ACE12341B

P-Channel Enhancement Mode Field Effect Transistor

Description

Load switch for Portable Applications.

Features

- V_{DS}=-20V
- I_D=-2A
- $R_{DS(ON)}$= @ V_{GS}=-4.5V, TYP 100mΩ
- $R_{DS(ON)}$= @ V_{GS}=-2.5V, TYP 120mΩ

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℃	I_D	-2	A
	T_A=70℃		-1.4	
Drain Current (Pulsed)*B		I_{DM}	-10	A
Power Dissipation	T_A=25℃	P_D	1.25	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	Max	Unit
Maximum Junction-to-Ambient	t ≤ 5s	R_{thJA}	80	100	℃/W

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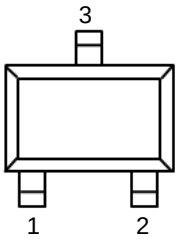
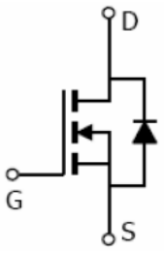
Packaging Type

TSOT-23-3





Pin Configuration

TSOT-23-3	Description	Function
1	G	Gate
2	S	Source
3	D	Drain

Ordering information

ACE12341B 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	-20			V
Zero gate voltage drain current	I_{DSS}	V_{DS}=-20V, V_{GS}=0V			-1	μA
Gate threshold voltage	$V_{GS(th)}$	V_{GS}=V_{DS}, I_{DS}=250μA	-0.4	-0.7	-1.2	V
Gate leakage current	I_{GSS}	V_{GS}=±12V, V_{DS}=0V			±100	nA
Drain-Source On-state Resistance	$R_{DS(on)}$	V_{GS}=-4.5V, I_D=-2A		100	150	mΩ
		V_{GS}=-2.5V, I_D=-1A		120	200	
Forward trans conductance	g_{FS}	V_{DS}=-5V, I_D=-2A		6.5		S
Diode forward voltage	V_{SD}	I_{SD}=-1A, V_{GS}=0V			-1.2	V
Diode forward current	I_S	TC =25°C			-2	A
Switching						
Total gate charge	Qg	V_{GS}=-4.5V, V_{DS}=-10V, I_D=-2A		3.8		nC
Gate-source charge	Qgs			0.7		
Gate-drain charge	Qgd			0.5		
Turn-on delay time	$t_{d(on)}$	V_{DD}=-10V, I_D=-2A R_G=3Ω, V_{GS}=-4.5V		15		ns
Turn-on rise time	Tr			17		
Turn-off delay time	$t_{d(off)}$			24		
Turn-off fall time	Tf			8		
Dynamic						
Input capacitance	Ciss	V_{GS}=0V, V_{DS}=-10V, f=1.0MHz		400		pF
Output capacitance	Coss			90		
Reverse transfer capacitance	Crss			60		

Typical Performance Characteristics

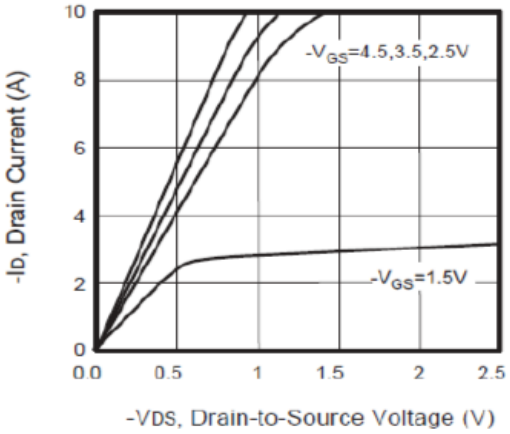


Figure 1. Output Characteristics

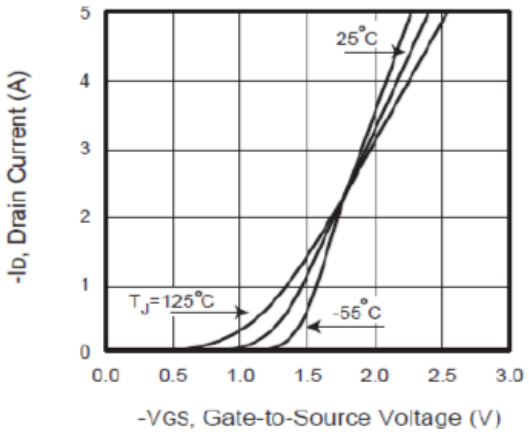


Figure 2. Transfer Characteristics

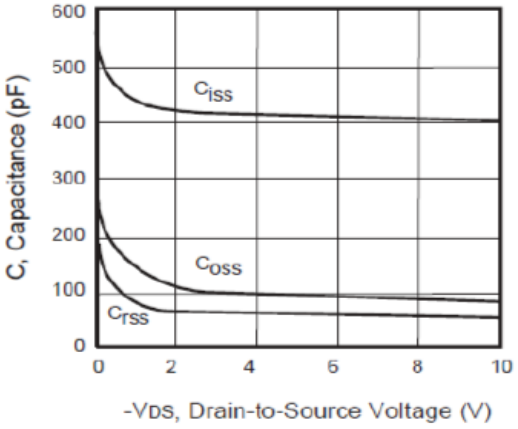


Figure 3. Capacitance

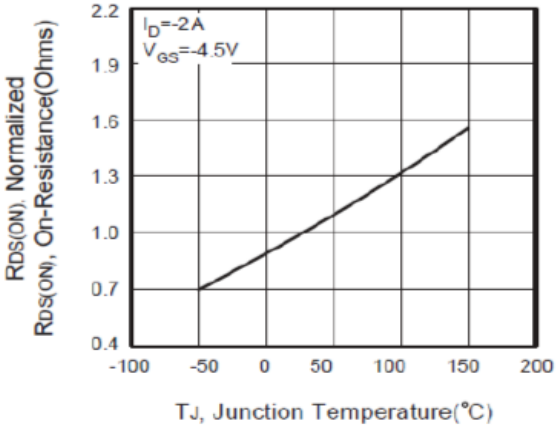


Figure 4. On-Resistance Variation with Temperature

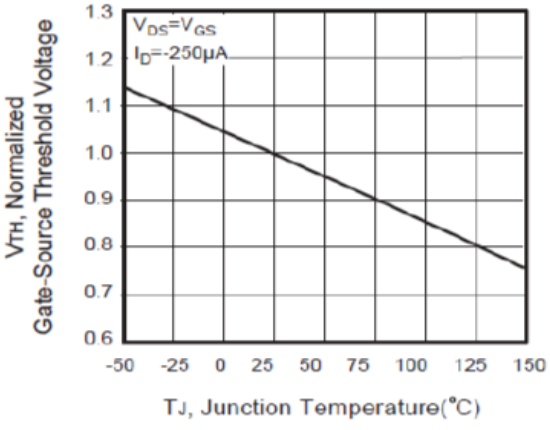


Figure 5. Gate Threshold Variation with Temperature

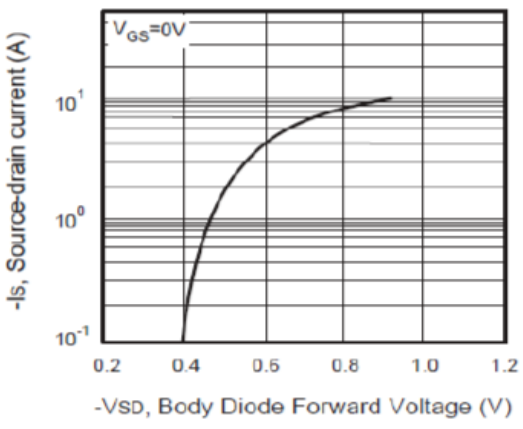


Figure 6. Body Diode Forward Voltage Variation with Source Current

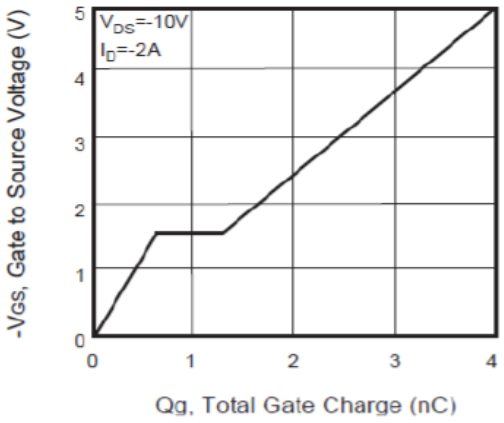


Figure 7. Gate Charge

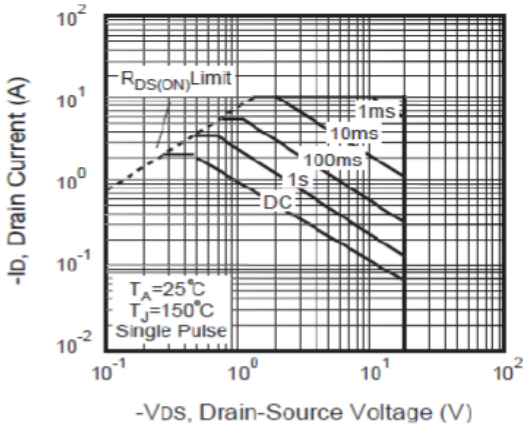


Figure 8. Maximum Safe Operating Area

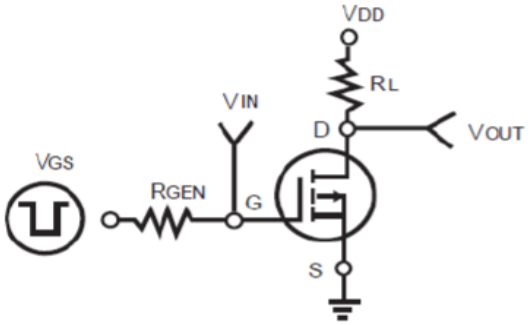


Figure 9. Switching Test Circuit

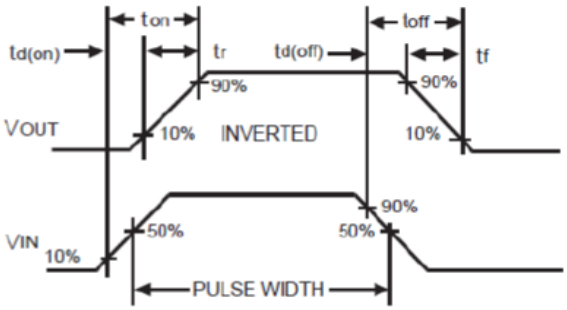


Figure 10. Switching Waveforms

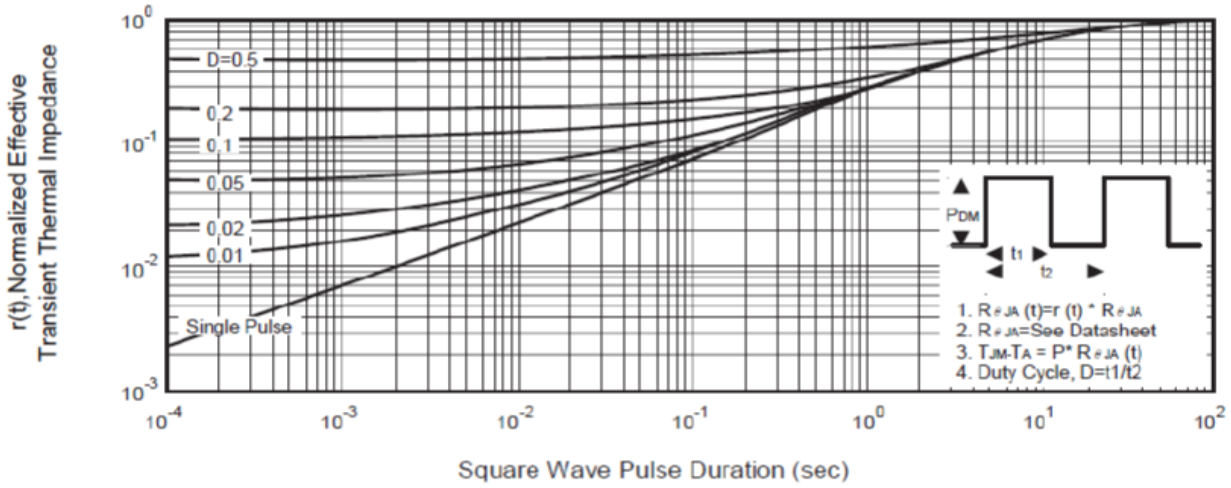
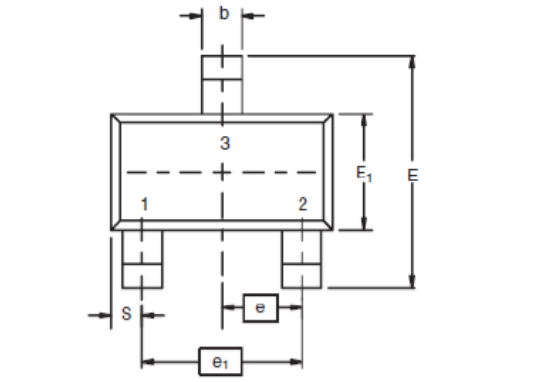
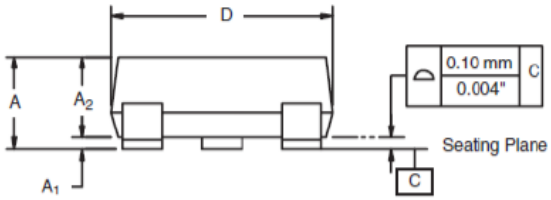


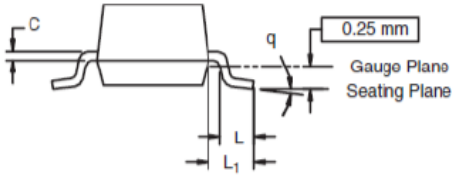
Figure 11. Normalized Thermal Transient Impedance Curve

Packing Information

TSOT-23-3







Dim	MILLIMETERS		INCHES	
	Min	Max	Min	Max
A	0.89	1.12	0.035	0.044
A_1	0.01	0.10	0.0004	0.004
A_2	0.88	1.02	0.0346	0.040
b	0.35	0.50	0.014	0.020
c	0.085	0.18	0.003	0.007
D	2.80	3.04	0.110	0.120
E	2.10	2.64	0.083	0.104
E_1	1.20	1.40	0.047	0.055
e	0.95 BSC		0.0374 Ref	
e_1	1.90 BSC		0.0748 Ref	
L	0.40	0.60	0.016	0.024
L_1	0.64 Ref		0.025 Ref	
S	0.50 Ref		0.020 Ref	
q	3°	8°	3°	8°

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.