Alfa-MOS Technology

AFN5195S

100V N-Channel Enhancement Mode MOSFET

General Description

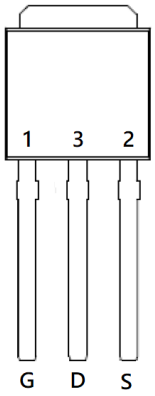
AFN5195S, N-Channel enhancement mode MOSFET, uses Advanced Trench Technology to provide excellent $R_{DS(ON)}$, low gate charge.

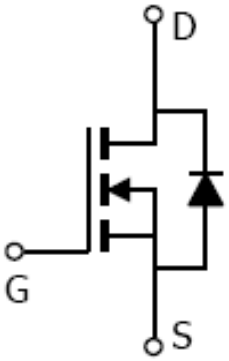
These devices are particularly suited for low voltage power management, and low in-line power loss are needed in commercial industrial surface mount applications.

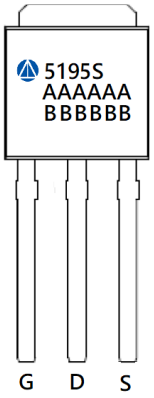
Features

- 100V/20A,$R_{DS(ON)}$=11mΩ@V_{GS}=10V
- 100V/15A,$R_{DS(ON)}$=13mΩ@V_{GS}=4.5V
- Super high density cell design for extremely low $R_{DS\ (ON)}$
- TO-251-3L package design

Pin Description (TO-251-3L)







Application

- Primary Side Switch
- POL Synchronous buck converter
- LED Backlight for LCD TV

Pin Define

Pin	Symbol	Description
1	G	Gate
2	S	Source
3	D	Drain

Ordering Information

Part Ordering No.	Part Marking	Package	Unit	Quantity
AFN5195ST251TG	5195S	TO-251-3L	Tube	80 EA

※ A Lot code
※ B Date code
※ AFN5195ST251TG : Tube ; Pb- Free ; Halogen –Free

※ Absolute Maximum Ratings

※ (T_A=25℃ Unless otherwise noted)

Parameter		Symbol	Typical	Unit
Drain-Source Voltage		V_{DSS}	100	V
Gate –Source Voltage		V_{GSS}	±20	V
Continuous Drain Current(T_J=150℃)	T_C=25℃	I_D	50	A
	T_C=70℃		30	
	T_A=25℃		15	
	T_A=70℃		12	
Pulsed Drain Current		I_{DM}	120	
Continuous Source Current(Diode Conduction)	T_A=25℃	I_S	16	
Single Pulse Avalanche Current		I_{AS}	25	
Power Dissipation	T_C=25℃	P_D	80	W
	T_C=70℃		30	
Operating Junction Temperature		T_J	150	℃
Storage Temperature Range		T_{STG}	-55/150	℃
Thermal Resistance-Junction to Ambient		$R_{\theta JA}$	62.5	℃/W

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※ 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	100			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}=100V,V_{GS}=0V			1	uA
		V_{DS}=100,V_{GS}=0V T_J=85℃			30	
On-State Drain Current	$I_{D(on)}$	V_{DS}≧5V,V_{GS}=10V	30			A
Drain-Source On-Resistance	$R_{DS(on)}$	V_{GS}=10V,I_D=20A		8	11	mΩ
		V_{GS}=4.5V,I_D=15A		10	13	
Forward Transconductance	g_{FS}	V_{DS}=10,I_D=20A		54		S
Diode Forward Voltage	V_{SD}	I_S=5A,V_{GS}=0V		0.75	1.2	V
Dynamic						
Total Gate Charge	Q_g	V_{DS}=50V,V_{GS}=4.5V I_D≡10A		16	25	nC
Gate-Source Charge	Q_{gs}			5		
Gate-Drain Charge	Q_{gd}			7.5		
Gate Resistance	R_g	f=1MHz	0.2	0.8	1.6	Ω
Input Capacitance	C_{iss}	V_{DS}=50V,V_{GS}=0V f=1MHz		1650		pF
Output Capacitance	C_{oss}			720		
Reverse Transfer Capacitance	C_{rss}			50		
Turn-On Time	$t_{d(on)}$	V_{DD}=50V,R_L=5Ω I_D≡10A,V_{GEN}=10V R_G=1Ω		12	24	ns
	t_r			8	16	
Turn-Off Time	$t_{d(off)}$			28	55	
	t_f			8	16	

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※ Typical Characteristics

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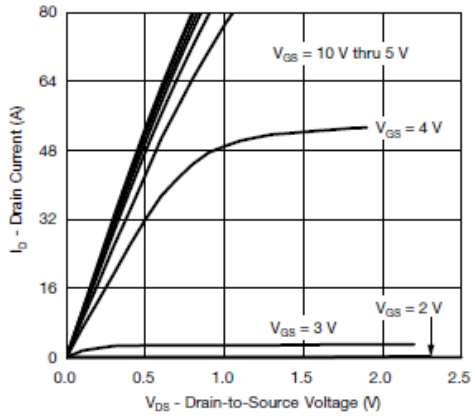
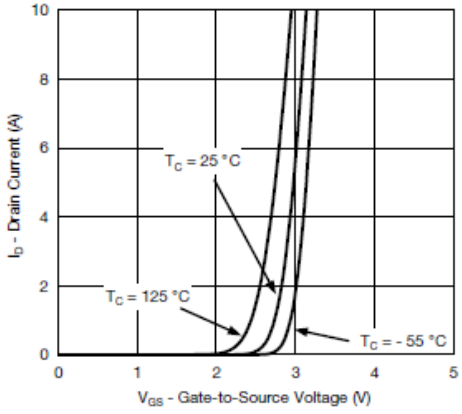
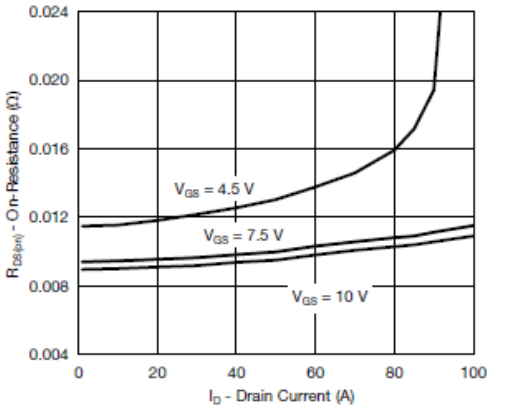


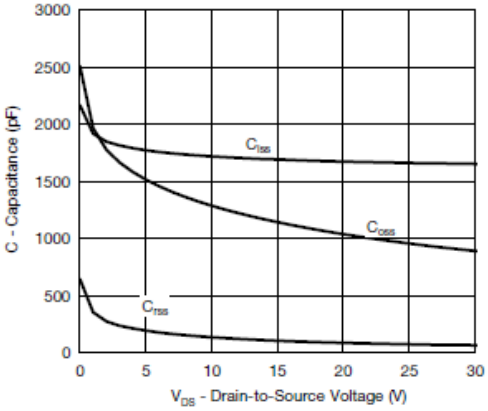
Output Characteristics



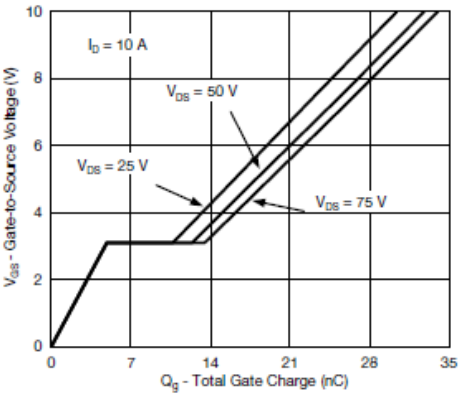
Transfer Characteristics



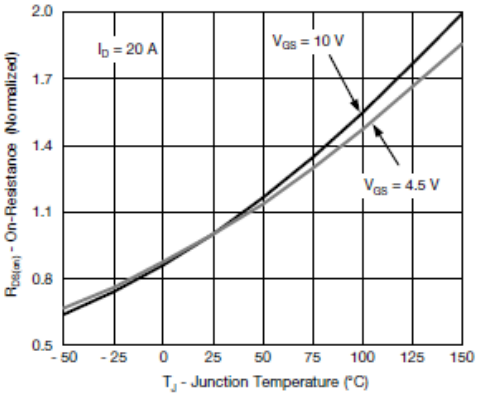
On-Resistance vs. Drain Current and Gate Voltage



Capacitance



Gate Charge



On-Resistance vs. Junction Temperature

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※ Typical Characteristics

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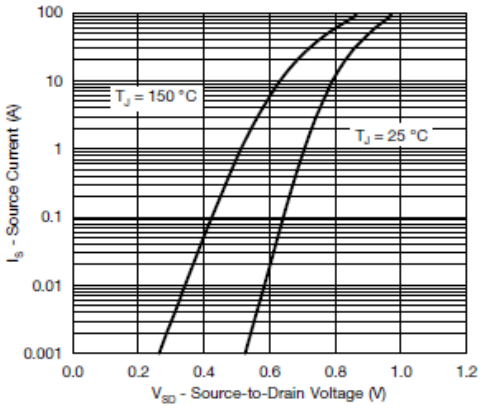
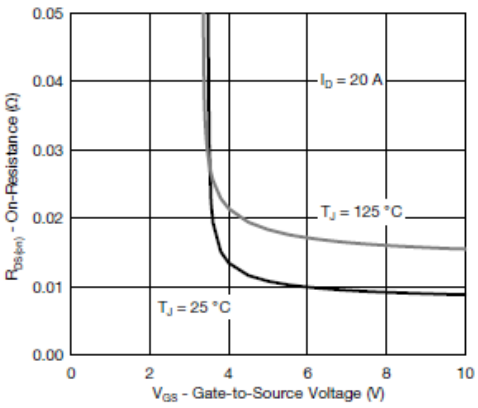
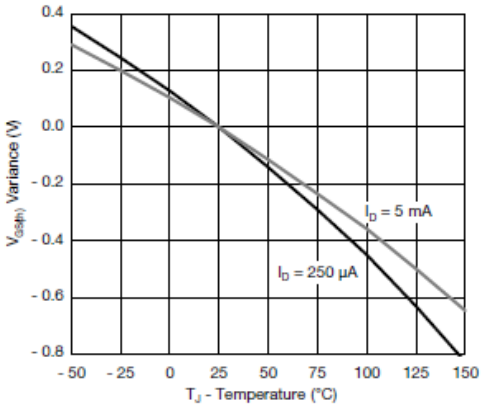


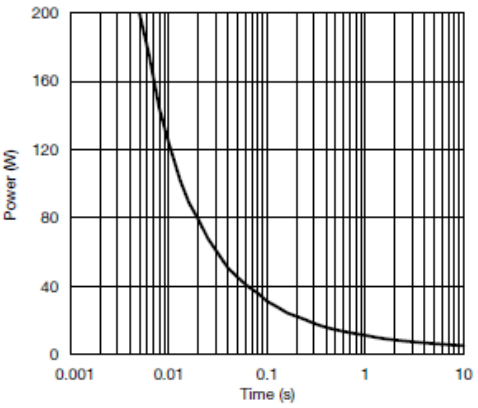
Source-Drain Diode Forward Voltage



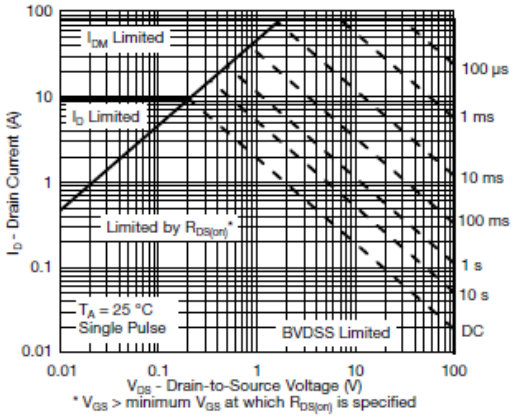
On-Resistance vs. Gate-to-Source Voltage



Threshold Voltage



Single Pulse Power, Junction-to-Ambient



Safe Operating Area, Junction-to-Ambient

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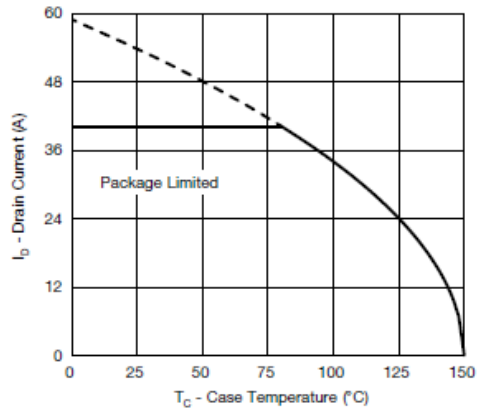

Current Derating [a]

※ Typical Characteristics

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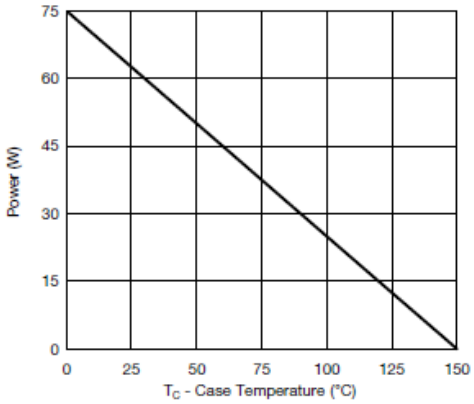
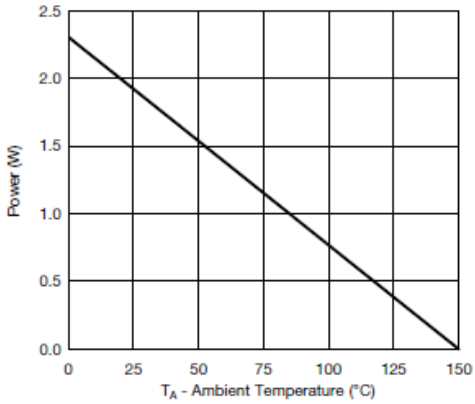
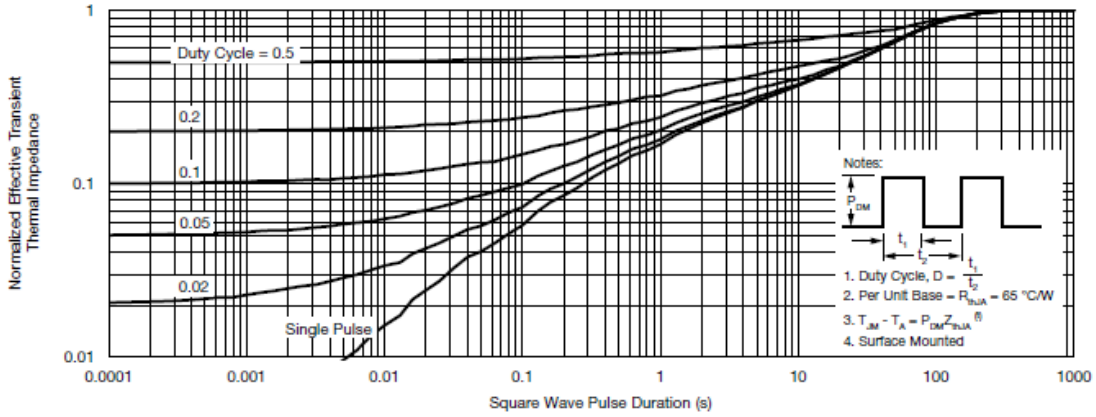


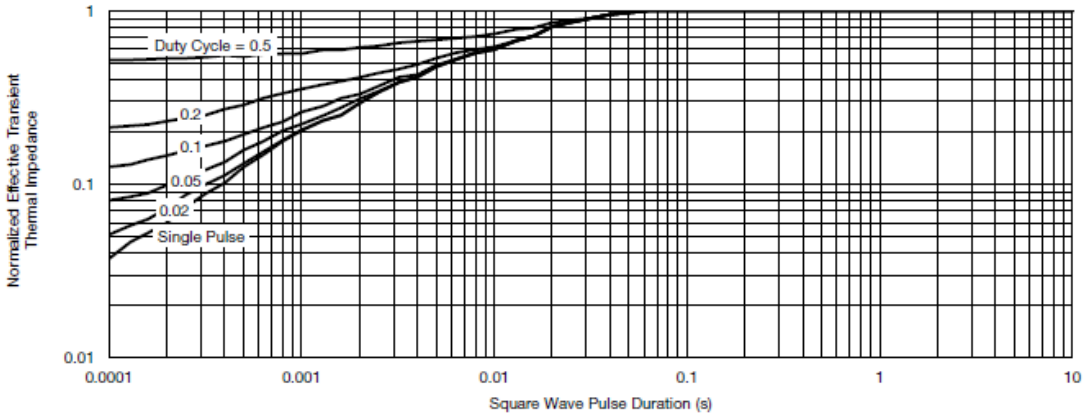
Power, Junction-to-Case



Power, Junction-to-Ambient



Normalized Thermal Transient Impedance, Junction-to-Ambient



Normalized Thermal Transient Impedance, Junction-to-Case

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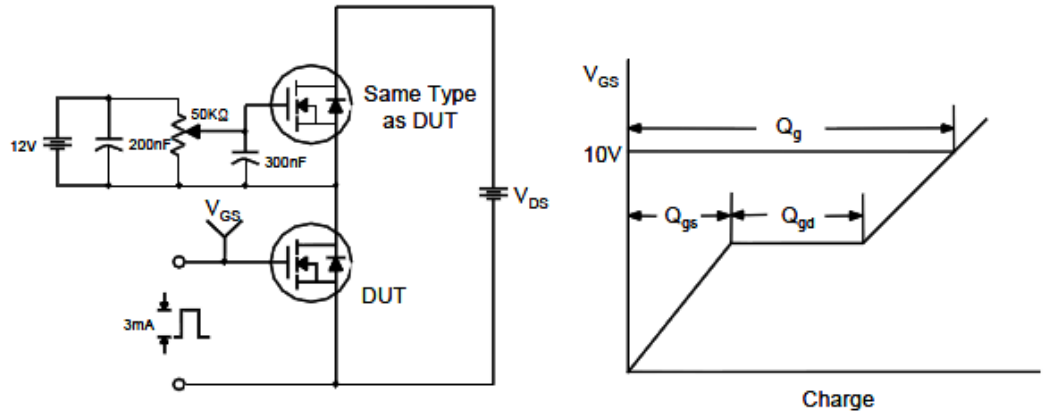
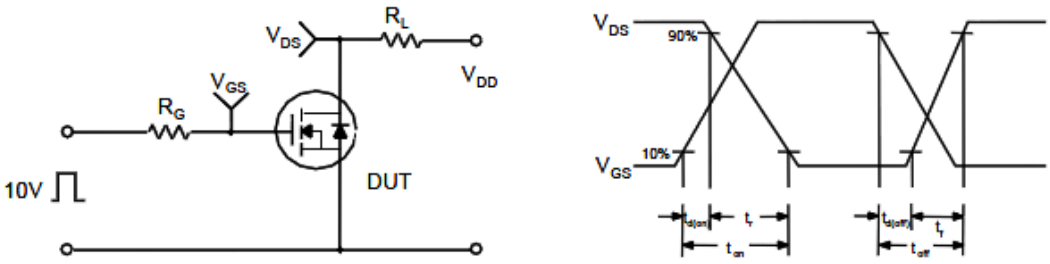
Typical Characteristics

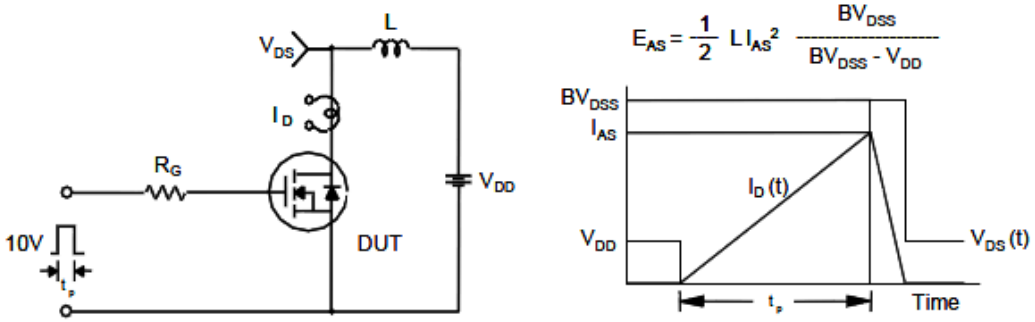
Gate Charge Test Circuit & Waveform



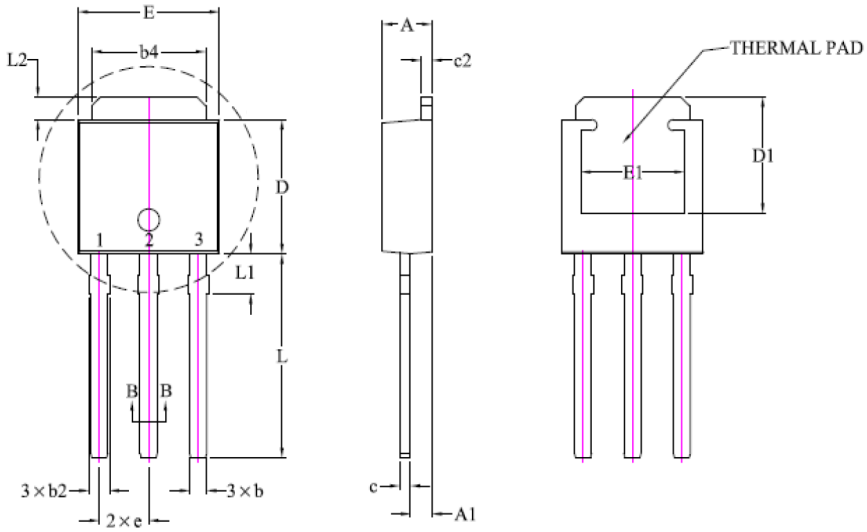
Resistive Switching Test Circuit & Waveforms



Unclamped Inductive Switching Test Circuit & Waveforms



Package Information (TO-251-3L)



Symbol	Millimeters		Inches	
	Min	Max	Min	Max
A	2.220	2.420	0.087	0.095
A1	0.890	1.140	0.035	0.045
b	0.550	0.670	0.022	0.026
b1	0.550	0.650	0.022	0.025
b2	0.760	0.960	0.030	0.038
b4	5.200	5.400	0.205	0.213
c	0.460	0.570	0.018	0.023
c1	0.450	0.550	0.018	0.022
c2	0.450	0.550	0.018	0.022
D	5.950	6.250	0.234	0.246
D1	4.200	4.500	0.165	0.177
E	6.400	6.700	0.252	0.264
E1	4.750	4.850	0.187	0.191
e	2.28 REF		0.090 REF	
L	8.900	9.500	0.350	0.374
L1	1.900	2.290	0.075	0.090
L2	0.900	1.000	0.035	0.039

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