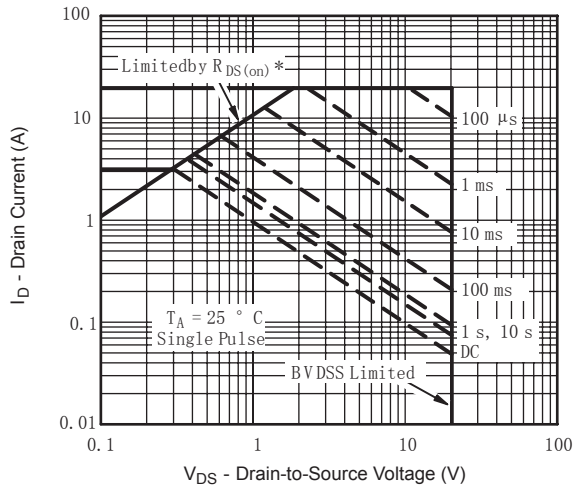
On-Resistance vs. Gate-to-Source Voltage



Threshold Voltage



Single Pulse Power, Junction-to-Ambient



* V_{GS} > minimum V_{GS} at which $R_{DS(on)}$ is specified

Safe Operating Area, Junction-to-Ambient

P-Channel MOSFET

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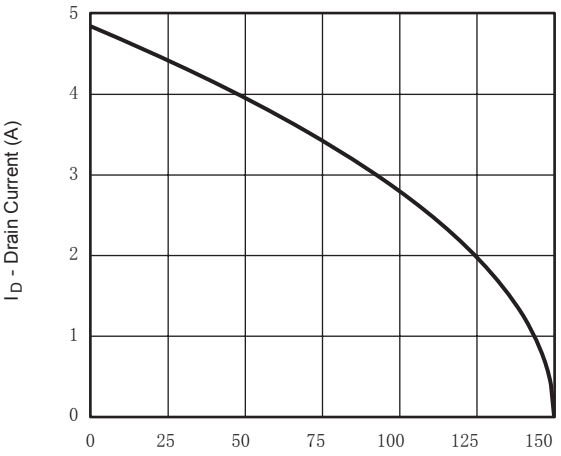
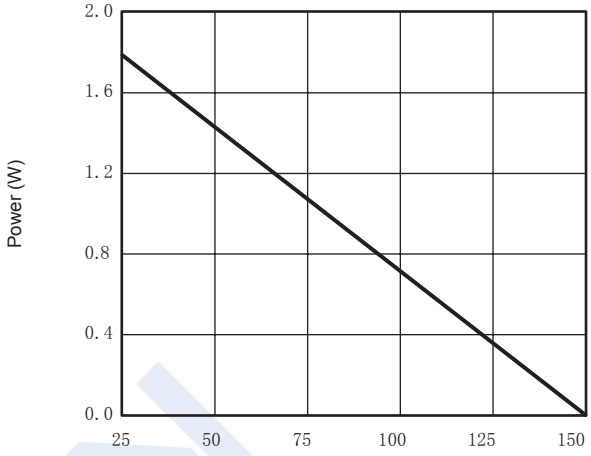
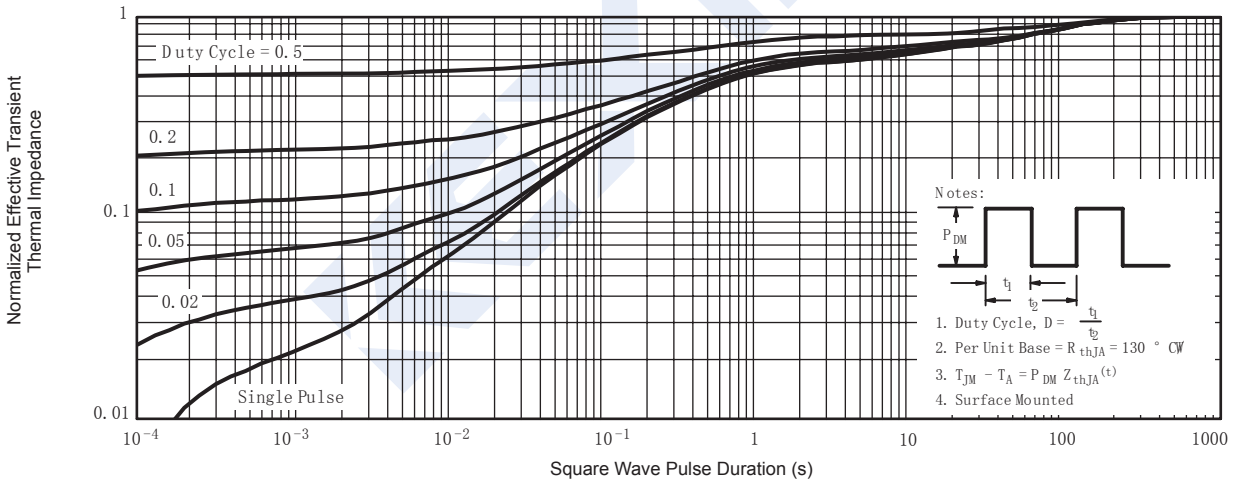
■ Typical Characterisitics



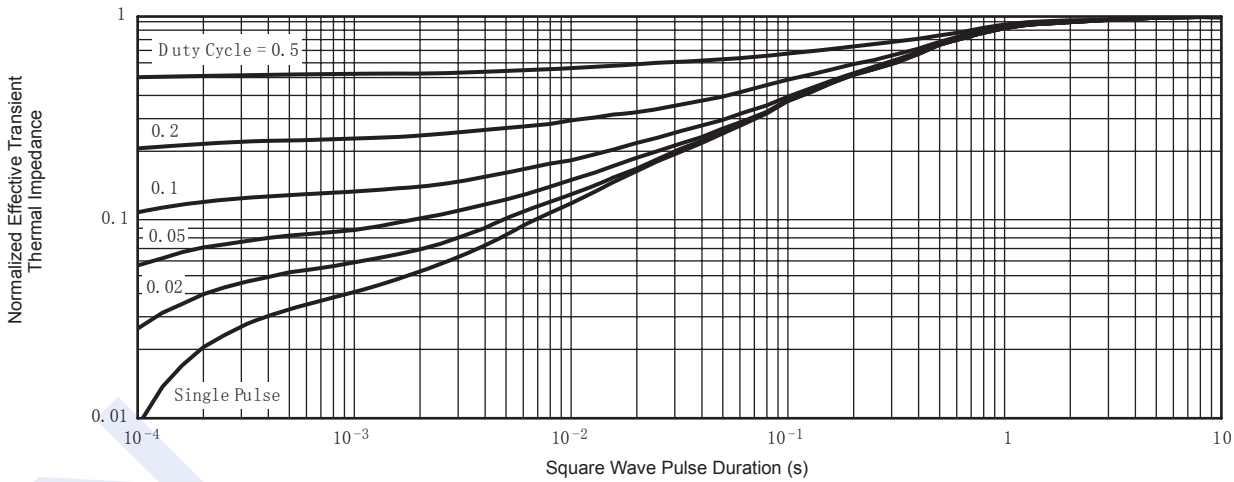
Current Derating*



Power Derating



Normalized Thermal Transient Im pedance, Junction-to-Ambient



Normalized Thermal Transient Impedance, Junction-to-Foot