



ACE8204TL

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

Description

The ACE8204TL uses advanced trench technology to provide excellent $R_{DS(ON)}$ and low gate charge. They offer operation over a wide gate drive range from 2.5V 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

- $V_{DS}(V)=20V$
- $I_D=7A$
- $R_{DS(ON)}<17\ m\Omega$ ($V_{GS}=4.5V$)
- $R_{DS(ON)}<24\ m\Omega$ ($V_{GS}=2.5V$)
- ESD Protected: 2000V
- DFN3*3-8L

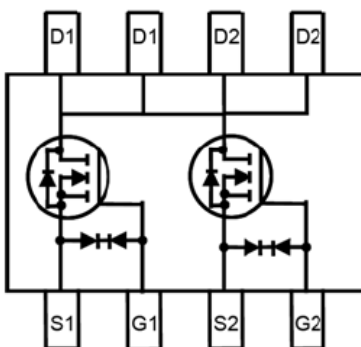
Absolute Maximum Ratings

$T_A=25^\circ C$, unless otherwise noted.

Parameter	Symbol	Max	Unit
Drain-Source Voltage	V_{DSS}	20	V
Gate-Source Voltage	V_{GSS}	± 8	V
Drain Current (Continuous) *AC	I_D	$T_A=25^\circ C$	7
		$T_A=70^\circ C$	6
Drain Current (Pulse)*B	I_{DM}	40	A
Power Dissipation	P_D	$T_A=25^\circ C$	2.5
		$T_A=70^\circ C$	1.6
Operating Temperature / Storage Temperature	T_J/T_{STG}	-55/150	$^\circ C$

Packaging Type

DFN3*3-8L



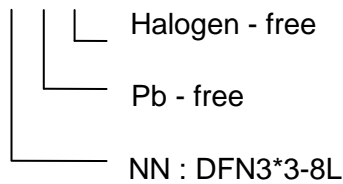


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Ordering information

ACE8204TL 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	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_{DS}=250\ \mu A$	0.3	0.7	1.1	
Gate Leakage Current	I_{GSS}	$V_{DS}=0V, V_{GS}=\pm 12V$			10	μA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=20V, V_{GS}=0V$			1	μA
Drain-Source On-state Resistance	$R_{DS(ON)}$	$V_{GS}=4.5V, I_D=6A$		12.5	17	$m\Omega$
		$V_{GS}=2.5V, I_D=5.5A$		17.7	24	
Forward Transconductance	g_{FS}	$V_{DS}=5V, I_D=6A$		33		S
Diode Forward Voltage	V_{SD}	$I_{SD}=1A, V_{GS}=0V$			1	V
Maximum Body-Diode Continuous Current	I_S				3.5	A
Switching						
Total Gate Charge	Q_g	$V_{DS}=10V, V_{GS}=4.5V, I_D=6A$		11		nC
Gate-Source Charge	Q_{gs}			2		
Gate-Drain Charge	Q_{gd}			3.2		
Turn-On Time	$td(on)$	$V_{GS}=5V, R_L=1.7\Omega, V_{DS}=10V, R_{GEN}=3\Omega$		0.3		us
	tr			0.6		
Turn-Off Time	$td(off)$			7.9		
	tf			4.4		
Dynamic						
Input Capacitance	C_{iss}	$V_{GS}=0V, V_{DS}=10V, f=1MHz$		920		pF
Output Capacitance	C_{oss}			155		
Reverse Transfer Capacitance	C_{rss}			75		



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. The current rating is based on the $t \leq 10s$ thermal resistance rating.
2. Repetitive rating, pulse width limited by junction temperature.
3. The $R_{\theta JA}$ is the sum of the thermal impedance from junction to lead $R_{\theta JL}$ and lead to ambient .
4. The static characteristics are obtained using $<300 \mu s$ pulses, duty cycle 0.5% max.
5. These tests are performed with the device mounted on 1in² FR-4 board with 2oz. Copper, in a still air environment with $T_A=25^{\circ}C$. The SOA curve provides a single pulse rating.

Typical Performance Characteristics

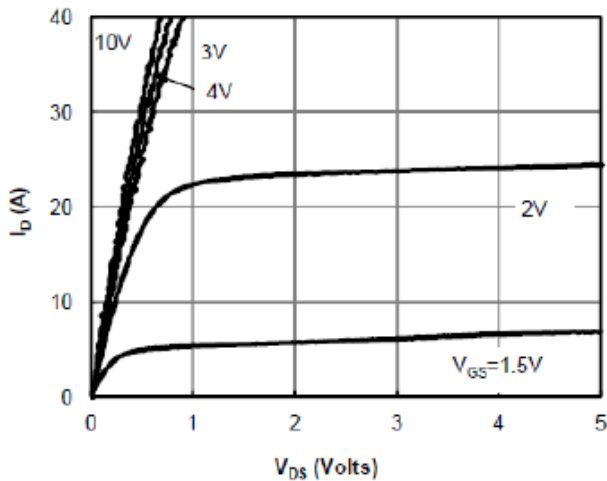


Fig 1: On-Region Characteristics (Note E)

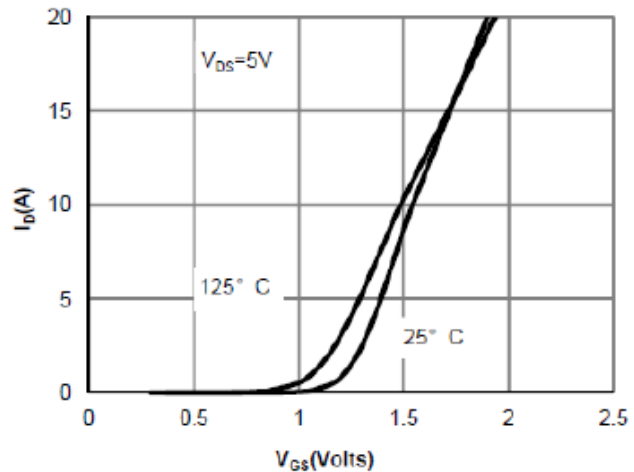


Figure 2: Transfer Characteristics (Note E)

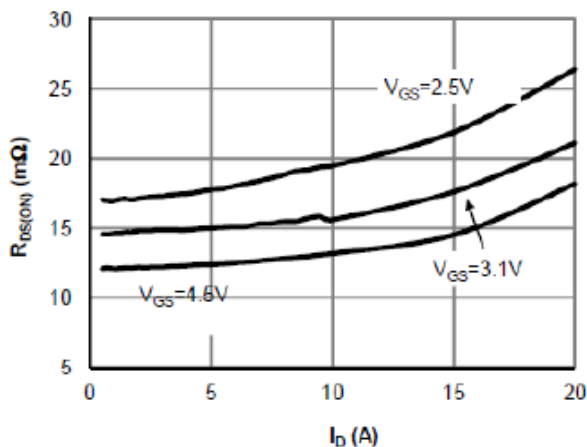


Figure 3: On-Resistance vs. Drain Current and Gate Voltage (Note E)

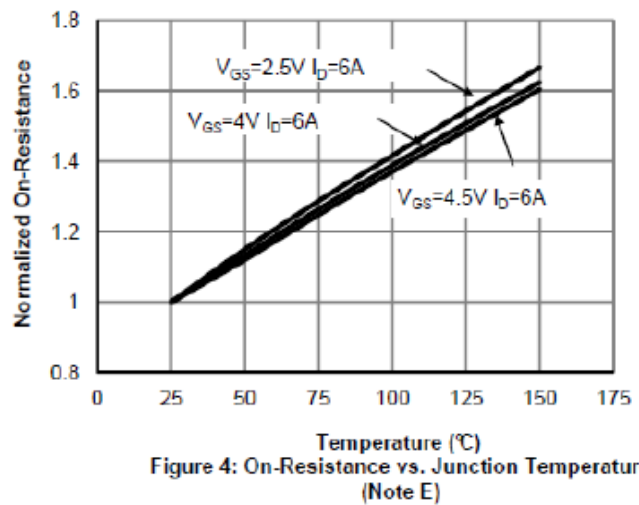


Figure 4: On-Resistance vs. Junction Temperature (Note E)



Typical Performance Characteristics

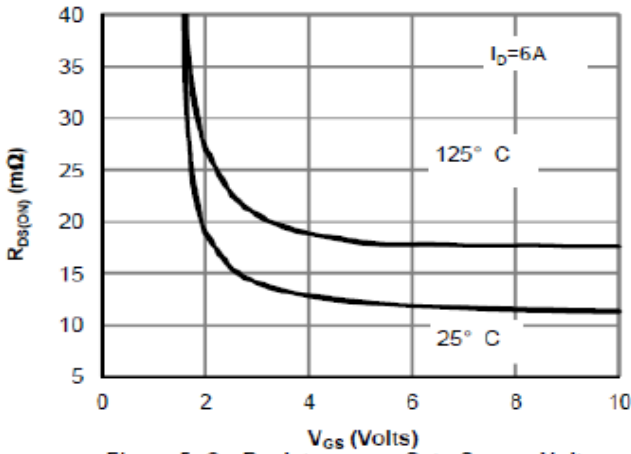


Figure 5: On-Resistance vs. Gate-Source Voltage (Note E)

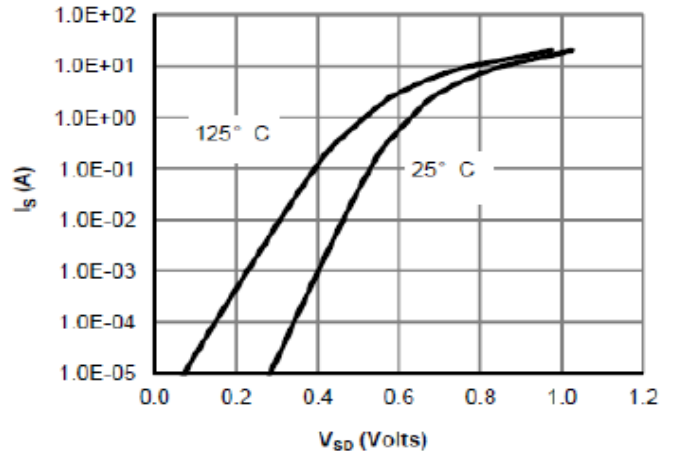


Figure 6: Body-Diode Characteristics (Note E)

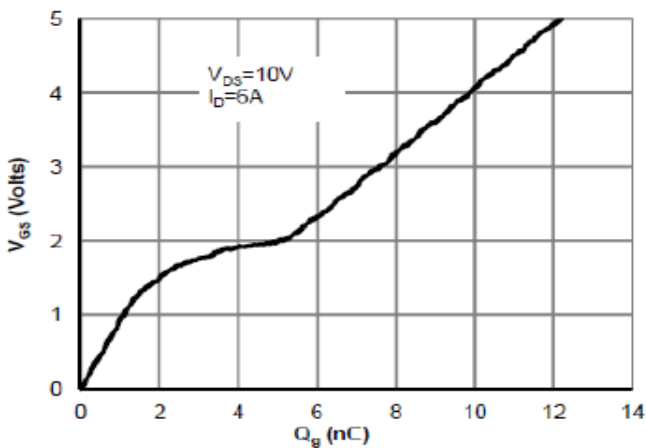


Figure 7: Gate-Charge Characteristics

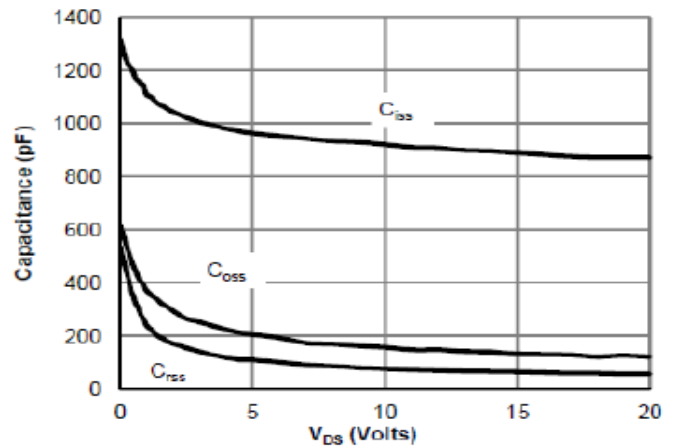


Figure 8: Capacitance Characteristics

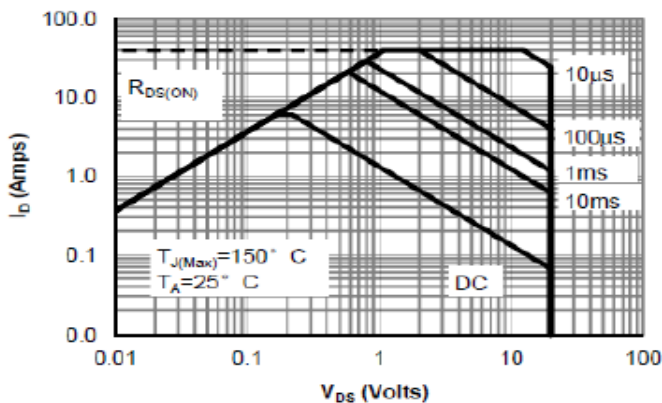


Figure 9: Maximum Forward Biased Safe Operating Area (Note F)

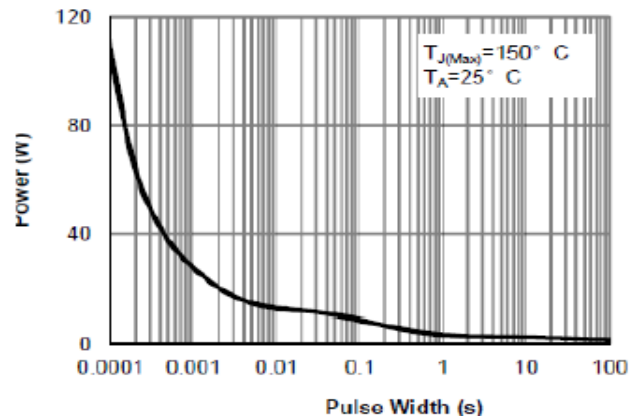


Figure 10: Single Pulse Power Rating Junction-to-Case (Note F)



Typical Performance Characteristics

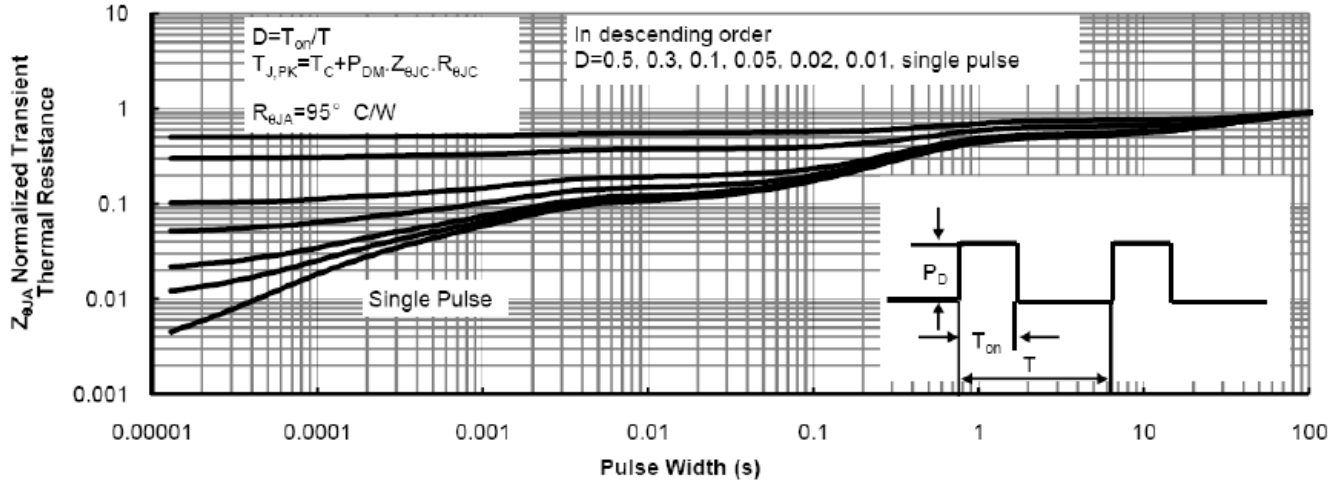


Figure 11: Normalized Maximum Transient Thermal Impedance (Note F)

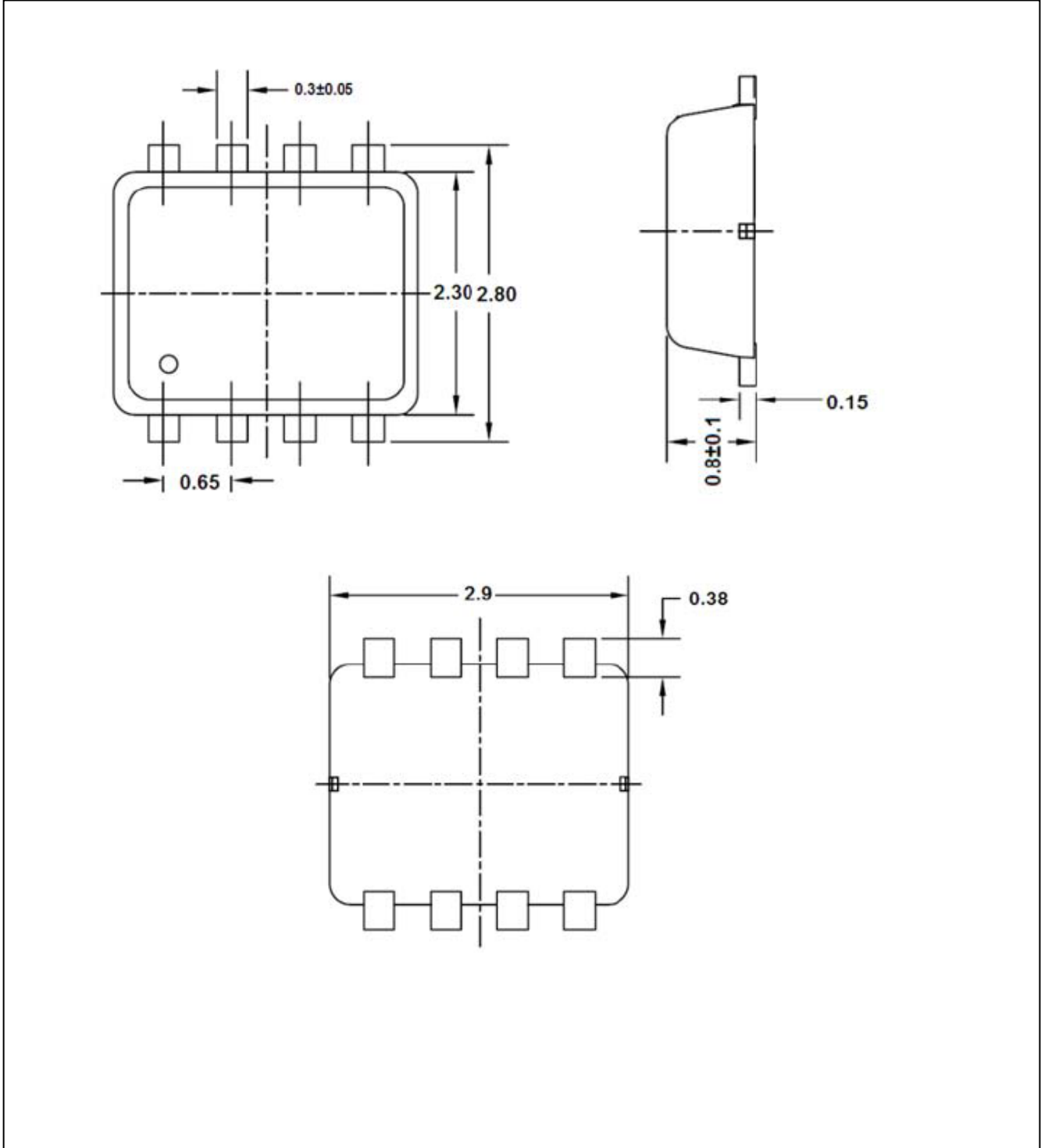


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Packing Information

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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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