



## General Description

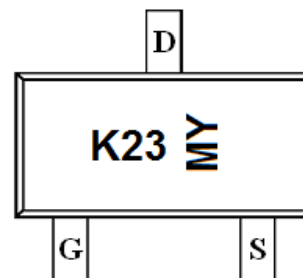
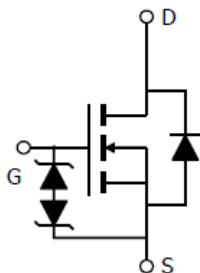
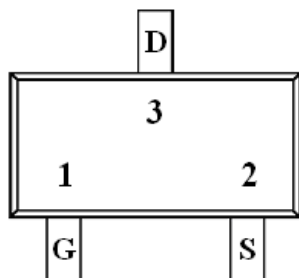
AFN123AS, N-Channel enhancement mode MOSFET, uses Advanced Trench Technology to provide excellent  $R_{DS(ON)}$ , low gate charge.

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

- $I_D=0.17A$ ,  $R_{DS(ON)}=5.8\Omega@V_{GS}=10V$
- $I_D=0.17A$ ,  $R_{DS(ON)}=6.8\Omega@V_{GS}=4.5V$
- Super high density cell design for extremely low RDS (ON)
- Exceptional on-resistance and maximum DC current capability
- ESD Protection Diode design-in
- SOT-23 package design

## Pin Description ( SOT-23 )



## 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
AFN123ASS23RG	K23YM	SOT-23	Tape & Reel	3000 EA

- ※ K23 Parts code
- ※ Y Year code ( 0 ~ 9 )
- ※ M Month code ( A ~ L = 1 ~ 12 )
- ※ AFN123ASS23RG : 7" Tape & Reel ; Pb- Free ; Halogen -Free



**Absolute Maximum Ratings**

(T<sub>A</sub>=25°C Unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V <sub>DSS</sub>	100	V
Gate –Source Voltage	V <sub>GSS</sub>	±20	V
Continuous Drain Current(T <sub>J</sub> =150°C)	I <sub>D</sub>	T <sub>A</sub> =25°C	0.17
		T <sub>A</sub> =70°C	0.17
Pulsed Drain Current	I <sub>DM</sub>	0.68	A
Continuous Source Current(Diode Conduction)	I <sub>S</sub>	0.45	A
Power Dissipation	P <sub>D</sub>	T <sub>A</sub> =25°C	1.25
		T <sub>A</sub> =70°C	0.8
Operating Junction Temperature	T <sub>J</sub>	150	°C
Storage Temperature Range	T <sub>STG</sub>	-55/150	°C
Thermal Resistance-Junction to Ambient	R <sub>θJA</sub>	120	°C/W

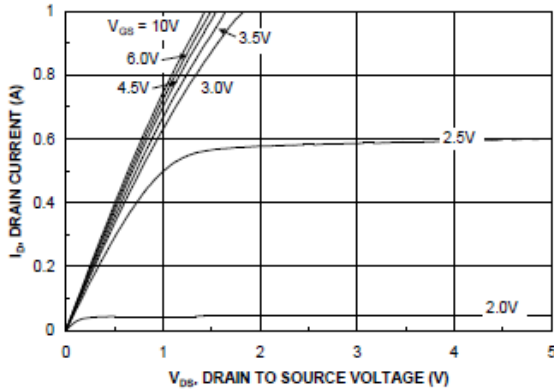
**Electrical Characteristics**

(T<sub>A</sub>=25°C Unless otherwise noted)

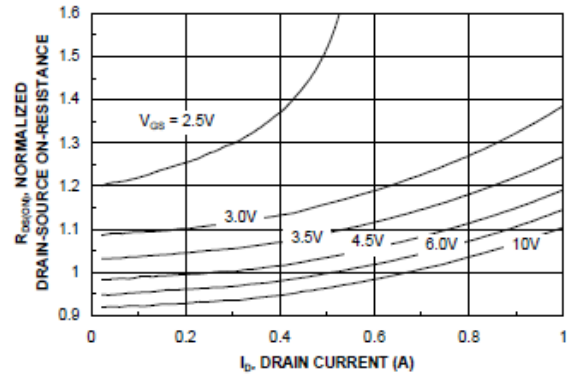
Parameter	Symbol	Conditions	Min.	Typ	Max.	Unit
<b>Static</b>						
Drain-Source Breakdown Voltage	V <sub>(BR)DSS</sub>	V <sub>GS</sub> =0V, I <sub>D</sub> =250uA	100			V
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250uA	1.0		2.0	
Gate Leakage Current	I <sub>GSS</sub>	V <sub>DS</sub> =0V, V <sub>GS</sub> =±20V			10	uA
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> =80V, V <sub>GS</sub> =0V			1	uA
		V <sub>DS</sub> =80V, V <sub>GS</sub> =0V T <sub>J</sub> =85°C			10	
Drain-Source On-Resistance	R <sub>DS(on)</sub>	V <sub>GS</sub> =10V, I <sub>D</sub> =0.17A		4.0	5.8	Ω
		V <sub>GS</sub> = 4.5V, I <sub>D</sub> =0.17A		4.6	6.8	
Forward Transconductance	g <sub>FS</sub>	V <sub>DS</sub> =10V, I <sub>D</sub> =0.17A		0.8		S
Diode Forward Voltage	V <sub>SD</sub>	I <sub>S</sub> =0.17A, V <sub>GS</sub> =0V		0.75	1.3	V
<b>Dynamic</b>						
Total Gate Charge	Q <sub>g</sub>	V <sub>DS</sub> =30V, V <sub>GS</sub> =10V I <sub>D</sub> ≧0.22A		1.8	3.5	nC
Gate-Source Charge	Q <sub>gs</sub>			0.2		
Gate-Drain Charge	Q <sub>gd</sub>			0.3		
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> =25V, V <sub>GS</sub> =0V f=1MHz		70		pF
Output Capacitance	C <sub>oss</sub>			8		
Reverse Transfer Capacitance	C <sub>rss</sub>			5		
Turn-On Time	t <sub>d(on)</sub>	V <sub>DD</sub> =30V, R <sub>G</sub> =50Ω I <sub>D</sub> ≧0.28A, V <sub>GEN</sub> =10V		5	10	ns
	t <sub>r</sub>			5	10	
Turn-Off Time	t <sub>d(off)</sub>			7	15	
	t <sub>f</sub>			10	20	



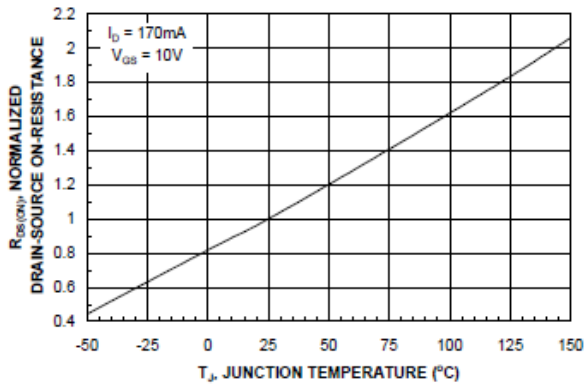
## Typical Characteristics



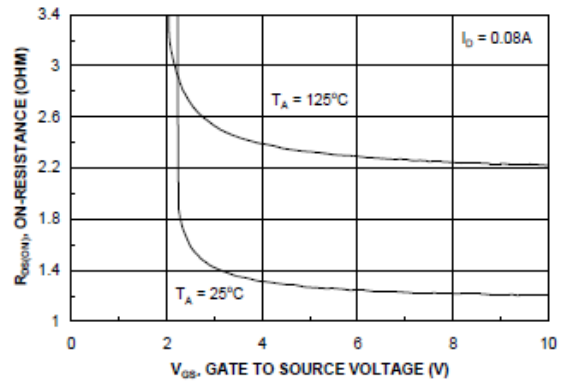
On-Region Characteristics



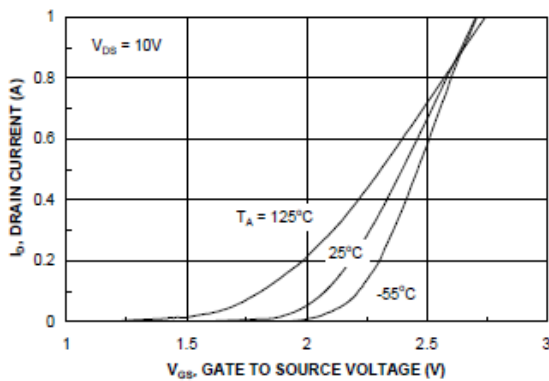
On-Resistance Variation with  
Drain Current and Gate Voltage



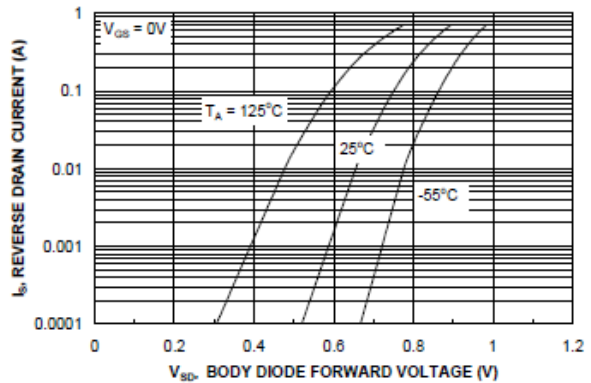
On-Resistance Variation with Temperature



On-Resistance Variation with  
Gate-to-Source Voltage



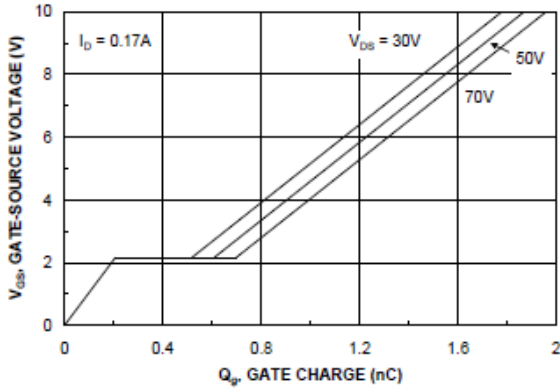
Transfer Characteristics



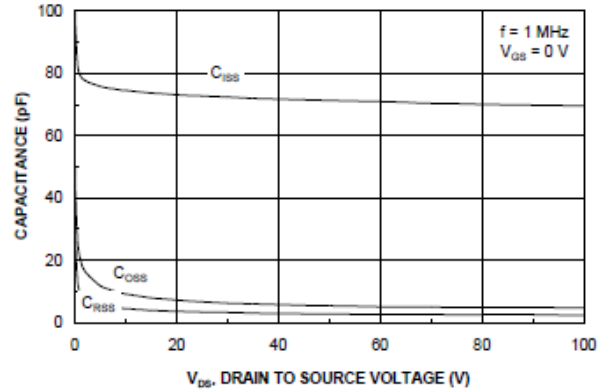
Body Diode Forward Voltage Variation  
with Source Current and Temperature



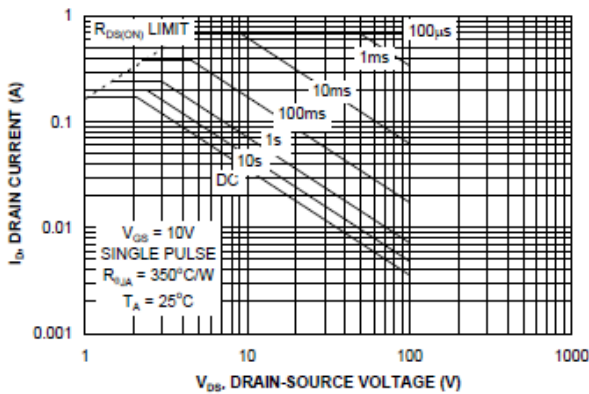
## Typical Characteristics



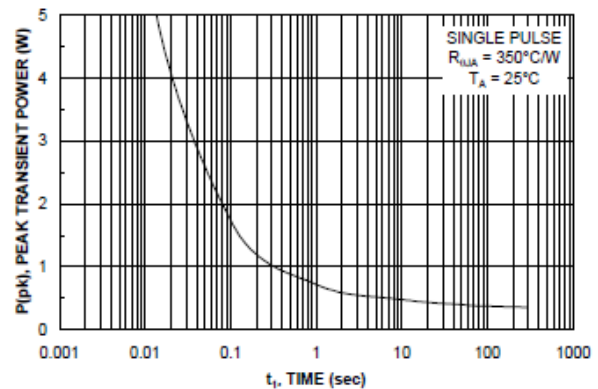
Gate Charge Characteristics



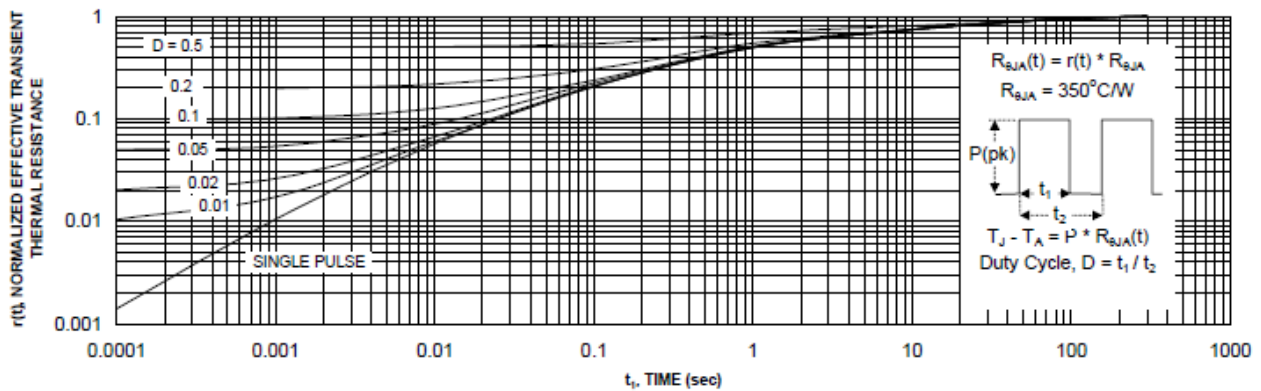
Capacitance Characteristics



Maximum Safe Operating Area



Single Pulse Maximum Power Dissipation

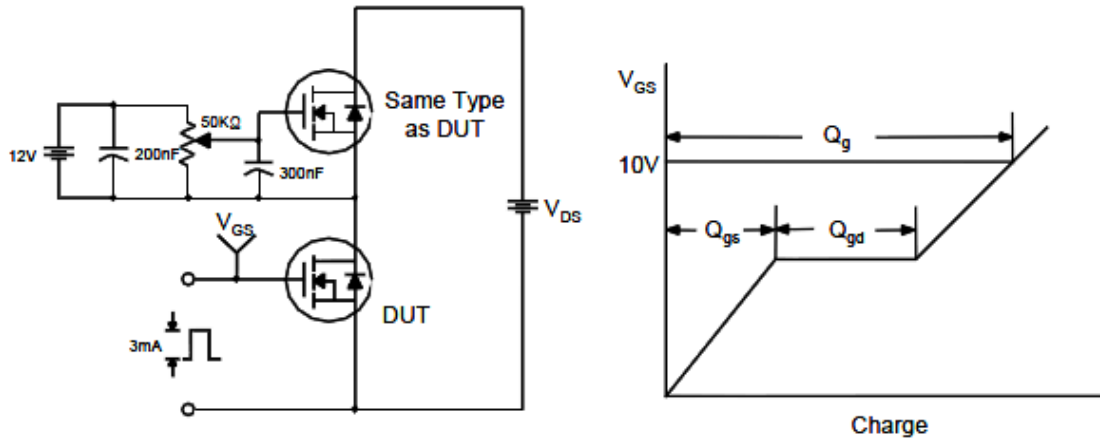


Transient Thermal Response Curve, Junction to Ambient

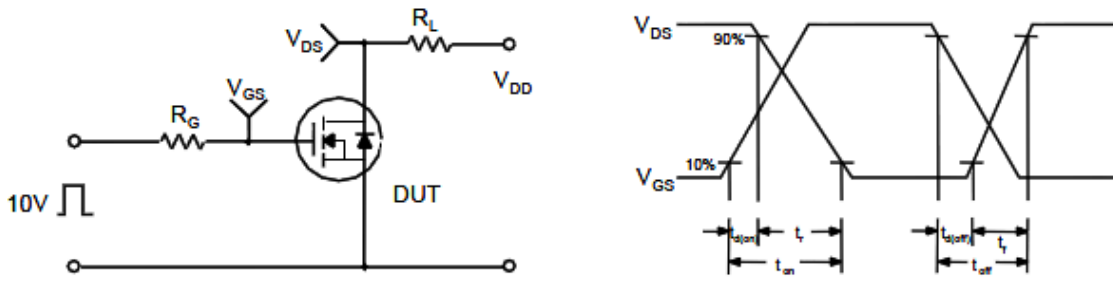


**Typical Characteristics**

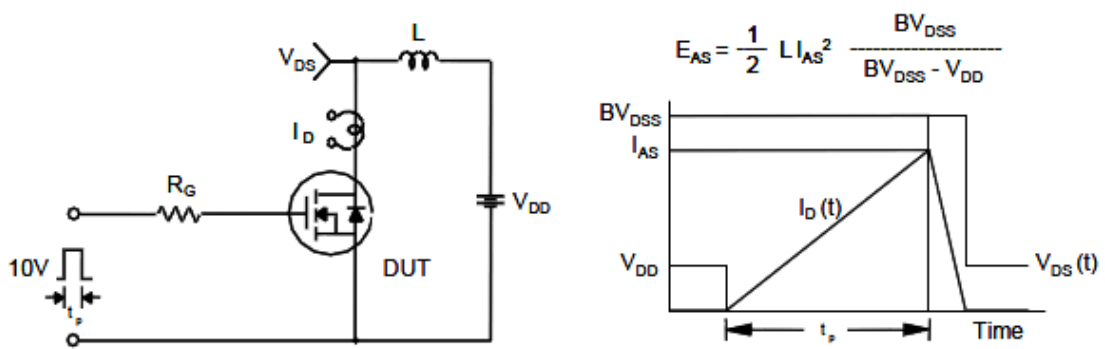
Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveforms

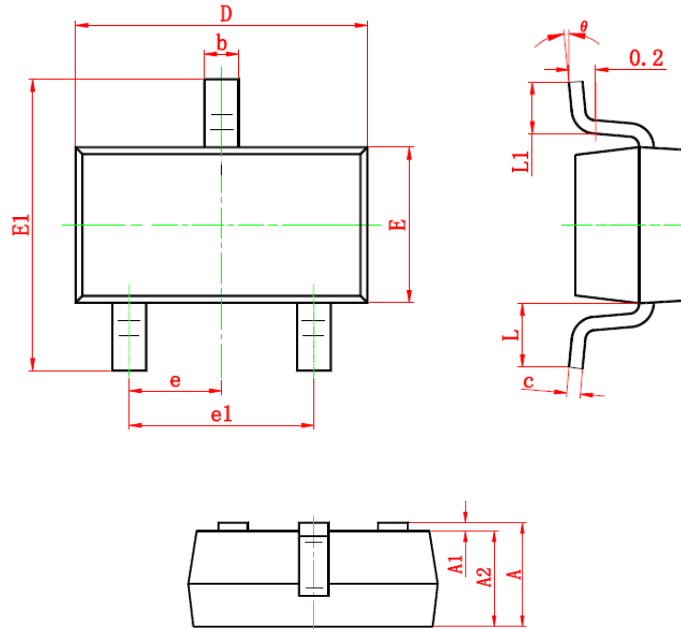


Unclamped Inductive Switching Test Circuit & Waveforms





**Package Information ( SOT-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
θ	0°	8°	0°	6°

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