ACE14422B
N-Channel Enhancement Mode Power MOSFET

Description
ACE14422B uses advanced trench technology and desgin to provide excellent $R_{DS(ON)}$ with low gate charge. It can be used in a wide variety of applications.

Features
- V_{DS} (V) = 20V ,I_D = 55A
- $R_{DS(ON)}$@V_{GS} = 10V, TYP 2.4mΩ
- $R_{DS(ON)}$@V_{GS} = 4.5V, TYP 2.6mΩ
- $R_{DS(ON)}$@V_{GS} = 2.5V, TYP3.5mΩ

Absolute Maximum Ratings

Parameter		Symbol	Max	Unit
Drain-Source Voltage		V_{DSS}	20	V
Gate-Source Voltage		V_{GSS}	±12	V
Drain Current (Continuous) *AC	T_A=25 °C	I_D	55	A
	T_A=100 °C		42	
Drain Current (Pulse)*B		I_{DM}	180	
Power Dissipation	T_A=25 °C	P_D	78	W
Operating and Storage Temperature Range		T_J,T_{STG}	-55 to 150	°C

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 Power dissipation P_{DSM} is based on $R_{\theta JA}$ and the maximum allowed junction temperature of 150°C. The value in any given application depends on the user's specific board design.

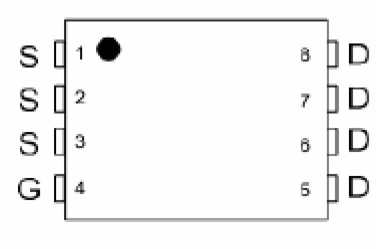
B. The power dissipation P_D is based on $T_{J(MAX)}$=150°C, using junction-to-case thermal resistance, and is more useful in setting the upper dissipation limit for cases where additional heatsinking is used.

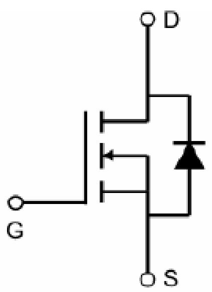
C. Repetitive rating, pulse width limited by junction temperature $T_{J(MAX)}$=150°C. Ratings are based on low frequency and duty cycles to keep initial T_J =25°C.

D. The $R_{\theta JA}$ is the sum of the thermal impedence from junction to case $R_{\theta JC}$ and case to ambient.

Packaging Type

DFN3*3-8L





ACE14422B

N-Channel Enhancement Mode Power MOSFET

Ordering information

ACE14422B XX + H

- H: Halogen - free
- +: Pb - free
- XX: NN: DFN3*3-8L

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	20			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=20V, V_{GS}=0V			1	uA
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_{DS}=250uA	0.4	0.75	1.5	V
Gate Leakage Current	I_{GSS}	V_{GS}=±12V, V_{DS}=0V			±100	nA
Static Drain-Source On-Resistance	$R_{DS(ON)}$	V_{GS}=10V, I_D=20A		2.4	3	mΩ
		V_{GS}=4.5V, I_D=15A		2.6	3.5	
		V_{GS}=2.5V, I_D=7A		3.5	5	
Forward Transconductance	g_{FS}	V_{DS}=5V, I_D=10A	85			S
Diode Forward Voltage	V_{SD}	I_{SD}=1A, V_{GS}=0V			1	V
Diode Forward Current	I_S				40	A
Switching						
Total Gate Charge	Q_g	V_{DS}=10V, I_D=10A V_{GS}=10V		72		nC
Gate-Source Charge	Q_{gs}			6.5		
Gate-Drain Charge	Q_{gd}			8.5		
Turn-On Delay Time	$T_{d(on)}$	V_{DD}=10V, V_{GS}=10V R_{GEN}=3Ω, I_D=1Ω		8		ns
Turn-On Rise Time	t_f			11		
Turn-Off Delay Time	$t_{d(off)}$			62		
Turn-Off Fall Time	t_f			23		
Dynamic						
Input Capacitance	C_{iss}	V_{DS}=10V, V_{GS}=0V f=1.0MHz		3800		pF
Output Capacitance	C_{oss}			1430		
Reverse Transfer Capacitance	C_{rss}			280		

Typical Performance Characteristics

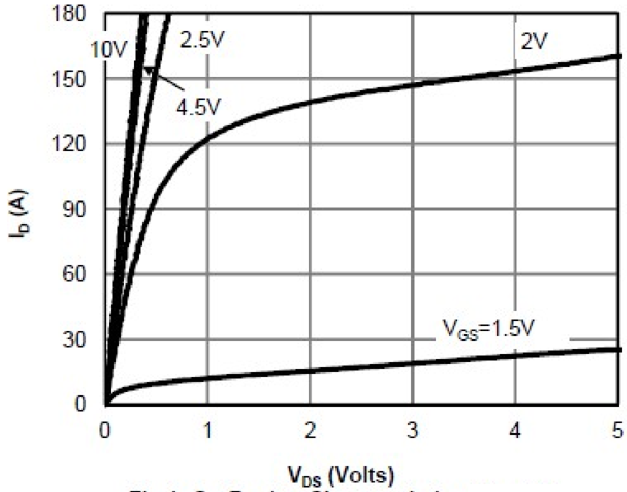


Fig 1: On-Region Characteristics

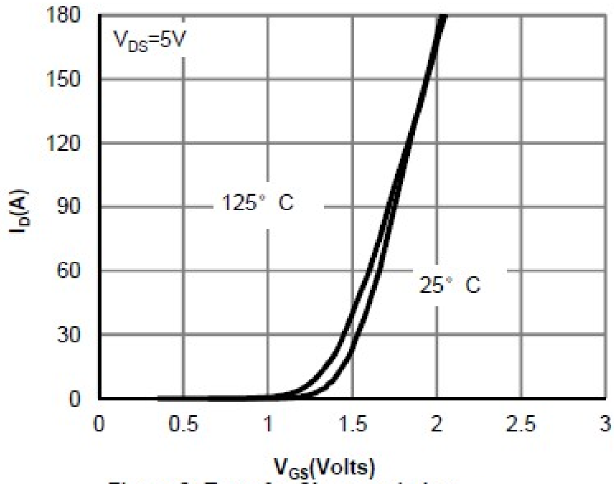


Figure 2: Transfer Characteristics

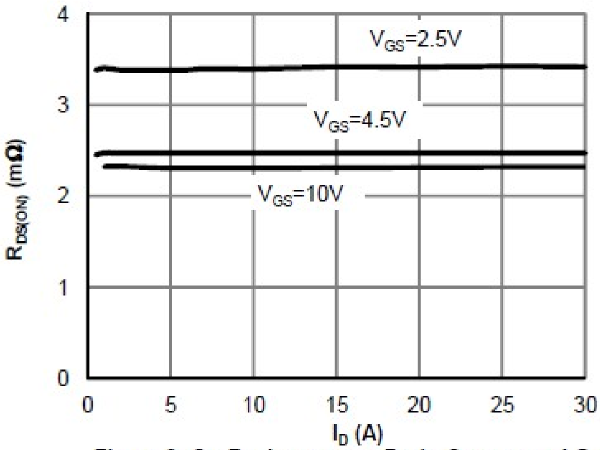


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

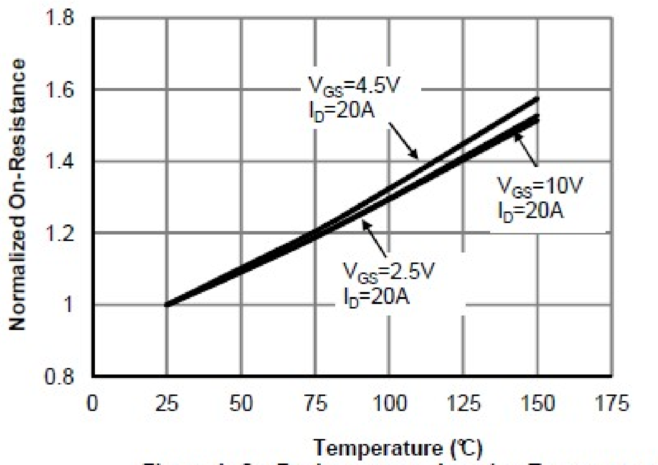


Figure 4: On-Resistance vs. Junction Temperature

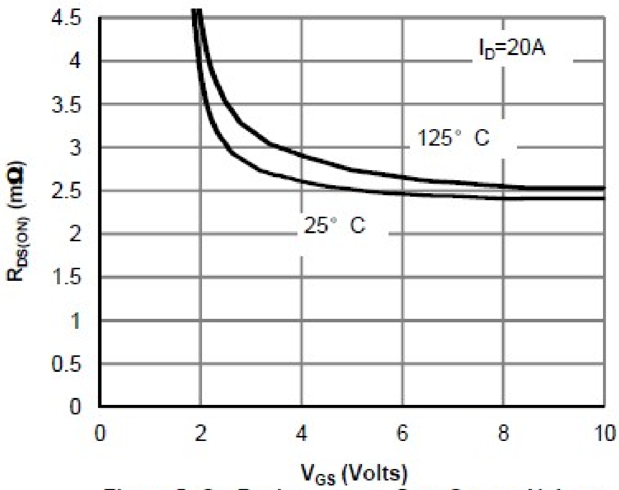


Figure 5: On-Resistance vs. Gate-Source Voltage

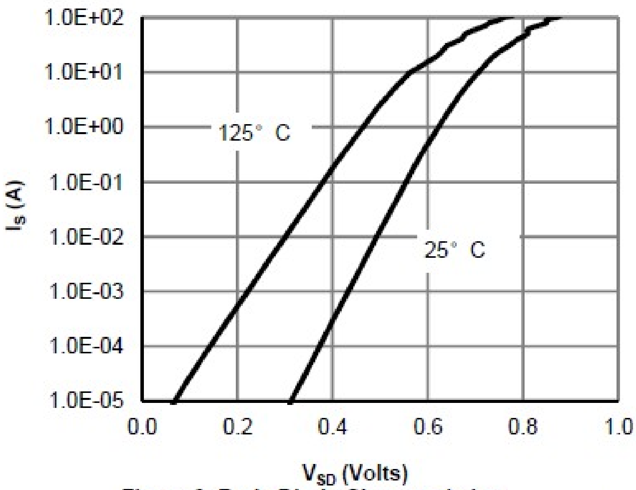


Figure 6: Body-Diode Characteristics

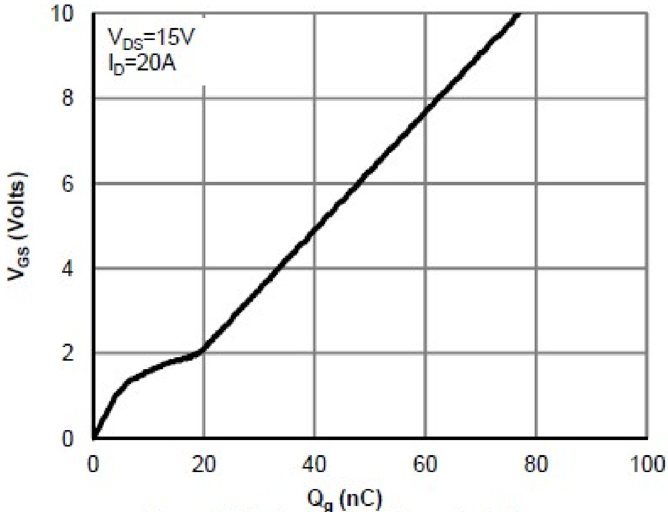


Figure 7: Gate-Charge Characteristics

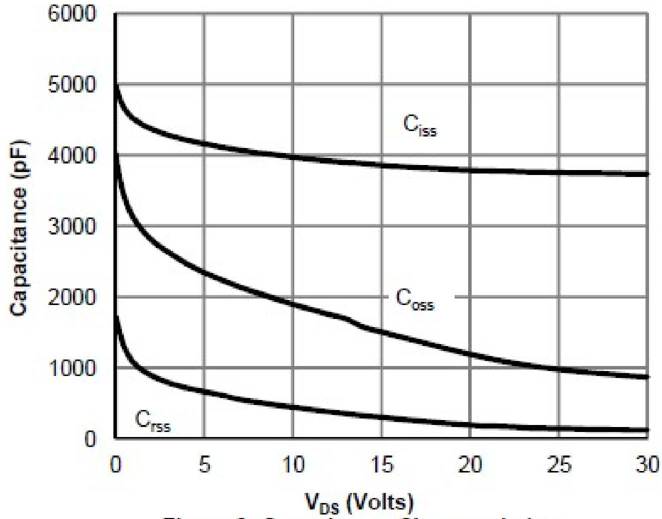
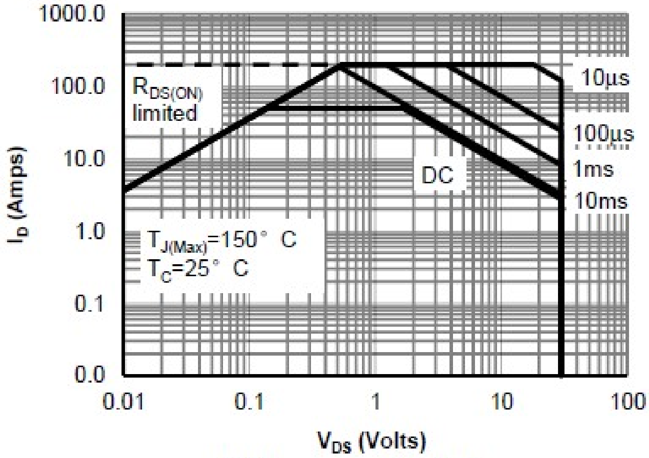


Figure 8: Capacitance Characteristics



VGS> or equal to 2.5V

Figure 9: Maximum Forward Biased Safe Operating Area

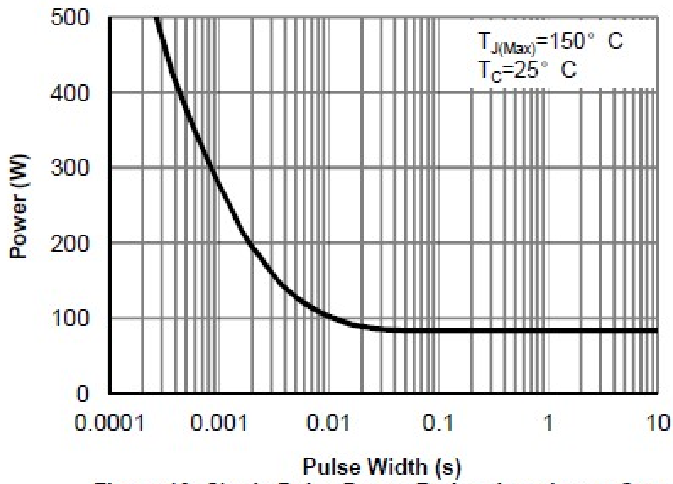


Figure 10: Single Pulse Power Rating Junction-to-Case

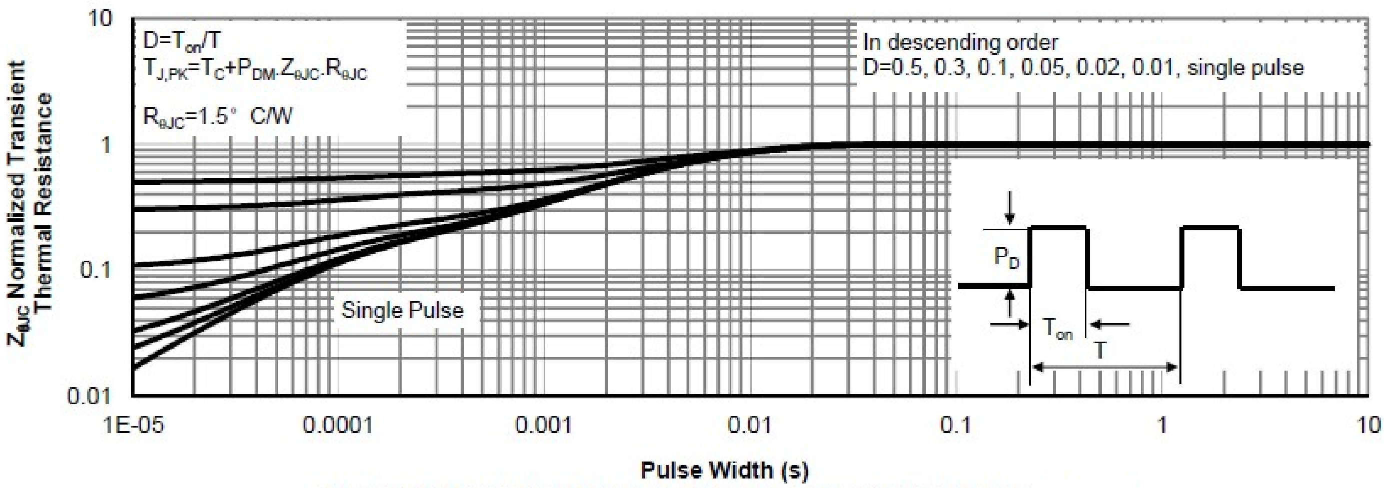
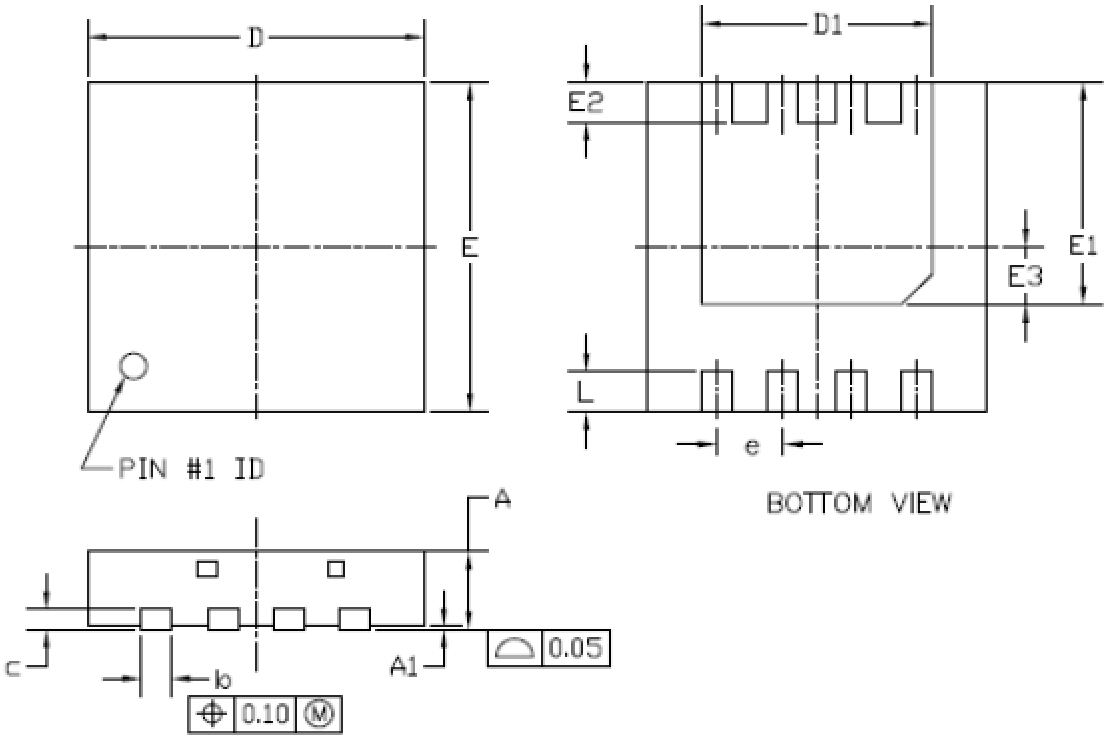


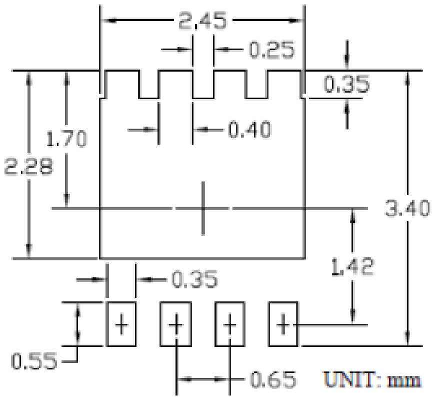
Figure 11: Normalized Maximum Transient Thermal Impedance

Packing Information

DFN3*3-8L



RECOMMENDED LAND PATTERN



SYMBOLS	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	0.65 BSC			0.026 BSC		
L	0.30	0.40	0.50	0.012	0.016	0.020

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 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.