Alfa-MOS Technology

AFP8989

60V P-Channel Enhancement Mode MOSFET

General Description

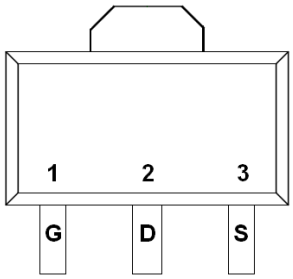
AFP8989, P-Channel enhancement mode MOSFET, uses Advanced Trench Technology to provide excellent $R_{DS(ON)}$, low gate charge.

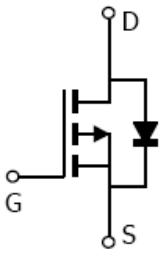
These devices are particularly suited for low voltage power management, and low in-line power loss are needed in commercial industrial surface mount applications.

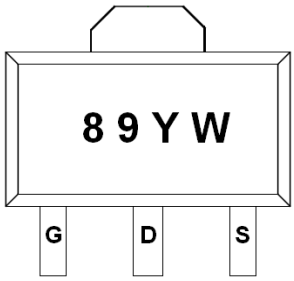
Features

- -60V/-3.6A, $R_{DS(ON)}$= 115mΩ@V_{GS}= -10V
- -60V/-2.6A, $R_{DS(ON)}$= 125mΩ@V_{GS}= -4.5V
- Super high density cell design for extremely low $R_{DS\ (ON)}$
- SOT-89-3L package design

Pin Description (SOT-89-3L)







Application

- Motor and Load Control
- LCD TV Inverter & AD/DC Inverter Systems.
- Backlight Inverter for LCD Display
- Load Switch
- CCFL Inverter

Pin Define

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

Ordering Information

Part Ordering No.	Part Marking	Package	Unit	Quantity
AFP8989S89RG	89YW	SOT-89-3L	Tape & Reel	1000 EA

※ 89 parts code
※ Y year code (0 ~ 9)
※ W week code (A ~ Z = 1 ~ 26 / a ~ z = 27 ~ 52)
※ AFP8989S89RG : 7” Tape & Reel ; Pb- Free ; Halogen- Free

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Absolute Maximum Ratings

(T_A=25℃ Unless otherwise noted)

Parameter		Symbol	Typical	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	-3.6	A
	T_A=70℃		-2.6	
Pulsed Drain Current		I_{DM}	-10	A
Continuous Source Current(Diode Conduction)		I_S	-1.6	A
Power Dissipation	T_A=25℃	P_D	1.45	W
	T_A=70℃		0.6	
Operating Junction Temperature		T_J	150	℃
Storage Temperature Range		T_{STG}	-55/150	℃
Thermal Resistance-Junction to Ambient		$R_{\theta JA}$	120	℃/W

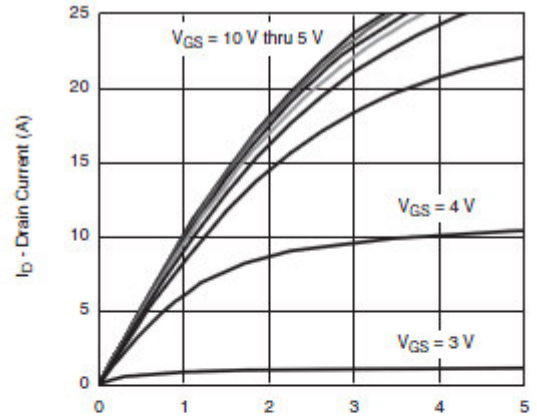
Electrical Characteristics

(T_A=25℃ Unless otherwise noted)

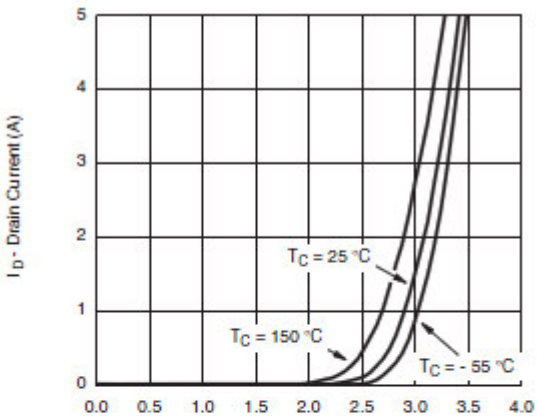
Parameter	Symbol	Conditions	Min.	Typ	Max.	Unit
Static						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS}=0V,I_D= -250uA	-60			V
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS},I_D= -250uA	-0.8		-2.5	
Gate Leakage Current	I_{GSS}	V_{DS}=0V,V_{GS}= ±20V			±100	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}= -48V,V_{GS}=0V			-1	uA
		V_{DS}= -48V,V_{GS}=0V T_J=85℃			-20	
On-State Drain Current	$I_{D(on)}$	V_{DS}≧ -5V,V_{GS}= -10V	-20			A
Drain-Source On-Resistance	$R_{DS(on)}$	V_{GS} = -10V,I_D=-3.6A		106	115	mΩ
		V_{GS} = -4.5V,I_D=-2.6A		115	125	
Forward Transconductance	g_{FS}	V_{DS}= -15V,I_D= -2.6A		12		S
Diode Forward Voltage	V_{SD}	I_S= -2A,V_{GS}=0V		-0.8	-1.2	V
Dynamic						
Total Gate Charge	Q_g	V_{DS}=-30V,V_{GS}=-10V I_D= -3.0A		12	20	nC
Gate-Source Charge	Q_{gs}			2.5		
Gate-Drain Charge	Q_{gd}			3.5		
Input Capacitance	C_{iss}	V_{DS}=-30V,V_{GS}=0V f=1MHz		900		pF
Output Capacitance	C_{oss}			90		
Reverse Transfer Capacitance	C_{rss}			40		
Turn-On Time	$t_{d(on)}$	V_{DD}=-30V,R_L=7.5Ω I_D≡-2.6A,V_{GEN}=-10V R_G=3Ω		10	20	ns
	t_r			6	10	
Turn-Off Time	$t_{d(off)}$			30	45	
	t_f			12	25	

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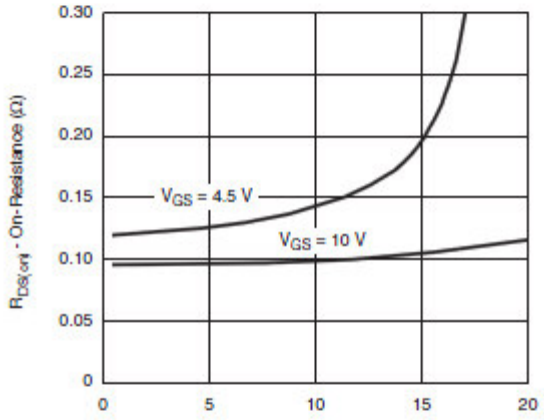
Typical Characteristics



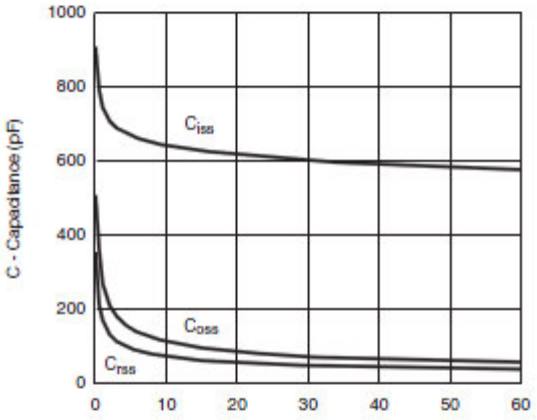
Output Characteristics



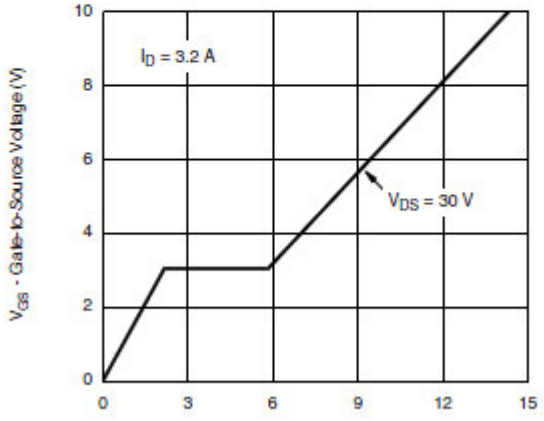
Transfer Characteristics



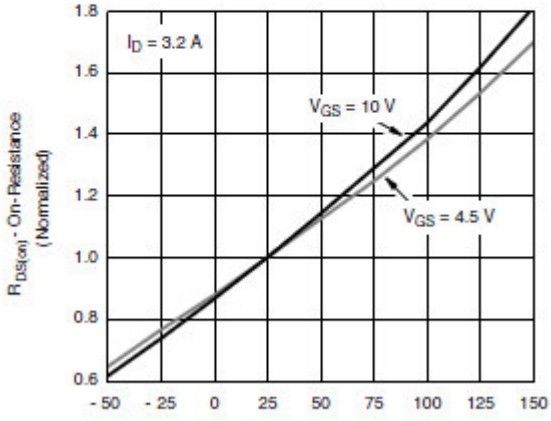
On-Resistance vs. Drain Current



Capacitance

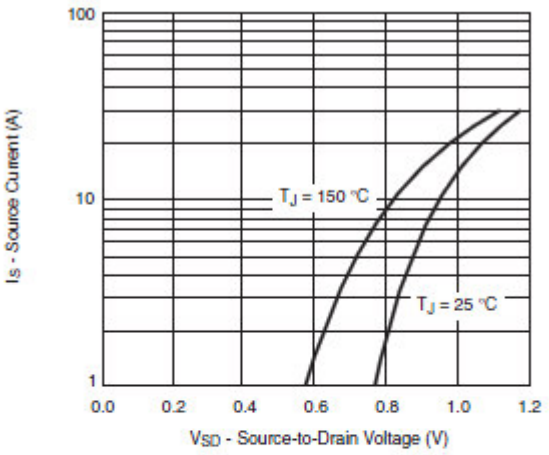


Gate Charge

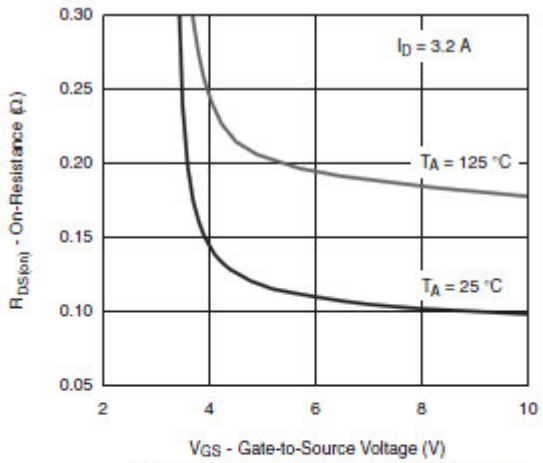


On-Resistance vs. Junction Temperature

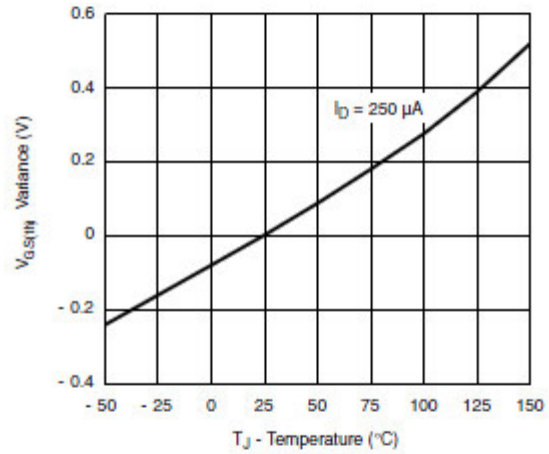
Typical Characteristics



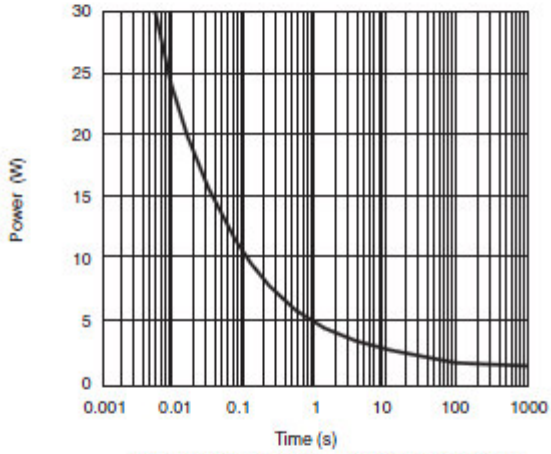
Source-Drain Diode Forward Voltage



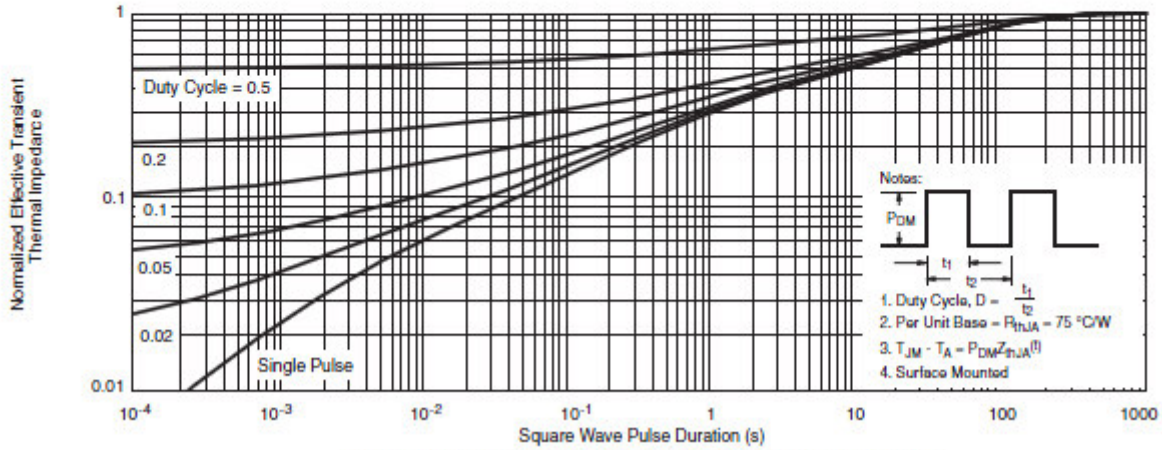
On-Resistance vs. Gate-to-Source Voltage



Threshold Voltage



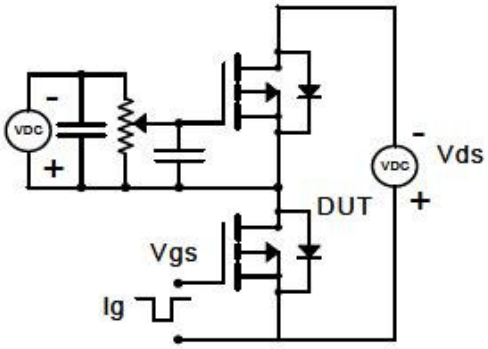
Single Pulse Power, Junction-to-Ambient

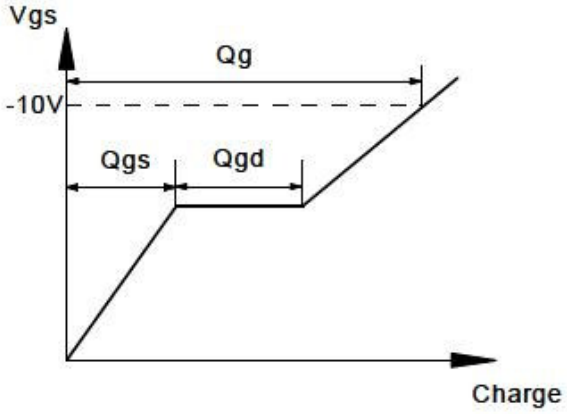


Normalized Thermal Transient Impedance, Junction-to-Ambient

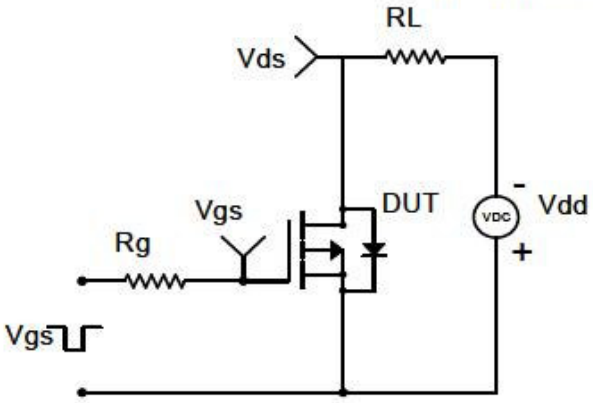
Typical Characteristics

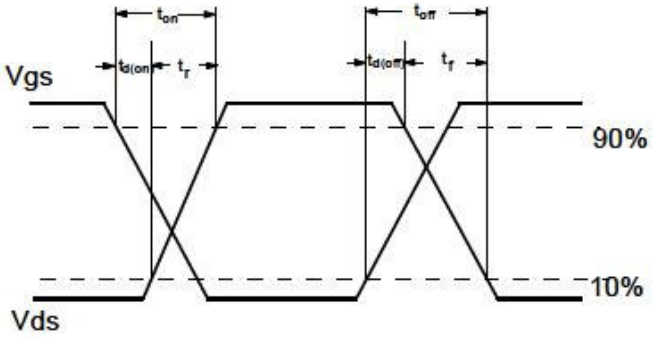
Gate Charge Test Circuit & Waveform



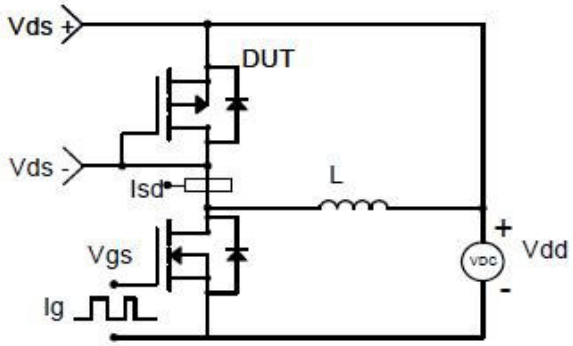


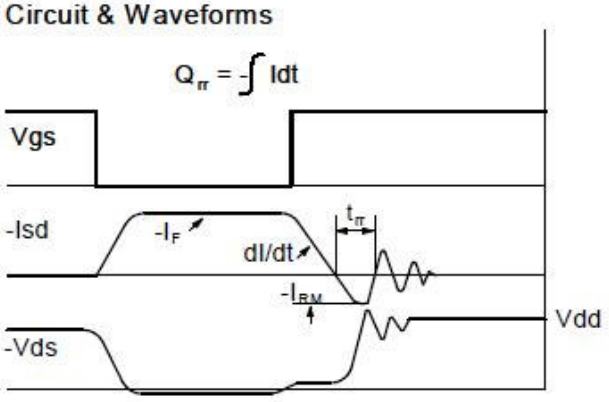
Resistive Switching Test Circuit & Waveforms



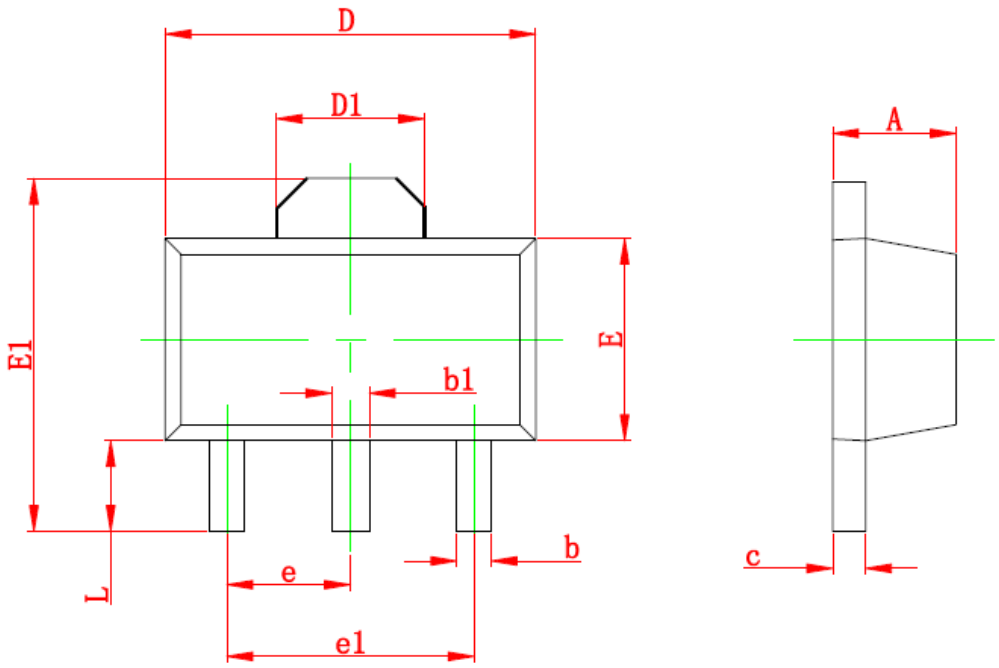


Diode Recovery Test Circuit & Waveforms





Package Information (SOT-89-3L)



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.400	1.600	0.055	0.063
b	0.320	0.520	0.013	0.197
b1	0.400	0.580	0.016	0.023
c	0.350	0.440	0.014	0.017
D	4.400	4.600	0.173	0.181
D1	1.550 REF		0.061 REF	
E	2.300	2.600	0.091	0.102
E1	3.940	4.250	0.155	0.167
e	1.500 TYP		0.060TYP	
e1	3.000 TYP		0.118TYP	
L	0.900	1.200	0.035	0.047

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2F, No.80, Sec.1, Cheng Kung Rd., Nan Kang Dist., Taipei City 115, Taiwan (R.O.C.)
Tel : 886 2) 2651 3928
Fax : 886 2) 2786 8483
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