



ACE3401

P-Channel Enhancement Mode MOSFET

Description

The ACE3401 is the P-Channel logic enhancement mode power field effect transistors are produced using high cell density, DMOS trench technology.

This high density process is especially tailored to minimize on-state resistance.

These devices are particularly suited for low voltage application such as cellular phone and notebook computer power management and other battery powered circuits, and low in-line power loss are needed in a very small outline surface mount package.

Features

- -30V/-4.0A, $R_{DS(ON)}=55m\Omega@V_{GS}=-10V$
- -30V/-3.2A, $R_{DS(ON)}=65m\Omega@V_{GS}=-4.5V$
- -30V/-1.2A, $R_{DS(ON)}=75m\Omega@V_{GS}=-2.5V$
- Super high density cell design for extremely low $R_{DS(ON)}$
- Exceptional on-resistance and maximum DC current capability

Application

- Power Management in Note book
- Portable Equipment
- Battery Powered System
- Load Switch
- DSC
- LCD Display inverter

Absolute Maximum Ratings

($T_A=25^\circ C$ Unless otherwise noted)

Parameter	Symbol	Typical	Unit	
Drain-Source Voltage	V_{DSS}	-30	V	
Gate-Source Voltage	V_{GSS}	± 12	V	
Continuous Drain Current ($T_J=150^\circ C$)	I_D	$T_A=25^\circ C$	-4.0	A
		$T_A=70^\circ C$	-3.2	
Pulsed Drain Current	I_{DM}	-15	A	
Continuous Source Current (Diode Conduction)	I_S	-1.0	A	
Power Dissipation	P_D	$T_A=25^\circ C$	1.25	W
		$T_A=70^\circ C$	0.8	
Operating Junction Temperature	T_J	150	$^\circ C$	
Storage Temperature Range	T_{STG}	-55/150	$^\circ C$	
Thermal Resistance-Junction to Ambient	$R_{\theta JA}$	120	$^\circ C/W$	

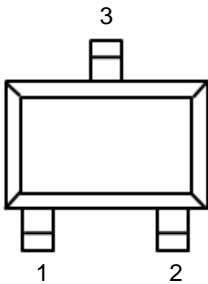


ACE3401

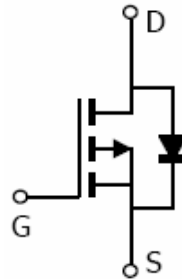
P-Channel Enhancement Mode MOSFET

Packaging Type

SOT-23-3L

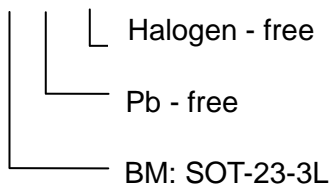


SOT-23-3L	Description
1	Gate
2	Source
3	Drain



Ordering information

ACE3401 XX + H



Electrical Characteristics

($T_A=25^\circ\text{C}$, Unless otherwise noted)

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Static						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=-250\mu A$	-30			V
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=-250\mu A$	-0.4		-1.0	V
Gate Leakage Current	I_{GSS}	$V_{DS}=0V, V_{GS}=\pm 12V$			± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=-24V, V_{GS}=0V$			-1	uA
		$V_{DS}=-24V, V_{GS}=0V, T_J=55^\circ\text{C}$			-10	
On-State Drain Current	$I_{D(ON)}$	$V_{DS} \leq -5V, V_{GS}=-10V$	-10			A
Drain-Source On-Resistance	$R_{DS(ON)}$	$V_{GS}=-10V, I_D=-4.0A$		0.045	0.055	Ω
		$V_{GS}=-4.5V, I_D=-3.2A$		0.050	0.065	
		$V_{GS}=-2.5V, I_D=-1.2A$		0.060	0.075	
Forward Transconductance	G_{fs}	$V_{DS}=-5.0V, I_D=-4.0A$		10		S
Diode Forward Voltage	V_{SD}	$I_S=-1.0A, V_{GS}=0V$		-0.8	-1.2	V
Dynamic						
Total Gate Charge	Q_g	$V_{DS}=-15V, V_{GS}=-10V, I_D \equiv -4.0A$		14	21	nC
Gate-Source Charge	Q_{gs}			1.9		
Gate-Drain Charge	Q_{gd}			3.7		
Input Capacitance	C_{iss}	$V_{DS}=-15V, V_{GS}=0V,$		540		pF

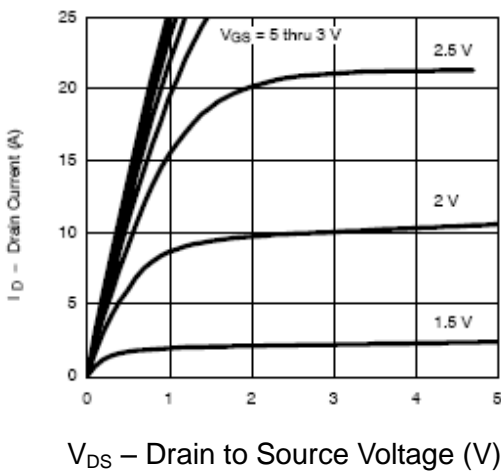


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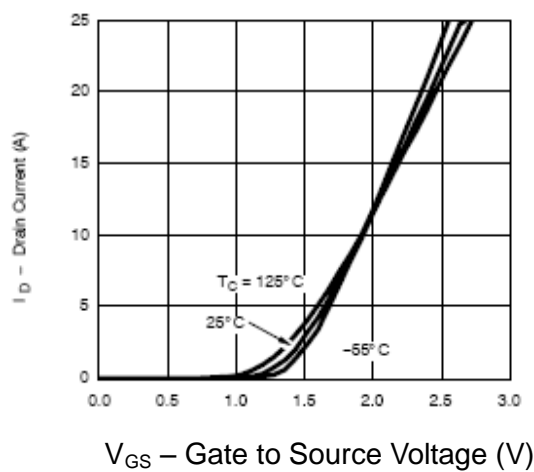
Output Capacitance	C_{OSS}	f=1MHz	131		ns
Reverse Transfer Capacitance	C_{RSS}		105		
Turn-On Time	$t_{d(on)}$	$V_{DD}=-15V, R_L=15\Omega$ $I_D=-1.0A, V_{GEN}=-10V$ $R_G=6\Omega$	10	15	
	t_r		15	25	
Turn-Off Time	$t_{d(off)}$		31	50	
	t_f		20	30	

Typical Characteristics

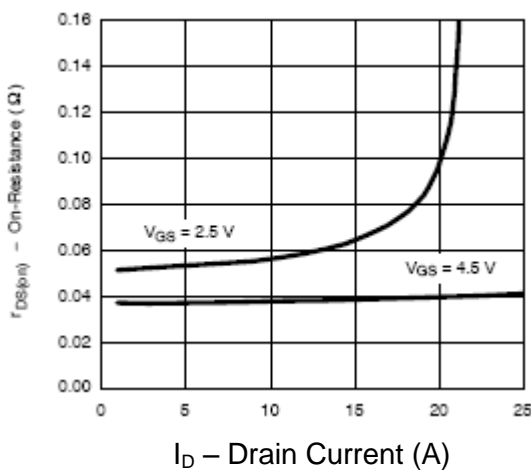
Output Characteristics



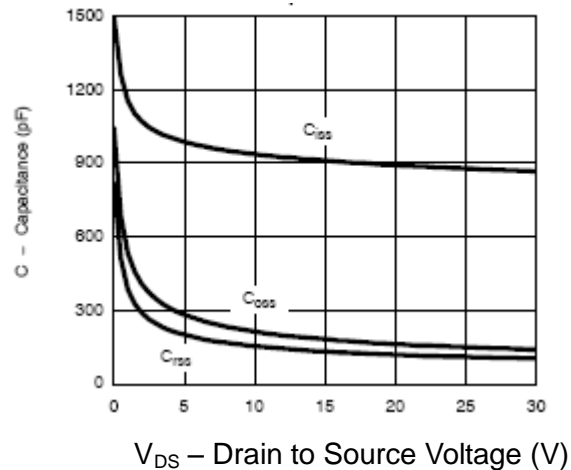
Transfer Characteristics



On-Resistance vs. Drain Current



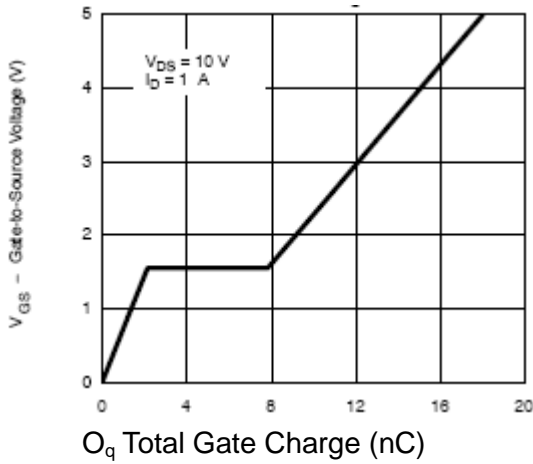
Capacitance



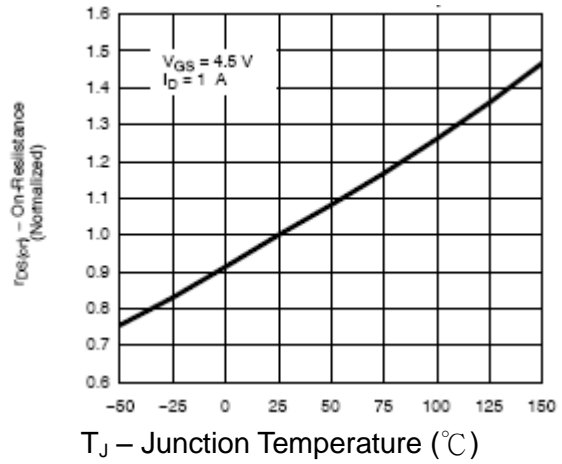


Typical Characteristics

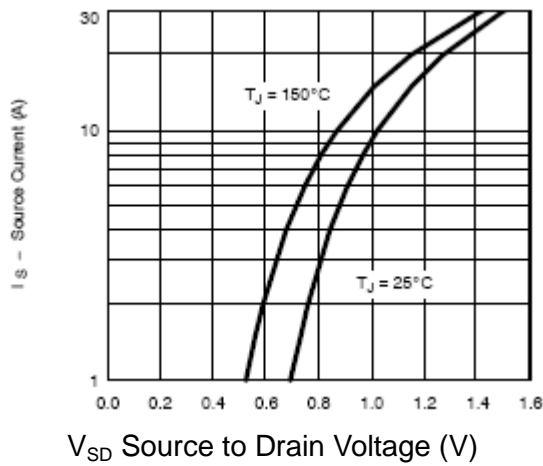
Gate Charge



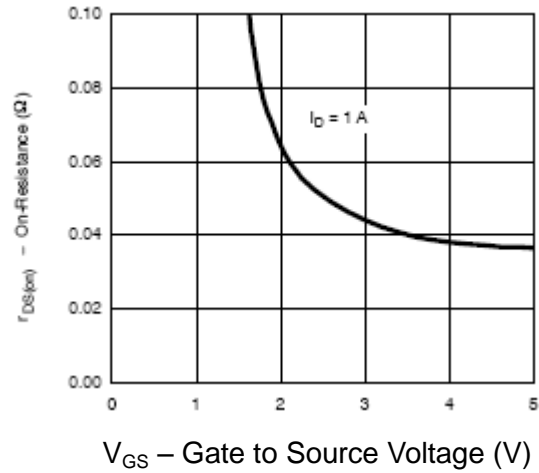
On-Resistance vs. Junction Temperature



Source-Drain Diode Forward Voltage



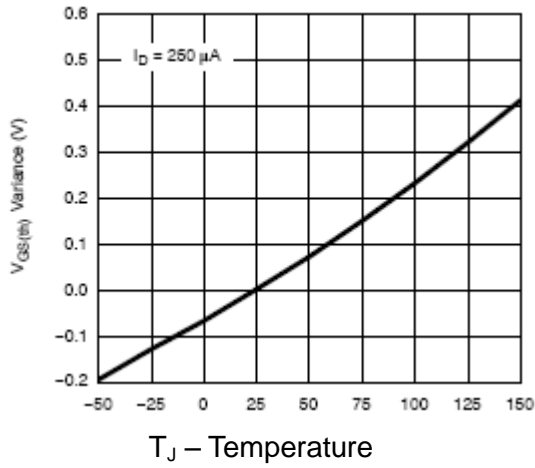
On-Resistance vs. Gate-to-Source Voltage



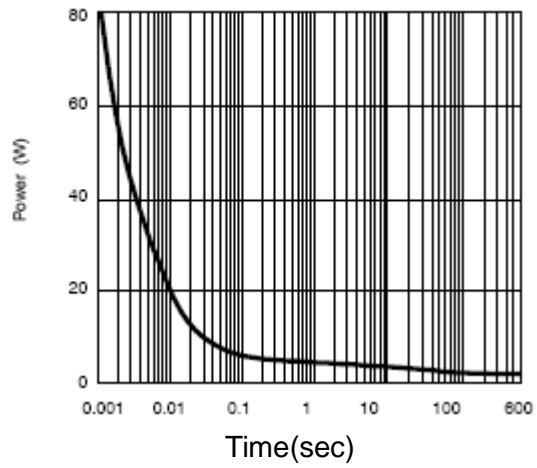


Typical Characteristics

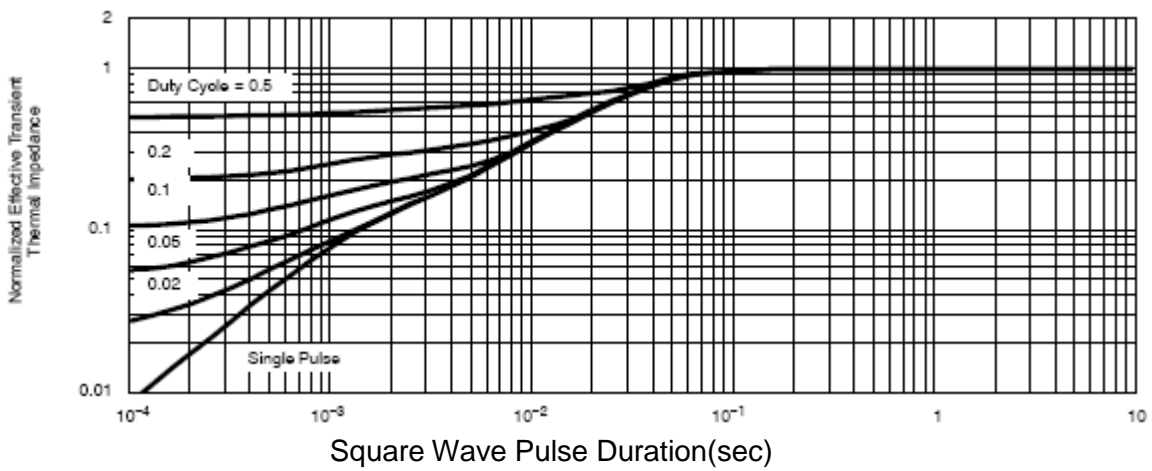
Threshold Voltage



Single Pulse Power, Junction-To-Ambient



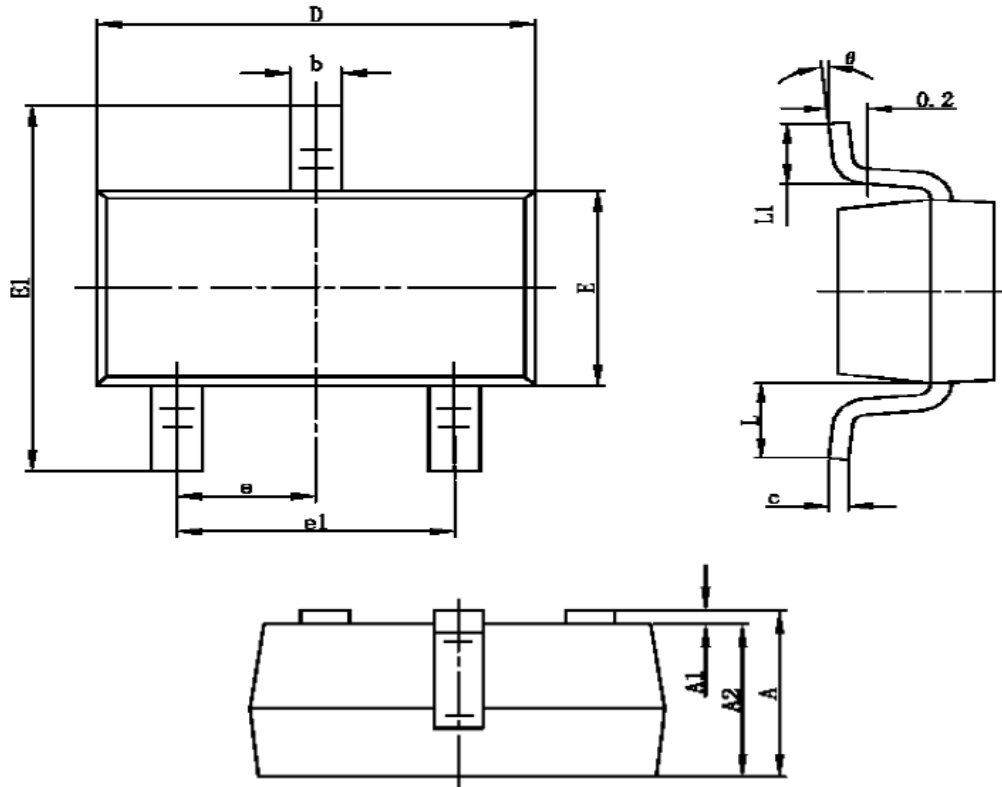
Normalized Thermal Transient Impedance, Junction-to-Foot





Packing Information

SOT-23-3L



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.050	1.250	0.041	0.049
A1	0.000	0.100	0.000	0.004
A2	1.050	1.150	0.041	0.045
b	0.300	0.400	0.012	0.016
c	0.100	0.200	0.004	0.008
D	2.820	3.020	0.111	0.119
E	1.500	1.700	0.059	0.067
E1	2.650	2.950	0.104	0.116
e	0.950TYP		0.037TYP	
e1	1.800	2.000	0.071	0.079
L	0.700REF		0.028REF	
L1	0.300	0.600	0.012	0.024
θ	0°	8°	0°	8°



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Notes

ACE does not assume any responsibility for use as critical components in life support devices or systems without the express written approval of the president and general counsel of ACE Electronics Co., LTD. As used herein:

1. Life support devices or systems are devices or systems which, (a) are intended for surgical implant into the body, or (b) support or sustain life, and whose failure to perform when properly used in accordance with instructions for use provided in the labeling, can be reasonably expected to result in a significant injury to the user.
2. A critical component is any component of a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or system, or to affect its safety or effectiveness.

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