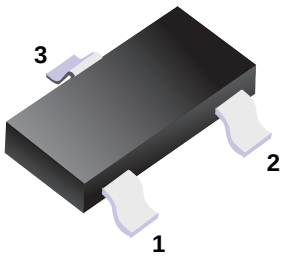
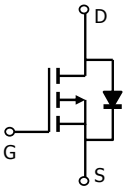
AO3401

P-Channel Enhancement MOSFET



1. Gate
2. Source
3. Drain

■ Simplified outline(SOT23-3L)



■ Features

- $V_{DS\ (V)}$ =-30V
- I_D =-4.2 A (V_{GS} =-10V)
- $R_{DS(ON)}$ < 50mΩ (V_{GS} =-10V)
- $R_{DS(ON)}$ < 65mΩ (V_{GS} =-4.5V)
- $R_{DS(ON)}$ < 120mΩ (V_{GS} =-2.5V)

■ Marking

Marking	X1DV

■ Absolute Maximum Ratings Ta = 25℃

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	V_{DS}	-30	V
Gate-Source Voltage	V_{GS}	±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 ≤ 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	

■ 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	-1.3	V
Static Drain-Source On-Resistance	$R_{DS(on)}$	V_{GS}=-10V, I_D=-4.2A		42	50	mΩ
		V_{GS}=-10V, I_D=-4.2A T_J=125℃			75	
		V_{GS}=-4.5V, I_D=-4A		53	65	
		V_{GS}=-2.5V, I_D=-1A		80	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

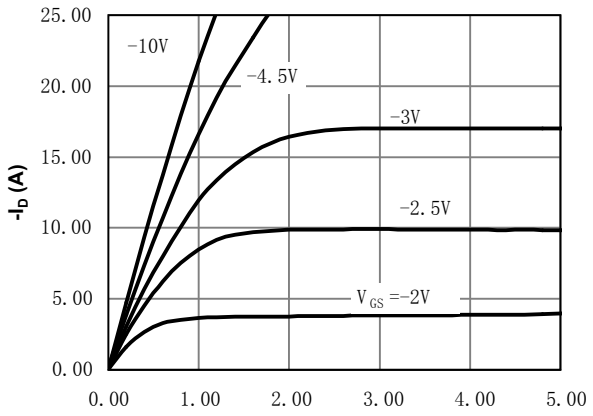


Fig 1: On-Region Characteristics

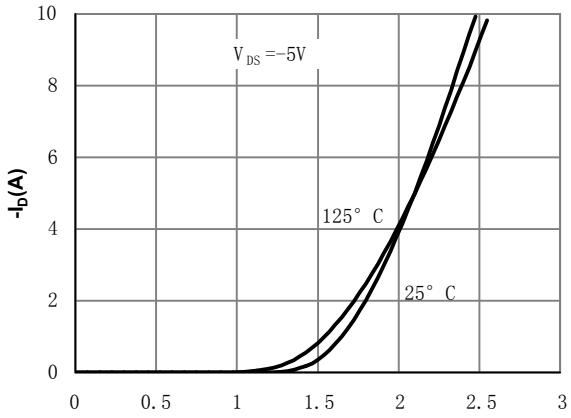


Figure 2: Transfer Characteristics

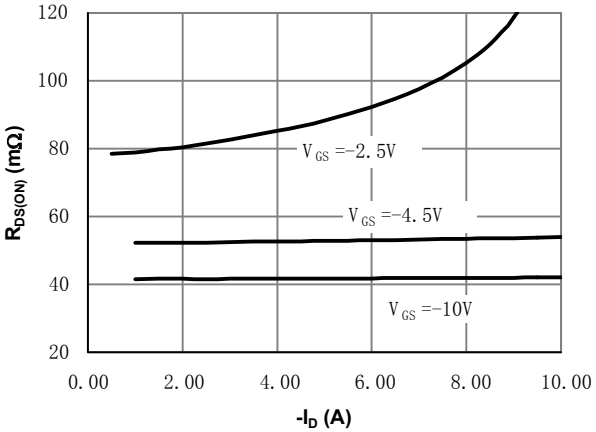


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

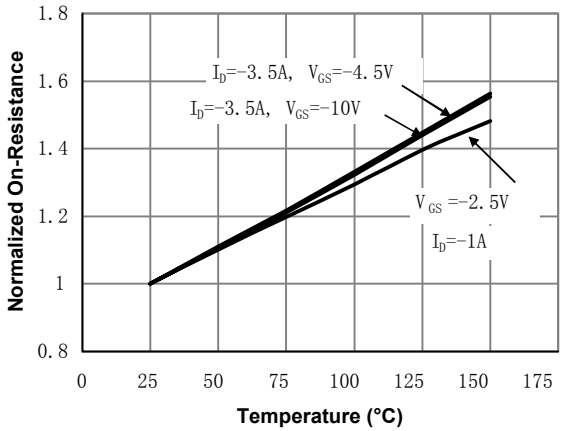


Figure 4: On-Resistance vs. Junction Temperature

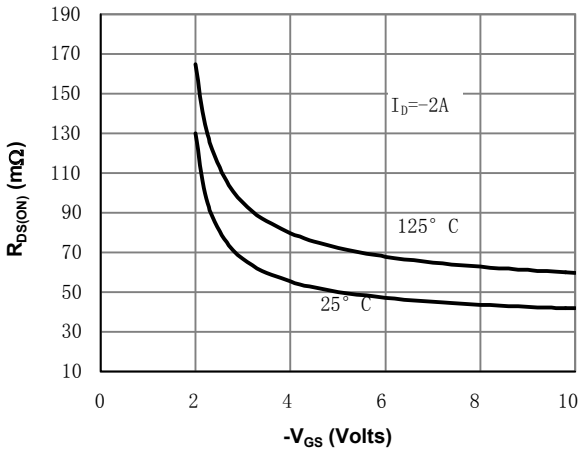


Figure 5: On-Resistance vs. Gate-Source Voltage

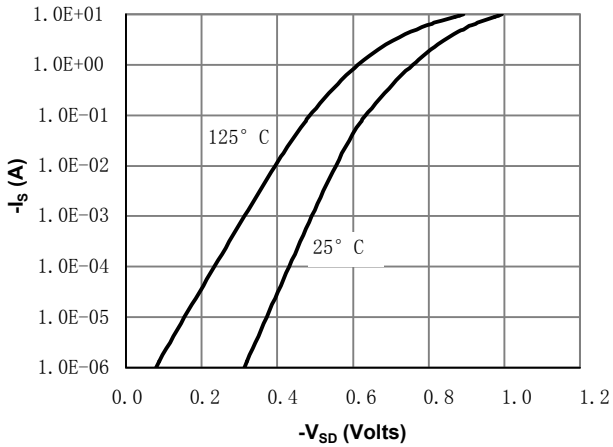


Figure 6: Body-Diode Characteristics

■ Typical Characterisitics

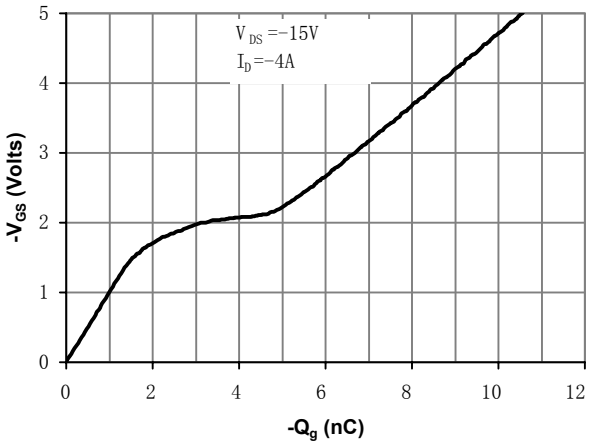


Figure 7: Gate-Charge Characteristics

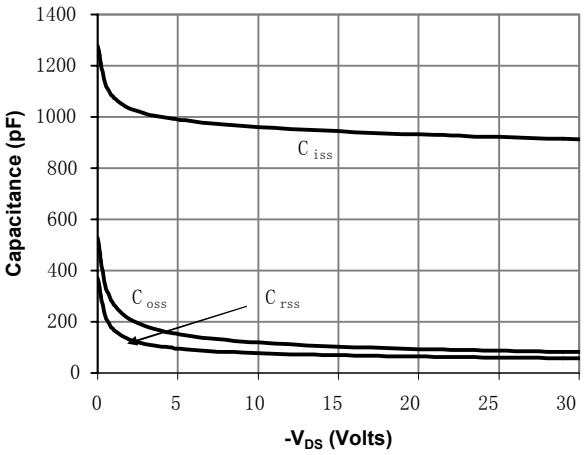


Figure 8: Capacitance Characteristics

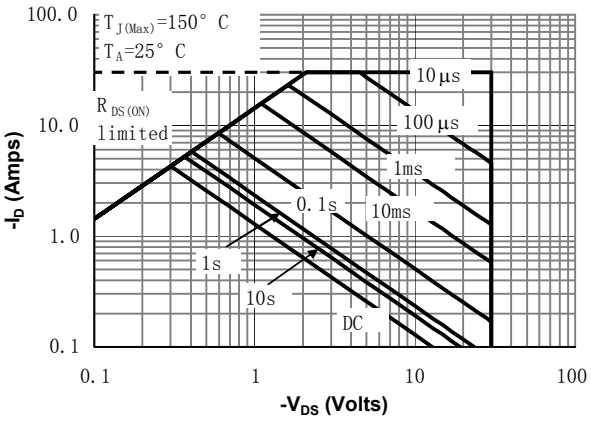


Figure 9: Maximum Forward Biased Safe Operating Area (Note E)

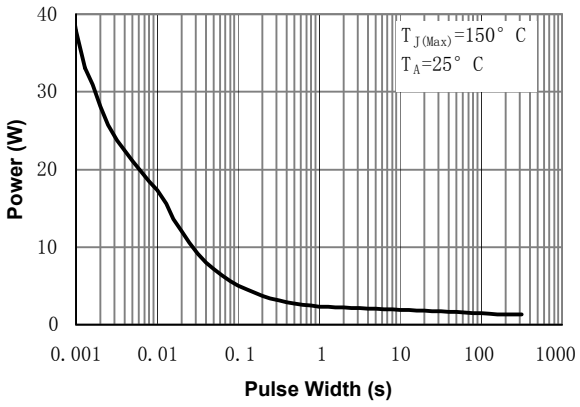


Figure 10: Single Pulse Power Rating Junction-to-Ambient (Note E)

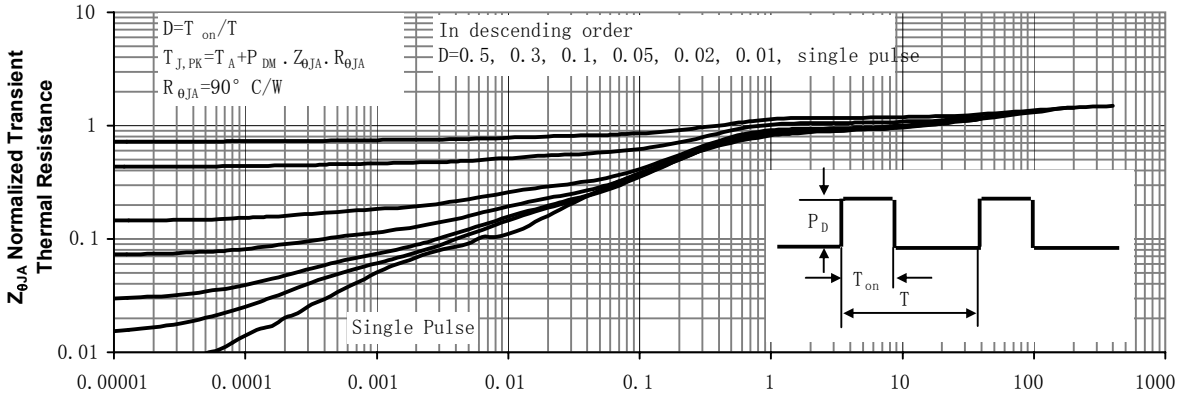
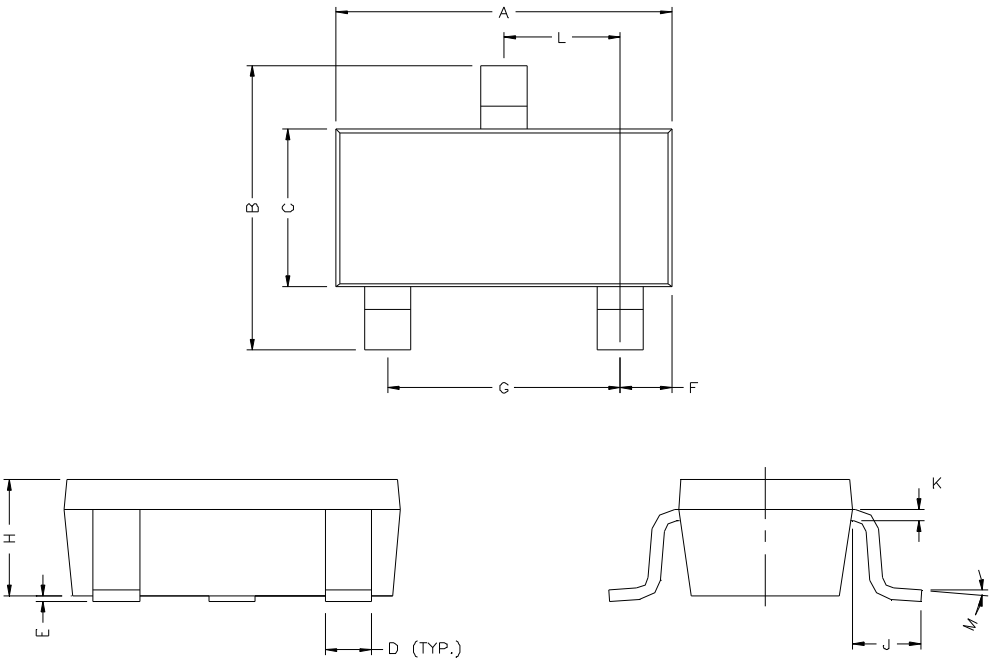


Figure 11: Normalized Maximum Transient Thermal Impedance

■ **SOT23-3L**



DIMENSIONS (mm are the original dimensions)

UNIT	A	B	C	D	E	F	G	H	K	J	L	M
mm	2.70 3.10	2.65 2.95	1.50 1.70	0.35 0.50	0 0.10	0.45 0.55	1.9	1.00 1.30	0.10 0.20	0.40 -	0.85 1.15	0° 10°