

Preliminary datasheet Sheet_DPA-400/F-3_68_EN_1.2_2013

DPA-400/F-3 High Performances Audiophile D Class Audio Amplifier
Powered by new technology (Regulated dual feedback fast smps without PWM).



Features:

- High efficiency (>90%)
- Low profile (32mm)
- Ultra low noise
- Up to 540W rms (2R)
- Innovative protections
- **APC** (Active Power Control)
- High reliability
- Weight 450g. (*)
- 1U Assemble

Applications:

- Studio monitor
- Multi Way
- High-End Active Sub
- Audiophile amplifiers

Description

The **DPA-xx series** was developed in order to achieve high performance very similar to class AB. to achieve this result, **MDI** laboratories has developed a new modulator scheme (45ns C.T.) and a very fast drive to ensure good stability with high frequency switching (400kHz-600kHz) with dynamical changing DT (**80 to 30ns**).

The **DPA-xx series** also equipped with innovative,proprietary technology, high performance PSU "**RIPS**". Able to offer an excellent transient response audio, ensuring a drop in voltage around 2.7 V, in the presence of high current burst 33-66ms. this ensures a natural dynamic, especially on reactive loads very heavy. (available in traditional psu, with **2x150.000uF**).

It includes very fast protection circuitry to protect all devices and the speakers in the event of anomalies. Special functions, eg. **APC** (Active Power Control) that can adjust the power in real time without thd (if audio envelope increases the current (over load) in relation at inductive load).

The result is an amplifier easy to assemble,fast,stable,with excellent audio performances,addressed for professionals applications.

Developed and assembled in Italy with high quality materials and manufacturing.



RoHS **CE** **EMC**
compliant
2002/95/EC

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Specifications (Amplifier Section)

POWER OUT & THD @1KHz	570W 0,06% (2R)- (470W 0,04% thd) (0,02% thd @180w-8R)
FREQUENCY RESPONSE	20Hz (-1dB) to 40KHz (-3dB) (4R) (+1dB at openload (40Khz))
SN/R	-102dB (weight-A) (Mute-Off)
THD	0,003% @30W (4R) -- 0,03% @100W (4R) flat in band (40Hz to 20KHz)
DF	200 (60Hz,4R /open)
OFFSET	+/-5mV (Auto Balanced)
Input	1Vrms 2x5K Balanced input
Gain	27dB

AUX VOLTAGE OUT	+/-15V 2x100mA (regulated LM317/LM337) Under fuse (1R)
PSRR REF (A)	72dB both Rail/(100Hz see note)

PROTECTIONS (*)	Short-cut up to max power ,dc-guard > +/-3V,thermal,over-load
(*) NOTE	Switch-on/off and entry/exit from protections, with auto MUTE
EFFICIENCY	>94% @ (25°, 230VAC ,4R,1KHz SIN,Clipped)
CARRIER RESIDUAL	360mV rms (4R) (400Khz)
STBY-CURRENT (Bias)	DC-2x150mA @ 25°, +/-60V (Input to GND)
OVER TEMPERATURE	80°C ± 5°C (shut down with auto-recovery)
WORKING TEMP/HUMIDITY	0 ~ 40°C 20 ~ 90% RH non-condensing (see note)
DIMENSION-WEIGHT	210x145x37mm (LxWxH) 600g. (Ref to AL Frame)

IMPORTAT NOTES

1. All parameters measured at 230VAC 50 Hz input, 25°C as ambient temperature,AL Frame include
- 2.

Caution and warning

CAUTION: Use Connector WITH SAME TYPE AND RATING !

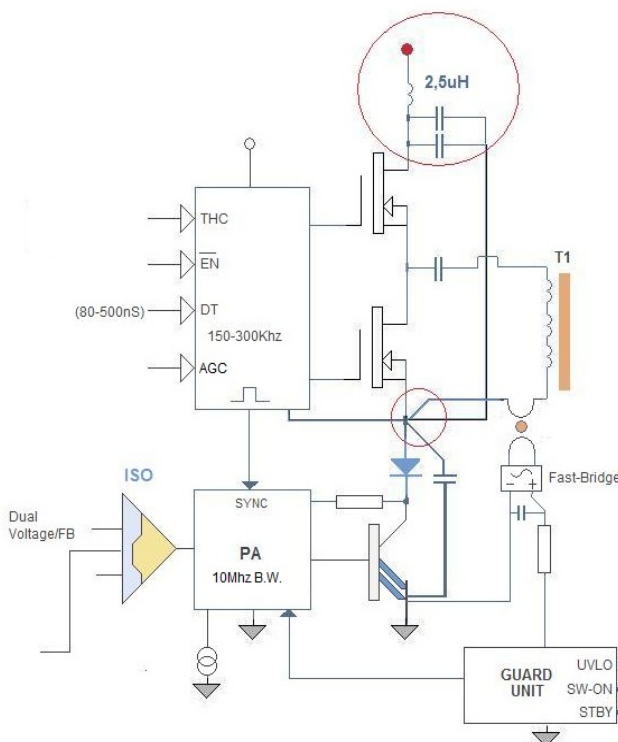
WARNING: TO REDUCE THE RISK OF FIRE OR ELECTRIC SHOCK, DO NOT EXPOSE THIS APPLIANCE TO RAIN OR MOISTURE.

Specifications (PSU Section)

INPUT-VOLTAGE	190 ~ 260VAC
AC LINE REGULATION	DC Output locked (190 to 260VAC,drift=10mV)
FREQUENCY RANGE	50 ~ 60Hz
STANDBY AC CURRENT	3mA(230VAC)-Energy save (CE)
EFFICIENCY	>90% (25°, 230VAC,150KHz PWM,2x5A Load)
FAN CN	+12V 200mA filtered,proportional drive output (see note 1)
OUTPUT CURRENT (DC)	25Amp peak repetitive @ +/-58V (50ms width pulse time)
RIPPLE & NOISE	DC: 1mV rms(100Hz-70mA @60V): 47mV rms(100Hz-2x5Amp @58V) Both polarity. HF:-80,0dB (Fo: 150 KHz,2x150mA @60V)
SETUP TIME	3000ms
OVERLOAD	>16A (100ms delayed)– shut down with auto-recovery (2 Sec.)
SHORT CIRCUIT	Shut down with auto-recovery (2 Sec.)
SMPS	half-bridge pwm 150-170KHz fixed, regulated by ultra fast high voltage linear power stage (150ns)
POWER OUTPUT (DC)	1Kw (t=30Sec.) @ +/-58V (current sensing disabled)
POWER FACTORY (AC)	thanks to the regulator synchronized and the owner transformer high efficiency, the smps use only 300uF400V filter. (pf) result near to "1"

Particular of the power regulator (Regulated dual feedback fast smps).

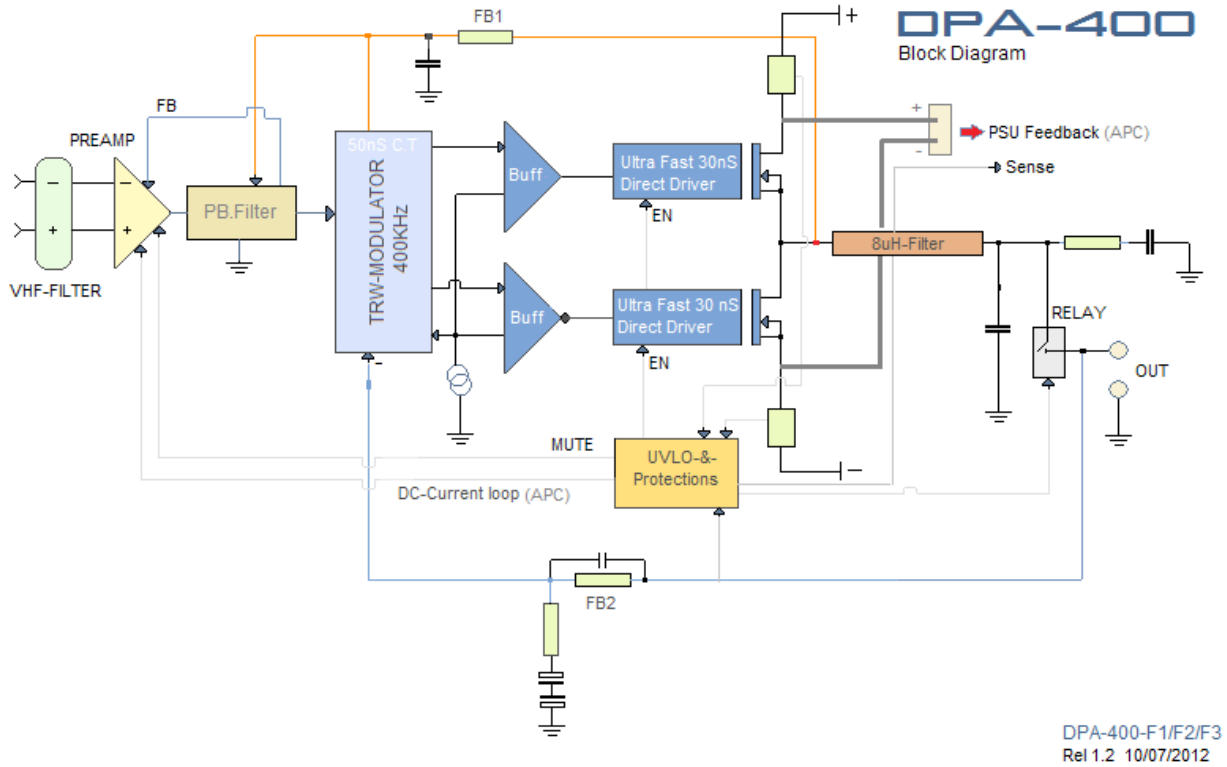
Release 1.3-07/2012



The DPA-400/F-xx use, after a long research, a new system of linear power regulator very fast, according to the transient response of the audio. The system provides also an extreme cleaning operation, varying only as the high voltage amplitude in relation to the audio modulation, without altering the inductance and the curve of the transformer.

We can not use a normal pwm, as currently used in in SMPS for industry,in side of audiophile amps. Spurious proportional to the peak current (generating a bad behavior of EMI / RFI), also those on the DC, are mixed with (f) of the carrier at output of power stage, altering in the presence of high percentage of modulation, the harmonic content of the envelope audio. A classic recognizable behavior of some class D, especially in the presence of sound as voice, electric piano and other musical instruments with similar geometry of the envelope.

Diagram



Innovation on DPA-400/F-xx

Parallel fast conversion (PWM):

The DPA-400/Fxx uses two comparators in parallel used in "common mode", with feedback set-point in order to obtain a low hysteresis, together with a square wave with rising edges fast but with corners slightly softened. This reduces the emission of harmonics and ensures a high speed modulation, also thanks to the very low output impedance obtained.

APC (Active Power Control):

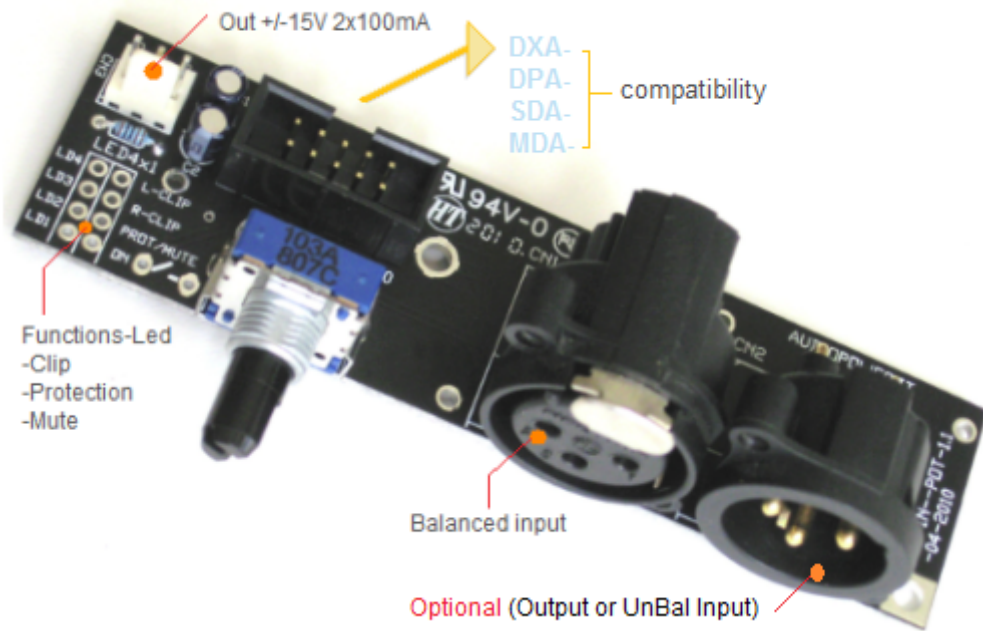
This system was developed after many measures in audio amplifiers with high output currents to reactive loads. (Include big A-B Class)

It could be observed (with realtime recording of the parameters of the current / output voltage Vs load) that, in some circumstances, some sound envelopes (Vs. load) , requires a huge output current, subjecting the states of power (including the psu) to a extra work with considerable production of thd, forcing the listener to turn down the volume.

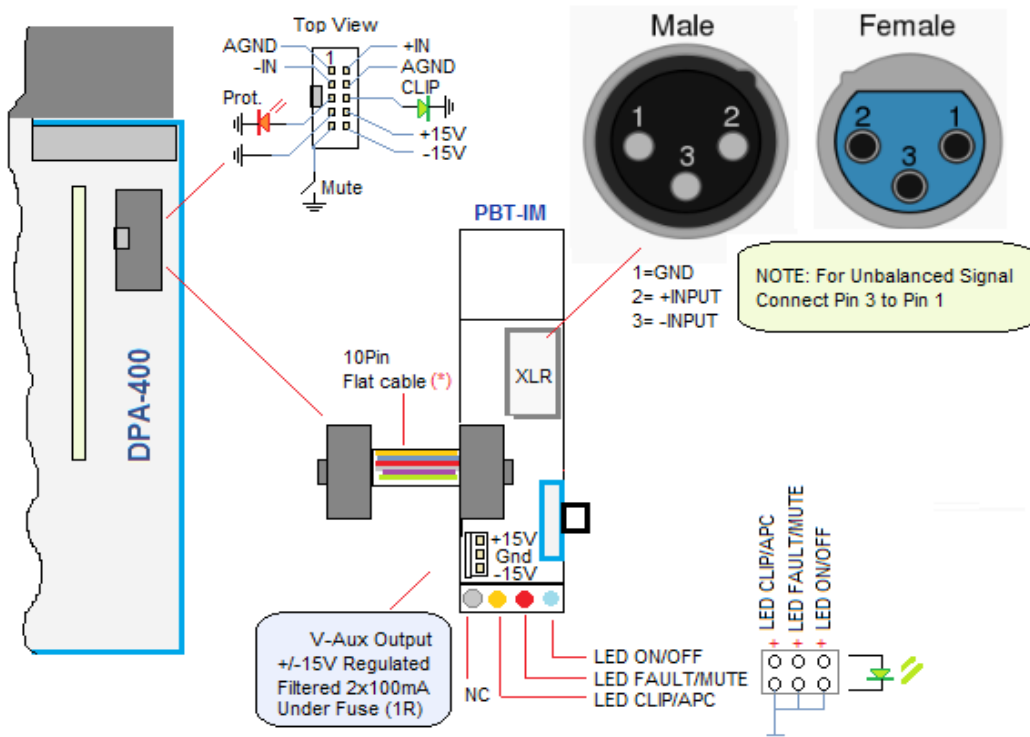
Description:

APC consists of a LOG amplifier with input connected to the differential sensing of current and output connected an "linear actuator (DUAL-JFET)", interacts in the gain of preamp stage in real time. In addition, this output is also used (with a filter), as the control of the maximum power in relation to temperature. We have obtained an amplifier capable of delivering maximum power under all conditions, without fatigue, with a powerful sound clean and excellent robustness.

Input & Controls Board (PBT-IM)



Input & Controls Connections



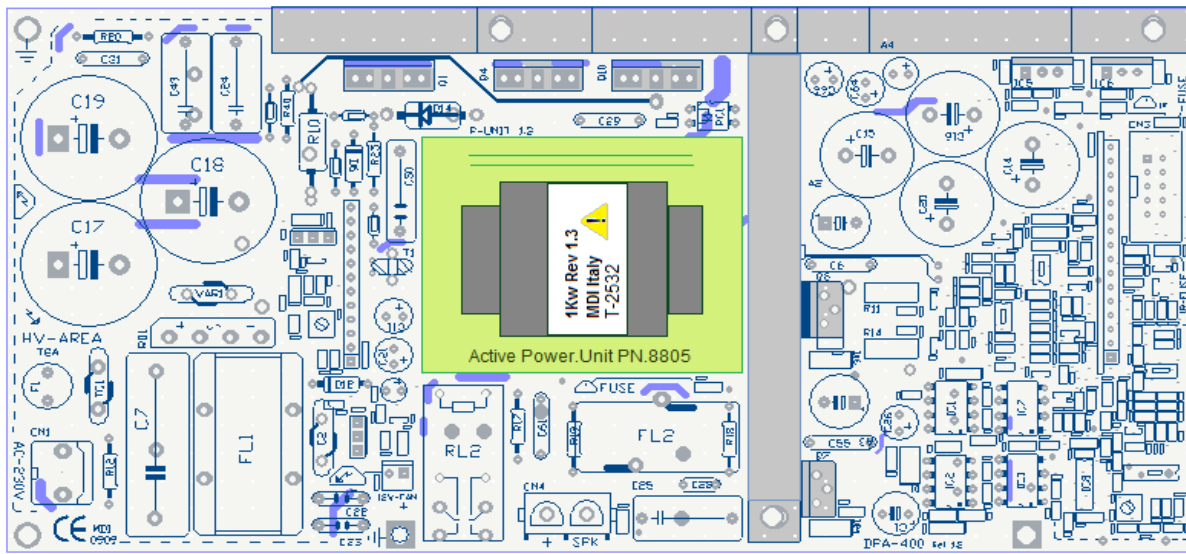
Flat Cable (*)

Thanks to the good shielding of the PCB and the signals very clean in section SMPS, can be used a flat cable up to 30cm in length, without anomalies or induced noise.

PCB Diagram

The **DPA-400/F-3** is only available in the full version of the aluminum frame, assembled and tested, offering the absence of noise and a good measure of RFI / EMI. **is not recommended to remove the amplifier from the frame.**

230 Vac connection: It is recommended to use a cable with a **size not less than 2mm x single wire.** Connect the ground wire to the aluminum frame, near the connector on the PCB 230Vac.



Measure 198x98 mm

Components & PCB Info

Pcb dimension 198x98; Height 27mm

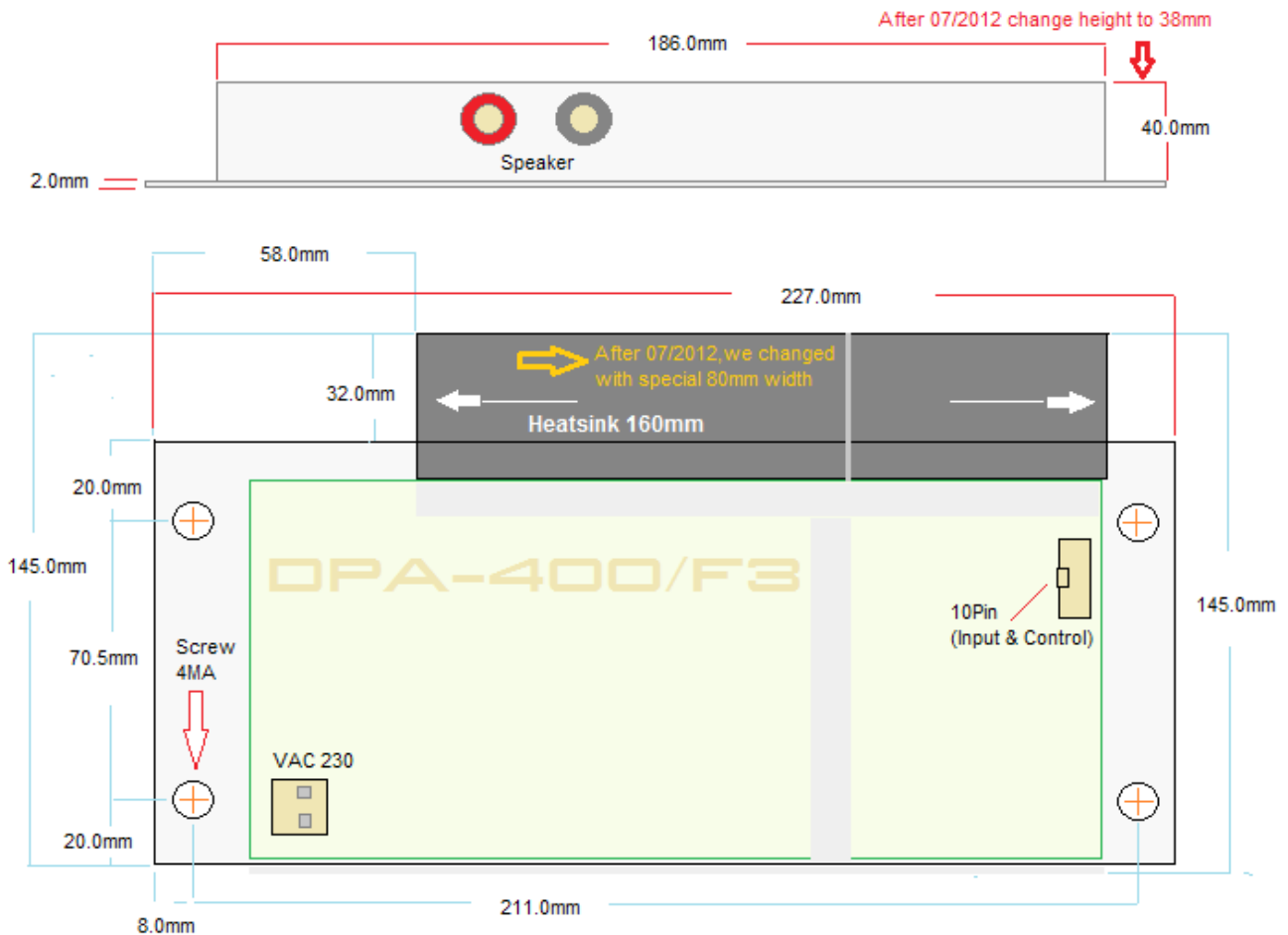
The **DPA-400/F-3** uses comp. In both side:

Discrete components = 80;

SMD components (total) = 300

Hybrid module = 3

Mechanical



Package contents:

- 1xPBT-IM complete include flat cable assembled
- All connectors (CN1,CN3)
- 2x steel spacers 3MAx6mm
- 10x steel screws 3MAx5mm
- 1xbase alluminum frame satin,thickness =2mm
- 4xsteel screws 4MAx8mm
- 4xIsolator (plastic) 4MA
- 1x datasheet

Info

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