Alfa-MOS Technology

AFP1073E
20V P-Channel Enhancement Mode MOSFET

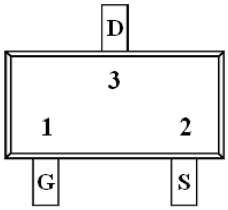
General Description

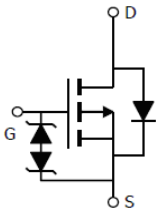
AFP1073E, P-Channel enhancement mode MOSFET, uses Advanced Trench Technology to provide excellent $R_{DS(ON)}$, low gate charge.
These devices are particularly suited for low voltage power management, such as smart phone and notebook computer, and low in-line power loss are needed in commercial industrial surface mount applications.

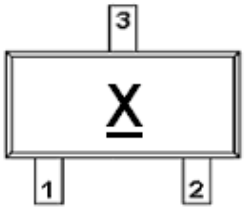
Features

- -20V/-0.6A, $R_{DS(ON)}$= 620 mΩ@ V_{GS} =-4.5V
- -20V/-0.5A, $R_{DS(ON)}$= 860 mΩ@ V_{GS} =-2.5V
- -20V/-0.4A, $R_{DS(ON)}$= 1250 mΩ@ V_{GS} =-1.8V
- Low Offset (Error) Voltage
- Low-Voltage Operation
- High-Speed Circuits
- ESD Protection (>2KV) Diode design–in
- Low Battery Voltage Operation
- SOT-723 package design

Pin Description (SOT-723)







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	G	Gate
2	S	Source
3	D	Drain

Ordering Information

Part Ordering No.	Part Marking	Package	Unit	Quantity
AFP1073ES72RG	X	SOT-723	Tape & Reel	8000 EA

※ AFP1073ES52RG : 7” Tape & Reel ; Pb- Free ; Halogen- Free

Absolute Maximum Ratings

(T_A=25℃ Unless otherwise noted)

Parameter		Symbol	Typical	Unit
Drain-Source Voltage		V_{DSS}	-20	V
Gate –Source Voltage		V_{GSS}	±12	V
Continuous Drain Current(T_J=150℃)	T_A=25℃	I_D	-0.7	A
	T_A=70℃		-0.4	
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	0.27	W
	T_A=70℃		0.16	
Operating Junction Temperature		T_J	-55/150	℃
Storage Temperature Range		T_{STG}	-55/150	℃

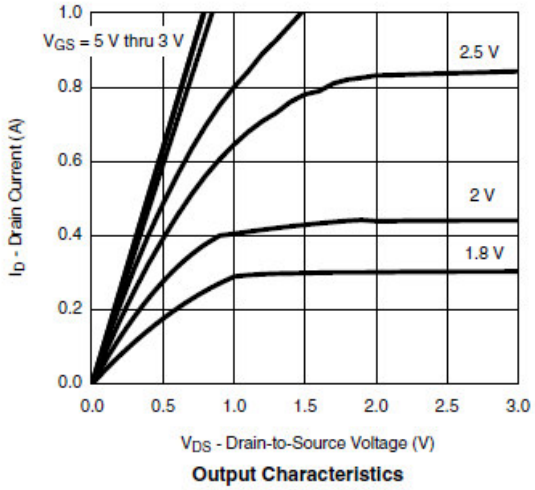
Electrical Characteristics

(T_A=25℃ Unless otherwise noted)

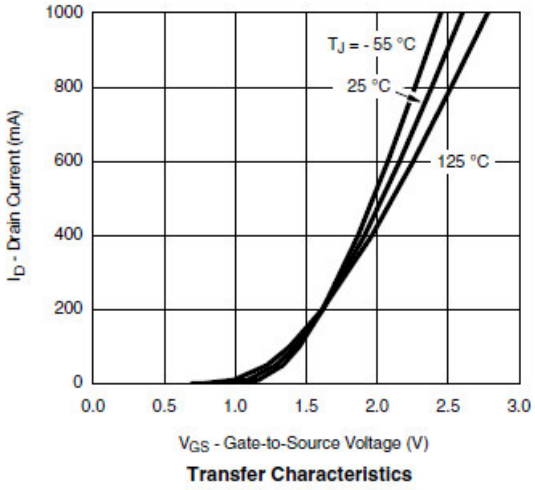
Parameter	Symbol	Conditions	Min.	Typ	Max.	Unit
Static						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS}=0V,I_D=-250uA	-20			V
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS},I_D=-250uA	-0.4		-1.0	
Gate Leakage Current	I_{GSS}	V_{DS}=0V,V_{GS}=±4.5V			±1	uA
		V_{DS}=0V,V_{GS}=±8V			±10	uA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=-20V,V_{GS}=0V			-1	uA
		V_{DS}=-20V,V_{GS}=0V T_J=85℃			-5	
On-State Drain Current	$I_{D(on)}$	V_{DS}≧5V,V_{GS}=4.5V	0.7			A
Drain-Source On-Resistance	$R_{DS(on)}$	V_{GS}=-4.5V,I_D=-0.6A		400	620	mΩ
		V_{GS}=-2.5V,I_D=-0.5A		580	860	
		V_{GS}=-1.8V,I_D=-0.4A		950	1250	
Forward Transconductance	g_{FS}	V_{DS}=-10V,I_D=-0.4A		1		S
Diode Forward Voltage	V_{SD}	I_S=-0.15A,V_{GS}=0V		0.65	1.2	V
Dynamic						
Input Capacitance	C_{iss}	V_{DS}=-10V,V_{GS}=0V f=1MHz		70	100	pF
Output Capacitance	C_{oss}			20		
Reverse Transfer Capacitance	C_{rss}			10		
Total Gate Charge	Q_g	V_{DS}=-10V,V_{GS}=-4.5V I_D≡-0.25A		1.0	1.3	nC
Gate-Source Charge	Q_{gs}			0.1		
Gate-Drain Charge	Q_{gd}			0.3		
Turn-On Time	$t_{d(on)}$	V_{DD}=-10V,R_L=30Ω I_D≡-0.2A,V_{GEN}=-4.5V R_G=10Ω		10	15	ns
	t_r			10	15	
Turn-Off Time	$t_{d(off)}$			40	60	

	t_f			30	50	

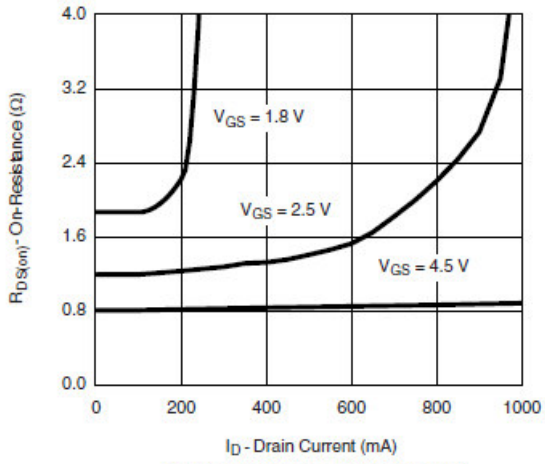
Typical Characteristics



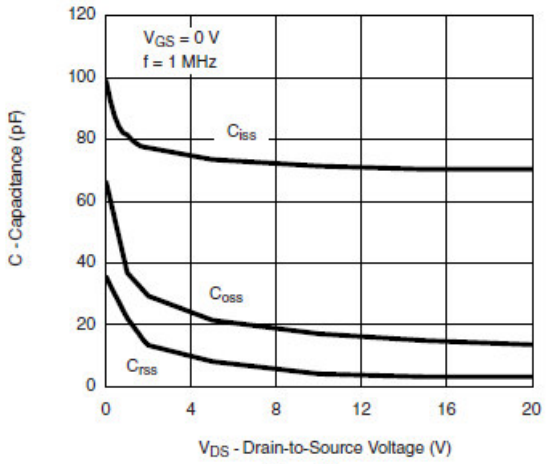
Output Characteristics



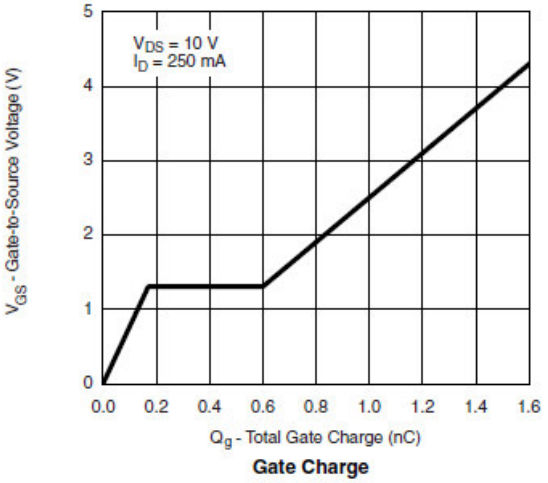
Transfer Characteristics



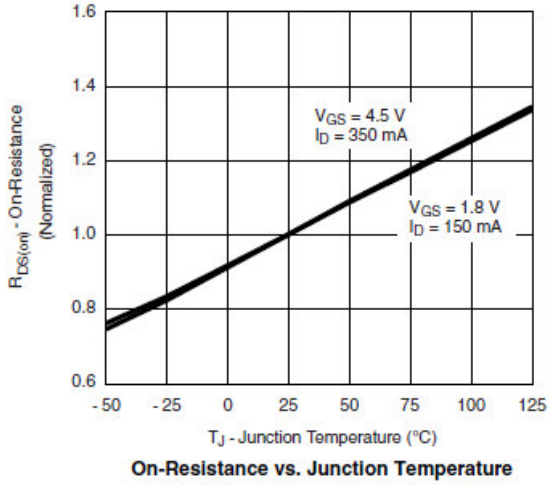
On-Resistance vs. Drain Current



Capacitance

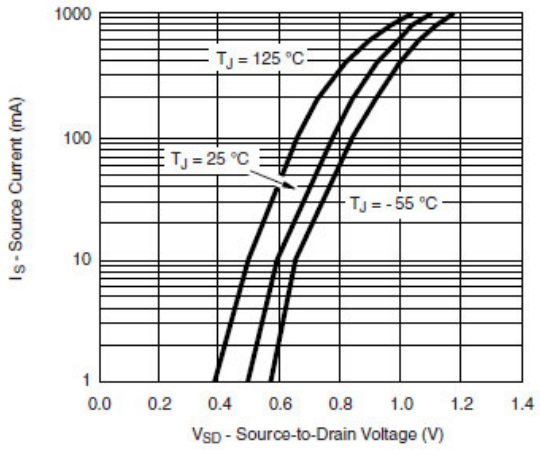


Gate Charge

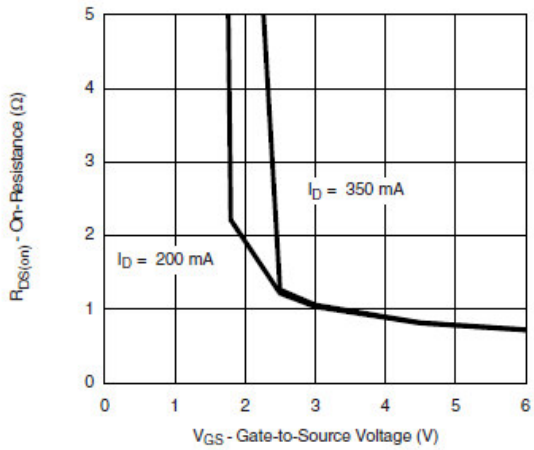


On-Resistance vs. Junction Temperature

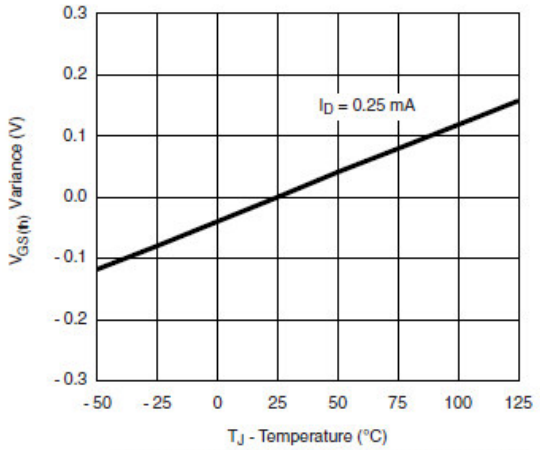
Typical Characteristics



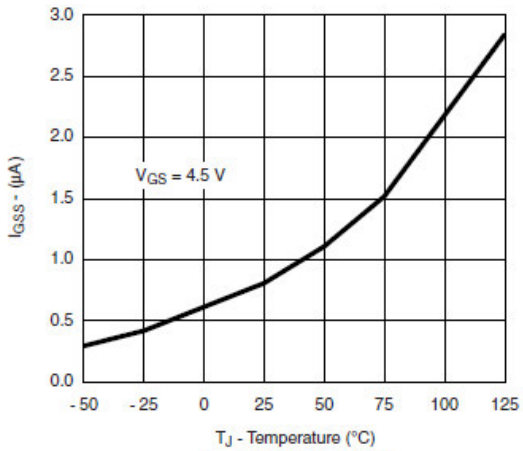
Source-Drain Diode Forward Voltage



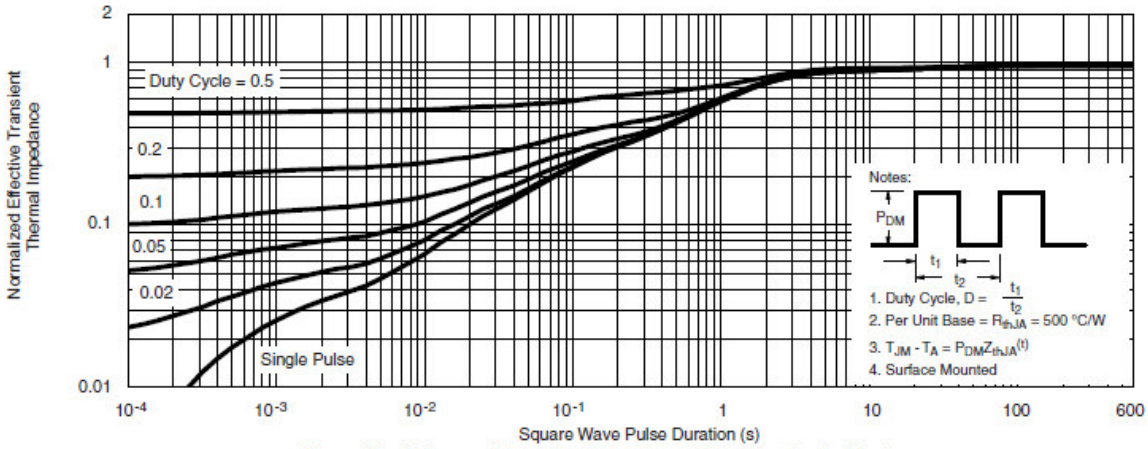
On-Resistance vs. Gate-to-Source Voltage



Threshold Voltage Variance vs. Temperature



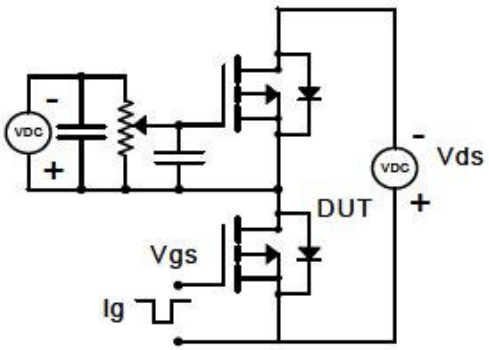
I_{GSS} vs. Temperature

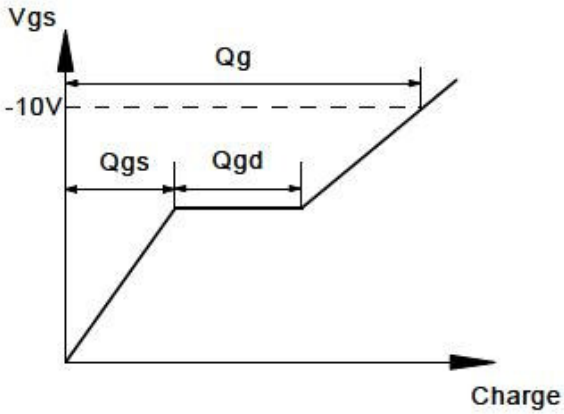


Normalized Thermal Transient Impedance, Junction-to-Ambient

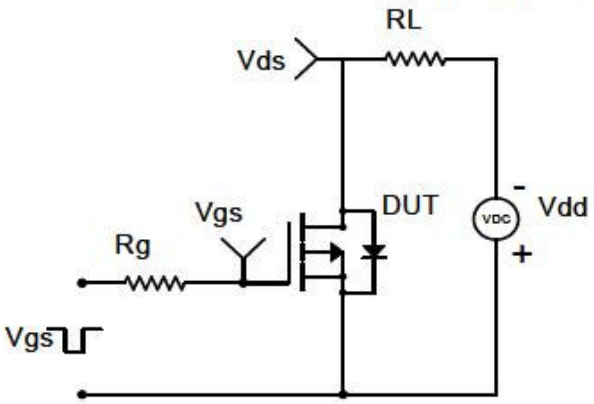
Typical Characteristics

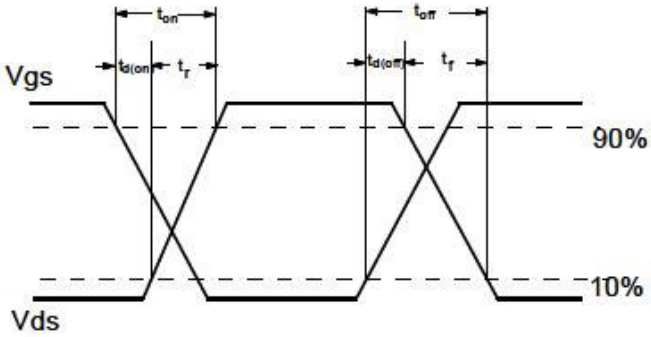
Gate Charge Test Circuit & Waveform



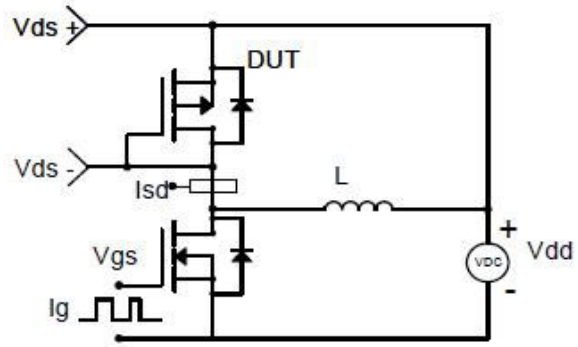


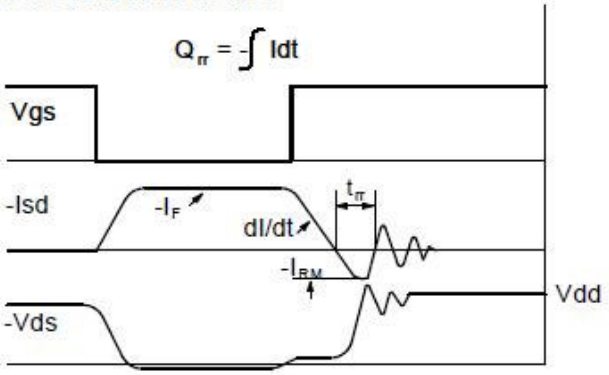
Resistive Switching Test Circuit & Waveforms



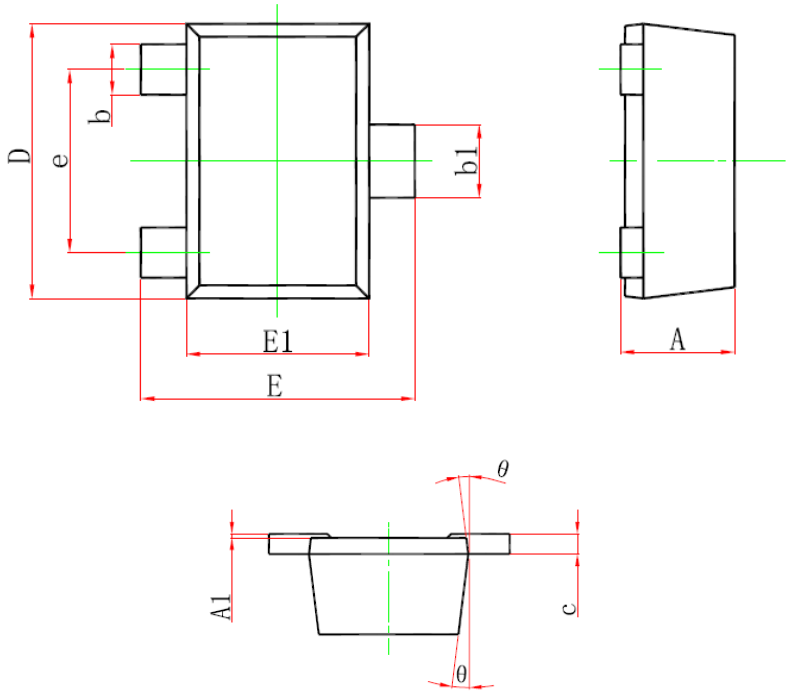


Diode Recovery Test Circuit & Waveforms





Package Information (SOT-723)



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A		0.500		0.020
A1	0.000	0.050	0.000	0.002
b	0.170	0.270	0.007	0.011
b1	0.270	0.370	0.011	0.015
c		0.150		0.006
D	1.150	1.250	0.045	0.049
E	1.150	1.250	0.045	0.049
E1	0.750	0.850	0.030	0.033
e	0.800TYP.		0.031TYP.	
θ	7° REF.		7° REF.	

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