ACE4444B

N-Channel Enhancement Mode Field Effect Transistor

Description

The ACE4444B uses advanced trench technology to provide excellent RDS(ON) and low gate charge. This device is suitable for use as a load switch or in PWM applications. The source leads are separated to allow a Kelvin connection to the source, which may be used to bypass the source inductance.

Features

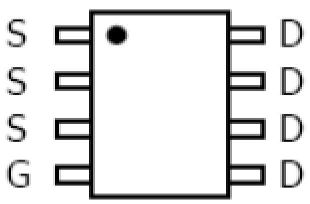
- V_{DS}(V)=30V
- I_D=20A (V_{GS}=10V)
- $R_{DS(ON)}$ < 5.5mΩ (V_{GS}=10V)
- $R_{DS(ON)}$ < 8.5mΩ (V_{GS}=4.5V)

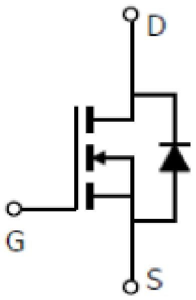
Absolute Maximum Ratings

Parameter		Symbol	Max	Unit
Drain-Source Voltage		V_{DSS}	30	V
Gate-Source Voltage		V_{GSS}	±20	V
Drain Current (Continuous) *AC	T_A=25°C	I_D	20	A
	T_A=70°C		17	
Drain Current (Pulse) *B		I_{DM}	80	
Power Dissipation	T_A=25°C	P_D	3	W
	T_A=70°C		2.1	
Operating and Storage Temperature Range		T_J,T_{STG}	-55 to 150	°C

Packaging Type

SOP-8





Ordering information

ACE4444B XX + H

- H: Halogen - free
- +: Pb - free
- XX: FM : SOP-8

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	30			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=24V, V_{GS}=0V			1	uA
Gate Leakage Current	I_{GSS}	V_{GS}=±20V, V_{DS}=0V			100	nA
Static Drain-Source On-Resistance	$R_{DS(ON)}$	V_{GS}=10V, I_D=20A		5.1	5.5	mΩ
		V_{GS}=4.5V, I_D=15A		7.4	8.5	
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_{DS}=250uA	1	1.8	3	V
Forward Transconductance	g_{FS}	V_{DS}=5V, I_D=20A		100		S
Diode Forward Voltage	V_{SD}	I_{SD}=1A, V_{GS}=0V		0.76	1.0	V
Maximum Body-Diode Continuous Current	I_S				4	A
Switching						
Total Gate Charge	Q_g	V_{DS}=15V, I_D=20A V_{GS}=4.5V		28.5	37	nC
Gate-Source Charge	Q_{gs}			8.1	10.5	
Gate-Drain Charge	Q_{gd}			12	15.6	
Turn-On Delay Time	$T_{d(on)}$	V_{DS}=15V, V_{GS}=10V R_{GEN}=3Ω, R_L=0.75Ω		19	38	ns
Turn-On Rise Time	t_r			9.44	18.88	
Turn-Off Delay Time	$t_{d(off)}$			58.84	117.68	
Turn-Off Fall Time	t_f			8.68	17.36	
Dynamic						
Input Capacitance	C_{iss}	V_{DS}=15V, V_{GS}=0V f=1MHz		3234.38		pF
Output Capacitance	C_{oss}			456.44		
Reverse Transfer Capacitance	C_{rss}			329.12		

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

C. The current rating is based on the t≤ 10s junction to ambient thermal resistance rating.

Typical Performance Characteristics

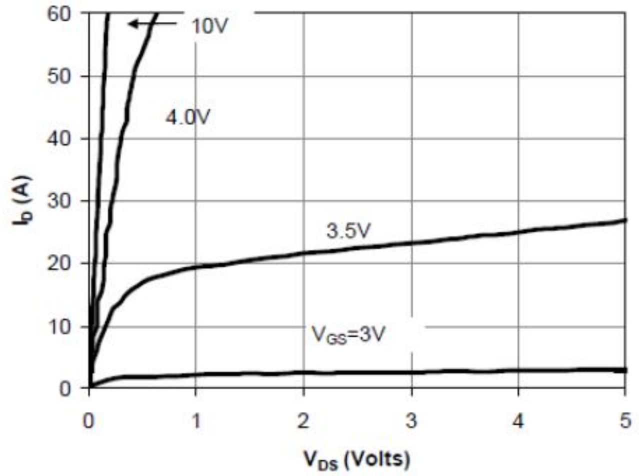


Fig 1: On-Region Characteristics

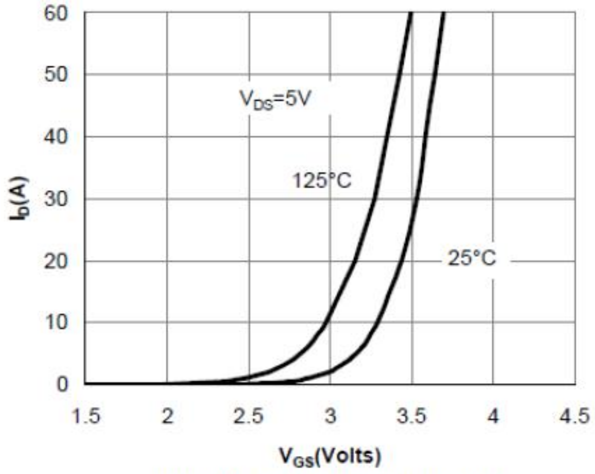


Figure 2: Transfer Characteristics

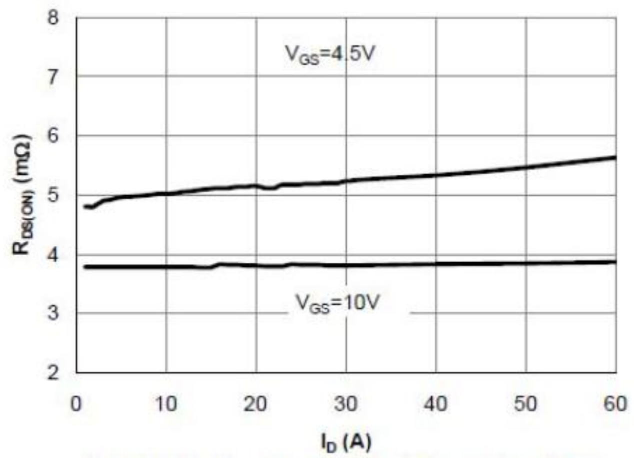


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

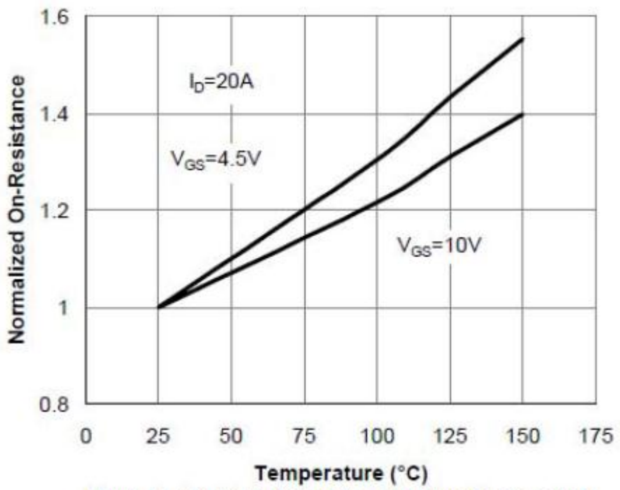


Figure 4: On-Resistance vs. Junction Temperature

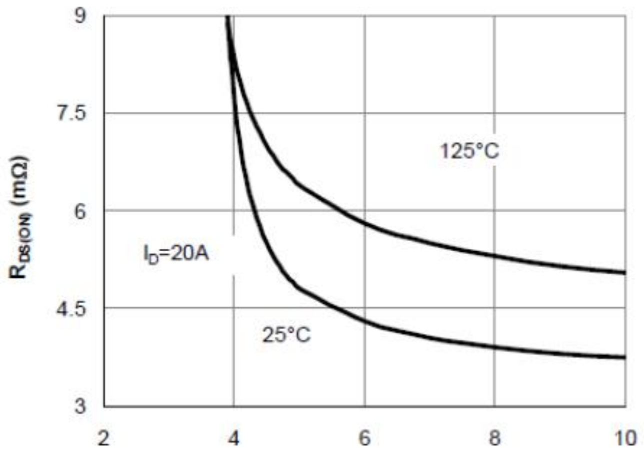


Figure 5: On-Resistance vs. Gate-Source Voltage

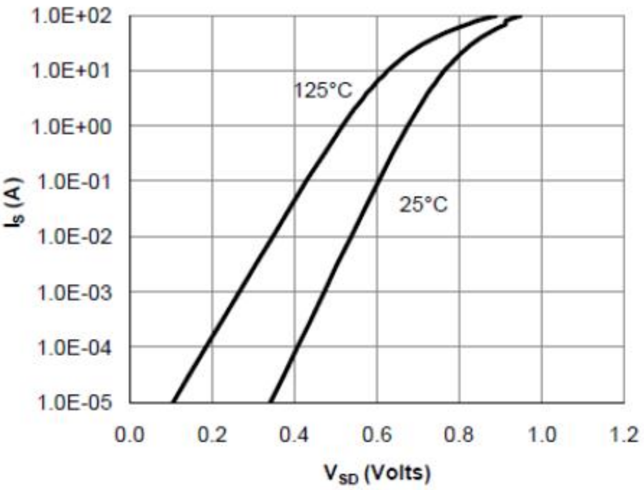


Figure 6: Body-Diode Characteristics

Typical Performance Characteristics

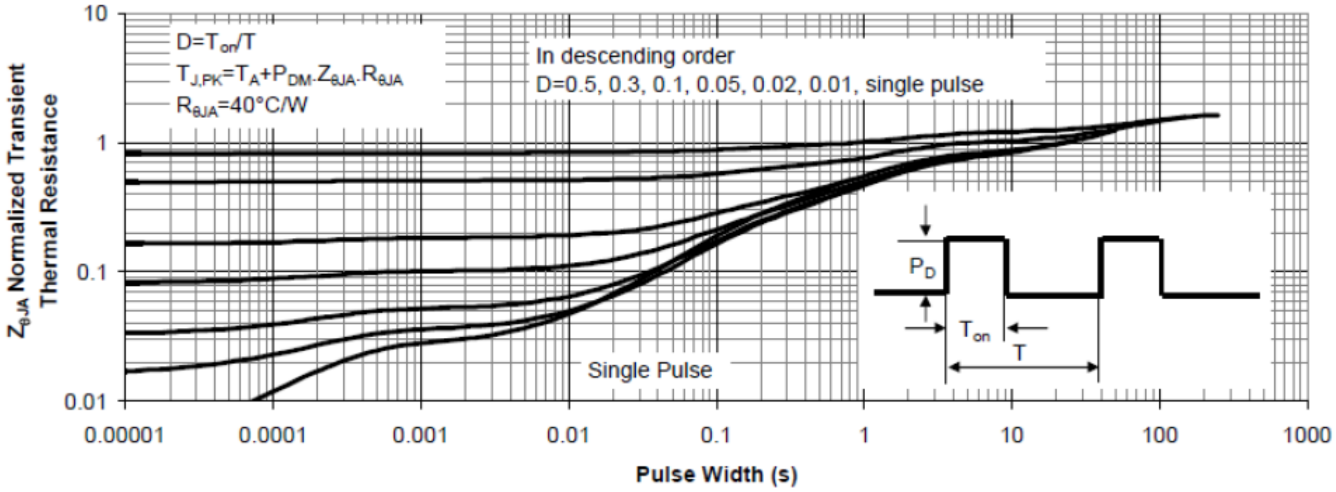
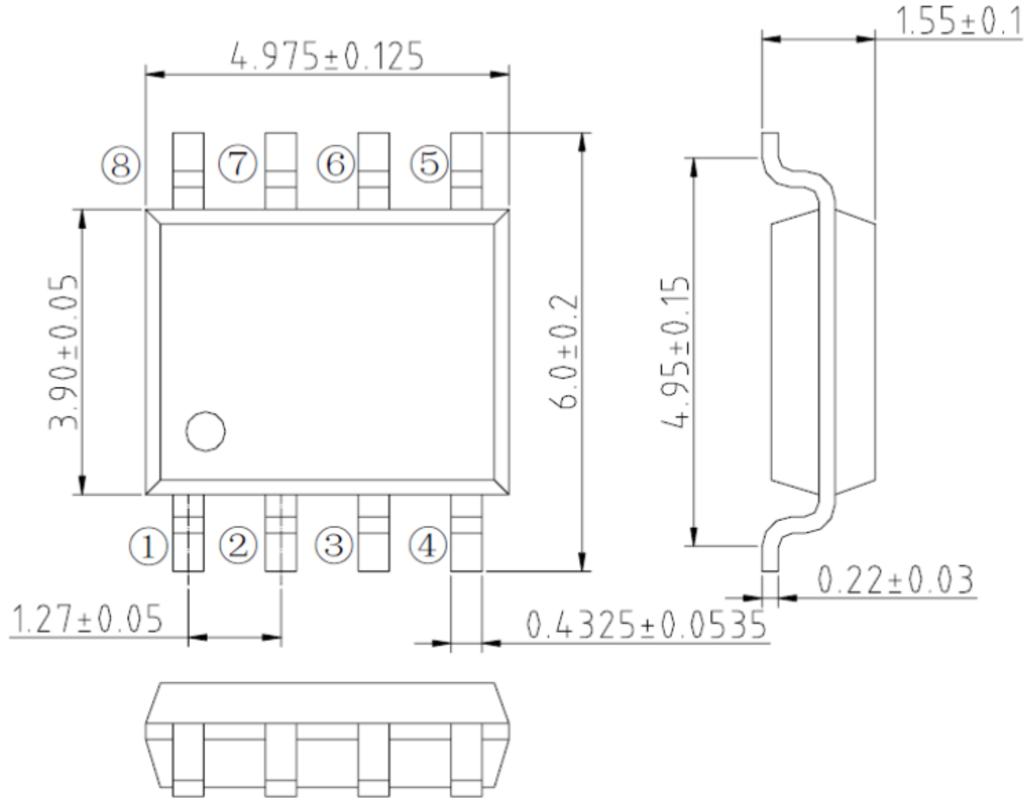


Figure 7 : Normalized Maximum Transient Thermal Impedance

Packing Information

SOP-8



Unit: mm

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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