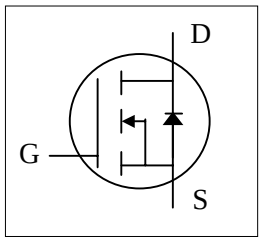
AP3987P-HF

Halogen-Free Product

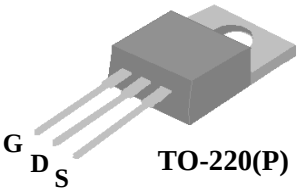
Advanced Power Electronics Corp.

N-CHANNEL ENHANCEMENT MODE POWER MOSFET

- ▼ **100% Avalanche Test**
- ▼ **Fast Switching Characteristic**
- ▼ **Simple Drive Requirement**
- ▼ **RoHS Compliant & Halogen-Free**



BV_{DSS}	600V
$R_{DS(ON)}$	1Ω
I_D	7A



TO-220(P)

Description

AP3987 series are specially designed as main switching devices for universal 90~265VAC off-line AC/DC converter applications. The TO-220 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-220 package is widely preferred for 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	600	V
V_{GS}	Gate-Source Voltage	±30	V
I_D@T_C=25℃	Continuous Drain Current, V_{GS} @ 10V	7	A
I_D@T_C=100℃	Continuous Drain Current, V_{GS} @ 10V	4.4	A
I_{DM}	Pulsed Drain Current[1]	28	A
P_D@T_C=25℃	Total Power Dissipation	104	W
E_{AS}	Single Pulse Avalanche Energy[2]	27	mJ
T_{STG}	Storage Temperature Range	-55 to 150	℃
T_J	Operating Junction Temperature Range	-55 to 150	℃

Thermal Data

Symbol	Parameter	Value	Unit
Rthj-c	Maximum Thermal Resistance, Junction-case	1.2	℃/W
Rthj-a	Maximum Thermal Resistance, Junction-ambient	62	℃/W

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=250uA	600	-	-	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance[3]	V_{GS}=10V, I_D=5A	-	-	1	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=5A	-	5	-	S
I_{DSS}	Drain-Source Leakage Current	V_{DS}=480V, V_{GS}=0V	-	-	100	uA
I_{GSS}	Gate-Source Leakage	V_{GS}=±30V, V_{DS}=0V	-	-	±100	nA
Q_g	Total Gate Charge	I_D=7A	-	55	90	nC
Q_{gs}	Gate-Source Charge	V_{DS}=480V	-	9	-	nC
Q_{gd}	Gate-Drain ("Miller") Charge	V_{GS}=10V	-	16	-	nC
$t_{d(on)}$	Turn-on Delay Time	V_{DD}=300V	-	15	-	ns
t_r	Rise Time	I_D=7A	-	15	-	ns
$t_{d(off)}$	Turn-off Delay Time	R_G=10Ω	-	100	-	ns
t_f	Fall Time	V_{GS}=10V	-	32	-	ns
C_{iss}	Input Capacitance	V_{GS}=0V	-	2750	4400	pF
C_{oss}	Output Capacitance	V_{DS}=25V	-	160	-	pF
C_{rss}	Reverse Transfer Capacitance	f=1.0MHz	-	6	-	pF

Source-Drain Diode

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
V_{SD}	Forward On Voltage[3]	I_S=7A, V_{GS}=0V	-	-	1.5	V
t_{rr}	Reverse Recovery Time	I_S=7A, V_{GS}=0V,	-	530	-	ns
Q_{rr}	Reverse Recovery Charge	dI/dt=100A/μs	-	8.6	-	uC

Notes:

1.Pulse width limited by Max. junction temperature.

2.Starting T_j=25°C , V_{DD}=50V , L=1.0mH , R_G=25Ω

3.Pulse test