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# BTM-99A

<b>Product Name</b>	BTM-99A
<b>version</b>	Bluetooth V4.0

<b>Product development Department</b>		<b>DATE</b>
<b>Prepared By</b>	LI YI	2015-11-15
<b>auditor</b>	DUYANG	2015-11-15
<b>Approved By</b>	Chenshengqi	2015-11-15

**DESCRIPTION:**

CSRA64215 QFN is a single-chip Bluetooth ROM audio solution for rapid evaluation and development of Bluetooth ROM stereo applications. The CSRA64215 QFN consumer audio platform for wired and wireless applications using the QFN package integrates an ultra-low power DSP and application processor, high-performance stereo codec, a power management subsystem and LED drivers. The CSR configuration tools and the development kit provide a flexible and powerful development platform to design advanced and high-quality Bluetooth stereo products using the CSRA64215 QFN single-chip Bluetooth audio solution.

**FEATURES:**

- ◆ Bluetooth® v4.2 specification compliant
- ◆ 80 MHz RISC MCU and 80 MIPS Kalimba DSP
- ◆ High-performance stereo codec with 1 microphone input (shared with line input) and 1 digital microphone (MEMS) interface
- ◆ Radio includes integrated balun with RF performance of 9 dBm (typ) transmit power and -90.5 dBm (typ) BDR receiver sensitivity
- ◆ AVRCP v1.6
- ◆ True Wireless Stereo (TWS)
- ◆ User and manufacturer configurable EQs
- ◆ aptX, aptX Low Latency, SBC and AAC decoders support
- ◆ Audio interfaces: PCM/I<sup>2</sup>S, SPDIF input, analogue/stereo line and digital microphone
- ◆ Multipoint support for A2DP connection to 2 A2DP sources for music playback
- ◆ Wideband speech supported by HFP v1.6 and mSBC codec
- ◆ Supported Bluetooth Profiles: A2DP v1.2, AVRCP v1.6, HFP v1.6, HSP v1.2

**APPLICATIONS:**

- ◆ High quality wireless speakerphones
- ◆ Wireless mono headsets
- ◆ Wireless stereo speakers
- ◆ Hands-free car kits

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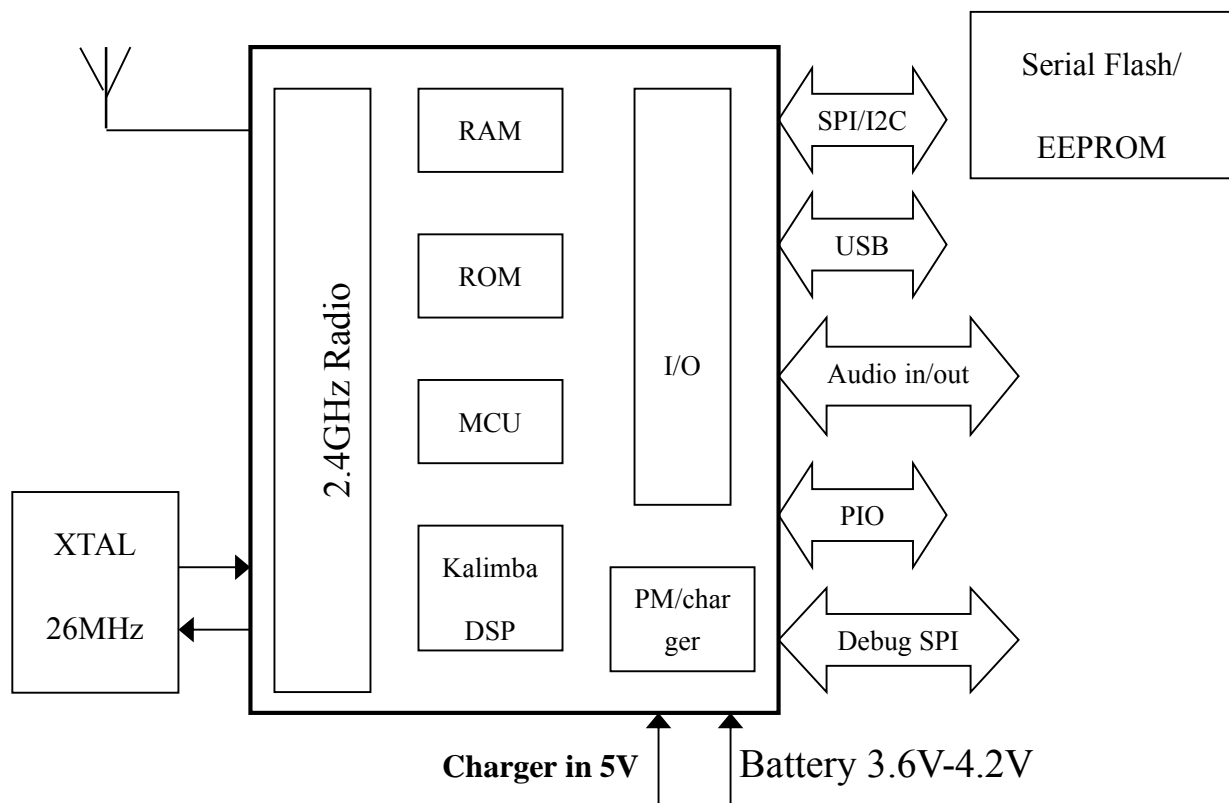
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**REVISION HISTORY**

Version	Comment	Custom	Date
1.0	Preliminary Datasheet	DUYANG	11/2015

## 1.0 Block Diagram



- Bluetooth Version 4.0 specification
- Operating Frequency 2.4GHz-2.48GHz ISM band
- Modulation GFSK(Gaussian Frequency Shift Keying)
- Transmit Power  $\leq 4\text{dBm}$ , Class 2
- Sensitivity  $\leq -81\text{dBm}$  at 0.1% BER
- Security features Authentication and encryption
- Support profiles Hands-Free Profile v1.6 and Headset Profile v1.2  
Advanced Audio Distribution Profile v1.2 and  
Audio/Video Remote Control Profile V1.4
- Power 3.3V-4.2 LI-batter
- Operating Temperature  $-20 \sim +70$  Centigrade
- Size 20mm x 25mm x 1.5 mm

**Figure 1:** Block diagram of BTM-99A

## 2.0 Electrical Characteristics

### Recommended operating conditions

	Min	Typ	Max	Unit
Operating temperature	-20	20	70	°C
VDD_BAT	3.0	3.8	4.2	V
VDD_CHG	4.5	5	6.5	V
VDD_IO	1.7	1.8	1.95	V

**Table 1:**Recommended operating conditions

### Battery charger

Charger Mode(BAT_P rising to 4.2V)		Min	Typ	Max	Unit
Supply current(a)		--	4.5	6	mA
Battery trickle charge current(b)		--	4	--	mA
Maximum battery fast charge current (I-CTRL = 15)(c) (d)	Headroom(e) > 0.7V	--	200	--	mA
	Headroom = 0.3V	--	150	--	mA
Minimum battery fast charge current (I-CTRL = 0)(c) (d)	Headroom > 0.7V	--	40	--	mA
	Headroom = 0.3V	--	35	--	mA

Trickle charge voltage threshold	--	2.9	--	V
Float voltage (with correct trim value set), VFLOAT (f)	4.10	4.15	4.2	V
Float voltage trim step size(f)	--	50	--	mV
Battery charge termination current, % of fast charge current	5	10	20	%

(a) Current into VDD\_CHG does not include current delivered to battery (IVDD\_CHG - IBAT\_P)

(b) BAT\_P < trickle charge voltage threshold

(c) Charge current can be set in 16 equally spaced steps

(d) Trickle charge threshold < BAT\_P < Float voltage

(e) Where headroom = VDD\_CHG - BAT\_P

(f) Float voltage can be adjusted in 15 steps. Trim setting is determined in production test and must be loaded into the battery charger by firmware during boot-up sequence

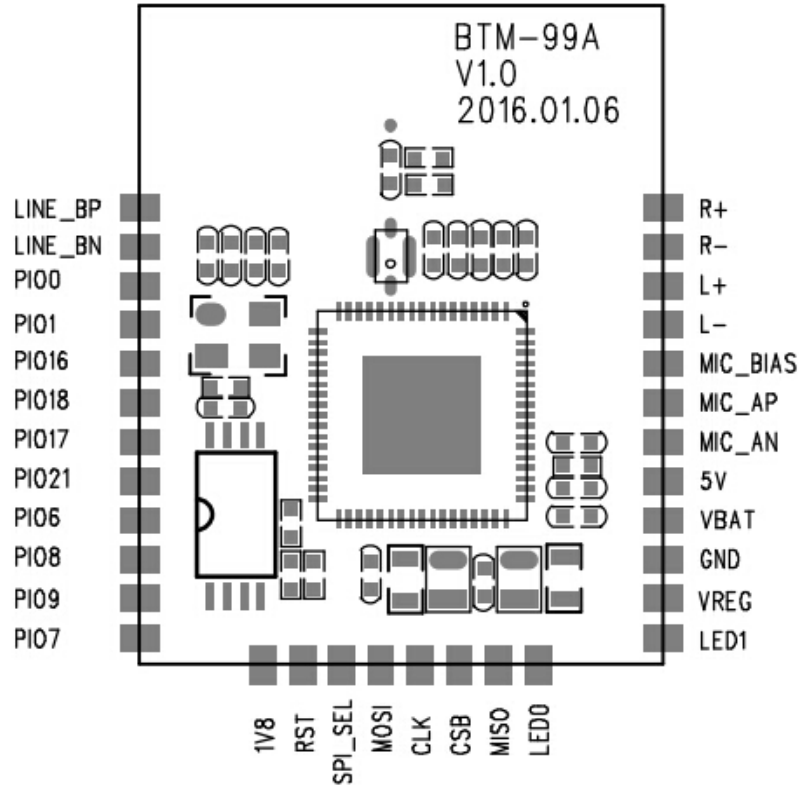
**Table 2:** Battery charger characteristics

## Reset

	Min	Typ	Max	Unit
$V_{TH,res}$ threshold voltage	0.65	0.85	1.50	V
$R_{IRES}$ input resistance	--	220	--	K $\Omega$
$C_{IRES}$ input capacitance	--	220	--	nF

**Table 3:** Reset terminal characteristics

3.Device Terminal Functions:



Lead	name	Function	Description
1	LINE_BP	R_LINE_BP	R_LINE_BP input
2	LINE_BN	R_LINE_BN	R_LINE_BN input
3	PIO[0]	PIO port	Programmable input/output line
4	PIO[1]	PIO port	Programmable input/output line
5	PIO[16]	PIO port	Programmable input/output line
6	PIO[18]	PIO port	Programmable input/output line
7	PIO[17]	PIO port	Programmable input/output line
8	PIO[21]	PIO port	Programmable input/output line
9	PIO[6]	PIO port	Programmableinput/outputline/i2s2_sd_out
10	PIO[8]	PIO port	Programmableinput/outputline/i2s2_sd_in

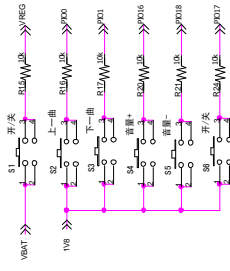
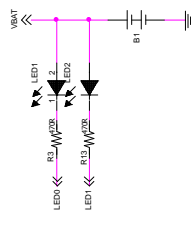
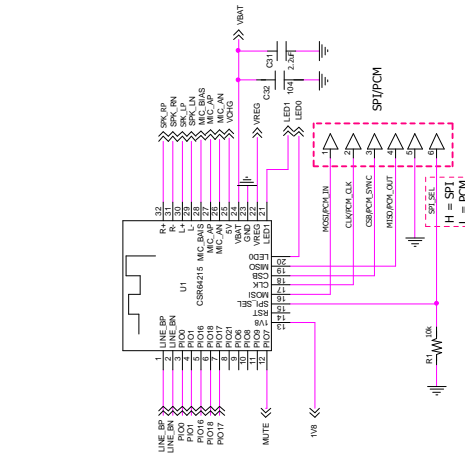
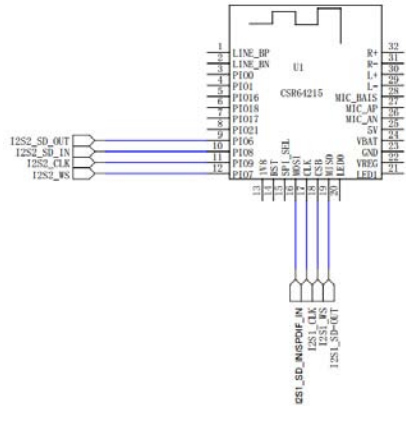
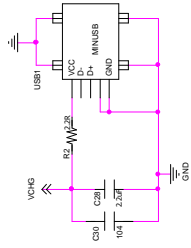
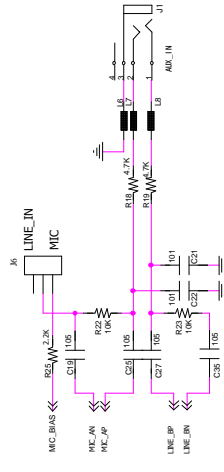
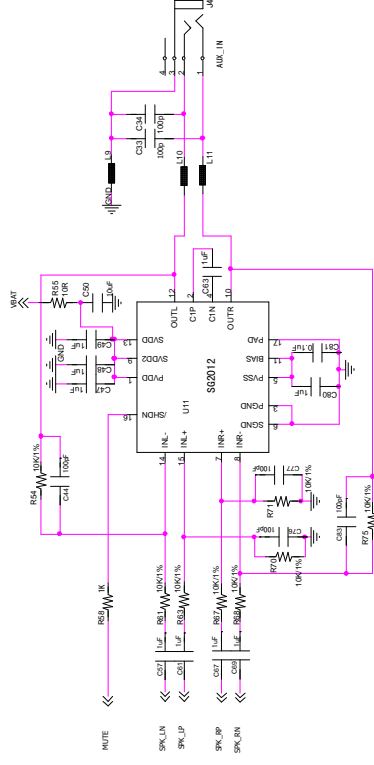
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11	PIO[9]	PIO port	Programmableinput/output line/i2s2_clk
12	PIO[7]	PIO port	Programmableinput/output line/i2s2_ws
13	1V8	1V8 POWER	Positive supply for 1.8V regulated output
14	RST	Reset	Logic low reset
15	SPI_SEL	SPIinterface	SPI/PCM choice feet
16	MOSI	SPIdatainput	SPIdatainput/SPDIF_IN/I2S1_SD_IN
17	CLK	SPI interface	SPI Clock/I2S1_CLK
18	CSB	SPI interface	Chip select for SPI/I2S1_WS
19	MISO	SPI interface	SPI data output/I2S1_SD_OUT
20	LED[0]	Status	LED driver
21	LED[1]	Status	LED driver
22	VREG	POWER ON/OFF	Moudle power on/off active high
23	GND	GND	GND
24	VBAT	Power Input	Lithium ion/polymer battery positive
25	5V	5V-charger	Lithium ion/polymer battery charger input
26	MIC_AN	MICInpt/L_LINE	MicrophoneInput/L_LINE_AN
27	MIC_AP	MICInpt/L_LINE	MicrophoneInput/L_LINE_AP
28	MIC_BIAS	MICpower	Microphonebias
29	L-	L-	Speaker output, channel L negative
30	L+	L+	Speaker output, channel L positive
31	R-	R-	Speaker output, channel R negative
32	R+	R+	Speaker output, channel R positive

#### 4.0 Example Application Schematic

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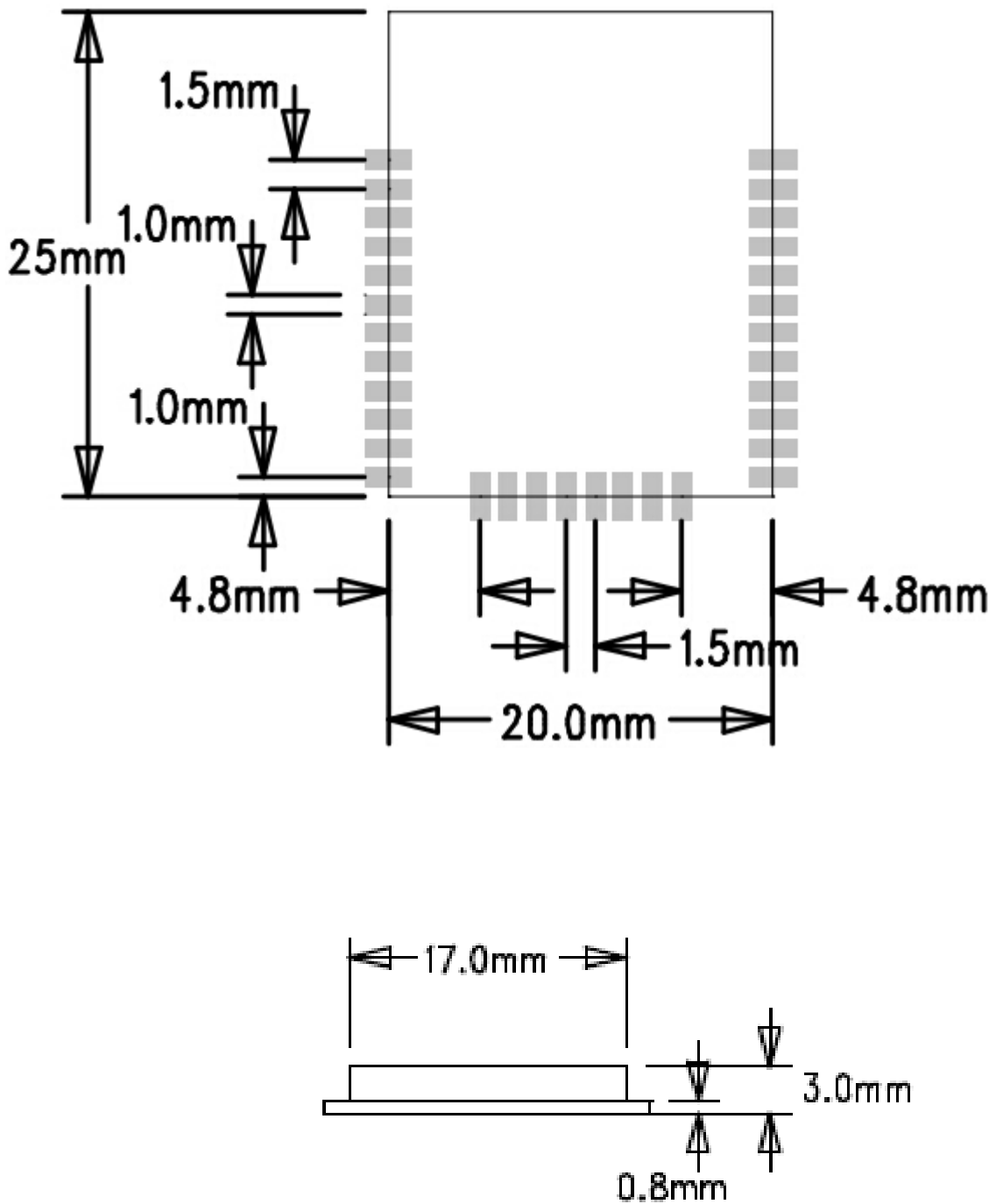




ELECTRONIC CO., LTD

TITLE:	BT Stereo SPK	PRODUCT NO:	
DRAWN BY:	DN/ang	LY NO:	
CHECKED BY:		SCALE:	1/1
APPROVED BY:		REV NO:	0A
		SIZE:	A4
		SHEET:	1/1

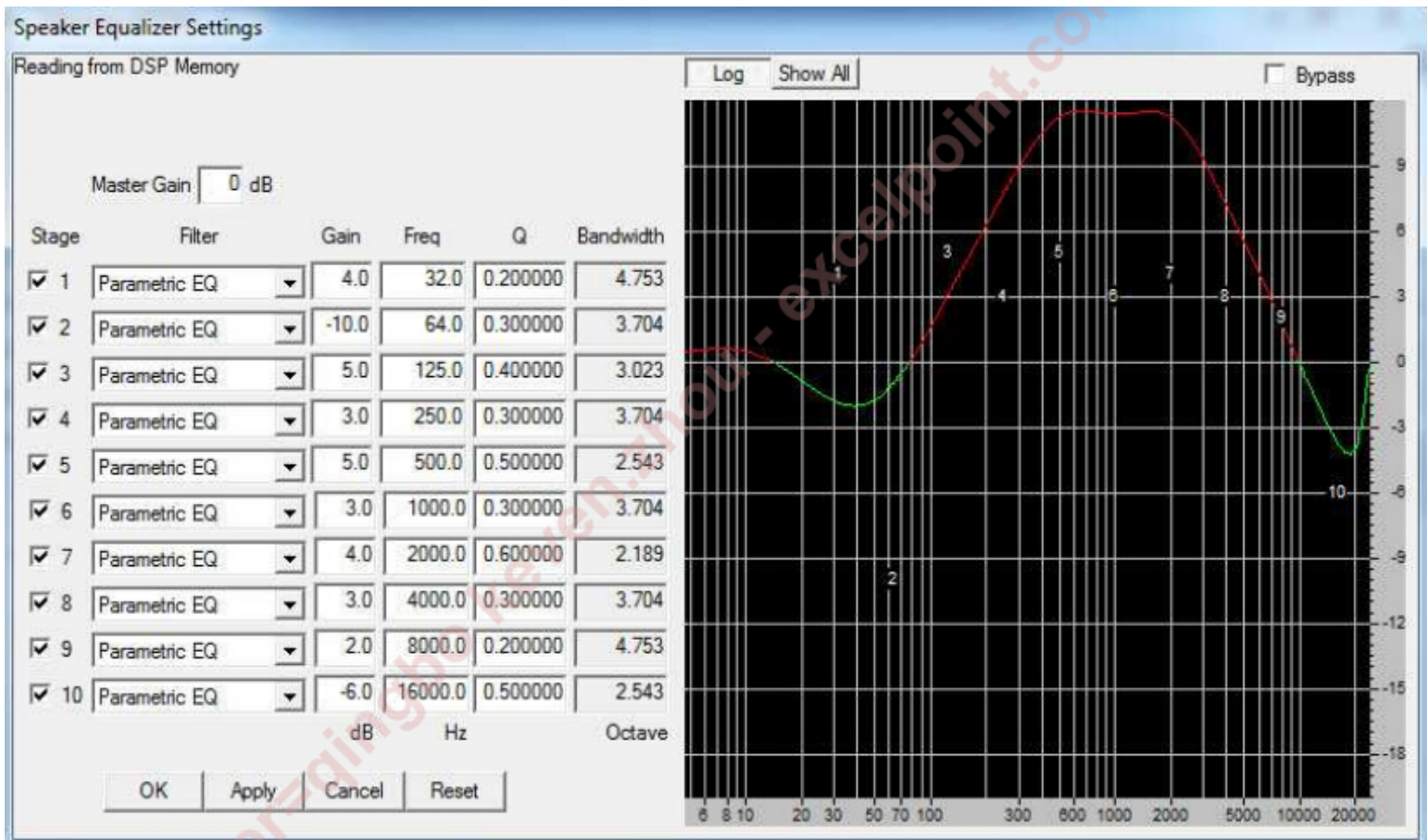
### 5.0 Package Dimensions



Unit: mm

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### 7.0 Configurable EQ:



**Figure 15.3: Configurable EQ GUI with Drag Points**

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