



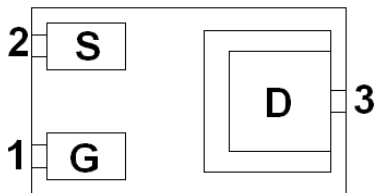
### General Description

AFP1601E, P-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.

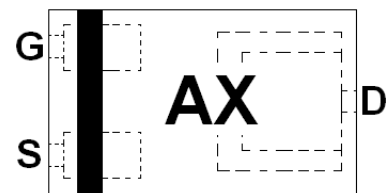
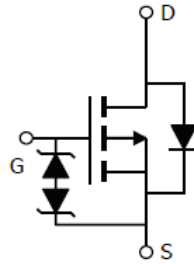
### Features

- $I_D = -0.4A$ ,  $R_{DS(ON)} = 580\text{ m}\Omega @ V_{GS} = -4.5V$
- $I_D = -0.3A$ ,  $R_{DS(ON)} = 680\text{ m}\Omega @ V_{GS} = -2.5V$
- $I_D = -0.1A$ ,  $R_{DS(ON)} = 950\text{ m}\Omega @ V_{GS} = -1.8V$
- Low Offset (Error) Voltage
- Low-Voltage Operation
- High-Speed Circuits
- ESD Protection Diode design-in
- Low Battery Voltage Operation
- DFN1.0X0.6-3L package design

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



BOTTOM VIEW



TOP VIEW

### Application

- Load/Power Switching Cell Phones, Pagers
- Battery Operated Systems
- Power Supply Converter Circuits

### Pin Define

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

### Ordering Information

Part Ordering No.	Part Marking	Package	Unit	Quantity
AFP1601EFN106RG	AX	DFN1.0X0.6-3L	Tape & Reel	10000 EA

※ A Product Code

※ X Monthly Code

( even year : A, B~ L )

( odd year : M, N~X )

※ AFP1601EFN106RG : 7" Tape & Reel ; Pb- Free ; Halogen -Free



### Absolute Maximum Ratings

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

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V <sub>DSS</sub>	-20	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

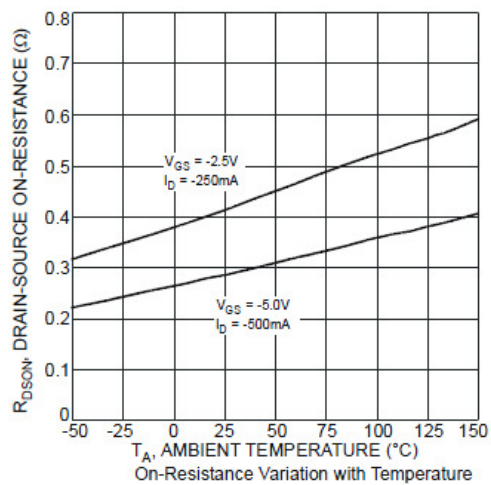
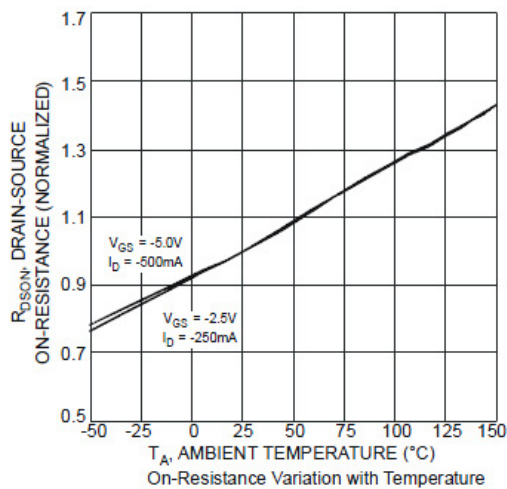
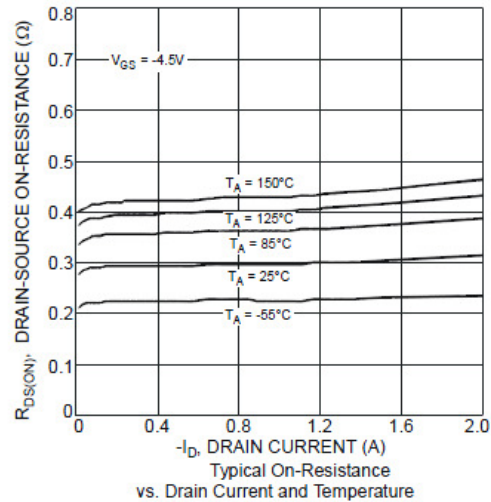
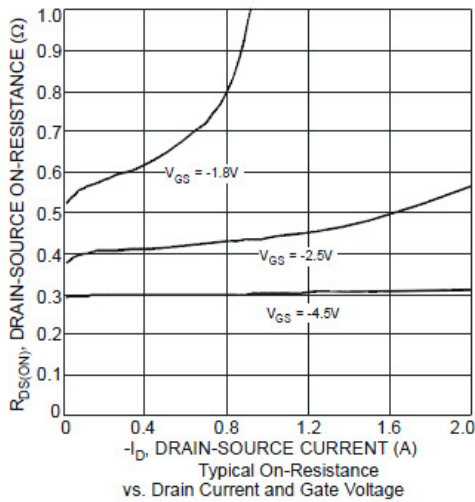
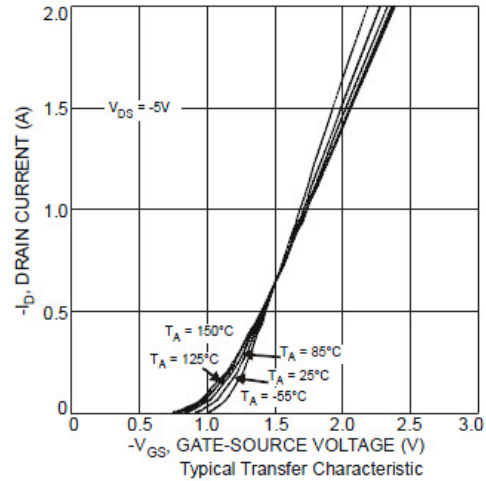
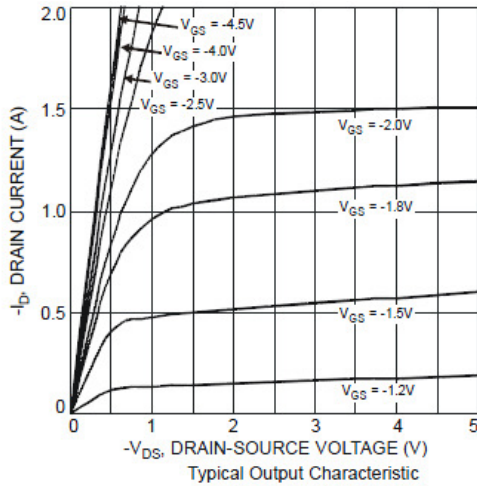
### Electrical Characteristics

(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	-20			V
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =-250uA	-0.3		-1.0	V
Gate Leakage Current	I <sub>GSS</sub>	V <sub>DS</sub> =0V, V <sub>GS</sub> =±12V			±1	mA
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> =-20V, V <sub>GS</sub> =0V			-1	uA
		V <sub>DS</sub> =-20V, V <sub>GS</sub> =0V T <sub>J</sub> =85°C			-5	uA
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> =-0.4A		400	580	mΩ
		V <sub>GS</sub> =-2.5V, I <sub>D</sub> =-0.3A		525	680	
		V <sub>GS</sub> =-1.8V, I <sub>D</sub> =-0.1A		700	950	
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		0.65	1.2	V
<b>Dynamic</b>						
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> =-10V, V <sub>GS</sub> =0V f=1MHz		70	100	pF
Output Capacitance	C <sub>oss</sub>			15		
Reverse Transfer Capacitance	C <sub>rss</sub>			10		
Total Gate Charge	Q <sub>g</sub>	V <sub>DS</sub> =-10V, V <sub>GS</sub> =-4.5V I <sub>D</sub> ≡-0.25A		1.0	2.0	nC
Gate-Source Charge	Q <sub>gs</sub>			0.2		
Gate-Drain Charge	Q <sub>gd</sub>			0.3		
Turn-On Time	t <sub>d(on)</sub>	V <sub>DD</sub> =-10V, R <sub>L</sub> =30Ω I <sub>D</sub> ≡-0.2A, V <sub>GEN</sub> =-4.5V R <sub>G</sub> =10Ω		8	15	ns
	t <sub>r</sub>			8	15	
Turn-Off Time	t <sub>d(off)</sub>			30	60	
	t <sub>f</sub>			20	40	

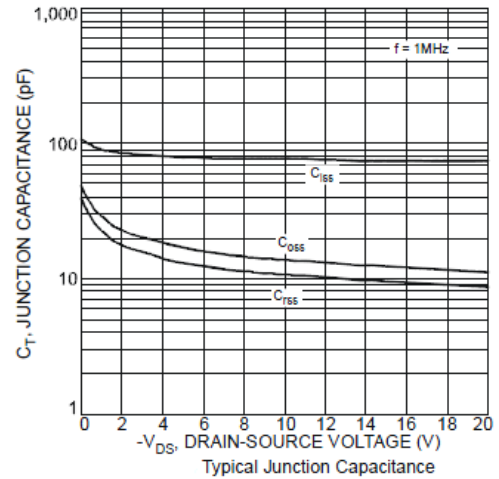
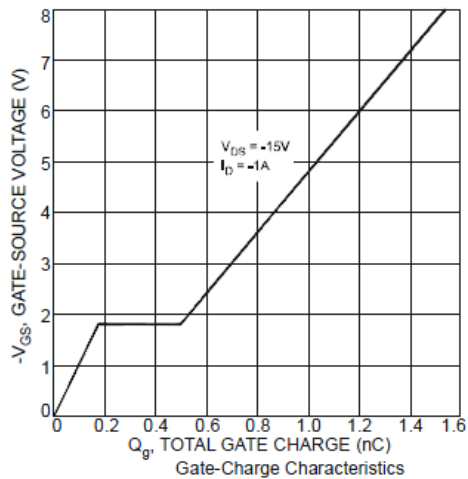
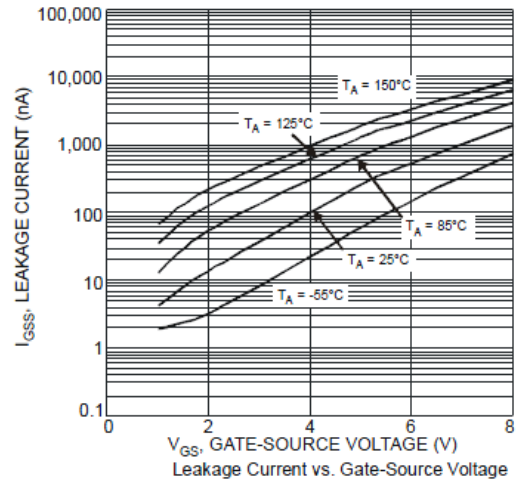
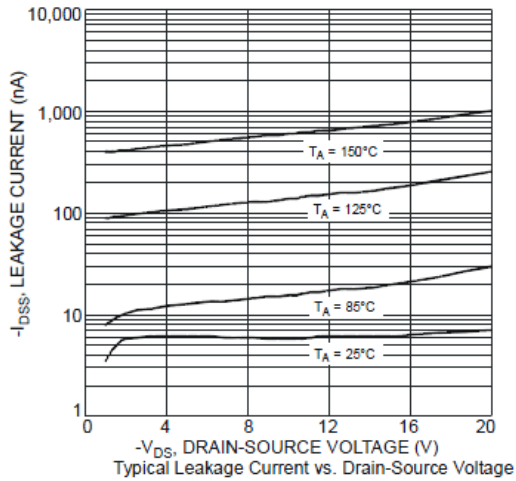
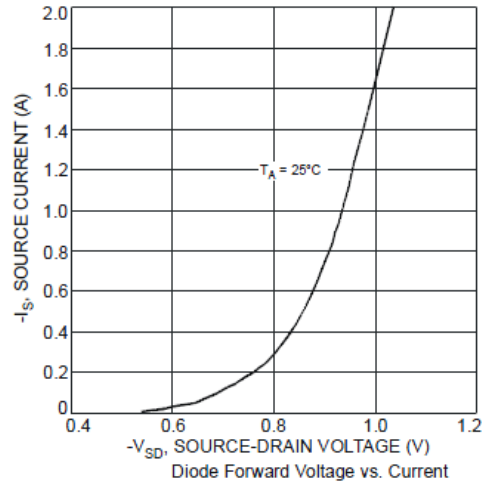
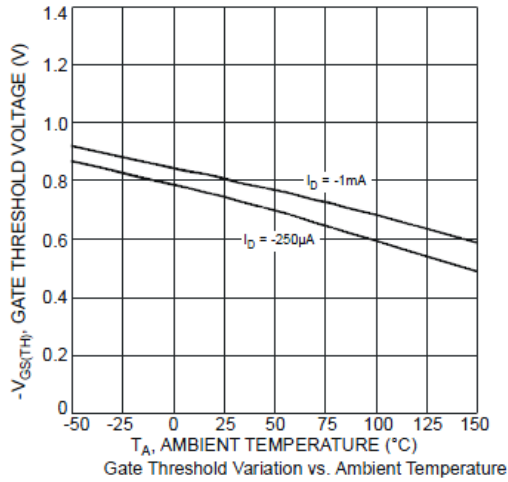


## Typical Characteristics





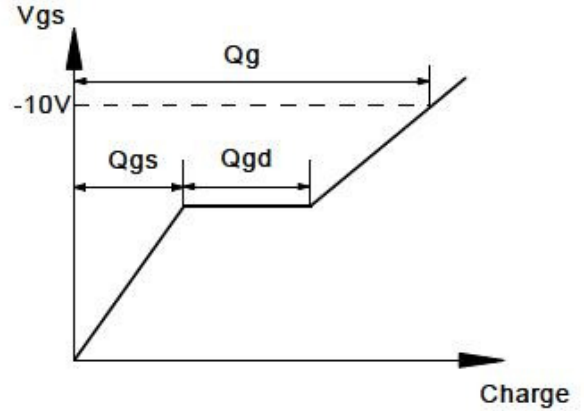
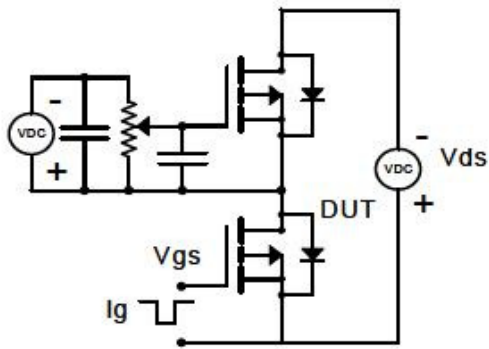
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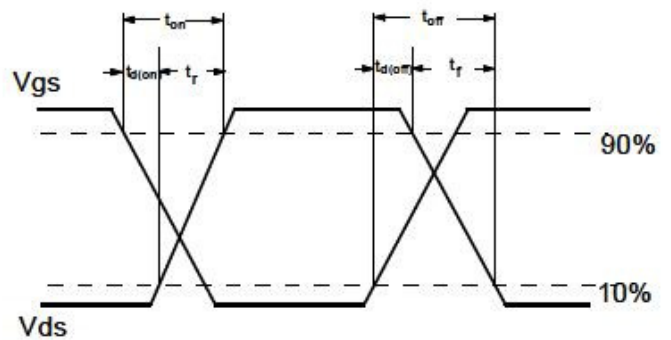
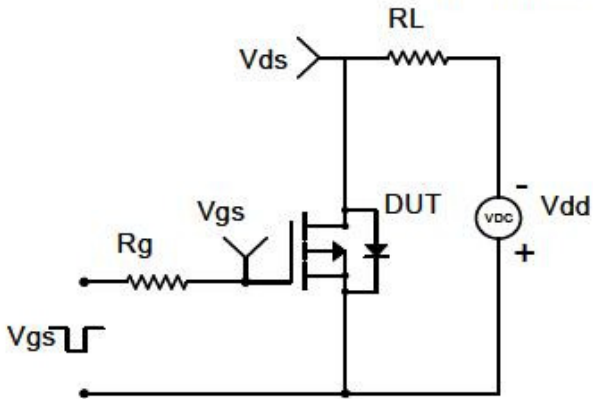


## Typical Characteristics

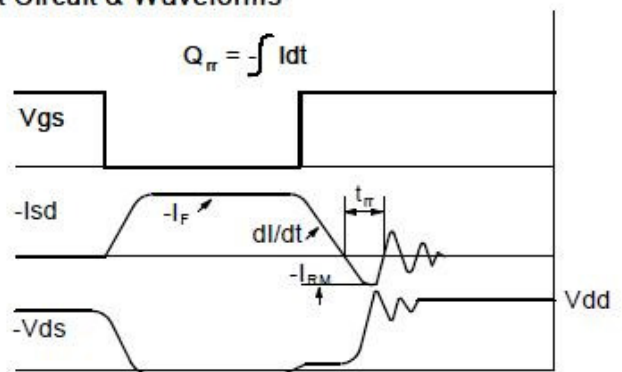
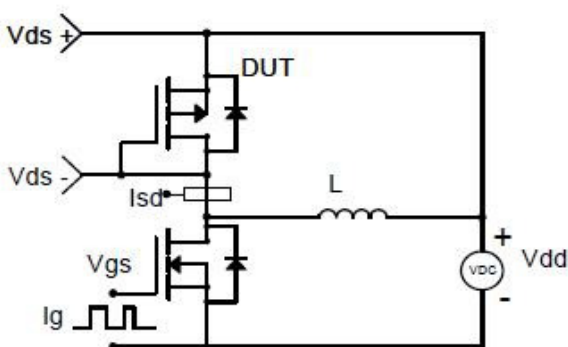
### Gate Charge Test Circuit & Waveform



### Resistive Switching Test Circuit & Waveforms

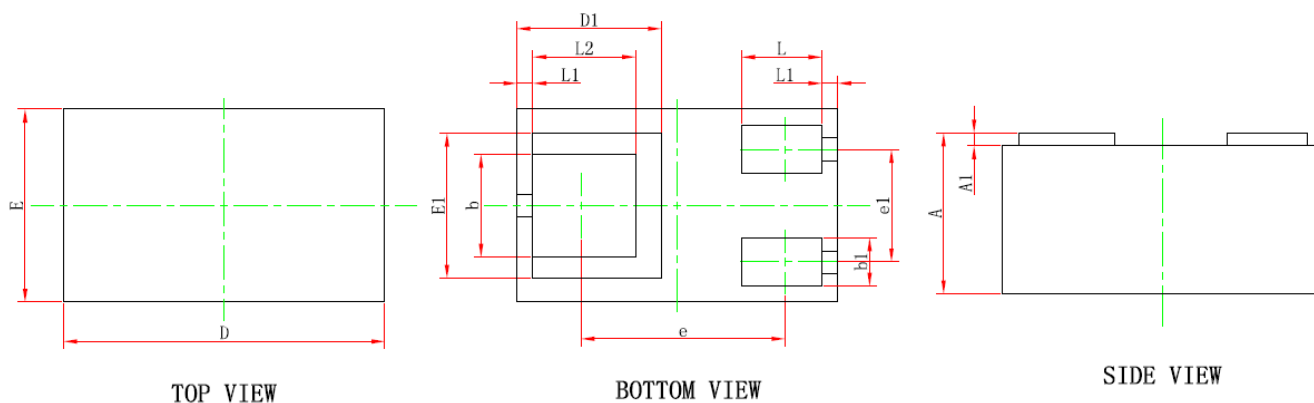


### Diode Recovery Test Circuit & Waveforms





**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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