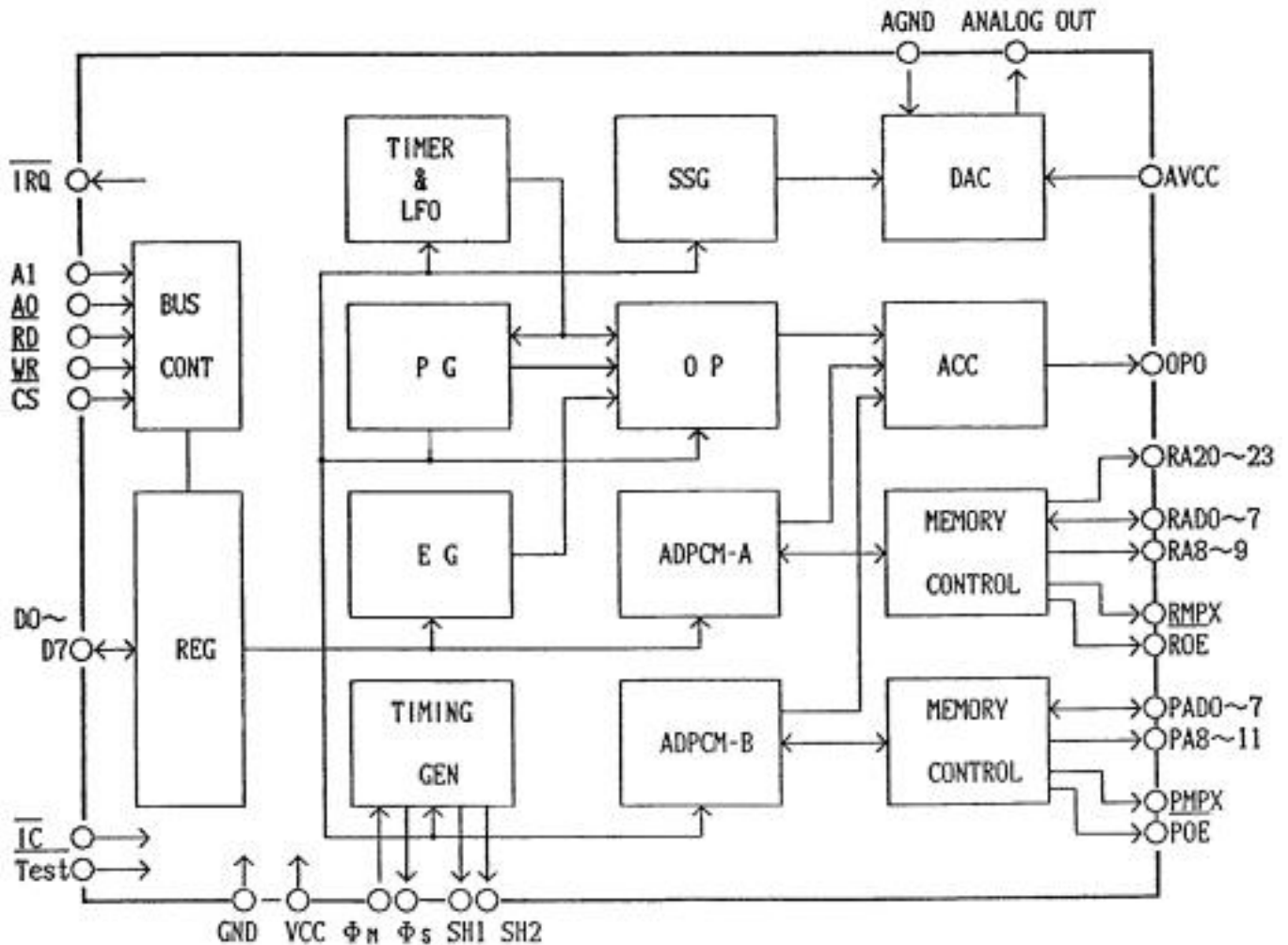


YM2610 Datasheet

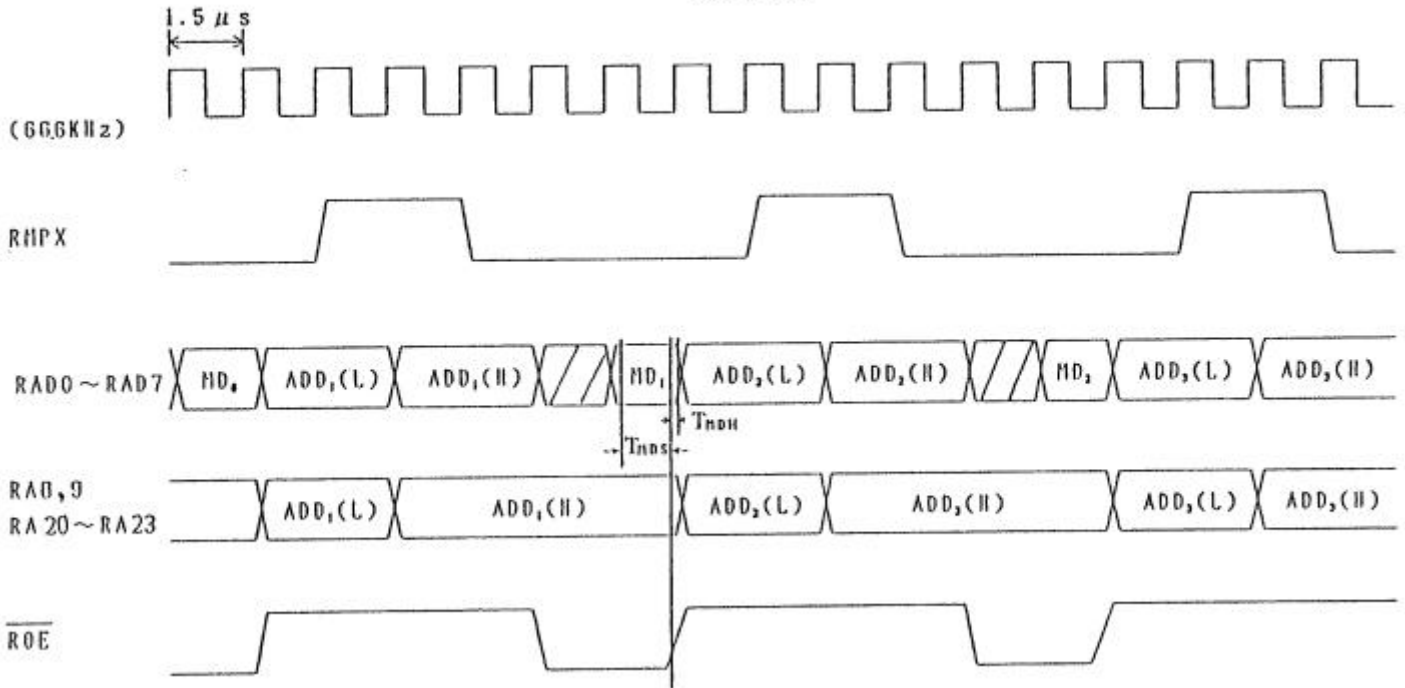
1. FM – 4 Channels on 4 operators, DAC compatible with YM3016
 2. SSG – 3 operators, compatible with YM2149 (Atari ST), 4th operator is Noise
 3. L/R – Sound channels out
 4. ADPCM-A – 6 channels 18.5 KHz, 16 MB Sample ROM size, 256 B min size of sample, 1 MB max
 5. ADPCM-B – 1 channel 1.8-55.5 KHz, 16 MB Sample ROM size, 256 B min size of sample, 1 MB max
- ADPCM compatible with YM2608



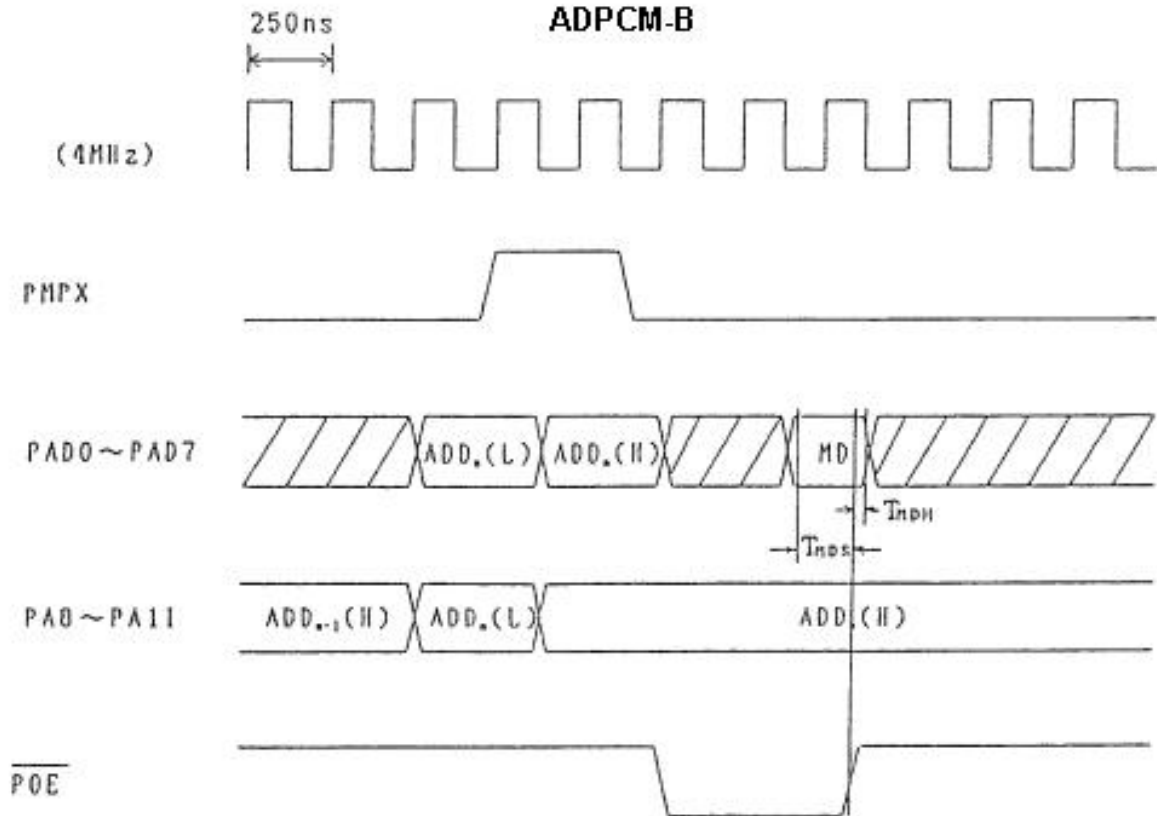
GND	1	1	0	64	ϕS
D0	2	I/O	1	63	ϕM
D1	3	I/O	1	62	VCC
D2	4	I/O	1	61	A1
D3	5	I/O	1	60	A0
D4	6	I/O	1	59	\overline{RD}
D5	7	I/O	1	58	\overline{WR}
D6	8	I/O	1	57	\overline{CS}
D7	9	I/O	0	56	\overline{TRQ}
RAD7	10	I/O	I/O	55	PAD7
RAD6	11	I/O	I/O	54	PAD6
RAD5	12	I/O	I/O	53	PAD5
RAD4	13	I/O	I/O	52	PAD4
RAD3	14	I/O	I/O	51	PAD3
RAD2	15	I/O	I/O	50	PAD2
RAD1	16	I/O	I/O	49	PAD1
RAD0	17	I/O	I/O	48	PAD0
GND	18	1	0	47	PMPX
VCC	19	1	0	46	POE
RMPX	20	0		45	NC
\overline{ROE}	21	0	0	44	PA11
RA9	22	0	0	43	PA10
RA8	23	0	0	42	PA9
NC	24		0	41	PA8
NC	25		1	40	\overline{TEST}
AGND	26	1		39	NC
ANALOG OUT	27	0	0	38	RA23
AVCC	28	1	0	37	RA22
SH1	29	0	0	36	RA21
SH2	30	0	0	35	RA20
OPO	31	0		34	NC
GND	32	1	1	33	\overline{IC}

/CS	/RD	/WR	A1	A0	D0-D7	Mode
0	1	0	0	0	\$00~\$10	SSG
					\$1F~\$20	ADPCM-B
					\$2F~\$30	FM
					\$30~\$B6	FM 1,2
0	1	0	0	1	\$00~\$10	SSG
					\$1F~\$20	ADPCM-B
					\$2F~\$30	FM
					\$30~\$B6	FM 1,2
0	1	0	1	0	\$00~\$2F	ADPCM-A
					\$30~\$B6	FM 3,4
0	1	0	1	1	\$00~\$2F	ADPCM-A
					\$30~\$B6	FM 3,4
0	0	1	0	0	\$00~\$0D	SSG

ADPCM-A



ADPCM-B



ADPCM-A

Address	D7	D6	D5	D4	D3	D2	D1	D0	Comment
00	DM	-	AON						DUMP/ADPCM-A On
01	-		ATL						Total Level
02	0	0	0	0	0	0	0	0	Test
08~0D	L	R	-	AC L					Output Select, Channel Select
10~15	Address								Start Address (L)
18~1D	Address								Start Address (H)
20~25	Address								End Address (L)
28~2D	Address								End Address (H)

ATL = all "0" – 0 db(silence)

ADPCM-B

Address	D7	D6	D5	D4	D3	D2	D1	D0	Comment
10	Start	-	Repeat	-			Reset	Control 1	
11	L	R	-						Control 2
12	Address								Start Address (L)
13	Address								Start Address (H)
14	Address								End Address (L)
15	Address								End Address (H)
16	-								-
17	-								-
18	-								-
19	Frequency								Delta-N (L)
1A	Frequency								Delta-N (H)
1B	Volume								EG Control
1C	B	-	A5	A4	A3	A2	A1	A0	Flag Control

Frequency ADPCM-B = $[(\text{Delta-N (H)} + \text{Delta-N (L)}) / 256] \times 55.5 \text{ KHz}$
(Example: Delta-N (H)=55, Delta-N (L)=21, Frequency = 18,5 KHz)

SSG

Address	D7	D6	D5	D4	D3	D2	D1	D0	Comment
00	Fine Tune								Channel-A Tone Period
01	-			Coarse Tune					
02	Fine Tune								Channel-B Tone Period
03	-			Coarse Tune					
04	Fine Tune								Channel-C Tone Period
05	-			Coarse Tune					
06	-		Noise Frequency						Noise Period
07	-	/Noise			/Tone				/Enable
08	-		M	Level					Channel-A Amplitude
09	-		M	Level					Channel-B Amplitude
0A	-		M	Level					Channel-C Amplitude
0B	Fine Tune								Envelop Period
0C	Coarse Tune								
0D	-		CONT	ATT	ALT	HOLD			Envelop Shape Cycle

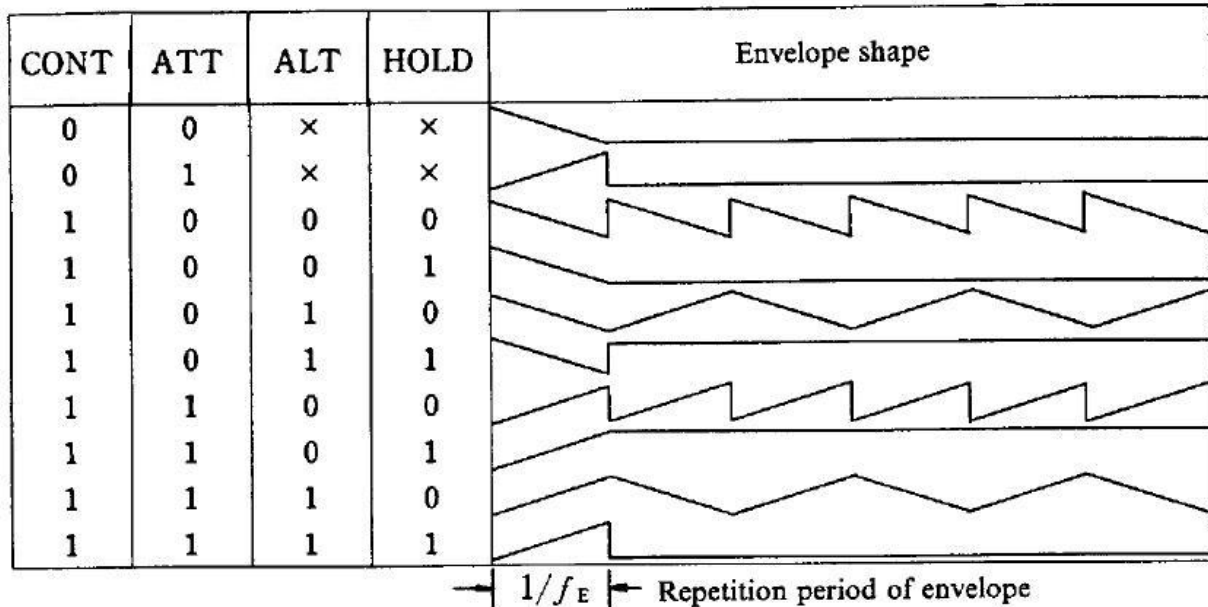
$F_{\text{noise}} = F_{\text{master}} / \text{Noise Frequency}$

$F_{a,b,c} = F_{\text{master}} / \text{Fine Tune}$

M - Mode

When M=0, the level is determined by 16 level selection

When M=1, the level is determined by common 5 bit output of the envelope generator



FM

Address	D7	D6	D5	D4	D3	D2	D1	D0	Comment
21	Test								LSI ,M Test Data
22	-			LFO	FREQ CONT				LFO ,M Freq Control
24	Timer-A								Timer-A 8
25	-			Timer-A				Timer-A 2	
26	Timer-B								Timer-B ,M Data
27	Mode		Reset B A		Enable B A		Load B A		Timer-A/B ,M Control, 2 CH ,M Mode
28	Slot			-		CH			Key-ON/OFF
29~2F	-								
31~3E	-		DT		MULTI				Detune/Multiple
41~4E	-		TL						Total Level
51~5E	KS		-		AR				Key Scale/Attack Rate
61~6E	AM	-		DR				AMON/Decay Rate	
71~7E	-			SR				Sustain Rate	
81~8E	SL			RR				Sustain Level/Release Rate	
91~9E	-			SSG-EG				SSG-Type Envelop Control	
A1,A2	F-Num 1								F-Numbers/Block
A5,A6	-		Block		F-Num 2				
A9,AA	2 CH * F-Num 1								
AD,AE	-		2CH*Block		2CH*F-Num2				
B1,B2	-		FB		Connect				Self Feedback/Connection
B5,B6	L	R	AMS		-		PMS		LR SEL./AM,PM SENS

FREQ CONT = 0~7 - 3.98 | 5.56 | 6.02 | 6.37 | 6.88 | 9.63 | 48.1 | 72.2 (Hz)

LFO = "1" - On

PMS = 0~7 - 0 | ±3.4 | ±6.7 | ±10 | ±14 | ±20 | ±40 | ±80

AMS = 0~3 - 0 | 1.44 | 5.9 | 11.8 (dB)

AM = "1" - On