



### General Description

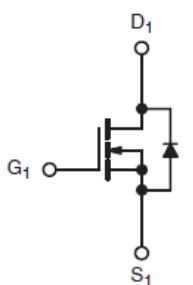
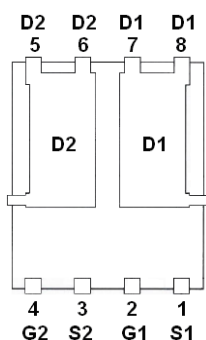
AFN5843AS, Dual N-Channel enhancement mode MOSFET, uses Advanced Trench Technology to provide excellent  $R_{DS(ON)}$ , low gate charge.

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

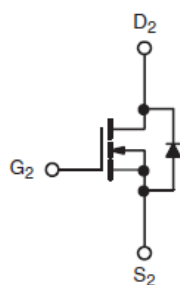
### Features

- $I_D=18A, R_{DS(ON)}=3.5m\Omega@V_{GS}=10V$
- $I_D=12A, R_{DS(ON)}=5.0m\Omega@V_{GS}=4.5V$
- Super high density cell design for extremely low  $R_{DS(ON)}$
- Exceptional on-resistance and maximum DC current capability
- DFN 5X6-8L package design

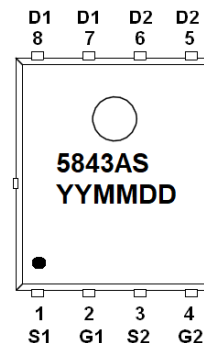
### Pin Description ( DFN5X6-8L )



N-Channel MOSFET



N-Channel MOSFET



### Application

- POL
- DC/DC

### Pin Define

Pin	Symbol	Description
1	S1	Source 1
2	G1	Gate 1
3	S2	Source 2
4	G2	Gate 2
5	D2	Drain 2
6	D2	Drain 2
7	D1	Drain 1
8	D1	Drain 1

### Ordering Information

Part Ordering No.	Part Marking	Package	Unit	Quantity
AFN5843ASFN568RG	5843AS	DFN 5X6-8L	Tape & Reel	2500 EA

※ 5843AS : Parts Code

※ YYMMDD : Date Code

※ AFN5843ASFN568RG : 13" Tape & Reel ; Pb- Free ; Halogen -Free



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

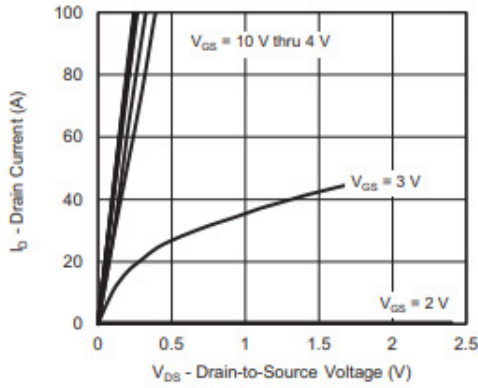
Parameter	Symbol	Typical	Unit
Drain-Source Voltage	$V_{DSS}$	40	V
Gate –Source Voltage	$V_{GSS}$	$\pm 20$	V
Continuous Drain Current( $T_J=150^\circ\text{C}$ )	$I_D$	$T_C=25^\circ\text{C}$	30
		$T_C=85^\circ\text{C}$	30
		$T_A=25^\circ\text{C}$	20
		$T_A=85^\circ\text{C}$	15
Pulsed Drain Current	$I_{DM}$	100	A
Continuous Source Current(Diode Conduction)	$I_S$	$T_C=25^\circ\text{C}$	30
		$T_A=25^\circ\text{C}$	3.0
Power Dissipation	$P_D$	$T_C=25^\circ\text{C}$	46
		$T_C=85^\circ\text{C}$	29
		$T_A=25^\circ\text{C}$	3.5
		$T_A=70^\circ\text{C}$	2.2
Operating Junction Temperature	$T_J$	150	$^\circ\text{C}$
Storage Temperature Range	$T_{STG}$	-55/150	$^\circ\text{C}$
Thermal Resistance-Junction to Ambient	$R_{\theta JA}$	35	$^\circ\text{C/W}$

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

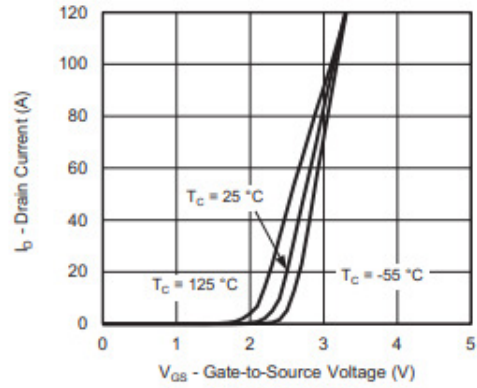
Parameter	Symbol	Conditions	Min.	Typ	Max.	Unit
<b>Static</b>						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=250\mu\text{A}$	40			V
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu\text{A}$	1.0		2.5	
Gate Leakage Current	$I_{GSS}$	$V_{DS}=0V, V_{GS}=\pm 20V$			$\pm 100$	nA
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=32V, V_{GS}=0V$			1	uA
		$V_{DS}=32V, V_{GS}=0V$ $T_J=85^\circ\text{C}$			10	
On-State Drain Current	$I_{D(on)}$	$V_{DS} \geq 5V, V_{GS}=10V$	30			A
Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS}=10V, I_D=18A$		2.5	3.5	m $\Omega$
		$V_{GS}=4.5V, I_D=12A$		3.5	5.0	
Forward Transconductance	$g_{FS}$	$V_{DS}=10V, I_D=10A$		76		S
Diode Forward Voltage	$V_{SD}$	$I_S=5A, V_{GS}=0V$		0.75	1.2	V
<b>Dynamic</b>						
Total Gate Charge	$Q_g$	$V_{DS}=20V, V_{GS}=4.5V$ $I_D \equiv 10A$		31.5	60	nC
Gate-Source Charge	$Q_{gs}$			11.5		
Gate-Drain Charge	$Q_{gd}$			7.0		
Gate Resistance	$R_g$	$f=1\text{MHz}$		1.7		$\Omega$
Input Capacitance	$C_{iss}$	$V_{DS}=20V, V_{GS}=0V$ $f=1\text{MHz}$		4350		pF
Output Capacitance	$C_{oss}$			760		
Reverse Transfer Capacitance	$C_{rss}$			110		
Turn-On Time	$t_{d(on)}$	$V_{DD}=20V, R_L=2\Omega$ $I_D \equiv 10A, V_{GEN}=10V$ $R_G=1\Omega$		15	30	ns
	$t_r$			35	70	
Turn-Off Time	$t_{d(off)}$			30	60	
	$t_f$			10	20	



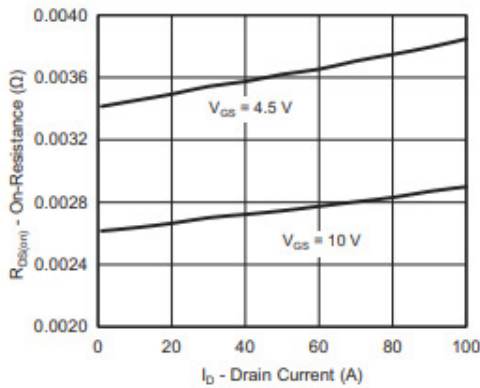
## Typical Characteristics



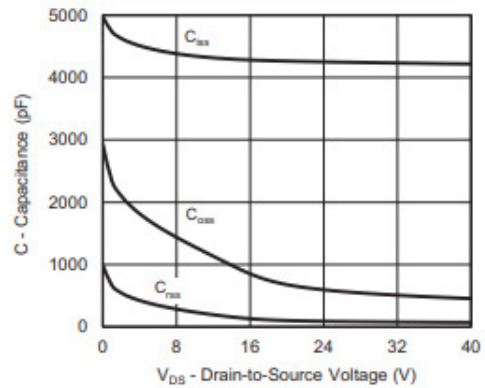
Output Characteristics



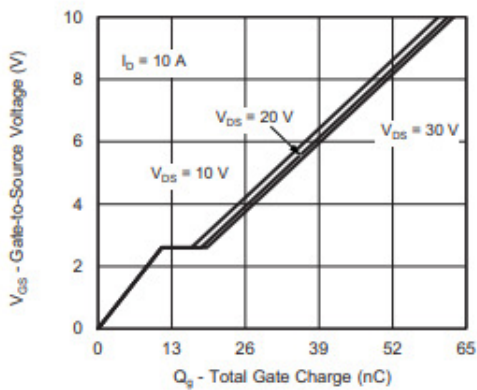
Transfer Characteristics



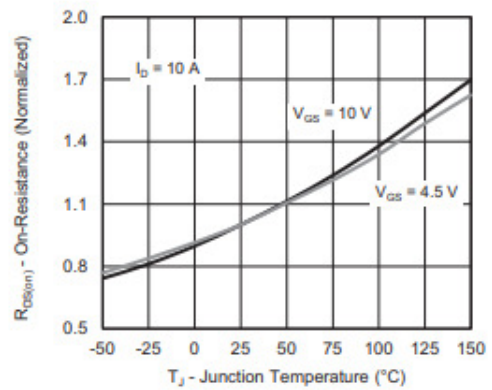
On-Resistance vs. Drain Current and Gate Voltage



Capacitance



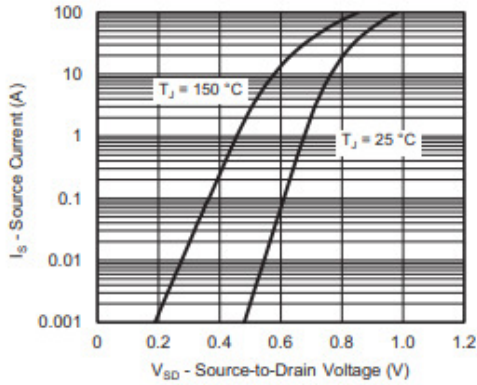
Gate Charge



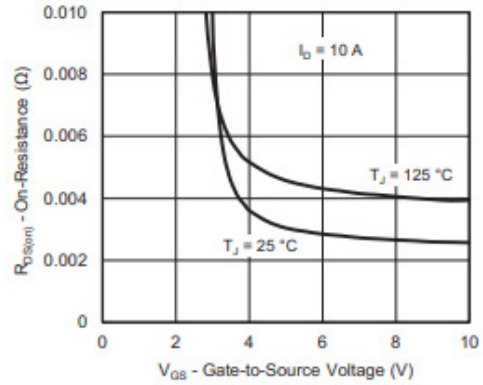
On-Resistance vs. Junction Temperature



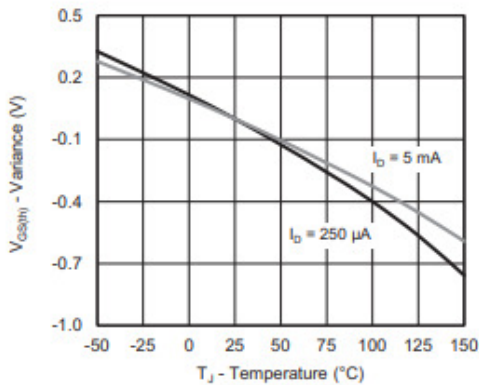
### Typical Characteristics



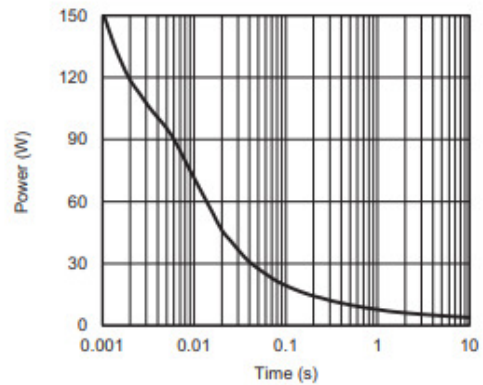
Source-Drain Diode Forward Voltage



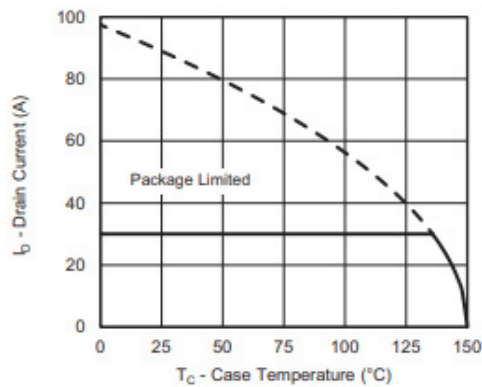
On-Resistance vs. Gate-to-Source Voltage



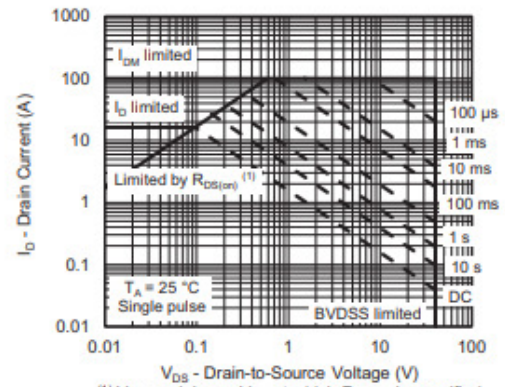
Threshold Voltage



Single Pulse Power, Junction-to-Ambient



Current Derating <sup>a</sup>

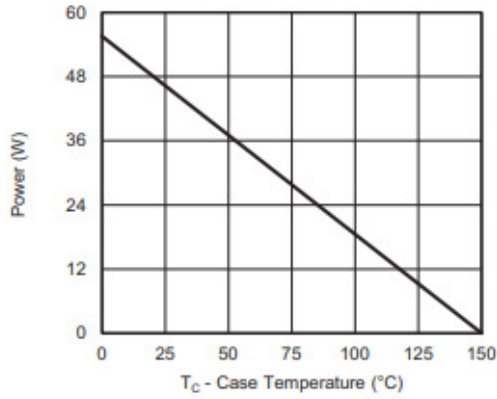


<sup>(1)</sup>  $V_{GS} >$  minimum  $V_{GS}$  at which  $R_{DS(on)}$  is specified

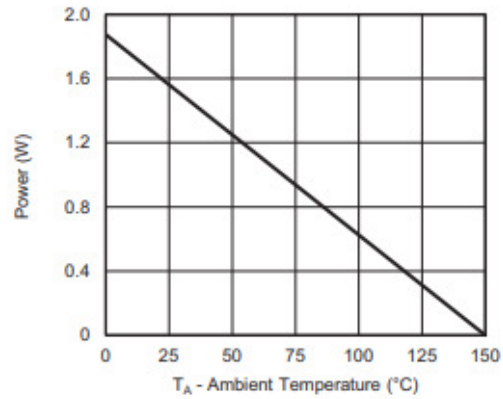
Safe Operating Area, Junction-to-Ambient



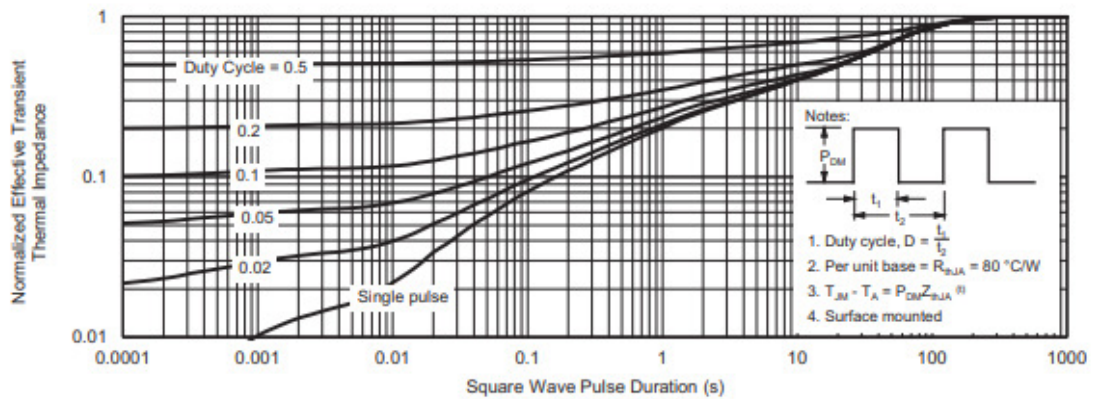
## Typical Characteristics



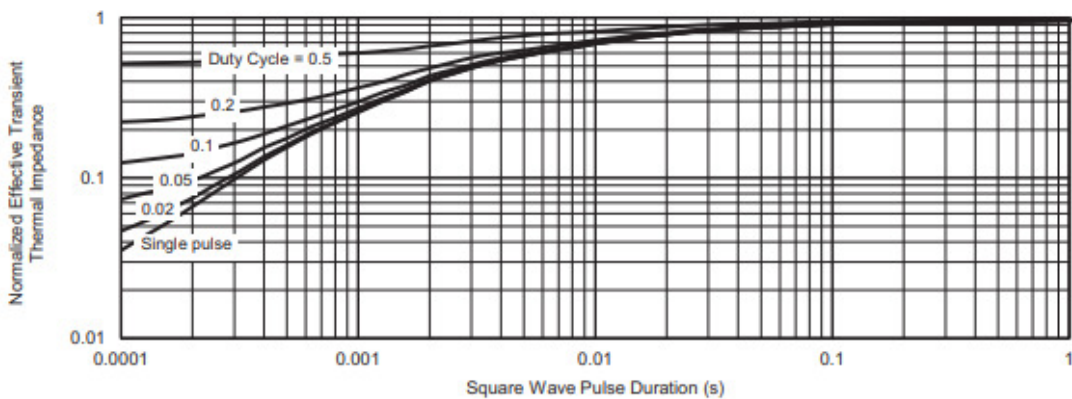
Power, Junction-to-Case



Power, Junction-to-Ambient



Normalized Thermal Transient Impedance, Junction-to-Ambient



Normalized Thermal Transient Impedance, Junction-to-Case



**Typical Characteristics**

Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveforms

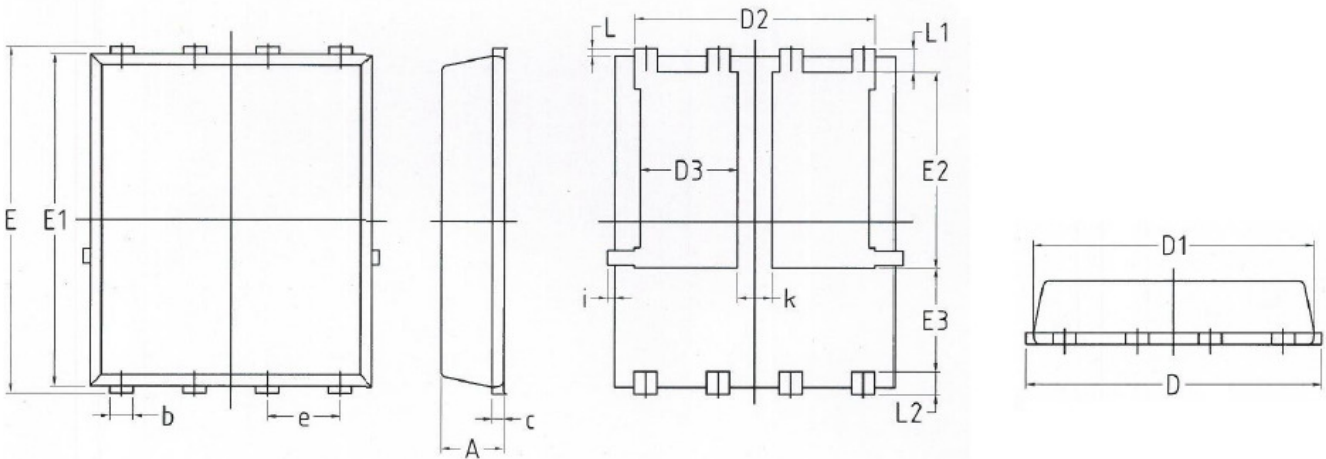


Unclamped Inductive Switching Test Circuit & Waveforms





**Package Information ( DFN 5X6-8L )**



SYMBOL	COMMON			
	MM		INCH	
	MIN.	MAX.	MIN.	MAX.
A	1.03	1.17	0.0406	0.0461
b	0.34	0.48	0.0134	0.0189
c	0.203 BSC		0.0080 BSC	
D	4.80	5.40	0.1890	0.2126
D1	4.80	5.00	0.1890	0.1969
D2	4.11	4.31	0.1620	0.1700
D3	1.60	1.80	0.0629	0.0708
E	5.95	6.15	0.2343	0.2421
E1	5.65	5.85	0.2224	0.2303
E2	3.30	3.50	0.1300	0.1378
E3	1.70	/	0.0630	/
e	1.27 BSC		0.05 BSC	
L	0.05	0.25	0.0019	0.0098
L1	0.38	0.50	0.0150	0.0197
L2	0.38	0.50	0.0150	0.0197
i	/	0.18	/	0.0070
k	0.5	0.7	0.0197	0.0276

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2F, No.80, Sec.1, Cheng Kung Rd., Nan Kang Dist., Taipei City 115, Taiwan (R.O.C.)  
Tel : 886 2) 2651 3928  
Fax : 886 2) 2786 8483  
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