ACE14409T

P-Channel Enhancement Mode Field Effect Transistor

Description

The ACE14409T uses advanced trench technology to provide excellent $R_{DS(ON)}$ with low gate charge. It can be used in a wide variety of applications.

Features

- V_{DS}(V)=-30V
- I_D=-12A
- $R_{DS(ON)}$ < 12mΩ (V_{GS}=-10V)
- $R_{DS(ON)}$ < 18mΩ (V_{GS}=-4.5V)

Absolute Maximum Ratings

Parameter		Symbol	Max	Unit
Drain-Source Voltage		V_{DS}	-30	V
Gate-Source Voltage		V_{GS}	±20	V
Drain Current (Continuous) * AC	T_A=25 °C	I_D	-12	A
	T_A=100 °C		-7.5	
Drain Current (Pulse) * B		I_{DM}	-48	
Power Dissipation	T_A=25 °C	P_D	3	W
	T_A=100°C		1.8	
Operating and Storage Temperature Range		T_J,T_{STG}	-55 to 150	°C

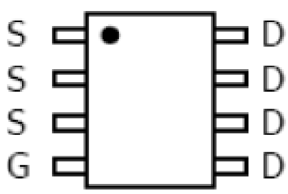
A: The value of $R_{\theta JA}$ is measured with the device mounted on 1in² FR-4 board with 2oz. Copper, in a still air environment with T_A=25°C. The value in any given application depends on the user's specific board design.

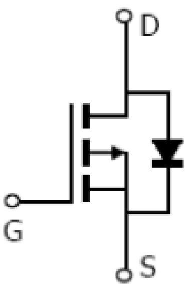
B: Repetitive rating, pulse width limited by junction temperature.

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

Packaging Type

SOP-8





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P-Channel Enhancement Mode Field Effect Transistor

Ordering information

ACE14409T XX + H

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

Electrical Characteristics

T_A=25 °C unless otherwise noted

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Static						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS}=0V, I_D=-250uA	-30			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=-30V, V_{GS}=0V			-1	uA
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_{DS}=-250μA	-1	-1.5	-3	V
Gate Leakage Current	I_{GSS}	V_{GS}=±20V, V_{DS}=0V			±100	nA
Static Drain-Source On-Resistance	$R_{DS(ON)}$	V_{GS}=-10V, I_D=-10A		12	15	mΩ
		V_{GS}=-4.5V, I_D=-7A		18	25	
Forward Transconductance	g_{FS}	V_{GS}=-10V, I_D=-10A	20			S
Diode Forward Voltage	V_{SD}	I_{SD}=-2A, V_{GS}=0V			-1.2	V
Switching						
Total Gate Charge	Q_g	V_{GS}=-10V,V_{DS}=-15V, I_D=-10A,		24		nC
Gate-Source Charge	Q_{gs}			3.5		
Gate-Drain Charge	Q_{gd}			6		
Turn-On Delay Time	$T_{d(on)}$	V_{GS}=-10V,V_{DS}=-15V, I_D=-10A ,R_{GEN}=1Ω		9		ns
Turn-On Rise Time	t_f			8		
Turn-Off Delay Time	$t_{d(off)}$			28		
Turn-Off Fall Time	t_f			10		
Dynamic						
Input Capacitance	C_{iss}	V_{GS}=0V,V_{DS}=-15V, f=1MHz		1750		pF
Output Capacitance	C_{oss}			215		
Reverse Transfer Capacitance	C_{rss}			180		

Typical Performance Characteristics

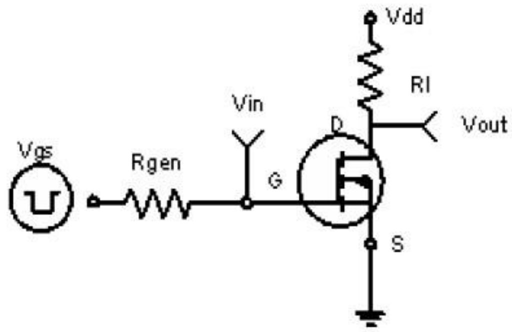


Figure 1:Switching Test Circuit

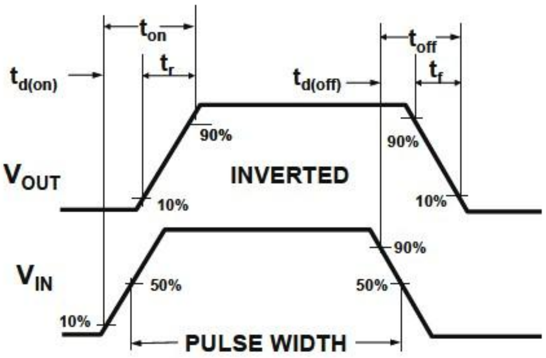


Figure 2:Switching Waveforms

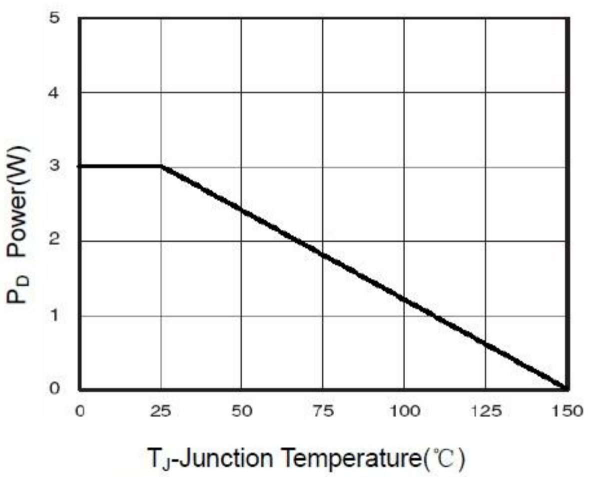


Figure 3 Power Dissipation

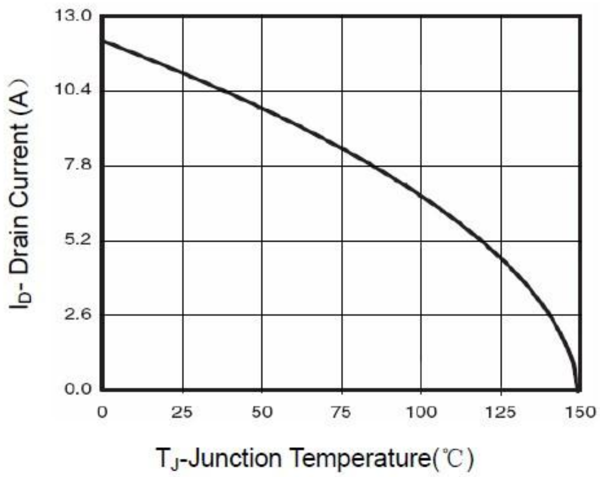


Figure 4 Drain Current

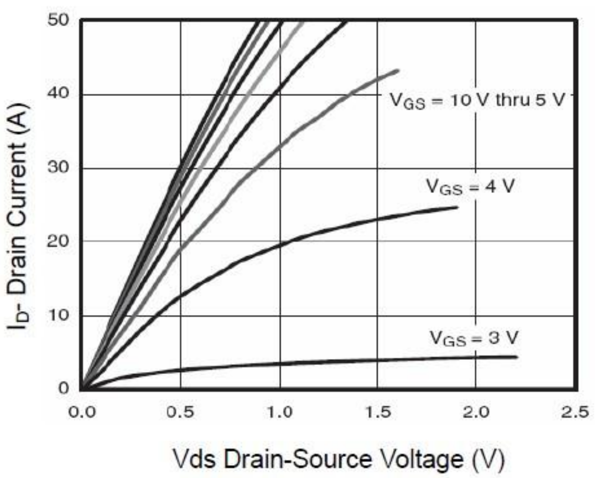


Figure 5 Output Characteristics

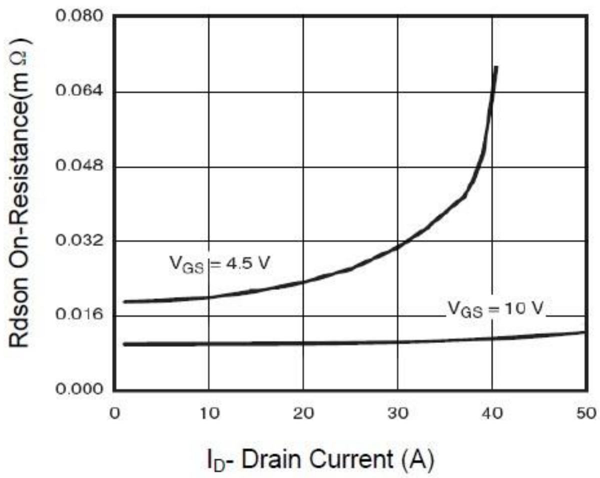


Figure 6 Drain-Source On-Resistance

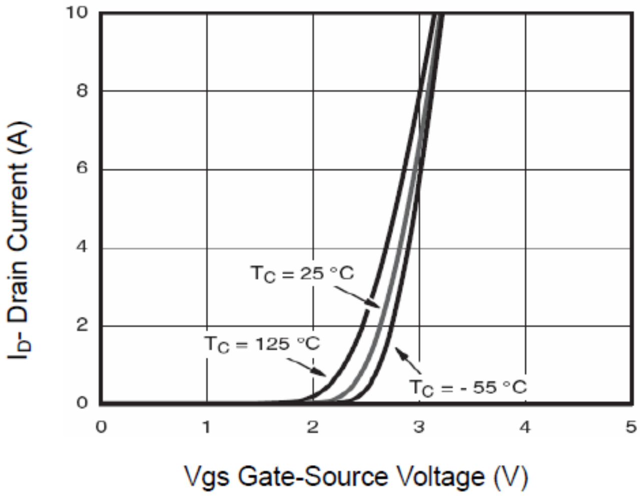


Figure 7 Transfer Characteristics

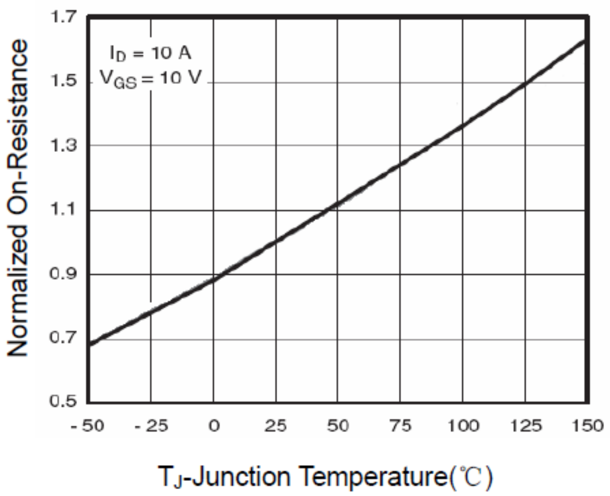


Figure 8 Drain-Source On-Resistance

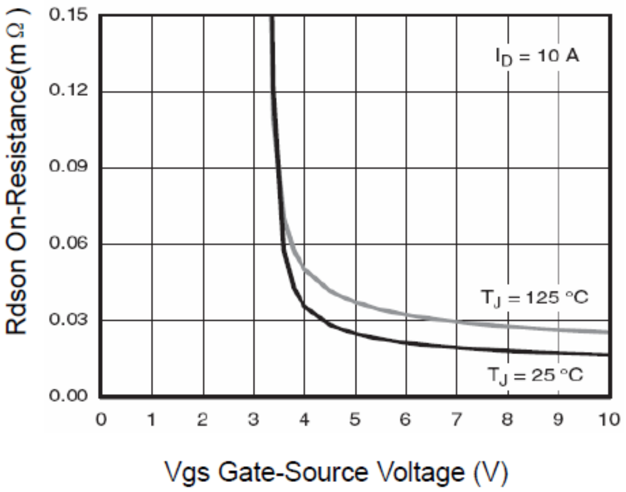


Figure 9 Rdson vs Vgs

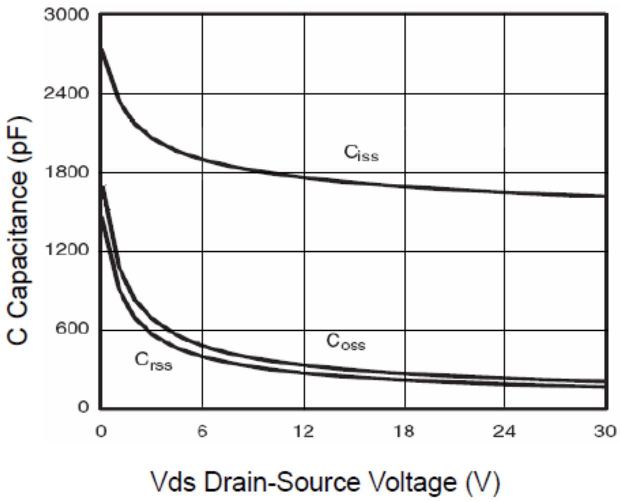


Figure 10 Capacitance vs Vds

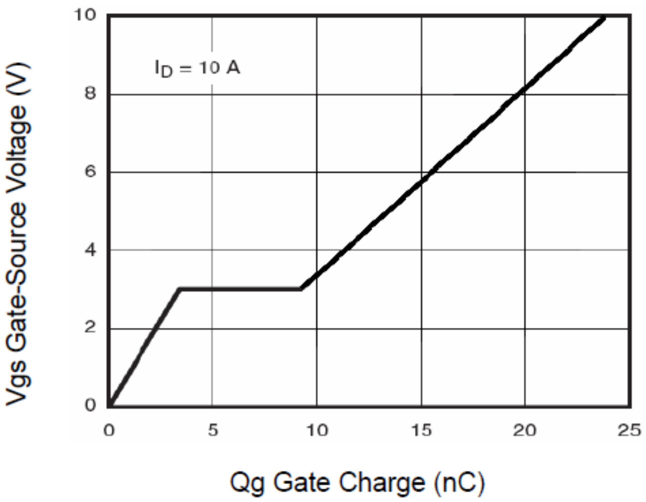


Figure 11 Gate Charge

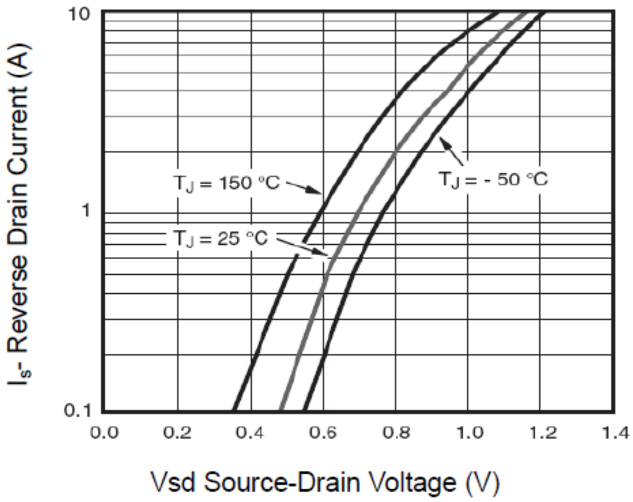


Figure 12 Source- Drain Diode Forward

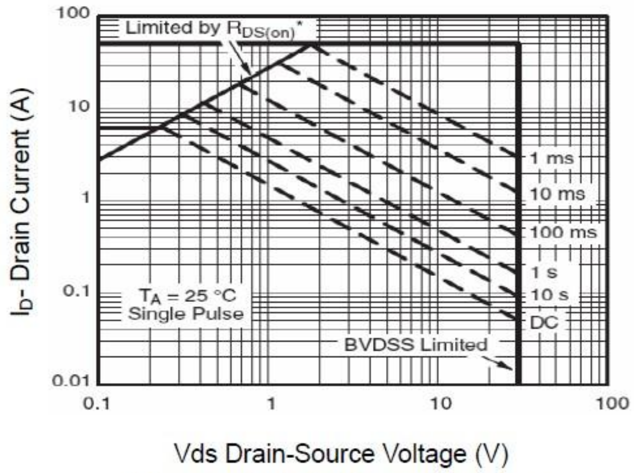


Figure 13 Safe Operation Area

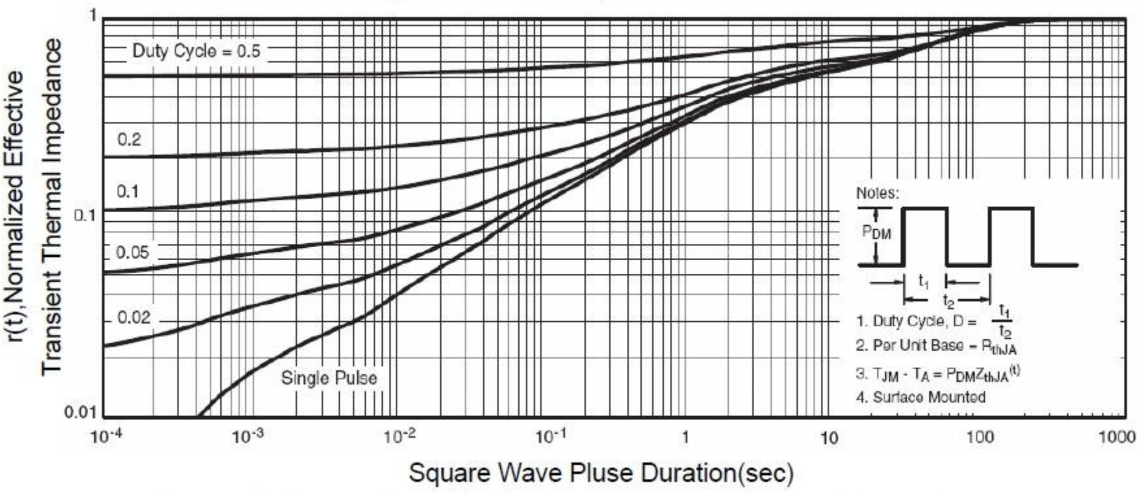
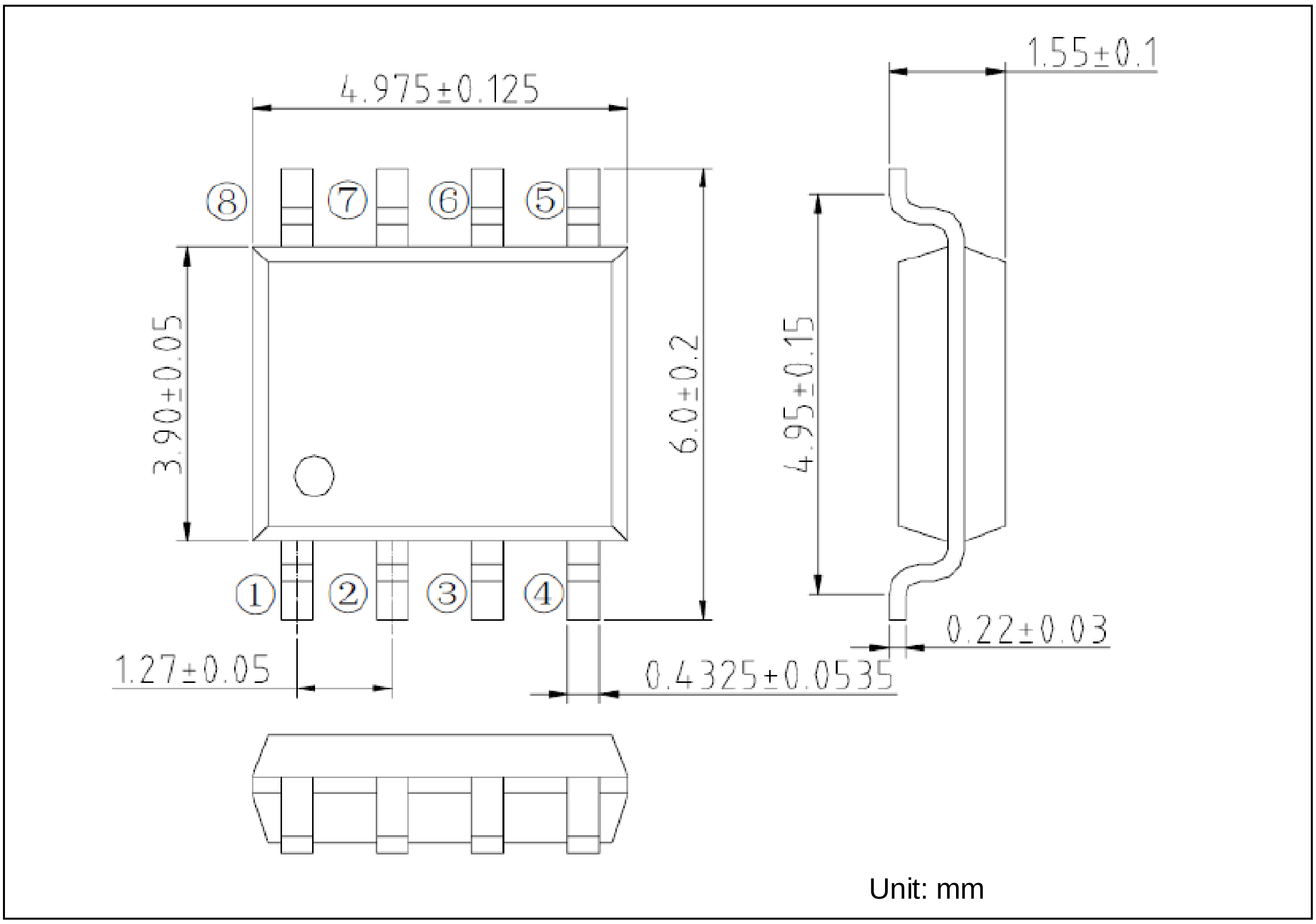


Figure 14 Normalized Maximum Transient Thermal Impedance

Packing Information

SOP-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.