W WM8725-EV1M

WM8725 EVALUATION BOARD USER HANDBOOK

INTRODUCTION

The WM8725 is high performance Stereo DAC.

This evaluation platform and documentation should be used in conjunction with the latest version of the WM8725 datasheet. The datasheet gives device functionality information as well as timing and data format requirements.

This evaluation platform has been designed to make it easy to gain familiarity with the WM8725 and to allow optimum performance to be measured.

GETTING STARTED

PACKING LIST

The WM8725 Evaluation Kit contains:

1 x WM8725-EV1B Evaluation Board (Labelled WM8725_EV1)

1 x WM8725-EV1M Evaluation Board User Handbook

CUSTOMER REQUIREMENTS

Minimum equipment requirements are:

- D.C. Power supply of +2.7 to +5.5V (See WM8725 Datasheet for details)
- D.C. Power supply of +5V.
- D.C. Power supply of +/- 12V

Digital Input Signal Path Requires:

- Digital coaxial or optical data source

Analog Output Path Requires:

- Two Audio receivers, for LEFT and RIGHT outputs.

BOARD FUNCTIONALITY

This evaluation platform has been designed as a simple means of evaluating the WM8725 Stereo DAC in a 14-pin SOIC package. It is versatile and can be configured for most applications.

There are two options for inputting digital data into the WM8725 evaluation board. There is a coaxial input (J12) via a standard phono connector or an optical input (U3) via a standard optical receiver module. A direct digital input is available via one side of a 2x8 pin header (H1).

The outputs from the WM8725 are analog Left and Right stereo signals. These analog signals can be passed through active low pass filters before being made accessible via standard phono connectors; J10 (FILT_OUTL) and J11 (FILT_OUTR). Alternatively, non-filtered outputs can be made accessible via standard phono connectors; J7 (VOUTL) and J15 (VOUTR).

All WM8725 device pins are accessible for easy measurement via two 1x8pin headers (J8 and J13) running up each side of the device.

PCB MAIN CONNECTIONS

POWER SUPPLIES

Table 1 – Power Connections.

Connector Reference	Connector Type	Signal Reference	Voltage level *
J1	4mm Panel Socket	+5V	5 VDC
J2	4mm Panel Socket	GND	0 VDC
J3	4mm Panel Socket	DVDD	2.7 to 5.5 VDC
J4	4mm Panel Socket	GND	0 VDC
J5	4mm Panel Socket	-12V	-12 VDC
J6	4mm Panel Socket	+12V	12 VDC

*** Refer to the WM8725 datasheet for limitations on individual supply voltages.**

Using appropriate power leads with 4mm connectors, +2.7V to +5.5V should be applied to the DVDD panel socket J3. 5V should be applied to panel socket J1. +12V should be applied to panel socket J6 while -12V should be applied to panel socket J5. GND should be connected to panel sockets J2 and J4.

DIGITAL INPUTS

Table 2 – Digital Input connections.

Connector Reference	Connector Type	Signal Reference
J12	Phono Connector	DIGITAL_COXIAL INPUT (SPDIF)
U3	Optical Receiver (TOSLINK)	DIGITAL_OPTICAL INPUT (SPDIF)

ANALOG OUTPUTS

Table 3 – Digital Output Connections.

Connector Reference	Connector Type	Signal Reference
J7	Phono Connector	VOUTL
J15	Phono Connector	VOUTR
J10	Phono Connector	FILT_OUTL
J11	Phono Connector	FILT_OUTR

INTERFACES

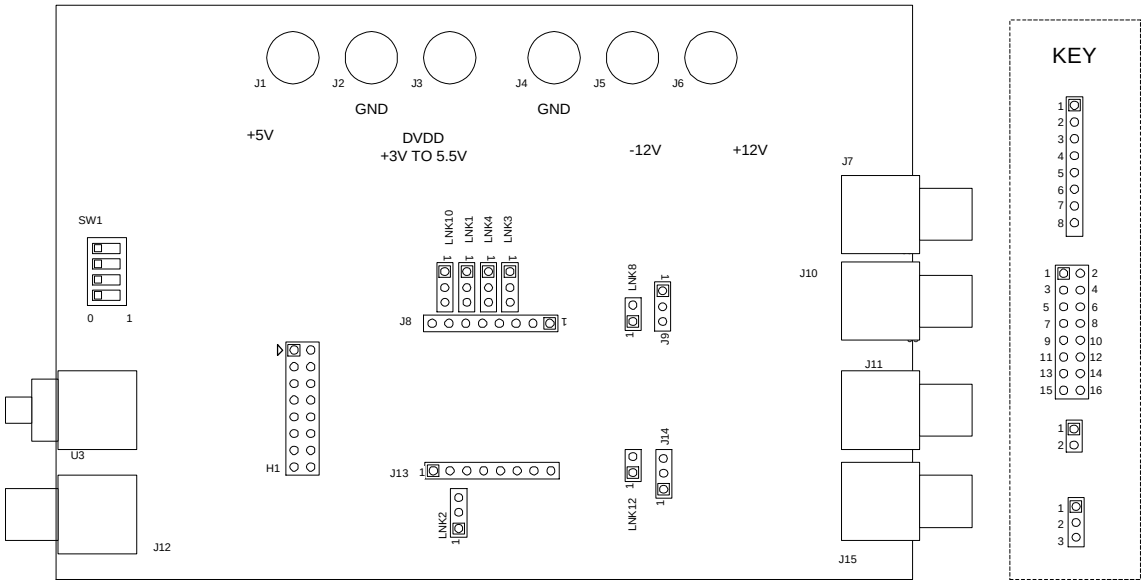

Figure 1 WM8725-EV1B Board Interfaces (Component Side)

HEADERS

Table 5 WM8725 Headers

J13	SIGNAL
1	LRCIN
2	DIN
3	BCKIN
4	NC
5	CAP
6	VOUTR
7	GND
8	GND

J8	SIGNAL
1	VDD
2	VOUTL
3	MUTE
4	NC
5	DEEMPH
6	FORMAT
7	MCLK
8	GND

Table 6 Headers

H1	SIGNAL
1	SDATA
3	DGND
5	MCK
7	DGND
9	FSYNC
11	DGND
13	SCK
15	DGND

H1	SIGNAL
2	DIN
4	DGND
6	MCLK
8	DGND
10	LRCIN
12	DGND
14	BCKIN
16	DGND

LINKS

Table 7 Links

LINKS	DESCRIPTION
LNK1	1-2 De-emphasis ON 2-3 De-emphasis OFF
LNK2	Not Populated
LNK3	1-2 Mute ON 2-3 Mute OFF
LNK4	Not Populated
LNK8	OPEN - VOUTL AC Coupled SHORT - VOUTL DC Coupled
LNK10	1-2 I2S or DSP 'early' mode 2-3 16-Bit Right Just. or DSP 'late' mode.
LNK12	OPEN - VOUTR AC Coupled SHORT - VOUTR DC Coupled
J9	1-2 Unfiltered VOUTL 2-3 Filtered VOUTL
J14	1-2 Unfiltered VOUTR 2-3 Filtered VOUTR

SWITCHES

Table 8 Switches

SWITCH	SETTING				DESCRIPTION
	1	**2**	**3**	**4**	**CS8414 Normal Audio Port Modes**
SW1	0	1	0	x	I^2S
	1	0	1	x	16 Bit Right Justify

BASIC TEST SETUP

The setup of the WM8725 device can be altered using the various links on the evaluation board. The following configuration, as shown below in figure 2, sets the digital audio interface mode to I^2S. It also configures de-emphasis OFF, mute OFF and AC coupled outputs with active filtering.

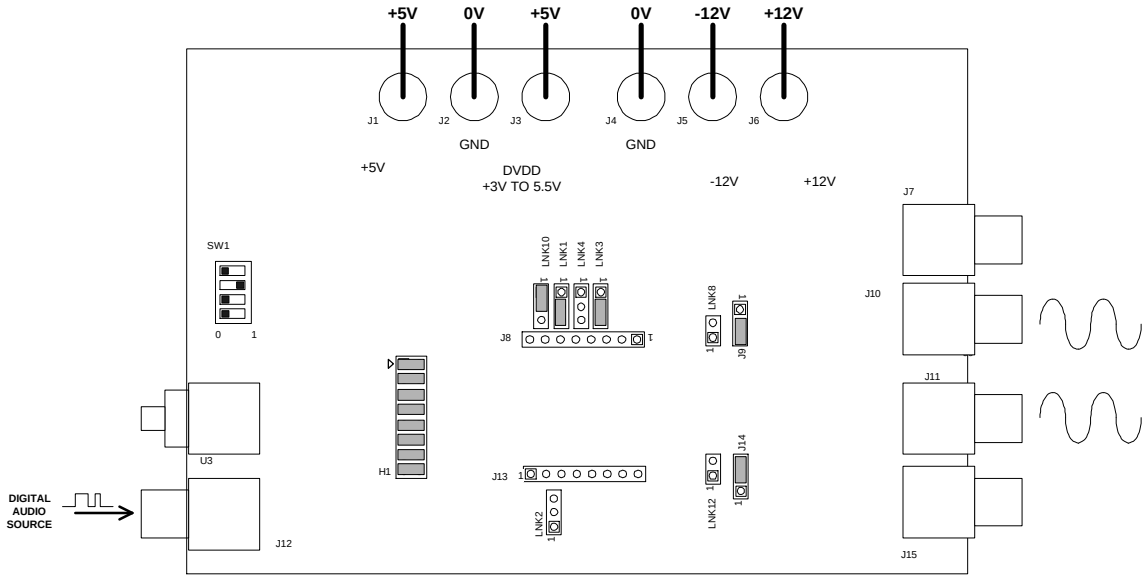

Figure 2 Basic Test Connection Diagram.

The hardware settings required for the WM8725 Evaluation board are described in the table below.

Table 10 - Basic Test Evaluation Board Hardware settings.

LINKS & SWITCHES	DESCRIPTION
H1	Add 8 Links as shown in figure 11
SW1	Set to 0100 for I^2S Mode
LNK1	Add Link 2-3
LNK3	Add Link 2-3
LNK9	Add Link 2-3
LNK10	Add Link 1-2
LNK14	Add Link 2-3

WM8725-EV1B SCHEMATIC

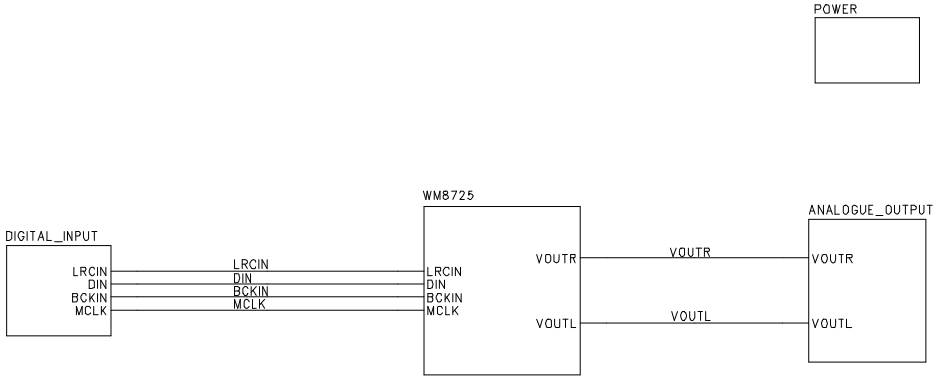

Figure 3 Functional Block Diagram

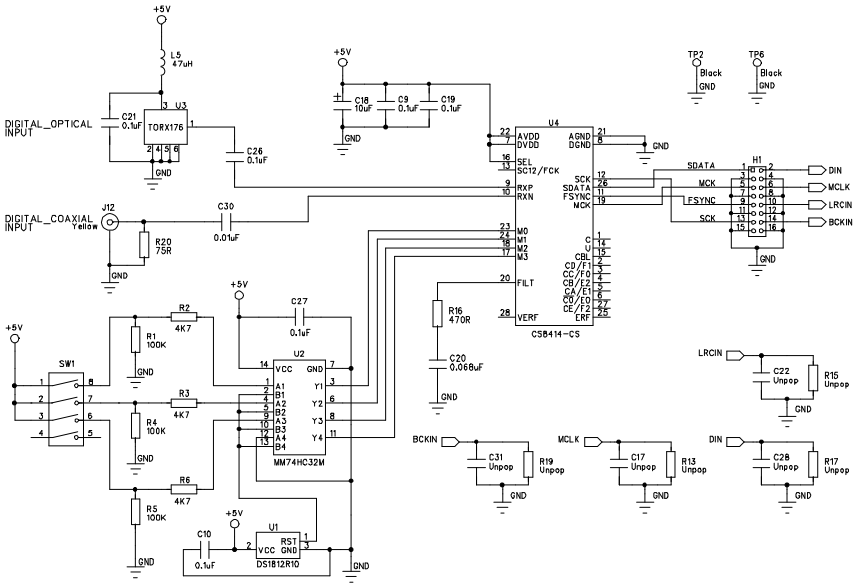

Figure 4 Digital Input

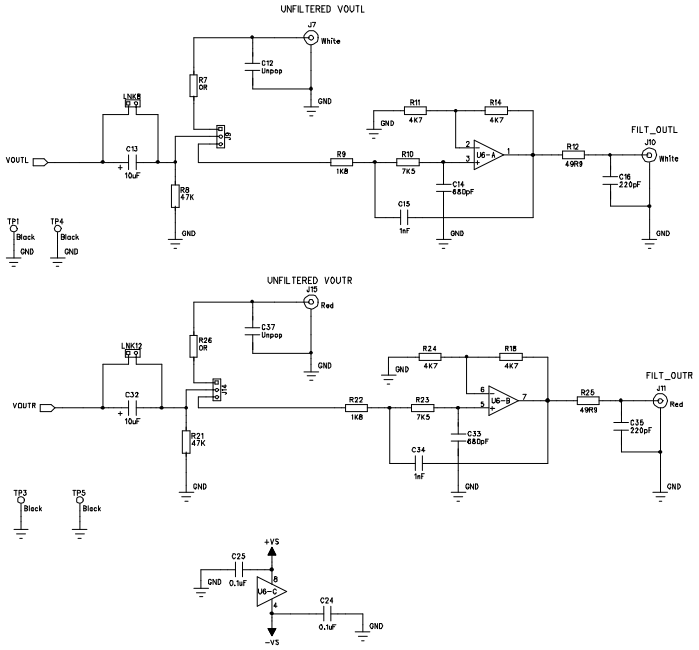

Figure 5 Analog Output

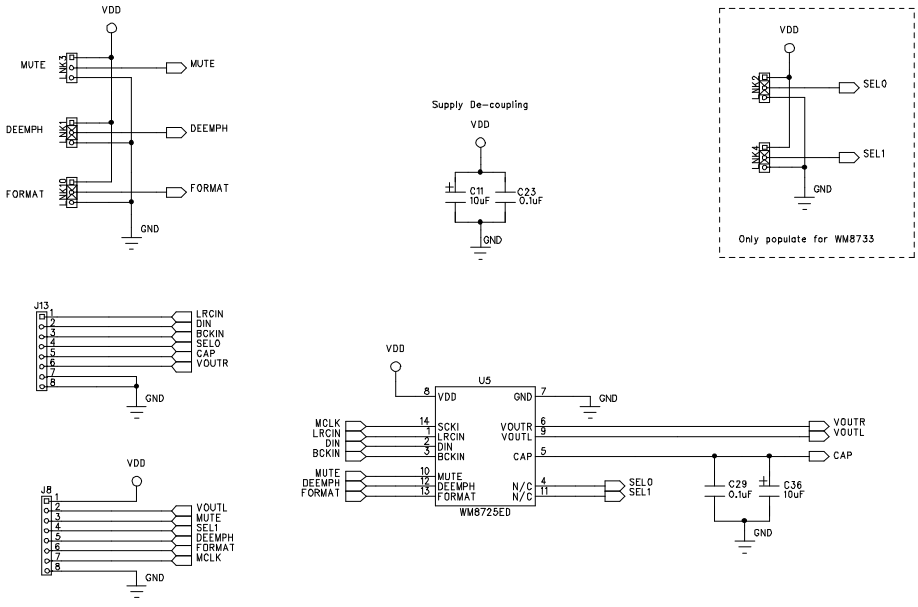

Figure 6 WM8725

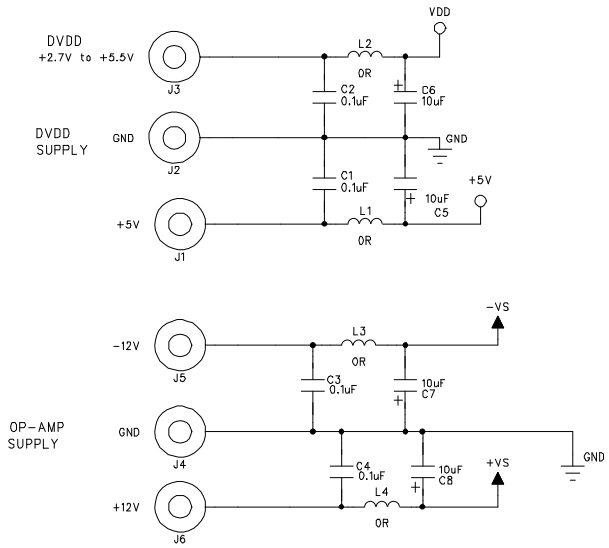

Figure 7 Power

WM8725-EV1B PCB LAYOUT

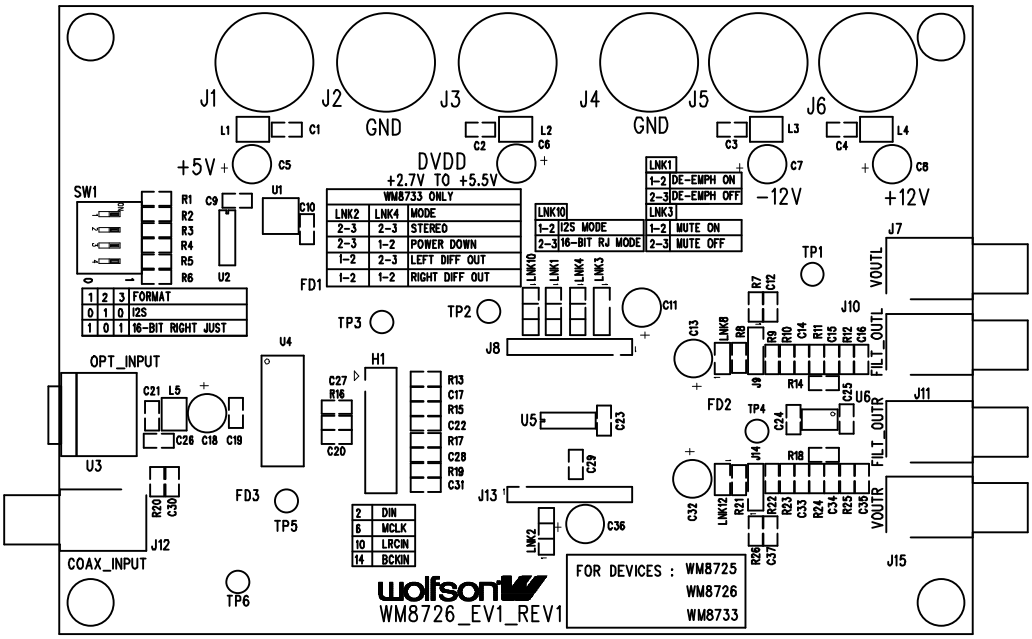

Figure 8 Top Layer Silkscreen

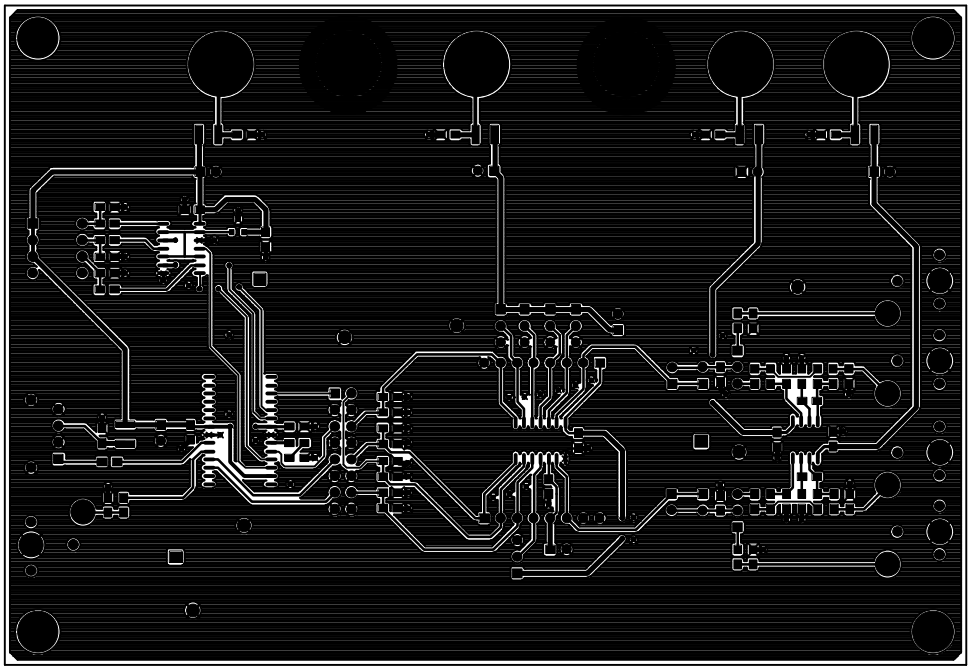

Figure 9 Top Layer

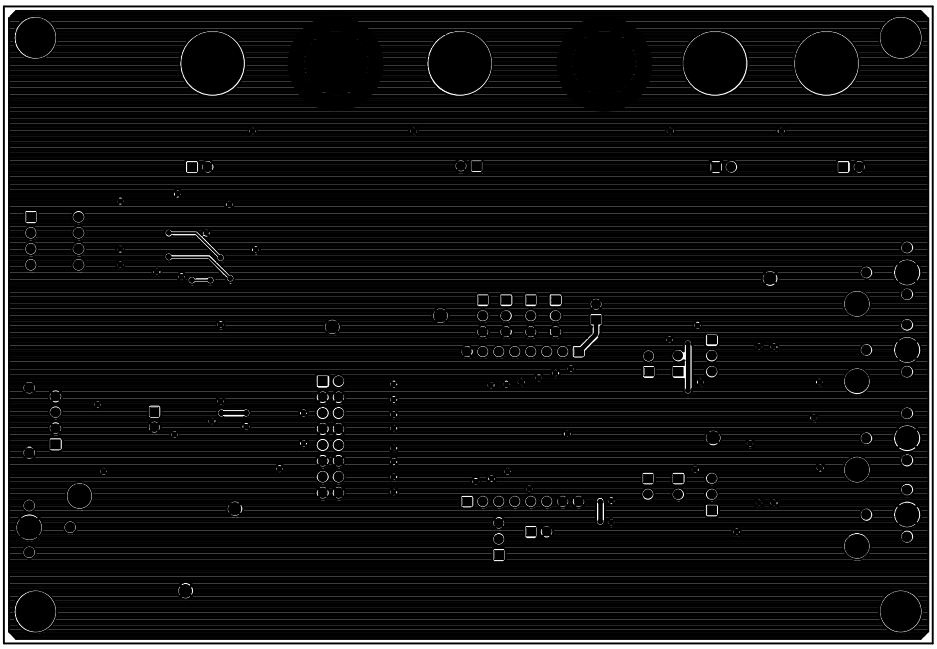

Figure 10 Bottom Layer

WM8725-EV1B BILL OF MATERIAL

Table 11 Bill Of Materials

Description	Reference	Quantity
Phono Socket PCB mount RED	J11, J15	2
Phono Socket PCB mount YELLOW	J12	1
Phono Socket PCB mount WHITE	J7, J10	2
DIL Switch 4-Way Rocker	SW1	1
1.32mm PCB Test Terminal BLACK	TP1 – TP6	6
220pF 0805 SMD Ceramic Capacitor 50V X7R	C16, C35	2
0.01uF 0805 SMD Ceramic Capacitor 50V X7R	C30	1
0.1uF 0805 SMD Ceramic Capacitor 50V X7R	C1 – C4, C9, C10, C19, C21, C23 – C27, C29	14
MM74HC32 Quad 2-input OR gate SO	U2	1
4mm Non-Insulated Panel Socket 16A	J1 – J6	6
1x2 PCB Pin Header 0.1" VERTICAL	LNK8, LNK12	2
1x3 PCB Pin Header 0.1" VERTICAL	J9, J14, LNK3	3
1x8 2.54mm pitch PCB Pin Header VERTICAL	J8, J13	2
2x8 2.54mm pitch PCB Pin Header VERTICAL	H1	1
MC33078 Low Noise Dual Op-Amp SO	U6	1
0.068uF 0805 SMD Ceramic Capacitor 25V X7R	C20	1
10uF 6.3 Dia 2.5 pitch Oscon Through Hole Cap. 16V 20%	C5 – C8, C11, C13, C18, C32, C36	9
DS1812 5V Power-On-Reset chip SOT	U1	1
680pF 0805 SMD Ceramic Capacitor 50V NPO	C14, C33	2
1nF 0805 SMD Ceramic Capacitor 50V NPO	C15, C34	2
0R 0805 SMD chip resistor 1% 0.1W	R7, R26	2
0R 1206 Resistor on 1210 Inductor site	L1 - L4	4
470R 0805 SMD chip resistor 1% 0.1W	R16	1
1K8 0805 SMD chip resistor 1% 0.1W	R9, R22	2
4K7 0805 SMD chip resistor 1% 0.1W	R2, R3, R6, R11, R14, R18, R24	7
47K 0805 SMD chip resistor 1% 0.1W	R8, R21	2
100K 0805 SMD chip resistor 1% 0.1W	R1, R4, R5	3
49R9 0805 SMD chip resistor 1% 0.125W	R12, R25	2
7K5 0805 SMD chip resistor 1% 0.125W	R10, R23	2
47uH 1210 Surface Mount Inductor 'PA series'	L5	1
Hexagonal brass M3 size spacer 20mm length	P1 - P4	4
75R 0805 SMD chip resistor 1% 0.125W	R20	1
Plain M3 size washer	W1 - W2	4
Slotted Panhead Screw - M3 thread; 12mm long	SC1 - SC4	4
CS8414 96kHz Digital Audio Receiver SO	U4	1
TORX176 Digirtal Audio Optical Receiver	U3	1
JSK9-16-G0 PCB 1x3 Jumper Switch 0.1" Center-off VERTICAL	LNK1, LNK10	2
WM8725 Stereo DAC	U5	1

EVALUATION SUPPORT

The aim of this evaluation kit is to help you to become familiar with the functionality and performance of the WM8725 Stereo DAC.

If you require more information or require technical support please contact Wolfson Microelectronics Applications group through the following channels:

Email:	apps@wolfsonmicro.com
Telephone:	(+44) 131 272 7070
Fax:	(+44) 131 272 7001
Mail:	Applications at the address on last page.

or contact your local Wolfson representative.

Additional information may be made available from time to time on our web site at:
http://www.wolfsonmicro.com

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