

Description

The ACE632 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
20V/0.95A, RDS(ON)=380mΩ@VGS=4.5V
20V/0.75A, RDS(ON)=450mΩ@VGS=2.5V
20V/0.65A, RDS(ON)=800mΩ@VGS=1.8V
- P-Channel
-20V/1.0A, RDS(ON)= 520mΩ@VGS=-4.5V
-20V/0.8A, RDS(ON)= 700mΩ@VGS=-2.5V
-20V/0.7A, RDS(ON)= 950mΩ@VGS=-1.8V
- Super high density cell design for extremely low RDS(ON)
- Exceptional on-resistance and maximum DC current capability

Application

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

Absolute Maximum Ratings

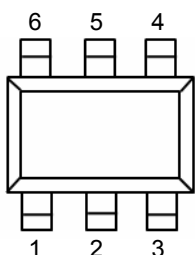
(T_A=25°C Unless otherwise noted)

Parameter	Symbol	Typical		Unit	
		N-Channel	P-Channel		
Drain-Source Voltage	V _{DS}	20	-20	V	
Gate-Source Voltage	V _{GS}	±12	±12	V	
Continuous Drain Current	I _D	T _A =25°C	-1.2	-1.0	A
		T _A =80°C	-0.9	-0.7	
Pulsed Drain Current ¹⁾	I _{DM}	4	-3	A	
Continuous Source Current (Diode Conduction)	I _S	0.6	-0.6		
Power Dissipation	P _D	T _A =25°C	0.3		W
		T _A =70°C	0.19		

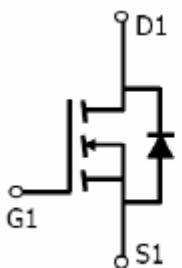
Operating Junction Temperature		T_J	-55 to 150		°C
Storage Temperature Range		T_{STG}	-55 to 150		°C
Thermal Resistance-Junction to Ambient	$T \leq 10\text{sec}$	$R_{\theta JA}$	360	360	°C/W
	Steady State		400	400	

Packaging Type

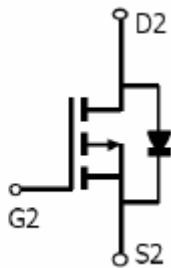
SC-70-6



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



N-Channel

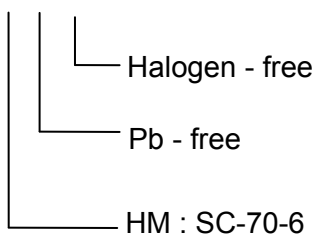


P-Channel

Ordering information

Selection Guide

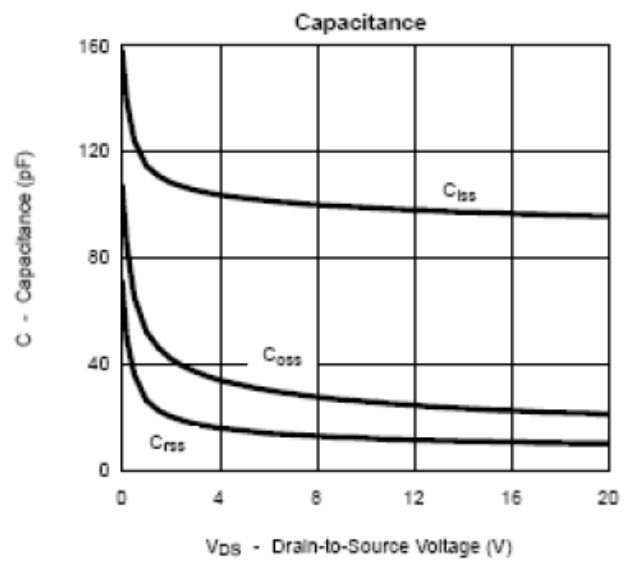
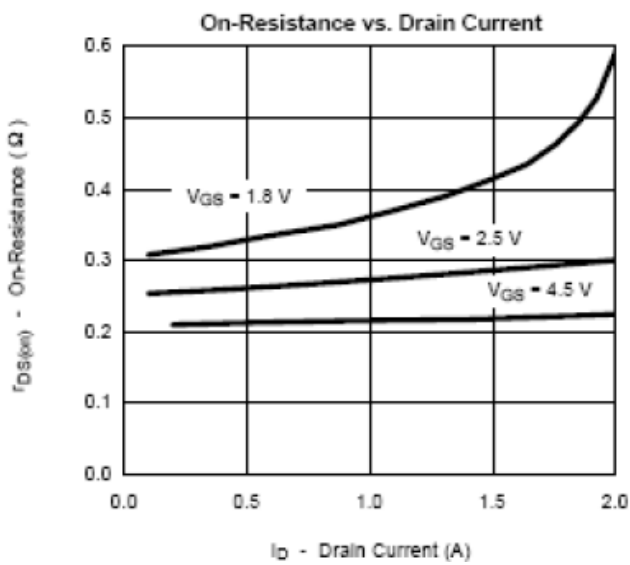
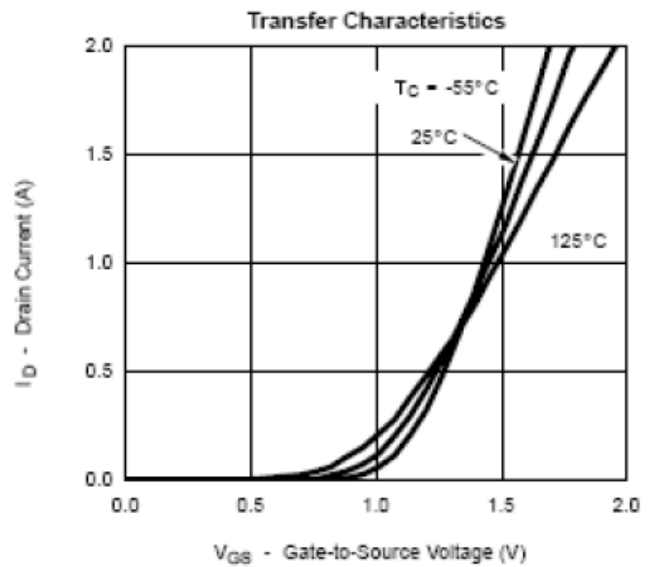
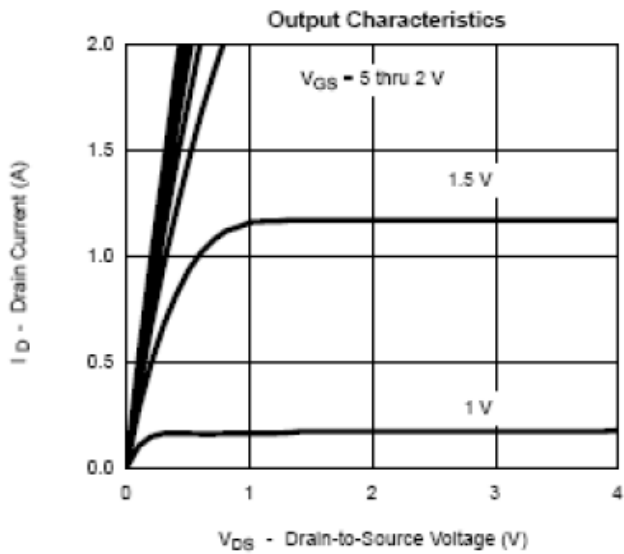
ACE632 XX + H



Electrical Characteristics

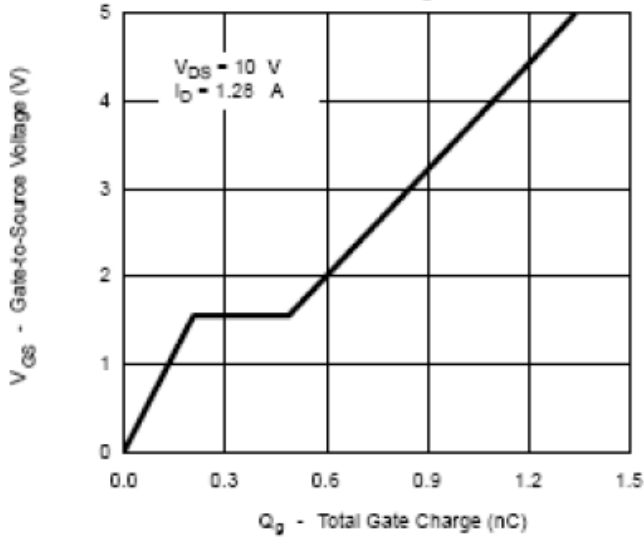
Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit	
Static							
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=250\mu A$	N-Ch	20		V	
		$V_{GS}=0V, I_D=250\mu A$	P-Ch	-20			
Drain-Source On Resistance	$R_{DS(ON)}$	$V_{GS}=4.5V, I_D=0.95A$	N-Ch		0.26	0.38	Ω
		$V_{GS}=-4.5V, I_D=-1.0A$	P-Ch		0.42	0.52	
		$V_{GS}=2.5V, I_D=0.75A$	N-Ch		0.32	0.45	
		$V_{GS}=-2.5V, I_D=-0.8A$	P-Ch		0.58	0.70	
		$V_{GS}=1.8V, I_D=0.65A$	N-Ch		0.42	0.80	
		$V_{GS}=-1.8V, I_D=-0.5A$	P-Ch		0.75	0.95	
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	N-Ch	0.35		1.0	V
		$V_{DS}=V_{GS}, I_D=-250\mu A$	P-Ch	-0.35		-1.0	
Gate Leakage Current	I_{GSS}	$V_{DS}=0V, V_{GS}=\pm 12V$	N-Ch			100	nA
		$V_{DS}=0V, V_{GS}=\pm 12V$	P-Ch			-100	
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=20V, V_{GS}=0V$	N-Ch			1	uA
		$V_{DS}=-20V, V_{GS}=0V$	P-Ch			1	
		$V_{DS}=20V, V_{GS}=0V, T_J=55^\circ C$	N-Ch			5	
		$V_{DS}=-20V, V_{GS}=0V, T_J=55^\circ C$	P-Ch			5	
On-State Drain Current	$I_{D(ON)}$	$V_{DS} \geq 4.5V, V_{GS} = 5V$	N-Ch	2			A
		$V_{DS} \geq -4.5V, V_{GS} = -5V$	P-Ch	-2			
Diode Forward Voltage	V_{SD}	$I_S=0.5A, V_{GS}=0V$	N-Ch		0.8	1.2	V
		$I_S=-0.5A, V_{GS}=0V$	P-Ch		-0.8	-1.2	
Forward Transconductance	g_{fs}	$V_{DS}=10V, I_D=1.2A$	N-Ch		2.6		S
		$V_{DS}=-10V, I_D=-1.0A$	P-Ch		1.5		
Dynamic							
Total Gate Charge	Q_g	N-Channel $V_{DS}=10V, V_{GS}=4.5V,$ $I_D \equiv 1.2A$ P-Channel $V_{DS}=-10V, V_{GS}=-4.5V,$ $I_D \equiv -1.0A$	N-Ch		1.2	2.0	nC
			P-Ch		1.1	1.8	
Gate-Source Charge	Q_{gs}		N-Ch		0.2		
			P-Ch		0.3		
Gate-Drain Charge	Q_{gd}		N-Ch		0.3		
			P-Ch		0.2		
Turn-On Time	$t_{d(on)}$	N-Ch		15	25	ns	
		P-Ch		18	30		
	t_r	N-Ch		20	30		
		P-Ch		25	40		
Turn-Off Time	$t_{d(off)}$	N-Ch		25	40		
		P-Ch		20	30		
	t_f	N-Ch		12	20		
		P-Ch		12	20		

Typical Characteristics (N-Channel)

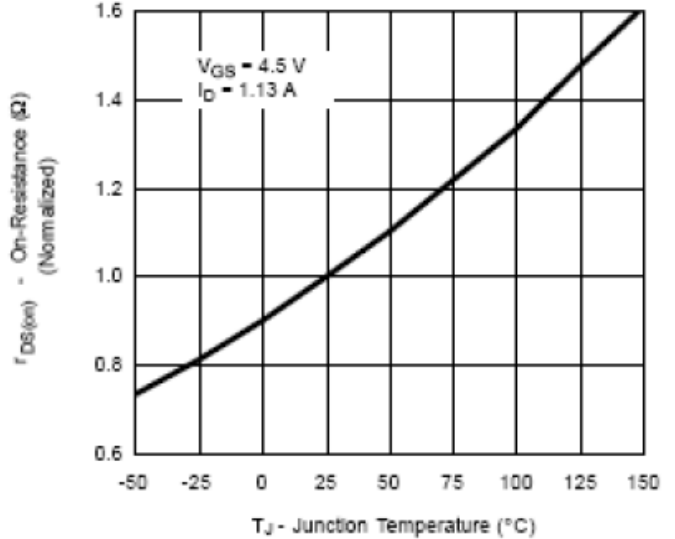


Typical Characteristics (N-Channel)

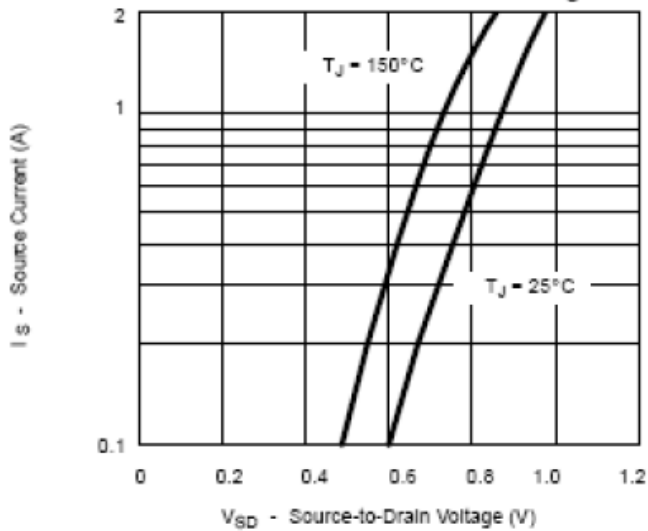
Gate Charge



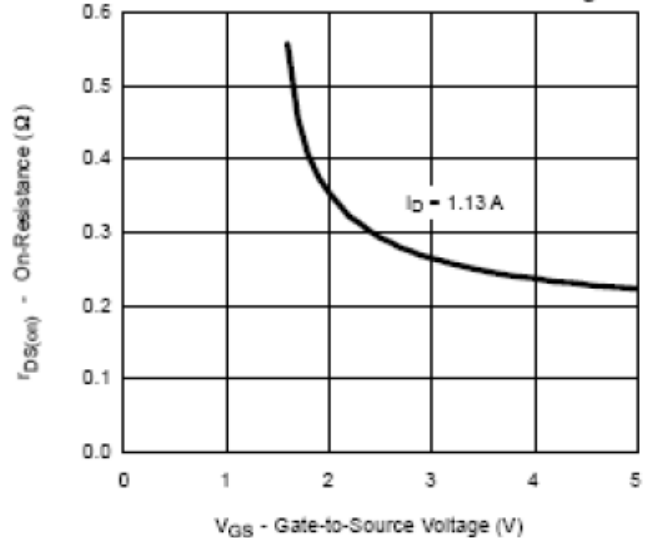
On-Resistance vs. Junction Temperature



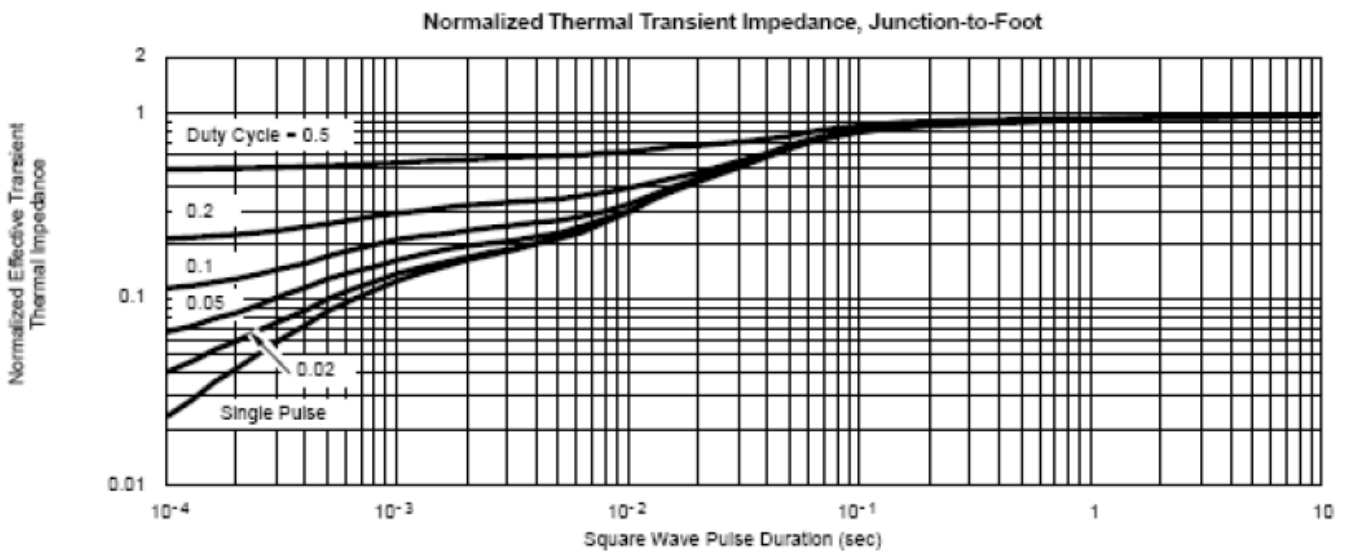
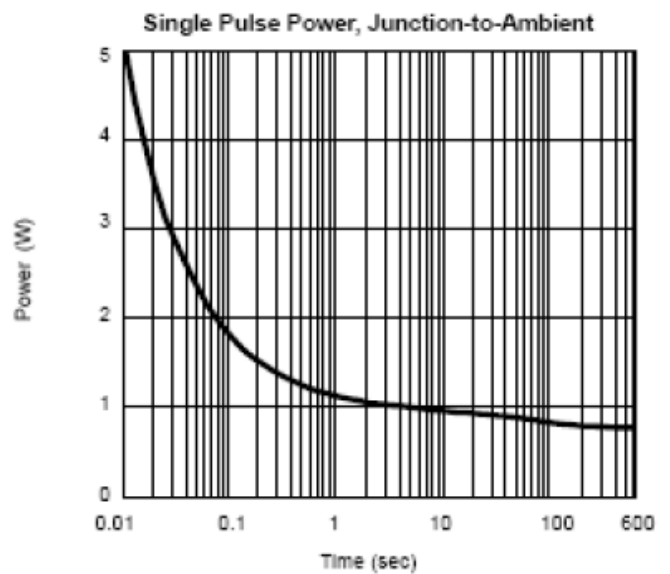
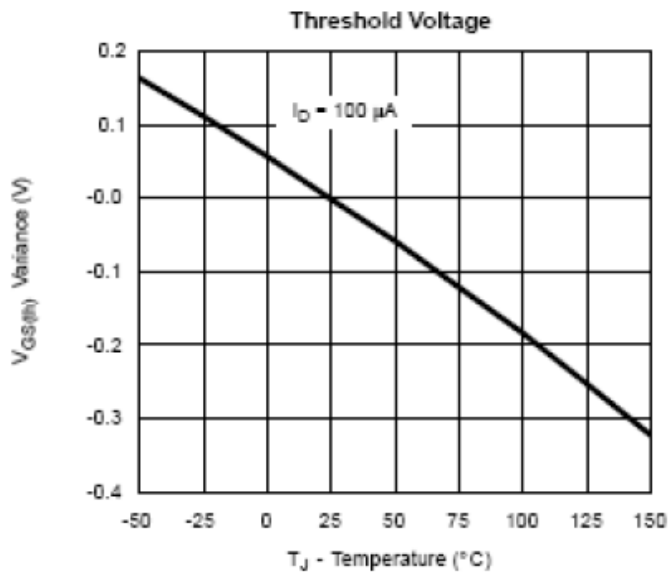
Source-Drain Diode Forward Voltage



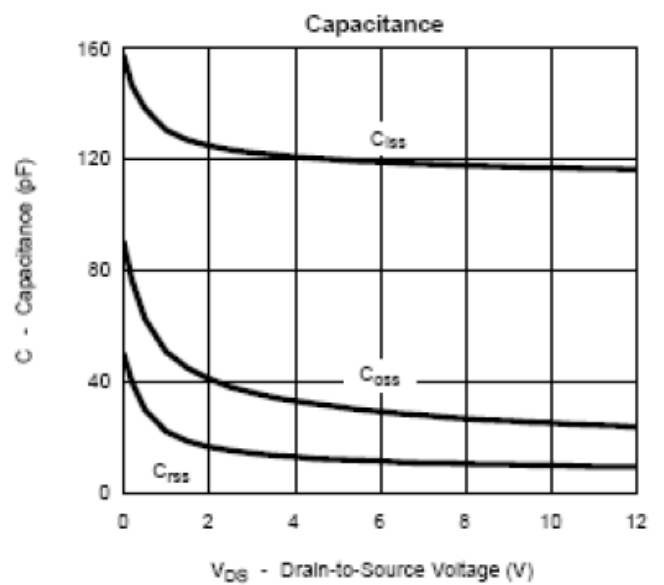
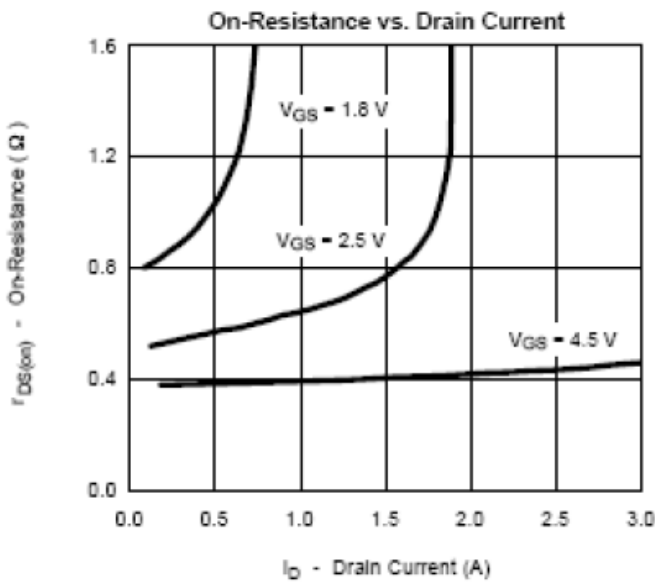
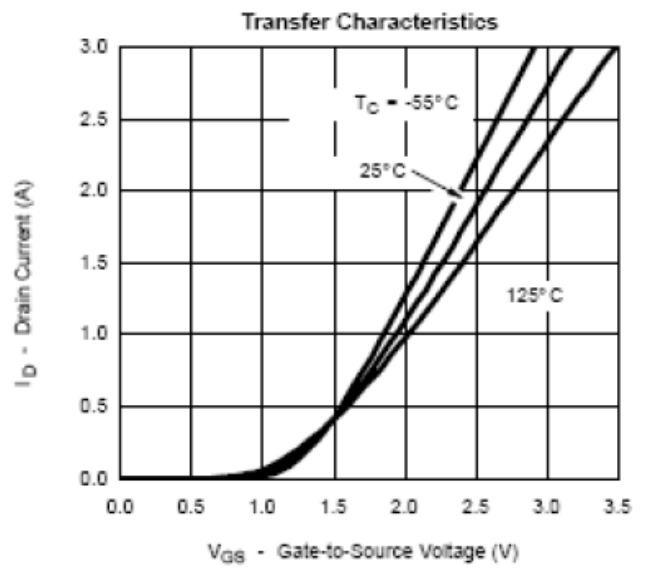
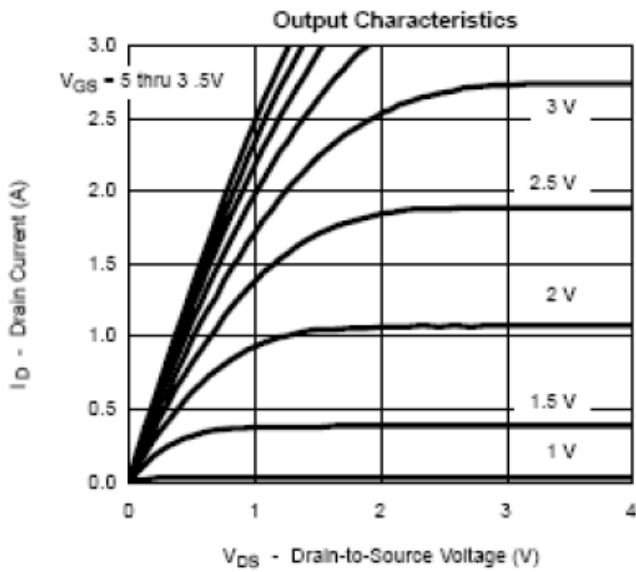
On-Resistance vs. Gate-to-Source Voltage



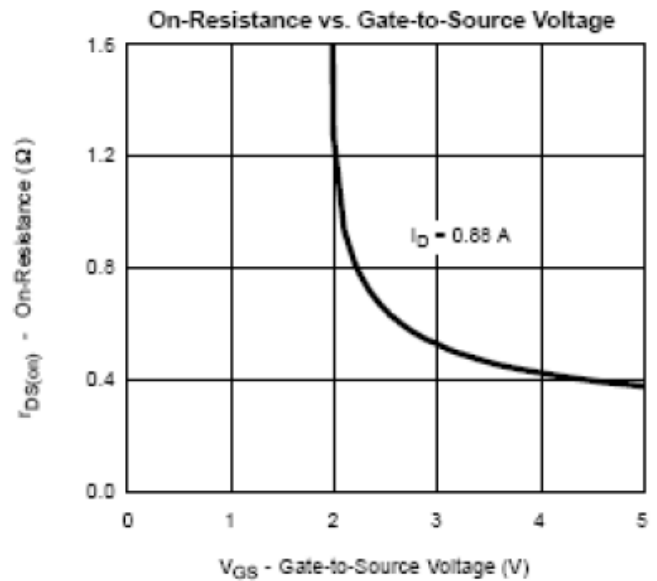
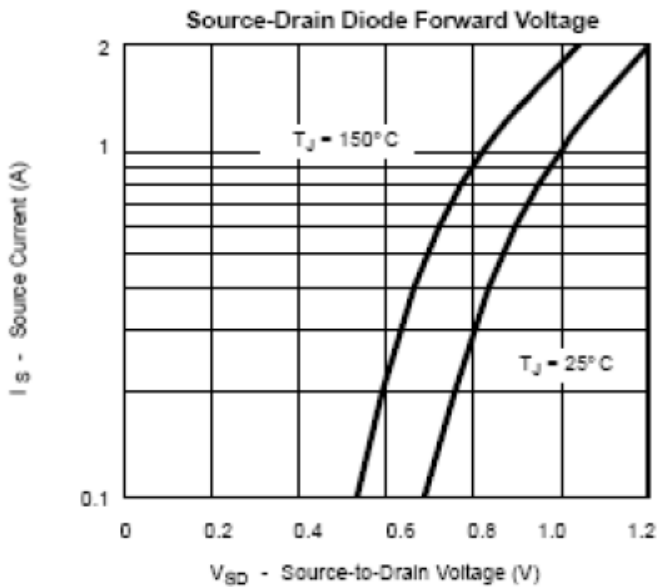
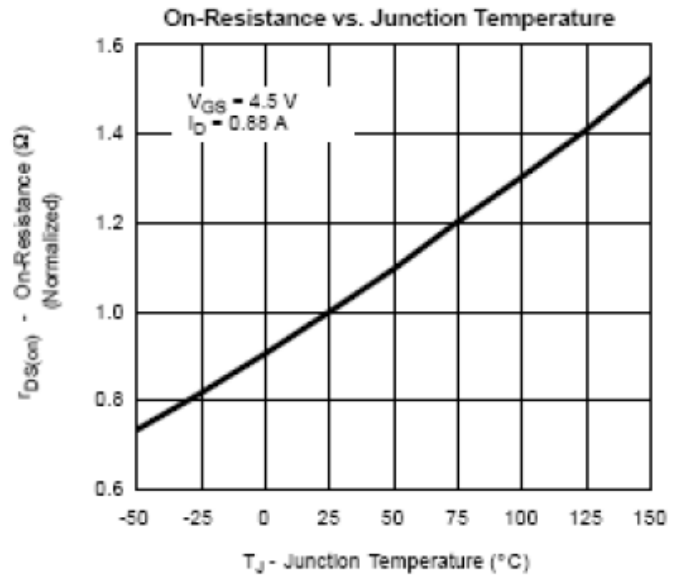
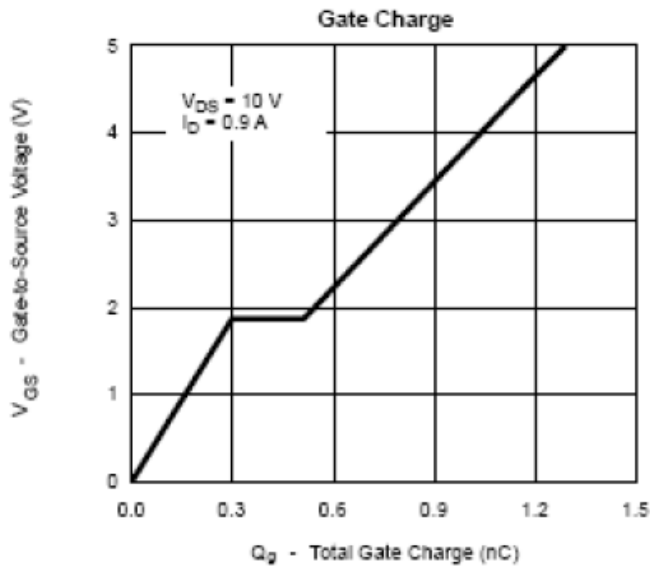
Typical Characteristics (N-Channel)



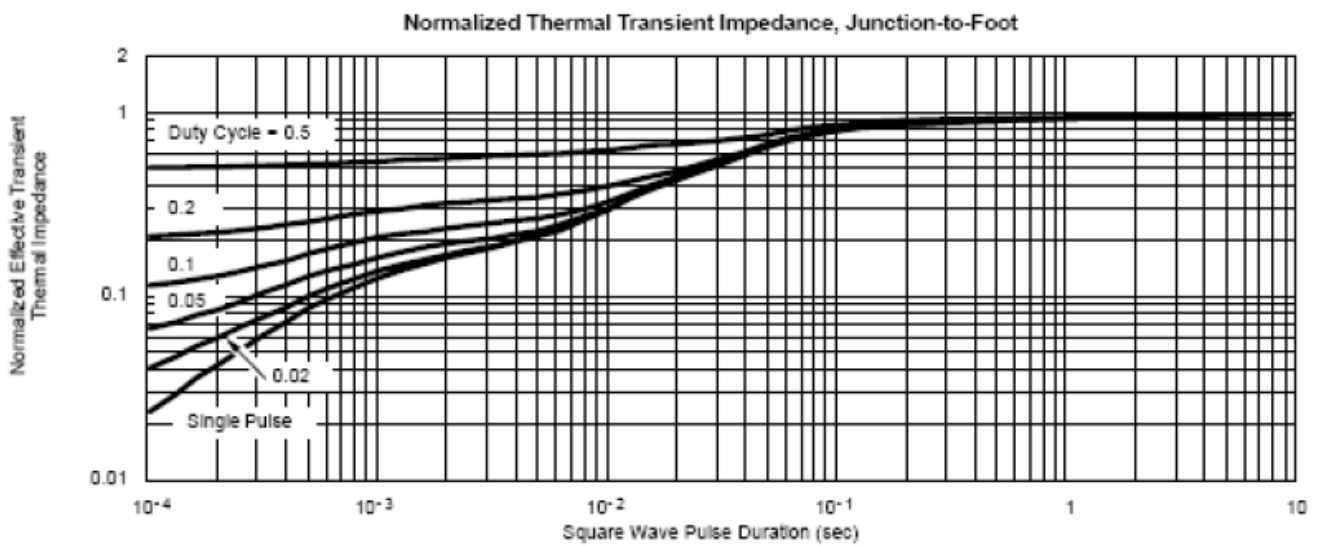
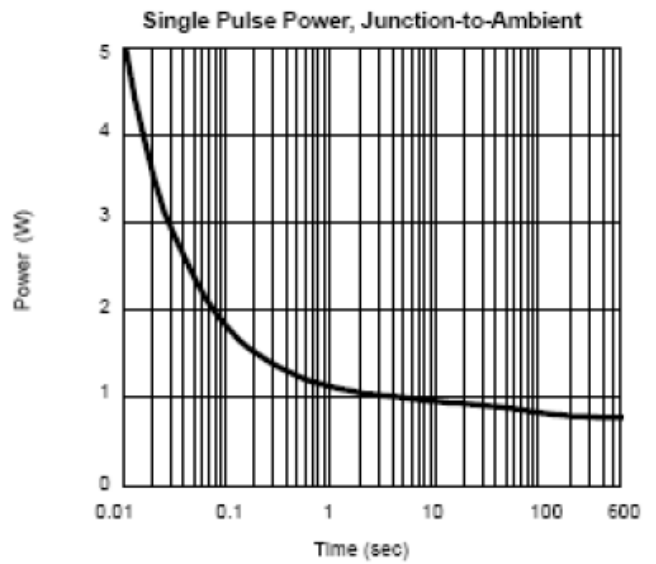
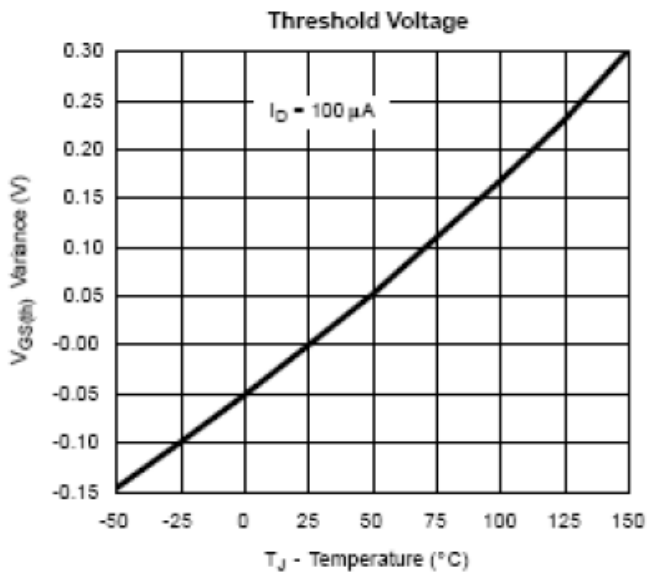
Typical Characteristics (P-Channel)



Typical Characteristics (P-Channel)

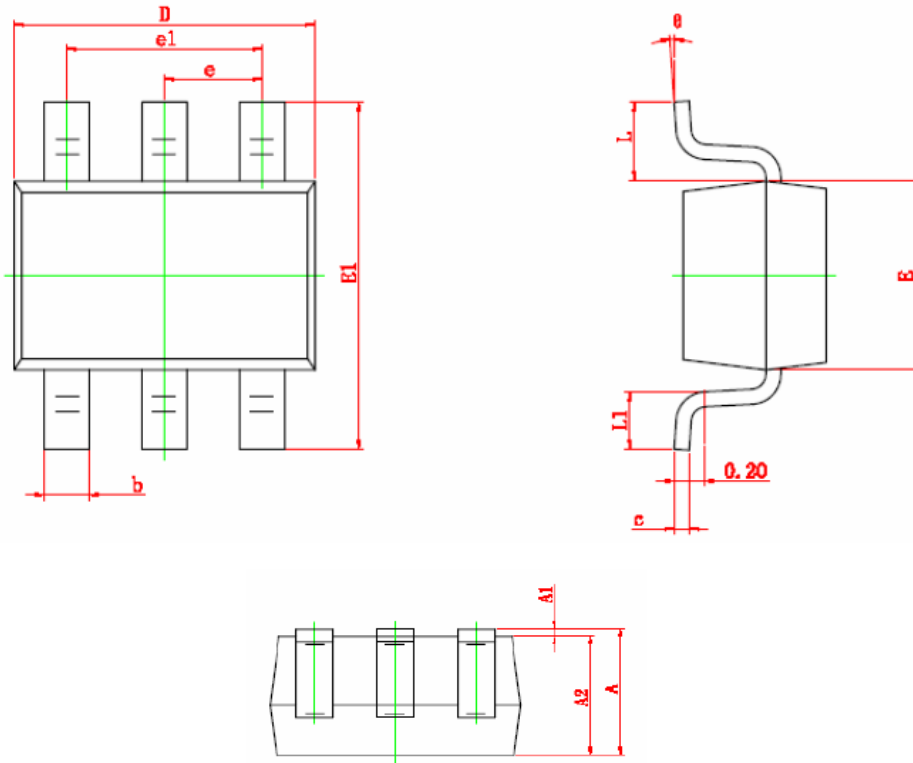


Typical Characteristics (P-Channel)



Packing Information

SC-70-6



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	0.900	1.100	0.035	0.043
A1	0.000	0.100	0.000	0.004
A2	0.900	1.000	0.035	0.039
b	0.150	0.350	0.006	0.014
c	0.080	0.150	0.003	0.006
D	2.000	2.200	0.079	0.087
E	1.150	1.350	0.045	0.053
E1	2.150	2.450	0.085	0.096
e	0.650 TYP		0.026 TYP	
e1	1.200	1.400	0.047	0.055
L	0.525 REF		0.021 REF	
L1	0.260	0.460	0.010	0.018
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 used 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.