



武汉芯源半导体有限公司

WUHAN XINYUAN SEMICONDUCTOR CO., LTD

# CW2302 Datasheet

SOT-23 N-Channel Enhancement MOSFET

Rev 1.0



# Contents

1	Features .....	3
2	Absolute Maximum Ratings .....	4
3	Electrical Characteristics.....	5
4	Typical Characterisitcs .....	6
5	Revision history .....	8

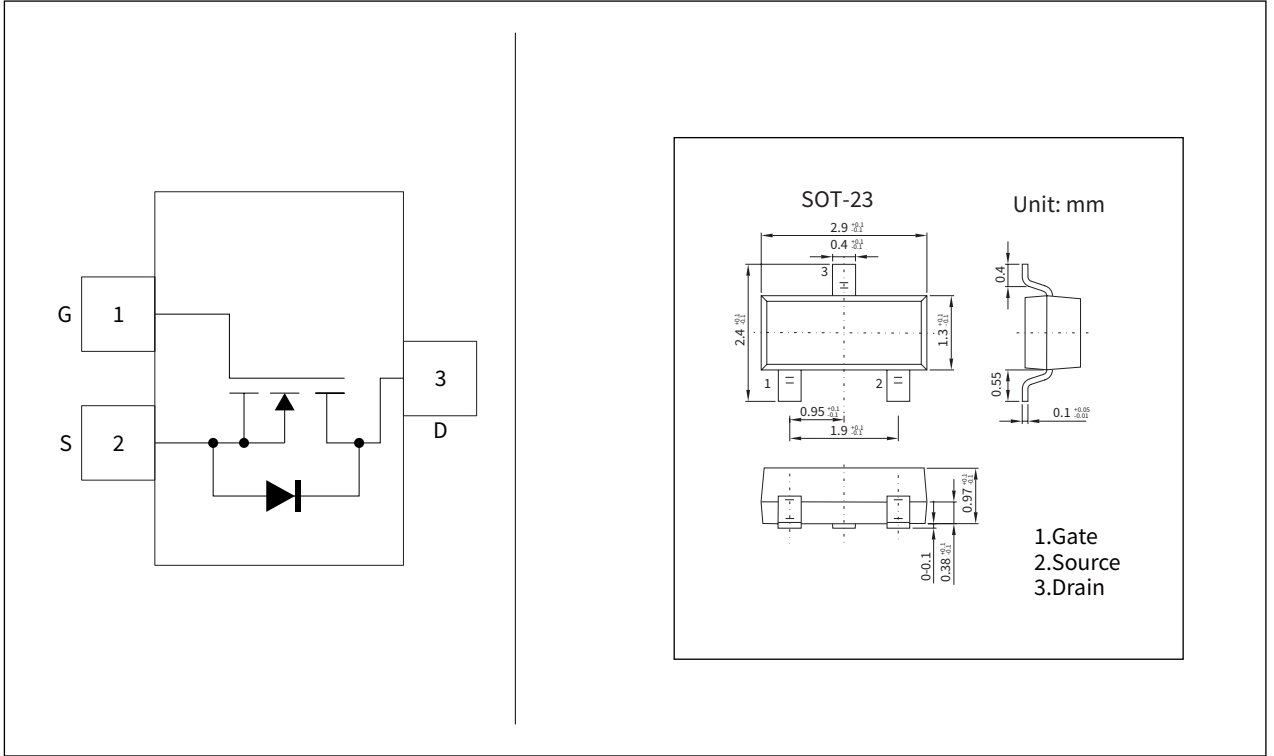


# 1 Features

$V_{DS} = 20V$

$R_{DS(ON)} = 85m\Omega @V_{GS} = 4.5V, I_D = 3.6A$

$R_{DS(ON)} = 115m\Omega @V_{GS} = 2.5V, I_D = 3.1A$



## 2 Absolute Maximum Ratings

Ta=25°C

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	$V_{DS}$	20	V
Gate-Source Voltage	$V_{GS}$	±8	V
Continuous Drain Current <sup>1</sup> Ta = 25°C	$I_D$	3.6	A
Continuous Drain Current <sup>1</sup> Ta = 70°C	$I_D$	2.8	A
Pulsed Drain Current	$I_{DM}$	10	A
Power Dissipation Ta = 25°C	$P_D$	1.25	W
Power Dissipation Ta = 70°C	$P_D$	0.8	W
Thermal Resistance.Junction- to-Ambient <sup>1</sup>	$R_{thJA}$	100	°C /W
Thermal Resistance.Junction- to-Ambient <sup>2</sup>	$R_{thJA}$	166	°C /W
Junction Temperature	$T_J$	150	°C
Storage Temperature Range	$T_{stg}$	-55 to 150	°C

*Caution 1: Surface Mounted on FR4 Board,  $t \leq 5$  sec.*

*Caution 2: Surface Mounted on FR4 Board.*



### 3 Electrical Characteristics

T<sub>a</sub>=25°C

Parameter	Symbol	Test conditions	MIN	TYP	MAX	UNIT
Drain-Source Breakdown Voltage	V <sub>DSS</sub>	V <sub>GS</sub> =0V, I <sub>D</sub> =250μA	20			V
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> =20V, V <sub>GS</sub> =0V			1	μA
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> =20V, V <sub>GS</sub> =0V, T <sub>J</sub> =55°C			10	
Gate-Body Leakage Current	I <sub>GSS</sub>	V <sub>DS</sub> =0V, V <sub>GS</sub> =±8V			±100	nA
Gate Threshold Voltage	V <sub>GS(TH)</sub>	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250μA	0.62	0.95	1.9	V
Static Drain-Source On-Resistance	R <sub>DS(ON)</sub>	V <sub>GS</sub> =4.5V, I <sub>D</sub> =3.6A		45	85	mΩ
		V <sub>GS</sub> =2.5V, I <sub>D</sub> =3.1A		70	115	
Forward Transconductance <sup>1</sup>	g <sub>FS</sub>	V <sub>DS</sub> =5V, I <sub>D</sub> =3.6A		8		S
Input Capacitance	C <sub>iss</sub>	V <sub>GS</sub> =0V, V <sub>DS</sub> =10V, f=1MHz		300		pF
Output Capacitance	C <sub>oss</sub>			120		pF
Reverse Transfer Capacitance	C <sub>rss</sub>			80		pF
Total Gate Charge	Q <sub>g</sub>	V <sub>GS</sub> =10V, V <sub>DS</sub> =4.5V, I <sub>D</sub> =3.6A		4	10	nC
Gate-Source Charge	Q <sub>gs</sub>			0.65		nC
Gate-Drain Charge	Q <sub>gd</sub>			1.5		nC
Turn-On DelayTime	t <sub>d(on)</sub>	V <sub>GS</sub> =4.5V, V <sub>DS</sub> =10V, R <sub>L</sub> =5.5Ω, R <sub>GEN</sub> =6Ω, I <sub>D</sub> =3.6A		7	15	ns
Turn-On Rise Time	t <sub>r</sub>			55	80	ns
Turn-Off DelayTime	t <sub>d(off)</sub>			16	60	ns
Turn-Off Fall Time	t <sub>f</sub>			10	25	ns
Continuous Source Current (Diode Conduction)	I <sub>s</sub>			1.6		A
Diode Forward Voltage	V <sub>SD</sub>	I <sub>s</sub> =1.6A, V <sub>GS</sub> =0V		0.76	1.2	V

*Caution 1: Pulse test: PW ≤ 300μs, duty cycle ≤ 2%.*

# 4 Typical Characteristics

Figure 4-1 Output Characteristics

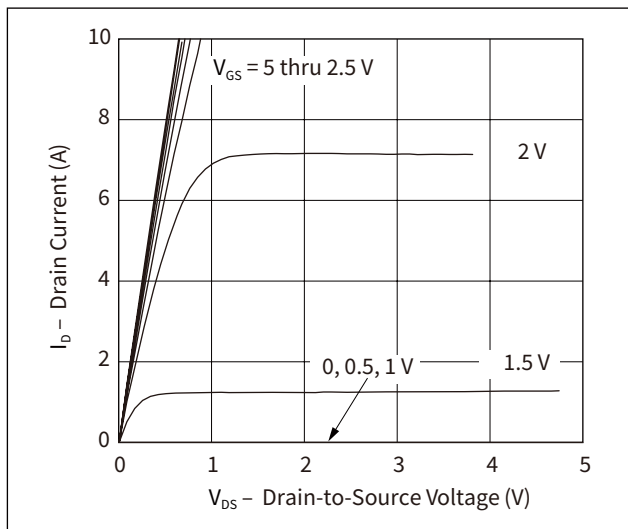


Figure 4-2 Transfer Characteristics

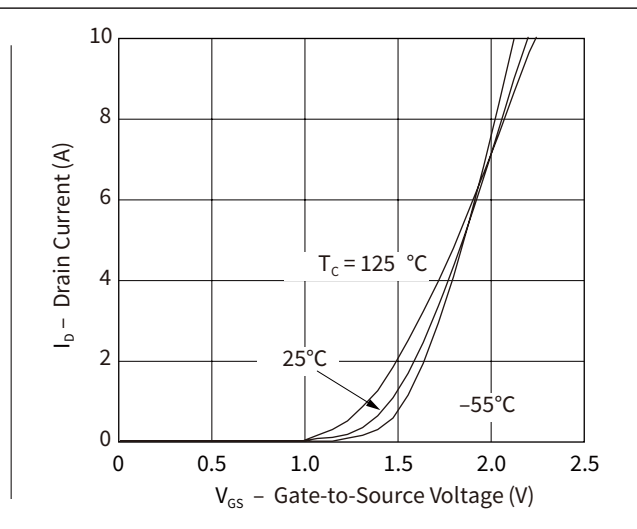


Figure 4-3 On-Resistance vs. Drain Current

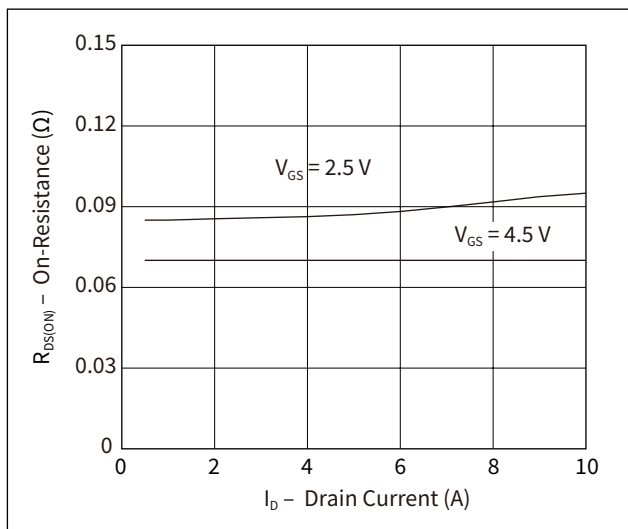


Figure 4-4 Capacitance

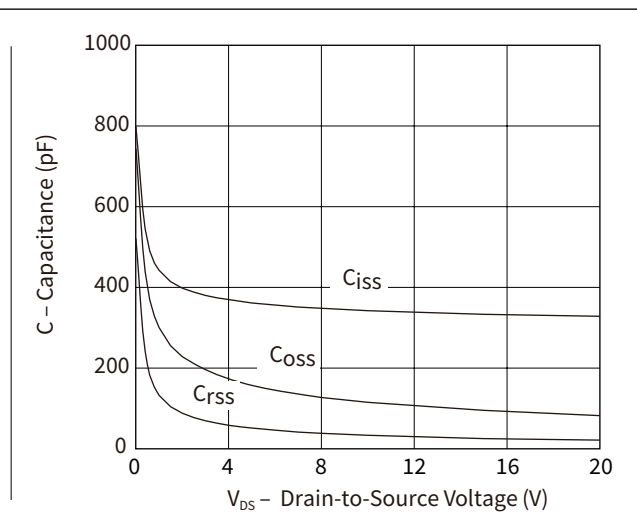


Figure 4-5 Gate Charge

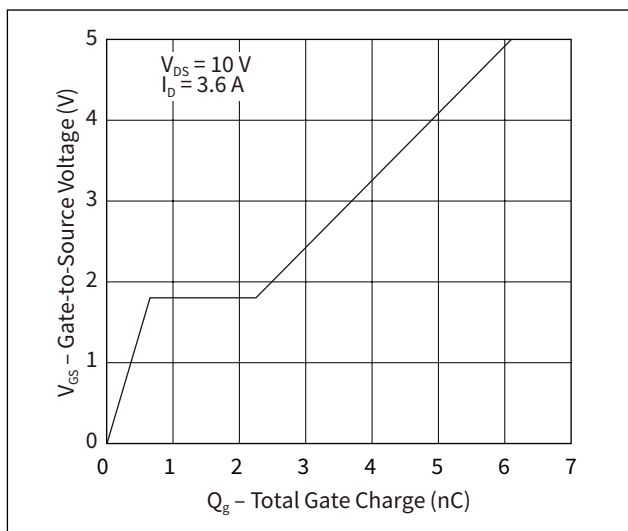


Figure 4-6 On-Resistance vs. Junction Temperature

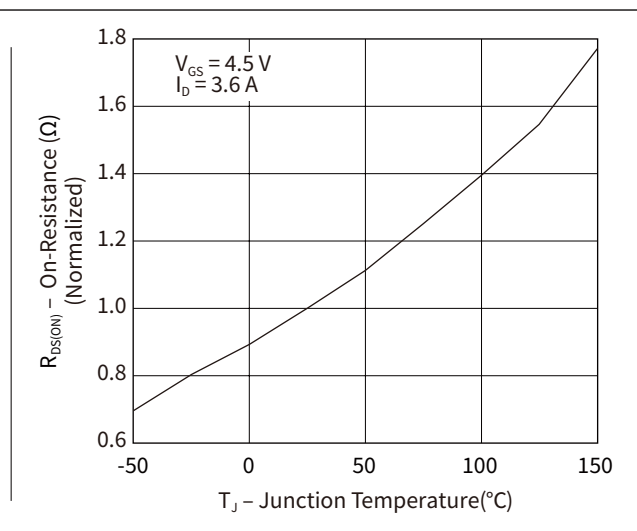


Figure 4-7 Source-Drain Diode Forward Voltage

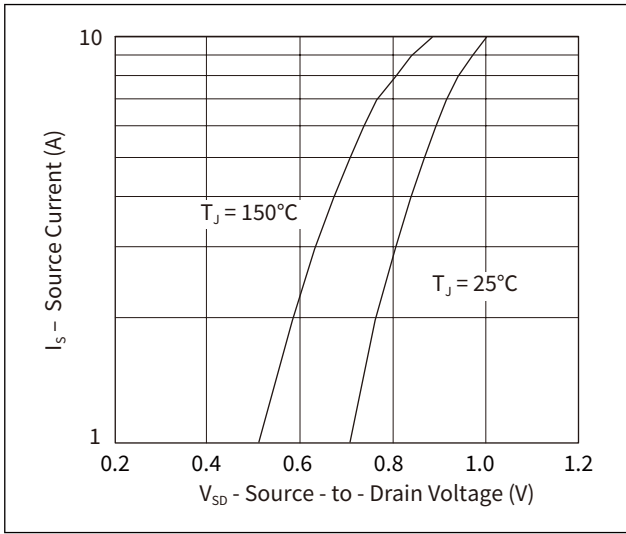


Figure 4-8 On-Resistance vs. Gate-to-Source Voltage

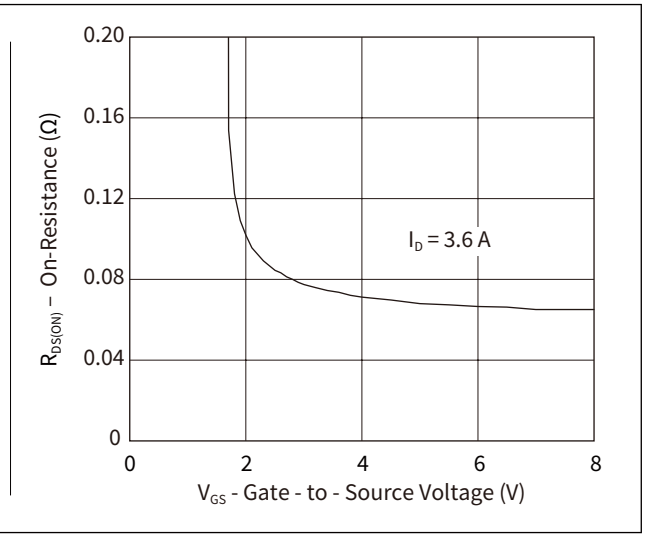


Figure 4-9 Threshold Voltage

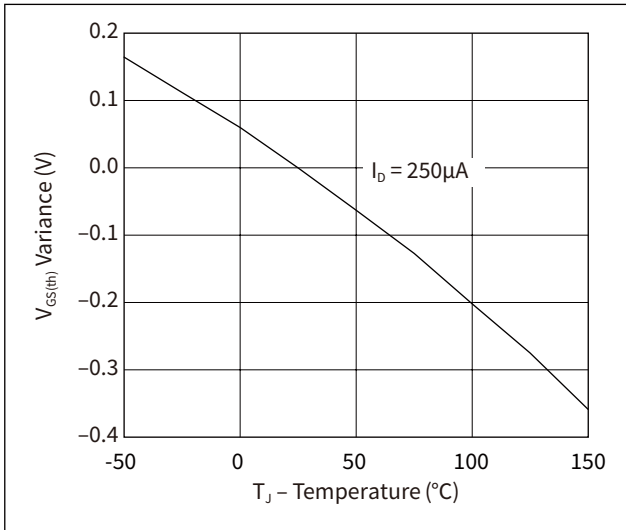


Figure 4-10 Single Pulse Power

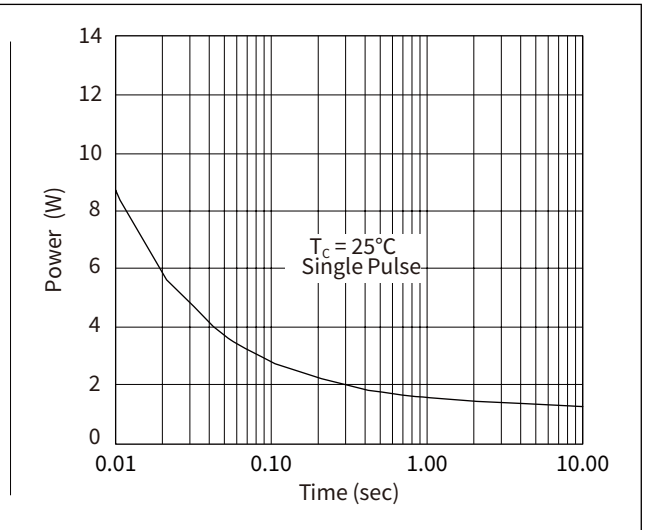
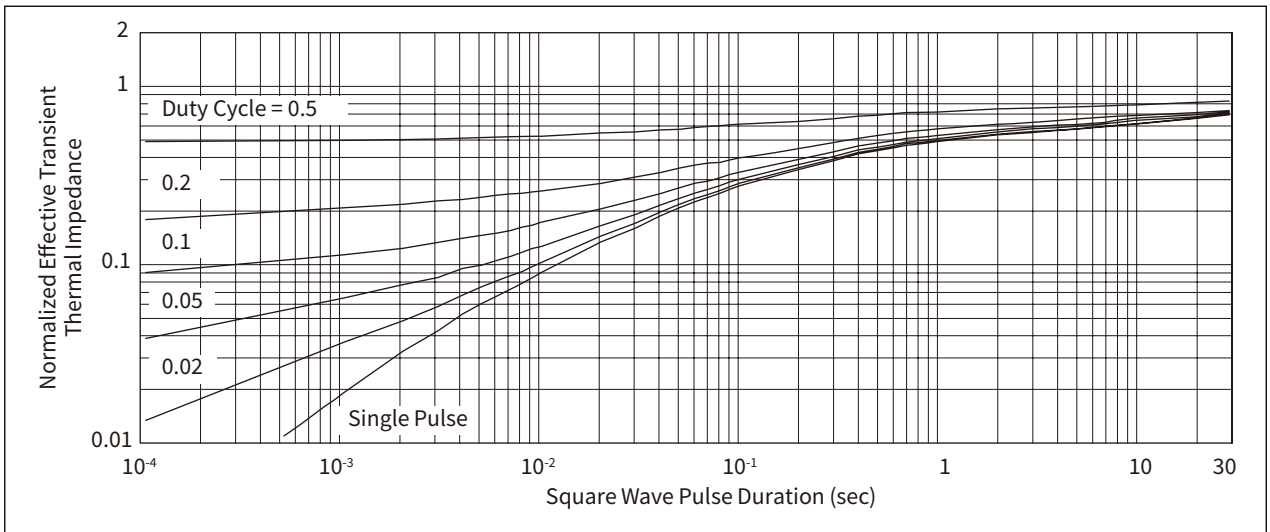


Figure 4-11 Normalized Thermal Transient Impedance, Junction-to-Ambient



## 5 Revision history

Table 5-1 Document revision history

Date	Revision	Changes
12-01-2023	Rev 1.0	Initial release.