



ACE14201T

P-Channel Enhancement Mode Power MOSFET

Description

The ACE14201T uses advanced trench technology and design to provide excellent $R_{DS(ON)}$ with low gate charge. It can be used in a wide variety of applications.

Features

- $V_{DS} (V) = -20V$ $I_D = -14A$
- $R_{DS(ON)} \leq 8.5m\Omega$ ($V_{GS} = -4.5V$)
- $R_{DS(ON)} \leq 12m\Omega$ ($V_{GS} = -2.5V$)
- $R_{DS(ON)} \leq 17m\Omega$ ($V_{GS} = -1.8V$)

Absolute Maximum Ratings @ $T_A=25^\circ C$ unless otherwise noted

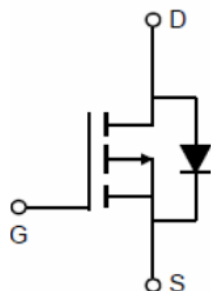
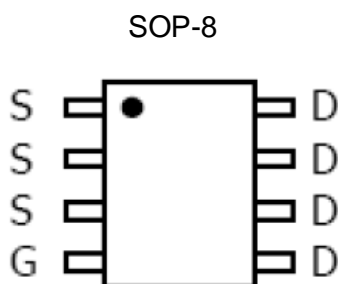
Parameter	Symbol	Max	Unit
Drain-Source Voltage	V_{DSS}	-20	V
Gate-Source Voltage	V_{GSS}	± 12	V
Drain Current (Continuous)*AC	I_D	$T_A=25^\circ C$	-14
		$T_A=100^\circ C$	-8.8
Drain Current (Pulsed)*B	I_{DM}	-56	A
Avalanche energy $L=0.1mH$	E_{AS}, E_{AR}	22	mJ
Power Dissipation	$T_A=25^\circ C$	P_D	2
Operating temperature / storage temperature	T_J/T_{STG}	-55~150	$^\circ C$
Thermal Resistance ,Junction-to-Ambient*	$R_{\theta JA}$	62	$^\circ C/W$

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 $T_A=25^\circ C$. 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 $t \leq 10s$ junction to ambient thermal resistance rating.

Packaging Type



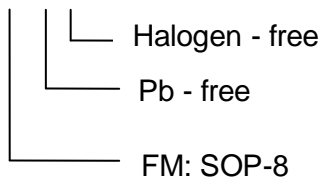


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Ordering information

ACE14201T XX + H



Electrical Characteristics $T_A=25^\circ\text{C}$, unless otherwise specified.

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Static						
Drain-source breakdown voltage	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=-250\mu A$	-20			V
Zero gate voltage drain current	I_{DSS}	$V_{DS}=-20V, V_{GS}=0V$			-1	μA
Gate threshold voltage	$V_{GS(th)}$	$V_{GS}=V_{DS}, I_{DS}=-250\mu A$	-0.3	-0.6		V
Gate leakage current	I_{GSS}	$V_{GS}=\pm 12V, V_{DS}=0V$			± 100	nA
Drain-source on-state resistance	$R_{DS(ON)}$	$V_{GS}=-4.5V, I_D=-8A$		6.5		m Ω
		$V_{GS}=-2.5V, I_D=-5A$		9		
		$V_{GS}=-1.8V, I_D=-3A$		12		
Forward trans conductance	g_{FS}	$V_{DS}=-10V, I_D=-5A$		20		S
Diode forward voltage	V_{SD}	$I_{SD}=-1A, V_{GS}=0V$			-1.2	V
Switching						
Total gate charge	Qg	$V_{GS}=-4.5V, V_{DS}=-10V, I_D=-5A$		44.4		nC
Gate-source charge	Qgs			7.2		
Gate-drain charge	Qgd			10.2		
Turn-on delay time	$t_{d(on)}$	$V_{GS}=-10V, V_{DD}=-15V,$ $I_D=-1A, R_{GEN} = 6\Omega$		13.2		ns
Turn-on rise time	Tr			68		
Turn-off delay time	$t_{d(off)}$			160		
Turn-off fall time	Tf			154		
Dynamic						
Input capacitance	Ciss	$V_{GS}=0V, V_{DS}=-15V, f=1.0MHz$		4060		pF
Output capacitance	Coss			520		
Reverse transfer capacitance	Crss			400		



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Typical Performance Characteristics

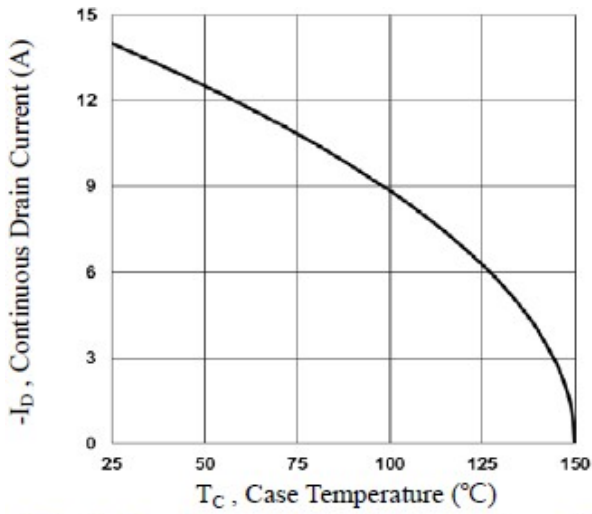


Fig.1 Continuous Drain Current vs. T_c

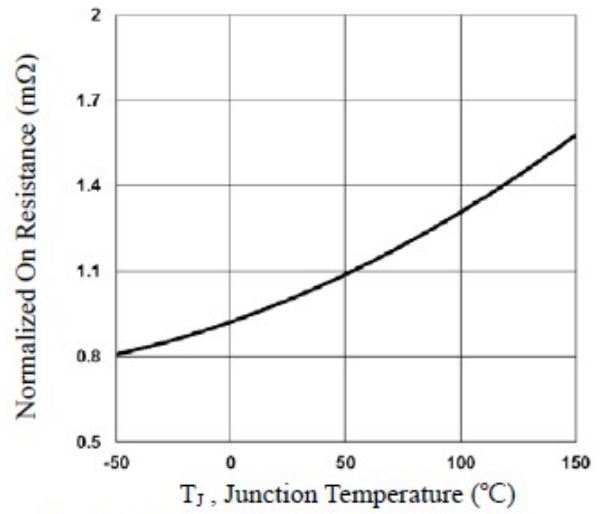


Fig.2 Normalized $R_{DS(on)}$ vs. T_j

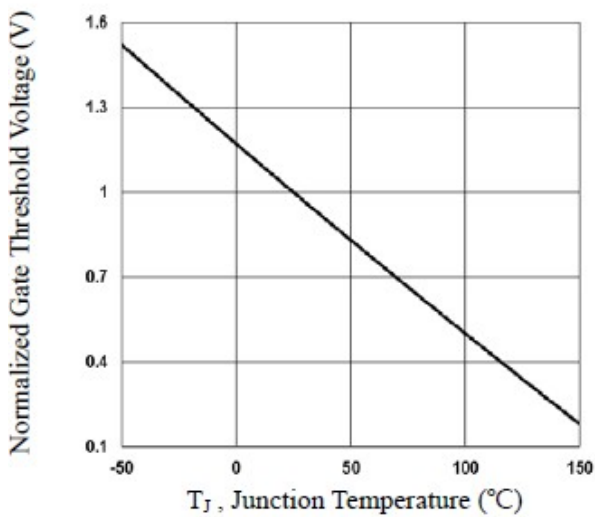


Fig.3 Normalized V_{th} vs. T_j

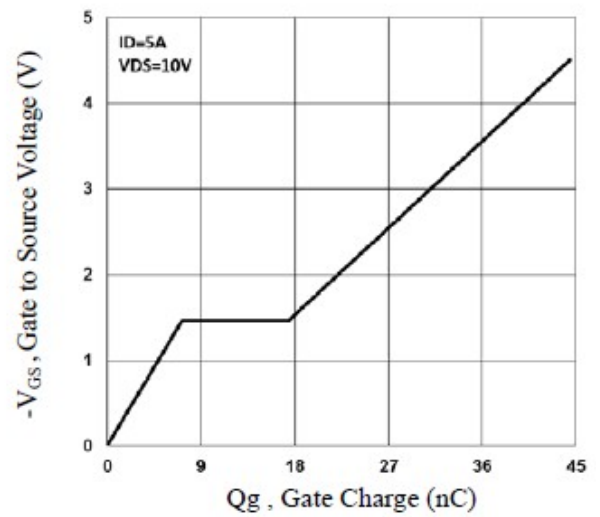


Fig.4 Gate Charge Waveform

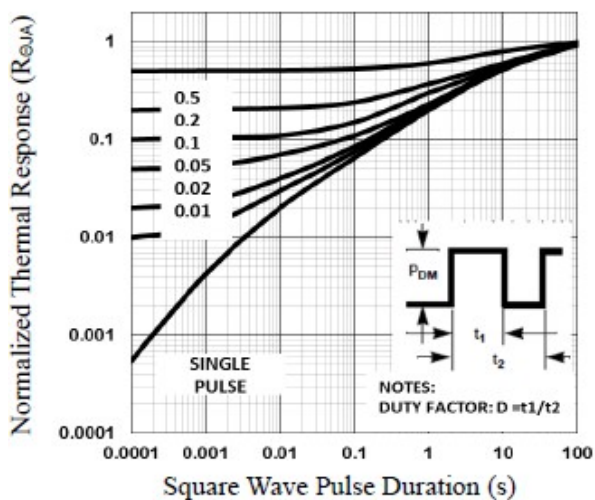


Fig.5 Normalized Transient Response

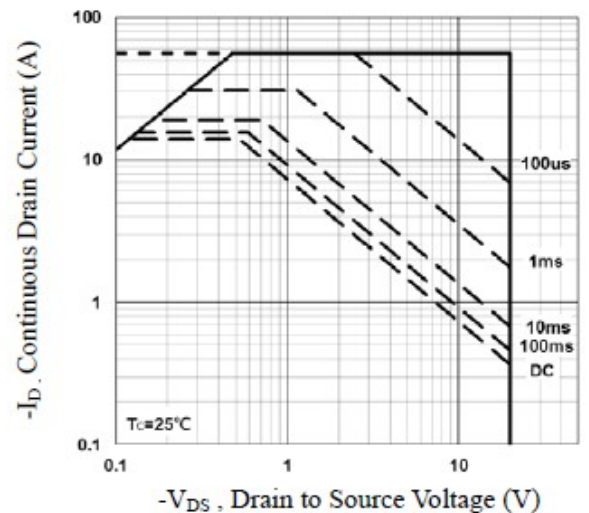


Fig.6 Maximum Safe Operation Area



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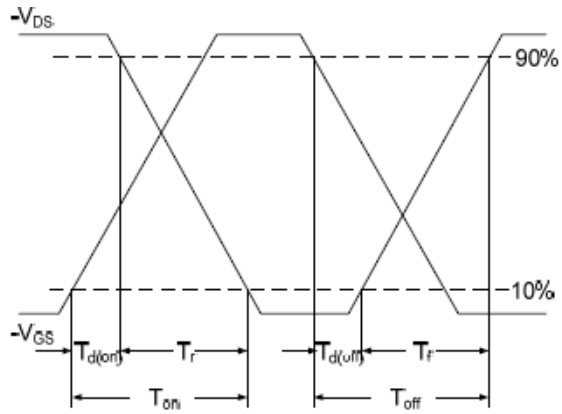


Fig.7 Switching Time Waveform

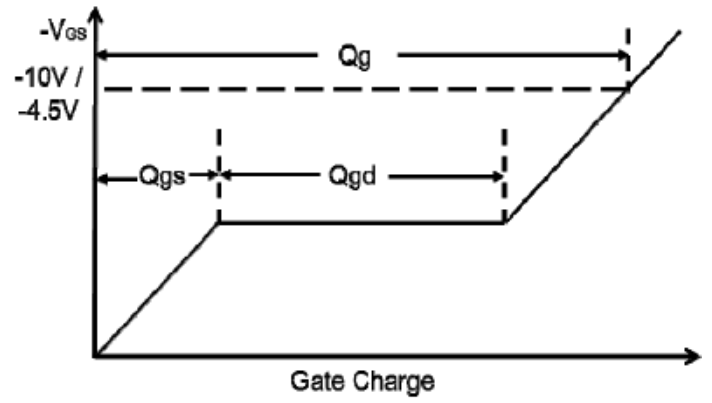


Fig.8 Gate Charge Waveform

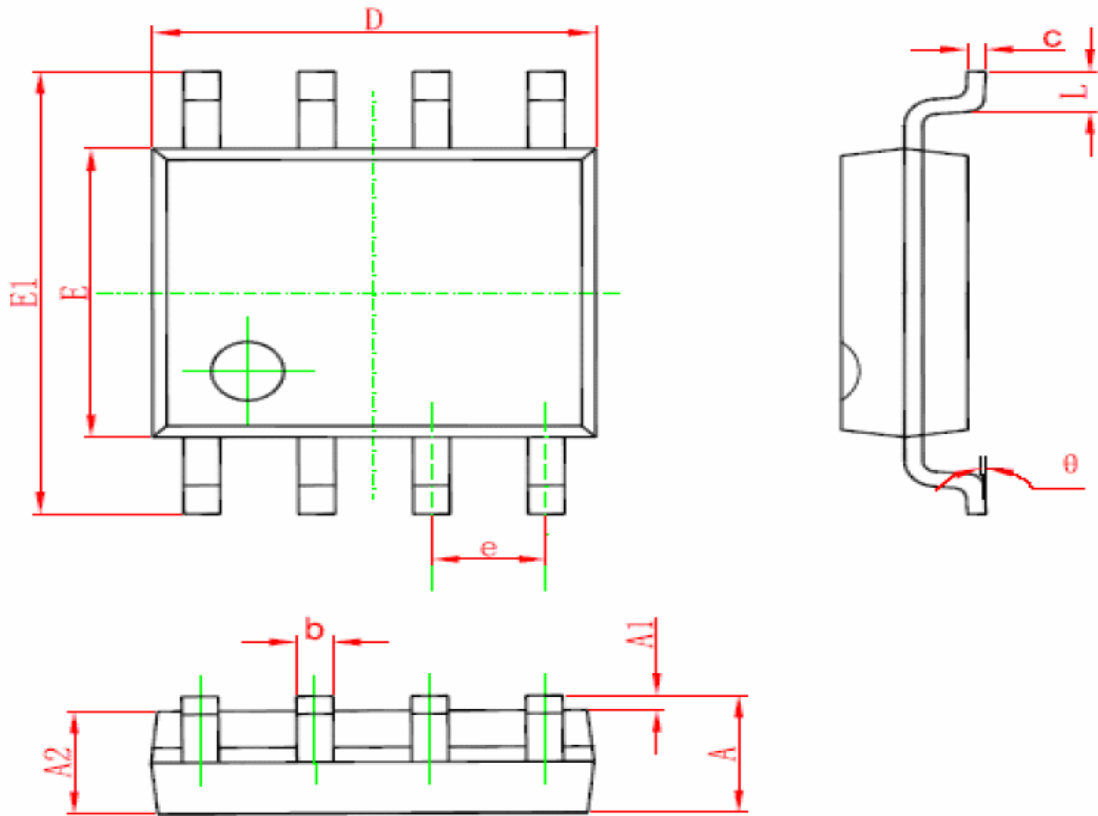


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Packing Information

SOP-8



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.350	1.750	0.053	0.069
A1	0.100	0.250	0.004	0.010
A2	1.350	1.550	0.053	0.061
b	0.330	0.510	0.013	0.020
c	0.170	0.250	0.006	0.010
D	4.700	5.100	0.185	0.200
E	3.800	4.000	0.150	0.157
E1	5.800	6.200	0.228	0.244
e	1.270 (BSC)		0.050 (BSC)	
L	0.400	1.270	0.016	0.050
θ	0°	8°	0°	8°



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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 whose 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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