Alfa-MOS Technology

AFC2517W
20V N & P Pair Enhancement Mode MOSFET

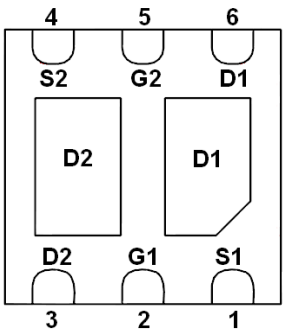
General Description

AFC2517W, 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.

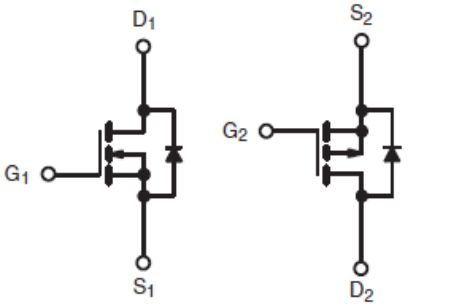
Features

- N-Channel
  20V/4.6A,$R_{DS(ON)}$=25mΩ@V_{GS}=4.5V
  20V/4.2A,$R_{DS(ON)}$=30mΩ@V_{GS}=2.5V
  20V/3.8A,$R_{DS(ON)}$=38mΩ@V_{GS}=1.8V
- P-Channel
  -20V/-3.6A,$R_{DS(ON)}$=52mΩ@V_{GS}=4.5V
  -20V/-3.2A,$R_{DS(ON)}$=65mΩ@V_{GS}=2.5V
  -20V/-1.2A,$R_{DS(ON)}$=82mΩ@V_{GS}=1.8V
- Super high density cell design for extremely low $R_{DS\ (ON)}$
- Exceptional on-resistance and maximum DC current capability
- DFN2X2-6L package design

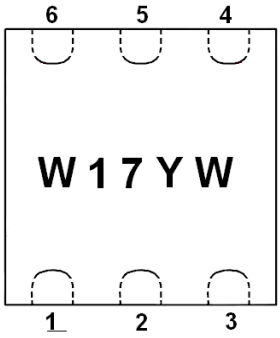
Pin Description (DFN2X2-6L)



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
AFC2517WFN226RG	W17YW	DFN2X2-6L	Tape & Reel	4000 EA

※ W17 parts code
※ Y year code
※ W week code
※ AFC2517WFN226RG : 7" Tape & Reel ; Pb- Free ; Halogen- Free

Absolute Maximum Ratings

(T_A=25℃ 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℃)	T_C=25℃	I_D	4.2	-4.2	A
	T_C=70℃		4.2	-4.2	
Pulsed Drain Current		I_{DM}	15	-15	A
Continuous Source Current(Diode Conduction)		I_S	1.6	-1.6	A
Power Dissipation	T_C=25℃	P_D	7.8		W
	T_C=70℃		5.0		
Operating Junction Temperature		T_J	150		℃
Storage Temperature Range		T_{STG}	-55/150		℃
Thermal Resistance-Junction to Ambient		$R_{\theta JA}$	52	52	℃/W
Thermal Resistance-Junction to Case(Drian)		$R_{\theta Jc}$	12.5	12.5	

Electrical Characteristics (N-Channel)

(T_A=25℃ Unless otherwise noted)

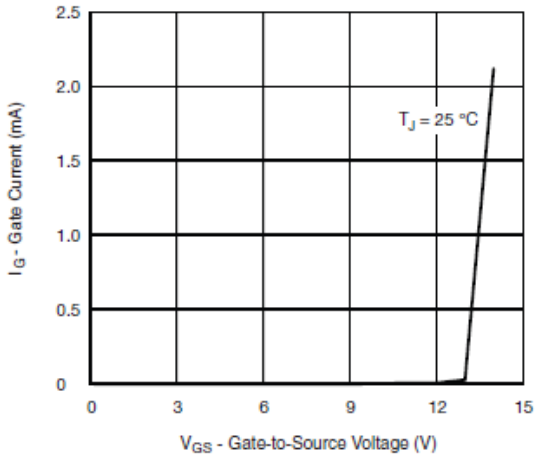
Parameter	Symbol	Conditions	Min.	Typ	Max.	Unit
Static						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS}=0V,I_D=250uA	20			V
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS},I_D=250uA	0.4		1.0	
Gate Leakage Current	I_{GSS}	V_{DS}=0V,V_{GS}=±12V			±100	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=16V,V_{GS}=0V			1	uA
		V_{DS}=16V,V_{GS}=0V T_J=85℃			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=4.6A		16	25	mΩ
		V_{GS}=2.5V,I_D=4.2A		20	30	
		V_{GS}=1.8V,I_D=2.8A		27	38	
Forward Transconductance	g_{FS}	V_{DS}=10V,I_D=4.6A		21		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}=10V,V_{GS}=4.5V I_D=5.9A		6.0	12	nC
Gate-Source Charge	Q_{gs}			0.75		
Gate-Drain Charge	Q_{gd}			0.85		
Input Capacitance	C_{iss}	V_{DS}=6V,V_{GS}=0V f=1MHz		480		pF
Output Capacitance	C_{oss}			120		
Reverse Transfer Capacitance	C_{rss}			75		
Turn-On Time	$t_{d(on)}$	V_{DD}=6V,R_L=1.3Ω I_D≡4.8A,V_{GEN}=4.5V R_G=1Ω		10	20	ns
	t_r			10	20	
Turn-Off Time	$t_{d(off)}$			20	40	
	t_f			10	20	

Electrical Characteristics (P-Channel)

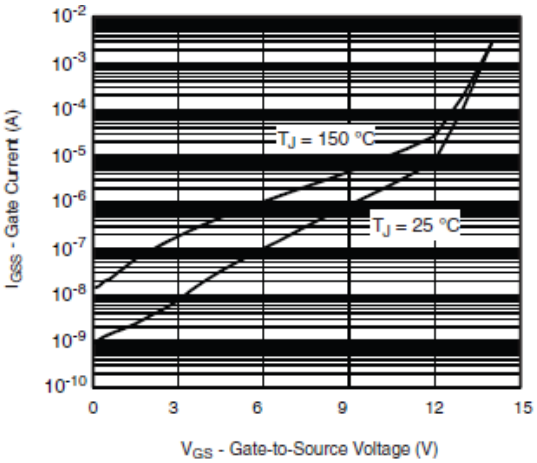
(T_A=25℃ Unless otherwise noted)

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℃			-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=-3.6A		42	52	mΩ
		V_{GS}=-2.5V,I_D=-3.2A		55	65	
		V_{GS}=-1.8V,I_D=-1.2A		69	82	
Forward Transconductance	g_{FS}	V_{DS}=-10V,I_D=-3.6A		11		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≡-4.3A		9	20	nC
Gate-Source Charge	Q_{gs}			1.2		
Gate-Drain Charge	Q_{gd}			2.8		
Input Capacitance	C_{iss}	V_{DS}=-6V,V_{GS}=0V f=1MHz		600		pF
Output Capacitance	C_{oss}			280		
Reverse Transfer Capacitance	C_{rss}			250		
Turn-On Time	$t_{d(on)}$	V_{DD}=-6V,R_L=1.6Ω I_D≡-3.8A,V_{GEN}=-4.5V R_G=1Ω		30	55	ns
	t_r			25	45	
Turn-Off Time	$t_{d(off)}$			30	55	
	t_f			20	40	

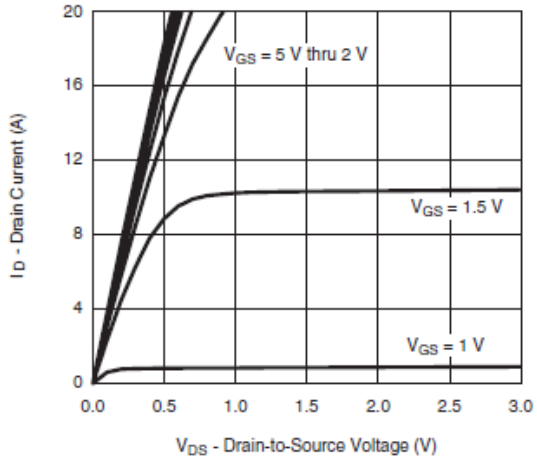
Typical Characteristics (N-Channel)



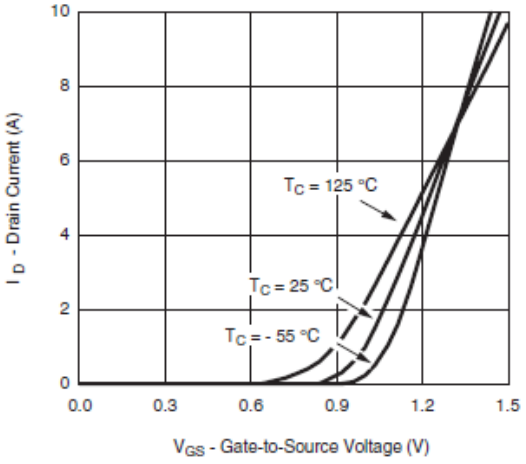
Gate Current vs. Gate-Source Voltage



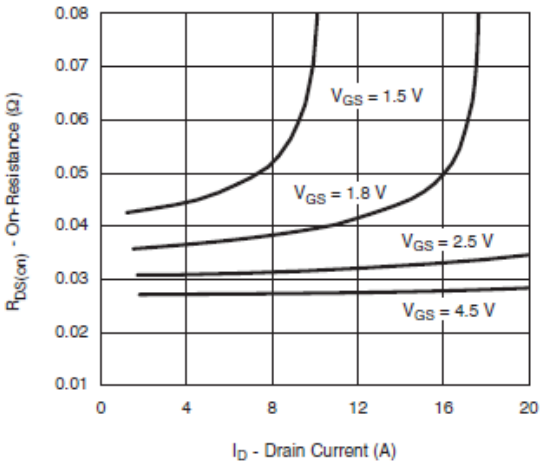
Gate Current vs. Gate-Source Voltage



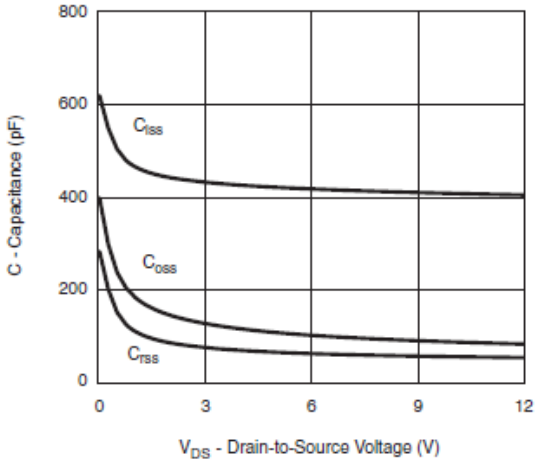
Output Characteristics



Transfer Characteristics

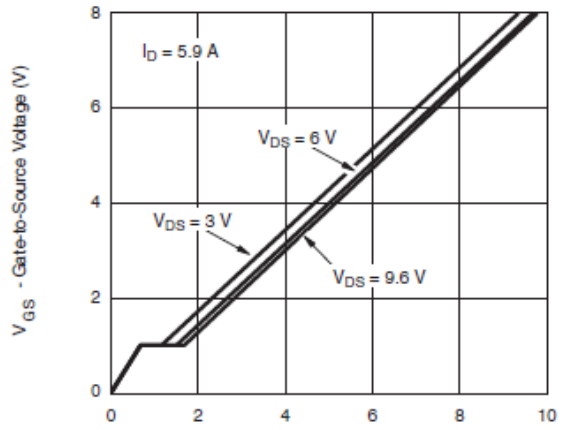


On-Resistance vs. Drain Current and Gate Voltage

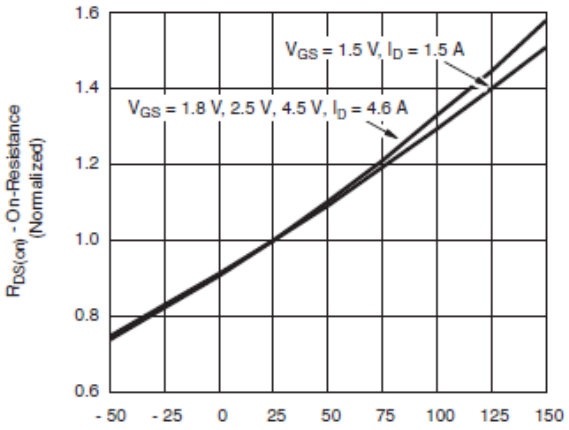


Capacitance

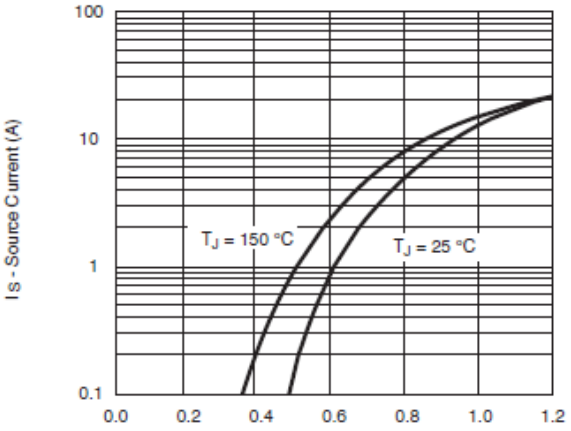
Typical Characteristics (N-Channel)



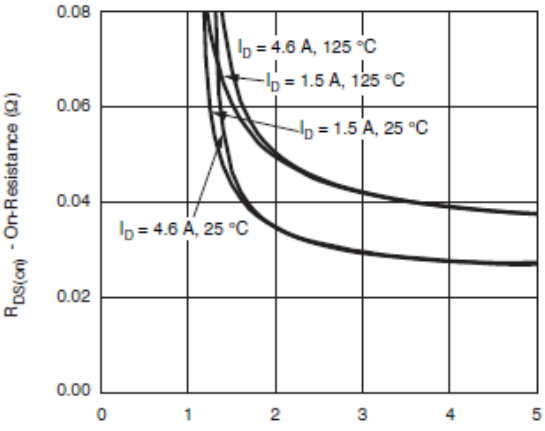
Gate Charge



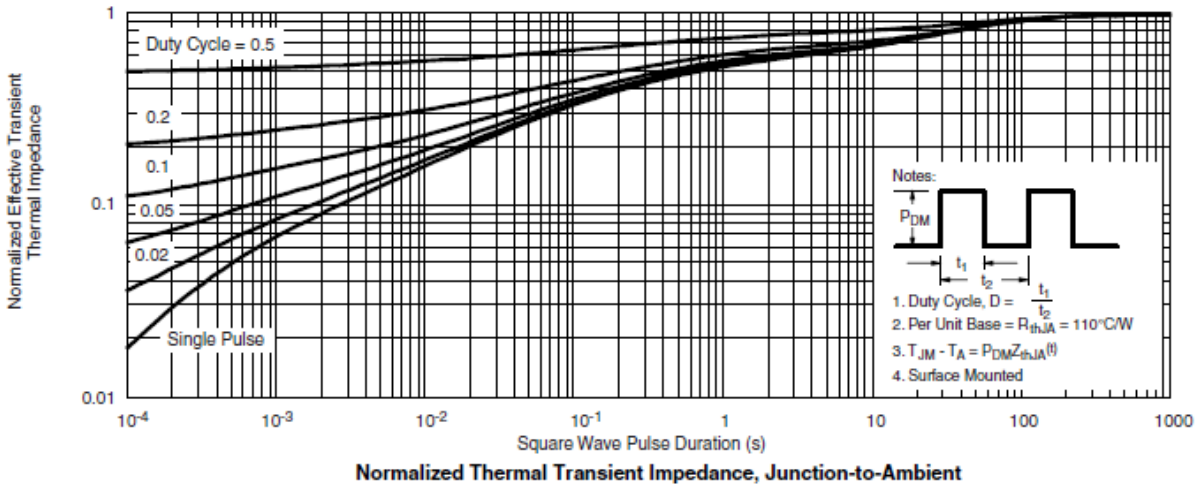
On-Resistance vs. Junction Temperature



Source-Drain Diode Forward Voltage



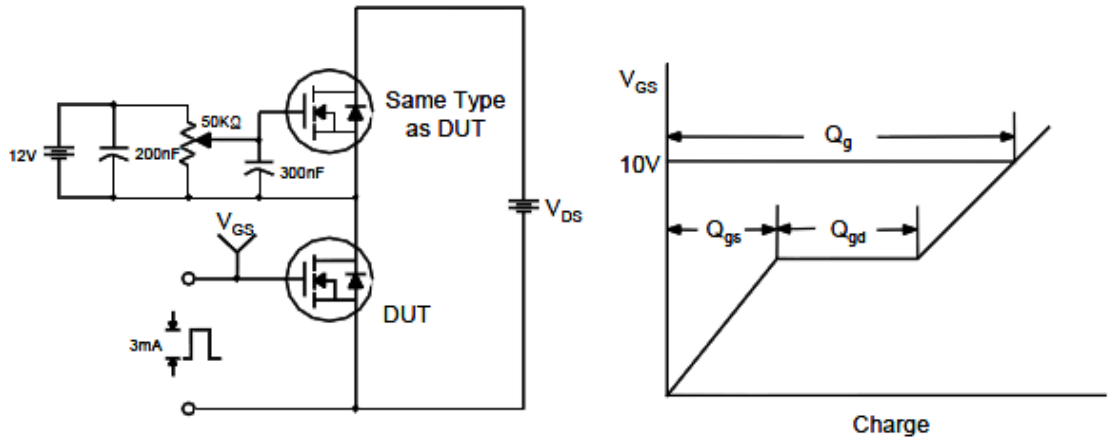
On-Resistance vs. Gate-to-Source Voltage



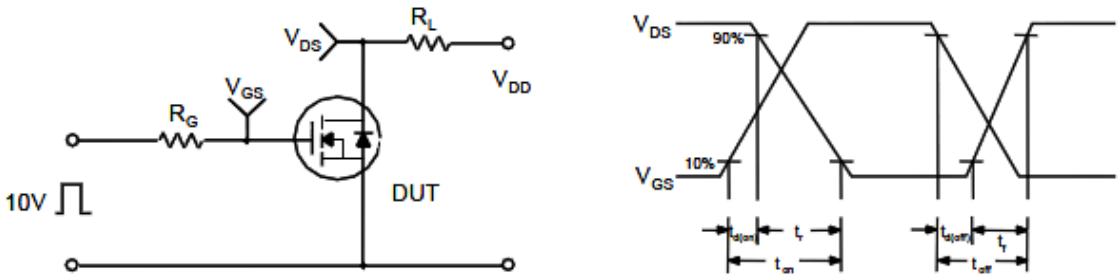
Normalized Thermal Transient Impedance, Junction-to-Ambient

Typical Characteristics (N-Channel)

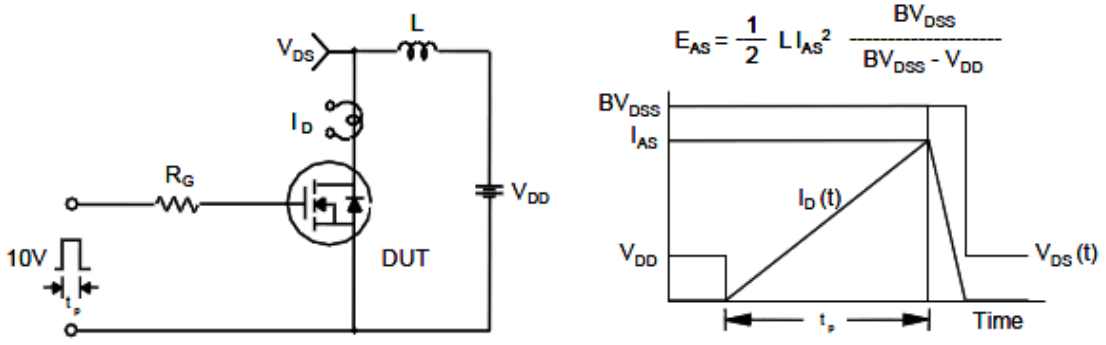
Gate Charge Test Circuit & Waveform



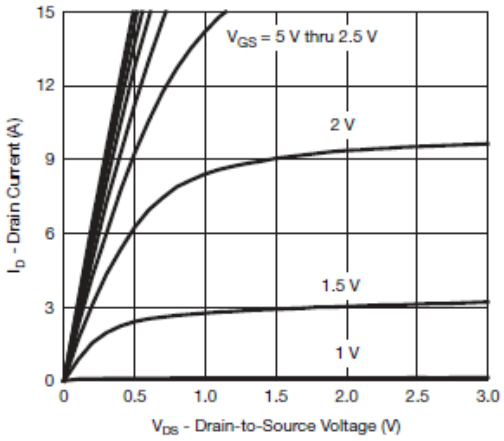
Resistive Switching Test Circuit & Waveforms



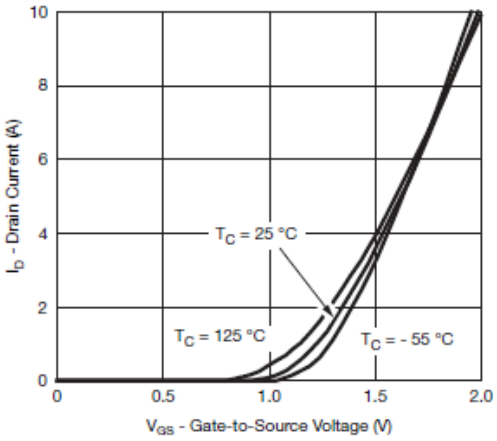
Unclamped Inductive Switching Test Circuit & Waveforms



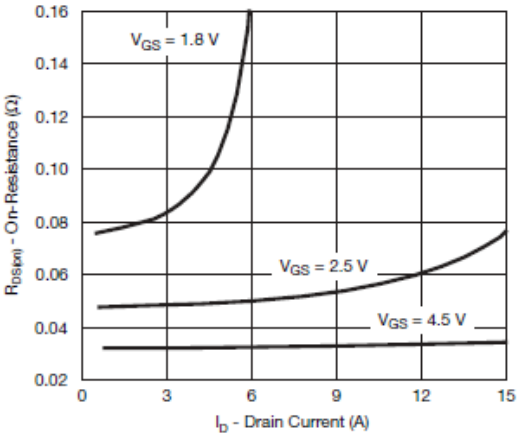
Typical Characteristics (P-Channel)



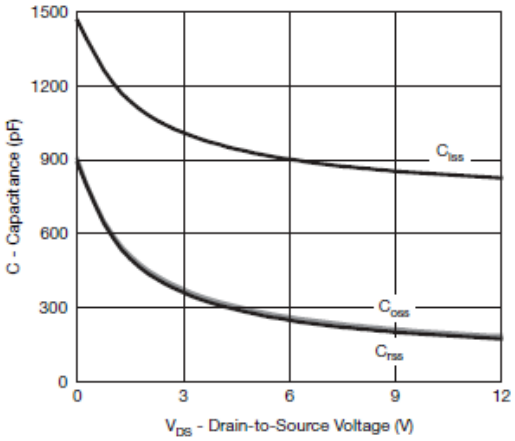
Output Characteristics



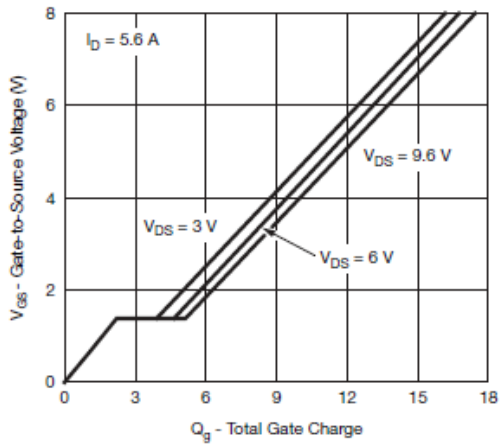
Transfer Characteristics



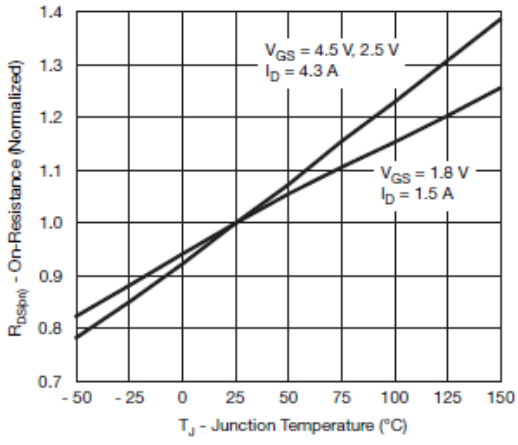
On-Resistance vs. Drain Current and Gate Voltage



Capacitance

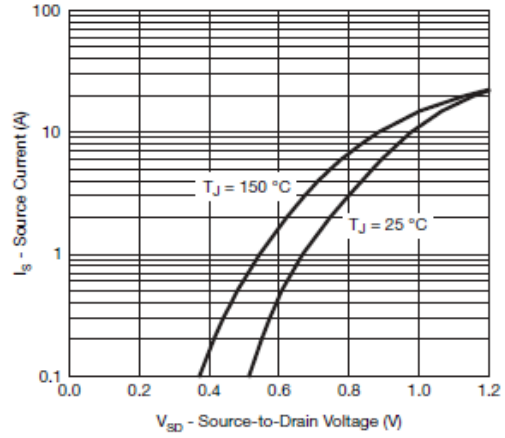


Gate Charge

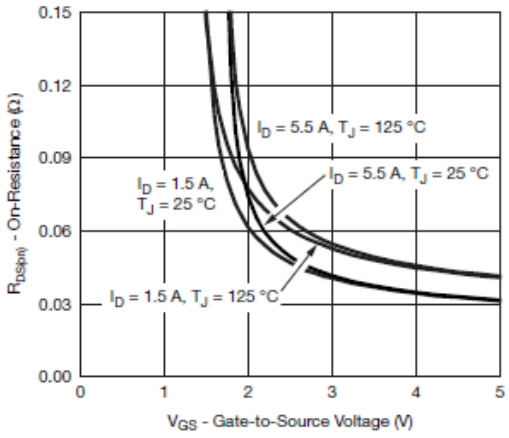


On-Resistance vs. Junction Temperature

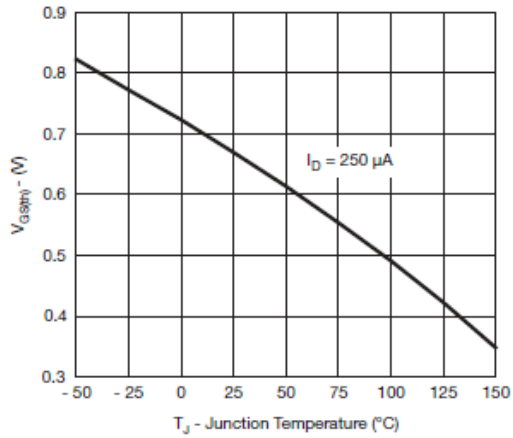
Typical Characteristics (P-Channel)



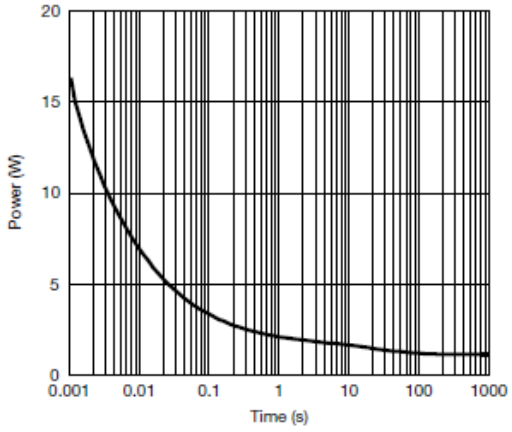
Soure-Drain Diode Forward Voltage



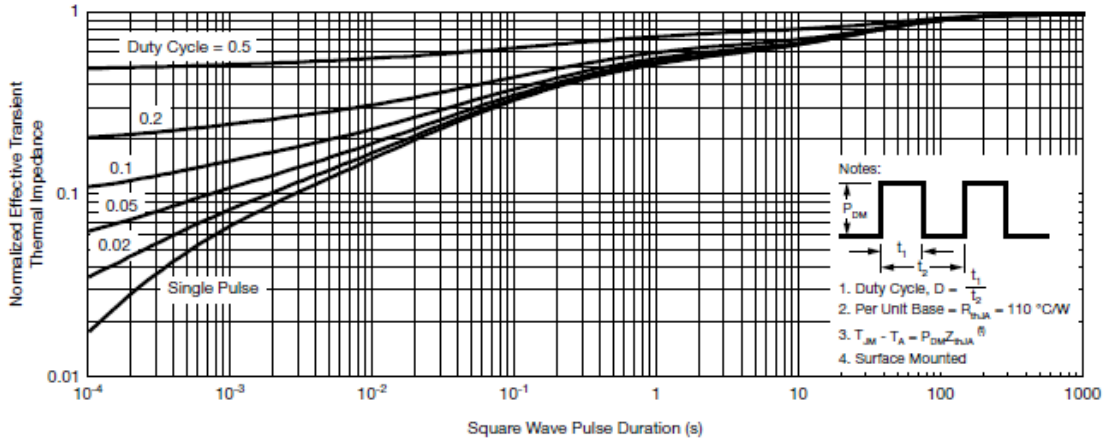
On-Resistance vs. Gate-to-Source Voltage



Threshold Voltage



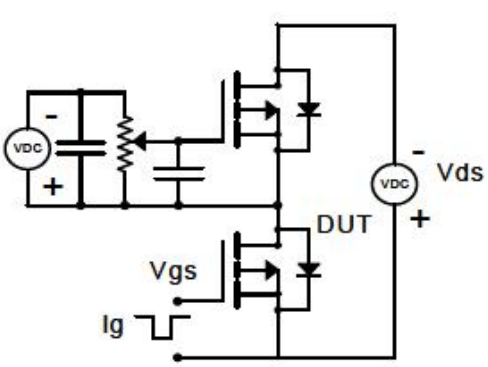
Single Pulse Power, Junction-to-Ambient

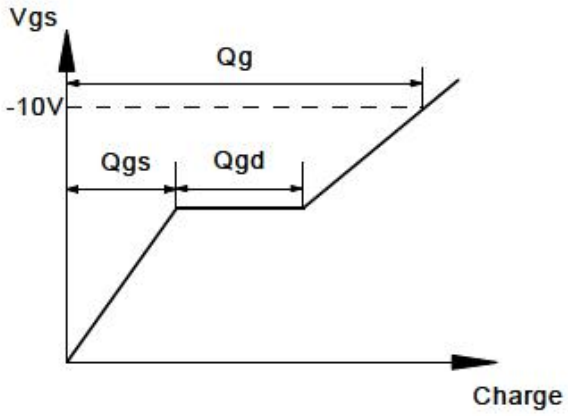


Normalized Thermal Transient Impedance, Junction-to-Ambient

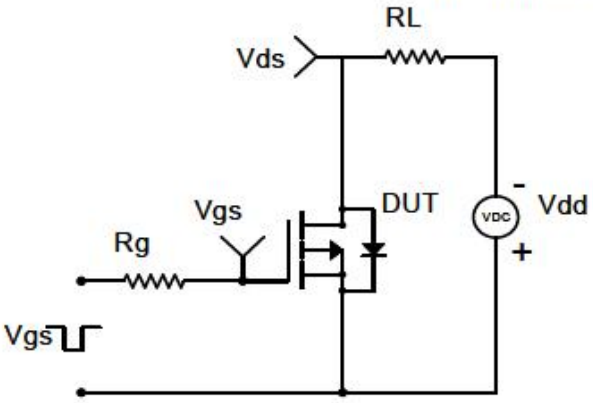
Typical Characteristics (P-Channel)

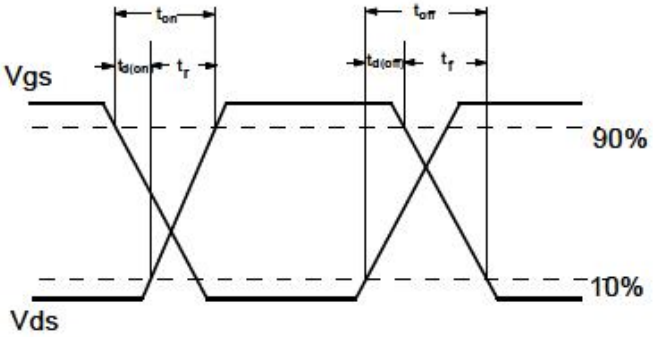
Gate Charge Test Circuit & Waveform



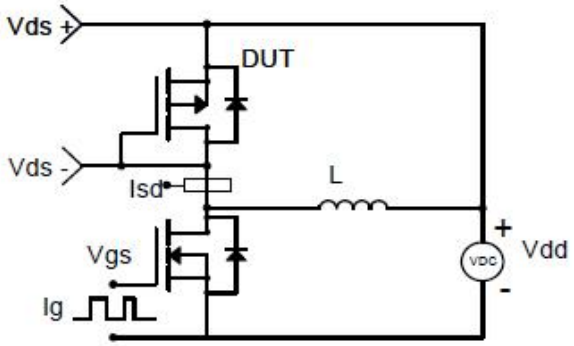


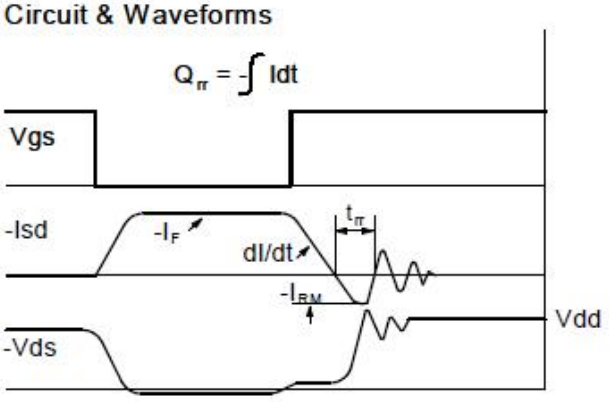
Resistive Switching Test Circuit & Waveforms



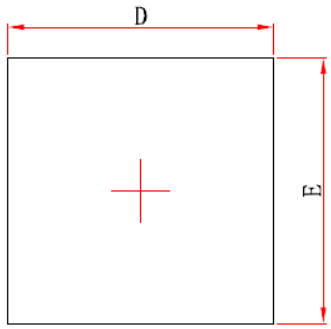


Diode Recovery Test Circuit & Waveforms

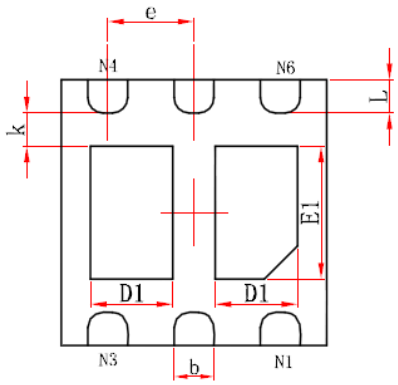




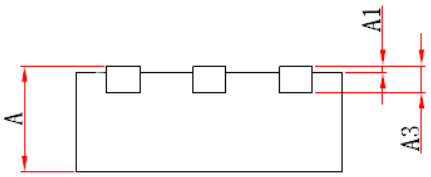
Package Information (DFN2X2-6L)



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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