



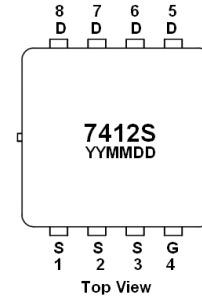
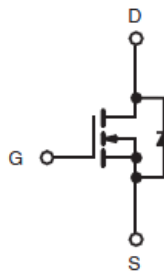
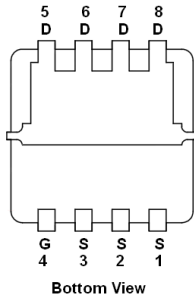
General Description

AFN7412S, N-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

- 30V/8A, $R_{DS(ON)}=24m\Omega@V_{GS}=10V$
- 30V/7A, $R_{DS(ON)}=30m\Omega@V_{GS}=4.5V$
- Super high density cell design for extremely low $R_{DS(ON)}$
- Exceptional on-resistance and maximum DC current capability
- DFN3.3X3.3-8L package design

Pin Description (DFN3.3X3.3-8L)



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
AFN7412SFN308RG	7412S	DFN3.3X3.3-8L	Tape & Reel	5000 EA

- ※ YY year code
- ※ MM month code
- ※ DD date code
- ※ AFN7412SFN308RG : 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}	30	V	
Gate –Source Voltage	V_{GSS}	± 20	V	
Continuous Drain Current($T_J=150^\circ\text{C}$)	I_D	$T_A=25^\circ\text{C}$	9	A
		$T_A=70^\circ\text{C}$	7	
Pulsed Drain Current	I_{DM}	30	A	
Continuous Source Current(Diode Conduction)	I_S	12	A	
Power Dissipation	P_D	$T_C=25^\circ\text{C}$	28	W
		$T_C=70^\circ\text{C}$	15	
		$T_A=25^\circ\text{C}$	3.1	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		

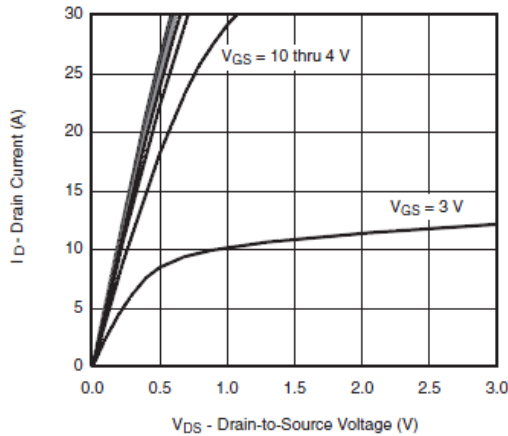
Electrical Characteristics

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

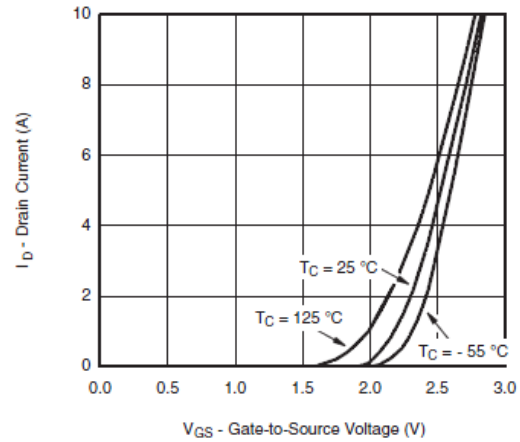
Parameter	Symbol	Conditions	Min.	Typ	Max.	Unit
Static						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=250\mu\text{A}$	30			V
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu\text{A}$	1.0		2.5	V
Gate Leakage Current	I_{GSS}	$V_{DS}=0V, V_{GS}=\pm 20V$			± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=24V, V_{GS}=0V$			1	uA
		$V_{DS}=24V, V_{GS}=0V$ $T_J=85^\circ\text{C}$			10	
On-State Drain Current	$I_{D(on)}$	$V_{DS} \geq 5V, V_{GS}=10V$	20			A
Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS}=10V, I_D=8A$		16	24	m Ω
		$V_{GS}=4.5V, I_D=7A$		24	30	
Forward Transconductance	g_{FS}	$V_{DS}=10V, I_D=8A$		17		S
Diode Forward Voltage	V_{SD}	$I_S=6A, V_{GS}=0V$		0.8	1.3	V
Dynamic						
Total Gate Charge	Q_g	$V_{DS}=15V, V_{GS}=4.5V$ $I_D=8A$		4	8	nC
Gate-Source Charge	Q_{gs}			1.5		
Gate-Drain Charge	Q_{gd}			1.2		
Input Capacitance	C_{iss}	$V_{DS}=15V, V_{GS}=0V$ $f=1\text{MHz}$		450		pF
Output Capacitance	C_{oss}			95		
Reverse Transfer Capacitance	C_{rss}			45		
Turn-On Time	$t_{d(on)}$	$V_{DD}=15V, R_L=2.4\Omega$ $I_D=6.3A, V_{GEN}=10V$ $R_G=1.0\Omega$		5	10	ns
	t_r			10	20	
Turn-Off Time	$t_{d(off)}$			15	30	
	t_f			10	20	



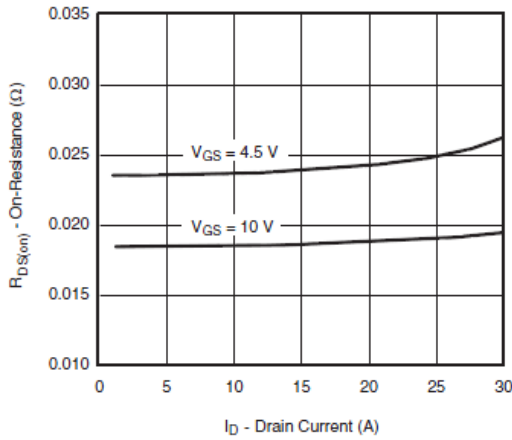
Typical Characteristics



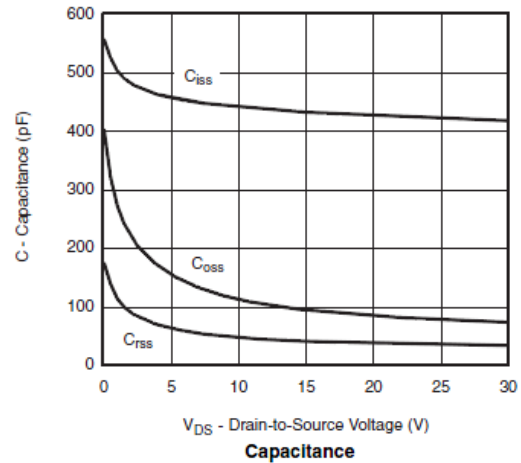
Output Characteristics



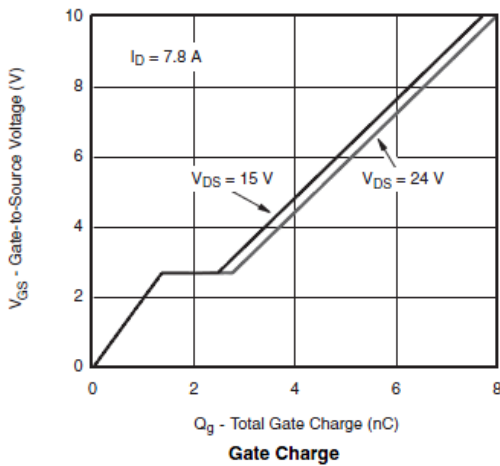
Transfer Characteristics



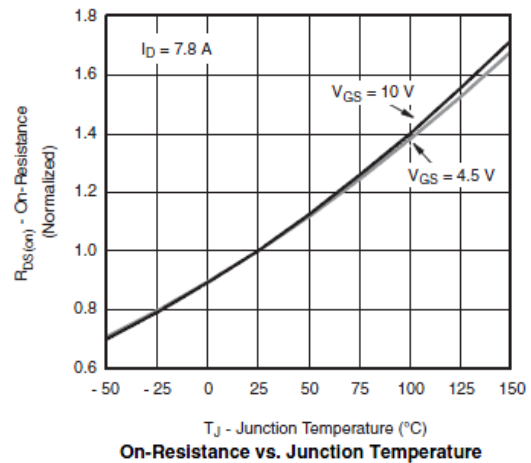
On-Resistance vs. Drain Current



Capacitance



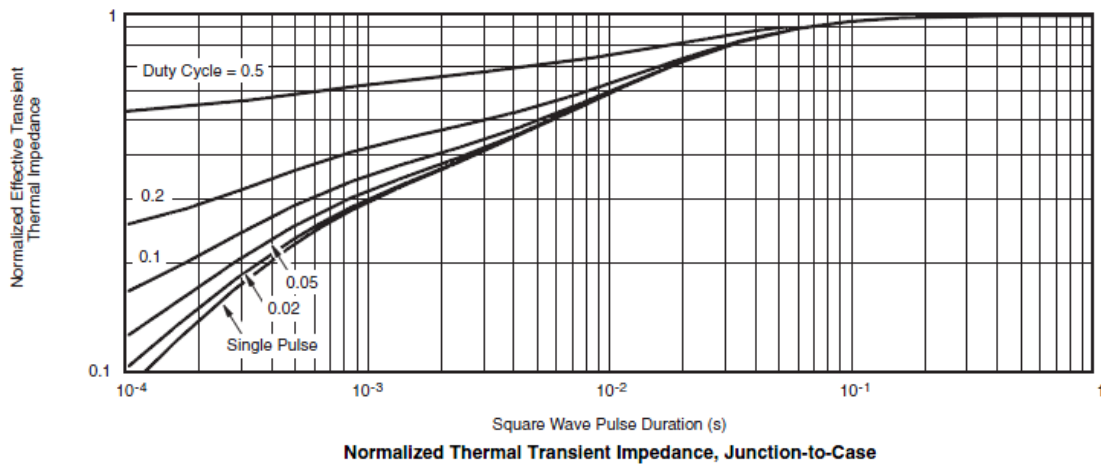
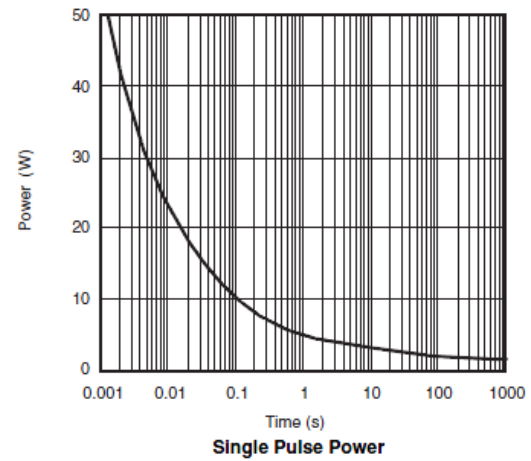
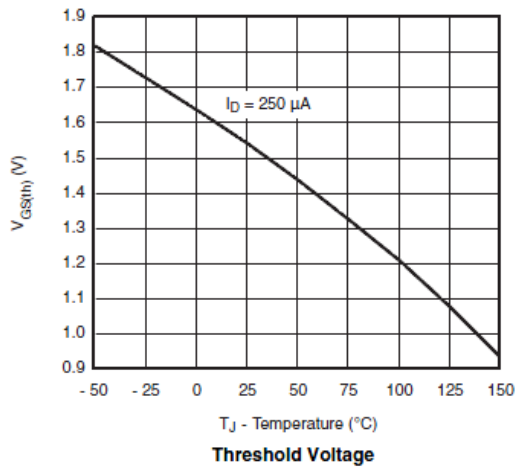
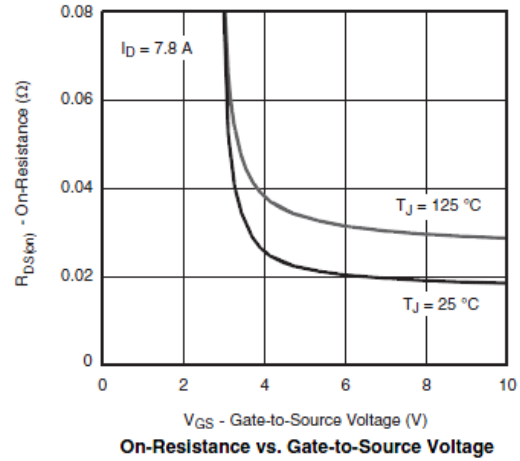
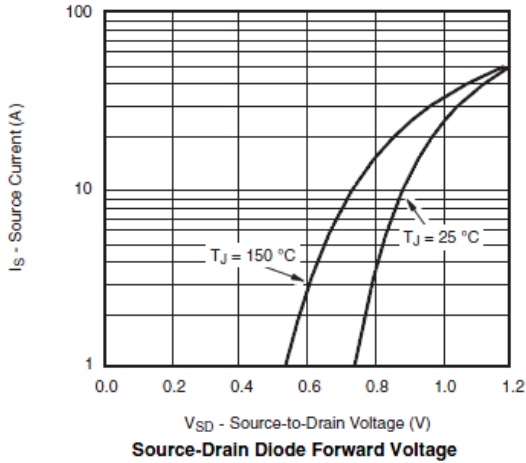
Gate Charge



On-Resistance vs. Junction Temperature



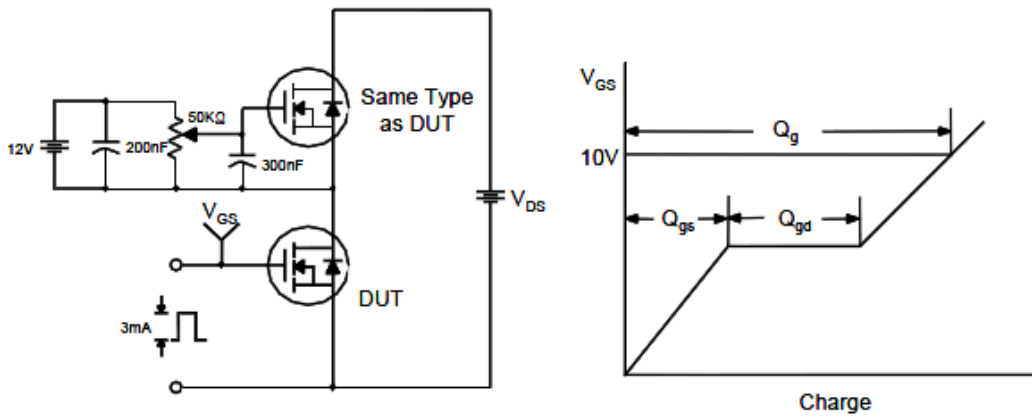
Typical Characteristics





Typical Characteristics

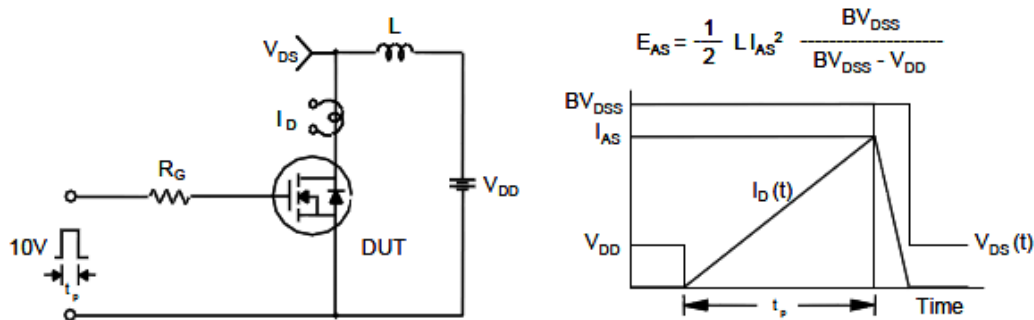
Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveforms

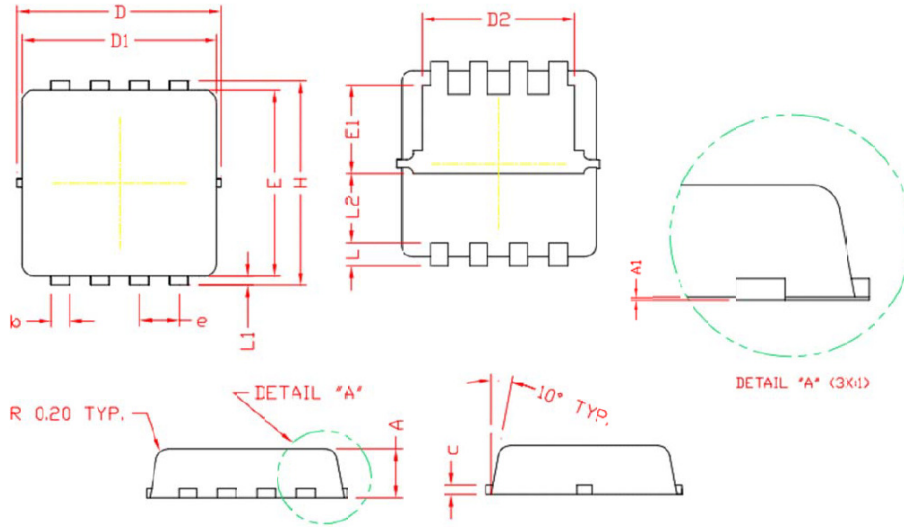


Unclamped Inductive Switching Test Circuit & Waveforms





Package Information (DFN3.3X3.3-8L)



COMMON DIMENSIONS

(UNITS OF MEASURE=MILLIMETER)

SYMBOL	MIN	NOM	MAX
A	0.70	0.80	0.90
A1	0.00	0.03	0.05
b	0.24	0.30	0.35
c	0.10	0.15	0.20
D	3.25	3.32	3.40
D1	3.05	3.15	3.25
D2	2.40	2.50	2.60
E	3.00	3.10	3.20
E1	1.35	1.45	1.55
e	0.65 BSC.		
H	3.20	3.30	3.40
L	0.30	0.40	0.50
L1	0.10	0.15	0.20
L2	1.13 REF.		

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