ACE4614B

30V Complementary Enhancement Mode Field Effect Transistor

Description

The ACE4614B uses advanced trench technology MOSFETs to provide excellent $R_{DS(ON)}$ and low gate charge. The complementary MOSFETs may be used in inverter and other applications.

Features

N-channel

- V_{DS}=30V
- I_D=9A
- $R_{DS(ON)}$<14mΩ(V_{GS}=10V)
- $R_{DS(ON)}$<22mΩ(V_{GS}=4.5V)

P-channel

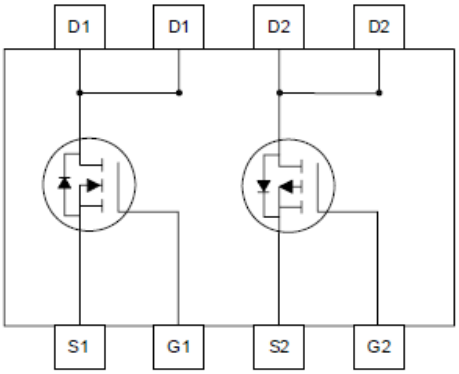
- V_{DS}=-30V
- I_D=-8A
- $R_{DS(ON)}$<20mΩ(V_{GS}=-10V)
- $R_{DS(ON)}$<35mΩ(V_{GS}=-4.5V)

Absolute Maximum Ratings

Parameter		Symbol	N-channel	P-channel	Unit
Drain-Source Voltage		V_{DSS}	30	-30	V
Gate-Source Voltage		V_{GSS}	±20	±20	V
Drain Current (Continuous) * AC	T_A=25°C	I_D	9	-8	A
	T_A=70°C		7.2	-6.4	
Drain Current (Pulse) * B		I_{DM}	40	-40	
Power Dissipation	T_A=25°C	P_D	2	2	W
	T_A=70°C		1.3	1.3	
Operating and Storage Temperature Range		T_J,T_{STG}	-55 to 150	-55 to 150	°C

Packaging Type

SOP-8



Ordering information

ACE4614B XX + H

- Halogen - free
- Pb - free
- FM : SOP-8

N-channel 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 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	14	mΩ
		V_{GS}=4.5V, I_D=10A		16.5	22	
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=250uA	1.4	2	3	V
Forward Transconductance	g_{FS}	V_{DS}=5V, I_D=10A		20		S
Diode Forward Voltage	V_{SD}	I_{SD}=1A, V_{GS}=0V		0.74	1.0	V
Maximum Body-Diode Continuous Current	I_S				2.6	A
Switching						
Total Gate Charge	Q_g	V_{DS}=15V, I_D=10A V_{GS}=5V		7.65	9.95	nC
Gate-Source Charge	Q_{gs}			2.82	3.67	
Gate-Drain Charge	Q_{gd}			2.49	3.24	
Turn-On Delay Time	$T_{d(on)}$	V_{DS}=15V,R_{GEN}=6Ω, V_{GS}=10V R_L=15Ω		13.92	27.84	ns
Turn-On Rise Time	t_f			2.64	5.28	
Turn-Off Delay Time	$t_{d(off)}$			31.4	62.8	
Turn-Off Fall Time	t_f			3.28	6.56	
Dynamic						
Input Capacitance	C_{iss}	V_{DS}=15V, V_{GS}=0V f=1MHz		886.01		pF
Output Capacitance	C_{oss}			151		
Reverse Transfer Capacitance	C_{rss}			75.77		

Note.

1. 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.
2. Repetitive rating, pulse width limited by junction temperature.
3. The current rating is based on the t≤10s junction to ambient thermal resistance rating.

Typical Performance Characteristics

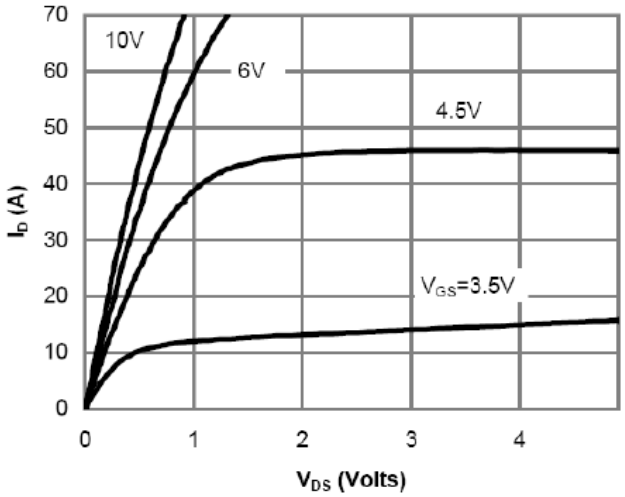


Fig 1: On-Region Characteristics

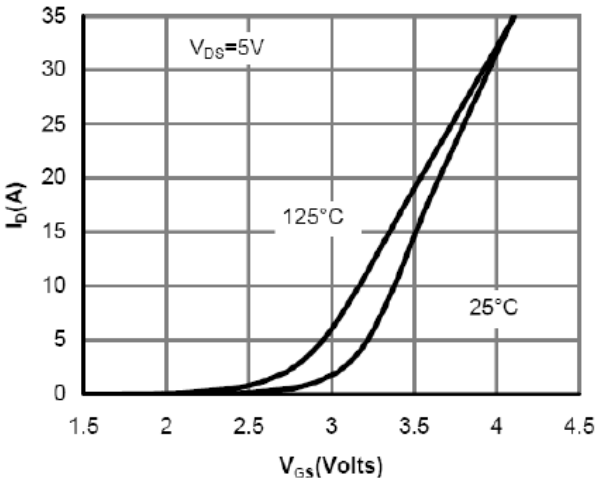


Figure 2: Transfer Characteristics

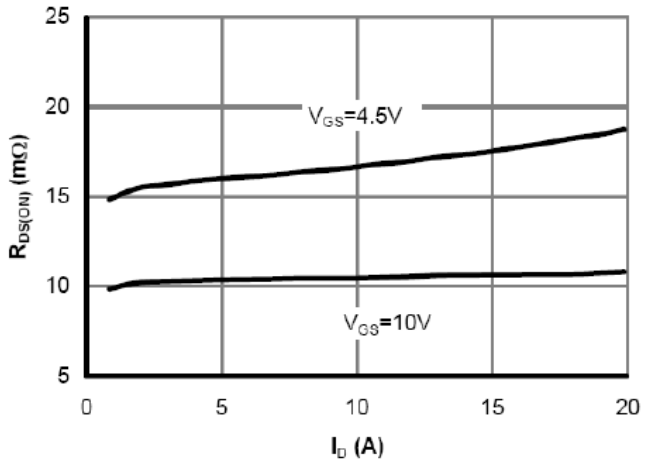


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

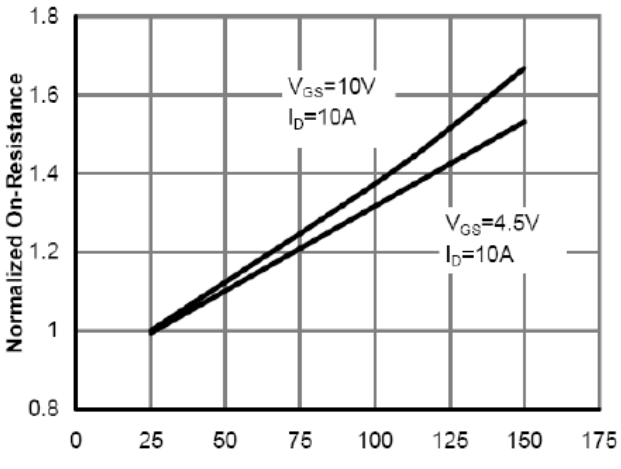


Figure 4: On-Resistance vs. Junction Temperature

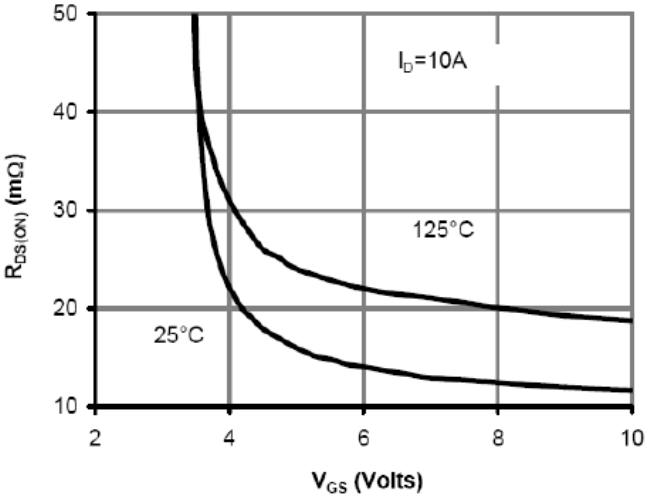


Figure 5: On-Resistance vs. Gate-Source Voltage

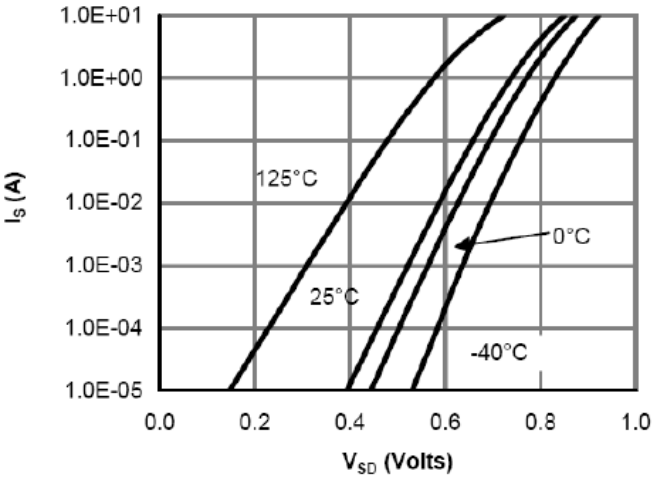


Figure 6: Body-Diode Characteristics

Typical Performance Characteristics

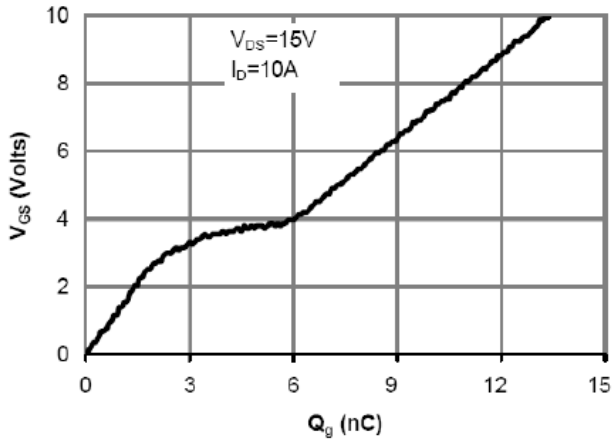


Figure 7: Gate-Charge Characteristics

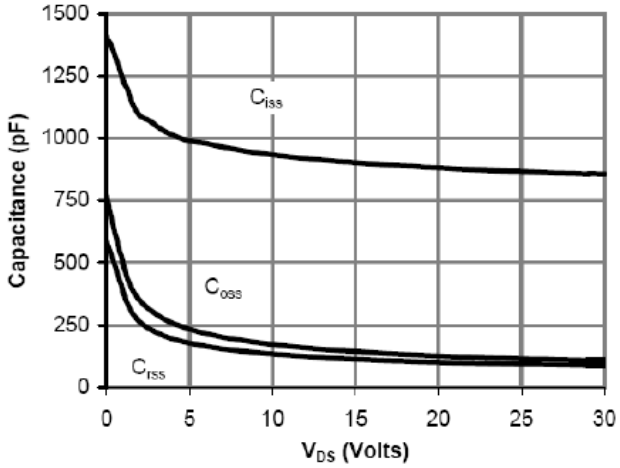


Figure 8: Capacitance Characteristics

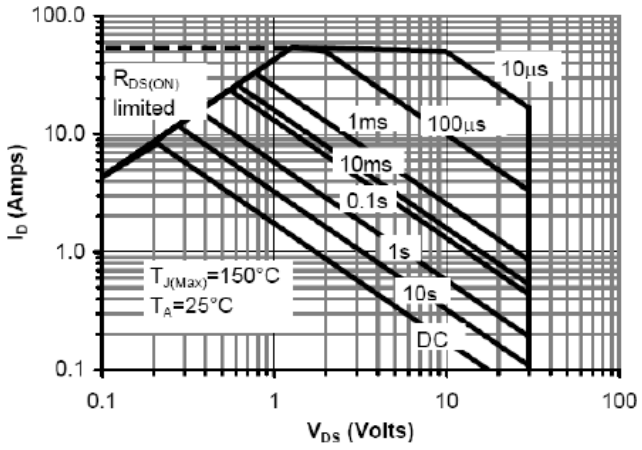


Figure 9: Maximum Forward Biased Safe Operating Area

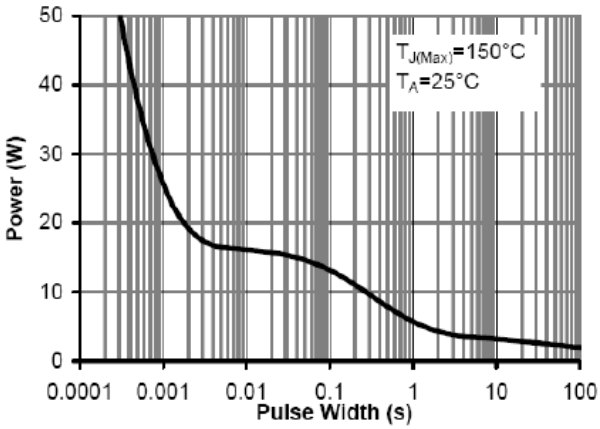


Figure 10: Single Pulse Power Rating Junction-to-Ambient

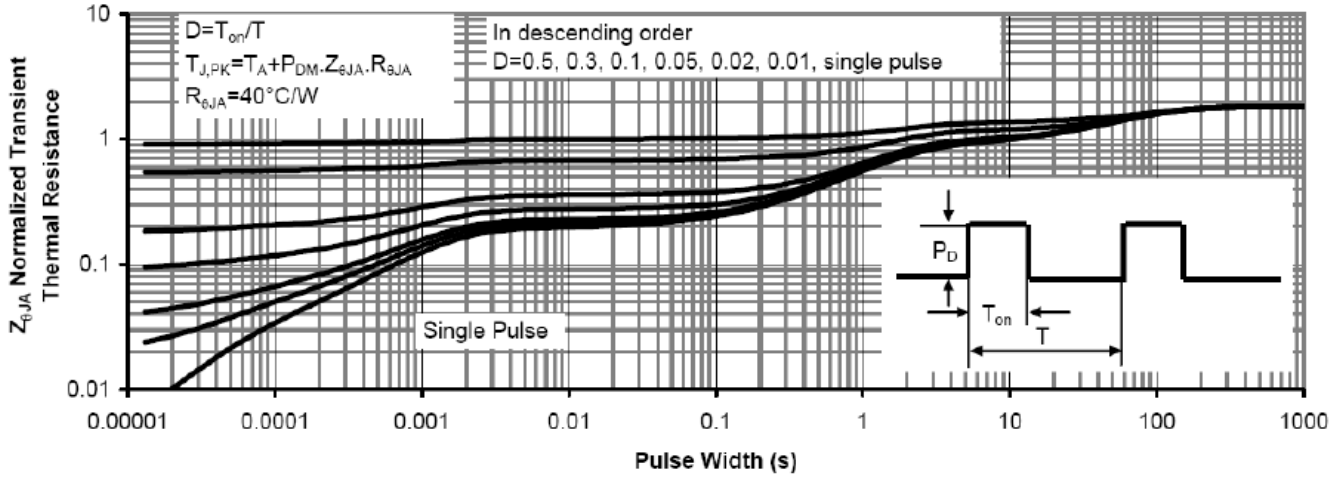


Figure 11: Normalized Maximum Transient Thermal Impedance

P-channel 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 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=-9.7A		17.1	20	mΩ
		V_{GS}=-4.5V, I_D=-7A		20.7	35	
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=-250uA	-1	-1.2	-2	V
Forward Transconductance	g_{FS}	V_{DS}=-5V, I_D=-8A		21.7		S
Diode Forward Voltage	V_{SD}	I_{SD}=-1A, V_{GS}=0V		-0.74	-1.0	V
Maximum Body-Diode Continuous Current	I_S				-2.1	A
Switching						
Total Gate Charge	Q_g	V_{DS}=-15V, I_D=-8A V_{GS}=-10V		33.82	43.97	nC
Gate-Source Charge	Q_{gs}			4.93	6.41	
Gate-Drain Charge	Q_{gd}			5.2	6.76	
Turn-On Delay Time	$T_{d(on)}$	V_{DS}=-15V,R_{GEN}=6Ω, V_{GS}=-10V R_L=15Ω		15.44	30.88	ns
Turn-On Rise Time	t_f			5.04	10.08	
Turn-Off Delay Time	$t_{d(off)}$			71.04	142.08	
Turn-Off Fall Time	t_f			16.8	33.6	
Dynamic						
Input Capacitance	C_{iss}	V_{DS}=-15V, V_{GS}=0V f=1MHz		1973	2200	pF
Output Capacitance	C_{oss}			491		
Reverse Transfer Capacitance	C_{rss}			231	325	

Note.

4. 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.
5. Repetitive rating, pulse width limited by junction temperature.
6. The current rating is based on the t≤10s junction to ambient thermal resistance rating.

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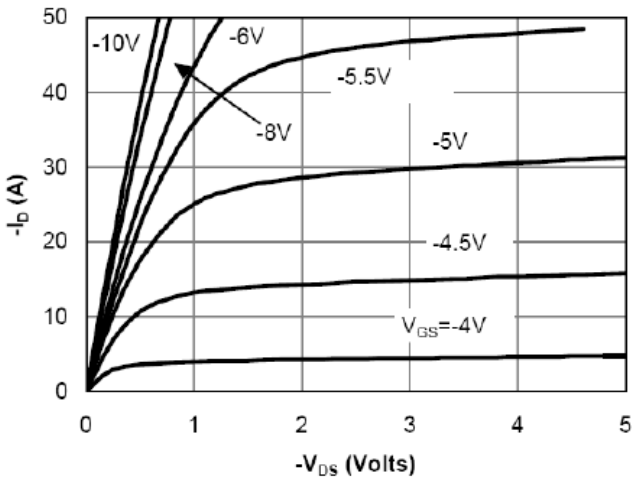


Fig 1: On-Region Characteristics

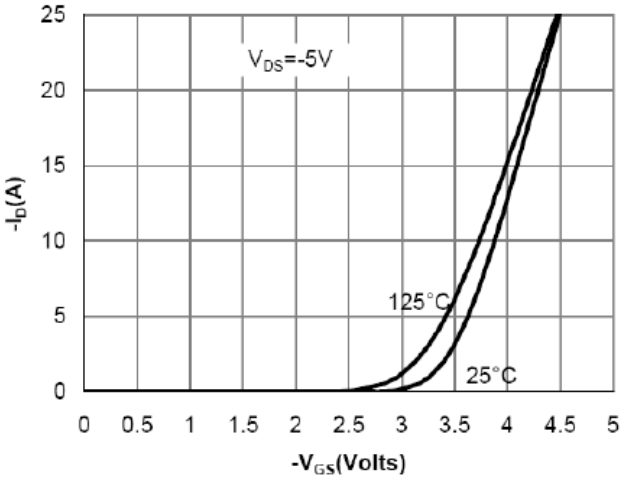
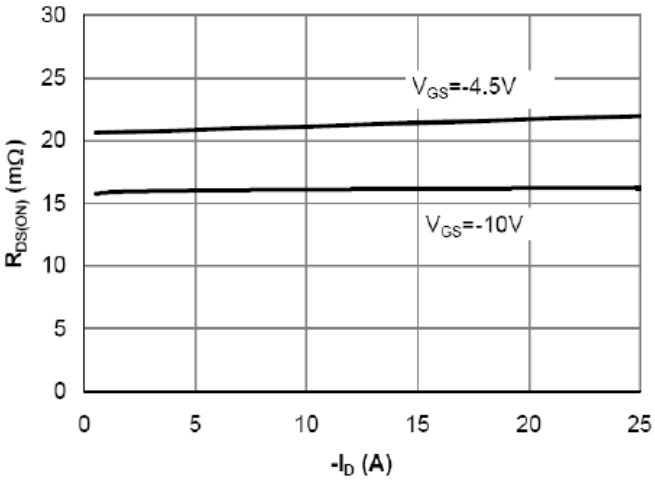


Figure 2: Transfer Characteristics



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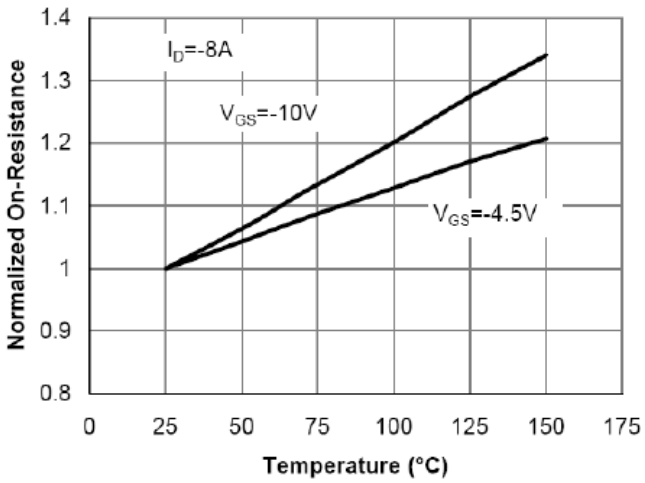

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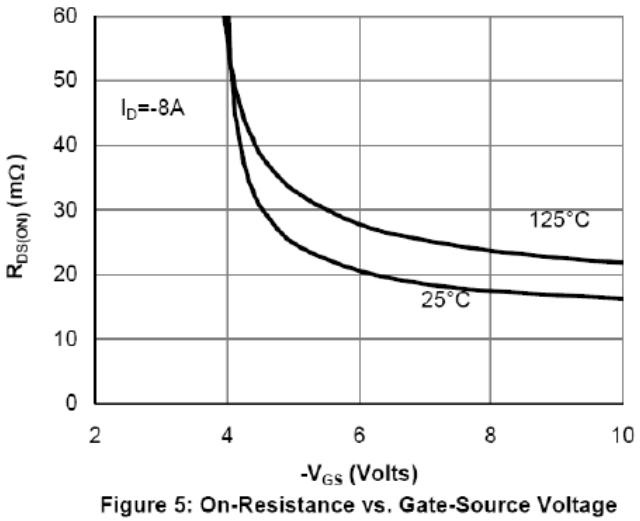

Figure 5: On-Resistance vs. Gate-Source Voltage

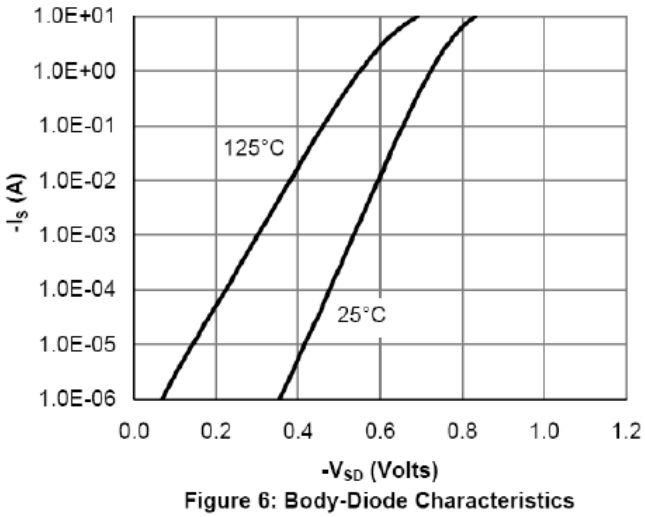

Figure 6: Body-Diode Characteristics

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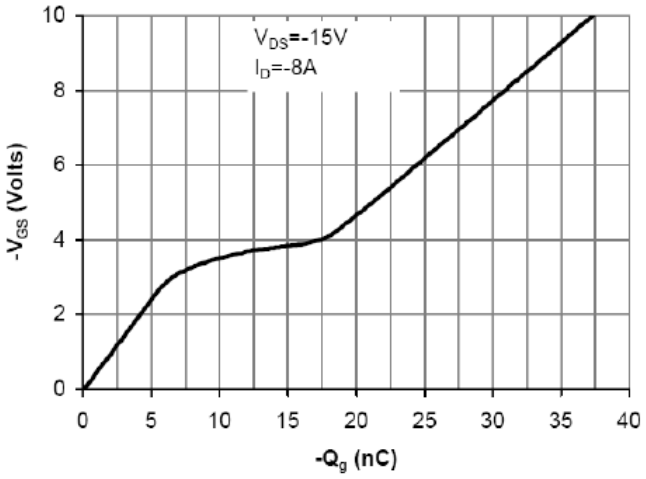
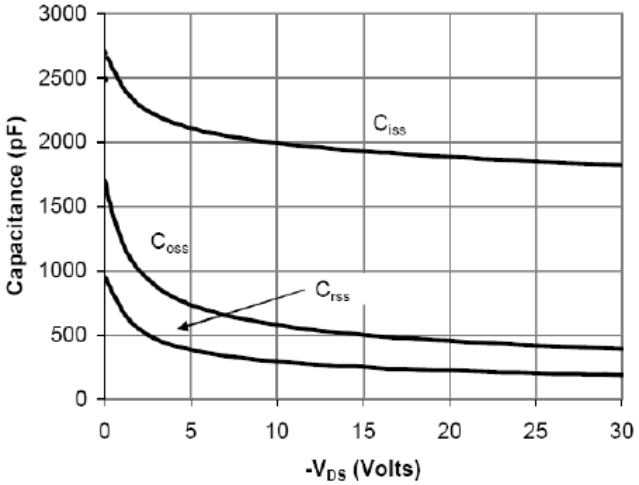


Figure 7: Gate-Charge Characteristics



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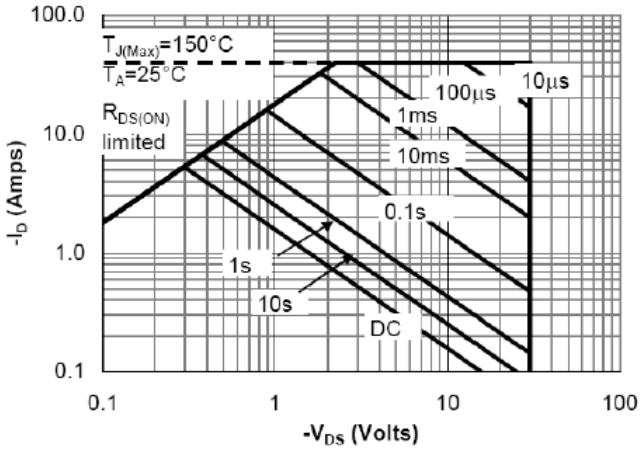

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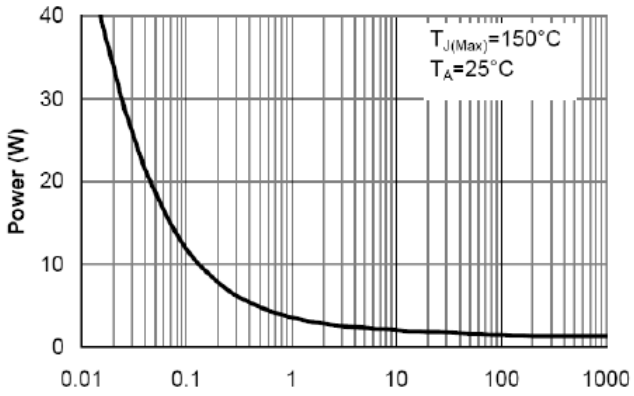

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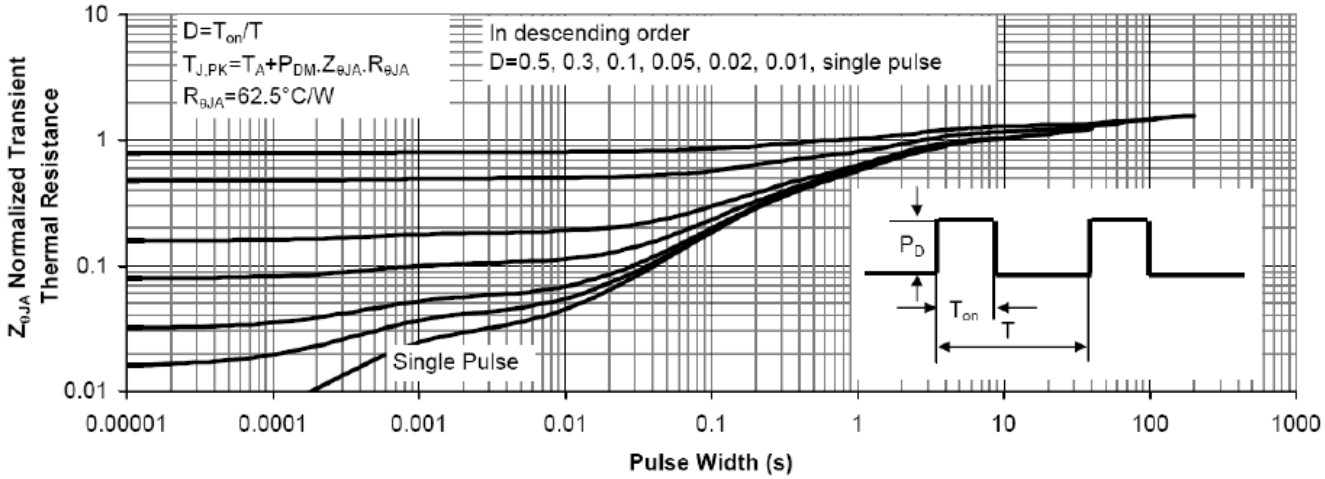
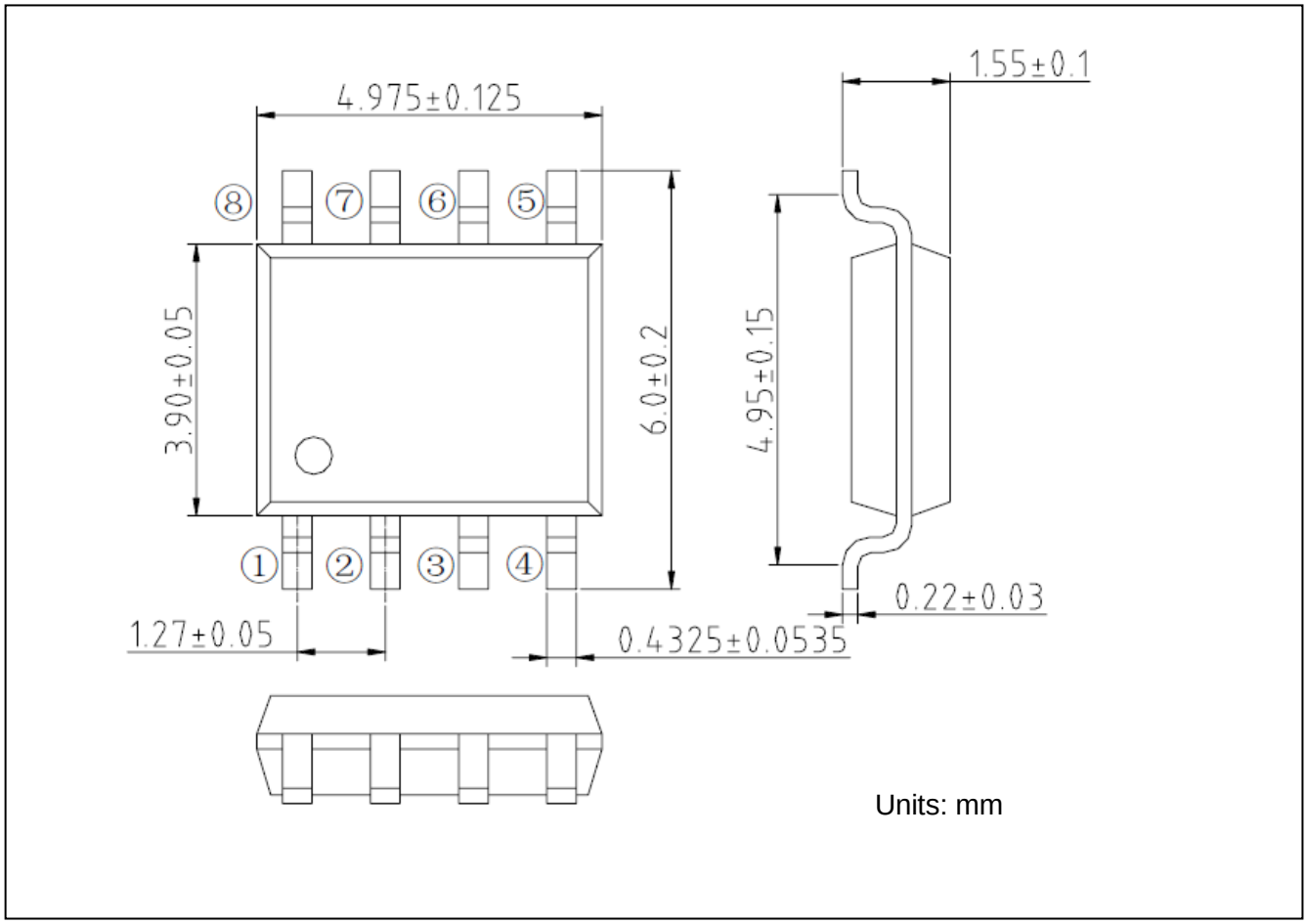


Figure 11: Normalized Maximum Transient Thermal Impedance

Packing Information

SOP-8



Notes

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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.

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