



General Description

AFN10A60D is an N-channel enhancement mode Power MOSFET which is produced using VDMOS technology. The improved planar stripe cell and the improved guard ring terminal have been especially tailored to minimize on-state resistance, provide superior switching performance, and withstand high energy pulse in the avalanche and commutation mode.

These devices are widely used in AC-DC power suppliers, DC-DC converters and H-bridge PWM motor drivers.

Features

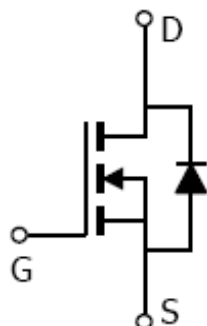
- 600V/5A, $R_{DS(ON)}=0.58\Omega_{(typ.)}@V_{GS}=10V$
- Low gate charge
- Low C_{rss}
- Fast switching
- Improved dv/dt capability

Application

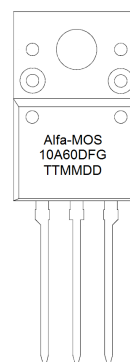
- AC-DC Switching Power Supply
- LCD / LED / PDP TV Lighting
- Solar Inverter

Pin Description

SYMBOL



TO-220F-3L



Absolute Maximum Ratings (T_c=25°C Unless otherwise noted)

Parameter	Symbol	Typical	Unit
		TO-220FB-3L	
Drain-Source Voltage	V_{DSS}	600	V
Gate –Source Voltage	V_{GSS}	±30	V
Drain Current	DC	10	A
	Pluse	40	A
Single Pulsed Avalanche Energy L=6.36mH, I _{AS} =10A, V _{DD} =90V, R _G =25Ω, starting T _J =25°C	E _{AS}	363	mJ
Power Dissipation T _C =25°C	P _D	45	W
Operating Junction Temperature	T _J	-55/150	°C
Storage Temperature Range	T _{STG}	-55/150	°C
Thermal Resistance-Junction to Case	R _{θJC}	2.78	°C/W
Thermal Resistance-channel to Ambient	R _{θJA}	62.5	°C/W



Pin Define

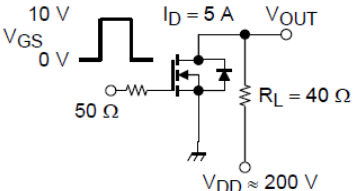
Pin	Symbol	Description
1	G	Gate
2	S	Source
3	D	Drain

Ordering Information

Part Ordering No.	Part Marking	Package	Material	Unit	Quantity
AFN10A60DT220FTG	Alfa-MOS 10A60DFG YYMMDD	TO-220F-3L	Halogen Free	Tube	50 EA

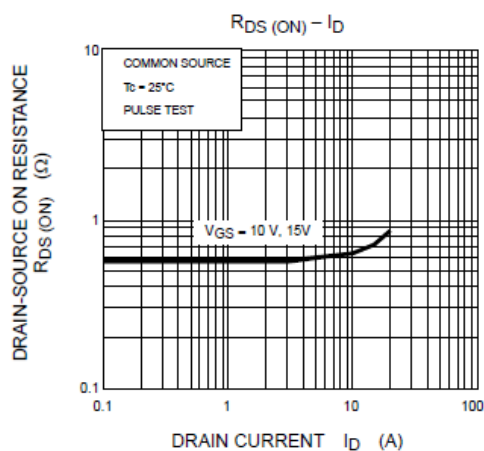
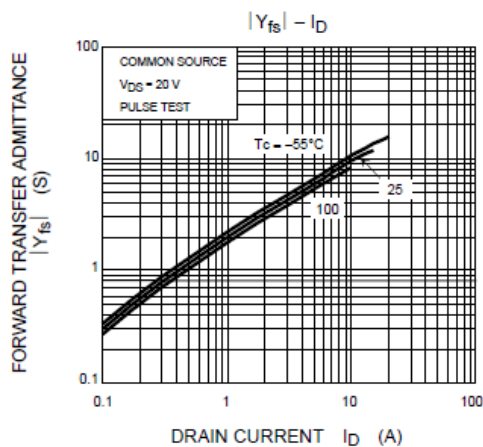
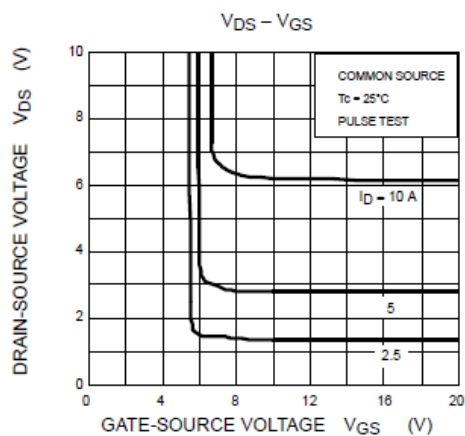
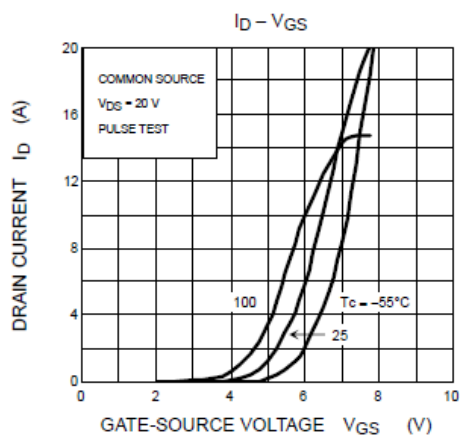
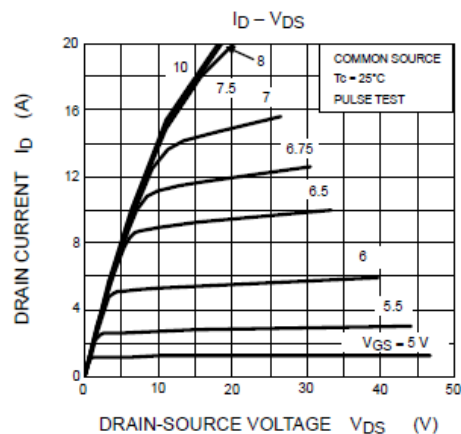
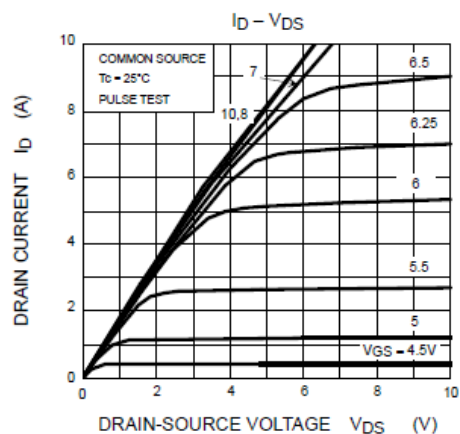
※ YYMMDD Date Code

Electrical Characteristics (T_c25°C Unless otherwise noted)

Parameter	Symbol	Conditions	Min.	Typ	Max.	Unit
Static						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=10mA$	600			V
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	2.0		4.0	V
Gate Leakage Current	I_{GSS}	$V_{DS}=0V, V_{GS}=\pm 30V$			± 1	μA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=600V, V_{GS}=0V$			10	μA
Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS}=10V, I_D=5.0A$		0.58	0.75	Ω
Forward Transconductance	g_{FS}	$V_{DS}=10V, I_D=5A$	1.5	6		S
Diode Forward Voltage	V_{SD}	$I_S=10A, V_{GS}=0V$			1.7	V
Reverse Recovery Time	T_{rr}	$I_S=10A, V_{GS}=0V, dI_F/dt=100A/\mu s$		535.39		ns
Reverse Recovery Charge	Q_{rr}	Pulse width $\leq 300\mu s$, Duty cycle $\leq 2\%$		4.6		μC
Dynamic						
Total Gate Charge	Q_g	$V_{DS}=400V, V_{GS}=10V, I_D=10A$		25		nC
Gate-Source Charge	Q_{gs}			16		
Gate-Drain Charge	Q_{gd}			9		
Input Capacitance	C_{iss}	$V_{DS}=25V, V_{GS}=0V, f=1MHz$		1350		pF
Output Capacitance	C_{oss}			6		
Reverse Transfer Capacitance	C_{rss}			135		
Turn-On Time	$t_{d(on)}$			22		ns
	t_r			55		
Turn-Off Time	$t_{d(off)}$			15		
	t_f			100		

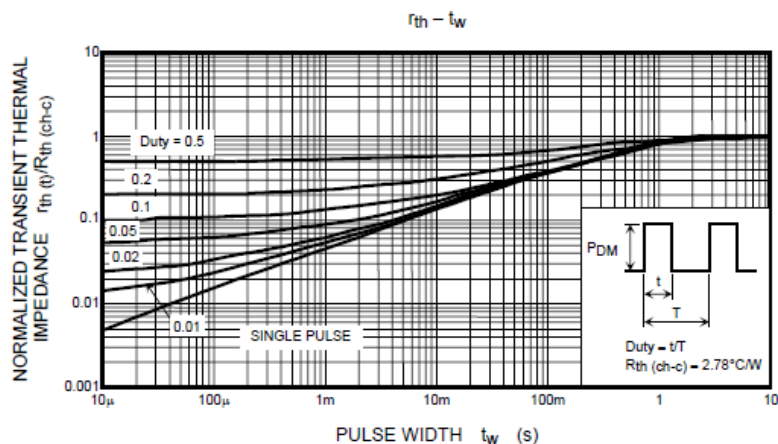
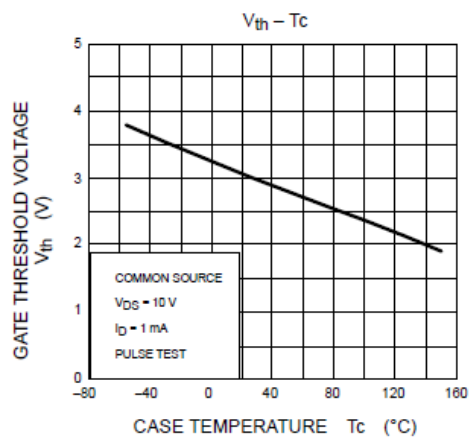
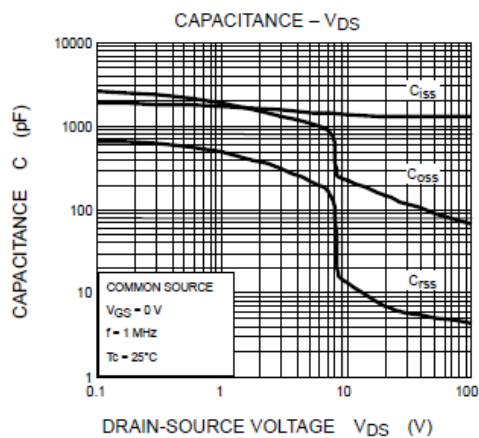
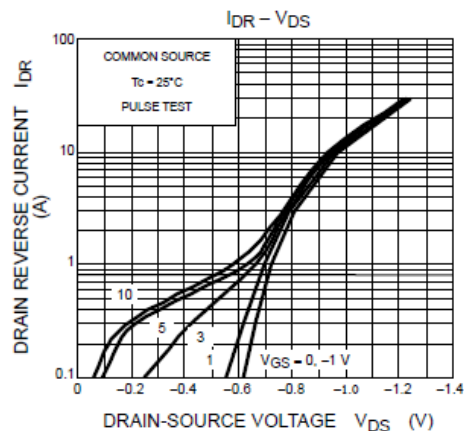
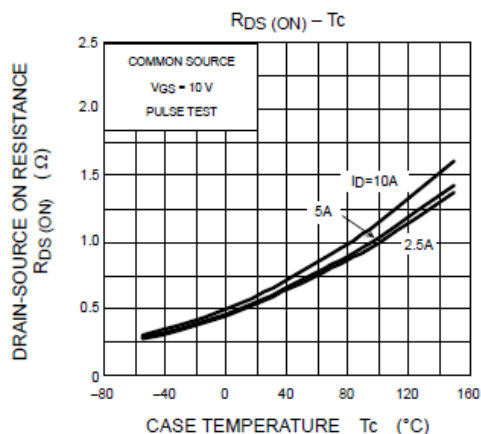


Typical Characteristics





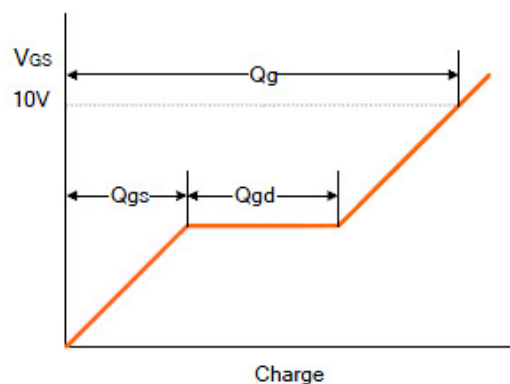
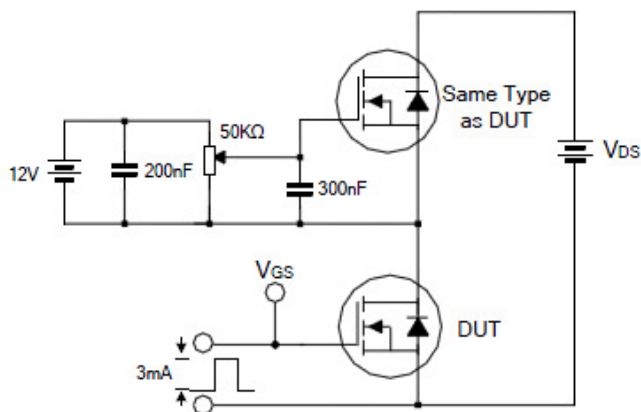
Typical Characteristics



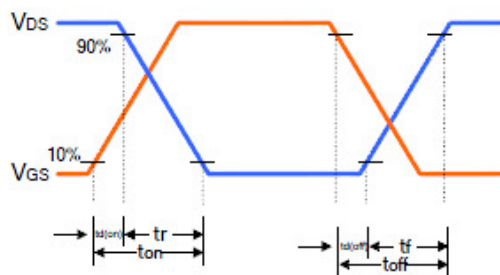
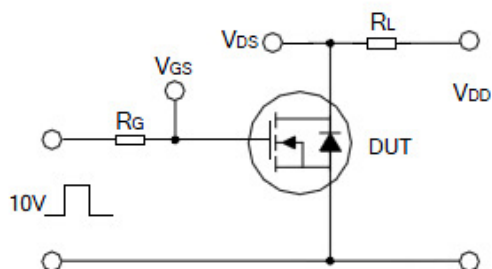


Typical Characteristics

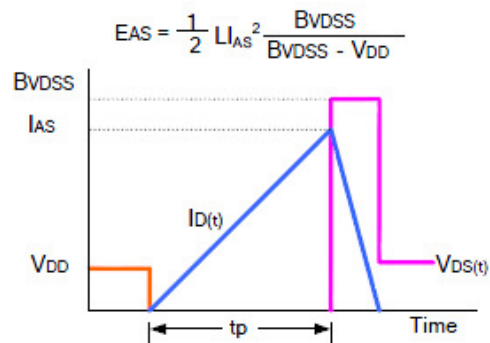
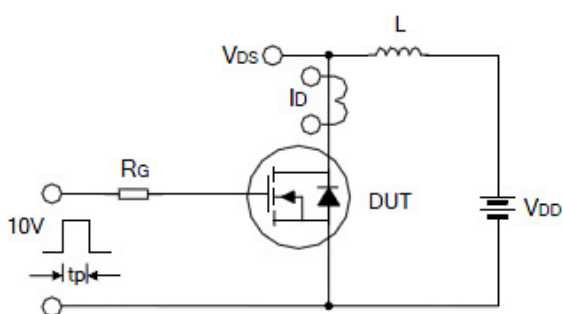
Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveform

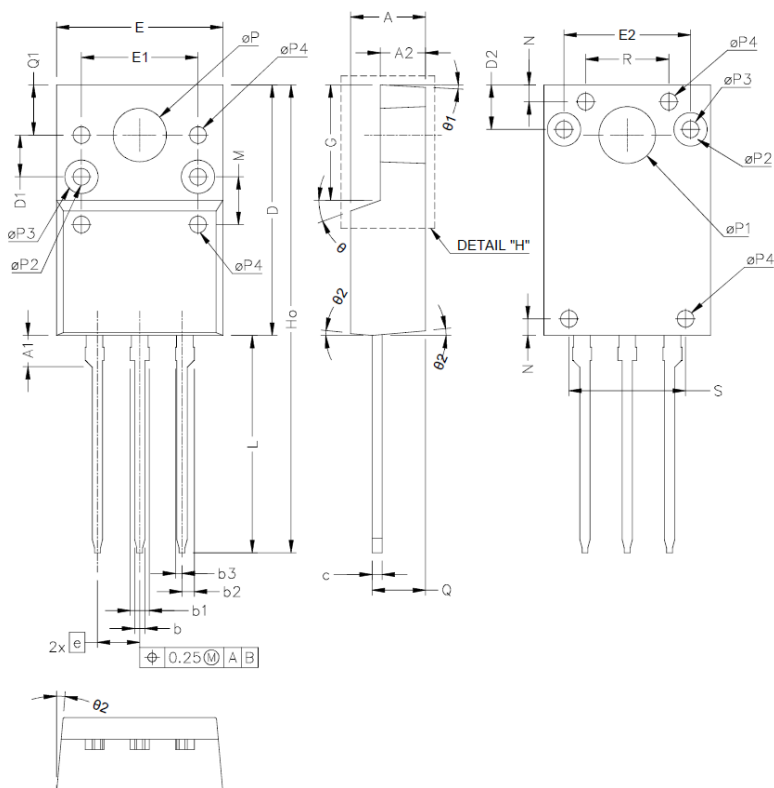


Unclamped Inductive Switching Test Circuit & Waveform





Package Information (TO-220F-3L)



SYMBOL	MIN	NOM	MAX	SYMBOL	MIN	NOM	MAX
A	4.30	4.50	4.70	M		(2.86)	
A1	1.80		2.10	N		(1.00)	
A2	2.50	2.70	2.90	θP	3.05		3.40
b	0.54	0.69	0.84	θP1		(3.40)	
b1	0.99	1.14	1.29	θP2		(1.00)	
b2	0.565	0.745	0.925	θP3		(2.00)	
b3	0.245	0.395	0.545	θP4		(1.00)	
c	0.49	0.60	0.79	Q	3.10	3.20	3.30
D	14.70	15.00	15.30	Q1	2.70	3.00	3.30
D1		(2.50)		R		(5.00)	
D2		(2.66)		S		(7.00)	
e	2.29		2.79	θ		(20°)	
E	9.70	10.00	10.30	θ1		(3°)	
E1		(7.00)		θ2		(5°)	
E2		(7.60)					
G	6.70	6.90	7.10				
Ho		(28.00)					
L	12.50	13.00	13.50				

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