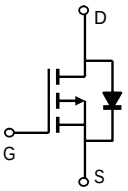
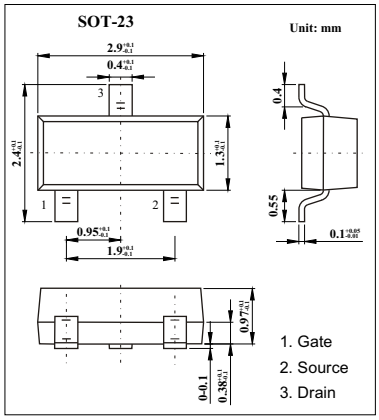
P-Channel Enhancement Mode MOSFET

KI2303DS

■ Features

- V_{DS} (V) = -30V
- I_D = -1.4 A
- $R_{DS(ON)}$ < 200mΩ (V_{GS} = -10V)
- $R_{DS(ON)}$ < 380mΩ (V_{GS} = -4.5V)





■ Absolute Maximum Ratings Ta = 25℃

Parameter		Symbol	5 sec	Steady State	Unit
Drain-Source Voltage		V_{DS}	-30		V
Gate-Source Voltage		V_{GS}	±20		V
Continuous Drain Current	T_A=25℃ T_A=70℃	I_D	-1.4 -1.1	-1.3 -1.0	A
Pulsed Drain Current *1		I_{DM}	-10		A
Power Dissipation	T_A=25℃ T_A=70℃	P_D	0.9 0.57	0.7 0.45	W
Thermal Resistance.Junction-to-Ambient		R_{thJA}	175		℃/W
Jumction Temperature		T_j	150		℃
Storage Temperature		T_{stg}	-55 to +150		℃

* 1. Pulse width limited by maximum junction temperature.

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■ Electrical Characteristics Ta = 25℃

Parameter	Symbol	Test conditons	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	V_{DSS}	V_{GS} = 0 V, I_D = -10 μA	-30			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = -30 V, V_{GS} = 0 V			-1	μA
		V_{DS} = -30 V, V_{GS} = 0 V, T_J = 55 ℃			-10	
Gate-Body Leakage	I_{GSS}	V_{DS} = 0 V, V_{GS} = ±20 V			±100	nA
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = -250 μA	-1.0		-3.0	V
Drain-Source On-State Resistance *	$R_{DS(on)}$	V_{GS} = -10 V, I_D = -1.7 A			0.2	Ω
		V_{GS} = -4.5 V, I_D = -1.3 A			0.38	
On-State Drain Current	$I_{D(on)}$	V_{DS} ≤ -5 V, V_{GS} = -10 V	-6			A
Forward Transconductance *	g_{fs}	V_{DS} = -5 V, I_D = -1.7 A		2.0		S
Input Capacitance	C_{iss}	V_{DS} = -15V ,V_{GS} = 0 , f = 1 MHz		180		pF
Output Capacitance	C_{oss}			50		
Reverse Transfer Capacitance	C_{rss}			35		
Total Gate Charge	Q_g	V_{DS} = -15V ,V_{GS} = -10 V , I_D= -1.7 A		4.3	10	nC
Gate-Source Charge	Q_{gs}			0.8		
Gate-Drain Charge	Q_{gd}			1.3		
Turn-On Time	$t_{d(on)}$	V_{DD} = -15V , R_L = 15Ω , I_D = -1A , V_{GEN} =- 4.5V , R_G = 6Ω		55	80	ns
	t_r			40	60	
Turn-Off Time	$t_{d(off)}$			10	20	
	t_f			10	20	
Continuous Source Current (diode conduction)	I_S				-0.75	A
Diode Forward Voltage *	V_{SD}	I_S = -0.75 A, V_{GS} = 0 V			-1.2	V

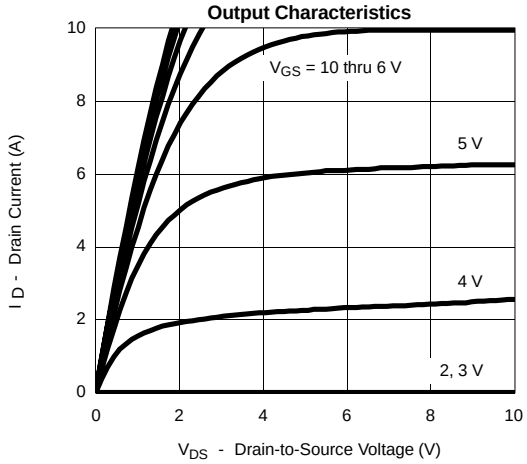
* Pulse test: PW ≤ 300 μs duty cycle ≤ 2%.

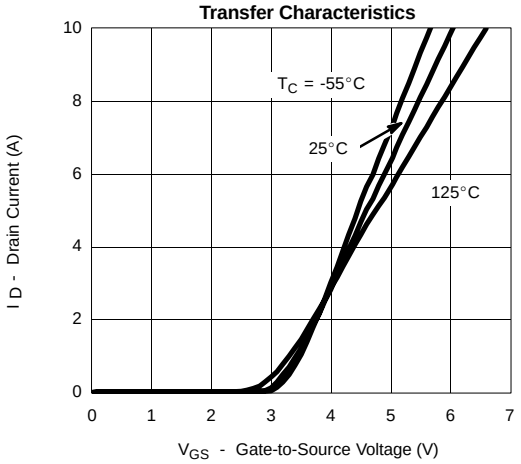
■ Marking

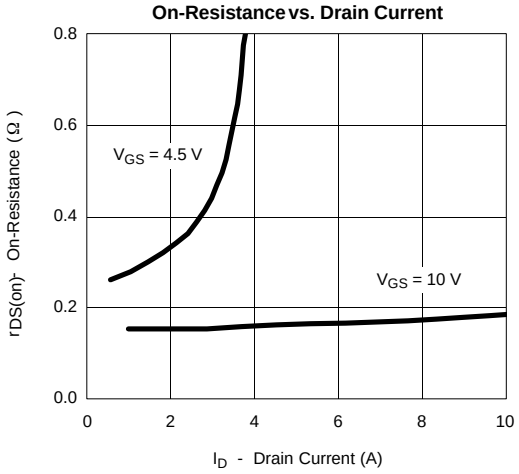
Marking	L3SUB

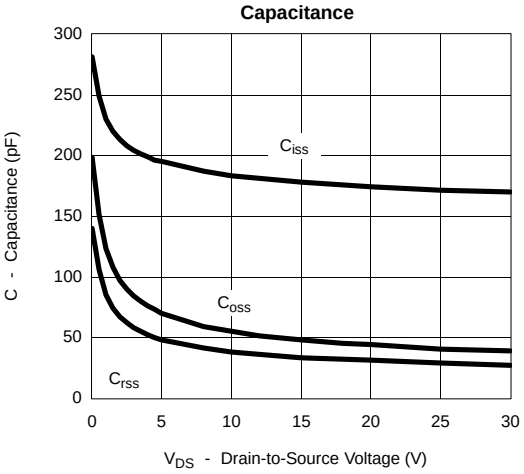
KI2303DS

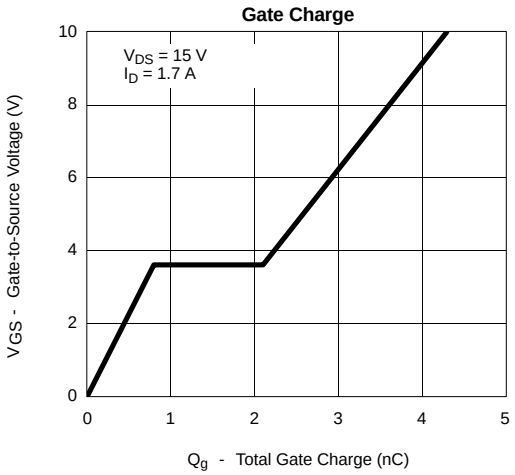
■ Typical Characteristics

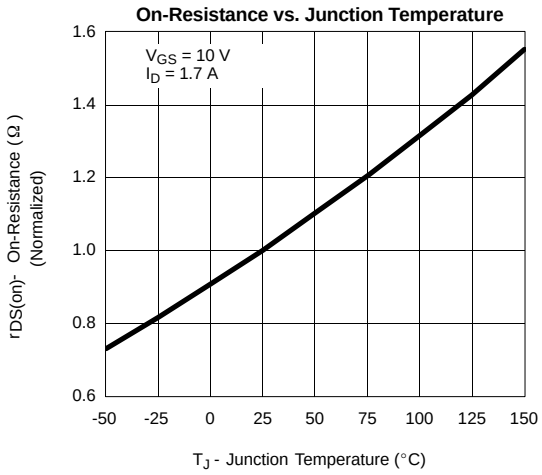












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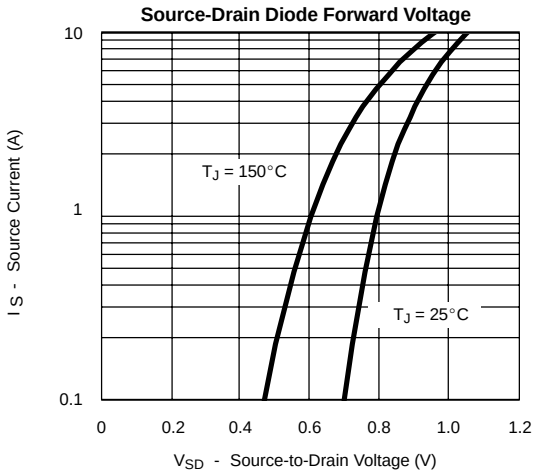
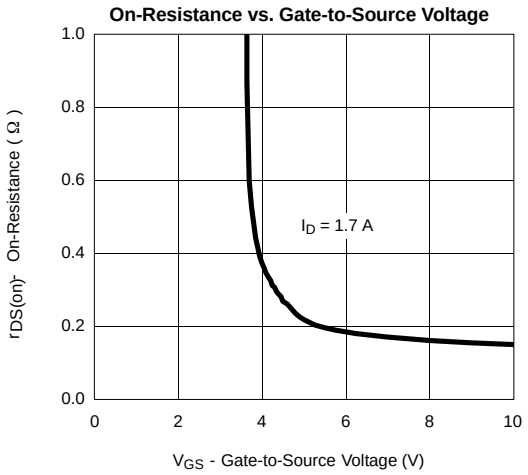
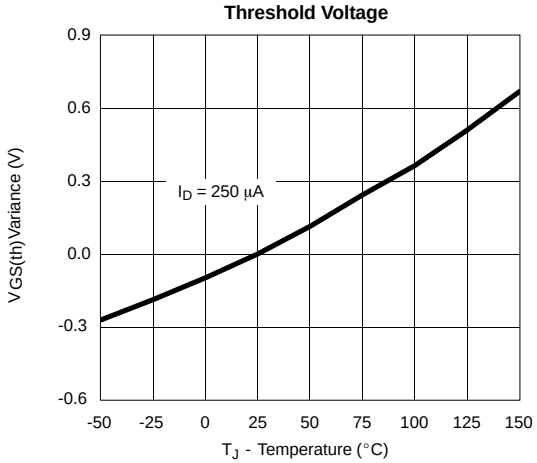
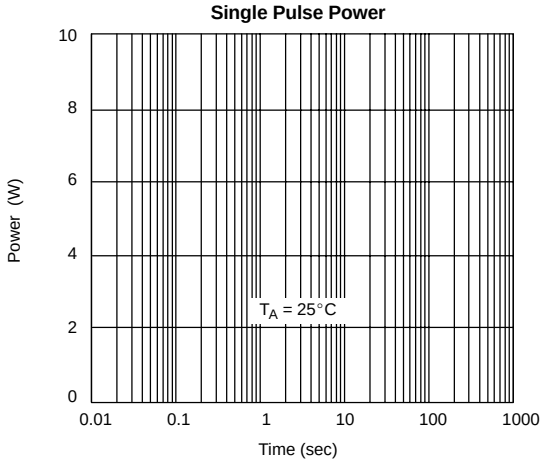
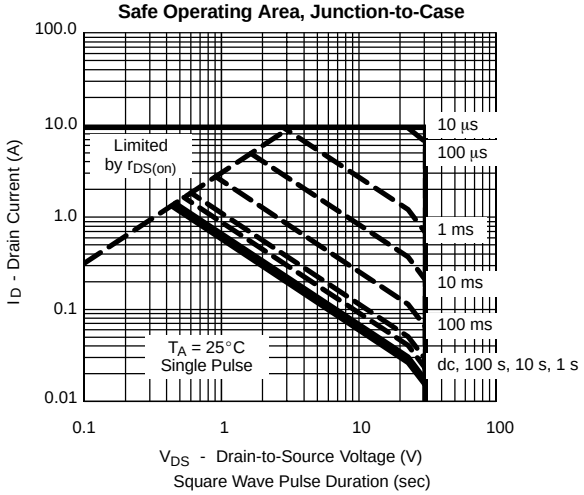

Source-Drain Diode Forward Voltage
10
1
0.1
0
0.2
0.4
0.6
0.8
1.0
1.2
T_J = 150°C
T_J = 25°C
I_S - Source Current (A)
V_{SD} - Source-to-Drain Voltage (V)


On-Resistance vs. Gate-to-Source Voltage
1.0
0.8
0.6
0.4
0.2
0.0
0
2
4
6
8
10
I_D = 1.7 A
$r_{DS(on)}$ - On-Resistance (Ω)
V_{GS} - Gate-to-Source Voltage (V)


Threshold Voltage
0.9
0.6
0.3
0.0
-0.3
-0.6
-50
-25
0
25
50
75
100
125
150
I_D = 250 µA
VGS(th)Variance (V)
T_J - Temperature (°C)


Single Pulse Power
10
8
6
4
2
0
0.01
0.1
1
10
100
1000
T_A = 25°C
Power (W)
Time (sec)


Safe Operating Area, Junction-to-Case
100.0
10.0
1.0
0.1
0.01
0.1
1
10
100
Limited by $r_{DS(on)}$
T_A = 25°C
Single Pulse
10 µs
100 µs
1 ms
10 ms
100 ms
dc, 100 s, 10 s, 1 s
I_D - Drain Current (A)
V_{DS} - Drain-to-Source Voltage (V)
Square Wave Pulse Duration (sec)

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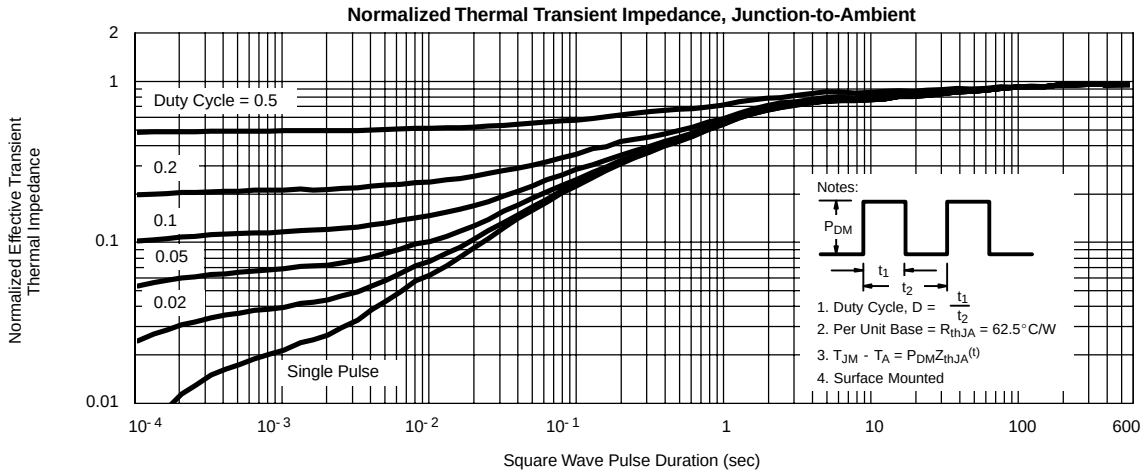
Normalized Thermal Transient Impedance, Junction-to-Ambient
Normalized Effective Transient Thermal Impedance
2
1
0.1
0.01
Duty Cycle = 0.5
0.2
0.1
0.05
0.02
Single Pulse
Notes:
PDM
t1
t2
1. Duty Cycle, D = t1/t2
2. Per Unit Base = RthJA = 62.5°C/W
3. TJM - TA = PDMZthJA(t)
4. Surface Mounted
10-4
10-3
10-2
10-1
1
10
100
600
Square Wave Pulse Duration (sec)