MY2-351PC

Class-D Module.Com

Notes

For additional information about the Class Damplifier modules, please visit our website or contact us.

MY2-351PC Integrative Class D power amplifier +PFC power

Brief Introduction

MY2-351PC integrative Class D amplifier module series are mainly designed and developed for the fierce competitive audio power amplifier market and the active loudspeaker market. It features with low cost, good timbre, high efficiency, stable workability, perfect protection function (short-circuit protection, over current protection, over heating protection, over or under voltage protection, power limiting, temperature limiting) and favorable electromagnetism compatibility helps your products in quick occupation into the market.

Applications include:

1. Active loudspeakers and subwoofers
2. Professional Audio.
3. Public Address systems.
4. High-end stereo and multi-channel amplifiers.

Features:

	Performance Index	Test Condition
Modulation Method	Analogue input, PWM	
Output Power Level	350W+350W 700W+700W Bridge mode:>1200 W	1kHz,THD+N=1%@8Ω 1kHz,THD+N=1%@4Ω 1kHz,THD+N=1%@8Ω
THD+N	0.01%	1kHz,1w
Efficiency	80%	1kHz,500w
S/N	>105dB(full power)	A-weighty Band width 22kHz
Frequency Response	<+/-1.5dB	20~20kHz@8Ω
Minimum Load Impedance	4Ω 8Ω	Stereo, Mono Bridge mode
Power Supply	AC100-240V	±10%
Static Power Consumption	<25w	
External Dimension	252×132×60(mm)	

More Features:

1.Mute control
2.Faulty indicator
3.Selectable mains AC100V-240V 45-65Hz
4.Input over/under voltage protection
5.Slow-moving heating cut off protection
6.Temperature power control
7.Output short-circuit, overload protection
8.Output DC protection
9.Providing temperature fan interface

Principle Brief Introduction

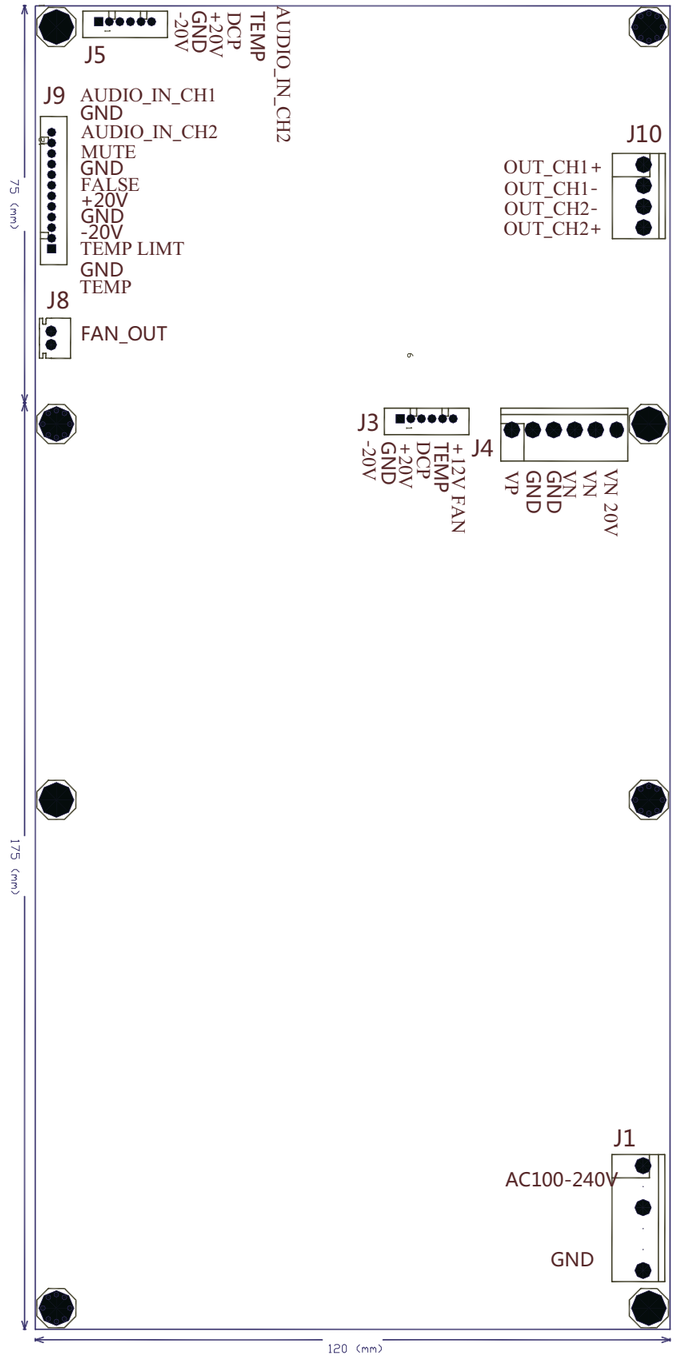
sMY2-301PC integrative Class D amplifier module is composed of Class D amplifier module in high efficiency and excellent timbre, and switch power supply with peak power, low electromagnetism interference.
The amplifier module is mainly amplifying the output of audio signals, and providing various protecting functions for amplifier itself and loading speakers.

MY2-301PC integrative amplifier module adopts Class D amplifier module technology of . And it has the below advantages:

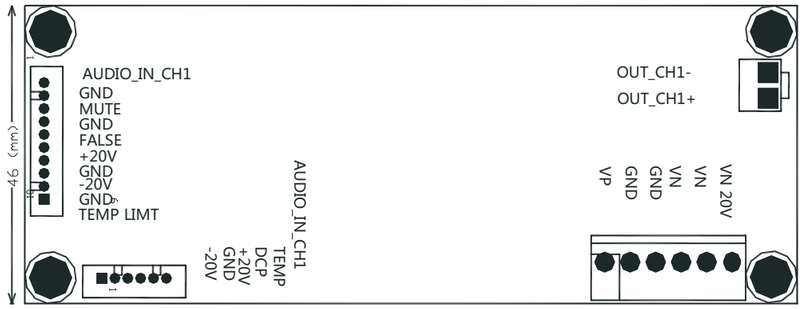
1.Self-adaptive erasing caused noise and distortion in amplifiers
2.Favorable electromagnetism compatibility
3.Minimum idles (static) current, high efficiency
4.Switch bridge amplifier adopts half bridge structure, imbalance output, can be bridged
5.Demodulation filter adopts precisely designed LC type Butterworth low path filter, reverting audio signals, assuring no phrase distortion.
6.Switch power unit mainly converts AC current to DC current for the amplifiers, and provides sufficient current. Since this module is aiming at international market, it shall apply to 100VAC-240VAC universal power supply.
7.adopting PFC switch power technology
8.Peak value output power VS. continuous output power is up to 3:1
9.Adopting low EMI frequency modulated oscillator

Input/output Interface Description

Interface Diagram of Integrative Class D amplifier module



Interface Diagram of single channel Class D amplifier module:



The input/output plug of the integrative Class D amplifier module from BAOYEHENG Company has seven industry standard connectors selected for long-term reliability.

Definitions of Socket Pin:

J9	Audio input, power output, control, indicate
J10	Audio output
J3	Power output, temperature signal output
J4	Power level supply output
J5	Power output, temperature signal output
J8	Tempera ture control fan interface
J1	City electricity input

J9:

Capsulation : CON-2.0-12			
Pin	Symbol	Definition	Type
12	AUDIO_IN_CH1	CH1 channel audio input (unbalanced)	Input
11	GND	Input signal ground	GND
10	AUDIO_IN_CH2	CH2 channel audio input (unbalanced)	Input
9	MUTE	Mute control (High efficiency)	Input
8	GND	Ground	GND
7	FALSE	Faulty indicator (High efficiency)	Output
6	+20V	+20V voltage	Output
5	GND	Power supply ground	GND
4	-20V	-20V voltage	Output
3	TEMP LIMT	Temperature compressive limit indicator	Output
		(High efficiency)	
2	GND	ground	GND
1	TEMP	Temperature level output	Output

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J10:

Capsulation:CON-3.96-4			
Pin	Symbol	Definition	Type
1	OUT_CH1+	Ch1 channel output terminal+	Output
2	OUT_ CH1 -	Ch1 channel output terminal-	Output
3	OUT_ CH2 -	Ch2 channel output terminal-	Output
4	OUT_ CH2+	Ch2 channel output terminal+	Output

J5:

Capsulation:CON-2.0-6			
Pin	Symbol	Definition	Type
1	-20V	-20V voltage	Output
2	GND	Power supply ground	GND
3	+20V	+20V voltage	Output
4	DCP	Amp output DC protection (low efficiency)	Input
5	TEMP	Temperature level output	Output
6	AUDIO_IN_CH2	CH2 c hannel input (unbalanced)	

J3:

Capsulation:CON-2. 0-6			
Pin	Symbol	Definition	Type
1	-20V	-20V voltage	Output
2	GND	Power supply ground	GND
3	+20V	+20V voltage	Output
4	DCP	Amp output DC protection (low efficiency)	Input
5	TEMP	Temperature level output	Output
6	+12V	Fan power supply	Output

J4:

Capsulation:CON-3.96-6			
Pin	Symbol	Definition	Type
1	VP	Power level positive voltage	Output
2	GND	Power level ground	GND
3	GND	Power level ground	GND
4	VN	Power level negative voltage	Output
5	VN	Power lev el negative voltage	Output
6	VN20V	Suspend 20V voltage	Output

J8:

Capsulation:CON-2.54-2			
Pin	Symbol	Definition	Type
1	VOUT	temperature controlling fun power supply DC+12V <0.5A	Output
2	GND_FAN	temperature controlling fun ground	GND

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J12:

Capsulation:CON-3.96-6(1,3,6)			
Pin	Symbol	Definition	Type
1	NEUTRAL	Line AC	Input
3	LINE	Neutral AC	Input
6	EARTH	Safety ground	GND

Limit Parameters

Warning: Limit parameters indicate limits beyond which may result in the damage or protection of the modules.

Power supply input

Symbol	Definition	Min. Value	Max. Value	Unit
AC100-240V	Off-line AC setting input	90	260	Volt
I_{FUSE}	220v Fuse current	8	15	Ampere
F	AC frequency	45	65	Hz

Audio, Control Input

Symbol	Definition	Min. Value	Max. Value	Unit
AUDIO_IN_R	R channel audio input	0	3．0(rms)	Volt
AUDIO_IN_L	L channel audio input	0	3．0(rms)	Volt
Input impedance		4.7k		Ω
VMUTE	Mute control low voltage Mute control high voltage	-0.3 4	0.7 5.3	Volt Volt

Audio, Control, Temperature Signal Output:

Symbol	Definition	Min.	Max.	Unit
R_L	Load impedance (unbridged)	4	∞	Ω
	Load impedance (bridged)	8	∞	Ω
I_{out}	Output current per channel	0	18	Ampere
V_{FALSE}	Fault indicate	0	5	Volt
V_{TEMP}	Temperature level output	0.5(0℃)	5(80℃)	Volt

Temperature:

Symbol	Definitio n	Min. Value	Max. Value	Unit
Ta	Working temperature	0	45	℃

Power supply output

Symbol	Parameter	Condition	Min. Value	Typical Value	Max. Value	Unit
I_{+15V}	+20V current	-	-	-	1	Ampere
I_{-15V}	-20V current	-	-	-	1	Ampere
I_{VN15V}	Suspend 20V current	-	-	-	1	Ampere
I_{VP}	Power level positive voltage	-	-	-	8(Music)	Ampere
I_{VN}	Power level negative voltage	-	-	-	8(Music)	Ampere

Power Specifications

Test conditions: Ta=25℃, f=1kHz cine vine, bridge mode, load=8Ω, AC220V

Symbol	Parameter	Condition	Min. Value	Typ ical Value	Max. Value	Unit
Tmax	Time of max. rated output power	-	-	5	-	S
Pt	Continuous output power	-	-	1400	-	Watt
Pq	Statical power consumption	Po=0W	-	25	-	Watt
η	Power efficiency	Po=200w Po=1000w	- -	70 83	- -	% %

Audio specifications

Test conditions: Ta=25℃，f=1kHz cine vine，load=8Ω，AC220V

Symbol	Parameter	Condition	Min. Value	Typical Value	Max. Value	Unit
Po		RL=4Ω	-	700	-	Watt
Po		RL=8Ω	-	350	-	Watt

General Audio specifications

Test conditions: Ta=25℃，f=1kHz cine vine，load=8Ω，AC220V

Symbol	Definition	Min . Value	Typical Value	Max. Value	Unit
THD+N	Distortion	-	0.02	-	%
$V_{n,o}$	Output noise	-	130	-	uV
A_v	Voltage gain	-	21	-	dB
F	Frequency response	-	-0.036~0.35	-	dB
F_u	HF limiting	-	22	-	kHz
F_l	LF limiting	-	10	-	Hz
Z_l	L oad impedance	-	8	-	Ω
D	Dynamic range	-	106	-	dB

Power Interferences

The signal on the mains connection is often very noise and large surge voltages are present. The integrative Class D amplifier module is equipped with mains filtering to suppress surges and noise.

Lightning Surge

To avoid damage of MY2-351PC integrative Class D amplifier module in case of surges caused by lightning, special care and components selection have resulted in capability of withstanding surges up to 3KV.

Mechanical Specifications

During development, MY2-351PC integrative Class D amplifier module has been exposed to tough mechanical tests to ensure the durability required for professional applications.

Test	Accelerate	Quantity
Power cut test, turn on power after test, to prove function intact		
Random Vibra tion	2grms	3*20min
Impact	10g/16ms,2 -4hz	1000times12) in every 6 directions
Vibration	70g/12ms	3times12) impact in every 6 directions
Live testing		
Sinusoidal vibration	2.5mm, 5-10hz,1g,10 -100hz	3 directions, 2hours12) in every direction
Random vibrati on	0.01g, 10 -20hz, 0.7grms -3dB/oct,20 -150hz	3 directions, 2hours12) in every direction

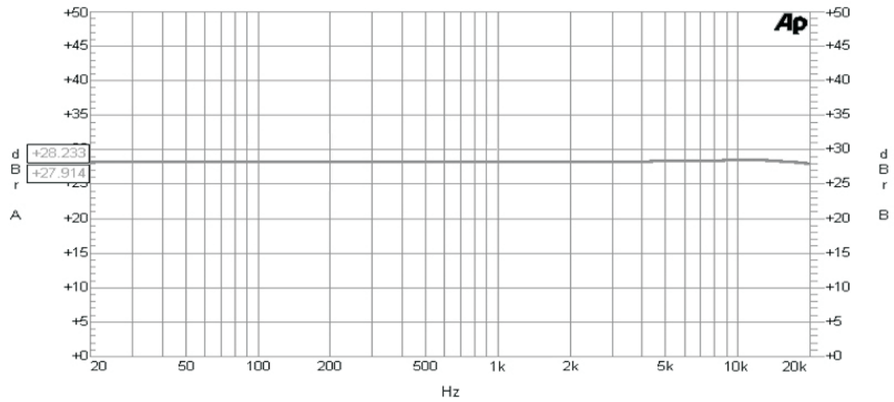
Table 16, Mechanical Property Test

12) 6 directions (up, down, left, right, front, back)

3 directions (up & down, left & right, front & back)

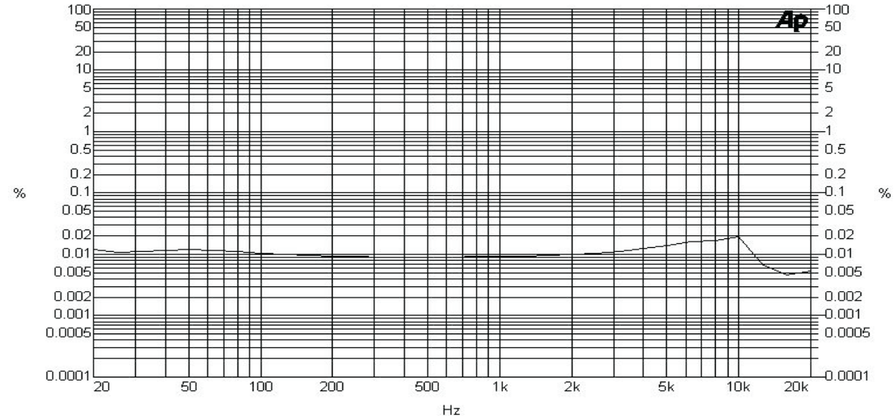
Typical performance characteristics

1、Frequency response

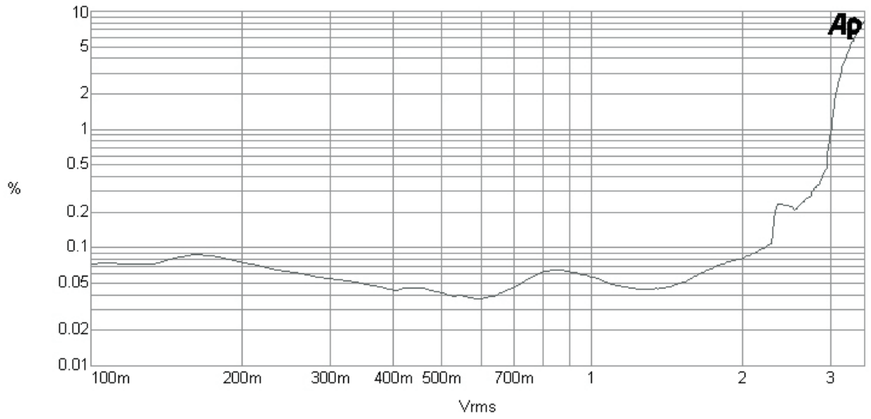


Frequency response curve（8Ω）

2、THD+N

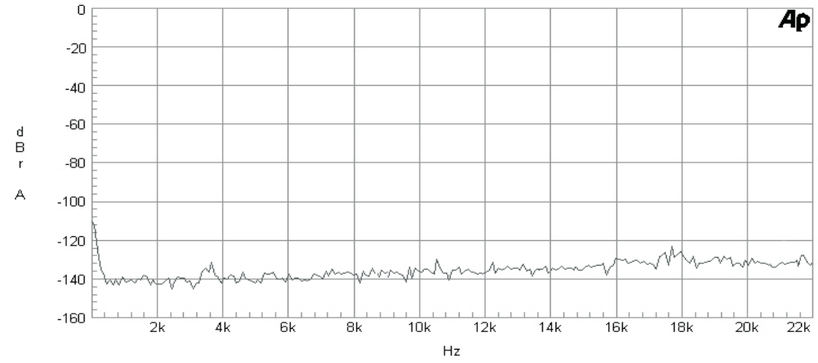


Distortion-Frequency curve (Po=1w)



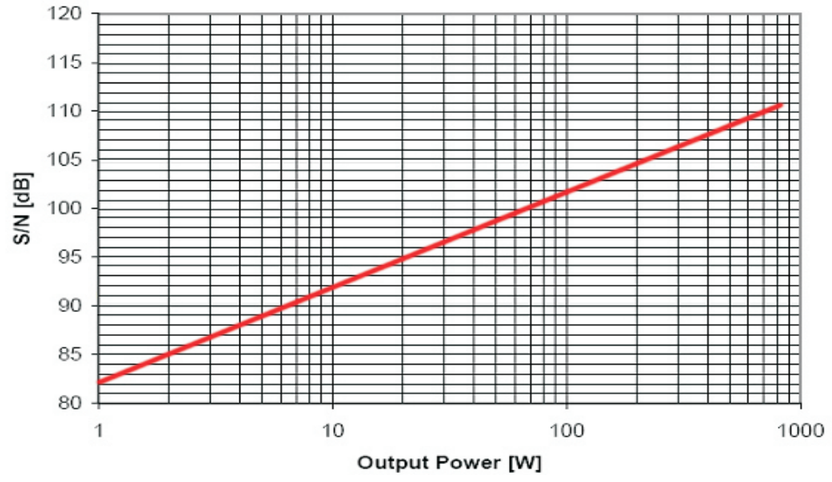
THD+N vs AMP

3、Background Noise



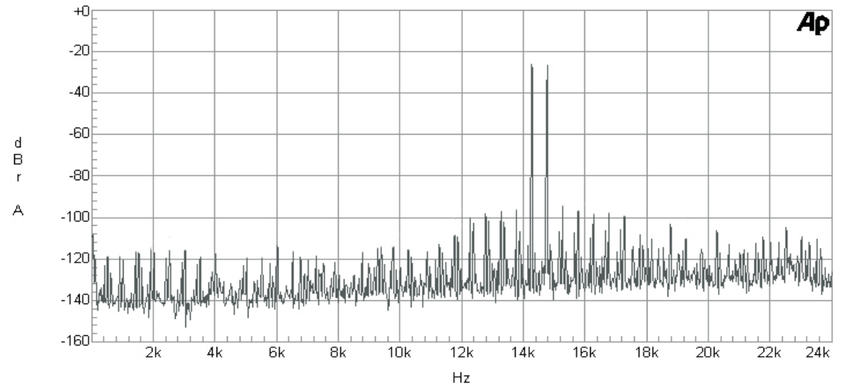
Background noise curve

4、S/N vs. Output power

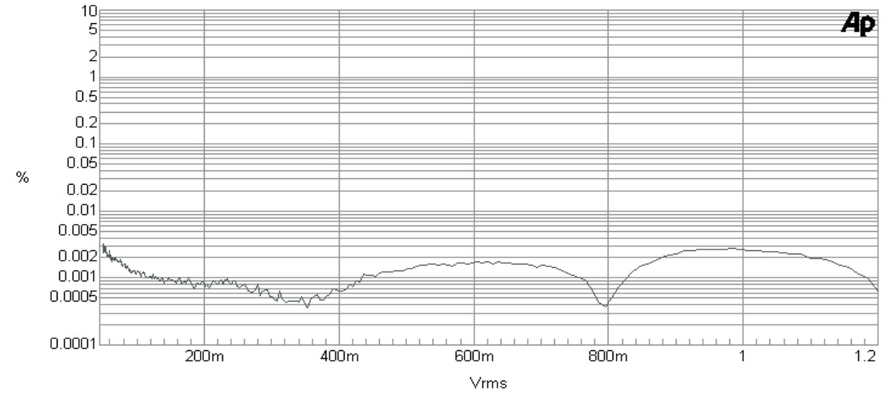


S/N vs. Output power (8Ω Impedance, bridged mode)

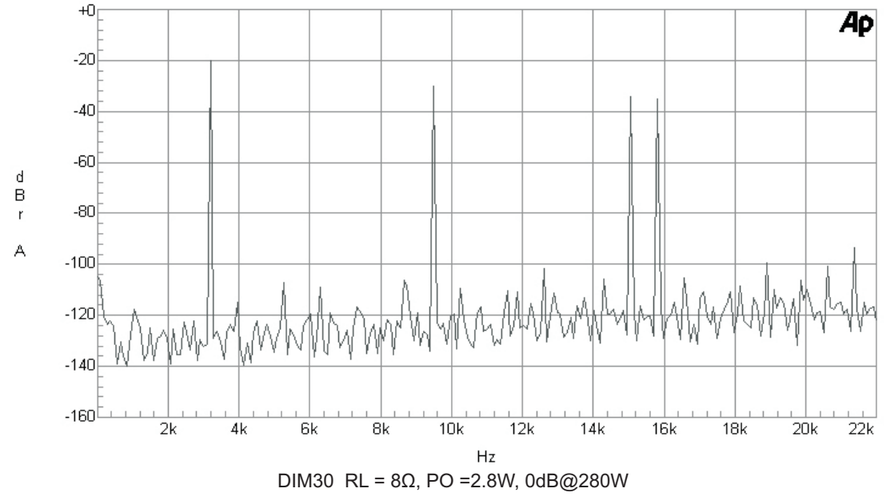
5、Intermodulation distortion (CCIF&TIM)



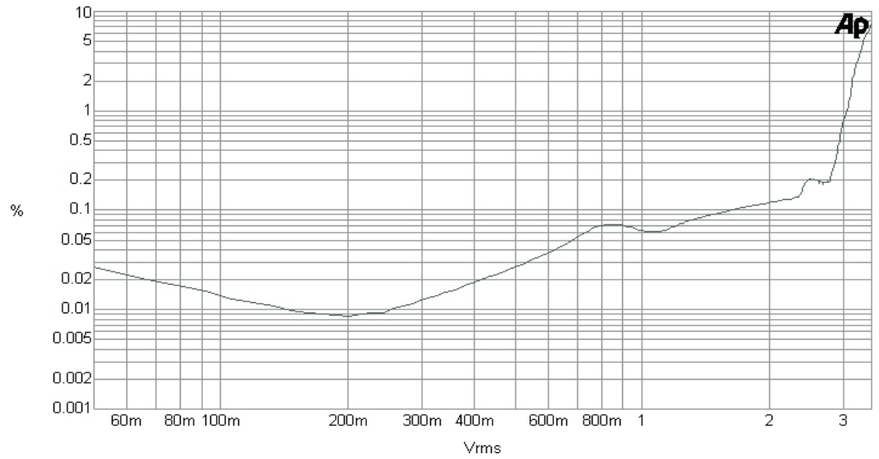
CCIF&IMD Analysis，RL=8Ω，PO =2.8W, 0dB@280W



CCIF IMD vs. PO, RL = 8Ω, f1 =14kHz, f2 = 15kHz.

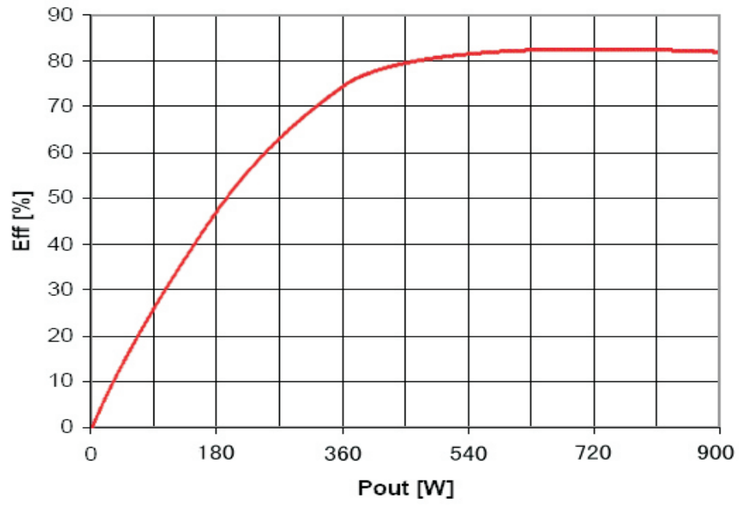


DIM30 RL = 8Ω, PO =2.8W, 0dB@280W



DIM30 vs AMP RL = 8Ω

Efficiency vs. Output power



Efficiency vs. output power (8Ω Impedance, 1KHZ Frequency，Bridged mode)

Loading

MY2-351PC integrative Class D Amplifier Module has much lower output impedance without the impact of load, Characteristics of low impedance and high damping factor enable it to drive loudspeakers of various loads and even easily drive large subwoofer

Standby（Mute ）Control/fault instruction

When the protection circuit is activated or standby (mute) port pulls up, fault indication ports will be automatically pull up. It can also pull the mute control pin in the outside to activate the low power consumption mode. Specific interface defined refer to the relevant forms of "ultimate argument".

Protection features

Over heat protection

BaoYeHeng Company's MY2-351PC --Integrative Class D digital amplifier module equipped with over heat protection, the protection circuit monitors the temperature of the MOS-FET. The amplifier module will automatically enter protection state when the temperature becomes too high (>80℃), The module will automatically start again if the temperature has dropped.

Over current protection

When the output current exceeds the max limit, the protection circuit will be activated to cut off output and be in protection state. The amplifier shall automatically recover after 2-3 seconds of short circuit over,

Over & Under voltage protection

The amplifier shall be in protection state when input voltage exceeds allowable range, until the voltage gets back to acceptable level.

Audio Input interface

The input impedance of the signal input section is approximately 4.7KΩ, which is an acceptable loading condition for pre-amps, active crossover outputs etc.

Audio Output Interface

The output stage is a LC type Butterworth filter; Butterworth filter can provide relatively flat frequency response and low output impedance.

Power off：

The module will enter into standby mode if:
1.The mains voltage drops below AC min or falls out of completely.
2.The standby pin (MUTE) is pulled high.
3.Temperature protection is triggered.
4.Over current protection is triggered:

Thermal Design

Traditional amplifier designs (such as class A/B) have a rather high request of thermal design to keep the transistor junction temperature low. MY2-351PC integrative Class D digital amplifier module is based on the very efficient switch technology providing high efficiency which needs no special process no thermal design. See "Efficiency vs. output power ".

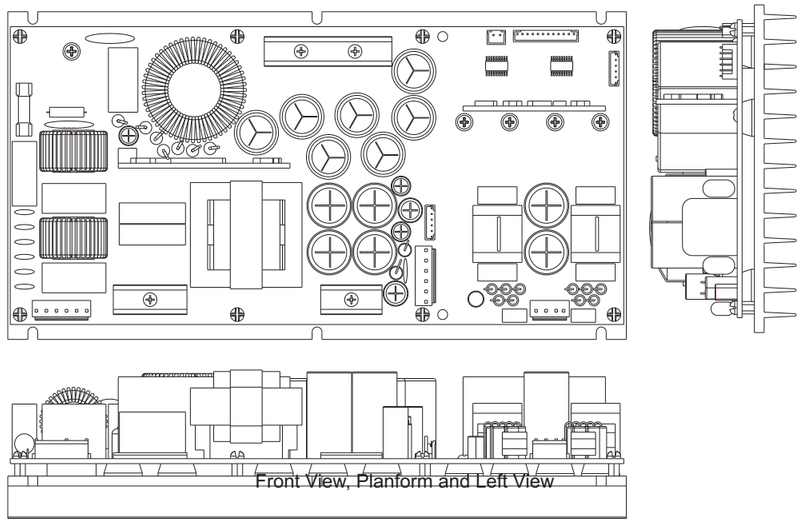
The MY2-35 1PC integrative digital amplifier module is designed for musical purposes. The thermal design is therefore for large short-term power handing and lower continuous power handling. If exceeds 65℃ the module will reach its maximum allowable temperature and the temperature limit function will be activated . Temperature over 80℃will activate the temperature protection.

For extreme low impedance loading requirement, at output stage or high temperature above 50℃， we recommend use of an external heatsink . Otherwise the rated power of the MY2-301PA integrative Class D digital amplifier module will be limited.

To ensure the module work long stability, power amplifier unit has temperature control fan connector, which can be accessed DC12V cooling fan, The fan will start when the heat sink temperature reach 48℃,When the heat sink temperature below 38 ℃, the fan will stop working.

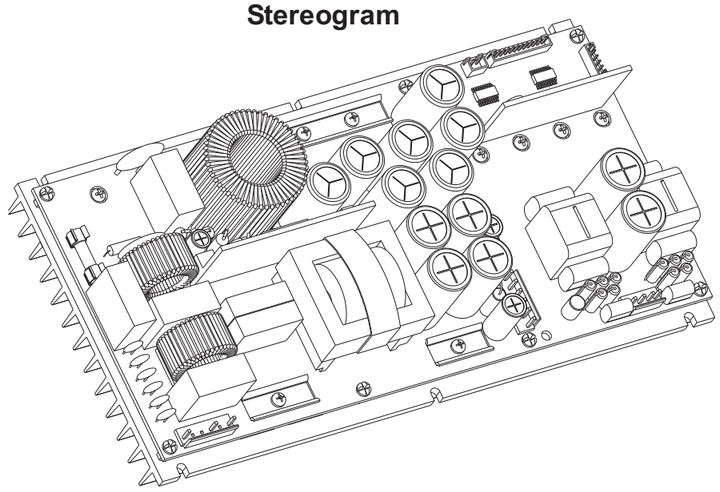
Fuses: The module only works with safe approved fuses.

Physical dimension (side elevation and sectional elevation)



Front View, Planform and Left View

Stereogram



Installation dimensions of each module

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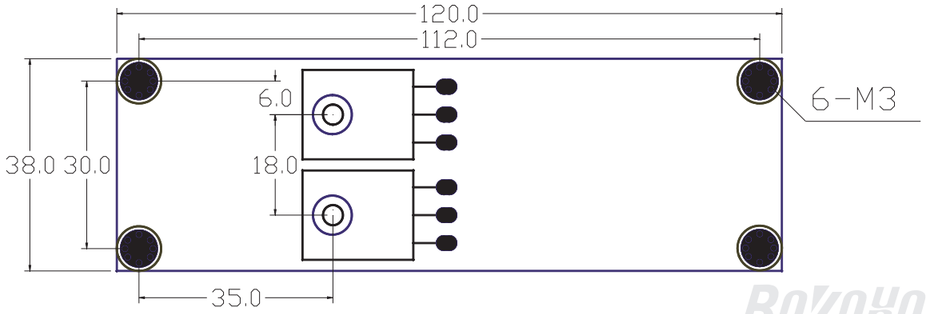

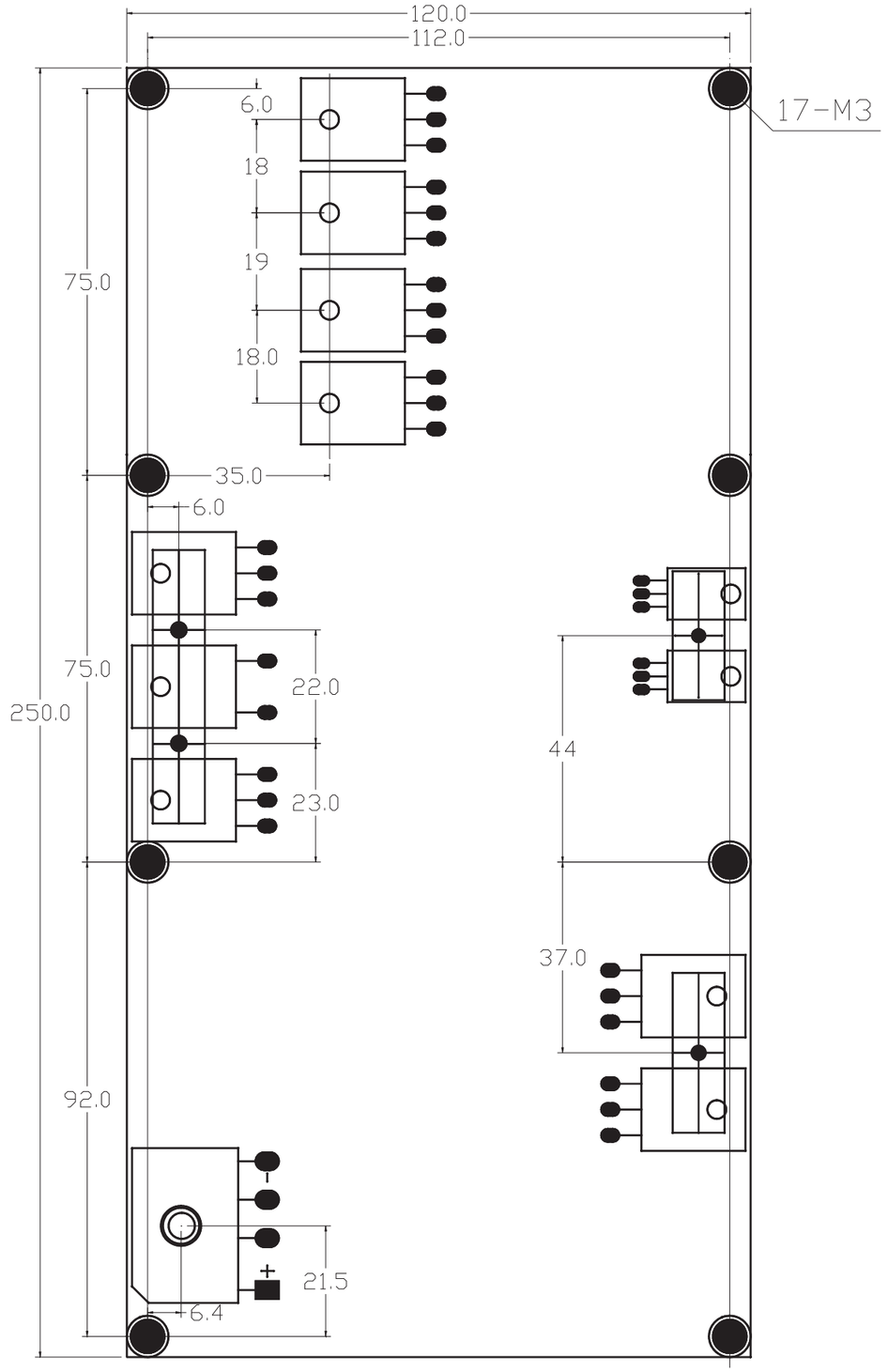

Specification :

This series product is divided into 2 forms:
Power + Dual-channel amplifier module（integrative Class D Amplifier）
Single-channel Class D amplifier Module
2 products are all available in below 3 power levels:
250W@8Ω/ch
300W@8Ω/ch
350W@8Ω/ch

Instructions :

My2 series Single channel Class D amplifier module must be used together with the Integrative Class D digital amplifier with same power level. Their power supply is provided by the integrative Class D amplifier module; it may cause damage or improper work of Single channel Class D amplifier module if powered by other external power supply.

Integrative Class D Amplifier Module:

Part No.	MY2-251PC	MY2-301PC	MY2-351PC
Each channel out put power	2×250W@8Ω 2×500W@4Ω	2×300W@8Ω 2×600W@4Ω	2×350W@8Ω 2×700W@4Ω
Bridge output power	900W@8Ω	1000W@8Ω	1200W@8Ω

Single channel Class D amplifier module:

Part No.	MY1-251C	MY1-301C	MY1-351C
Output power	1×250W@8Ω 1×500W@4Ω	1×300W@8Ω 1×600W@4Ω	1×350W@8Ω 1×700W@4Ω

Power specifications for Integrated digital amplifer module:

Model No.	MY2-251PC	MY2-301PC	MY2-351PC
Output voltage/current	±75V/8A ±20V/1A VN-20V/1A +12V/0.5A	±82V/8A ±20V/1A VN-20V/1A +12V/0.5A	±88V/8A ±20V/1A VN-20V/1A +12V/0.5A
Rated power	1000W	1200W	1400W
Max power	1500W(Music)	1600W(Music)	1800W(Music)
Input Voltage	AC100-240V	AC100-240V	AC100-240V

Bridge use: input equal reverse signal into AUDIO_IN_L, AUDIO_IN_R; connect two ports OUTPUT_R+, OUTPUT_L+ of the driver.

Other technical indicators such as: S / N, THD + N, frequency response and so on,please refer to the whole data sheet.

Packing and storing

Each module should be wrapped separately and can't put together directly. The module is to be stored at temperature from -20℃~90℃. Humidity levels lower than 85%.

ESD warning

The integrative digital amplifier modules are manufactured according to the following ESD precautions.

1.IEC 61340-5-1: Protection of electronic devices from electrostatic phenomena. General Requirements.
2.IEC 61340-5-2: Protection of electronic devices from electrostatic phenomena. User Guide
3.ANSI/ESD-S20.20-1999: Protection of Electrical and Electronic parts. Assemblies and Equipment.

Further handling of the products should comply with the same standards.
The general guarantee policy of integrative digital amplifier module does not cover ESD damaged products due to improper handling.

Contact Information
For additional information about the digital amplifier modules, please contact us.

Class-dmodule.com
Part of Smart Audio Design
www.smartaudiodesign.nl