



General Description

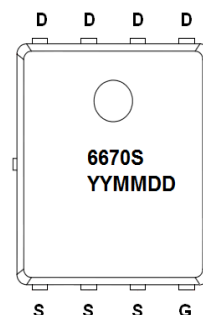
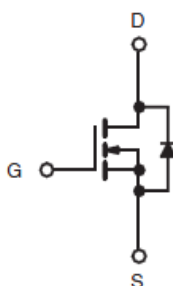
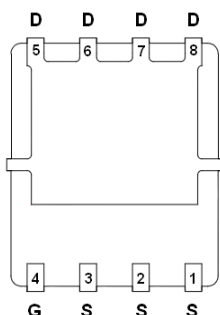
AFN6670S, N-Channel enhancement mode MOSFET, uses Advanced Trench Technology to provide excellent $R_{DS(ON)}$, low gate charge.

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

- 60V/20A, $R_{DS(ON)} = 4.8m\Omega @ V_{GS}=10V$
- 60V/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°C 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°C)	I _{DSM}	24	A
		18	
Pulsed Drain Current	I _{DM}	200	
Continuous Source Current(Diode Conduction)	I _S	4.2	
Single Pulse Avalanche Current	L=0.1mH I _{AS} E _{AS}	25	
		30	mJ
Power Dissipation	P _D	5.0	W
		3.2	
Operating Junction Temperature	T _J	150	°C
Storage Temperature Range	T _{STG}	-55/150	°C
Thermal Resistance-Junction to Ambient	t ≤ 10 s R _{θJA}	20	°C/W
Maximum Junction-to-Case (Drain)	Steady-State R _{θJC}	1.8	

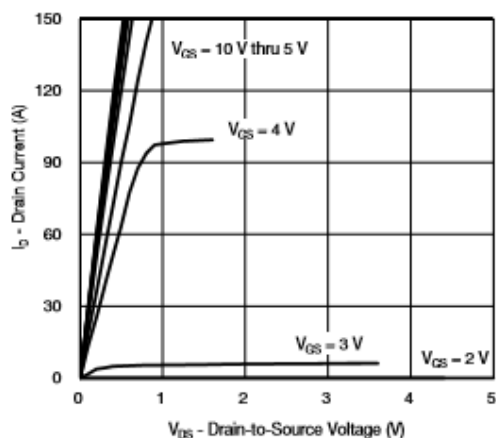
Electrical Characteristics

(T_A=25°C Unless otherwise noted)

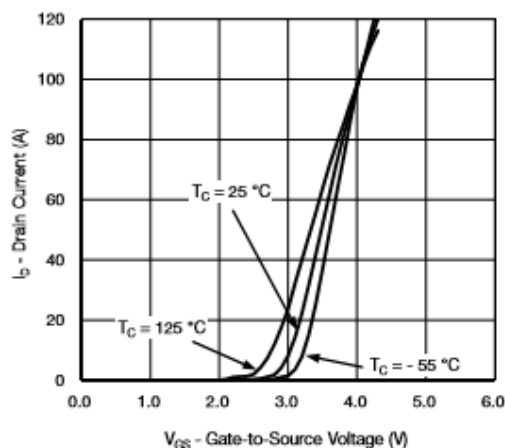
Parameter	Symbol	Conditions	Min.	Typ	Max.	Unit
Static						
Drain-Source Breakdown Voltage	V _{(BR)DSS}	V _{GS} =0V, I _D =250uA	60			V
Gate Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250uA	1.0		3.0	
Gate Leakage Current	I _{GSS}	V _{DS} =0V, V _{GS} =±16V			±100	nA
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =48V, V _{GS} =0V			1	uA
		V _{DS} =48V, V _{GS} =0V T _J =85°C			30	
On-State Drain Current	I _{D(on)}	V _{DS} ≥ 5V, V _{GS} =10V	30			A
Drain-Source On-Resistance	R _{DS(on)}	V _{GS} =10V, I _D =20A		3.8	4.8	mΩ
		V _{GS} =6.0V, I _D =15A		4.8	6.0	
		V _{GS} =4.5V, I _D =10A		6.0	8.0	
Forward Transconductance	g _{FS}	V _{DS} =15V, I _D =20A		80		S
Diode Forward Voltage	V _{SD}	I _S =20A, V _{GS} =0V		0.8	1.3	V
Dynamic						
Total Gate Charge	Q _g	V _{DS} =30V, V _{GS} =4.5V I _D ≡10A		18	35	nC
Gate-Source Charge	Q _{gs}			9		
Gate-Drain Charge	Q _{gd}			6		
Input Capacitance	C _{iss}	V _{DS} =30V, V _{GS} =0V f=1MHz		3175		pF
Output Capacitance	C _{oss}			1250		
Reverse Transfer Capacitance	C _{rss}			100		
Turn-On Time	t _{d(on)}	V _{DD} =30V, R _L =30Ω I _D ≡10A, V _{GEN} =10V R _G =1Ω		20	40	ns
	t _r			10	20	
Turn-Off Time	t _{d(off)}			30	60	
	t _f			10	20	



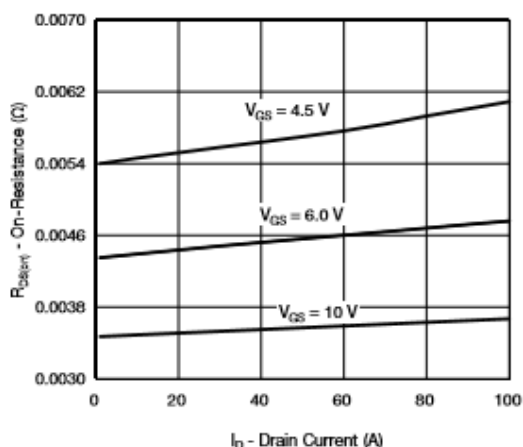
Typical Characteristics



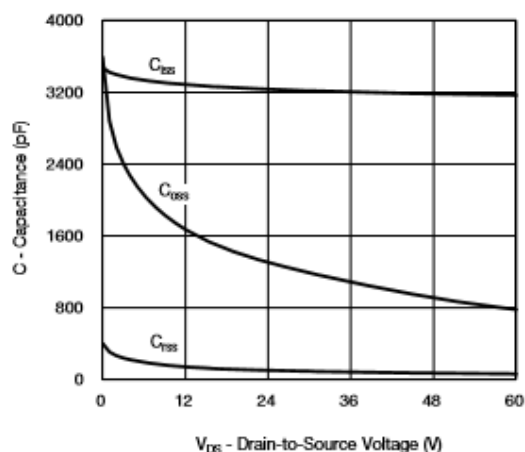
Output Characteristics



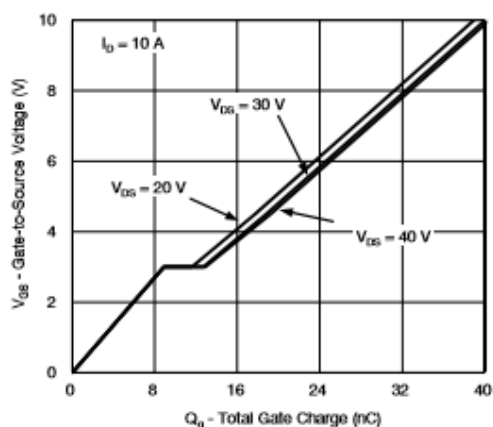
Transfer Characteristics



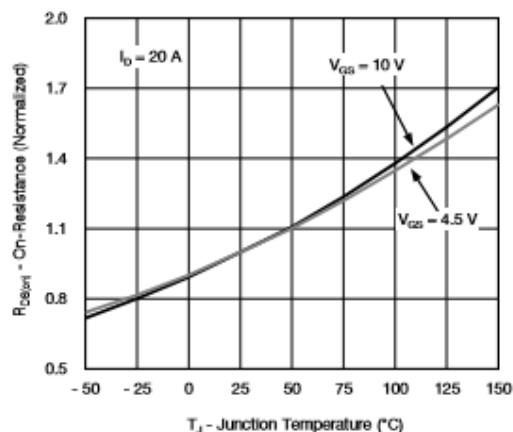
On-Resistance vs. Drain Current



Capacitance



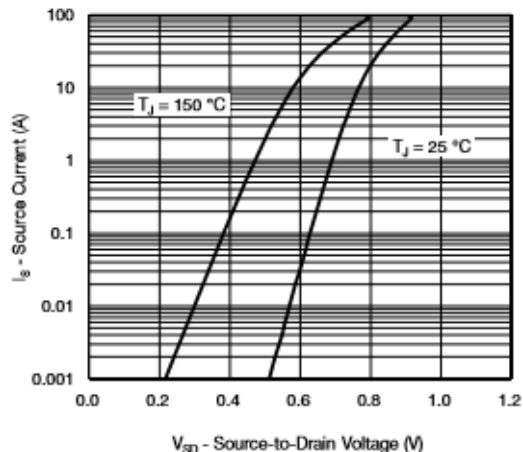
Gate Charge



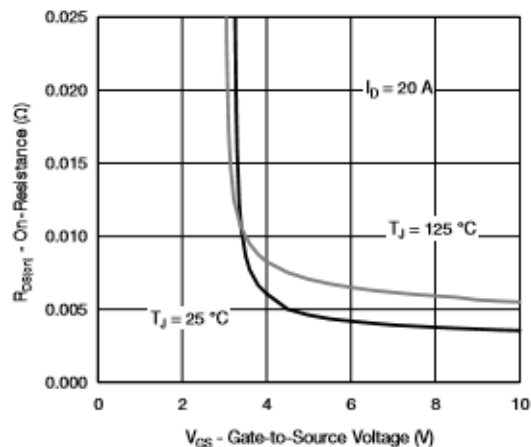
On-Resistance vs. Junction Temperature



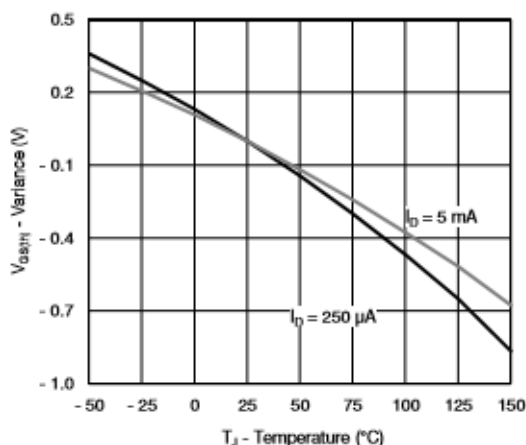
Typical Characteristics



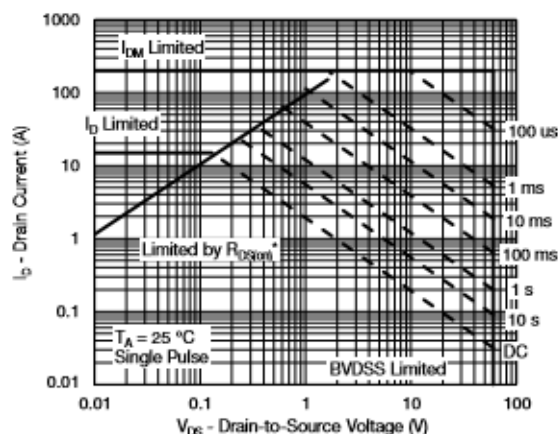
Source-Drain Diode Forward Voltage



On-Resistance vs. Gate-to-Source Voltage

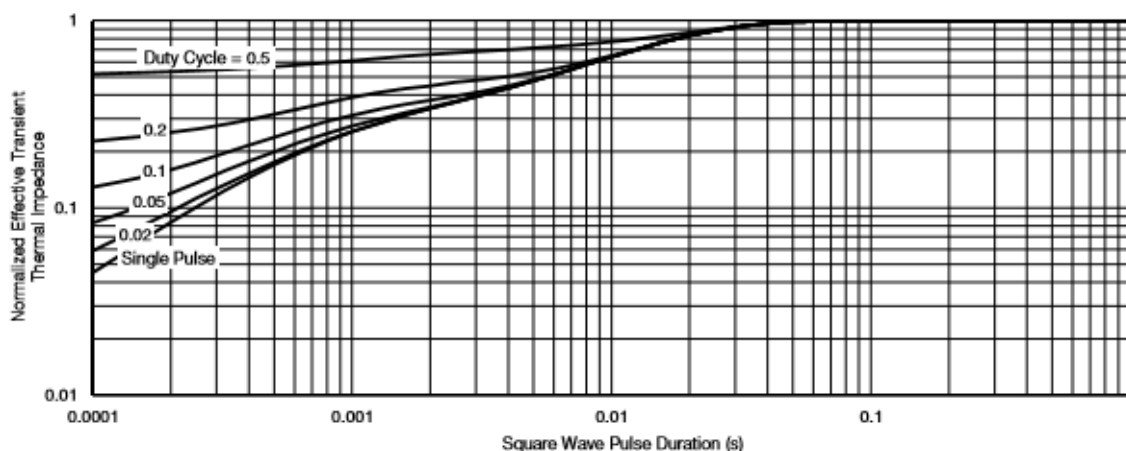


Threshold Voltage



* V_{GS} > minimum V_{GS} at which $R_{DS(on)}$ is specified

Safe Operating Area, Junction-to-Ambient

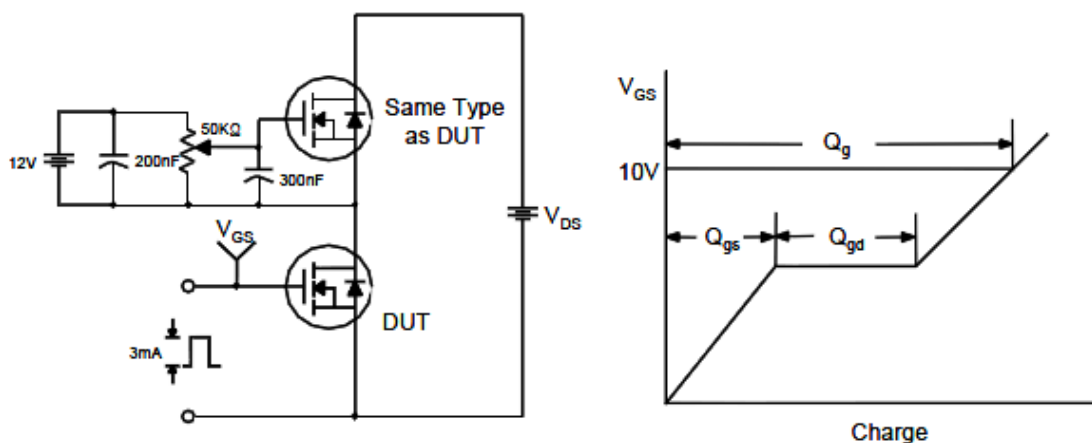


Normalized Thermal Transient Impedance, Junction-to-Case

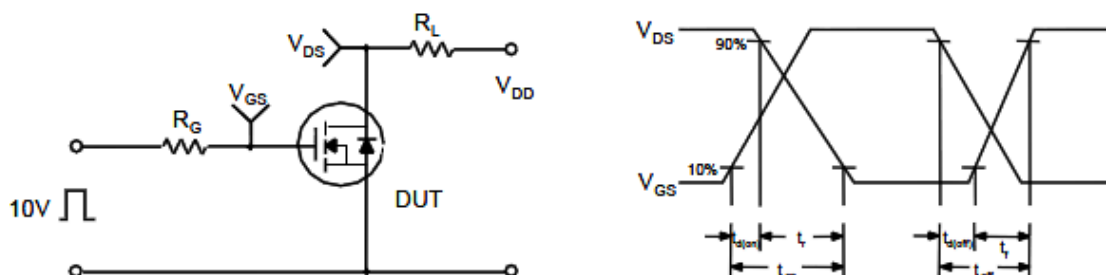


Typical Characteristics

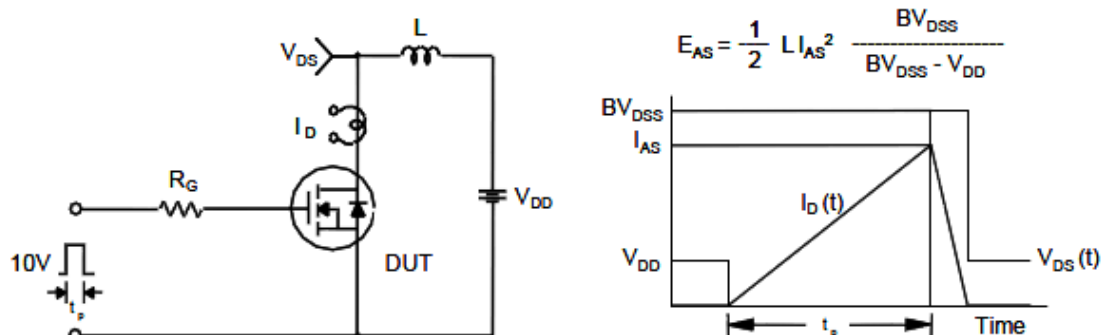
Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveforms

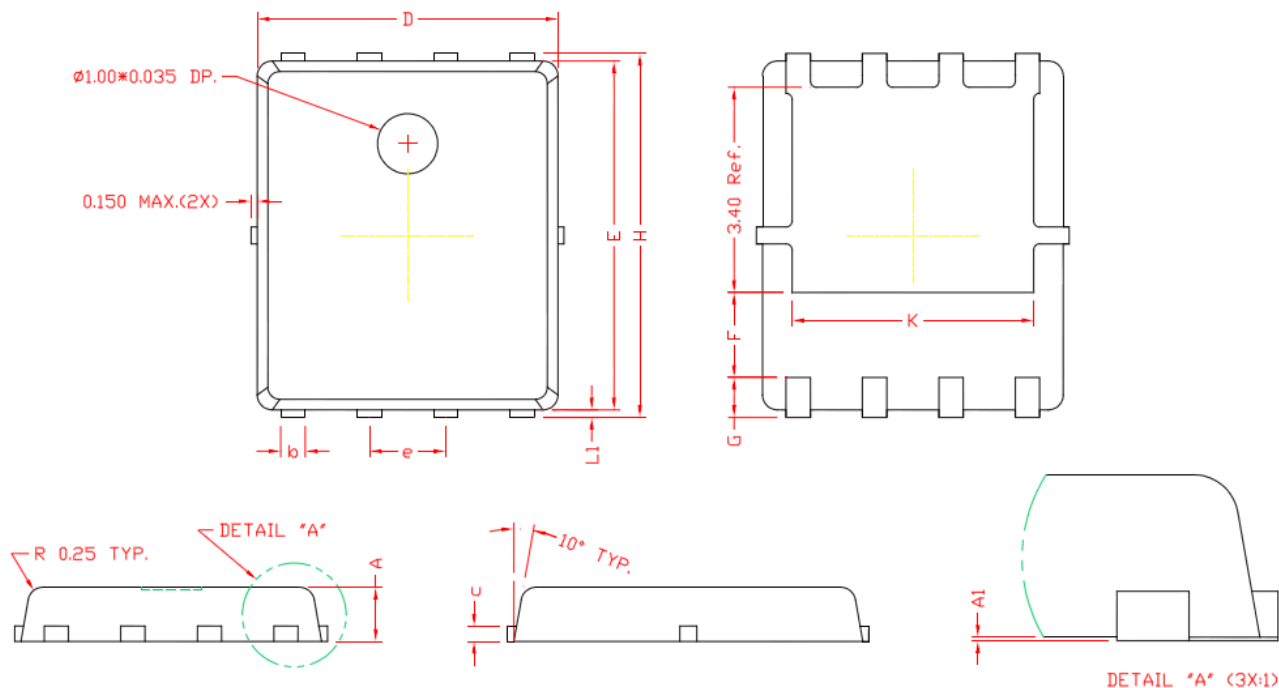


Unclamped Inductive Switching Test Circuit & Waveforms





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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