Alfa-MOS Technology

AFN7898S

200V N-Channel Enhancement Mode MOSFET

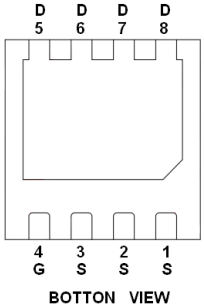
General Description

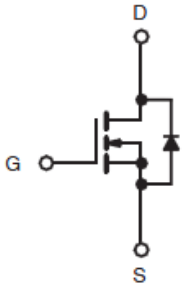
AFN7898S, N-Channel enhancement mode MOSFET, uses Advanced Trench Technology to provide excellent $R_{DS(ON)}$, low gate charge.
These devices are particularly suited for low voltage power management, such as smart phone and notebook computer and other battery powered circuits, and low in-line power loss are needed in commercial industrial surface mount applications.

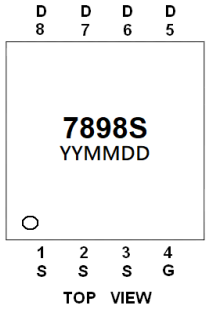
Features

- I_D=7A,$R_{DS(ON)}$=105mΩ@V_{GS}=10V
- I_D=7A,$R_{DS(ON)}$=115mΩ@V_{GS}=7.5V
- 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

- Primary Side Switch
- Synchronous Rectification
- DC/DC Converters & DC/AC Inverters
- Boost 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
AFN7898SFN338RG	7898S	DFN3X3-8L	Tape & Reel	5000 EA

※ YY year code
※ MM month code
※ DD date code
※ AFN7898SFN338RG : 13”Tape & Reel ; Pb- Free ; Halogen –Free

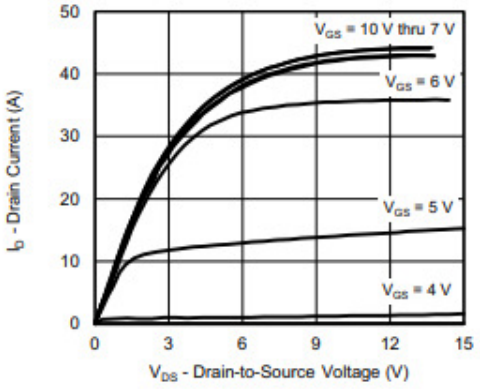
Absolute Maximum Ratings (T_A=25℃ Unless otherwise noted)

Parameter			Symbol	Typical		Unit
Drain-Source Voltage			V_{DSS}	200		V
Gate –Source Voltage			V_{GSS}	±20		V
Continuous Drain Current(T_J=150℃)	T_C=25℃	T_C=70℃	I_D	14	11	A
	T_A=25℃	T_A=70℃		4.2	3.2	
Pulsed Drain Current (t=100us)			I_{DM}	30		
Continuous Source Current(Diode Conduction)	T_C=25℃	T_A=25℃	I_S	14	4.2	
Single pulse avalanche current	L = 0.1 mH		I_{AS}	10		
Single pulse avalanche energy			E_{AS}	5		mJ
Power Dissipation	T_C=25℃	T_C=70℃	P_D	55	35	W
	T_A=25℃	T_A=70℃		4.8	3.0	
Operating Junction Temperature			T_J	150		℃
Storage Temperature Range			T_{STG}	-55/150		℃
Thermal Resistance-Junction to Ambient	t ≦ 10 s		$R_{\theta JA}$	21		℃/W
Maximum junction-to-case (drain)	Steady state		$R_{\theta JC}$	1.7		

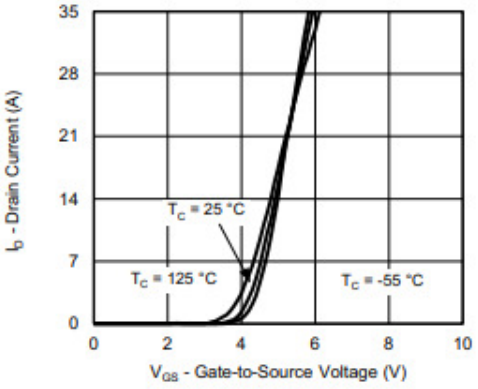
Electrical Characteristics (T_A=25℃ Unless otherwise noted)

Parameter	Symbol	Conditions	Min.	Typ	Max.	Unit
Static						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS}=0V,I_D=250uA	200			V
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS},I_D=250uA	2		4	
Gate Leakage Current	I_{GSS}	V_{DS}=0V,V_{GS}=±20V			±100	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=160V,V_{GS}=0V			1	uA
		V_{DS}=160V,V_{GS}=0V T_J=85℃			10	
On-State Drain Current	$I_{D(on)}$	V_{DS}≧5V,V_{GS}=10V	15			A
Drain-Source On-Resistance	$R_{DS(on)}$	V_{GS}=10V,I_D=7A		95	105	mΩ
		V_{GS}=7.5V,I_D=7A		100	115	
Forward Transconductance	g_{FS}	V_{DS}=10V,I_D=7A		16		S
Diode Forward Voltage	V_{SD}	I_S=5.0A,V_{GS}=0V		0.8	1.2	V
Dynamic						
Total Gate Charge	Q_g	V_{DS}=100V,V_{GS}=7.5V I_D≡3A		9	15	nC
Gate-Source Charge	Q_{gs}			3		
Gate-Drain Charge	Q_{gd}			3		
Gate resistance	R_g	f=1MHz	0.6	1.9	3.5	Ω
Input Capacitance	C_{iss}	V_{DS}=100V,V_{GS}=0V f=1MHz		715		pF
Output Capacitance	C_{oss}			55		
Reverse Transfer Capacitance	C_{rss}			8		
Turn-On Time	$t_{d(on)}$	V_{DD}=100V,R_L=33.3Ω I_D≡3A,V_{GEN}=10V R_G=1.0Ω		10	20	ns
	t_r			15	30	
Turn-Off Time	$t_{d(off)}$			15	30	
	t_f			15	30	

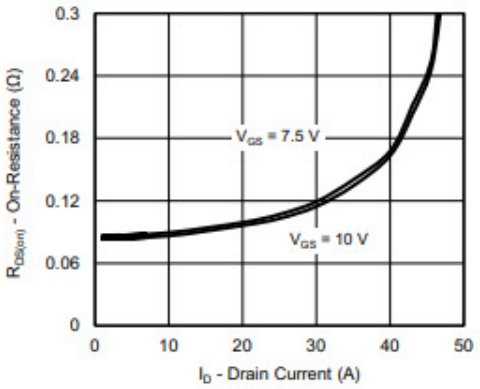
Typical Characteristics



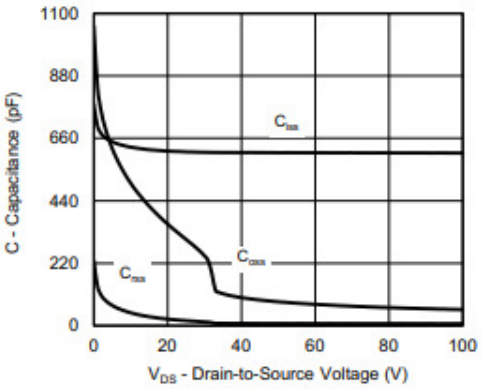
Output Characteristics



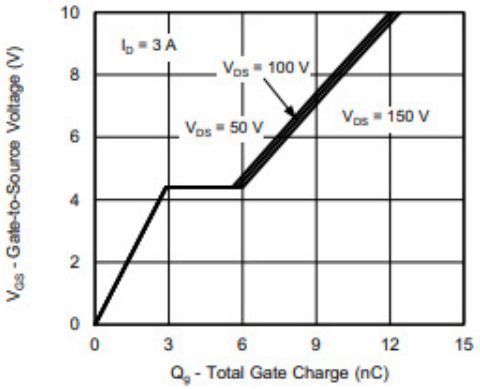
Transfer Characteristics



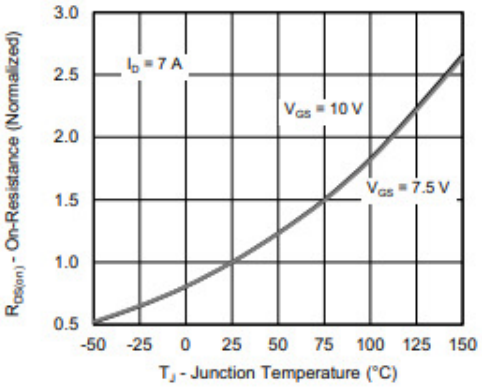
On-Resistance vs. Drain Current



Capacitance

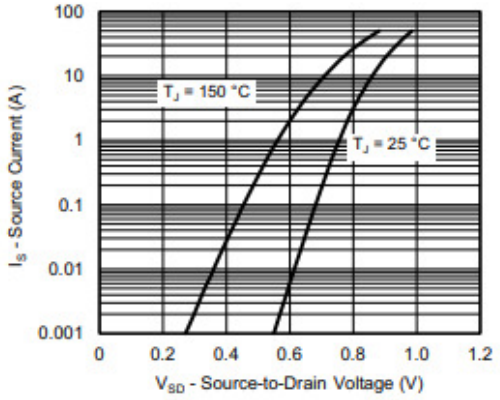


Gate Charge

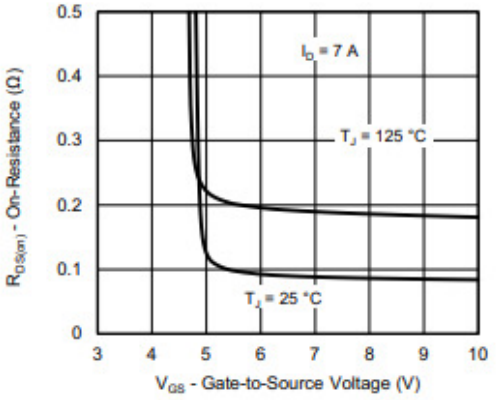


On-Resistance vs. Junction Temperature

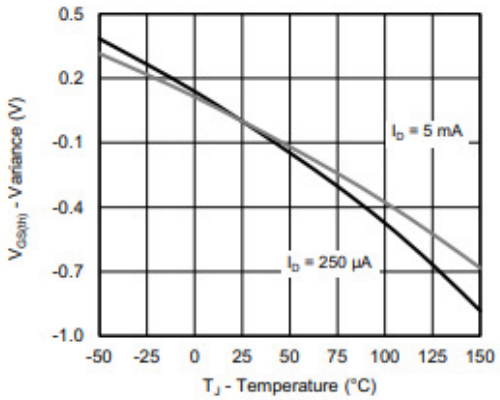
Typical Characteristics



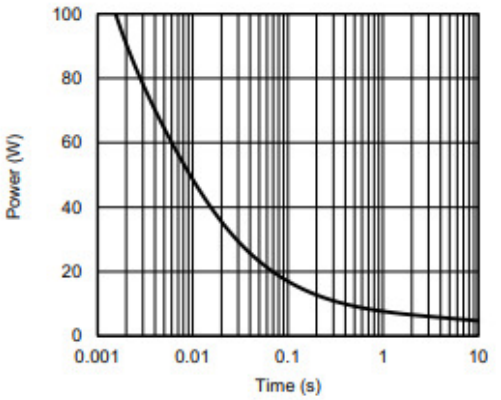
Source-Drain Diode Forward Voltage



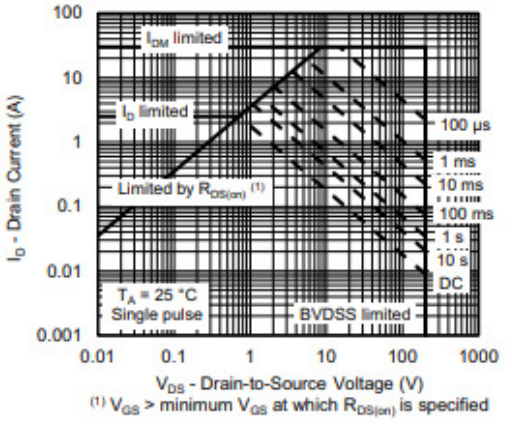
On-Resistance vs. Gate-to-Source Voltage



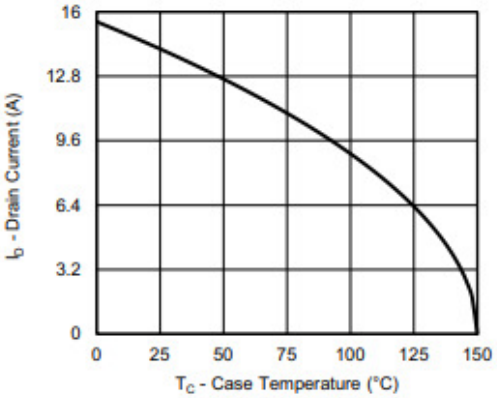
Threshold Voltage



Single Pulse Power, Junction-to-Ambient

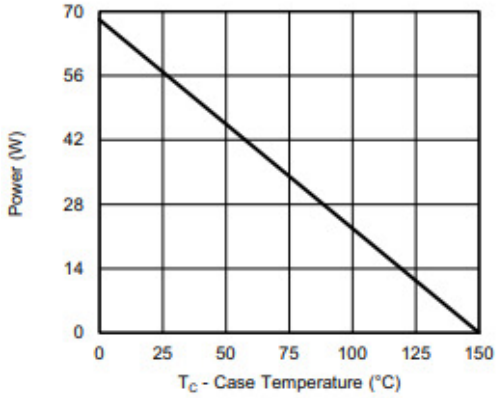


Safe Operating Area

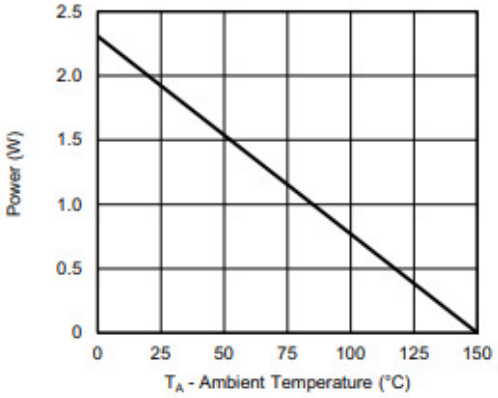


Current Derating [a]

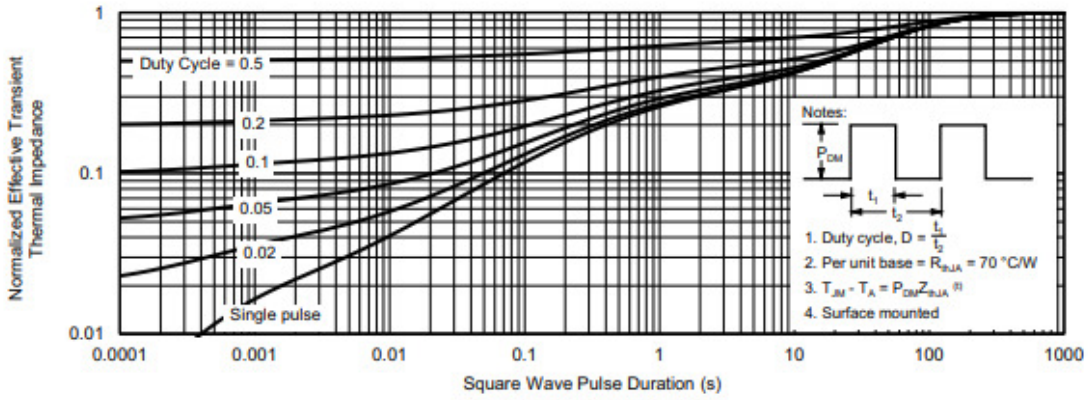
Typical Characteristics



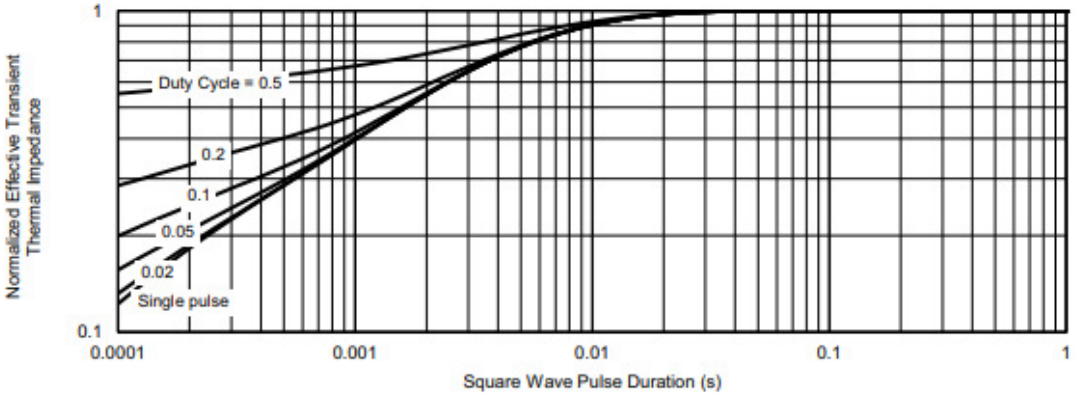
Power, Junction-to-Case



Power, Junction-to-Ambient



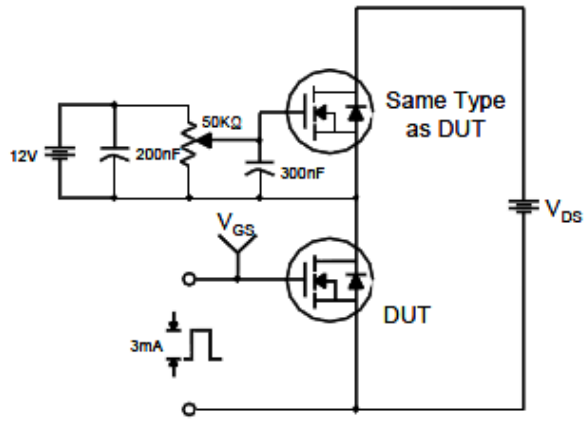
Normalized Thermal Transient Impedance, Junction-to-Ambient

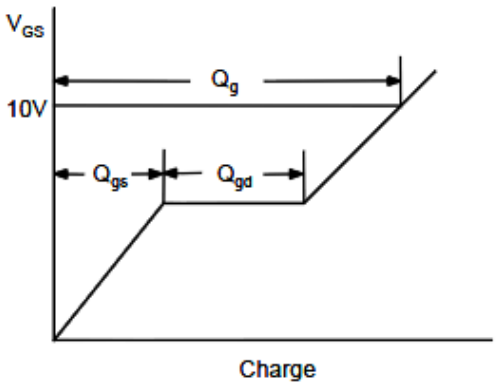


Normalized Thermal Transient Impedance, Junction-to-Case

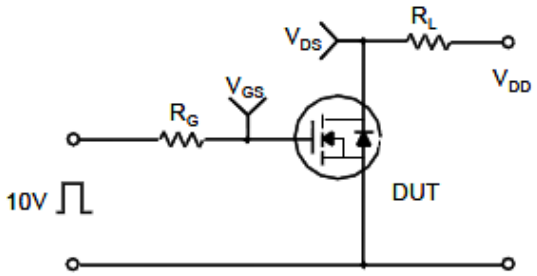
Typical Characteristics

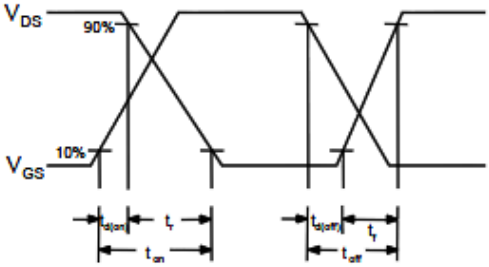
Gate Charge Test Circuit & Waveform



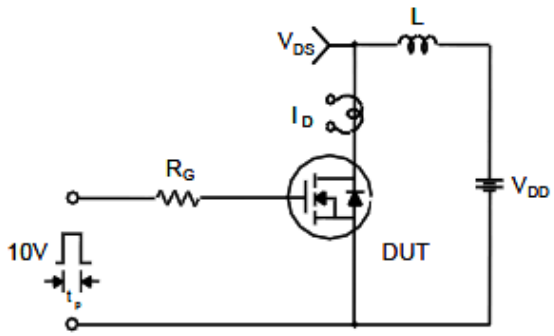


Resistive Switching Test Circuit & Waveforms

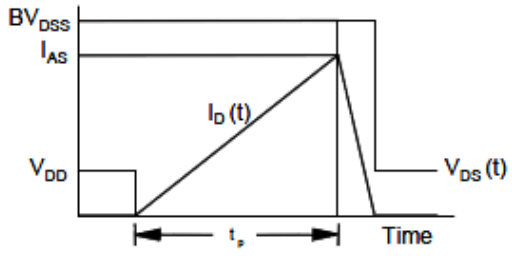




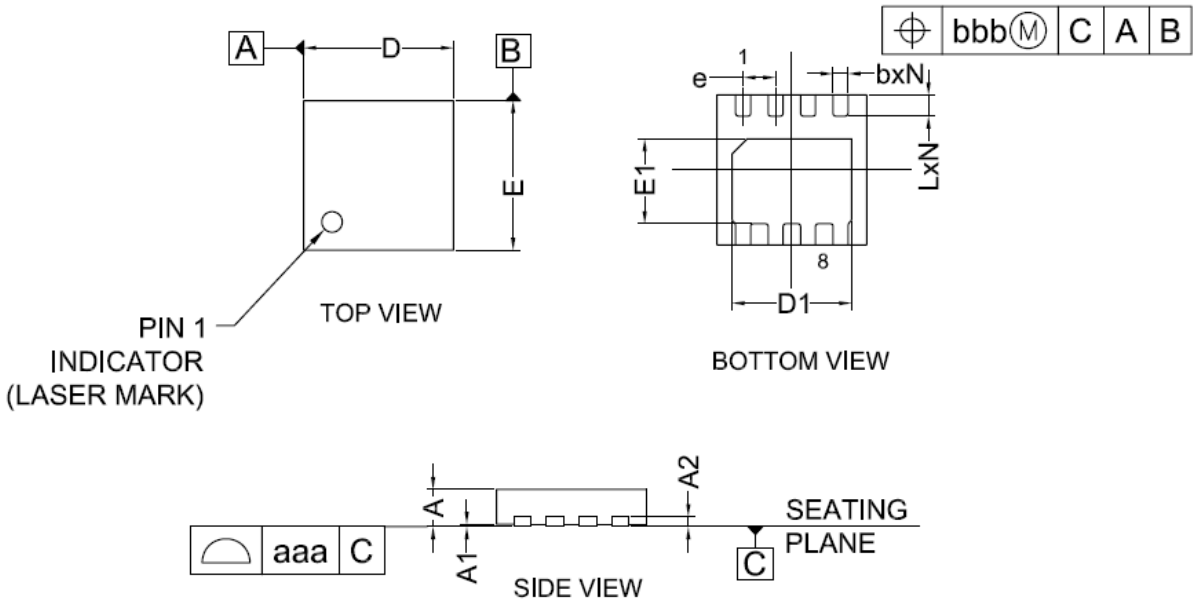
Unclamped Inductive Switching Test Circuit & Waveforms



$$E_{AS} = \frac{1}{2} L I_{AS}^2 \frac{BV_{DSS}}{BV_{DSS} - V_{DD}}$$



Package Information (DFN3X3-8L)



SYMBOL	MIN	TYP	MAX
A	0.70	0.75	0.80
A1	0.00	0.02	0.05
A2		0.203	
b	0.25	0.30	0.35
D	2.90	3.00	3.10
D1	2.35	2.40	2.45
E	2.90	3.00	3.10
E1	1.65	1.70	1.75
e		0.65BSC	
L	0.37	0.42	0.47
N		8	
aaa		0.08	
bbb		0.10	

COMMON DIMENSIONS
(UNITS OF MEASURE=MILLIMETER)

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