



General Description

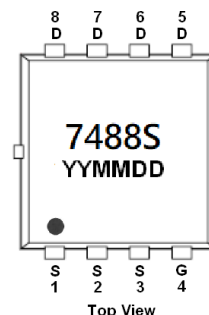
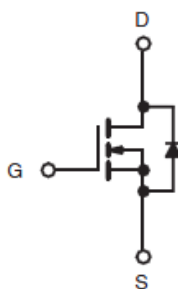
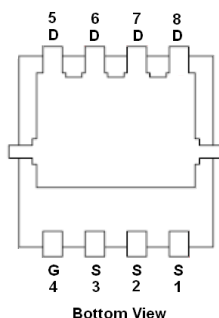
AFN7488S, N-Channel enhancement mode MOSFET, uses Advanced Trench Technology to provide excellent $R_{DS(ON)}$, low gate charge.

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

- $I_D=20A, R_{DS(ON)}=6.5m\Omega@V_{GS}=10V$
- $I_D=15A, R_{DS(ON)}=9.5m\Omega@V_{GS}=4.5V$
- 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
AFN7488SFN308RG	7488S	DFN3.3X3.3-8L	Tape & Reel	5000 EA

※ YY year code

※ MM month code

※ DD date code

※ AFN7488SFN308RG : 13" Tape & Reel ; Pb- Free ; Halogen -Free



Absolute Maximum Ratings

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

Parameter	Symbol	Typical	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_{DSM}	$T_C=25^{\circ}\text{C}$	42
		$T_C=70^{\circ}\text{C}$	32
Pulsed Drain Current ($t=100\mu\text{s}$)	I_{DM}	$T_A=25^{\circ}\text{C}$	16
		$T_A=70^{\circ}\text{C}$	12
Continuous Source Current(Diode Conduction)	I_S	$T_C=25^{\circ}\text{C}$	18
		$T_A=25^{\circ}\text{C}$	3
Single Pulse Avalanche Current	I_{AS}	$L=0.1\text{mH}$	28
			E_{AS}
Power Dissipation	P_D	$T_C=25^{\circ}\text{C}$	20
		$T_C=75^{\circ}\text{C}$	12
Operating Junction Temperature	T_J	$T_A=25^{\circ}\text{C}$	3.2
		$T_A=75^{\circ}\text{C}$	2.0
Storage Temperature Range	T_{STG}	-55/150	$^{\circ}\text{C}$
Thermal Resistance-Junction to Ambient	$R_{\theta JA}$	31	$^{\circ}\text{C}/\text{W}$
Maximum Junction-to-Case (Drain)	$R_{\theta JA}$	5	

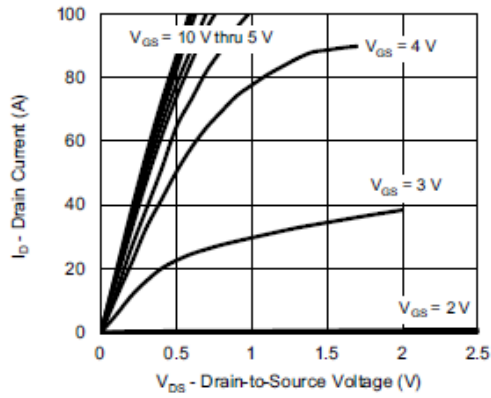
Electrical Characteristics

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

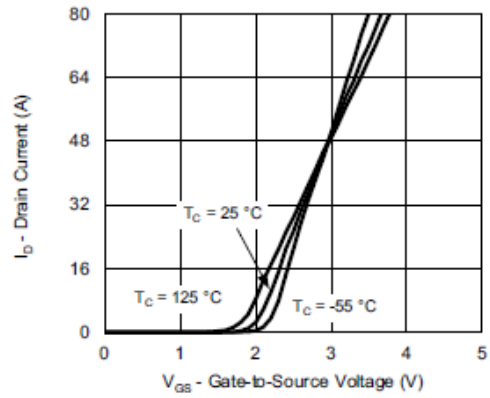
Parameter	Symbol	Conditions	Min.	Typ	Max.	Unit
Static						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS}=0\text{V}, I_D=250\mu\text{A}$	30			V
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu\text{A}$	1.0		2.5	
Gate Leakage Current	I_{GSS}	$V_{DS}=0\text{V}, V_{GS}=\pm 20\text{V}$			± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=24\text{V}, V_{GS}=0\text{V}$			1	uA
		$V_{DS}=24\text{V}, V_{GS}=0\text{V}$ $T_J=85^{\circ}\text{C}$			10	
On-State Drain Current	$I_{D(on)}$	$V_{DS} \geq 5\text{V}, V_{GS}=10\text{V}$	30			A
Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS}=10\text{V}, I_D=20\text{A}$		5.3	6.5	m Ω
		$V_{GS}=4.5\text{V}, I_D=15\text{A}$		8.0	9.5	
Forward Transconductance	g_{FS}	$V_{DS}=10\text{V}, I_D=10\text{A}$		50		S
Diode Forward Voltage	V_{SD}	$I_S=5\text{A}, V_{GS}=0\text{V}$		0.75	1.2	V
Dynamic						
Total Gate Charge	Q_g	$V_{DS}=15\text{V}, V_{GS}=4.5\text{V}$ $I_D=10\text{A}$		8	15	nC
Gate-Source Charge	Q_{gs}			2.4		
Gate-Drain Charge	Q_{gd}			3.2		
Gate Resistance	R_g	$f=1\text{MHz}$	0.4	1.7	3.4	Ω
Input Capacitance	C_{iss}	$V_{DS}=15\text{V}, V_{GS}=0\text{V}$ $f=1\text{MHz}$		950		pF
Output Capacitance	C_{oss}			295		
Reverse Transfer Capacitance	C_{rss}			35		
Turn-On Time	$t_{d(on)}$	$V_{DD}=15\text{V}, R_L=1.5\Omega$ $I_D=10\text{A}, V_{GEN}=10\text{V}$ $R_G=1\Omega$		8	16	ns
	t_r			25	50	
Turn-Off Time	$t_{d(off)}$			15	30	
	t_f			8	16	



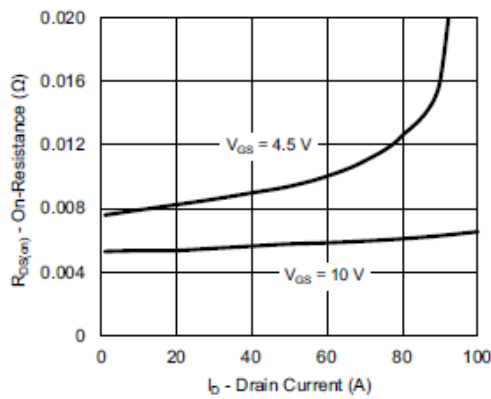
Typical Characteristics



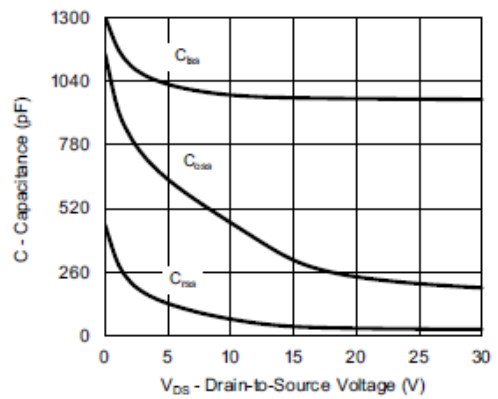
Output Characteristics



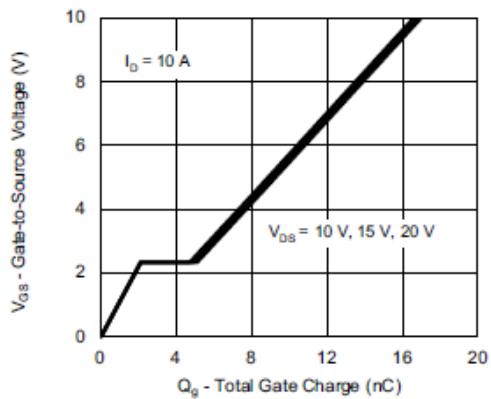
Transfer Characteristics



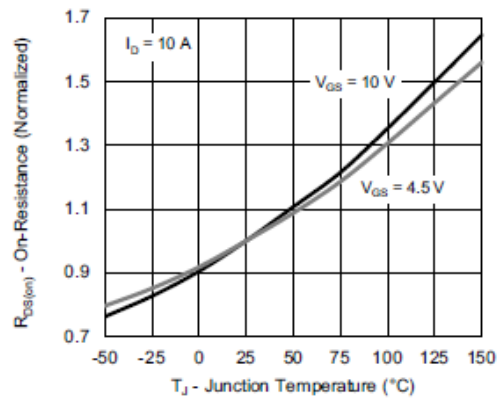
On-Resistance vs. Drain Current



Capacitance



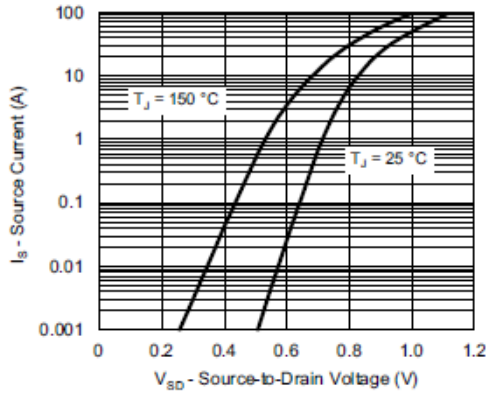
Gate Charge



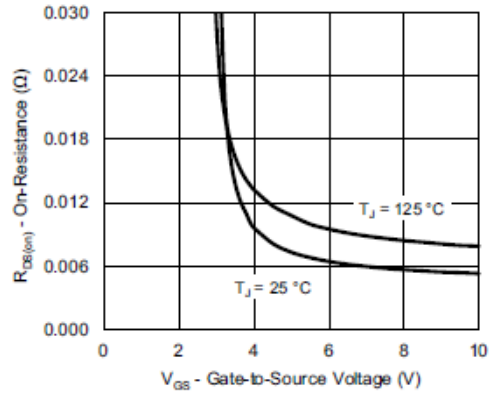
On-Resistance vs. Junction Temperature



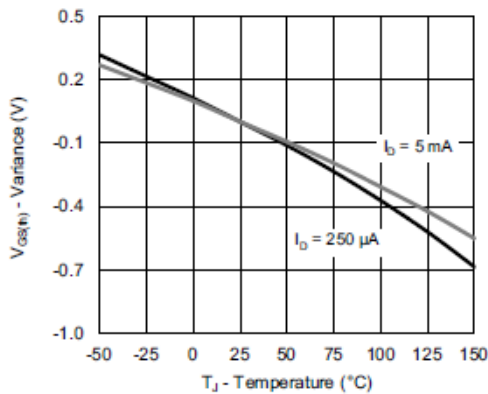
Typical Characteristics



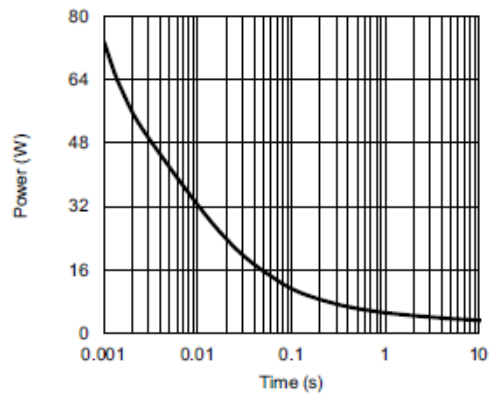
Source-Drain Diode Forward Voltage



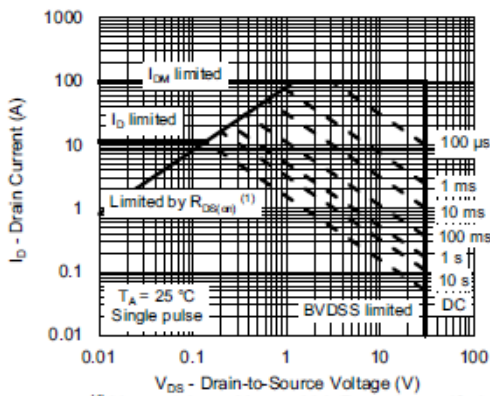
On-Resistance vs. Gate-to-Source Voltage



Threshold Voltage

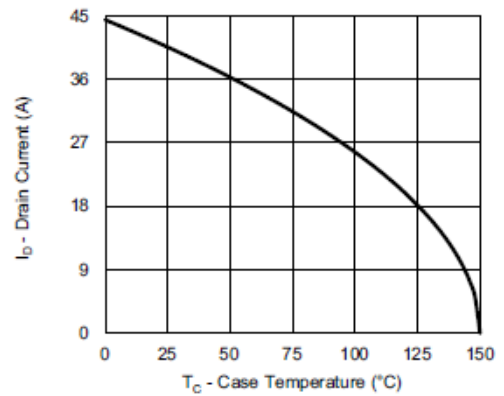


Single Pulse Power, Junction-to-Ambient



⁽¹⁾ $V_{GS} >$ minimum V_{GS} at which $R_{DS(on)}$ is specified

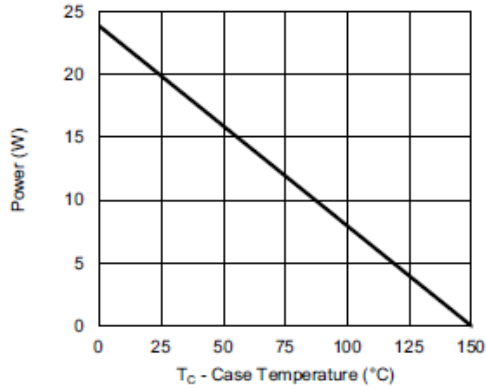
Safe Operating Area



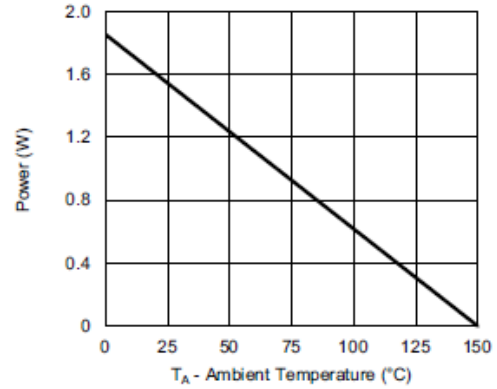
Current Derating ^a



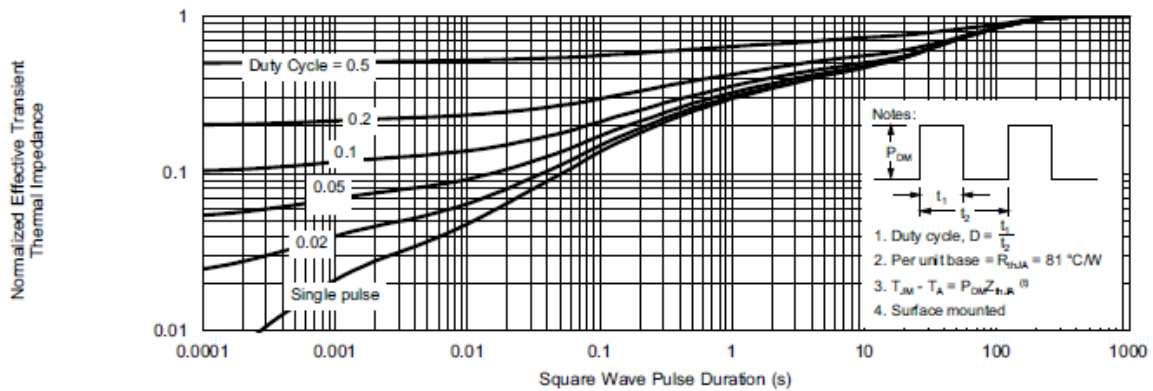
Typical Characteristics



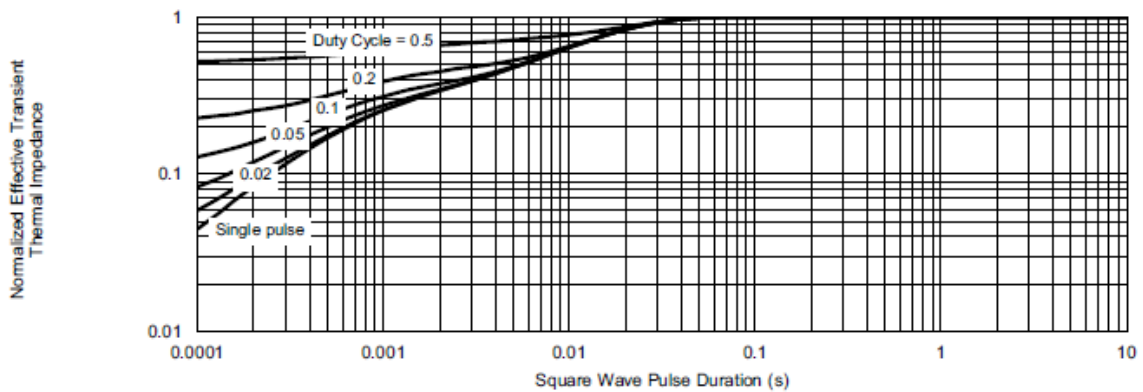
Power, Junction-to-Case



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

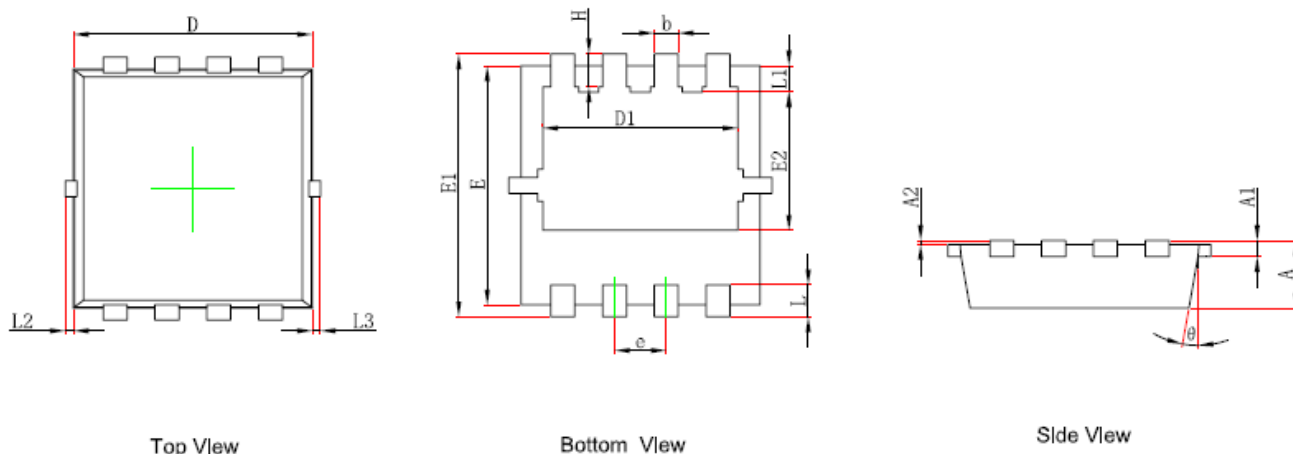


Unclamped Inductive Switching Test Circuit & Waveforms





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



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.650	0.850	0.026	0.033
A1	0.152 REF.		0.006 REF.	
A2	0~0.05		0~0.002	
D	2.900	3.100	0.114	0.122
D1	2.300	2.600	0.091	0.102
E	2.900	3.100	0.114	0.122
E1	3.150	3.450	0.124	0.136
E2	1.535	1.935	0.060	0.076
b	0.200	0.400	0.008	0.016
e	0.550	0.750	0.022	0.030
L	0.300	0.500	0.012	0.020
L1	0.180	0.480	0.007	0.019
L2	0~0.100		0~0.004	
L3	0~0.100		0~0.004	
H	0.315	0.515	0.012	0.020
θ	9°	13°	9°	13°

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