



General Description

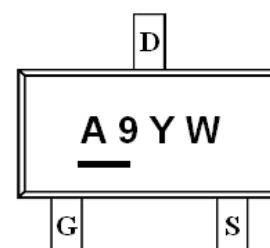
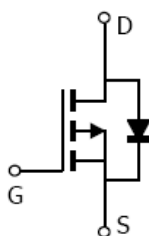
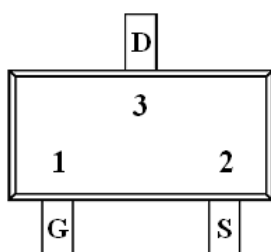
AFP2319A, P-Channel enhancement mode MOSFET, uses Advanced Trench Technology to provide excellent $R_{DS(ON)}$, low gate charge.

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

- -40V/-3.0A, $R_{DS(ON)}=100m\Omega@V_{GS}=-10V$
- -40V/-2.4A, $R_{DS(ON)}=130m\Omega@V_{GS}=-4.5V$
- Super high density cell design for extremely low $R_{DS(ON)}$
- Exceptional on-resistance and maximum DC current capability
- SOT-23 package design

Pin Description (SOT-23)



Application

- Load Switch
- DC-DC System

Pin Define

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

Ordering Information

Part Ordering No.	Part Marking	Package	Unit	Quantity
AFP2319AS23RG	A9YW	SOT-23	Tape & Reel	3000 EA

- ※ A9 parts code
- ※ Y year code (0 ~ 9)
- ※ W week code (A ~ Z = 1 ~ 26 / a ~ z = 27 ~ 52)
- ※ AFP2319AS23RG : 7" Tape & Reel ; Pb- Free ; Halogen- Free



Absolute Maximum Ratings

($T_A=25^{\circ}\text{C}$ Unless otherwise noted)

Parameter	Symbol	Typical	Unit
Drain-Source Voltage	V_{DSS}	-40	V
Gate –Source Voltage	V_{GSS}	± 20	V
Continuous Drain Current($T_J=150^{\circ}\text{C}$)	I_D	$T_A=25^{\circ}\text{C}$	-3.0
		$T_A=70^{\circ}\text{C}$	-2.4
Pulsed Drain Current	I_{DM}	-12	A
Continuous Source Current(Diode Conduction)	I_S	-1.0	A
Power Dissipation	P_D	$T_A=25^{\circ}\text{C}$	1.25
		$T_A=70^{\circ}\text{C}$	0.8
Operating Junction Temperature	T_J	150	$^{\circ}\text{C}$
Storage Temperature Range	T_{STG}	-55/150	$^{\circ}\text{C}$
Thermal Resistance-Junction to Ambient	$R_{\theta JA}$	120	$^{\circ}\text{C}/\text{W}$

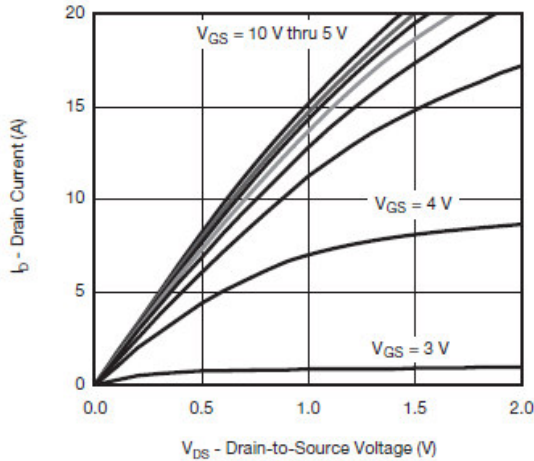
Electrical Characteristics

($T_A=25^{\circ}\text{C}$ Unless otherwise noted)

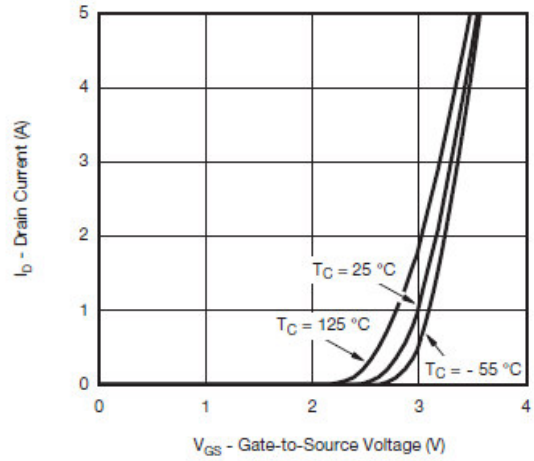
Parameter	Symbol	Conditions	Min.	Typ	Max.	Unit
Static						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS}=0\text{V}, I_D=-250\mu\text{A}$	-40			V
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=-250\mu\text{A}$	-1.0		-2.0	V
Gate Leakage Current	I_{GSS}	$V_{DS}=0\text{V}, V_{GS}=\pm 20\text{V}$			± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=-32\text{V}, V_{GS}=0\text{V}$			-1	uA
		$V_{DS}=-32\text{V}, V_{GS}=0\text{V}$ $T_J=85^{\circ}\text{C}$			-30	
On-State Drain Current	$I_{D(on)}$	$V_{DS} \leq -5\text{V}, V_{GS}=-10\text{V}$	-6			A
Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS}=-10\text{V}, I_D=-3.0\text{A}$		85	100	m Ω
		$V_{GS}=-4.5\text{V}, I_D=-2.4\text{A}$		110	130	
Forward Transconductance	g_{FS}	$V_{DS}=-5\text{V}, I_D=-3.0\text{A}$		8		S
Diode Forward Voltage	V_{SD}	$I_S=-1.25\text{A}, V_{GS}=0\text{V}$		-0.75	-1.3	V
Dynamic						
Total Gate Charge	Q_g	$V_{DS}=-20\text{V}, V_{GS}=-4.5\text{V}$ $I_D \equiv -3.0\text{A}$		5	10	nC
Gate-Source Charge	Q_{gs}			1.5		
Gate-Drain Charge	Q_{gd}			2.5		
Input Capacitance	C_{iss}	$V_{DS}=-20\text{V}, V_{GS}=0\text{V}$ $f=1\text{MHz}$		500		pF
Output Capacitance	C_{oss}			65		
Reverse Transfer Capacitance	C_{rss}			50		
Turn-On Time	$t_{d(on)}$	$V_{DD}=-20\text{V}, R_L=8\Omega$ $I_D \equiv -2.5\text{A}, V_{GEN}=-4.5\text{V}$ $R_G=1.0\Omega$		25	50	ns
	t_r			15	30	
Turn-Off Time	$t_{d(off)}$			10	25	
	t_f			10	25	



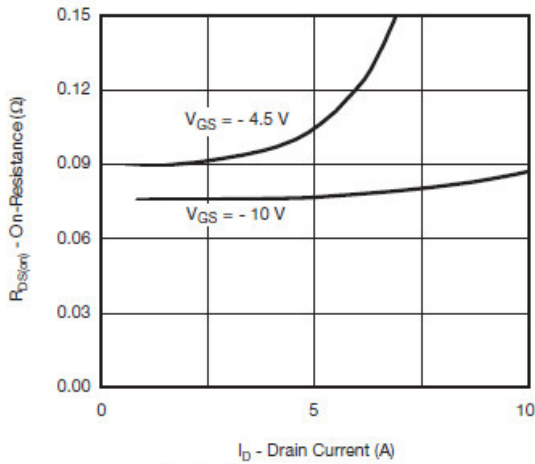
Typical Characteristics



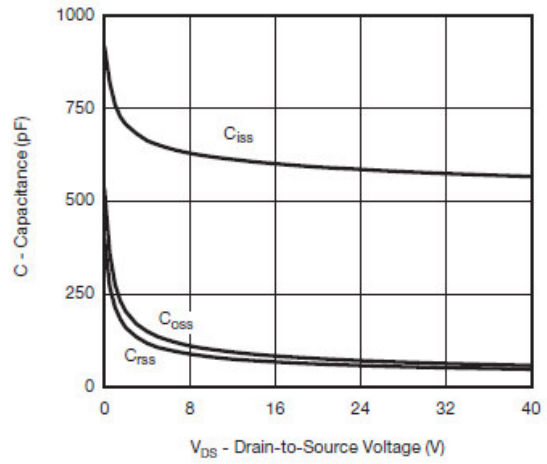
Output Characteristics



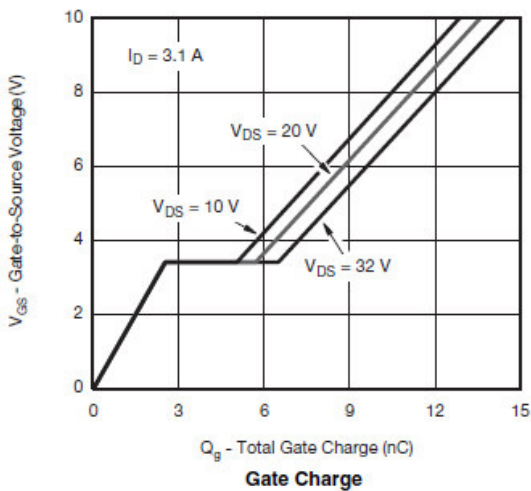
Transfer Characteristics



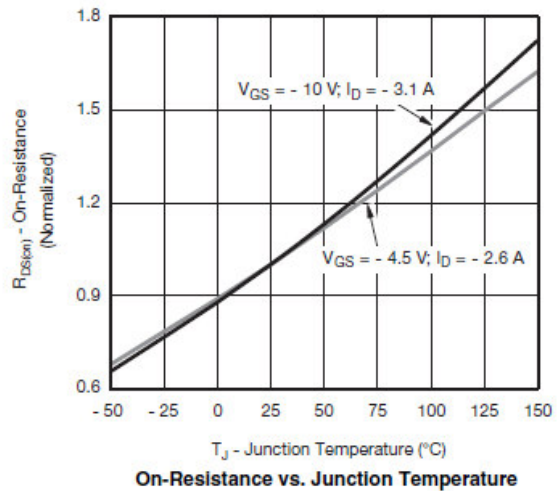
On-Resistance vs. Drain Current



Capacitance



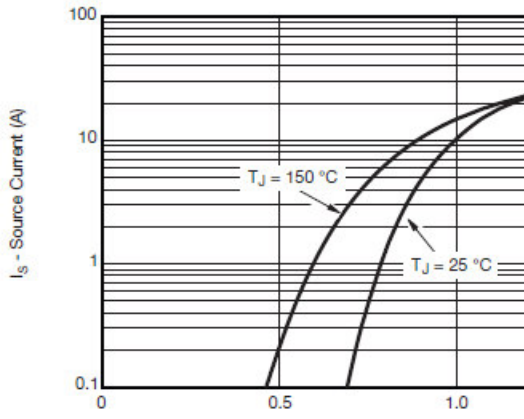
Gate Charge



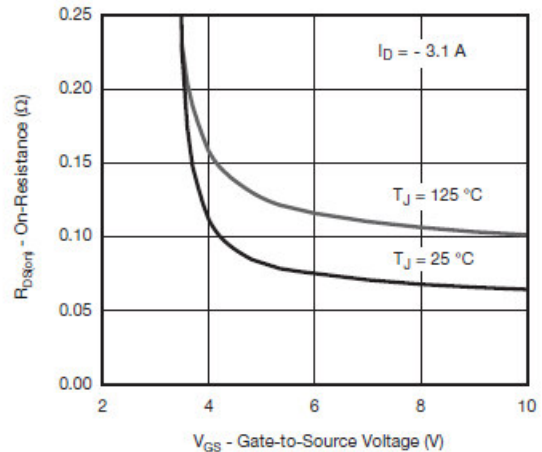
On-Resistance vs. Junction Temperature



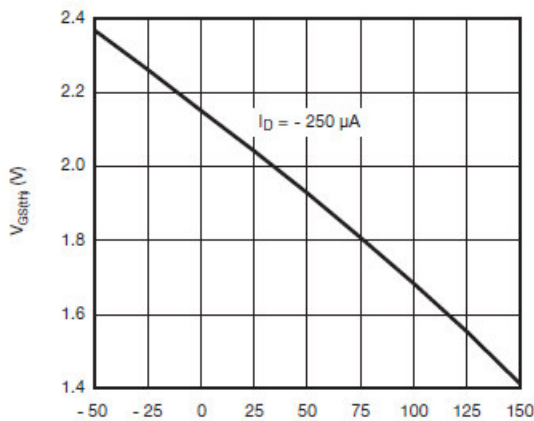
Typical Characteristics



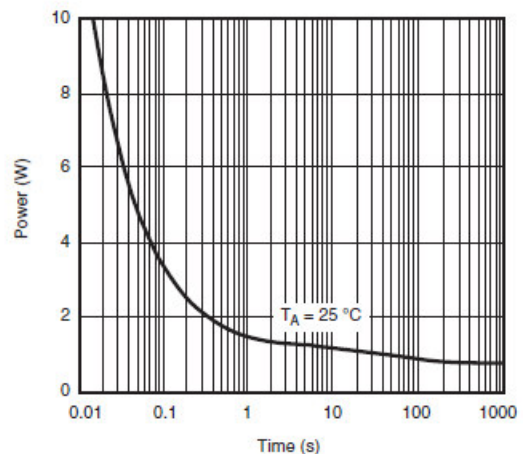
Source-Drain Diode Forward Voltage



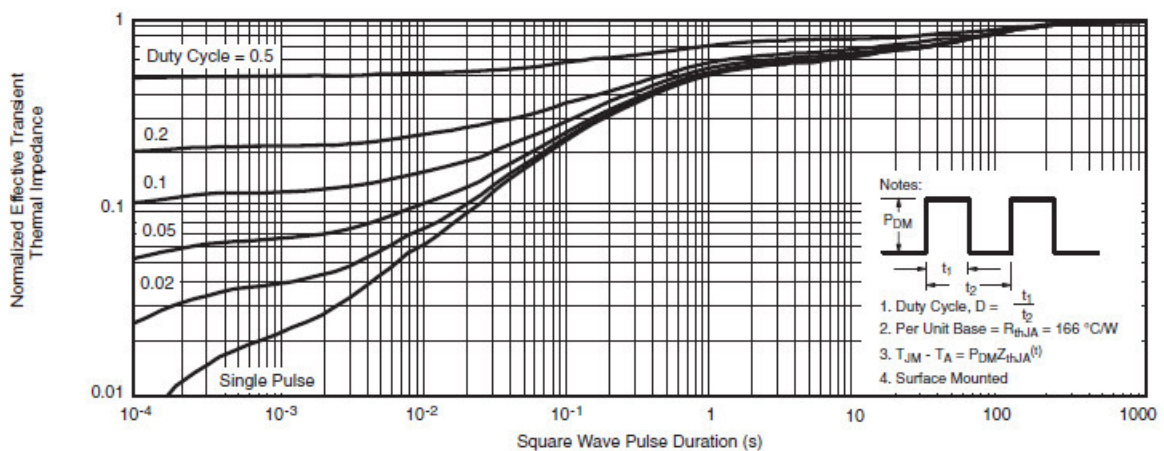
On-Resistance vs. Gate-to-Source Voltage



Threshold Voltage



Single Pulse Power (Junction-to-Ambient)



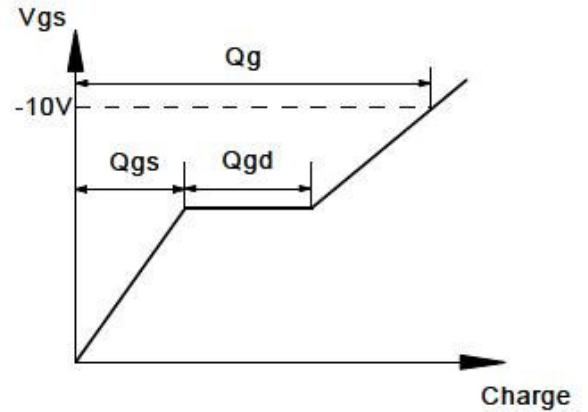
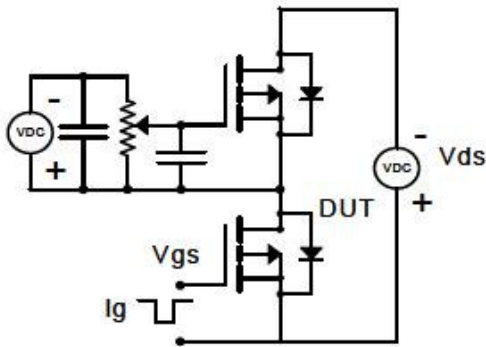
Normalized Thermal Transient Impedance, Junction-to-Ambient

- Notes:
-
- Duty Cycle, $D = \frac{t_1}{t_2}$
 - Per Unit Base = $R_{th,JA} = 166^\circ\text{C/W}$
 - $T_{JM} - T_A = P_{DM}Z_{thJA}(t)$
 - Surface Mounted

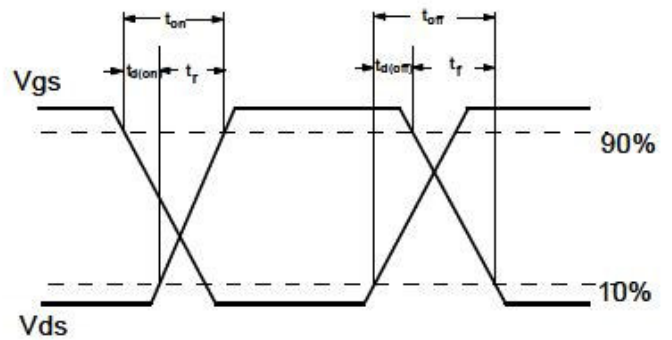
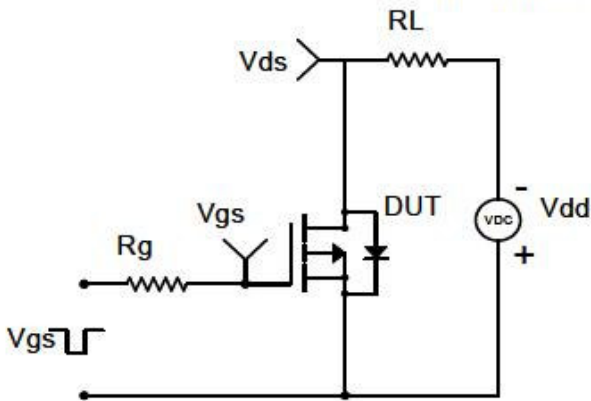


Typical Characteristics

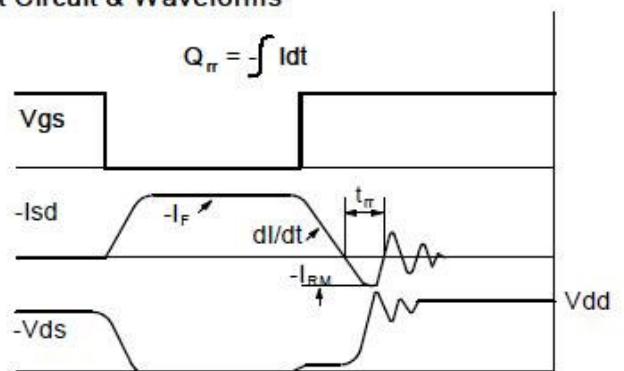
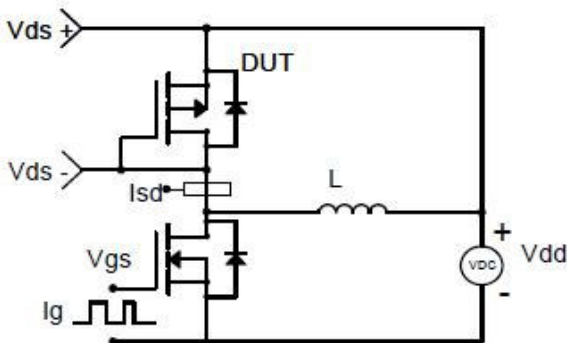
Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveforms

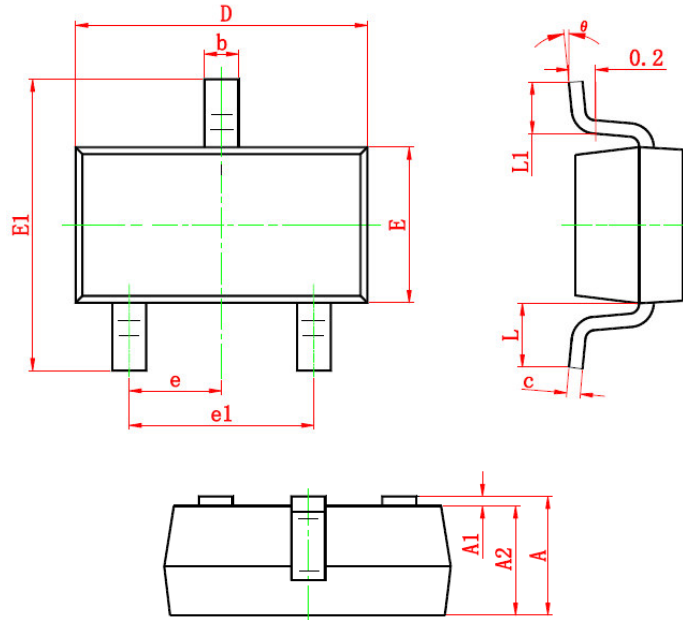


Diode Recovery Test Circuit & Waveforms





Package Information (SOT-23)



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	0.900	1.200	0.035	0.043
A1	0.000	0.100	0.000	0.004
A2	0.900	1.100	0.035	0.039
b	0.300	0.500	0.012	0.020
c	0.080	0.150	0.003	0.006
D	2.800	3.000	0.110	0.118
E	1.200	1.400	0.047	0.055
E1	2.250	2.550	0.089	0.100
e	0.950 TYP		0.037 TYP	
e1	1.800	2.000	0.071	0.079
L	0.550 REF		0.022 REF	
L1	0.300	0.500	0.012	0.020
theta	0°	8°	0°	6°

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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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