



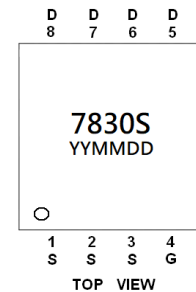
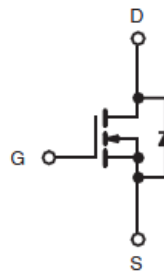
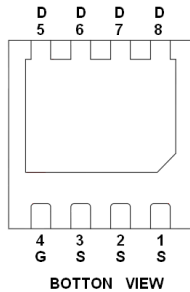
General Description

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

- 80V/ 15A, $R_{DS(ON)}=8.5m\Omega@V_{GS}=10V$
- 80V/ 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 ($T_A=25^\circ\text{C}$ Unless otherwise noted)

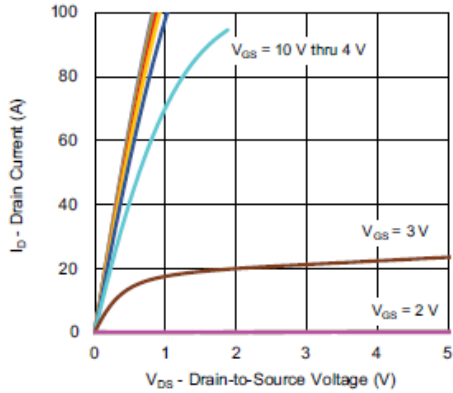
Parameter	Symbol	Typical	Unit
Drain-Source Voltage	V_{DSS}	80	V
Gate –Source Voltage	V_{GSS}	± 20	V
Continuous Drain Current($T_J=150^\circ\text{C}$)	$T_C=25^\circ\text{C}$	55	A
	$T_C=70^\circ\text{C}$	45	
Pulsed Drain Current ($t=100\mu\text{s}$)	$T_A=25^\circ\text{C}$	16	
	$T_A=70^\circ\text{C}$	12	
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	$T_C=25^\circ\text{C}$	55	35
	$T_A=25^\circ\text{C}$	4.8	3.2
Operating Junction Temperature	T_J	150	$^\circ\text{C}$
Storage Temperature Range	T_{STG}	-55/150	$^\circ\text{C}$
Thermal Resistance-Junction to Ambient	$R_{\theta JA}$	22	$^\circ\text{C}/\text{W}$
Maximum junction-to-case (drain)	$R_{\theta JC}$	1.8	

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

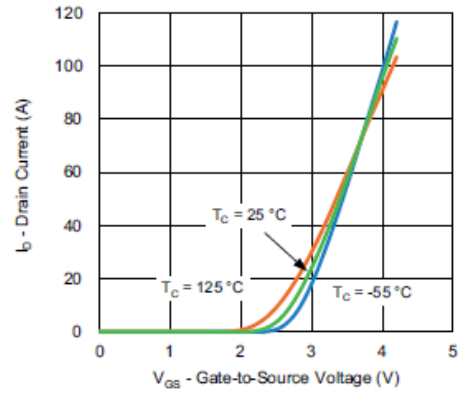
Parameter	Symbol	Conditions	Min.	Typ	Max.	Unit
Static						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=250\mu\text{A}$	80			V
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu\text{A}$	1.0		2.5	V
Gate Leakage Current	I_{GSS}	$V_{DS}=0V, V_{GS}=\pm 20V$			± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=64V, V_{GS}=0V$			1	uA
		$V_{DS}=64V, V_{GS}=0V$ $T_J=85^\circ\text{C}$			15	
On-State Drain Current	$I_{D(on)}$	$V_{DS} \geq 10V, V_{GS}=10V$	40			A
Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS}=10V, I_D=15A$		7.2	8.5	m Ω
		$V_{GS}=4.5V, I_D=10A$		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	$f=1\text{MHz}$	0.4	1.4	2.4	Ω
Input Capacitance	C_{iss}	$V_{DS}=40V, V_{GS}=0V$ $f=1\text{MHz}$		2050		pF
Output Capacitance	C_{oss}			205		
Reverse Transfer Capacitance	C_{rss}			15		
Turn-On Time	$t_{d(on)}$	$V_{DD}=40V, R_L=4\Omega$ $I_D=10A, V_{GEN}=10V$ $R_G=1.0\Omega$		10	20	ns
	t_r			8	16	
Turn-Off Time	$t_{d(off)}$			25	50	
	t_f			8	16	



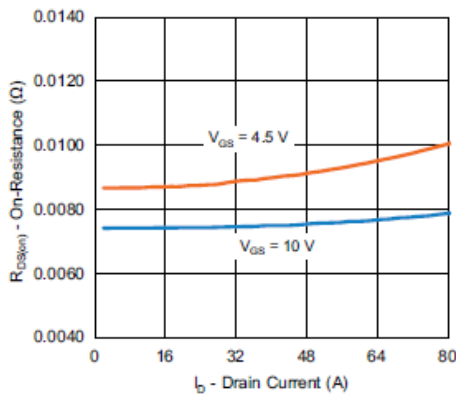
Typical Characteristics



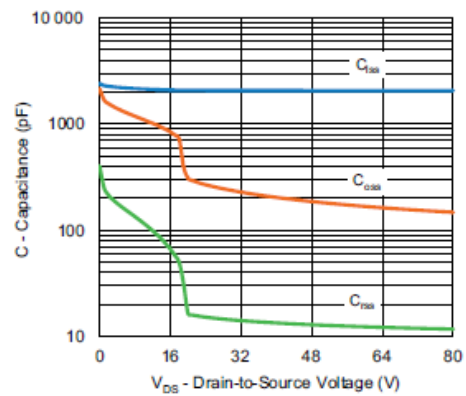
Output Characteristics



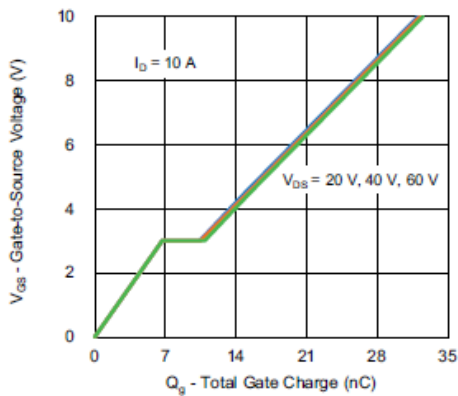
Transfer Characteristics



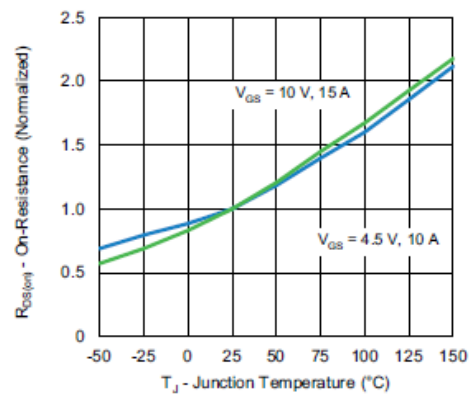
On-Resistance vs. Drain Current and Gate Voltage



Capacitance



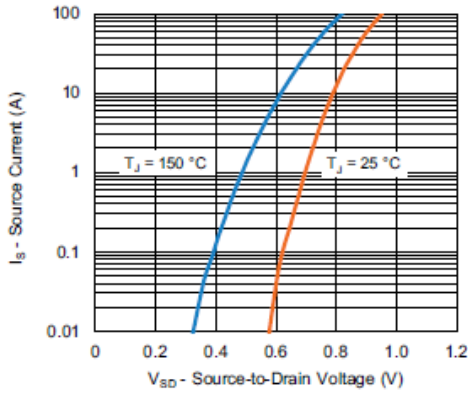
Gate Charge



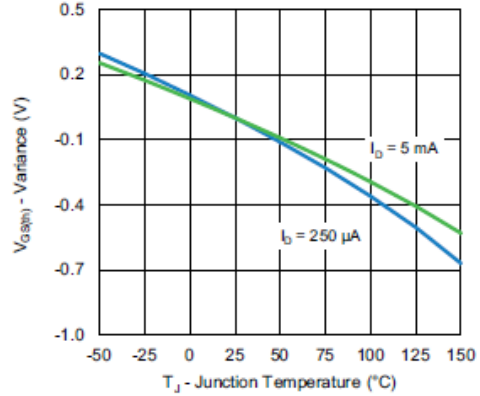
On-Resistance vs. Junction Temperature



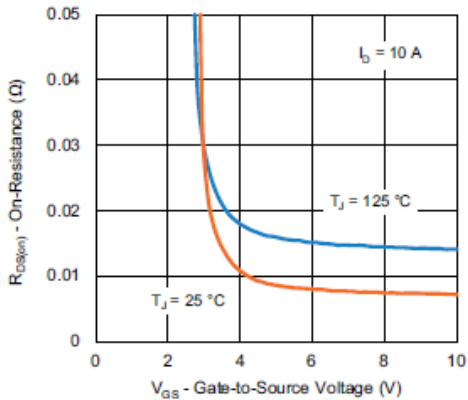
Typical Characteristics



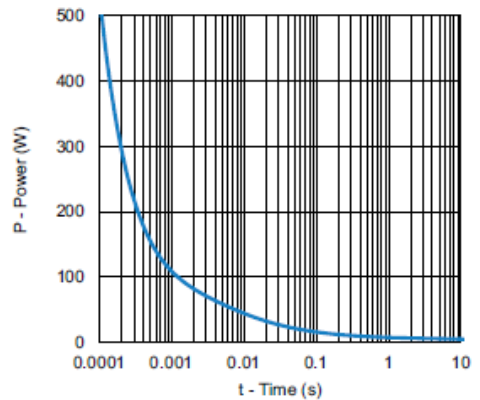
Source-Drain Diode Forward Voltage



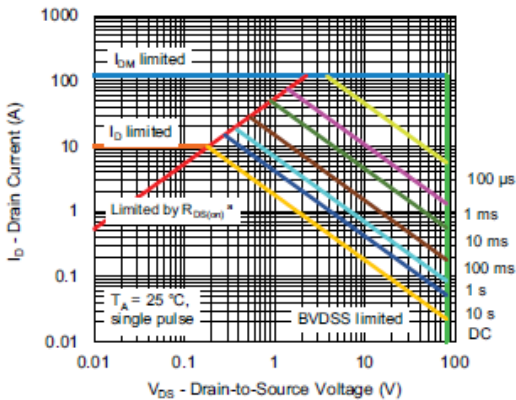
Threshold Voltage



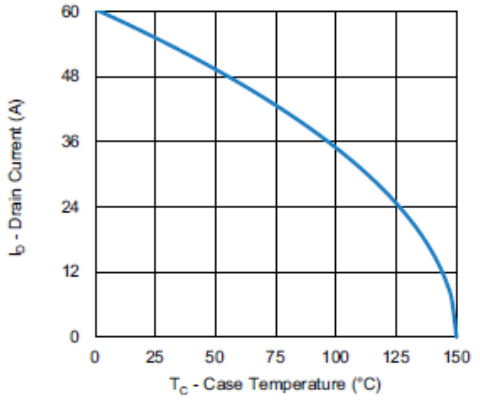
On-Resistance vs. Gate-to-Source Voltage



Single Pulse Power, Junction-to-Ambient



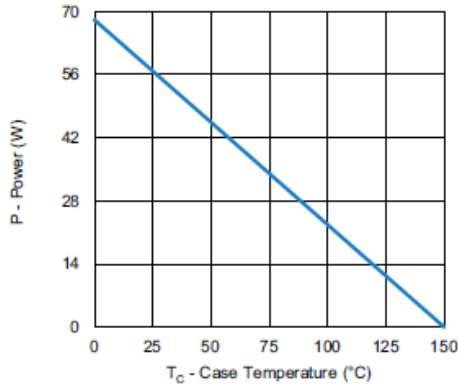
Safe Operating Area, Junction-to-Ambient



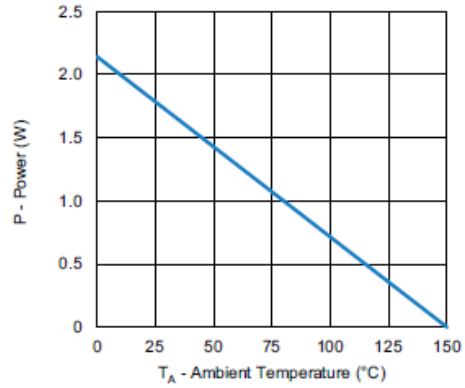
Current Derating ^a



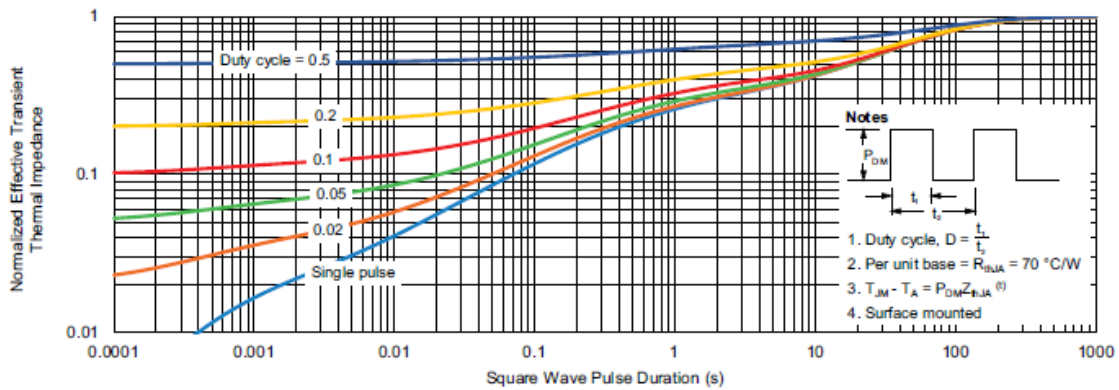
Typical Characteristics



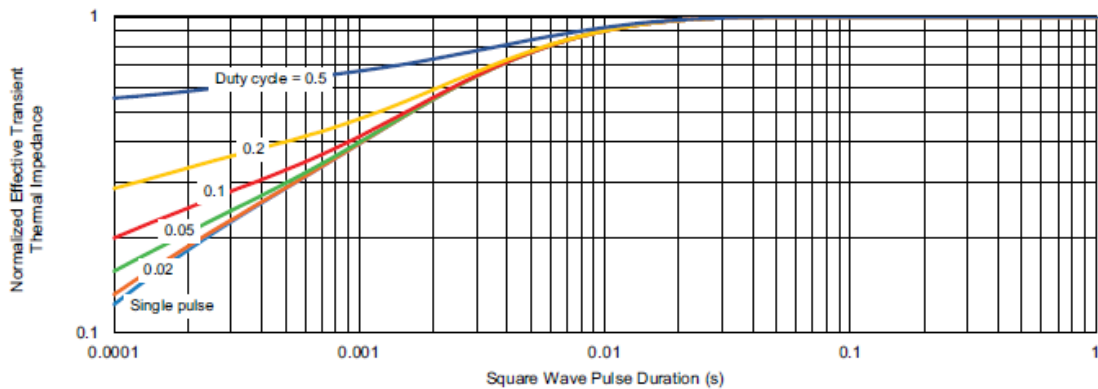
Power, Junction-to-Case



Power, Junction-to-Ambient



Normalized Thermal Transient Impedance, Junction-to-Ambient

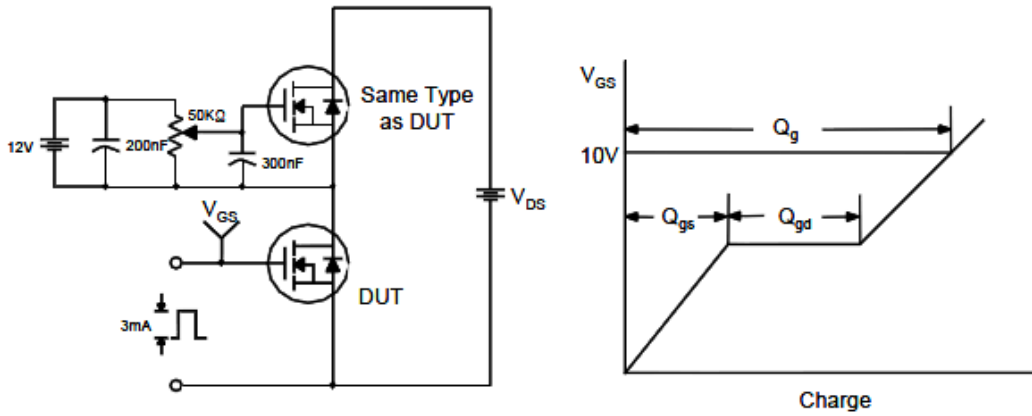


Normalized Thermal Transient Impedance, Junction-to-Case

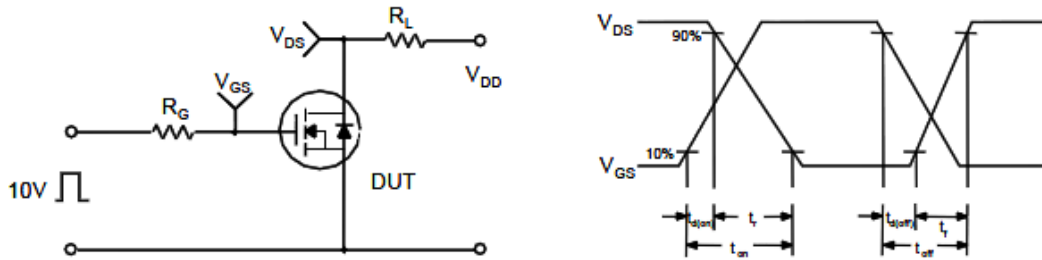


Typical Characteristics

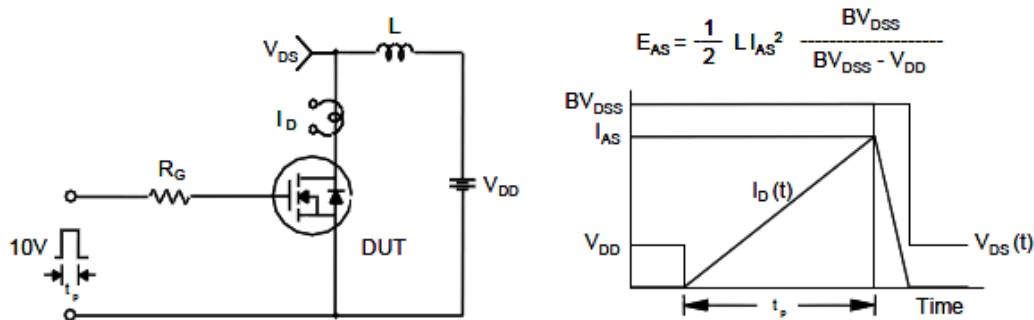
Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveforms

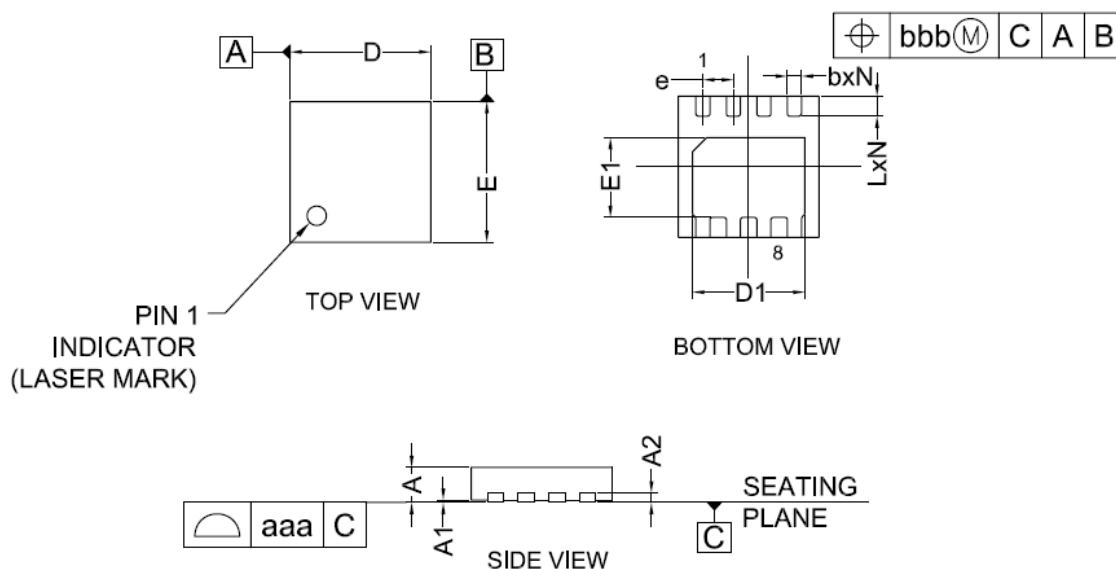


Unclamped Inductive Switching Test Circuit & Waveforms





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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