Alfa-MOS Technology

AFN1424
20V N-Channel Enhancement Mode MOSFET

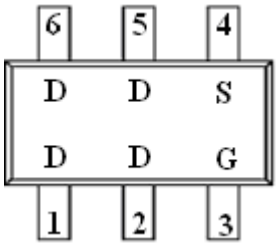
General Description

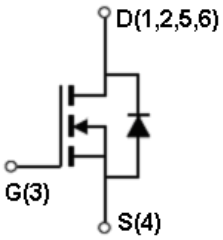
AFN1424, N-Channel enhancement mode MOSFET, uses Advanced Trench Technology to provide excellent $R_{DS(ON)}$, low gate charge.
These devices are particularly suited for low voltage power management, such as smart phone and notebook computer and other battery powered circuits, and low in-line power loss are needed in commercial industrial surface mount applications.

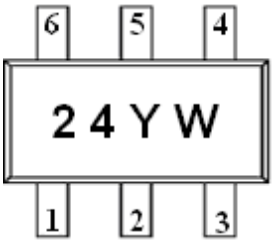
Features

- 20V/5.0A,$R_{DS(ON)}$=30mΩ@V_{GS}=4.5V
- 20V/3.2A,$R_{DS(ON)}$=36mΩ@V_{GS}=2.5V
- 20V/2.4A,$R_{DS(ON)}$=46mΩ@V_{GS}=1.8V
- Super high density cell design for extremely low $R_{DS\ (ON)}$
- Exceptional on-resistance and maximum DC current capability
- SOT-363 package design

Pin Description (SOT-363)







Application

- Portable Equipment
- Battery Powered System
- Net Working System

Pin Define

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

Ordering Information

Part Ordering No.	Part Marking	Package	Unit	Quantity
AFN1424S36RG	24YW	SOT-363	Tape & Reel	3000 EA

※ 24 parts code
※ Y year code (0 ~ 9)
※ W week code (A ~ Z = 1 ~ 26 / a ~ z = 27 ~ 52)
※ AFN1424S36RG : 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}	20	V
Gate –Source Voltage		V_{GSS}	±12	V
Continuous Drain Current(T_J=150℃)	T_A=25℃	I_D	4.0	A
	T_A=70℃		3.2	
Pulsed Drain Current		I_{DM}	10	A
Continuous Source Current(Diode Conduction)		I_S	0.9	A
Power Dissipation	T_A=25℃	P_D	1.0	W
	T_A=70℃		0.52	
Operating Junction Temperature		T_J	150	℃
Storage Temperature Range		T_{STG}	-55/150	℃
Thermal Resistance-Junction to Ambient		$R_{\theta JA}$	120	℃/W

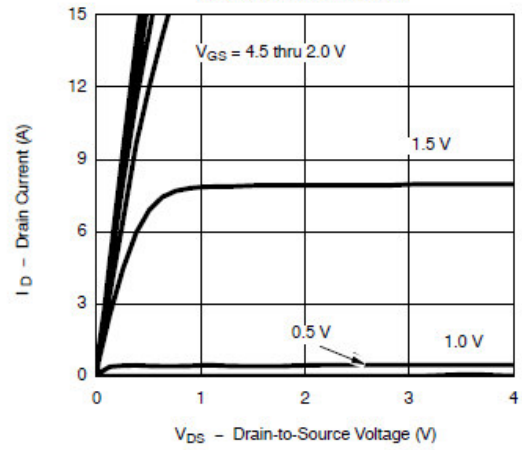
Electrical Characteristics

(T_A=25℃ Unless otherwise noted)

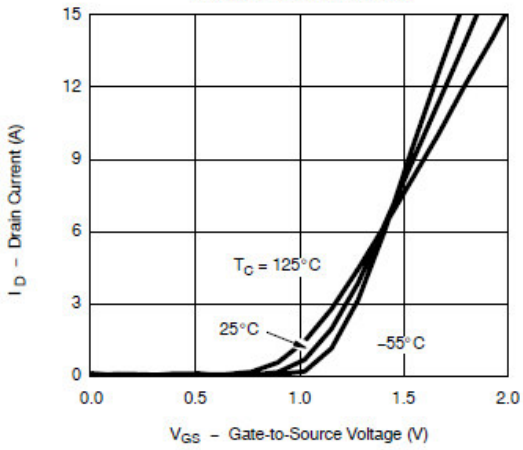
Parameter	Symbol	Conditions	Min.	Typ	Max.	Unit
Static						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS}=0V,I_D=250uA	20			V
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS},I_D=250uA	0.45		0.85	
Gate Leakage Current	I_{GSS}	V_{DS}=0V,V_{GS}=±12V			±100	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=16V,V_{GS}=0V			1	uA
		V_{DS}=16V,V_{GS}=0V T_J=85℃			10	
On-State Drain Current	$I_{D(on)}$	V_{DS}≧5V,V_{GS}=4.5V	6			A
		V_{DS}≧5V,V_{GS}=2.5V	4			
Drain-Source On-Resistance	$R_{DS(on)}$	V_{GS}=4.5V,I_D=5.0A		25	30	mΩ
		V_{GS}=2.5V,I_D=3.2A		29	36	
		V_{GS}=1.8V,I_D=2.4A		37	46	
Forward Transconductance	g_{FS}	V_{DS}=5V,I_D=3.6A		10		S
Diode Forward Voltage	V_{SD}	I_S=1.6A,V_{GS}=0V		0.85	1.2	V
Dynamic						
Total Gate Charge	Q_g	V_{DS}=10V,V_{GS}=4.5V I_D≡4.0A		11	15	nC
Gate-Source Charge	Q_{gs}			1.2		
Gate-Drain Charge	Q_{gd}			2.5		
Input Capacitance	C_{iss}	V_{DS}=10V,V_{GS}=0V f=1MHz		600		pF
Output Capacitance	C_{oss}			205		
Reverse Transfer Capacitance	C_{rss}			60		
Turn-On Time	$t_{d(on)}$	V_{DD}=10V,R_L=5.5Ω I_D≡4.0A,V_{GEN}=4.5V R_G=6Ω		15	25	ns
	t_r			40	60	
Turn-Off Time	$t_{d(off)}$			48	70	
	t_f			30	45	

Typical Characteristics

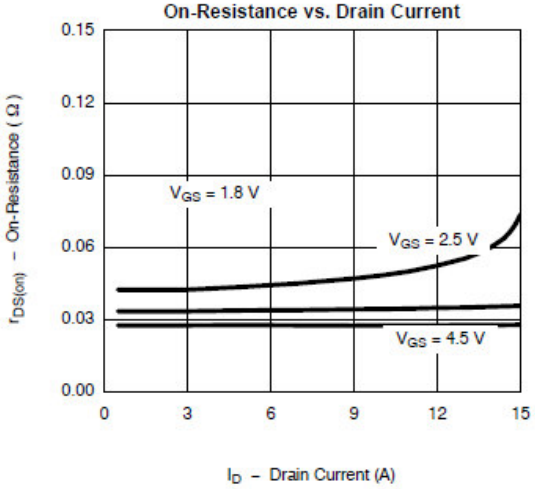
Output Characteristics



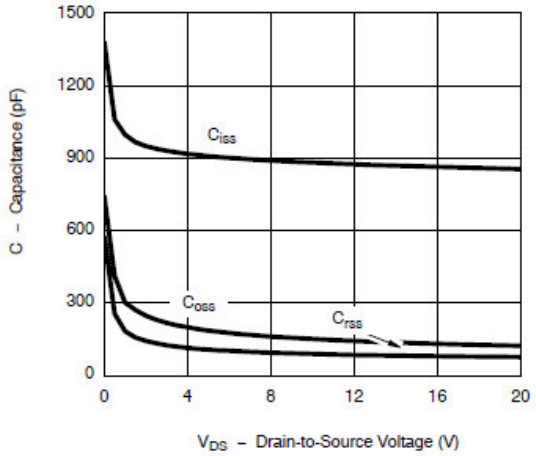
Transfer Characteristics



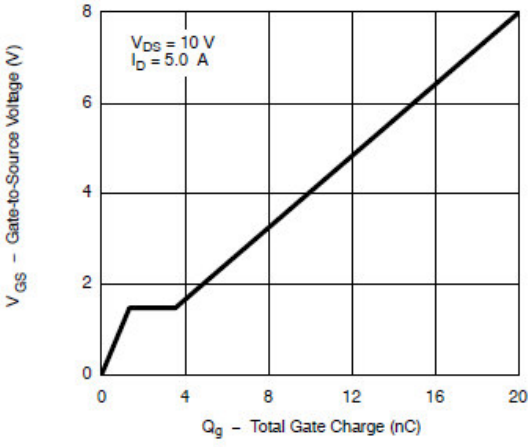
On-Resistance vs. Drain Current



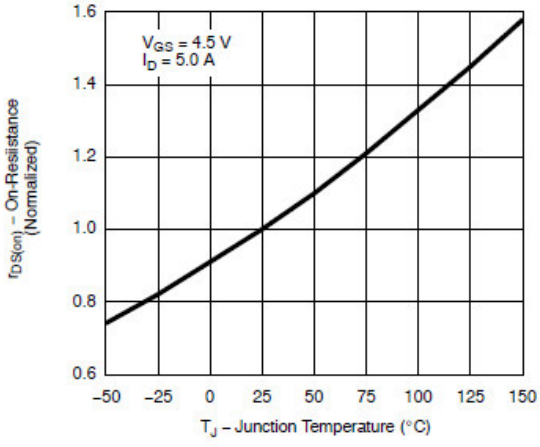
Capacitance



Gate Charge

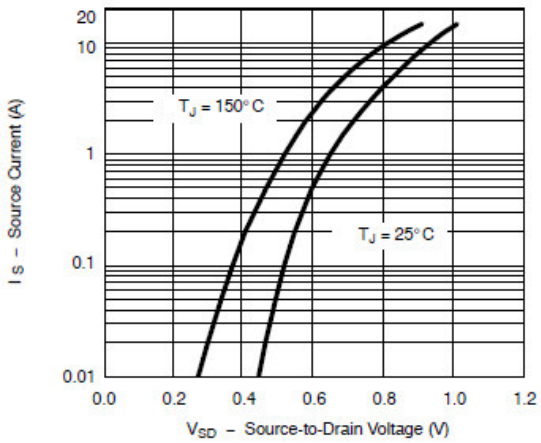


On-Resistance vs. Junction Temperature

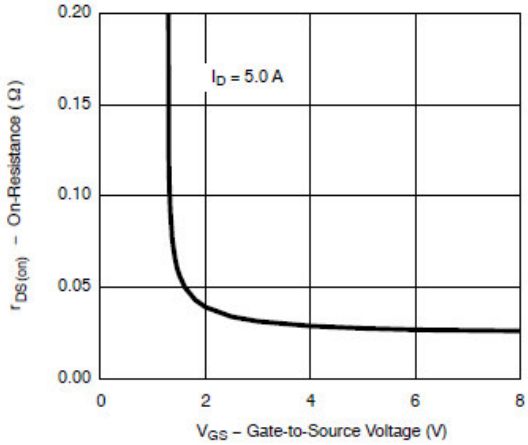


Typical Characteristics

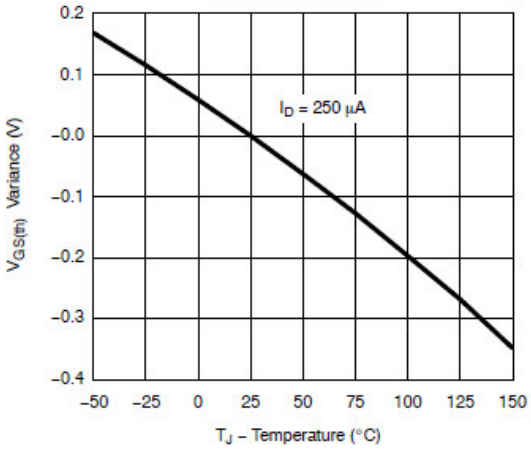
Source-Drain Diode Forward Voltage



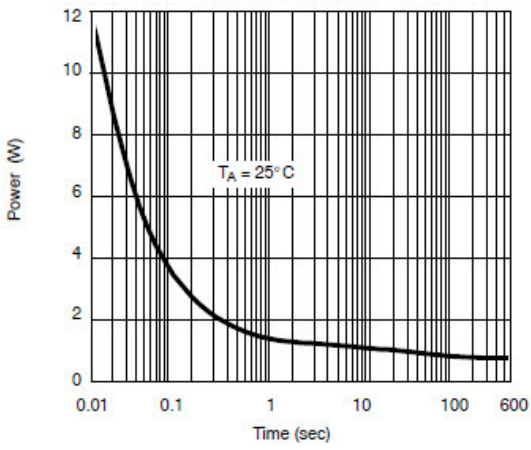
On-Resistance vs. Gate-to-Source Voltage



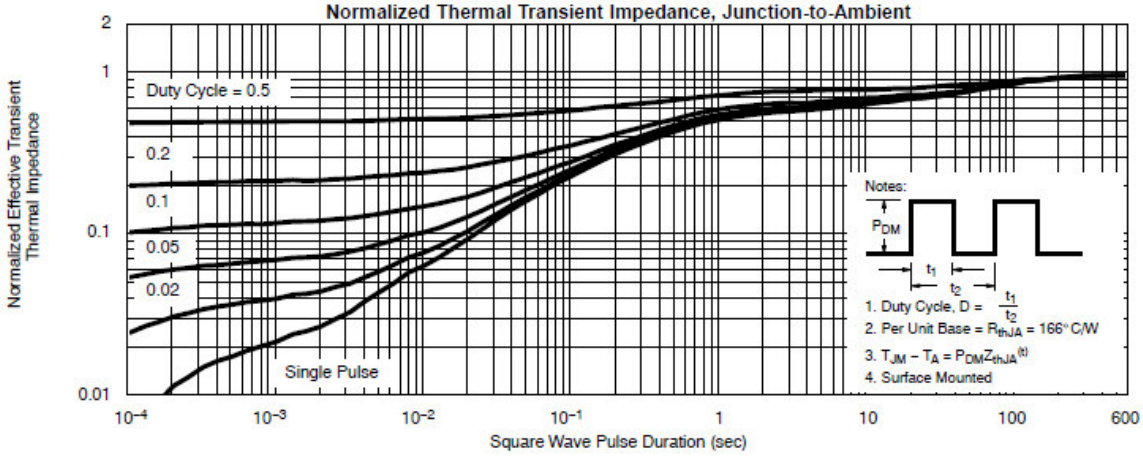
Threshold Voltage



Single Pulse Power

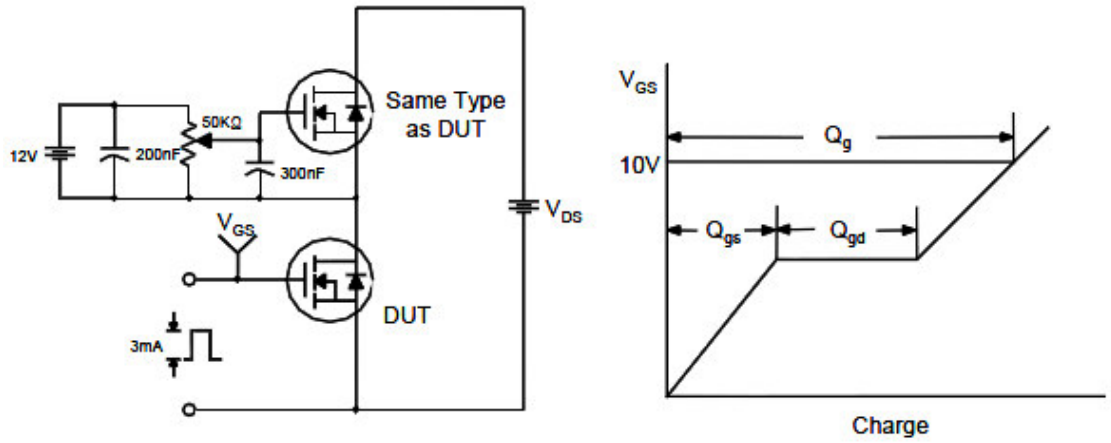


Normalized Thermal Transient Impedance, Junction-to-Ambient

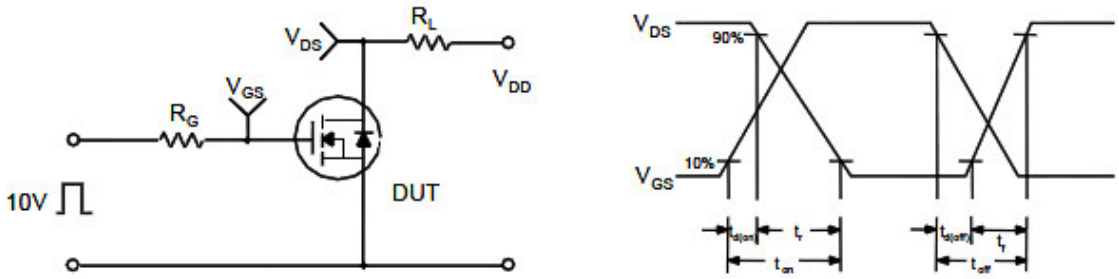


Typical Characteristics

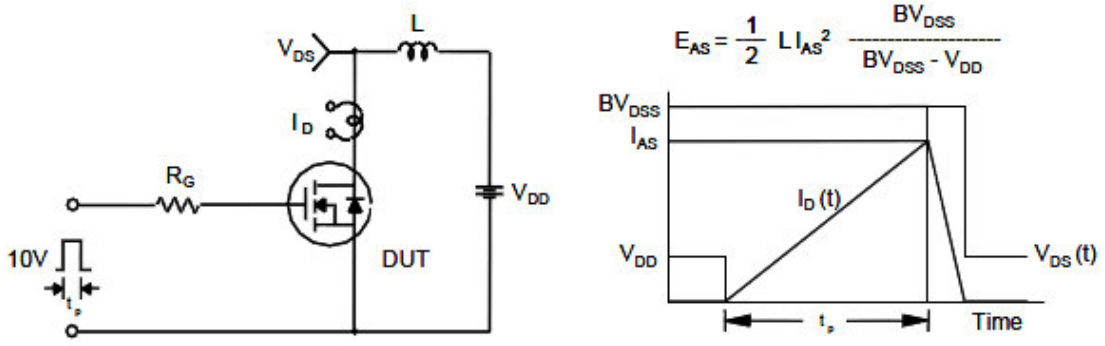
Gate Charge Test Circuit & Waveform



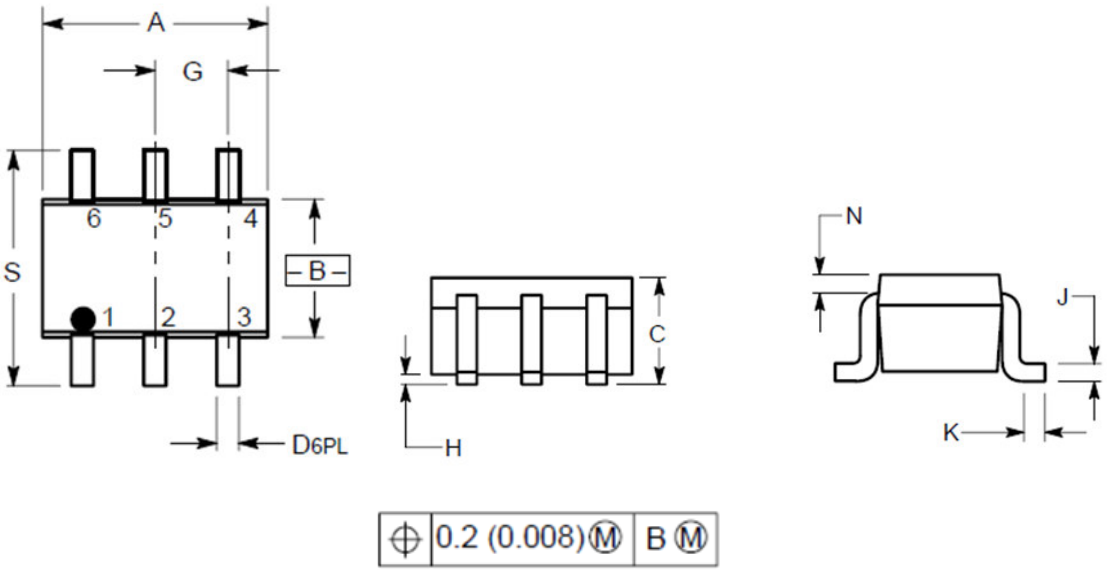
Resistive Switching Test Circuit & Waveforms



Unclamped Inductive Switching Test Circuit & Waveforms



Package Information (SOT-363)



DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.071	0.087	1.80	2.20
B	0.045	0.053	1.15	1.35
C	0.031	0.043	0.80	1.10
D	0.004	0.012	0.10	0.30
G	0.026 BSC		0.65 BSC	
H	---	0.004	---	0.10
J	0.004	0.010	0.10	0.25
K	0.004	0.012	0.10	0.30
N	0.008 REF		0.20 REF	
S	0.079	0.087	2.00	2.20

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