

amplifiers

PAM PROseries

4th GENERATION ECLER PROFESSIONAL AMPLIFIERS.

The use of switching mosfet and the result of innovation in 3 basic aspects of the design make the 6 models of the 4th generation SPM technology the most advanced audio amplifiers in the market.

1.- Protection system based on the SOA (Safe Operating Area).

The SOA is the normal operating area of the MOSFET. The special point on switching Mosfets is that they can support power peaks of three or more times the maximum DC power for very short times, thus making possible for an amplifier to punctually drive a 0.3 ohm load with a 150A current peak. As a consequence of that, the protection circuit must be intelligent and able to take decisions in function of each situation.

- **Overload protection.**

The overload protection avoids the possible overheating of the Mosfet when the maximum power is exceeded for a time longer than the permitted. The protection system used in these amplifiers is fast, secure, simple and operates for sections. The circuit detects and limits the current so that, for the worst case of drain-source voltage, the maximum power is never exceeded. A high speed logic circuit evaluates how critical the problem is and, in case of danger, disconnects the output signal by means of a relay. The autoreset system acts in a few seconds and reconnects de relay. If the problem is still there, the process will be repited up to 4 times within a maximum period of 5 minutes.

- **Temperature protection.**

A sensor detects when the temperature rises above 90° C and opens the protection relay. This only happens when, after a long period of time, sand, dust or other materials can block or lessen the efficiency of the cooling system.

- **DC Out protection.**

Avoids the possibility of applying a DC voltage directly to the loudspeakers which would destroy the loudspeaker coils.

- **Anticlip protection.**

An excessive clipping generates a high-energy pseudo-square signal that affects the sound quality and can even damage the loudspeakers. The anticlip circuit avoids this by reducing the input signal when the output exceeds the preset limits.

The ECLER Professional Series protections are non destructive in opposition to the most commonly destructive protections found in almost all the amplifiers. The destructive protection limits the current when there is an excessive output signal without stopping the amplifier and produces a high degradation of the audio quality. The SPM non destructive protections only act when there is an excessive power dissipation within a minimum preset time. Thus the amplifier can supply a very high impulsional power and take the maximum benefit of the SOA without affecting the sound quality.

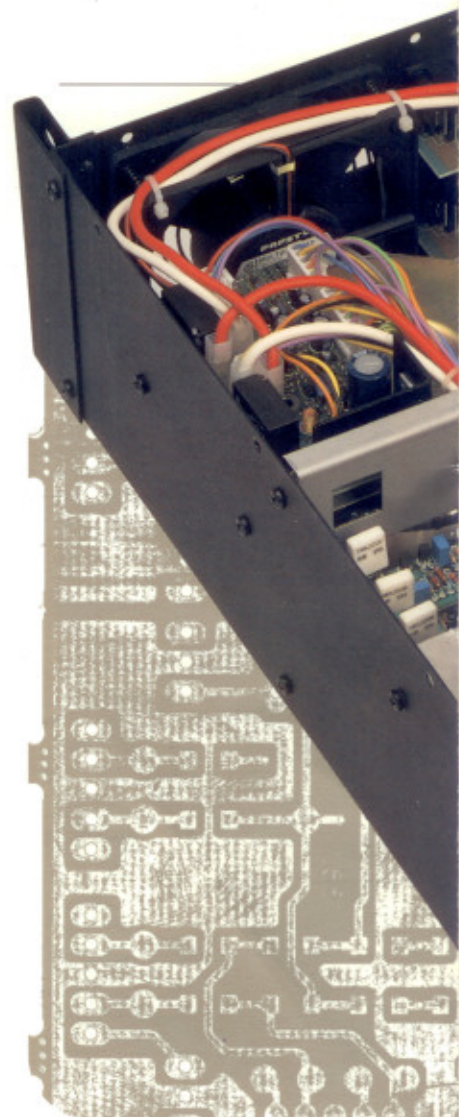
2.- Cooling system.

For the same power, the Switching Mosfet heats 15° C less than the conventional Mosfets and 10° C less than bipolar transistors. While the conventional audio Mosfets and the bipolar transistors must be cooled immediatly, the switching Mosfet enables to cool first other components such as the electrolytic capacitors which operating life strongly depends on the temperature.



Complete series of PRO amplifiers.

inside view of PAM2600



| | PAM300 | PAM600 | PAM1000 | PAM1400 | PAM2000 | PAM2600 |
|-----------------------------------------------------------------------|-------------------|-----------|------------------------|------------------|------------------------|-----------|
| Frequency response @ max. output power (-10dB) | 7 Hz - 80 kHz | | | | | |
| Harmonic distortion + noise @ 1kHz | < 0.02% | | | < 0.03% | | |
| Intermodulation distortion 50 Hz & 7 kHz, 4:1 ratio @ nom. out. power | < 0.03% | | | | | |
| THD100 | < 0.05% | | | < 0.03% | | |
| Signal/noise ratio 20 Hz-20 kHz ref. 1W/4Ω | > 85 dB | > 80 dB | > 85 dB | > 85 dB | > 80 dB | > 80 dB |
| Signal/noise ratio 20 Hz-20 kHz nominal power/4Ω | > 107 dB | > 105 dB | > 106 dB | > 110 dB | > 108 dB | > 108 dB |
| Damping factor | > 350 | > 310 | > 400 | > 420 | > 140 | > 140 |
| Slew rate | ± 32 V/μs | ± 75 V/μs | ± 80 V/μs | ± 85 V/μs | ± 95 V/μs | ± 95 V/μs |
| Channel crosstalk @ 1kHz | > 80 dB | | | > 65 dB | | |
| Input sensitivity/impedance | 0 dBV/47 kΩ | | | | | |
| Input connector | XLR3 balanced | | | | | |
| Output connector | speak on | | | | | |
| Power consumption @ max. out/4Ω | 530 VA | 965 VA | 1445 VA | 1800 VA | 2730 VA | 3650 VA |
| Front panel dimensions w x h | 482.6 x 88 mm | | | 482.6 x 132.5 mm | | |
| Chassis dimensions w x h x d | 440 x 88 x 420 mm | | 482.6 x 132.5 x 380 mm | | 482.6 x 132.5 x 514 mm | |
| Weight | 14 kg | 15.1 kg | 19.7 kg | 22 kg | 30.5 kg | 31.2 kg |

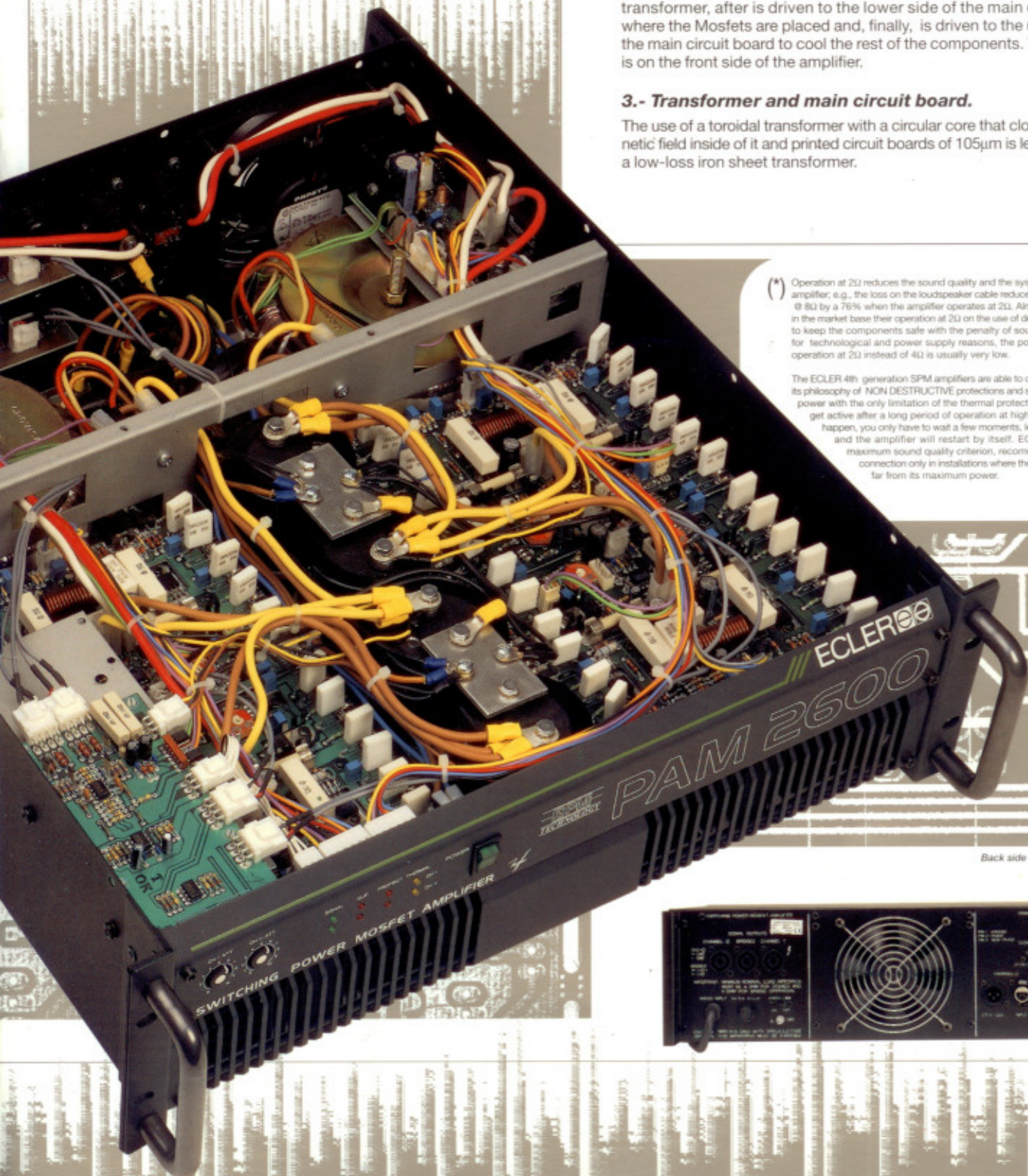
| OUTPUT POWER (W RMS, 1 kHz, 1% THD) | PAM300 | PAM600 | PAM1000 | PAM1400 | PAM2000 | PAM2600 |
|----------------------------------------------|--------|--------|---------|---------|---------|---------|
| 4Ω stereo | 187 W | 352 W | 583 W | 737 W | 990 W | 1350 W |
| 8Ω stereo | 126 W | 220 W | 363 W | 451 W | 615 W | 875 W |
| 2Ω stereo(*) | 275 W | 490 W | 895 W | 1160 W | 1260 W | 1740 W |
| 8Ω bridged | 376 W | 704 W | 1177 W | 1474 W | ----- | ----- |
| 16Ω bridged | 258 W | 451 W | 726 W | 902 W | ----- | ----- |
| OUTPUT POWER (W RMS, 20 Hz-20 kHz, 0.1% THD) | PAM300 | PAM600 | PAM1000 | PAM1400 | PAM2000 | PAM2600 |
| 4Ω stereo | 158 W | 307 W | 510 W | 625 W | 880 W | 1160 W |
| 8Ω stereo | 108 W | 196 W | 320 W | 385 W | 550 W | 770 W |
| 2Ω stereo(*) | 220 W | 415 W | 704 W | 990 W | 1090 W | 1500 W |
| 8Ω bridged | 315 W | 615 W | 1020 W | 1250 W | ----- | ----- |
| 16Ω bridged | 218 W | 390 W | 605 W | 772 W | ----- | ----- |
| OUTPUT PEAK POWER (W RMS) | PAM300 | PAM600 | PAM1000 | PAM1400 | PAM2000 | PAM2600 |
| 2Ω / 1 kHz One channel driven | 500 W | 900 W | 1700 W | 2300 W | 3260 W | 4000 W |

(*) Both channels operating after 1h warming up at -3dB max. power

The air is moved by a temperature-controlled variable-speed fan in order to guarantee the maximum efficiency. The air intake is on the back side of the amplifier. The air-stream cools the power capacitors and the transformer, after is driven to the lower side of the main circuit board where the Mosfets are placed and, finally, is driven to the upper side of the main circuit board to cool the rest of the components. The air outlet is on the front side of the amplifier.

3.- Transformer and main circuit board.

The use of a toroidal transformer with a circular core that closes the magnetic field inside of it and printed circuit boards of 105μm is less noisy than a low-loss iron sheet transformer.



(*) Operation at 2Ω reduces the sound quality and the system efficiency of any amplifier, e.g. the loss on the loudspeaker cable reduces the Damping factor @ 8Ω by a 76% when the amplifier operates at 2Ω. Almost all the amplifiers in the market base their operation at 2Ω on the use of destructive protections to keep the components safe with the penalty of sound quality. Also and for technological and power supply reasons, the power gain involved in operation at 2Ω instead of 4Ω is usually very low.

The ECLER 4th generation SPM amplifiers are able to operate at 2Ω keeping its philosophy of NON DESTRUCTIVE protections and supply all the available power with the only limitation of the thermal protection, which would only get active after a long period of operation at high power. If this would happen, you only have to wait a few moments, lessen the input signal and the amplifier will restart by itself. ECLER, following the maximum sound quality criterion, recommends to use the 2Ω connector only in installations where the amplifier will operate far from its maximum power.

Back side of PAM2600

