Alfa-MOS Technology

AFN1330KS
60V N-Channel Enhancement Mode MOSFET

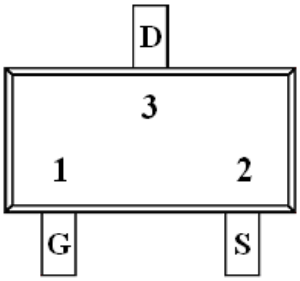
General Description

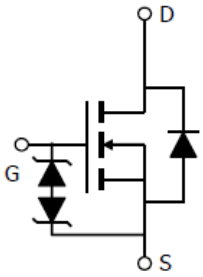
AFN1330KS, N-Channel enhancement mode MOSFET, uses Advanced Trench Technology to provide excellent $R_{DS(ON)}$, low gate charge.
These devices are particularly suited for low voltage power management, such as smart phone and notebook computer and other battery powered circuits, and low in-line power loss are needed in commercial industrial surface mount applications.

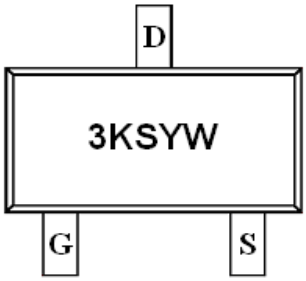
Features

- 60V/0.5A , $R_{DS(ON)}$=2.4Ω@V_{GS}=10V
- 60V/0.3A , $R_{DS(ON)}$=3.0Ω@V_{GS}=4.5V
- Super high density cell design for extremely low RDS (ON)
- Exceptional on-resistance and maximum DC current capability
- ESD Protection (2KV) 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
AFN1330KSS32RG	3KSYW	SOT-323	Tape & Reel	3000 EA

※ 3KS Parts code
※ Y Year code (0 ~ 9)
※ W Week code (A ~ Z = 1 ~ 26 / a ~ z = 27 ~ 52)
※ AFN1330KSS32RG : 7” Tape & Reel ; Pb- Free ; Halogen- Free

Absolute Maximum Ratings

(T_A=25℃ Unless otherwise noted)

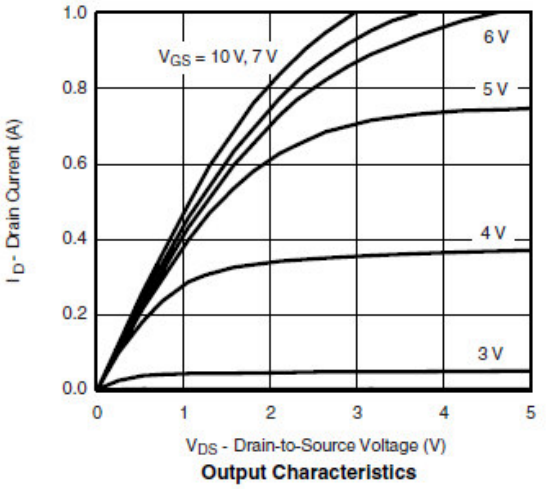
Parameter		Symbol	Typical	Unit
Drain-Source Voltage		V_{DSS}	60	V
Gate –Source Voltage		V_{GSS}	±20	V
Continuous Drain Current(T_J=150℃)	T_A=25℃	I_D	0.5	A
	T_A=70℃		0.3	
Pulsed Drain Current		I_{DM}	1.0	A
Continuous Source Current(Diode Conduction)		I_S	0.4	A
Power Dissipation	T_A=25℃	P_D	0.35	W
	T_A=70℃		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

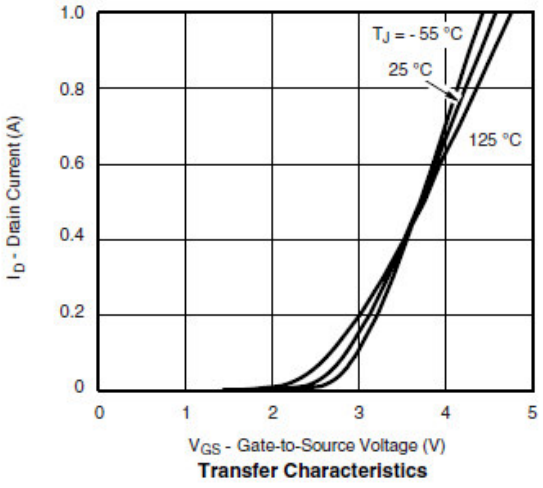
(T_A=25℃ Unless otherwise noted)

Parameter	Symbol	Conditions	Min.	Typ	Max.	Unit
Static						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS}=0V,I_D=250uA	60			V
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS},I_D=250uA	1.0		2.0	
Gate Leakage Current	I_{GSS}	V_{DS}=0V,V_{GS}=±20V			3	uA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=60V,V_{GS}=0V			1	uA
		V_{DS}=60V,V_{GS}=0V T_J=85℃			10	
Drain-Source On-Resistance	$R_{DS(on)}$	V_{GS}=10V,I_D=0.5A		1.2	2.4	Ω
		V_{GS}= 4.5V,I_D=0.3A		1.6	3.0	
Forward Transconductance	g_{FS}	V_{DS}=10V,I_D=0.2A		0.2		S
Diode Forward Voltage	V_{SD}	I_S=0.2A,V_{GS}=0V		0.75	1.4	V
Dynamic						
Total Gate Charge	Q_g	V_{DS}=10V,V_{GS}=4.5V I_D≡0.25A		450		pC
Gate-Source Charge	Q_{gs}			110		
Gate-Drain Charge	Q_{gd}			150		
Input Capacitance	C_{iss}	V_{DS}=25V,V_{GS}=0V f=1MHz		30		pF
Output Capacitance	C_{oss}			8		
Reverse Transfer Capacitance	C_{rss}			5		
Turn-On Time	$t_{d(on)}$	V_{DD}=30V,R_L=150Ω I_D≡0.2A,V_{GEN}=10V R_G=10Ω		4	10	ns
	t_r			5	15	
Turn-Off Time	$t_{d(off)}$			12	20	
	t_f			10	20	

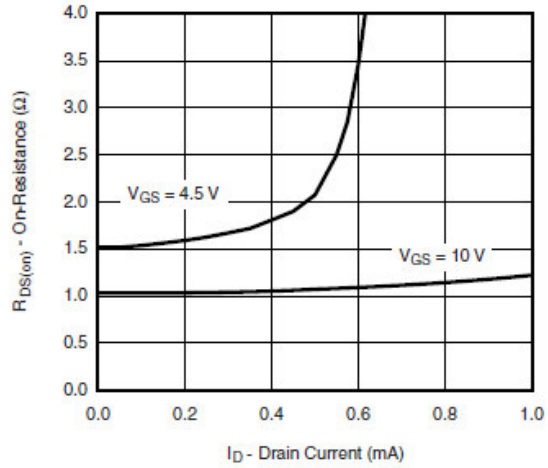
Typical Characteristics



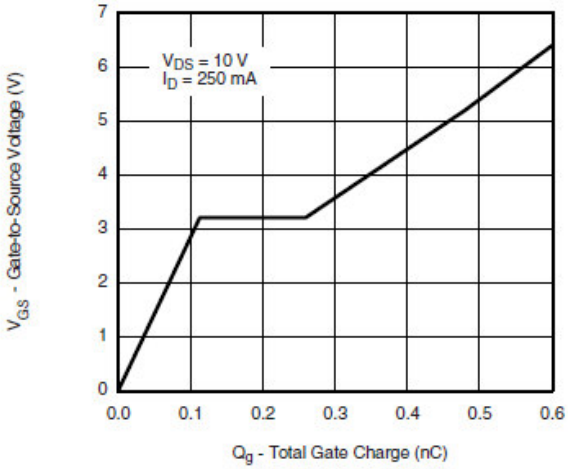
Output Characteristics



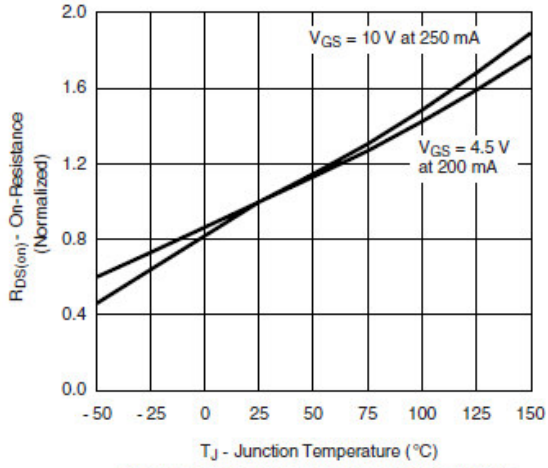
Transfer Characteristics



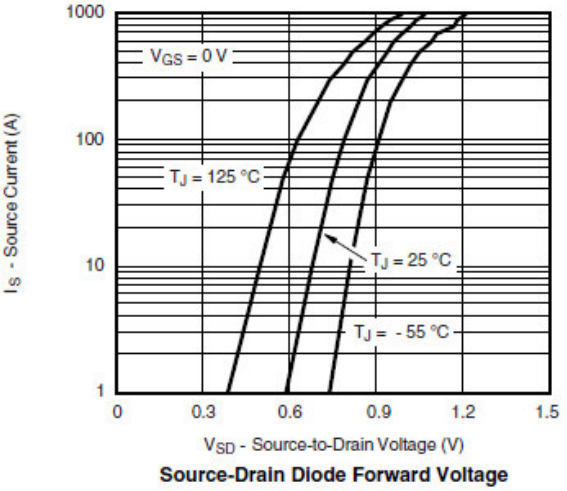
On-Resistance vs. Drain Current



Gate Charge

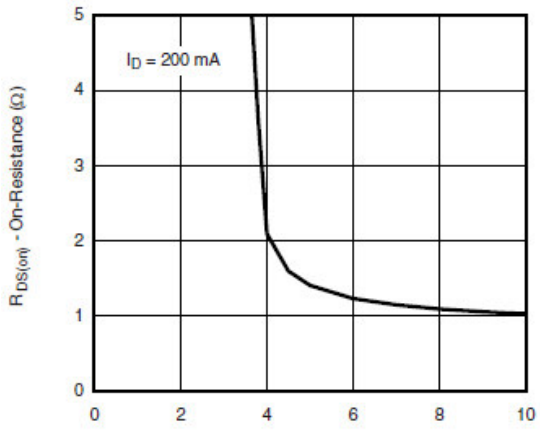


On-Resistance vs. Junction Temperature

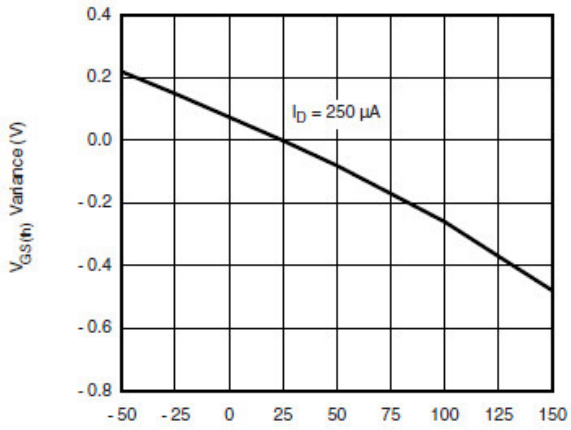


Source-Drain Diode Forward Voltage

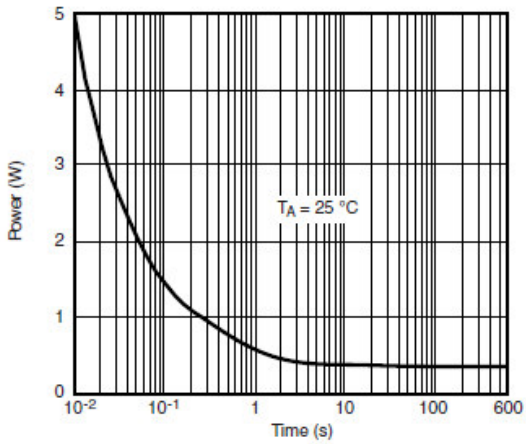
Typical Characteristics



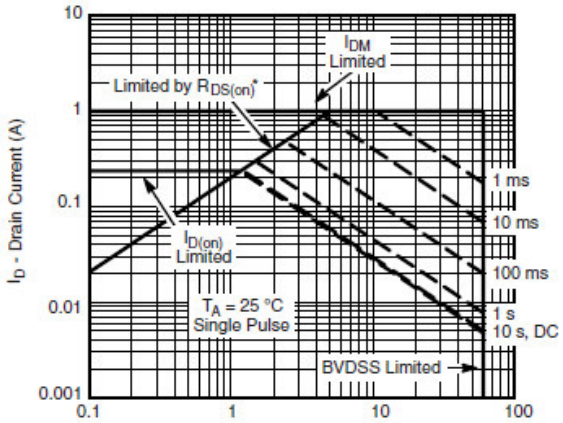
On-Resistance vs. Gate-Source Voltage



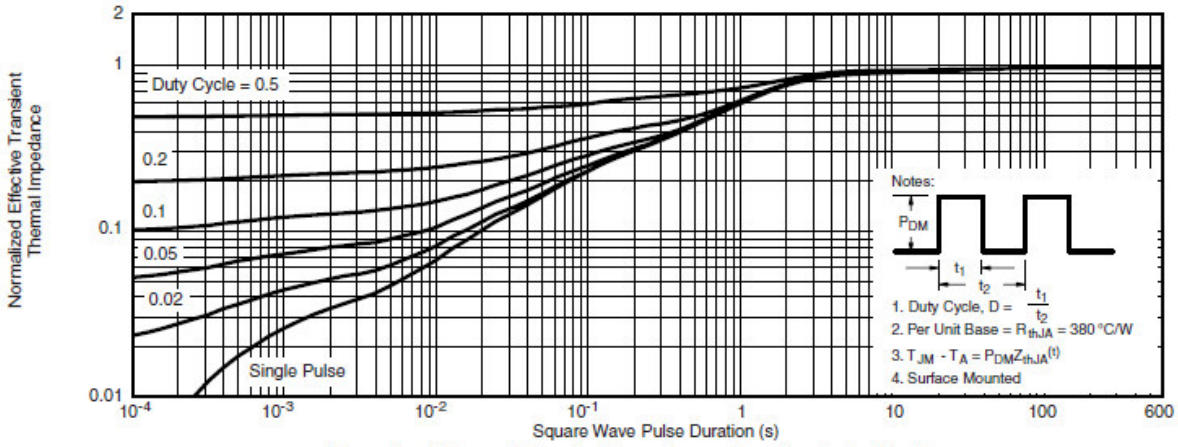
Threshold Voltage Variance over Temperature



Single Pulse Power



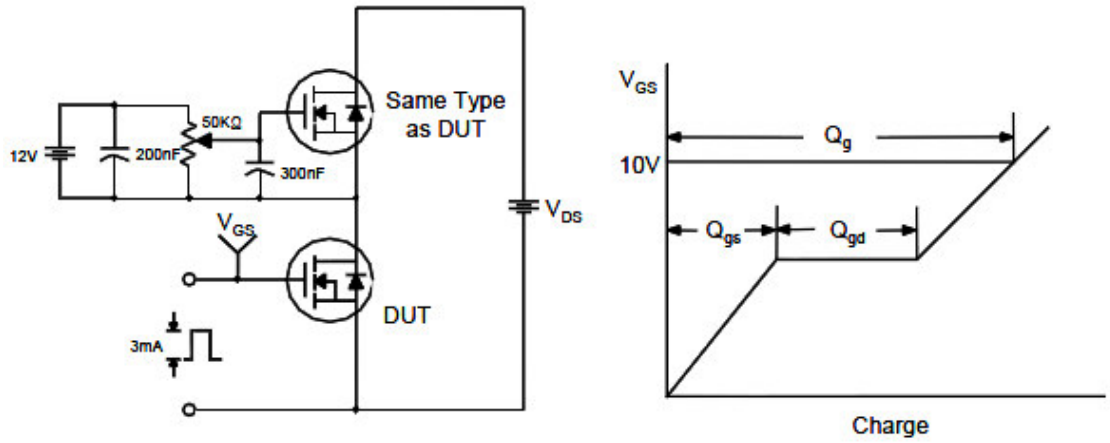
Safe Operating Area



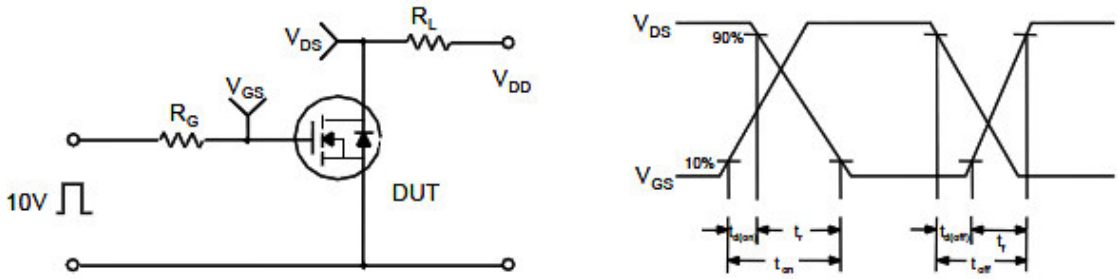
Normalized Thermal Transient Impedance, Junction-to-Ambient

Typical Characteristics

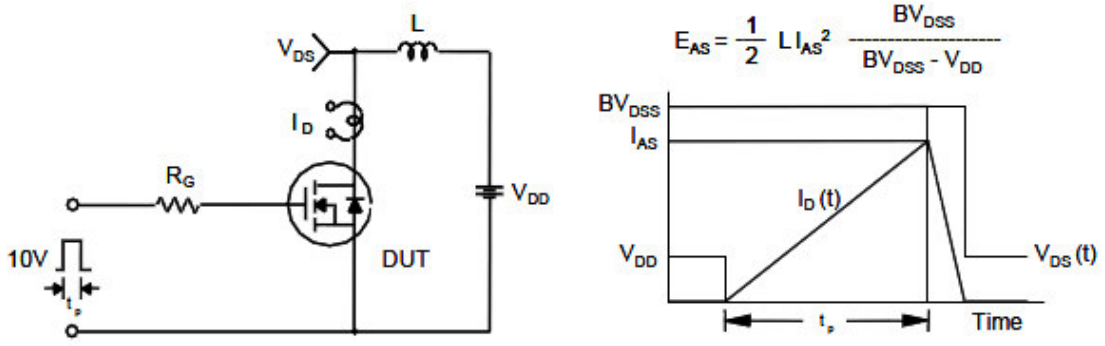
Gate Charge Test Circuit & Waveform



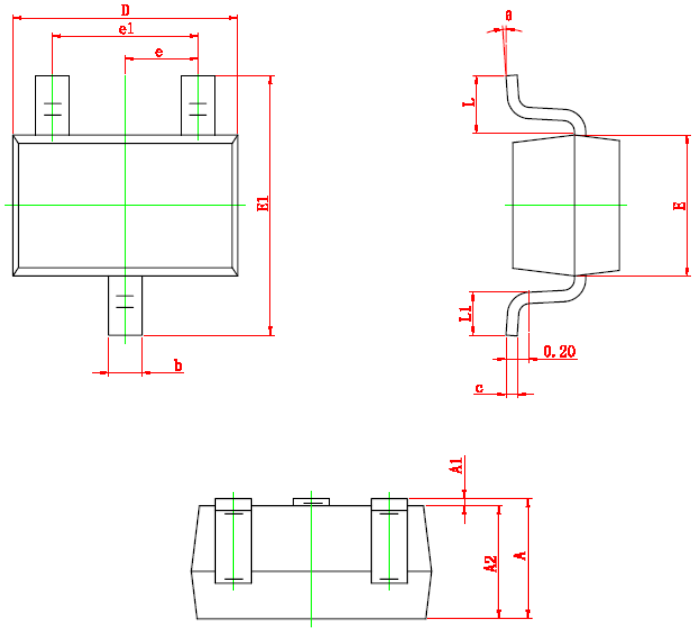
Resistive Switching Test Circuit & Waveforms



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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