



ACEDC6904B

N-Channel Enhancement Mode Power MOSFET

Description

ACEDC6904B uses advanced trench technology and design to provide excellent $R_{DS(on)}$ with low gate charge. It can be used in a wide variety of applications.

Features

- $V_{DS}=60V$, $I_D=29A$
- $R_{DS(ON)}$ @ $V_{GS}=10V$, TYP $10m\Omega$
- $R_{DS(ON)}$ @ $V_{GS}=4.5V$, TYP $12m\Omega$

Absolute Maximum Ratings

Parameter	Symbol	Max	Unit
Drain-Source Voltage	V_{DSS}	60	V
Gate-Source Voltage	V_{GSS}	± 20	V
Drain Current (Continuous)*AC	I_D	$T_A=25^\circ C$	29
		$T_A=100^\circ C$	20
Drain Current (Pulsed)*B	I_{DM}	168	A
Single Pulse Avalanche Energy ²	EAS	48	mJ
Single Pulse Avalanched Current ²	IAS	17	A
Power Dissipation	$T_A=25^\circ C$	P_D	21
Operating temperature / storage temperature	T_J/T_{STG}	-55~150	$^\circ C$

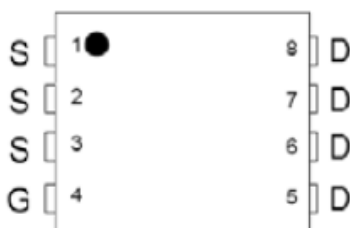
A: The value of $R_{\theta JA}$ is measured with the device mounted on $1in^2$ FR-4 board with 2oz. Copper, in a still air environment with $T_A=25^\circ C$. The value in any given application depends on the user's specific board design.

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

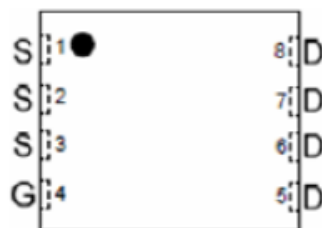
C: The current rating is based on the $t \leq 10s$ junction to ambient thermal resistance rating.

Packaging Type

PDFN3*3-8L



DFN3*3-8L





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Ordering information

ACEDC6904B XX + H

Halogen - free
 Pb - free
 PD: PDFN3*3-8L
 NN: DFN3*3-8L

Electrical Characteristics

$T_A=25^{\circ}\text{C}$, unless otherwise specified.

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Static						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS} = 0V, I_D = 250\mu A$	60			V
Zero Gate Voltage Drain Current	I_{DSS1}	$V_{DS} = 20V, V_{GS} = 0V$			1	μA
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{GS} = V_{DS}, I_{DS} = 250\mu A$	1.2	1.6	2.2	V
Gate Leakage Current	I_{GSS}	$V_{GS} = \pm 20V, V_{DS} = 0V$			± 100	nA
Drain-Source On-state Resistance	$R_{DS(on)}$	$V_{GS} = 10V, I_D = 10A$		10	12	m Ω
		$V_{GS} = 4.5V, I_D = 8A$		12	15	
Forward Trans Conductance	g_{FS}	$V_{DS} = 10V, I_D = 6A$		11.7		S
Diode Forward Voltage	V_{SD}	$I_{SD} = 1A, V_{GS} = 0V$			1	V
Diode Forward Current	I_S				17	A
Switching						
Total Gate Charge	Q_g	$V_{DS} = 30V, I_D = 10A, V_{GS} = 10V$		39.2	59	nC
Gate-Source Charge	Q_{gs}			5.9	9	nC
Gate-Drain Charge	Q_{gd}			8.5	15	nC
Turn-on Delay Time	$t_{d(on)}$	$V_{DD} = 10V, I_D = 1A, V_{GS} = 10V, R_G = 6\Omega$		9.6	18	ns
Turn-on Rise Time	t_r			28.2	54	ns
Turn-off Delay Time	$t_{d(off)}$			45.3	86	ns
Turn-off Fall Time	t_f			10.9	21	ns
Dynamic						
Input Capacitance	C_{iss}	$V_{DS} = 25V, V_{GS} = 0V, f = 1.0MHz$		2100	3050	pF
Output Capacitance	C_{oss}			165	240	pF
Reverse Transfer Capacitance	C_{rss}			80	120	pF
Gate resistance	R_g	$V_{GS} = 0V, V_{DS} = 0V, F = 1MHz$		1.6	3.2	Ω



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Typical Performance Characteristics

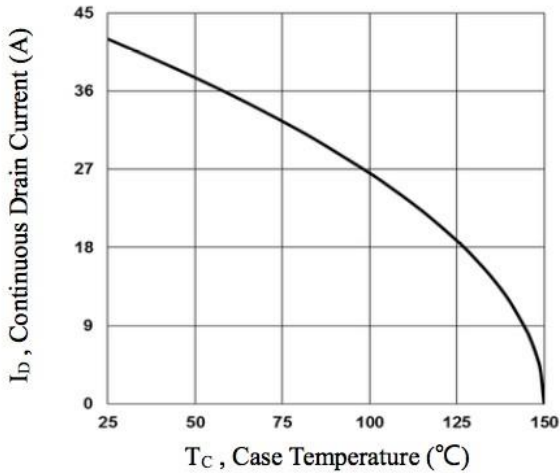


Fig.1 Continuous Drain Current vs. T_C

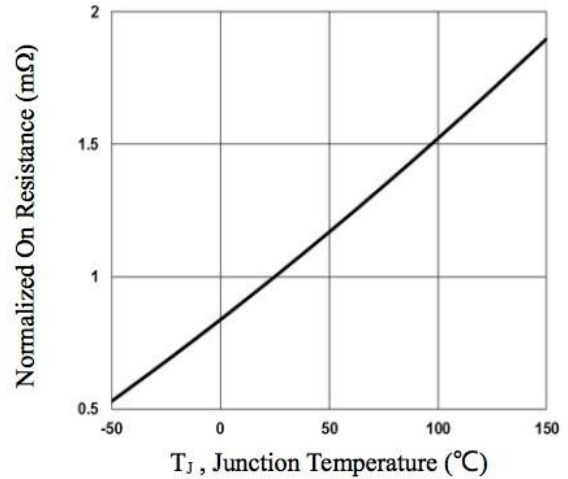


Fig.2 Normalized $R_{DS(on)}$ vs. T_J

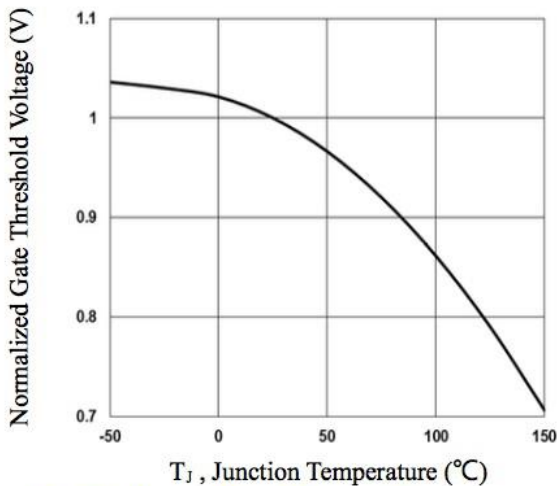


Fig.3 Normalized V_{th} vs. T_J

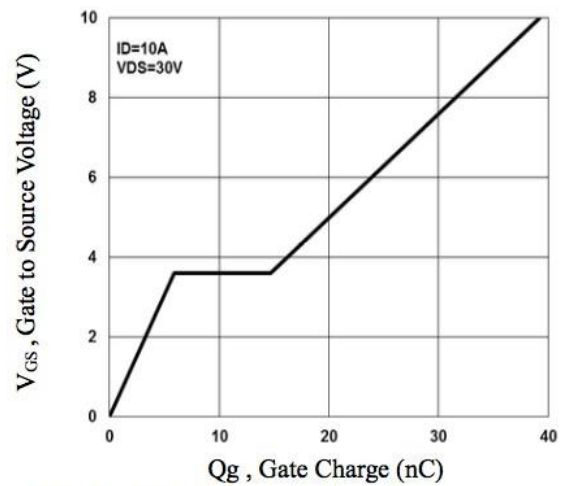


Fig.4 Gate Charge Waveform

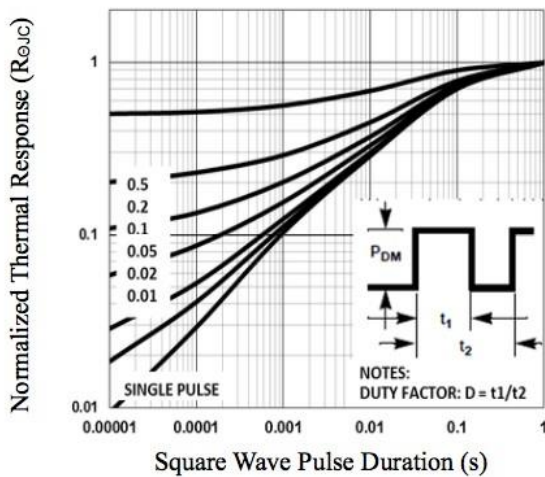


Fig.5 Normalized Transient Response

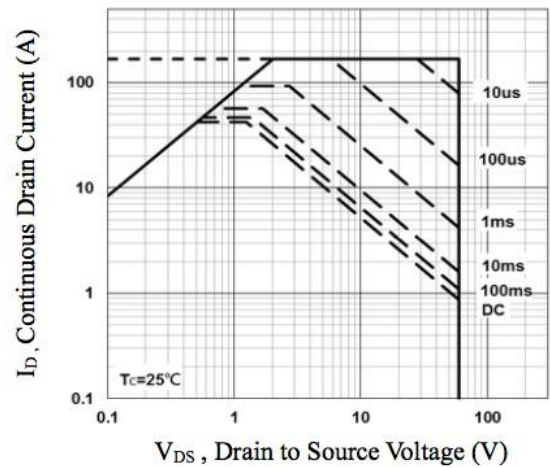


Fig.6 Maximum Safe Operation Area



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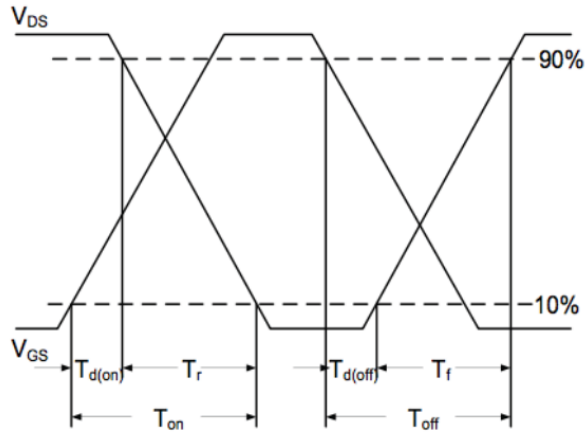


Fig.7 Switching Time Waveform

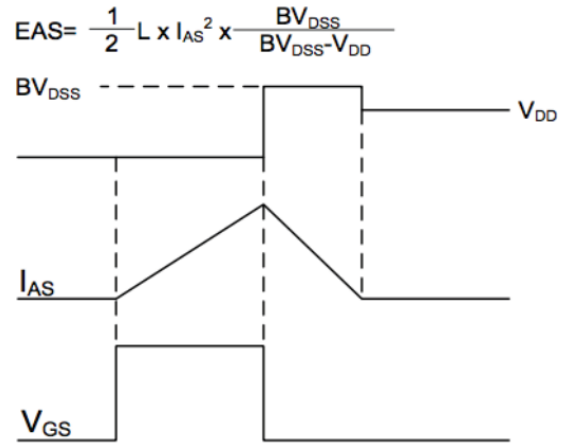


Fig.8 EAS Waveform

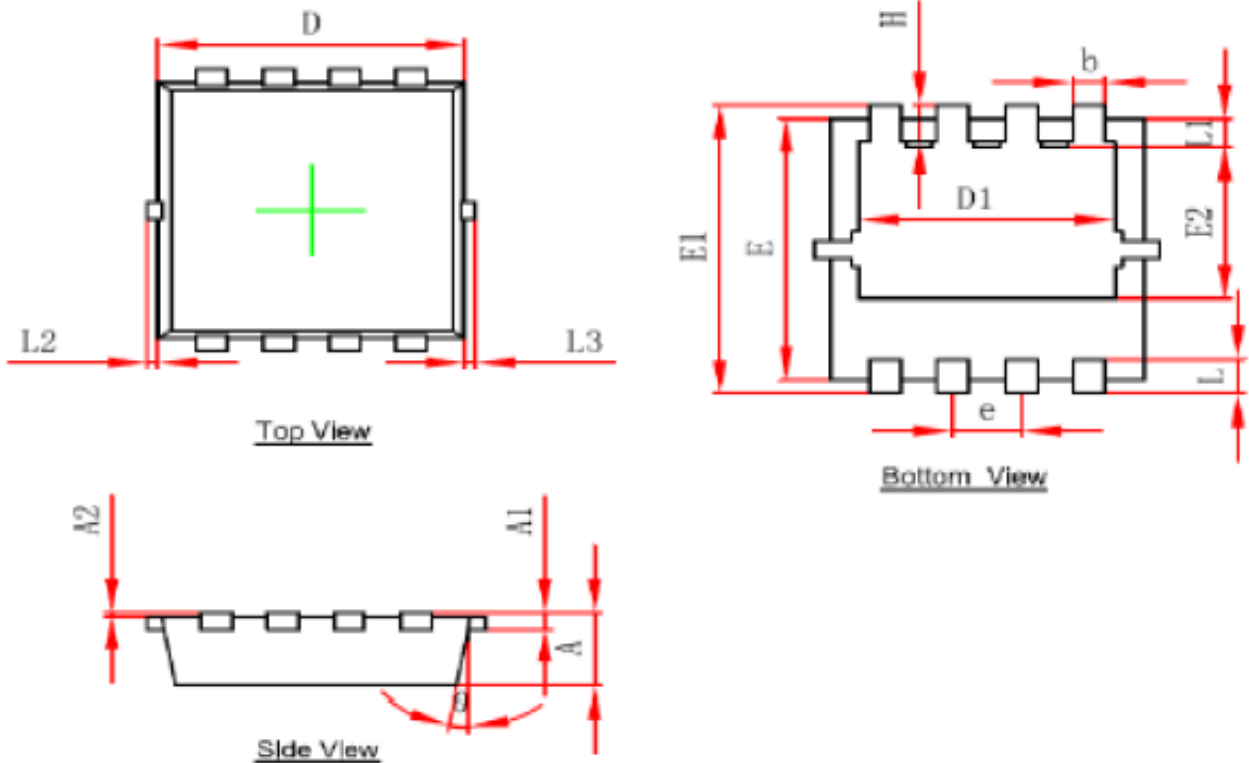


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Packing Information

PDFN3*3-8L



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.650	0.850	0.026	0.033
A1	0.152 REF		0.008 REF	
A2	0-0.05		0-0.002	
D	2.900	3.100	0.114	0.122
D1	2.300	2.600	0.091	0.102
E	2.900	3.100	0.114	0.122
E1	3.150	3.450	0.124	0.136
E2	1.535	1.935	0.060	0.078
b	0.200	0.400	0.008	0.018
e	0.550	0.750	0.022	0.030
L	0.300	0.500	0.012	0.020
L1	0.180	0.480	0.007	0.019
L2	0~0.100		0~0.004	
L3	0~0.100		0~0.004	
H	0.315	0.515	0.012	0.020
θ	9°	13°	9°	13°

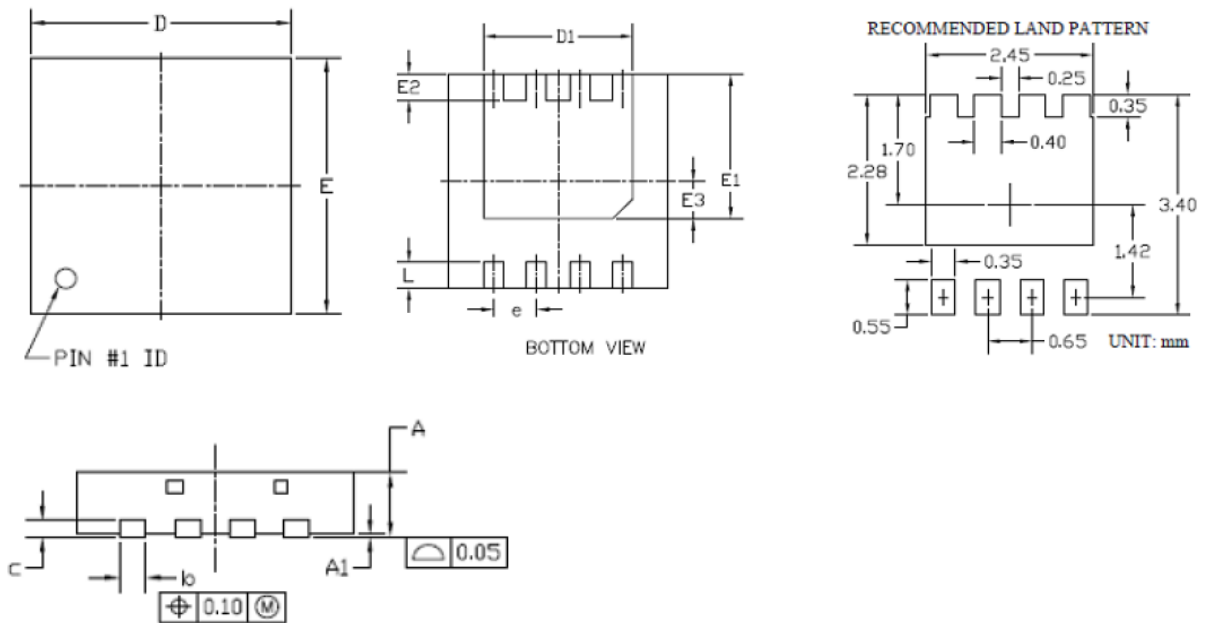


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Packing Information

DFN3*3-8L



Symbol	Dimensions In Millimeters			Dimensions In Inches		
	Min.	NOM	Max.	Min.	NOM	Max.
A	0.70	0.75	0.80	0.028	0.030	0.031
A1			0.05			0.002
b	0.24	0.30	0.35	0.009	0.012	0.014
c	0.10	0.15	0.25	0.004	0.006	0.010
D	3.20	3.30	3.40	0.126	0.130	0.134
D1	2.15	2.25	2.35	0.085	0.089	0.093
E	3.20	3.30	3.40	0.126	0.130	0.134
E1	2.13	2.23	2.33	0.084	0.088	0.092
E2	0.30	0.40	0.50	0.012	0.016	0.020
E3	0.48	0.58	0.68	0.019	0.023	0.027
e	0.65BSC			0.026BSC		
L	0.30	0.40	0.50	0.012	0.016	0.020



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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 used 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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