ACE1060B

N-Channel Super Trench Power MOSFET

Description

ACE1060B uses Super Trench technology that is uniquely optimized to provide the most efficient high frequency switching performance. Both conduction and switching power losses are minimized due to an extremely low combination of $R_{DS(ON)}$ and Qg. This device is ideal for high-frequency switching and synchronous rectification.

Features

- V_{DS}=100V, I_D=60A
- $R_{DS(ON)1}$@V_{GS}=10V, TYP 7.2mΩ

Absolute Maximum Ratings

Parameter		Symbol	Max	Unit
Drain-Source Voltage		V_{DSS}	100	V
Gate-Source Voltage		V_{GSS}	±20	V
Drain Current (Continuous)*AC	T_A=25℃	I_D	60	A
	T_A=100℃		52	
Drain Current (Pulsed)*B		I_{DM}	240	A
Power Dissipation	T_A=25℃	P_D	105	W
Operating temperature / storage temperature		T_J/T_{STG}	-55~150	℃

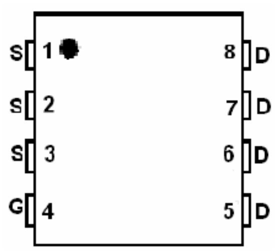
A: The value of $R_{θJA}$ is measured with the device mounted on 1in^2 FR-4 board with 2oz. Copper, in a still air environment with T_A=25°C. The value in any given application depends on the user's specific board design.

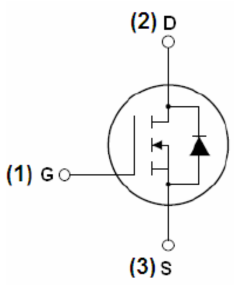
B: Repetitive rating, pulse width limited by junction temperature.

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

Packaging Type

DFN5*6-EP





Ordering information

ACE1060B XX + H

- H: Halogen - free
- +: Pb - free
- XX: PN: DFN5*6-EP

Electrical Characteristics

T_A=25℃, unless otherwise specified.

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Static						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS} = 0V, I_D = 250μA	100			V
Zero Gate Voltage Drain Current	I_{DSS1}	V_{DS} = 100V, V_{GS} = 0V			1	μA
Gate Threshold Voltage	$V_{GS(TH)}$	V_{GS} = V_{DS} , I_{DS}= 250μA	2.5		4.5	V
Gate Leakage Current	I_{GSS}	V_{GS}= ±20V , V_{DS}=0V			±100	nA
Drain-Source On-state Resistance	$R_{DS(on)}$	V_{GS} = 10V , I_D= 30A		7.2	8.5	mΩ
Forward Trans Conductance	g_{FS}	V_{DS}= 10V , I_D= 30A	40			S
Diode Forward Voltage	V_{SD}	I_{SD}= 60A , V_{GS}= 0V			1.2	V
Diode Forward Current	I_S				60	A
Switching						
Total Gate Charge	Q_g	V_{DS}= 50V, I_D= 30A, V_{GS}= 10V		48		nC
Gate-Source Charge	Q_{gs}			15		nC
Gate-Drain Charge	Q_{gd}			8		nC
Turn-on Delay Time	$t_{d(on)}$	V_{DD}= 50V,I_D= 30A, V_{GS}= 10V,R_{GEN}= 4.7Ω		12		ns
Turn-on Rise Time	t_r			43		ns
Turn-off Delay Time	$t_{d(off)}$			31		ns
Turn-off Fall Time	t_f			10		ns
Dynamic						
Input Capacitance	C_{iss}	V_{DS}=50V,V_{GS}= 0V, f= 1.0MHz		3400		pF
Output Capacitance	C_{oss}			580		pF
Reverse Transfer Capacitance	C_{rss}			30		pF

Typical Performance Characteristics

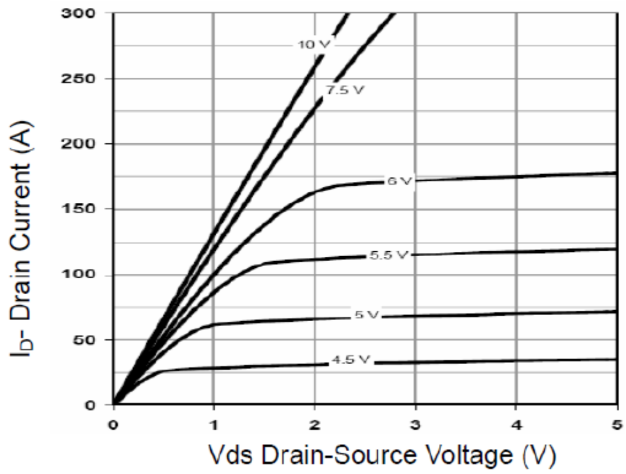


Figure 1 Output Characteristics

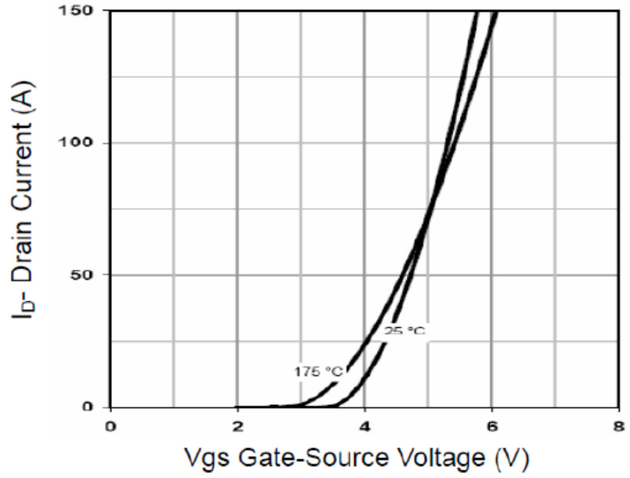


Figure 2 Transfer Characteristics

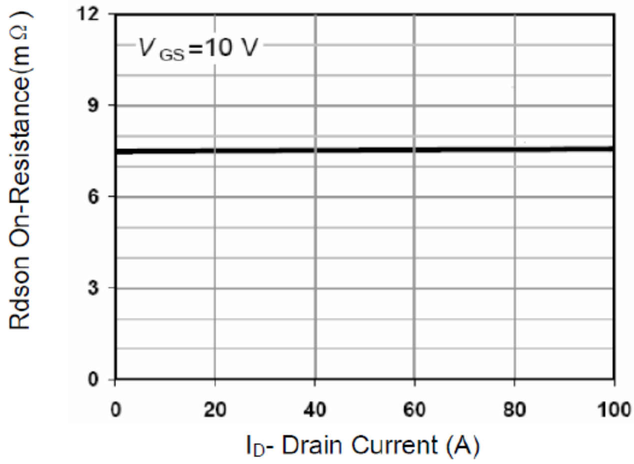


Figure 3 Rdson- Drain Current

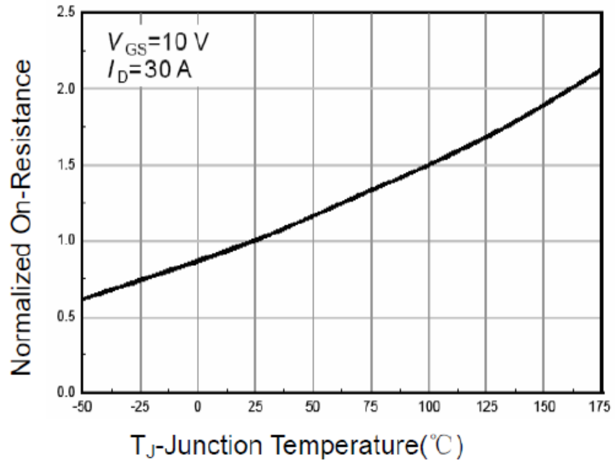


Figure 4 Rdson-JunctionTemperature

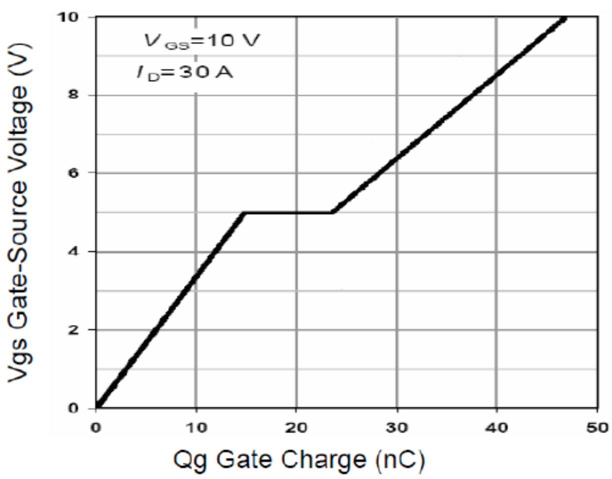


Figure 5 Gate Charge

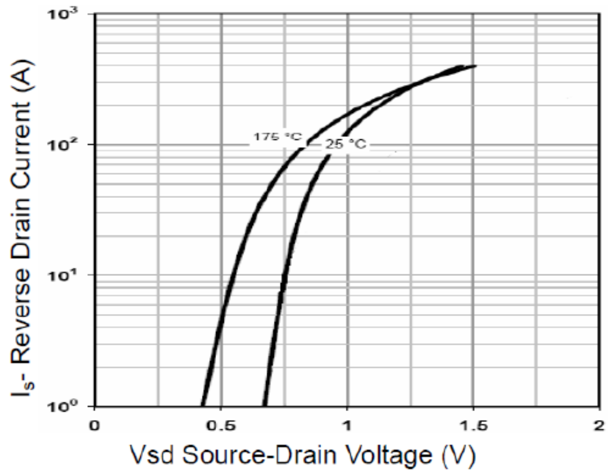


Figure 6 Source- Drain Diode Forward

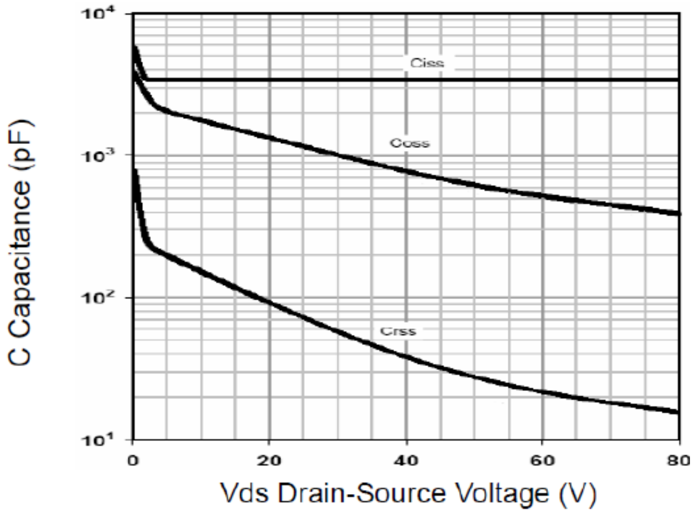


Figure 7 Capacitance vs Vds

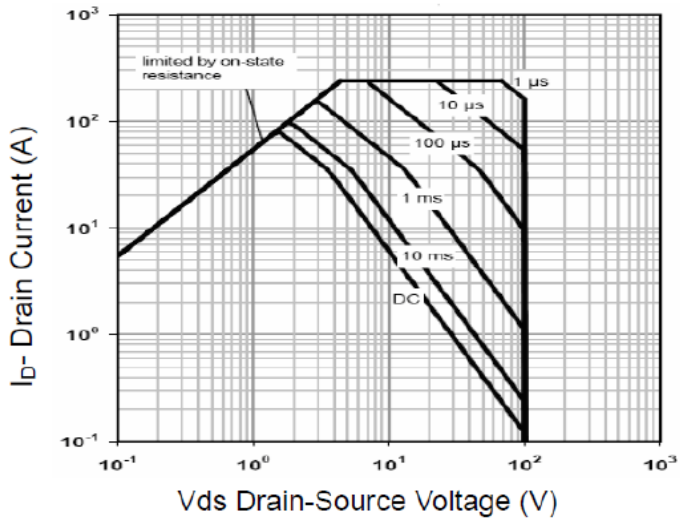


Figure 8 Safe Operation Area

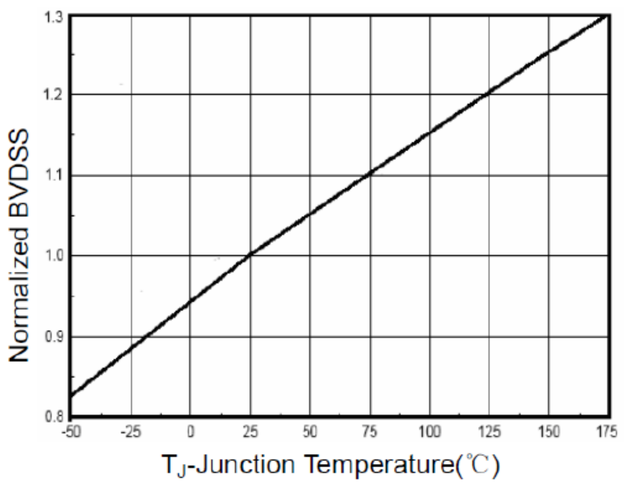


Figure 9 BV_{DSS} vs Junction Temperature

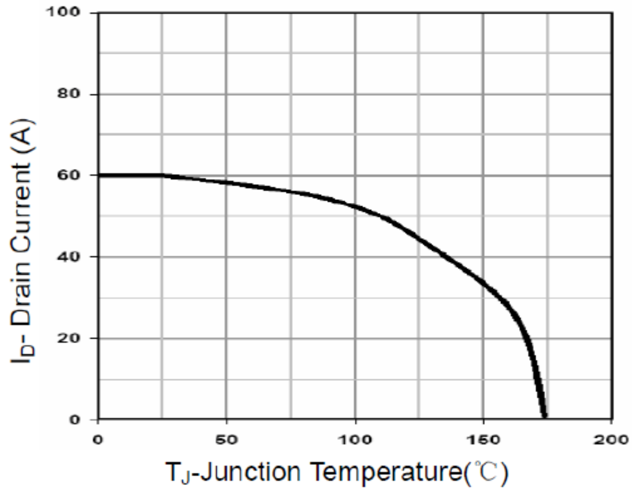


Figure 10 Current De-rating

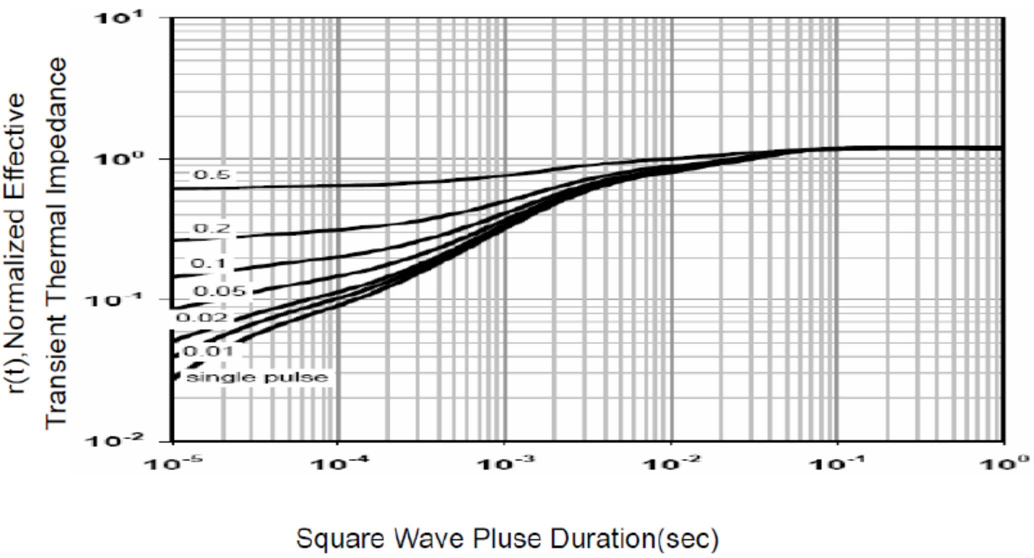
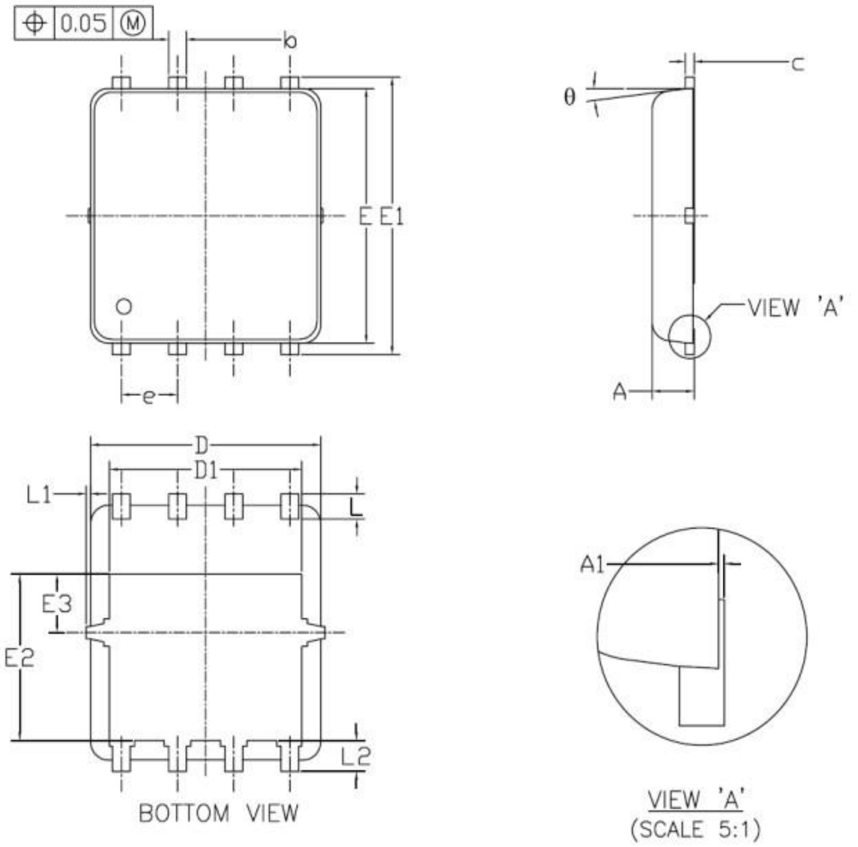


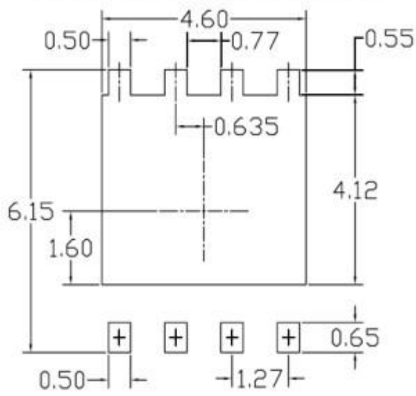
Figure 11 Normalized Maximum Transient Thermal Impedance

Packing Information

DFN5*6-EP



RECOMMENDED LAND PATTERN



SYMBOLS	DIMENSIONS IN MILLIMETERS			DIMENSIONS IN INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
A	0.85	0.95	1.00	0.033	0.037	0.039
A1	0.00	——	0.05	0.000	——	0.002
b	0.30	0.40	0.50	0.012	0.016	0.020
c	0.15	0.20	0.25	0.006	0.008	0.010
D	5.20 BSC			0.205 BSC		
D1	4.35 BSC			0.171 BSC		
E	5.55 BSC			0.219 BSC		
E1	6.05 BSC			0.238 BSC		
E2	3.625 BSC			0.143 BSC		
E3	1.275 BSC			0.050 BSC		
e	1.27 BSC			0.050 BSC		
L	0.45	0.55	0.65	0.018	0.022	0.026
L1	0	——	0.15	0	——	0.006
L2	0.68 REF			0.027 REF		
θ	0°	——	10°	0°	——	10°

UNIT: mm

NOTE

1. PACKAGE BODY SIZES EXCLUDE MOLD FLASH AND GATE BURRS.
   MOLD FLASH AT THE NON-LEAD SIDES SHOULD BE LESS THAN 6 MILS EACH.
2. CONTROLLING DIMENSION IS MILLIMETER.
   CONVERTED INCH DIMENSIONS ARE NOT NECESSARILY EXACT.

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.

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