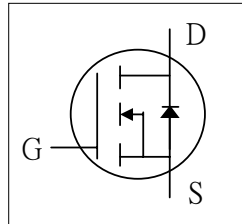




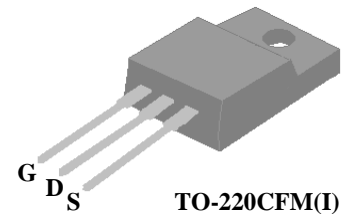
- ▼ **100% Avalanche Rated**
- ▼ **Fast Switching**
- ▼ **Simple Drive Requirement**



BV_{DSS}	700V
$R_{DS(ON)}$	1.4 Ω
I_D	7A

Description

AP07N70 series are specially designed as main switching devices for universal 90~265VAC off-line AC/DC converter applications. The TO-220CFM 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-220CFM package is widely preferred for all commercial-industrial applications. The device is suited for switch mode power supplies, DC-AC converters and high current high speed switching circuits.

Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	700	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
Rthj-c	Maximum Thermal Resistance, Junction-case	3.4	$^\circ C/W$
Rthj-a	Maximum Thermal Resistance, Junction-ambient	65	$^\circ C/W$



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Electrical Characteristics @ $T_j=25^\circ\text{C}$ (unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=1mA$	700	-	-	V
$\Delta BV_{DSS}/\Delta T_j$	Breakdown Voltage Temperature Coefficient	Reference to $25^\circ\text{C}, I_D=1mA$	-	0.6	-	$V/^\circ\text{C}$
$R_{DS(ON)}$	Static Drain-Source On-Resistance ³	$V_{GS}=10V, I_D=3.5A$	-	-	1.4	Ω
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu A$	2	-	4	V
g_{fs}	Forward Transconductance	$V_{DS}=50V, I_D=3.5A$	-	4.5	-	S
I_{DSS}	Drain-Source Leakage Current	$V_{DS}=600V, V_{GS}=0V$	-	-	10	μA
	Drain-Source Leakage Current ($T_j=125^\circ\text{C}$)	$V_{DS}=480V, V_{GS}=0V$	-	-	500	μA
I_{GSS}	Gate-Source Leakage	$V_{GS}=\pm 30V, V_{DS}=0V$	-	-	± 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	$R_G=10\Omega, V_{GS}=10V$	-	35	-	ns
t_f	Fall Time	$R_D=43\Omega$	-	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	$T_j=25^\circ\text{C}, I_S=7A, V_{GS}=0V$	-	-	1.5	V

Notes:

1. Pulse width limited by Maximum junction temperature.
2. Starting $T_j=25^\circ\text{C}$, $V_{DD}=50V$, $L=5mH$, $R_G=25\Omega$, $I_{AS}=7A$.
3. Pulse test

THIS PRODUCT IS SENSITIVE TO ELECTROSTATIC DISCHARGE, PLEASE HANDLE WITH CAUTION.

USE OF THIS PRODUCT AS A CRITICAL COMPONENT IN LIFE SUPPORT OR OTHER SIMILAR SYSTEMS IS NOT AUTHORIZED.

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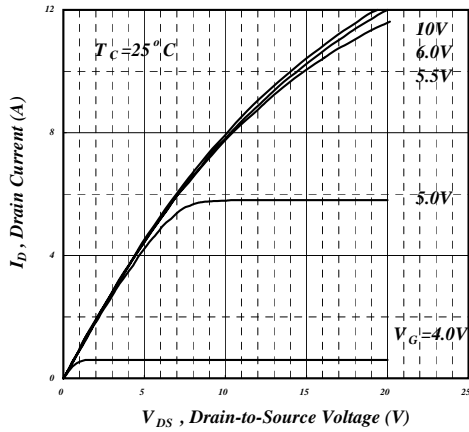


Fig 1. Typical Output Characteristics

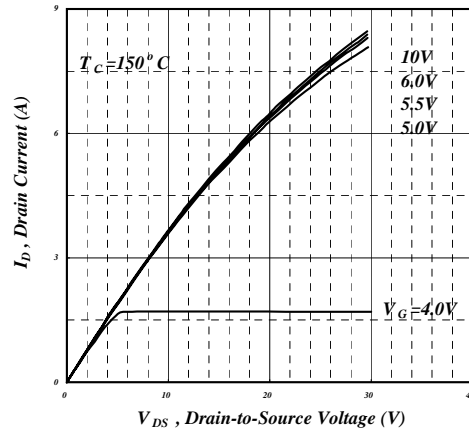


Fig 2. Typical Output Characteristics

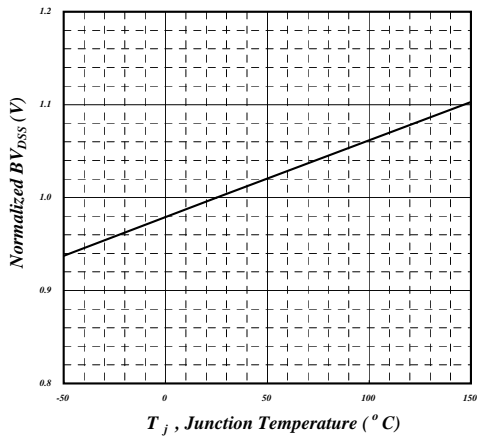


Fig 3. Normalized BV_{DSS} v.s. Junction Temperature

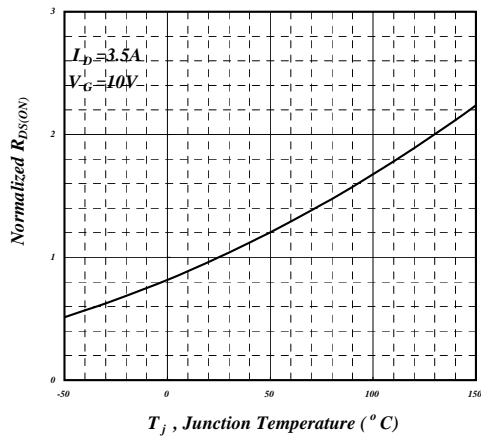


Fig 4. Normalized On-Resistance v.s. Junction Temperature

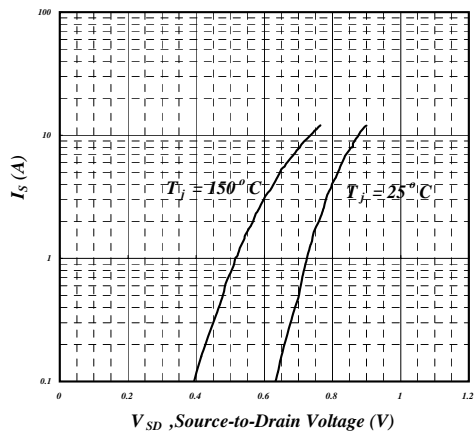


Fig 5. Forward Characteristic of Reverse Diode

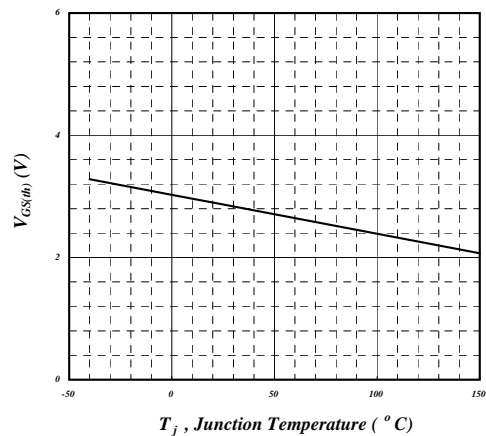


Fig 6. Gate Threshold Voltage v.s. Junction Temperature



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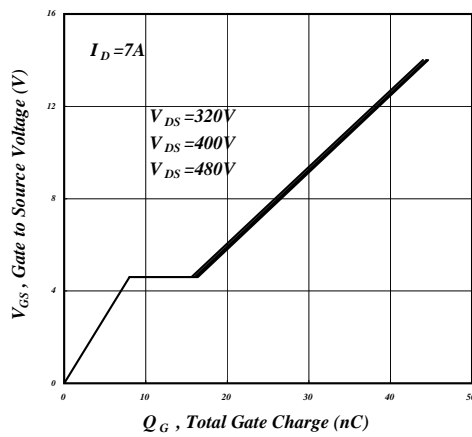


Fig 7. Gate Charge Characteristics

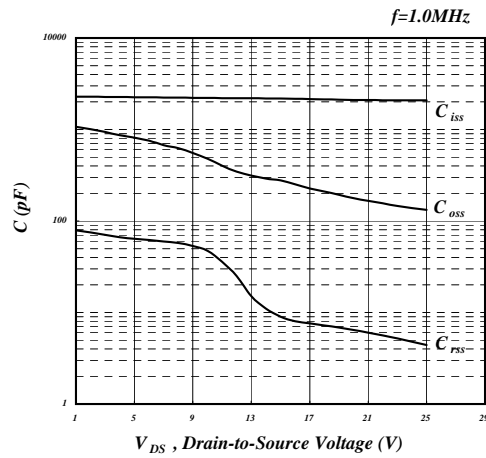


Fig 8. Typical Capacitance Characteristics

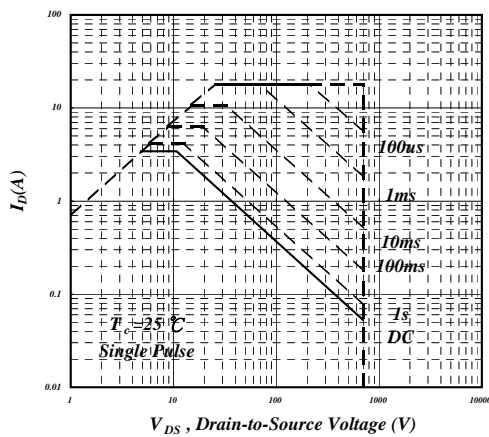


Fig 9. Maximum Safe Operating Area

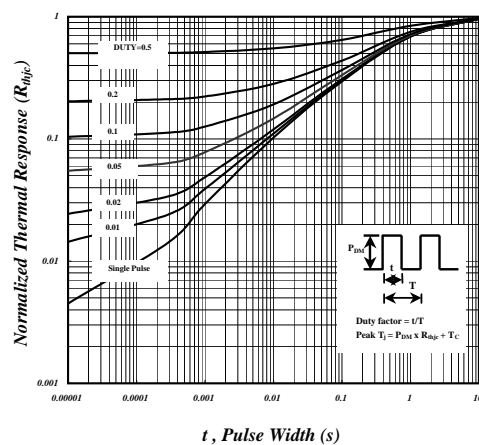


Fig 10. Effective Transient Thermal Impedance

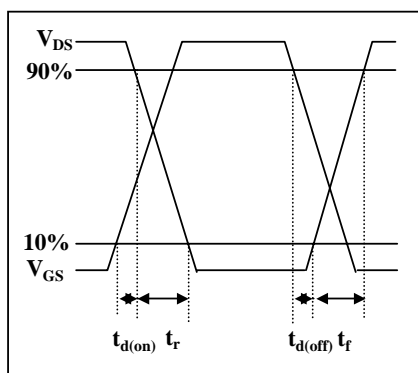


Fig 11. Switching Time Waveform

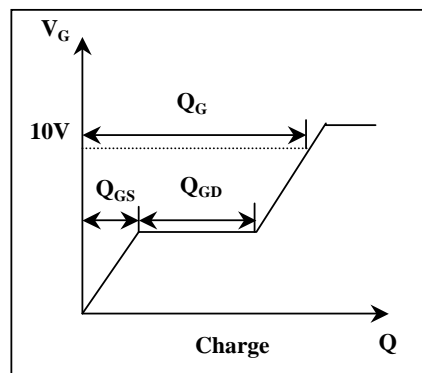


Fig 12. Gate Charge Waveform