



ACE8601B

Dual N-Channel Enhancement Mode Field Effect Transistor with ESD Protection

Description

The ACE8601B uses advanced trench technology to provide excellent $R_{DS(ON)}$ and low gate charge. They offer operation over a wide gate drive range from 1.8V to 8V. It is ESD protected. This device is suitable for use as a uni-directional or bi-directional load switch, facilitated by its common-drain configuration.

Features

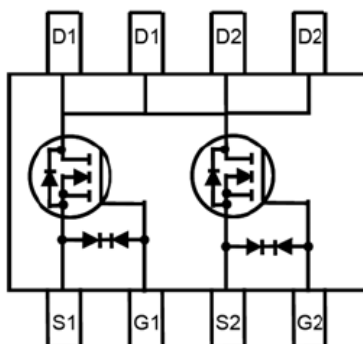
- $V_{DS}(V)=20V$
- $I_D=6A$ ($V_{GS}=4.5V$)
- $R_{DS(ON)}<21\ m\Omega$ ($V_{GS}=4.5V$)
- $R_{DS(ON)}<25\ m\Omega$ ($V_{GS}=2.5V$)
- $R_{DS(ON)}<35\ m\Omega$ ($V_{GS}=1.8V$)
- ESD Protected: 2000V

Absolute Maximum Ratings

Parameter	Symbol	Max	Unit
Drain-Source Voltage	V_{DSS}	20	V
Gate-Source Voltage	V_{GSS}	± 8	V
Continuous Drain Current *AC	I_D	$T_A=25^\circ C$	6
		$T_A=70^\circ C$	4.8
Pulsed Drain Current	I_{DM}	24	A
Power Dissipation	P_D	$T_A=25^\circ C$	2.5
		$T_A=70^\circ C$	1.6
Operating Junction Temperature / Storage Temperature Range	T_J/T_{STG}	-55/150	$^\circ C$

Packaging Type

DFN3*3-8L



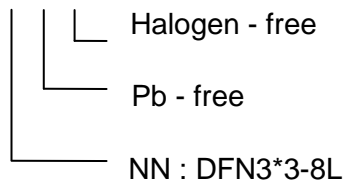


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Ordering information

ACE8601B XX + H



Electrical Characteristics

$T_A=25^{\circ}\text{C}$, 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	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_{DS}=250\ \mu A$	0.4	0.52	1	
Gate Leakage Current	I_{GSS}	$V_{DS}=0V, V_{GS}=\pm 8V$			10	μA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=20V, V_{GS}=0V$			1	μA
Maximum Body-Diode Continuous Current	I_S				2.5	A
Drain-Source On-Resistance	$R_{DS(ON)}$	$V_{GS}=4.5V, I_D=8A$		16.2	21	m Ω
		$V_{GS}=2.5V, I_D=7A$		19.4	25	
		$V_{GS}=1.8V, I_D=6A$		24.4	33	
Forward Transconductance	g_{fs}	$V_{DS}=5V, I_D=6.5A$		13		S
Diode Forward Voltage	V_{SD}	$I_{SD}=2.5A, V_{GS}=0V$		0.67	1.6	V
Switching						
Total Gate Charge	Q_g	$V_{DS}=10V, V_{GS}=4.5V, I_D=8A$		13.8	17.94	nC
Gate-Source Charge	Q_{gs}			4.1	5.33	
Gate-Drain Charge	Q_{gd}			5.6	7.28	
Turn-On Time	$td(on)$	$V_{GS}=5V, R_L=1.5\ \Omega, V_{DS}=10V, R_{GEN}=3\ \Omega$		6.2	12.4	nS
	tr			12.7	25.4	
Turn-Off Time	$td(off)$			51.7	103.4	
	tf			16	32	
Dynamic						
Input Capacitance	C_{iss}	$V_{GS}=0V, V_{DS}=10V, f=1\text{MHz}$		1160		pF
Output Capacitance	C_{oss}			104		
REVERSE Transfer Capacitance	C_{rss}			29		



Note:

1. 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 $T_A=25^{\circ}C$. The value in any given application depends on the user's specific board design.
2. Repetitive rating, pulse width limited by junction temperature.
3. The current rating is based on the $\leq 10s$ junction to ambient thermal resistance rating.

Typical Performance Characteristics

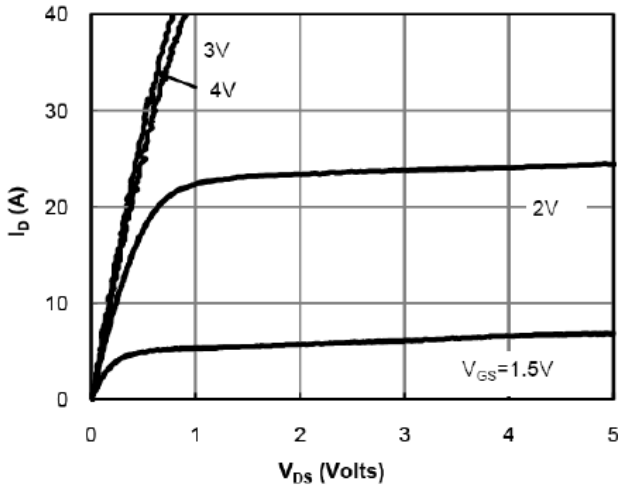


Fig 1: On-Region Characteristics

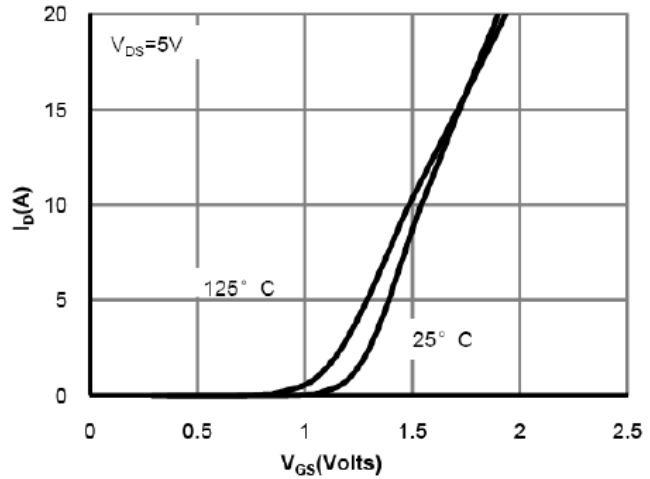


Figure 2: Transfer Characteristics

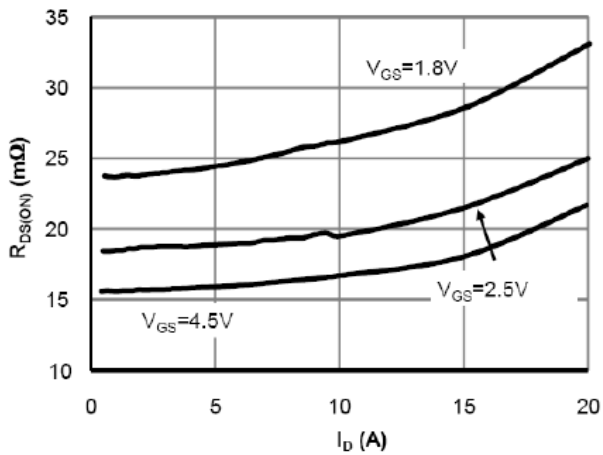


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

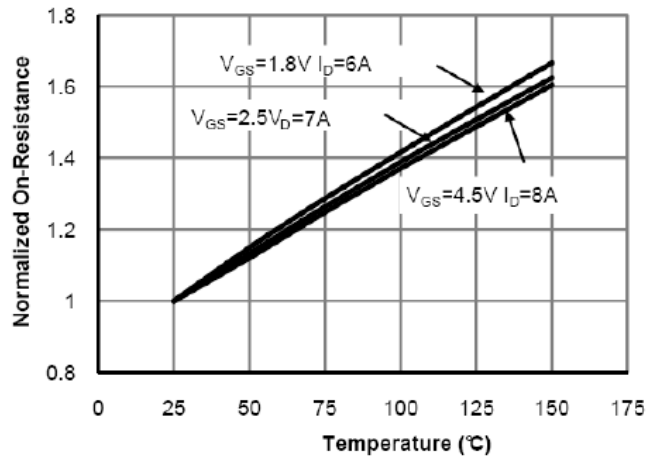


Figure 4: On-Resistance vs. Junction Temperature



Typical Performance Characteristics

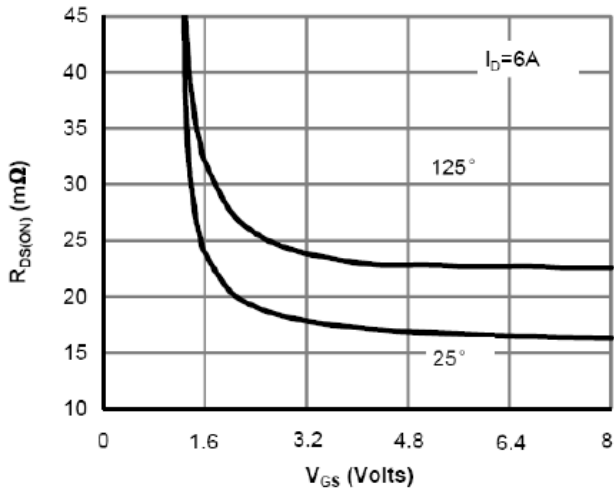


Figure 5: On-Resistance vs. Gate-Source Voltage

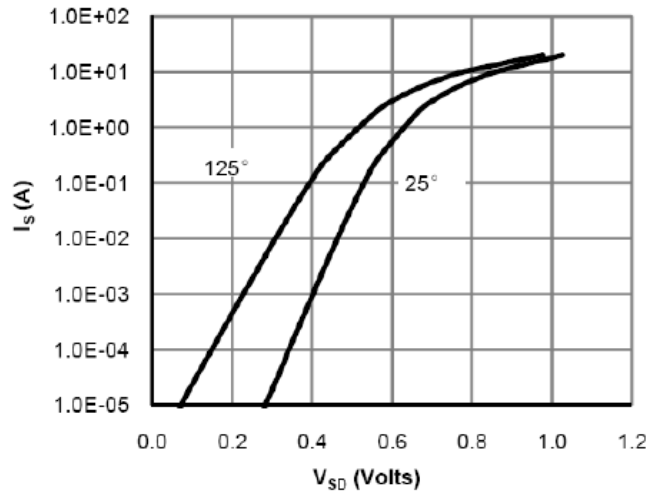


Figure 6: Body-Diode Characteristics

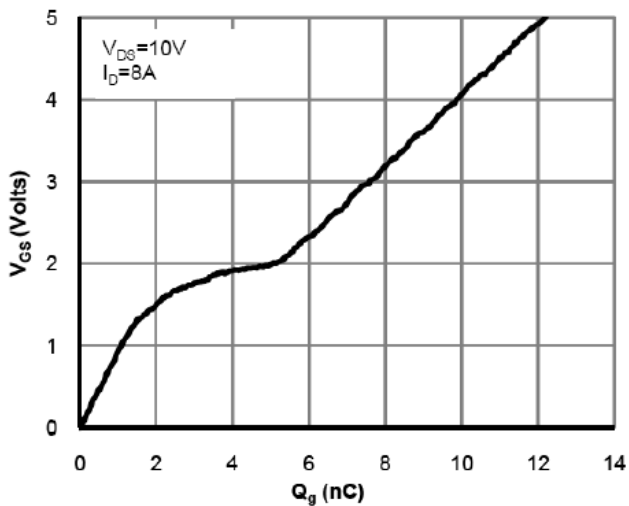


Figure 7: Gate-Charge Characteristics

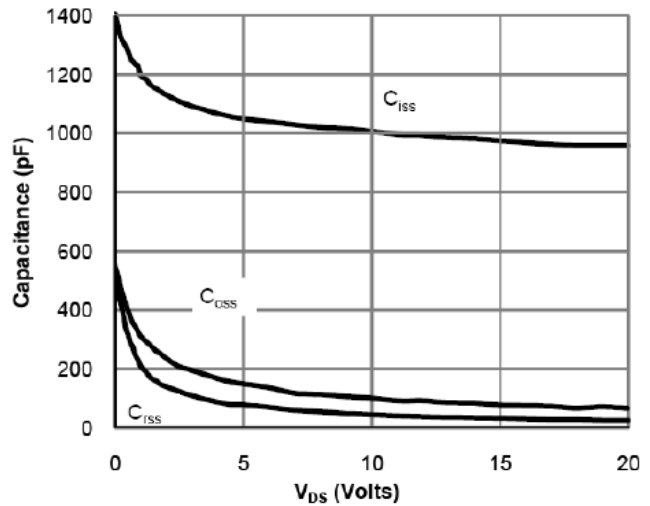


Figure 8: Capacitance Characteristics

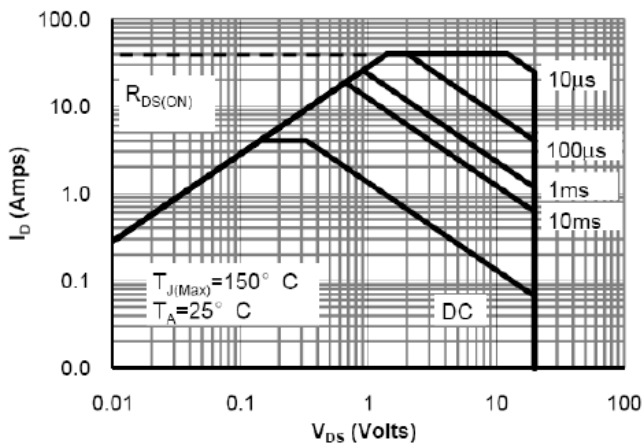


Figure 9: Maximum Forward Biased Safe Operating Area

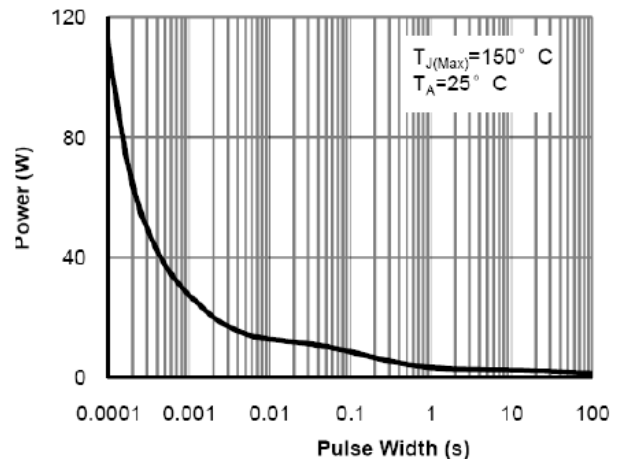


Figure 10: Single Pulse Power Rating Junction-to-Case



Typical Performance Characteristics

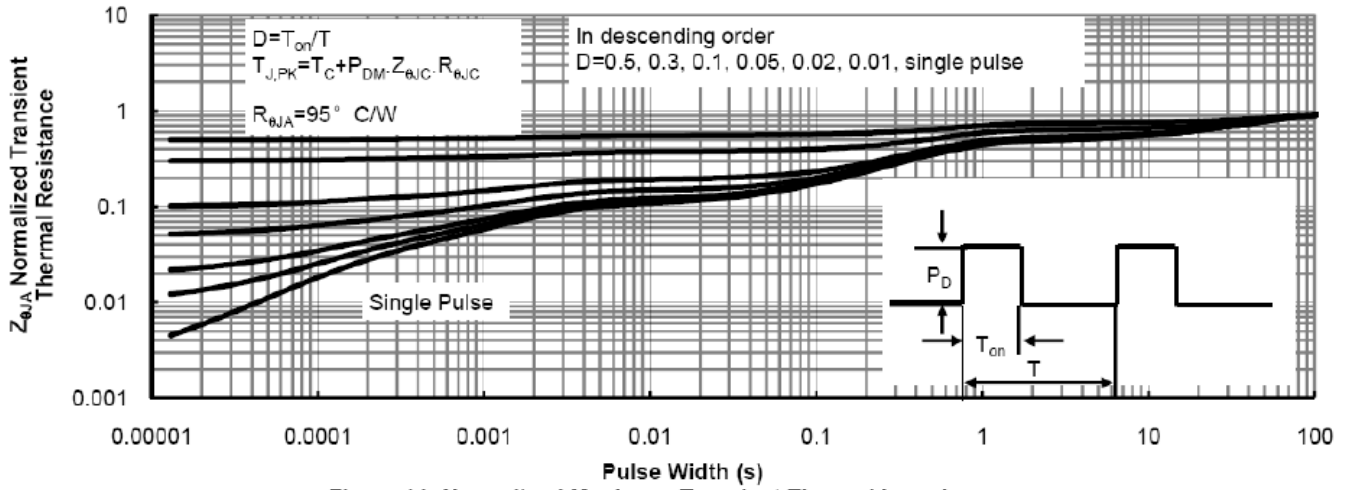


Figure 11: Normalized Maximum Transient Thermal Impedance

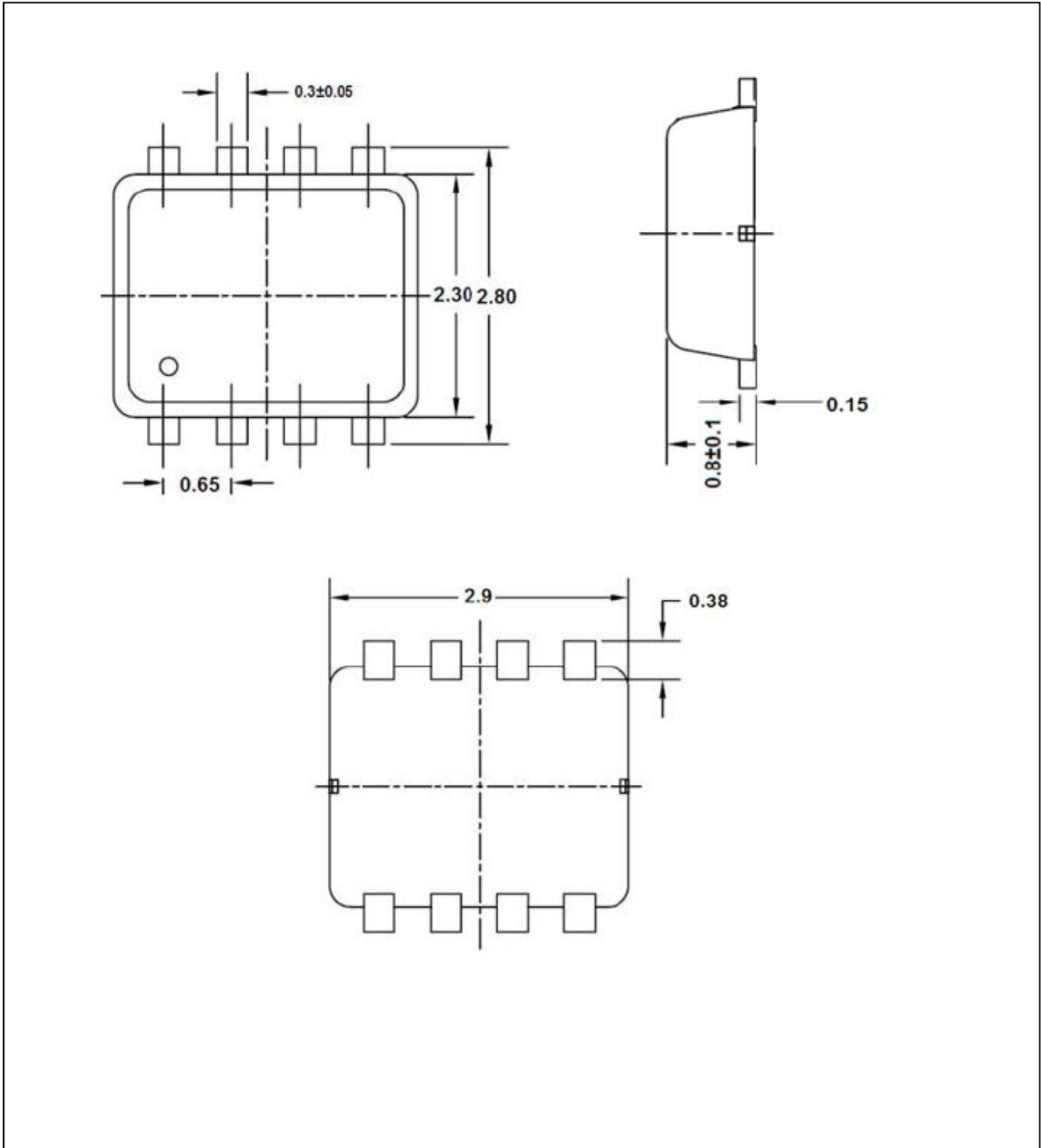


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Packing Information

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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 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 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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