### General Description

The AO6601 uses advanced trench technology to provide excellent $R_{DS(ON)}$ and low gate charge. The complementary MOSFETs form a high-speed power inverter, suitable for a multitude of applications.
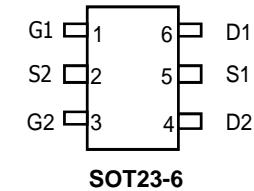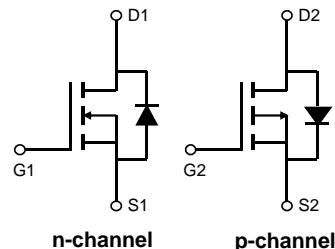
Features

N-Ch:
- $V_{DS(V)}$=30V
- I_D= 3.4A $\quad(V_{GS}$=10V)
- $R_{DS(ON)} < 60m\Omega \quad (V_{GS} = 10V)$
- $R_{DS(ON)} < 70m\Omega \quad (V_{GS} = 4.5V)$
- $R_{DS(ON)} < 90m\Omega \quad (V_{GS} = 2.5V)$

P-Ch:
- $V_{DS(V)}$=-30V
- I_D=-2.3A $\quad(V_{GS}$=-10V)
- $R_{DS(ON)} < 115m\Omega \quad (V_{GS} = -10V)$
- $R_{DS(ON)} < 150m\Omega \quad (V_{GS} = -4.5V)$
- $R_{DS(ON)} < 200m\Omega \quad (V_{GS} = -2.5V)$

n-channel   **p-channel**

SOT23-6

Absolute Maximum Ratings T_A=25℃ unless otherwise noted

Parameter		Symbol	Max n-channel	Max p-channel	Units
Drain-Source Voltage		V_{DS}	30	-30	V
Gate-Source Voltage		V_{GS}	±12	±12	V
Continuous Drain Current	T_A=25℃	I_D	3.4	-2.3	A
	T_A=70℃		2.7	-1.8	
Pulsed Drain Current ^{C}		I_{DM}	20	-15	
Power Dissipation ^{B}	T_A=25℃	P_D	1.15	1.15	W
	T_A=70℃		0.73	0.73	
Junction and Storage Temperature Range		T_J, T_{STG}	-55 to 150		℃

Thermal Characteristics

Parameter		Symbol	Typ	Max	Units
Maximum Junction-to-Ambient	t ≤ 10s	$R_{\theta JA}$	78	110	℃/W
Maximum Junction-to-Ambient	Steady-State		106	150	℃/W
Maximum Junction-to-Lead	Steady-State	$R_{\theta JL}$	64	80	℃/W

N-Channel Electrical Characteristics (T$_J$=25℃ unless otherwise noted)

Symbol	Parameter	Conditions		Min	Typ	Max	Units
STATIC PARAMETERS							
BV$_{DSS}$	Drain-Source Breakdown Voltage	I$_D$=250µA, V$_{GS}$=0V		30			V
I$_{DSS}$	Zero Gate Voltage Drain Current	V$_{DS}$=30V, V$_{GS}$=0V				1	µA
			T$_J$=55℃			5	
I$_{GSS}$	Gate-Body leakage current	V$_{DS}$=0V, V$_{GS}$=±12V				±100	nA
V$_{GS(th)}$	Gate Threshold Voltage	V$_{DS}$=V$_{GS}$ I$_D$=250µA		0.5	1	1.5	V
I$_{D(ON)}$	On state drain current	V$_{GS}$=10V, V$_{DS}$=5V		20			A
R$_{DS(ON)}$	Static Drain-Source On-Resistance	V$_{GS}$=10V, I$_D$=3.4A			46	60	mΩ
		V$_{GS}$=4.5V, I$_D$=3A			50	70	mΩ
		V$_{GS}$=2.5V, I$_D$=2A			62	90	mΩ
g$_{FS}$	Forward Transconductance	V$_{DS}$=5V, I$_D$=3.4A			14		S
V$_{SD}$	Diode Forward Voltage	I$_S$=1A,V$_{GS}$=0V			0.75	1	V
I$_S$	Maximum Body-Diode Continuous Current					1.5	A
DYNAMIC PARAMETERS							
C$_{iss}$	Input Capacitance	V$_{GS}$=0V, V$_{DS}$=15V, f=1MHz		185	235	285	pF
C$_{oss}$	Output Capacitance			25	35	45	pF
C$_{rss}$	Reverse Transfer Capacitance			10	18	25	pF
R$_g$	Gate resistance	V$_{GS}$=0V, V$_{DS}$=0V, f=1MHz		0.9	1.8	2.7	Ω
SWITCHING PARAMETERS							
Q$_g$(10V)	Total Gate Charge	V$_{GS}$=10V, V$_{DS}$=15V, I$_D$=3.4A			10	12	nC
Q$_g$(4.5V)	Total Gate Charge				4.7	6	nC
Q$_{gs}$	Gate Source Charge				0.95		nC
Q$_{gd}$	Gate Drain Charge				1.6		nC
t$_{D(on)}$	Turn-On DelayTime	R$_{GEN}$=3Ω			3.5		ns
t$_{D(off)}$	Turn-Off DelayTime				17.5		ns
t$_f$	Turn-Off Fall Time				2.5		ns
t$_{rr}$	Body Diode Reverse Recovery Time	I$_F$=3.4A, dI/dt=100A/µs			8.5	12	ns
Q$_{rr}$	Body Diode Reverse Recovery Charge	I$_F$=3.4A, dI/dt=100A/µs			2.55	4	nC

A. The value of R$_{θJA}$ 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. The power dissipation P$_D$ is based on T$_{J(MAX)}$=150° C, using ⩽ 10s junction-to-ambient thermal resistance.

C. Repetitive rating, pulse width limited by junction temperature T$_{J(MAX)}$=150° C. Ratings are based on low frequency and duty cycles to keep initialT$_J$=25° C.

D. The R$_{θJA}$ is the sum of the thermal impedance from junction to lead R$_{θJL}$ and lead to ambient.

E. The static characteristics in Figures 1 to 6 are obtained using <300µs pulses, duty cycle 0.5% max.

F. These curves are based on the junction-to-ambient thermal impedance which is measured with the device mounted on 1in^2 FR-4 board with 2oz. Copper, assuming a maximum junction temperature of T$_{J(MAX)}$=150° C. The SOA curve provides a single pulse rating.

## N-Channel: TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS
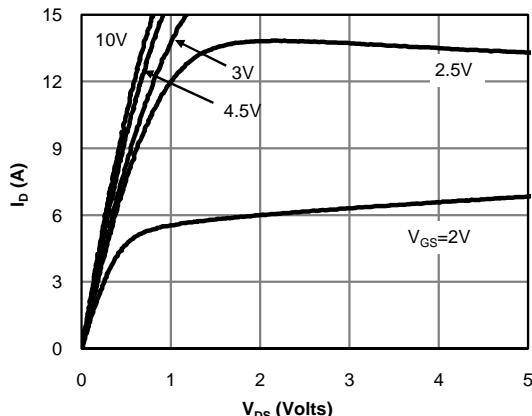
Fig 1: On-Region Characteristics (Note E)
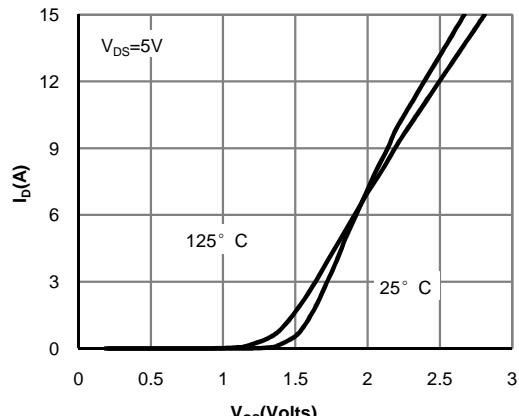

Figure 2: Transfer Characteristics (Note E)
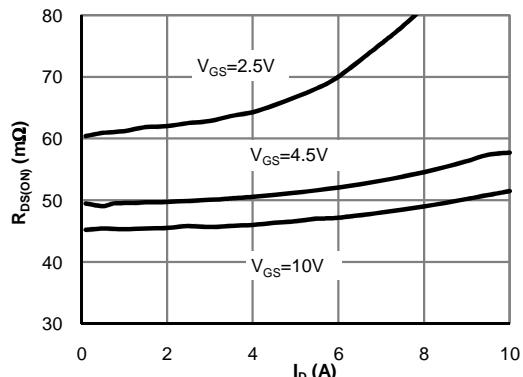
Figure 3: On-Resistance vs. Drain Current and Gate Voltage (Note E)
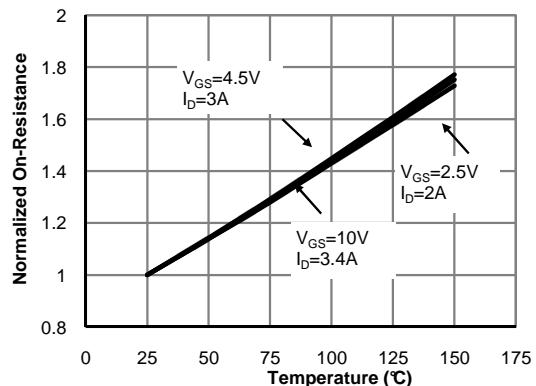


Figure 4: On-Resistance vs. Junction Temperature (Note E)
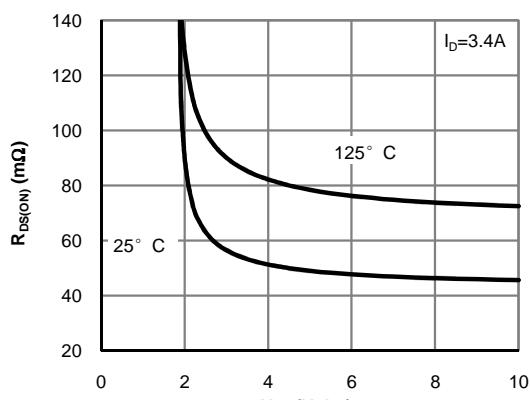


Figure 5: On-Resistance vs. Gate-Source Voltage (Note E)
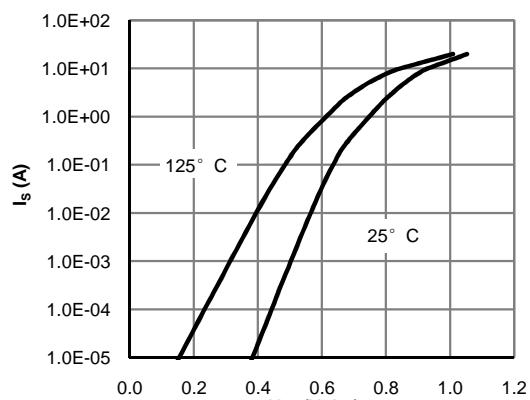
Figure 6: Body-Diode Characteristics (Note E)

N-Channel: TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS
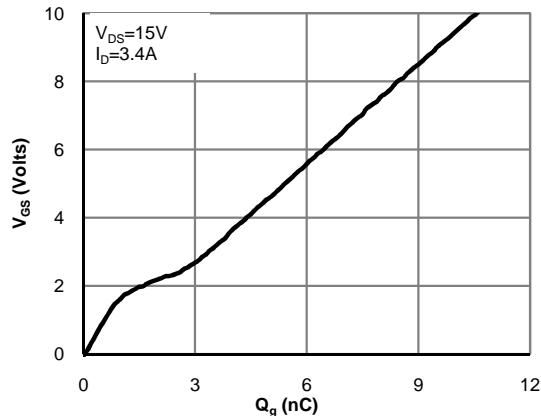
Figure 7: Gate-Charge Characteristics

Figure 8: Capacitance Characteristics

Figure 9: Maximum Forward Biased
Safe Operating Area (Note F)

Figure 10: Single Pulse Power Rating Junction-
to-Ambient (Note F)

Figure 11: Normalized Maximum Transient Thermal Impedance (Note F)
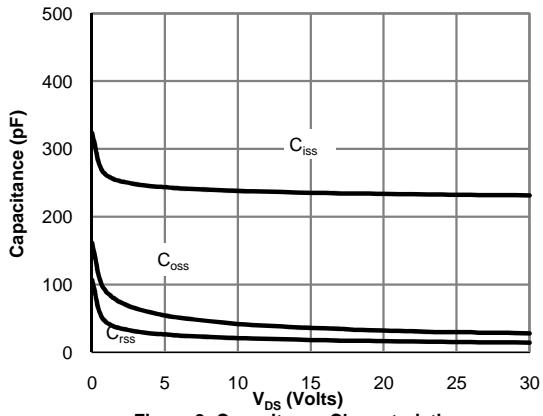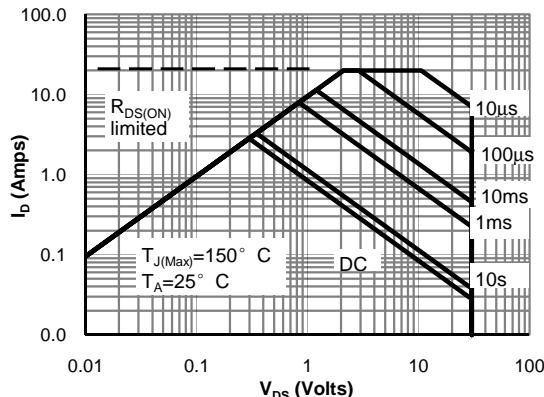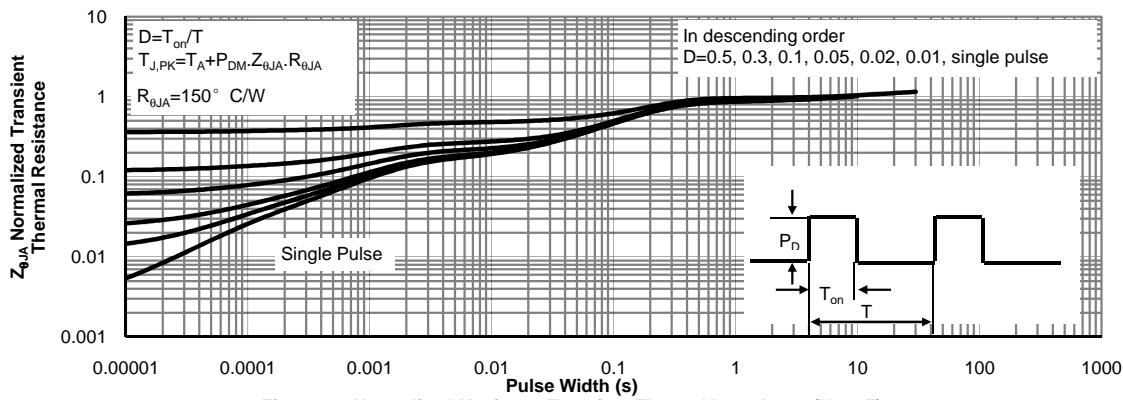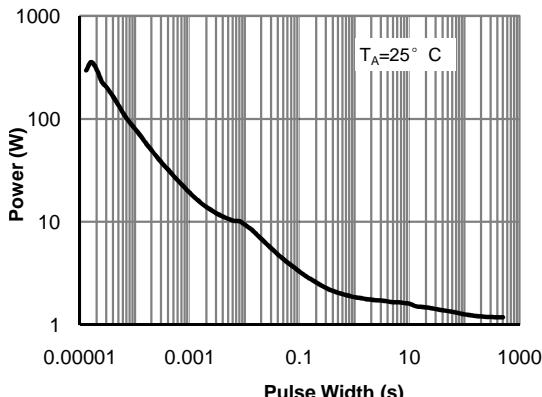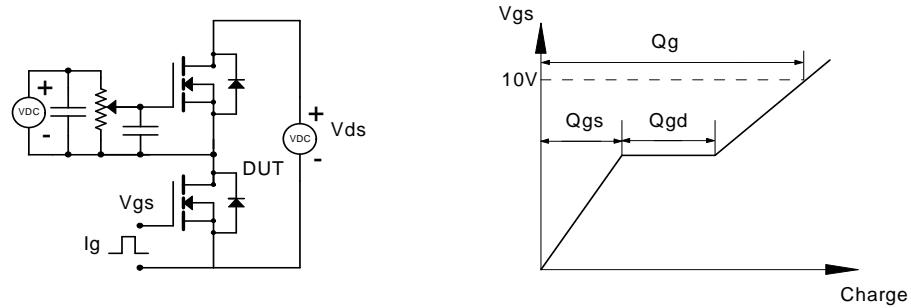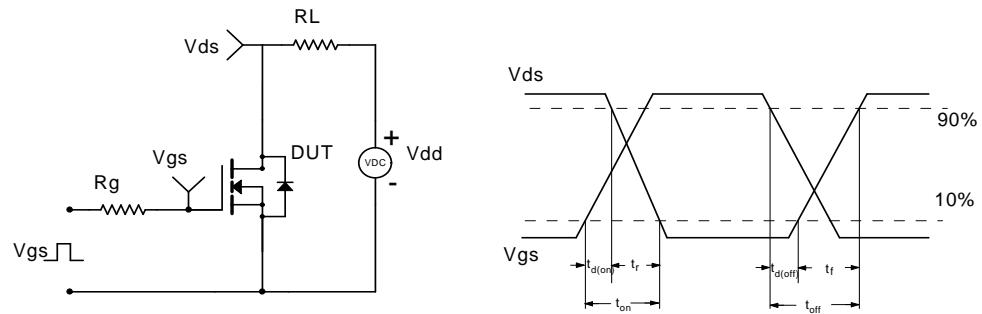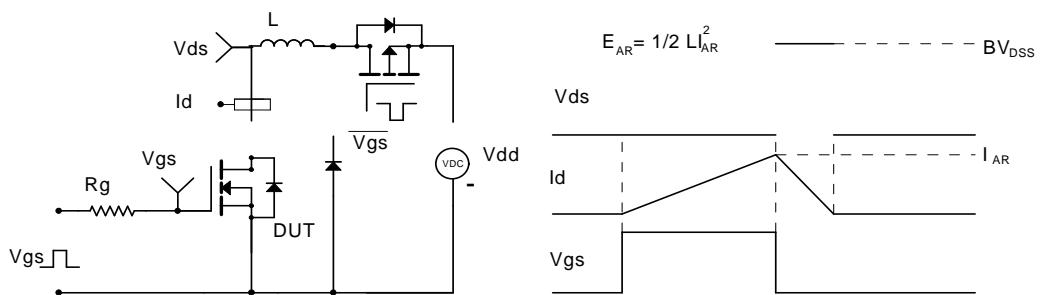
Gate Charge Test Circuit & Waveform
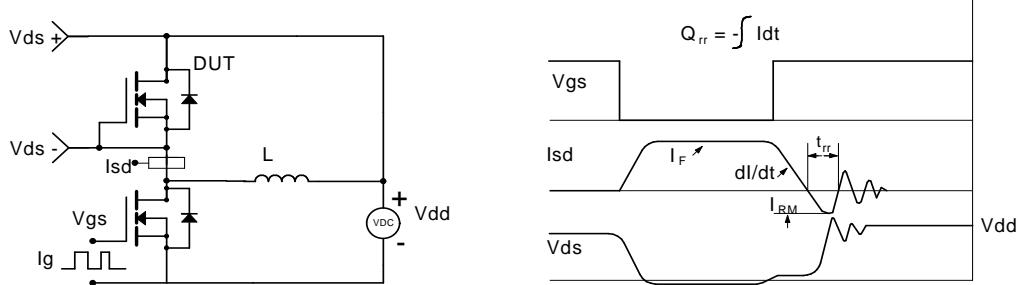
Resistive Switching Test Circuit & Waveforms

Unclamped Inductive Switching (UIS) Test Circuit & Waveforms

$$E_{AR} = 1/2 \, LI_{AR}^2 \qquad \qquad BV_{DSS}$$

Diode Recovery Test Circuit & Waveforms

$$Q_{rr} = -\int Idt$$

P-Channel Electrical Characteristics (T_J=25℃ unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Units
STATIC PARAMETERS						
BV$_{DSS}$	Drain-Source Breakdown Voltage	I$_D$=-250μA, V$_{GS}$=0V	-30			V
I$_{DSS}$	Zero Gate Voltage Drain Current	V$_{DS}$=-30V, V$_{GS}$=0V			-1	μA
I$_{GSS}$	Gate-Body leakage current	V$_{DS}$=0V, V$_{GS}$=±12V			±100	nA
V$_{GS(th)}$	Gate Threshold Voltage	V$_{DS}$=V$_{GS}$ I$_D$=-250μA	-0.6	-1	-1.4	V
I$_{D(ON)}$	On state drain current	V$_{GS}$=-10V, V$_{DS}$=-5V	-15			A
R$_{DS(ON)}$	Static Drain-Source On-Resistance	V$_{GS}$=-10V, I$_D$=-2.3A		88	115	mΩ
		V$_{GS}$=-4.5V, I$_D$=-2A		103	150	mΩ
		V$_{GS}$=-2.5V, I$_D$=-1A		139	200	mΩ
g$_{FS}$	Forward Transconductance	V$_{DS}$=-5V, I$_D$=-2.3A		8		S
V$_{SD}$	Diode Forward Voltage	I$_S$=-1A,V$_{GS}$=0V		-0.78	-1	V
I$_S$	Maximum Body-Diode Continuous Current				-1.5	A
DYNAMIC PARAMETERS						
C$_{iss}$	Input Capacitance	V$_{GS}$=0V, V$_{DS}$=-15V, f=1MHz	205	260	315	pF
C$_{oss}$	Output Capacitance		25	37	50	pF
C$_{rss}$	Reverse Transfer Capacitance		10	20	30	pF
R$_g$	Gate resistance	V$_{GS}$=0V, V$_{DS}$=0V, f=1MHz	4	8	12	Ω
SWITCHING PARAMETERS						
Q$_g$(10V)	Total Gate Charge	V$_{GS}$=10V, V$_{DS}$=-15V, I$_D$=-2.3A	4.5	5.9	7	nC
Q$_g$(4.5V)	Total Gate Charge		2	2.8	4	nC
Q$_{gs}$	Gate Source Charge			0.7		nC
Q$_{gd}$	Gate Drain Charge			1		nC
t$_{D(on)}$	Turn-On DelayTime	R$_{GEN}$=3Ω		6		ns
t$_{D(off)}$	Turn-Off DelayTime			20		ns
t$_f$	Turn-Off Fall Time			5		ns
t$_{rr}$	Body Diode Reverse Recovery Time	I$_F$=-2.3A, dI/dt=100A/μs		11.5	15	ns
Q$_{rr}$	Body Diode Reverse Recovery Charge	I$_F$=-2.3A, dI/dt=100A/μs		4.5	6	nC

A. The value of R$_{θJA}$ 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. The power dissipation P$_D$ is based on T$_{J(MAX)}$=150°C, using ≤ 10s junction-to-ambient thermal resistance.

C. Repetitive rating, pulse width limited by junction temperature T$_{J(MAX)}$=150°C. Ratings are based on low frequency and duty cycles to keep initialT$_J$=25°C.

D. The R$_{θJA}$ is the sum of the thermal impedance from junction to lead R$_{θJL}$ and lead to ambient.

E. The static characteristics in Figures 1 to 6 are obtained using <300μs pulses, duty cycle 0.5% max.

F. These curves are based on the junction-to-ambient thermal impedance which is measured with the device mounted on 1in^2 FR-4 board with 2oz. Copper, assuming a maximum junction temperature of T$_{J(MAX)}$=150°C. The SOA curve provides a single pulse rating.

P-Channel: TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS
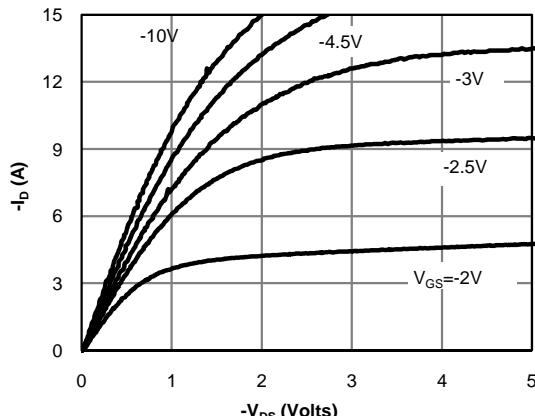


Fig 1: On-Region Characteristics (Note E)
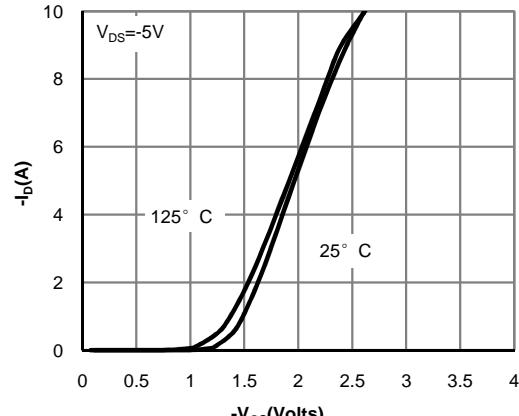
Figure 2: Transfer Characteristics (Note E)
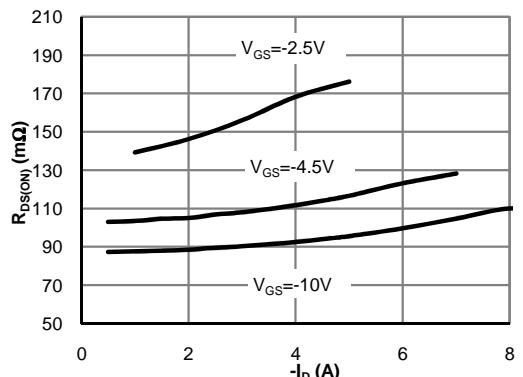
Figure 3: On-Resistance vs. Drain Current and Gate Voltage (Note E)
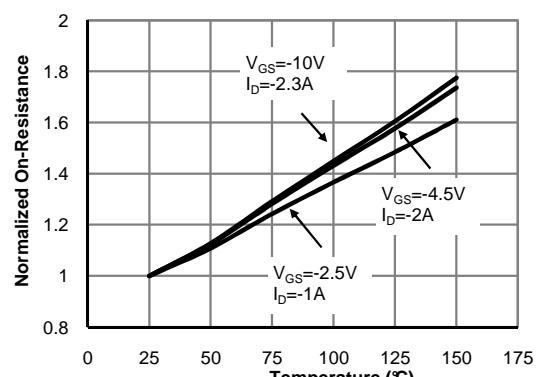
Figure 4: On-Resistance vs. Junction Temperature (Note E)
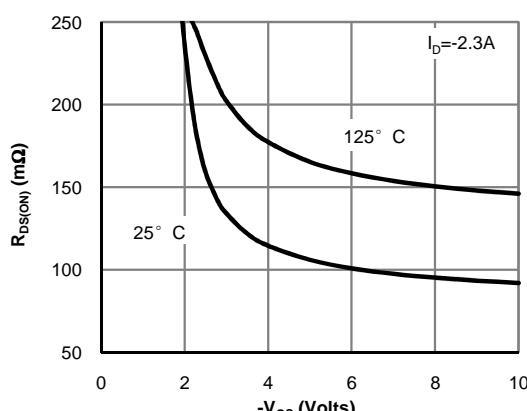
Figure 5: On-Resistance vs. Gate-Source Voltage (Note E)
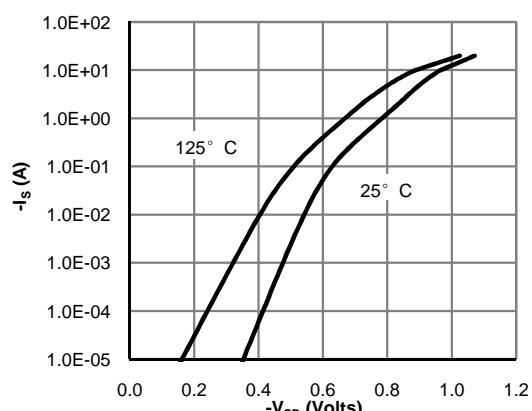
Figure 6: Body-Diode Characteristics (Note E)

**P-Channel: TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS**
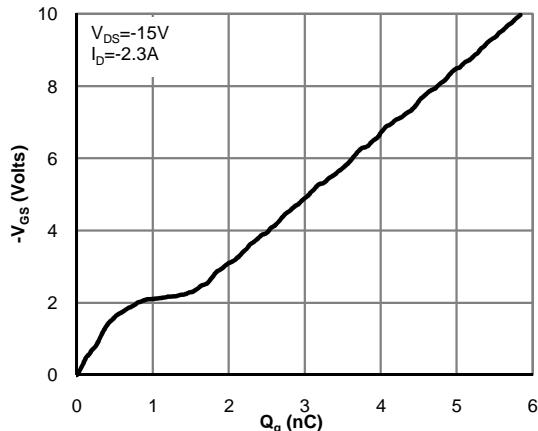
Figure 7: Gate-Charge Characteristics

Figure 8: Capacitance Characteristics

Figure 9: Maximum Forward Biased Safe
Operating Area (Note F)

Figure 10: Single Pulse Power Rating Junction-
to-Ambient (Note F)


Figure 11: Normalized Maximum Transient Thermal Impedance (Note F)

Gate Charge Test Circuit & Waveform

Resistive Switching Test Circuit & Waveforms

## Unclamped Inductive Switching (UIS) Test Circuit & Waveforms

$$E_{AR} = 1/2\ LI_{AR}^2$$

Diode Recovery Test Circuit & Waveforms

$$Q_{rr} = \int Idt$$
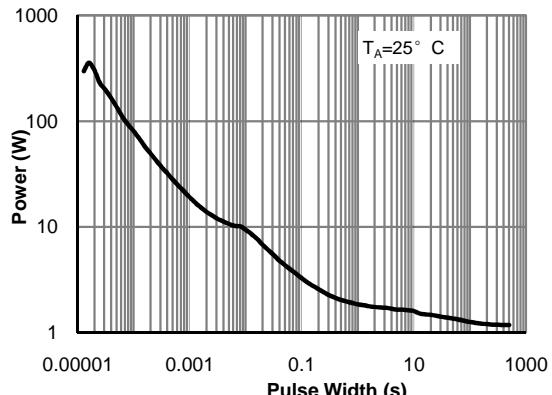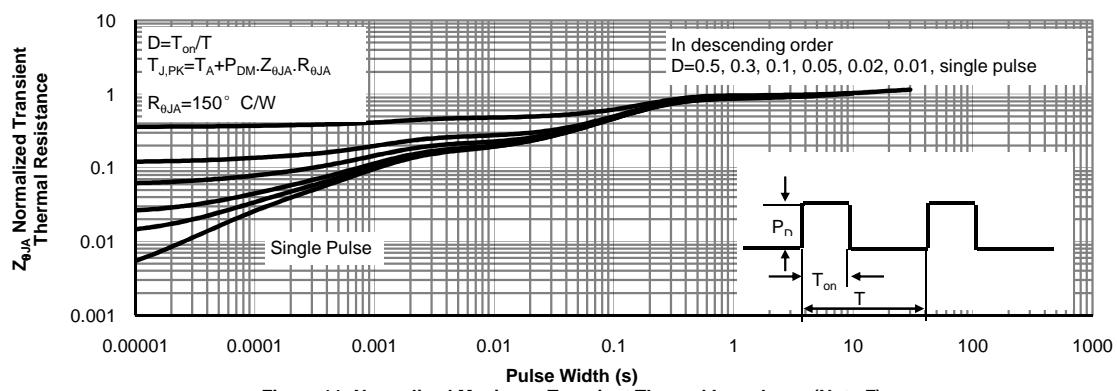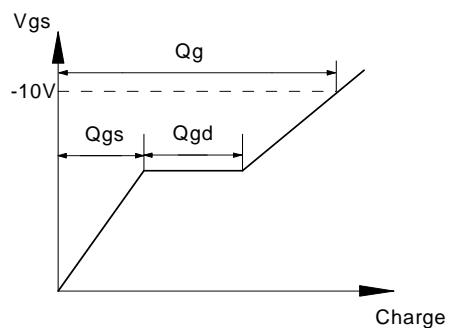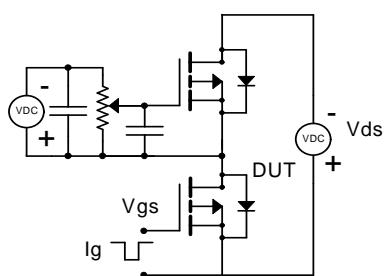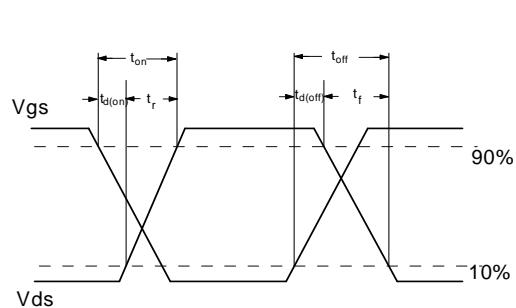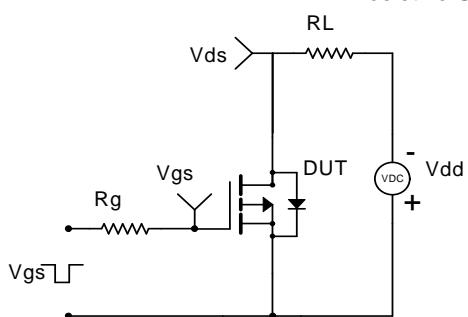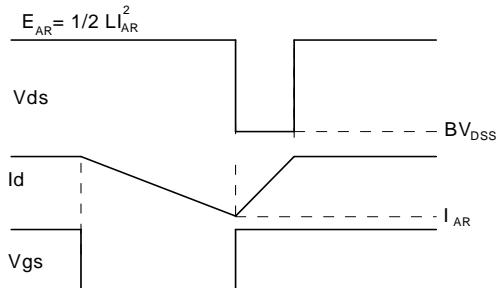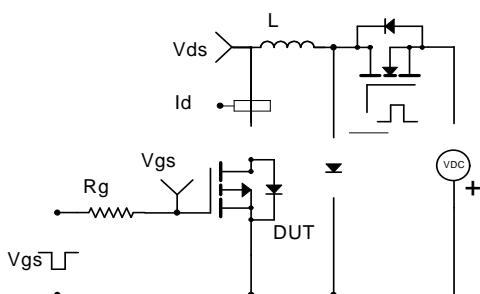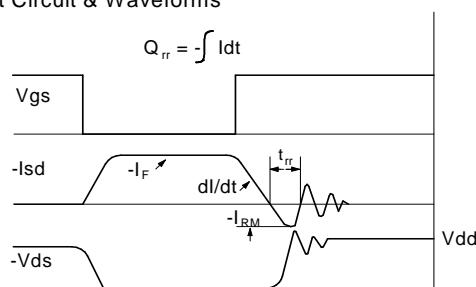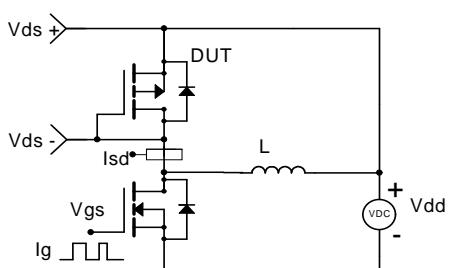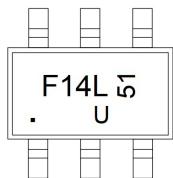
SOT23-6 PACKAGE OUTLIE DIMENSIONS

Marking

F14L 51
. U

Ordering information

Order code	Package	Baseqty	Deliverymode
UMW AO6601	SOT23-6	3000	Tape and reel

X-ON Electronics

Largest Supplier of Electrical and Electronic Components

Click to view similar products for MOSFET *category:*

Click to view products by Youtai *manufacturer:*

Other Similar products are found below :

IRFD120 JANTX2N5237 2SK2267(Q) BUK455-60A/B TK100A10N1,S4X(S MIC4420CM-TR VN1206L NDP4060 SI4482DY IRS2092STRPBF-EL IPS70R2K0CEAKMA1 TK31J60W5,S1VQ(O TK31J60W,S1VQ(O TK16J60W,S1VQ(O 2SK2614(TE16L1,Q) DMN1017UCP3-7 EFC2J004NUZTDG P85W28HP2F-7071 DMN1053UCP4-7 NTE2384 DMC2700UDMQ-7 DMN2080UCB4-7 DMN61D9UWQ-13 US6M2GTR DMN31D5UDJ-7 DMP22D4UFO-7B IPS60R3K4CEAKMA1 DMN1006UCA6-7 DMN16M9UCA6-7 STF5N65M6 IRF40H233XTMA1 STU5N65M6 DMN6022SSD-13 DMN13M9UCA6-7 DMTH10H4M6SPS-13 IPS60R360PFD7SAKMA1 DMN2990UFB-7B SSM3K35CT,L3F IPLK60R1K0PFD7ATMA1 2N7002W-G MCAC30N06Y-TP IPWS65R035CFD7AXKSA1 MCQ7328-TP SSM3J143TU,LXHF DMN12M3UCA6-7 PJMF280N65E1_T0_00201 PJMF380N65E1_T0_00201 PJMF280N60E1_T0_00201 PJMF600N65E1_T0_00201 PJMF900N65E1_T0_00201