ACE4710B

P-Channel Enhancement Mode MOSFET with Schottky Diode

Description

ACE4710B combines a P-Channel enhancement mode power MOSFET which is produced with high cell density and DMOS trench technology and a low forward voltage schottky diode. This device particularly suits low voltage applications, especially for battery powered circuits, the tiny and thin outline saves PCB consumption.

Features

MOSFET

- V_{DS}(V)=-20V
- I_D=-4A
- $R_{DS(ON)}$@-4.5V, 58mΩ (Typ.)
- $R_{DS(ON)}$@-2.5V, 76mΩ (Typ.)
- $R_{DS(ON)}$@-1.8V, 97mΩ (Typ.)

Schottky

- VR 20V
- IF 2A
- VF@1A<430mV

Application

- Li Battery Charging
- High Side DC/DC Converter
- High Side Driver for Brushless DC Motor
- Power Management in Portable, Battery Powered Devices

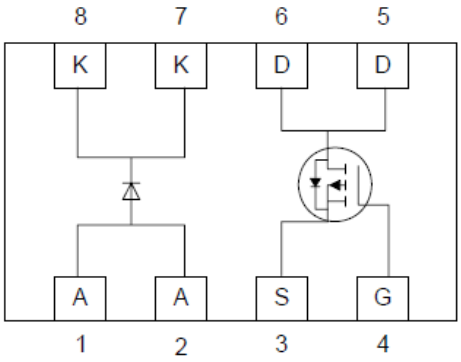
Absolute Maximum Ratings

Parameter		Symbol	Max	Unit
Drain-Source Voltage		V_{DSS}	-20	V
Gate-Source Voltage		V_{GSS}	±8	V
Drain Current (Continuous)	Continuous	I_D	-4	A
	Pulsed		-25	
Schottky Reverse Voltage		V_R	20	V
Schottky Continuous Forward Current		I_F	2	A
Power Dissipation Derating above T_A=25°C (Note 1)		P_D	1.5	W
Operating and Storage Temperature Range		T_J,T_{STG}	-55 to 150	°C

Note: 1. Device mounted on FR-4 PCB, 1 inch x 0.85 inch x 0.062 inches. The rating is for each chip in the package.

Packaging Type

DFN3*2



Ordering information

ACE4710B XX + H

- Halogen - free
- Pb - free
- QN : DFN3*2

Electrical Characteristics

T_A=25 °C unless otherwise noted

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
P-channel Enhancement Mode MOSFET						
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	uA
Gate Leakage Current	I_{GSS}	V_{GS}=±8V, V_{DS}=0V			±100	nA
Static Drain-Source On-Resistance	$R_{DS(ON)}$	V_{GS}=-4.5V, I_D=-4A		58	96	mΩ
		V_{GS}=-2.5V, I_D=-3A		76	118	
		V_{GS}=-1.8V, I_D=-2A		97	236	
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_{DS}=-250μA	-0.5	-0.7	-1.2	V
Turn-On Delay Time	$T_{d(on)}$	V_{DD}=-6V, R_L=6Ω, R_G=6Ω, V_{GEN}=-4.5V, I_D=-1A		20		ns
Turn-On Rise Time	t_f			18		
Turn-Off Delay Time	$t_{d(off)}$			300		
Turn-Off Fall Time	t_f			120		
Input Capacitance	C_{iss}	V_{DS}=-6V, V_{GS}=0V f=1MHz		450		pF
Output Capacitance	C_{oss}			180		
Reverse Transfer Capacitance	C_{rss}			90		

Schottky Diode						
Breakdown Voltage	V_R	I_R=300uA	20			V
Forward Voltage Drop	V_F	I_F=1A		0.37	0.43	V
Maximum reverse leakage current	I_R	V_R=20V		15	200	uA

Note : 2. Short duration test pulse used to minimize self-heating effect.

Typical Performance Characteristics

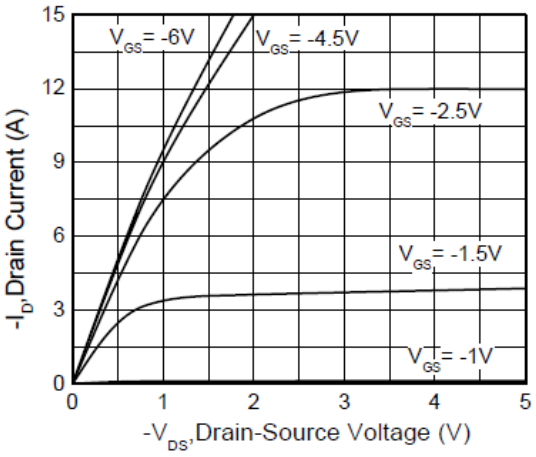


Figure 1. Output Characteristics

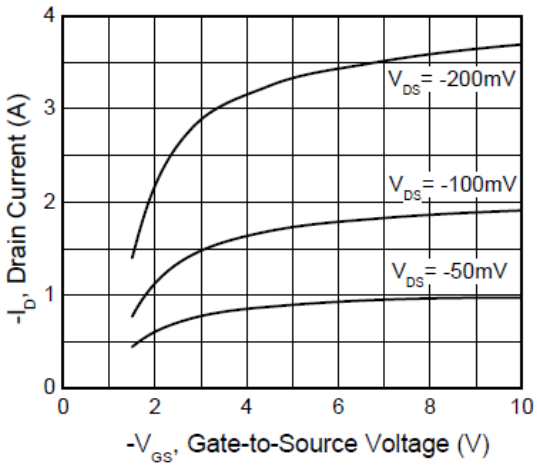


Figure 2. Transfer Characteristics

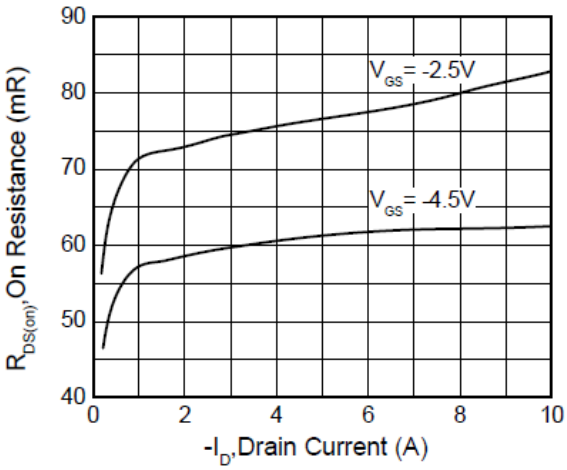


Figure 3. On Resistance Vs. Drain Current

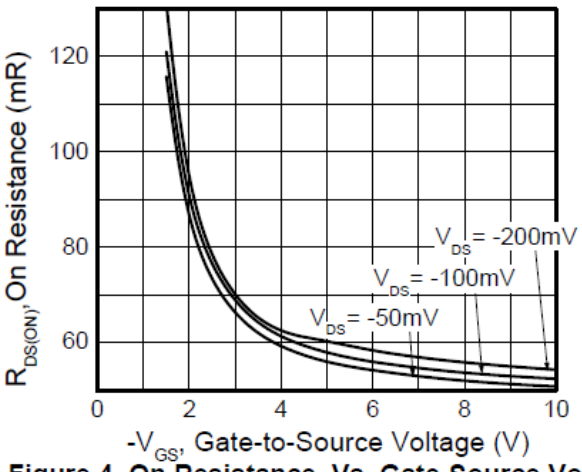


Figure 4. On Resistance Vs. Gate-Source Voltage

Typical Performance Characteristics

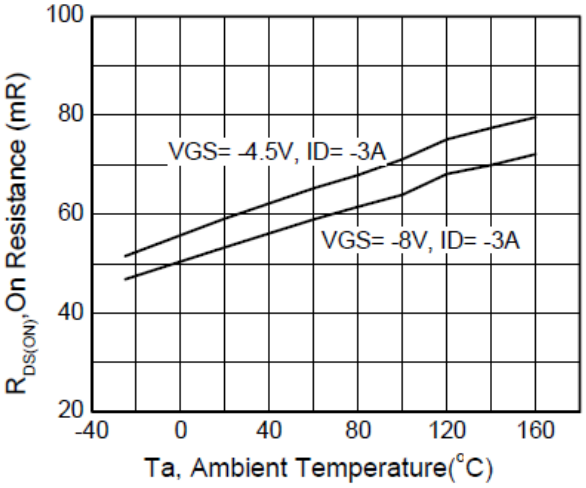


Figure 5. On Resistance Vs. Temperature

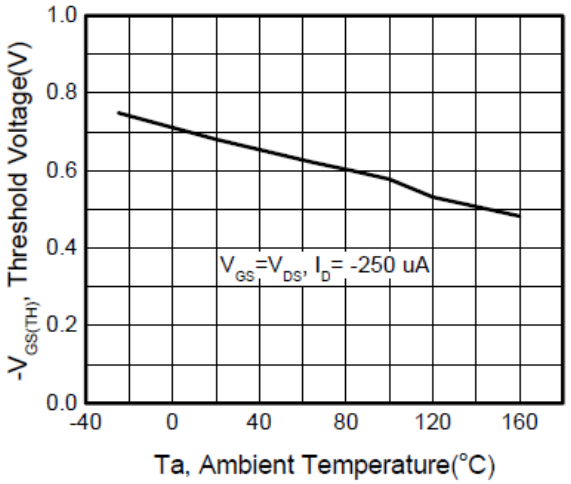


Figure 6. Threshold Voltage Vs. Temperature

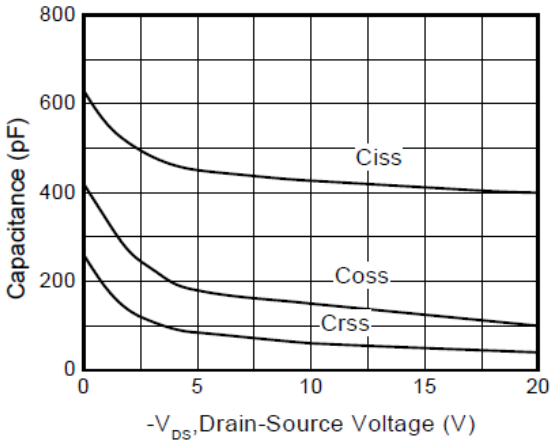


Figure 8. Capacitance

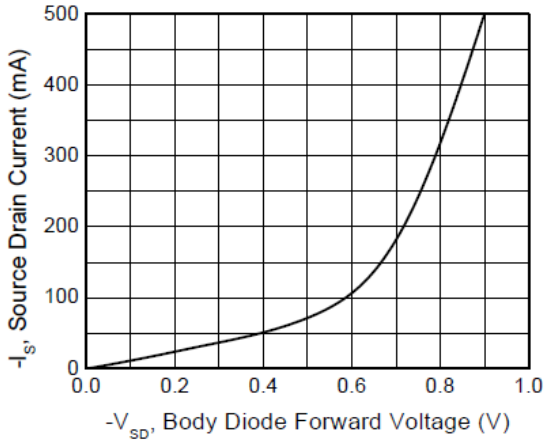


Figure 7. Body Diode Forward Characteristics

- **Schottky Diode Typical Performance Characteristics**

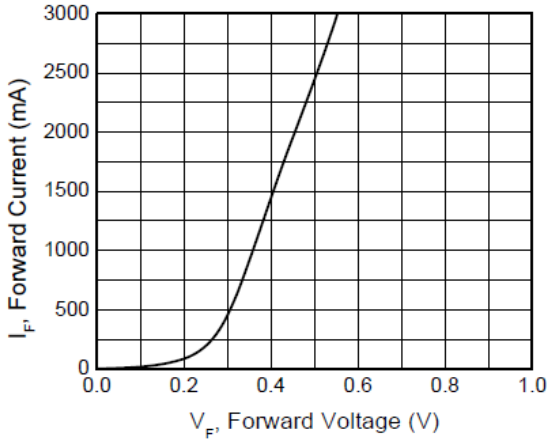


Figure 9. Schottky Forward Characteristics

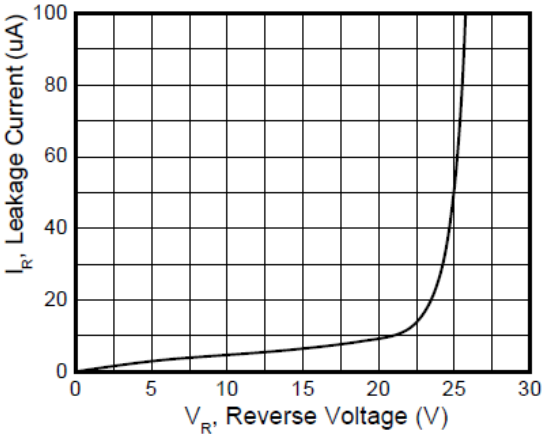


Figure10. Schottky Reverse Characteristics

Typical Performance Characteristics

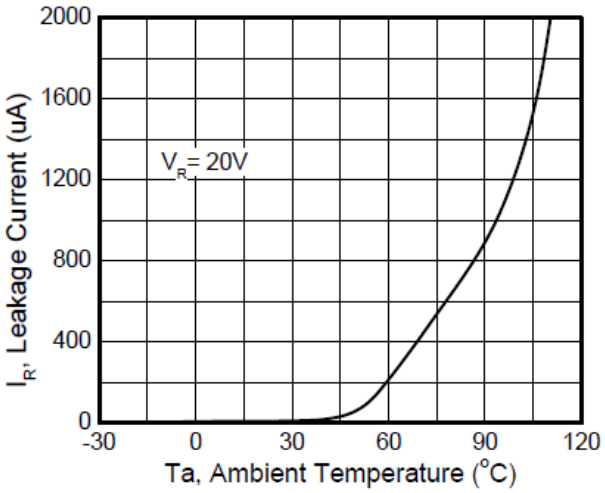
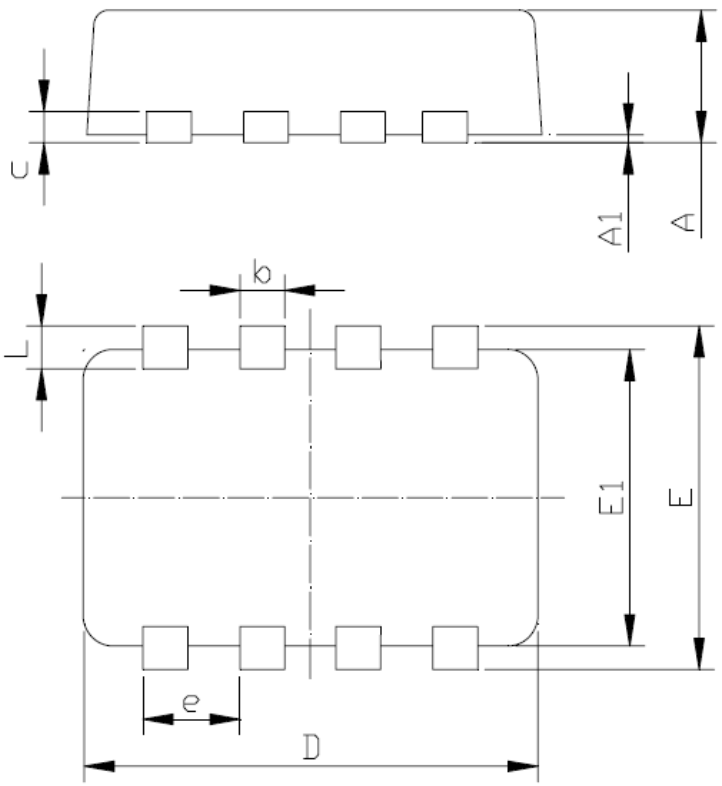


Figure 11. Leakage Current Vs. Temperature

Packing Information

DFN3*2



Package:DFN3X2			
Unit:mm			
Dim	Min	Typ	Max
A	0.70	0.80	0.90
A1	0.00	---	0.05
c	0.08	0.152	0.25
D	3.00 BSC		
E	2.00 BSC		
E1	1.70 BSC		
e	0.65 BSC		
L	0.20	0.275	0.40

Unit: mm

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.

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