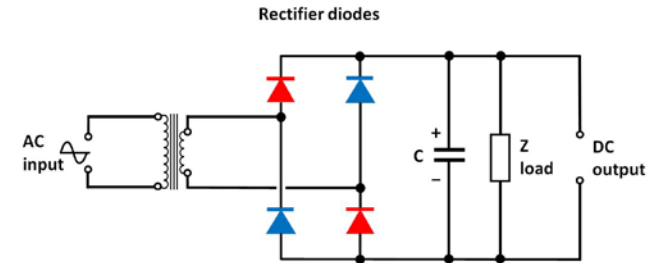


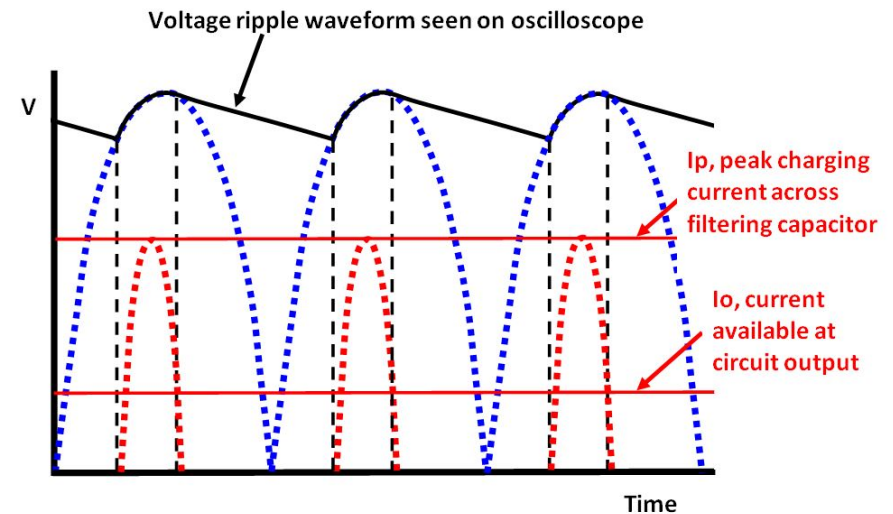
1 - Problems inherent to classic rectifier circuits

In a basic full wave rectifier circuit, two rectifying power diodes are connected to a single load. When a power bridge rectifier is used, the four diodes are mounted in series pairs while only two diodes are conducting current during each half cycle. Rippled waveform obtained at output of these rectifying devices is transformed into a waveform close to DC waveform by the use of input capacitor. Residual voltage ripple waveform can be seen on oscilloscope. Voltage ripple waveform currently shown on all technical papers and books related to rectifying circuit demonstrate clearly that Ohm law is forgotten: only voltage waveform is shown, while current ripple waveform is not taken in consideration.

On a classic bridge rectifier circuit followed by an input smoothing capacitor, **figure 1** show on black line the "saw tooth" like aspect of voltage ripple wave that can be seen on oscilloscope. Dotted blue line show waveform of rectified half waves. In red dot line appear the peak charging current I_p and I_o , the current available across output load. Note that I_o , the average current available across output load is quite low compared to peak charging current.



AFigure



Classic rectifier circuit. Ripple seen on oscilloscope with a voltage probe.

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2 - Problems inherent to classic rectifier circuits

With a classic bridge rectifier circuit followed by an input smoothing capacitor and referring to **figure 1** of last page, it is necessary to take in consideration not only the voltage ripple waveform across output load, but also I_p , the peak charging current and I_o , the output current available across output load. **Figure 2** shows A, in yellow, area where charged capacitor current flow into the output load. It is followed by B, area where voltage across capacitor is lower than AC rectified voltage. Result: AC rectified current (lower red line) charge the capacitor while a part of current (around 20%) available across the capacitor flow into the output load. This is why real current available across output load take the shape of red line that can be seen on **figure 3**. This deformed square of current waveform is an important problem inherent to all conventional full wave and bridge rectifier's circuits. It cannot be eliminated or minimizes with the help of high speed rectifying diodes, special audio diodes or new generation diodes such as SBD or SiC diodes: even if some improvement is more or less audible, origin of this problem is not treated. It generate strong noise flowing into power supplies and earth lines in devices, while generating noise flowing into AC line.

Figure 2

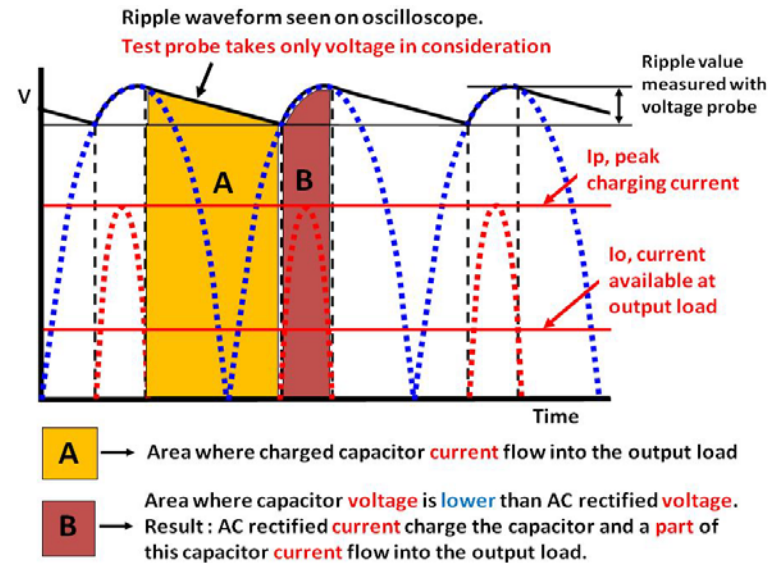
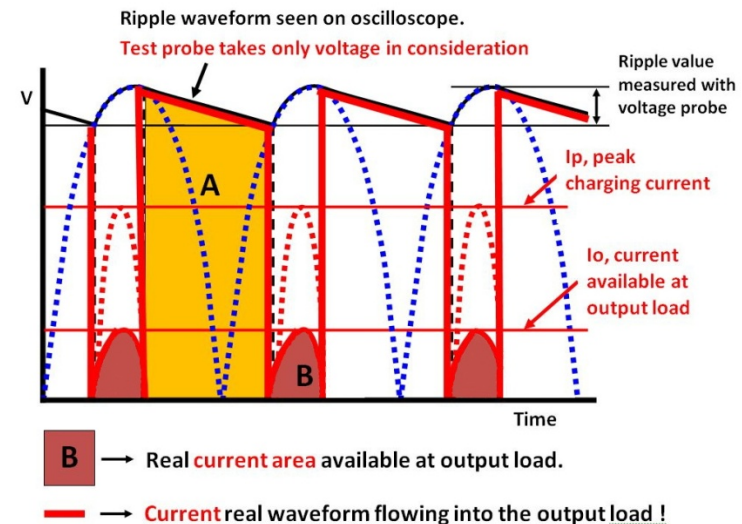


Figure 3



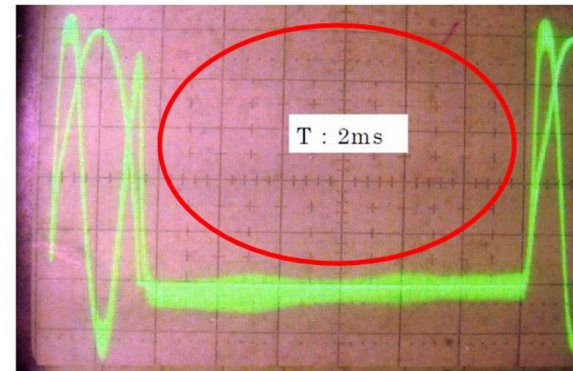
3 - Problems inherents to classic rectifier circuits

Above mentioned strong current noise explained and detailed on figures 1, 2 and 3, can be seen with a current probe connected to an oscilloscope. **Figure 4** show that during a lag time close to 2 ms, a hole of current appear, meaning that needed current cannot flow into output load during this period.

In audio filed, when such kind of current noise is generated by power supply, there is no way to remove it by conventional methods : IEC filter insertion between AC line and power transformer primary winding, high quality capacitors mounted in parallel on chemical capacitors, use of regulated power supply circuits. The reason is the loose of silent earth and silent power supply lines taken as reference for these circuits. When this kind of noise polluted power supply is used in audio circuit, sound reproduction of small music harmonics is masked by a noise present in power supplies, DC lines and mostly in earth lines, even when regulated power supplies are used.

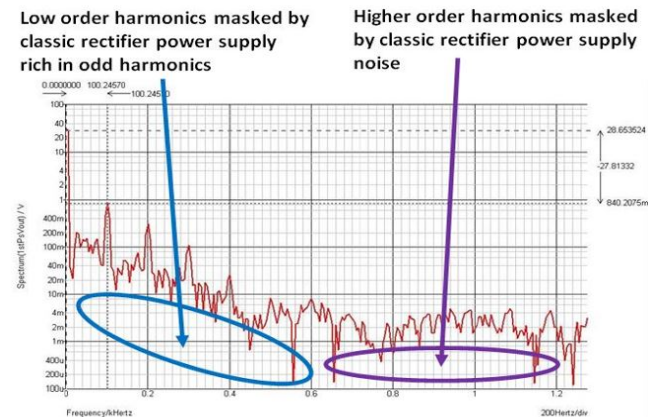
Figure 5 show a series of music harmonics masked, below 400 Hz, by power supply and earth lines noise. Presence of such kind of noise is degrading sound quality of reproduced audio signals: deepness, music harmonics richness, sound analysis, transparency.

Figure 4



With conventional rectifier circuit, during a lag time of 2 ms, a hole of current appears and cannot flow into the output load.

Figure 5



Harmonic content of classic rectifier power supply connected to a power amplifier receiving above mentioned 100 Hz sawtooth signal. First order and higher order harmonics are masked by noise.

After Mr Degawa Saburo AES conference, Tokyo 2007

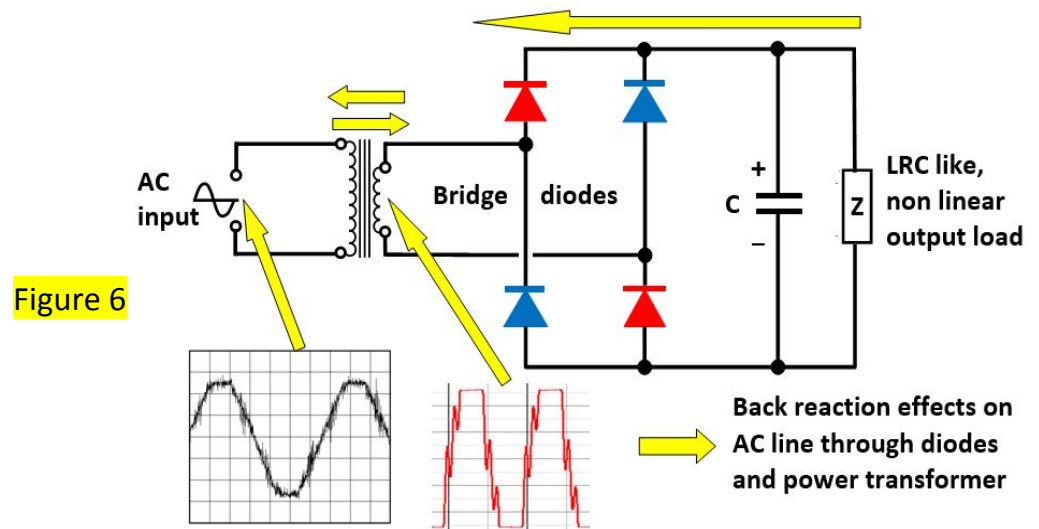
4 - An important noise problem due to classic rectifier circuits

Noise feedback effect in conventional power supply

Conventional power supply are affected by several noise problems that are degrading the sound quality of audio devices. They cannot be eliminated later on, even with the help of best quality filtering capacitors, EMI shielded filters, chokes or insertion of discrete performant regulated power supply. The reason is because the hole of current seen on figure 4, produce not only a limited current possibility available across output load. It generate a clipped sine wave, a current pulsed noise flowing back to power transformer via secondary winding through negative return circuit.

This noise feedback effect is shown on **Figure 6**.

Because power transformer is not designed to support such kinds of high frequencies switching noise, a noise polluted AC waveform appear on power transformer primary winding, not before but after EMI filter that cannot work correctly. Capacitive effect of screen foil present on power transformer transmit noise to core mounted on device chassis. This generate a strong noise pollution of earth line used as electric reference for audio devices such as audio preamplifiers or power amplifier. Above mentionned figure 5 show the increase of noise resulting of this auto-pollution effect.



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5 – Degawa circuits, a new era in ultra performant modules

A short introduction of Mr Degawa

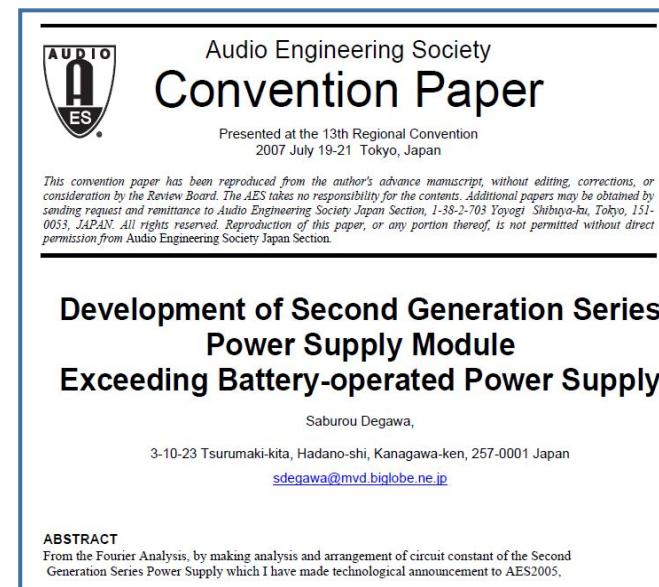
Graduated at Tokai University in 1961, Saburo Degawa joined International Rectifier Japan in 1961. He offered during more than 40 years his best skills to this company, particularly his favorite hobby : high fidelity improvements in audio technology. He worked in this company as a key engineer. He is the author of several invention patents related to audio diodes, special SBD diodes, unique noiseless circuitry for audio use.

One of his most important works is the publication of a white paper (figure 7) at Audio Engineering Society, in 2007, a white paper related to a revolutionary development a of series power supply module eliminating noise problems above mentionned. Thanks to this new circuit, hole of current detailed on figure 4 is filled, leading to a dramatic noise reduction. In comparison with a conventional rectifier circuit, ripple reduction improvement can reach 46 %. This is due to the filling of current hole of current, thanks to the use of special components matched with time delay circuit including coils. In 2003, he founded A & R Lab, a company dedicated to high end audio devices. He developped then for A&R Lab a wide range of modules for applications in audio and also for cars batteries.



Saburo Degawa

Figure 7



4 – A wide range of patented ultra performant audio modules

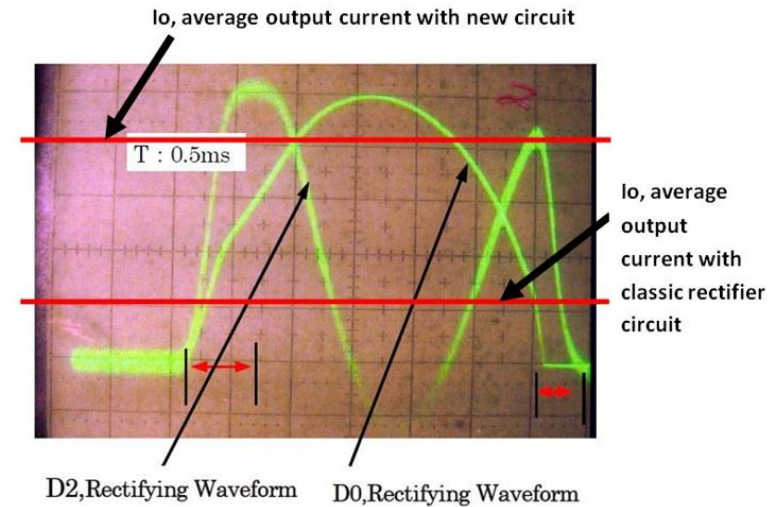
A matchless improvement in power supplies domain

As explained in previous pages, conventional power supply are affected by different noise problems that are inherent to conventional rectifying circuit. They cannot be eliminated later on, even with the use of best quality filtering capacitors, EMI shielded filters, chokes or insertion of discrete performant regulated power supply.

Thanks to Degawa New generation power rectifying module, hole of current above mentioned and seen on figure 4 is completely filled, leading to a very large improvement of current available across output load. This unique possibility is seen on **figure 8**.

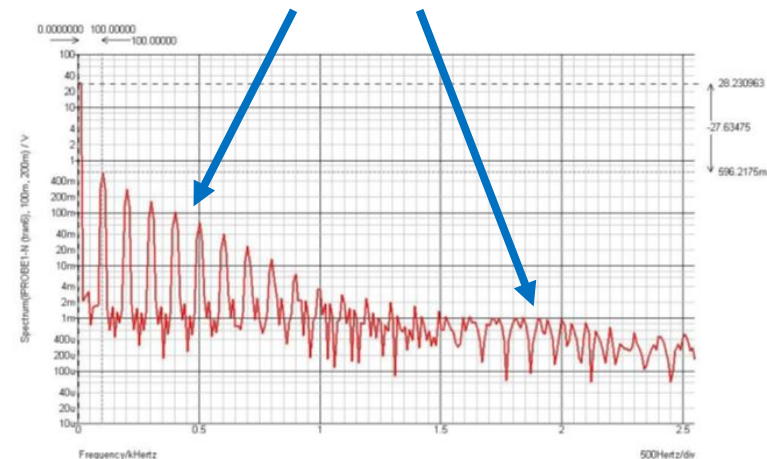
A spectrum analyser show in comparison of figure 5 a complete recovery of harmonic content of a music signal that was previously masked by switching noise generated by conventional power supply. This very significative improvement is show on **figure 9**. Sound quality, transparency, sound resolution, tridimensional effect, bass definition and articulation, dynamic range covering all the audio range.

Figure 8



Compared to Figure 5, audio signal harmonics are not masked by power supply switching noise present across output load. Harmonics contained in audio signals can be reproduced without noise masking.

Figure 9



5 – A wide range of patented ultra performant audio modules

A wide range of ultra-performant modules for audio

In the 90's perfectionist in audio were looking for best audio parts to get the best of their circuit possibilities. They had at their disposal only a limited range of components to improve their power supply circuits, such as FRD (Fast Recovery Diodes) and later some kinds of SBD diodes (Schottky Barrier Diodes) designed for audio application. Even if such kinds of expensive parts can offer some improvement of sound quality, there is nothing to compare face to stunning performances offered by Degawa New Generation rectifying modules and associated LCM and CPM modules.

Degawa New Generation rectifying modules are available in different forms, for applications from low voltage, low current (solid state circuits), low voltage high current (tube heater circuits, solid state circuits until high voltage / low current and medium current circuits (tubes preamplifiers and amplifiers). LCM modules (Line Control Module) and CPM modules (Capacitor Potential Module) complete Degawa New Generation Rectifying Modules, offering incredible improvement of sound performances, far beyond a "just noticeable difference" heard in many cases.



Some Degawa's invention patents references:

N° 182 8714

N° 126 6357

N° 312 6184

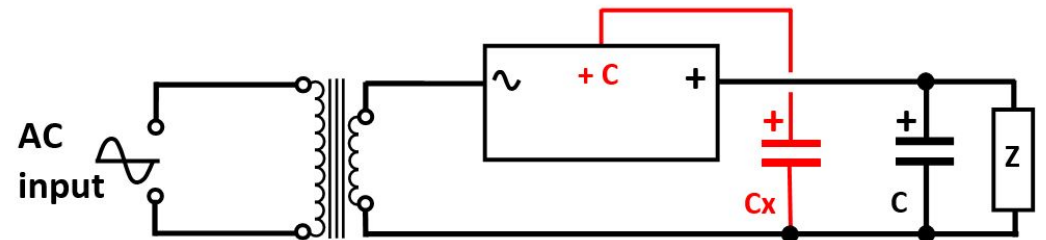
N° 313 3340

N° 412 6357

New generation of rectifier circuits, LCM, Line Control Module, CPM, Capacitance Potential Module, Special modules for exciting coils of electrodynamic loudspeakers, Cell Exert modules for cars batteries.

**Degawa New Generation rectifier's modules,
Half Wave, 12A series,
Peak forward current 12 Amps,
Peak reverse voltage from 10 V to 1,300 V**

These Degawa New Generation rectifying modules are offering stunning, unbeatable advantages based on patented devices using Degawa exclusive components. Conventional rectifying process are inducing, two times each cycle, a hole of current (about 1 ms duration) generated by staircase current accidents between capacitor and rectifying diode current flowing into output load. Degawa New generation rectifier modules offers unique advantage of reducing considerably ripple waveform (around 50 % improvement in push-pull mode). Very significative reduction of noise, normally present in DC supply and earth lines, including those using regulated circuit, permit to recover around 10 % of sound informations masked by conventional power supplies. Results are unbeatable advantages regarding sound transparency, music instruments harmonics original richness, three dimensional reproduction, S/N ratio, dynamic range, sound realism accuracy.



Cx value = C x 1, 9 to 2

For C = 100 μ F, Cx = 190 to 200 μ F

Degawa Half Wave rectifier modules, 12 amps versions

S12A10HVer II: 12 A/100 V, AC max 30 V

S12A15HVer II: 12 A/150 V, AC max 50 V

S12A22HVer II: 12A/220 V, AC max 70 V

S12A45UVer II: 12A/450 V, AC max 150 V

S12A60UVer II: 12A/600 V, AC max 200 V

S12A90UVer II: 12A/900 V, AC max 300 V

S12A130UVer II: 12A/1,300 V, AC max 430 V



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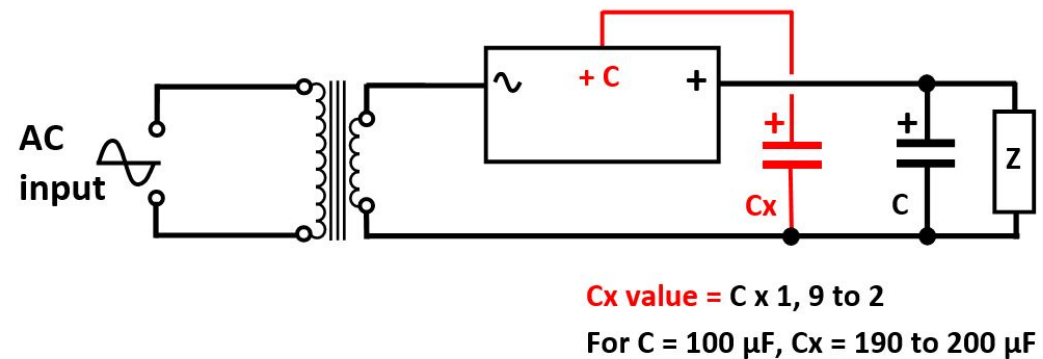
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**Degawa New Generation rectifier's modules,
Half Wave, 40 A to 60 A series,
Peak forward current 40 to 60 Amps,
Peak reverse voltage from 100 V to 1,300 V**

These Degawa New Generation rectifying modules are offering stunning, unbeatable advantages based on patented devices using Degawa exclusive components. Conventional rectifying process are inducing, two times each cycle, a hole of current (about 1 ms duration) generated by staircase current accidents between capacitor and rectifying diode current flowing into output load. Degawa New generation rectifier modules offers unique advantage of reducing considerably ripple waveform (around 50 % improvement in push-pull mode). Very significative reduction of noise, normally present in DC supply and earth lines, including those using regulated circuit, permit to recover around 10 % of sound informations masked by conventional power supplies. Results are unbeatable advantages regarding sound transparency, music instruments harmonics original richness recovery, three dimensional reproduction, S/N ratio, dynamic range, sound realism accuracy. Designed for transistors or tubes audio circuits.



Degawa Half Wave rectifier modules, 40 to 60 amps versions

S40A22HVer II: 40 A/220 V, AC max 70 V

S40A45UVer II: 40 A/450 V, AC max 150 V

S40A60UVer II: 40A/600 V, AC max 200 V

S40A90UVer II: 40A/900 V, AC max 300 V

S40A130UVer II: 40A/1,300 V, AC max 440 V

S60A10HVer II: 60A/100 V, AC max 30 V

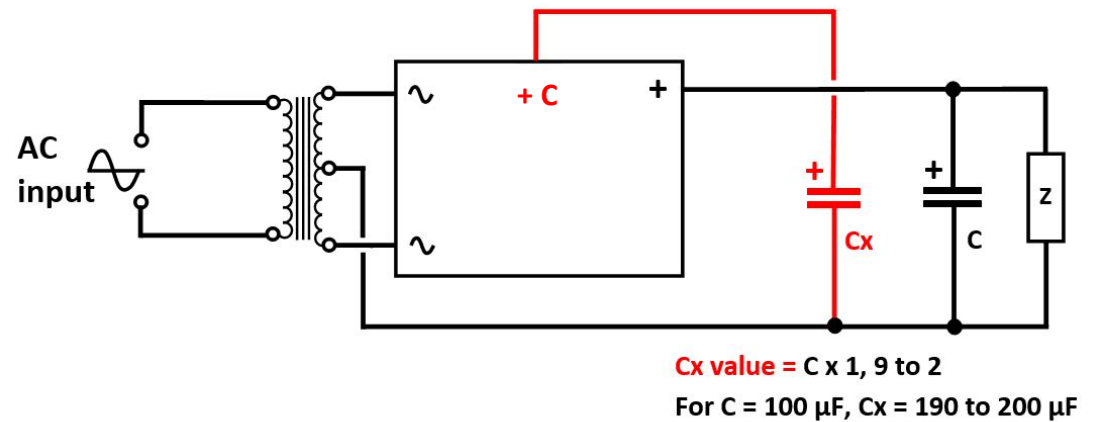
S60A15HVer II: 60A/150 V, AC max 50 V



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**Degawa New Generation rectifier's modules,
Full Wave, Center Tap, 24 to 80 A series,
Peak forward current 24 to 80 Amps,
Peak reverse voltage from 100 V to 1,300 V**

These Degawa New Generation rectifying modules are offering stunning, unbeatable advantages based on patented devices using Degawa exclusive components. Conventional rectifying process are inducing, two times each cycle, a hole of current (about 1 ms duration) generated by starecase current accidents between capacitor and rectifying diode current flowing into output load. Degawa New generation rectifier modules offers unique advantage of reducing considerably ripple waveform (around 50 % improvement in push-pull mode). Very significative reduction of noise, normally present in DC supply and earth lines, including those using regulated circuit, permit to recover around 10 % of sound informations masked by conventional power supplies. Results are unbeatable advantages regarding sound transparency, music instruments harmonics original richness recovery, three dimensional reproduction, S/N ratio, dynamic range, sound realism accuracy. Designed for transistors or tubes audio circuits.



Degawa Full Wave rectifier module, Center tap, 24 to 80 Amps versions

C24A45UVer II: 24 A/450 V, AC max 150 V

C24A60UVer II: 24 A/600 V, AC max 200 V

C24A90UVer II: 24A/900 V, AC max 300 V

C24A130UVer II: 24A/1,300 V, AC max 440 V

C80A90UVer II: 80A/900 V, AC max 300 V

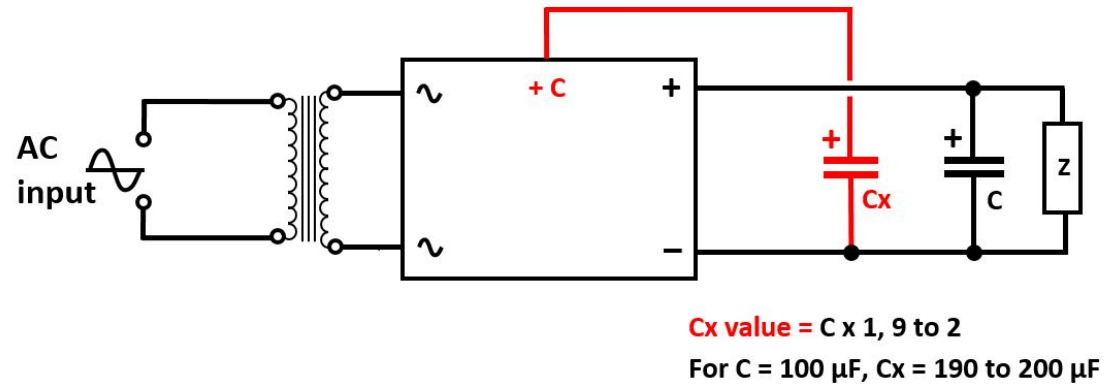
C80A130UVer II: 80A/1,300 V, AC max 440 V



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**Degawa New Generation rectifier's modules,
Full Wave, 24 A series,
Peak forward current 24 Amps,
Peak reverse voltage from 60 V to 600 V**

These Degawa New Generation rectifying modules are offering stunning, unbeatable advantages based on patented devices using Degawa exclusive components. Conventional rectifying process are inducing, two times each cycle, a hole of current (about 1 ms duration) generated by staircase current accidents between capacitor and rectifying diode current flowing into output load. Degawa New generation rectifier modules offers unique advantage of reducing considerably ripple waveform (around 50 % improvement in push-pull mode). Very significative reduction of noise, normally present in DC supply and earth lines, including those using regulated circuit, permit to recover around 10 % of sound informations masked by conventional power supplies. Results are unbeatable advantages regarding sound transparency, music instruments harmonics original richness recovery, three dimensional reproduction, S/N ratio, dynamic range, sound realism accuracy. Designed for transistors or tubes audio circuits.



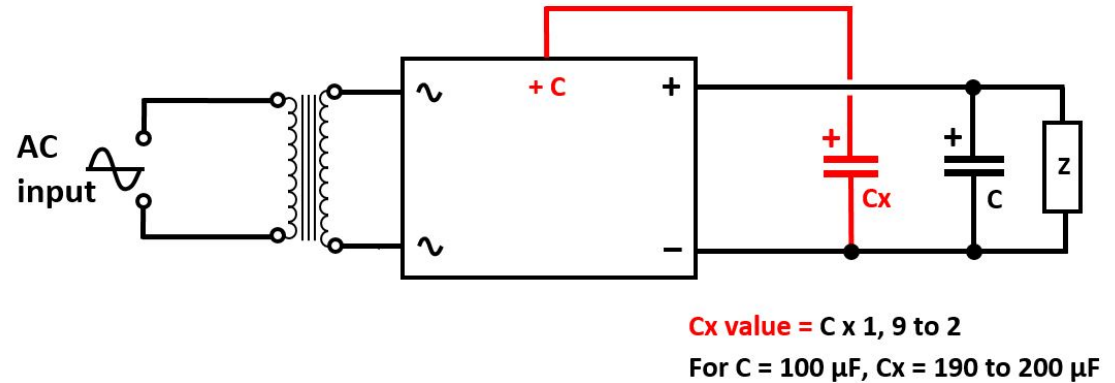
Degawa Full Wave rectifier module, 24 Amps versions

- B24A06HVer II: 24 A/60 V, AC max 35 V**
- B24A10HVer II: 24 A/100 V, AC max 60 V**
- B24A22HVer II: 24A/220 V, AC max 140 V**
- B24A35UVer II: 24A/350 V, AC max 210 V**
- B24A45UVer II: 24A/450 V, AC max 310 V**
- B24A60UVer II: 24A/600 V, AC max 420 V**



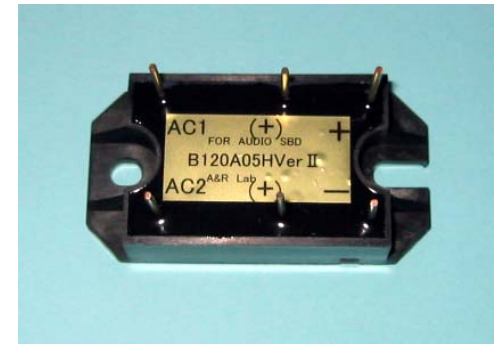
**Degawa New Generation rectifier's modules,
Full Wave, 80 to 120 A series,
Peak forward current 80 to 120 Amps,
Peak reverse voltage from 60 V to 600 V**

These Degawa New Generation rectifying modules are offering stunning, unbeatable advantages based on patented devices using Degawa exclusive components. Conventional rectifying process are inducing, two times each cycle, a hole of current (about 1 ms duration) generated by staircase current accidents between capacitor and rectifying diode current flowing into output load. Degawa New generation rectifier modules offers unique advantage of reducing considerably ripple waveform (around 50 % improvement in push-pull mode). Very significative reduction of noise, normally present in DC supply and earth lines, including those using regulated circuit, permit to recover around 10 % of sound informations masked by conventional power supplies. Results are unbeatable advantages regarding sound transparency, music instruments harmonics original richness recovery, three dimensional reproduction, S/N ratio, dynamic range, sound realism accuracy. Designed for transistors or tubes audio circuits, including heater DC supply circuits.



Degawa Full Wave rectifier module, 80 to 120 Amps versions

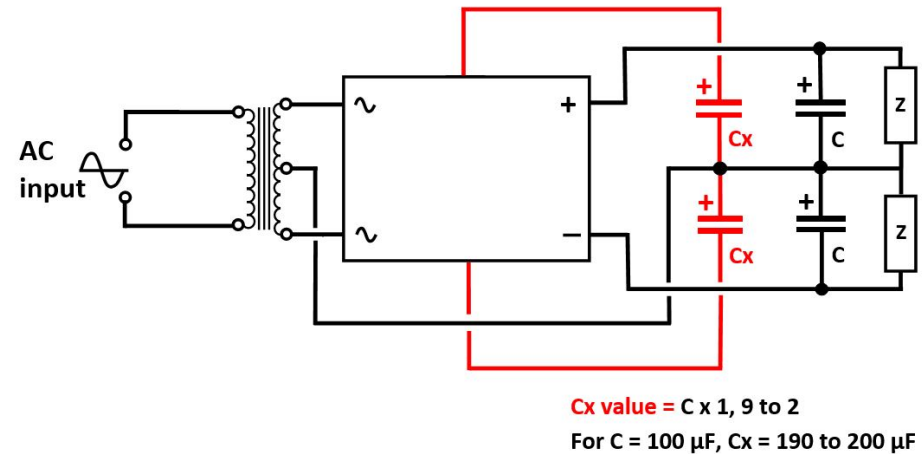
B80A22HVer II: 80 A/220 V, AC max 140 V
B80A35UVer II: 80 A/350 V, AC max 210 V
B80A45UVer II: 80 A/450 V, AC max 310 V
B80A60UVer II: 80 A/600 V, AC max 210 V
B120A06UVer II: 120 A/60 V, AC max 21 V
B120A10UVer II: 120 A/100 V, AC max 35 V
B120A15UVer II: 120 A/150 V, AC max 50 V



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**Degawa New Generation rectifier's modules,
Full Wave, center tap, 24 to 80A and $\pm$ sym. output
Peak forward current 24 to 80 Amps,
Peak reverse voltage from 60 V to 600 V**

These Degawa New Generation rectifying modules are offering stunning, unbeatable advantages based on patented devices using Degawa exclusive components. Conventional rectifying process are inducing, two times each cycle, a hole of current (about 1 ms duration) generated by staircase current accidents between capacitor and rectifying diode current flowing into output load. Degawa New generation rectifier modules offers unique advantage of reducing considerably ripple waveform (around 50 % improvement in push-pull mode). Very significative reduction of noise, normally present in DC supply and earth lines, including those using regulated circuit, permit to recover around 10 % of sound informations masked by conventional power supplies. Results are unbeatable advantages regarding sound transparency, music instruments harmonics original richness recovery, three dimensional reproduction, S/N ratio, dynamic range, sound realism accuracy. Dedicated to circuits using symmetrical power supplies.



Degawa Full Wave rectifier modules, 24 to 80 Amps versions

BC24A06HVer II: 24A/60 V, AC max 21 V
BC24A10HVer II: 24A/100 V, AC max 35 V
BC24A22HVer II: 24 V/220 V, AC max 140 V
BC24A35UVer II: 24 A/350 V, AC max 210 V
BC24A45UVer II: 24 A/450 V, AC max 310 V
BC24A60UVer II: 24 A/600 V, AC max 420 V
BC80A22UVer II: 80 A/220 V, AC max 140 V
BC80A45UVer II: 80 A/450 V, AC max 310 V
BC80A60UVer II: 80 A/600 V, AC max 420 V

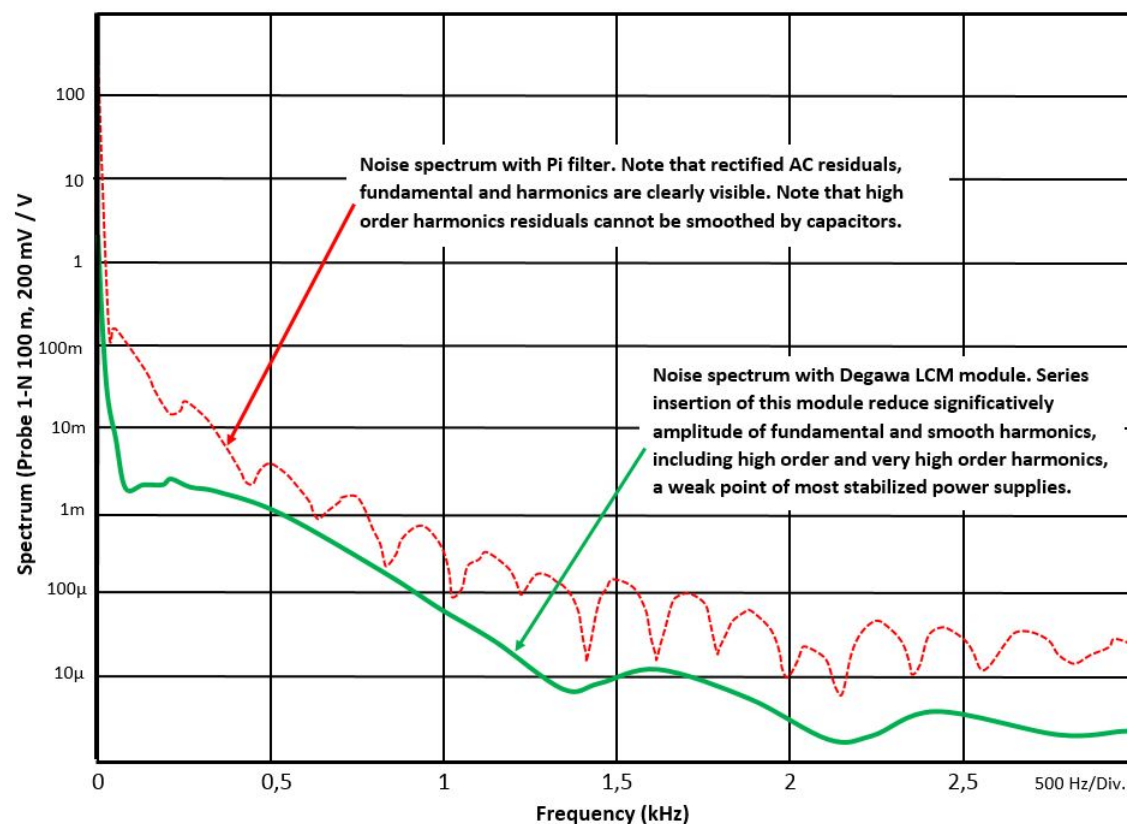


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Degawa New Generation LCM + CPM modules.

Two complementary modules designed to get the best possibilities offered by Degawa New Generation rectifier's modules.

LCM, series connection Line Control Module and CPM, parallel connection Capacitor Potential Module are two devices that are designed to offer by their mutual benefits the best of stunning possibilities permitted by Degawa New Generation rectifier's modules. Both modules designed for DC use are offering multiples benefits that are impossible to get with the use of classic RC Pi filtering, LC Pi filtering, use of bypass capacitors, of complementary RC Pi filtering or use of simple or sophisticated regulated or stabilized power supplies. These devices protected by several invention patents such as Japan patent N°3133340 are offering the unique synergy of very efficient noise reduction, not only the residual noise resulting of rectifying process but also the voltage and current noise auto-generated by active circuits such as audio amplifier power stage, driver stage, line stage solicited by audio signals, transmitting back current back current dynamic noise pollution on $\pm$ DC lines and especially earth lines. A wide range of LCM and CPM modules is designed for each audio application, from transistors circuit until high voltage use for tube audio circuits.



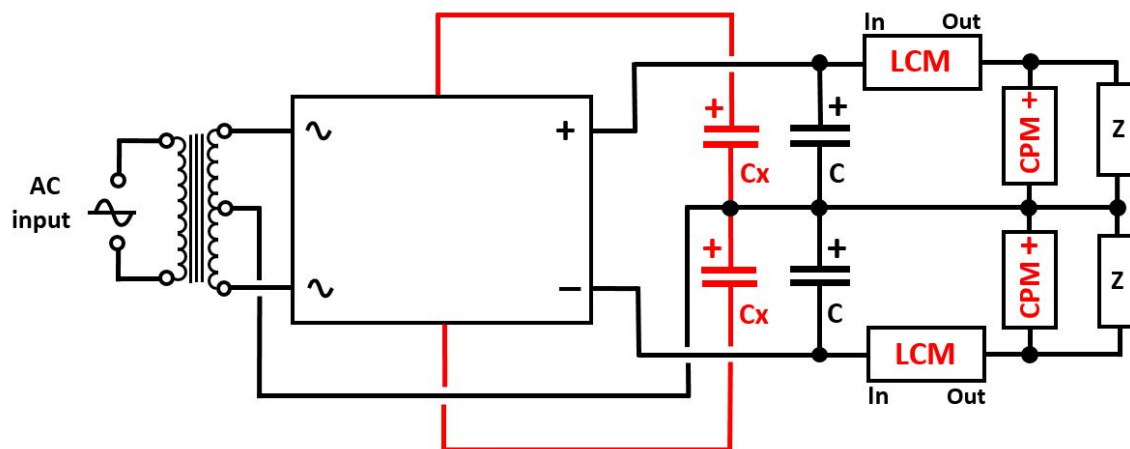
Noise spectrum Fourier analysis comparison on rectified power supply using classic bridge rectifier circuit followed by Pi RC filtering (red dotted line) and same circuit using series connected **LCM Line Control Module** (green plain line). The green plain line show that LCM module reduces and smooth even and odd harmonics residuals of AC rectified half waves. This cannot be obtained with the same efficiency with other circuits or components, including with bypass capacitors or choke filtering.

Degawa New Generation CPM modules.

A patented dynamic noise reduction module without equivalent, dedicated to DC power supplies circuits.

CPM Capacitor Potential Modules are patented modules (Japan invention patent N° 3133340) designed to remove static and dynamic noise present in audio power supplies circuits DC supply line and present especially in current form in earth lines. Audio amplifiers power stages, driver stages, line stage and preamplifiers stages solicited by audio signals are generating reflected voltage and current fluctuations that are flowing back into DC power supplies.

DC power supply lines located close to output stage of audio power amplifiers are strongly concerned by effects like back EMF from loudspeakers. This effect clearly visible in form of voltage modulated noise is also flowing back in current form through filtering capacitor to earth line used as electric reference for audio circuits. This phenomenon explains why classic filtering circuit, bypass capacitors, choke filtering, regulated and stabilized power supply circuits and even diodes or SBD classic diodes are unable to resolve these auto-pollution effects. A wide range of Degawa CPM modules is proposed for most audio circuits, for transistors or tubes applications.



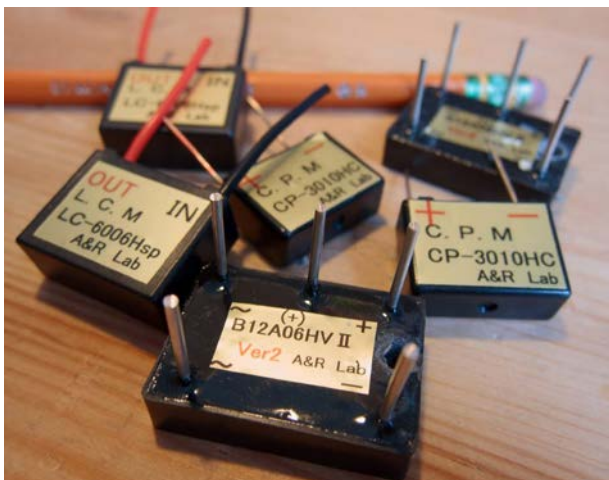
Cx value = C x 1, 9 to 2

For C = 100 µF, Cx = 190 to 200 µF

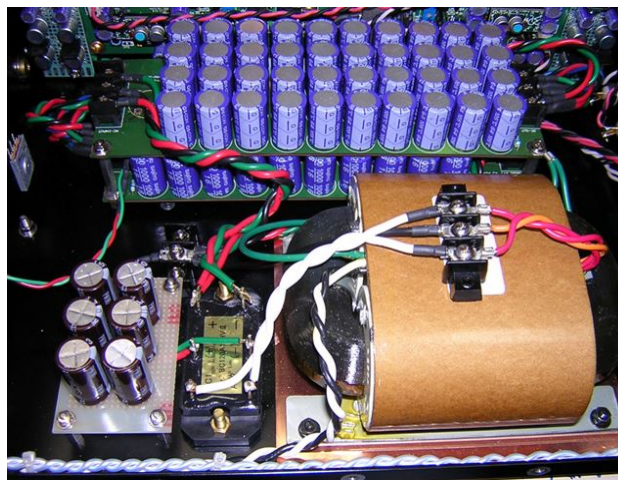
An example of symmetrical power supply with center tap on secondary winding using Degawa New Generation modules with:

- Full wave, center tap **New Generation rectifier module** completed by Cx capacitor and C filtering capacitor,
- **LCM Line Control Module**, series connected module dedicated to DC circuits, respecting Input and Output connections,
- **CPM Capacitor Potential Module**, parallel connected, wired close to audio circuit where voltage and current fluctuation are important (for instance power amplifier output stage power supply points).

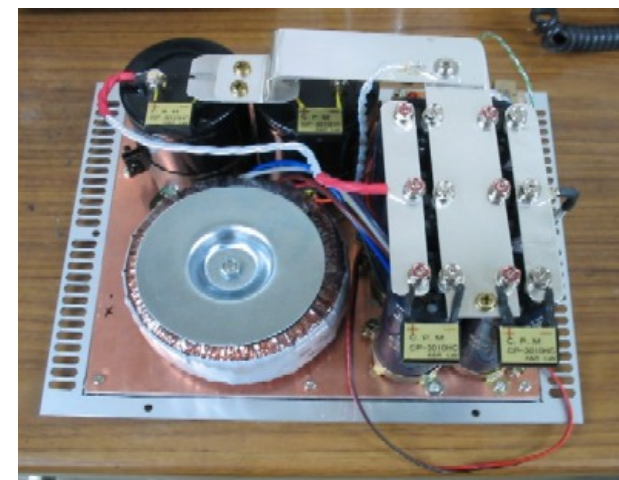
Examples of Degawa New Generation rectifier's modules, LCM and CPM modules used to upgrade high end audio products and DIY audio devices



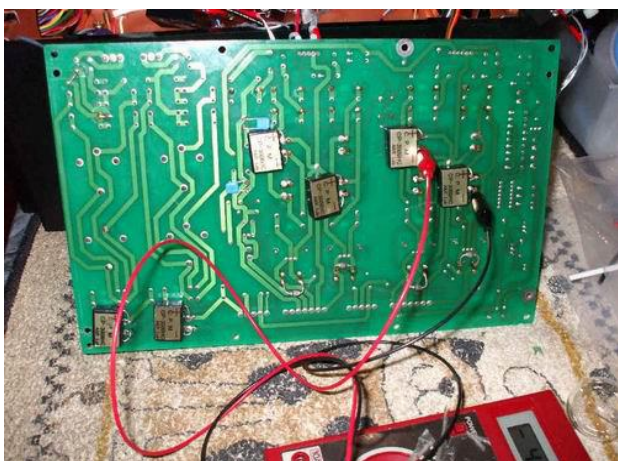
Several Degawa rectifier's modules, LCM and CPM modules



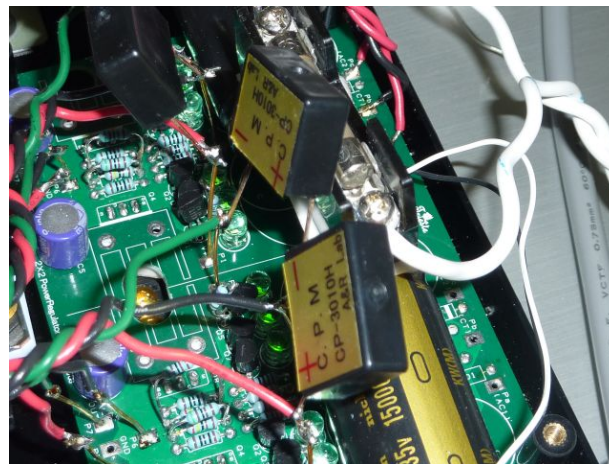
Degawa rectifier's modules, LCM and CPM modules used on a DIY power amplifier



Degawa rectifier's modules, LCM and CPM modules used on a DIY power amplifier



Degawa CPM modules fixed on a high end audio product printed circuit



CPM modules on a printed circuit board

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Degawa New Generation CPM modules.

CPM parallel modules for tube amplifiers:

CP-1045Hsp, max 450 V
CP-1045HCsp, max 450 V
CP-1050HCsp, DC max 500 V
CP-1060Hsp, max 600 V
CP-2045Hsp, max 450 V
CP-2045HCsp, max 450 V
CP-2050HCsp, max 500 V
CP-2060Hsp, max 600 V
CP-3030Hsp, max 300 V
CP-3045Hsp, max 450 V
CP-3060Hsp, max 600 V

CPM parallel modules for tube amplifiers heater circuits and for tubes and transistors circuits:

CP-0205H10M, max 50 V
CP-0245HC, max 450 V
CP-0250HC, max 500 V
CP-0310HC, max 100 V
CP-1022HC, max 150 V
CP-3006HC, max 60 V
CP3010HC, max 100 V
CP-3015HC, max 150 V

Degawa New Generation LCM modules.

LCM series modules for tube amplifiers:

LC-2045Hsp, max 450 V
LC-2060Hsp, max 600 V

LC-3020Hsp, max 200 V
LC-3050Hsp, max 500 V
LC-3060Hsp, max 600 V

For DC Bias circuit:

LC-1060Hsp, max 600 V bias only

LCM series modules for low voltages, mainly transistors circuits:

LC-3003H, max 30 V
LC-3006H, max 60 V
LC-6003H, max 30 V
LC-6006H, max 60 V
LC-6015H, max 150 V

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A showroom with instant test comparisons possibilities

At A&R Lab showroom located in Hadano, a city located at about 70 km south-west of Tokyo, the showroom offers the unique possibility of instant A-B comparisons between several original classic and high end audio products and upgraded versions. On most products A-B switches are permitting to listen on the same products, the same music content, at the same sound level how important is the sound improvement obtained when Degawa New generation modules are used. On several high end audio products, including very expensive ones, it is also possible to verify how important is the sound improvement just when CPM modules only are used for upgrading performances.



Degawa New Generation MF modules.

A patented modules designed for power supply of electromagnetic loudspeakers field coils

Thanks to Degawa MF modules especially designed for power supplies of electromagnetic loudspeakers field coils, incredible sound quality improvement can be obtained by simple insertion of patented MF modules (Japan invention patent N°3126184). Degawa's MF modules are using not only exclusive patented circuits, but also patented components not available in the market in other forms are offering to old field coils loudspeakers from companies such as Western Electric, Jensen Klangfilm or Siemens. Thanks to this MF modules, a very important Eddy current reduction in the magnetic circuit result to a strong reduction of Back EMF effect into last stages of power amplifiers, to power supply lines. Very impressive sound quality improvements obtained concerns sound transparency, gain in dynamic range, low frequencies articulation, subjective bandwidth, sound definition at low levels, and three dimensional stage transcription. These four legs MF modules ($\pm$ input, $\pm$ output) are designed for different models of electromagnetic loudspeakers using exciting coils connected to voltages from 10 V to 320 V. The MF modules are subject to special order.



MF modules versions:

MF-S: 30 A / DC max 30 V

MF-2: 60 A / DC max 30 V

MF-3: 30 A / DC max 320 V

MF-4: 60 A / DC max 100 V

MF-5: 60 A / DC max 150 V

All MF modules must be connected as close as possible to electromagnetic loudspeakers exciting coils connections.

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New Generation rectifier's modules Price-List 1

Half Wave rectifier modules, 12 A:

S12A10HVer II: 12 A/100 V, AC max 30 V	¥ 5,500
S12A15HVer II: 12 A/150 V, AC max 50 V	¥ 5,800
S12A22HVer II: 12A/220 V, AC max 70 V	¥ 6,000
S12A45UVer II: 12A/450 V, AC max 150 V	¥ 7,400
S12A60UVer II: 12A/600 V, AC max 200 V	¥ 7,700
S12A90UVer II: 12A/900 V, AC max 300 V	¥ 8,000
S12A130UVer II: 12A/1,300 V, AC max 430 V	¥ 9,000
-S12A45UVer II: 12A/450 V, AC max 150 V	¥ 7,400

Half Wave rectifier modules, 40 to 60 A:

S40A22HVer II: 40 A/220 V, AC max 70 V	¥ 9,000
S40A45UVer II: 40 A/450 V, AC max 150 V	¥ 8,500
S40A60UVer II: 40A/600 V, AC max 200 V	¥ 9,000
S40A90UVer II: 40A/900 V, AC max 300 V	¥ 10,000
S40A130UVer II: 40A/1,300 V, AC max 440 V	¥ 11,000
S60A10HVer II: 60A/100 V, AC max 30 V	¥ 9,000
S60A15HVer II: 60A/150 V, AC max 50 V	¥ 9,000

Full Wave rectifier module, Center tap, 24 to 80 A:

C24A45UVer II: 24 A/450 V, AC max 150 V	¥ 13,000
C24A60UVer II: 24 A/600 V, AC max 200 V	¥ 14,000
C24A90UVer II: 24A/900 V, AC max 300 V	¥ 16,000
C24A130UVer II: 24A/1,300 V, AC max 440 V	¥ 18,000
C80A90UVer II: 80A/900 V, AC max 300 V	¥ 24,000
C80A130UVer II: 80A/1,300 V, AC max 440 V	¥ 26,000
C80A130UVer IIM: 80A/1,300 V, AC max 440 V	¥ 24,000

Full Wave rectifier module, 24 A:

B24A06HVer II: 24 A/60 V, AC max 35 V	¥ 10,000
B24A10HVer II: 24 A/100 V, AC max 64 V	¥ 11,000
B24A22HVer II: 24A/220 V, AC max 140 V	¥ 12,000
B24A35UVer II: 24A/350 V, AC max 210 V	¥ 15,000
B24A45UVer II: 24A/450 V, AC max 310 V	¥ 16,000
B24A60UVer II: 24A/600 V, AC max 420 V	¥ 18,000

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New Generation rectifier's modules Price-List 2

Full Wave rectifier module, 80 to 120 A:

B80A22HVer II: 80 A/220 V, AC max 140 V	¥ 22,000
B80A35UVer II: 80 A/350 V, AC max 210 V	¥ 23,000
B80A45UVer II: 80 A/450 V, AC max 310 V	¥ 24,000
B80A60UVer II: 80 A/600 V, AC max 210 V	¥ 26,000
B80A60UVer IIM: 80 A/600 V, AC max 210 V	¥ 24,000
B120A06UVer II: 120 A/60 V, AC max 21 V	¥ 20,000
B120A10UVer II: 120 A/100 V, AC max 35 V	¥ 20,000
B120A15UVer II: 120 A/150 V, AC max 50 V	¥ 22,000

Full Wave rectifier modules, 24 to 80 A:

BC24A06HVer II: 24A/60 V, AC max 21 V	¥ 10,000
BC24A10Hver II: 24A/100 V, AC max 35 V	¥ 11,000
BC24A22Hver II: 24 V/220 V, AC max 140 V	¥ 12,000
BC24A35UVer II: 24 A/350 V, AC max 210 V	¥ 15,000
BC24A45UVer II: 24 A/450 V, AC max 310 V	¥ 16,000
BC24A60UVer II: 24 A/600 V, AC max 420 V	¥ 18,000
BC80A22UVer II: 80 A/220 V, AC max 140 V	¥ 22,000
BC80A45UVer II: 80 A/450 V, AC max 310 V	¥ 24,000
BC80A60UVer II: 80 A/600 V, AC max 420 V	¥ 26,000

Degawa New Generation MF modules:

MF-S: 30 A / DC max 30 V	¥ 8,000
MF-2: 60 A / DC max 30 V	¥ 10,000
MF-3: 30 A / DC max 320 V	¥ 10,000
MF-4: 60 A / DC max 100 V	¥ 10,000
MF-5: 60 A / DC max 150 V	¥ 10,000
MF-SP: 90 A / DC max 30 V	¥ 15,000 (WE version)
MF-SP: 180 A / DC max 30 V	¥ 26,000 (WE version)

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New Generation CPM & LCM modules Price-List

New Generation CPM modules.

CPM parallel modules for tube amplifiers:

CP-1045H, max 450 V	¥ 4,000
CP-1045HC, max 450 V	¥ 4,300
CP-1050HCsp, DC max 500 V	¥ 4,800
CP-1060Hsp, max 600 V	¥ 4,500
CP-2045Hsp, max 450 V	¥ 4,400
CP-2045HCsp, max 450 V	¥ 4,800
CP-2050HCsp, max 500 V	¥ 5,400
CP-2060Hsp, max 600 V	¥ 5,000
CP-3030Hsp, max 300 V	¥ 3,700
CP-3045Hsp, max 450 V	¥ 4,700
CP-3060Hsp, max 600 V	¥ 6,300

CPM parallel modules for tube amplifiers heater circuits and for tubes and transistors circuits:

CP-0205H10M, max 50 V	¥ 3,200
CP-0245HC, max 450 V	¥ 3,000
CP-0250HC, max 500 V	¥ 3,200
CP-0310HC, max 100 V	¥ 3,000
CP-1022HC, max 150 V	¥ 3,200
CP-3006HC, max 60 V	¥ 3,200
CP3010HC, max 100 V	¥ 3,500
CP-3015HC, max 150 V	¥ 3,600

Degawa New Generation LCM modules.

LCM series modules for tube amplifiers:

LC-2045Hsp, max 450 V	¥ 4,400
LC-2060Hsp, max 600 V	¥ 5,000
LC-3020Hsp, max 200 V	¥ 3,700
LC-3050Hsp, max 500 V	¥ 5,000
LC-3060Hsp, max 600 V	¥ 6,300

For DC Bias circuit:

LC-1060Hsp, max 600 V bias only	¥ 4,800
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LCM series modules for low voltages, mainly transistors circuits:

LC-3003H, max 30 V	¥ 2,800
LC-3006H, max 60 V	¥ 2,800
LC-6003Hsp, max 30 V	¥ 5,400
LC-6006Hsp, max 60 V	¥ 5,400
LC-6015Hsp, max 150 V	¥ 5,400

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New Generation CPM modules, HCSP versions Price-List

New Generation CPM modules.

**CPM parallel modules for tube amplifiers,
HCSP versions, MIL specs, Silver plated with
Teflon insulation leads:**

CP-6003HCSP, max 30 V	¥ 5,400
CP-6006HCSP, max 60 V	¥ 5,400
CP-60010HCSP, max 30 V	¥ 5,400
CP-9003HCSP, max 30 V	¥ 7,600
CP-9006HCSP, max 60 V	¥ 7,600
CP-9010HCSP, max 100 V	¥ 7,600
CP- 12003HCSP, max 30 V	¥ 9,800
CP-12006HCSP, max 60 V	¥ 9,800
CP-12010HCSP, max 100 V	¥ 9,800
CP-15003HCSP, max 30 V	¥ 12,000
CP-15006HCSP, max 60 V	¥ 12,000
CP-15010HCSP, max 100 V	¥ 12,000
CP-21003HCSP, max 30 V	¥ 20,000
CP-21006HCSP, max 60 V	¥ 20,000
CP-21010HCSP, max 100 V	¥ 20,000

Above mentioned reference are mainly designed
for low voltage audio devices, transistors amplifiers.

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Degawa Cell Exert Module CE-1503H Ver II

A revolutionary module using patented semiconductor, patented circuit (Japan N° 31828714) designed to improve car's performances.

Thanks to the use of last generation technologies in domain of semiconductors, this module is using patented circuit and patented semiconductors especially designed of electronic circuit of cars. With this Version II, a simple and fast connection (5 mn only) of this module across battery improve considerably performances of circuits taking in charge engine electric control.

- 1 – Motor-fuel consumption reduced from 10 to 15 %.
- 2 – Suppression of reverse pulsed current into earth line electric circuit improving battery lifetime.
- 3 – Strong reduction of pulsed noise in electric circuit improve sound quality of car's radio and CD device.
- 4 – Better acceleration feeling of engine.
- 5 – Audible reduction of engine noise.

These stunning improvement possibilities cannot be obtained without the use of dedicated Degawa patented semiconductors. Offer benefits of ultra low conducting resistance, very high pulsed current possibilities, and very high voltage isolation protecting this device against static electricity effects noted on cars.

CE-1503H Ver 2, 12 volts version ¥17,400-

CE-21003H Ver 2, 12 volts version ¥29,000-



Car battery (12 V)

Cell Exert Module fixed across battery. Only 5 mn work is enough for his fixation on battery.

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