ACE12410B

N-Channel Enhancement Mode Field Effect Transistor

Features

- V_{DS} (V) = 20V
- I_D = 11.5A
- $R_{DS(ON)}$ = 10.5mΩ@V_{GS}=4.5V
- $R_{DS(ON)}$ = 14mΩ@V_{GS}=2.5V

General Description

- load switch
- battery protection applications
- ESD Protection

Absolute Maximum Ratings

Parameter		Symbol	Max	Unit
Drain-Source Voltage		V_{DSS}	20	V
Gate-Source Voltage		V_{GSS}	±12	V
Drain Current (Continuous) *AC	T_A=25°C	I_D	11.5	A
	T_A=70°C		9.2	
Drain Current (Pulse)*B		I_{DM}	32	
Power Dissipation	T_A=25°C	P_D	2.8	W
Operating and Storage Temperature Range		T_J,T_{STG}	-55 to 150	°C

A: The value of RθJA is measured with the device mounted on 1in2 FR-4 board with 2oz. Copper, in a still air environment with TA=25°C. The value in any given application depends on the user's specific board design.

B: Repetitive rating, pulse width limited by junction temperature.

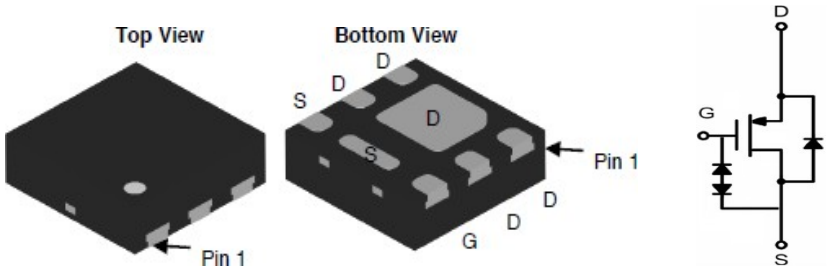
C: The current rating is based on the t≤ 10s junction to ambient thermal resistance rating, package limited 8A.

Thermal Resistance Ratings

Parameter		Symbol	Maximum	Unit
Maximum Junction-to-Ambient	t ≤10s	R_{thJA}	45	°C/W

Packaging Type

DFN2*2-6L



Ordering information

ACE12410B XX + H

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

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=250uA	20			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=20V, V_{GS}=0V			1	μA
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_{DS}=250uA	0.4	0.7	1	V
Gate Leakage Current	I_{GSS}	V_{GS}=±10V, V_{DS}=0V			±10	μA
Static Drain-Source On-Resistance	$R_{DS(ON)}$	V_{GS}=4.5V, I_D=8A		10.5	14	mΩ
		V_{GS}=2.5V, I_D=4A		14	18	
Diode Forward Voltage	V_{SD}	I_{SD}=1A, V_{GS}=0V		0.75	1	V
Diode Forward Current*AB	I_S	T_A =25°C			3.7	A
Switching						
Total Gate Charge	Q_g	V_{DS}=10V, I_D=8A V_{GS}=4.5V		7		nC
Gate-Source Charge	Q_{gs}			1		
Gate-Drain Charge	Q_{gd}			2.4		
Turn-On Delay Time	$T_{d(on)}$	V_{GS}=4.5V, V_{DS}=10V R_L=1.25Ω, R_{GEN}=3Ω		3		ns
Turn-On Rise Time	t_f			4.5		
Turn-Off Delay Time	$t_{d(off)}$			28		
Turn-Off Fall Time	t_f			6		
Dynamic						
Input Capacitance	C_{iss}	V_{DS}=10V, V_{GS}=0V f=1.0MHz		790		pF
Output Capacitance	C_{oss}			164		
Reverse Transfer Capacitance	C_{rss}			103		

A: The value of $R_{\theta JA}$ is measured with the device mounted on 1in² FR-4 board with 2oz. Copper, in a still air environment with T_A=25°C. The value in any given application depends on the user's specific board design.

B: The current rating is based on the t≤ 10s junction to ambient thermal resistance rating, package limited 8A.

Typical Performance Characteristics

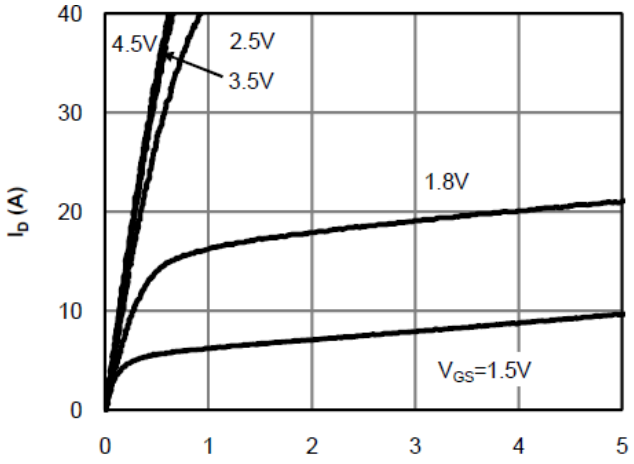


Fig 1: On-Region Characteristics

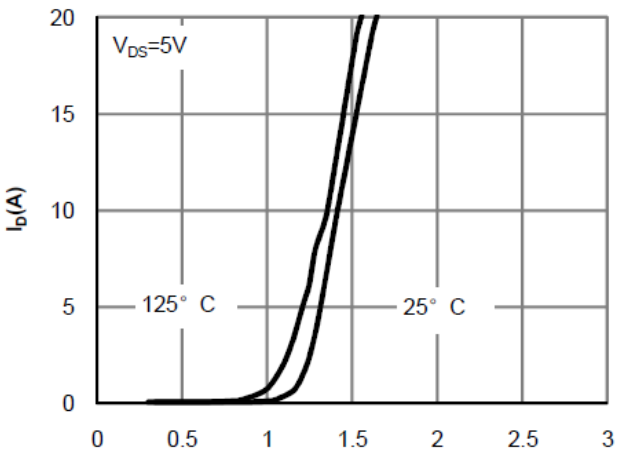


Figure 2: Transfer Characteristics

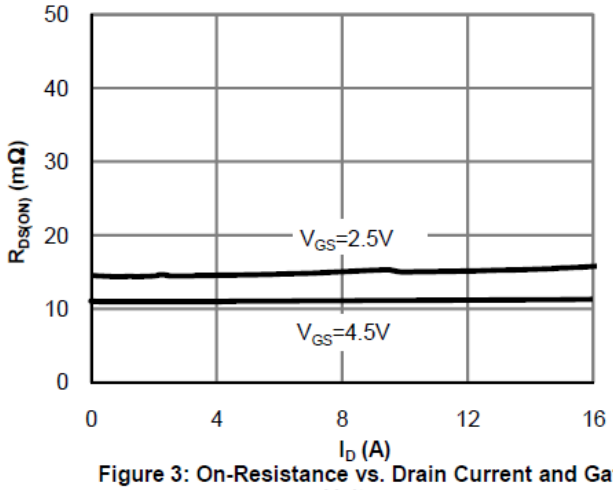


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

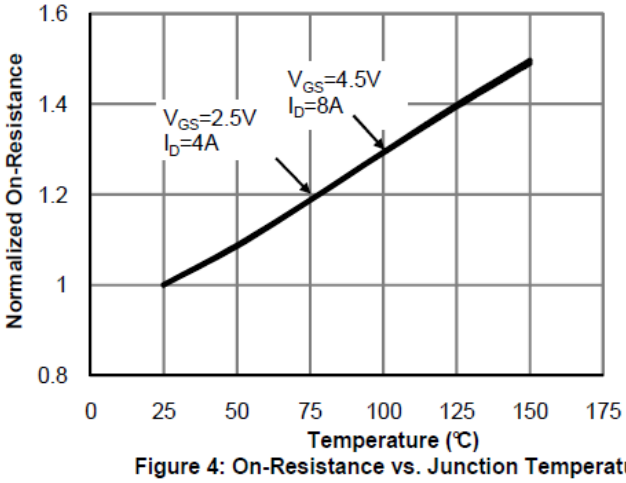


Figure 4: On-Resistance vs. Junction Temperature

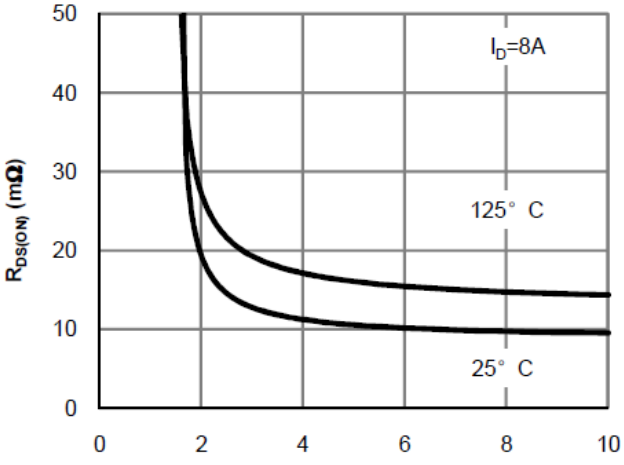


Figure 5: On-Resistance vs. Gate-Source Voltage

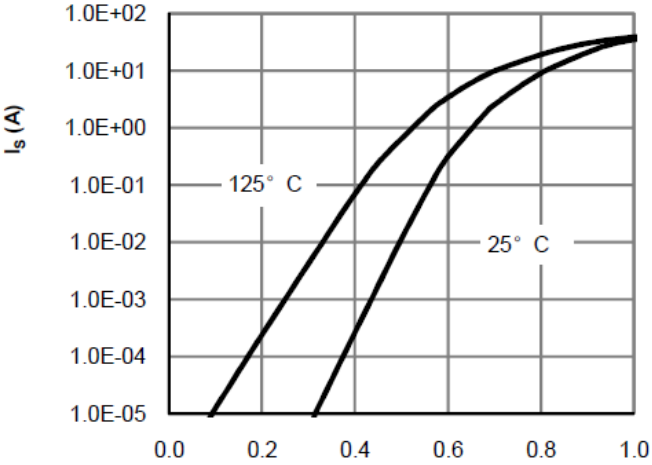


Figure 6: Body-Diode Characteristics

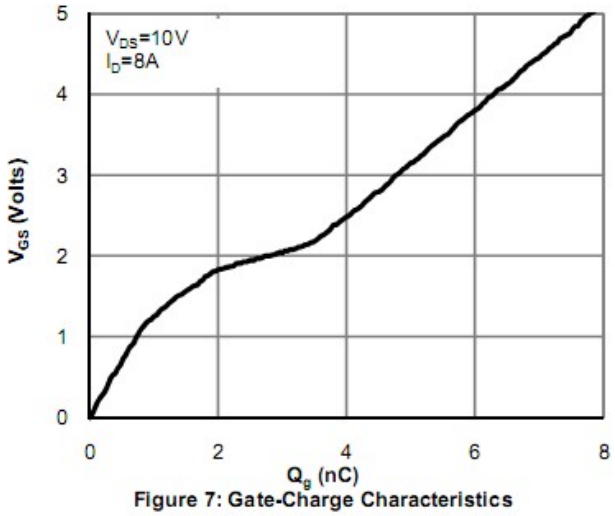


Figure 7: Gate-Charge Characteristics

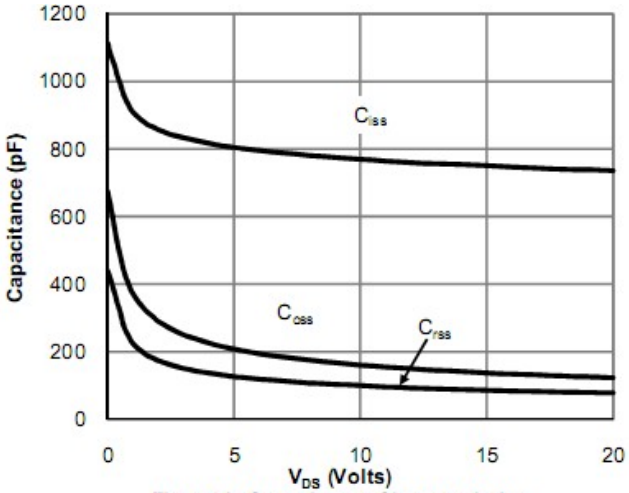


Figure 8: Capacitance Characteristics

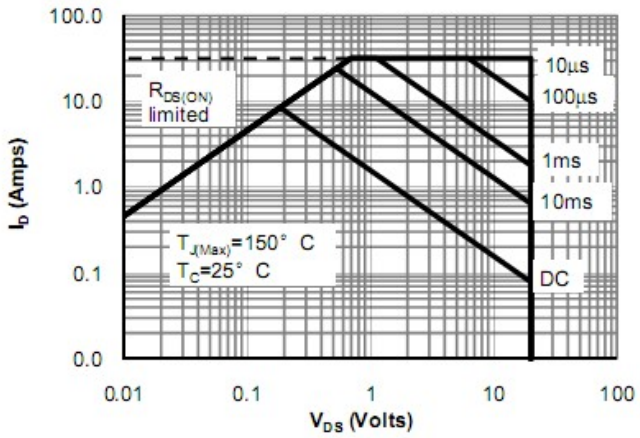


Figure 9: Maximum Forward Biased Safe Operating Area (Note F)

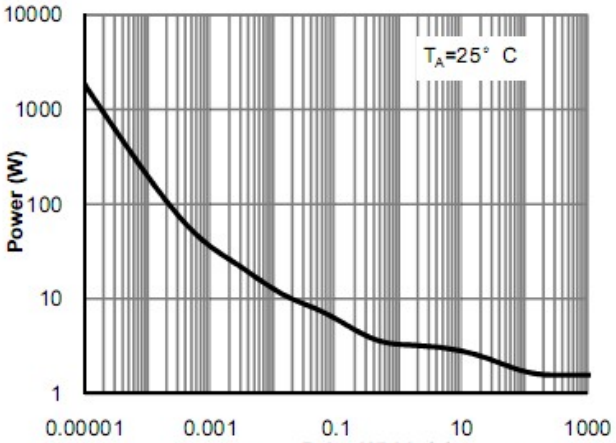


Figure 11: Single Pulse Power Rating Junction-to-Ambient (Note H)

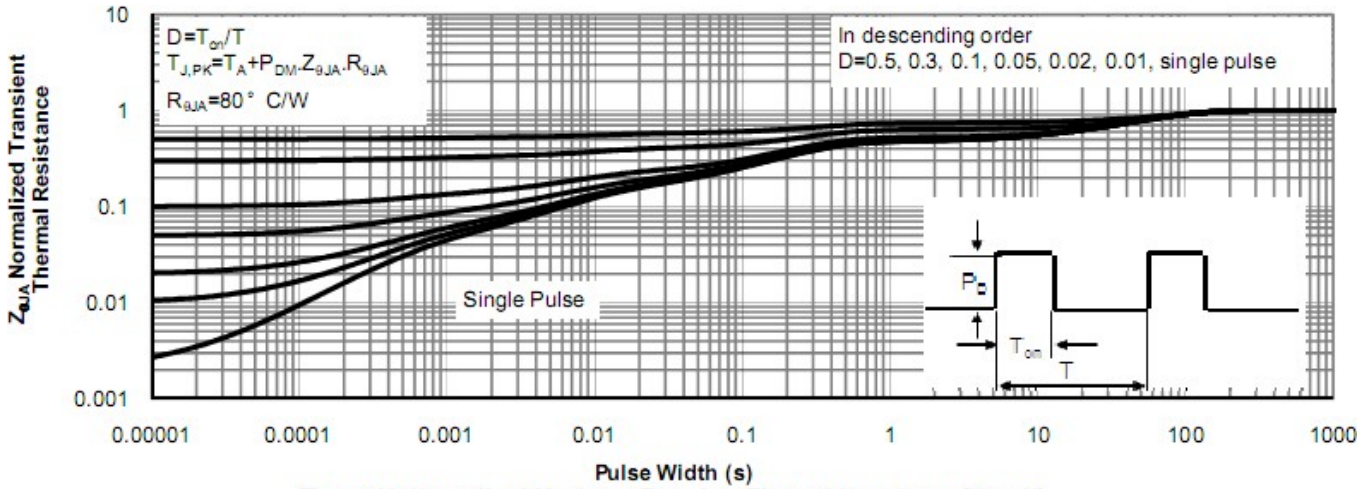
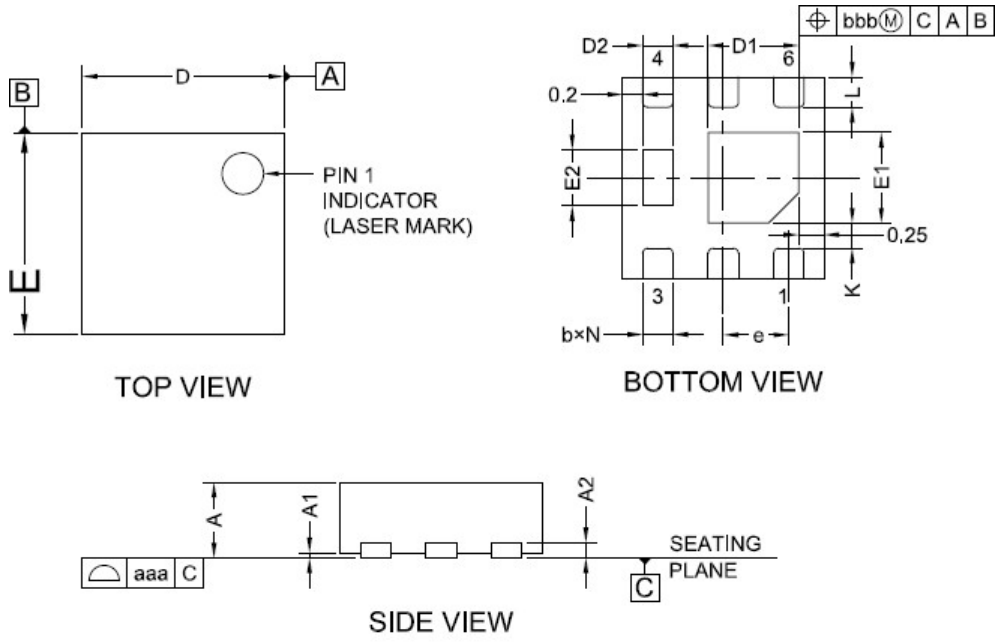


Figure 12: Normalized Maximum Transient Thermal Impedance (Note H)

Packing Information

DFN2*2-6L



COMMON DIMENSIONS

(UNITS OF MEASURE=MILLIMETER)

SYMBOL	MIN	TYP	MAX
A	0.50	0.60	0.70
A1	0.00	0.02	0.05
A2		0.152REF.	
b	0.25	0.30	0.35
D	1.95	2.00	2.05
D1	0.80	0.90	1.00
D2	0.25	0.30	0.35
E	1.95	2.00	2.05
E1	0.80	0.90	1.00
E2	0.46	0.56	0.66
e		0.65BSC	
L	0.25	0.30	0.35
J		0.40BSC	
K		0.20MIN	
N		6	
aaa		0.08	
bbb		0.10	

NOTES:

1.CONTROLLING DIMENSIONS ARE IN MILLIMETERS(ANGLES IN DEGREES).

2. COPLANARITY APPLIES TO THE EXPOSED PAD AS THE TERMINALS.

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 Technology Co., LTD. As sued 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 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.