ACE7407A

P-Channel Enhancement Mode MOSFET

Description

The ACE7407A 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 where high-side switching, and low in-line power loss are needed in a very small outline surface mount package.

Features

- -20V/-3.4A, $R_{DS\ (ON)}$= 100mΩ@VGS=-4.5V
- -20V/-2.4A, $R_{DS\ (ON)}$= 125mΩ@VGS=-2.5V
- -20V/-1.7A, $R_{DS\ (ON)}$= 150mΩ@VGS=-1.8V
- -20V/-1.0A, $R_{DS\ (ON)}$= 220mΩ@VGS=-1.25V
- 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
- DC/DC Converter
- Load Switch
- DSC
- LCD Display inverter

ACE7407A

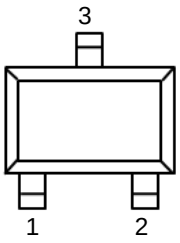
P-Channel Enhancement Mode MOSFET

Absolute Maximum Ratings

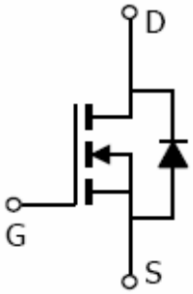
Parameter		Symbol	Max	Unit
Drain-Source Voltage		V_{DSS}	-20	V
Gate-Source Voltage		V_{GSS}	±12	V
Continuous Drain Current (T_J=150℃)	T_A=25℃	I_D	-2.3	A
	T_A=70℃		-1.7	
Pulsed Drain Current		I_{DM}	-6	A
Continuous Source Current (Diode Conduction)		I_S	-1.4	A
Power Dissipation	T_A=25℃	P_D	0.33	W
	T_A=70℃		0.21	
Operating Junction Temperature		T_J	-55/150	°C
Storage Temperature Range		T_{STG}	-55/150	°C
Thermal Resistance-Junction to Ambient		$R_{\theta JA}$	105	°C/W

Packaging Type

SOT-323



SOT-323	Description
1	Gate
2	Source
3	Drain



Ordering information

ACE7407A CM + H

- Halogen - free
- Pb - free
- CM : SOT-323

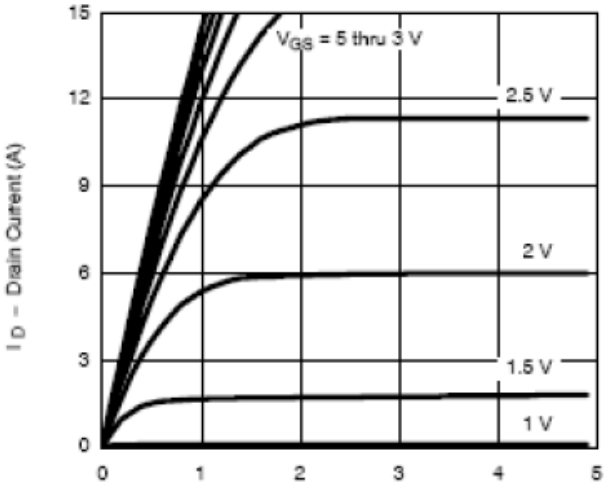
Electrical Characteristics

T_A=25℃, unless otherwise noted

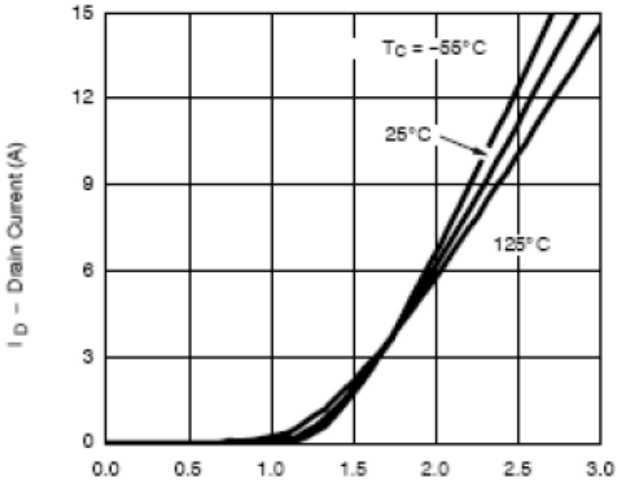
Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Static						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS}=0V, I_D=-250uA	-20			V
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=-250uA	-0.35		-0.8	
Gate Leakage Current	I_{GSS}	V_{DS}=0V,V_{GS}=±12V			±100	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=-20V, V_{GS}=0V			-1	uA
		V_{DS}=-20V, V_{GS}=0V T_J=55℃			-5	
		V_{DS}≧-5V, V_{GS}=-4.5V	-6			A
Drain-Source On-Resistance	$R_{DS(ON)}$	V_{GS}=-4.5V, I_D=-3.4A		0.080	0.100	Ω
		V_{GS}=-2.5V, I_D=-2.4A		0.105	0.125	
		V_{GS}=-1.8V, I_D=-1.7A		0.130	0.150	
		V_{GS}=-1.25V, I_D=-1.0A		0.180	0.22	
Forward Transconductance	Gfs	V_{DS}=-5V,I_D=-2.8A		6		S
Diode Forward Voltage	V_{SD}	I_S=-1.5A, V_{GS}=0V		-0.8	-1.2	V
Dynamic						
Total Gate Charge	Q_g	V_{DS}=-6V, V_{GS}=-4.5V, I_D=-2.8A		4.8	8	nC
Gate-Source Charge	Q_{gs}			1.0		
Gate-Drain Charge	Q_{gd}			1.0		
Input Capacitance	Ciss	V_{DS}=-6V, V_{GS}=0V, f=1MHz		485		pF
Output Capacitance	Coss			85		
Reverse Transfer Capacitance	Crss			40		
Turn-On Time	td(on)	V_{DD}=-6V, R_L=6Ω, V_{GEN}=-4.5V, I_D=-1.0A ,R_G=6Ω		10	16	nS
	tr			13	23	
Turn-Off Time	td(off)			18	25	
	tf			15	20	

Typical Performance Characteristics

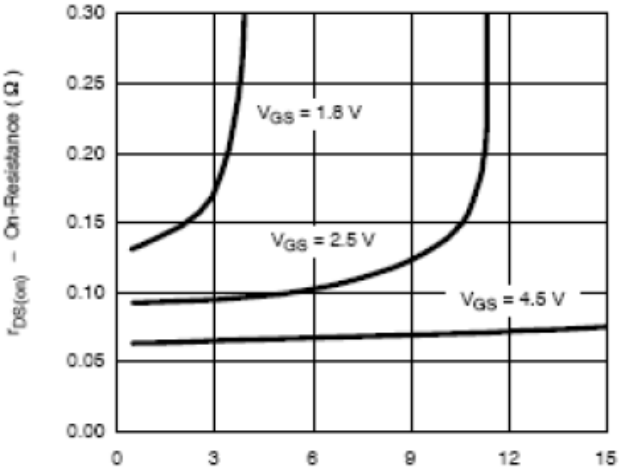
Output Characteristics



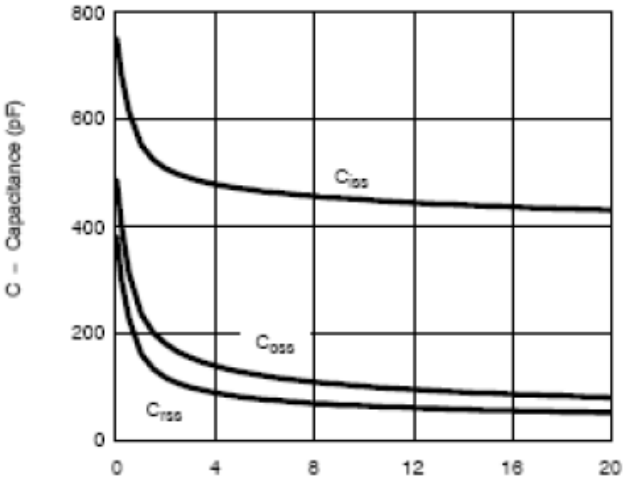
Transfer Characteristics



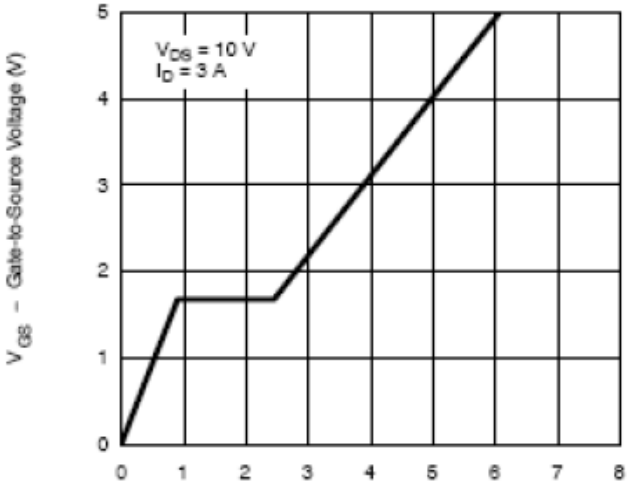
On-Resistance vs. Drain Current



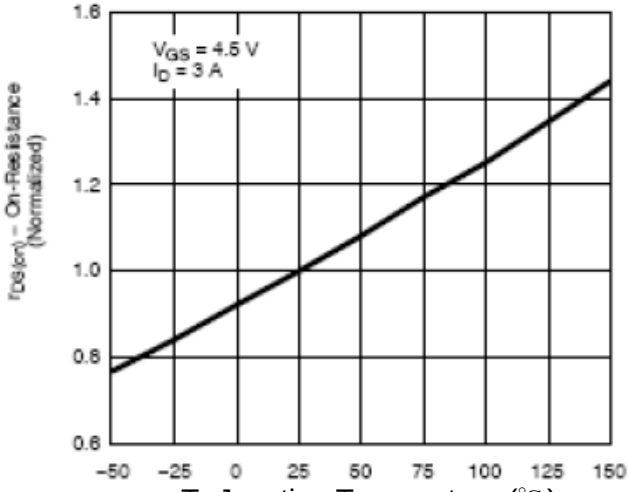
Capacitance



Gate Charge

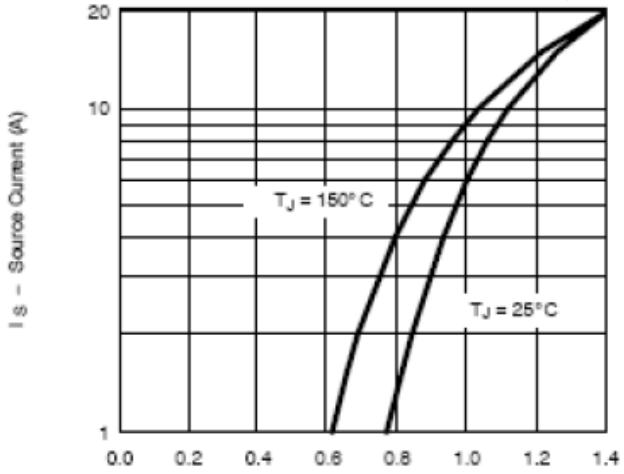


On-Resistance vs. Junction Temperature



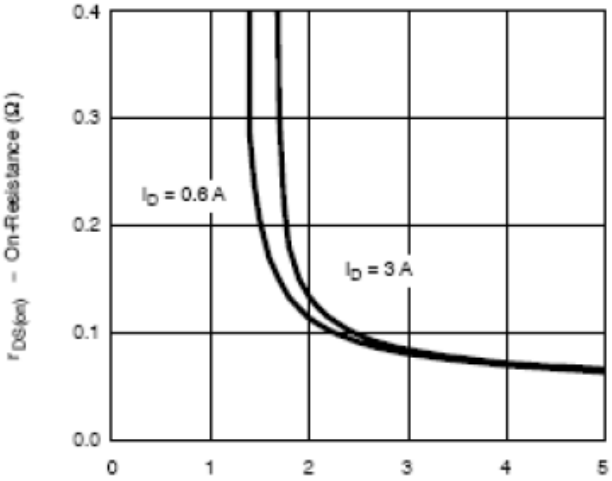
Typical Performance Characteristics

Source-Drain Diode Forward Voltage



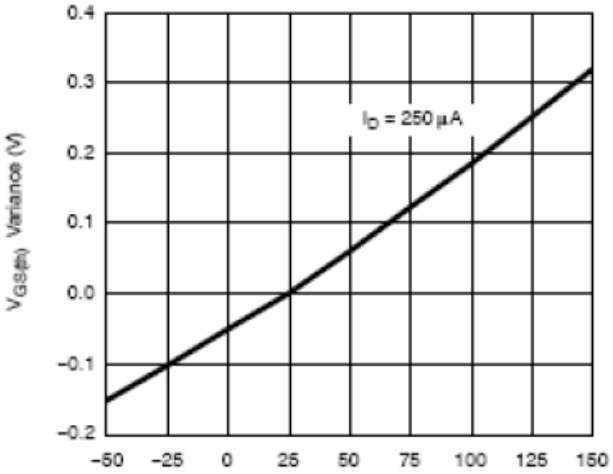
V_{SD}-Source-to-Drain Voltage (V)

On-Resistance vs. Gate-to-Source Voltage



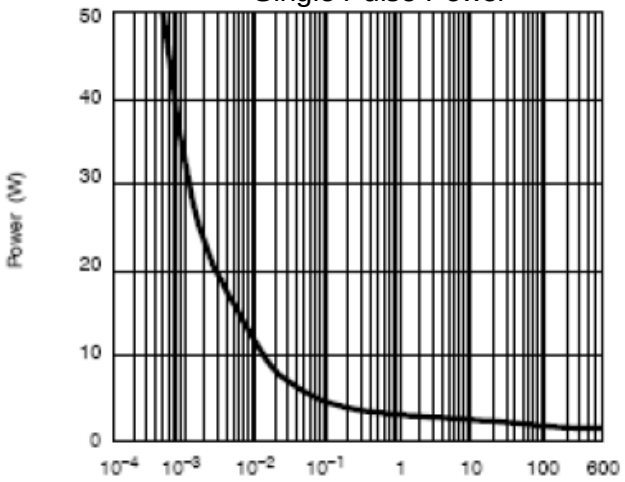
V_{GS}-Gate-to-Source Voltage (V)

Threshold Voltage



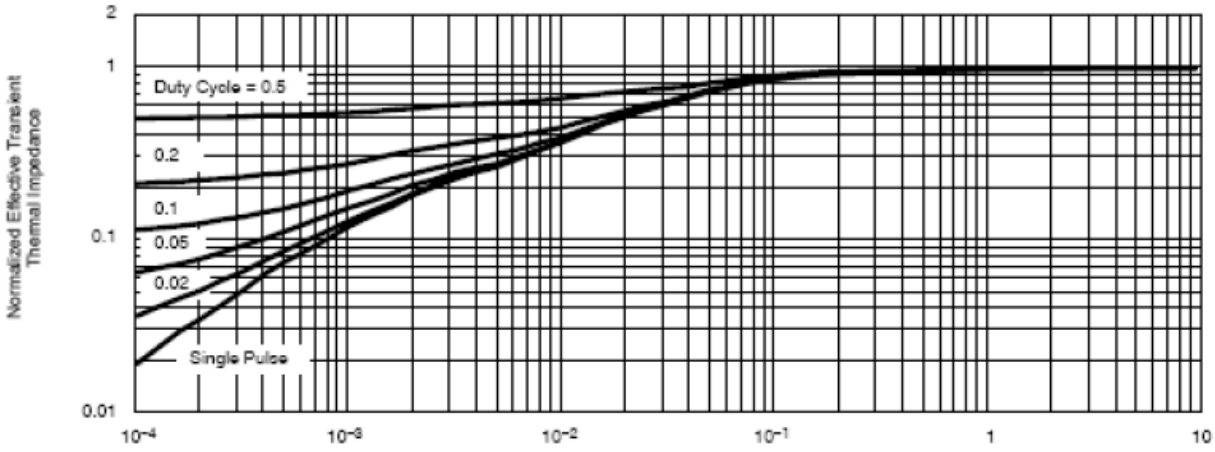
T_J-Temperature(℃)

Single Pulse Power



Time (sec)

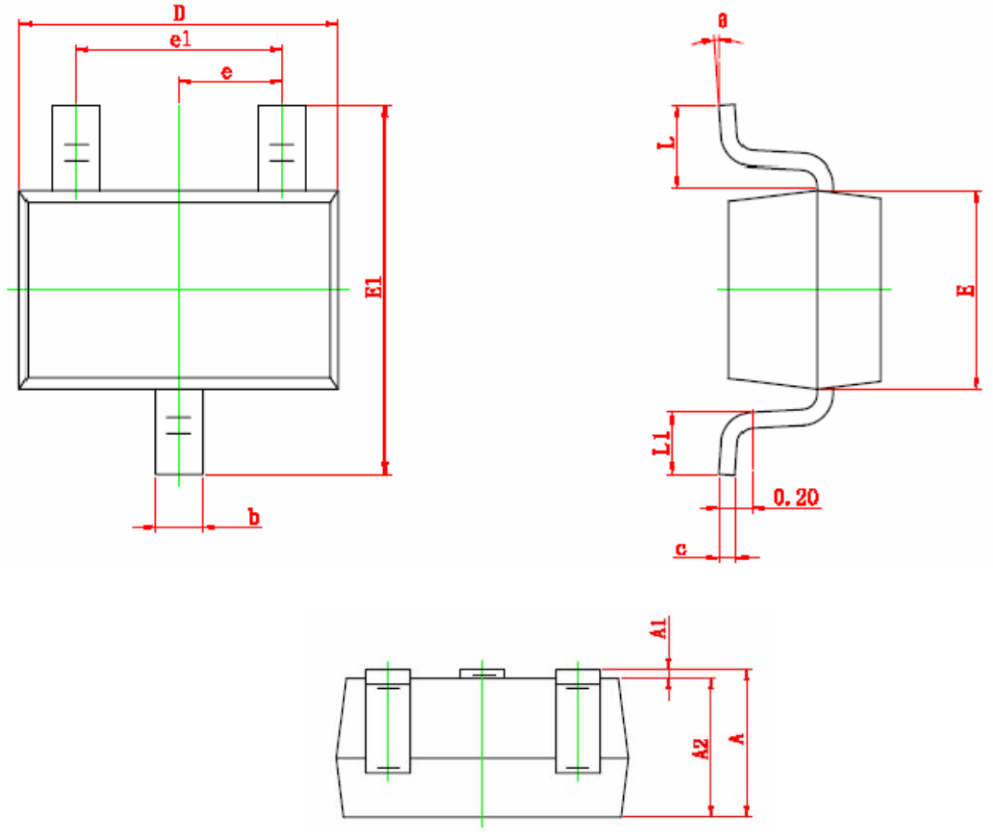
Normalized Thermal Transient Impedance, Junction-to Foot



Square Wave Pulse Duration (sec)

Packing Information

SOT-323



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	0.900	1.100	0.035	0.043
A1	0.000	0.100	0.000	0.004
A2	0.900	1.000	0.035	0.039
b	0.200	0.400	0.008	0.016
c	0.080	0.150	0.003	0.006
D	2.000	2.200	0.079	0.087
E	1.150	1.350	0.045	0.053
E1	2.150	2.450	0.085	0.096
e	0.650 TYP		0.026 TYP	
e1	1.200	1.400	0.047	0.055
L	0.525 REF		0.021 REF	
L1	0.260	0.460	0.010	0.018
θ	0°	8°	0°	8°

Notes

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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 shoes 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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