Alfa-MOS Technology

AFN123WS
100V N-Channel Enhancement Mode MOSFET

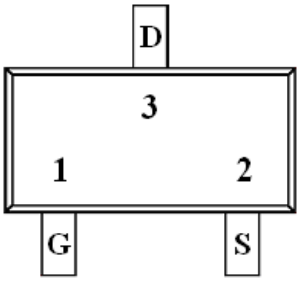
General Description

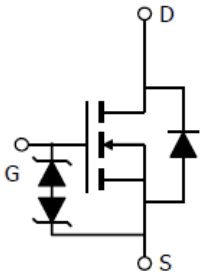
AFN123WS, N-Channel enhancement mode MOSFET, uses Advanced Trench Technology to provide excellent $R_{DS(ON)}$, low gate charge.
These devices are particularly suited for low voltage power management, such as smart phone and notebook computer and other battery powered circuits, and low in-line power loss are needed in commercial industrial surface mount applications.

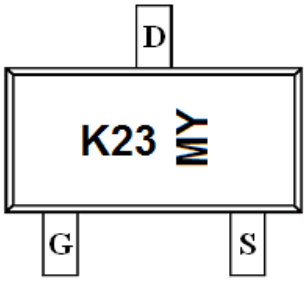
Features

- 100V/0.17A , $R_{DS(ON)}$=5.8Ω@V_{GS}=10V
- 100V/0.17A , $R_{DS(ON)}$=6.8Ω@V_{GS}=4.5V
- Super high density cell design for extremely low RDS (ON)
- Exceptional on-resistance and maximum DC current capability
- ESD Protection Diode design–in
- SOT-323 package design

Pin Description (SOT-323)







Application

- Drivers: Relays, Solenoids, Lamps, Hammers, Display, Memories, Transistors, etc.
- High saturation current capability. Direct Logic-Level Interface: TTL/CMOS
- Battery Operated Systems
- Solid-State Relays

Pin Define

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

Ordering Information

Part Ordering No.	Part Marking	Package	Unit	Quantity
AFN123WSS32RG	K23YM	SOT-323	Tape & Reel	3000 EA

※ K23 Parts code
※ Y Year code (0 ~ 9)
※ M Month code (A ~ L = 1 ~ 12)
※ AFN123WSS32RG : 7” Tape & Reel ; Pb- Free ; Halogen- Free

Absolute Maximum Ratings

(T_A=25℃ Unless otherwise noted)

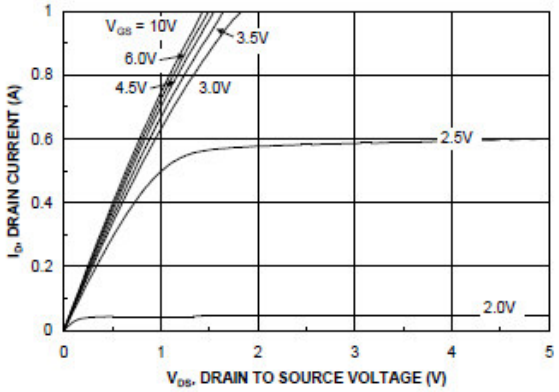
Parameter		Symbol	Typical	Unit
Drain-Source Voltage		V_{DSS}	100	V
Gate –Source Voltage		V_{GSS}	±20	V
Continuous Drain Current(T_J=150℃)	T_A=25℃	I_D	0.17	A
	T_A=70℃		0.17	
Pulsed Drain Current		I_{DM}	0.68	A
Continuous Source Current(Diode Conduction)		I_S	0.4	A
Power Dissipation	T_A=25℃	P_D	0.35	W
	T_A=70℃		0.22	
Operating Junction Temperature		T_J	150	150
Storage Temperature Range		T_{STG}	-55/150	-55/150
Thermal Resistance-Junction to Ambient		$R_{\theta JA}$	120	120

Electrical Characteristics

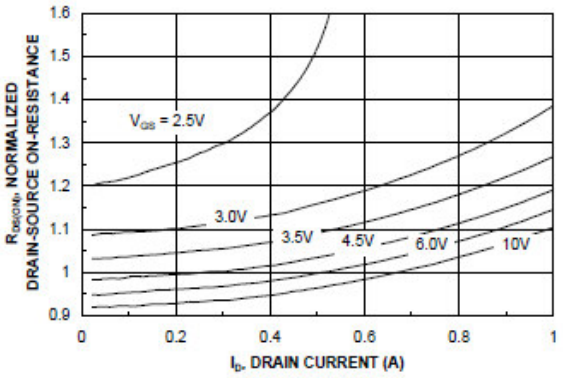
(T_A=25℃ Unless otherwise noted)

Parameter	Symbol	Conditions	Min.	Typ	Max.	Unit
Static						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS}=0V,I_D=250uA	100			V
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS},I_D=250uA	1.0		3.0	
Gate Leakage Current	I_{GSS}	V_{DS}=0V,V_{GS}=±20V			10	uA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=80V,V_{GS}=0V			1	uA
		V_{DS}=80V,V_{GS}=0V T_J=85℃			10	
Drain-Source On-Resistance	$R_{DS(on)}$	V_{GS}=10V,I_D=0.17A		4.0	5.8	Ω
		V_{GS}= 4.5V,I_D=0.17A		4.6	6.8	
Forward Transconductance	g_{FS}	V_{DS}=10V,I_D=0.17A		0.8		S
Diode Forward Voltage	V_{SD}	I_S=0.17A,V_{GS}=0V		0.75	1.3	V
Dynamic						
Total Gate Charge	Q_g	V_{DS}=30V,V_{GS}=10V I_D≡0.22A		1.8	3.5	nC
Gate-Source Charge	Q_{gs}			0.2		
Gate-Drain Charge	Q_{gd}			0.3		
Input Capacitance	C_{iss}	V_{DS}=25V,V_{GS}=0V f=1MHz		70		pF
Output Capacitance	C_{oss}			8		
Reverse Transfer Capacitance	C_{rss}			5		
Turn-On Time	$t_{d(on)}$	V_{DD}=30V,R_G=50Ω I_D≡0.28A,V_{GEN}=10V		5	10	ns
	t_r			5	10	
Turn-Off Time	$t_{d(off)}$			7	15	
	t_f			10	20	

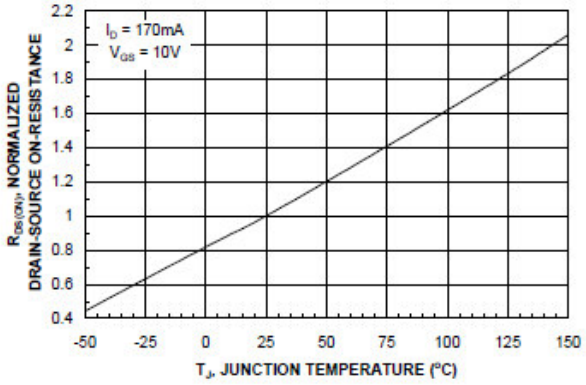
Typical Characteristics



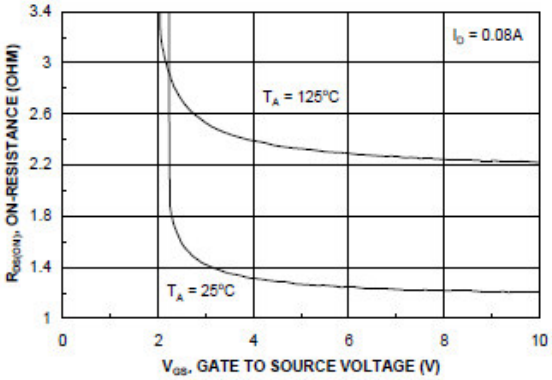
On-Region Characteristics



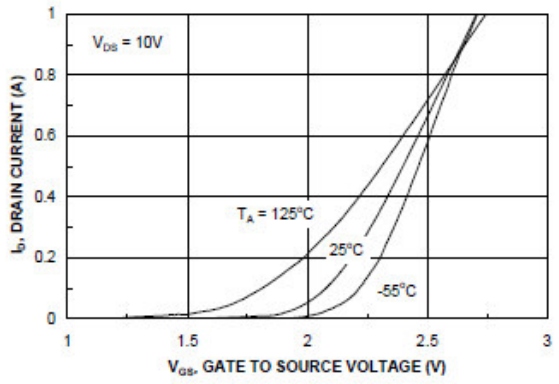
On-Resistance Variation with Drain Current and Gate Voltage



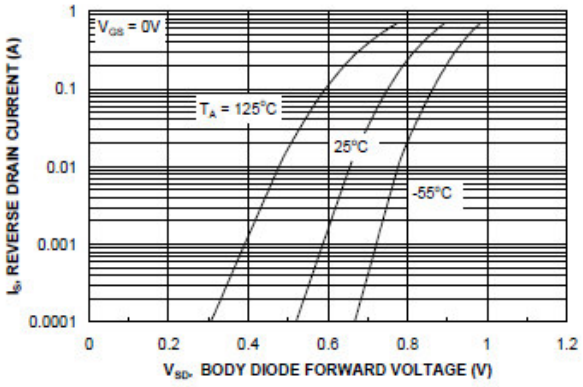
On-Resistance Variation with Temperature



On-Resistance Variation with Gate-to-Source Voltage

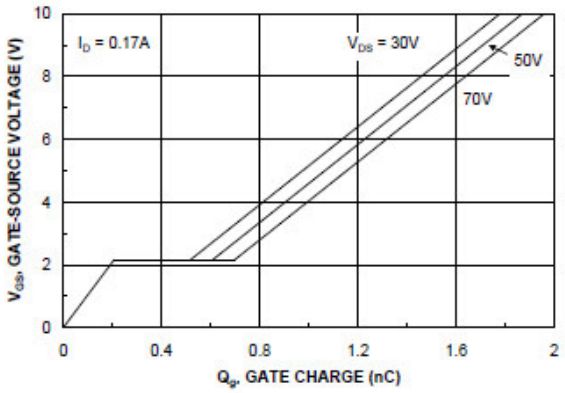


Transfer Characteristics

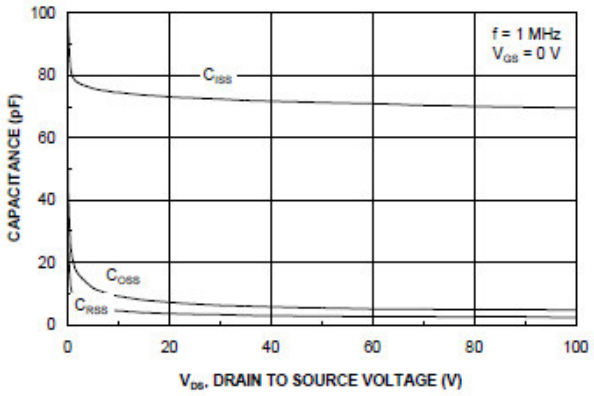


Body Diode Forward Voltage Variation with Source Current and Temperature

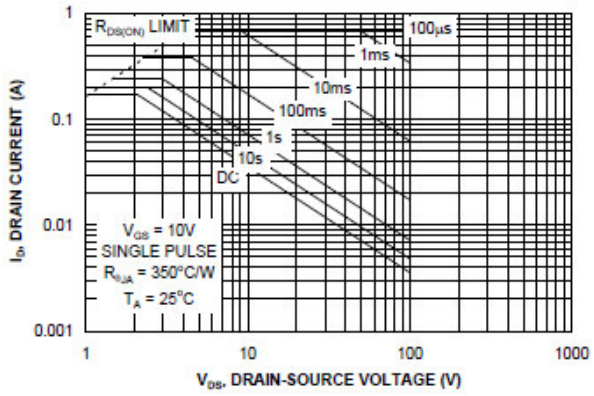
Typical Characteristics



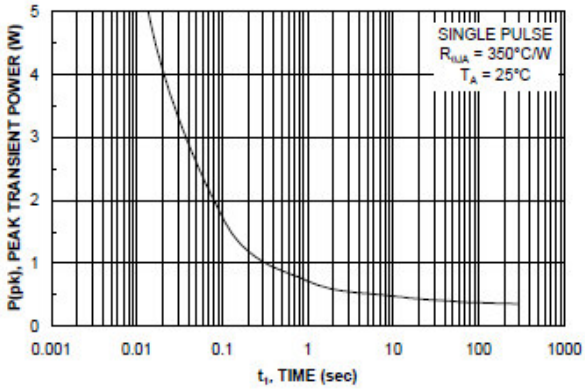
Gate Charge Characteristics



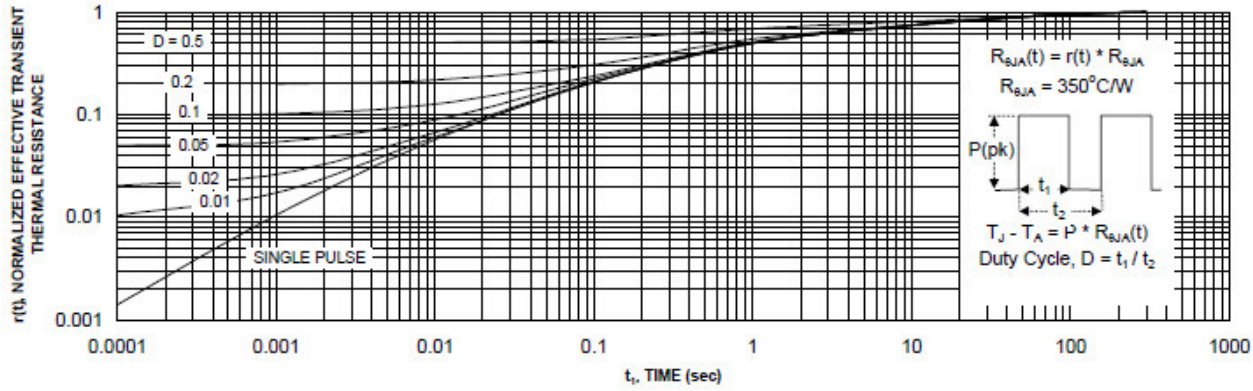
Capacitance Characteristics



Maximum Safe Operating Area



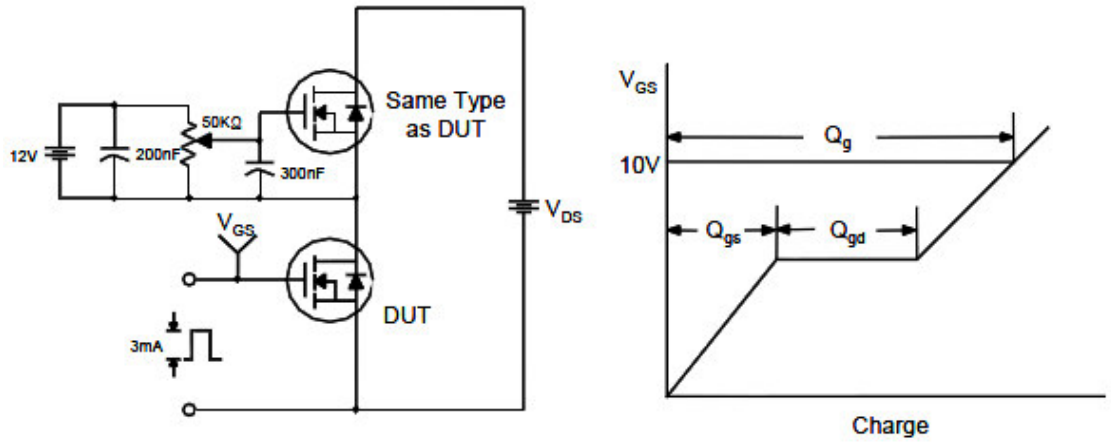
Single Pulse Maximum Power Dissipation



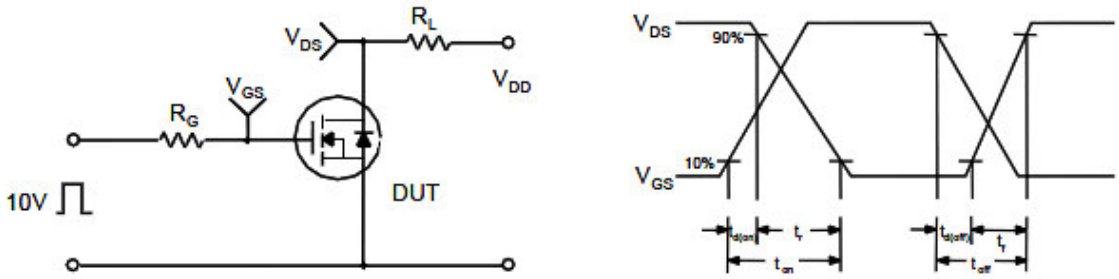
Transient Thermal Response Curve, Junction to Ambient

Typical Characteristics

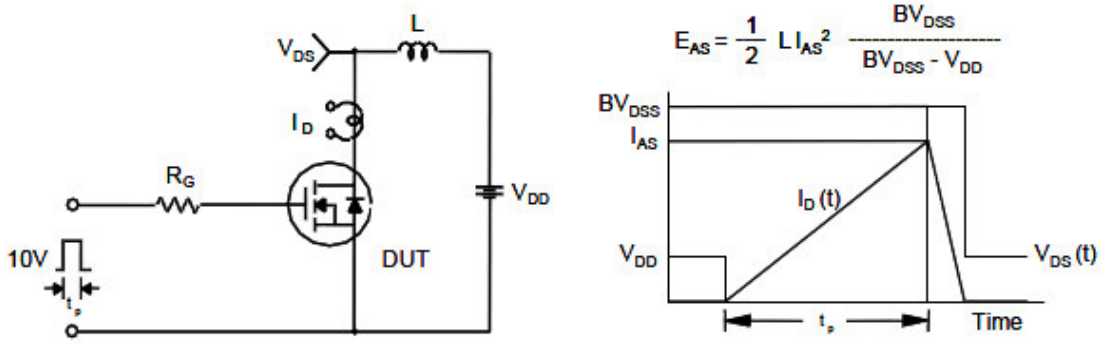
Gate Charge Test Circuit & Waveform



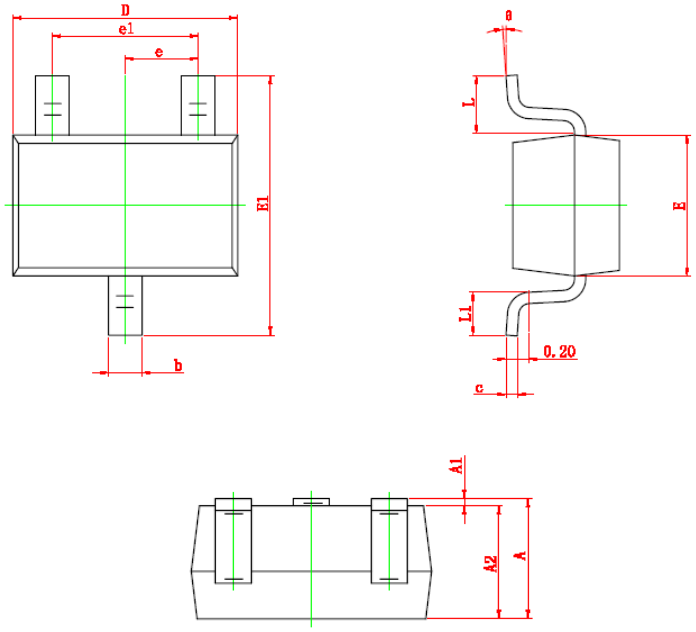
Resistive Switching Test Circuit & Waveforms



Unclamped Inductive Switching Test Circuit & Waveforms



Package Information (SOT-323)



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	0.200	0.400	0.008	0.016
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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