



General Description

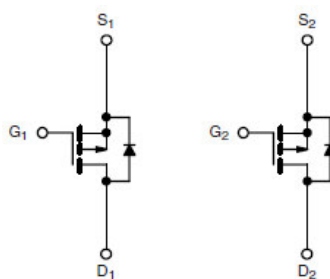
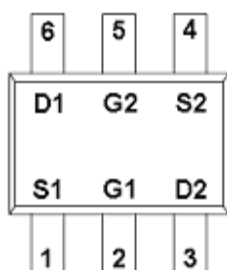
AFP1933, P-Channel enhancement mode MOSFET, uses Advanced Trench Technology to provide excellent $R_{DS(ON)}$, low gate charge.

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

- -30V/-0.55A, $R_{DS(ON)} = 900 \text{ m}\Omega @ V_{GS} = -10\text{V}$
- -30V/-0.35A, $R_{DS(ON)} = 1000 \text{ m}\Omega @ V_{GS} = -4.5\text{V}$
- -30V/-0.15A, $R_{DS(ON)} = 1800 \text{ m}\Omega @ V_{GS} = -2.5\text{V}$
- Low Offset (Error) Voltage
- Low-Voltage Operation
- High-Speed Circuits
- Low Battery Voltage Operation
- SOT-363 package design

Pin Description (SOT-363)



Application

- Drivers: Relays, Solenoids, Lamps, Hammers, Displays, Memories
- PA Switch
- Level Switch

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
AFP1933S36RG	33YW	SOT-363	Tape & Reel	3000 EA

※ 33 parts code

※ Y year code (0 ~ 9)

※ W week code (A ~ Z = 1 ~ 26 / a ~ z = 27 ~ 52)

※ AFP1933S36RG : 7" Tape & Reel ; Pb- Free ; Halogen- Free



Absolute Maximum Ratings

(T_A=25°C Unless otherwise noted)

Parameter	Symbol	Typical	Unit
Drain-Source Voltage	V _{DSS}	-30	V
Gate –Source Voltage	V _{GSS}	±12	V
Continuous Drain Current(T _J =150°C)	I _D	T _A =25°C -0.55	A
		T _A =70°C -0.15	
Pulsed Drain Current	I _{DM}	-1.0	A
Continuous Source Current(Diode Conduction)	I _S	-0.3	A
Power Dissipation	P _D	T _A =25°C 0.3	W
		T _A =70°C 0.2	
Operating Junction Temperature	T _J	-55/150	°C
Storage Temperature Range	T _{STG}	-55/150	°C

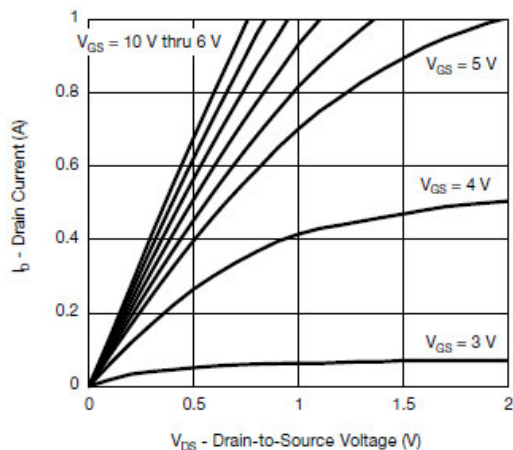
Electrical Characteristics (P-Channel)

(T_A=25°C Unless otherwise noted)

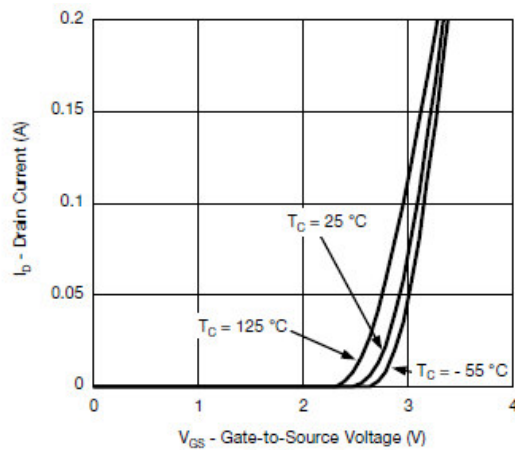
Parameter	Symbol	Conditions	Min.	Typ	Max.	Unit
Static						
Drain-Source Breakdown Voltage	V _{(BR)DSS}	V _{GS} =0V, I _D =-250uA	-30			V
Gate Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =-250uA	-0.7		-1.5	
Gate Leakage Current	I _{GSS}	V _{DS} =0V, V _{GS} =±12V			±100	nA
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =-24V, V _{GS} =0V			-1	uA
		V _{DS} =-24V, V _{GS} =0V T _J =85°C			-5	
On-State Drain Current	I _{D(on)}	V _{DS} ≥ 5V, V _{GS} =4.5V	0.5			A
Drain-Source On-Resistance	R _{DS(on)}	V _{GS} =-10V, I _D =-0.55A		650	900	mΩ
		V _{GS} =-4.5V, I _D =-0.35A		800	1000	
		V _{GS} =-2.5V, I _D =-0.15A		1200	1800	
Forward Transconductance	g _{FS}	V _{DS} =-15V, I _D =-0.5A		1		S
Diode Forward Voltage	V _{SD}	I _S =-0.15A, V _{GS} =0V		0.65	1.3	V
Dynamic						
Input Capacitance	C _{iss}	V _{DS} =-15V, V _{GS} =0V f=1MHz		34		pF
Output Capacitance	C _{oss}			12		
Reverse Transfer Capacitance	C _{rss}			8		
Total Gate Charge	Q _g	V _{DS} =-15V, V _{GS} =-4.5V I _D =-0.15A		0.8	1.3	nC
Gate-Source Charge	Q _{gs}			0.4		
Gate-Drain Charge	Q _{gd}			0.4		
Turn-On Time	t _{d(on)}	V _{DD} =-15V, R _L =38Ω I _D =-0.15A, V _{GEN} =-4.5V R _G =1Ω		35	50	ns
	t _r			20	30	
Turn-Off Time	t _{d(off)}			10	20	
	t _f			10	20	



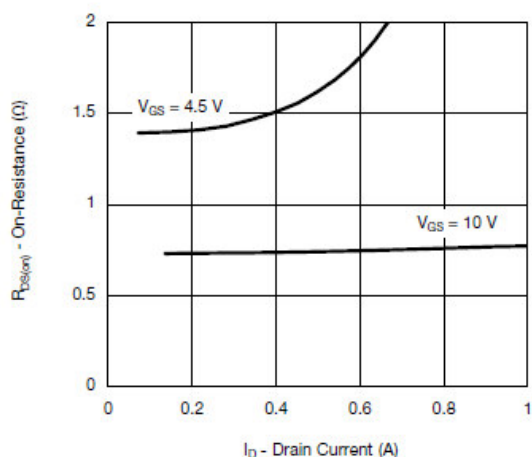
Typical Characteristics



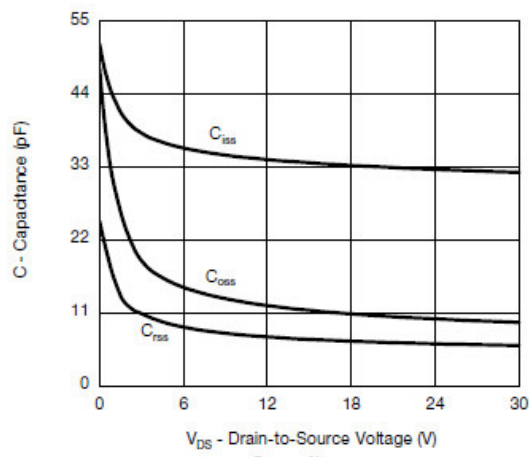
Output Characteristics



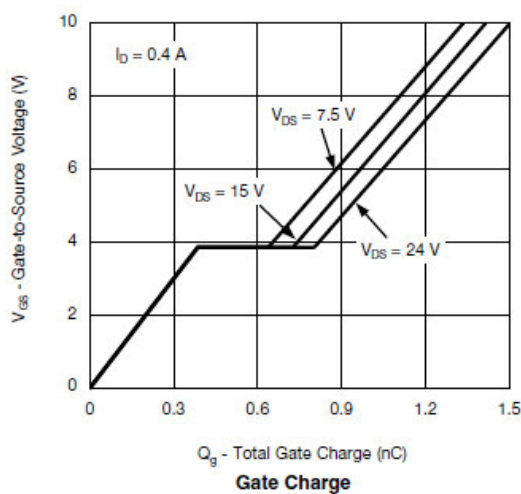
Transfer Characteristics



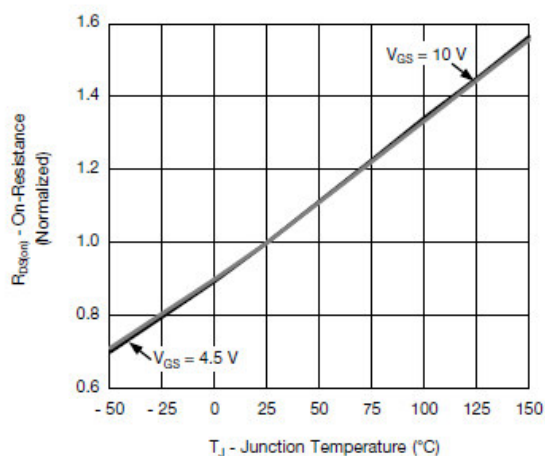
On-Resistance vs. Drain Current and Gate Voltage



Capacitance



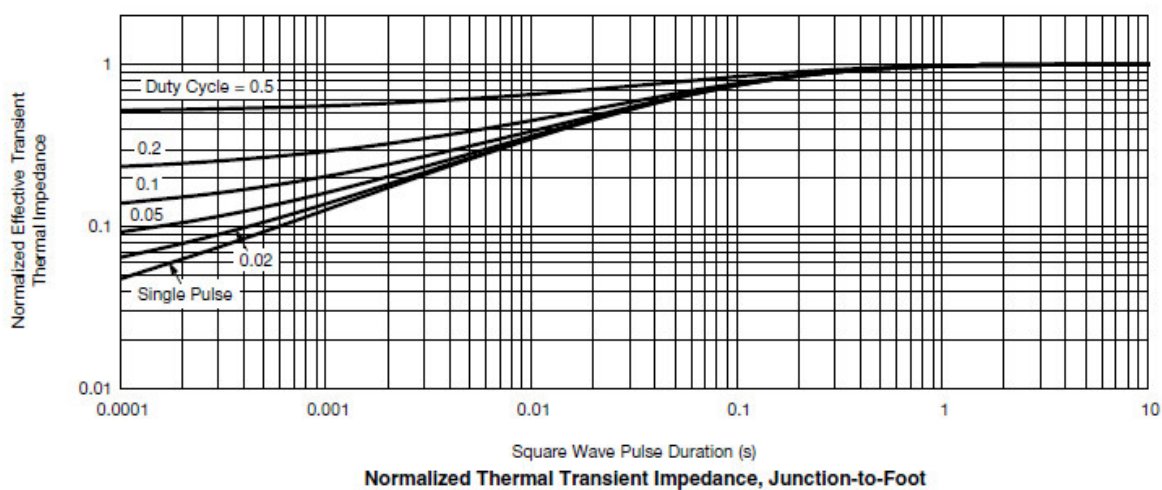
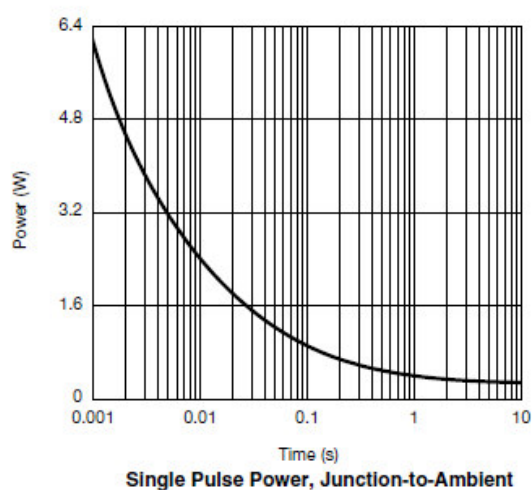
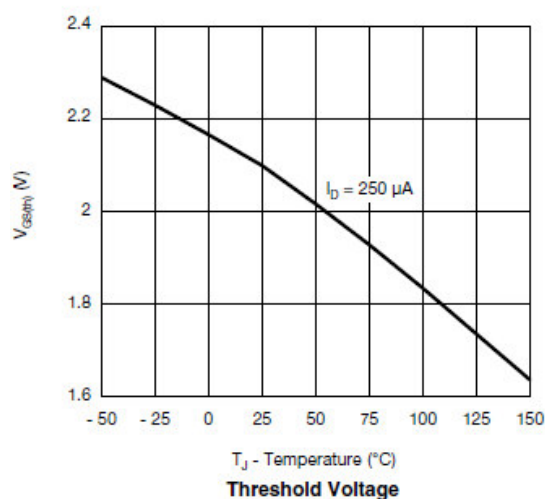
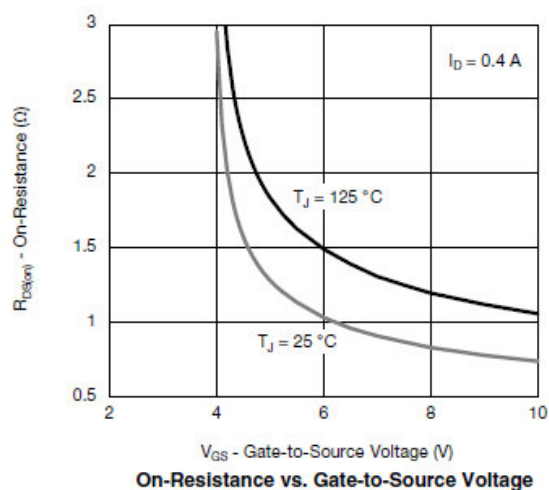
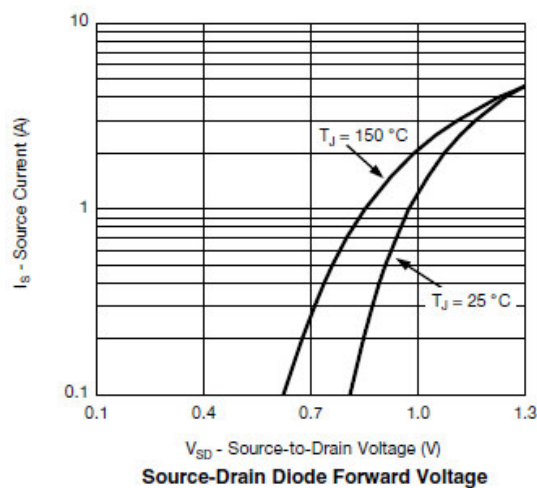
Gate Charge



On-Resistance vs. Junction Temperature



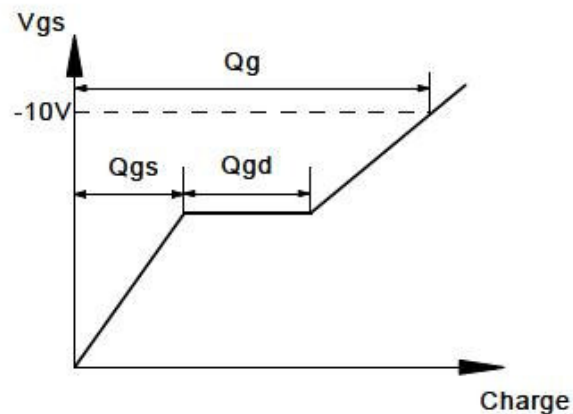
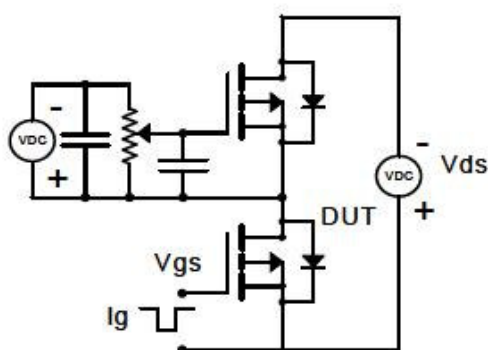
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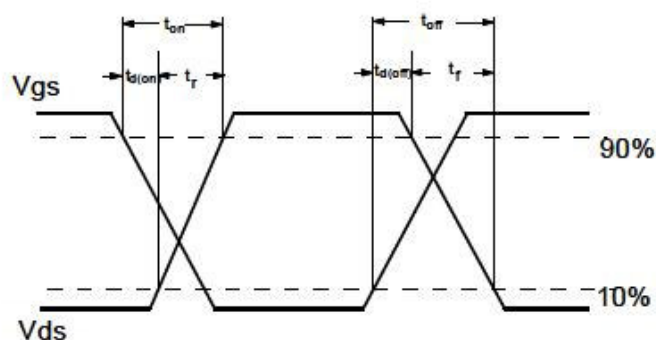
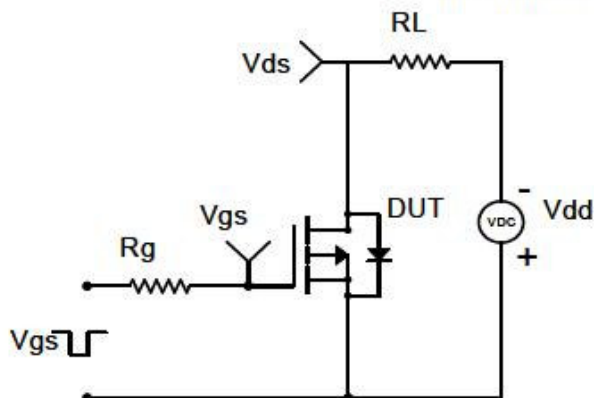


Typical Characteristics

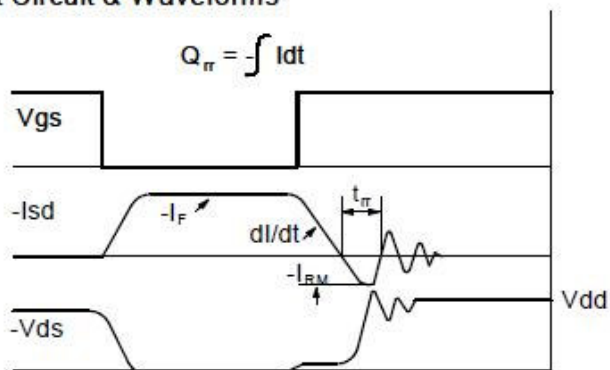
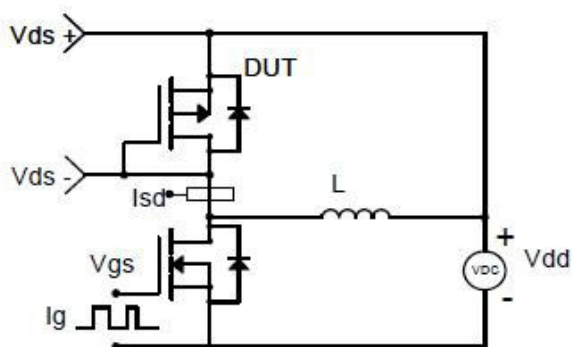
Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveforms

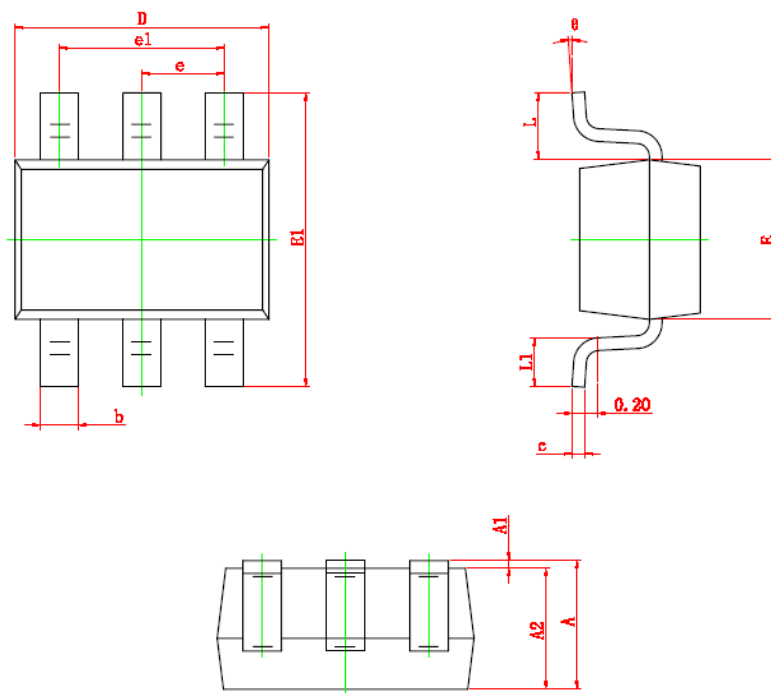


Diode Recovery Test Circuit & Waveforms





Package Information (SOT-363)



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	0.900	1.100	0.035	0.043
A1	0.000	0.100	0.000	0.004
A2	0.900	1.000	0.035	0.039
b	0.150	0.350	0.006	0.014
c	0.080	0.150	0.003	0.006
D	2.000	2.200	0.079	0.087
E	1.150	1.350	0.045	0.053
E1	2.150	2.450	0.085	0.096
e	0.650 TYP		0.026 TYP	
e1	1.200	1.400	0.047	0.055
L	0.525 REF		0.021 REF	
L1	0.260	0.460	0.010	0.018
θ	0°	8°	0°	8°

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