ACE17306B

N-Channel Enhancement Mode Power MOSFET

Description

- boost converters
- synchronous rectifiers
- industrial power supplies

Features

- V_{DS}=40V
- I_D=60A
- $R_{DS(ON)}$@V_{GS}=10V,TYP6.6 mΩ
- $R_{DS(ON)}$@V_{GS}=4.5V,TYP8.9 mΩ

Absolute Maximum Ratings

Parameter		Symbol	Ratings	Units
Drain-Source Voltage		V_{DSS}	40	V
Gate-Source Voltage		V_{GSS}	±20	V
Drain Current(Continuous) *AC	T_C=25℃	I_D	60	A
	T_C=100℃		42	
Drain Current(Pulsed) *B		I_{DM}	165	A
Power Dissipation	T_C=25℃	P_D	53.5	W
Operating temperature / storage temperature		T_J/T_{STG}	-55~150	℃

Note :

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 value in any given application depends on the user's specific board design.

b. Repetitive rating, pulse width limited by junction temperature.

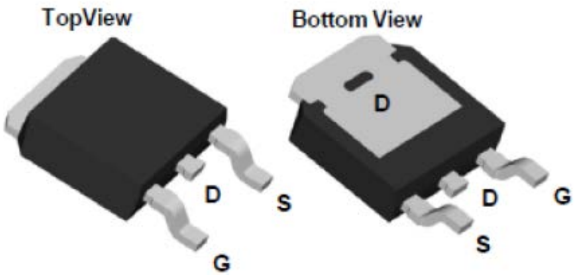
c. The current rating is based on the t≤ 10s junction to ambient thermal resistance rating

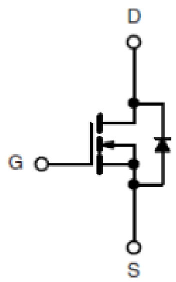
Thermal Resistance Ratings

Parameter		Symbol	Typical	Maximum	Units
Maximum Junction-to-Ambient	Steady State	R_{thJA}	41	50	°C/W
Maximum Junction-to-Case (Drain)	Steady State	R_{thJC}	2.2	2.8	

Packaging Type

TO-252





Ordering information

ACE17306B XX + H

- Halogen - free (H)
- Pb - free (+)
- YM：TO-252 (XX)

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	40			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 40V, V_{GS} = 0V			1	μA
Gate Threshold Voltage	$V_{GS(TH)}$	V_{GS} = V_{DS}, I_{DS}= 250μA	1.2	1.7	2.5	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 = 20A		6.6	12	mΩ
		V_{GS} = 4.5V, I_D = 10A		8.9	15	
Forward Transconductance	g_{FS}	V_{DS}= 5V, I_D= 20A		70		S
Diode Forward Voltage	V_{SD}	I_{SD}= 1A , V_{GS}=0V			1.1	V
Diode Forward Current	I_S	TC =25°C			60	A
Switching						
Total Gate Charge	Q_g	V_{GS}=10V,V_{DS}=20V, I_D=20A		19		nC
Gate-Source Charge	Q_{gs}			4.5		
Gate-Drain Charge	Q_{gd}			2.3		
Turn-on Delay Time	$t_{d(on)}$	V_{GS}=10V,V_{DS}=20V, R_L=1Ω, R_{GEN}=3Ω		6		ns
Turn-on Rise Time	t_r			2.5		
Turn-off Delay Time	$t_{d(off)}$			23		
Turn-Off Fall Time	t_f			4		
Dynamic						
Input Capacitance	C_{iss}	V_{DS}=20V,V_{GS}=0V, f=1.0MHz		1350		pF
Output Capacitance	C_{oss}			405		
Reverse Transfer Capacitance	C_{rss}			26		

Typical Performance Characteristics (TJ = 25 ℃, unless otherwise noted)

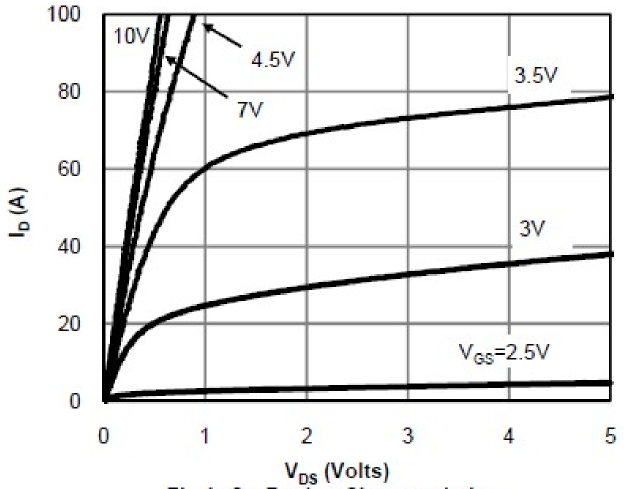


Fig 1: On-Region Characteristics

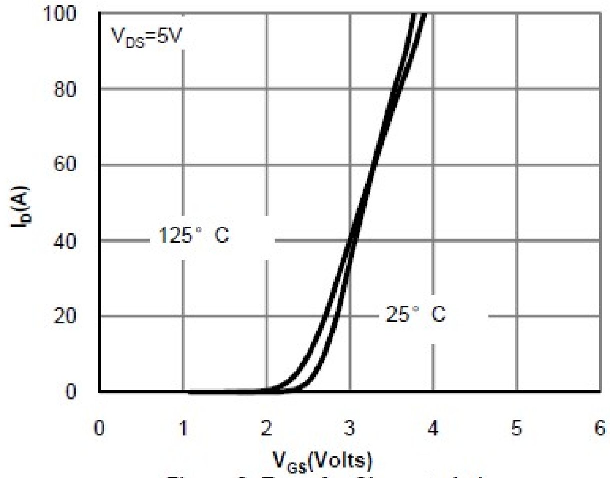


Figure 2: Transfer Characteristics

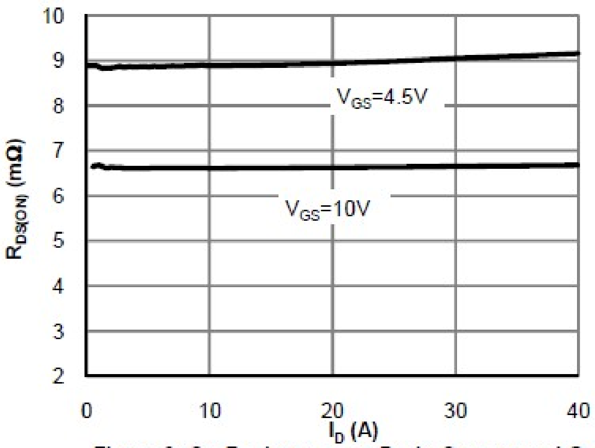


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

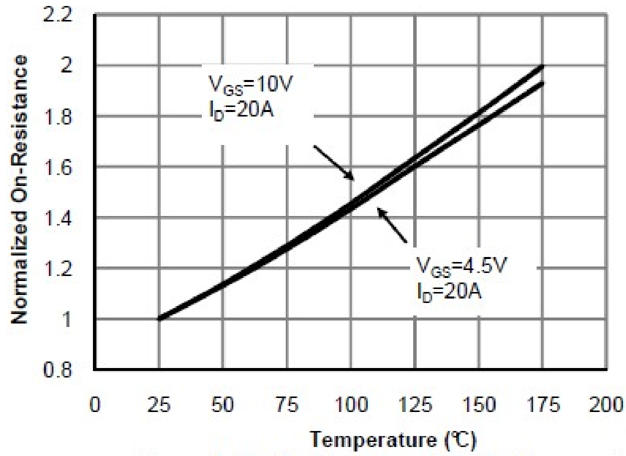


Figure 4: On-Resistance vs. Junction Temperature

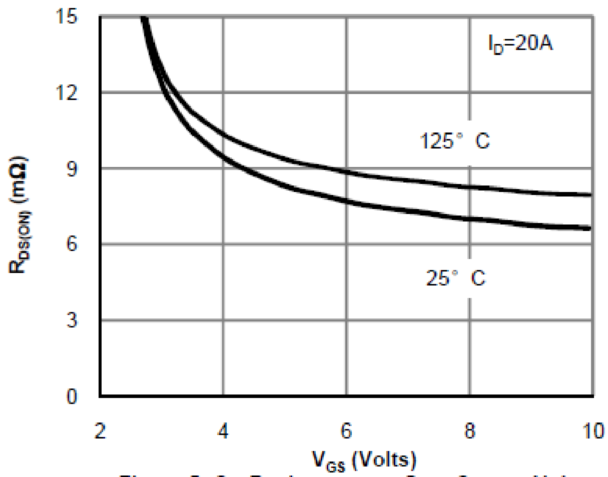


Figure 5: On-Resistance vs. Gate-Source Voltage

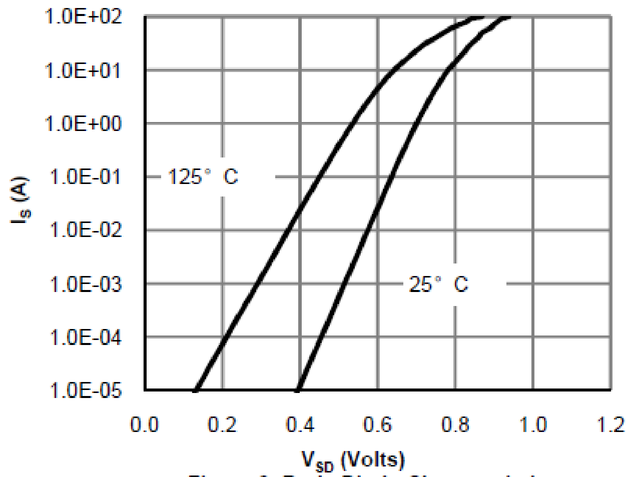


Figure 6: Body-Diode Characteristics

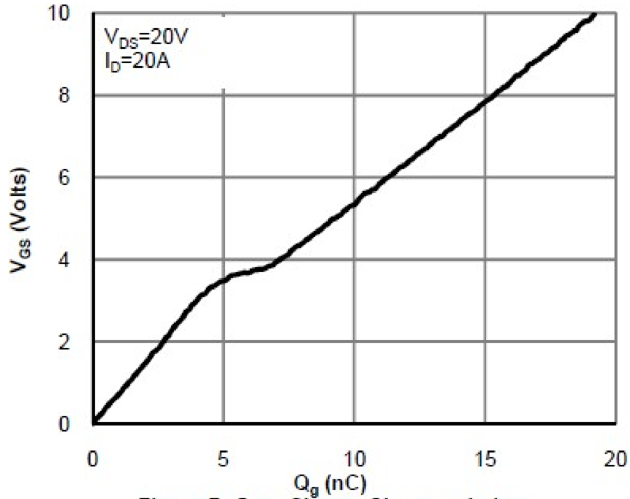


Figure 7: Gate-Charge Characteristics

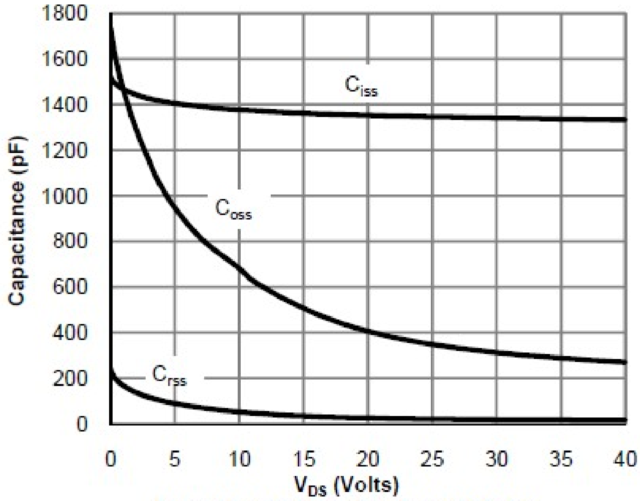


Figure 8: Capacitance Characteristics

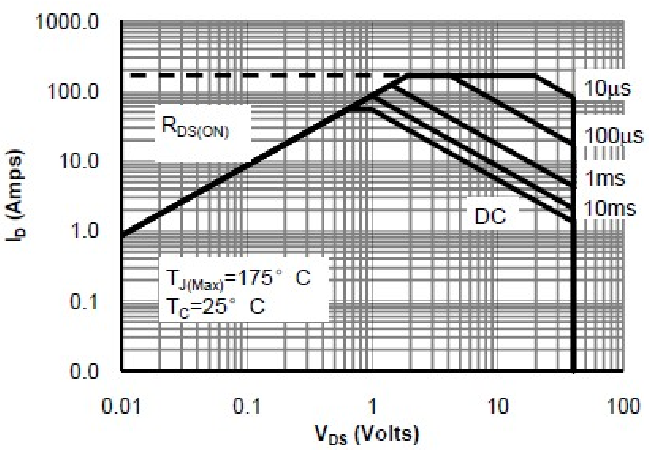


Figure 9: Maximum Forward Biased Safe Operating Area

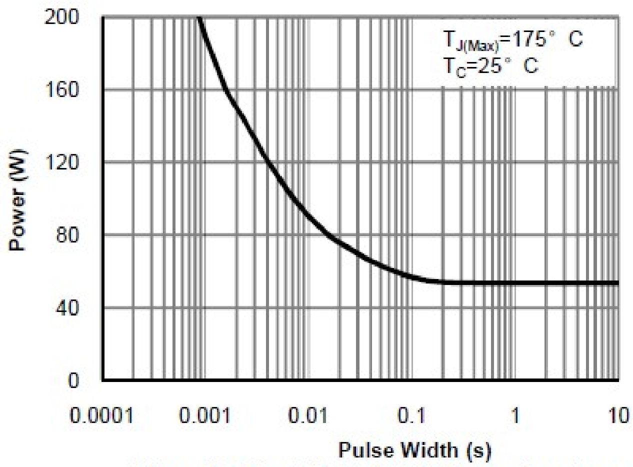


Figure 10: Single Pulse Power Rating Junction-to-Ca

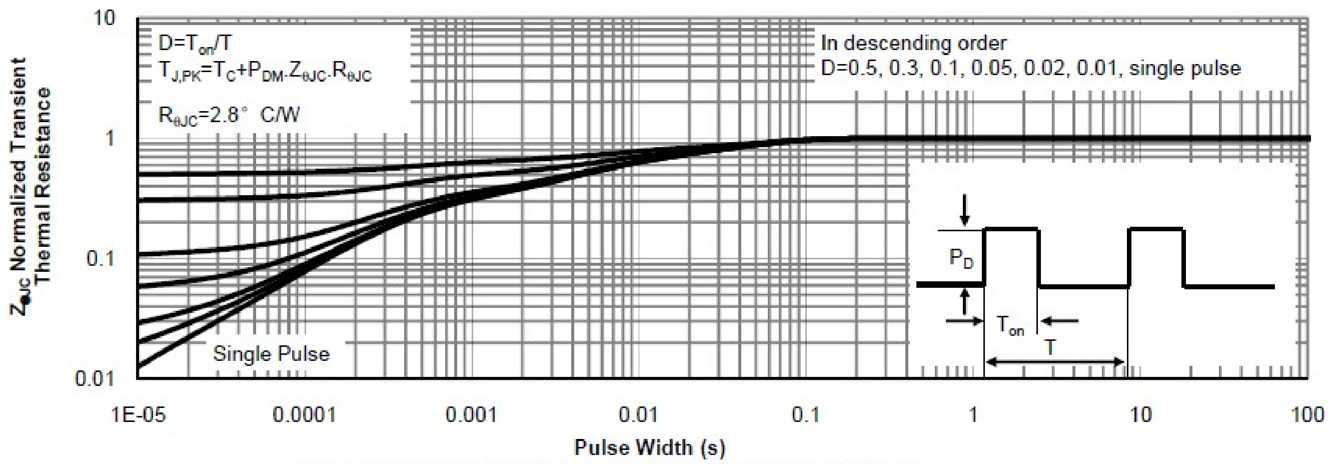
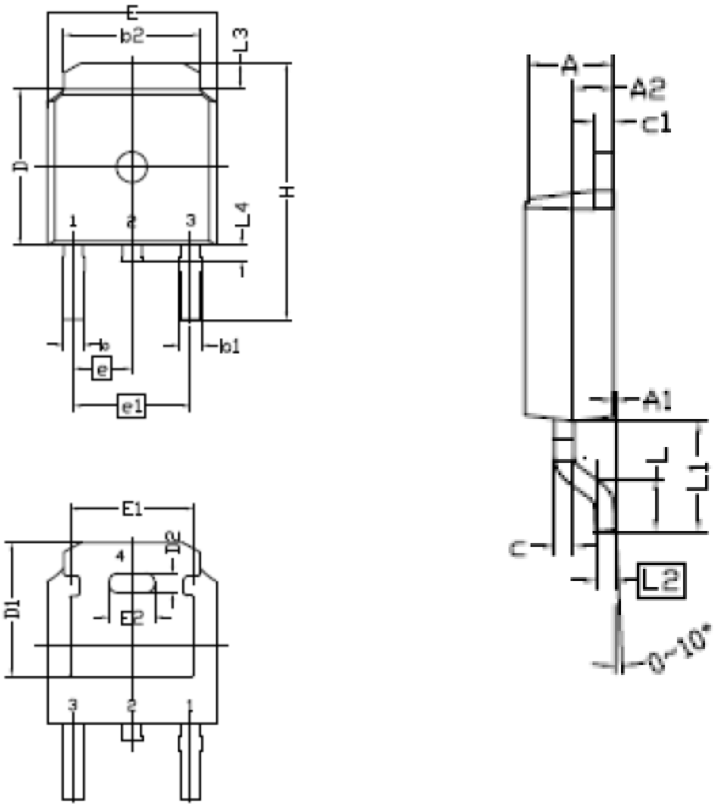


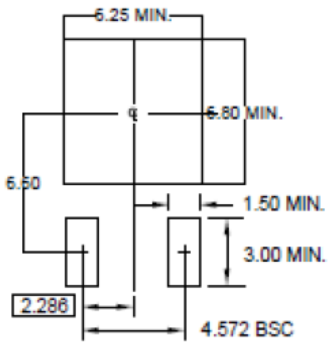
Figure 11: Normalized Maximum Transient Thermal Impedance

Packing Information

TO-252



RECOMMENDED LAND PATTERN



UNIT: mm

SYMBOL	DIMENSION IN MILLIMETERS			DIMENSIONS IN INCHES		
	MIN.	NOM.	MAX.	MIN.	NOM.	MAX.
A	2.184	2.286	2.388	0.086	0.090	0.094
A1	0.000	----	0.127	0.000	----	0.005
A2	0.889	1.041	1.143	0.035	0.041	0.045
b	0.635	0.762	0.889	0.025	0.030	0.035
b1	0.762	0.840	1.143	0.030	0.033	0.045
b2	4.953	5.340	5.461	0.195	0.210	0.215
c	0.450	0.508	0.610	0.018	0.020	0.024
c1	0.450	0.508	0.610	0.018	0.020	0.024
D	5.969	6.096	6.223	0.235	0.240	0.245
D1	5.210	5.249	5.380	0.205	0.207	0.212
D2	0.662	0.762	0.862	0.026	0.030	0.034
E	6.350	6.604	6.731	0.250	0.260	0.265
E1	4.318	4.826	4.901	0.170	0.190	0.193
E2	1.678	1.778	1.878	0.066	0.070	0.074
e	2.286 BSC			0.090 BSC		
e1	4.572 BSC			0.180 BSC		
H	9.398	10.033	10.414	0.370	0.395	0.410
L	1.270	1.520	2.032	0.050	0.060	0.080
L1	2.921 REF.			0.115REF.		
L2	0.408	0.508	0.608	0.016	0.020	0.024
L3	0.889	1.016	1.270	0.035	0.040	0.050
L4	0.635	----	1.016	0.025	----	0.040

NOTE
1. PACKAGE BODY SIZES EXCLUDE MOLD FLASH AND GATE BURRS. MOLD FLASH SHOULD BE LESS THAN 6 MILS.
2. DIMENSION L IS MEASURED IN GAUGE PLANE
3. TOLERANCE 0.10 mm UNLESS OTHERWISE SPECIFIED
4. CONTROLLING DIMENSION IS MILLIMETER. CONVERTED INCH DIMENSIONS ARE NOT NECESSARILY EXACT.
5. REFER TO JEDEC TO-252 (AA)

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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