



## General Description

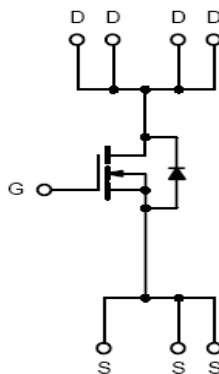
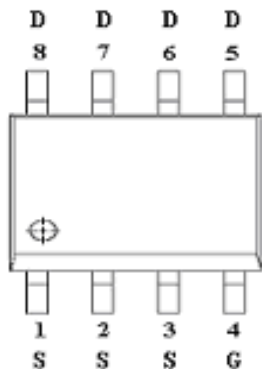
AFN4064S, N-Channel enhancement mode MOSFET, uses Advanced Trench Technology to provide excellent  $R_{DS(ON)}$ , low gate charge.

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

- $I_D=20A, R_{DS(ON)}=4.5m\Omega@V_{GS}=10V$
- $I_D=10A, R_{DS(ON)}=5.8m\Omega@V_{GS}=4.5V$
- Super high density cell design for extremely low  $R_{DS(ON)}$
- SOP-8P package design

## Pin Description ( SOP-8P )



## Application

- DC/DC Primary Side Switch
- Industrial
- Synchronous Rectification
- Load Switch
- DC/DC Converters
- DC/AC Inverters

## 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
AFN4064SS8RG	4064S	SOP-8P	Tape & Reel	2500 EA

※ A Lot code

※ B Date code

※ AFN4064SS8RG : 13" Tape & Reel ; Pb- Free ; Halogen -Free



### ※ Absolute Maximum Ratings

※ (T<sub>A</sub>=25°C Unless otherwise noted)

Parameter	Symbol	Typical	Unit
Drain-Source Voltage	V <sub>DSS</sub>	60	V
Gate -Source Voltage	V <sub>GSS</sub>	±20	V
Continuous Drain Current (T <sub>J</sub> =150°C)	I <sub>DSM</sub>	T <sub>C</sub> =25°C	32
		T <sub>C</sub> =70°C	26
Pulsed Drain Current ( t=100us)	I <sub>DM</sub>	T <sub>A</sub> =25°C	20
		T <sub>A</sub> =70°C	18
Continuous Source Current (Diode Conduction)	I <sub>S</sub>	7	A
Single Pulse Avalanche Current	I <sub>AS</sub>	T <sub>C</sub> =25°C	25
		T <sub>A</sub> =25°C	3.1
Power Dissipation	P <sub>D</sub>	L=0.1mH	30
		E <sub>AS</sub>	30
Operating Junction Temperature	T <sub>J</sub>	T <sub>C</sub> =25°C	7.8
		T <sub>C</sub> =75°C	5
Storage Temperature Range	T <sub>STG</sub>	T <sub>A</sub> =25°C	3.5
		T <sub>A</sub> =75°C	2.2
Operating Junction Temperature	T <sub>J</sub>	150	°C
Storage Temperature Range	T <sub>STG</sub>	-55/150	°C
Thermal Resistance-Junction to Ambient	R <sub>θJA</sub>	35	°C/W
Maximum Junction-to-Case (Drain)	R <sub>θJA</sub>	16	

※

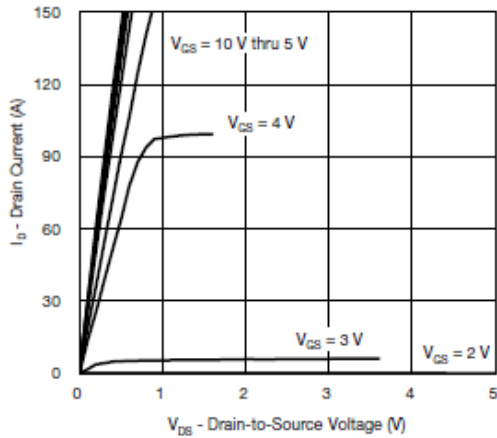
### ※ Electrical Characteristics

※ (T<sub>A</sub>=25°C Unless otherwise noted)

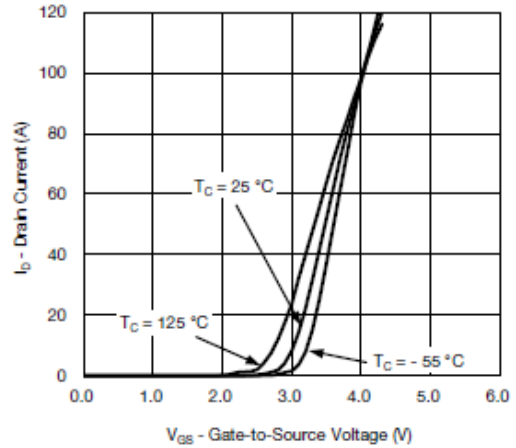
Parameter	Symbol	Conditions	Min.	Typ	Max.	Unit
<b>Static</b>						
Drain-Source Breakdown Voltage	V <sub>(BR)DSS</sub>	V <sub>GS</sub> =0V, I <sub>D</sub> =250uA	60			V
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250uA	1.0		2.5	
Gate Leakage Current	I <sub>GSS</sub>	V <sub>DS</sub> =0V, V <sub>GS</sub> =±20V			±100	nA
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> =48V, V <sub>GS</sub> =0V			1	uA
		V <sub>DS</sub> =48V, V <sub>GS</sub> =0V T <sub>J</sub> =85°C			10	
On-State Drain Current	I <sub>D(on)</sub>	V <sub>DS</sub> ≥ 5V, V <sub>GS</sub> =10V	30			A
Drain-Source On-Resistance	R <sub>DS(on)</sub>	V <sub>GS</sub> =10V, I <sub>D</sub> =20A		3.8	4.5	mΩ
		V <sub>GS</sub> =4.5V, I <sub>D</sub> =10A		5.0	5.8	
Forward Transconductance	g <sub>FS</sub>	V <sub>DS</sub> =15V, I <sub>D</sub> =10A		75		S
Diode Forward Voltage	V <sub>SD</sub>	I <sub>S</sub> =5A, V <sub>GS</sub> =0V		0.75	1.2	V
<b>Dynamic</b>						
Total Gate Charge	Q <sub>g</sub>	V <sub>DS</sub> =30V, V <sub>GS</sub> =4.5V I <sub>D</sub> ≧10A		56	70	nC
Gate-Source Charge	Q <sub>gs</sub>			16	32	
Gate-Drain Charge	Q <sub>gd</sub>			4		
Gate Resistance	R <sub>g</sub>	f=1MHz	0.5	2.0	3.0	Ω
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> =30V, V <sub>GS</sub> =0V f=1MHz		3458		pF
Output Capacitance	C <sub>oss</sub>			1255		
Reverse Transfer Capacitance	C <sub>rss</sub>			22		
Turn-On Time	t <sub>d(on)</sub>	V <sub>DD</sub> =30V, R <sub>L</sub> =3.0Ω I <sub>D</sub> ≧10A, V <sub>GEN</sub> =10V R <sub>G</sub> =1Ω		15	30	ns
	t <sub>r</sub>			8	16	
Turn-Off Time	t <sub>d(off)</sub>			30	60	
	t <sub>f</sub>			8	16	



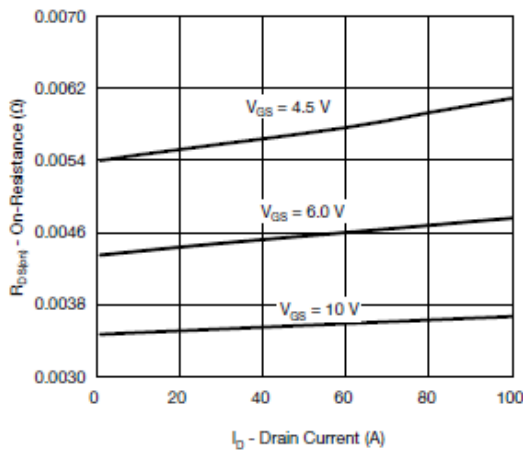
## Typical Characteristics



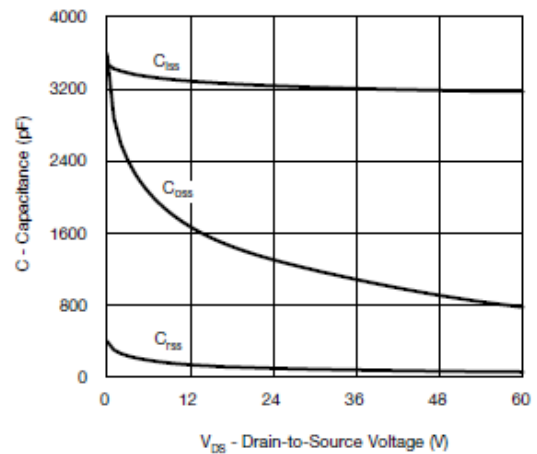
Output Characteristics



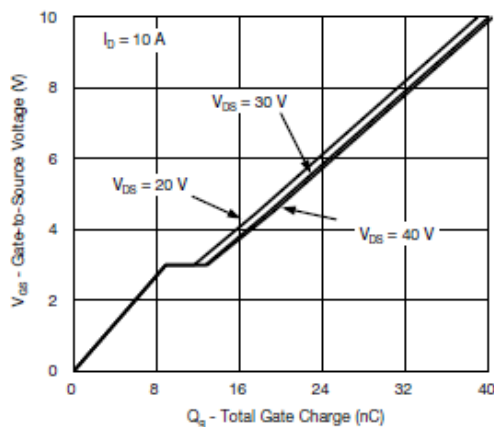
Transfer Characteristics



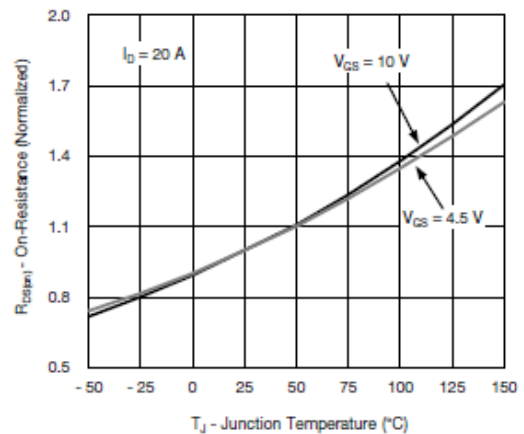
On-Resistance vs. Drain Current



Capacitance



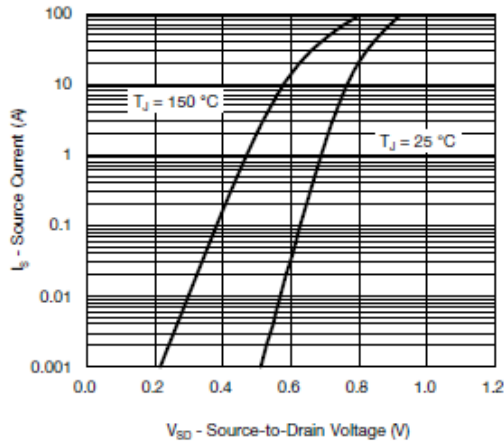
Gate Charge



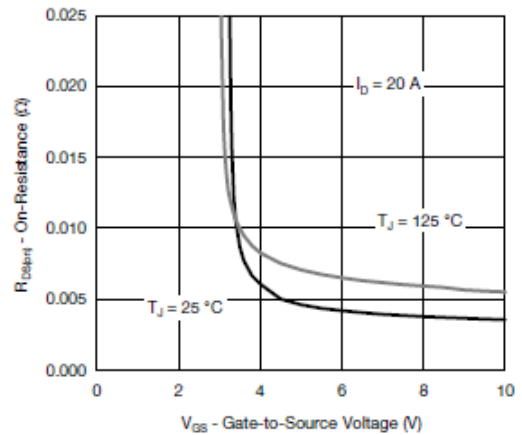
On-Resistance vs. Junction Temperature



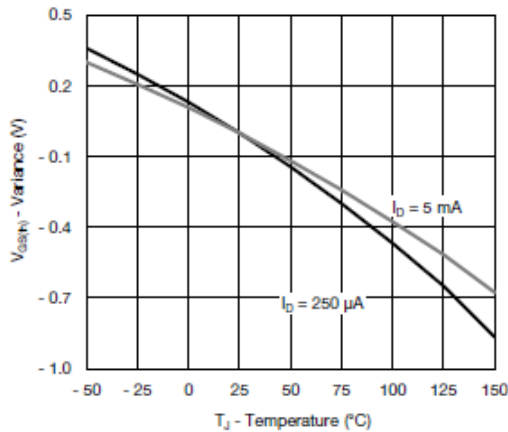
## Typical Characteristics



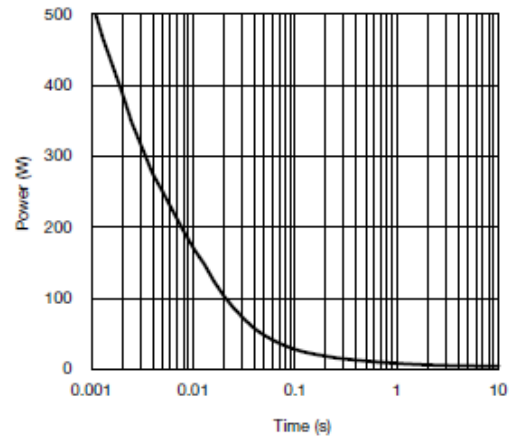
Source-Drain Diode Forward Voltage



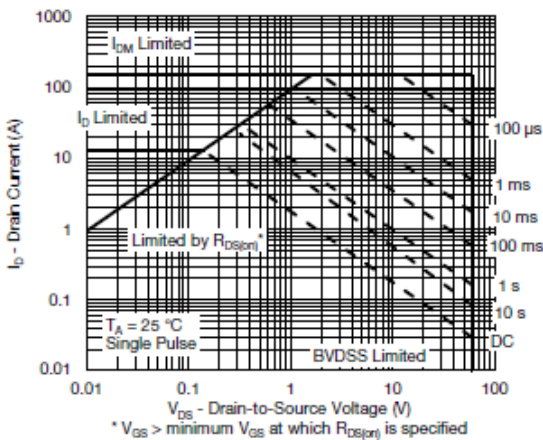
On-Resistance vs. Gate-to-Source Voltage



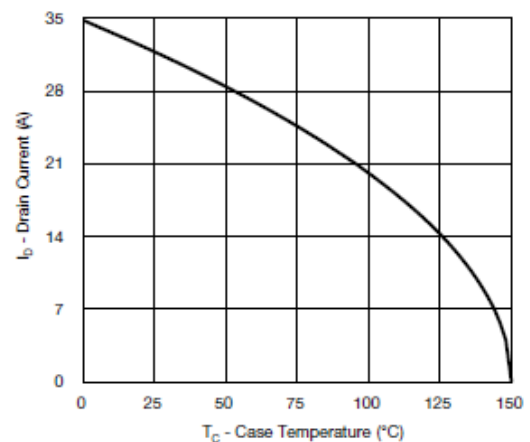
Threshold Voltage



Single Pulse Power, Junction-to-Ambient



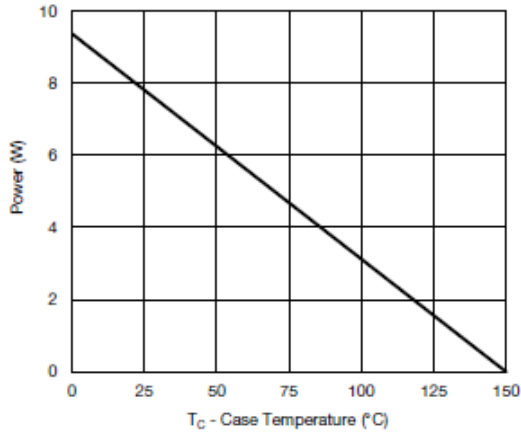
Safe Operating Area, Junction-to-Ambient



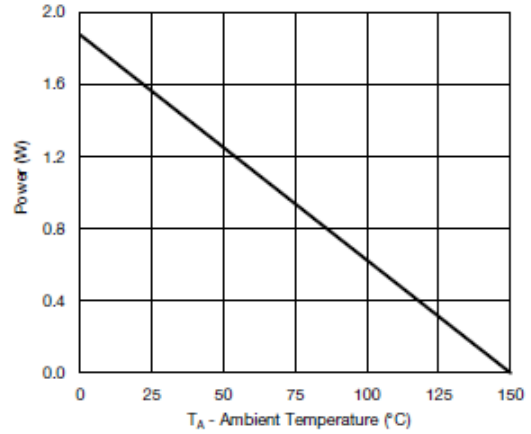
Current Derating\*



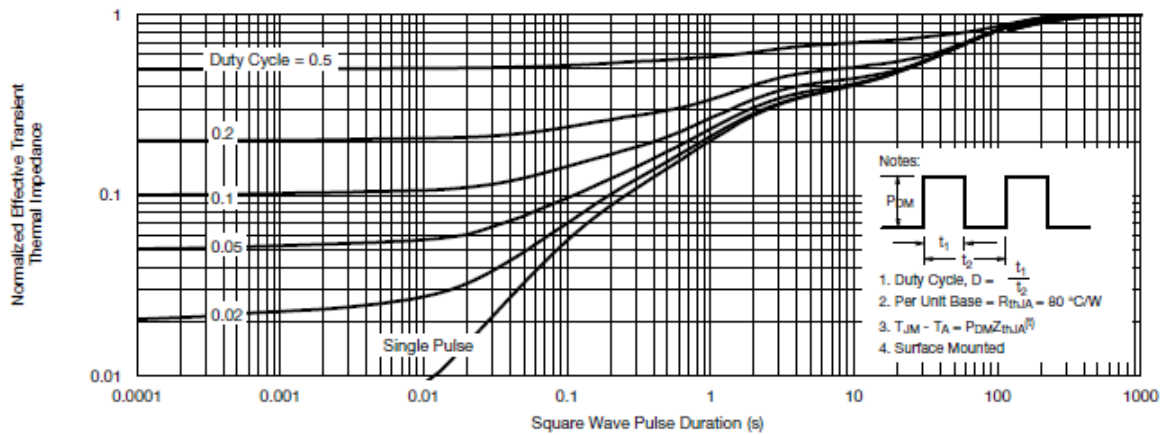
## Typical Characteristics



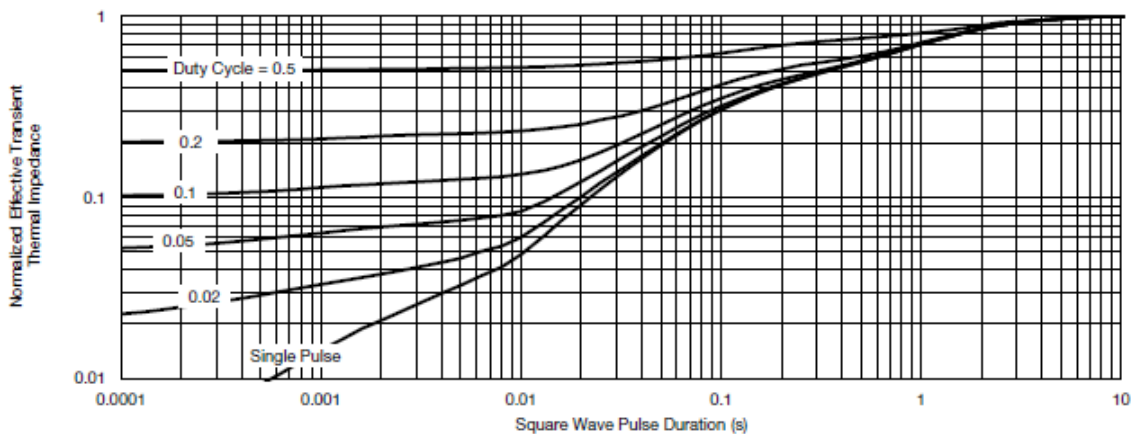
Power, Junction-to-Foot



Power, Junction-to-Ambient



Normalized Thermal Transient Impedance, Junction-to-Ambient



Normalized Thermal Transient Impedance, Junction-to-Foot



**Typical Characteristics**

Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveforms

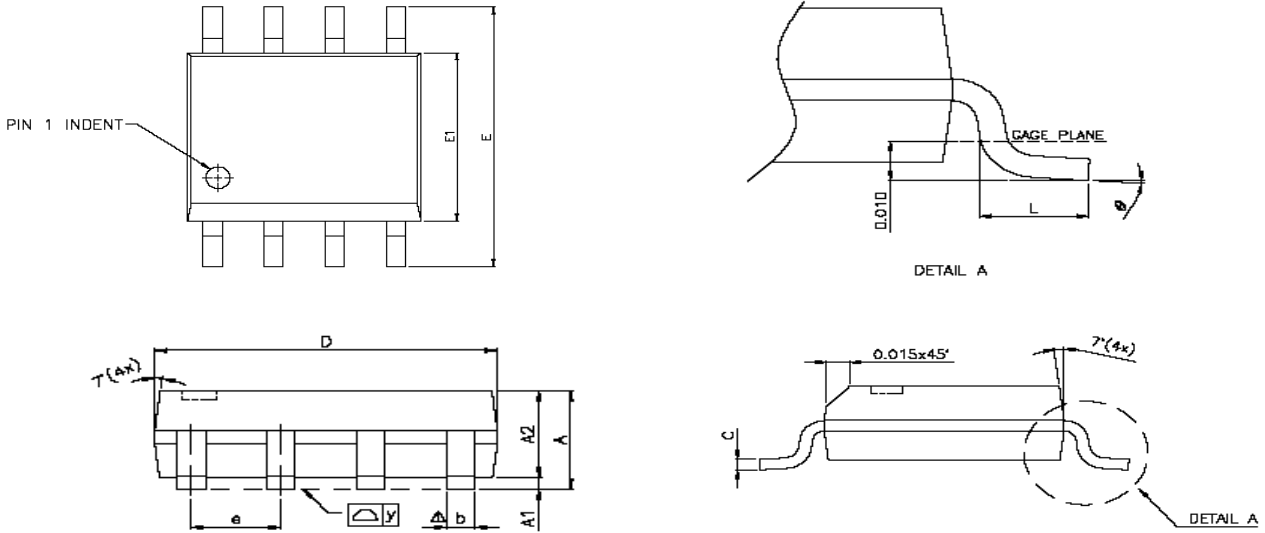


Unclamped Inductive Switching Test Circuit & Waveforms





**Package Information ( SOP-8P )**



SYMBOLS	DIMENSIONS IN MILLIMETERS			DIMENSIONS IN INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
A	1.47	1.60	1.73	0.058	0.063	0.068
A1	0.10	—	0.25	0.004	—	0.010
A2	—	1.45	—	—	0.057	—
b	0.33	0.41	0.51	0.013	0.016	0.020
C	0.19	0.20	0.25	0.0075	0.008	0.0098
D	4.80	4.85	4.95	0.189	0.191	0.195
E	5.80	6.00	6.20	0.228	0.236	0.244
E1	3.80	3.90	4.00	0.150	0.154	0.157
e	—	1.27	—	—	0.050	—
L	0.38	0.71	1.27	0.015	0.028	0.050
$\Delta$ y	—	—	0.076	—	—	0.003
$\phi$	0°	—	8°	0°	—	8°

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