ACE16302A

N & P Pair Enhancement Mode MOSFET

Description

The ACE16302A is the N- and P-Channel enhancement mode power field effect transistors are produced using high cell density, DMOS trench technology. This high density process is especially tailored to minimize on-state resistance and provide superior switching performance. These devices are particularly suited for low voltage applications such as notebook computer power management and other battery powered circuits where high-side switching, low in-line power loss and resistance to transients are needed.

Features

- N-Channel
  30V/2.8A,$R_{DS(ON)}$= 60mΩ@V_{GS}=10V
  30V/2.3A,$R_{DS(ON)}$= 80mΩ@V_{GS}=4.5V
- P-Channel
  -30V/-2.8A,$R_{DS(ON)}$=105mΩ@V_{GS}=- 10V
  -30V/-2.5A,$R_{DS(ON)}$=135mΩ@V_{GS}=-4.5V
- Super high density cell design for extremely low $R_{DS\ (ON)}$
- Exceptional on-resistance and maximum DC current capability

Applications

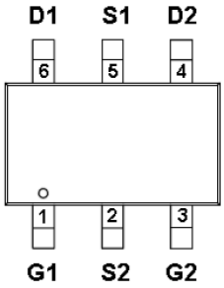
- Power Management in Note book
- Portable Equipment
- Battery Powered System
- DC/DC Converter
- Load Switch
- DSC
- LCD Display inverter

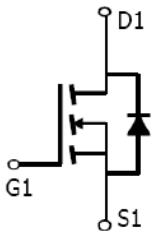
Absolute Maximum Ratings (T_A=25℃ Unless otherwise noted)

Parameter		Symbol	Typical		Unit
			N-Channel	P-Channel	
Drain-Source Voltage		V_{DSS}	30	-30	V
Gate-Source Voltage		V_{GSS}	±20	±20	V
Continuous Drain Current (T_J=150℃)	T_A=25℃	I_D	2.8	-2.8	A
	T_A=70℃		2.3	-2.1	
Pulsed Drain Current		I_{DM}	10	-8	A
Continuous Source Current(Diode Conduction)		I_S	1.25	-1.4	A
Power Dissipation	T_A=25℃	P_D	1.9		W
	T_A=70℃		1.2		
Operating Junction Temperature		T_J	-55~150		°C
Storage Temperature Range		T_{STG}	-55~150		°C
Thermal Resistance-Junction to Ambient	T≦10sec	$R_{\theta JA}$	50	52	°C /W
	Steady State		90	90	

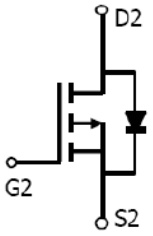
Packaging Type

TSOT-23-6





n-channel



p-channel

Pin Description

Pin	Symbol	Description
1	G1	Gate 1
2	S2	Source 2
3	G2	Gate 2
4	D2	Drain 2
5	S1	Source 1
6	D1	Drain1

Ordering information

ACE16302A XX + H

- Halogen - free
- Pb - free
- GMS: TSOT23-6

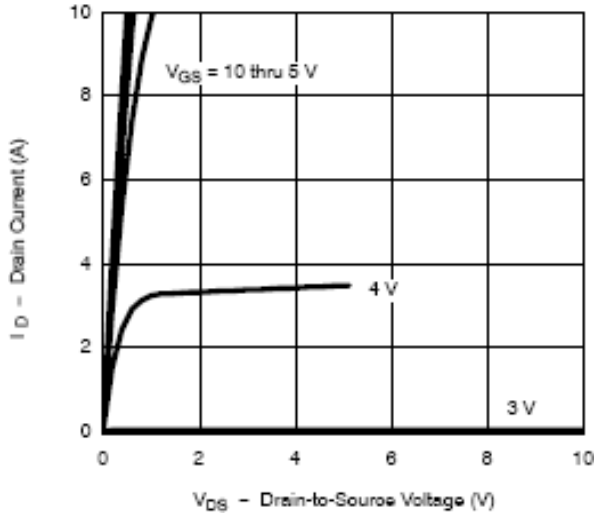
Electrical Characteristics

T_A=25℃, unless otherwise noted.

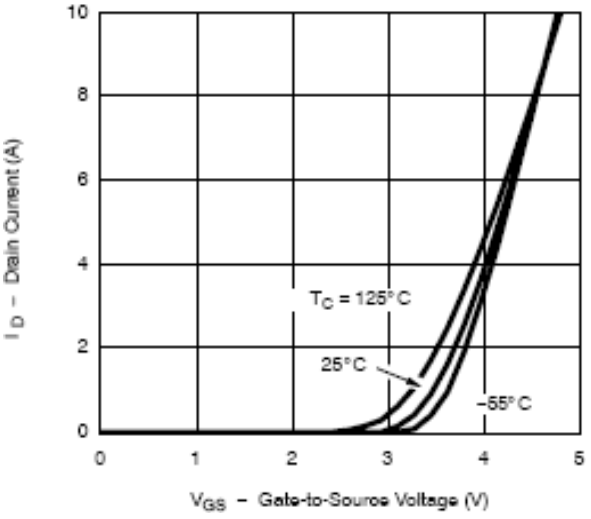
Parameter	Symbol	Conditions		Min.	Typ.	Max.	Unit
Static							
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS}=0V,I_D= 250uA	N-Ch	30			V
		V_{GS}=0V,I_D=-250uA	P-Ch	-30			
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS},I_D=250uA	N-Ch	1		3	
		V_{DS}=V_{GS},I_D=-250uA	P-Ch	1		-3	
Gate Leakage Current	I_{GSS}	V_{DS}=0V,V_{GS}=±20V	N-Ch			±100	uA
		V_{DS}=0V,V_{GS}=±20V	P-Ch			±100	
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}= 24V,V_{GS}=0V	N-Ch			1	uA
		V_{DS}=-24V,V_{GS}=0V	P-Ch			-1	
On-State Drain Current	$I_{D(on)}$	V_{DS}= 24V,V_{GS}=0V,T_J=55℃	N-Ch			10	A
		V_{DS}=-24V,V_{GS}=0V,T_J=55℃	P-Ch			-10	
Drain-Source On-Resistance	$R_{DS(ON)}$	V_{DS}≥ 5V,V_{GS} = 10V	N-Ch	6			mΩ
		V_{DS}≤ -5V,V_{GS} =-10V	P-Ch	-6			
		V_{GS}= 10V,I_D= 2.8A	N-Ch		0.043	0.060	
		V_{GS}=-10V,I_D=-2.8A	P-Ch		0.088	0.105	
Forward Trans Conductance	gfs	V_{GS}= 4.5V,I_D= 2.3A	N-Ch		0.056	0.080	S
		V_{GS}=-4.5V,I_D=-2.5A	P-Ch		0.118	0.135	
Diode Forward Voltage	V_{SD}	V_{DS}=4.5V,I_D=2.8A	N-Ch		4.6		V
		V_{DS}=-10V,I_D=-2.8A	P-Ch		4		
Dynamic							
Total Gate Charge	Q_g	N-Channel V_{DS}=15 ,V_{GS}=4.5V , I_D≡2.0A P-Channel V_{DS}=-15V ,V_{GS}=-4.5V , I_D≡-2.0A	N-Ch		4.5	10	nC
			P-Ch		5.8	10	
Gate-Source Charge	Q_{gs}		N-Ch		0.8		
			P-Ch		0.8		
Gate-Drain Charge	Q_{gd}		N-Ch		1.0		
			P-Ch		1.5		
Turn-On Time	td(on)	N-Channel V_{DD}=15 , R_L=10Ω,V_{GEN}=10V , R_G=3Ω P-Channel V_{DD}=-15V , R_L=15Ω,V_{GEN}=-10V , R_G=3Ω	N-Ch		8	20	ns
			P-Ch		9	20	
	tr		N-Ch		12	30	
			P-Ch		9	20	
Turn-Off Time	td(off)		N-Ch		17	35	
			P-Ch		18	35	
	tf		N-Ch		8	20	
			P-Ch		6	20	

Typical Performance Characteristics (N-Channel)

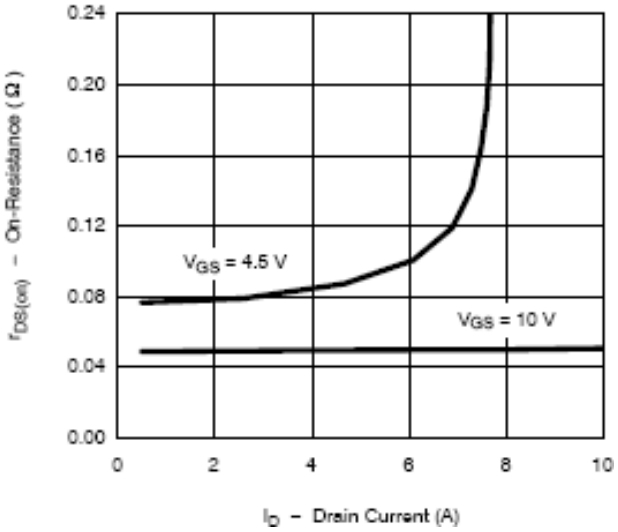
Output Characteristics



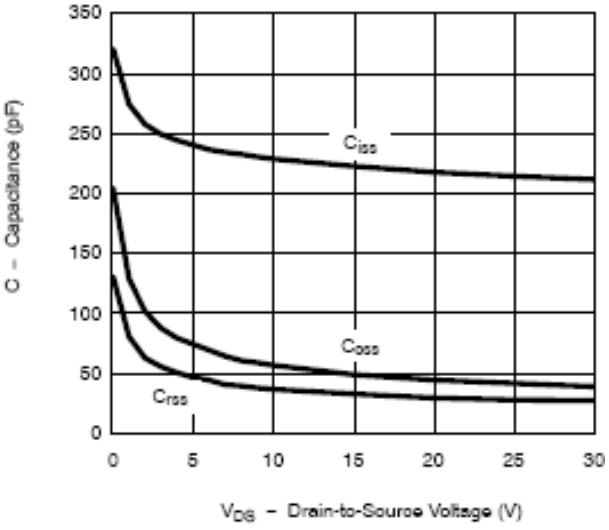
Transfer Characteristics



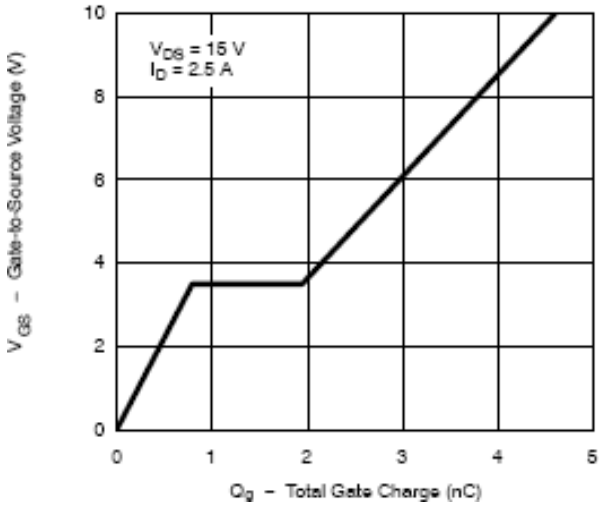
On-Resistance vs. Drain Current



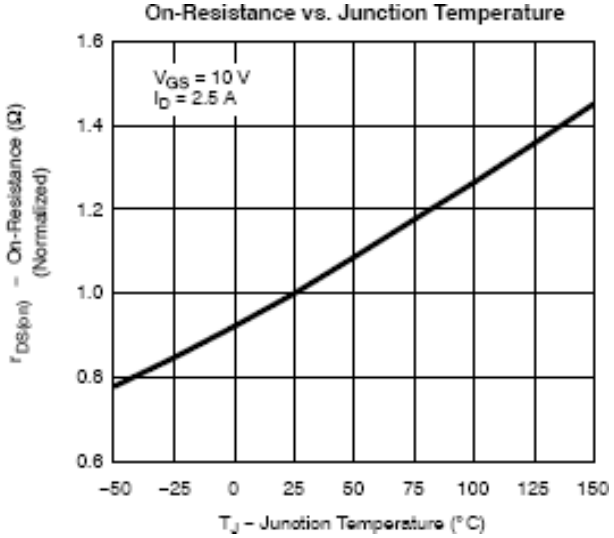
Capacitance



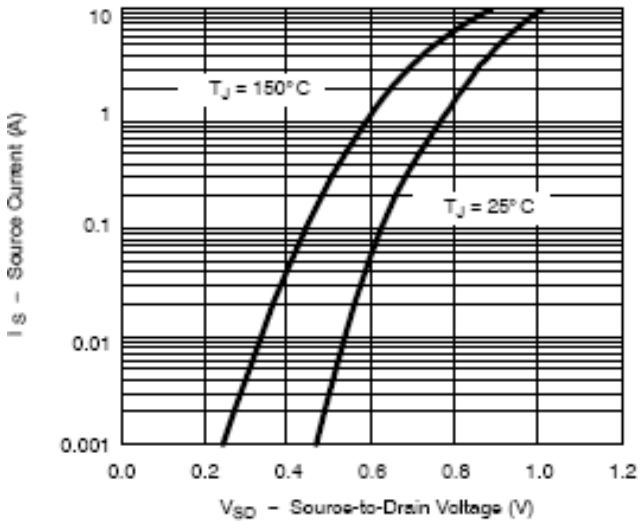
Gate Charge



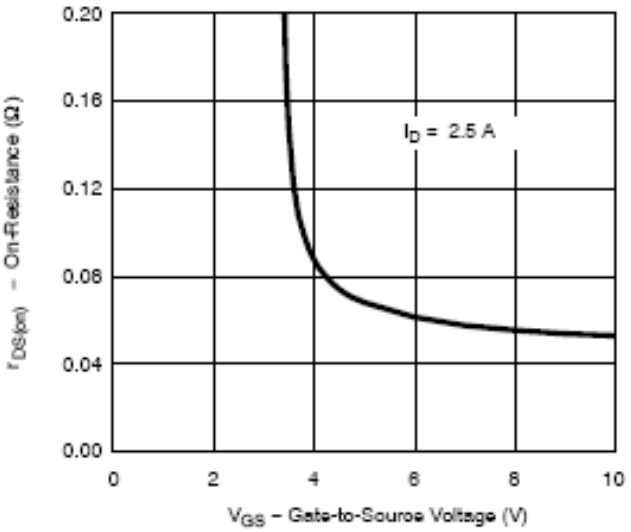
On-Resistance vs. Junction Temperature



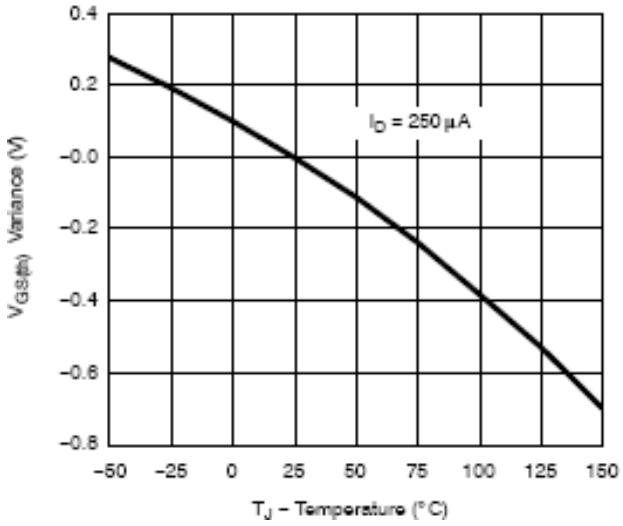
Source-Drain Diode Forward Voltage



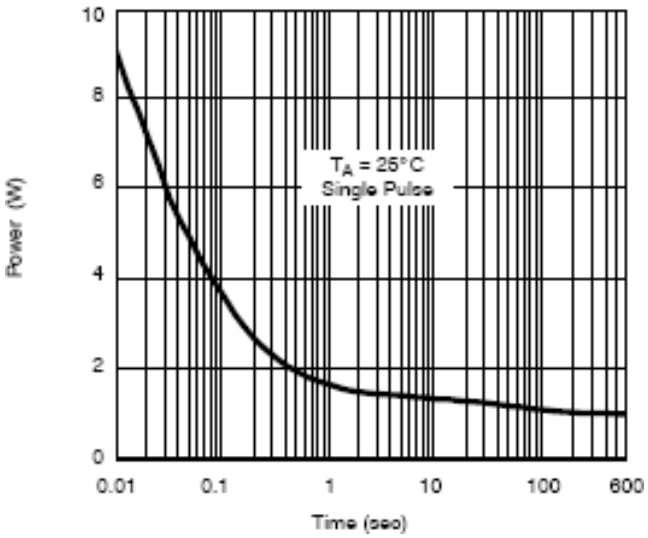
On-Resistance vs. Gate-to-Source Voltage



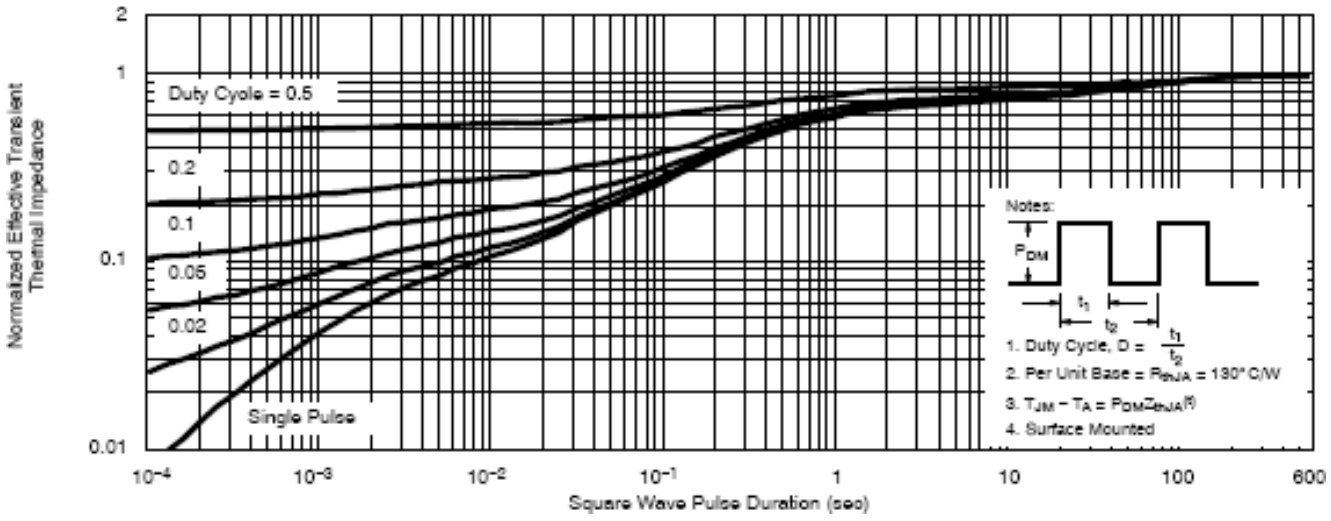
Threshold Voltage



Single Pulse Power

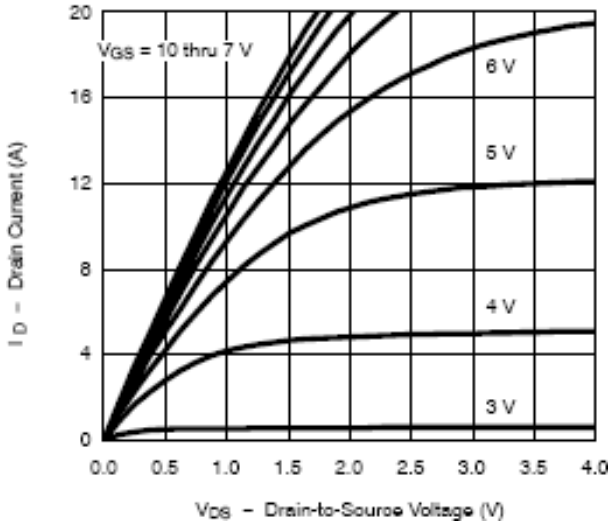


Normalized Thermal Transient Impedance, Junction-to-Ambient

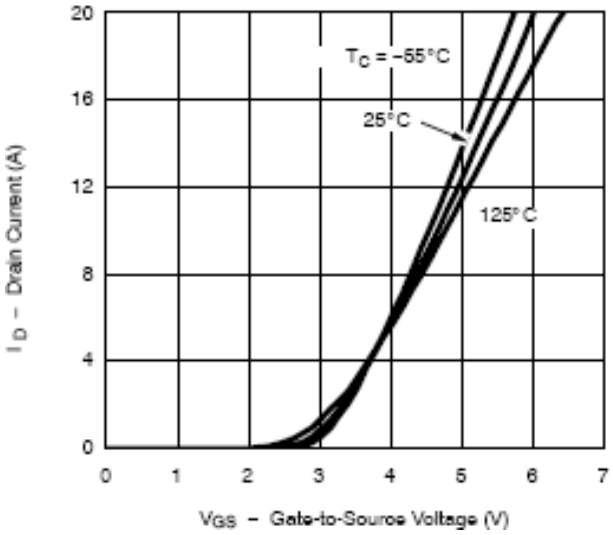


Typical Performance Characteristics (P-Channel)

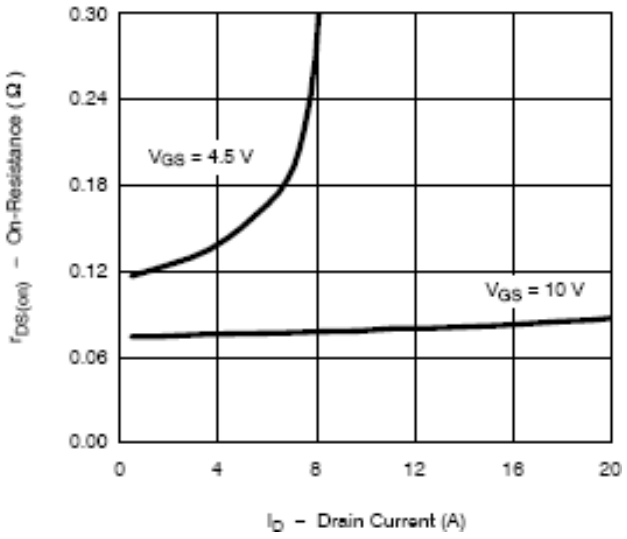
Output Characteristics



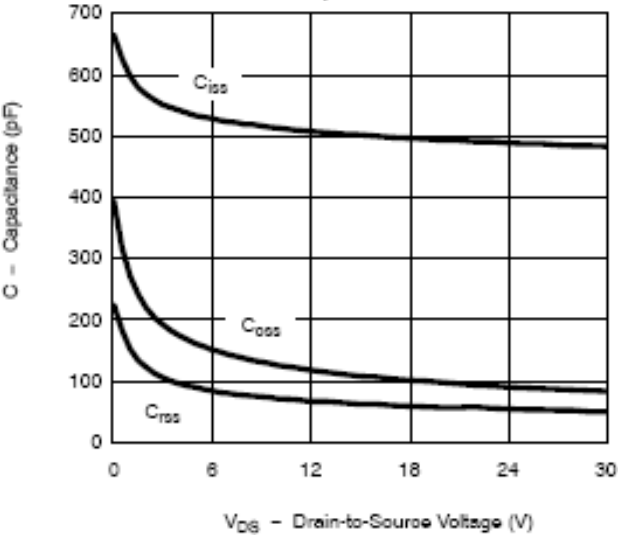
Transfer Characteristics



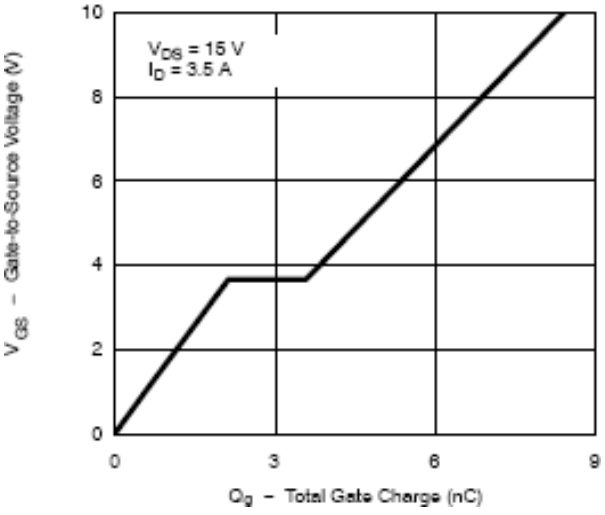
On-Resistance vs. Drain Current



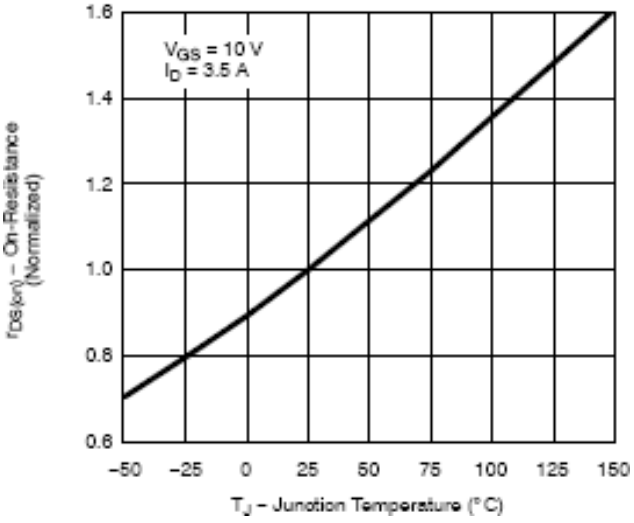
Capacitance



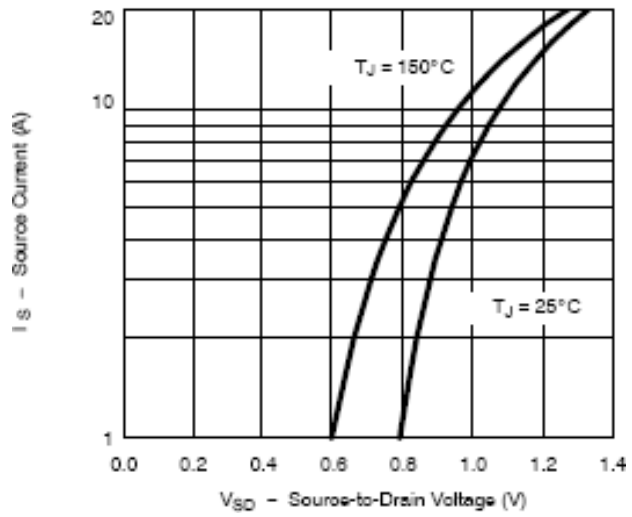
Gate Charge



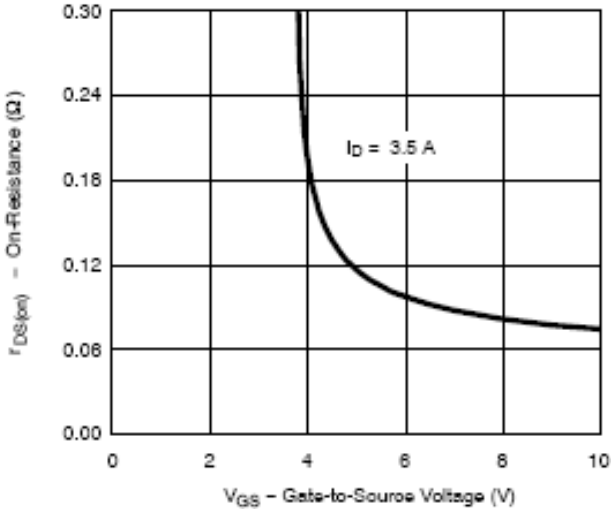
On-Resistance vs. Junction Temperature



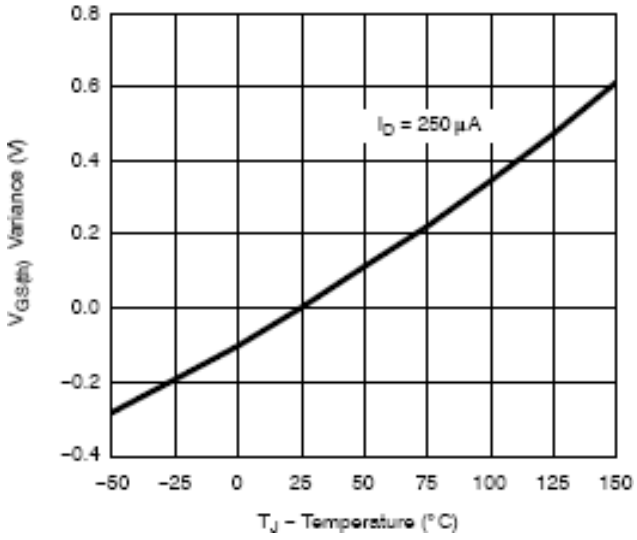
Source-Drain Diode Forward Voltage



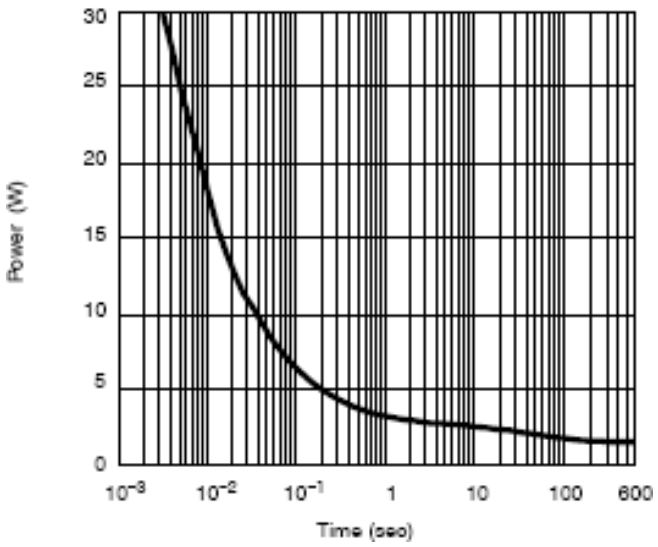
On-Resistance vs. Gate-to-Source Voltage



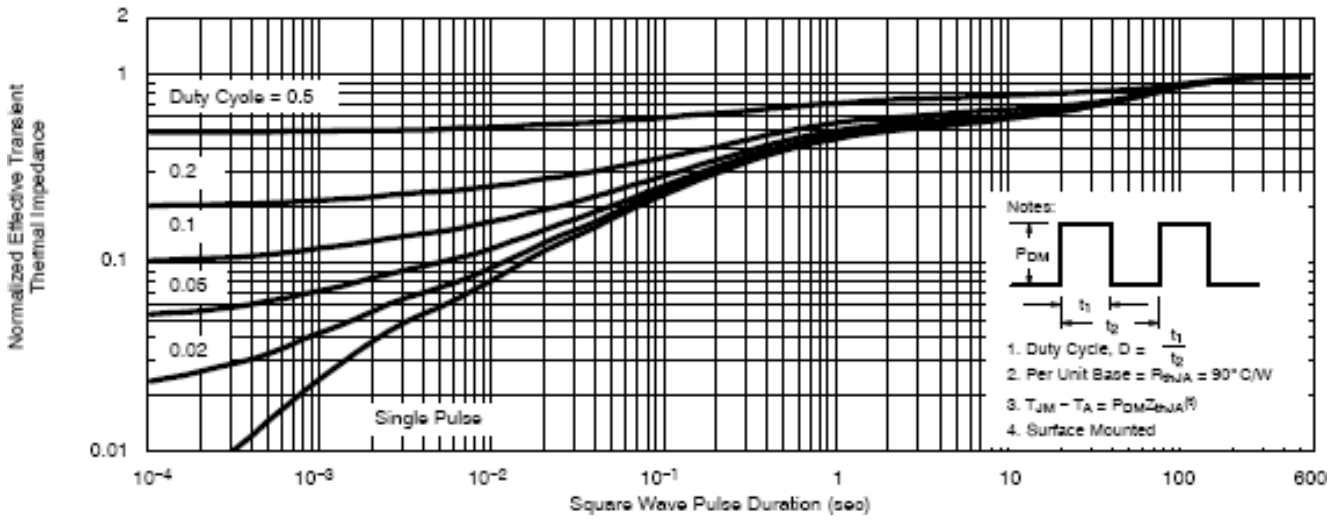
Threshold Voltage



Single Pulse Power

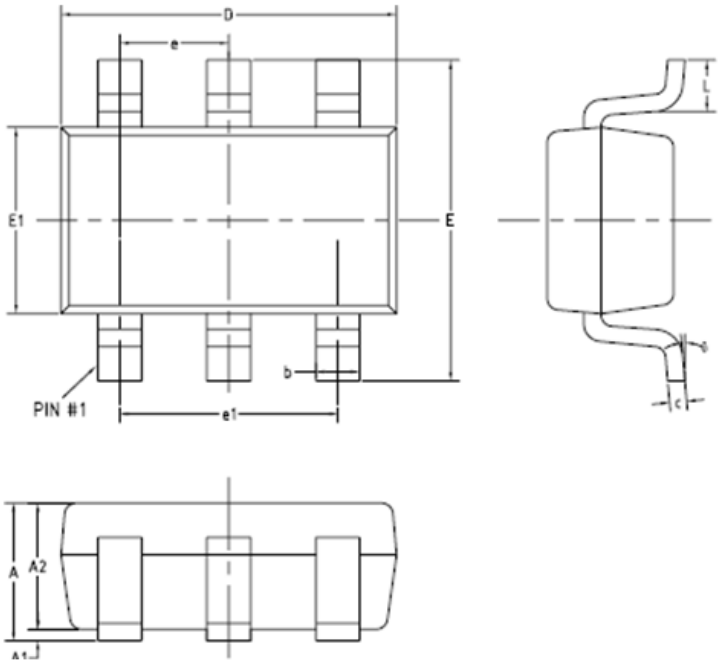


Normalized Thermal Transient Impedance, Junction-to-Ambient



Packing Information

TSOT23-6



Symbol	Min	Typ	Max
A	0.70		0.90
A1	0		0.10
A2	0.70	0.75	0.80
b	0.35		0.50
c	0.08		0.20
D	2.82	2.92	3.02
E	2.65	2.80	2.95
E1	1.60	1.65	1.70
e	0.95 BSC		
e1	1.90 BSC		
L	0.30	0.40	0.60
L1	0.59 REF		
L2	0.25 BSC		
θ	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.