

### DESCRIPTION

The TUP110 series of AC/DC switching power supplies are for 110 watts of continuous output power. They are enclosed in a 94V-1 rated polyphenylene-oxide case with an IEC 320 inlet to mate with interchangeable cord for world-wide use. An on/off switch can be added at request. All models meet CISPR 22 and FCC class B emission limits, and comply with UL, CSA, IEC and CE requirements.

### FEATURES

- Single, dual, triple or quadruple outputs
- Optional output connectors
- Optional on/off switch
- Optional Power Fail Detect (PFD) signal
- 100% burn-in
- Wide input range 85 to 264 VAC
- Input surge current protection
- Overvoltage protections
- Overcurrent protections

### INPUT SPECIFICATIONS

Input voltage : 85 to 264 VAC  
Input frequency : 47 to 63 Hz  
Input current : 3.20A ( rms ) for 115VAC  
1.80A ( rms ) for 230VAC  
Leakage current : 0.40mA max. @ 115VAC, 60Hz  
0.80mA max. @ 230VAC, 50Hz

### OUTPUT SPECIFICATIONS

Output voltage/current : See rating chart  
Total output power : 110 watts maximum  
Ripple and noise : 1% peak to peak maximum  
Overvoltage protection : Provided on output #1 only; set at 112 – 132% of its nominal output voltage  
Overcurrent protection : All outputs protected to short circuit conditions  
Temperature coefficient : All outputs  $\pm 0.04\%/^{\circ}\text{C}$  maximum  
Transient response : Maximum excursion of 4% or better on all models, recovering to 1% of final value within 500 $\mu\text{s}$  after a 25% step load change  
PFD signal (optional) : TTL logic high for normal operation and TTL logic low upon loss of input power. This signal appears at least 1ms prior to +5V output dropping 5% below its nominal value. This signal also provides a minimum delay of 100ms after +5V is within regulation.

### TUP110 SERIES



### Safety Standard Approvals :



UL 60950-1  
CSA C22.2 No. 60950-1



TÜV EN60950-1

### ENVIRONMENTAL SPECIFICATIONS

Operating temperature : 0°C to +70°C  
Storage temperature : -40°C to +85°C  
Relative humidity : 5% to 95% non-condensing  
Derating : Derate from 100% at +50°C linearly to 50% at +70°C

### GENERAL SPECIFICATIONS

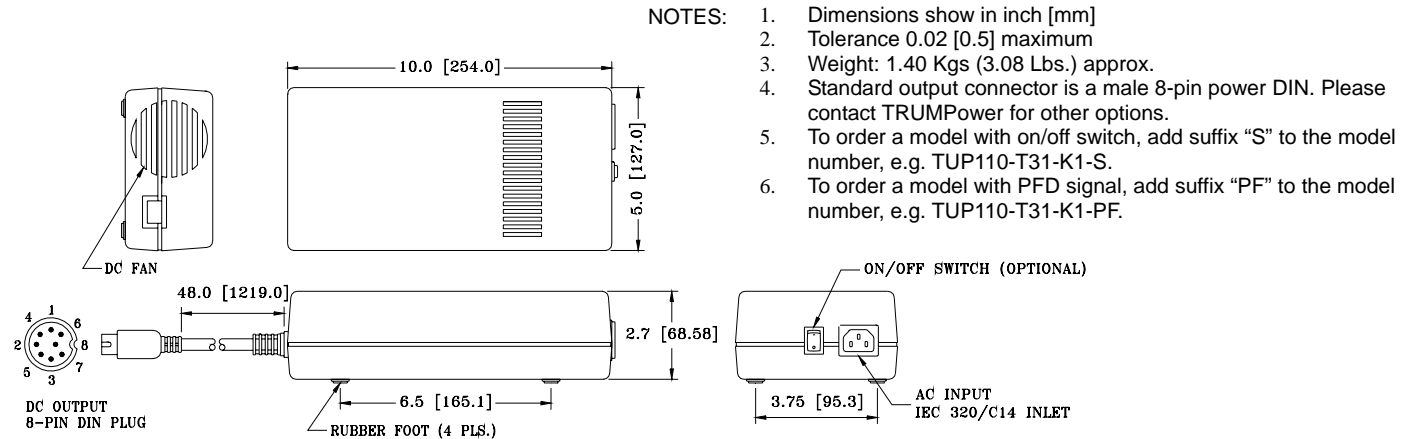
Switching frequency : 20K to 250KHz, varies with load and line  
Efficiency : 70% minimum on single output models with  $V_o \geq 12\text{V}$ , 65% minimum on the others  
Hold-up time : 12 msec minimum at 110VAC  
Line regulation :  $\pm 0.5\%$  maximum at full load  
Inrush current : 15 amps @ 115VAC, or 30 amps @ 230VAC, at 25°C cold start  
Withstand voltage : 3000VAC from input to output  
1500VAC from input to ground  
500VAC from output to ground  
MTBF : 550,000 hours minimum at full load at 25°C ambient, calculated per MIL-HDBK-217F, excluding DC fan  
EMC performance (EN55024)  
EN55022: Class B conducted, class B radiated  
FCC: Class B conducted, class B radiated  
VCCI: Class B conducted, class B radiated  
EN61000-3-2: Harmonic distortion, class A  
EN61000-3-3: Line flicker  
EN61000-4-2: ESD,  $\pm 8\text{KV}$  air and  $\pm 4\text{KV}$  contact  
EN61000-4-3: Radiated immunity, 3V/m  
EN61000-4-4: Fast transient/burst,  $\pm 1\text{KV}$   
EN61000-4-5: Surge,  $\pm 1\text{KV}$  diff,  $\pm 2\text{KV}$  com.  
EN61000-4-6: Conducted immunity, 3Vrms  
EN61000-4-8: Magnetic field immunity, 1A/m  
EN61000-4-11: Voltage dips, 30% reduction for 500ms and >95% reduction for 10ms

## OUTPUT VOLTAGE/CURRENT RATING CHART

Product No.	Output #1				Output #2				Output #3				Output #4				Maximum Output Power	
	Vnom.	Imin.	Imax.	Tol.	Vnom.	Imin.	Imax.	Ipeak.	Tol.	Vnom.	Imin.	Imax.	Tol.	Vnom.	Imin.	Imax.		Tol.
TUP110-S05	5V	0A	22A	5%			(N/A)											110W
TUP110-S12	12V	0A	9.0A	4%			(N/A)											110W
TUP110-S15	15V	0A	7.5A	3%			(N/A)											110W
TUP110-S24	24V	0A	4.5A	3%			(N/A)											110W
TUP110-S30	30V	0A	3.6A	3%			(N/A)											110W
TUP110-S48	48V	0A	2.3A	3%			(N/A)											110W
TUP110-D23	+5V	0A	10A	5%	+12V	0A	5A	9.0A	5%	(N/A)								110W
TUP110-T31	+5V	0A	10A	5%	+12V	0A	5A	9.0A	5%	-12V	0A	1A	5%					110W
TUP110-T32	+5V	0A	10A	5%	+15V	0A	4A	7.5A	5%	-15V	0A	1A	5%					110W
TUP110-Q40	+5V	0A	10A	5%	+12V	0A	5A	9.0A	5%	-12V	0A	1A	5%	-5V	0A	1A	5%	110W
TUP110-Q41	+5V	0A	10A	5%	+15V	0A	4A	7.5A	5%	-15V	0A	1A	5%	+24V	0A	1A	5%	110W
TUP110-Q42	+5V	0A	10A	5%	+12V	0A	5A	9.0A	5%	-12V	0A	1A	5%	+12V	0A	1A	5%	110W
TUP110-Q45	+5V	0A	10A	5%	+12V	0A	5A	9.0A	5%	-12V	0A	1A	5%	+24V	0A	1A	5%	110W
TUP110-Q45-1	+5V	2A	10A	5%	+12V	0A	5A	9.0A	5%	-12V	0A	1A	5%	+24V	1.5A	3A	10%	110W
TUP110-Q45-2	+5V	0A	10A	5%	+24V	0A	3A	5.0A	5%	-12V	0A	1A	5%	+12V	0A	1A	5%	110W
TUP110-Q46	+5V	0A	10A	5%	+15V	0A	4A	7.5A	5%	-15V	0A	1A	5%	-5V	0A	1A	5%	110W

Notes: (1) Peak output current with 10% maximum duty cycle for less than 60 seconds. Total peak power must not exceed 130 watts.  
 (2) The output #1 of model TUP110-Q45-1 needs a minimum current of 2A to support the other outputs at their maximum rated loads.

## MECHANICAL SPECIFICATIONS



## PIN CHART

Product No.		PIN							
		1	2	3	4	5	6	7	8
TUP110-S05	TUP110-S12	RETURN	RETURN	OUTPUT #1	RETURN	OUTPUT #1	RETURN	OUTPUT #1	N.C. or PFD
TUP110-S15	TUP110-S24			OUTPUT #1		OUTPUT #1			
TUP110-S30	TUP110-S48			OUTPUT #1		OUTPUT #1			
TUP110-D23		COMMON RETURN	N.C.	OUTPUT #1	N.C.	OUTPUT #2	COMMON RETURN	OUTPUT #1	N.C. or PFD
TUP110-T31	TUP110-T32	COMMON RETURN	OUTPUT #3	OUTPUT #1	N.C.	OUTPUT #2	COMMON RETURN	OUTPUT #1	N.C. or PFD
TUP110-Q40	TUP110-Q41	COMMON RETURN	OUTPUT #3	OUTPUT #1	OUTPUT #4	OUTPUT #2	COMMON RETURN	OUTPUT #1	N.C. or PFD
TUP110-Q42	TUP110-Q45								
TUP110-Q45-1	TUP110-Q45-2								
TUP110-Q46									