Alfa-MOS Technology

AFN1621E

60V N-Channel Enhancement Mode MOSFET

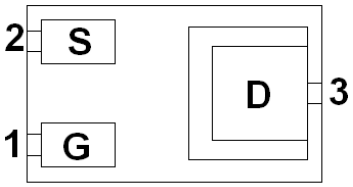
General Description

AFN1621E, 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.

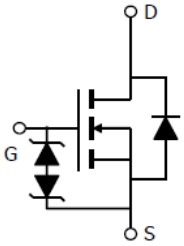
Features

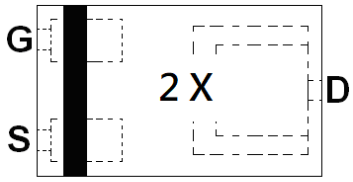
- 60V/0.5A , $R_{DS(ON)}$=1.8Ω@V_{GS}=10V
- 60V/0.05A , $R_{DS(ON)}$=2.0Ω@V_{GS}=4.5V
- Low Offset (Error) Voltage
- Low-Voltage Operation
- High-Speed Circuits
- Low Battery Voltage Operation
- ESD Protected
- DFN1.0X0.6-3L package design

Pin Description (DFN1.0X0.6-3L)



BOTTOM VIEW





TOP VIEW

Application

- 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
AFN1621EFN106RG	2X	DFN1.0X0.6-3L	Tape & Reel	10000 EA

※ 2 Product Code
※ X Monthly Code
(even year : A , B~ L)
(odd year : N, M~X)
※ AFN1621EFN106RG : 7" Tape & Reel ; Pb- Free ; Halogen –Free

Absolute Maximum Ratings

(T_A=25℃ Unless otherwise noted)

Parameter		Symbol	Value	Unit
Drain-Source Voltage		V_{DSS}	60	V
Gate –Source Voltage		V_{GSS}	±20	V
Continuous Drain Current(T_J=150℃)	T_A=25℃	I_D	0.5	A
	T_A=70℃		0.3	
Pulsed Drain Current		I_{DM}	1.5	A
Continuous Source Current(Diode Conduction)		I_S	0.3	A
Power Dissipation	T_A=25℃	P_D	0.27	W
	T_A=70℃		0.16	
Operating Junction Temperature		T_J	-55/150	℃
Storage Temperature Range		T_{STG}	-55/150	℃

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	60			V
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS},I_D=250uA	1.0		2.0	
Gate Leakage Current	I_{GSS}	V_{DS}=0V,V_{GS}=±20V			3	uA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=60V,V_{GS}=0V			1	uA
		V_{DS}=60V,V_{GS}=0V T_J=85℃			10	
Drain-Source On-Resistance	$R_{DS(on)}$	V_{GS}=10V,I_D=0.5A		1.2	1.8	Ω
		V_{GS}= 4.5V,I_D=0.05A		1.6	2.0	
Forward Transconductance	g_{FS}	V_{DS}=10V,I_D=0.2A		0.2		S
Diode Forward Voltage	V_{SD}	I_S=0.2A,V_{GS}=0V		0.75	1.4	V
Dynamic						
Total Gate Charge	Q_g	V_{DS}=10V,V_{GS}=4.5V I_D≡0.25A		500		pC
Gate-Source Charge	Q_{gs}			100		
Gate-Drain Charge	Q_{gd}			150		
Input Capacitance	C_{iss}	V_{DS}=25V,V_{GS}=0V f=1MHz		30		pF
Output Capacitance	C_{oss}			8		
Reverse Transfer Capacitance	C_{rss}			5		
Turn-On Time	$t_{d(on)}$	V_{DD}=30V,R_L=150Ω I_D≡0.2A,V_{GEN}=-4.5V R_G=10Ω		10	20	ns
	t_r			35	50	
Turn-Off Time	$t_{d(off)}$			20	30	
	t_f			40	60	

Typical Characteristics

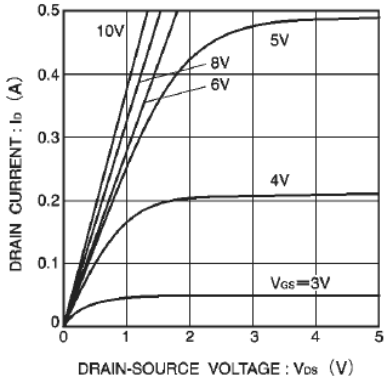


Fig.1 Typical output characteristics

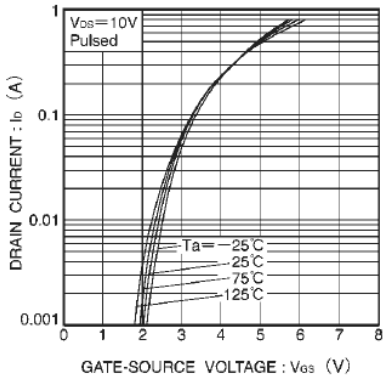


Fig.2 Typical transfer characteristics

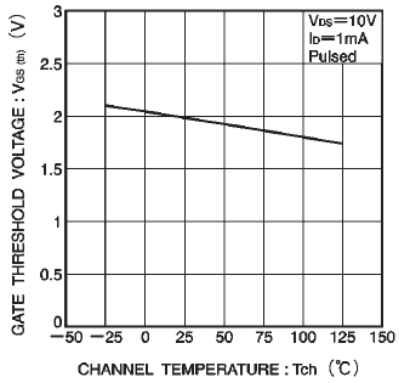


Fig.3 Gate threshold voltage vs. channel temperature

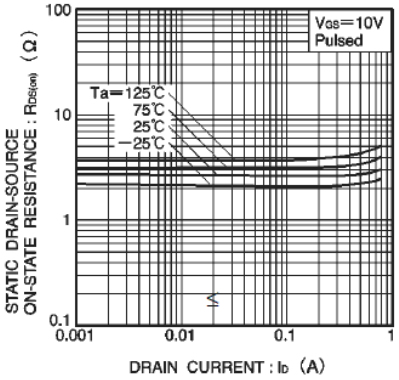


Fig.4 Static drain-source on-state resistance vs. drain current

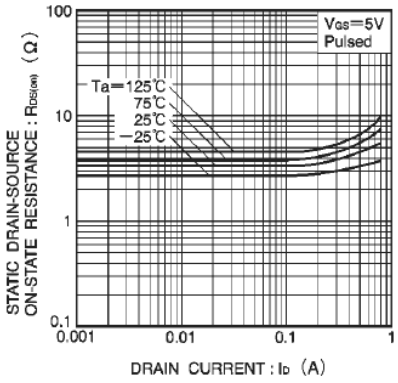


Fig.5 Static drain-source on-state resistance vs. drain current

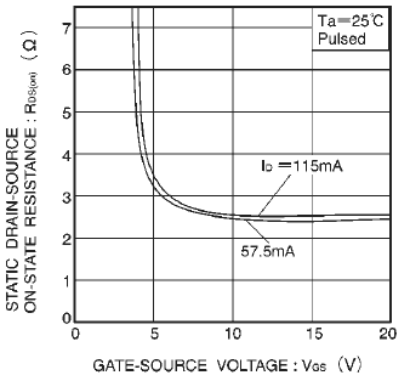


Fig.6 Static drain-source on-state resistance vs. gate-source voltage

Typical Characteristics

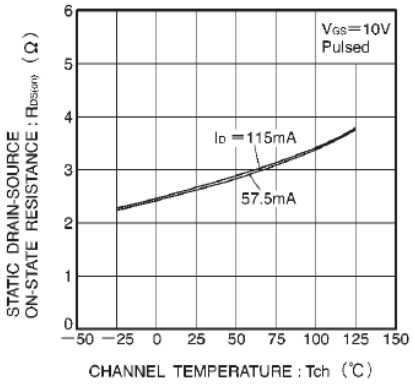


Fig.7 Static drain-source on-state resistance vs. channel temperature

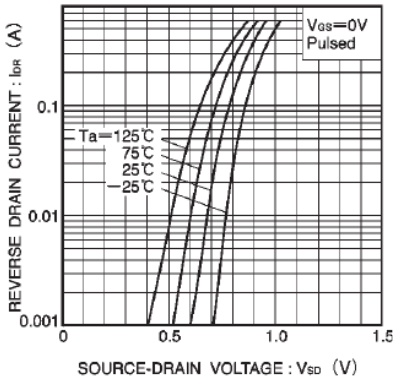


Fig.8 Reverse drain current vs. source-drain voltage

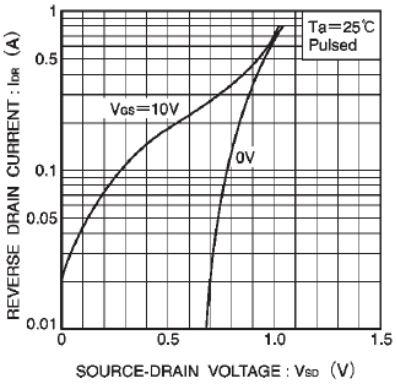


Fig.9 Reverse drain current vs. source-drain voltage

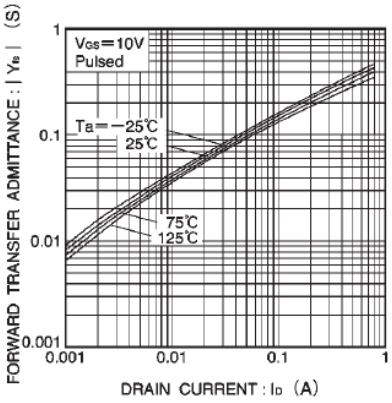


Fig.10 Forward transfer admittance vs. drain current

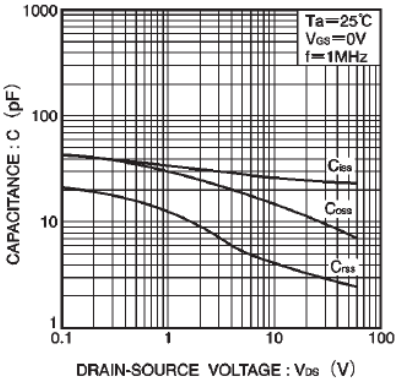


Fig.11 Typical capacitance vs. drain-source voltage

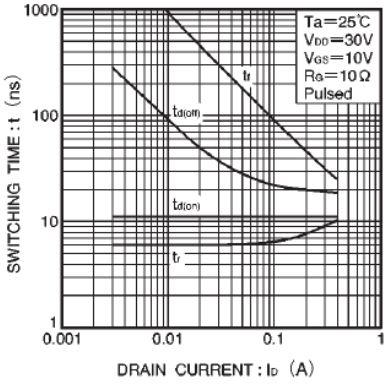
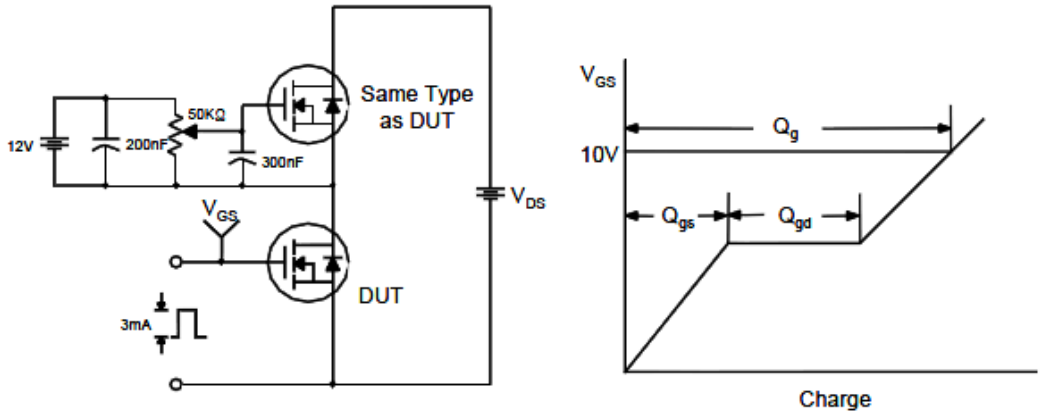


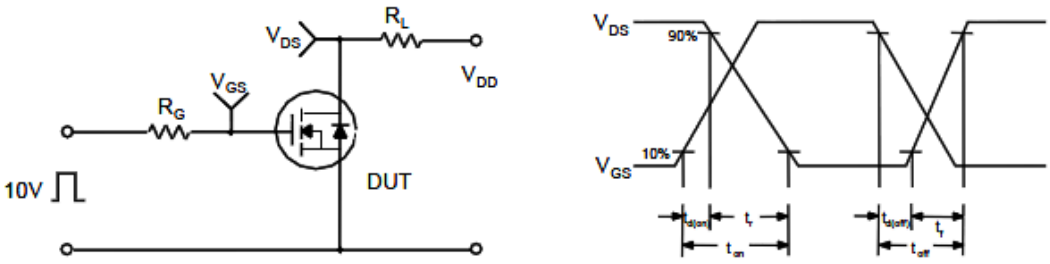
Fig. Switching characteristics

Typical Characteristics

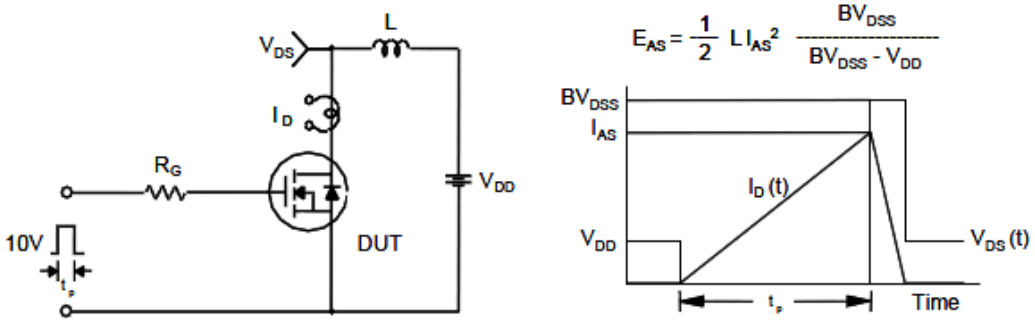
Gate Charge Test Circuit & Waveform



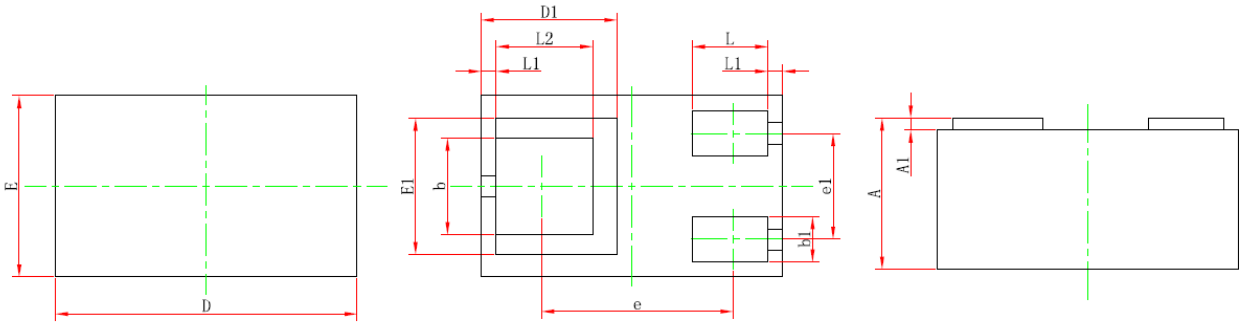
Resistive Switching Test Circuit & Waveforms



Unclamped Inductive Switching Test Circuit & Waveforms



Package Information (DFN1.0X0.6-3L)



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.450	0.550	0.018	0.022
A1	0.010	0.100	0.000	0.004
D	0.950	1.050	0.037	0.041
E	0.550	0.650	0.022	0.026
D1	0.450REF.		0.018REF.	
E1	0.450REF.		0.018REF.	
b	0.270	0.370	0.011	0.015
b1	0.100	0.200	0.004	0.008
e	0.635REF.		0.025REF.	
e1	0.300	0.400	0.012	0.016
L	0.200	0.300	0.008	0.012
L1	0.050REF.		0.002REF.	
L2	0.270	0.370	0.011	0.015

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