



## General Description

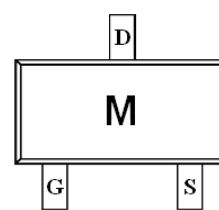
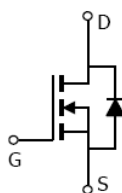
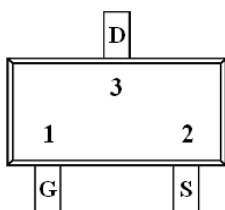
AFN1032, N-Channel enhancement mode MOSFET, uses Advanced Trench Technology to provide excellent  $R_{DS(ON)}$ , low gate charge.

These devices are particularly suited for low voltage power management, such as smart phone and notebook computer, and low in-line power loss are needed in commercial industrial surface mount applications.

## Features

- 30V/0.6A,  $R_{DS(ON)}=440m\Omega@V_{GS}=4.5V$
- 30V/0.5A,  $R_{DS(ON)}=500m\Omega@V_{GS}=2.5V$
- 30V/0.4A,  $R_{DS(ON)}=750m\Omega@V_{GS}=1.8V$
- Low Offset (Error) Voltage
- Low-Voltage Operation
- High-Speed Circuits
- Low Battery Voltage Operation
- SOT-523 package design

## Pin Description ( SOT-523 )



## Application

- Drivers: Relays, Solenoids, Lamps, Hammers, Displays, Memories
- Battery Operated Systems
- Power Supply Converter Circuits
- Load/Power Switching Smart Phones, Pagers

## Pin Define

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

## Ordering Information

Part Ordering No.	Part Marking	Package	Unit	Quantity
AFN1032S52RG	M	SOT-523	Tape & Reel	3000 EA

※ AFN1032S52RG : 7" 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>	30	V
Gate –Source Voltage	V <sub>GSS</sub>	±12	V
Continuous Drain Current(T <sub>J</sub> =150°C)	I <sub>D</sub>	T <sub>A</sub> =25°C	0.7
		T <sub>A</sub> =70°C	0.4
Pulsed Drain Current	I <sub>DM</sub>	1.0	A
Continuous Source Current(Diode Conduction)	I <sub>S</sub>	0.3	A
Power Dissipation	P <sub>D</sub>	T <sub>A</sub> =25°C	0.27
		T <sub>A</sub> =70°C	0.16
Operating Junction Temperature	T <sub>J</sub>	-55/150	°C
Storage Temperature Range	T <sub>STG</sub>	-55/150	°C

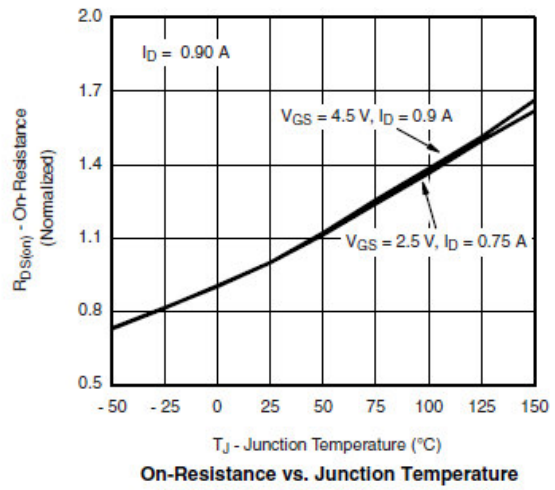
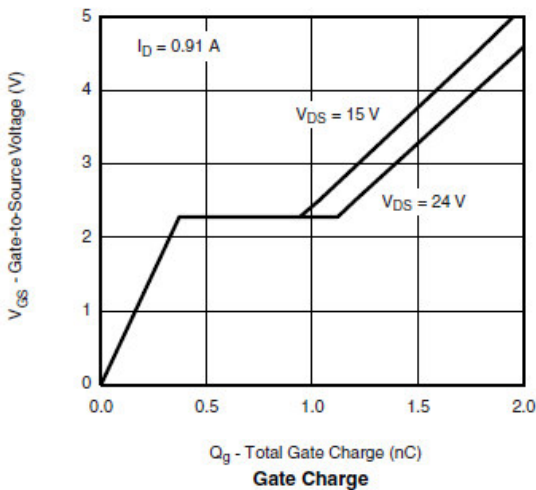
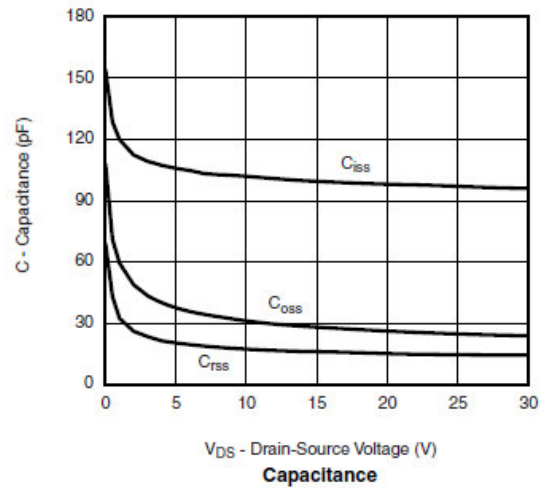
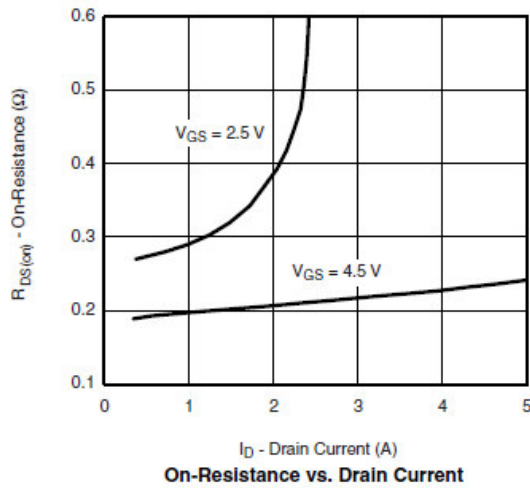
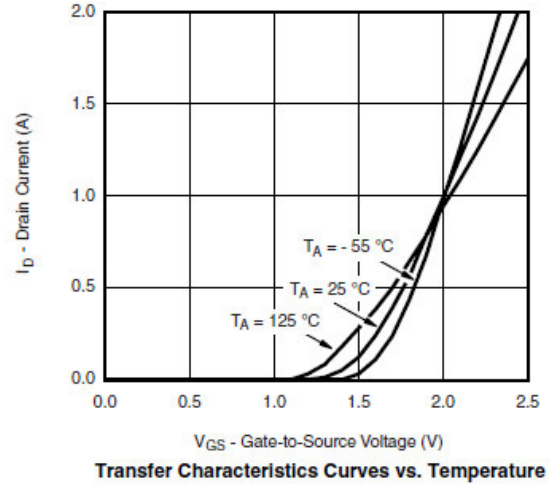
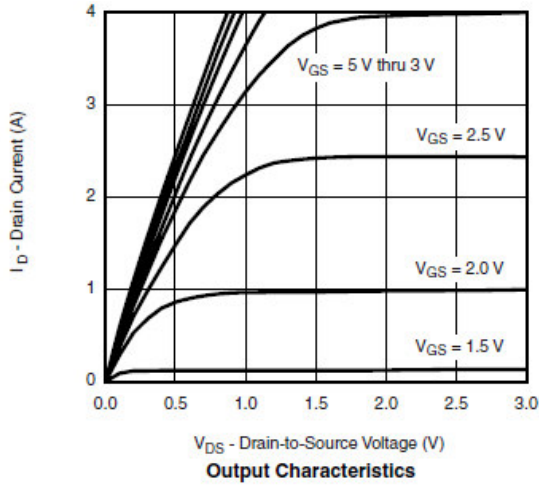
## Electrical Characteristics

(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	30			V
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250uA	0.5		1.0	
Gate Leakage Current	I <sub>GSS</sub>	V <sub>DS</sub> =0V, V <sub>GS</sub> =±12V			±100	nA
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> =24V, V <sub>GS</sub> =0V			1	uA
		V <sub>DS</sub> =24V, V <sub>GS</sub> =0V T <sub>J</sub> =85°C			5	
On-State Drain Current	I <sub>D(on)</sub>	V <sub>DS</sub> ≥ 5V, V <sub>GS</sub> =4.5V	0.7			A
Drain-Source On-Resistance	R <sub>DS(on)</sub>	V <sub>GS</sub> =4.5V, I <sub>D</sub> =0.6A		350	440	mΩ
		V <sub>GS</sub> =2.5V, I <sub>D</sub> =0.5A		430	500	
		V <sub>GS</sub> =1.8V, I <sub>D</sub> =0.4A		680	750	
Forward Transconductance	g <sub>FS</sub>	V <sub>DS</sub> =10V, I <sub>D</sub> =0.4A		1		S
Diode Forward Voltage	V <sub>SD</sub>	I <sub>S</sub> =0.15A, V <sub>GS</sub> =0V		0.6	1.2	V
<b>Dynamic</b>						
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> =15V, V <sub>GS</sub> =0V f=1MHz		85		pF
Output Capacitance	C <sub>oss</sub>			25		
Reverse Transfer Capacitance	C <sub>rss</sub>			15		
Total Gate Charge	Q <sub>g</sub>	V <sub>DS</sub> =15V, V <sub>GS</sub> =4.5V I <sub>D</sub> ≅0.6A		1.4	1.8	nC
Gate-Source Charge	Q <sub>gs</sub>			0.3		
Gate-Drain Charge	Q <sub>gd</sub>			0.6		
Turn-On Time	t <sub>d(on)</sub>	V <sub>DD</sub> =15V, R <sub>L</sub> =20Ω I <sub>D</sub> ≅0.5A, V <sub>GEN</sub> =4.5V R <sub>G</sub> =1Ω		15	25	ns
	t <sub>r</sub>			25	45	
Turn-Off Time	t <sub>d(off)</sub>			15	25	
	t <sub>f</sub>			10	20	

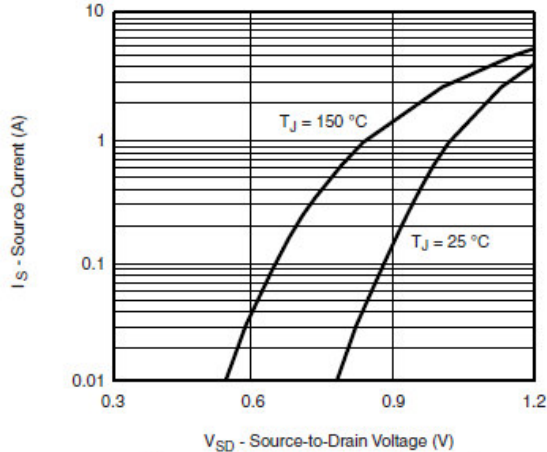


## Typical Characteristics

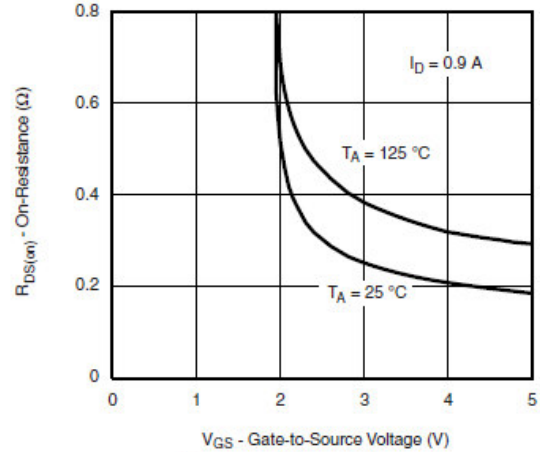




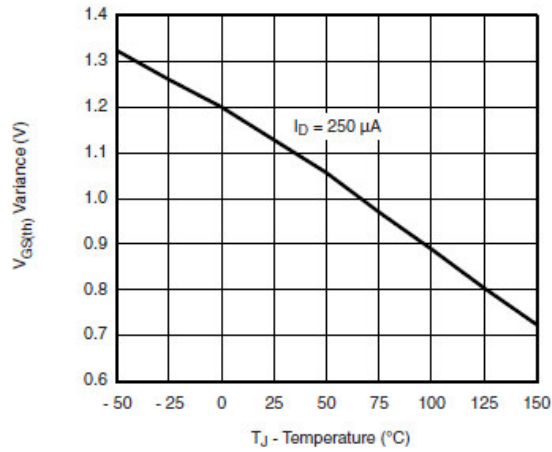
## Typical Characteristics



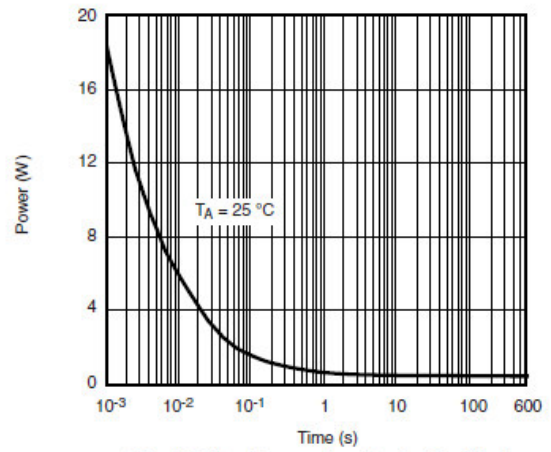
Forward Diode Voltage vs. Temperature



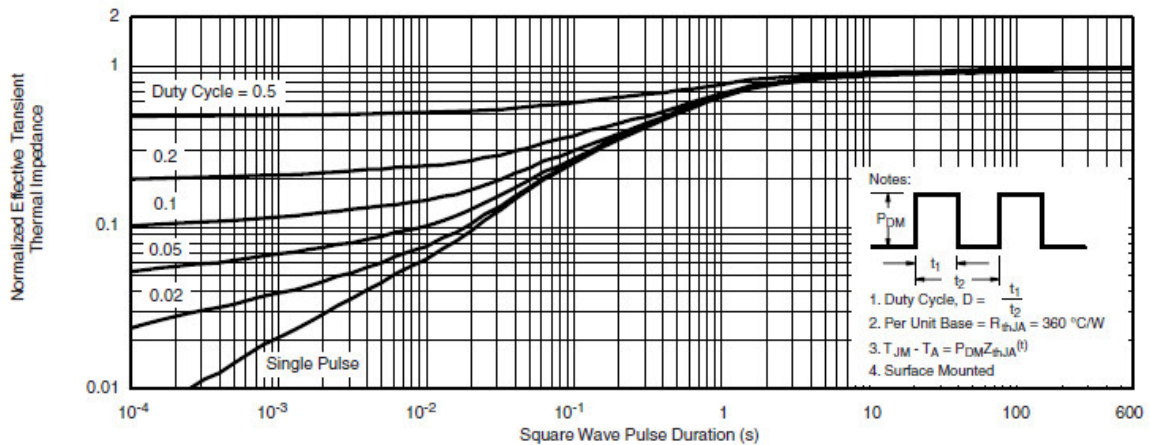
$R_{DS(on)}$  vs.  $V_{GS}$  vs. Temperature



Threshold Voltage



Single Pulse Power, Junction-to-Ambient



Normalized Thermal Transient Impedance, Junction-to-Ambient



**Typical Characteristics**

Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveforms

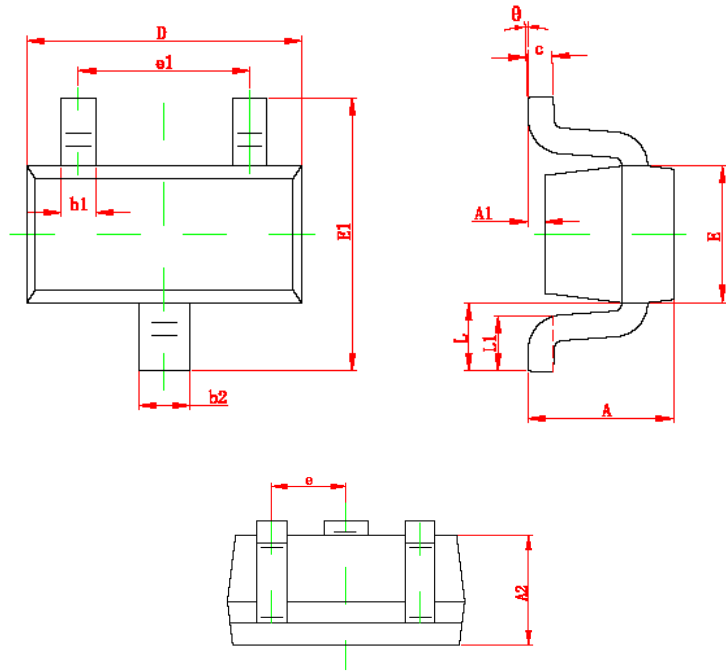


Unclamped Inductive Switching Test Circuit & Waveforms





**Package Information ( SOT-523 )**



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	0.700	0.900	0.028	0.035
A1	0.000	0.100	0.000	0.004
A2	0.700	0.800	0.028	0.031
b1	0.150	0.250	0.006	0.010
b2	0.250	0.325	0.010	0.013
c	0.100	0.200	0.004	0.008
D	1.500	1.700	0.059	0.067
E	0.750	0.850	0.030	0.033
E1	1.450	1.750	0.057	0.069
e	0.500 TYP		0.020 TYP	
e1	0.900	1.100	0.035	0.043
L	0.550 REF		0.022 REF	
L1	0.280	0.440	0.011	0.017
theta	0°	4°	0°	4°

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