ACE12322A

Dual N-Channel Enhancement Mode MOSFET

Description

The ACE12322A is the Dual N-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 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

- 20V/4.0A,$R_{DS(ON)}$=26mΩ@VGS=4.5V
- 20V/3.0A,$R_{DS(ON)}$=35mΩ@VGS=2.5V
- 20V/2.0A,$R_{DS(ON)}$=50mΩ@VGS=1.8V
- Super high density cell design for extremely low $R_{DS\ (ON)}$
- Exceptional on-resistance and maximum DC current capability
- DFN2X2-6L package design

Applications

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

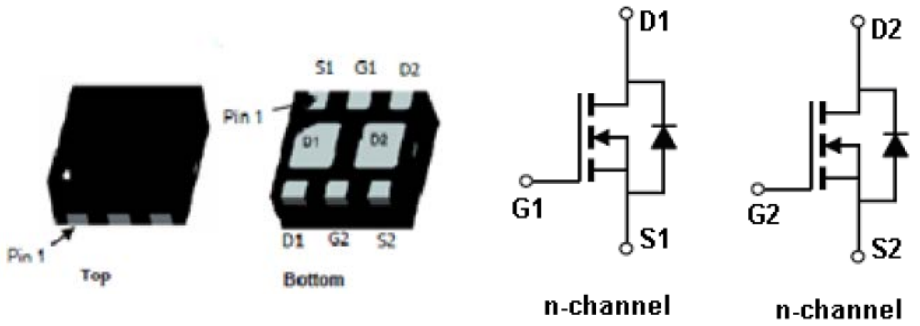
Absolute Maximum Ratings

(T_A=25℃ Unless otherwise noted)

Parameter		Symbol	Typical	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	4.5	A
	T_A=70℃		4.5	
Pulsed Drain Current		I_{DM}	20	A
Continuous Source Current(Diode Conduction)		I_S	1.6	A
Power Dissipation	T_A=25℃	P_D	1.9	W
	T_A=70℃		1.2	
Operating Junction Temperature		T_J	-55~150	°C
Storage Temperature Range		T_{STG}	-55~150	°C
Thermal Resistance-Junction to Ambient	T≦5sec	$R_{\theta JA}$	65	°C /W
	Steady State		95	

Packaging Type

DFN2*2-6L



Pin Description

Pin	Symbol	Description
1	S1	Source 1
2	G1	Gate 1
3	D2	Drain 2
4	S2	Source 2
5	G2	Gate 2
6	D1	Drain 1
Exposed Backside Metal	D1/D2	Drain

Ordering information

ACE12322A XX + H

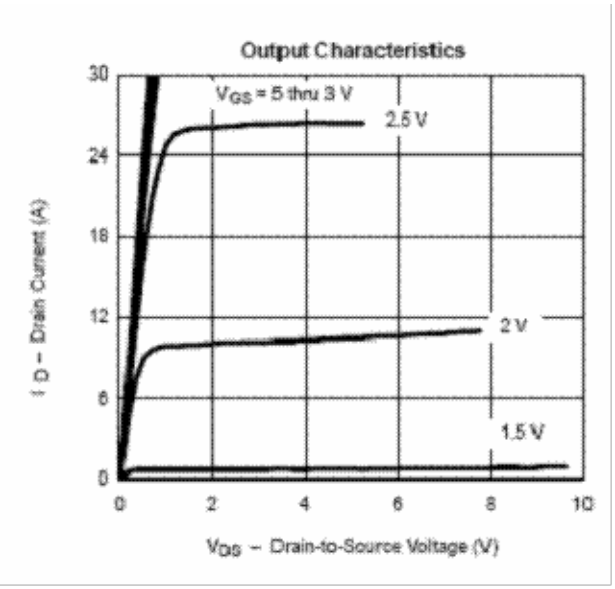
- Halogen - free
- Pb - free
- MN: DFN2*2-6L

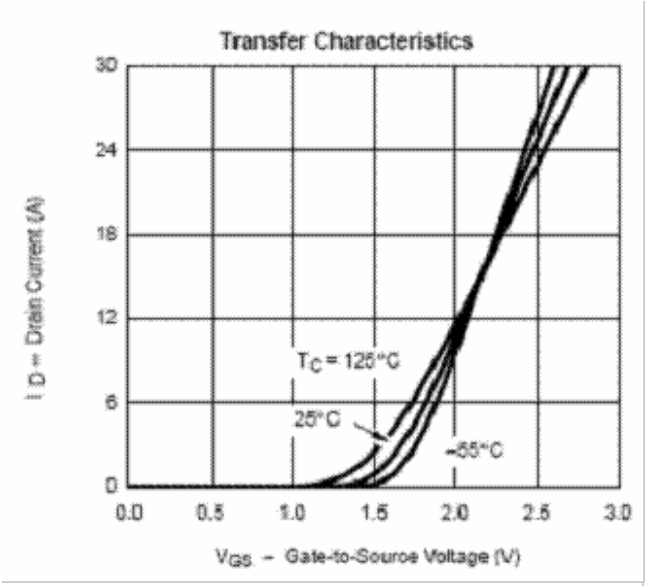
Electrical Characteristics

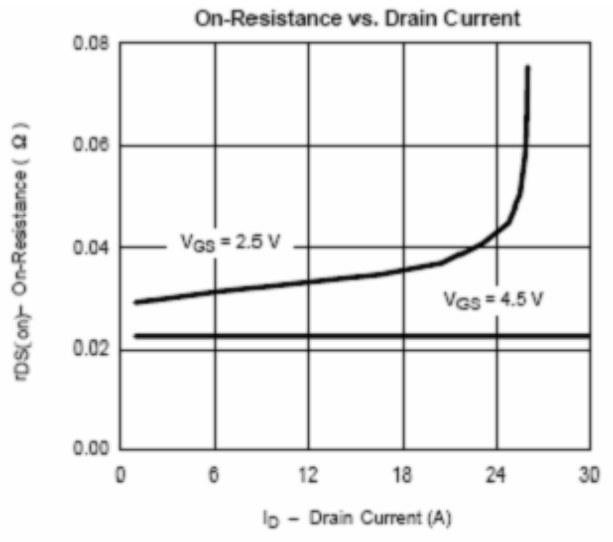
T_A=25℃, unless otherwise noted.

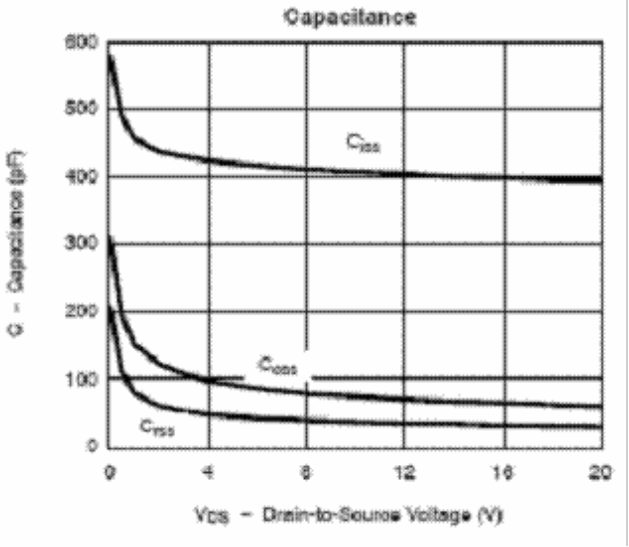
Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Static						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS}=0V, I_D=250uA	20			V
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=250uA	0.4		1.0	
Gate Leakage Current	I_{GSS}	V_{DS}=0V,V_{GS}=±12V			±100	uA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=20V, V_{GS}=0V			1	uA
		V_{DS}=20V, V_{GS}=0V, T_J=55℃			10	
On-State Drain Current	$I_{D(on)}$	V_{DS}≦4.5V,V_{GS}=5V	15			A
Drain-Source On-Resistance	$R_{DS(ON)}$	V_{GS}=4.5V, I_D=4.0A			26	mΩ
		V_{GS}=2.5V, I_D=3.0A			35	
		V_{GS}=1.8V, I_D=2.0A			50	
Forward Trans Conductance	gfs	V_{DS}=5V, I_D=-3.5A		10		S
Diode Forward Voltage	V_{SD}	V_{GS}=0V, I_S=1A			1.0	V
Dynamic						
Total Gate Charge	Q_g	V_{DS}=15V, V_{GS}=4.5V, I_D≡4.0A		8.6		nC
Gate-Source Charge	Q_{gs}			1.37		
Gate-Drain Charge	Q_{gd}			2.3		
Input Capacitance	Ciss	V_{DS} = 8V, f = 1MHz, V_{GS} = 0V		575		pF
Output Capacitance	Coss			84		
Reverse Transfer Capacitance	Crss			22		
Turn-On Time	td(on)	V_{DD}=10V, I_D≡3.0A, R_G=3.3Ω, V_{GEN}=4.5V		5.2		ns
	tr			34		
Turn-Off Time	td(off)			23		
	tf			9.2		

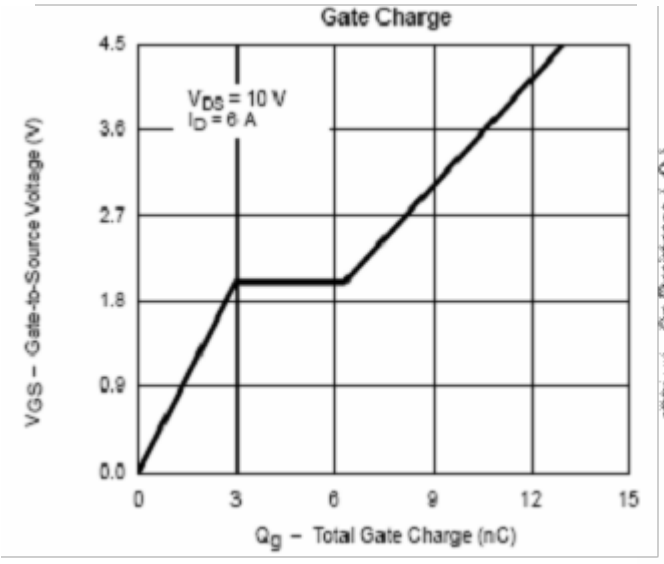
Typical Performance Characteristics

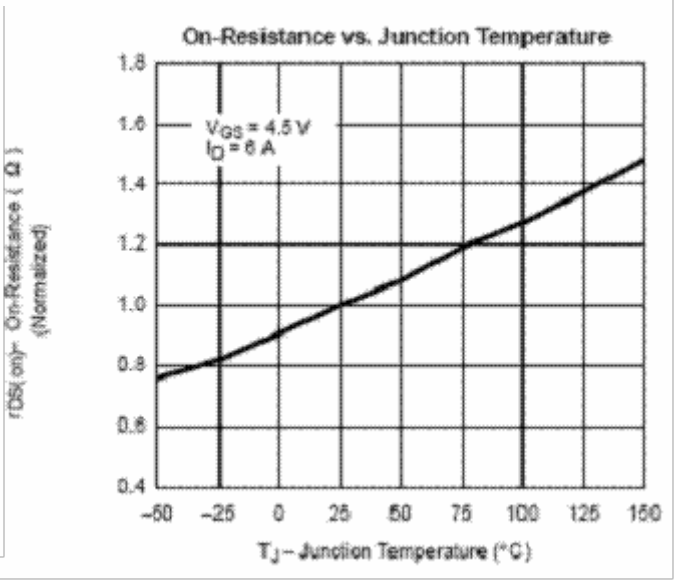


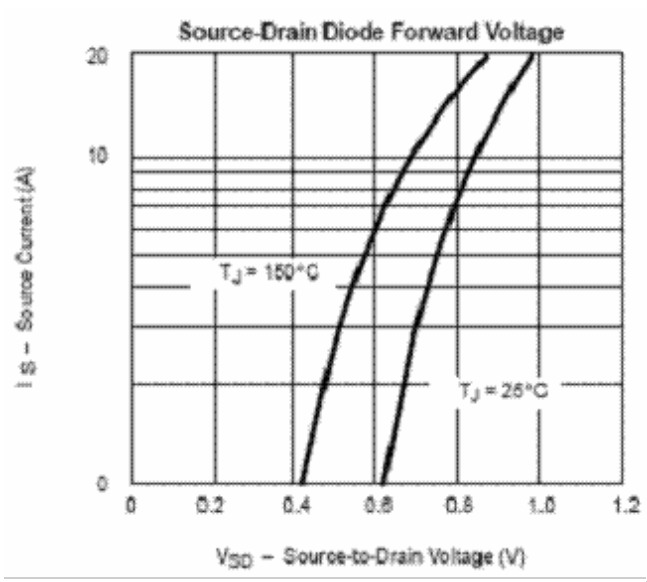


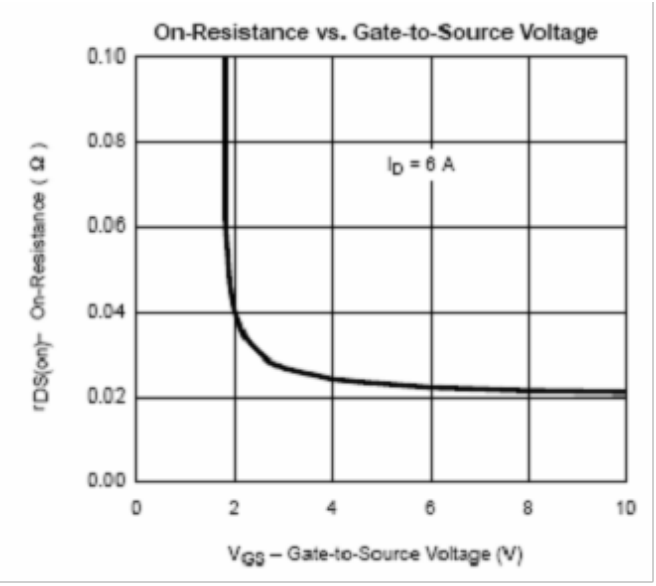


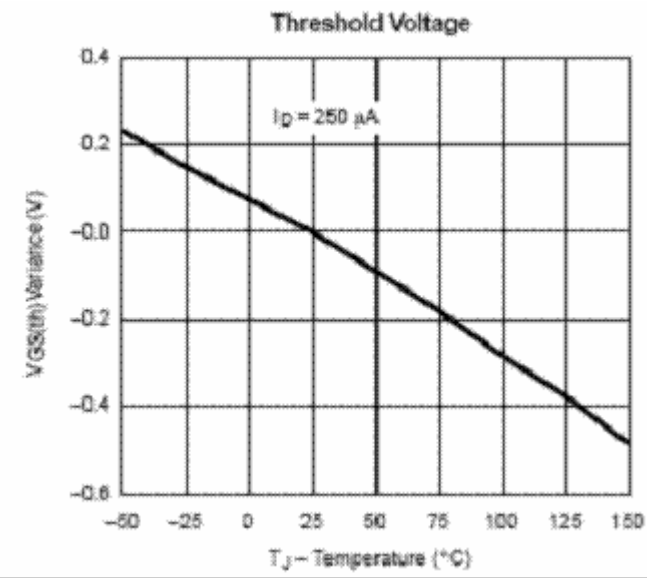


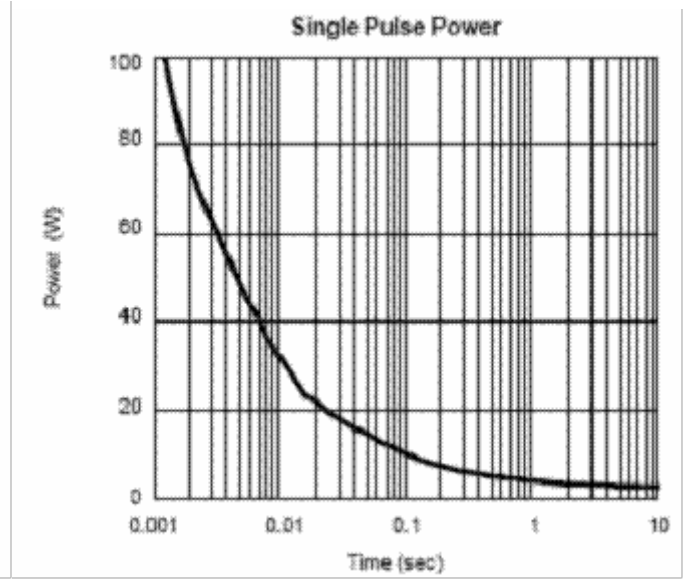


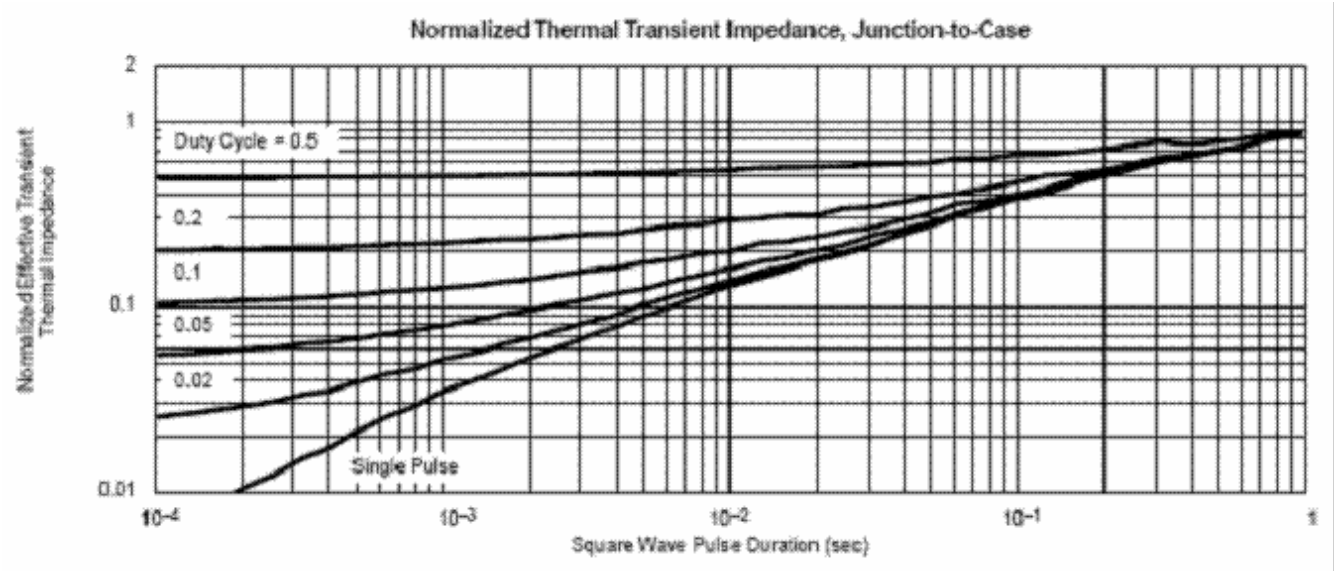



Source-Drain Diode Forward Voltage
I S – Source Current (A)
20
10
0
T_J = 150°C
T_J = 25°C
0
0.2
0.4
0.6
0.8
1.0
1.2
V_{SD} – Source-to-Drain Voltage (V)


On-Resistance vs. Gate-to-Source Voltage
$r_{DS(on)}$ – On-Resistance (Ω)
0.10
0.08
0.06
0.04
0.02
0.00
I_D = 6 A
0
2
4
6
8
10
V_{GS} – Gate-to-Source Voltage (V)

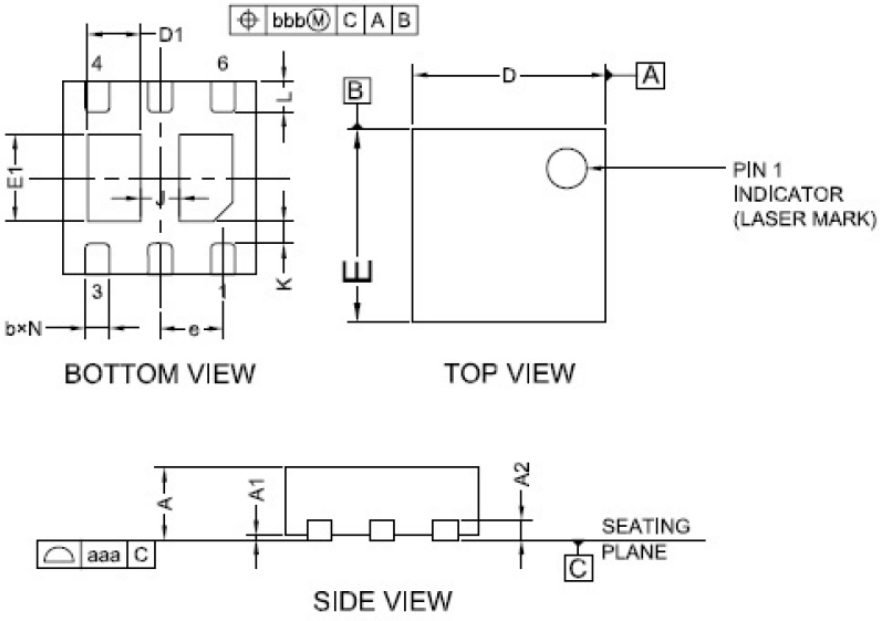

Threshold Voltage
V GS(th) Variance (V)
0.4
0.2
-0.0
-0.2
-0.4
-0.6
I_D = 250 µA
-50
-25
0
25
50
75
100
125
150
T_J – Temperature (°C)


Single Pulse Power
Power (W)
100
80
60
40
20
0
0.001
0.01
0.1
1
10
Time (sec)


Normalized Thermal Transient Impedance, Junction-to-Case
Normalized Effective Transient Thermal Impedance
2
1
0.1
0.01
Duty Cycle = 0.5
0.2
0.1
0.05
0.02
Single Pulse
10^{-4}
10^{-3}
10^{-2}
10^{-1}
1
Square Wave Pulse Duration (sec)

Packing Information

DFN2*2-6L



COMMON DIMENSIONS
(UNITS OF MEASURE=MILLIMETER)

Symbol	Min	Typ	Max
A	0.70	0.75	0.80
A1	0.00	0.02	0.05
A2		0.203	
b	0.20	0.25	0.30
D	1.95	2.00	2.05
D1	0.50	0.55	0.60
E	1.95	2.00	2.05
E1	0.85	0.90	0.95
e		0.65BSC	
L	0.27	0.32	0.37
J		0.40BSC	
K		0.20MIN	
N		6	
aaa		0.08	
bbb		0.10	

Notes

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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.