



## General Description

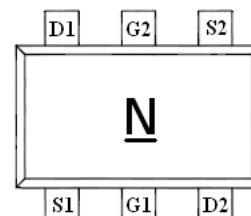
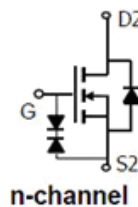
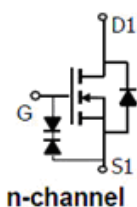
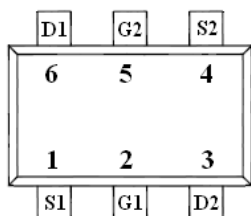
AFN1034E, N-Channel enhancement mode MOSFET, uses Advanced Trench Technology to provide excellent  $R_{DS(ON)}$ , low gate charge.

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,  $R_{DS(ON)}=450m\Omega@V_{GS}=4.5V$
- 30V/0.5A,  $R_{DS(ON)}=600m\Omega@V_{GS}=2.5V$
- Low Offset (Error) Voltage
- Low-Voltage Operation
- High-Speed Circuits
- Low Battery Voltage Operation
- ESD Protected
- SOT-563 package design

## Pin Description ( SOT-563 )



## 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	S1	Source 1
2	G1	Gate 1
3	D2	Drain 2
4	S2	Source 2
5	G2	Gate 2
6	D1	Drain1

## Ordering Information

Part Ordering No.	Part Marking	Package	Unit	Quantity
AFN1034ES56RG	N	SOT-563	Tape & Reel	3000 EA

※ AFN1034ES56RG : 7" Tape & Reel ; Pb- Free ; Halogen- Free



### Absolute Maximum Ratings

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

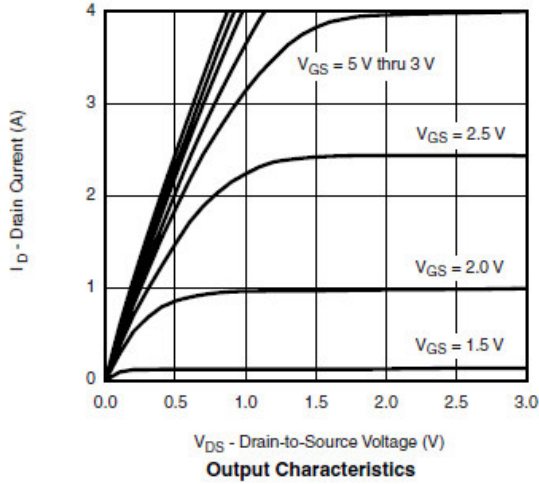
Parameter	Symbol	Typical	Unit
Drain-Source Voltage	V <sub>DSS</sub>	30	V
Gate –Source Voltage	V <sub>GSS</sub>	±12	V
Continuous Drain Current(T <sub>J</sub> =150°C)	I <sub>D</sub>	T <sub>A</sub> =25°C	0.7
		T <sub>A</sub> =70°C	0.4
Pulsed Drain Current	I <sub>DM</sub>	1.0	A
Continuous Source Current(Diode 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

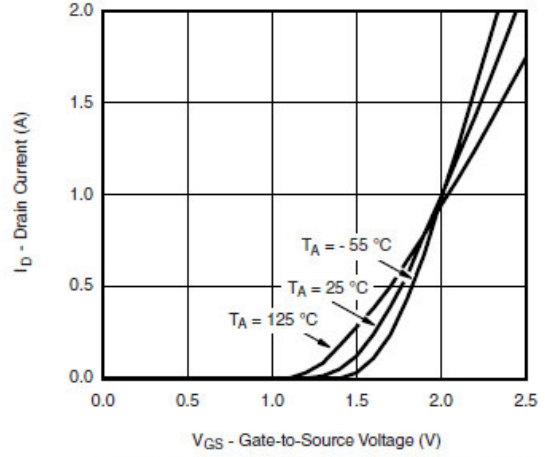
(T<sub>A</sub>=25°C Unless otherwise noted)

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		1.5	
Gate Leakage Current	I <sub>GSS</sub>	V <sub>DS</sub> =0V, V <sub>GS</sub> =±12V			±5	mA
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		400	450	mΩ
		V <sub>GS</sub> =2.5V, I <sub>D</sub> =0.5A		550	600	
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	

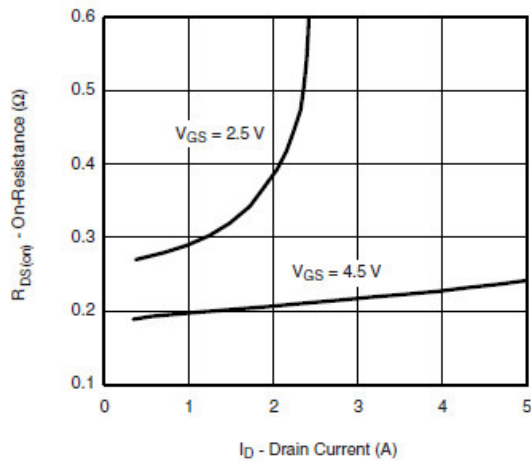
### Typical Characteristics



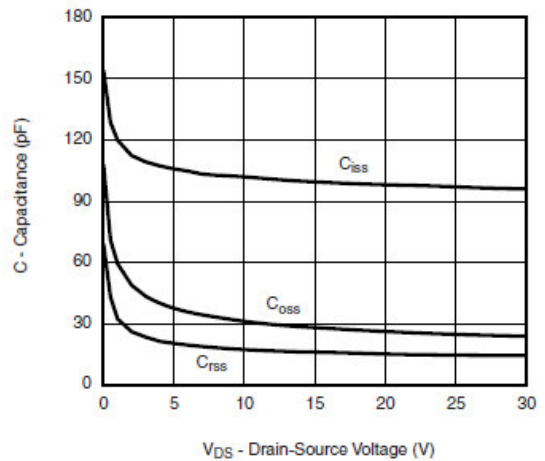
Output Characteristics



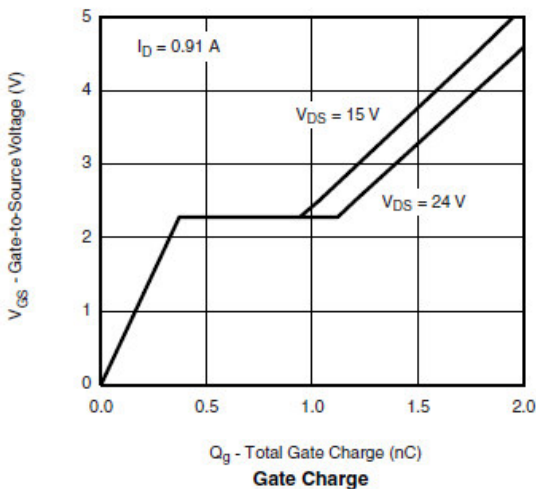
Transfer Characteristics Curves vs. Temperature



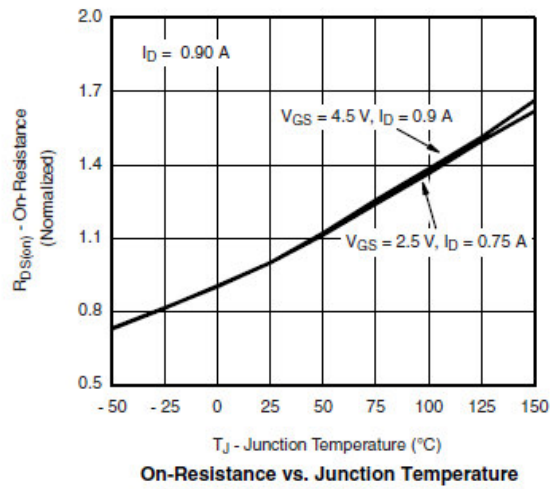
On-Resistance vs. Drain Current



Capacitance

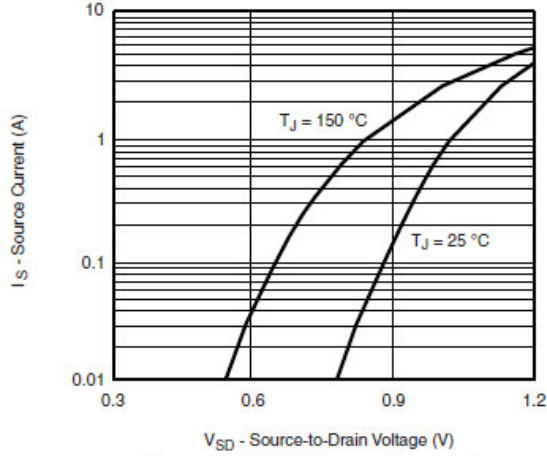


Gate Charge

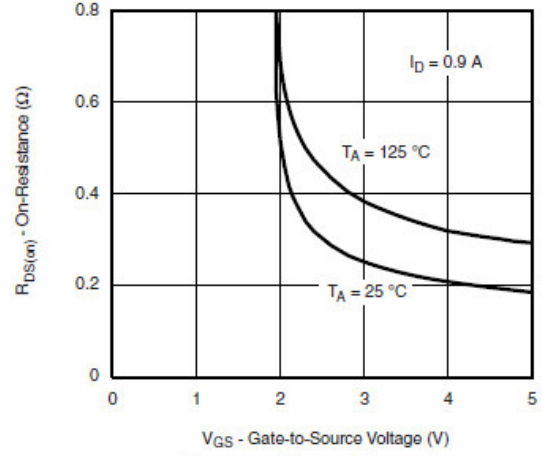


On-Resistance vs. Junction Temperature

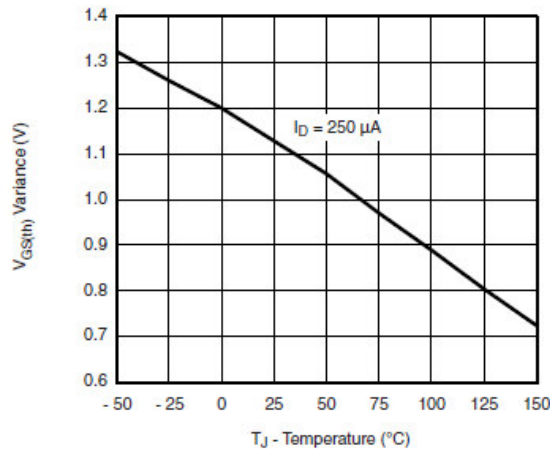
## Typical Characteristics



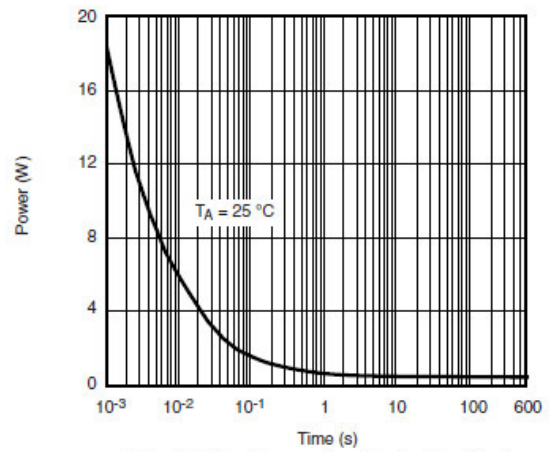
Forward Diode Voltage vs. Temperature



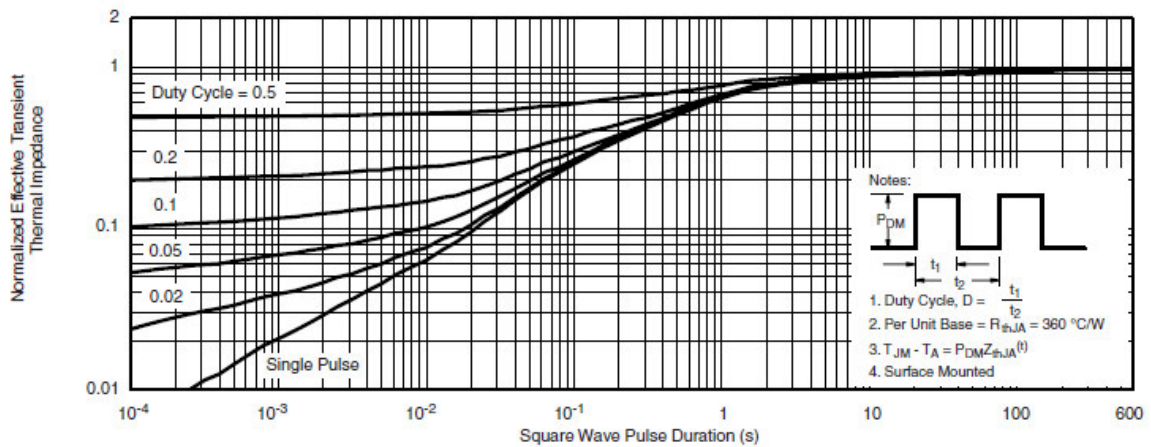
$R_{DS(on)}$  vs.  $V_{GS}$  vs. Temperature



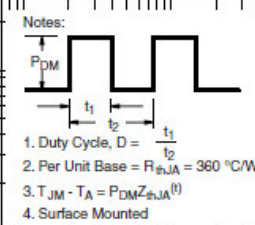
Threshold Voltage



Single Pulse Power, Junction-to-Ambient



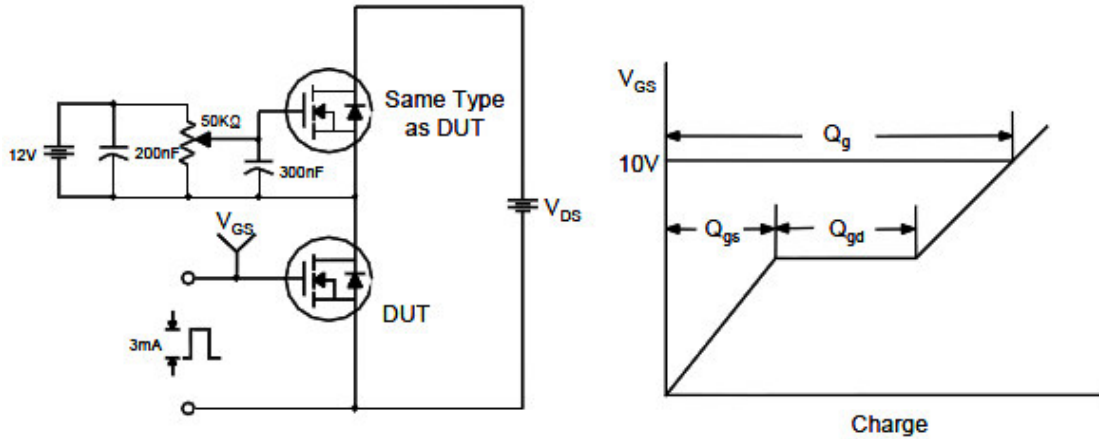
Normalized Thermal Transient Impedance, Junction-to-Ambient



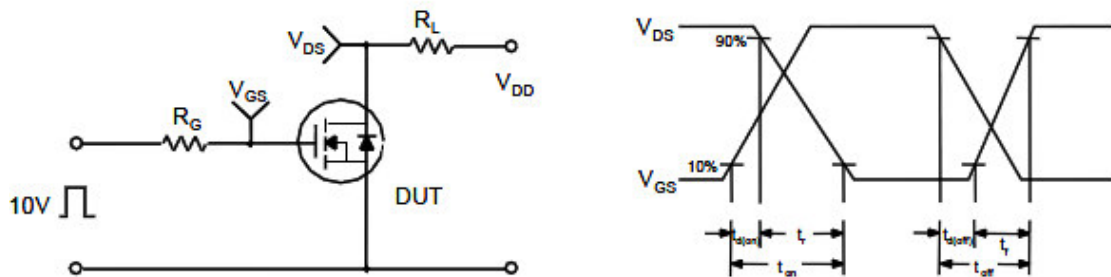
## Typical Characteristics



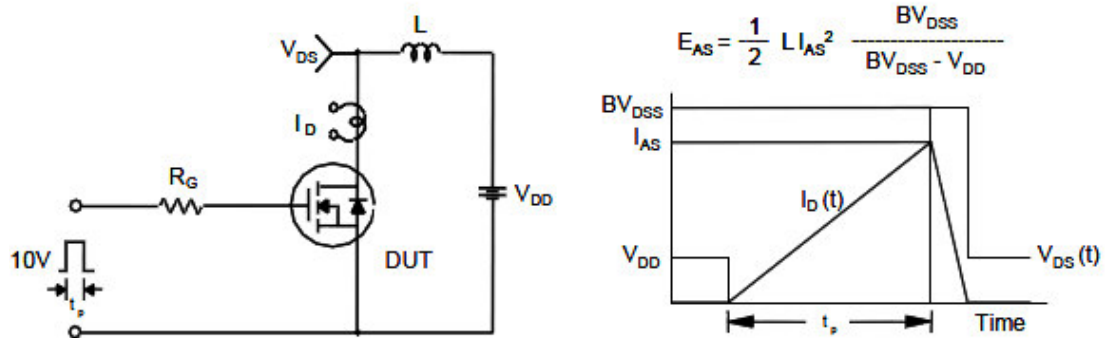
Gate Charge Test Circuit & Waveform



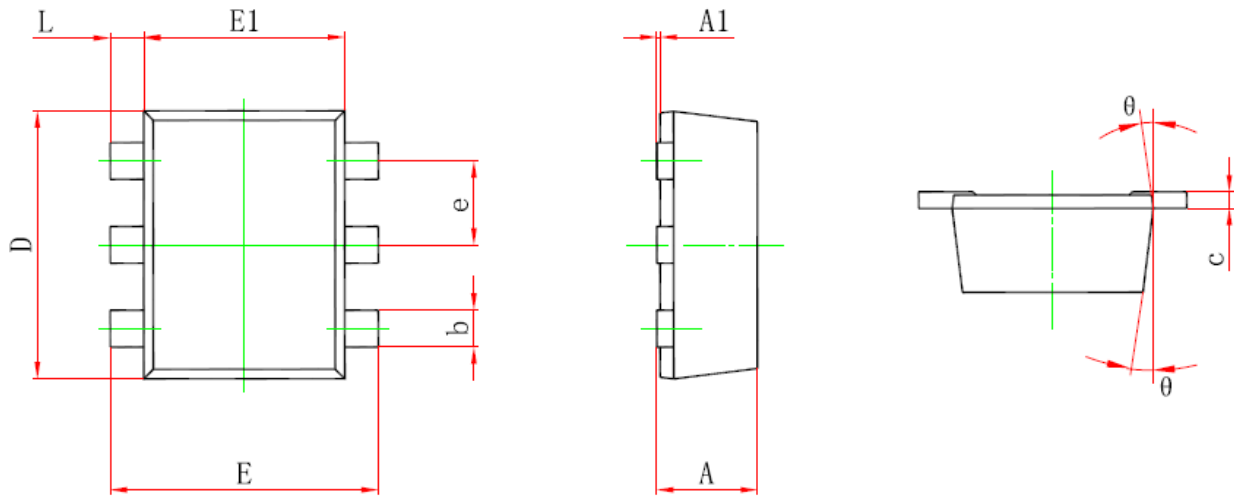
Resistive Switching Test Circuit & Waveforms



Unclamped Inductive Switching Test Circuit & Waveforms



**Package Information ( SOT-563 )**



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.525	0.600	0.021	0.024
A1	0.000	0.050	0.000	0.002
e	0.450	0.550	0.018	0.022
c	0.090	0.160	0.004	0.006
D	1.500	1.700	0.059	0.067
b	0.170	0.270	0.007	0.011
E1	1.100	1.300	0.043	0.051
E	1.500	1.700	0.059	0.067
L	0.100	0.300	0.004	0.012
θ	7° <sub>REF.</sub>		7° <sub>REF.</sub>	

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 2F, No.80, Sec.1, Cheng Kung Rd., Nan Kang Dist., Taipei City 115, Taiwan (R.O.C.)  
 Tel : 886 2) 2651 3928  
 Fax : 886 2) 2786 8483  
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