



### General Description

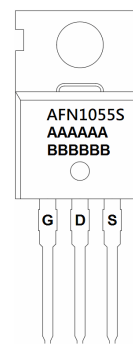
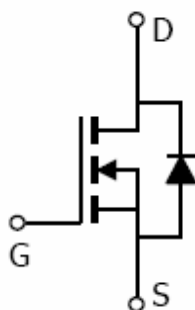
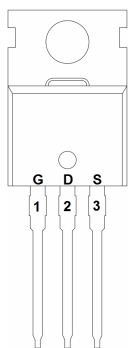
AFN1055S, N-Channel enhancement mode MOSFET, uses Advanced Trench Technology to provide excellent  $R_{DS(ON)}$ , low gate charge.

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

- 100V/40A,  $R_{DS(ON)}=6.0m\Omega@V_{GS}=10V$
- 100V/20A,  $R_{DS(ON)}=9.0m\Omega@V_{GS}=4.5V$
- Super high density cell design for extremely low  $R_{DS(ON)}$
- TO-220-3L package design

### Pin Description ( TO-220-3L )



### Application

- Power Supply - Secondary Synchronous Rectification
- Industrial
- Primary Switch

### Pin Define

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

### Ordering Information

Part Ordering No.	Part Marking	Package	Unit	Quantity
AFN1055ST220TG	AFN1055S AAAAAA BBBBBB	TO-220-3L	Tube	50 EA

- ※ A Lot code
- ※ B Date code
- ※ AFN1055ST220TG : Tube ; Pb- Free ; Halogen –Free



**Absolute Maximum Ratings**

(T<sub>A</sub>=25°C Unless otherwise noted)

Parameter	Symbol	Typical	Unit
Drain-Source Voltage	V <sub>DSS</sub>	100	V
Gate –Source Voltage	V <sub>GSS</sub>	±20	V
Continuous Drain Current(T <sub>J</sub> =150°C)	I <sub>D</sub>	T <sub>c</sub> =25°C	120
		T <sub>c</sub> =70°C	80
Pulsed Drain Current	I <sub>DM</sub>	350	A
Continuous Source Current(Diode Conduction)	I <sub>S</sub>	100	
Single Pulse Avalanche Current	I <sub>AS</sub>	70	
Power Dissipation	P <sub>D</sub>	75	W
Operating Junction Temperature	T <sub>J</sub>	150	°C
Storage Temperature Range	T <sub>STG</sub>	-55/150	°C
Thermal Resistance-Junction to Ambient	R <sub>θJA</sub>	62.5	°C/W

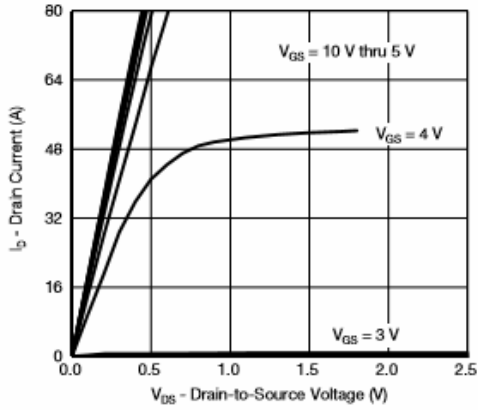
**Electrical Characteristics**

(T<sub>A</sub>=25°C Unless otherwise noted)

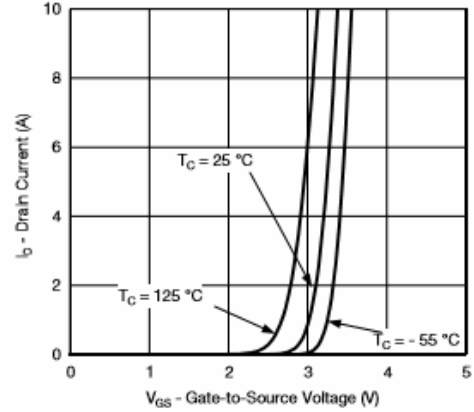
Parameter	Symbol	Conditions	Min.	Typ	Max.	Unit
<b>Static</b>						
Drain-Source Breakdown Voltage	V <sub>(BR)DSS</sub>	V <sub>GS</sub> =0V, I <sub>D</sub> =250uA	100			V
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250uA	1.0	1.6	2.5	
Gate Leakage Current	I <sub>GSS</sub>	V <sub>DS</sub> =0V, V <sub>GS</sub> =±20V			±100	nA
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> =80V, V <sub>GS</sub> =0V			1	uA
		V <sub>DS</sub> =80V, V <sub>GS</sub> =0V T <sub>J</sub> =85°C			10	
On-State Drain Current	I <sub>D(on)</sub>	V <sub>DS</sub> ≥ 5V, V <sub>GS</sub> =10V	30			A
Drain-Source On-Resistance	R <sub>DS(on)</sub>	V <sub>GS</sub> =10V, I <sub>D</sub> =40A		5.08	6.0	mΩ
		V <sub>GS</sub> =4.5V, I <sub>D</sub> =20A		6.98	9.0	
Forward Transconductance	g <sub>FS</sub>	V <sub>DS</sub> =10V, I <sub>D</sub> =20A		68		S
Diode Forward Voltage	V <sub>SD</sub>	I <sub>S</sub> =5A, V <sub>GS</sub> =0V		0.8	1.3	V
<b>Dynamic</b>						
Total Gate Charge	Q <sub>g</sub>	V <sub>DS</sub> =50V, V <sub>GS</sub> =4.5V I <sub>D</sub> ≡20A		25	50	nC
Gate-Source Charge	Q <sub>gs</sub>			10		
Gate-Drain Charge	Q <sub>gd</sub>			10		
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> =50V, V <sub>GS</sub> =0V f=1MHz		2860		pF
Output Capacitance	C <sub>oss</sub>			720		
Reverse Transfer Capacitance	C <sub>rss</sub>			70		
Turn-On Time	t <sub>d(on)</sub>	V <sub>DD</sub> =50V, R <sub>L</sub> =2.5Ω I <sub>D</sub> ≡20A, V <sub>GEN</sub> =10V R <sub>G</sub> =1Ω		15	30	ns
	t <sub>r</sub>			15	30	
Turn-Off Time	t <sub>d(off)</sub>			35	70	
	t <sub>f</sub>			10	20	



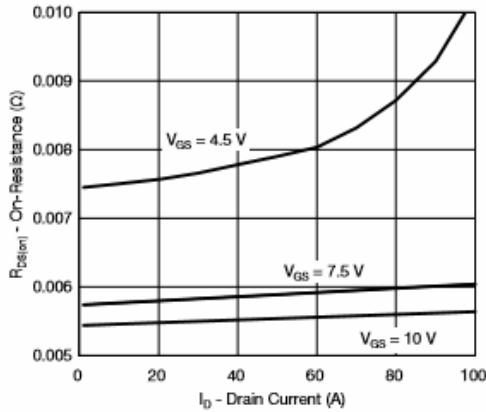
## Typical Characteristics



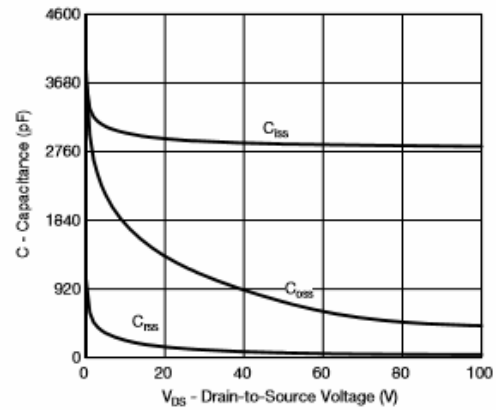
Output Characteristics



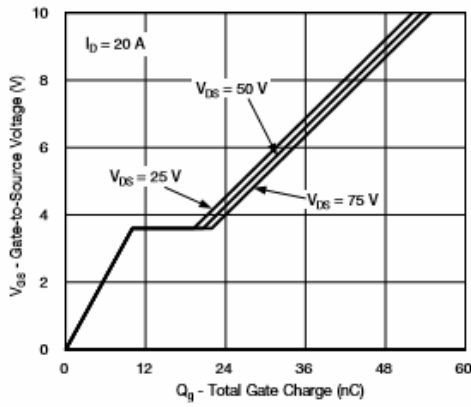
Transfer Characteristics



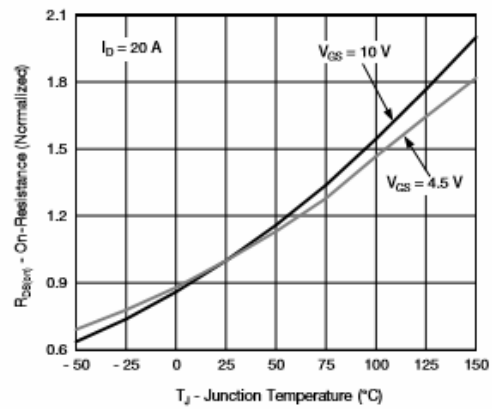
On-Resistance vs. Drain Current



Capacitance



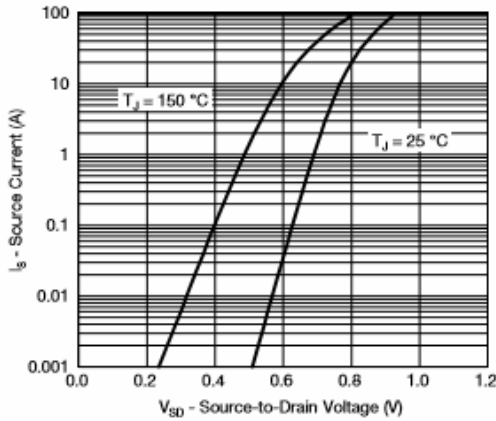
Gate Charge



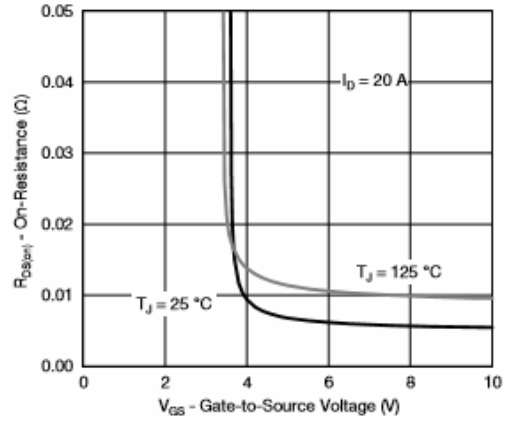
On-Resistance vs. Junction Temperature



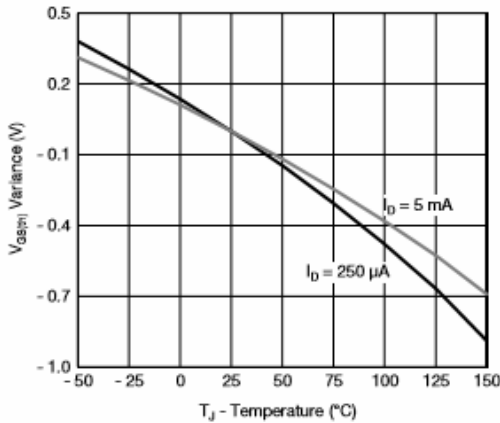
**Typical Characteristics**



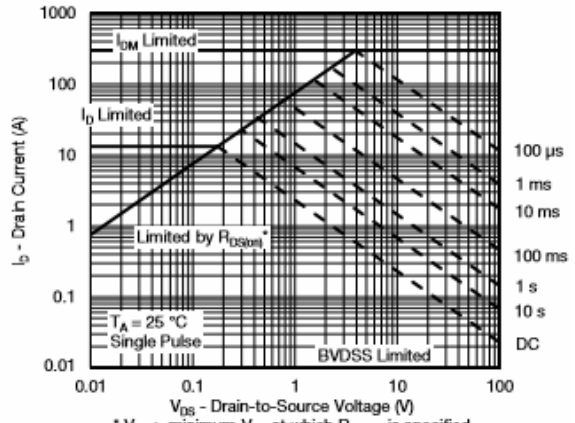
**Source-Drain Diode Forward Voltage**



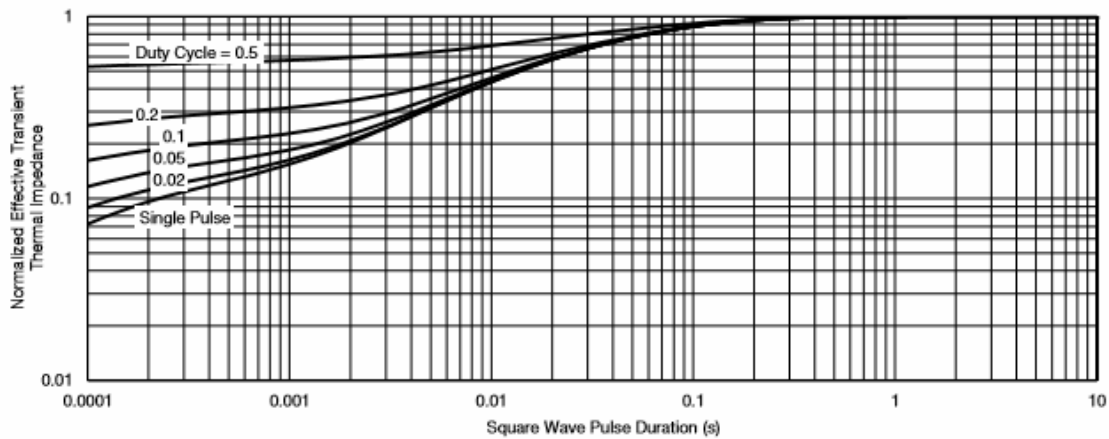
**On-Resistance vs. Gate-to-Source Voltage**



**Threshold Voltage**



**Safe Operating Area, Junction-to-Ambient**

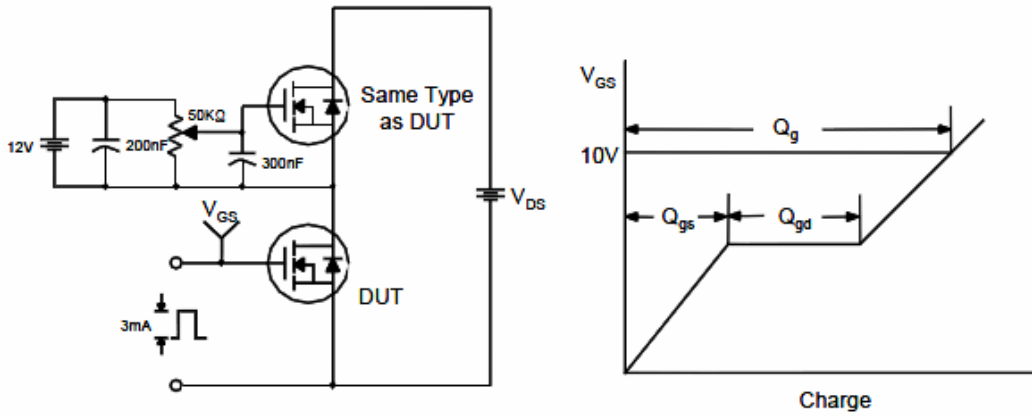


**Normalized Thermal Transient Impedance, Junction-to-Case**

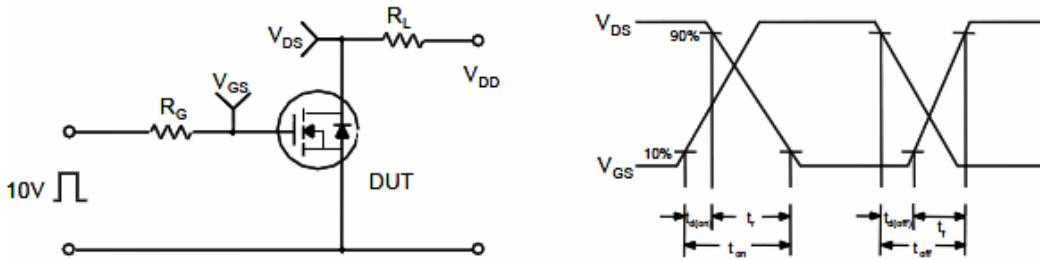


**Typical Characteristics**

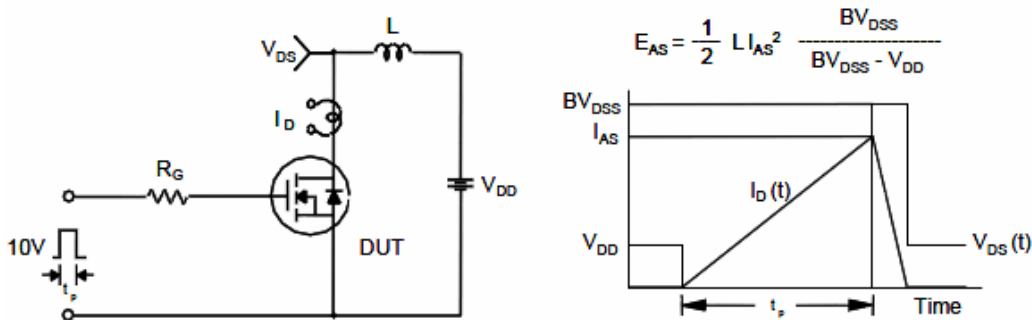
Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveforms

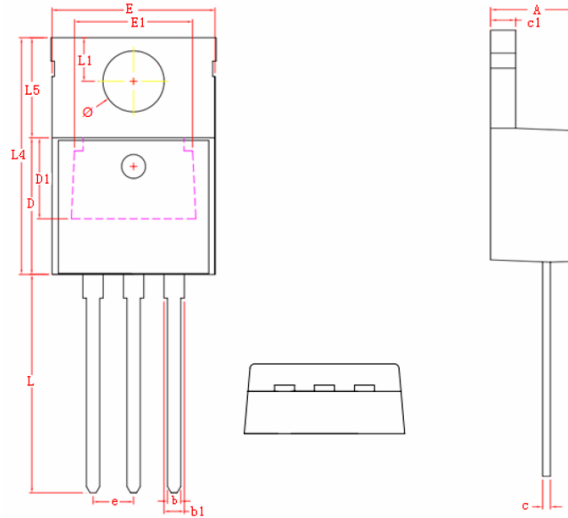


Unclamped Inductive Switching Test Circuit & Waveforms





**Package Information ( TO-220-3L )**



COMMON DIMENSIONS  
(UNITS OF MEASURE=MILLIMETER)

SYMBOL	MIN	NOM	MAX
A	4.40	4.60	4.80
b	0.76	0.88	1.00
D	8.60	8.80	9.00
c	0.36	0.43	0.50
E	9.80	10.10	10.40
L4	14.70	15.00	15.30
L5	6.20	6.40	6.60
D1	5.10 REF.		
c1	1.25	1.35	1.45
b1	1.17	1.32	1.47
L	13.25	13.75	14.25
e	2.54 REF.		
L1	2.60	2.75	2.89
Ø	3.71	3.84	3.96
E1	7.40 REF.		

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