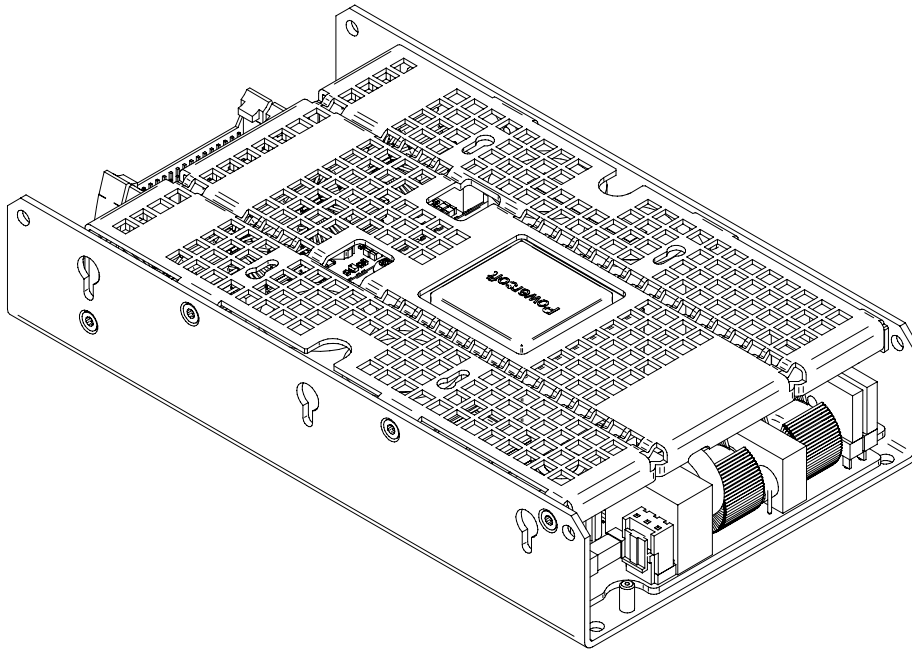




LiteMod 4HV



USER GUIDE

powersoft_LiteMod4HV_UG_en

Data are subject to change without notice.
For latest update please refer to the
online version available on www.powersoft-audio.com.

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Important safety instructions

This amplifier module is intended to be installed inside other devices and must be checked in the final product.



THE TRIANGLE WITH THE LIGHTNING BOLT IS USED TO ALERT THE USER TO THE RISK OF ELECTRIC SHOCK.



THE TRIANGLE WITH THE EXCLAMATION POINT IS USED TO ALERT THE USER TO IMPORTANT OPERATING OR MAINTENANCE INSTRUCTIONS.



THE CE-MARK INDICATES THE COMPLIANCE OF THE PRODUCT TO ALL THE APPLICABLE EUROPEAN DIRECTIVES



SYMBOL FOR EARTH/GROUND CONNECTION.



SYMBOL FOR CONFORMITY WITH DIRECTIVE 2012/19/EC OF THE EUROPEAN PARLIAMENT ON WASTE ELECTRICAL AND ELECTRONIC EQUIPMENT (WEEE).



0°C TO +35°C
DERATING ABOVE 35°C.



10% TO 90% HUMIDITY (NON CONDENSING).



DO NOT USE THE UNIT AT ALTITUDES ABOVE 2000 M.



DO NOT USE THE UNIT IN TROPICAL ENVIRONMENT.



WARNING: TO REDUCE THE RISK OF ELECTRIC SHOCK, DO NOT ATTEMPT TO OPEN ANY PART OF THE UNIT. NO USER-SERVICEABLE PARTS INSIDE. REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.



CONNECTION TO THE MAINS SHALL BE DONE ONLY BY A ELECTROTECHNICAL SKILLED PERSON ACCORDING THE NATIONAL REQUIREMENTS OF THE COUNTRIES WHERE THE UNIT IS SOLD.



VERIFY THAT YOUR MAINS CONNECTION IS CAPABLE OF SATISFYING THE POWER RATINGS OF THE DEVICE.



CAUTION

**RISK OF ELECTRIC SHOCK
DO NOT OPEN**



This unit has been engineered and manufactured to ensure your personal safety. But IMPROPER USE CAN RESULT IN POTENTIAL ELECTRICAL SHOCK OR FIRE HAZARD.

In order not to defeat the safeguards incorporated into this product, observe the following basic rules for its installation, use and service. Please read these "Important Safeguards" carefully before use. Read these instructions.

1. Read these instructions.
2. Keep these instructions.
3. Heed all warnings.
4. Follow all instructions.
5. Do not use this equipment near water.
6. Do not block any ventilation openings. Install in accordance with Powersoft's instructions.
7. Do not install near any heat sources such as radiators, heat registers, stoves or other apparatus that produce heat.
8. Do not defeat the safety purpose of the polarized or grounding-type plug.
9. Only use attachments/accessories specified by Powersoft.
10. Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.
11. The apparatus shall be connected to a MAINS socket outlet with a protective earthing connection.



DO NOT EXPOSE THIS EQUIPMENT TO RAIN OR MOISTURE, DRIPPING OR SPLASHING LIQUIDS. OBJECTS FILLED WITH LIQUIDS, SUCH AS VASES, SHOULD NOT BE PLACED ON THIS APPARATUS.



SPEAKER TERMINALS COULD BE HAZARDOUS LIVE IF SPEAKER BRIDGE MODE CONNECTION IS USED.



PROPER CONNECTIONS AND INSULATIONS TECHNIQUES MUST BE ADOPTED WHEN SPEAKER BRIDGE MODE CONNECTION IS USED.

THE MANUFACTURER CANNOT BE HELD RESPONSIBLE FOR DAMAGES CAUSED TO PERSONS, THINGS OR DATA DUE TO AN IMPROPER OR MISSING GROUND CONNECTION.

CONTACT THE AUTHORIZED SERVICE CENTER FOR ORDINARY AND EXTRAORDINARY MAINTENANCE.

IT IS ABSOLUTELY NECESSARY TO VERIFY THESE FUNDAMENTAL REQUIREMENTS OF SAFETY AND, IN CASE OF DOUBT, REQUIRE AN ACCURATE CHECK BY QUALIFIED PERSONNEL.

Importantes instructions de sécurité

Ce module d'amplification est destiné à être installé à l'intérieur d'autres dispositifs et doit donc être contrôlé sur le produit fini.



LE TRIANGLE AVEC LE SYMBOLE D'UN ÉCLAIR EST UTILISÉ POUR ALERTER L'UTILISATEUR DU RISQUE DE CHOC ÉLECTRIQUE.



LE TRIANGLE AVEC LE POINT D'EXCLAMATION EST UTILISÉ POUR ALERTER L'UTILISATEUR SUR DES INSTRUCTIONS DE FONCTIONNEMENT OU D'ENTRETIEN IMPORTANTES.



LE SIGNE CE INDIQUE LA CONFORMITÉ DU PRODUIT À TOUTES LES DIRECTIVES EUROPÉENNES APPLICABLES



SYMBOLE POUR LA CONNEXION TERRE / MASSE.



SYMBOLE INDIQUANT QUE L'ÉQUIPEMENT EST DESTINÉ À UN USAGE INTÉRIEUR UNIQUEMENT.



SYMBOLE DE CONFORMITÉ AVEC LA DIRECTIVE 2012/19/CE DU PARLEMENT EUROPÉEN RELATIVE AUX DÉCHETS D'ÉQUIPEMENTS ÉLECTRIQUES ET ÉLECTRONIQUES (DEEE).



DE 0°C À +35°C

DÉCLASSEMENT AU DESSUS DE 35°C.



DE 10 % À 85 % D'HUMIDITÉ (SANS CONDENSATION).



NE PAS UTILISER PAS L'APPAREIL À DES ALTITUDES AU-DESSUS DE 2000 M.



NE PAS UTILISER L'APPAREIL DANS UN ENVIRONNEMENT TROPICAL.



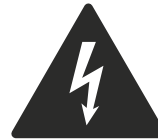
AVERTISSEMENT : POUR RÉDUIRE LE RISQUE DE CHOC ÉLECTRIQUE, NE PAS ESSAYER D'OUVRIER TOUTE PARTIE DE L'APPAREIL. AUCUNE PIÈCE RÉPARABLE PAR L'UTILISATEUR A L'INTÉRIEUR. RENVOYER L'ENTRETIEN AU PERSONNEL DE SERVICE QUALIFIÉ.



LE BRANCHEMENT AU SECTEUR NE SERA EFFECTUÉ QUE PAR UNE PERSONNE QUALIFIÉE DANS LE DOMAINE ÉLECTROTECHNIQUE SELON LES EXIGENCES NATIONALES DES PAYS OU L'APPAREIL EST VENDU.



VÉRIFIER QUE VOTRE CONNEXION SECTEUR EST CAPABLE DE SATISFAIRE LES VALEURS DE PUISSANCE DE L'APPAREIL.



AVIS

**RISQUES D'ÉLECTROCUTION
NE PAS OUVRIR**



Cet appareil a été conçu et fabriqué pour assurer votre sécurité personnelle. Mais UNE UTILISATION INCORRECTE PEUT ENTRAÎNER UN RISQUE D'ÉLECTROCUTION OU D'INCENDIE.

Respecter les règles de base suivantes pour son installation, utilisation et entretien, afin de ne pas compromettre les mesures de sécurité incorporées dans ce produit. Veuillez lire attentivement ces «Consignes de sécurité importantes» avant utilisation.

1. Lisez ces instructions.
2. Gardez ces instructions.
3. Tenez compte de toutes les mises en garde.
4. Suivez toutes les instructions.
5. N'utilisez pas cet amplificateur à proximité de l'eau.
6. Assurez-vous d'une bonne ventilation de l'appareil. Installez en accord avec les instructions préconisées par Powersoft.
7. N'installez pas l'appareil à proximité de sources de chaleur ou d'autres appareils produisant de la chaleur.
8. Respectez le dispositif de mise à la terre de la prise secteur.
9. Utilisez uniquement les accroches et accessoires spécifiés par Powersoft.
10. Confiez toute réparation à un technicien qualifié. L'intervention d'un technicien est nécessaire dans les cas suivants : le cordon d'alimentation ou la prise secteur sont endommagés, des corps étrangers ou du liquide se sont introduits dans l'appareil, l'appareil a été exposé à la pluie ou à l'humidité, l'appareil montre des signes de dysfonctionnement ou est tombé.
11. L'appareil doit être connecté à une prise SECTEUR dotée d'une mise à la terre de protection.



NE PAS EXPOSER CET APPAREIL A LA PLUIE OU A L'HUMIDITÉ, AUX GOUTTES OU AUX ÉCLABOUSSURES. LES OBJETS REMPLIS DE LIQUIDE, TELS QUE LES VASES, NE DOIVENT PAS ÊTRE PLACÉS SUR CET APPAREIL.



LES BORNES D'ENCEINTES POURRAIENT ÊTRE DANGEREUX SI LA CONNEXION DE MODE PONT DU HAUT-PARLEUR EST UTILISÉ.



ADOPTER DES TECHNIQUES CORRECTES DE CONNEXION ET D'ISOLEMENT LORSQUE LA CONNEXION EN MODE BRIDGE HAUT-PARLEUR EST UTILISÉ.

LE FABRICANT NE PEUT ÊTRE TENU RESPONSABLE DES DOMMAGES CAUSÉS AUX PERSONNES, AUX CHOSES OU AUX DONNÉES EN RAISON D'UNE CONNEXION À LA TERRE INCORRECTE OU MANQUANTE.


CONTACTER LE CENTRE DE SERVICE AUTORISÉ POUR UN ENTRETIEN ORDINAIRE ET EXTRAORDINAIRE.


IL EST ABSOLUMENT NÉCESSAIRE DE VÉRIFIER CES CONDITIONS FONDAMENTALES DE SÉCURITÉ ET, EN CAS DE DOUTE, D'OBTENIR UNE VÉRIFICATION PRÉCISE PAR DU PERSONNEL QUALIFIÉ.

Instrucciones de seguridad importantes

Este módulo amplificador está diseñado para ser instalado dentro de otros dispositivos y debe verificarse en el producto final.

 EL TRIÁNGULO CON EL RAYO ES USADO PARA ALERTAR AL USUARIO DEL RIESGO DE DESCARGA ELÉCTRICA.

 EL TRIÁNGULO CON EL SIGNO DE EXCLAMACIÓN ES USADO PARA ALERTAR AL USUARIO DE INSTRUCCIONES DE OPERACIÓN Y MANTENIMIENTO IMPORTANTES.

 EL MARCADO CE INDICA QUE EL PRODUCTO CUMPLE TODAS LAS DIRECTIVAS EUROPEAS VIGENTES

 SÍMBOLO PARA TIERRA/CONEXIÓN A TIERRA.

 SÍMBOLO INDICANDO QUE EL EQUIPO ES SOLO PARA USO INTERIOR.


 SÍMBOLO PARA LA CONFORMIDAD CON LA DIRECTIVA 2012/19/EC DEL PARLAMENTO EUROPEO SOBRE EL DESECHO DE EQUIPOS ELÉCTRICOS Y ELECTRÓNICOS (WEEE por sus siglas en Inglés).


 ENTRE 0°C Y +35°C
DEGRADACIÓN POR ENCIMA DE 35°C.

 ENTRE 10% Y 90% DE HUMEDAD (SIN CONDENSADO).

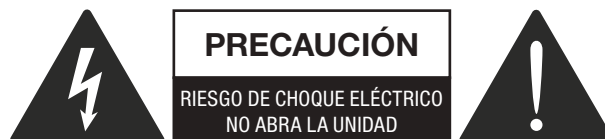
 NO USE LA UNIDAD EN ALTITUDES SOBRE LOS 2000 METROS.

 NO USE LA UNIDAD EN AMBIENTES TROPICALES.

 ADVERTENCIA: PARA REDUCIR EL RIESGO DE DESCARGA ELÉCTRICA, NO INTENTE ABRIR NINGUNA PARTE DE LA UNIDAD. NO EXISTEN PARTES INTERNAS REPARABLES PARA EL USUARIO. REFIERA LA REVISIÓN A PERSONAL DE MANTENIMIENTO CALIFICADO.

 LA CONEXIÓN A LA RED ELÉCTRICA DEBERÁ SER EFECTUADA SOLAMENTE POR UNA PERSONA QUE ESTÉ CAPACITADA EN EL ÁREA DE ELECTROTÉCNICA DE ACUERDO A LOS REQUERIMIENTOS NACIONALES DE LOS PAÍSES DONDE LA UNIDAD SEA VENDIDA.


 VERIFIQUE QUE SU CONEXIÓN A LA RED ELÉCTRICA ES CAPAZ DE SATISFACER LOS ÍNDICES DE ENERGÍA DE ESTE DISPOSITIVO.




Esta unidad ha sido diseñada y fabricada para garantizar su seguridad personal. Pero SU USO INADECUADO PUEDE RESULTAR EN UNA POTENCIAL DESCARGA ELÉCTRICA O RIESGO DE FUEGO.

Con el fin de no anular las garantías incorporadas en este producto, siga las siguientes reglas básicas para su instalación, uso y servicio. Por favor lea cuidadosamente estas "Garantías Importantes" antes de su uso.

1. Lea estas instrucciones.
2. Guarde estas instrucciones.
3. Preste atención a todas las advertencias.
4. Siga todas las instrucciones.
5. No use este aparato cerca del agua.
6. No bloquee las aberturas de ventilación. Realice la instalación de acuerdo con las indicaciones de Powersoft.
7. No instale cerca ninguna fuente de calor como, por ejemplo, radiadores, rejillas de calefacción, hornos u otros aparatos que produzcan calor.
8. No elimine el diseño de seguridad del enchufe, ya sea del tipo polarizado o con conexión a tierra.
9. Use exclusivamente los dispositivos/accesorios indicados por Powersoft.
10. El servicio técnico debe realizarlo siempre personal cualificado. Se requerirá servicio de asistencia técnica cuando el aparato sufra algún tipo de daño como, por ejemplo, que el cable de alimentación o el enchufe estén dañados, que se haya derramado líquido o hayan caído objetos dentro del aparato, que éste se haya expuesto a la lluvia o humedad, que no funcione normalmente o que se haya caído.
11. Este aparato deberá ser conectado a un enchufe de salida de red eléctrica con una protectora conexión a tierra.

 NO EXPONGA ESTE UNIDAD A LA LLUVIA O LA HUMEDAD, GOTE O SALPICADURAS. NO COLOQUE OBJETOS LLENOS DE LÍQUIDOS, TALES COMO VASIJAS, SOBRE EL APARATO.

 TERMINALES DE LOS ALTAVOCES PODRÍA SER PELIGROSO, SI SU CONEXIÓN SE UTILIZA EL ALTAVOZ MODO PUENTE.

 ADOPTAR TÉCNICAS CORRECTAS DE CONEXIÓN Y AISLAMIENTO CUANDO SE USA CONEXIÓN DE ALTAVOZ MODO PUENTE.

EL FABRICANTE NO SE HACE RESPONSABLE POR DAÑOS CAUSADOS A PERSONAS, OBJETOS O DATOS DEBIDO A UNA CONEXIÓN A TIERRA INAPROPIADA O FALTANTE.

CONTACTE AL CENTRO DE SERVICIO AUTORIZADO PARA MANTENIMIENTO DE RUTINA O EXTRAORDINARIO.

ES ABSOLUTAMENTE NECESARIO VERIFICAR ESTOS REQUERIMIENTOS FUNDAMENTALES DE SEGURIDAD Y, EN CASO DE DUDA, EXIJA UN CORRECTO CHEQUEO POR PARTE DE UN PERSONAL CALIFICADO.

Importanti istruzioni di sicurezza

Questo modulo amplificatore è destinato ad essere installato dentro altri dispositivi e deve quindi essere controllato nel prodotto finito.

 IL TRIANGOLO CON IL SIMBOLO DEL FULMINE VIENE UTILIZZATO PER AVVISARE L'UTENTE SUL RISCHIO DI SCOSSE ELETTRICHE.


 IL TRIANGOLO CON IL PUNTO ESCLAMATIVO VIENE UTILIZZATO PER AVVISARE L'UTENTE SU IMPORTANTI ISTRUZIONI DI FUNZIONAMENTO O DI MANUTENZIONE.

 LA MARCATURA CE INDICA LA CONFORMITÀ DEL PRODOTTO A TUTTE LE DIRETTIVE EUROPEE IN VIGORE

 SIMBOLO PER IL COLLEGAMENTO DELLA MESSA A TERRA.


 SIMBOLO CHE INDICA CHE IL DISPOSITIVO PUO' ESSERE UTILIZZATO SOLO ALL'INTERNO.


 SIMBOLO INDICANTE LA CONFORMITÀ ALLA DIRETTIVA 2012/19/CE DEL PARLAMENTO EUROPEO SUI RIFIUTI DI APPARECCHIATURE ELETTRICHE ED ELETTRONICHE (RAEE).

 DA 0°C A +35°C
DERATING OLTRE I 35°C.

 DAL 10% AL 90% DI UMIDITÀ (NON CONDENSANTE).

 NON UTILIZZARE IL DISPOSITIVO AD ALTITUDINI SUPERIORI A 2000 M.

 NON UTILIZZARE IL DISPOSITIVO IN UN AMBIENTE TROPICALE.

 ATTENZIONE: PER RIDURRE IL RISCHIO DI SCOSSE ELETTRICHE NON TENTARE DI APRIRE ALCUNA PARTE DEL DISPOSITIVO. ALL'INTERNO NON E' PRESENTE ALCUN COMPONENTE RIPARABILE DALL'UTENTE. PER L'ASSISTENZA RIVOLGERSI A PERSONALE TECNICO QUALIFICATO.

 IL COLLEGAMENTO ALLA RETE ELETTRICA DEVE ESSERE ESEGUITO DA UN ELETTRICISTA QUALIFICATO ATTENENDOSI AI REQUISITI DEL PAESE IN CUI IL DISPOSITIVO VIENE VENDUTO.


 CONTROLLARE CHE LA CONNESSIONE DI RETE SIA IN GRADO DI SODDISFARE LA POTENZA NOMINALE DEL DISPOSITIVO.





Il dispositivo è stato progettato e fabbricato per garantire la vostra sicurezza personale. TUTTAVIA UN UTILIZZO NON CORRETTO PUO' PROVOCARE RISCHI DI SCOSSE ELETTRICHE E DI INCENDI.

Per non compromettere le protezioni incorporate nel prodotto, rispettare le seguenti regole di base relative all'installazione, all'utilizzo e alla manutenzione. Si prega di leggere queste "Istruzioni sulla sicurezza" accuratamente prima dell'utilizzo.

1. Leggere queste istruzioni.
2. Conservare le istruzioni.
3. Tenere conto di tutti gli avvisi.
4. Seguire tutte le istruzioni.
5. Non usare l'apparecchio in prossimità di acqua.
6. Non ostruire le prese di ventilazione. Installare secondo le indicazioni del produttore.
7. Non installare vicino a fonti di calore quali radiatori, bocchette dell'aria calda, stufe o altri apparecchi (compresi gli amplificatori) che producono calore.
8. Non compromettere la sicurezza delle spine polarizzate o con messa a terra.
9. Usare solo accessori specificati dal produttore.
10. Ricorrere a personale qualificato per qualsiasi intervento. Tali interventi sono necessari in caso di guasti dell'apparecchio quali danneggiamento del cavo di alimentazione o della spina, versamento di liquidi o caduta di oggetti nell'apparecchio, esposizione a pioggia o umidità o se l'apparecchio non funziona normalmente o è caduto.
11. Il dispositivo deve essere collegato a una presa di corrente con collegamento protetto da messa a terra.

 NON ESPORRE QUESTO APPARECCHIO ALLA PIOGGIA, UMIDITÀ O SOSTANZE LIQUIDE. OGGETTI PIENI DI LIQUIDI, COME VASI, NON DEVONO ESSERE COLLOCATI SU QUESTO APPARATO.

 I TERMINALI DEI DIFFUSORI POTREBBERO ESSERE PERICOLOSI, SE VIENE UTILIZZATA LA CONNESSIONE IN MODALITÀ BRIDGE DEGLI ALTOPARLANTI.

 ADOTTARE LE CORRETTE TECNICHE DI CONNESSIONE E ISOLAMENTO QUANDO VIENE UTILIZZATA LA CONNESSIONE IN MODALITÀ BRIDGE DEGLI ALTOPARLANTI.

IL PRODUTTORE DECLINA OGNI RESPONSABILITÀ PER DANNI PROVOCATI A PERSONE, COSE O DATI A CAUSA DI UN COLLEGAMENTO NON CORRETTO O MANCANTE DELLA MESSA A TERRA.

CONTATTARE IL CENTRO DI ASSISTENZA AUTORIZZATO PER ESEGUIRE LA MANUTENZIONE ORDINARIA E STRAORDINARIA.

E' ASSOLUTAMENTE NECESSARIO CONTROLLARE QUESTI REQUISITI FONDAMENTALI SULLA SICUREZZA E, IN CASO DI DUBBI, RICHIEDERE UN CONTROLLO ACCURATO DA PERSONALE QUALIFICATO.

Regulatory information

FCC COMPLIANCE NOTICE

This device complies with part 15 of the FCC rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

CAUTION: Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

NOTE: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- ▶ Reorient or relocate the receiving antenna.
- ▶ Increase the separation between the equipment and receiver.
- ▶ Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- ▶ Consult the dealer or an experienced radio/TV technician for help.

WEEE DIRECTIVE

If the time arises to throw away your product, please recycle all the possible components.



This symbol indicates that when the end-user wishes to discard this product, it must be sent to separate collection facilities for recovery and recycling. By separating this product from other household-type waste, the volume of waste sent to incinerators or land-fills will be reduced and natural resources will thus be conserved.

The Waste Electrical and Electronic Equipment Directive (WEEE Directive) aims to minimise the impact of electrical and electronic goods on the environment. Powersoft S.p.A. comply with the Directive 2002/96/EC and 2003/108/EC of the European Parliament on waste electrical finance the cost of treatment and recovery of electronic equipment (WEEE) in order to reduce the amount of WEEE that is being disposed of in land-fill site. All of our products are marked with the WEEE symbol; this indicates that this product must NOT be disposed of with other waste. Instead it is the user's responsibility to dispose of their waste electrical and electronic equipment by handing it over to an approved reprocessor, or by returning it to Powersoft S.p.A. for reprocessing. For more information about where you can send your waste equipment for recycling, please contact Powersoft S.p.A. or one of your local distributors.

EC DECLARATION OF CONFORMITY

Manufacturer:
Powersoft S.p.A.
via E. Conti 5
50018 Scandicci (Fi)
Italy

We declare that under our sole responsibility the products:

Model Name: LiteMod 4HV

Intended use: Professional Audio Amplifier Module

Are in conformity with the provisions of the following EC Directives, including all amendments, and with national legislation implementing these directives:

2014/35/EU	Low Voltage Directive
2014/30/EU	Electromagnetic Compatibility Directive
2011/65/EU	RoHs Directive

The following harmonized standards are applied:

EN 55032:2012,
EN 55032:2012/AC:2013
EN 55035:2017
EN 61000-3-2:2014
EN 61000-3-3:2013
EN 61000-3-11:2000
EN 62368-1:2014
EN 62368-1:2014/AC:2015

Scandicci,
18 November 2020

Marco Cati
Quality & Process Manager

For compliance questions only: compliance@powersoft.it

Electrostatic Discharge (ESD)

Electrostatic discharge (ESD) is one of the most significant factors leading to damage and failure of a wide variety of electronic components.

Poor handling can cause internal damage, which is invisible. This internal damage can then cause electrical failure or reliability problems.



It is recommended that all workstations where Electrostatic Discharge Sensitive devices (ESDS) and assemblies are handled outside of full static protection packaging (i.e. within static control areas) should be provided with some form of ground conductive or dissipative flooring.

7:1.Welcome

Congratulations on your purchase of the Powersoft LiteMod 4HV module.

We know you are eager to use the LiteMod module, but please take a moment to read this user's manual and safety instructions. In case you have any questions, please do not hesitate to contact your dealer or Powersoft.

The LiteMod 4HV is a four channel amplifier modules specifically designed to drive high power loudspeakers.

The LiteMod 4HV represents an important evolution in power amplifier modules: extremely compact and light-weight LiteMod 4HV can be easily integrated into any appliance such as active loudspeakers and stand alone rack amplifiers.

The new design of the power supply equipped with PFC, reduces power consumption (less than 0.9 W in standby) while enhancing reliability and consistency in all operating conditions. The high efficiency of the output stage improves overall performance delivering pristine power and clean output signal. A dedicated optional DSP board can be easily plugged to the module providing a complete solution in a compact package.

Powersoft LiteMod 4HV is the ultimate flexible platform suiting your application design.

7:2.Unpacking & checking for shipping damage

Your Powersoft product has been completely tested and inspected before leaving the factory. Carefully inspect the shipping package before opening it, and then immediately inspect your new product. If you find any damage notify the shipping company immediately.

7:3.Disposal of the packing material

The transport and protective packing has been selected from materials which are environmentally friendly for disposal and can normally be recycled.

Rather than just throwing these materials away, please ensure they are offered for recycling.

Thermal constraints

This device must be correctly heatsinked for proper and reliable operation: an appropriate external passive heat sink guarantees by design thermal efficiency and reliability.

Proper heatsink planarity is strongly suggested to allow thermal transfer from the module's bottom plate to the heatsink; a thermal compound may be used, but it is not strictly necessary.

In order to ensure proper ventilation of the module, reasonable spacing of at least 100 mm must be left between the frame of the unit and any side component or surface of the enclosure.

The module has been designed to fit into a loudspeaker cabinet: please refer to [FIGURE 1](#) for proper module placing.

IN [FIGURE 1](#) HEATSINK FINS ARE SET HORIZONTALLY (WRONG!) ONLY FOR DESCRIPTIVE PURPOSE.

All configuration showed in [FIGURE 1](#) are viable for proper module placing and cooling. We suggest to position the module vertically with respect the ground in order to take advantage of the chimney effect for ventilation and heat dissipation.

In [FIGURE 1.a](#) the module and the loudspeakers share the same room into the cabinet. This is the default placement solution: it allows good ventilation because of woofer diaphragm movement and high air volume; be aware of magnetic field interaction: place the module far enough from loudspeakers magnet in order to prevent fans blockage.

[FIGURE 1.b](#) shows the more efficient cooling configuration, even if it is less effective against dust and moisture that can get into the module. By allowing external air flow, it is possible to reduce the fins width on the heatsink by maintaining good cooling performances.

8:1.Heatsink performance

Here we suggest a rule of thumb to calculate the thermal resistance of the heatsink.

The absolute thermal resistance of the heatsink is the temperature difference (kelvin or celsius) across its structure when a unit of heat energy flows through it in unit time (watt). For seek of simplicity: a heatsink with low thermal resistance offers high heat dissipation, as well as a low electric resistance allows high current flowing through a conductive wire.

In order to define the maximum allowed thermal resistance for the heatsink let assume the following:

- ▶ e as the amp module efficiency
- ▶ cf as the crest factor of the audio signal
- ▶ W_{max} as the peak power delivered by the module
- ▶ T_{amb} as the highest ambient temperature
- ▶ T_{mod} as the highest operating temperature

The thermal resistance of the heatsink derives from the following formula:

$$R_{th} = \frac{T_{mod} - T_{amb}}{\text{Dissipated power}}$$

The maximum dissipated power can be calculated as:

$$\text{Dissipated power} = \frac{W_{max} (1 - e)}{cf}$$

For example, stating an efficiency of 80%, 6 dB crest factor and 3400 W peak power, the dissipated heat is:

$$\frac{3400 (1 - 0.8)}{4} = 170 \text{ W}$$

Supposing that the thermal protection of the module (T_{mod}) is set at 75°C (167°F) on the bottom plate and stating an ambient temperature of 45 °C (113°F), the previous example gives:

$$\frac{75 - 45}{170} = 0.14^\circ\text{C/W}$$

meaning that the temperature of the bottom plate is always lower than 75°C if the heatsink has a thermal resistance better than 0.14°C/W (or 0.14 K/W) with ambient temperature up to 45 °C.

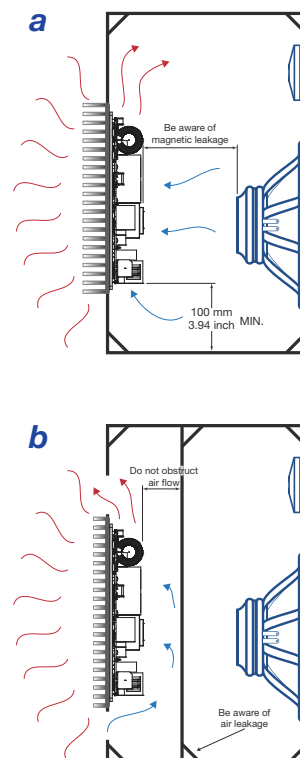



FIGURE 1: Cooling solutions (for descriptive purpose the heatsink fins are set in wrong direction);
 a) Module and loudspeaker into the same chamber;
 b) Module in a separate vented chamber.

Electromagnetic Compatibility (EMC) & Safety

9:1.AC MAINS filter

This equipment has been tested and found to be compliant with regulations listed in “Reference Standard” section. This equipment is compliant with Class A of CISPR 32. In a residential environment this equipment may cause radio interference.

 In order to improve the electromagnetic compatibility an EMC filter must be inserted before the AC MAINS plugs on the power supply. Powersoft suggests:

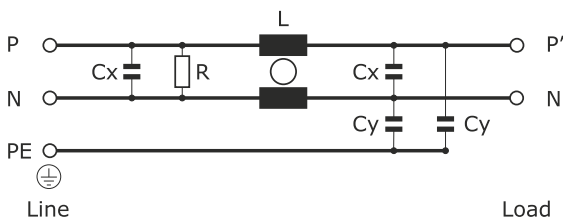


FIGURE 2: Typical electrical schematic of the EMI Filter.

9:2.Cabling

Wiring between the amp module and the load may lead to radio frequency noise. The following guide lines should be observed:

- ▶ reduced cabling length is advisable;
- ▶ keep cable pairs as close as possible to each other in order to minimize the antenna effect;
- ▶ design the cabling path far from RF noise source;
- ▶ set the cabling for RF noise rejection: shielded or twisted cables are advisable configuration (ref. FIGURE 4);
- ▶ place ferrites as close to the module as possible

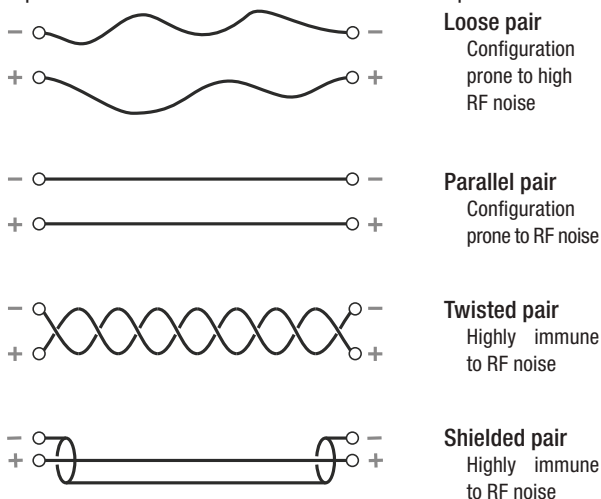


FIGURE 4: Cabling configuration.

9:3.Ferrite cores

Reject RF noise from input and output cabling by installing ferrite shields. Powersoft suggests the FAIR RITE 0431164181, or equivalent.

Wrap both cables around one side of each ferrite so that it pass through each ferrite twice (ref. FIGURE 3). Install the ferrite shield as close as possible to where the cable plugs into the amplifier. Placing the ferrite elsewhere on the cable noticeably reduces its effectiveness.

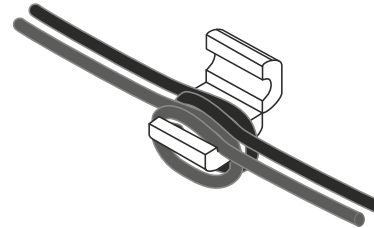


FIGURE 3: Ferrite core installation on I/O wirings.

9:4.Chassis shielding

If not already present on the product, a full body metal chassis or a shielding cage will provide best shielding of RF emission. In order to achieve the highest shielding, minimize the amount and size of holes or opening in the chassis.

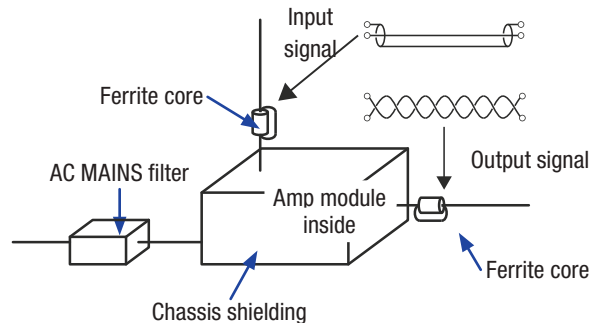



FIGURE 5: Tools and best practice for improving the electromagnetic compatibility.

9:5.Earth connection

 This device must be powered exclusively by earth connected mains sockets in electrical networks compliant to the IEC 364 or similar rules. Is absolutely necessary to verify this fundamental requirement of safety and, in case of doubt, require an accurate check by a qualified personal.

Is absolutely necessary to ground this device using the proper earth connection on the metal frame of the chassis; use M4 nut and bolt with proper split washer – grover washer – to secure the earth terminal lug.

Mechanical drawings

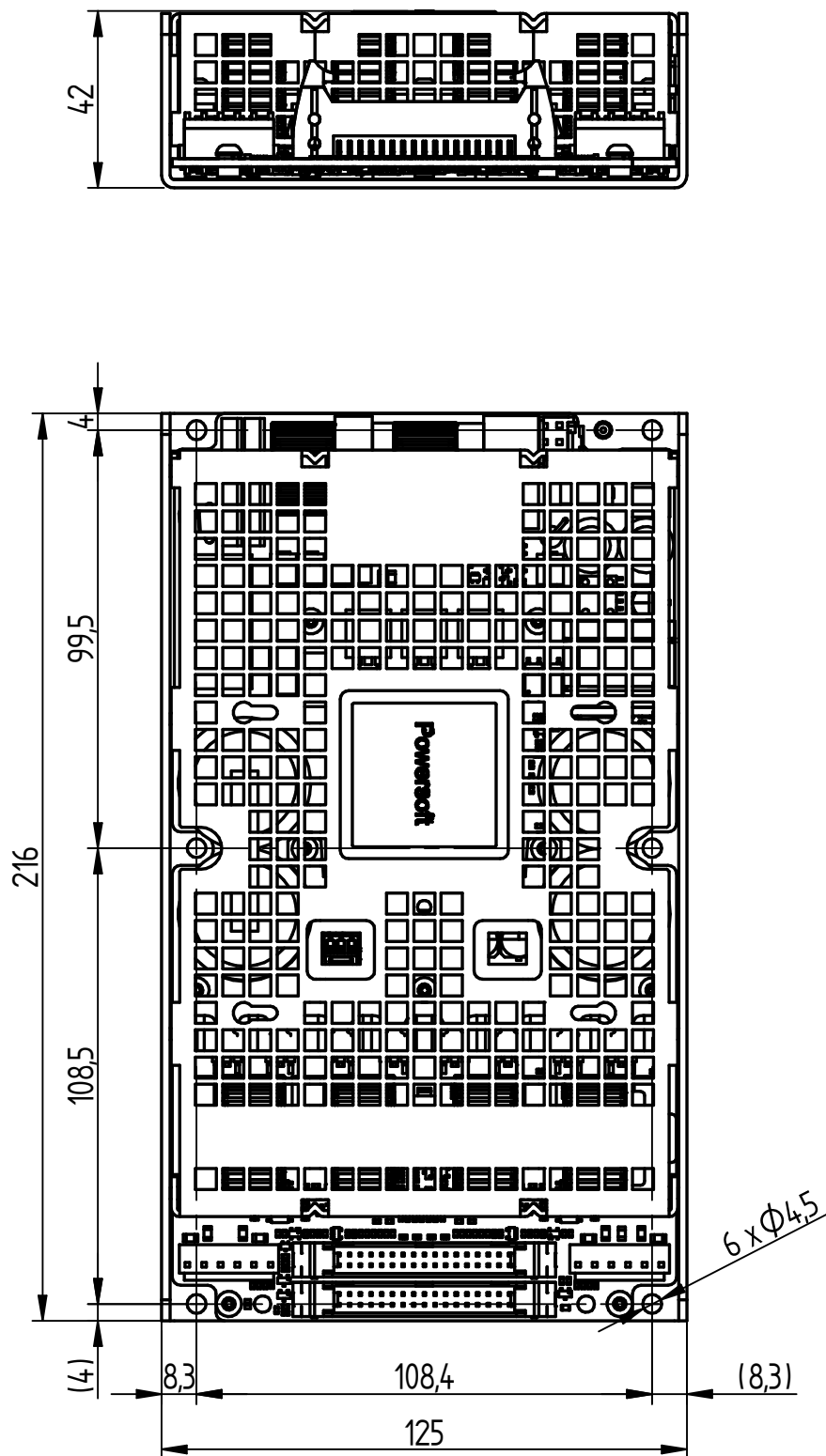
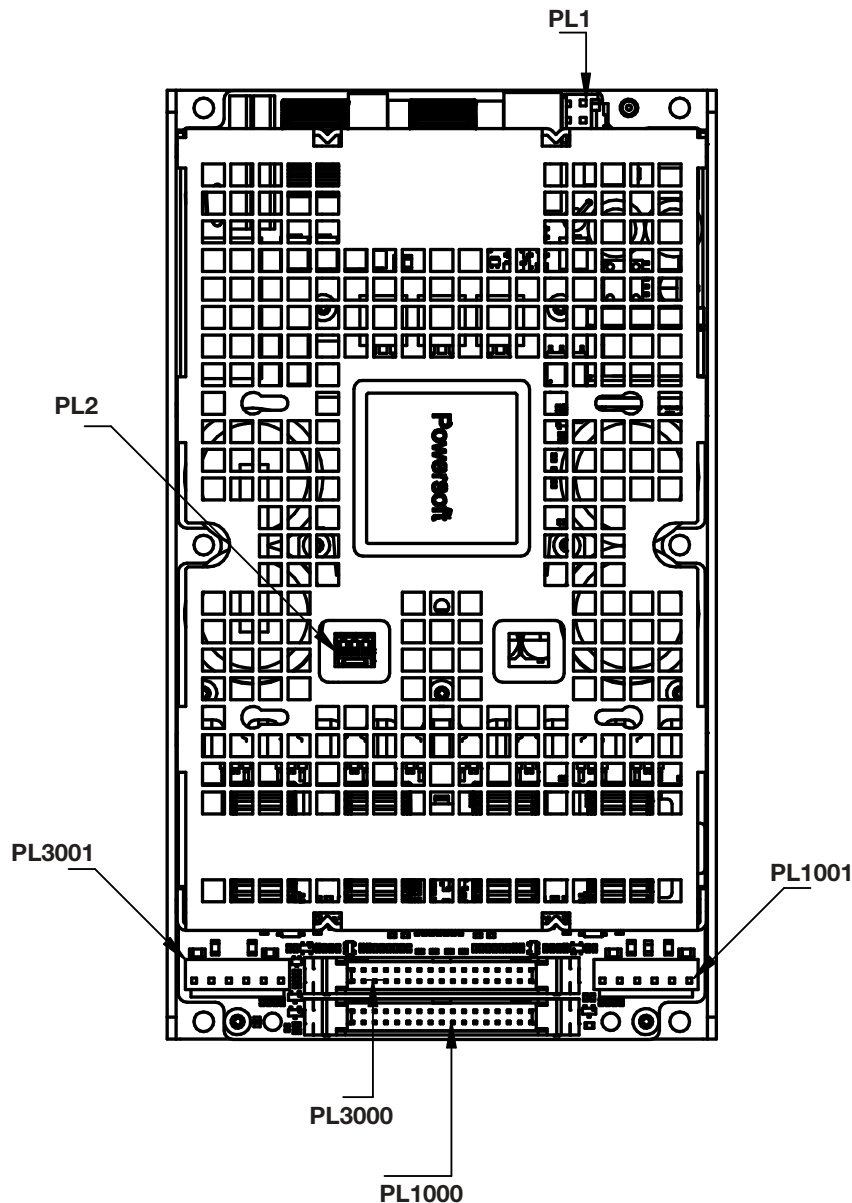


FIGURE 6: LiteMod4HV side and back plate (all dimensions in millimeters).

Connections



11:1.Grounding

The amplifier module is intended to be assembled in an End Product.

In the End Product, the metal plate of the amplifier module shall be mechanically fixed and electrically connected to conductive parts connected to protective earth – PE.

The main PE connector of the End Product shall be connected to the chassis, or to the accessible conductive enclosure parts, with suitable measures according the standard and applicable national deviations.

Any EMI filter added into the mains cable must be screwed to grounded metal parts of the chassis and its PE cable must be connected to grounding point of end product.

11:2.Bill of connectors

CODE	NAME	TYPE
PL1000 PL3000	Input connector	IDC socket 34 pin
PL1001 PL3001	Output connector	JST B6P-VH
PL1	AC Mains	JST B3P-VH
PL2	FAN	Molex 22-27-2031

Mating connectors (not provided)

Loudspeaker wires housing: JST VHR-6N

Mains connector housing: JST VHR-3N

Terminals: SVH-41T_P1-1

Fan connector: Molex 22-01-2035

Terminals: KK 254 4809 series

11:2.1.PL1 pinout

Pin#	Symbol	Description
1	L	AC Mains: Line input
2	n/c	not connected
3	N	AC Mains: neutral input

11:2.2.PL2 pinout

Pin#	Symbol	Description
1	GND	Ground connection
2	HOT	+12 V, 200 mA max current draw
3	GND	Ground connection

The PL2 molex plug is intended for connecting a fan whose activation is driven in relation to the temperature.

11:2.3.PL1000, PL3000 pinout

LiteMod4HV - PL1000 (IDC34p)

Pin#	Name	Type	Description	Range	Scale Factor	Impedance		
1	SDPWS	IN	Power supply shut down. Active High. Enable energy save mode (consumption <1W). Same as pin 34. Same as pin 1 and 34 on PL3000	3,3VDC < VIH < 12VDC	\	4,7KΩ		
2	READY 1	OUT	Channel 1 PWM state. High when output 1 PWM generation is enabled	VOH= 5VDC / VOL= 1VDC	\	100KΩ		
3	RESERVED	\	\	\	\	\		
4	+5VDC OUT	POWER	Regulated +5VDC supply output (+/-5%). Same as pin 31. Same as pin 4 and 31 on PL3000	Max current available= 50mA	\	\		
5	GND	POWER						
6	IN 1+	IN	Channel 1 balanced input (non-inverting)	3VRMS input for full output Absolute MAX input= 8VRMS	\	Differential= 3KΩ Common mode= 3,5KΩ (bal)		
			Channel 1 unbalanced input (non-inverting, when shorting pin 7 to GND)			3,5KΩ (unbal)		
7	IN 1-	IN	Channel 1 balanced input (inverting)			3VRMS input for full output Absolute MAX input= 8VRMS	\	Differential= 3KΩ Common mode= 0,95KΩ (bal)
			Channel 1 unbalanced input (inverting, when shorting pin 6 to GND)					1,5KΩ (unbal)
8	GND	POWER						
9	VOUT1MON	OUT	Channel 1 output voltage monitor	0-4,5VDC	20V/V			4,5KΩ
10	PROTECT 1	OUT	Channel 1 output stage protection monitor. Low when output is in protect state	11VDC < VOH < 13VDC 0VDC < VOL < 1VDC	\	Open Collector - 100KΩ Pullup		
11	IOUT1MON	OUT	Channel 1 output current monitor	0-4VDC	8,35A/V	2,7KΩ		
12	TEMPMON 12	OUT	Output stages 1&2 temperature monitor. Highest temperature between channel 1 and 2 is considered. Same as pin 23	0-5VDC	See Table	10KΩ		
13	+12VDC OUT	POWER	Regulated +12VDC (+/-10%) supply output (for audio circuits). Same as pin 22. Same as pin 13 and 22 on PL3000	Max current available= 1A	\	\		
14	-12VDC OUT	POWER	Regulated -12VDC (+/-10%) supply output (for audio circuits). Same as pin 21. Same as pin 14 and 21 on PL3000.	Max current available= 0,3A	\	\		
15	MUTE 1	IN	Channel 1 hardware mute. Active low. Disable output stage PWM generator	VIL (max)=0,2VDC	\	47KΩ Internal pull-up to +5VDC		
16	+VCCMON	OUT	Positive rail bus monitor	+4,5VDC MAX	20V/V	4,5KΩ		
17	-VCCMON	OUT	Negative rail bus monitor	-4,5VDC MAX	20V/V	4,5KΩ		
18	-VCCMON	OUT	Negative rail bus monitor	-4,5VDC MAX	20V/V	4,5KΩ		
19	+VCCMON	OUT	Positive rail bus monitor	+4,5VDC MAX	20V/V	4,5KΩ		
20	MUTE 2	IN	Channel 2 hardware mute. Active low. Disable output stage PWM generator	VIL (max)=0,2VDC	\	47KΩ Internal pull-up to +5VDC		
21	-12VDC OUT	POWER	Regulated -12VDC (+/-10%) supply output (for audio circuits) Same as pin 14. Same as pin 14 and 21 on PL3000	Max current available= 0,3A	\	\		

Pin#	Name	Type	Description	Range	Scale Factor	Impedance
22	+12VDC OUT	POWER	Regulated +12VDC (+/-10%) supply output (for audio circuits) Same as pin 13. Same as pin 13 and 22 on PL3000	Max current available= 1A	\	\
23	TEMPMON 12	OUT	Output stages 1&2 temperature monitor. Highest temperature between channel 1 and 2 is considered. Same as pin 12	0-5VDC	See Table	10K Ω
24	IOUT2MON	OUT	Channel 2 output current monitor	0-4VDC	8,35A/V	2,7K Ω
25	PROTECT 2	OUT	Channel 2 output stage protection monitor. Low when output is in protect state	11VDC < VOH < 13VDC / 0VDC < VOL < 1VDC	\	Open Collector - 100K Ω Pullup
26	VOUT2MON	OUT	Channel 2 output voltage monitor	0-4,5VDC	20V/V	4,5K Ω
27	GND	POWER				
28	IN 2-	IN	Channel 2 balanced input (inverting)	3VRMS input for full output Absolute MAX input= 8VRMS	\	Differential= 3K Ω / Common mode= 3.5K Ω (bal)
			Channel 2 unbalanced input (inverting, when shorting pin 29 to GND)			\
29	IN 2+	IN	Channel 2 balanced input (non-inverting)		\	Differential= 3K Ω / Common mode= 0.95K Ω (bal)
			Channel 2 unbalanced input (non-inverting, when shorting pin 28 to GND)		\	1,5K Ω (unbal)
30	GND	POWER				
31	+5VDC OUT	POWER	Regulated +5VDC (+/-5%) supply output. Same as pin 31. Same as pin 4 and 31 on PL3000	Max current available= 50mA	\	\
32	RESERVED	\	\	\	\	\
33	READY 2	OUT	Channel 2 PWM state. High when output 2 PWM generation is enabled	VOH= 5VDC / VOL= 1VDC	\	100K Ω
34	SDPWS	IN	Power supply shut down. Active High. Enable enegy save mode (consumption <1W). Same as pin 1. Same as pin 1 and 34 on PL3000	3,3VDC < VIH < 12VDC	\	4,7K Ω

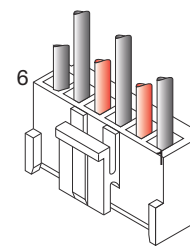
LiteMod4HV - PL3000 (IDC34p)

Pin#	Name	Type	Description	Range	Scale Factor	Impedance
1	SDPWS	IN	Power supply shut down. Active High. Enable energy save mode (consumption <1W). Same as pin 34. Same as pin 1 and 34 on PL1000	3,3VDC < VIH < 12VDC	\	4,7KΩ
2	READY 3	OUT	Channel 3 PWM state. High when output 3 PWM generation is enabled	VOH= 5VDC / VOL= 1VDC	\	100KΩ
3	RESERVED	\	\	\	\	\
4	+5VDC OUT	POWER	Regulated +5VDC (+/-5%) supply output. Same as pin 31. Same as pin 4 and 31 on PL1000	Max current available= 50mA	\	\
5	GND	POWER				
6	IN 3+	IN	Channel 3 balanced input (non-inverting)	3VRMS input for full output Absolute MAX input= 8VRMS	\	Differential= 3KΩ / Common mode= 3,5KΩ (bal)
			Channel 3 unbalanced input (non-inverting, when shorting pin 7 to GND)			3,5KΩ (unbal)
7	IN 3-	IN	Channel 3 balanced input (inverting)		\	Differential= 3KΩ / Common mode= 0,95KΩ (bal)
			Channel 3 unbalanced input (inverting, when shorting pin 6 to GND)			1,5KΩ (unbal)
8	GND	POWER				
9	VOUT3MON	OUT	Channel 3 output voltage monitor	0-4,5VDC	20V/V	4,5KΩ
10	PROTECT 3	OUT	Channel 3 output stage protection monitor. Low when output is in protect state.	11VDC < VOH < 13VDC / 0VDC < VOL < 1VDC	\	Open Collector - 100KΩ Pullup
11	IOUT3MON	OUT	Channel 3 output current monitor	0-4VDC	8,35A/V	2,7KΩ
12	TEMPMON 34	OUT	Output stages 3&4 temperature monitor. Highest temperature between channel 3 and 4 is considered. Same as pin 23	0-5VDC	See table	10KΩ
13	+12VDC OUT	POWER	Regulated +12VDC (+/-10%) supply output (for audio circuits). Same as pin 22. Same as pin 13 and 22 on PL1000	Max current available= 1A	\	\
14	-12VDC OUT	POWER	Regulated -12VDC (+/-10%) supply output (for audio circuits). Same as pin 21. Same as pin 14 and 21 on PL1000.	Max current available= 0,3A	\	\
15	MUTE 3	IN	Channel 3 hardware mute. Active low. Disable output stage PWM generator	VIL (max)=0,2VDC	\	47KΩ Internal pull-up to +5VDC
16	+VCCMON	OUT	Positive rail bus monitor	+4,5VDC MAX	20V/V	4,5KΩ
17	-VCCMON	OUT	Negative rail bus monitor	-4,5VDC MAX	20V/V	4,5KΩ
18	-VCCMON	OUT	Negative rail bus monitor	-4,5VDC MAX	20V/V	4,5KΩ
19	+VCCMON	OUT	Positive rail bus monitor	+4,5VDC MAX	20V/V	4,5KΩ
20	MUTE 4	IN	Channel 4 hardware mute. Active low. Disable output stage PWM generator	VIL (max)=0,2VDC	\	47KΩ Internal pull-up to +5VDC
21	-12VDC OUT	POWER	Regulated -12VDC (+/-10%) supply output (for audio circuits) Same as pin 14. Same as pin 14 and 21 on PL1000	Max current available= 0,3A	\	\
22	+12VDC OUT	POWER	Regulated +12VDC (+/-10%) supply output (for audio circuits) Same as pin 13. Same as pin 13 and 22 on PL1000	Max current available= 1A	\	\
23	TEMPMON 34	OUT	Output stages 3&4 temperature monitor. Highest temperature between channel 3 and 4 is considered. Same as pin 12	0-5VDC	See table	10KΩ
24	IOUT4MON	OUT	Channel 4 output current monitor	0-4VDC	8,35A/V	2,7KΩ
25	PROTECT 4	OUT	Channel 4 output stage protection monitor. Low when output is in protect state	11VDC < VOH < 13VDC / 0VDC < VOL < 1VDC	\	Open Collector - 100KΩ Pullup
26	VOUT4MON	OUT	Channel 4 output voltage monitor	0-4,5VDC	20V/V	4,5KΩ
27	GND	POWER				

Pin#	Name	Type	Description	Range	Scale Factor	Impedance
28	IN 4-	IN	Channel 4 balanced input (inverting)	3VRMS input for full output Absolute MAX input= 8VRMS	\	Differential= 3KΩ / Common mode= 3.5KΩ (bal)
			Channel 4 unbalanced input (inverting, when shorting pin 29 to GND)		\	3,5KΩ (unbal)
29	IN 4+	IN	Channel 4 balanced input (non-inverting)		\	Differential= 3KΩ / Common mode= 0,95KΩ (bal)
			Channel 4 unbalanced input (non-inverting, when shorting pin 28 to GND)		\	1,5KΩ (unbal)
30	GND	POWER				
31	+5VDC OUT	POWER	Regulated +5VDC (+/-5%) supply output. Same as pin 4. Same as pin 4 and 31 on PL1000	Max current available= 50mA	\	\
32	RESERVED	\	\	\	\	\
33	READY 4	OUT	Channel 4 PWM state. High when output 1&2 PWM generation is enabled	VOH= 5VDC / VOL= 1VDC	\	100KΩ
34	SDPWS	IN	Power supply shut down. Active High. Enable energy save mode (consumption <1W). Same as pin 1. Same as pin 1 and 34 on PL1000	3,3VDC < VIH < 12VDC	\	4,7KΩ

11:2.4.PL1001, PL3001 pinout

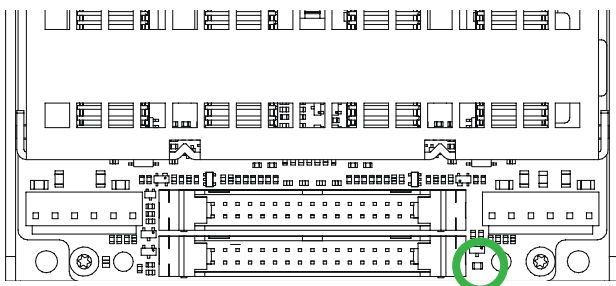
Pin#	PL1001 Polarity	PL3001 Polarity
1	CH1 (-)	CH2 (+)
2	CH1 (+)	CH2(-)
3	CH3 (-)	CH4 (+)
4	CH3 (+)	CH 4 (-)
5	GND	GND
6	PARALLEL	PARALLEL



Loudspeaker wires housing: JST VHR-6N

11:3.LED encoding

A single LED is located on the point indicated in the picture.



Color	Status	Description
	solid off	OFF - amp is off
■	solid on	READY - amp is ready to be used

11:4. Internal Signal Path Polarity

In order to increase the power's supply energy storage efficiency, signals coming from channel pairs 1-2 are reversed in polarity.

This ensures a symmetrical use of the voltage rails: if, for example, both channels 1 and 2 input signals are going through a peak at the same time, channel 1's energy will come from the positive voltage rails while channel 2, whose polarity is reversed with respect to channel 1, will be fed energy from the negative voltage rails. In this manner, the power supply will work symmetrically, with one channel driven by the positive rails and the other by the symmetrical negative rails. Channel 2's signal will be polarity reversed once more to ensure that both channels output with the same polarity as their corresponding input signals.

For this reason it is very important not to invert the polarity of either channels before feeding them to the module. A double polarity inversion (the first by the user inserting the input signal and the other by the amplifier's internal circuitry) results in no inversion at all. If this were the case, both channels would be weighting on only one side (positive or negative) of the power supply's voltage rails. This would result in an inefficient use of the power supply's energy.

Please pay special attention in using balanced inputs on all measurement equipment (such as oscilloscope probes) when you are bench testing.

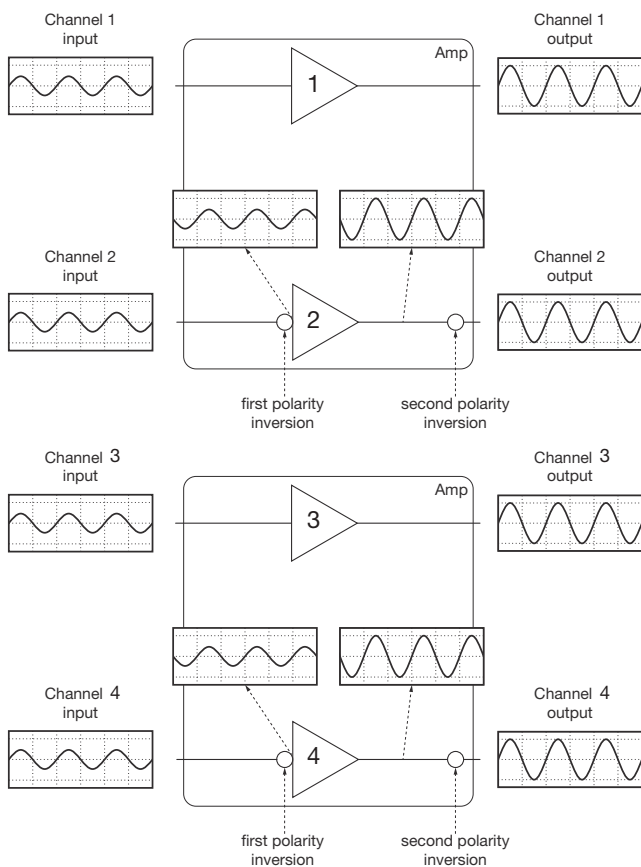


FIGURE 7: Internal signal path polarity with example input signals. All channels are fed with the same sine signal.

11:5. Output Configuration

LiteMod 4HV can be configured in 5 different output type of connections:

4 x SE (Single Ended): 4 independent channels.

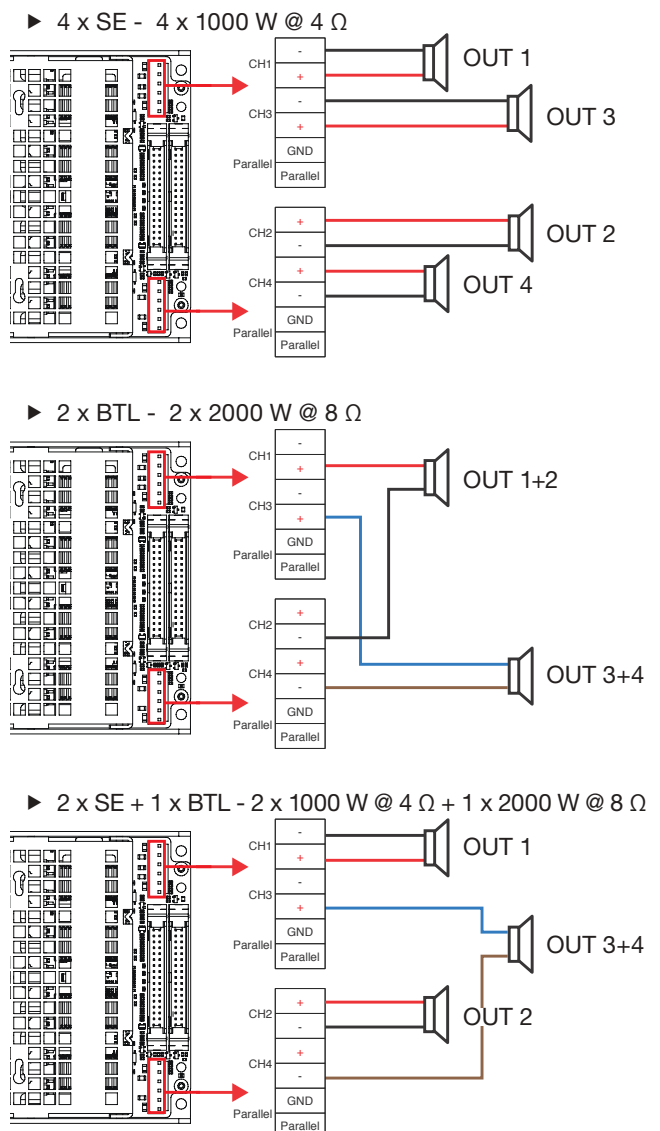
2 x BTL (Bridge Tied Load): Two couples of channels bridged.

2 x SE + 1 x BTL: A couple of channel bridged while the remaining two channels kept single ended.

2 x PTL (Parallel Tied Load); Two couple of channels obtained by paralleling two channels of the module. This configuration can be activated by short circuiting two pins of output connector indicated on [FIGURE 8](#), it must be done before switching on the module. Activating the parallel mode on one of the output connectors, implies setting up parallel mode on both channel pairs. For safety reasons we suggest to apply the parallel mode on both connectors.

1 x PBTL (Parallel Bridge Tied Load): A single channel can be obtained by bridging the PTL configuration.

When setting up the PTL mode, input signals must be applied only on PL1000 connector (only one ribbon cable needed): input #1 will drive outputs CH1 and CH3 while input #2 will drive outputs CH2 and CH4.



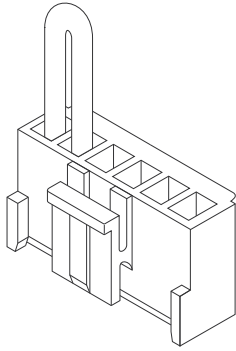
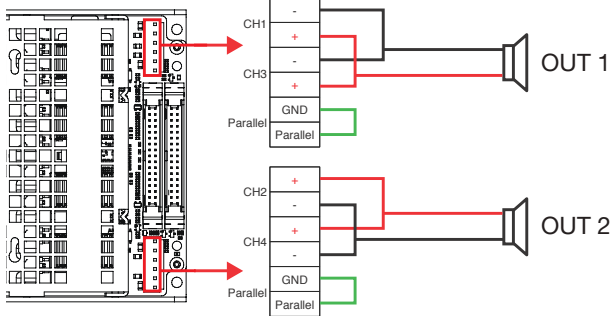
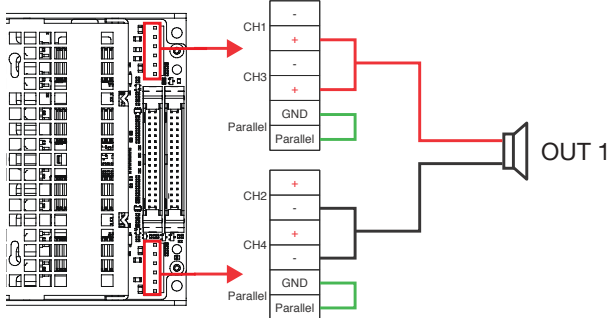


FIGURE 8: Short-circuited pins on the output connector.

► 2 x PTL - 2 x 2000 W @ 2 Ω

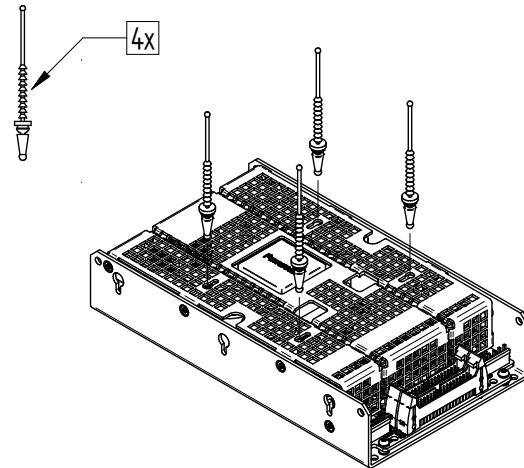


► 1 x PBTI - 1 x 4000 W @ 4 Ω

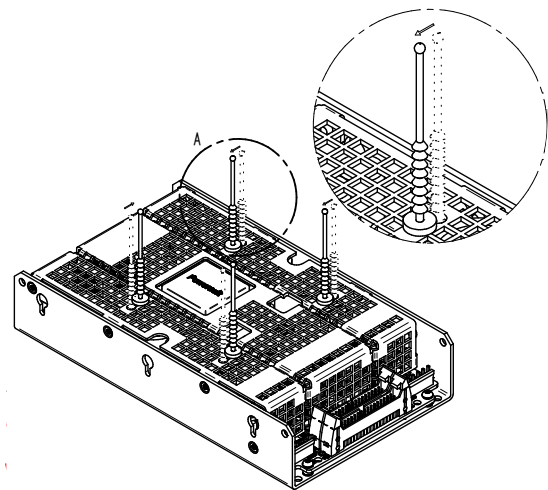


Fan installation

Insert the rubber standoff on the mounting holes located on top of the module.

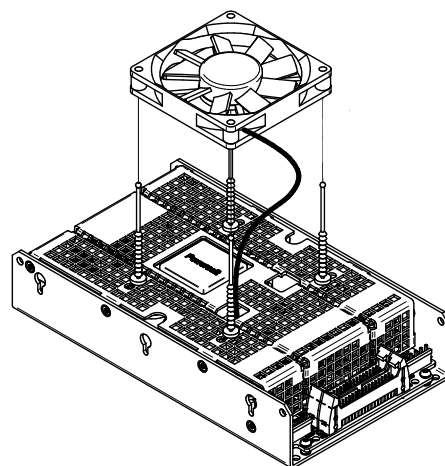


Lock the rubber standoffs in place as indicated in the picture.

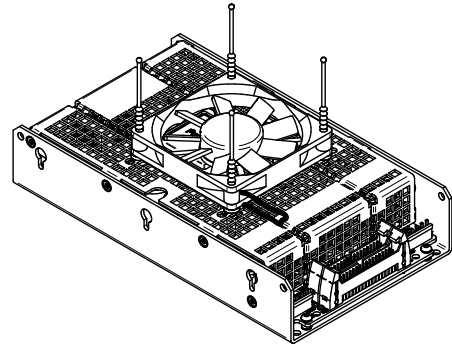


Connect the fan and secure it to the module with the rubber standoffs.

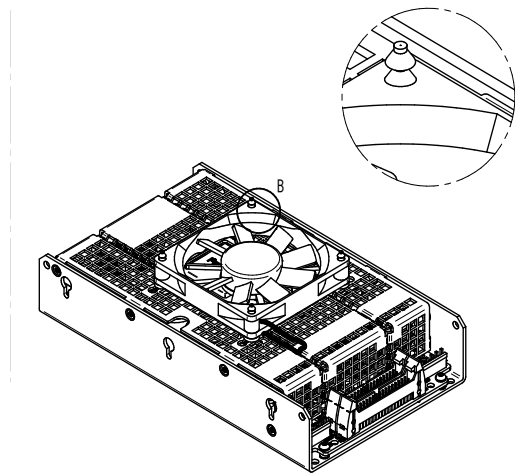
The fan must blow towards the amplifier.



Pull on the rubber standoffs until the fan is secured to the module.



Cut the exceeding rubber being careful not to compromise the various components.



Protections

Fault protections are systems designed to protect people from severe or fatal electric shocks and avoid severe damages on the amplifier or the loudspeakers in case of electrical parameters out of scaling or critical changes in environmental conditions.

The architecture of Powersoft's amplifiers includes several protection mechanisms triggered by harmful signal and temperature. Protection systems and triggers are independently implemented in the power supply section (power supply protection) and the amplifier section (amplifier protections) in order to minimize system damages and maximize efficiency.

In case any limiter requires >17dB of gain reduction, each channel's relative PROTECT pin (PL1000 - #10=ch1 #25=ch2, PL3000 - #10=ch3 #25=ch4) will become active.

If any limiter requires a >20 dB reduction, the module will shut off.

13:1.Fan Control

Fan starts to run as soon as the amp module measures a temperature greater than 60°, the fan control keeps fan at maximum speed for the first 2s, then its speed will be controlled according to operating temperature. When the amp module reaches 75°, the fan starts to run at maximum speed.

The fan is not included in the package, Powersoft recommends the following (or equivalent):

- ▷ 80x80= SUNON, series ME80151Vx

T (°C)	TempMon
25	2.95
30	2.87
35	2.78
40	2.67
45	2.53
50	2.37
55	2.19
60*	2
65	1.79
70	1.57
75**	1.31
80	1.05
85	0.76
90	0.47

*FAN ACTIVATION THRESHOLD
**MAX SPEED

TABLE 1: TempMon

13:2.Power supply protections

Power supply protections aim to avoid damages due to stress of the Power supply or to isolate a faulty section in the electrical power system from the rest of the device in order to prevent the propagation of the fault and limit damages.

13:2.1.Primary AC mains overcurrent protection

A surface mount 16A time-delay fuse prevents against dangerous mains overcurrents in case of a internal failure.

The fuse is soldered on the PCB, it can be replaced only by an authorized Powersoft Service Center.

13:2.2.Primary AC mains overvoltage protection

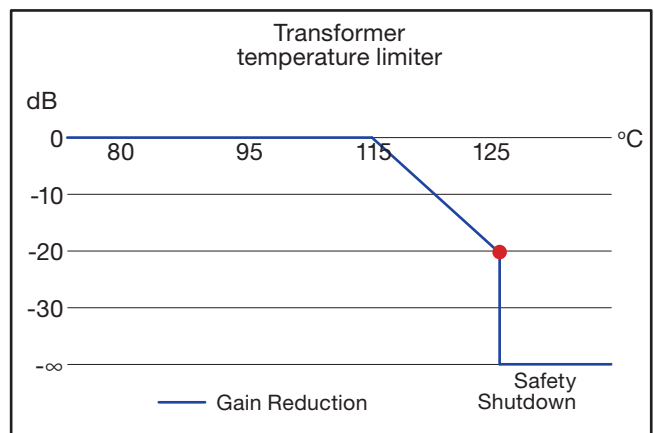
LiteMod 4HV has a 400 VAC temporary tolerant power supply. AC mains overvoltage threshold is set to about 280 V_{RMS}. If the AC mains voltage exceeds 280 V_{RMS} the primary power supply stops working, but the auxiliary voltages remain active.

The power supply turns on again when the AC mains voltage drops under about 275 V_{RMS}.

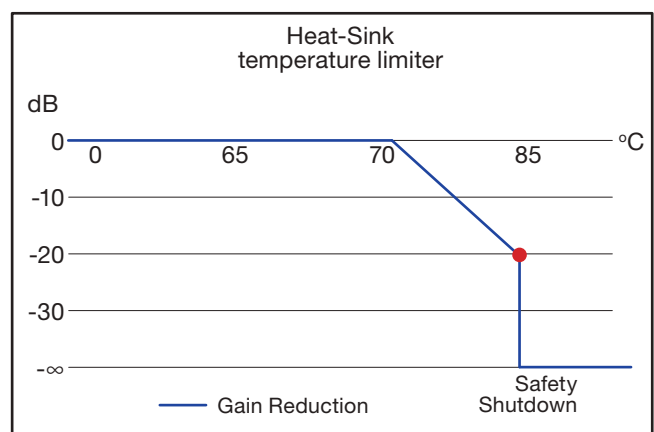
13:2.3.Primary thermal protection

The temperature is detected at the power supply's MOSFETs located on the Main Board's bottom side and inside the power transformer.

The limiting factor is set as follows: 0dB @ 105°C, and -20dB @ 125°C. When the temperature exceeds the safety threshold of 125°C, the system switches off.



Another sensor is located on the heatsink, when the temperature exceed the safety threshold (0 dB @70 °C, -20 dB @85° C), the system switch off.



13:2.4.Total power limiter

When the module detects a long term output current of >11 A, and an output power grater than 700 W, it will limit the output power accordingly.

13:3.Amplifier protections

Amplifier protections are triggered by the audio signals, output currents and voltages, and by the temperature of the output stage's devices. Temperature is read by NTC (Negative Temperature Coefficient) thermistors. NTCs provide a voltage proportional to temperature read, which decreases with an increasing temperature.

The average of the temperatures read by all NTCs triggers a secondary thermal limiter which acts as follow: 0dB @ 70°C, and -20dB @ 85°C. When temperature exceeds the safety threshold of 85°C the system switches off.

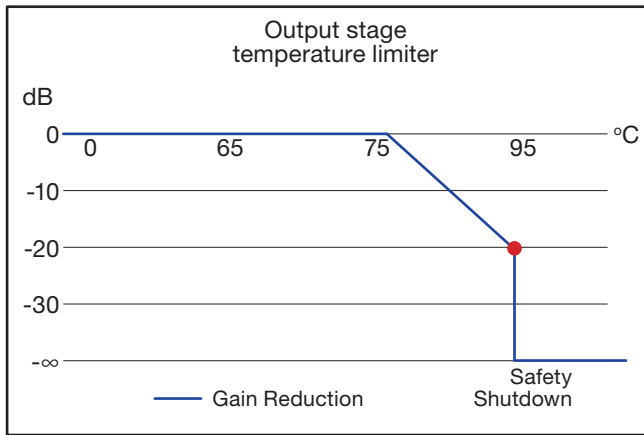


TABLE 1 displays the relationship between temperature and voltage drop across NTC thermistors. NTC's voltage drop for each channel are routed to the respective TEMPON contacts (pin #12 and #23) on PL1001.

The limiting factor is 0dB @ 75° C, and -20dB @ 95° C.

Since the temperature is detected on the PCB surface it does not represent the actual temperature of the plate: be aware that some parts of the amplifier may be at higher temperature, but not at risk of failure.

13:3.1.Harmful signal protections

Bad signals can cause amplifier and loudspeakers damages. In order to limit such failures, harmful signal triggers specific protections.

13:3.1.1.Output short circuit

If the load impedance is too low or the loudspeaker cable is short circuited (because of voice coil damages, wires short circuit, improper wiring, etc), the amplifier output current could rise to harmful values.

When the output current reaches 50 A_{peak} the amplifier section switches off (in less than 5us), while the power supply is still working.

The module will then start a series of checks at different intervals, in which it will try to switch itself on again, as

described in the table below, and will then cycle the entire process indefinitely.

Time	Cycle #
2 s	30 times
10 s	90 times
5 min	6 times
30 min	1 time

13:3.1.2.RMS output current protection

A long term limiter, limits current of each channel to 7Arms.

13:3.1.3.High frequency stationary loud signals

High frequency stationary signals, such as sine waves with high amplitude, tend to stress the amplifier section of the module as well as the loudspeakers voice coils.

If the output signal is above 20 kHz the protection will activate in 0.5 s when the output amplitude exceeds 20 V_{RMS}.

- High Freq. limiter
THR= 20Vrms @20kHz

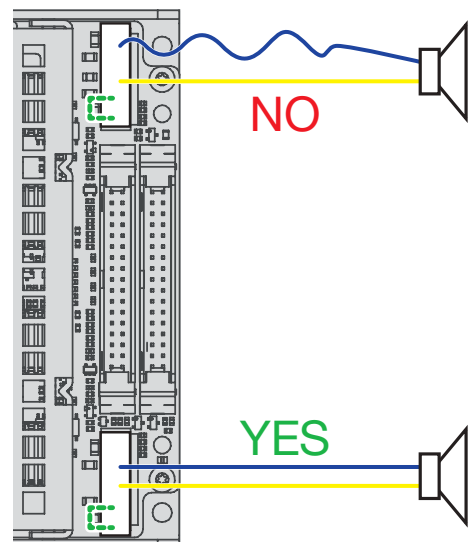
13:3.1.4.Soft Clip Limiter

Clipping signals will be smoothed out with an attack time of 2 ms and a release time of 20ms.

13:3.1.5.Output Current Mismatch Protection

When using the module in PTL mode, paralleled channels, mightn't share the same amount of current, so in case their mismatch would be too high, a protection will be engaged muting the outputs for 60 seconds. The module then restarts normally unless the protection would be engaged again.

In order to avoid this protection verify that PTL output cable to be short and of the same lenght.



Cable Kit - KT000349

For module evaluation only.

14:1.Mains Cable – CB000727



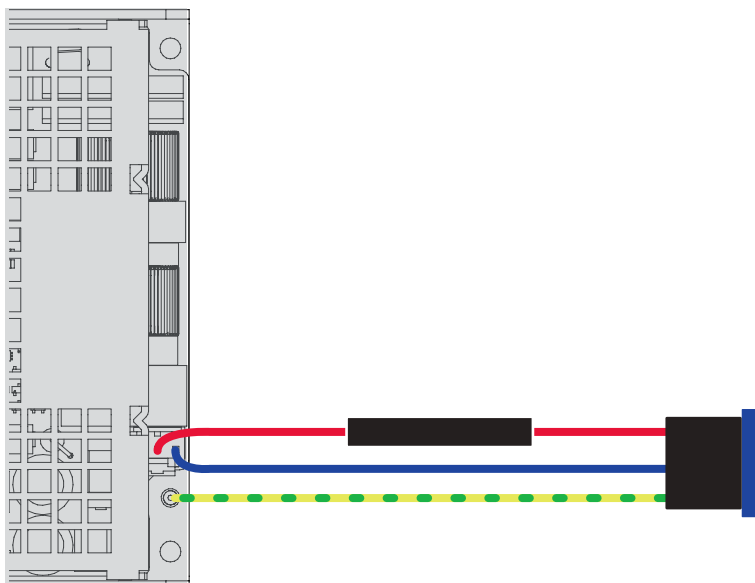
Bill of Materials

Q	Part Description	MPN / Specs
1	PowerCon	NAC3MPA-1
1	JST connector	VHR-3N
2	JST Contacts	SVH-21T-P1.1 (22 ~ 18 AWG), SVH-41T-P1-1 (20 ~ 16 AWG)
1	Fuse Holder	SCI R3-32B2
1	Fuse	LITTELFUSE 326 15AT
1	Red cable	14 AWG
1	Blu cable	14 AWG
1	Yellow/Green cable	14 AWG

JST Housing pin-out

Powercon pin-out

PIN 1	AC Mains L (red wire)	PIN L	AC Mains L (red wire)
PIN 2	Not connected	PIN N	AC Mains N (blue wire)
PIN 3	AC Mains N (blue wire)	PIN GND	Ground
AMP GND	Ground (yellow-green wire)		



14:2.Output cable, 4 x SE configuration – CB000731



Bill of Materials

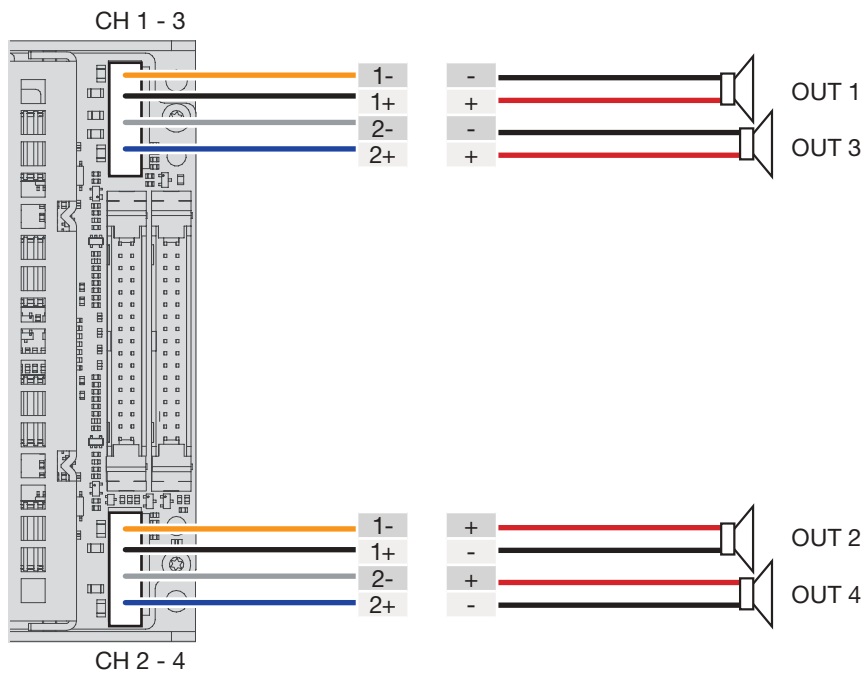
Q	Part Description	MPN / Specs
1	Speakon	NL4MP-UC
1	JST Connector	VHR-6N
4	JST Contacts	SVH-21T-P1.1 (22 ~ 18 AWG), SVH-41T-P1-1 (20 ~ 16 AWG)
1	White Cable	16 AWG
1	Blue Cable	16 AWG
1	Orange Cable	16 AWG
1	Grey Cable	16 AWG

Pin Out CH 1-3

JST Pin	Cable	Speakon Pin	Speaker Pin
1	ORANGE	1-	-
2	WHITE	1+	+
3	GREY	2-	-
4	BLUE	2+	+
5	N.C.	N.C.	N.C.
6	N.C.	N.C.	N.C.

Pin Out CH 2-4

JST Pin	Cable	Speakon Pin	Speaker Pin
1	ORANGE	1-	+
2	WHITE	1+	-
3	GREY	2-	+
4	BLUE	2+	-
5	N.C.	N.C.	N.C.
6	N.C.	N.C.	N.C.



14:3.Output cable, 2 x BTL configuration – CB000730



Bill of Materials

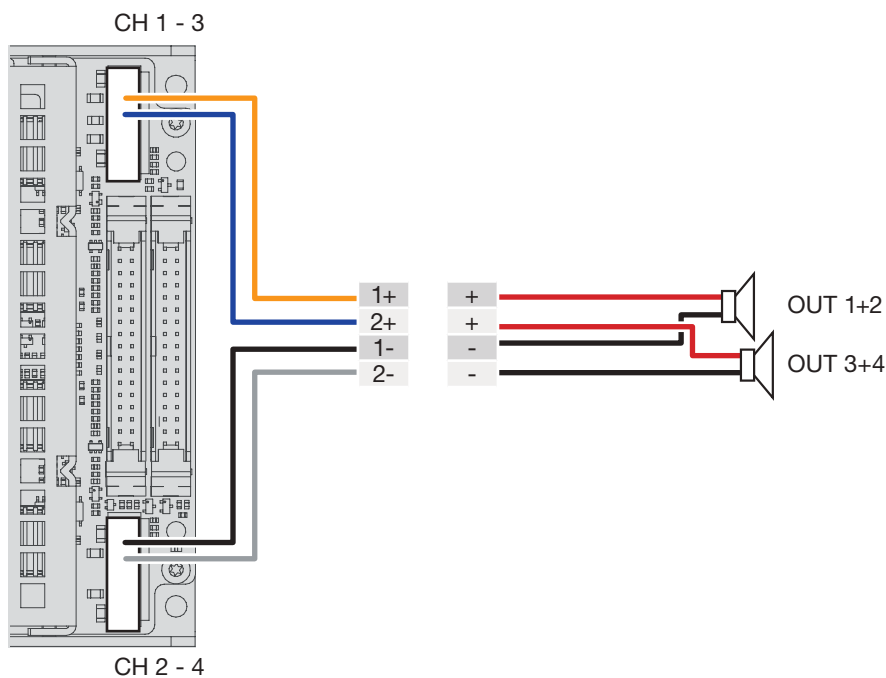
Q	Part Description	MPN / Specs
1	Speakon	NL4MP-UC
2	JST Connector	VHR-6N
4	JST Contacts	SVH-21T-P1.1 (22 ~ 18 AWG), SVH-41T-P1-1 (20 ~ 16 AWG)
1	White Cable	16 AWG
1	Blue Cable	16 AWG
1	Orange Cable	16 AWG
1	Grey Cable	16 AWG

Pin Out CH 1-3

JST Pin	Cable	Speakon Pin	Speaker Pin
1	N.C.	N.C.	N.C.
2	ORANGE	1-	+
3	N.C.	N.C.	N.C.
4	BLUE	2-	+
5	N.C.	N.C.	N.C.
6	N.C.	N.C.	N.C.

Pin Out CH 2-4

JST Pin	Cable	Speakon Pin	Speaker Pin
1	N.C.	N.C.	N.C.
2	WHITE	1+	-
3	N.C.	N.C.	N.C.
4	GREY	2+	-
5	N.C.	N.C.	N.C.
6	N.C.	N.C.	N.C.



14:4.Output cable, 2 x PTL configuration – CB000733



Bill of Materials

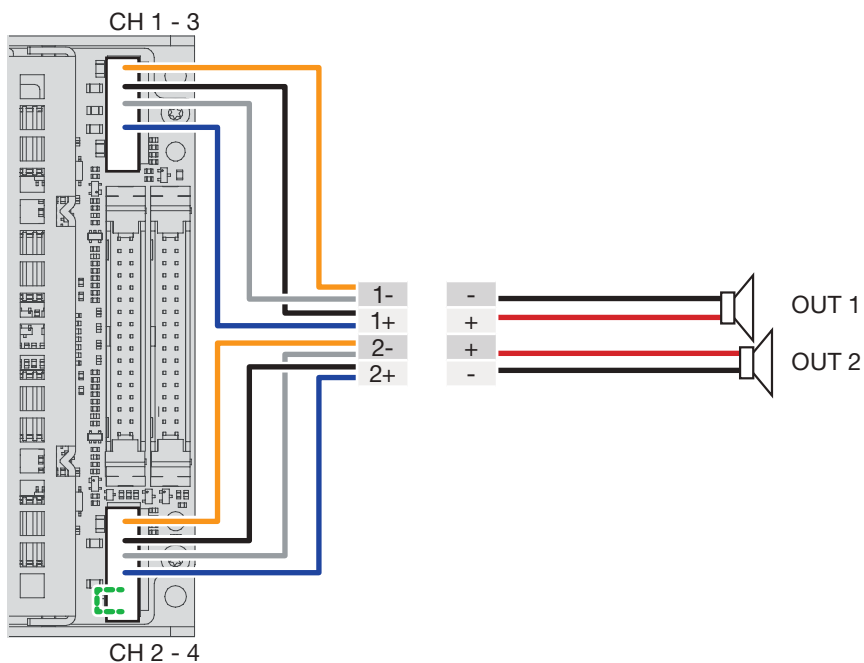
Q	Part Description	MPN / Specs
1	Speakon	NL4MP-UC
2	JST Connector	VHR-6N
8	JST Contacts	SVH-21T-P1.1 (22 ~ 18 AWG), SVH-41T-P1-1 (20 ~ 16 AWG)
2	White Cable	16 AWG
2	Blue Cable	16 AWG
2	Orange Cable	16 AWG
2	Grey Cable	16 AWG
2	Loop Cable	16 AWG

Pin Out CH 1-3

JST Pin	Cable	Speakon Pin	Speaker Pin
1	ORANGE	1-	-
2	WHITE	1+	+
3	GREY	1-	-
4	BLUE	1+	+
5	LOOP	N.C.	N.C.
6	LOOP	N.C.	N.C.

Pin Out CH 2-4

JST Pin	Cable	Speakon Pin	Speaker Pin
1	ORANGE	2-	+
2	WHITE	2+	-
3	GREY	2-	+
4	BLUE	2+	-
5	LOOP	N.C.	N.C.
6	LOOP	N.C.	N.C.



14:5.Output cable, 1 x PBTL configuration – CB000732



Bill of Materials

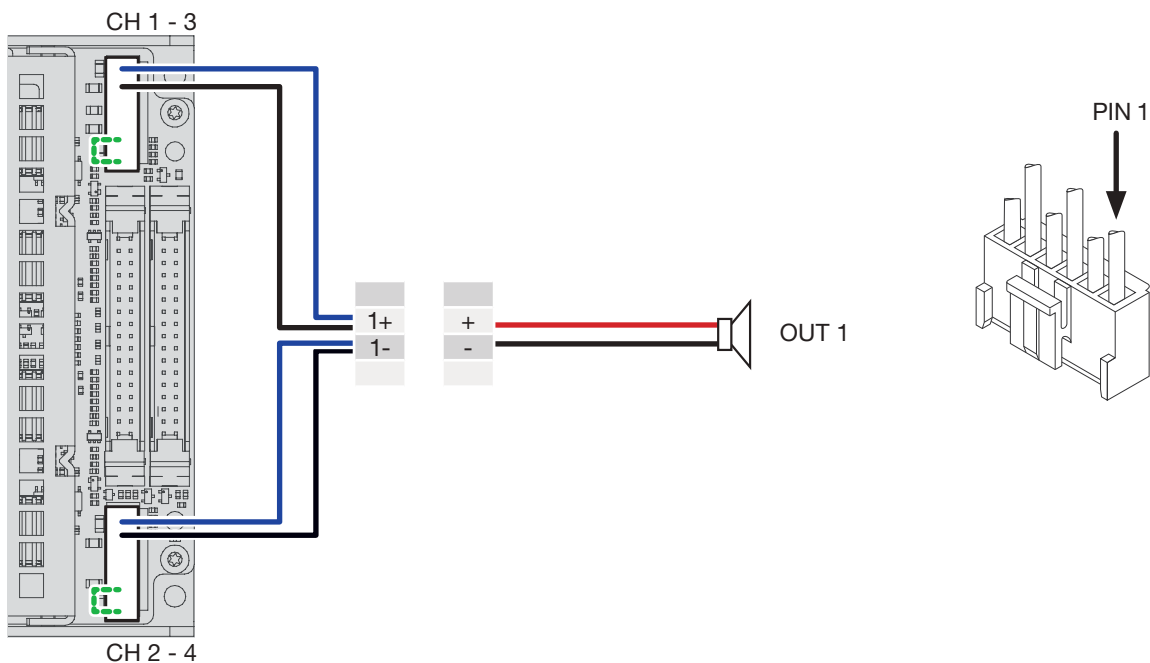
Q	Part Description	MPN / Specs
1	Speakon	NL4MP-UC
2	JST Connector	VHR-6N
4	JST Contacts	SVH-21T-P1.1 (22 ~ 18 AWG), SVH-41T-P1-1 (20 ~ 16 AWG)
2	White Cable	16 AWG
2	Blue Cable	16 AWG
2	Loop Cable	16 AWG

Pin Out CH 1-3

JST Pin	Cable	Speakon Pin	Speaker Pin
1	N.C.	N.C.	N.C.
2	WHITE	1+	+
3	N.C.	N.C.	N.C.
4	BLUE	1+	+
5	LOOP	N.C.	N.C.
6	LOOP	N.C.	N.C.

Pin Out CH 2-4

JST Pin	Cable	Speakon Pin	Speaker Pin
1	N.C.	N.C.	N.C.
2	WHITE	1-	-
3	N.C.	N.C.	N.C.
4	BLUE	1-	-
5	LOOP	N.C.	N.C.
6	LOOP	N.C.	N.C.



15:1.Switch functions

The KT000291 is a basic evaluation board adapting up to 4 XLR inputs into two Powersoft IDC 34 poles connectors. It includes two switches able to parallel inputs into two paralleled couples. Additional test points help the user to monitor some readout signals and provide some signals to the amplifier.



FIGURE 9:KT000291 Evaluation Board

Switch	Description
Switch1/2	Parallel inputs ch1 and ch2
Switch3/4	Parallel inputs ch3 and ch4
XLR Inputs	Description
SO1	Input CH1
SO2	Input CH2
SO3	Input CH3
SO4	Input CH4

Test Point Name	type	PL1/2 IDC 34 poles pin #	Description
GND	PWR	5,8,27,30	Secondary ground
MUTE 1/2	IN	15,20	Mute channels 1 and 2 (active low)
RX232 1/2	-	2	reserved
TX232 1/2	-	3	reserved
+5VDC 1/2	PWR	4	+5V (Max absorption 0,1A)
GND	PWR	5,8,27,30	Secondary ground
IN+1	IN	6	Positive input channel 1
IN-1	IN	7	Negative input channel 1
GND	PWR	5,8,27,30	Secondary ground
SDPWS 1/2	IN	1	Shut Down Power Supply (provide a voltage $3V3 < V < 12V$ to shut down the module)
VOUT1MON	OUT	9	Output voltage monitor channel 1 (20V/V)
PROTECT1	OUT	10	Protect status channel 1 (active low)
IOUT1MON	OUT	11	Output current monitor channel 1 (7,5V/V)
TEMPMON 1/2	OUT	12,23	Temperature monitor Channels 1/2
+12VDC 1/2	PWR	13,22	Positive Auxiliary Power Supply
-12VDC 1/2	PWR	14,21	Negative Auxiliary Power Supply
+VCCMON 1/2	OUT	16,19	Positive Rail voltage monitor (20V/V)
-VCCMON 1/2	OUT	17,18	Negative Rail voltage monitor (20V/V)

PL1 Signals on PL1/2 connector (channels 1 and 2)

Test Point Name	type	PL1/2 IDC 34 poles pin #	Description
GND	PWR	5,8,27,30	Secondary ground
MUTE 1/2	IN	15,20	Mute channels 1 and 2 (active low)
RX232 1/2	-	2	reserved
TX232 1/2	-	3	reserved
+5VDC 1/2	PWR	4	+5V (Max absorption 0,1A)
GND	PWR	5,8,27,30	Secondary ground
IN+2	IN	29	Positive input channel 2
IN-2	IN	28	Negative input channel 2
GND	PWR	5,8,27,30	Secondary ground
SDPWS 1/2	IN	1	Shut Down Power Supply (provide a voltage $3V3 < V < 12V$ to shut down the module)
VOUT2MON	OUT	26	Output voltage monitor channel 2 (20V/V)
PROTECT2	OUT	25	Protect status channel 2 (active low)
IOUT2MON	OUT	24	Output current monitor channel 2 (7,5V/V)
TEMPMON 1/2	OUT	12,23	Temperature monitor Channels 1/2
+12VDC 1/2	PWR	13,22	Positive Auxiliary Power Supply
-12VDC 1/2	PWR	14,21	Negative Auxiliary Power Supply
+VCCMON 1/2	OUT	16,19	Positive Rail voltage monitor (20V/V)
-VCCMON 1/2	OUT	17,18	Negative Rail voltage monitor (20V/V)

PL2 Signals on PL1/2 connector (channels 1 and 2)

Test Point Name	type	PL3/4 IDC 34 poles pin #	Description
GND	PWR	5,8,27,30	Secondary ground
MUTE 3/4	IN	15,20	Mute channels 3 and 4 (active low)
RX232 3/4	-	2	reserved
TX232 3/4	-	3	reserved
+5VDC 3/4	PWR	4	+5V (Max absorption 0,1A)
GND	PWR	5,8,27,30	Secondary ground
IN+3	IN	6	Positive input channel 3
IN-3	IN	7	Negative input channel 3
GND	PWR	5,8,27,30	Secondary ground
SDPWS 3/4	IN	1	Shut Down Power Supply (provide a voltage $3V3 < V < 12V$ to shut down the module)
VOU3MON	OUT	9	Output voltage monitor channel 1 (20V/V)
PROTECT3	OUT	10	Protect status channel 3 (active low)
IOU3MON	OUT	11	Output current monitor channel 3 (7,5V/V)
TEMPMON 3/4	OUT	12,23	Temperature monitor Channels 3/4
+12VDC 3/4	PWR	13,22	Positive Auxiliary Power Supply
-12VDC 3/4	PWR	14,21	Negative Auxiliary Power Supply
+VCCMON 3/4	OUT	16,19	Positive Rail voltage monitor (20V/V)
-VCCMON 3/4	OUT	17,18	Negative Rail voltage monitor (20V/V)

PL3 Signals on PL3/4connector (channels 3 and 4)

Test Point Name	type	PL3/4 IDC 34 poles pin #	Description
GND	PWR	5,8,27,30	Secondary ground
MUTE 3/4	IN	15,20	Mute channels 3 and 4 (active low)
RX232 3/4	-	2	reserved
TX232 3/4	-	3	reserved
+5VDC 3/4	PWR	4	+5V (Max absorption 0,1A)
GND	PWR	5,8,27,30	Secondary ground
IN+4	IN	29	Positive input channel 4
IN-4	IN	28	Negative input channel 4
GND	PWR	5,8,27,30	Secondary ground
SDPWS 3/4	IN	1	Shut Down Power Supply (provide a voltage $3V3 < V < 12V$ to shut down the module)
VOU4MON	OUT	26	Output voltage monitor channel 4 (20V/V)
PROTECT4	OUT	25	Protect status channel 4 (active low)
IOU4MON	OUT	24	Output current monitor channel 4 (7,5V/V)
TEMPMON 3/4	OUT	12,23	Temperature monitor Channels 3/4
+12VDC 3/4	PWR	13,22	Positive Auxiliary Power Supply
-12VDC 3/4	PWR	14,21	Negative Auxiliary Power Supply
+VCCMON 3/4	OUT	16,19	Positive Rail voltage monitor (20V/V)
-VCCMON 3/4	OUT	17,18	Negative Rail voltage monitor (20V/V)

PL4 Signals on PL3/4connector (channels 3 and 4)

Support and warranty

This Powersoft product contains no user-serviceable parts. All warranty repairs must be carried by a certified technician operating in a Powersoft Authorized service center.

To learn more about warranty terms and conditions, visit powersoft.com/warranty.

For any service related enquire, please write to service@powersoft.com.

Output Power, all channels driven symmetrically

# of channels	4 ch	2 ch	2 ch	1 ch
Configuration	SE	BTL	PTL	PBTL
2 Ω	750 W	-	2000 W	3000 W
4 Ω	1000 W	1500 W	1500 W	4000 W
8 Ω	750 W	2000 W	800 W	3000 W
70 V	900 W	1200 W	1800 W	2400 W
100 V	-	1800 W	-	3600 W

Output Power, half channels at -6dB

2 Ω	1100 W	-	2600 W	-
4 Ω	1300 W	2200 W	1800 W	-
8 Ω	900 W	2600 W	900 W	-
70 V	1400 W	1200 W	2800 W	-
100 V	-	2500 W	-	-
Maximum output voltage (typ.)	135 V _{peak}	270 V _{peak}	135 V _{peak}	270 V _{peak}
Maximum output current (typ.)	50 A _{peak}	50 A _{peak}	100 A _{peak}	100 A _{peak}

Audio

Gain	26 dB
Frequency Response (±1 dB, 1 W @ 8 Ω)	10 Hz - 30 kHz
S/N (20 Hz - 20 kHz A-Weighted @ 8 Ω)	117 dB (A) Typ.
Noise Floor	-80 dBV (A) Typ.
Crosstalk Separation (1 kHz)	80 dB Typ.
Input sensitivity	16 dBu
Input impedance	6 kΩ balanced
THD+N (from 0.1 W to 1/2 Power)	< 0.08% (0.05% Typ.)
DIM (from 0.1 W to 1/2 Power)	< 0.2% (0.05% Typ.)
Damping Factor	> 500 @ 1 kHz

Construction

Dimensions	216 x 125 x 42 mm
Weight	1300 g

AC Mains Power

Power supply	Universal input, regulated Switch Mode with PFC
Nominal voltage	100-240 V AC @ 50/60Hz
Operating Voltage	85-264 V AC
Power Factor	cosφ > 0.9 @ 4 Ω full power
Consumption	
Standby	< 1 W (with an aux load < 100 mW)
Idle	14 W @ 100-240 V AC
Rated Load @ 1/8 Max Output Power	600 W
AC Current Avg./Short Term	Nominal 6 A Max 30 A

Aux Supplies

Max aux supply current draw @ +12 V	1000 mA
Max aux supply current draw @ -12 V	300 mA
Max aux supply current draw @ +5V	50 mA
Fan output (temperature controlled) @ +12V	200 mA

Thermal & Environment

Operating temperature & Humidity	0° to 35° C, 0 to 90% Non condensing	
Thermal Dissipation	Cooling Plate + Optional Variable Speed Fan	
1/8 Max Output Power @ 4Ω	Current Draw @ 230 V	2.6 A _{rms}
	Thermal Loss @ 230 V	400 BTU/h
	Current Draw @ 115 V	5.2 A _{rms}
	Thermal Loss @ 115 V	420 BTU/h

Reference Standard

Vibration	EN 60068-2-64: 2008 (Random Test) EN 60068-2-27:2009 (Shock Test)
EMC immunity	EN 55035:2017
EMC emissions	EN 55032:2012/AC:2013
EMC other	EN 61000-3-2:2014 EN 61000-3-3:2013 EN 61000-3-11:2000
Safety standards	EN 62368-1:2014 EN 62368-1:2014/AC:2015

Electrical characteristics T_a = 25° C
(unless otherwise specified)



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For questions about sales, application and technical support,
service, maintenance, and compliance, please refer to the
powersoft website

powersoft-audio.com