



**Advanced Power
Electronics Corp.**

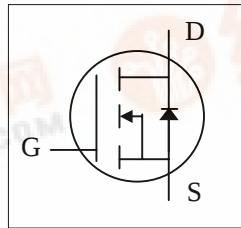
AP07N70CF-A

Pb Free Plating Product

N-CHANNEL ENHANCEMENT MODE

POWER MOSFET

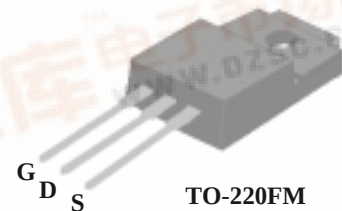
- ▼ Dynamic dv/dt Rating
- ▼ Repetitive Avalanche Rated
- ▼ Fast Switching
- ▼ Simple Drive Requirement
- ▼ RoHS Compliant



BV_{DSS}	650V
$R_{DS(ON)}$	1.2 Ω
I_D	7A

Description

AP07N70 series are specially designed as main switching devices for universal 90~265VAC off-line AC/DC converter applications. TO-220FM type provide high blocking voltage to overcome voltage surge and sag in the toughest power system with the best combination of fast switching, ruggedized design and cost-effectiveness.



The TO-220FM package is universally preferred for all commercial-industrial applications. The device is suited for switch mode power supplies, DC-AC converters and high current high speed switching

Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	650	V
V_{GS}	Gate-Source Voltage	± 30	V
$I_D @ T_C = 25^\circ C$	Continuous Drain Current, $V_{GS} @ 10V$	7	A
$I_D @ T_C = 100^\circ C$	Continuous Drain Current, $V_{GS} @ 10V$	4.4	A
I_{DM}	Pulsed Drain Current ¹	18	A
$P_D @ T_C = 25^\circ C$	Total Power Dissipation	37	W
	Linear Derating Factor	0.3	W/ $^\circ C$
E_{AS}	Single Pulse Avalanche Energy ²	140	mJ
I_{AR}	Avalanche Current	7	A
E_{AR}	Repetitive Avalanche Energy	7	mJ
T_{STG}	Storage Temperature Range	-55 to 150	$^\circ C$
T_J	Operating Junction Temperature Range	-55 to 150	$^\circ C$

Thermal Data

Symbol	Parameter	Value	Units
R_{thj-c}	Thermal Resistance Junction-case	Max. 3.4	$^\circ C/W$
R_{thj-a}	Thermal Resistance Junction-ambient	Max. 65	$^\circ C/W$



AP07N70CF-A

Electrical Characteristics@T_j=25°C(unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =1mA	650	-	-	V
ΔBV _{DSS} /ΔT _j	Breakdown Voltage Temperature Coefficient	Reference to 25°C, I _D =1mA	-	0.6	-	V/°C
R _{DS(ON)}	Static Drain-Source On-Resistance	V _{GS} =10V, I _D =3.5A	-	-	1.2	Ω
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =250uA	2	-	4	V
g _{fs}	Forward Transconductance	V _{DS} =10V, I _D =3.5A	-	4.5	-	S
I _{DSS}	Drain-Source Leakage Current (T _j =25°C)	V _{DS} =600V, V _{GS} =0V	-	-	10	uA
	Drain-Source Leakage Current (T _j =150°C)	V _{DS} =480V, V _{GS} =0V	-	-	100	uA
I _{GSS}	Gate-Source Leakage	V _{GS} =±30V	-	-	±100	nA
Q _g	Total Gate Charge ³	I _D =7A	-	32	-	nC
Q _{gs}	Gate-Source Charge	V _{DS} =480V	-	8.6	-	nC
Q _{gd}	Gate-Drain ("Miller") Charge	V _{GS} =10V	-	9	-	nC
t _{d(on)}	Turn-on Delay Time ³	V _{DD} =300V	-	17	-	ns
t _r	Rise Time	I _D =7A	-	15	-	ns
t _{d(off)}	Turn-off Delay Time	R _G =10Ω, V _{GS} =10V	-	35	-	ns
t _f	Fall Time	R _D =43Ω	-	18	-	ns
C _{iss}	Input Capacitance	V _{GS} =0V	-	2075	-	pF
C _{oss}	Output Capacitance	V _{DS} =25V	-	120	-	pF
C _{rss}	Reverse Transfer Capacitance	f=1.0MHz	-	8	-	pF

Source-Drain Diode

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
I _S	Continuous Source Current (Body Diode)	V _D =V _G =0V , V _S =1.5V	-	-	7	A
I _{SM}	Pulsed Source Current (Body Diode) ¹		-	-	18	A
V _{SD}	Forward On Voltage ³	T _j =25°C , I _S =7A, V _{GS} =0V	-	-	1.5	V

Notes:

1.Pulse width limited by safe operating area.

2.Starting T_j=25°C , V_{DD}=50V , L=5mH , R_G=25Ω , I_{AS}=7A.

3.Pulse width ≤300us , duty cycle ≤2%.

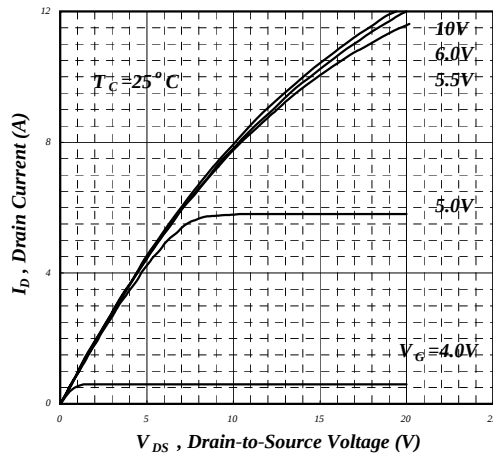


Fig 1. Typical Output Characteristics

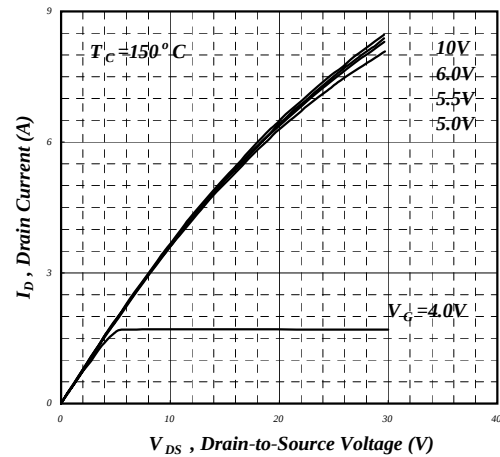


Fig 2. Typical Output Characteristics

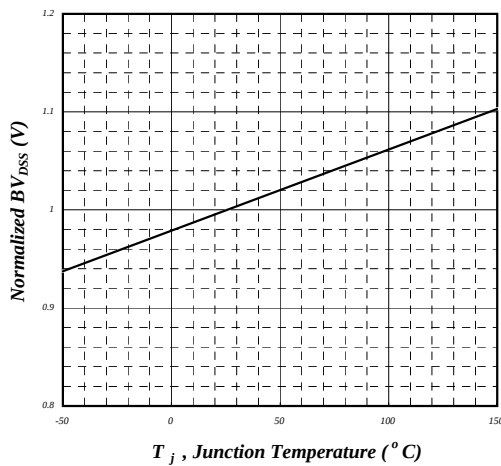


Fig 3. Normalized BV_{DS} v.s. Junction Temperature

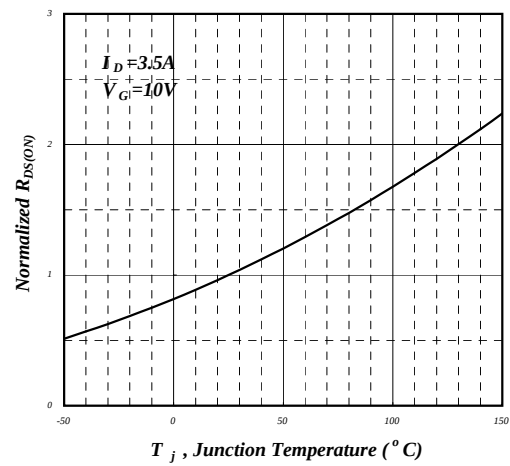


Fig 4. Normalized On-Resistance v.s. Junction Temperature

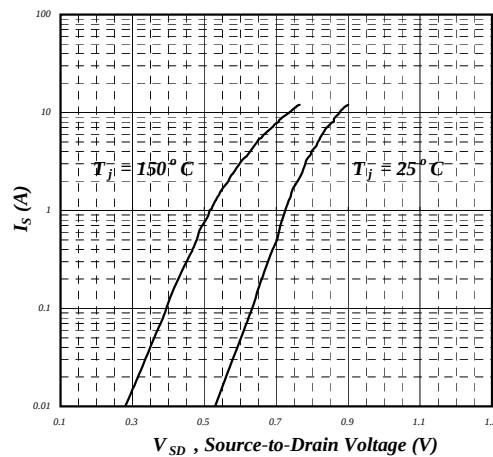


Fig 5. Forward Characteristic of Reverse Diode

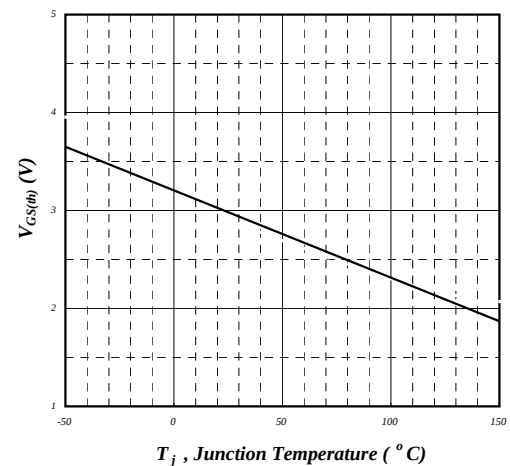


Fig 6. Gate Threshold Voltage v.s. Junction Temperature



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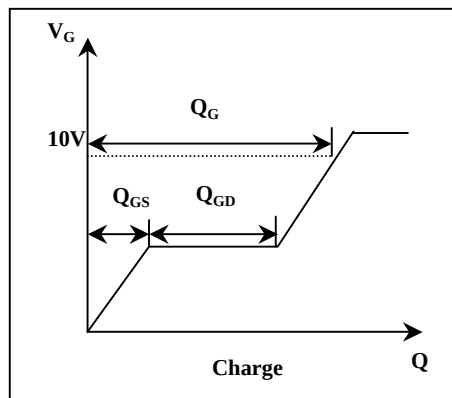
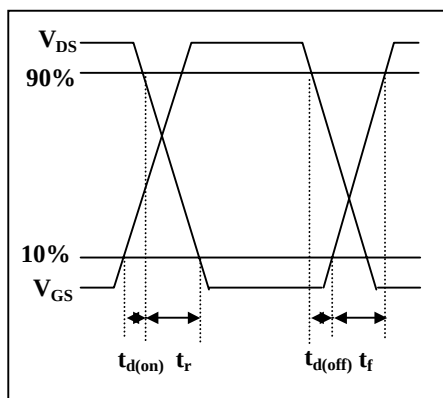
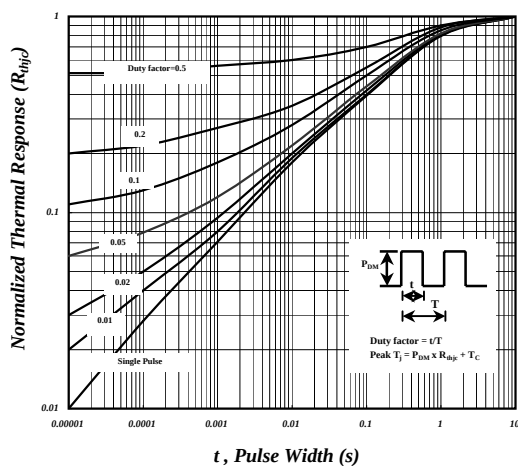
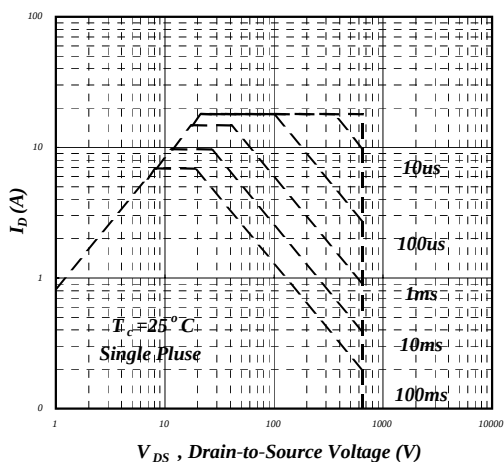
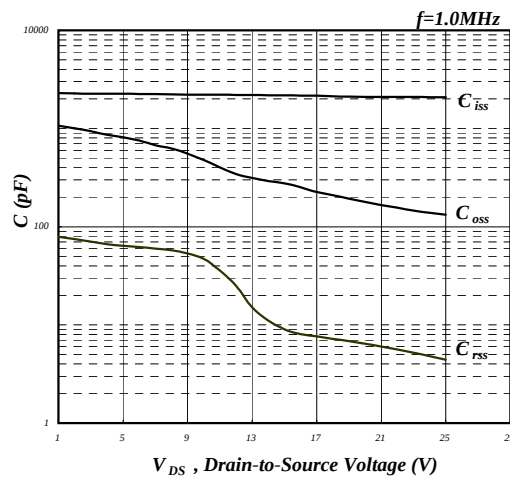
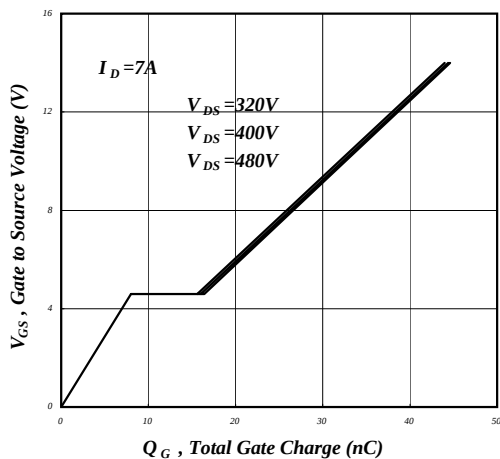


Fig 11. Switching Time Waveform

Fig 12. Gate Charge Waveform