



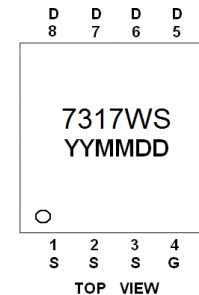
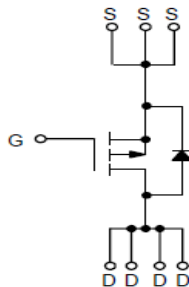
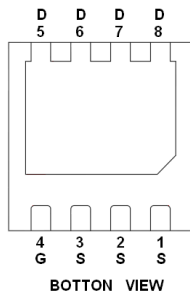
## General Description

AFP7317WS, 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

- -150V/-1.4A,  $R_{DS(ON)}=750\text{ m}\Omega@V_{GS}=-10V$
- -150V/-1.0A,  $R_{DS(ON)}=800\text{ m}\Omega@V_{GS}=-6V$
- 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

- DC-DC Converter
- POL

## Pin Define

Pin	Symbol	Description
1	S	Source
2	S	Source
3	S	Source
4	G	Gate
5	D	Drain
6	D	Drain
7	D	Drain
8	D	Drain

## Ordering Information

Part Ordering No.	Part Marking	Package	Unit	Quantity
AFP7317WSFN338RG	7317WS	DFN3X3-8L	Tape & Reel	5000 EA

- ※ YY year code
- ※ MM month code
- ※ DD date code
- ※ AFP7317WSFN338RG : 13" Tape & Reel ; Pb- Free ; Halogen -Free



※ **Absolute Maximum Ratings** ( $T_A=25^\circ\text{C}$  Unless otherwise noted)

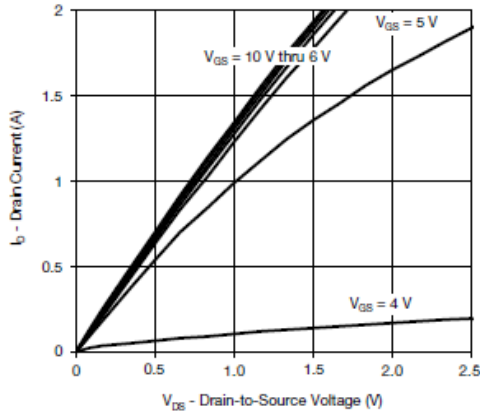
Parameter	Symbol	Value	Unit
Drain-Source Voltage	$V_{DS}$	-150	V
Gate-Source Voltage	$V_{GS}$	$\pm 20$	V
Continuous Drain Current ( $T_J=150^\circ\text{C}$ )	$I_D$	$T_C=25^\circ\text{C}$ $T_A=25^\circ\text{C}$	-3.0
		$T_C=70^\circ\text{C}$ $T_A=70^\circ\text{C}$	-2.4 -1.0
Pulsed Drain Current	$I_{DM}$	-3.2	A
Single pulse avalanche energy	$E_{AS}$	0.5	mJ
Continuous Source Current (Diode Conduction)	$I_S$	$L=1.0\text{ mH}$ $T_C=25^\circ\text{C}$ $T_A=25^\circ\text{C}$	-10
		$T_C=70^\circ\text{C}$ $T_A=70^\circ\text{C}$	-2.7
Power Dissipation	$P_D$	$T_C=25^\circ\text{C}$ $T_A=25^\circ\text{C}$	28
		$T_C=70^\circ\text{C}$ $T_A=70^\circ\text{C}$	15 3.2
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)

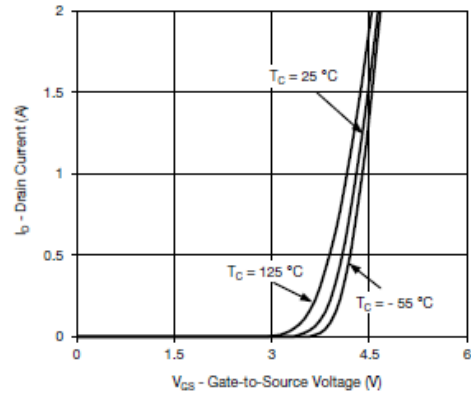
Parameter	Symbol	Conditions	Min.	Typ	Max.	Unit
<b>Static</b>						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=-250\mu A$	-150			V
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=-250\mu A$	-2.0		-4.0	
Gate Leakage Current	$I_{GSS}$	$V_{DS}=0V, V_{GS}=\pm 20V$			$\pm 100$	nA
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=-120V, V_{GS}=0V$			-1	$\mu A$
		$V_{DS}=-120V, V_{GS}=0V$ $T_J=85^\circ\text{C}$			-30	
On-State Drain Current	$I_{D(on)}$	$V_{DS} \geq -15V, V_{GS}=-10V$	-1.6			A
Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS}=-10V, I_D=-1.4A$		685	750	m $\Omega$
		$V_{GS}=-6V, I_D=-1.0A$		735	800	
Forward Transconductance	$g_{FS}$	$V_{DS}=-15V, I_D=-0.5A$		3		S
Diode Forward Voltage	$V_{SD}$	$I_S=-1.0A, V_{GS}=0V$		-0.75	-1.2	V
<b>Dynamic</b>						
Total Gate Charge	$Q_g$	$V_{DS}=-75V, V_{GS}=-10V$ $I_D \equiv -1.1A$		7.0	12	nC
Gate-Source Charge	$Q_{gs}$			1.8		
Gate-Drain Charge	$Q_{gd}$			2.2		
Gate Resistance	$R_g$	$f=1\text{MHz}$		10	15	$\Omega$
Pulse Diode Forward Current	$I_{SM}$				-12	A
Input Capacitance	$C_{iss}$	$V_{DS}=-75V, V_{GS}=0V$ $f=1\text{MHz}$		280		pF
Output Capacitance	$C_{oss}$			20		
Reverse Transfer Capacitance	$C_{rss}$			15		
Turn-On Time	$t_{d(on)}$	$V_{DD}=-75V, R_L=85\Omega$ $I_D \equiv -1.0A, V_{GEN}=-10V$ $R_G=1.0\Omega$		10	20	ns
	$t_r$			15	30	
Turn-Off Time	$t_{d(off)}$			15	30	
	$t_f$			10	25	
Body Diode Reverse Recovery Time	$t_{rr}$		$I_F=-0.5A, di/dt=100A/\mu s,$		50	
Body Diode Reverse Recovery Charge	$Q_{rr}$	$T_J=25^\circ\text{C}$		95	150	nC



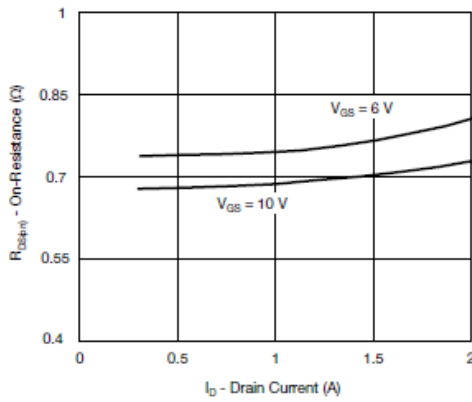
## Typical Characteristics



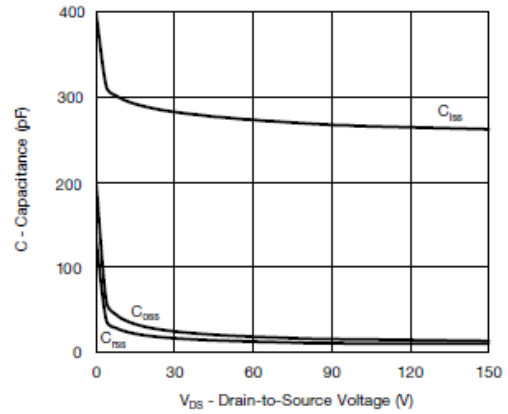
Output Characteristics



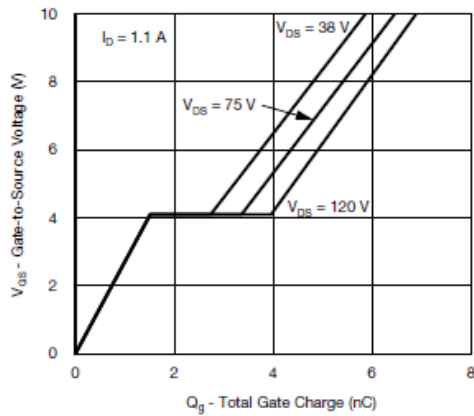
Transfer Characteristics



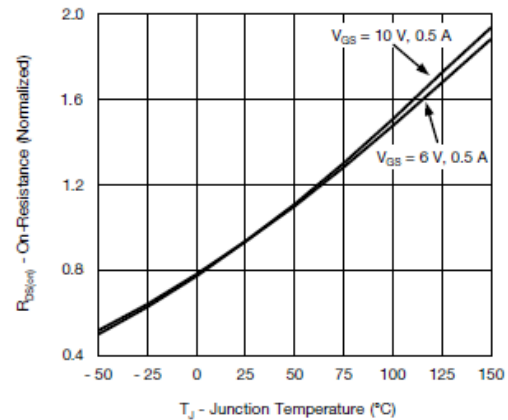
On-Resistance vs. Drain Current and Gate Voltage



Capacitance



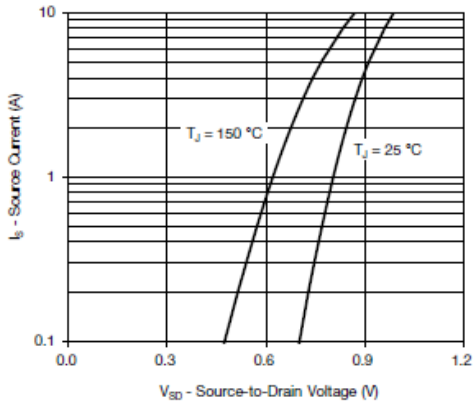
Gate Charge



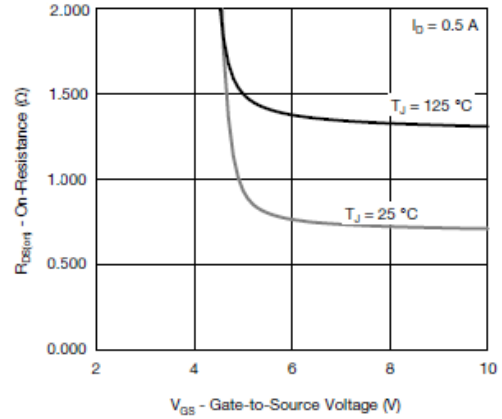
On-Resistance vs. Junction Temperature



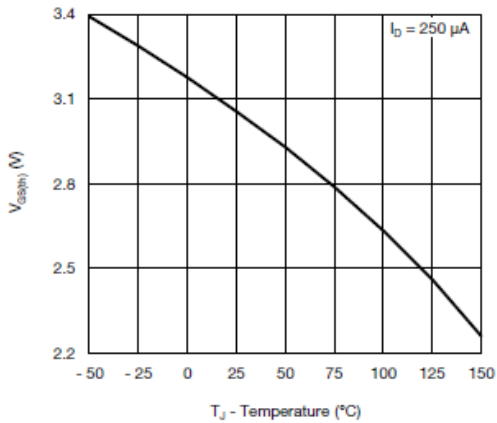
## Typical Characteristics



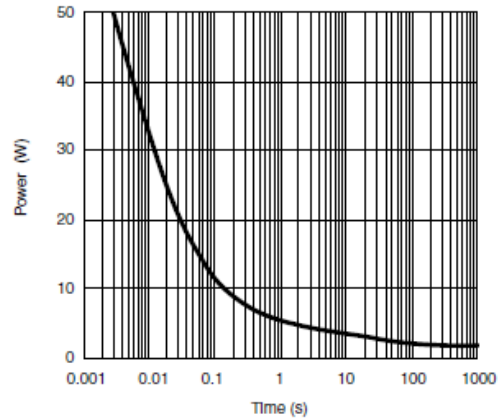
Source-Drain Diode Forward Voltage



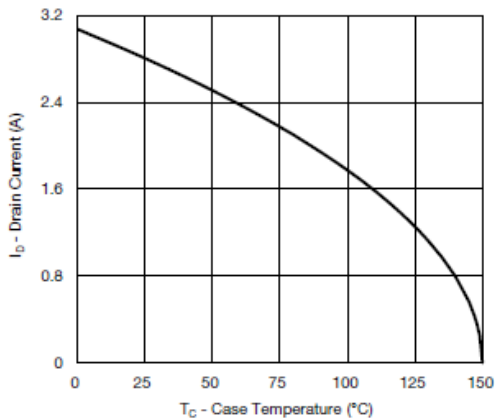
On-Resistance vs. Gate-to-Source Voltage



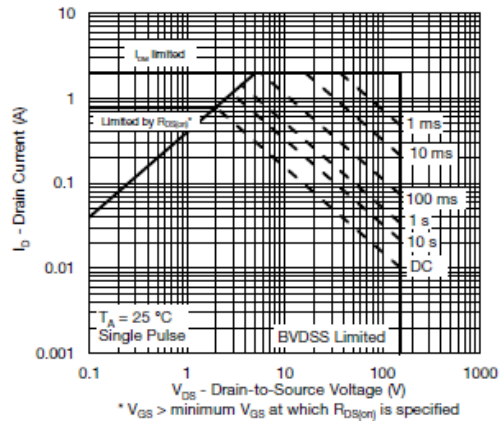
Threshold Voltage



Single Pulse Power, Junction-to-Ambient



Max Current vs. Case Temperature

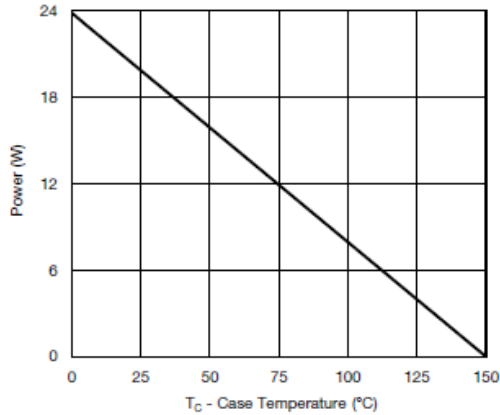


\*  $V_{GS} >$  minimum  $V_{GS}$  at which  $R_{DS(on)}$  is specified

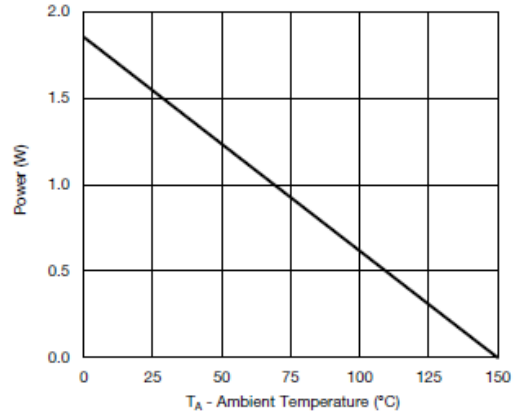
Safe Operating Area at  $T_A = 25^\circ\text{C}$



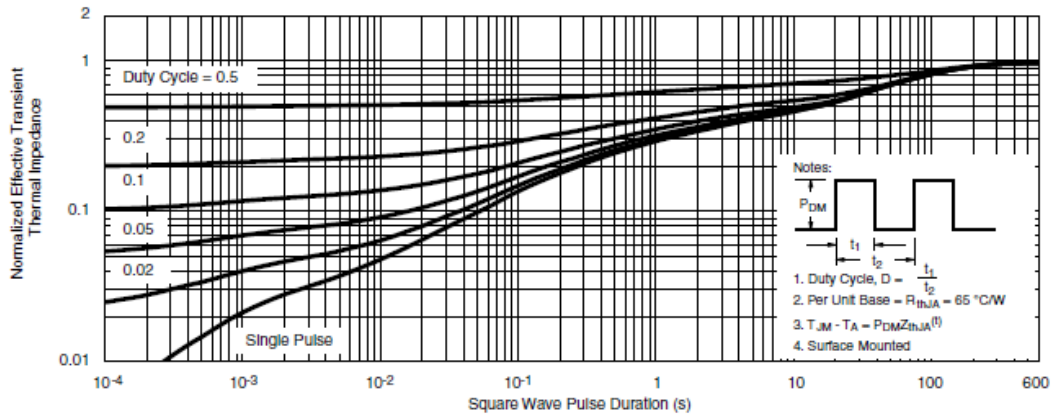
## Typical Characteristics



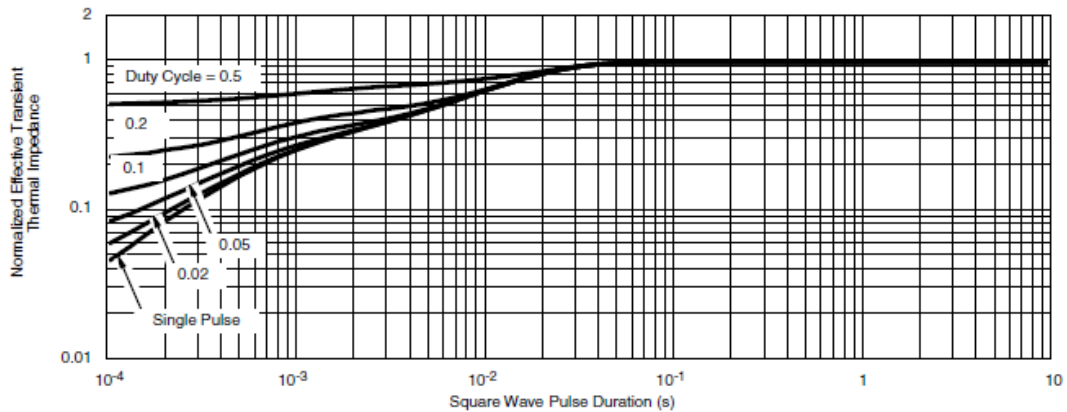
Power Junction-to-Case



Power Junction-to-Ambient



Normalized Thermal Transient Impedance, Junction-to-Ambient

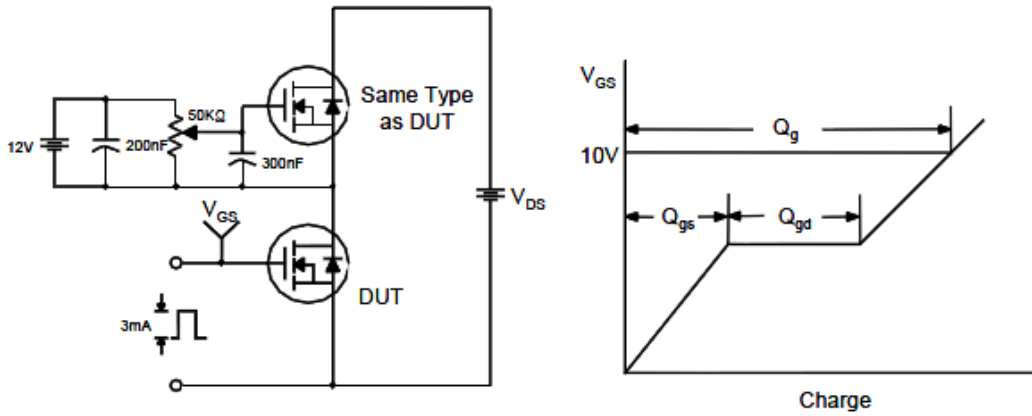


Normalized Thermal Transient Impedance, Junction-to-Case

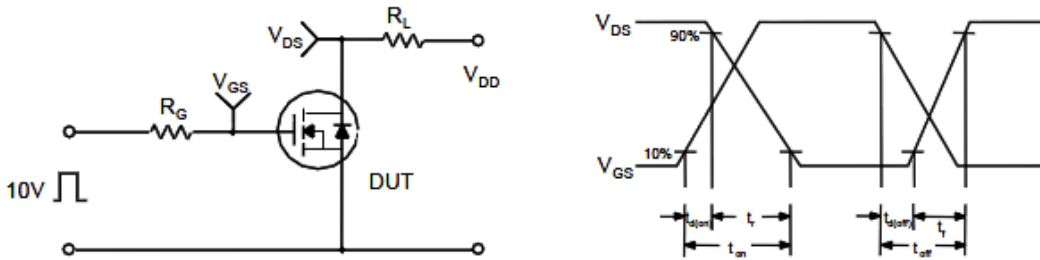


## Typical Characteristics

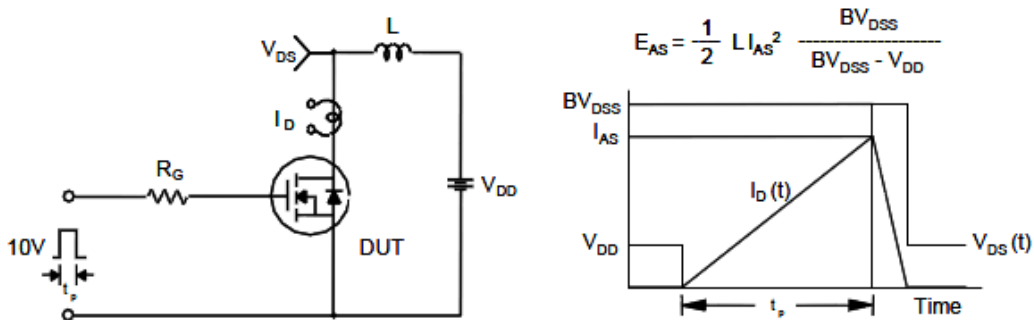
Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveforms

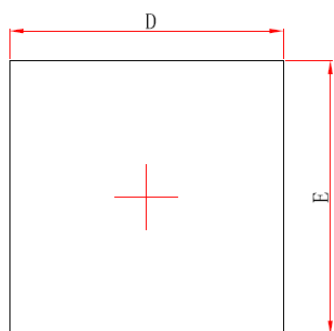


Unclamped Inductive Switching Test Circuit & Waveforms

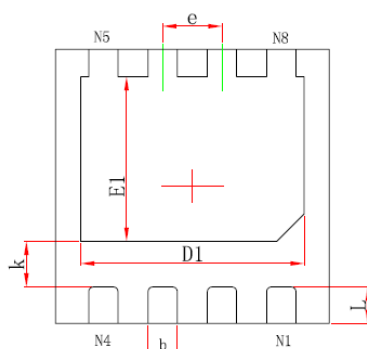




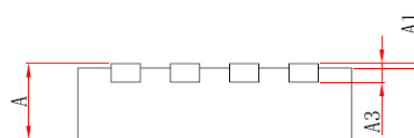
**Package Information ( DFN3X3-8L )**



**Top View**



**Bottom View**



**Side View**

Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.700	0.900	0.028	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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