

# User manual

## **BM240**

Version:	Initiated by:	Date:	Reviewed by:	Date:
V1.0	Burgess	20210104		

### Approval List

Function	Name	Date	Signature
Group Leader			
R&D Manager			
Project Manager			
Program Manager			
SCM Manager			
QA Manager			
Customer			

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**Document History**

Date	Version	Author	Change
2020.01.04	V1.0	Burgess	

**Document Confidentiality**

For internal use only

## 1 INTRODUCTION

### 1.1 General Product Description

The “BM240” is an amplifier box for built-in power supply ,It Can play optical source , bluetooth source and Aux source music. It includes a left and a right channel for stereo. There is a pair button and an indication of RGB lights. and a dial switch for selecting a different EQ .

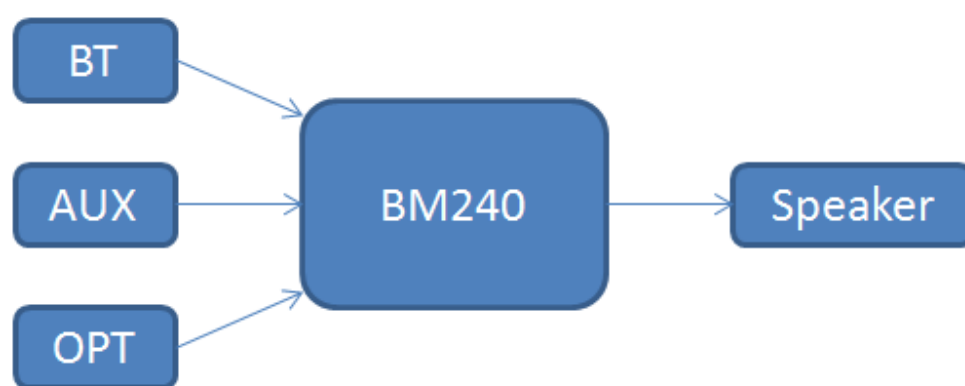
### 1.2 Definitions, Acronyms, Symbols and Abbreviations

Abbreviation	Comment	Abbreviation	Comment
CRS	Customer requirements Specifications	dB	Decibel: Unit of Sound Level
EMC	Electro Magnetic Compatibility	Hz	Hertz: Unit of Frequency
LED	Light Emitting Diode	BSMI	Bureau of Standards, Metrology and Inspection
N/A	Not Applicable	SASO	Saudi Arabian Standards Organization
Oct	octave	NOM	Norma's Officials Mexicans
TA	Type Approval	PC	Polycarbonate
TBC	To be confirmed	ABS	Acrylonitrile Butadiene Styrene
TBD	To be defined	POM	Polyoxymethylene
ID	Industrial Design	CE	Conformité Européenne
DV or DVT	Design Verification Test	FCC	Federal Communications Commission
DM or DMT	Design Maturity Test	ODM	Original Design Manufacturer
FM	Frequency Modulation	PSS&L	Product Safety, Security & Liability
RMS	Root Mean Square	50N	50 Newton
PHC	Power Handling Capacity	TR	Trial Run
RH	Relative Humidity	TCMF	Test Case Management File
ESD	Electro Static Discharge	PMPO	Peak Music Power Output
S/N	Signal to Noise Ratio	IEC	Intern. Electro technical Commission
THD	Total Harmonic Distortion	Fo	Resonance Frequency
EUT	Equipment Under Test	TPU	Thermo Plastic Urethane
SoC	Statement of Conformance	SPL	Sound Pressure Level
FR	Flame Retardants	HDMI	High-Definition Multimedia Interface
OEM	Original Equipment Manu fact.	HDCP	High-bandwidth Digital Content Protect.
&	Important remark	CEC	Consumer Electronics Control
		FRS	Functional Requirement Specification

Table 1 Definitions

## 2 General Application Description (Usage Scenarios)

For this Product, It is enclosed in a box.



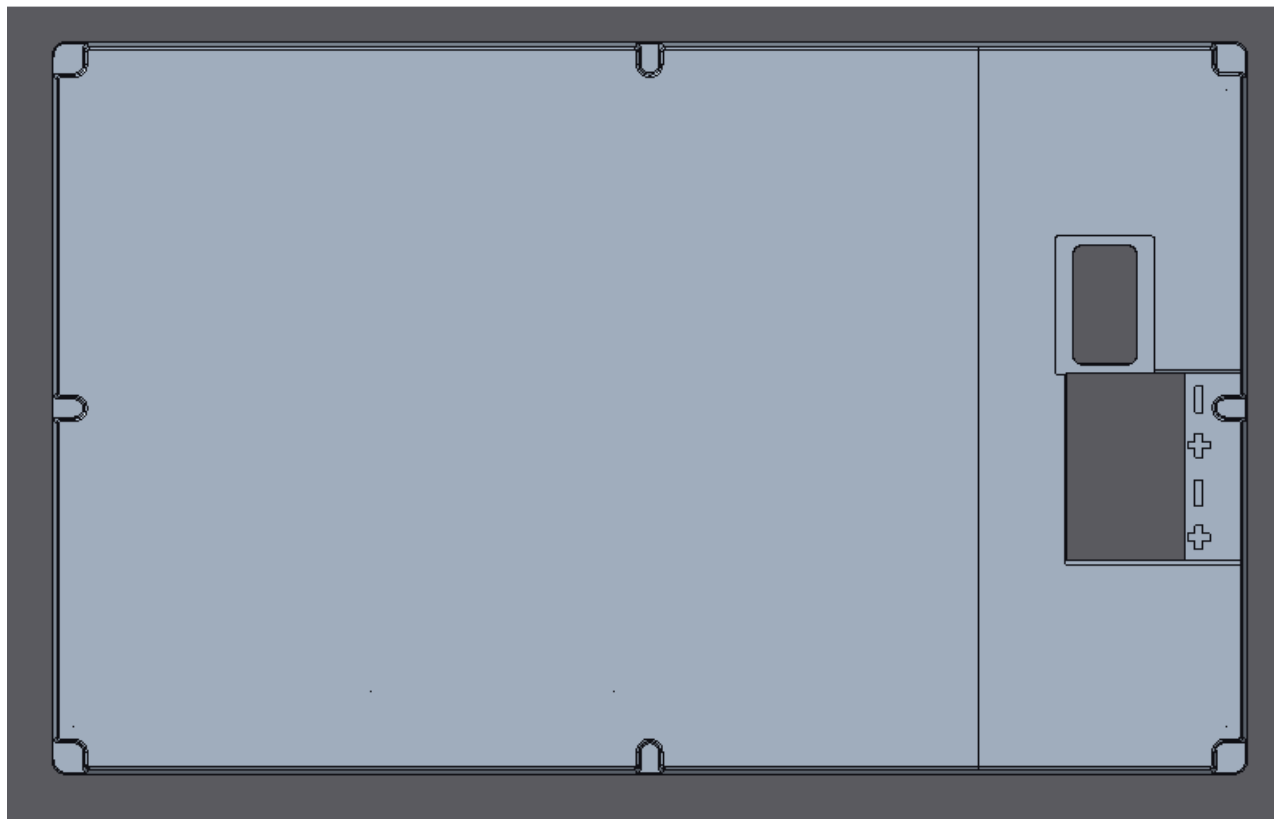
### **3 General Product Overview**

#### **3.1 ID Drawings**

##### **Front Panel:**

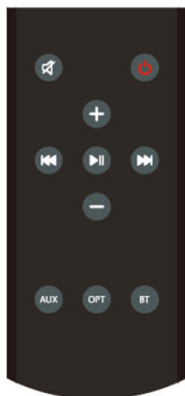
- AUX input
- Optical input
- Service (software update)
- BT/Pair button
- 100-240V~50/60Hz, 80W (Power in)

##### **Rear Panel:**



- Dial switch(choose a different EQ)
- Output terminal( left and right)

## Remote:



- Mute
- Power
- Volume up
- Last
- Pause
- Next
- Volume down
- Aux source
- Optical source
- BT source
- When pushing |<< on the remote for 2s BT pairing is turned OFF
- When pushing >>| on the remote for 2s BT pairing is turned ON
- When pushing the BT button on remote for 2s the device is disconnected from the phone currently paired with the BM240, this allows a change in who is connected via remote

## 3.2 Functions

INPUTS	Quantity	USER INTERFACE
Digital Audio Input	X1	Optical
Analog Audio Input	X1	AUX
Power supply	X1	AC Power
OUTPUTS		USER INTERFACE
Speaker output	X2 pair	2 X 25W
OTHER		USER INTERFACE

RGB LED	X1	See user Interface part
Dial switch	X1	Choose different EQ
Bottom	X1	Pair bottom

### 3.3 Key Features and Performance

1. Bluetooth input source, requires Distance greater than 10m in open distance.
2. The pair bottom can set the bluetooth .
3. The RGB LED indicate different states .
4. Remote control. requires Distance greater than 10m in open distance.

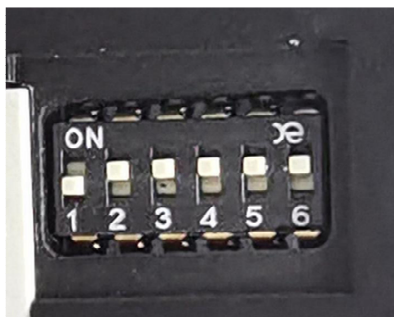
### 3.4 Special connectors & modes.

#### Debug/Tuning connector

A 6 pin connector will be present on the PCBA to allow the connection to the MCU for Debug and Tuning purpose.

#### Factory test mode

Set the dial switch as below picture.



## 4 System Structure

### 4.1 Digital-in

Optical input can support a rate of 192Khz . Don't support Dolby and DTS . only PCM 2.0.

### 4.2 Analog-in

Aux input max 1.25V rms input, standby mode by audio signal detector .

### 4.3 BT-in

ATS2819 module, Can support BT5.0 .



Operating Frequency Band	2.4GHz ~ 2.48GHz unlicensed ISM band
Bluetooth Specification	V2.1+EDR /V4.2
Bluetooth Protocol	A2DP,AVRCP,HFP,SPP BAS,DIS,FMP,HRP,HRS,HTP,HTS,IAS,LLS
Output Power Class	Class 2
Operating Voltage	Core :1.2V, IO:3.1V, BAT:3.3V~4.5V
Operating temperate range	-10 ℃ ~ +70 ℃
External Interface	UART,SPI,TWI,I2S,IR,SD Card,USB,DMIC

## 4.4 DSP-functionality

The DSP(ADAU1761) – functionality consists of the following features:

- Volume control
- EQ

## 4.5 Amplification

The AMP(TPA3116) is class D – type, driving 4 ohms speakers.

## 4.6 User Interface

- 1: output terminal (4 ohm loads can be connected and output 2X25W)
- 2: AC in (100-240V~50/60Hz,80W )
- 3: pair button (the remote control pair and reboot the BT)
- 4: indication LED
- 5: optical terminal
- 6: Dial switch (set different EQ)

### Bottom

pair bottom : the remote control pair and factory reset.

- Press and hold on till blink red: factory reset.

### indication LED

LED	1x RGB LED
Bluetooth mode	Blue
Optical	ORANGE
AUX	GREEN

### 4.6.1 The buttons' feature and led features.

Buttons:

Button name	Button operation	Feature
pair button	Short Press	Enter the remote control pairing mode
	Press hold on till blink red	factory reset

LED:

Led	Behavior	The meaning
RGB	Solid Red	Standby mode
	Solid Green	AUX source
	Solid Orange	OPT source
	Solid Blue	BT source
	Blink Red fast	Factory data reset

## 5 Performance specifications

### 5.1 Audio Specifications

Test conditions: BM240 connected with 4 ohm load .

#### 5.1.1 Power AMP Section (Test mode)

PARAMETER(aux in)				SPECS
Continuous Average Power		4 ohms	1kHz	≥25W
THD	4 ohms	25W	1kHz	≤1%
S/N		25W	1kHz	≥80dB( A-weighted)
Frequency Response		20Hz - 20 kHz		+/-0.5dB
CHANNEL SEPARATION				≥60db
Sensitivity				800mv
PARAMETER(optical in)				SPECS
Continuous Average Power		4 ohms	1kHz	≥25W
THD	4 ohms	25W	1kHz	≤1%
S/N		25W	1kHz	≥80dB( A-weighted)
Frequency Response		20Hz - 20 kHz		+/-0.5dB
CHANNEL SEPARATION				≥60db
Sensitivity				800mv
PARAMETER(BT in)				SPECS
Continuous Average Power		4 ohms	1kHz	≥25W
THD	4 ohms	25W	1kHz	≤1%

**FCC regulatory conformance:**

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.
- (2) This device must accept any interference received, including interference that may cause undesired operation.

**NOTE:** This equipment has been tested and found to comply with the limits for a **Class B** 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 instructions, 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

**NOTE:** The manufacturer is not responsible for any radio or TV interference caused by unauthorized modifications to this equipment. Such modifications could void the user's authority to operate the equipment.

**RF Exposure**

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment.

**IC regulatory conformance**

This device complies with CAN ICES-003 (B)/NMB-003(B).

This device contains licence-exempt transmitter(s)/receiver(s) that comply with Innovation, Science and Economic Development Canada's licence-exempt RSS(s). Operation is subject to the following two conditions:

- (1) This device may not cause interference.
- (2) This device must accept any interference, including interference that may cause undesired operation of the device.

Cet appareil est conforme à la norme CAN ICES-003 (B)/NMB-003 (B).

Cet appareil contient des émetteurs / récepteurs exempt (s) de licence qui sont conformes aux RSS exemptes de licence d'Innovation, Sciences et Développement économique Canada. Son fonctionnement est soumis aux deux conditions suivantes:

- (1) Cet appareil ne doit pas provoquer d'interférences.
- (2) Cet appareil doit accepter toute interférence, y compris les interférences susceptibles de provoquer un fonctionnement indésirable de l'appareil.

**RF Exposure**

This equipment complies with IC radiation exposure limits set forth for an uncontrolled environment.

Cet équipement est conforme aux limites d'exposition aux radiations de la IC définies pour un environnement non contrôlé.