

YRW801

WAVE DATA ROM

■ OVERVIEW

The YRW801 is a wave data ROM for the YMF278B (OPL4) Wave Table synthesizer, integrating all tones GM (General MIDI) System Level 1 into one chip.

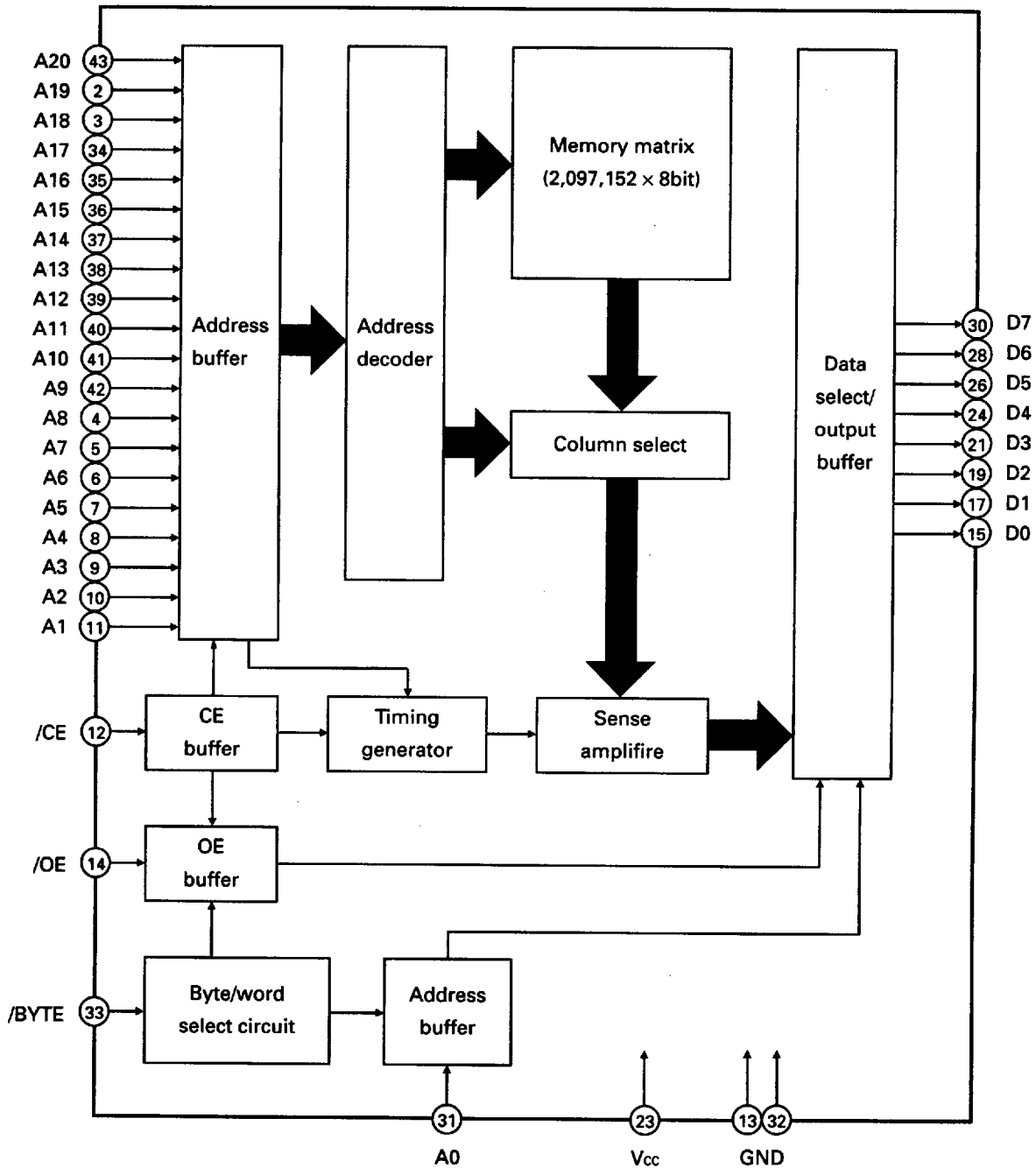
The chip set of YMF278B and YRW801 enables high-quality and compact design of sound system based on GM.

However, the YRW801 needs the control software of YAMAHA.

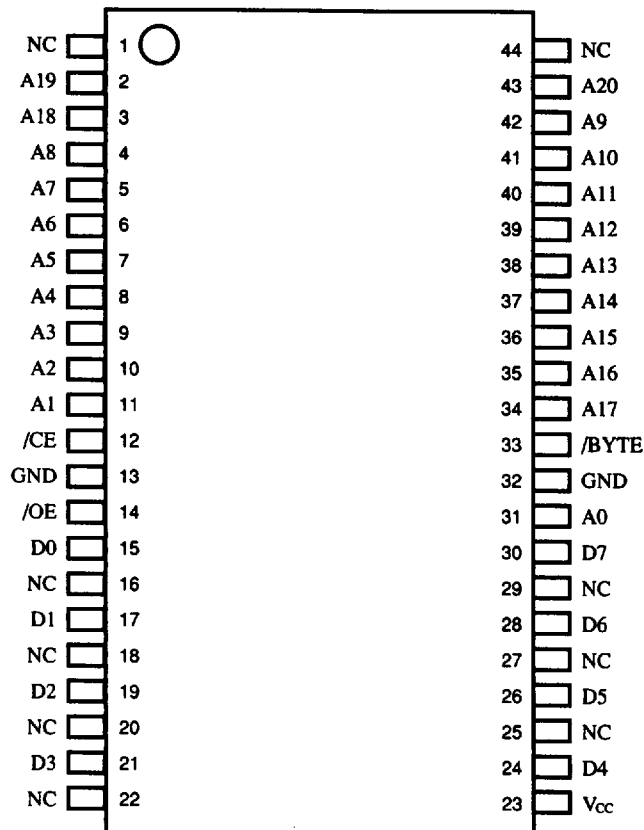
■ FEATURES

- Built-in wave data of tones which comply with GM System Level 1.
 - Melody tone128 tones
 - Percussion tone.....47 tones
- 16Mbit capacity (2,097,152word × 8bit)
- Maximum 150 ns access time
- Maximum 50mA current consumption (Operation mode)
- Maximum 100μA current consumption (Stand-by mode)
- + 5V single power supply
- 44-pin plastic SOP

■ BLOCK DIAGRAM



■ PIN OUT DIAGRAM



<44 pin SOP Top View>

■ PIN CONFIGURATION

Name	I/O	Function
A 0 ~ A 20	I	Address input
D 0 ~ D 7	O	Data output
/BYTE	I	Byte mode / Word mode select input
/CE	I	Chip enable input
/OE	I	Output enable input
Vcc	-	+5V power supply
GND	-	Ground
NC	-	Non connection

Note) Be sure to set /BYTE pin to 'L' level.

■ FUNCTION OVERVIEW

/CE	/OE	Data output
H	X	Hi-Z
L	H	Hi-Z
L	L	D 0 ~ D 7

Note) × : Don't care

Hi-z : High impedance

■ ELECTRICAL CHARACTERISTICS

1. Absolute Maximum Ratings

Item	Symbol	Rating	Unit
Power supply voltage	V_{CC}	-0.3 ~ 7.0	V
Input voltage	V_I	-0.3 ~ $V_{CC} + 0.3$	V
Output voltage	V_O	-0.3 ~ $V_{CC} + 0.3$	V
Operating temperature	T_{OP}	0 ~ 70	°C
Storage temperature	T_{STG}	-50 ~ 125	°C

2. Recommended operating conditions

Item	Symbol	Min.	Typ.	Max.	Unit
Power supply voltage	V_{CC}	4.75	5.0	5.25	V

3. DC characteristics (Condition : $V_{CC} = 5.0 \pm 0.25$ V, $T_a = 0 \sim 70$ °C)

Item	Symbol	Condition	Min.	Max.	Unit
Power consumption (Stand-by)	I_{SB1}	/CE = V_{IH}		2	mA
	I_{SB2}	/CE = $V_{CC} - 0.2V$		100	μA
Power consumption (Operation)	I_{CC1}	$t_{rc} = 150ns, *1$		50	mA
	I_{CC2}	$t_{rc} = 1\mu s, *1$		40	mA
Input highlevel voltage	V_{IH}		2.2	$V_{CC} + 0.3$	V
Input lowlevel voltage	V_{IL}		-0.3	0.8	V
Output highlevel voltage	V_{OH}	$I_{OH} = -400\mu A$	2.4		V
Output lowlevel voltage	V_{OL}	$I_{OL} = 2.0mA$		0.4	V
Input leakage current	I_{LI}	$V_I = 0V, V_{CC}$		10	μA
Output leakage current	I_{LO}	$V_O = 0V, V_{CC} *2$		10	μA
Input capacity	C_i	$f = 1MHz$		10	pF
Output capacity	C_o	$T_a = 25^\circ C$		10	pF

Note) *1 $V_I = V_{IH}, V_{IL}, /CE = V_{IL}$ (Output pin is open)

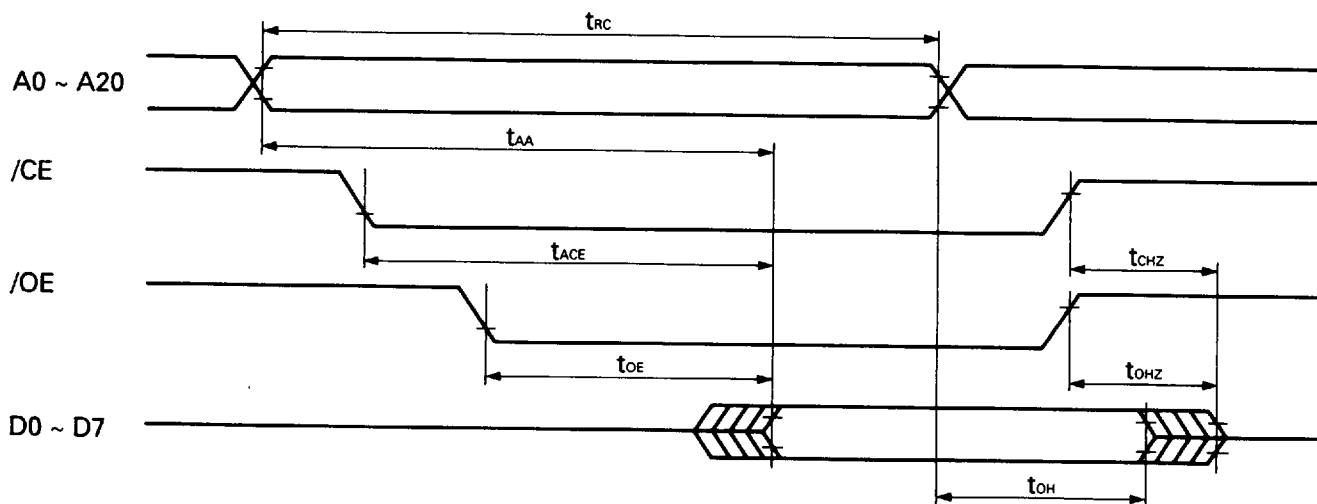
*2 $/CE = V_{IH}, /OE = V_{IH}$ (Output pin is open)

4. AC characteristics ($V_{CC} = 5.0 \pm 0.25V$, $T_a = 0 \sim 70 \text{ }^\circ\text{C}$)

Item	Symbol	Min.	Max.	Unit
Read cycle time	t_{RC}	150		ns
Address access time	t_{AA}		150	ns
Chip enable access time	t_{ACE}		150	ns
Output enable delay time	t_{OE}		70	ns
Output data hold time	t_{OH}	5		ns
Output floating time	t_{CHZ}		60 *1	ns
	t_{OHZ}		60 *1	ns

Note) *1 : Time until output ports become open states.

5. Timing



Note) Data is fixed whichever of t_{AA} , t_{ACE} , or t_{OE} passes last.

■ GM System Level 1 Sound Set

Prog#	Instrument	Prog#	Instrument
1.	Acoustic Grand Piano	45.	Tremolo Strings
2.	Bright Acoustic Piano	46.	Pizzicate Strings
3.	Electric Grand Piano	47.	Orchestral Harp
4.	Honky-tonk Piano	48.	Timpani
5.	Electric Piano 1	49.	String Ensemble 1
6.	Electric Piano 2	50.	String Ensemble 2
7.	Harpsichord	51.	Synth Strings 1
8.	Clavi	52.	Synth Strings 2
9.	Celesta	53.	Choir Aahs
10.	Glockenspiel	54.	Voice Oohs
11.	Music Box	55.	Synth Voice
12.	Vibraphone	56.	Orchestra Hit
13.	Marimba	57.	Trumpet
14.	Xylophone	58.	Trombone
15.	Tubular Bells	59.	Tuba
16.	Dulcimer	60.	Muted Trumpet
17.	Drawbar Organ	61.	French Horn
18.	Percussive Organ	62.	Brass Section
19.	Rock Organ	63.	Synth Brass 1
20.	Church Organ	64.	Synth Brass 2
21.	Reed Organ	65.	Soprano Sax
22.	Accordion	66.	Alto Sax
23.	Harmonica	67.	Tenor Sax
24.	Tango Accordion	68.	Baritone Sax
25.	Acoustic Guitar (nylon)	69.	Oboe
26.	Acoustic Guitar (steel)	70.	English Horn
27.	Electric Guitar (jazz)	71.	Bassoon
28.	Electric Guitar (clean)	72.	Clarinet
29.	Electric Guitar (muted)	73.	Piccolo
30.	Overdriven Guitar	74.	Flute
31.	Distortion Guitar	75.	Recorder
32.	Guitar harmonics	76.	Pan Flute
33.	Acoustic Bass	77.	Blown Bottle
34.	Electric Bass (finger)	78.	Shakuhachi
35.	Electric Bass (pick)	79.	Whistle
36.	Fretless Bass	80.	Ocarina
37.	Slap Bass 1	81.	Lead 1 (square)
38.	Slap Bass 2	82.	Lead 2 (sawtooth)
39.	Synth Bass 1	83.	Lead 3 (calliope)
40.	Synth Bass 2	84.	Lead 4 (chiff)
41.	Violin	85.	Lead 5 (charang)
42.	Viola	86.	Lead 6 (voice)
43.	Cello	87.	Lead 7 (fifths)
44.	Contrabass	88.	Lead 8 (bass + lead)

Prog#	Instrument	Prog#	Instrument
89.	Pad 1 (new age)	109.	Kalimba
90.	Pad 2 (warm)	110.	Bag pipe
91.	Pad 3 (polysynth)	111.	Fiddle
92.	Pad 4 (choir)	112.	Shanai
93.	Pad 5 (bowed)	113.	Tinkle Bell
94.	Pad 6 (metallic)	114.	Agogo
95.	Pad 7 (halo)	115.	Steel Drums
96.	Pad 8 (sweep)	116.	Woodblock
97.	FX 1 (rain)	117.	Taiko Drum
98.	FX 2 (soundtrack)	118.	Melodic Tom
99.	FX 3 (crystal)	119.	Synth Drum
100.	FX 4 (atmosphere)	120.	Reverse Cymbal
101.	FX 5 (brightness)	121.	Guitar Fret Noise
102.	FX 6 (goblins)	122.	Breath Noise
103.	FX 7 (echoes)	123.	Seashore
104.	FX 8 (sci-fi)	124.	Bird Tweet
105.	Sitar	125.	Telephone Ring
106.	Banjo	126.	Helicopter
107.	Shamisen	127.	Applause
108.	Koto	128.	Gunshot

■ GM System Level 1 Percussion Map

MIDI Key	Drum Sound	MIDI Key	Drum Sound
35.	Acoustic Bass Drum	59.	Ride Cymbal 2
36.	Bass Drum 1	60.	Hi Bongo
37.	Side Stick	61.	Low Bongo
38.	Acoustic Snare	62.	Mute Hi Conga
39.	Hand Clap	63.	Open Hi Conga
40.	Electric Snare	64.	Low Conga
41.	Low Floor Tom	65.	High Timbale
42.	Closed Hi Hat	66.	Low Timbale
43.	High Floor Tom	67.	High Agogo
44.	Pedal Hi-Hat	68.	Low Agogo
45.	Low Tom	69.	Cabasa
46.	Open Hi-Hat	70.	Maracas
47.	Low-Mid Tom	71.	Short Whistle
48.	Hi Mid Tom	72.	Long Whistle
49.	Crash Cymbal 1	73.	Short Guiro
50.	High Tom	74.	Long Guiro
51.	Ride Cymbal 1	75.	Claves
52.	Chinese Cymbal	76.	Hi Wood Block
53.	Ride Bell	77.	Low Wood Block
54.	Tambourine	78.	Mute Cuica
55.	Splash Cymbal	79.	Open Cuica
56.	Cowbell	80.	Mute Triangle
57.	Crash Cymbal 2	81.	Open Triangle
58.	Vibraslap		

EXTERNAL DIMENSIONS

• YRW801-M

