



武汉芯源半导体有限公司

WUHAN XINYUAN SEMICONDUCTOR CO., LTD

CW3401 Datasheet

SOT-23 P-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

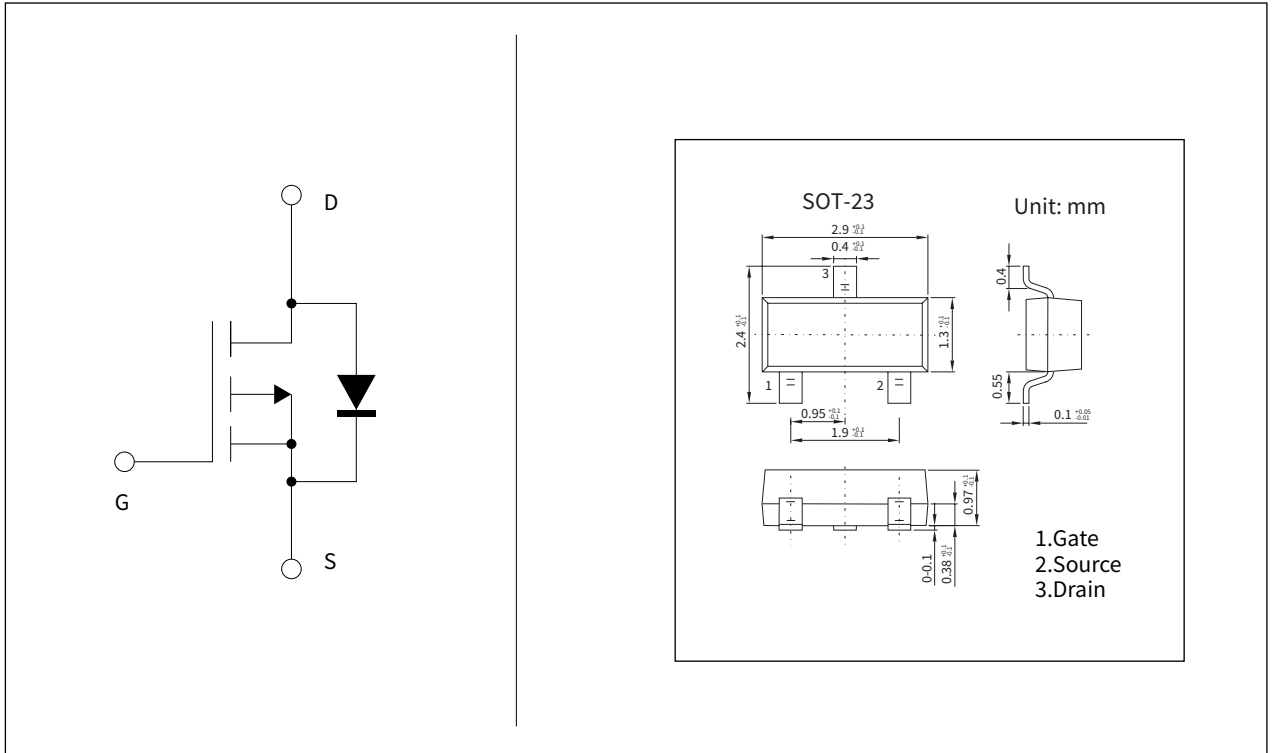
$V_{DS(V)} = -30V$

$I_D = -4.2A (V_{GS} = -10V)$

$R_{DS(ON)} < 50m\Omega (V_{GS} = -10V)$

$R_{DS(ON)} < 65m\Omega (V_{GS} = -4.5V)$

$R_{DS(ON)} < 120m\Omega (V_{GS} = -2.5V)$



2 Absolute Maximum Ratings

Ta=25°C

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	V_{DS}	-30	V
Gate-Source Voltage	V_{GS}	± 12	V
Continuous Drain Current Ta = 25°C	I_D	-4.2	A
Continuous Drain Current Ta = 70°C	I_D	-3.5	A
Pulsed Drain Current	I_{DM}	-30	A
Power Dissipation Ta = 25°C	P_D	1.4	W
Power Dissipation Ta = 70°C	P_D	1	W
Thermal Resistance.Junction- to-Ambient t ≤ 10s	R_{thJA}	90	°C /W
Thermal Resistance.Junction- to-Ambient	R_{thJA}	125	°C /W
Thermal Resistance.Junction- to-Case	R_{thJC}	60	°C /W
Junction Temperature	T_J	150	°C
Storage Temperature Range	T_{stg}	-55 to 150	°C



3 Electrical Characteristics

Ta=25°C

Parameter	Symbol	Test conditions	MIN	TYP	MAX	UNIT
Drain-Source Breakdown Voltage	V_{DSS}	$V_{GS}=0V, I_D=-250\mu A$	-30			V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=-24V, V_{GS}=0V$			-1	μA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=-24V, V_{GS}=0V, T_J=55^\circ C$			-5	
Gate-Body leakage current	I_{GSS}	$V_{DS}=0V, V_{GS}=\pm 12V$			± 100	nA
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{DS}=V_{GS}, I_D=-250\mu A$	-0.4		-1.3	V
Static Drain-Source On-Resistance	$R_{DS(ON)}$	$V_{GS}=-10V, I_D=-4.2A$			50	m Ω
		$V_{GS}=-10V, I_D=-4.2A, T_J=125^\circ C$			75	
		$V_{GS}=-4.5V, I_D=-4A$			65	
		$V_{GS}=-2.5V, I_D=-1A$			120	
On state drain current	$I_{D(ON)}$	$V_{GS}=-4.5V, V_{DS}=-5V$	-25			A
Forward Transconductance	g_{FS}	$V_{DS}=-5V, I_D=-5A$	7	11		S
Input Capacitance	C_{iss}	$V_{GS}=0V, V_{DS}=-15V, f=1MHz$		954		pF
Output Capacitance	C_{oss}			115		pF
Reverse Transfer Capacitance	C_{rss}			77		pF
Gate resistance	R_g	$V_{GS}=0V, V_{DS}=0V, f=1MHz$		6		Ω
Total Gate Charge	Q_g	$V_{GS}=-4.5V, V_{DS}=-15V, I_D=-4A$		9.4		nC
Gate Source Charge	Q_{gs}			2		nC
Gate Drain Charge	Q_{gd}			3		nC
Turn-On DelayTime	$t_{d(on)}$	$V_{GS}=-10V, V_{DS}=-15V, R_L=3.6\Omega, R_{GEN}=6\Omega$		6.3		ns
Turn-On Rise Time	t_r			3.2		ns
Turn-Off DelayTime	$t_{d(off)}$			38.3		ns
Turn-Off Fall Time	t_f			12		ns
Body Diode Reverse Recovery Time	T_{rr}	$I_F=-4A, di/dt=100A/\mu s$		20.2		ns
Body Diode Reverse Recovery Charge	Q_{rr}	$I_F=5A, di/dt=100A/\mu s$		11.2		nC
Maximum Body-Diode Continuous Current	I_s				-2.2	A
Diode Forward Voltage	V_{SD}	$I_S=-1A, V_{GS}=0V$		-0.75	-1	V

4 Typical Characteristics

Figure 4-1 On-Region Characteristics

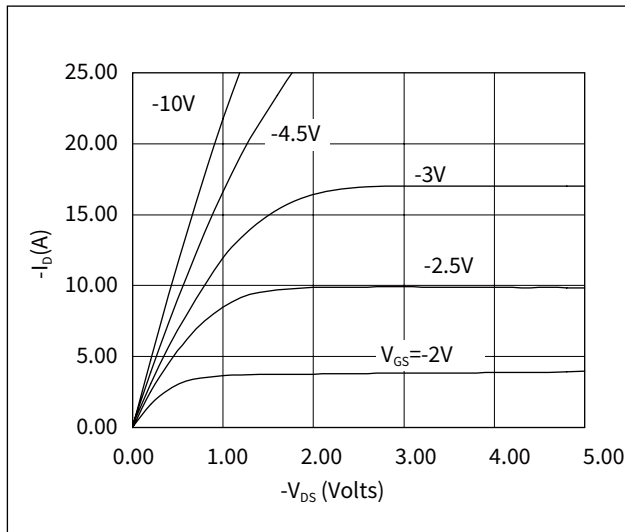


Figure 4-2 Transfer Characteristics

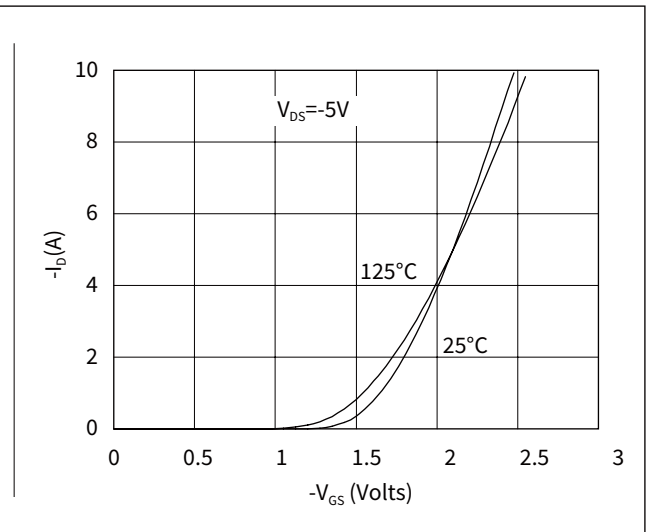


Figure 4-3 On-Resistance vs. Drain Current and Gate Voltage

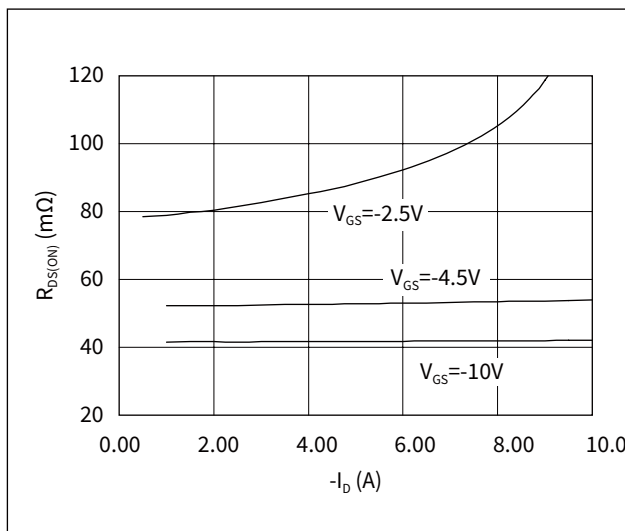


Figure 4-4 On-Resistance vs. Junction Temperature

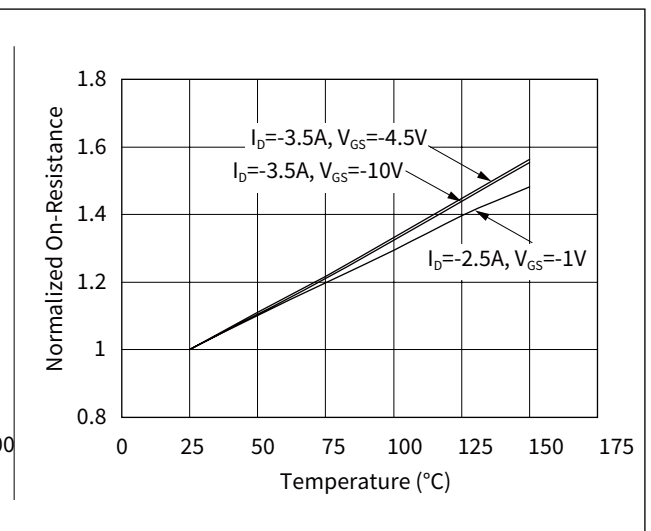


Figure 4-5 On-Resistance vs. Gate-Source Voltage

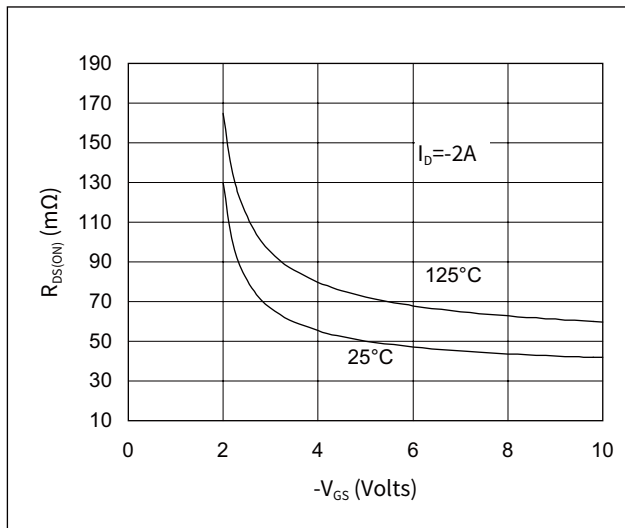


Figure 4-6 Body-Diode Characteristics

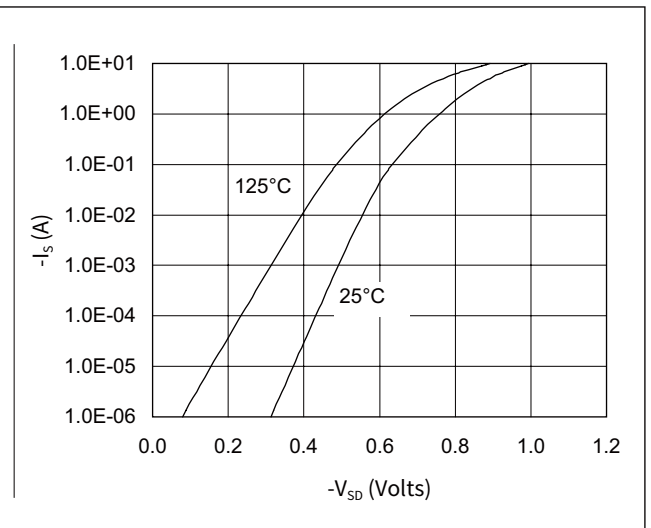


Figure 4-7 Gate-Charge Characteristics

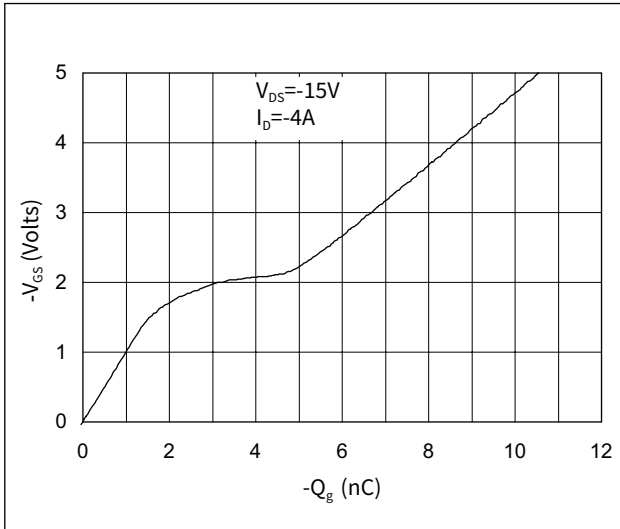


Figure 4-8 Capacitance Characteristics

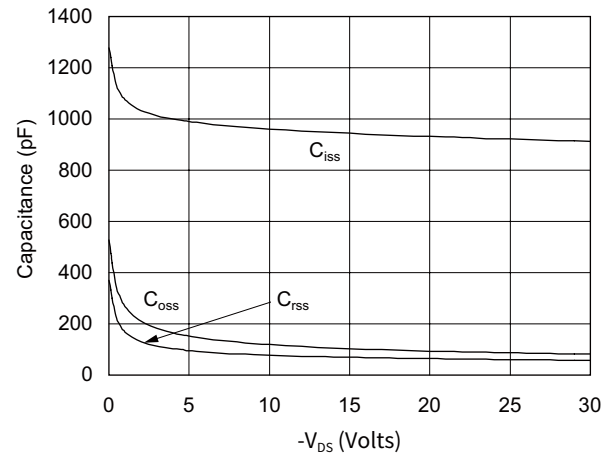


Figure 4-9 Maximum Forward Biased Safe Operating Area (Note E)

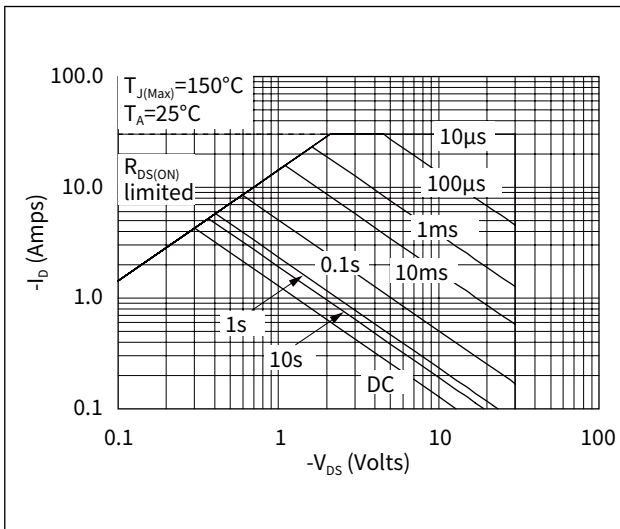


Figure 4-10 Single Pulse Power Rating Junction-to-Ambient (Note E)

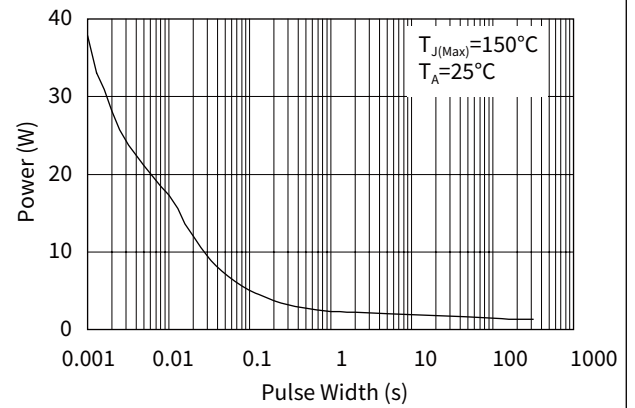
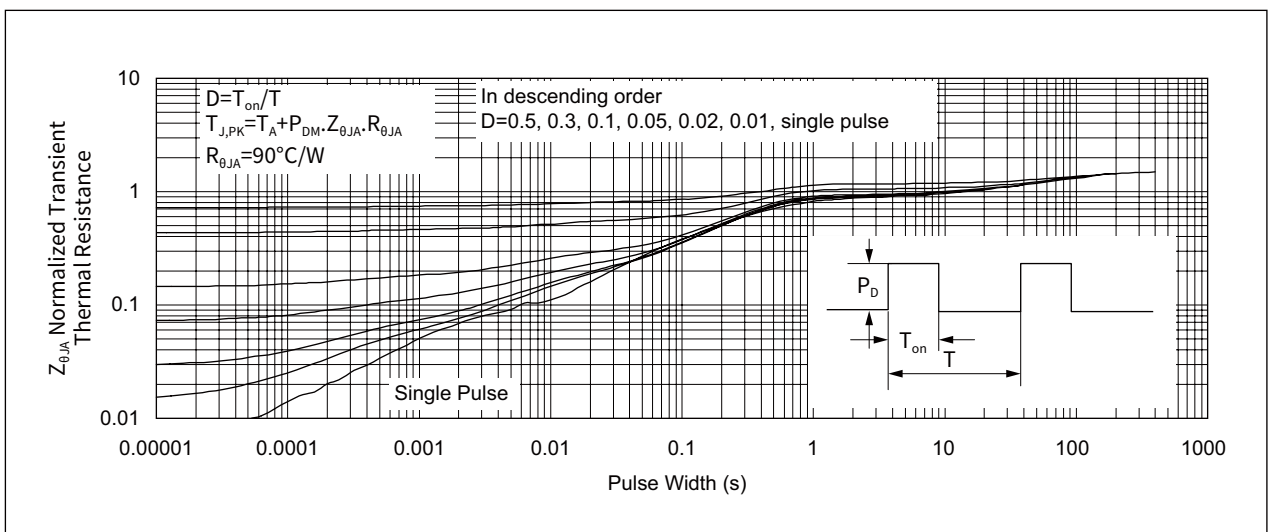


Figure 4-11 Normalized Maximum Transient Thermal Impedance



5 Revision history

Table 5-1 Document revision history

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