ACE14201T

P-Channel Enhancement Mode Power MOSFET

Description

The ACE14201T uses advanced trench technology and desgin 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℃ 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	T_A=25℃	I_D	-14	A
	T_A=100℃		-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℃	P_D	2	W
Operating temperature / storage temperature		T_J/T_{STG}	-55~150	℃
Thermal Resistance ,Junction-to-Ambient*		$R_{\theta JA}$	62	℃/W

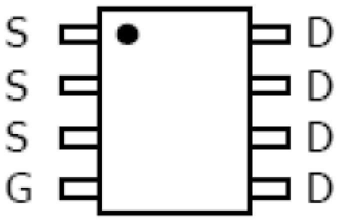
A: The value of $R_{\theta JA}$ is measured with the device mounted on $1in^2$ FR-4 board with 2oz. Copper, in a still air environment with T_A=25°C. The value in any given application depends on the user's specific board design.

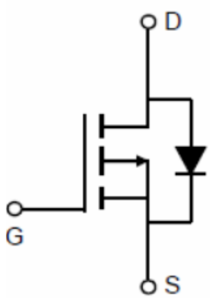
B: Repetitive rating, pulse width limited by junction temperature.

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

Packaging Type

SOP-8





Ordering information

ACE14201T XX + H

- H: Halogen - free
- +: Pb - free
- XX: FM: SOP-8

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	-0.3	-0.6		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=-8A		6.5		mΩ
		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} = 6Ω		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		

Typical Performance Characteristics

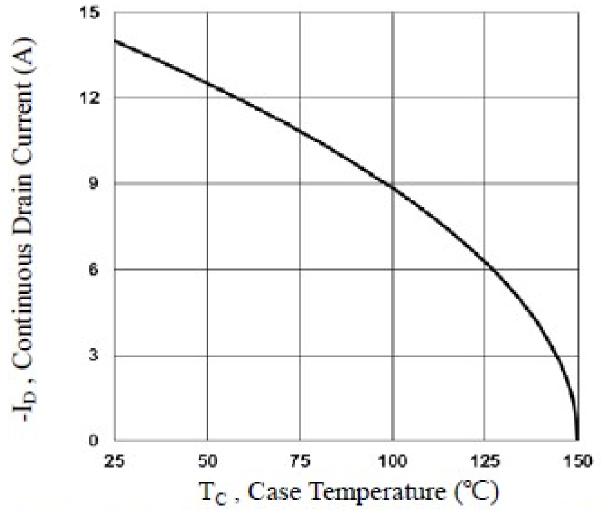


Fig.1 Continuous Drain Current vs. T_C

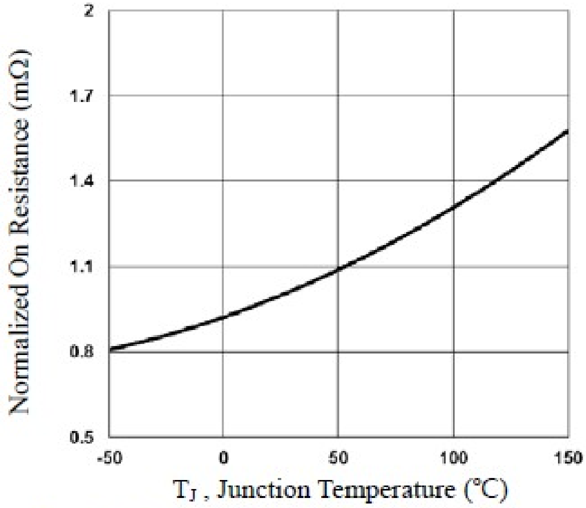


Fig.2 Normalized RDSON vs. T_J

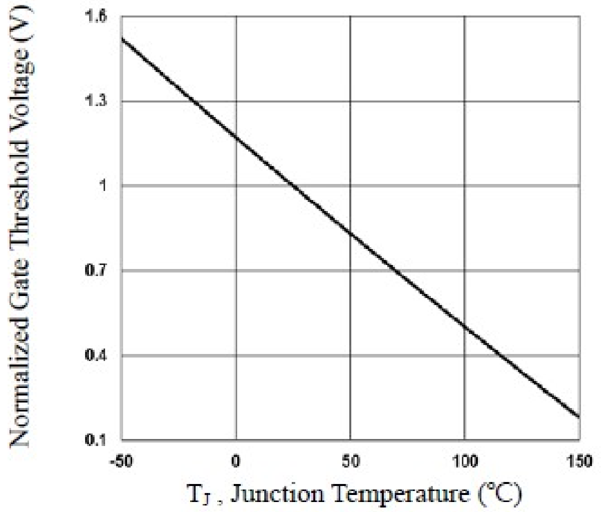


Fig.3 Normalized V_{th} vs. T_J

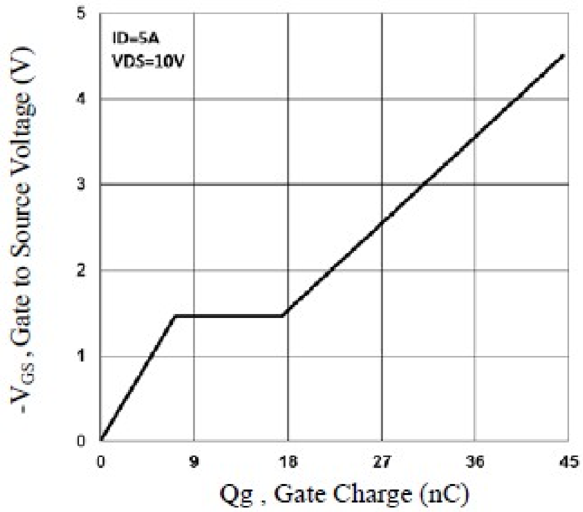


Fig.4 Gate Charge Waveform

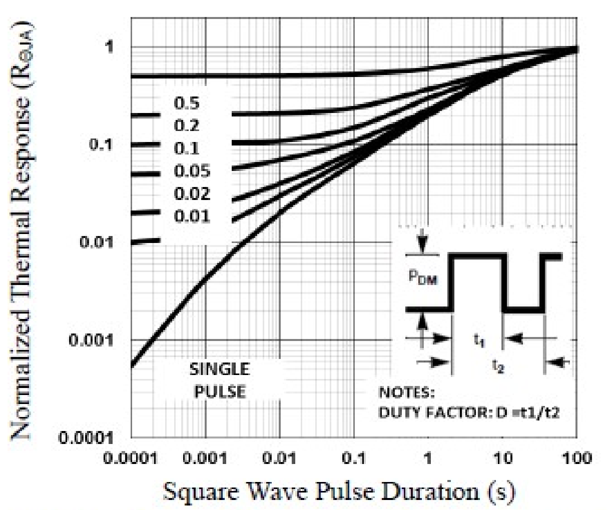


Fig.5 Normalized Transient Response

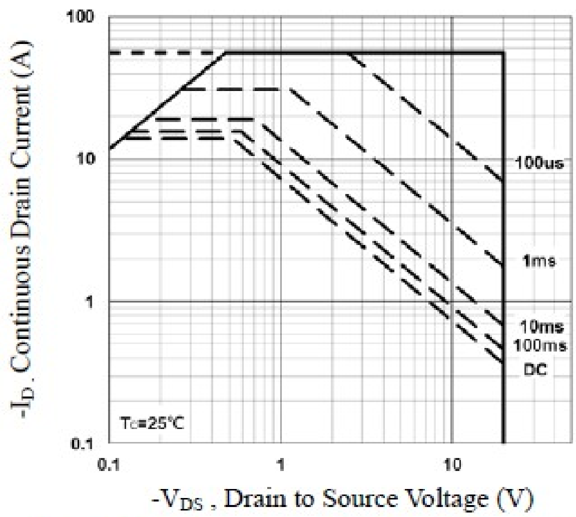


Fig.6 Maximum Safe Operation Area

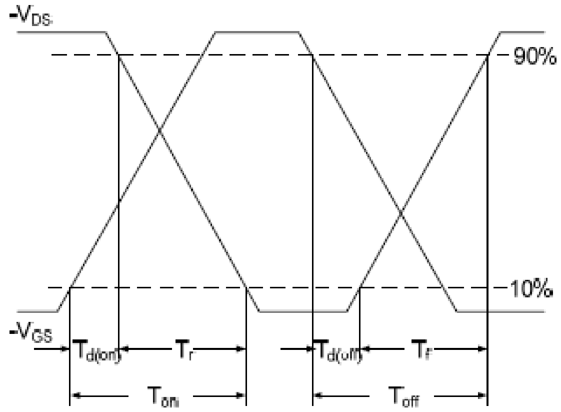


Fig.7 Switching Time Waveform

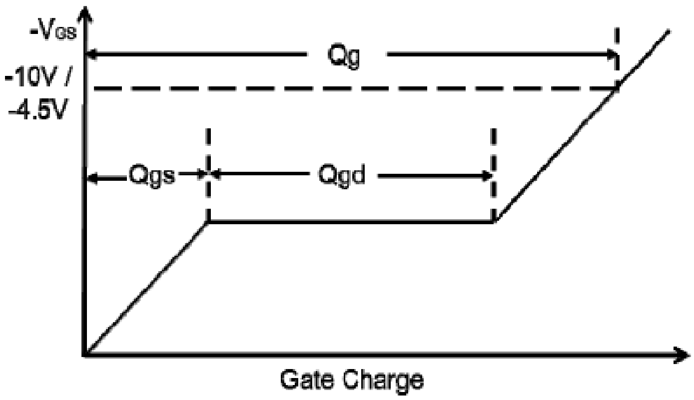
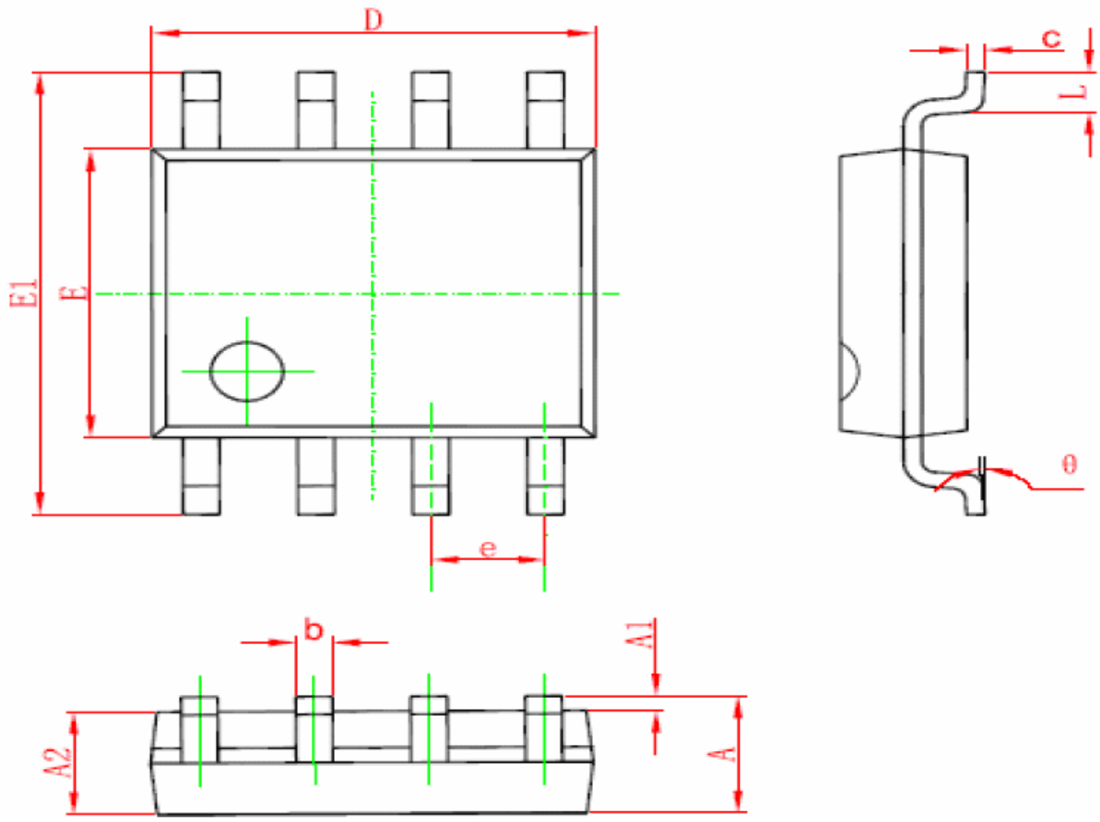


Fig.8 Gate Charge Waveform

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°

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.