



General Description

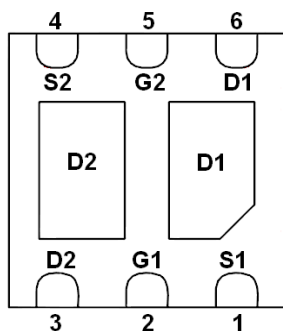
AFC2527W, N & P Pair enhancement mode MOSFET, uses Advanced Trench Technology to provide excellent $R_{DS(ON)}$, low gate charge.

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

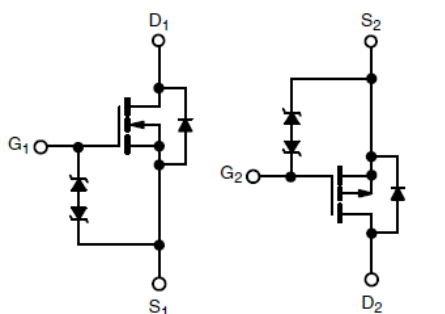
Features

- N-Channel
20V/5.0A, $R_{DS(ON)}=19m\Omega@V_{GS}=4.5V$
20V/4.6A, $R_{DS(ON)}=23m\Omega@V_{GS}=2.5V$
20V/4.2A, $R_{DS(ON)}=34m\Omega@V_{GS}=1.8V$
- P-Channel
-20V/-4.5A, $R_{DS(ON)}=42m\Omega@V_{GS}=4.5V$
-20V/-3.4A, $R_{DS(ON)}=52m\Omega@V_{GS}=2.5V$
-20V/-2.4A, $R_{DS(ON)}=68m\Omega@V_{GS}=1.8V$
- Super high density cell design for extremely low $R_{DS(ON)}$
- Exceptional on-resistance and maximum DC current capability
- ESD protection
- DFN2X2-6L package design

Pin Description (DFN2X2-6L)

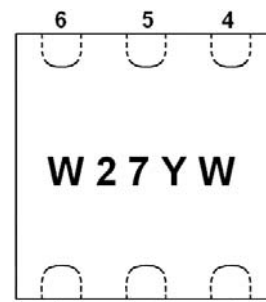


BOTTOM VIEW



N-Channel MOSFET

P-Channel MOSFET



TOP VIEW

Application

- Portable Devices Such as Smart Phones, Tablet PCs and Mobile Computing
 - Load Switches
 - Power Management
 - DC/DC Converters



Pin Define

Pin	Symbol	Description
1	S1	Source1
2	G1	Gate1
3	D2	Drain2
4	S2	Source2
5	G2	Gate2
6	D1	Drain1

Ordering Information

Part Ordering No.	Part Marking	Package	Unit	Quantity
AFC2527WFN226RG	W27YW	DFN2X2-6L	Tape & Reel	4000 EA

- ※ W27 parts code
- ※ Y year code
- ※ W week code
- ※ AFC2527WFN226RG : 7" Tape & Reel ; Pb- Free ; Halogen- Free

Absolute Maximum Ratings

(T_A=25°C Unless otherwise noted)

Parameter	Symbol	Typical		Unit	
		N-Channel	P-Channel		
Drain-Source Voltage	V _{DSS}	20	-20	V	
Gate –Source Voltage	V _{GSS}	±12	±12	V	
Continuous Drain Current(T _J =150°C)	I _D	T _c =25°C	4.5	-4.5	A
		T _c =70°C	4.5	-4.5	
Pulsed Drain Current	I _{DM}	20	-20	A	
Continuous Source Current(Diode Conduction)	I _S	1.6	-1.6	A	
Power Dissipation	P _D	T _c =25°C	7.8	W	
		T _c =70°C	5.0		
Operating Junction Temperature	T _J	150		°C	
Storage Temperature Range	T _{STG}	-55/150		°C	
Thermal Resistance-Junction to Ambient	R _{θJA}	52	52	°C/W	
Thermal Resistance-Junction to Case(Drian)	R _{θJc}	12.5	12.5		



Electrical Characteristics (N-Channel)

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

Parameter	Symbol	Conditions	Min.	Typ	Max.	Unit
Static						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=250\mu A$	20			V
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	0.4		1.0	V
Gate Leakage Current	I_{GSS}	$V_{DS}=0V, V_{GS}=\pm 12V$			± 10	μA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=16V, V_{GS}=0V$			1	μA
		$V_{DS}=16V, V_{GS}=0V$ $T_J=85^\circ\text{C}$			10	
On-State Drain Current	$I_{D(on)}$	$V_{DS} \geq 5V, V_{GS}=4.5V$	15			A
Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS}=4.5V, I_D=5.0A$		15	19	m Ω
		$V_{GS}=2.5V, I_D=4.6A$		18	23	
		$V_{GS}=1.8V, I_D=4.2A$		27	34	
Forward Transconductance	g_{FS}	$V_{DS}=6V, I_D=5A$		28		S
Diode Forward Voltage	V_{SD}	$I_S=1.5A, V_{GS}=0V$		0.85	1.2	V
Dynamic						
Total Gate Charge	Q_g	$V_{DS}=6V, V_{GS}=4.5V$ $I_D=5.0A$		6.0	12	nC
Gate-Source Charge	Q_{gs}			0.8		
Gate-Drain Charge	Q_{gd}			0.8		
Input Capacitance	C_{iss}	$V_{DS}=6V, V_{GS}=0V$ $f=1\text{MHz}$		620		pF
Output Capacitance	C_{oss}			180		
Reverse Transfer Capacitance	C_{rss}			100		
Turn-On Time	$t_{d(on)}$	$V_{DD}=10V, R_L=5.5\Omega$ $I_D=3.6A, V_{GEN}=4.5V$		10	20	ns
	t_r			10	20	
Turn-Off Time	$t_{d(off)}$	$R_G=6\Omega$		25	40	ns
	t_f			10	20	



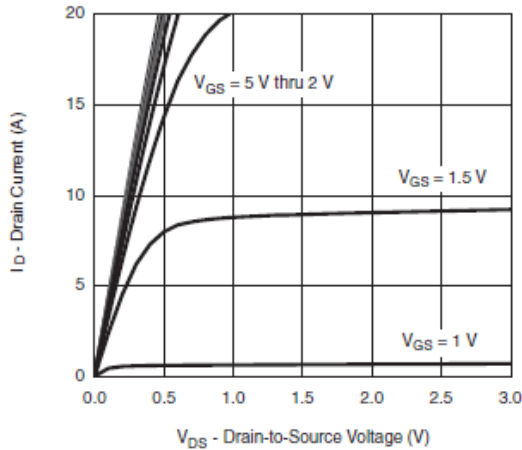
Electrical Characteristics (P-Channel)

(T_A=25°C Unless otherwise noted)

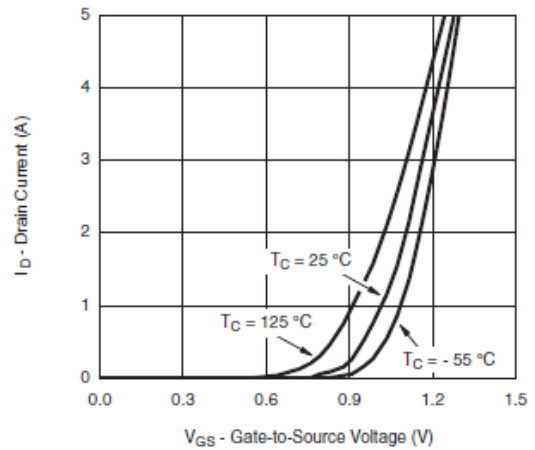
Parameter	Symbol	Conditions	Min.	Typ	Max.	Unit
Static						
Drain-Source Breakdown Voltage	V _{(BR)DSS}	V _{GS} =0V, I _D =-250uA	-20			V
Gate Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =-250uA	-0.4		-1.0	
Gate Leakage Current	I _{GSS}	V _{DS} =0V, V _{GS} =±8V			±10	uA
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =-16V, V _{GS} =0V			-1	uA
		V _{DS} =-16V, V _{GS} =0V T _J =85°C			-10	
On-State Drain Current	I _{D(on)}	V _{DS} ≥-5V, V _{GS} =-4.5V	-10			A
Drain-Source On-Resistance	R _{DS(on)}	V _{GS} =-4.5V, I _D =-4.5A		37	42	mΩ
		V _{GS} =-2.5V, I _D =-3.4A		46	52	
		V _{GS} =-1.8V, I _D =-2.4A		59	68	
Forward Transconductance	g _{FS}	V _{DS} =-6V, I _D =-4.6A		12		S
Diode Forward Voltage	V _{SD}	I _S =-1.25A, V _{GS} =0V		-0.85	-1.2	V
Dynamic						
Total Gate Charge	Q _g	V _{DS} =-6V, V _{GS} =-4.5V I _D ≡-5.6A		10	18	nC
Gate-Source Charge	Q _{gs}			2.5		
Gate-Drain Charge	Q _{gd}			2.8		
Input Capacitance	C _{iss}	V _{DS} =-6V, V _{GS} =0V f=1MHz		1450		pF
Output Capacitance	C _{oss}			265		
Reverse Transfer Capacitance	C _{rss}			255		
Turn-On Time	t _{d(on)}	V _{DD} =-10V, R _L =2.7Ω I _D ≡-3.7A, V _{GEN} =-4.5V		15	25	ns
	t _r			25	40	
Turn-Off Time	t _{d(off)}			40	65	
	t _f		R _G =1Ω		15	



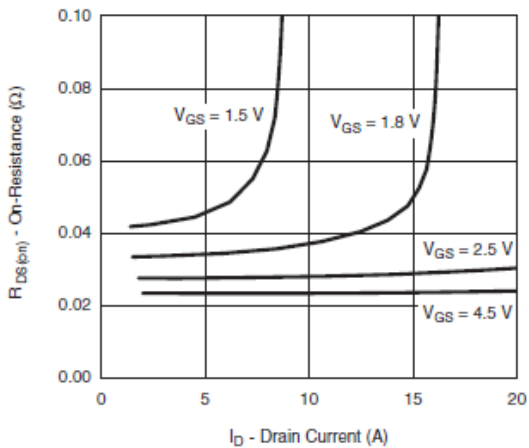
Typical Characteristics (N-Channel)



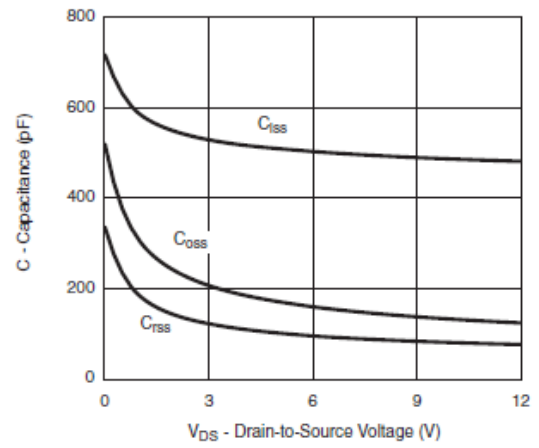
Output Characteristics



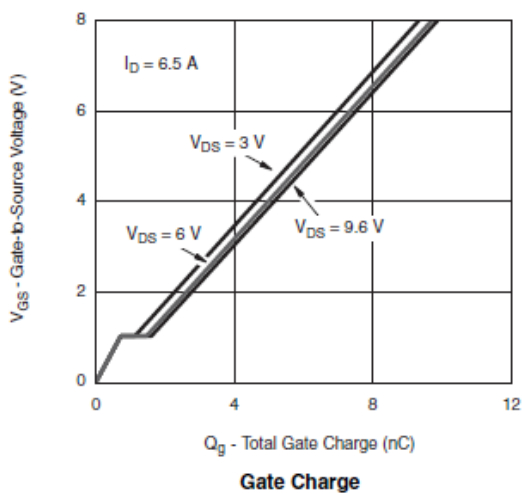
Transfer Characteristics



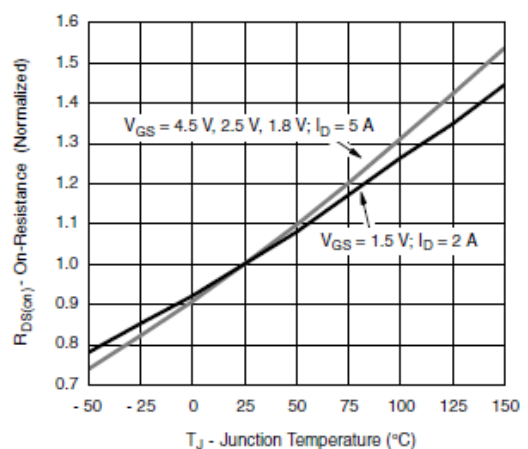
On-Resistance vs. Drain Current and Gate Voltage



Capacitance



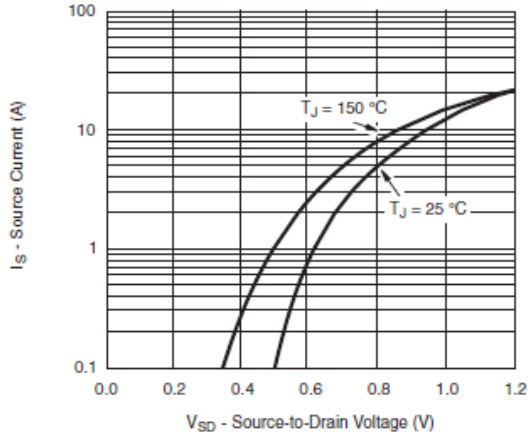
Gate Charge



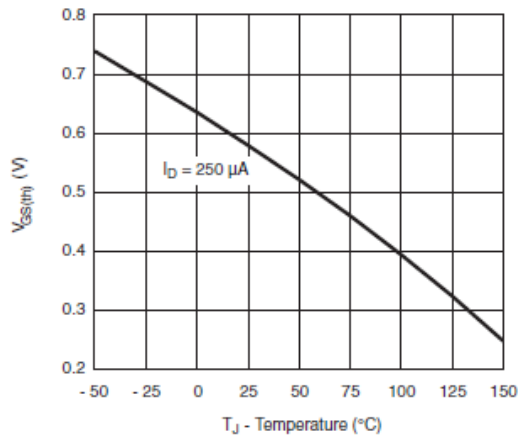
On-Resistance vs. Junction Temperature



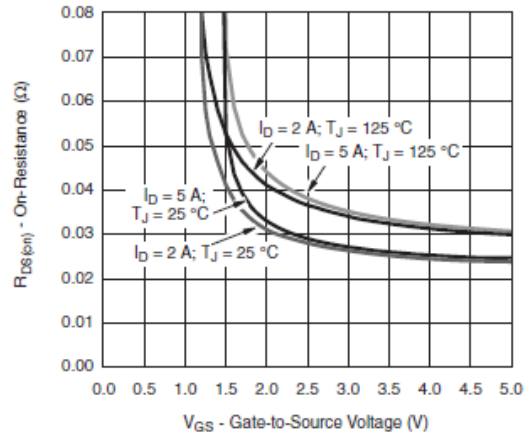
Typical Characteristics (N-Channel)



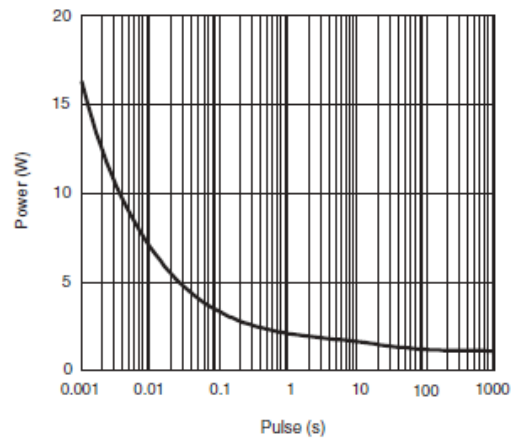
Source-Drain Diode Forward Voltage



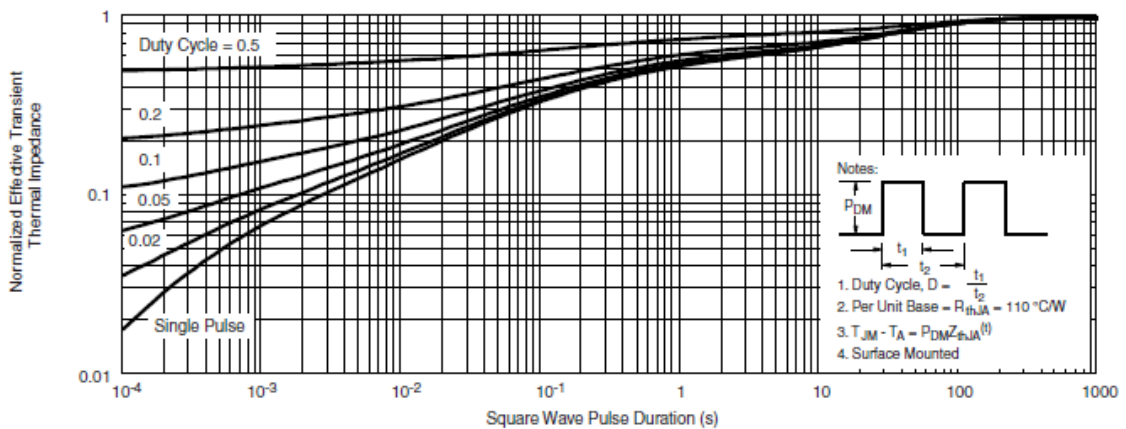
Threshold Voltage



On-Resistance vs. Gate-to-Source Voltage



Single Pulse Power (Junction-to-Ambient)

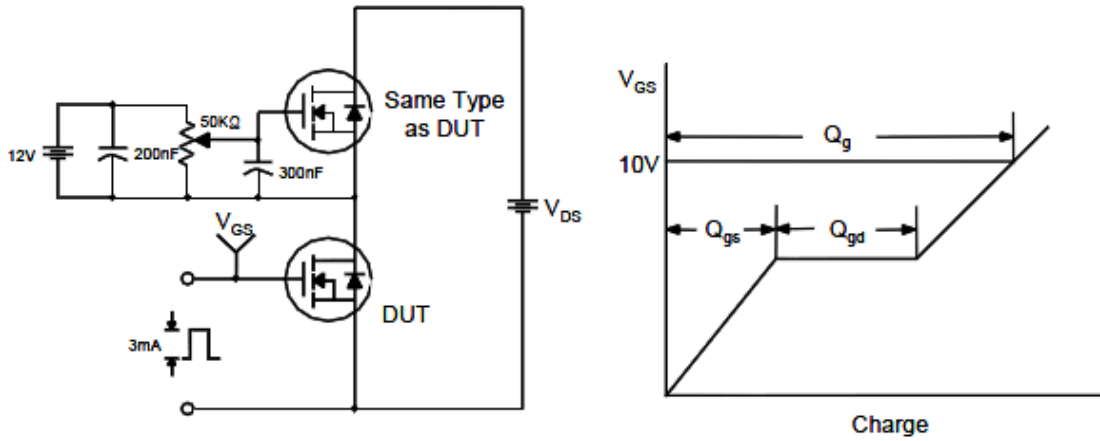


Normalized Thermal Transient Impedance, Junction-to-Ambient

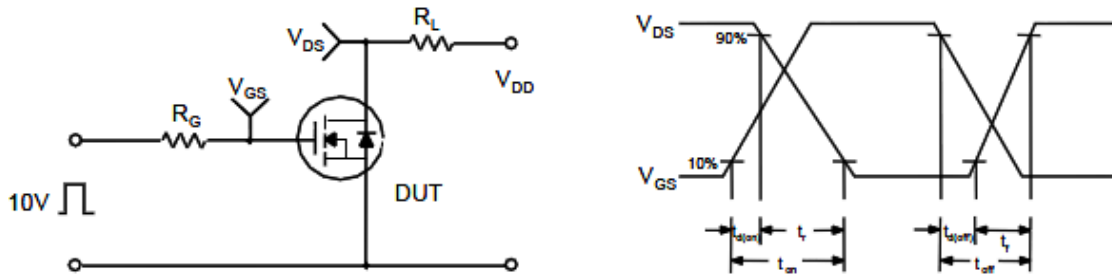


Typical Characteristics (N-Channel)

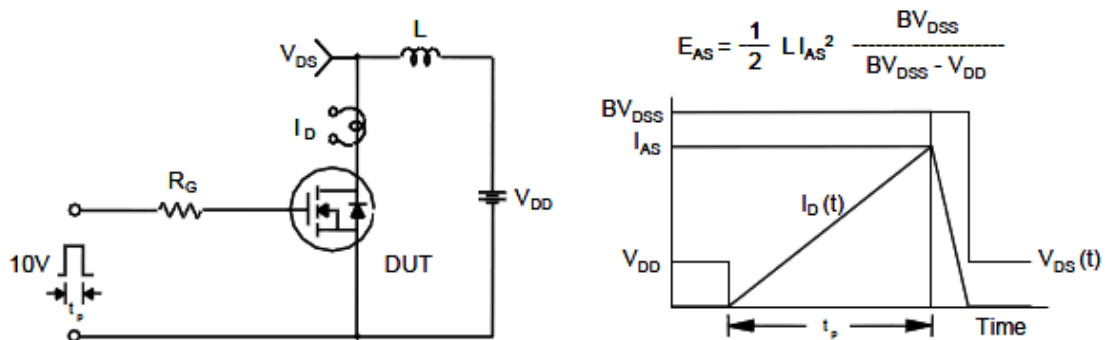
Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveforms

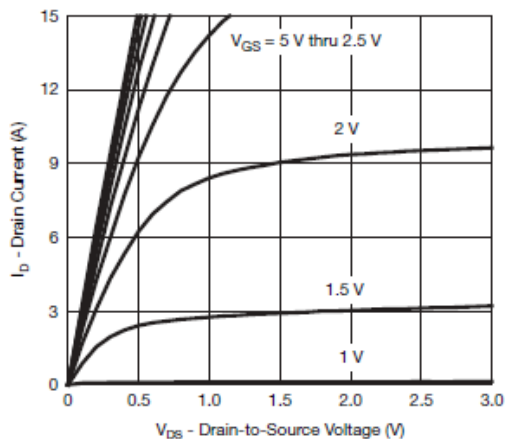


Unclamped Inductive Switching Test Circuit & Waveforms

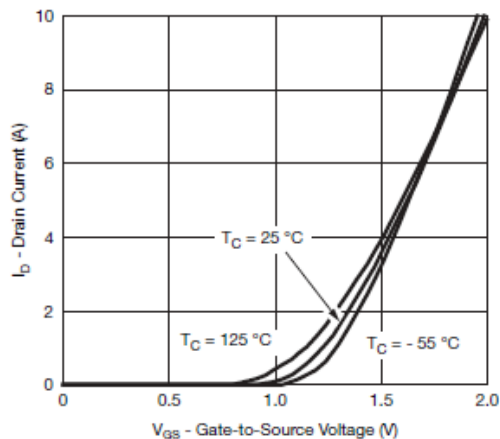




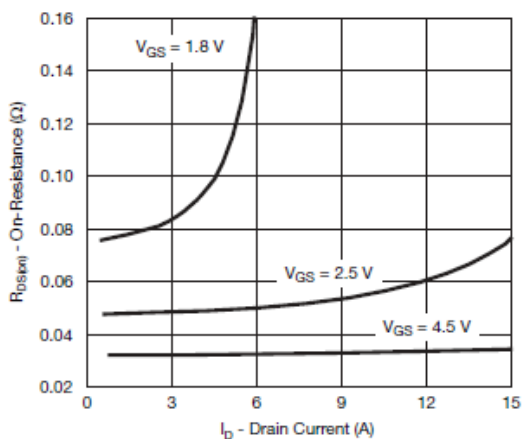
Typical Characteristics (P-Channel)



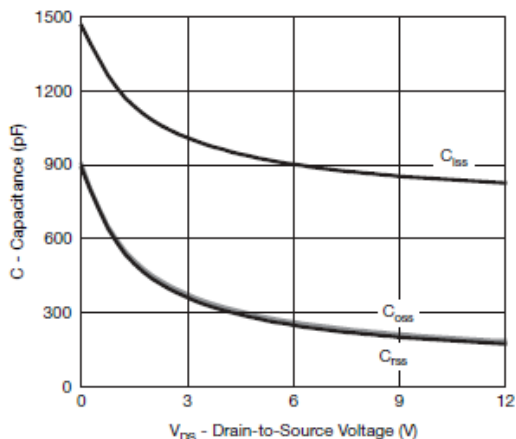
Output Characteristics



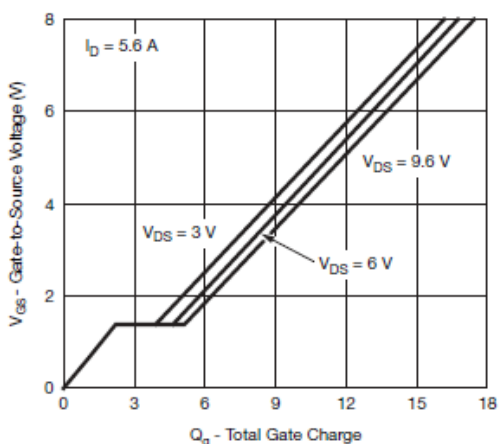
Transfer Characteristics



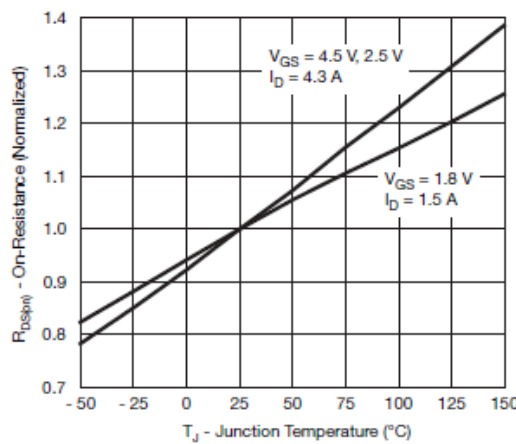
On-Resistance vs. Drain Current and Gate Voltage



Capacitance



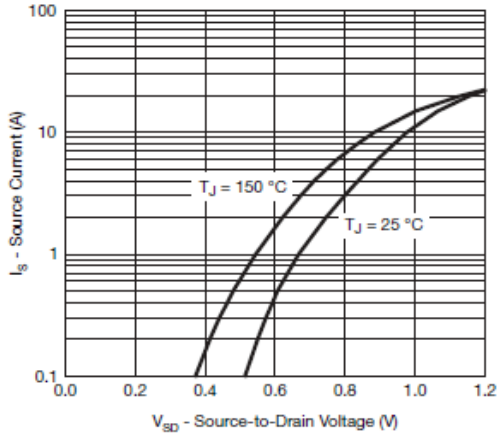
Gate Charge



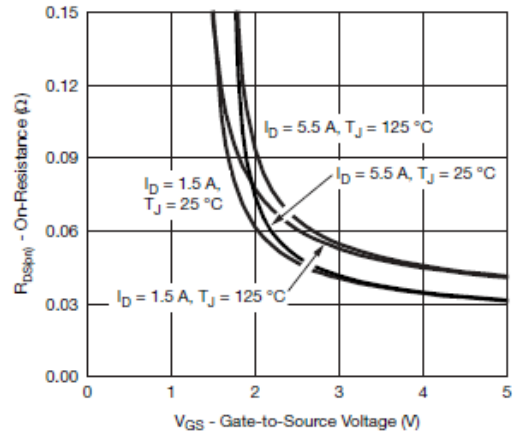
On-Resistance vs. Junction Temperature



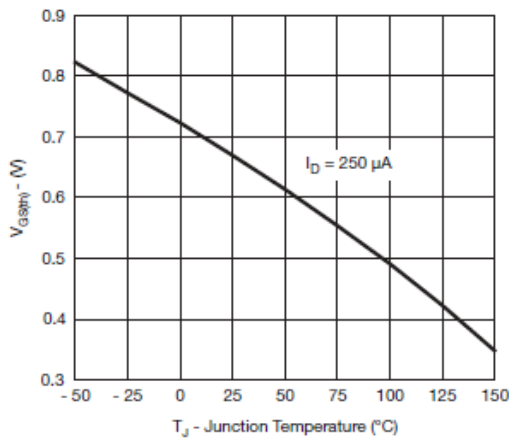
Typical Characteristics (P-Channel)



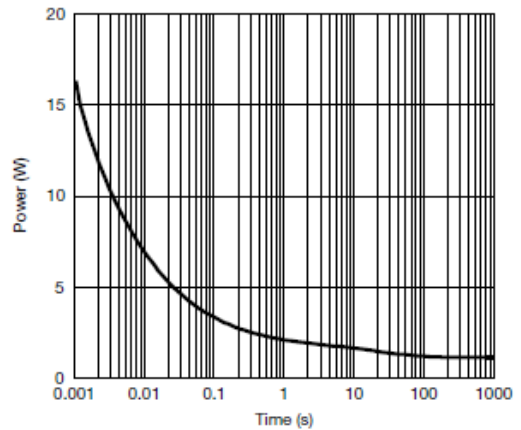
Source-Drain Diode Forward Voltage



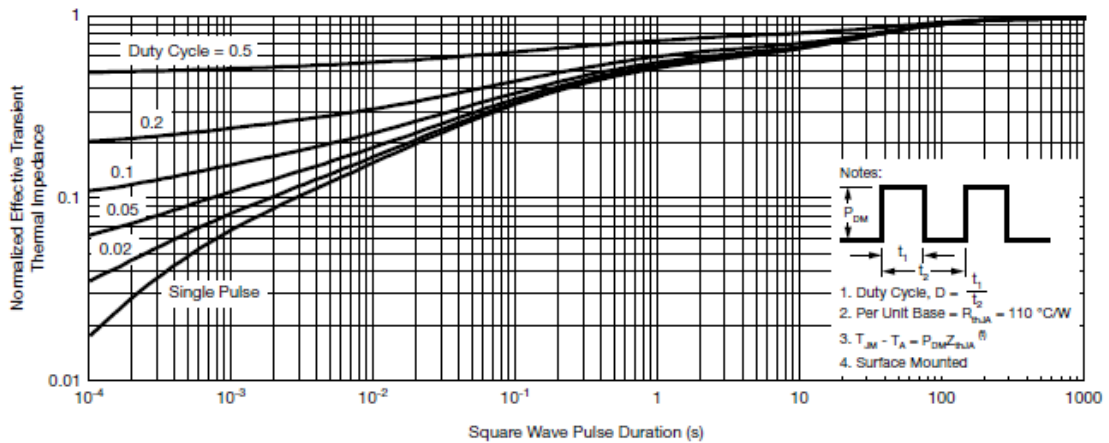
On-Resistance vs. Gate-to-Source Voltage



Threshold Voltage



Single Pulse Power, Junction-to-Ambient

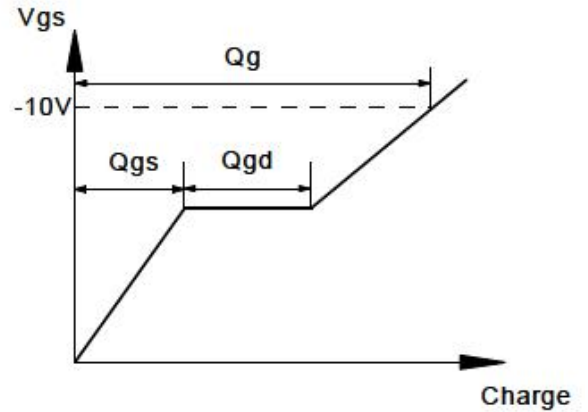
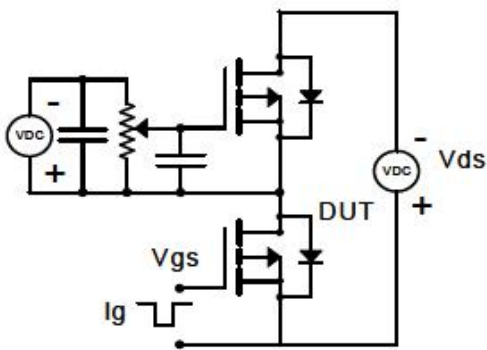


Normalized Thermal Transient Impedance, Junction-to-Ambient

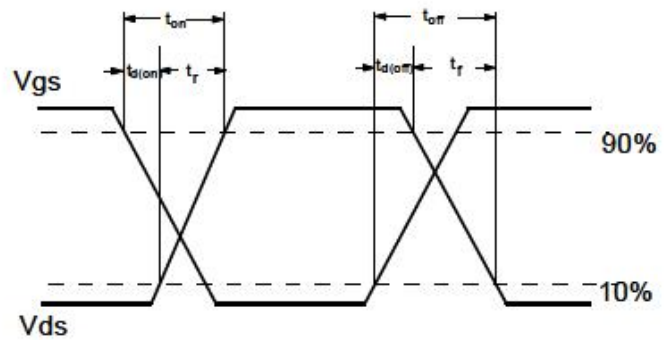
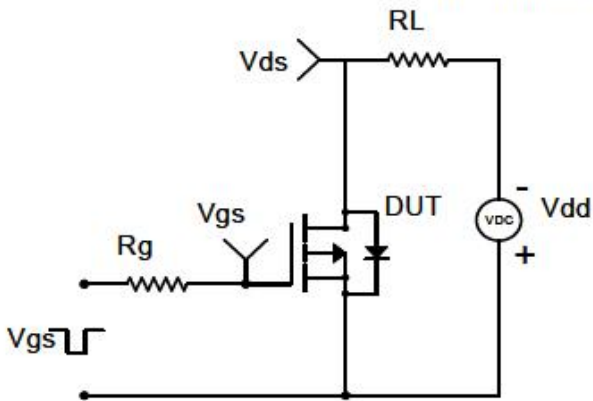


Typical Characteristics (P-Channel)

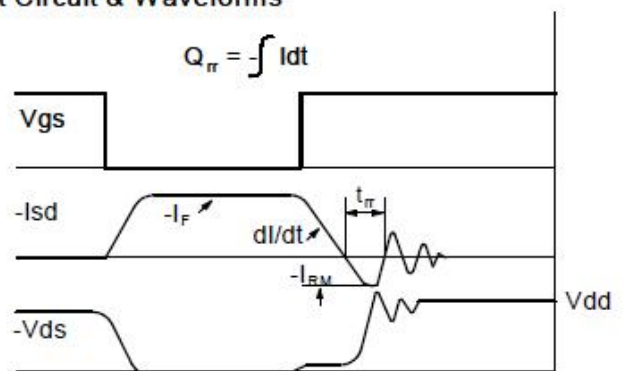
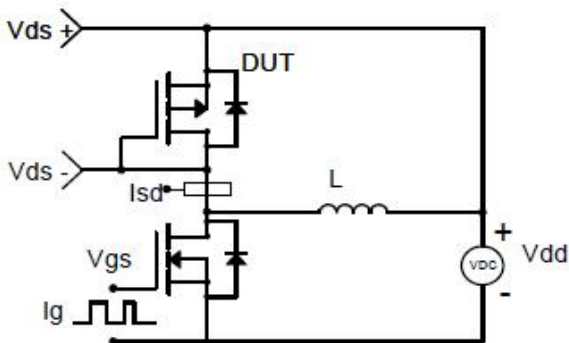
Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveforms

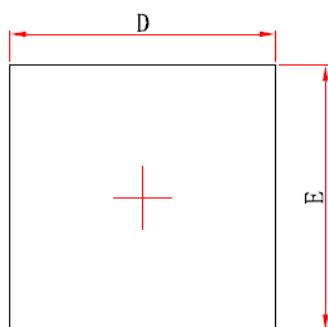


Diode Recovery Test Circuit & Waveforms

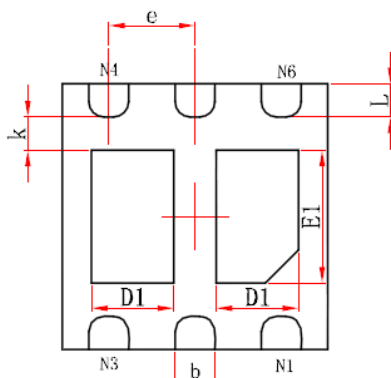




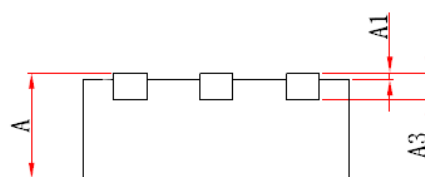
Package Information (DFN2X2-6L)



Top View



Bottom View



Side View

Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.700/0.800	0.800/0.900	0.028/0.031	0.031/0.035
A1	0.000	0.050	0.000	0.002
A3	0.203REF.		0.008REF.	
D	1.924	2.076	0.076	0.082
E	1.924	2.076	0.076	0.082
D1	0.520	0.720	0.020	0.028
E1	0.900	1.100	0.035	0.043
k	0.200MIN.		0.008MIN.	
b	0.250	0.350	0.010	0.014
e	0.650TYP.		0.026TYP.	
L	0.174	0.326	0.007	0.013

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