



General Description

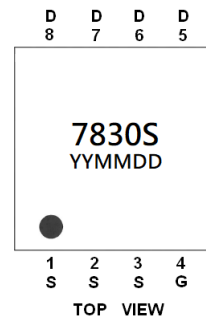
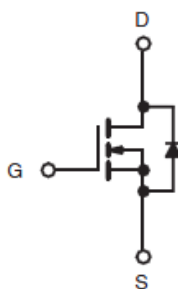
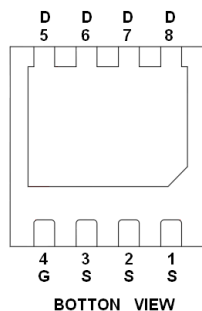
AFN7830S, N-Channel enhancement mode MOSFET, uses Advanced Trench Technology to provide excellent $R_{DS(ON)}$, low gate charge.

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

- $I_D=15A, R_{DS(ON)}=8.5m\Omega@V_{GS}=10V$
- $I_D=10A, R_{DS(ON)}=12.5m\Omega@V_{GS}=4.5V$
- Super high density cell design for extremely low $R_{DS(ON)}$
- Exceptional on-resistance and maximum DC current capability
- 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
AFN7830SFN338RG	7830S	DFN3X3-8L	Tape & Reel	5000 EA

※ YY year code

※ MM month code

※ DD date code

※ AFN7830SFN338RG : 13" Tape & Reel ; Pb- Free ; Halogen -Free



Absolute Maximum Ratings (T_A=25°C Unless otherwise noted)

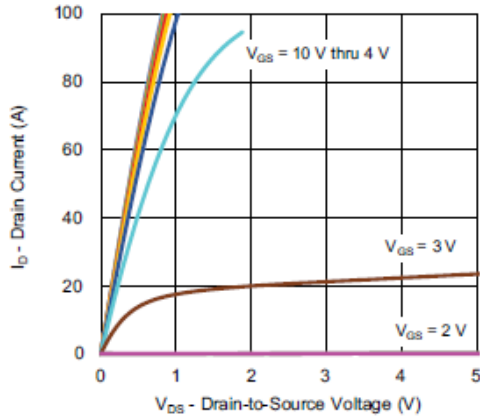
Parameter	Symbol	Typical	Unit
Drain-Source Voltage	V _{DSS}	80	V
Gate -Source Voltage	V _{GSS}	±20	V
Continuous Drain Current (T _J =150°C)	I _D	T _C =25°C	55
		T _C =70°C	45
Pulsed Drain Current (t=100us)	I _{DM}	T _A =25°C	16
		T _A =70°C	12
Continuous Source Current (Diode Conduction)	I _S	50	4.5
Single pulse avalanche current	I _{AS}	20	
Single pulse avalanche energy	E _{AS}	20	mJ
Power Dissipation	P _D	T _C =25°C	55
		T _C =70°C	35
Operating Junction Temperature	T _J	T _A =25°C	4.8
		T _A =70°C	3.2
Operating Junction Temperature	T _J	150	°C
Storage Temperature Range	T _{STG}	-55/150	°C
Thermal Resistance-Junction to Ambient	R _{θJA}	22	°C/W
Maximum junction-to-case (drain)	R _{θJC}	1.8	

Electrical Characteristics (T_A=25°C Unless otherwise noted)

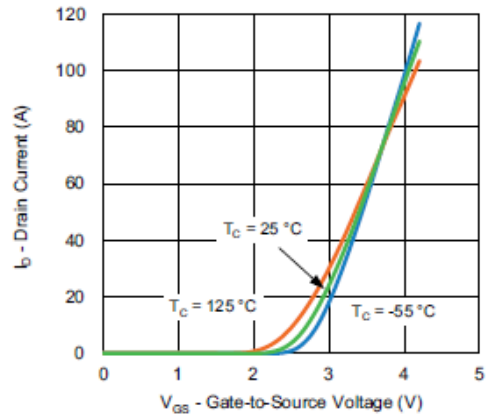
Parameter	Symbol	Conditions	Min.	Typ	Max.	Unit
Static						
Drain-Source Breakdown Voltage	V _{(BR)DSS}	V _{GS} =0V, I _D =250uA	80			V
Gate Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250uA	1.0		2.5	
Gate Leakage Current	I _{GSS}	V _{DS} =0V, V _{GS} =±20V			±100	nA
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =64V, V _{GS} =0V			1	uA
		V _{DS} =64V, V _{GS} =0V T _J =85°C			15	
On-State Drain Current	I _{D(on)}	V _{DS} ≥ 10V, V _{GS} =10V	40			A
Drain-Source On-Resistance	R _{DS(on)}	V _{GS} =10V, I _D =15A		7.2	8.5	mΩ
		V _{GS} =4.5V, I _D =10A		10.5	12.5	
Forward Transconductance	g _{FS}	V _{DS} =15V, I _D =10A		36		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} =40V, V _{GS} =4.5V I _D ≡10A		15	30	nC
Gate-Source Charge	Q _{gs}			7		
Gate-Drain Charge	Q _{gd}			4		
Gate resistance	R _g	f=1MHz	0.4	1.4	2.4	Ω
Input Capacitance	C _{iss}	V _{DS} =40V, V _{GS} =0V f=1MHz		2050		pF
Output Capacitance	C _{oss}			205		
Reverse Transfer Capacitance	C _{rss}			15		
Turn-On Time	t _{d(on)}	V _{DD} =40V, R _L =4Ω I _D ≡10A, V _{GEN} =10V R _G =1.0Ω		10	20	ns
	t _r			8	16	
Turn-Off Time	t _{d(off)}			25	50	
	t _f			8	16	



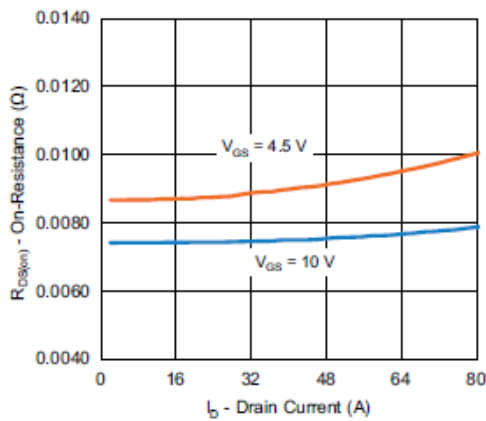
Typical Characteristics



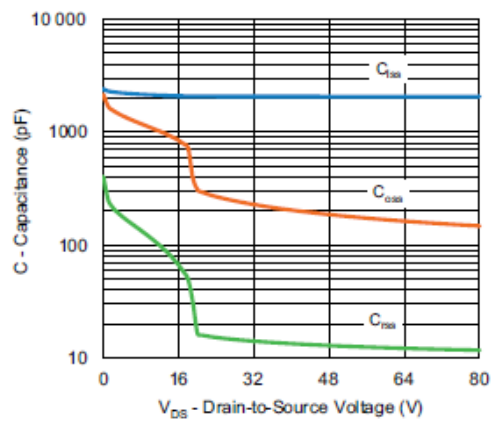
Output Characteristics



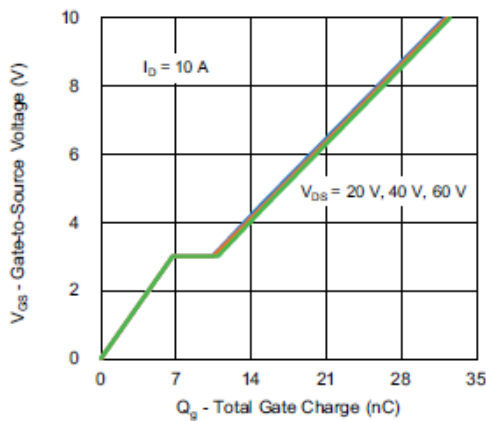
Transfer Characteristics



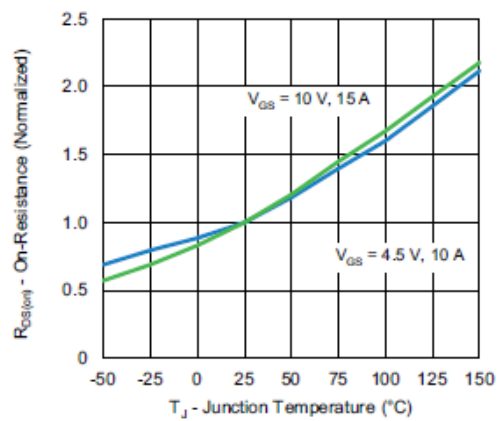
On-Resistance vs. Drain Current and Gate Voltage



Capacitance



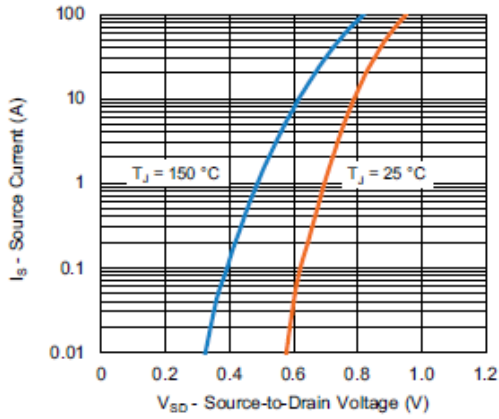
Gate Charge



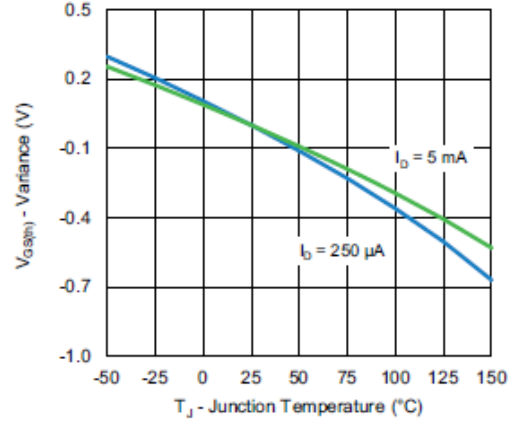
On-Resistance vs. Junction Temperature



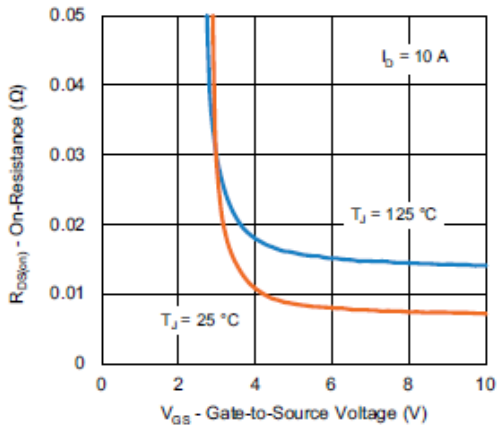
Typical Characteristics



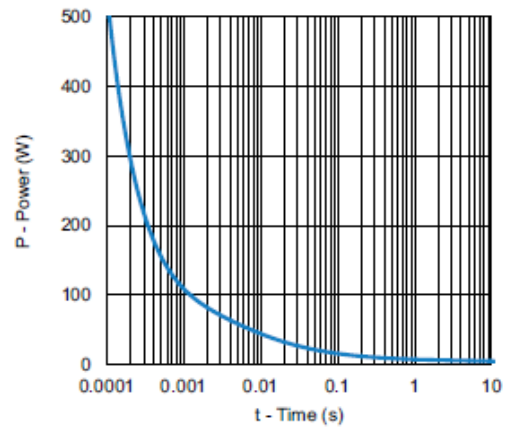
Source-Drain Diode Forward Voltage



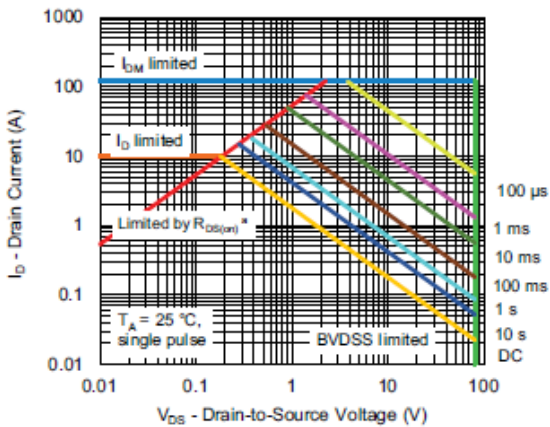
Threshold Voltage



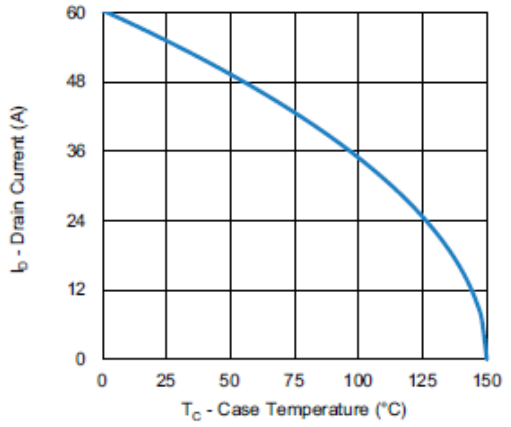
On-Resistance vs. Gate-to-Source Voltage



Single Pulse Power, Junction-to-Ambient



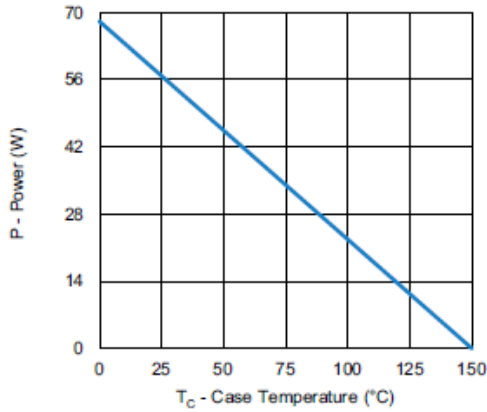
Safe Operating Area, Junction-to-Ambient



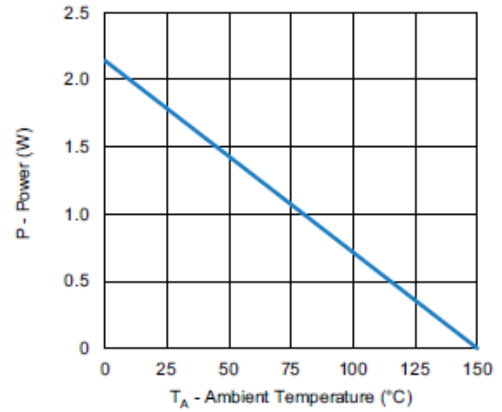
Current Derating^a



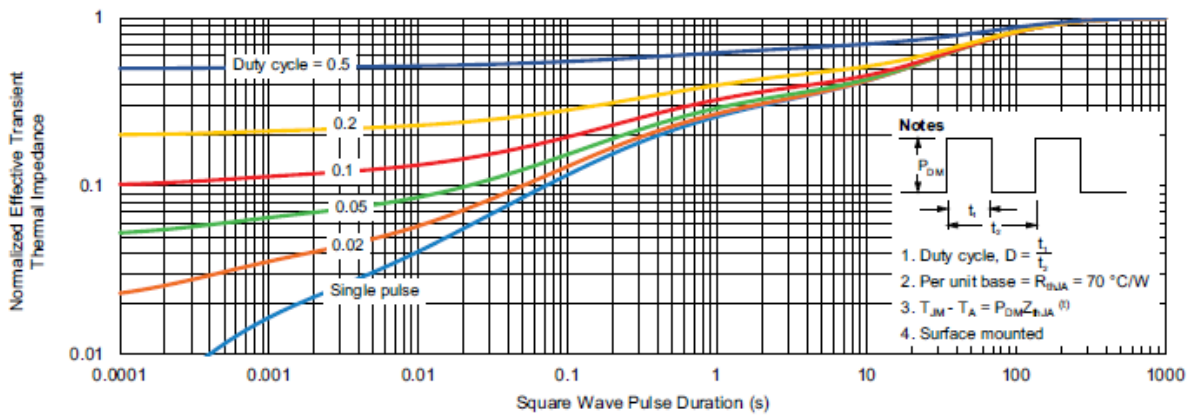
Typical Characteristics



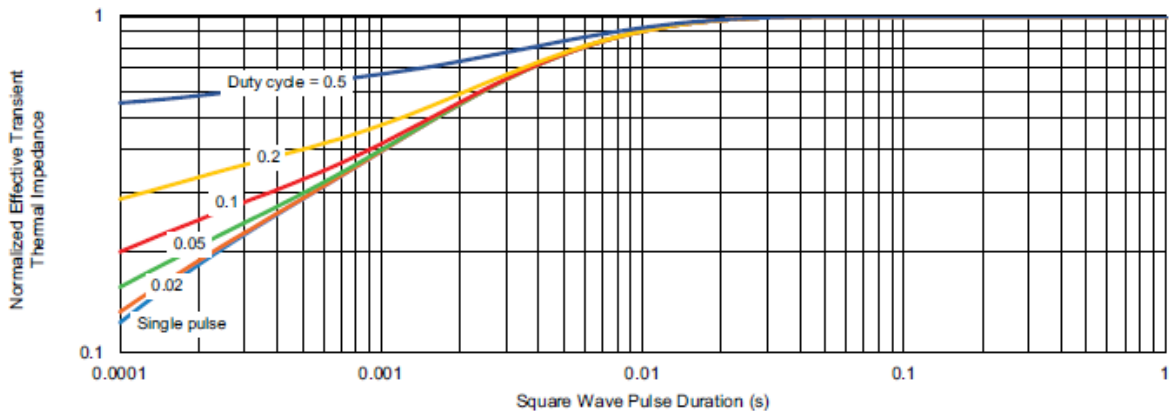
Power, Junction-to-Case



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

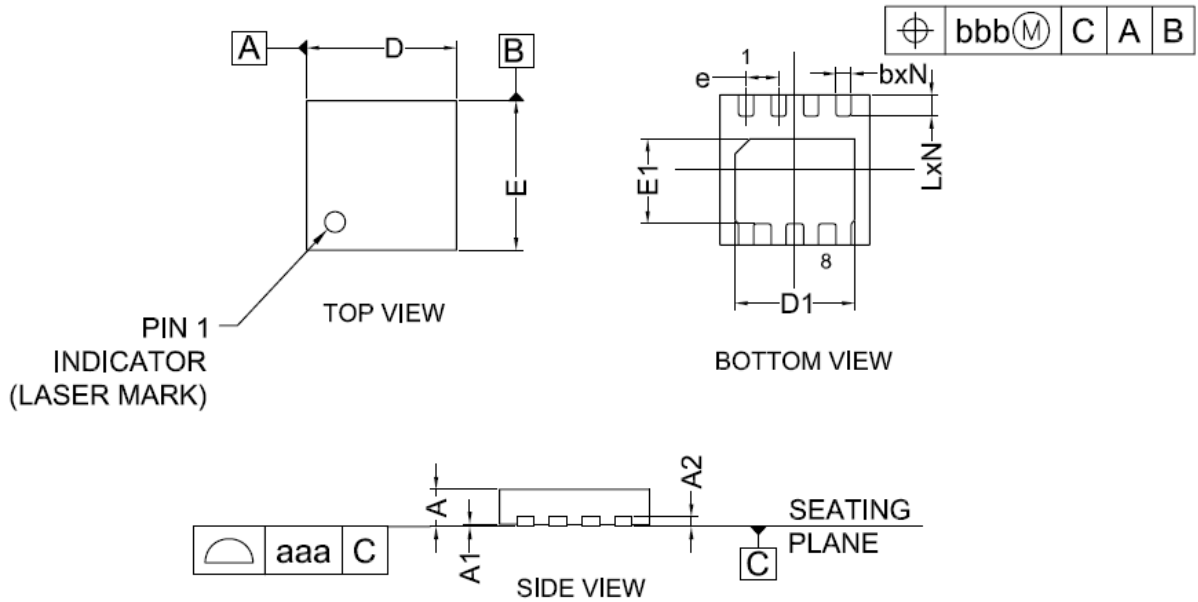


Unclamped Inductive Switching Test Circuit & Waveforms





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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