



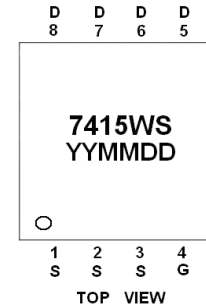
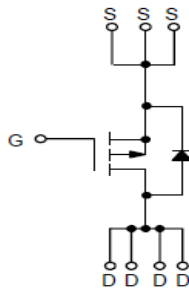
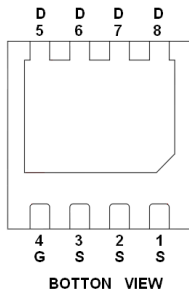
General Description

AFP7415WS, P-Channel 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, such as smart phone and notebook computer and other battery powered circuits, and low in-line power loss are needed in commercial industrial surface mount applications.

Features

- -60V/-7A, $R_{DS(ON)} = 56m\Omega @ V_{GS} = -10V$
- -60V/-7A, $R_{DS(ON)} = 66m\Omega @ V_{GS} = -4.5V$
- Super high density cell design for extremely low $R_{DS(ON)}$
- Exceptional on-resistance and maximum DC current capability
- DFN3X3-8L package design

Pin Description (DFN3X3-8L)



Application

- Load Switches
- Half-Bridge Motor Drives
- High Voltage Non-Synchronous Buck Converters

Pin Define

Pin	Symbol	Description
1~3	S	Source
4	G	Gate
5~8	D	Drain

Ordering Information

Part Ordering No.	Part Marking	Package	Unit	Quantity
AFP7415WSFN338RG	7415WS	DFN3X3-8L	Tape & Reel	5000 EA

※ YY year code

※ MM month code

※ DD date code

※ AFP7415WSFN338RG : 13" Tape & Reel ; Pb- Free ; Halogen -Free



Absolute Maximum Ratings

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

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DSS}	-60	V
Gate-Source Voltage	V_{GSS}	± 20	V
Continuous Drain Current($T_J=150^\circ\text{C}$)	I_D	$T_A=25^\circ\text{C}$	-14
		$T_A=70^\circ\text{C}$	-10
Pulsed Drain Current	I_{DM}	-45	A
Continuous Source Current(Diode Conduction)	I_S	-3	A
Power Dissipation	P_D	$T_C=25^\circ\text{C}$	28
		$T_C=70^\circ\text{C}$	15
		$T_A=25^\circ\text{C}$	3.2
		$T_A=70^\circ\text{C}$	2.0
Operating Junction Temperature	T_J	150	$^\circ\text{C}$
Storage Temperature Range	T_{STG}	-55/150	$^\circ\text{C}$
Thermal Resistance Junction-to-Case (Drain)	$R_{\theta JC}$	5	$^\circ\text{C/W}$
Thermal Resistance-Junction to Ambient	$R_{\theta JA}$	40	

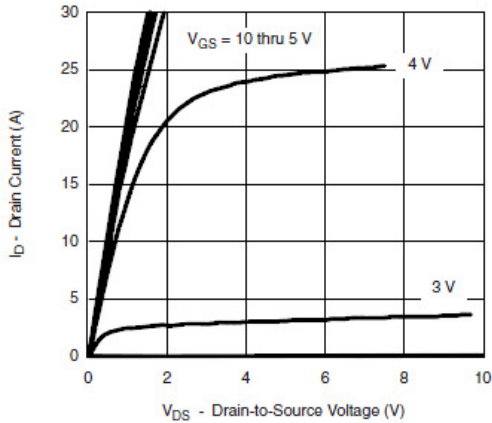
Electrical Characteristics

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

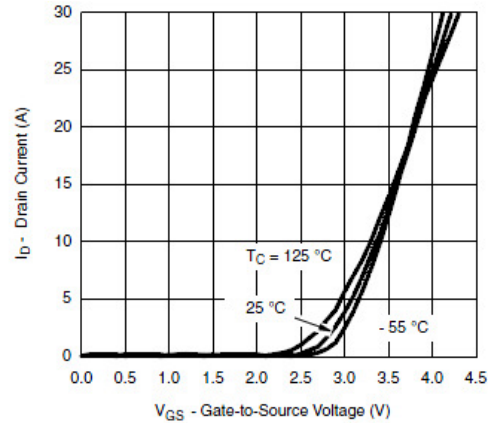
Parameter	Symbol	Conditions	Min.	Typ	Max.	Unit
Static						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=-250\mu\text{A}$	-60			V
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=-250\mu\text{A}$	-1.0		-2.5	
Gate Leakage Current	I_{GSS}	$V_{DS}=0V, V_{GS}=\pm 20V$			± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=-48V, V_{GS}=0V$			-1	μA
		$V_{DS}=-48V, V_{GS}=0V$ $T_J=85^\circ\text{C}$			-20	
On-State Drain Current	$I_{D(on)}$	$V_{DS} \geq -5V, V_{GS}=-10V$	-20			A
Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS}=-10V, I_D=-7A$		46	56	m Ω
		$V_{GS}=-4.5V, I_D=-7A$		56	66	
Forward Transconductance	g_{FS}	$V_{DS}=-15V, I_D=-3.2A$		12		S
Diode Forward Voltage	V_{SD}	$I_S=-3A, V_{GS}=0V$		-0.8	-1.3	V
Dynamic						
Total Gate Charge	Q_g	$V_{DS}=-30V, V_{GS}=-10V$ $I_D=-10.0A$		25	40	nC
Gate-Source Charge	Q_{gs}		5			
Gate-Drain Charge	Q_{gd}		8			
Input Capacitance	C_{iss}	$V_{DS}=-25V, V_{GS}=0V$ $f=1\text{MHz}$		1200	2000	pF
Output Capacitance	C_{oss}		140			
Reverse Transfer Capacitance	C_{rss}		90			
Turn-On Time	$t_{d(on)}$	$V_{DD}=-30V, R_L=3.0\Omega$ $I_D=-18A, V_{GEN}=-10V$ $R_G=2.5\Omega$		10	20	ns
	t_r			10	20	
Turn-Off Time	$t_{d(off)}$			45	80	
	t_f			25	40	



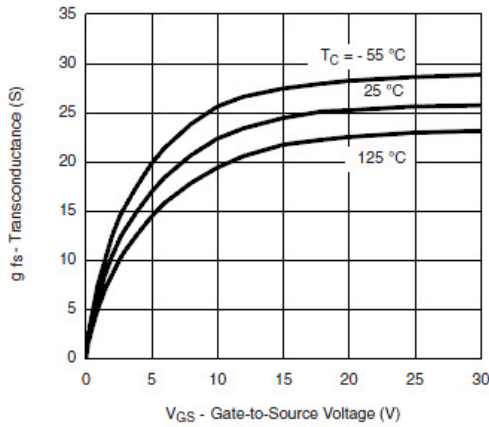
Typical Characteristics



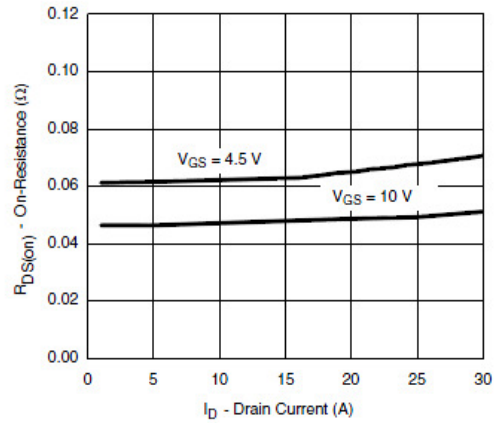
Output Characteristics



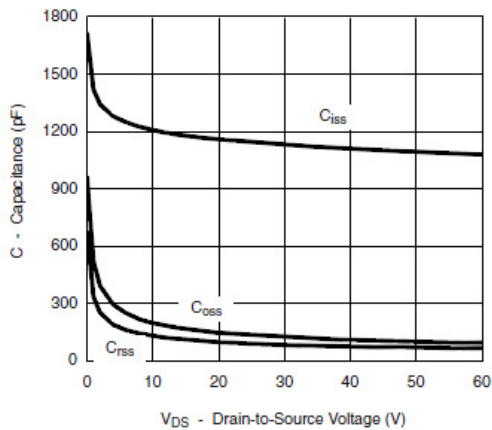
Transfer Characteristics



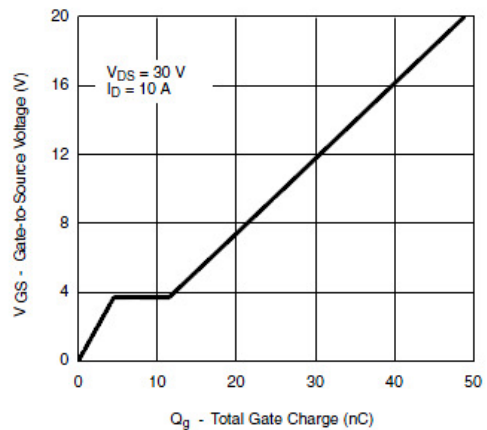
Transconductance



On-Resistance vs. Drain Current



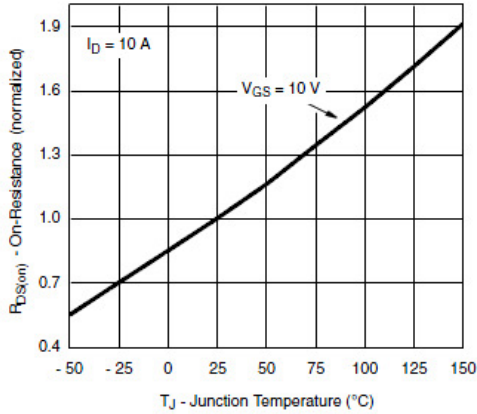
Capacitance



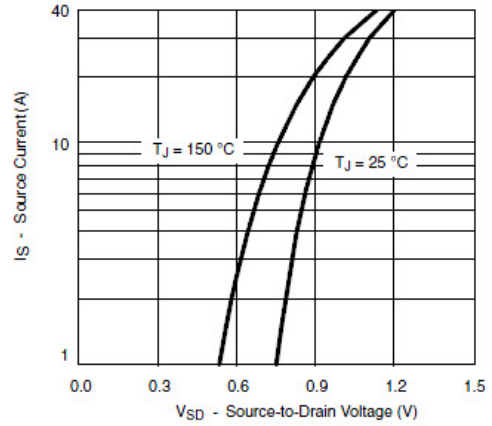
Gate Charge



Typical Characteristics

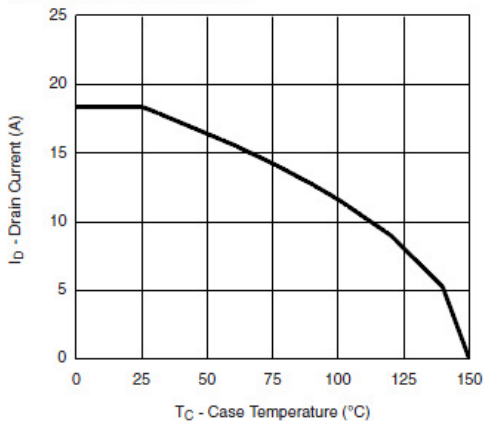


On-Resistance vs. Junction Temperature

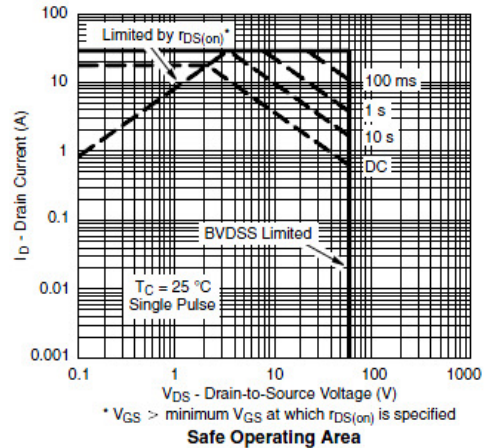


Source-Drain Diode Forward Voltage

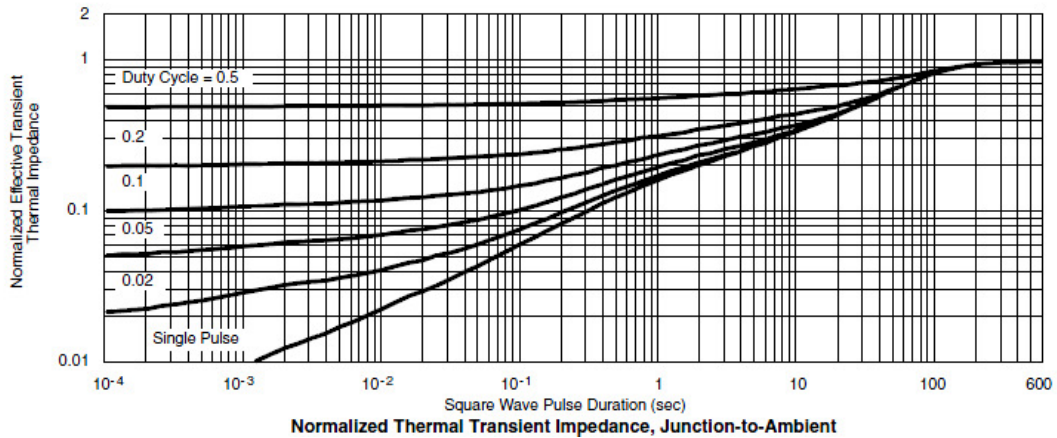
THERMAL RATINGS



Maximum Drain Current vs. Case Temperature



* $V_{GS} >$ minimum V_{GS} at which $r_{DS(on)}$ is specified
Safe Operating Area



Normalized Thermal Transient Impedance, Junction-to-Ambient

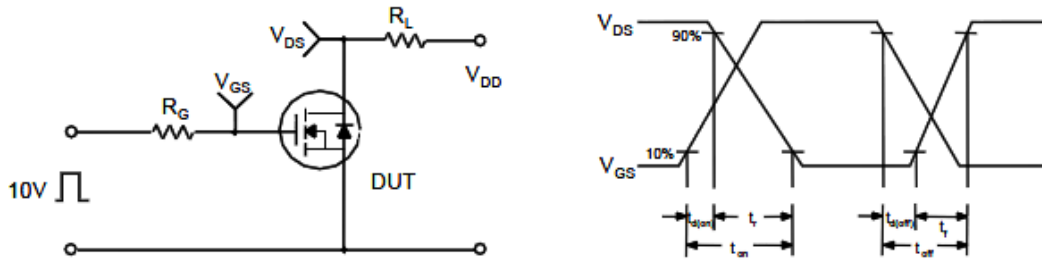


Typical Characteristics

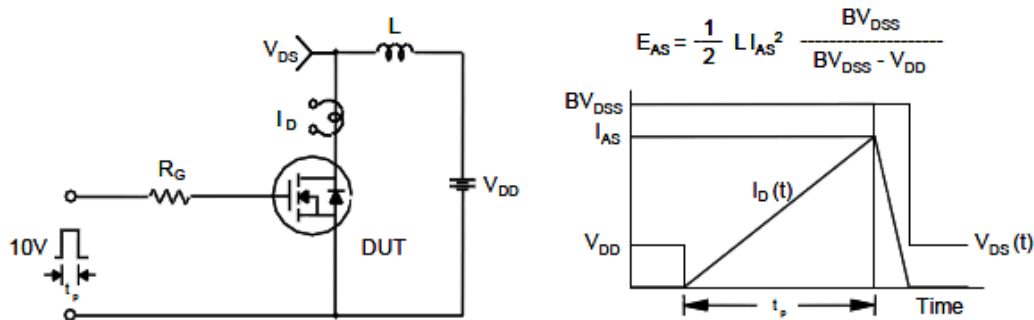
Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveforms

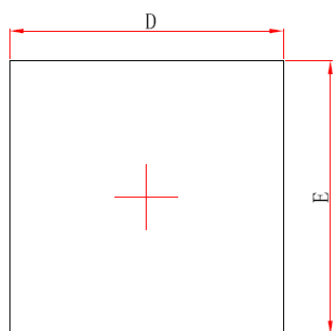


Unclamped Inductive Switching Test Circuit & Waveforms

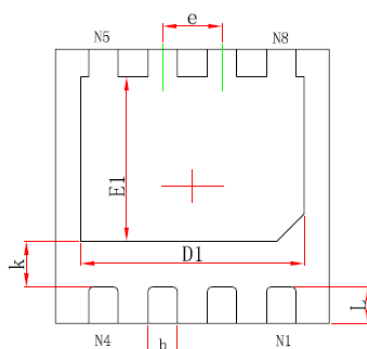




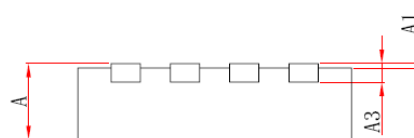
Package Information (DFN3X3-8L)



Top View



Bottom View



Side View

Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.800	0.900	0.031	0.035
A1	0.000	0.050	0.000	0.002
A3	0.203REF.		0.008REF.	
D	2.924	3.076	0.115	0.121
E	2.924	3.076	0.115	0.121
D1	2.350	2.550	0.093	0.100
E1	1.700	1.900	0.067	0.075
k	0.450	0.550	0.018	0.022
b	0.270	0.370	0.011	0.015
e	0.650TYP.		0.026TYP.	
L	0.324	0.476	0.013	0.019

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