



## General Description

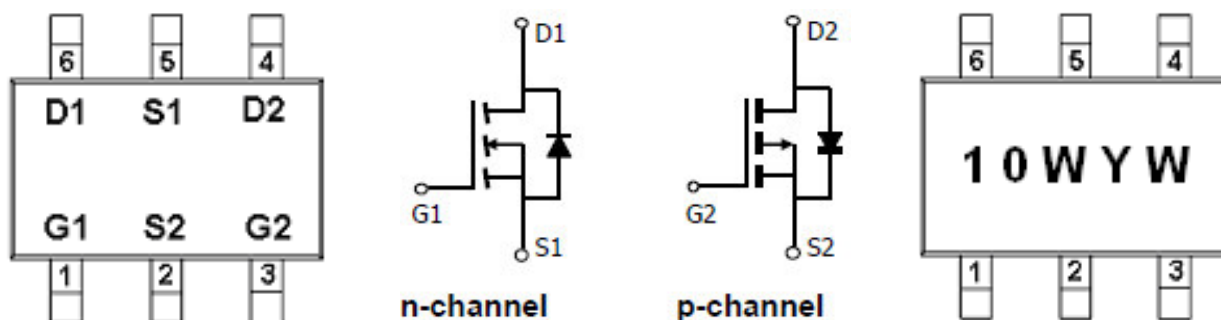
AFC6610W, N & P Pair enhancement mode MOSFET, uses Advanced Trench Technology to provide excellent  $R_{DS(ON)}$ , low gate charge.

These devices are particularly suited for low voltage power management, and low in-line power loss are needed in commercial industrial surface mount applications.

## Features

- N-Channel  
100V/2.3A,  $R_{DS(ON)}=310m\Omega@V_{GS}=10V$   
100V/1.8A,  $R_{DS(ON)}=320m\Omega@V_{GS}=4.5V$
- P-Channel  
-100V/-1.0A,  $R_{DS(ON)}=650m\Omega@V_{GS}=-10V$   
-100V/-0.5A,  $R_{DS(ON)}=700m\Omega@V_{GS}=-4.5V$
- Super high density cell design for extremely low  $R_{DS(ON)}$
- Exceptional on-resistance and maximum DC current capability
- SOT-23-6L package design

## Pin Description (SOT-23-6L)



## Application

- LED Backlight
- DC/DC Converter
- Load Switch for Portable Applications

## Pin Define

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

Part Ordering No.	Part Marking	Package	Unit	Quantity
AFC6610WS26RG	10WYW	SOT-23-6L	Tape & Reel	3000 EA

※ 10W parts code

※ Y year code ( 0 ~ 9 )

※ W week code ( A ~ Z = 1 ~ 26 / a ~ z = 27 ~ 52 )

※ AFC6610WS26RG : 7" Tape & Reel ; Pb- Free ; Halogen- Free



### Absolute Maximum Ratings

( $T_A=25^{\circ}\text{C}$  Unless otherwise noted)

Parameter	Symbol	Typical		Unit	
		N-Channel	P-Channel		
Drain-Source Voltage	$V_{DSS}$	100	-100	V	
Gate –Source Voltage	$V_{GSS}$	$\pm 20$	$\pm 20$	V	
Continuous Drain Current( $T_J=150^{\circ}\text{C}$ )	$I_D$	$T_A=25^{\circ}\text{C}$	-2.3	-1.0	A
		$T_A=70^{\circ}\text{C}$	-1.8	-0.5	
Pulsed Drain Current	$I_{DM}$	-4	-4	A	
Continuous Source Current(Diode Conduction)	$I_S$	-1.5	-1.5	A	
Power Dissipation	$P_D$	$T_A=25^{\circ}\text{C}$	2.0	W	
		$T_A=70^{\circ}\text{C}$	1.3		
Operating Junction Temperature	$T_J$	150		$^{\circ}\text{C}$	
Storage Temperature Range	$T_{STG}$	-55/150		$^{\circ}\text{C}$	
Thermal Resistance-Junction to Ambient	$R_{\theta JA}$	120		$^{\circ}\text{C}/\text{W}$	

### Electrical Characteristics ( N-Channel )

( $T_A=25^{\circ}\text{C}$  Unless otherwise noted)

Parameter	Symbol	Conditions	Min.	Typ	Max.	Unit
<b>Static</b>						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=250\mu\text{A}$	100			V
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu\text{A}$	1.0		2.0	
Gate Leakage Current	$I_{GSS}$	$V_{DS}=0V, V_{GS}=\pm 20V$			$\pm 100$	nA
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=80V, V_{GS}=0V$			1	uA
		$V_{DS}=80V, V_{GS}=0V$ $T_J=85^{\circ}\text{C}$			10	
On-State Drain Current	$I_{D(on)}$	$V_{DS} \geq 5V, V_{GS}=4.5V$	5			A
Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS}=10V, I_D=2.3A$			310	m $\Omega$
		$V_{GS}=4.5V, I_D=1.8A$			320	
Forward Transconductance	$g_{FS}$	$V_{DS}=20V, I_D=1.5A$		2		S
Diode Forward Voltage	$V_{SD}$	$I_S=1.3A, V_{GS}=0V$		0.85	1.2	V
<b>Dynamic</b>						
Total Gate Charge	$Q_g$	$V_{DS}=50V, V_{GS}=4.5V$ $I_D \equiv 1.6A$		2.8	5.8	nC
Gate-Source Charge	$Q_{gs}$			0.75		
Gate-Drain Charge	$Q_{gd}$			1.4		
Input Capacitance	$C_{iss}$	$V_{DS}=50V, V_{GS}=0V$ $f=1\text{MHz}$		200		pF
Output Capacitance	$C_{oss}$			22		
Reverse Transfer Capacitance	$C_{rss}$			13		
Turn-On Time	$t_{d(on)}$	$V_{DD}=50V, R_L=39\Omega$ $I_D \equiv 1.3A, V_{GEN}=4.5V$ $R_G=1\Omega$		25	50	ns
	$t_r$			20	50	
Turn-Off Time	$t_{d(off)}$			15	30	
	$t_f$			10	25	



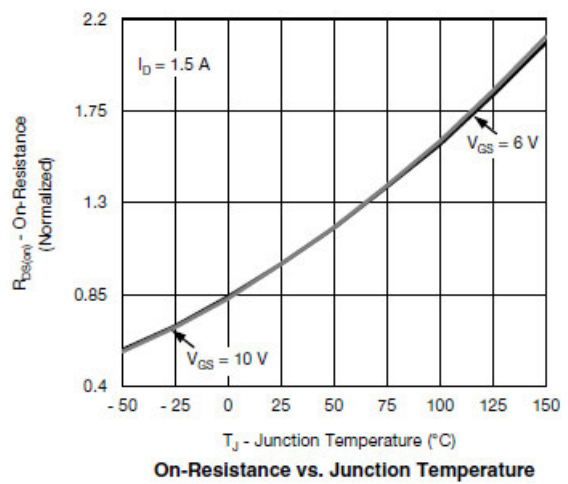
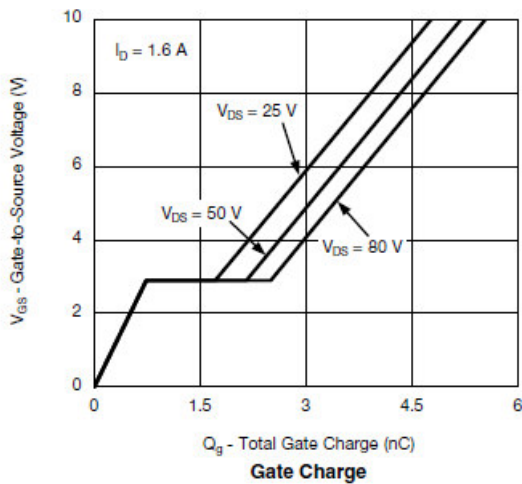
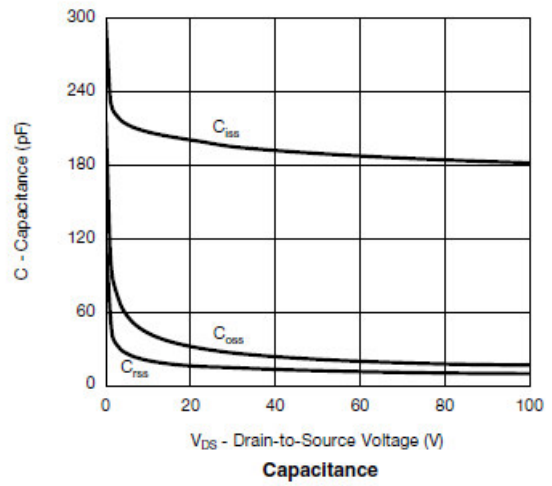
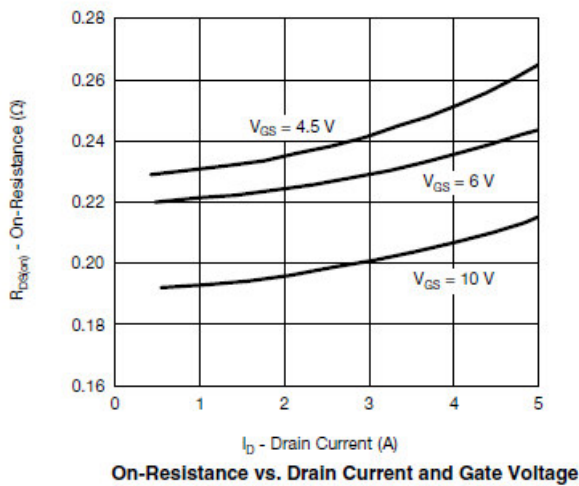
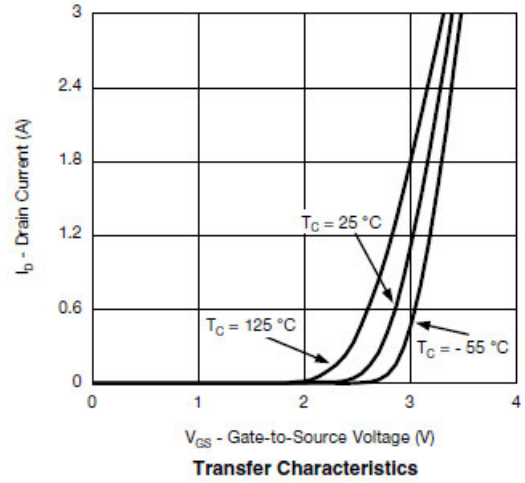
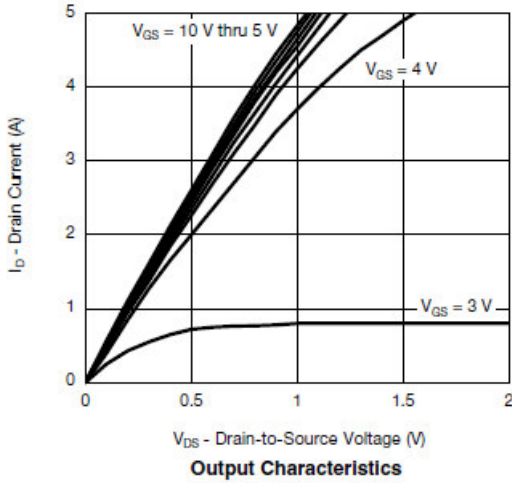
**Electrical Characteristics ( P-Channel )**

(T<sub>A</sub>=25°C Unless otherwise noted)

Parameter	Symbol	Conditions	Min.	Typ	Max.	Unit
<b>Static</b>						
Drain-Source Breakdown Voltage	V <sub>(BR)DSS</sub>	V <sub>GS</sub> =0V, I <sub>D</sub> =-250uA	-100			V
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =-250uA	-1.0		-2.5	
Gate Leakage Current	I <sub>GSS</sub>	V <sub>DS</sub> =0V, V <sub>GS</sub> =±12V			±100	nA
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> =-80V, V <sub>GS</sub> =0V			-1	uA
		V <sub>DS</sub> =-80V, V <sub>GS</sub> =0V T <sub>J</sub> =85°C			-30	
On-State Drain Current	I <sub>D(on)</sub>	V <sub>DS</sub> ≤ -15V, V <sub>GS</sub> =-10V	-1.6			A
Drain-Source On-Resistance	R <sub>DS(on)</sub>	V <sub>GS</sub> =-10V, I <sub>D</sub> =-1.0A		600	650	mΩ
		V <sub>GS</sub> =-4.5V, I <sub>D</sub> =-0.5A		620	700	
Forward Transconductance	g <sub>FS</sub>	V <sub>DS</sub> =-15V, I <sub>D</sub> =-0.5A		2.8		S
Diode Forward Voltage	V <sub>SD</sub>	I <sub>S</sub> =-0.5A, V <sub>GS</sub> =0V		-0.75	-1.3	V
<b>Dynamic</b>						
Total Gate Charge	Q <sub>g</sub>	V <sub>DS</sub> =-75V, V <sub>GS</sub> =-10V I <sub>D</sub> ≡-0.5A		9	20	nC
Gate-Source Charge	Q <sub>gs</sub>			2.5		
Gate-Drain Charge	Q <sub>gd</sub>			3.5		
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> =-25V, V <sub>GS</sub> =0V f=1MHz		450	650	pF
Output Capacitance	C <sub>oss</sub>			50		
Reverse Transfer Capacitance	C <sub>rss</sub>			30		
Turn-On Time	t <sub>d(on)</sub>	V <sub>DD</sub> =-75V, R <sub>L</sub> =75Ω I <sub>D</sub> ≡-1.0A, V <sub>GEN</sub> =-10V R <sub>G</sub> =6.0Ω		10	20	ns
	t <sub>r</sub>			15	30	
Turn-Off Time	t <sub>d(off)</sub>			20	40	
	t <sub>f</sub>			15	30	

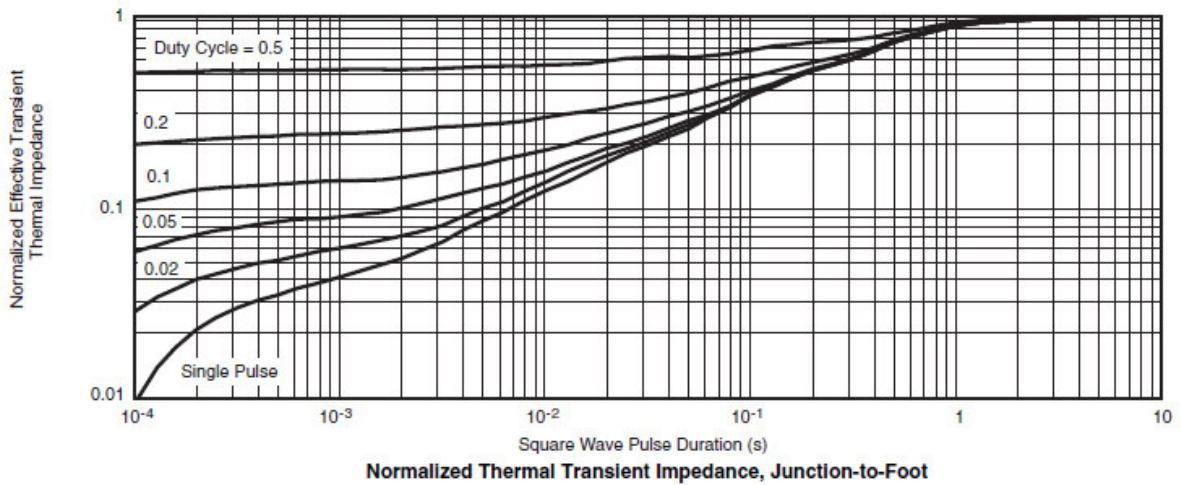
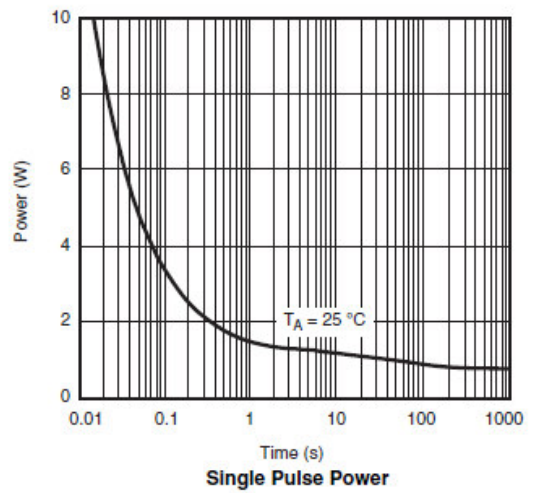
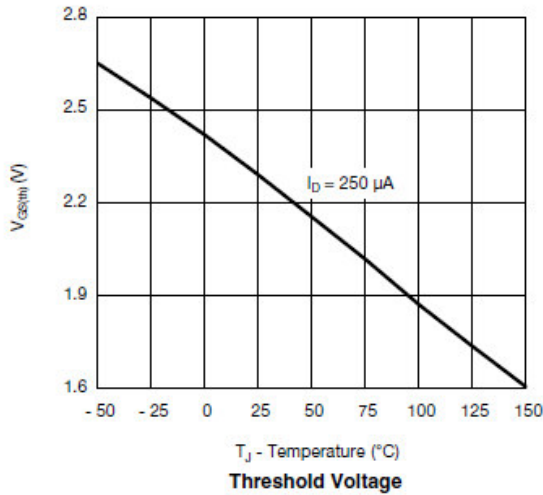
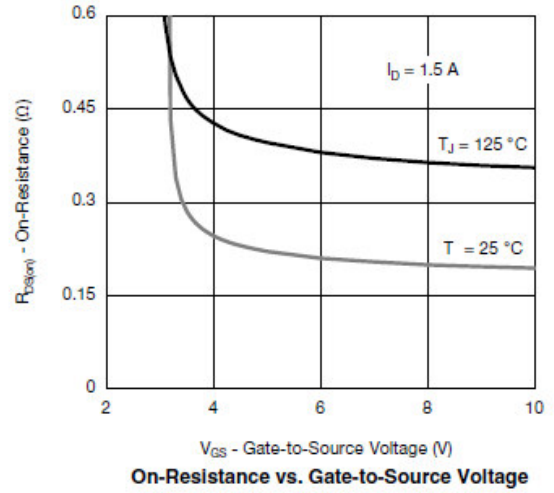
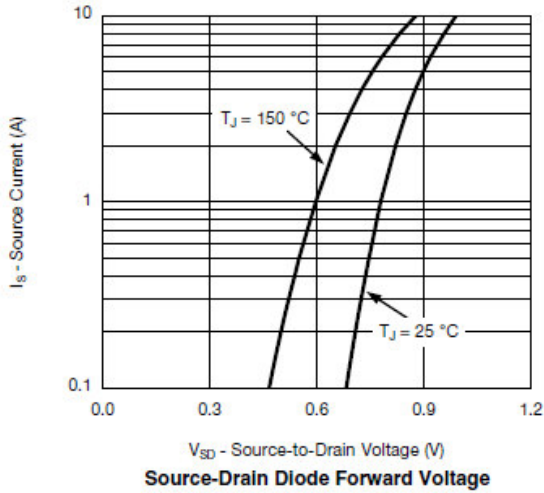


**Typical Characteristics ( N-Channel )**





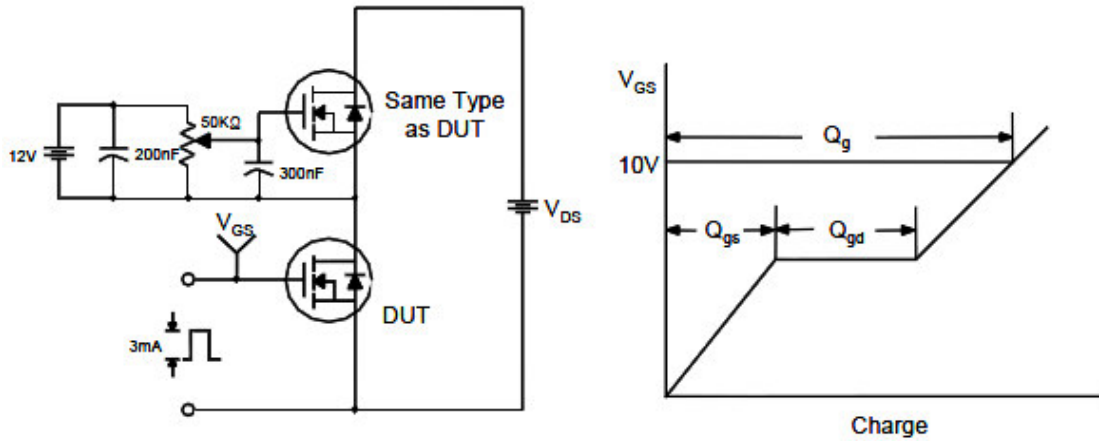
## Typical Characteristics ( N-Channel )



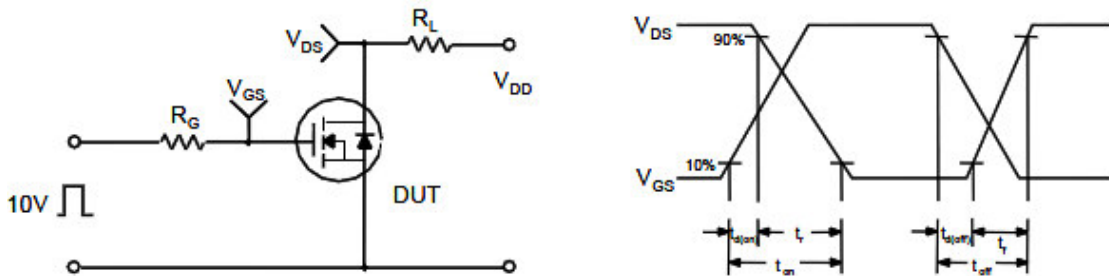


**Typical Characteristics ( N-Channel )**

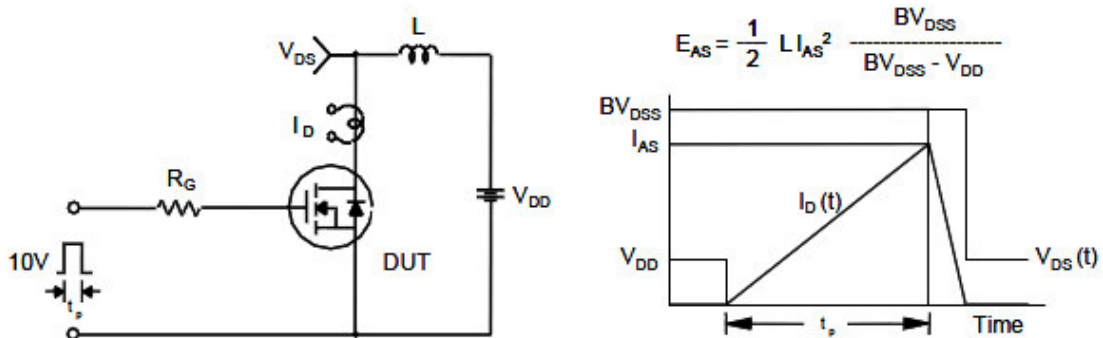
Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveforms



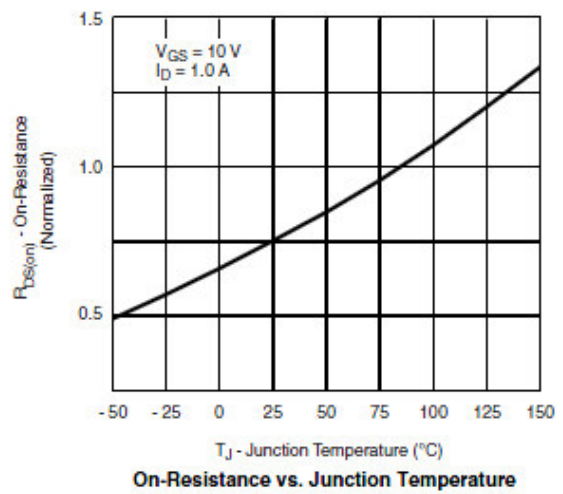
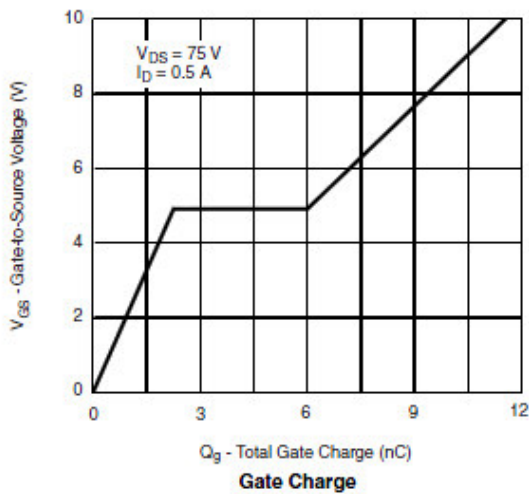
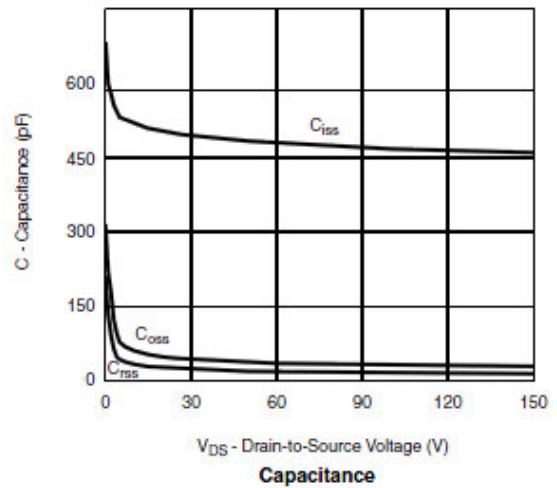
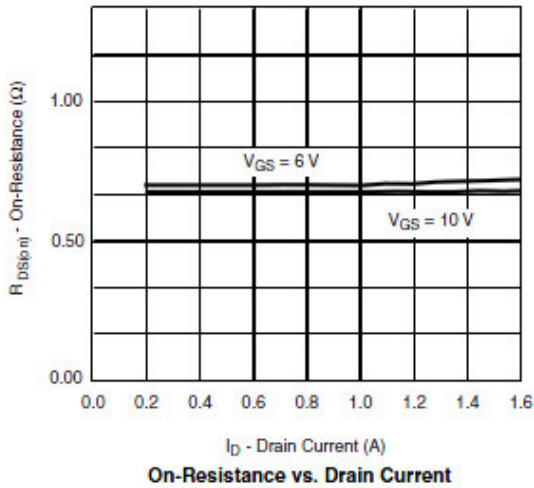
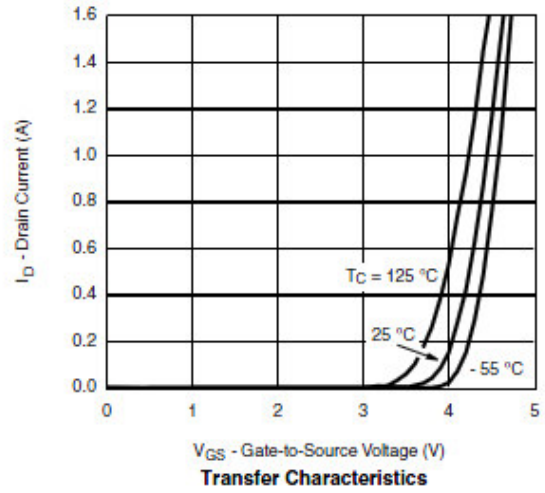
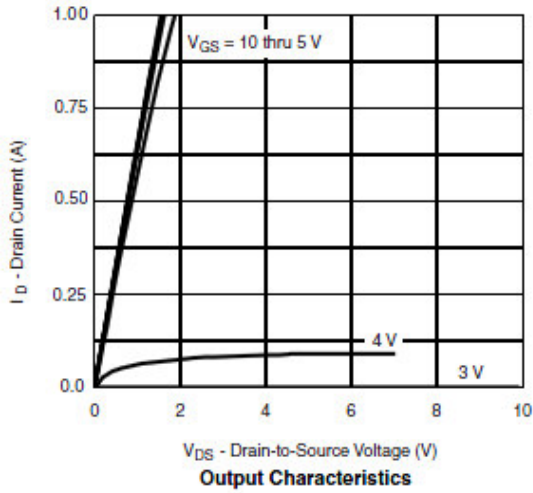
Unclamped Inductive Switching Test Circuit & Waveforms





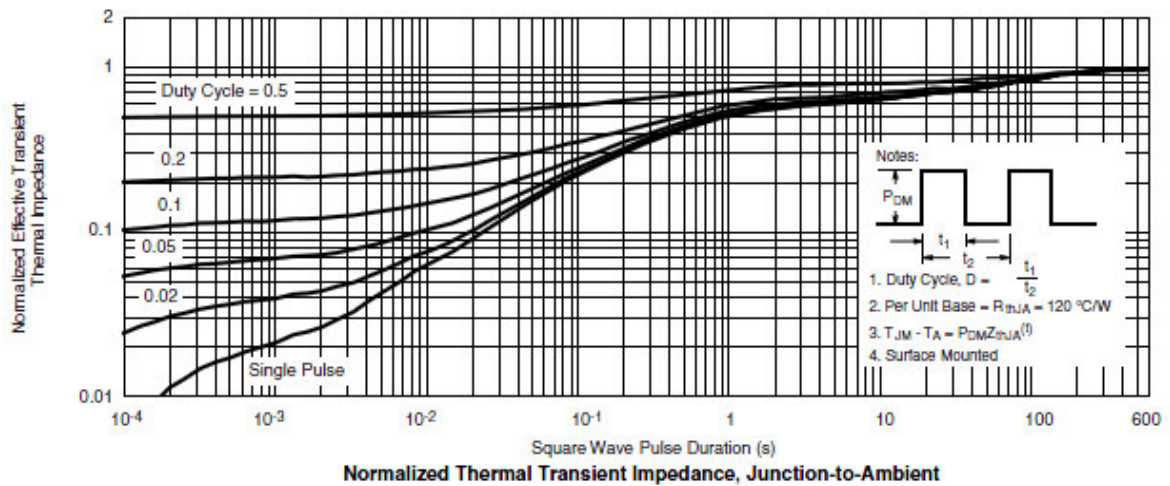
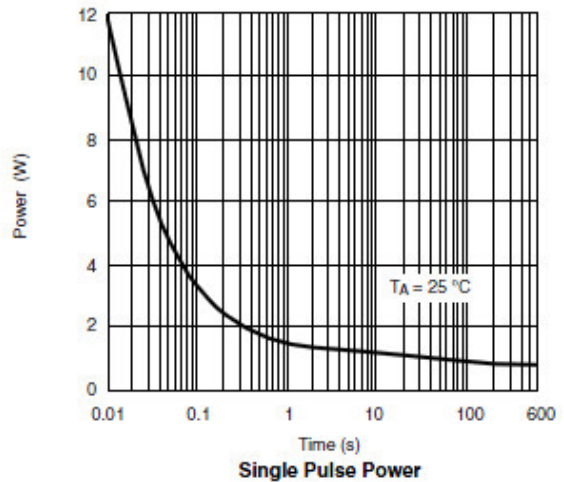
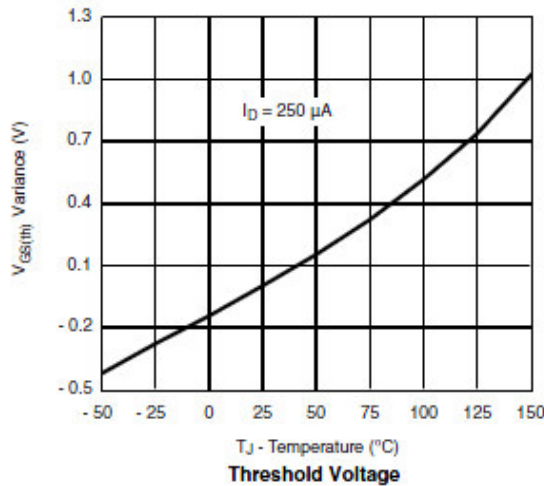
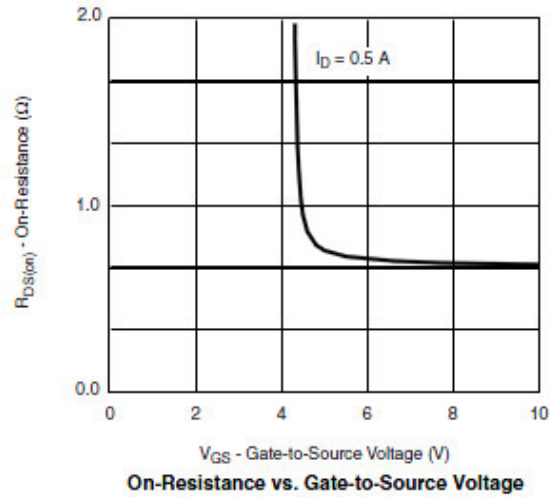
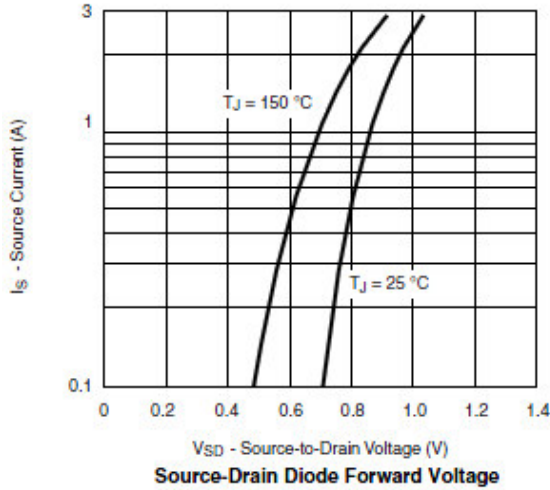


## Typical Characteristics ( P-Channel )





**Typical Characteristics ( P-Channel )**

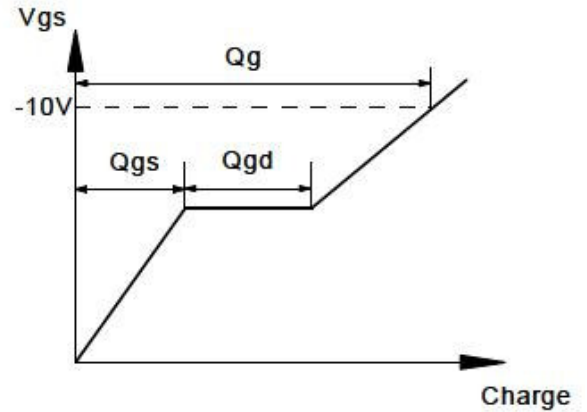
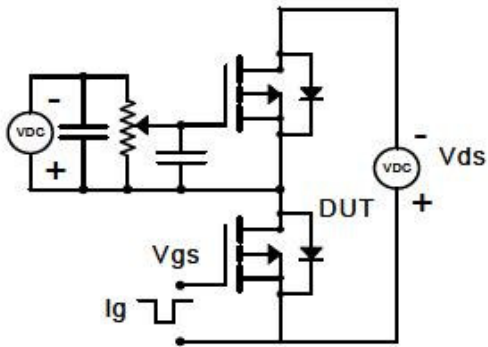




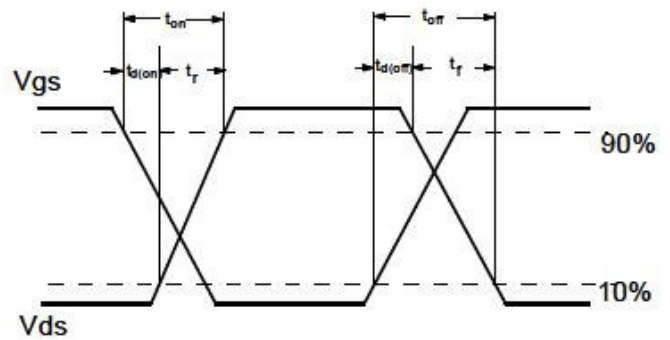
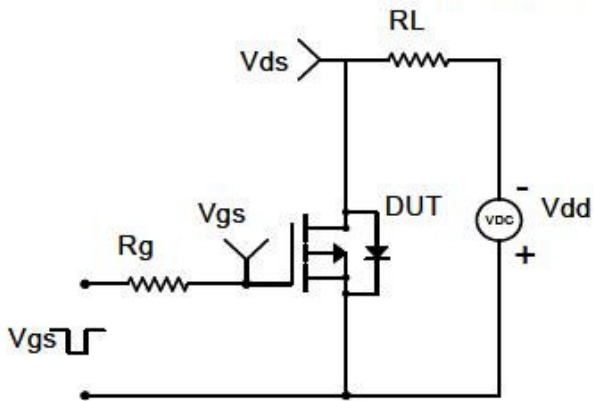


## Typical Characteristics

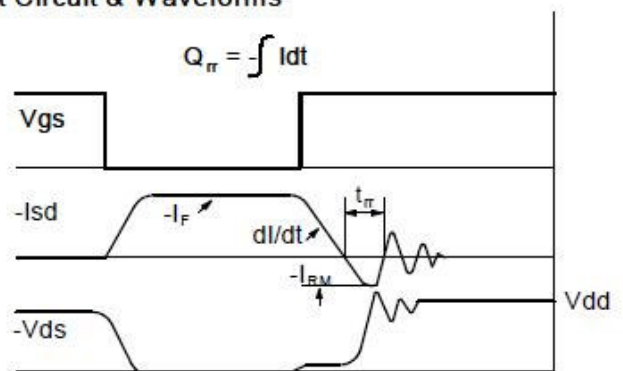
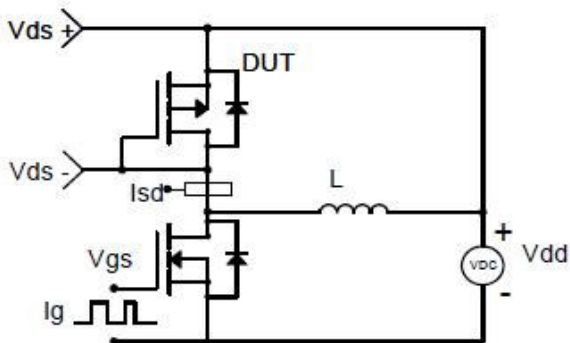
### Gate Charge Test Circuit & Waveform



### Resistive Switching Test Circuit & Waveforms

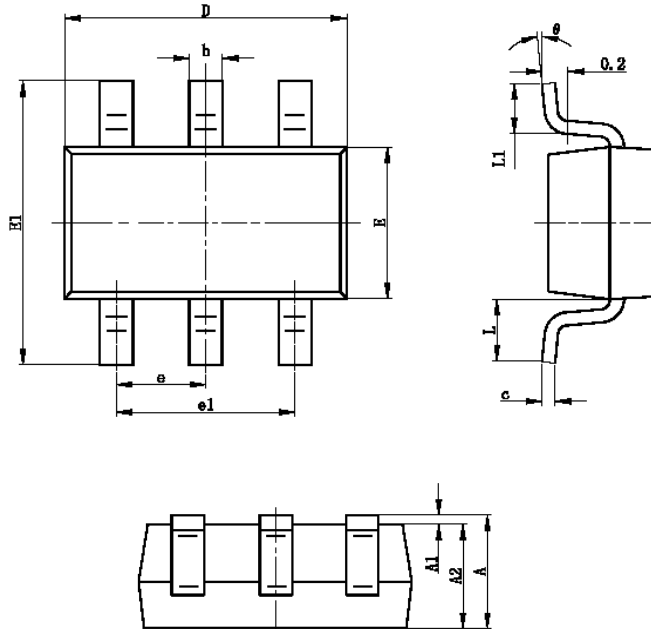


### Diode Recovery Test Circuit & Waveforms





**Package Information (SOT-23-6L )**



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.050	1.250	0.041	0.049
A1	0.000	0.100	0.000	0.004
A2	1.050	1.150	0.041	0.045
b	0.300	0.400	0.012	0.016
c	0.100	0.200	0.004	0.008
D	2.820	3.020	0.111	0.119
E	1.500	1.700	0.059	0.067
E1	2.650	2.950	0.104	0.116
e	0.950TYP		0.037TYP	
e1	1.800	2.000	0.071	0.079
L	0.700REF		0.028REF	
L1	0.300	0.600	0.012	0.024
θ	0°	8°	0°	8°

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