ACE1512E

N-Channel Enhancement Mode Field Effect Transistor with ESD Protection

Description

The ACE1512E uses advanced trench technology to provide excellent $R_{DS(ON)}$ and low gate charge. They offer operation over a wide gate drive range from 1.8V to 8V.
It is ESD protected.

Features

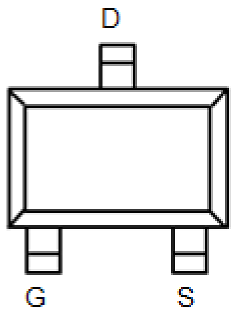
- V_{DS} (V)=20V
- I_D=6.5A (V_{GS}=4.5V)
- $R_{DS(ON)}$<21mΩ (V_{GS}=4.5V)
- $R_{DS(ON)}$<25mΩ (V_{GS}=2.5V)
- $R_{DS(ON)}$<33mΩ (V_{GS}=1.8V)
- ESD Protected : 2000V

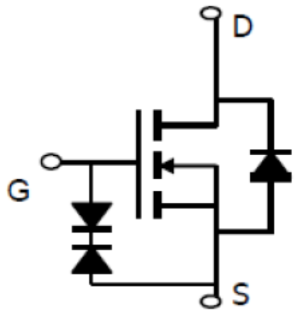
Absolute Maximum Ratings

Parameter		Symbol	Ratings	Unit
Drain-Source Voltage		V_{DSS}	20	V
Gate-Source Voltage		V_{GSS}	±8	V
Drain Current (Continuous)*AC	T_A=25℃	I_D	6.5	A
	T_A=70℃		5.2	
Drain Current (Pulsed)*B		I_{DM}	24	A
Power Dissipation	T_A=25℃	P_D	1	W
	T_A=70℃		0.64	
Operating temperature / storage temperature		T_J/T_{STG}	-55~150	℃

Packaging Type

TSOT-23-3





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N-Channel Enhancement Mode Field Effect Transistor with ESD Protection

Ordering information

ACE1512EBMS + H

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

Electrical Characteristics

T_A=25°C, 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	0.52	1	V
Gate leakage current	I_{GSS}	V_{GS}=±8V, V_{DS}=0V			10	μA
Drain-source on-state resistance	$R_{DS(ON)}$	V_{GS}=4.5V, I_D=6.5A		16.2	21	mΩ
		V_{GS}=2.5V, I_D=5.5A		19.4	25	
		V_{GS}=1.8V, I_D=5A		24.4	33	
Forward transconductance	g_{FS}	V_{DS}=5V, I_D=6.5A		13		S
Diode forward voltage	V_{SD}	I_{SD}=2.5A, V_{GS}=0V		0.67	1.6	V
Maximum body-diode continuous current	I_S				2.5	A
Switching						
Total gate charge	Q_g	V_{GS}=4.5V, V_{DS}=10V, I_D=8A		13.8	17.94	nC
Gate-source charge	Q_{gs}			4.1	5.33	
Gate-drain charge	Q_{gd}			5.6	7.28	
Turn-on delay time	$t_{d(on)}$	V_{GS}=5V, V_{DS}=10V R_L=1.5Ω, R_{GEN}=3Ω		6.2	12.4	ns
Turn-on rise time	t_r			12.7	25.4	
Turn-off delay time	$t_{d(off)}$			51.7	103.4	
Turn-off fall time	t_f			16	32	
Dynamic						
Input capacitance	C_{iss}	V_{GS}=0V, V_{DS}=10V, f=1MHz		1160		pF
Output capacitance	C_{oss}			104		
Reverse transfer capacitance	C_{rss}			29		

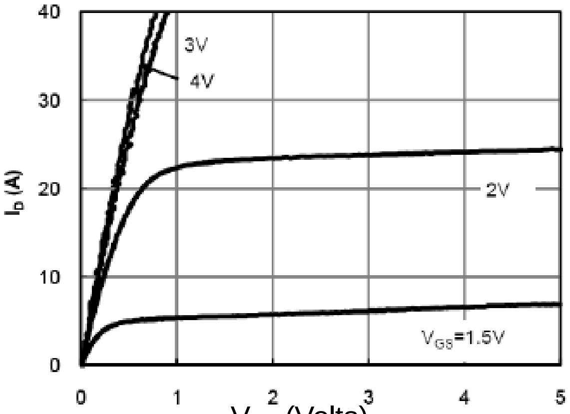
Note :

A: The value of RθJA is measured with the device mounted on 1in² FR-4 board with 2oz. Copper, in a still air environment with TA=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.

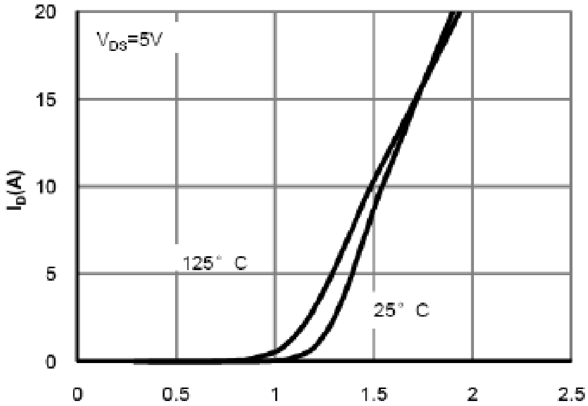
C: The current rating is based on the t≤ 10s junction to ambient thermal resistance rating.

Typical Performance Characteristics



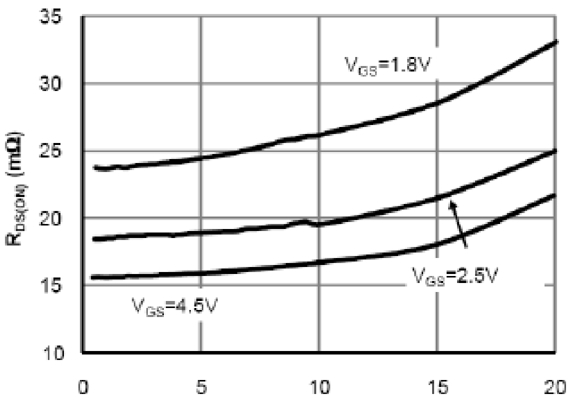
V_{DS} (Volts)

On-Region Characteristics



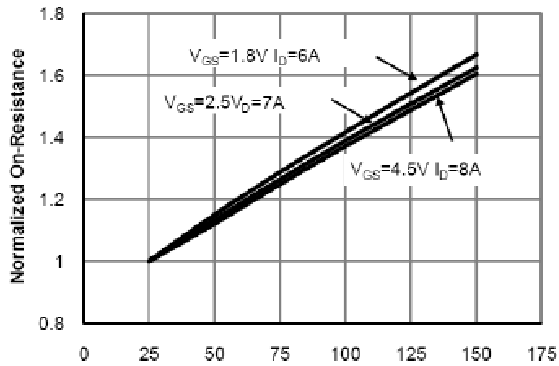
V_{GS} (Volts)

Transfer Characteristics



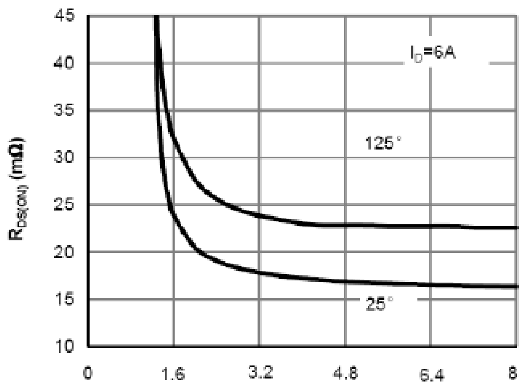
I_D(A)

On-Resistance vs. Drain Current and Gate
Gate Voltage



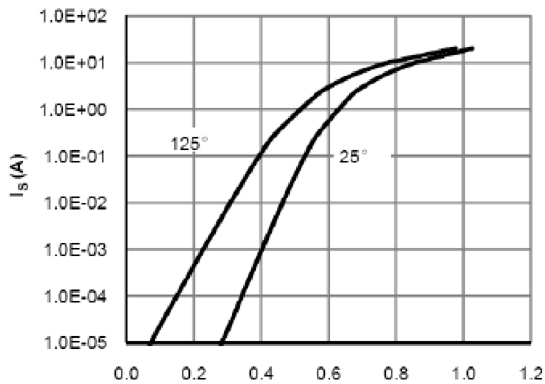
Temperature (^{O}C)

On-Resistance vs. Junction Temperature



V_{GS} (Volts)

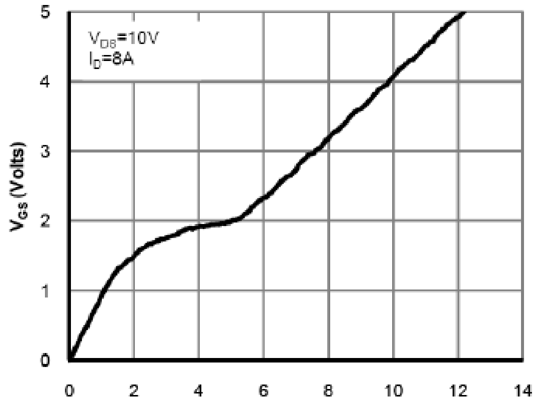
On-Resistance vs. Gate-Source Voltage



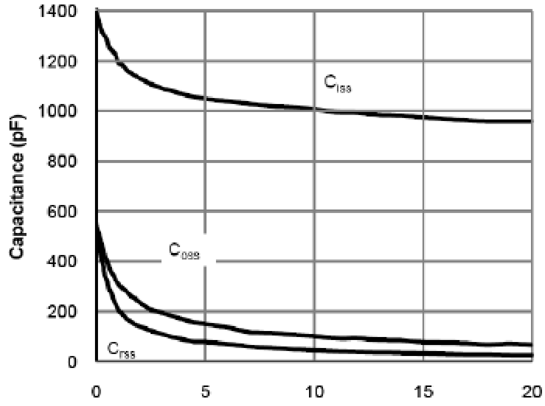
V_{SD} (Volts)

Body-Diode Characteristics

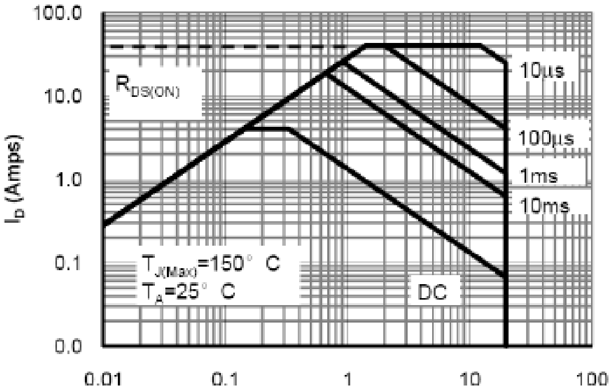
Typical Performance Characteristics



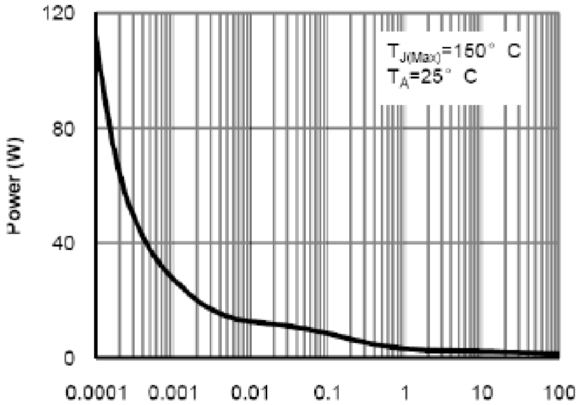
Qg (nC)
Gate-Charge Characteristics



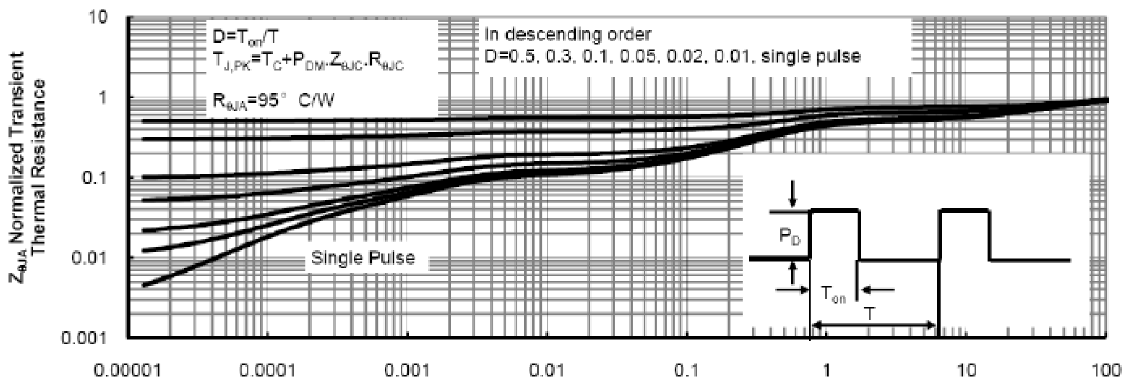
V_{DS} (Volts)
Capacitance Characteristics



V_{DS} (Volts)
Maximum Forward Biased Safe Operating Area



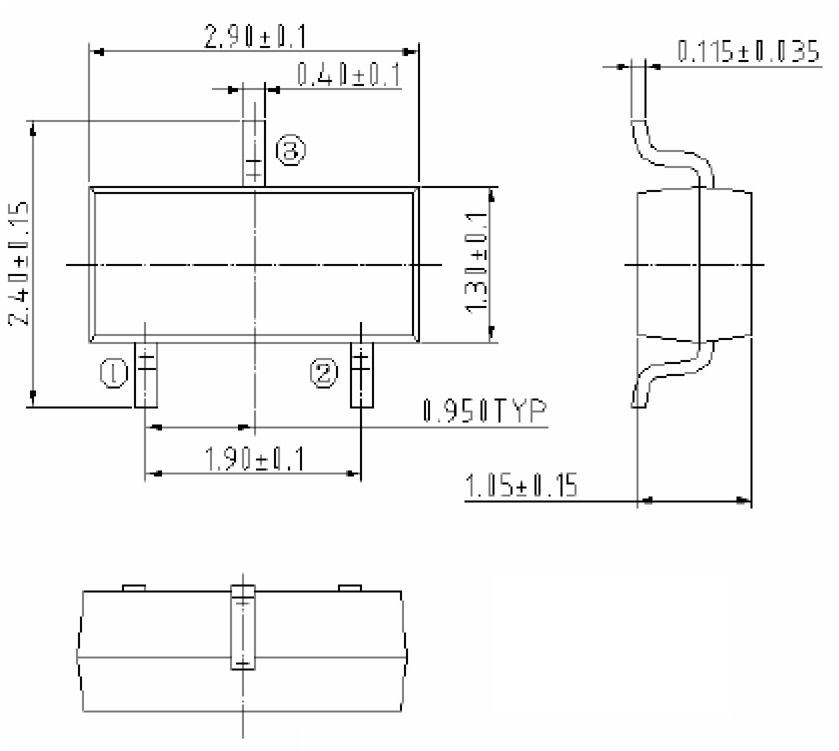
Pulse Width(s)
Single Pulse Power Rating Junction-to-Case



Pulse Width(s)
Normalized Maximum Transient Thermal Impedance

Packing Information

TSOT-23-3



SYMBOLS	DIMENSIONS IN MILLIMETERS		
	MIN	NOM	MAX
A	0.935	0.95	1.10
A1	0.01		0.10
A2	0.85	0.90	0.925
B	0.30	0.40	0.50
C	0.10	0.15	0.25
D	2.70	2.90	3.10
E	2.60	2.80	3.00
E1	1.40	1.60	1.80
e	0.95BSC		
e1	1.90BSC		
L	0.30	0.40	0.60
L1	0.60REF		
L2	0.25BSC		
R	0.10		
Θ	0°	4°	8°
Θ1	7°NOM		

nit: mm

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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