PRELIMINARY

Notice: This is not a final specification.
Some parametric limits are subject to change.

M65842FP
DIGITAL SOUND PROCESSOR

DESCRIPTION

The M65842FP is a digital sound processor providing the tone control, special bass boost and compressor functions.

This processor is suitable for sound control of car audio, portable CD, electronic musical instruments, etc.

FEATURES

■Tone control

..... Bass: -12dB to +12dB 2dB step at 13 stages
Treble: -12dB to +12dB 2dB step at 13 stages

■Special bass boost

..... Input frequency of 55Hz or less
Input amplitude of -20dB (+12dB)
Input amplitude of -10dB (+6dB)
Input amplitude of 0dB (0dB)

■Compression

Input amplitude of -54dB or less: Boost can be selected from +10, +15 and +20dB

■Audio input/output interface

Supports I^2S or non-I^2S

■3-line serial data control

■Supports the three types of sampling frequencies(32kHz,44.1kHz and 48kHz)

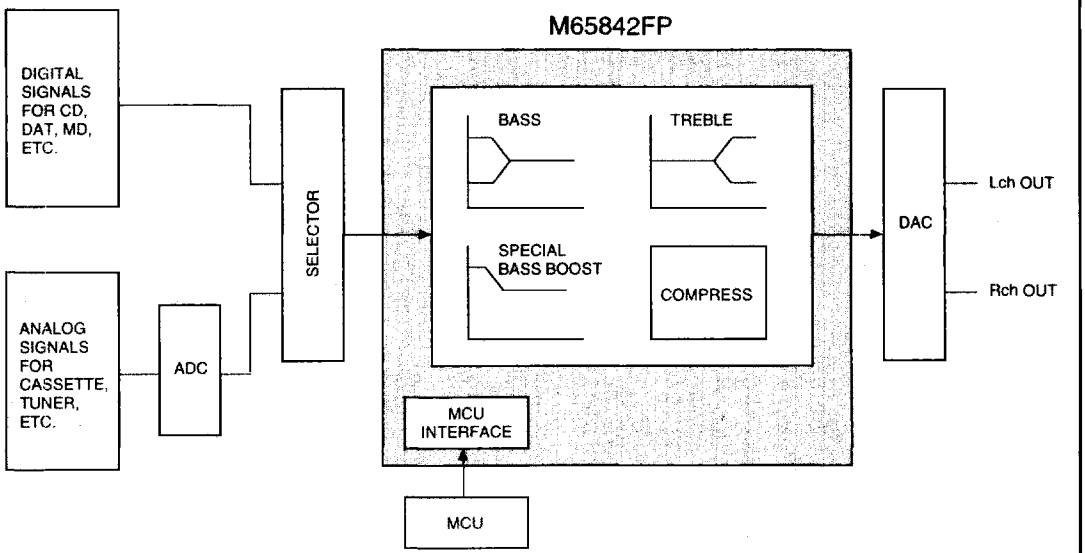
Outline 24P2W-A
1.27mm pitch 450mil SOP
(8.4mm×15.0mm×2.0mm)

RECOMMENDED OPERATING CONDITIONS

Supply voltage range ..... V_{DD}=2.7 to 5.5V

Rated supply voltage..... V_{DD}=5V

SYSTEM CONFIGURATION



MITSUBISHI ELECTRIC

PIN DESCRIPTION

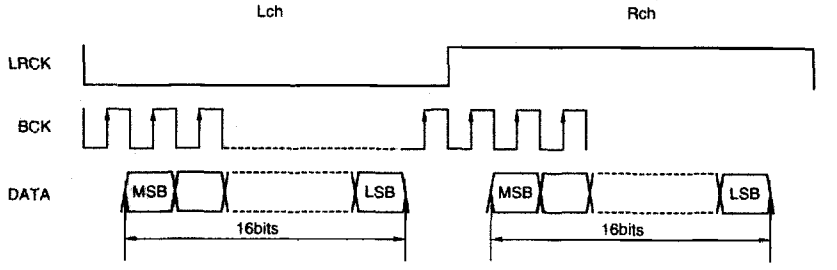
Pin No.	Symbol	I/O	Function
①	LRCKI	I	Audio interface: inputs LR clock
②	BCKI	I	Audio interface: inputs bit clock
③	DATAI	I	Audio interface: inputs data
④	MCKI	I	Inputs master clock 256fs
⑤	GND	–	GND
⑥	I²SSW	I	Switches audio interface format L = I²S, H = non-I²S
⑦	TMODE1	I	Test pin: sets to "L"
⑧	TMODE2	I	
⑨	TMODE3	I	
⑩	SDI	I	Microcomputer interface: inputs data
⑪	SCK	I	Microcomputer interface: inputs clock
⑫	STRB	I	Microcomputer interface: inputs strobe
⑬	TEST1	O	Test pin: inhibits connection with external units
⑭	TEST2	O	
⑮	TEST3	O	
⑯	RESET	I	Reset input "L" = reset
⑰	TEST4	O	Test pin: inhibits connection with external units
⑱	TEST5	O	
⑲	TEST6	O	
⑳	V_{DD}	–	Supply voltage
㉑	BCKO	O	Audio interface: outputs bit clock
㉒	DATAO	O	Audio interface: outputs data
㉓	MCKO	O	Master clock output 256fs
㉔	LRCKO	O	Audio interface: outputs LR clock

FUNCTION DESCRIPTION

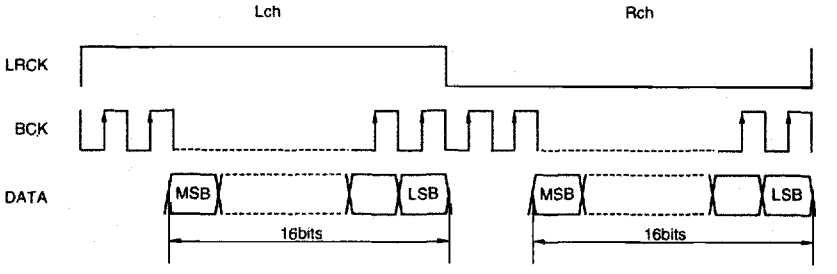
1.AUDIO INTERFACE

Capable of supporting I²S or non-I²S audio interface format

(1)I²S format timing (I²SSW = L)



(2)Non-I²S format timing (I²SSW = H)

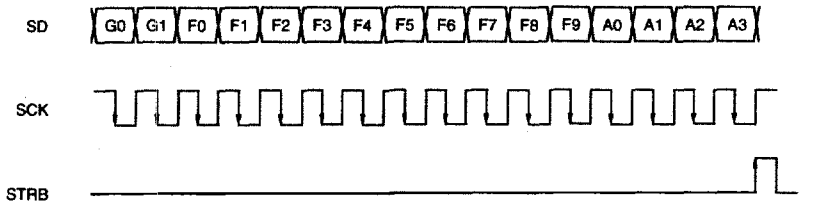


2. MICROCOMPUTER INTERFACE

The following functions are controlled with 3-line serial data from the microcomputer.

① Special bass boost (SBB)..... ON/OFF
② Tone control
Bass (BASS)..... 12dB to +12dB / 2dB step
Treble (TRE)..... 12dB to +12dB/2dB step
③ Compressor (COMP).....OFF/ON (3 types)
④ Sampling frequencies (FS)... 32 kHz, 44.1 kHz, and 48 kHz
⑤ Mute (MUTE)..... ON/OFF
⑥ Attenuation (ATT)..... ON/OFF
⑦ Bypass (BYP)

DATA FORMAT



Note. SD serial data is read at the falling edge of SCK, and last 16 bits are loaded at the rising edge of STRB.

G0	G1	F0	F1	F2	F3	F4	F5	F6	F7	F8	F9	A0	A1	A2	A3

1	1	BASS 3 2 1 0				TRE 3 2 1 0				FS 1 0		Chip Address			

1	0	COMP 1 0		X	ATT	X	X	SBB	MUTE	BYP	X	Chip Address			

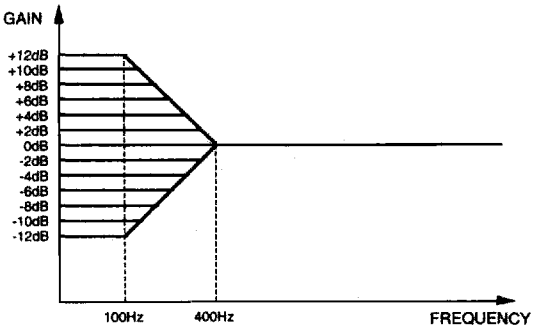
Chip Address = 0 0 1 1

3. TONE CONTROL

(1) Bass

In the range of -12dB to +12dB, can be set with 2dB step at 13 stages (including 0dB).

BASS CONTROL CHARACTERISTICS



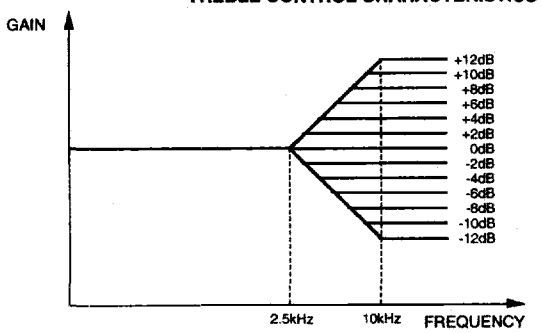
Level (dB)	BASS			
	3	2	1	0
+12	1	1	0	0
+10	1	0	1	1
+8	1	0	1	0
+6	1	0	0	1
+4	1	0	0	0
+2	0	1	1	1
0	0	1	1	0
-2	0	1	0	1
-4	0	1	0	0
-6	0	0	1	1
-8	0	0	1	0
-10	0	0	0	1
-12	0	0	0	0

Reset 0dB (0110))

(2) Treble

In the range of -12dB to +12dB, can be set with 2dB step at 13 stages (including 0dB).

TREBLE CONTROL CHARACTERISTICS



Level (dB)	TRE			
	3	2	1	0
+12	1	1	0	0
+10	1	0	1	1
+8	1	0	1	0
+6	1	0	0	1
+4	1	0	0	0
+2	0	1	1	1
0	0	1	1	0
-2	0	1	0	1
-4	0	1	0	0
-6	0	0	1	1
-8	0	0	1	0
-10	0	0	0	1
-12	0	0	0	0

Reset 0dB (0110)

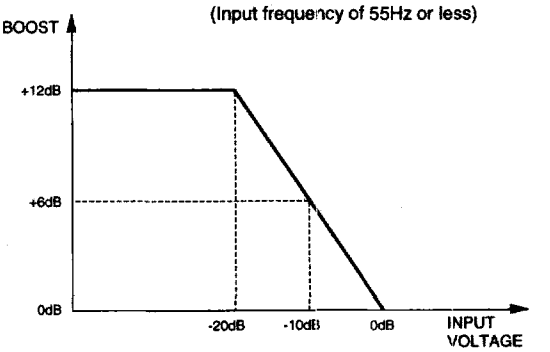
4. SPECIAL BASS BOOST

When special bass boost is set to on, and the input frequency is 55Hz or less, the boost is automatically set according to the input signal level.

SBB	Special bass boost
0	OFF
1	ON

For reset: OFF (0)

SPECIAL BASS BOOST CHARACTERISTICS
(Input frequency of 55Hz or less)



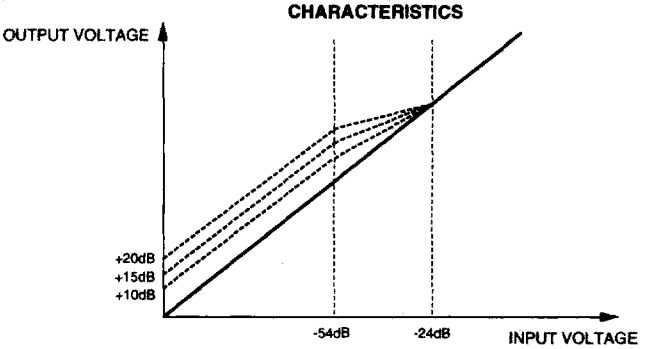
5. COMPRESSOR

When compressor is turned on, a signal of -54dB or less in input signal level is output amplitude by 10dB, 15dB and 20dB.

COMP		Compressor	
1	0		
0	0	OFF	
0	1	ON	+10dB
1	0		+15dB
1	1		+20dB

For reset: OFF (00)

COMPRESSOR CHARACTERISTICS



ATTACK TIME 0 sec
RELEASE TIME 12 sec

6. ATTENUATION

When the tone control is boosted, the input signal level can be attenuated to prevent overflow.

ATT	Attenuation
0	OFF 0dB
1	ON -12.7 dB

For reset: OFF (0)

7. BYPASS

When bypass is set to on, input signal bypasses internal processing units and is output directly.

BYP	Bypass
0	OFF
1	ON

For reset: ON (1)

8. MUTE

Output can be muted.

MUTE	Mute
0	ON
1	OFF

For reset: ON (0)

9. SAMPLING FREQUENCY

The processor can support the three types of sampling frequencies: 32kHz, 44.1kHz and 48 kHz.

FS		Sampling frequency
1	0	
0	0	32kHz
0	1	44.1kHz
1	0	48kHz

For reset: 44.1 kHz (01)