



General Description

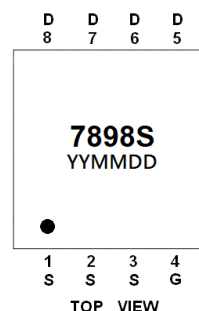
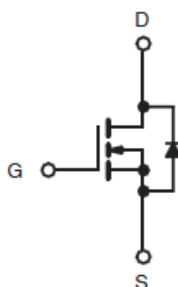
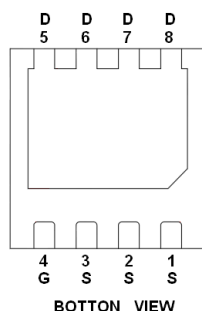
AFN7898S, N-Channel enhancement mode MOSFET, uses Advanced Trench Technology to provide excellent $R_{DS(ON)}$, low gate charge.

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

- $I_D=7A, R_{DS(ON)}=115m\Omega@V_{GS}=10V$
- $I_D=7A, R_{DS(ON)}=125m\Omega@V_{GS}=7.5V$
- 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 ($T_A=25^\circ\text{C}$ Unless otherwise noted)

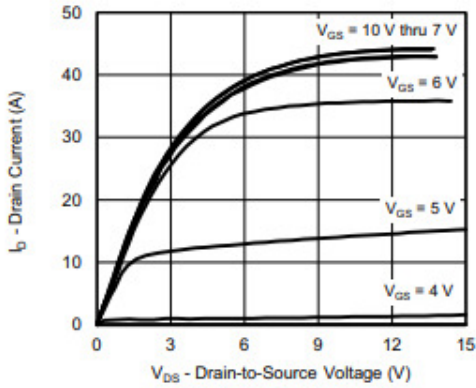
Parameter	Symbol	Typical	Unit
Drain-Source Voltage	V_{DSS}	200	V
Gate –Source Voltage	V_{GSS}	± 20	V
Continuous Drain Current ($T_J=150^\circ\text{C}$)	$T_C=25^\circ\text{C}$	14	A
	$T_C=70^\circ\text{C}$	11	
Pulsed Drain Current ($t=100\mu\text{s}$)	$T_A=25^\circ\text{C}$	4.2	
	$T_A=70^\circ\text{C}$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

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

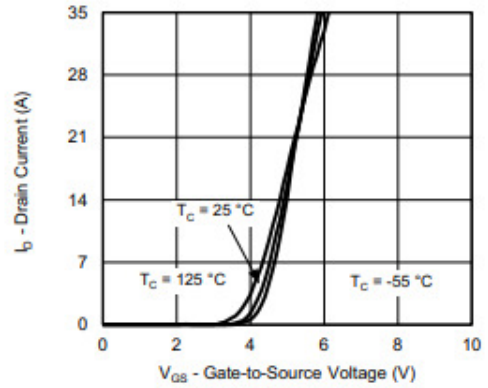
Parameter	Symbol	Conditions	Min.	Typ	Max.	Unit
Static						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=250\mu\text{A}$	200			V
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu\text{A}$	2		4	
Gate Leakage Current	I_{GSS}	$V_{DS}=0V, V_{GS}=\pm 20V$			± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=160V, V_{GS}=0V$			1	uA
		$V_{DS}=160V, V_{GS}=0V$ $T_J=85^\circ\text{C}$			10	
On-State Drain Current	$I_{D(on)}$	$V_{DS} \geq 5V, V_{GS}=10V$	15			A
Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS}=10V, I_D=7A$		100	115	m Ω
		$V_{GS}=7.5V, I_D=7A$		105	125	
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	$f=1\text{MHz}$	0.6	1.9	3.5	Ω
Input Capacitance	C_{iss}	$V_{DS}=100V, V_{GS}=0V$ $f=1\text{MHz}$		715		pF
Output Capacitance	C_{oss}			55		
Reverse Transfer Capacitance	C_{rss}			8		
Turn-On Time	$t_{d(on)}$	$V_{DD}=100V, R_L=33.3\Omega$ $I_D=3A, V_{GEN}=10V$ $R_G=1.0\Omega$		10	20	ns
	t_r			15	30	
Turn-Off Time	$t_{d(off)}$			15	30	
	t_f			15	30	



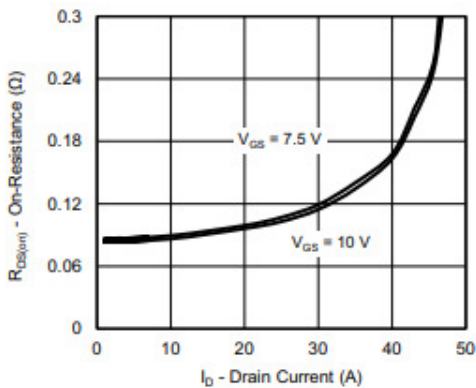
Typical Characteristics



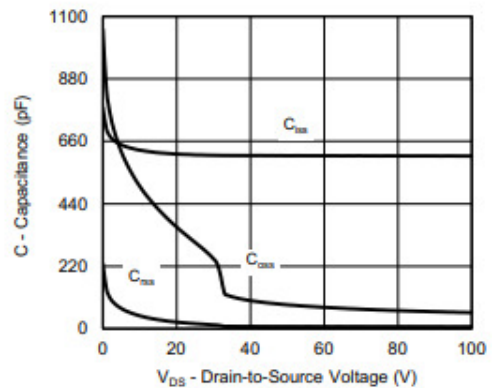
Output Characteristics



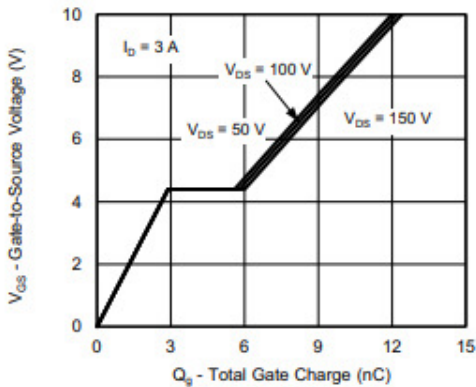
Transfer Characteristics



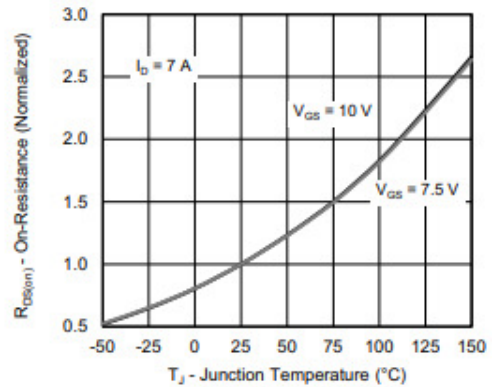
On-Resistance vs. Drain Current



Capacitance



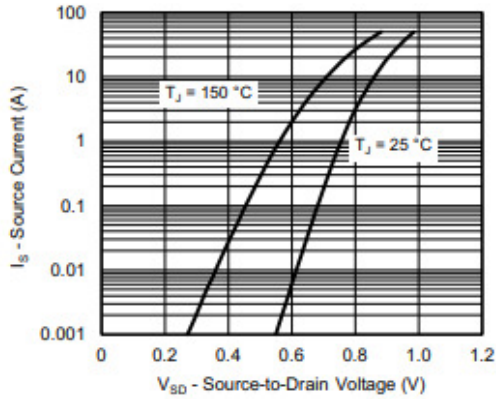
Gate Charge



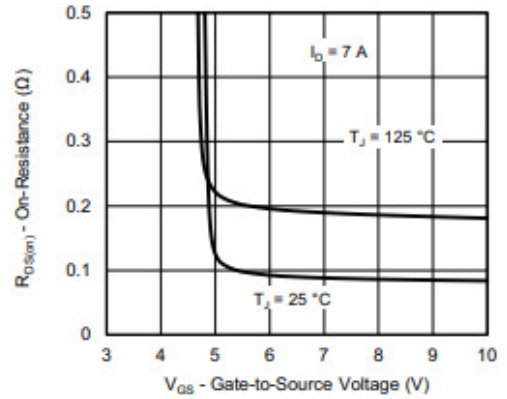
On-Resistance vs. Junction Temperature



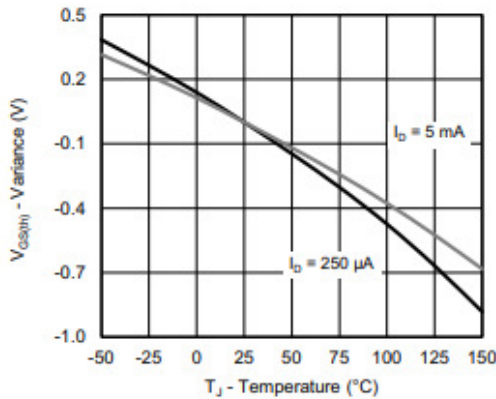
Typical Characteristics



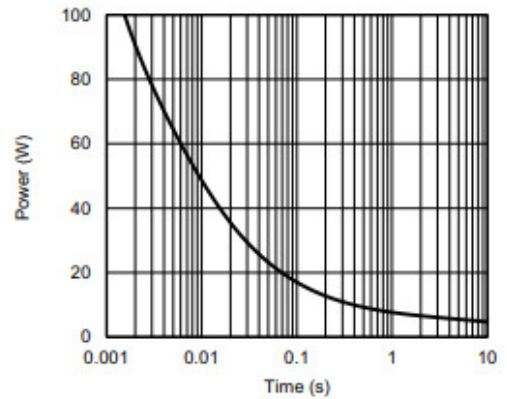
Source-Drain Diode Forward Voltage



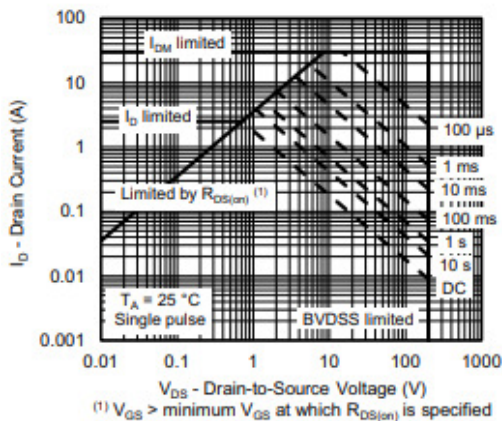
On-Resistance vs. Gate-to-Source Voltage



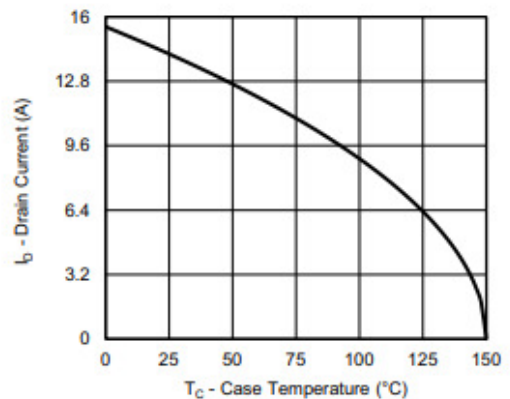
Threshold Voltage



Single Pulse Power, Junction-to-Ambient



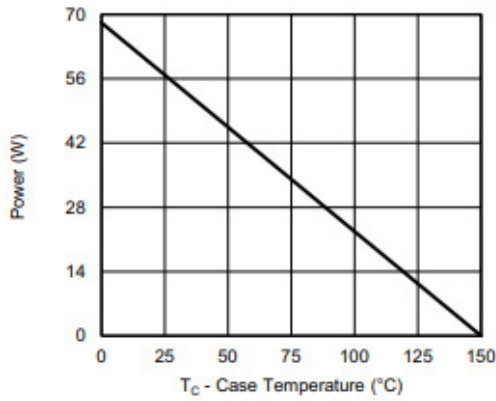
Safe Operating Area



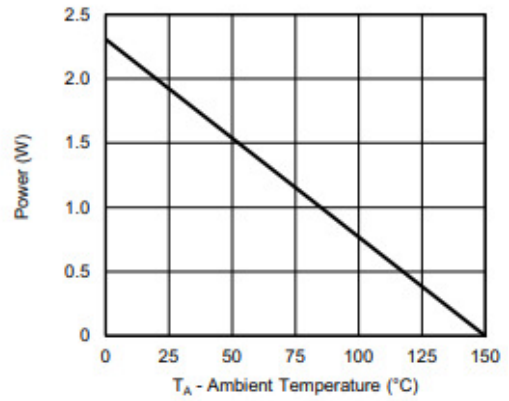
Current Derating ^a



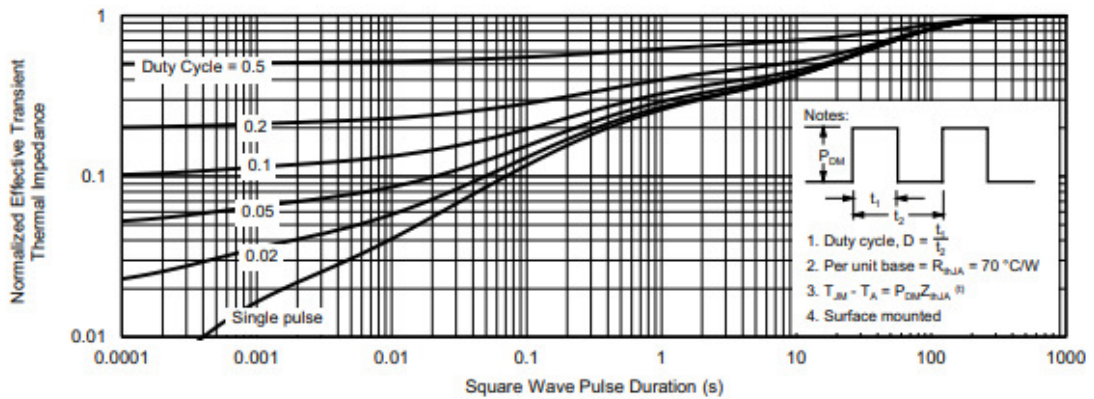
Typical Characteristics



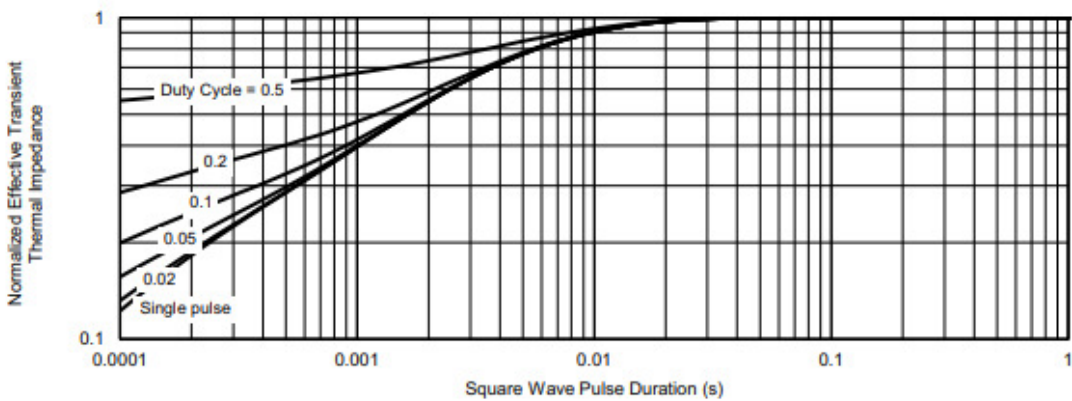
Power, Junction-to-Case



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

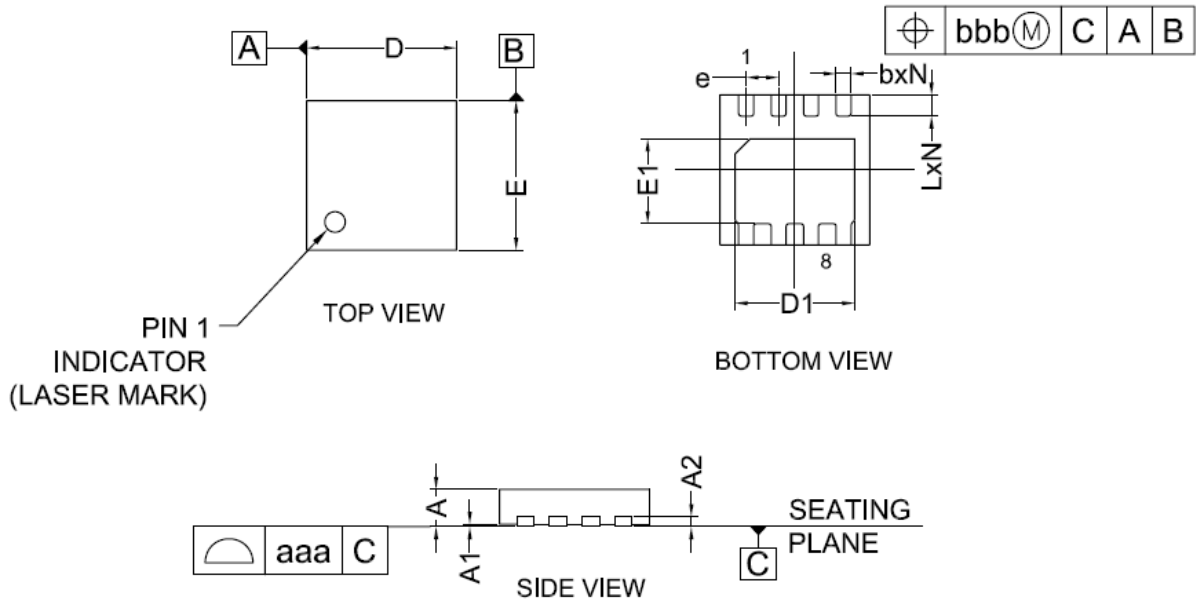


Unclamped Inductive Switching Test Circuit & Waveforms





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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