Alfa-MOS Technology

AFP1933

30V P-Channel Enhancement Mode MOSFET

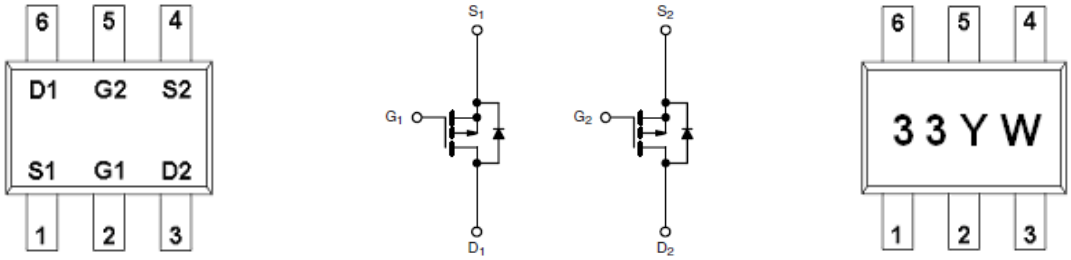
General Description

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 mΩ@ VGS =-10V
- -30V/-0.35A, $R_{DS(ON)}$= 1000 mΩ@ VGS =-4.5V
- -30V/-0.15A, $R_{DS(ON)}$= 1800 mΩ@ V_{GS} =-2.5V
- 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℃ Unless otherwise noted)

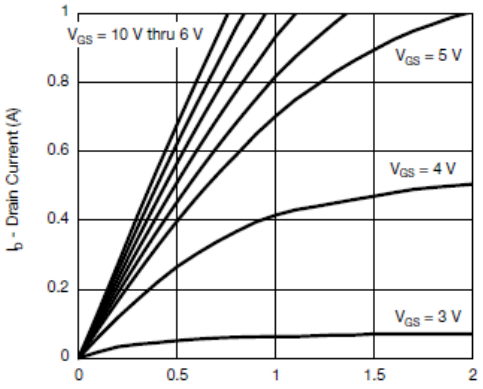
Parameter		Symbol	Value	Unit
Drain-Source Voltage		V_{DSS}	-30	V
Gate –Source Voltage		V_{GSS}	±12	V
Continuous Drain Current(T_J=150℃)	T_A=25℃	I_D	-0.55	A
	T_A=70℃		-0.15	
Pulsed Drain Current		I_{DM}	-1.0	A
Continuous Source Current(Diode Conduction)		I_S	-0.3	A
Power Dissipation	T_A=25℃	P_D	0.3	W
	T_A=70℃		0.2	
Operating Junction Temperature		T_J	-55/150	℃
Storage Temperature Range		T_{STG}	-55/150	℃

Electrical Characteristics (P-Channel)

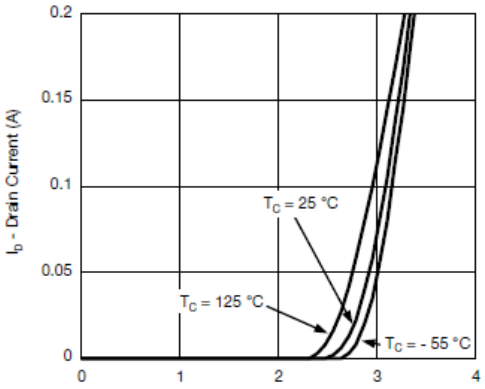
(T_A=25℃ Unless otherwise noted)

Parameter	Symbol	Conditions	Min.	Typ	Max.	Unit
Static						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS}=0V,I_D=-250uA	-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℃			-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	

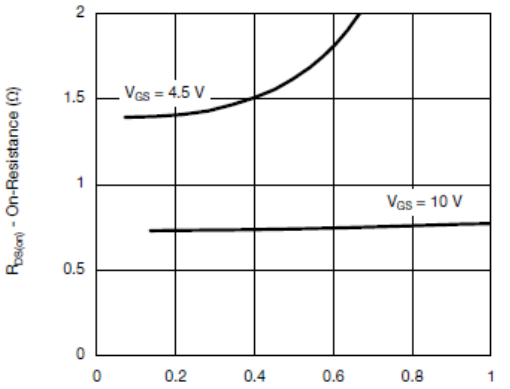
Typical Characteristics



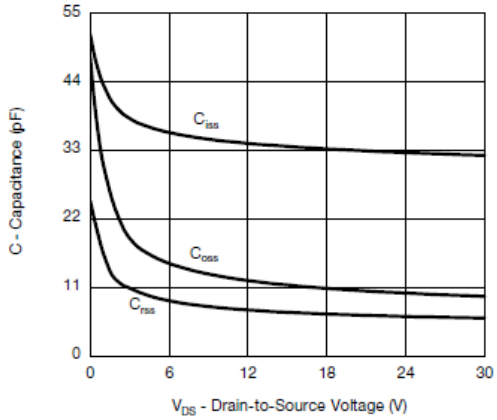
Output Characteristics



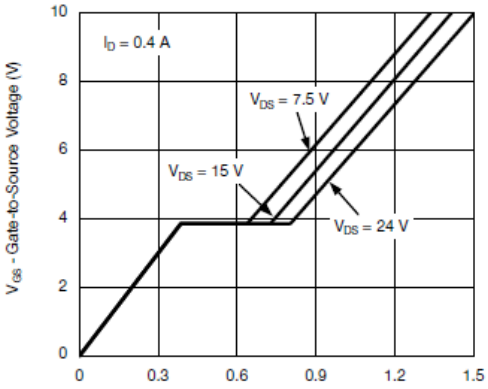
Transfer Characteristics



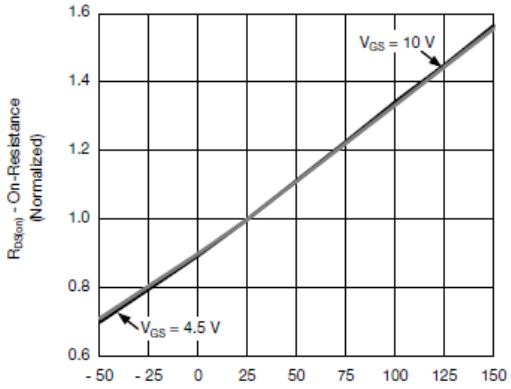
On-Resistance vs. Drain Current and Gate Voltage



Capacitance

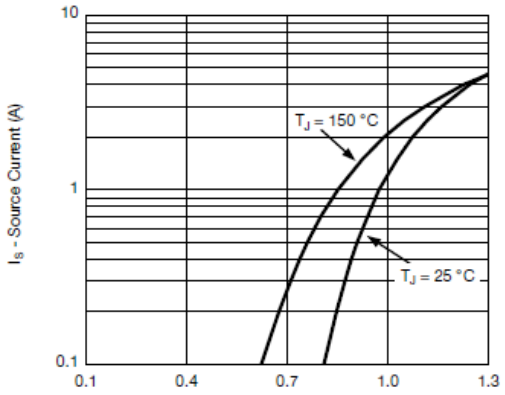


Gate Charge

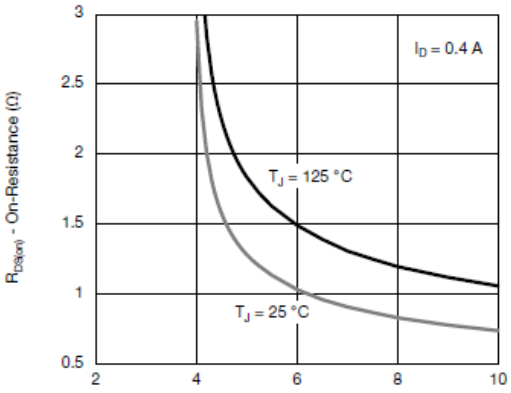


On-Resistance vs. Junction Temperature

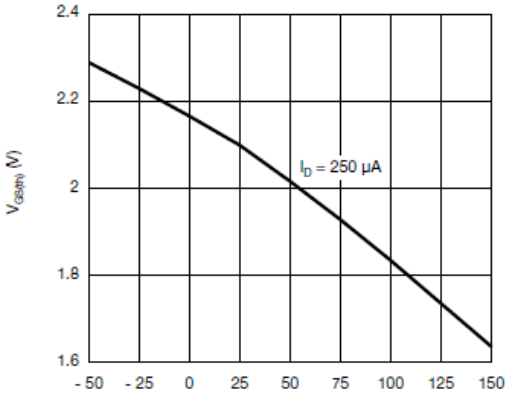
Typical Characteristics



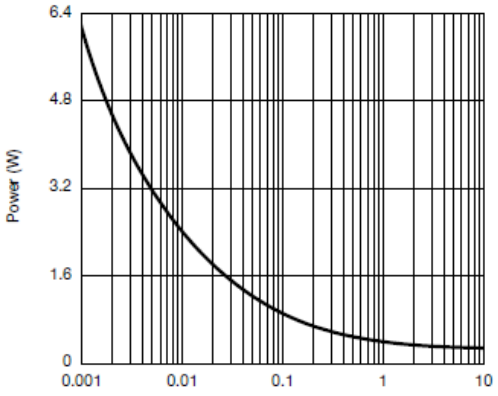
Source-Drain Diode Forward Voltage



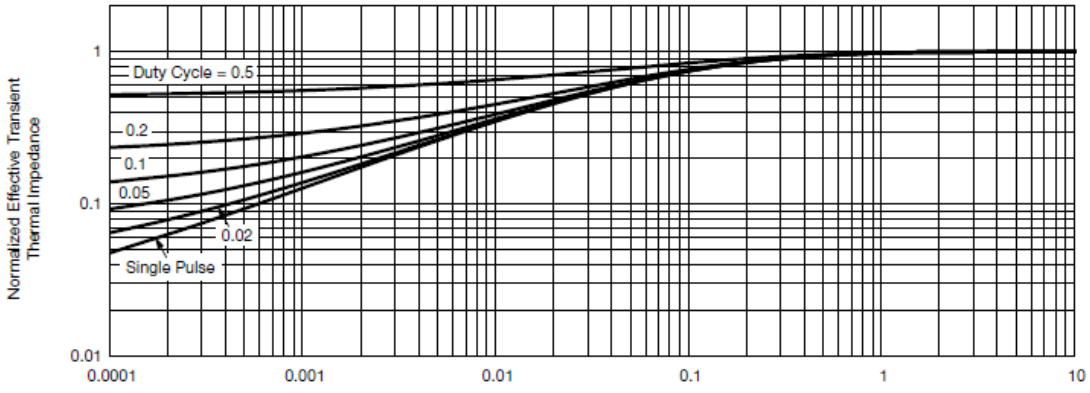
On-Resistance vs. Gate-to-Source Voltage



Threshold Voltage



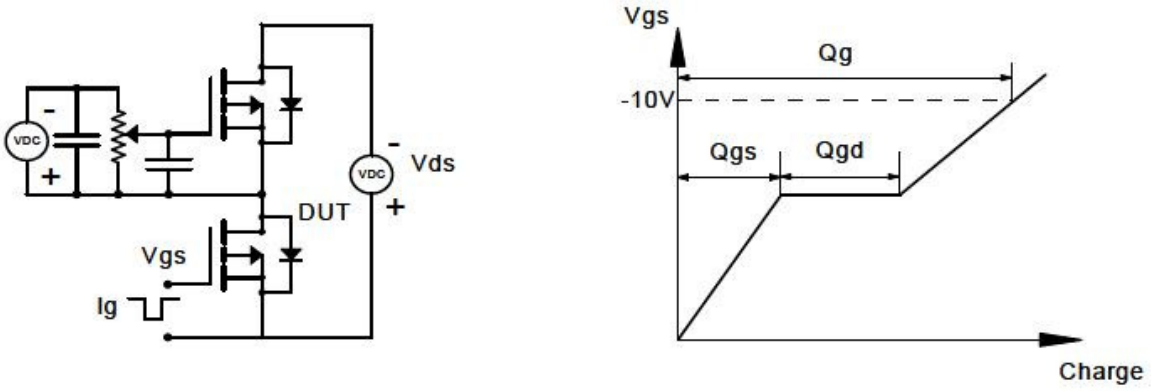
Single Pulse Power, Junction-to-Ambient



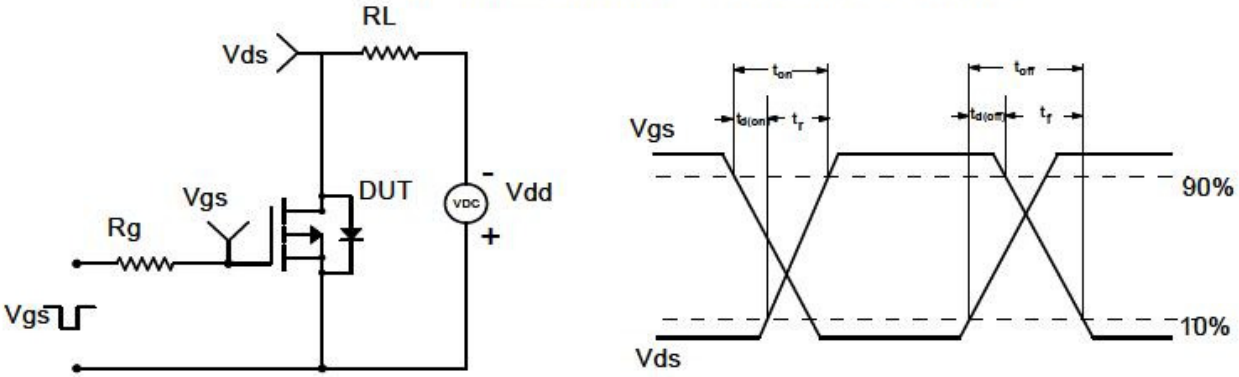
Normalized Thermal Transient Impedance, Junction-to-Foot

Typical Characteristics

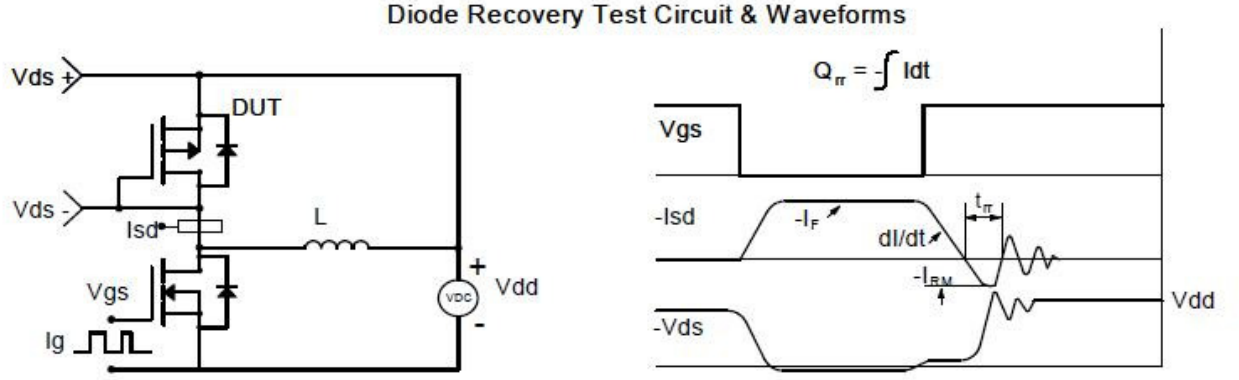
Gate Charge Test Circuit & Waveform



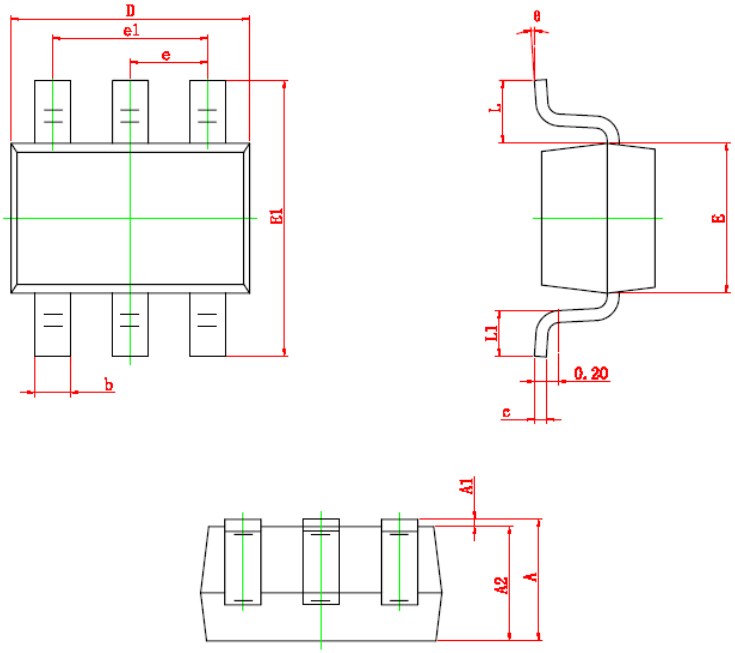
Resistive Switching Test Circuit & Waveforms



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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