



One chip reverb solution that is compact, easy to use, and quite powerful

Built in DRAM eliminates the need for wide bus connections to external RAM and the choice of built in programs.

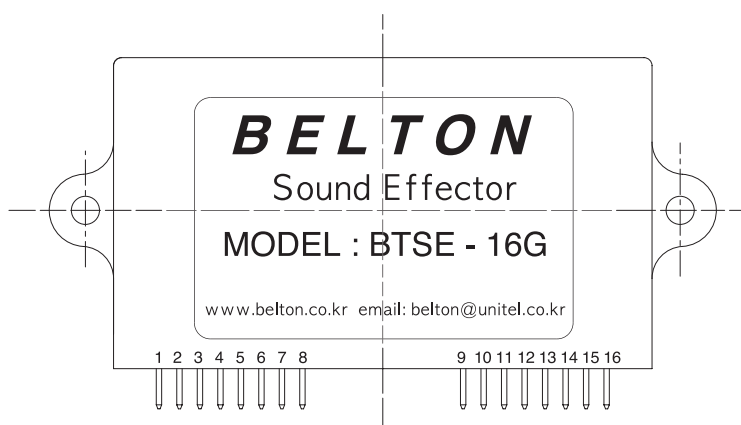
Features

- 16 internal ROM programs consisting of halls, rooms, plates, delays, chorus, flange, vocal cancel, and rotary speaker emulation.
- 32k location DRAM provides over 0.68s of delay at 48kHz sampling frequency.
- Internal crystal oscillator circuit eliminates need for discrete external passive components.
- Internal voltage regulators allow operation from 5.5V down to 3.0V V_{DD} .
- Internal 1000pF bypass capacitor to reduce voltage swings at the rails.

Applications

- Personal stereos with reverb functions
- Extremely portable guitar effects boxes
- Karaoke machines utilizing the vocal cancel program
- Hardware reverb effects for computer sound cards
- Ambience settings for car stereos

Terminal connection



- | | |
|-------------------|-----------------|
| 1. Left output | 9. Gray cord-3 |
| 2. Right output | 10. Gray cord-2 |
| 3. Analog ground | 11. Gray cord-1 |
| 4. Input | 12. Gray cord-4 |
| 5. N.C | 13. N.C |
| 6. Digital ground | 14. N.C |
| 7. +15V | 15. N.C |
| 8. -15V | 16. +5V |

NEW**REVERBERATION UNIT**

ROTARY SWITCH

ENCODER SWITCH

VACUUM TUBE SOCKET & SHIELD

POWER ENTRY

JACK & XLR SOCKET



Belton Engineering Co., Ltd.

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DIGITAL SOUND EFFECTOR

BELTON

CAT. NO. : BSE - 2

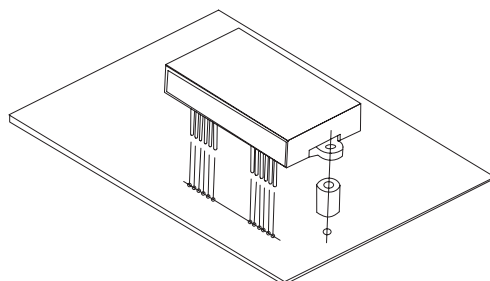
Electrical Specification

- Configuration : Left and Right
- AD-DA conversion : 24Bit
- S/N ratio(A-weight) : 96dB
- Dynamic range : 107dB
- Frequency response : 20Hz-20kHz
- Max. Input voltage : 4.0Vp-p
- Input impedance : 160kohm
- Max output voltage : 4.0Vp-p
- Min Output load res : 5kohm
- Power supply : +5V, +/-15V
- Current consumption : 120mA

Mounting Type

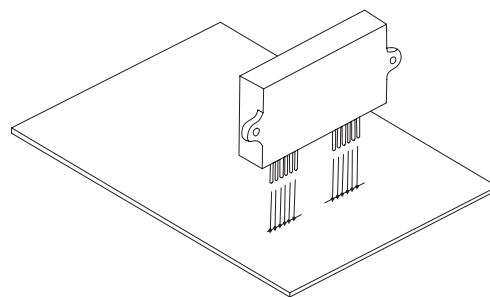
BTSE - 16 G

Horizontal mount



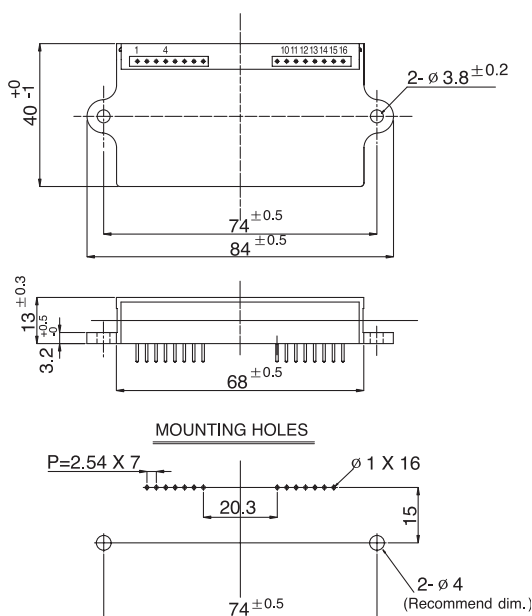
BTSE - 16 GV

Vertical mount

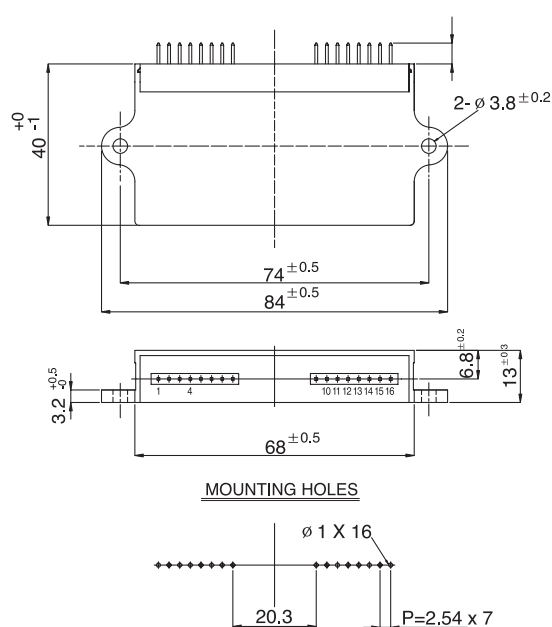


Dimensions

BTSE - 16 G



BTSE - 16 GV

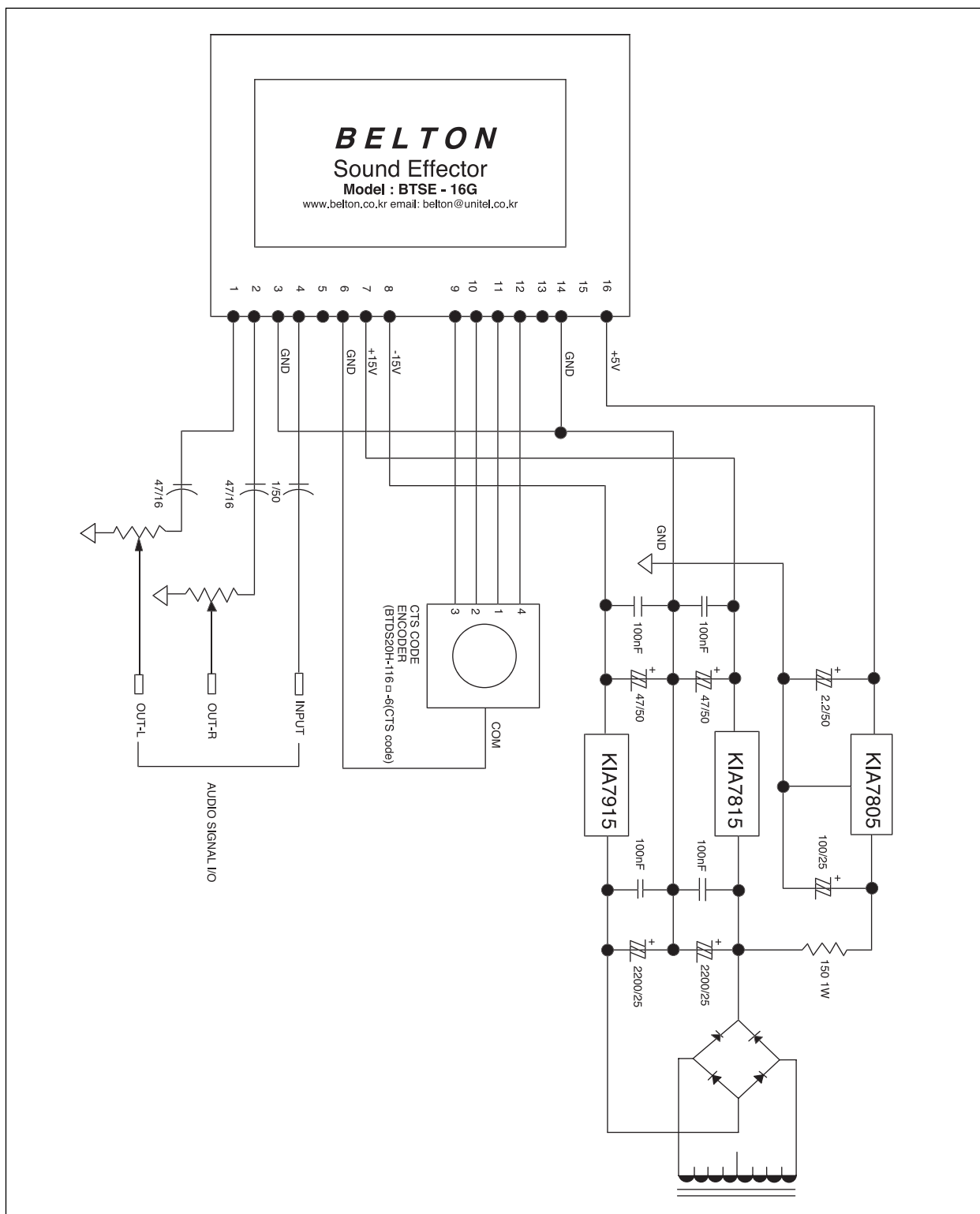


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Recommended Circuits



REVERBERATION UNIT
ROTARY SWITCH
ENCODER SWITCH
VACUUM TUBE SOCKET & SHIELD
POWER ENTRY
JACK & XLR SOCKET



Internal Programs

The BTSE-16G comes with 16 internal ROM programs ready to go, utilizing the skills and techniques of the Belton Reverb. Co. By setting the chip to internal mode, the four program pins may be used to select between the different algorithms.

- Program List

Prog	Name	Description
0110	Hall 1	Bright hall reverb for drums, guitars, and vocals.
0010	Hall 2	Warm hall for acoustic guitars, pianos, and vocals.
1010	Room 1	Hardwood studio for acoustic instruments.
1110	Room 2	Ambience for acoustic mixes and synth sounds.
1111	Room 3	Warm room for guitars and rhythm instruments.
1011	Plate 1	Classic plate reverb for lead vocals and instruments.
1001	Plate 2	Sizzling bright plate reverb for vocals and instruments.
1101	Plate 3	Short vintage plate reverb for snares and guitars.
1100	Chorus	Stereo chorus for guitars and pianos.
1000	Flange	Stereo flanger for jet wash effects.
0000	Delay 1	125ms slapback delay for vocals and guitars.
0100	Delay 2	190ms deay for percussive arpeggios.
0101	Chorus/Room 1	Chorus with reverb for guitars, synths, and pianos.
0001	Chorus/Room 2	Auto-wah guitar effect with reverb for lead instruments.
0011	Vocal Cancel	Removes lead vocals from many stereo recordings.
0111	Rotary Speaker	Rotary speaker emulation for organs and guitars.

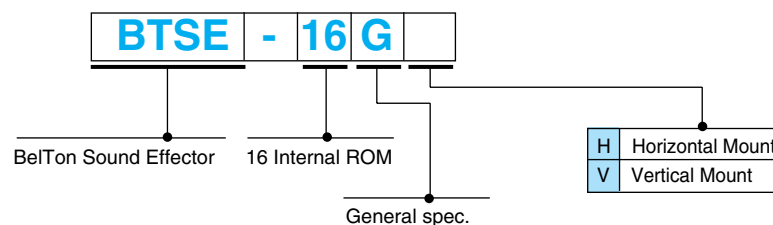
Note :

The unusual ordering of the programs allows a 16-position rotary switch's Gray code output to be connected to the program pins.

Suggested Ordering Procedure

- To specify the Digital Sound Effector specification, please compose desired part numbers from data below and fill in the specification you desire in the following square.

Example

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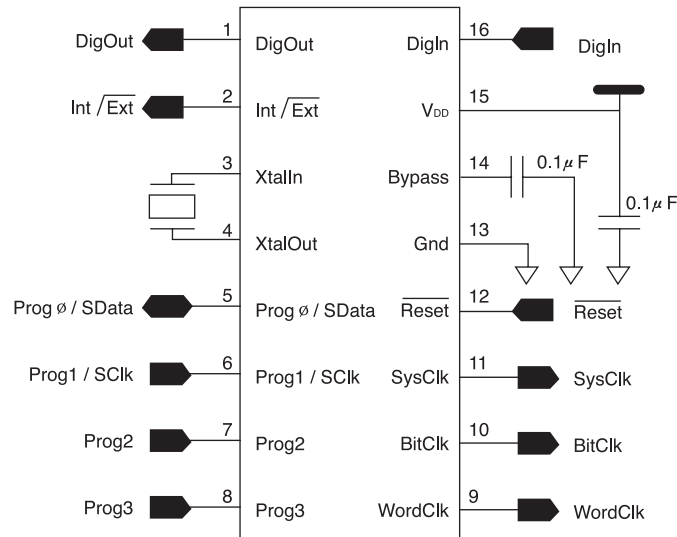


DIGITAL SOUND EFFECTOR

BELTON

CAT. NO. : BSE - 5

Suggested Connections



REVERBERATION UNIT

ROTARY SWITCH

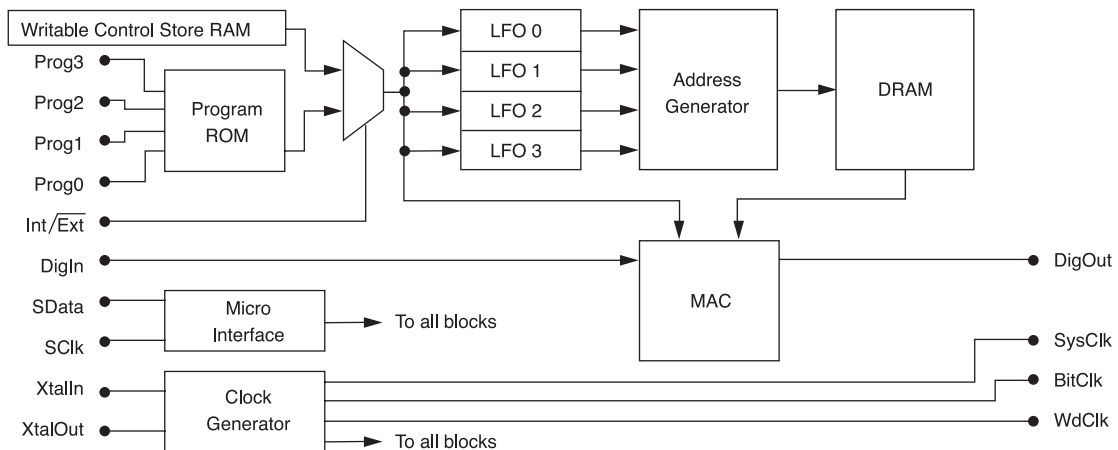
ENCODER SWITCH

VACUUM TUBE SOCKET & SHIELD

POWER ENTRY

JACK & XLR SOCKET

Block Diagram



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DIGITAL SOUND EFFECTOR

BELTON

CAT. NO. : BSE - 6

Electrical Characteristics and Operating Conditions

REVERBERATION UNIT
ROTARY SWITCH
ENCODER SWITCH
VACUUM TUBE SOCKET & SHIELD
POWER ENTRY
JACK & XLR SOCKET

Parameter	Description	Condition	Min	Typ	Max	Units
Electrical Characteristics and Operating Conditions						
V _{DD}	Supply Voltage		3.0	5.0	5.5	V
I _{DD}	Supply Current : SCR		9	10	11	mA
Gnd	Ground		-	0.0	-	V
F _S	Sample rate		24	48	50	kHz
Temp	Temperature		0	25	70	°C
Output (DigOut, SysClk, BitClk, WordClk)						
V _{OH}	Logical "1" output voltage	Unloaded	0.9 V _{DD}	V _{DD}	-	V
V _{OL}	Logical "0" output voltage	Unloaded	-	0	0.05 V _{DD}	V
I _{OH}	Logical "1" output current	V _{DD} =5V V _O =4.5V	-	-	-8.0	mA
I _{OL}	Logical "0" output current	V _{DD} =5V V _O =0.4V	-	-	8.0	mA
Inputs (DigIn, Int/Ext, Prog0/Sdata, Prog1/SClk, Prog2, Prog3, Reset)						
V _{IH}	Logical "1" input voltage		2.5	-	V _{DD}	V
V _{IL}	Logical "0" input voltage		0	-	0.5	V
I _{IH}	Logical "1" input current	V _{DD} =V _{IH} =5V	-	-	2	μA
I _{IL}	Logical "0" input current	No pullup pin	-	-	2	μA
I _{ILP}	Logical "0" input current	Pullup pin, V _{in} =0	83	167	333	μA
C _{IN}	Input Capacitance		-	2.0	-	pF

Note :

1. All other voltages are relative to Gnd.
2. If V_{DD} will always be below 3.6V (including the effects of ripple, spikes, etc.) then the Bypass pin should be connected to V_{DD}.

Pin Descriptions : Internal DSP chip (* : Pull up to V_{DD} via nominal internal 30kΩ resistor)

Pin #	Name	Pin type	Description
1	Digout	Output	Digital serial output for stereo DAC.
2	Int/Ext	Input*	Internal/external program selection. 1:Internal, 0:External.
3	XtalIn	Input	12.288MHz crystal input. ¹
4	XtalOut	Output	12.288MHz crystal output. ¹
5	Prog0/SData	Bidirectional*	Internal program select 0 / serial interface data line.
6	Prog1/SClk	Input*	Internal program select 1 / serial interface clock line.
7	Prog2	Input*	Internal program select 2.
8	Prog3	Input*	Internal program select 3.
9	WordClk	Output	Word clock output.
10	BitClk	Output	Bit clock output.
11	SysClk	Output	System clock output.
12	Reset	Input	Active low reset.
13	Gnd	Ground	Ground connection
14	Bypass	Bidirectional	Connect 0.1μF bypass capacitor, Gnd for internal regulator.
15	V _{DD}	Power	VDD power pin. Connect 0.1μF capacitor to Gnd.
16	DigIn	Input	Digital serial input from stereo ADC.

Note :

1. Internal 18pF capacitor to ground. Internal 120kΩ resistor between Xtal pads.
2. If V_{DD} will always be below 3.6V (including the effects of ripple, spikes, etc.) then the Bypass pin should be connected to V_{DD}.



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DIGITAL SOUND EFFECTOR

BELTON

(BTSE-16G SERIES)

Proposed Panel design for Sound effector

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REVERBERATION
UNIT

ROTARY
SWITCH

ENCODER
SWITCH

VACUUM TUBE
SOCKET & SHIELD

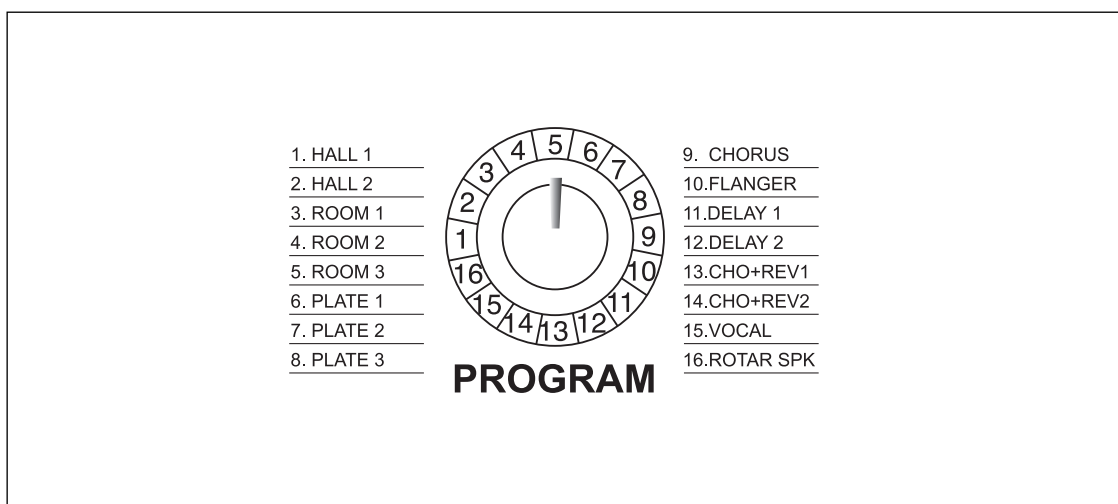
POWER ENTRY

JACK & XLR
SOCKET

Note :

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Program Mode Change for Panel



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