



General Description

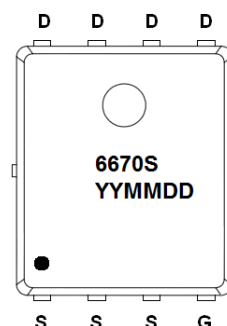
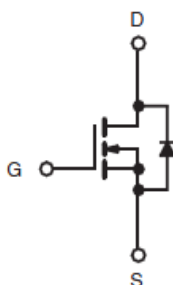
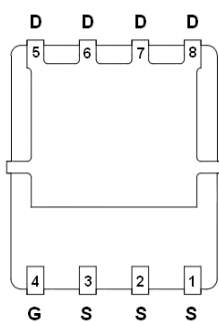
AFN6670S, N-Channel enhancement mode MOSFET, uses Advanced Trench Technology to provide excellent $R_{DS(ON)}$, low gate charge.

These devices are particularly suited for low voltage power management, and low in-line power loss are needed in commercial industrial surface mount applications.

Features

- $I_D=20A, R_{DS(ON)}= 4.8m\Omega@V_{GS}=10V$
- $I_D=15A, R_{DS(ON)}= 6.0m\Omega@V_{GS}=6.0V$
- $60V/10A, R_{DS(ON)}= 8.0m\Omega@V_{GS}=4.5V$
- Super high density cell design for extremely low $R_{DS(ON)}$
- DFN5X6-8L package design

Pin Description (DFN5X6-8L)



Application

- DC/DC Primary Side Switch
- Industrial
- Synchronous Rectification
- Load Switch
- DC/DC Converters
- DC/AC Inverters

Pin Define

Pin	Symbol	Description
1~3	S	Source
4	G	Gate
5~8	D	Drain

Ordering Information

Part Ordering No.	Part Marking	Package	Unit	Quantity
AFN6670SFN568RG	6670S	DFN5X6-8L	Tape & Reel	2500 EA

※ 6670S : Parts Code

※ YYMMDD : Date Code

※ AFN6670SFN568RG : 13" Tape & Reel ; Pb- Free ; Halogen- Free



Absolute Maximum Rating

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

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DSS}	60	V
Gate –Source Voltage	V_{GSS}	± 20	V
Continuous Drain Current($T_J=150^{\circ}\text{C}$)	I_{DSM}	$T_A=25^{\circ}\text{C}$	24
		$T_A=70^{\circ}\text{C}$	18
Pulsed Drain Current	I_{DM}	200	A
Continuous Source Current(Diode Conduction)	I_S	$T_A=25^{\circ}\text{C}$	4.2
Single Pulse Avalanche Current	$L=0.1\text{mH}$	I_{AS}	25
		E_{AS}	30
Power Dissipation	P_D	$T_A=25^{\circ}\text{C}$	5.0
		$T_A=75^{\circ}\text{C}$	3.2
Operating Junction Temperature	T_J	150	$^{\circ}\text{C}$
Storage Temperature Range	T_{STG}	-55/150	$^{\circ}\text{C}$
Thermal Resistance-Junction to Ambient	$t \leq 10\text{ s}$	$R_{\theta JA}$	20
Maximum Junction-to-Case (Drain)	Steady-State	$R_{\theta JC}$	1.8

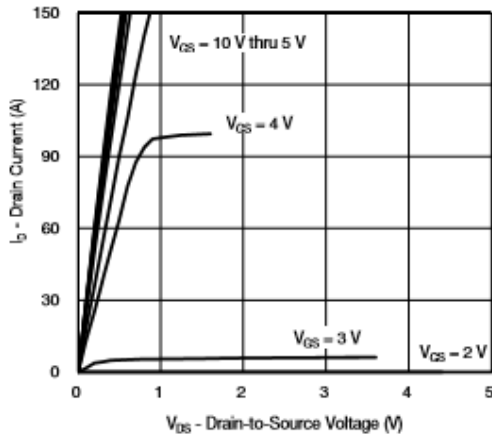
Electrical Characteristics

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

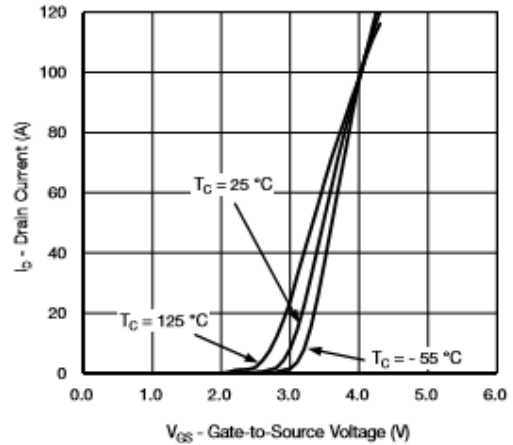
Parameter	Symbol	Conditions	Min.	Typ	Max.	Unit
Static						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS}=0\text{V}, I_D=250\mu\text{A}$	60			V
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu\text{A}$	1.0		3.0	V
Gate Leakage Current	I_{GSS}	$V_{DS}=0\text{V}, V_{GS}=\pm 16\text{V}$			± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=48\text{V}, V_{GS}=0\text{V}$			1	μA
		$V_{DS}=48\text{V}, V_{GS}=0\text{V}$ $T_J=85^{\circ}\text{C}$			30	
On-State Drain Current	$I_{D(on)}$	$V_{DS} \geq 5\text{V}, V_{GS}=10\text{V}$	30			A
Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS}=10\text{V}, I_D=20\text{A}$		3.8	4.8	$\text{m}\Omega$
		$V_{GS}=6.0\text{V}, I_D=15\text{A}$		4.8	6.0	
		$V_{GS}=4.5\text{V}, I_D=10\text{A}$		6.0	8.0	
Forward Transconductance	g_{FS}	$V_{DS}=15\text{V}, I_D=20\text{A}$		80		S
Diode Forward Voltage	V_{SD}	$I_S=20\text{A}, V_{GS}=0\text{V}$		0.8	1.3	V
Dynamic						
Total Gate Charge	Q_g	$V_{DS}=30\text{V}, V_{GS}=4.5\text{V}$ $I_D \equiv 10\text{A}$		18	35	nC
Gate-Source Charge	Q_{gs}			9		
Gate-Drain Charge	Q_{gd}			6		
Input Capacitance	C_{iss}	$V_{DS}=30\text{V}, V_{GS}=0\text{V}$ $f=1\text{MHz}$		3175		pF
Output Capacitance	C_{oss}			1250		
Reverse Transfer Capacitance	C_{rss}			100		
Turn-On Time	$t_{d(on)}$	$V_{DD}=30\text{V}, R_L=30\Omega$ $I_D \equiv 10\text{A}, V_{GEN}=10\text{V}$ $R_G=1\Omega$		20	40	ns
	t_r			10	20	
Turn-Off Time	$t_{d(off)}$			30	60	
	t_f			10	20	



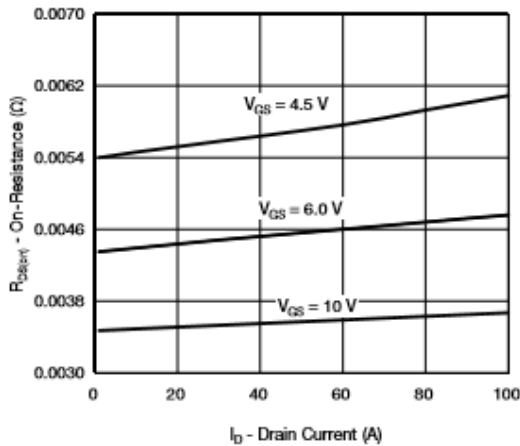
Typical Characteristics



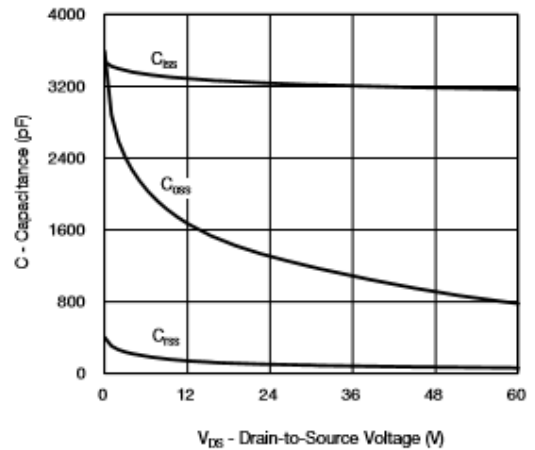
Output Characteristics



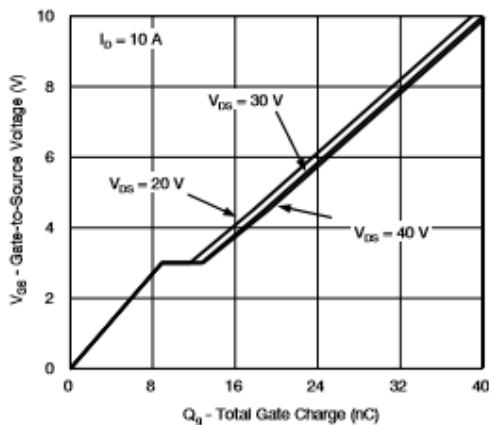
Transfer Characteristics



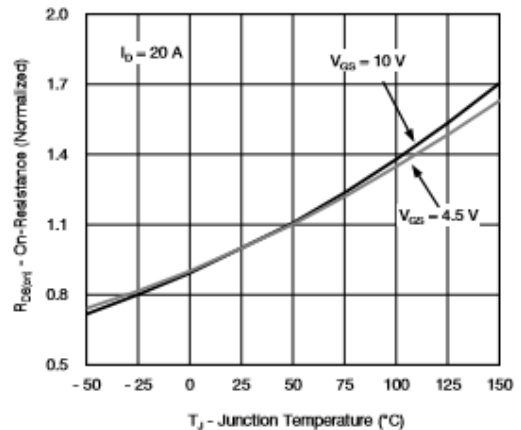
On-Resistance vs. Drain Current



Capacitance



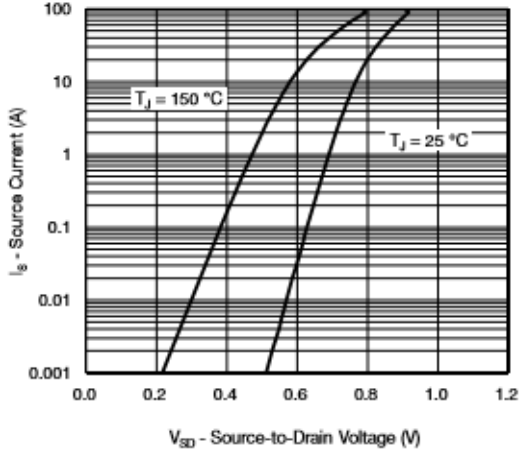
Gate Charge



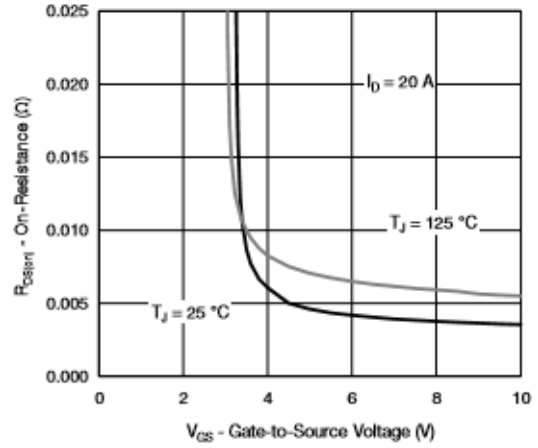
On-Resistance vs. Junction Temperature



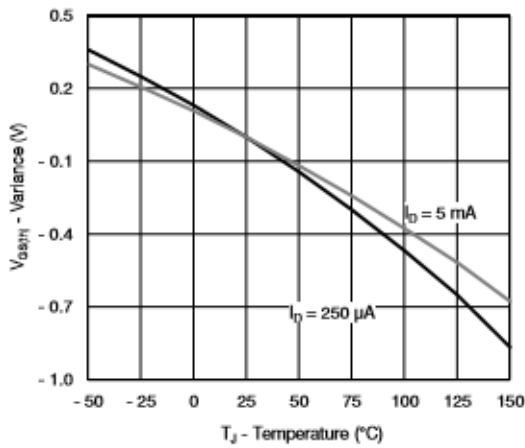
Typical Characteristics



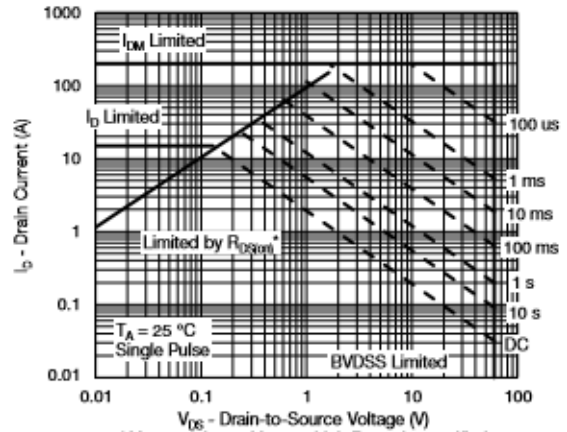
Source-Drain Diode Forward Voltage



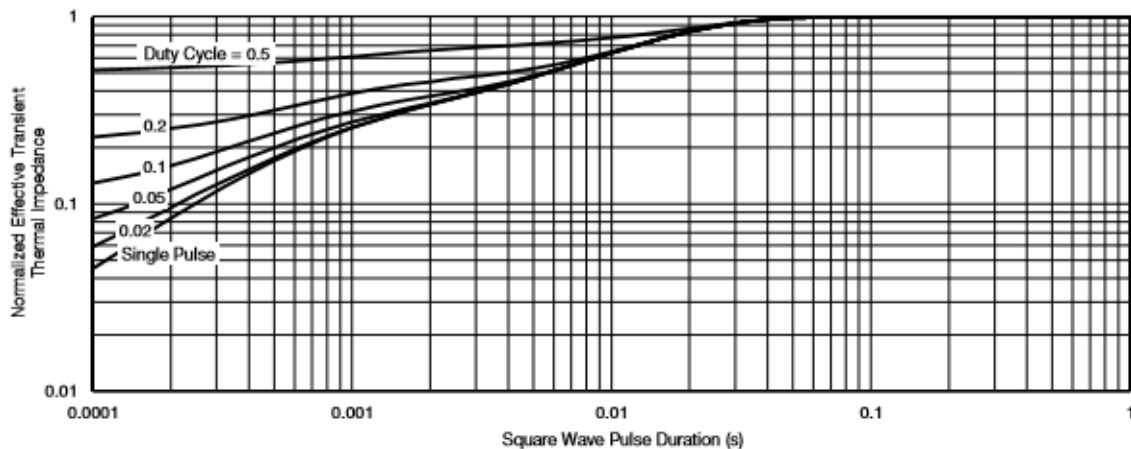
On-Resistance vs. Gate-to-Source Voltage



Threshold Voltage



Safe Operating Area, Junction-to-Ambient



Normalized Thermal Transient Impedance, Junction-to-Case



Typical Characteristics

Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveforms

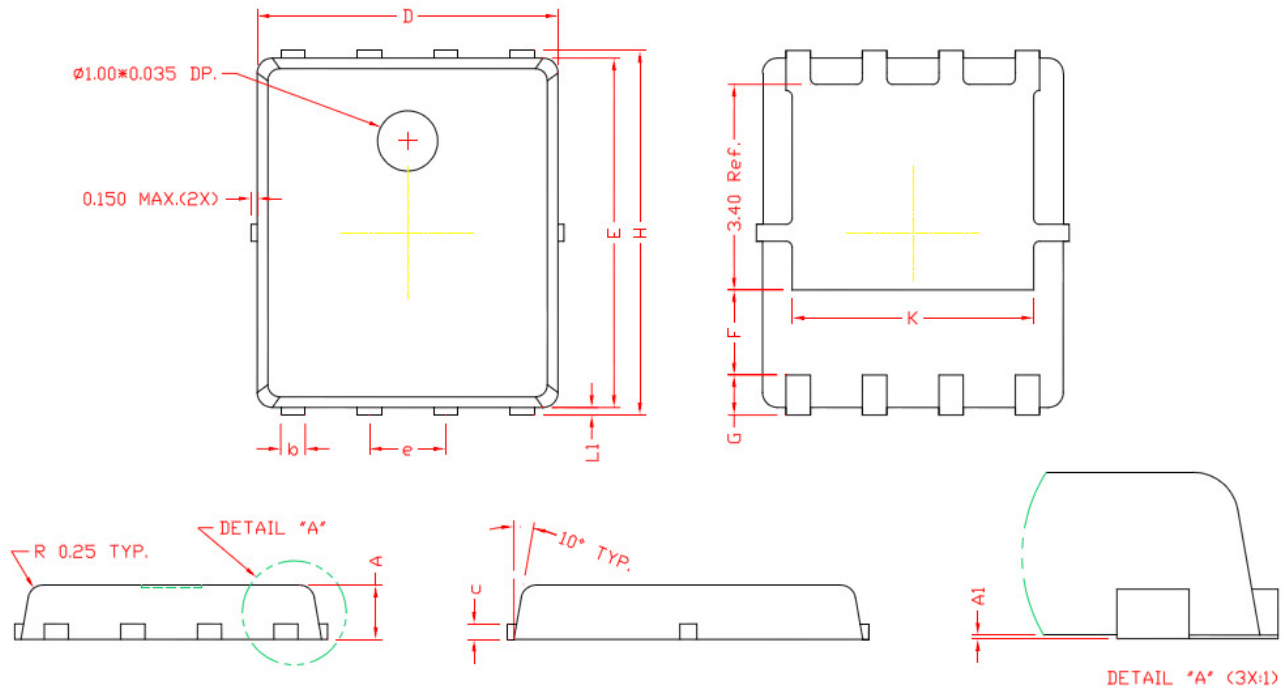


Unclamped Inductive Switching Test Circuit & Waveforms





Package Information (DFN5X6-8L)



DIMENSIONS

REF.	Millimeters		REF.	Millimeters	
	Min.	Max.		Min.	Max.
A	0.80	1.00	E	5.70	5.90
A1	0.00	0.05	e	1.27 BSC.	
b	0.35	0.49	H	5.95	6.20
c	0.254 Ref.		L1	0.10	0.18
D	4.90	5.10	G	0.60 Ref.	
F	1.40 Ref.		K	4.00 Ref.	

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