

P-Channel 30-V (D-S) MOSFET

■ FEATURES

- Low $R_{DS(on)}$ Provides Higher Efficiency and Extends Battery Life
- Lower gate charge
- Fast Switch
- High performance trench technology
- Miniature SOT23 Surface Mount Package Saves Board Space

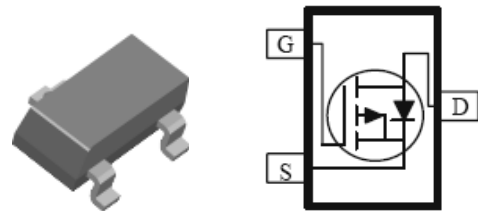
■ Product Summary

MOSFET		
$V_{DS}(V)$	$R_{DS(on)}(\Omega)$	$I_D(A)$
-30 V	60@ $V_{GS} = -10 V$	-4.2
	75@ $V_{GS} = -4.5 V$	-4.0
	120@ $V_{GS} = -2.5 V$	-1.0

■ Description

These miniature surface mount MOSFETs utilize High Cell Density process. Low $R_{DS(on)}$ assures minimal power loss and conserves energy, making this device ideal for use in power management circuitry. Typical applications are lower voltage application, power management in portable and battery-powered products such as computers, printers, and PCMCIA cards, cellular and cordless telephones.

■ SOT23



Maximum Ratings (TA = 25 °C UNLESS OTHERWISE NOTED)

Symbol	Parameter		Maximum	Unit
V_{DS}	Drain-Source Voltage		-30	V
V_{GS}	Gate-Source Voltage		±12	
I_D	Continuous Drain Current ^a	$T_A=25^{\circ}C$	-4.2	A
		$T_A=70^{\circ}C$	-3.5	
I_{DM}	Pulsed Drain Current ^b		-30	
I_S	Continuous Source Current (Diode Conduction) ^a		-2.2	A
P_D	Power Dissipation ^a	$T_A=25^{\circ}C$	1.38	W
R_{THJA}	Maximum Junction-to-Ambient ^a		357	°C/W
T_J, T_{stg}	Operation Junction and Storage Temperature Range		-55 to 150	°C

Notes:

- (a) Surface Mounted on 1" x 1" FR4 Board.
 (b) Pulse width limited by maximum junction temperature

Electrical Characteristics

SPECIFICATIONS (TA = 25°C UNLESS OTHERWISE NOTED)						
Parameter	Symbol	Test Condition	Limits			Unit
			Min	Typ	Max	
Switch Off Characteristics						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} =0V, I _D =-250uA	-30			V
Gate-Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = 250uA	-0.5		-1.2	V
Gate-Body Leakage	I _{GSS}	V _{DS} = 0 V, V _{GS} =±12V			±100	nA
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = -24 V, V _{GS} = 0 V T _J = 25°C			-1	uA
		V _{DS} = -24 V, V _{GS} = 0 V, T _J = 55°C			-5	
Drain-Source On-Resistance ^a	R _{DS(on)}	V _{GS} = -10 V, I _D = -4.2 A		43	60	mΩ
		V _{GS} = -4.5 V, I _D = -4.0 A		58	75	
		V _{GS} = -2.5 V, I _D = -1.0A		86	120	
Forward Transconductance ^a	g _{fs}	V _{DS} = -5V, I _D = -5A		11		S
Diode Forward Voltage	V _{SD}	I _S = -1.0 A, V _{GS} = 0 V			-1.0	V
Reverse Recovery Time	T _{rr}	I _S = -4A,V _{GS} =0V, di/dt=100A/uS		20.2		nS
Reverse Recovery Charge	Q _{rr}			11.2		nC
Dynamic ^b						
Total Gate Charge	Q _g	V _{DS} = -15V, V _{GS} = -4.5V I _D = -4A		9.4	16	nC
Gate-Source Charge	Q _{gs}			2		
Gate-Drain Charge	Q _{gd}			3		
Turn-On Delay Time	t _{d(on)}	V _{DS} =-15V, R _L =3.6Ω, R _G = 6Ω, V _{GS} = -10V		6.3	13	ns
Turn-On Rise Time	t _r			3.2	8.4	
Turn-Off Delay Time	t _{d(off)}			38.2	48.5	
Turn-Off Fall Time	t _f			12	21.3	
Input Capacitance	C _{iss}	V _{GS} =0V,V _{DS} =-15V,f =1.0MHz		954	1104	pF
Output Capacitance	C _{oss}			115	187	
Reverse Transfer Capacitance	C _{rss}			77	97	
Gate Resistance	R _g	f =1.0MHz		6		Ω

Notes:

- (a) Pulse test: pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$
 (b) Guaranteed by design; not subject to production testing

Typical Electrical Characteristics (P Channel)

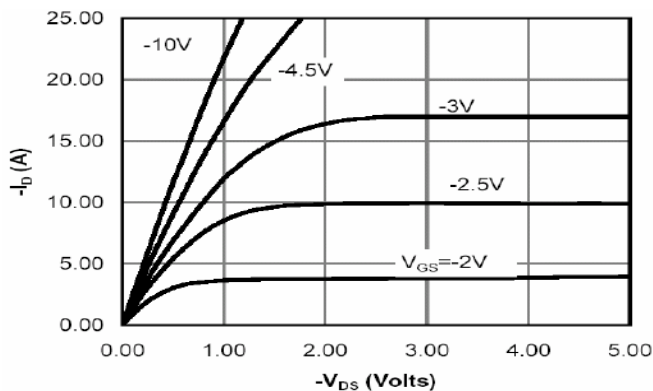


Fig 1. Typical Output Characteristics

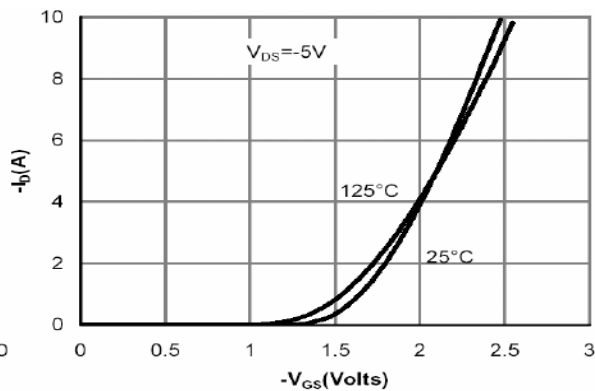


Fig 2. Transfer Characteristics

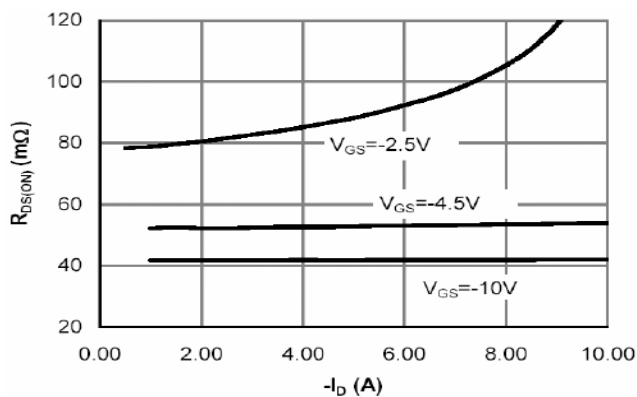


Fig 3. On-Resistance v.s. Drain Current and Gate Voltage

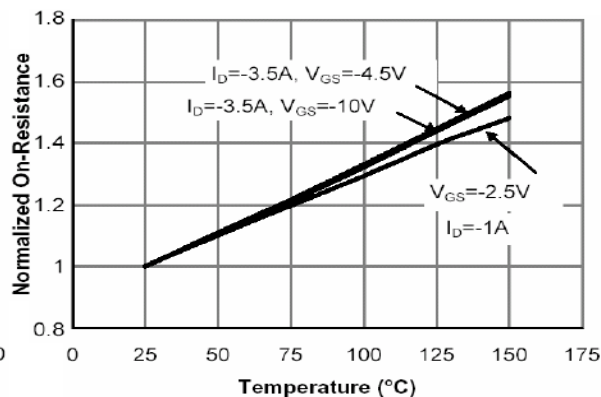


Fig 4. On-Resistance v.s. Junction Temperature

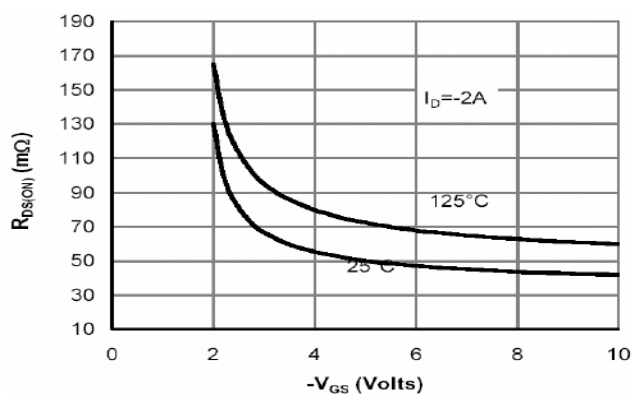


Fig 5. On-Resistance v.s. Gate-Source Voltage

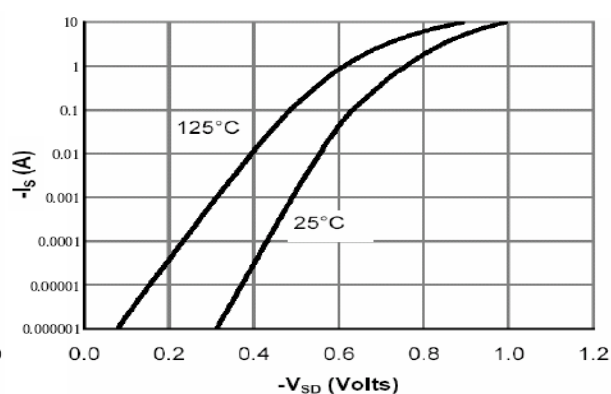


Fig 6. Body Diode Characteristics

Typical Electrical Characteristics (P Channel)

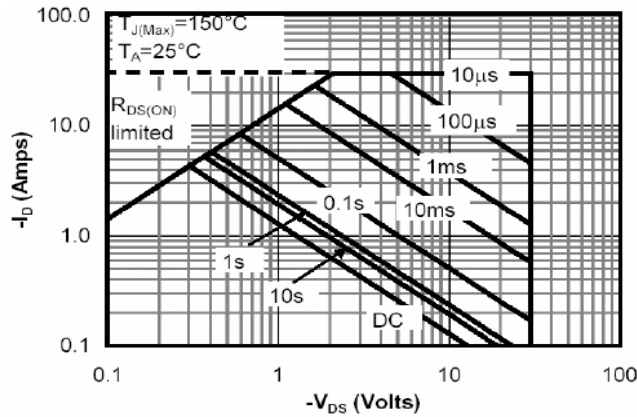


Fig 7. Maximum Safe Operating Area

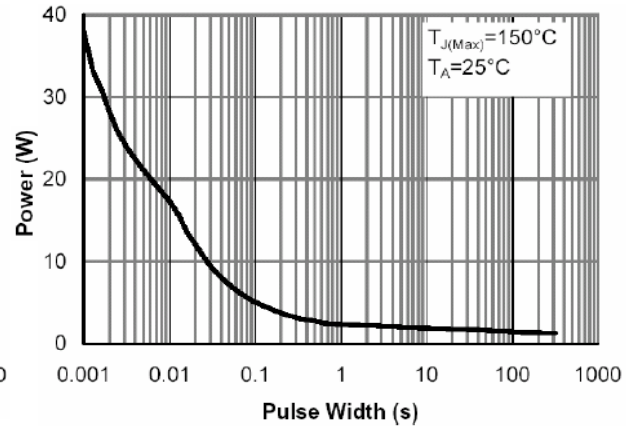


Fig 8. Single Pulse Power Rating Junction-to-Ambient

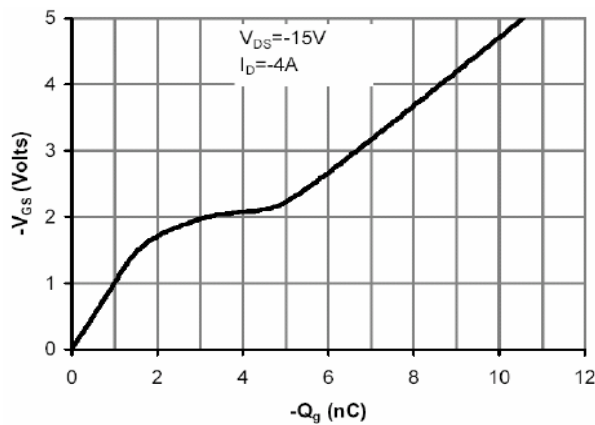


Fig 9. Gate Charge Characteristics

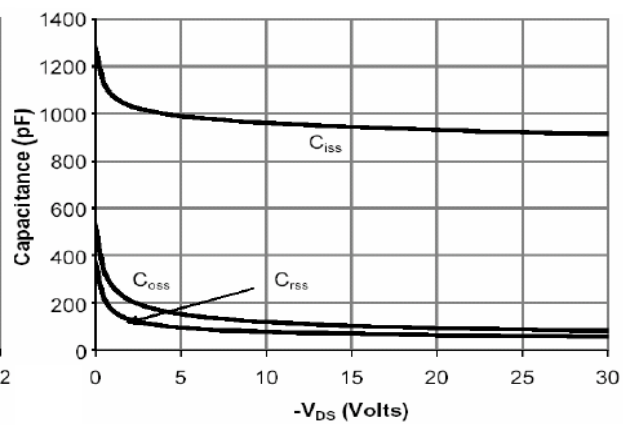


Fig 10. Typical Capacitance Characteristic

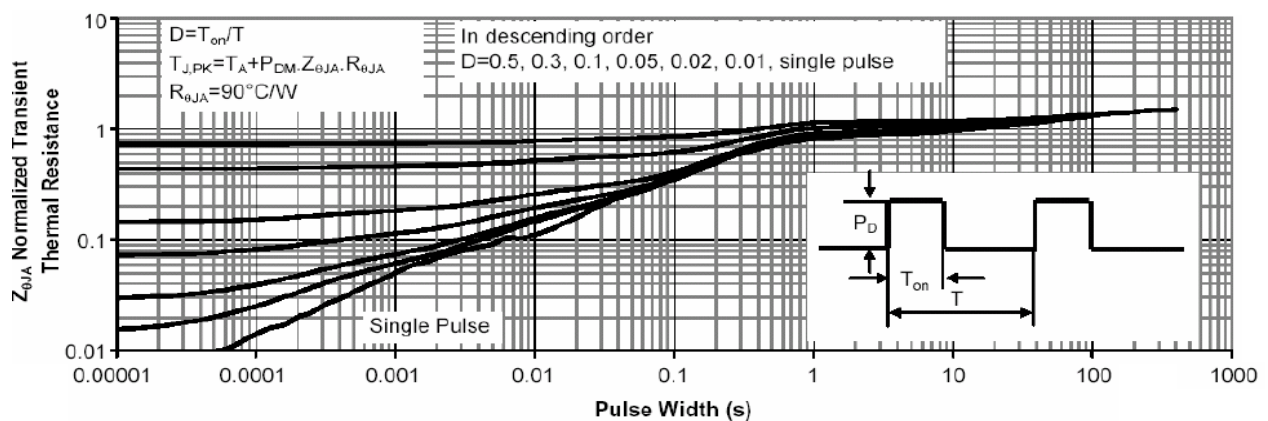
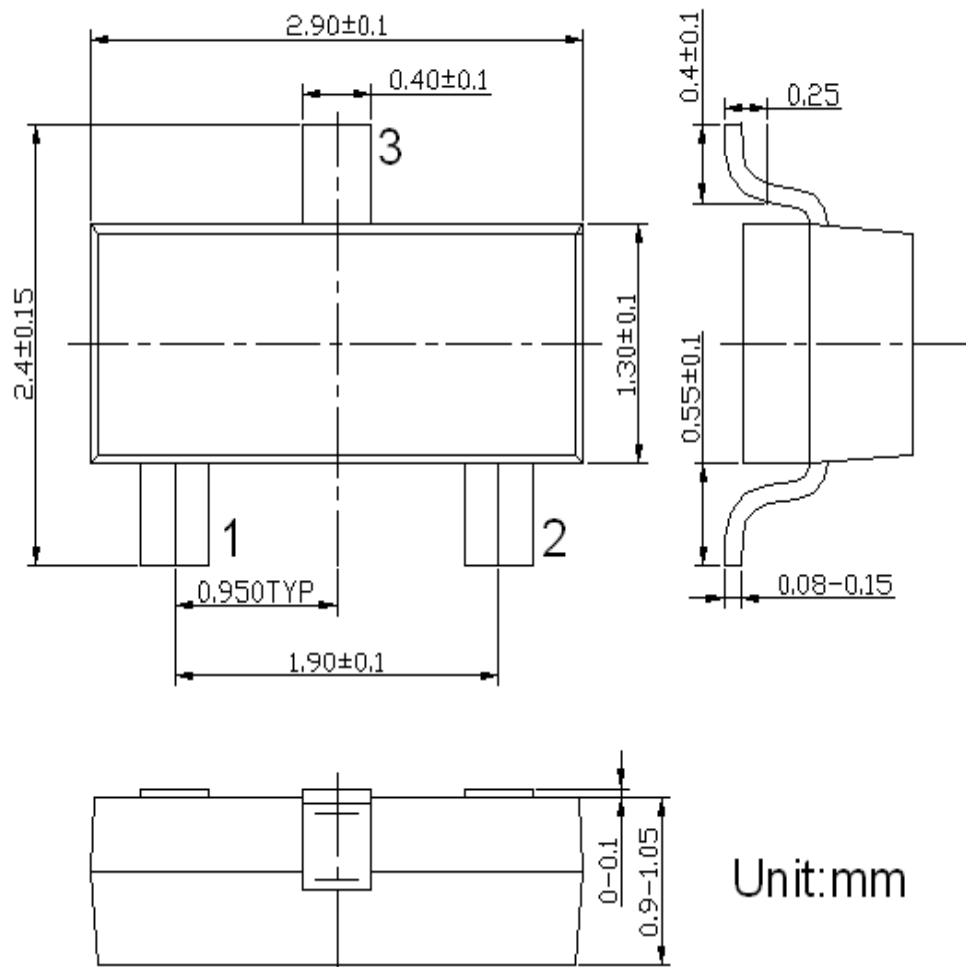


Fig 11. Normalized Maximum Transient Thermal Impedance

Ordering Information

Part number	Marking	package	Quantity per reel
AO3401	3401	SOT23	3000

Package Information
(SOT23)


Unit:mm

Carrier Dimensions

PKG TYPE	W	P	E	F	D	D1	Po	Po10	P2
SOT23	8.00	4.00	1.75	3.50	1.50	1.00	4.00	40.00	2.00
Tolerance	+0.3/-0.1	±0.1	±0.1	±0.1	±0.1	±0.1	±0.1	±0.2	±0.05

A0	B0	K0	T
3.15	2.77	1.22	0.20
±0.1	±0.1	±0.1	±0.02

