



ACE5213A

P-Channel Enhancement Mode MOSFET

Description

The ACE5213A is the P-Channel 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 and provide superior switching performance.

These devices are particularly suited for low voltage applications such as notebook computer power management and other battery powered circuits where high-side switching, low in-line power loss, and resistance to transients are needed.

Features

- P-Channel
 - 20V/0.45A, $R_{DS(ON)} = 0.52\Omega @ V_{GS} = -4.5V$
 - 20V/0.35A, $R_{DS(ON)} = 0.70\Omega @ V_{GS} = -2.5V$
 - 20V/0.25A, $R_{DS(ON)} = 0.95\Omega @ V_{GS} = -1.8V$
- Super high density cell design for extremely low $R_{DS(ON)}$
- Exceptional on-resistance and maximum DC current capability

Application

- Drivers : Relays/Solenoids/Lamps/Hammers
- Power Supply Converter Circuits
- Load/Power Switching Cell Phones, Pagers

Absolute Maximum Ratings

Parameter	Symbol	Max	Unit	
Drain-Source Voltage	V_{DSS}	-20	V	
Gate-Source Voltage	V_{GSS}	± 12	V	
Continuous Drain Current ($T_J = 150^\circ C$)	I_D	$T_A = 25^\circ C$	-0.45	A
		$T_A = 70^\circ C$	-0.35	
Pulsed Drain Current	I_{DM}	-1.0	A	
Continuous Source Current (Diode Conduction)	I_S	-0.3	A	
Power Dissipation	P_D	$T_A = 25^\circ C$	0.27	W
		$T_A = 70^\circ C$	0.16	
Operating Junction Temperature	T_J	-55/150	$^\circ C$	
Storage Temperature Range	T_{STG}	-55/150	$^\circ C$	

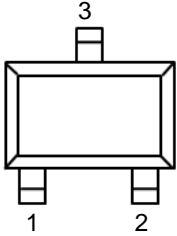


ACE5213A

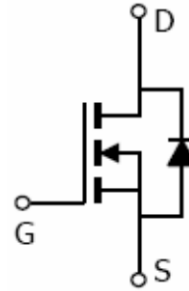
P-Channel Enhancement Mode MOSFET

Packaging Type

SOT-523

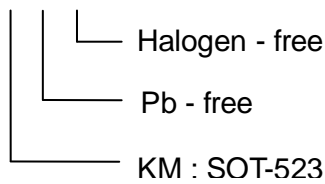


SOT-523	Description
1	Gate
2	Source
3	Drain



Ordering information

ACE5213A **KM** + H



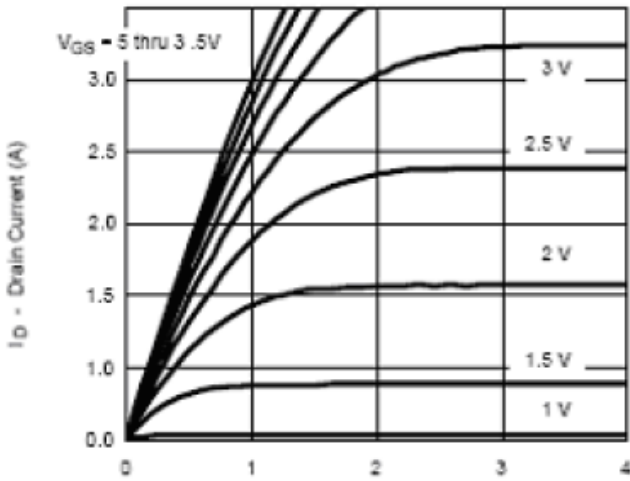
Electrical Characteristics T_A=25°C, unless otherwise noted

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Static						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=-250\mu A$	-20			V
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=-250\mu A$	-0.35		-0.8	
Gate Leakage Current	I_{GSS}	$V_{DS}=0V, V_{GS}=\pm 12V$			± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=-20V, V_{GS}=0V$			-1	μA
		$V_{DS}=-20V, V_{GS}=0V, T_J=55^\circ C$			-5	
		$V_{DS} \geq -4.5V, V_{GS}=-5V$	-0.7			A
Drain-Source On-Resistance	$R_{DS(ON)}$	$V_{GS}=-4.5V, I_D=-0.45A$		0.42	0.52	Ω
		$V_{GS}=-2.5V, I_D=-0.35A$		0.58	0.70	
		$V_{GS}=-1.8V, I_D=-0.25A$		0.75	0.95	
Forward Transconductance	G_{fs}	$V_{DS}=-10V, I_D=-0.25A$		0.4		S
Diode Forward Voltage	V_{SD}	$I_S=-0.15A, V_{GS}=0V$		-0.8	-1.2	V
Dynamic						
Total Gate Charge	Q_g	$V_{DS}=-10V, V_{GS}=-4.5V, I_D=-0.6A$		1.5	2.0	nC
Gate-Source Charge	Q_{gs}			0.3		
Gate-Drain Charge	Q_{gd}			0.35		
Turn-On Time	$td(on)$	$V_{DD}=-10V, R_L=10\Omega, V_{GEN}=-4.5V, I_D=-0.4A, R_G=6\Omega$		5	10	nS
	tr			15	25	
Turn-Off Time	$td(off)$			8	15	
	tf			1.4	1.8	

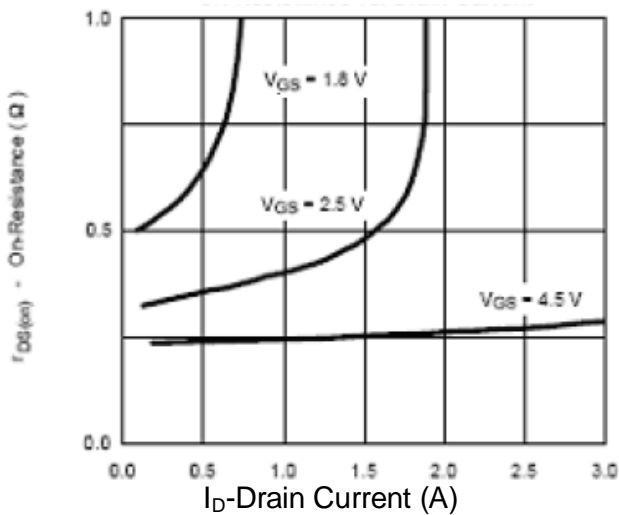


Typical Performance Characteristics

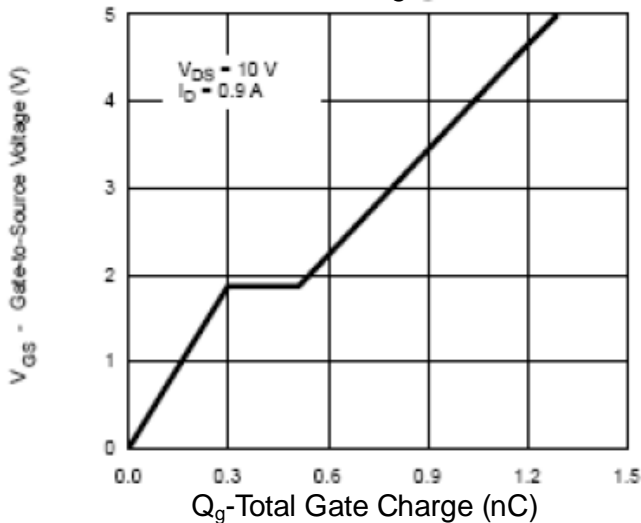
Output Characteristics



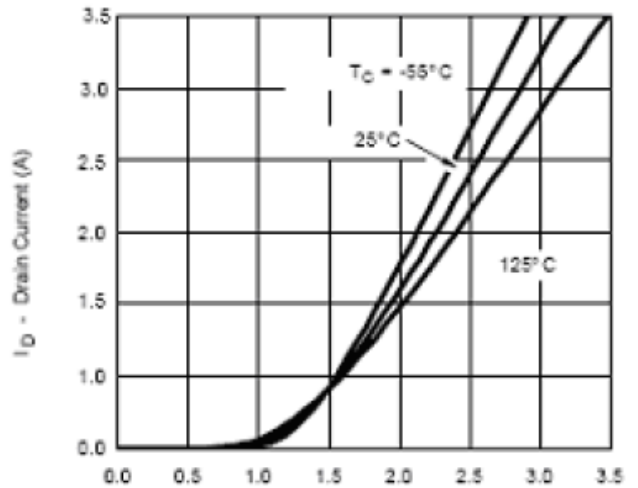
V_{DS} -Drain-to-Source Voltage (V)
On-Resistance vs. Drain Current



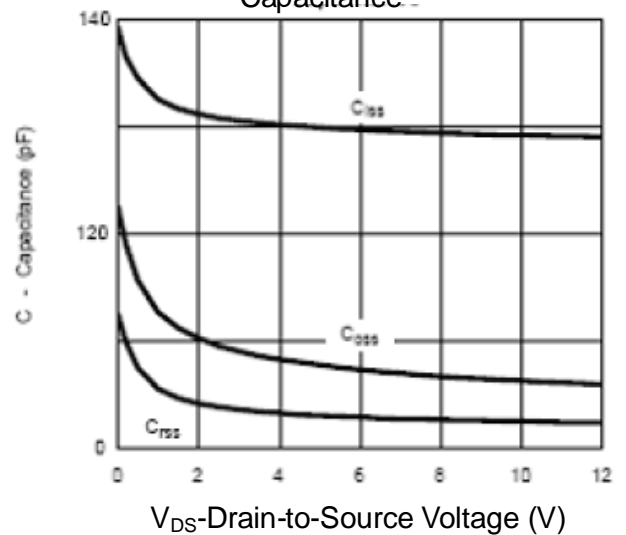
I_D -Drain Current (A)
Gate Charge



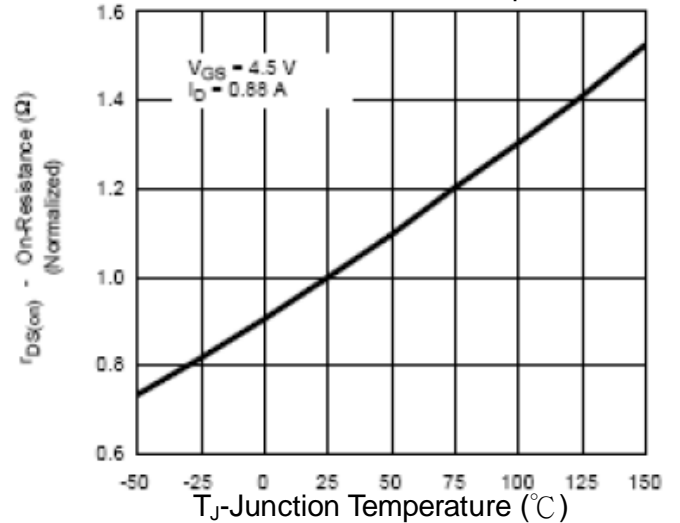
Transfer Characteristics



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



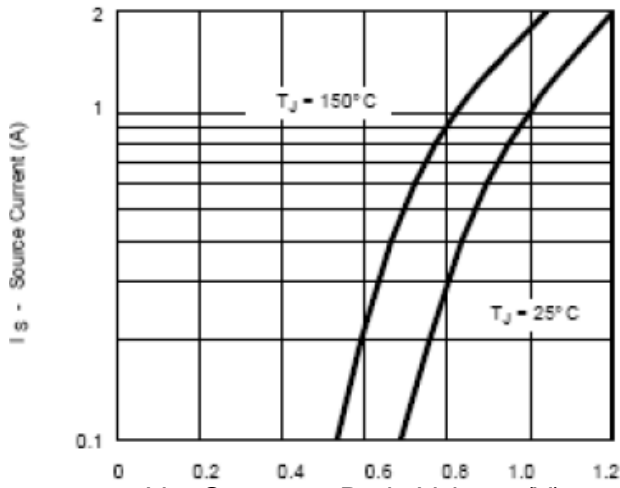
V_{DS} -Drain-to-Source Voltage (V)
On-Resistance vs. Junction Temperature



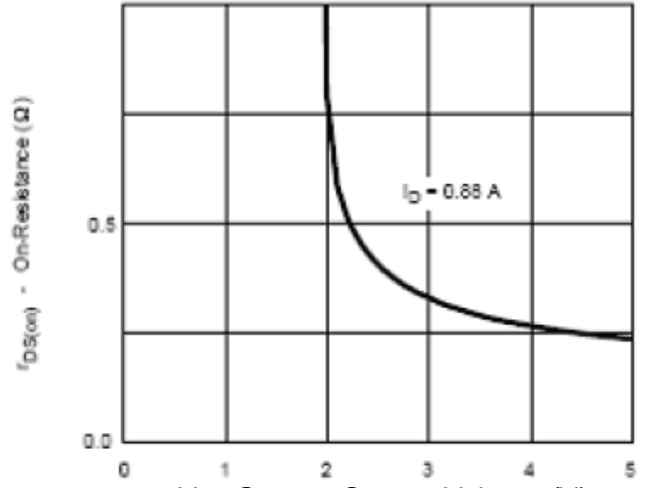


Typical Performance Characteristics

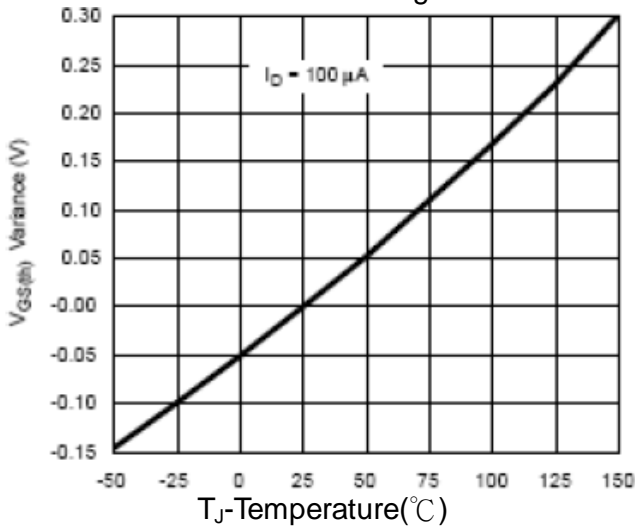
Source-Drain Diode Forward Voltage



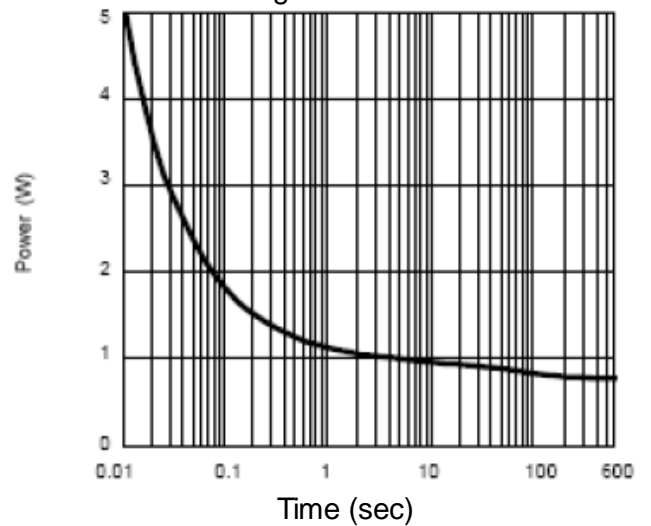
On-Resistance vs. Gate-to-Source Voltage



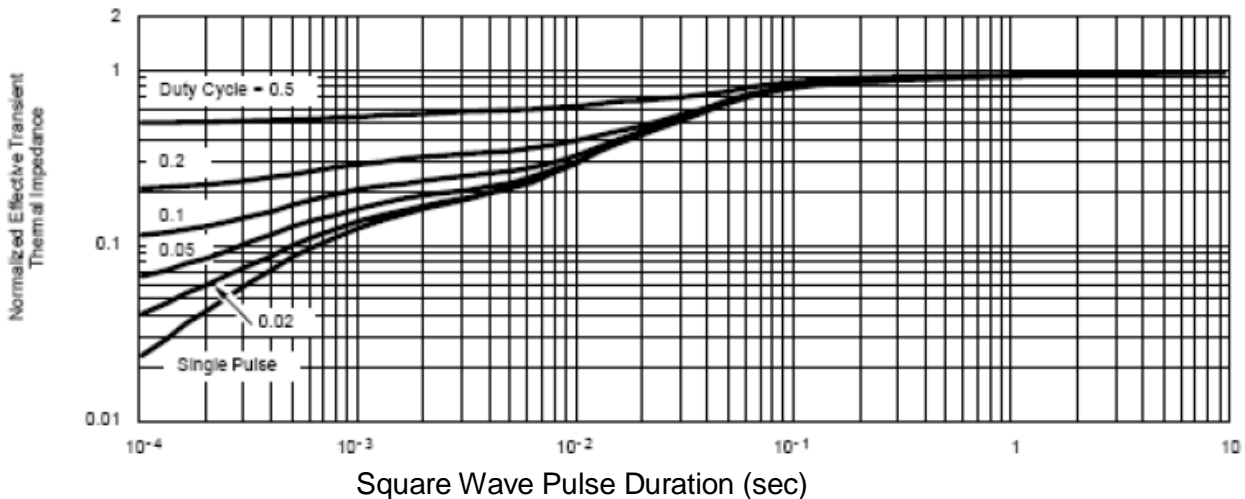
Threshold Voltage



Single Pulse Power



Normalized Thermal Transient Impedance, Junction-to Foot

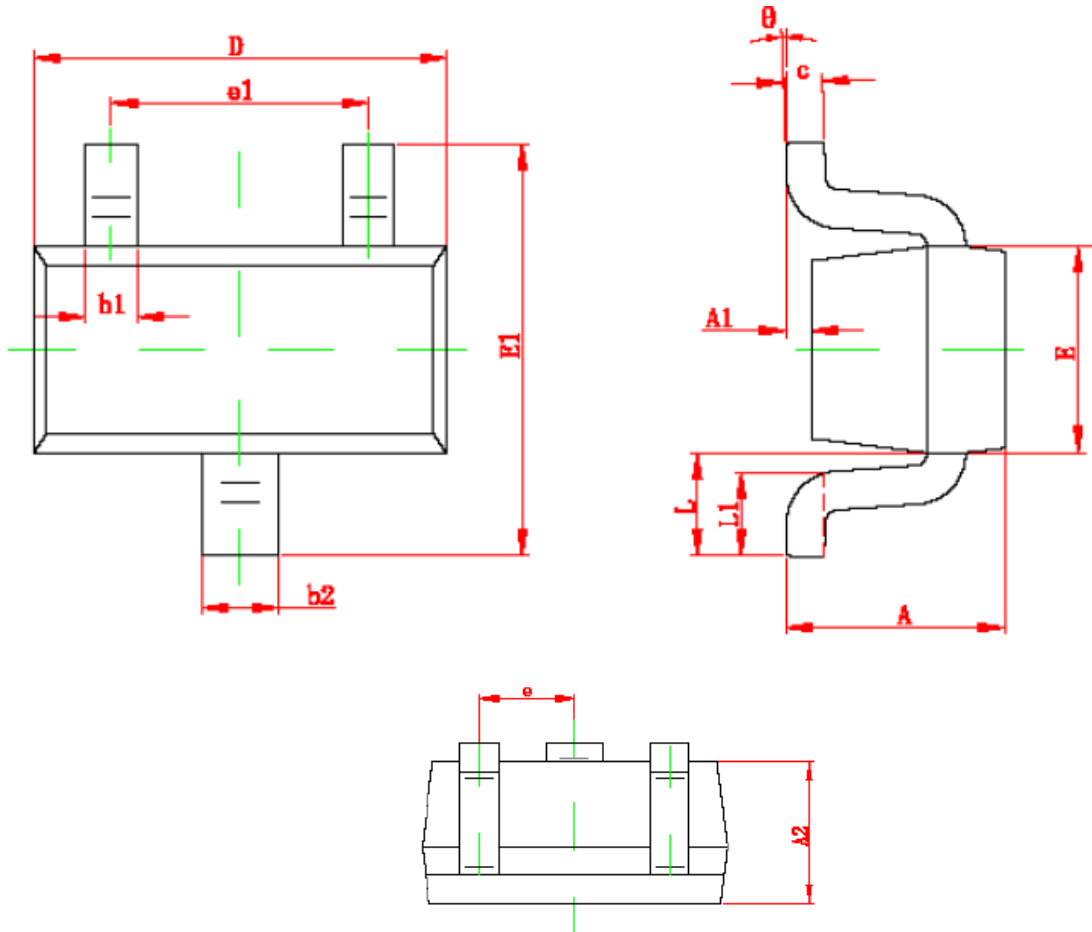




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Packing Information

SOT-523



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	0.700	0.900	0.028	0.035
A1	0.000	0.100	0.000	0.004
A2	0.700	0.800	0.028	0.031
b1	0.150	0.250	0.006	0.010
b2	0.250	0.325	0.010	0.013
c	0.100	0.200	0.004	0.008
D	1.500	1.700	0.059	0.067
E	0.750	0.850	0.030	0.033
E1	1.450	1.750	0.057	0.069
e	0.500 TYP		0.020 TYP	
e1	0.900	1.100	0.035	0.043
L	0.550 REF		0.022 REF	
L1	0.280	0.440	0.011	0.017
θ	0°	4°	0°	4°



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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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