AO3401A

P-Channel Enhancement MOSFET
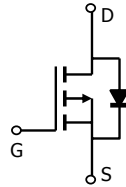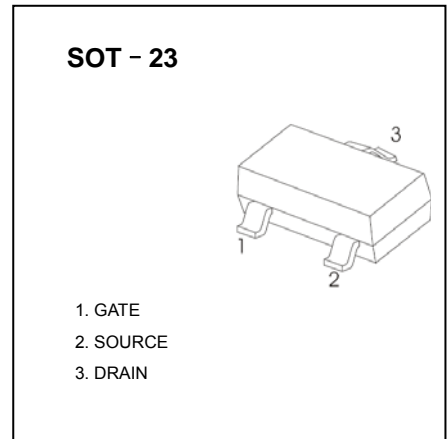
SOT–23

1. GATE
2. SOURCE
3. DRAIN

■ Features

● $V_{DS(V)}$ =-30V

● I_D =-4.2 A (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)

■ Absolute Maximum Ratings Ta = 25℃

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

P-Channel Enhancement MOSFET

■ 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}=-24V, V_{GS}=0V			-1	μA
		V_{DS}=-24V, V_{GS}=0V, T_J=55℃			-5	
Gate-Body leakage current	I_{GSS}	V_{DS}=0V, V_{GS}=±12V			±100	nA
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS} I_D=-250μA	-0.4		-1.3	V
Static Drain-Source On-Resistance	$R_{DS(ON)}$	V_{GS}=-10V, I_D=-4.2A			50	mΩ
		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		
Reverse Transfer Capacitance	C_{rss}			77		
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		
Gate Drain Charge	Q_{gd}			3		
Turn-On DelayTime	$t_{d(on)}$	V_{GS}=-10V, V_{DS}=-15V, R_L=3.6Ω, R_{GEN}=6Ω		6.3		ns
Turn-On Rise Time	t_r			3.2		
Turn-Off DelayTime	$t_{d(off)}$			38.3		
Turn-Off Fall Time	t_f			12		
Body Diode Reverse Recovery Time	t_{rr}	I_F=-4A, dI/dt=100A/μs		20.2		
Body Diode Reverse Recovery Charge	Q_{rr}	I_F=5A, dI/dt=100A/μs		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

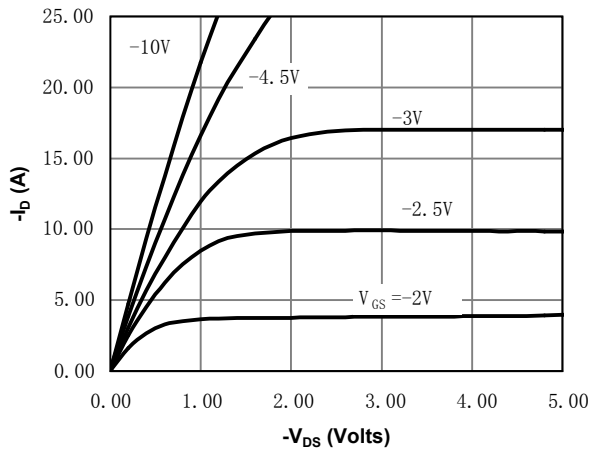■ Typical Characterisitics

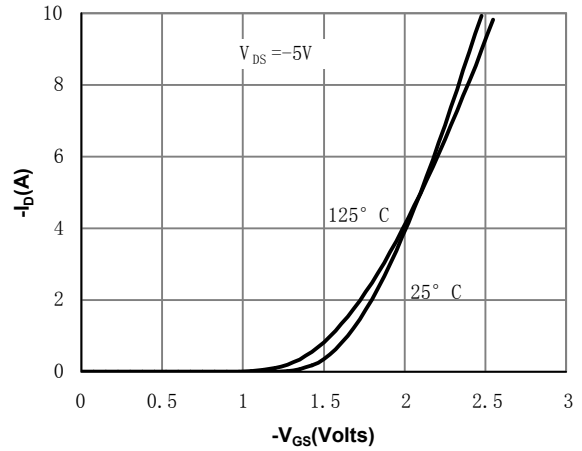**Fig 1: On-Region Characteristics**
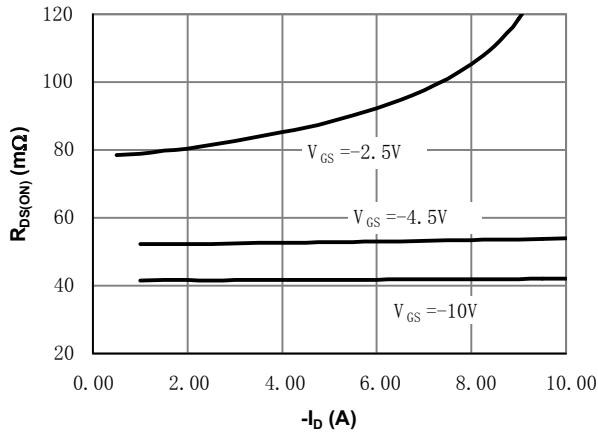

Figure 2: Transfer Characteristics

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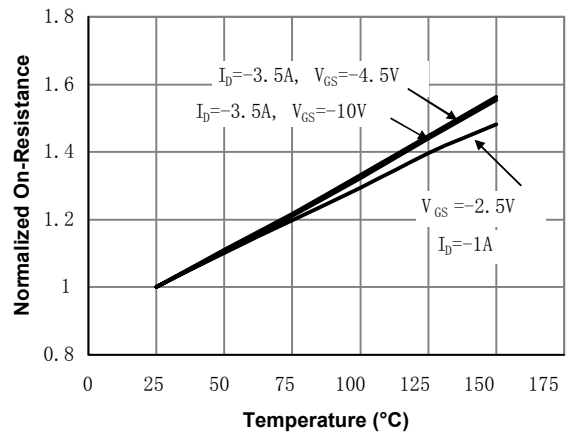

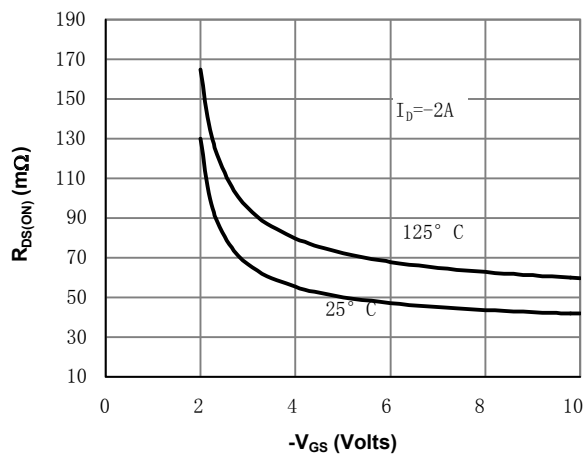**Figure 4: On-Resistance vs. Junction Temperature**
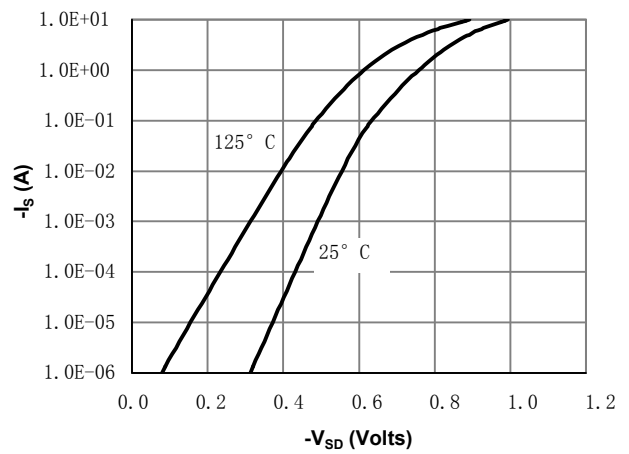

Figure 5: On-Resistance vs. Gate-Source Voltage

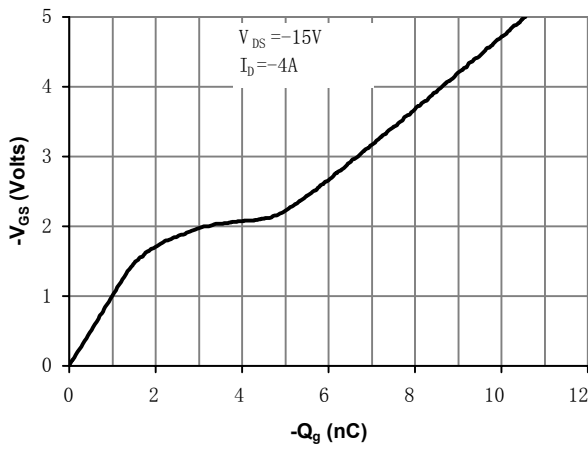**Figure 6: Body-Diode Characteristics**

■ Typical Characterisitics
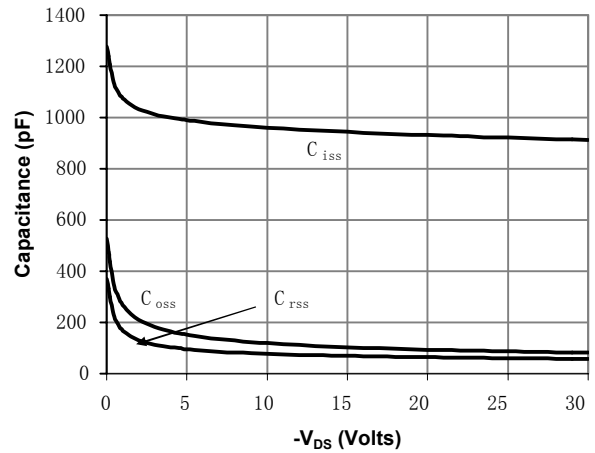

Figure 7: Gate-Charge Characteristics

$V_{DS}=-15V$
$I_D=-4A$

Figure 8: Capacitance Characteristics

C_{iss}

C_{oss} C_{rss}
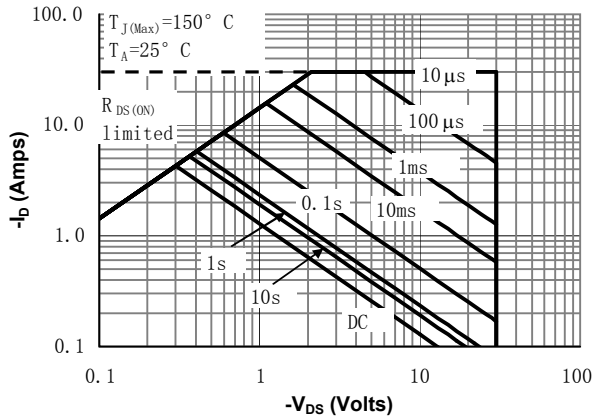
Figure 9: Maximum Forward Biased Safe Operating Area (Note E)

$T_{J(Max)}=150°C$
$T_A=25°C$

$R_{DS(ON)}$ limited
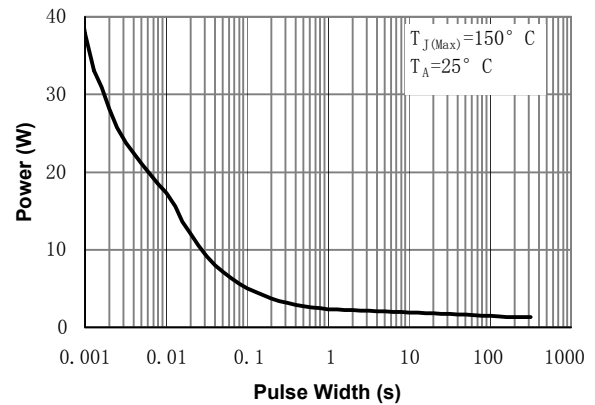
10 μs
100 μs
1ms
0.1s
10ms
1s
10s
DC

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

$T_{J(Max)}=150°C$
$T_A=25°C$
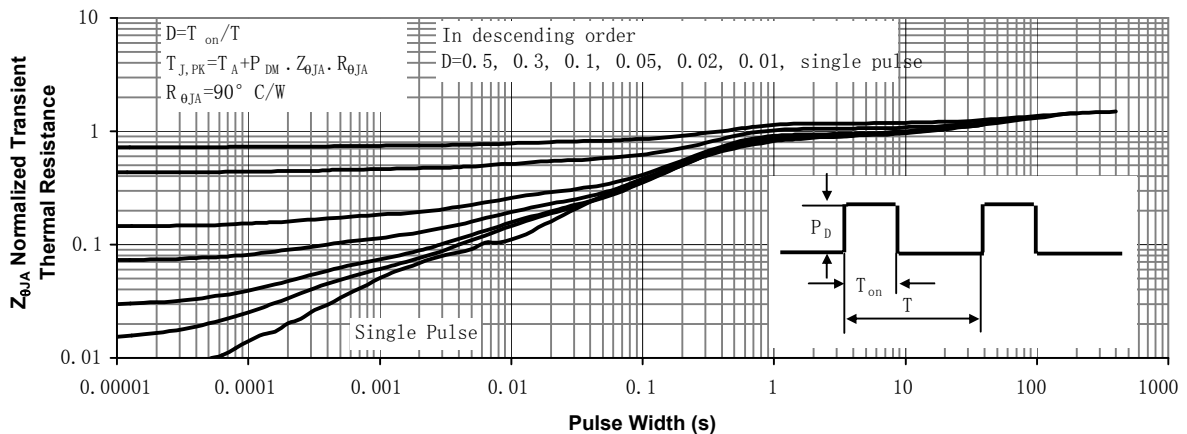
Figure 11: Normalized Maximum Transient Thermal Impedance

$D=T_{on}/T$
$T_{J,PK}=T_A+P_{DM}\cdot Z_{\theta JA}\cdot R_{\theta JA}$
$R_{\theta JA}=90°C/W$

In descending order
D=0.5, 0.3, 0.1, 0.05, 0.02, 0.01, single pulse

P_D
T_{on}
T

Single Pulse

SOT-23 PACKAGE OUTLINE DIMENSIONS
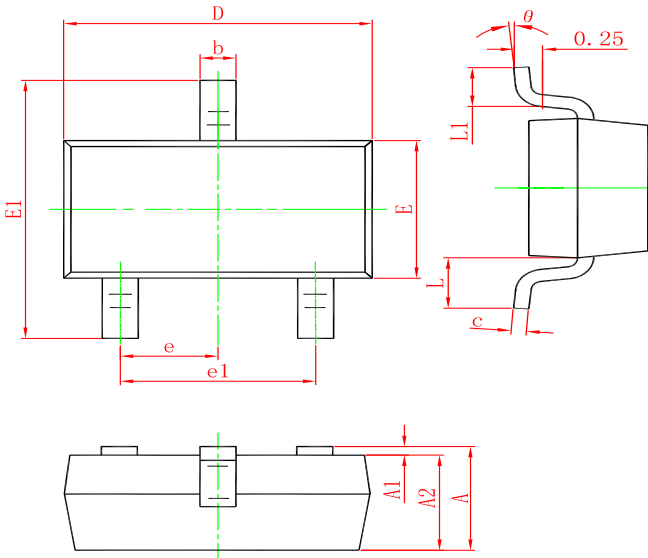
Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.900	1.150	0.035	0.045
A1	0.000	0.100	0.000	0.004
A2	0.900	1.050	0.035	0.041
b	0.300	0.500	0.012	0.020
c	0.080	0.150	0.003	0.006
D	2.800	3.000	0.110	0.118
E	1.200	1.400	0.047	0.055
E1	2.250	2.550	0.089	0.100
e	0.950 TYP.		0.037 TYP.	
e1	1.800	2.000	0.071	0.079
L	0.550 REF.		0.022 REF.	
L1	0.300	0.500	0.012	0.020
θ	0°	8°	0°	8°

Marking

X1PV 3R
U
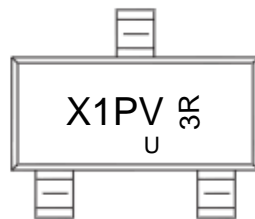
Ordering information

Order code	Package	Baseqty	Deliverymode
AO3401A	SOT-23	3000	Tape and reel