ACE1A1516B

N-Channel Enhancement Mode Field Effect Transistor

Description

The ACE1A1516B uses advanced trench technology to provide excellent $R_{DS(ON)}$ and low gate charge. This device is suitable for use as Battery protection or in other switching application.

Features

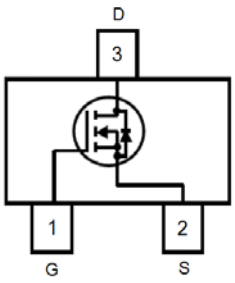
- V_{DS} (V) = 60V,I_D = 3A
- $R_{DS(ON)}$<105mΩ @ V_{GS}= 10V
- $R_{DS(ON)}$<125mΩ @ V_{GS}= 4.5V
- TSOT-23-3 Package

Absolute Maximum Ratings

Parameter		Symbol	Max	Unit
Drain-Source Voltage		V_{DSS}	60	V
Gate-Source Voltage		V_{GSS}	±20	V
Drain Current (Continuous)	T_A=25℃	I_D	3	A
	T_A=70℃		2.4	
Drain Current (Pulsed)		I_{DM}	10	A
Power Dissipation	T_A=25℃	P_D	1.7	W
	T_A=70℃		0.85	
Operating temperature / storage temperature		T_J/T_{STG}	-55~150	℃

Packaging Type

TSOT-23-3



Ordering information

ACE1A1516B XX + H

- Halogen - free
- Pb - free
- BMS: TSOT-23-3

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	60			V
Zero gate voltage drain current	I_{DSS}	V_{DS}=60V, V_{GS}=0V			1	μA
Gate threshold voltage	$V_{GS(th)}$	V_{GS}=V_{DS}, I_{DS}=250μA	1.3	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=3A		82	105	mΩ
		V_{GS}=4.5V, I_D=3A		102	125	
Forward trans conductance	g_{FS}	V_{DS}=15V, I_D=2A		3		S
Diode forward voltage	V_{SD}	I_{SD}=1A, V_{GS}=0V			1.0	V
Maximum Body-Diode Continuous Current	I_S				3	A
Switching						
Total gate charge	Qg	V_{GS}=4.5V, V_{DS}=30V, I_D=3A		6		nC
Gate-source charge	Qgs			1		
Gate-drain charge	Qgd			1.3		
Turn-on delay time	$t_{d(on)}$	V_{GS}=10V, I_D =1.5A, V_{DS}= 30V, R_{GEN} = 1Ω		6		ns
Turn-on rise time	Tr			15		
Turn-off delay time	$t_{d(off)}$			15		
Turn-off fall time	Tf			10		
Dynamic						
Input capacitance	Ciss	V_{GS}=0V, V_{DS}=30V, f=1.0MHz		247		pF
Output capacitance	Coss			34		
Reverse transfer capacitance	Crss			19.5		

Notes:

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°C. The value in any given application depends on the user's specific board design.
2. Repetitive rating, pulse width limited by junction temperature.
3. The $R_{\theta JA}$ is the sum of the thermal impedence from junction to lead $R_{\theta JA}$ and lead to ambient.
4. The static characteristics in Figures 1 to 6 are obtained using <300 μs 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°C. The SOA curve provides a single pulse rating.
6. The current rating is based on the t≤10s thermal resistance rating.

Typical Performance Characteristics

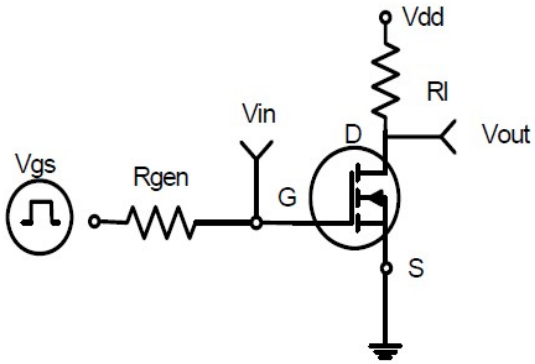


Figure 1:Switching Test Circuit

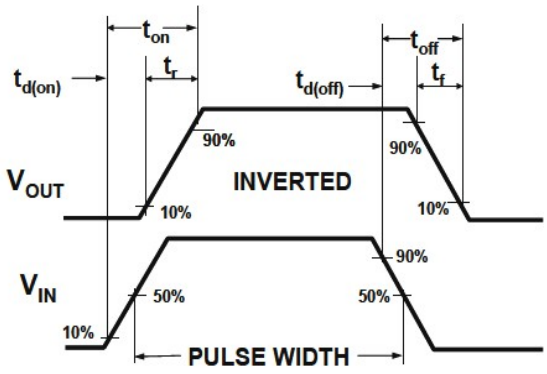


Figure 2:Switching Waveforms

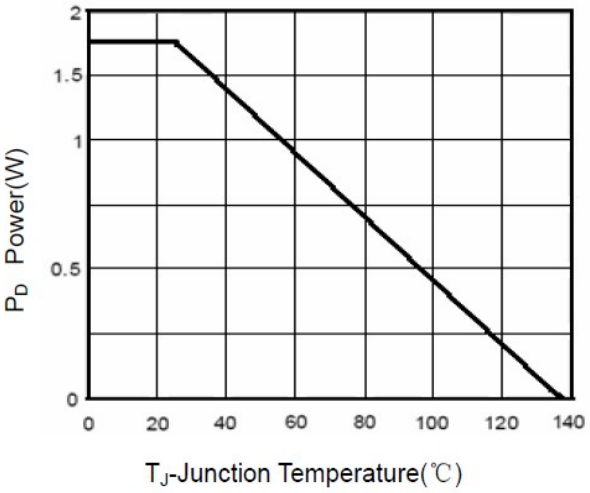


Figure 3 Power Dissipation

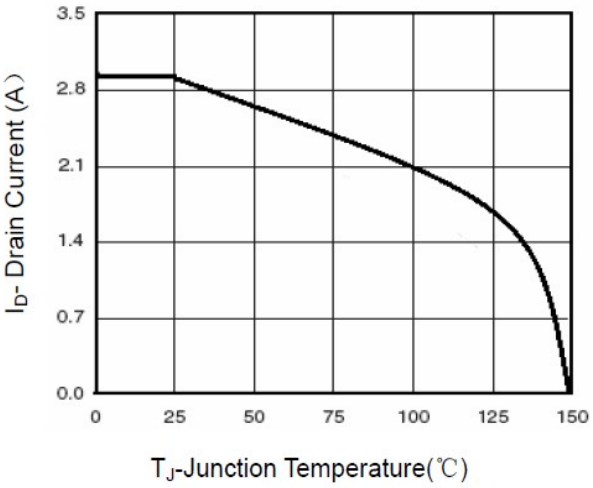


Figure 4 Drain Current

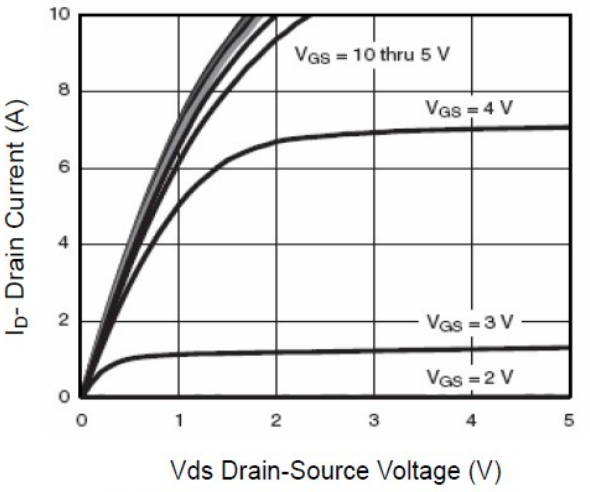


Figure 5 Output Characteristics

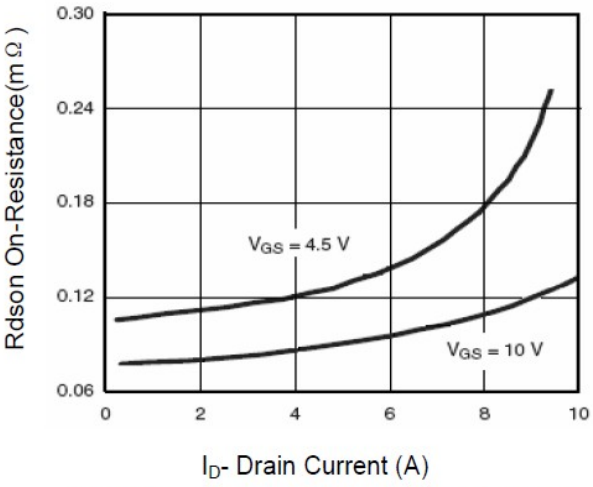


Figure 6 Drain-Source On-Resistance

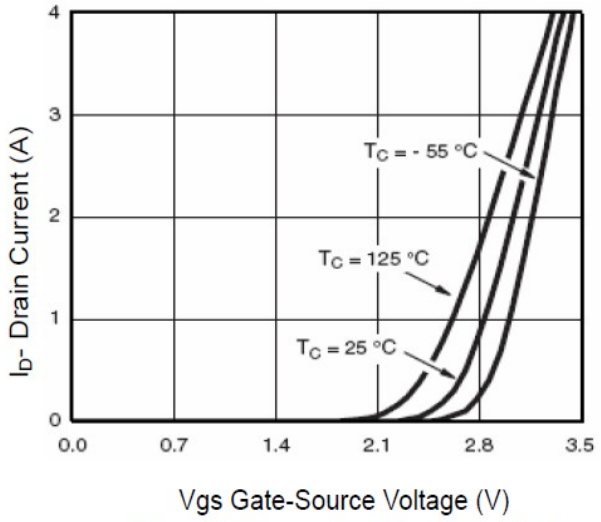


Figure 7 Transfer Characteristics

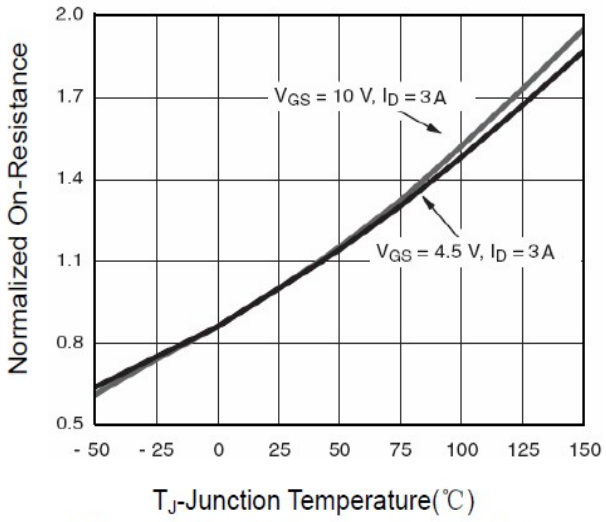


Figure 8 Drain-Source On-Resistance

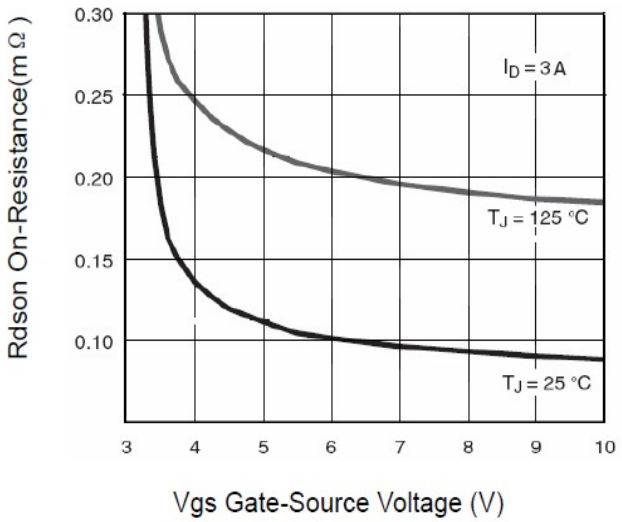


Figure 9 Rdson vs Vgs

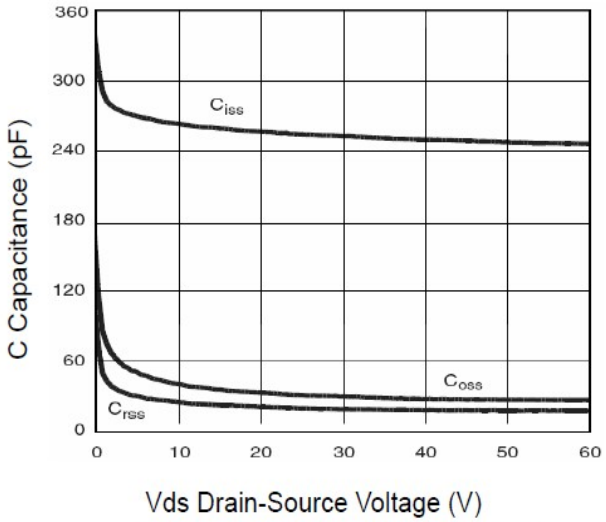


Figure 10 Capacitance vs Vds

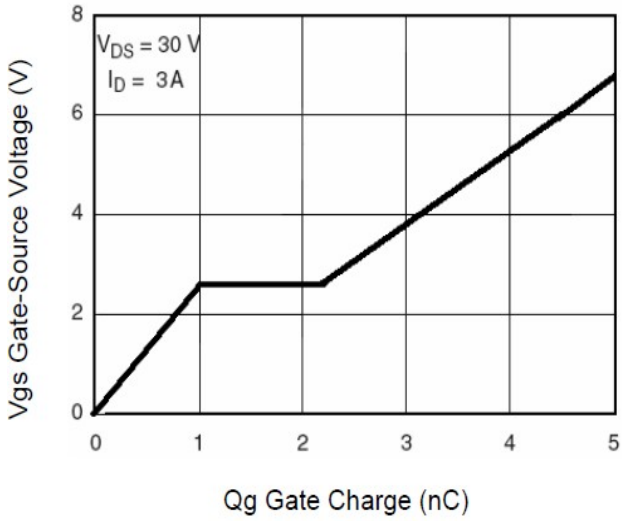


Figure 11 Gate Charge

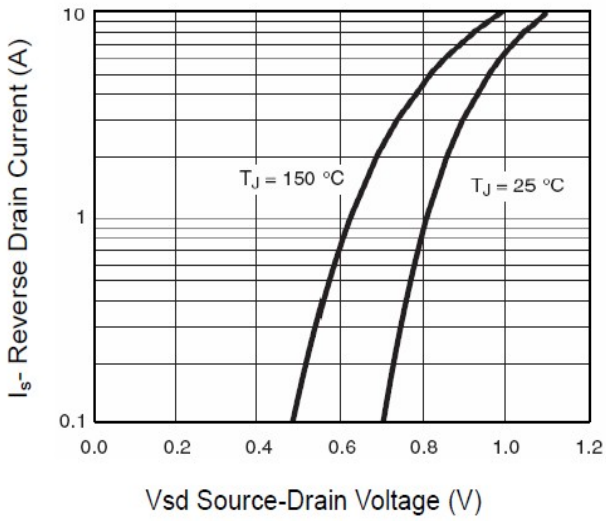


Figure 12 Source- Drain Diode Forward

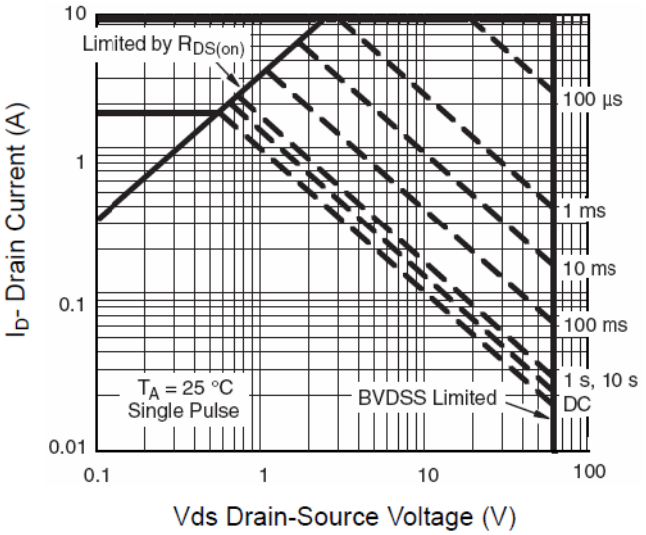


Figure 13 Safe Operation Area

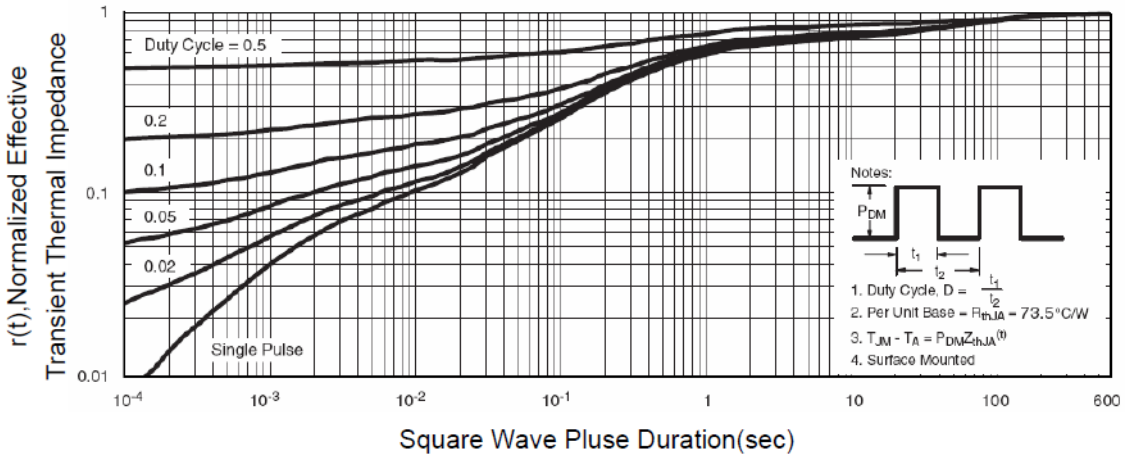
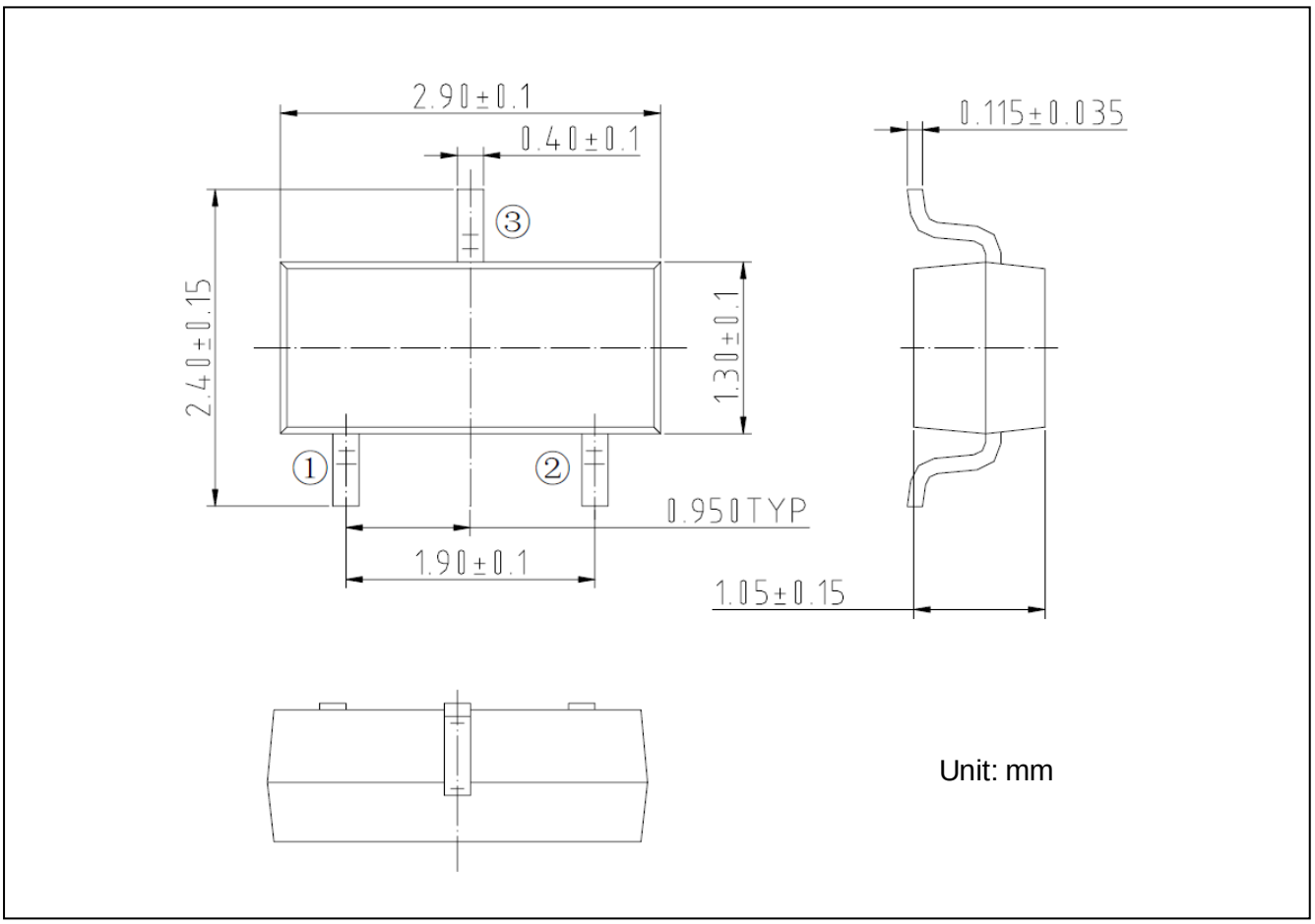


Figure 14 Normalized Maximum Transient Thermal Impedance

Packing Information

TSOT-23-3



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.