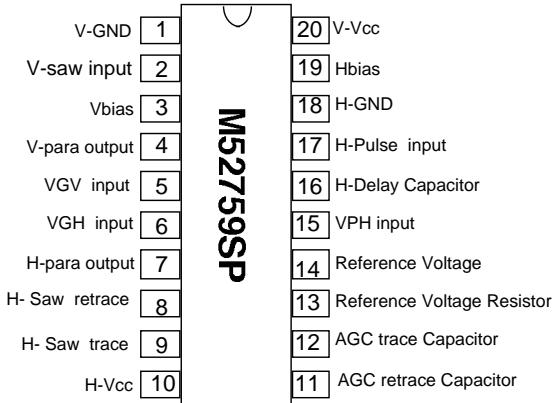


PROVISINAL INFORMATION**M52759SP****UNIFORMITY FOR CRT DISPLAY MONITOR****DESCRIPTION**

M52759SP is Semiconductor Integrated Circuit for uniformity of CRT Display Monitor. It generates horizontal and vertical parabola waves and is able to revise contrast of CRT Display Monitor if it is used with Video Pre. Amp. M52742SP that has uniformity circuit.

FEATURES

- It can control phase of horizontal wave.
- It can changes the parabola wave unbalance .
- It contains the horizontal saw wave generator and Auto Gain Control circuit , so that it is able to keep the amplitude constant if frequency change.
- It can changes the parabola wave unbalance .
- Frequency Band Width: horizontal 24 to 120kHz
vertical 50 to 185Hz
- Input: horizontal 5Vp-p Pulse
vertical 3.2 Vp-p V Saw

PIN CONFIGURATION (TOP VIEW)

Package:20P4B

STRUCTURE

Bipolar Silicon Monolithic IC

APPLICATION

CRT Display Monitor

Supply voltage range

11.5V to 12.5V

Rated supply voltage

12V

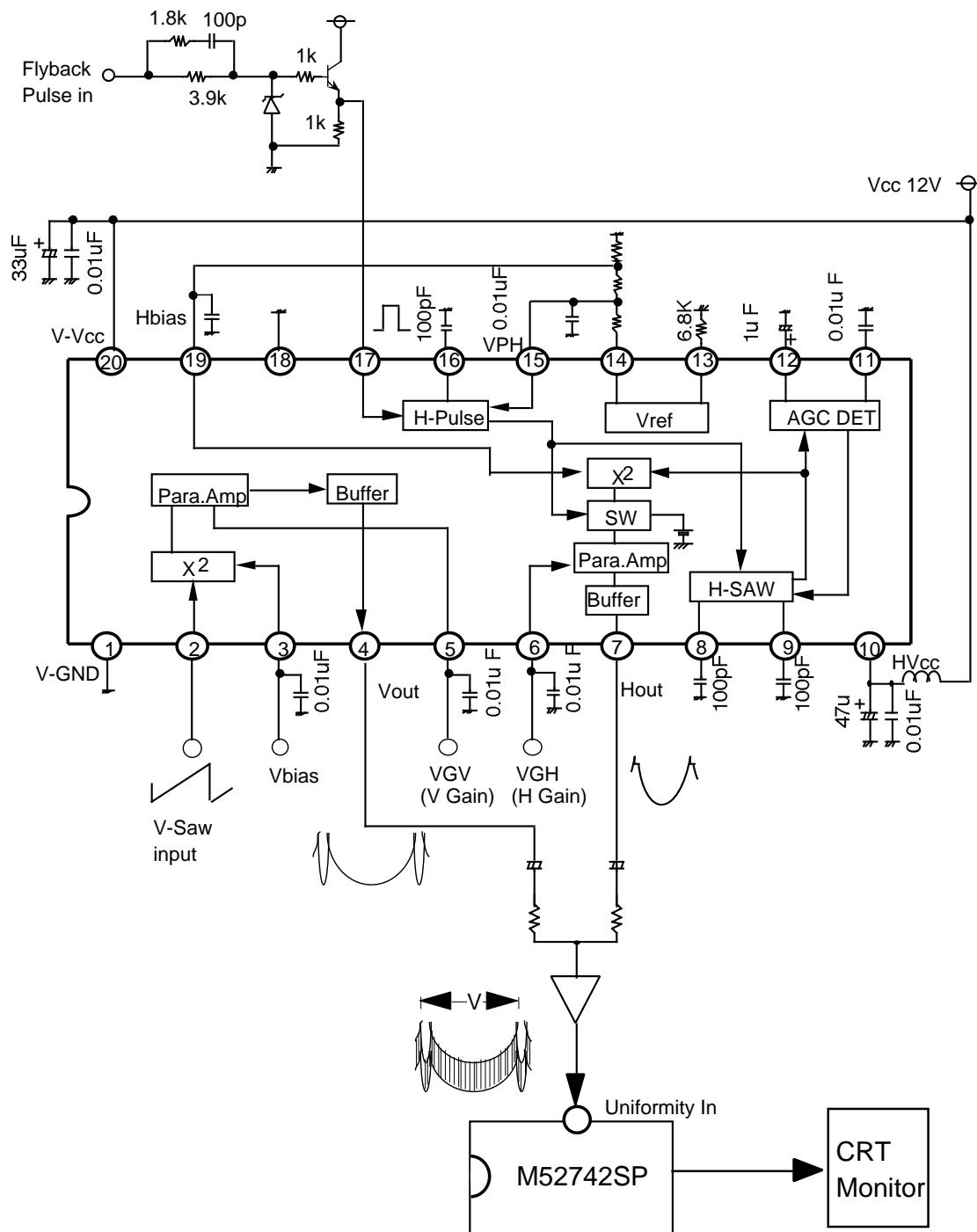
Application Example

FIG1. BLOCK DIAGRAM

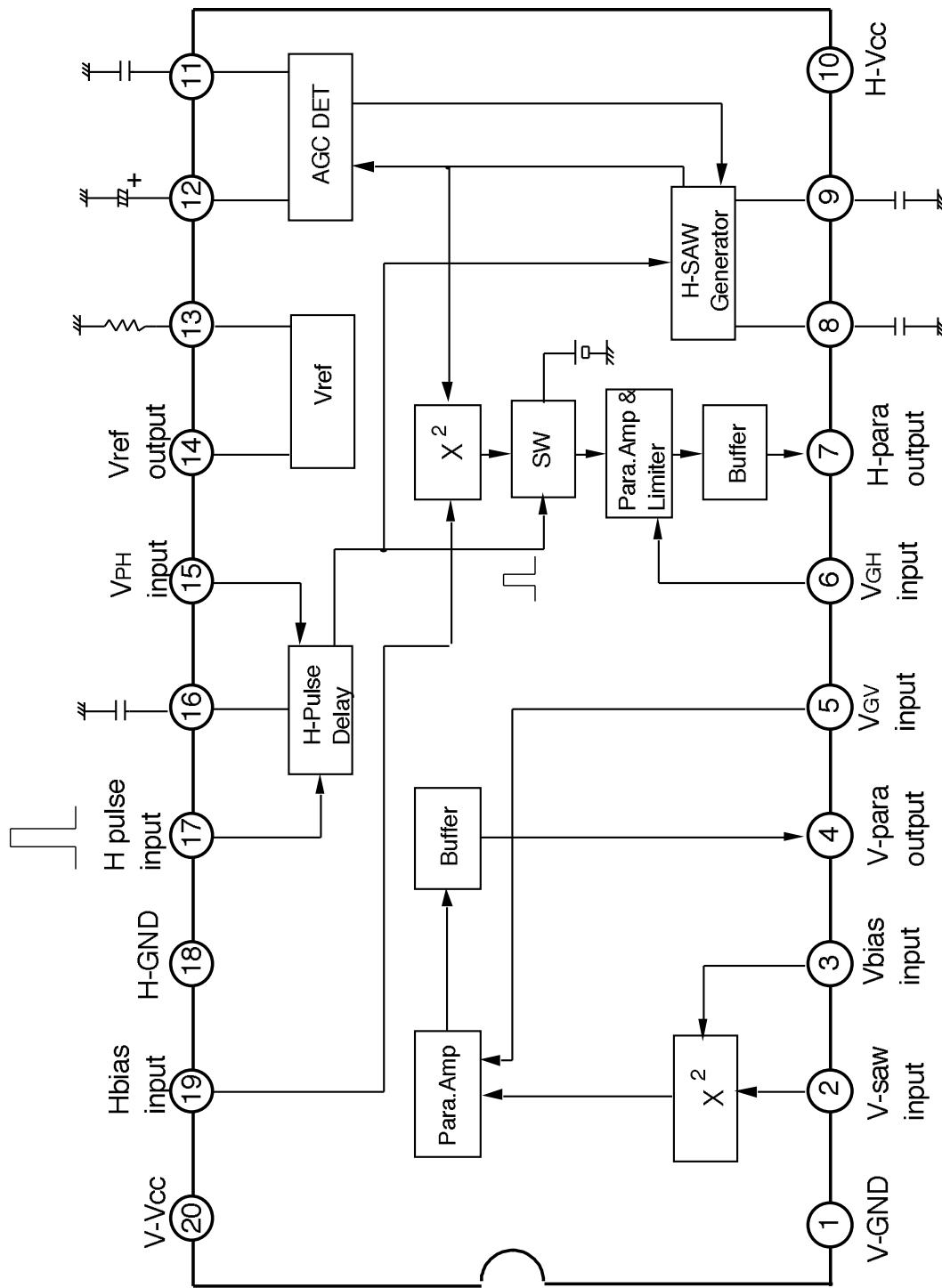
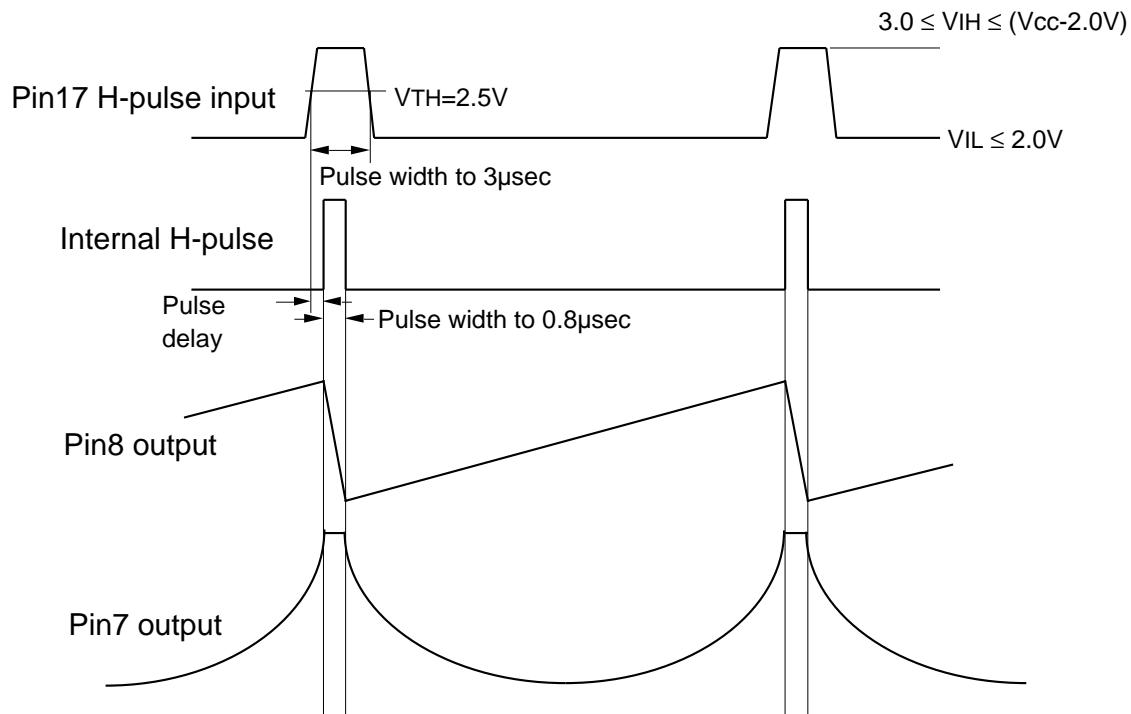
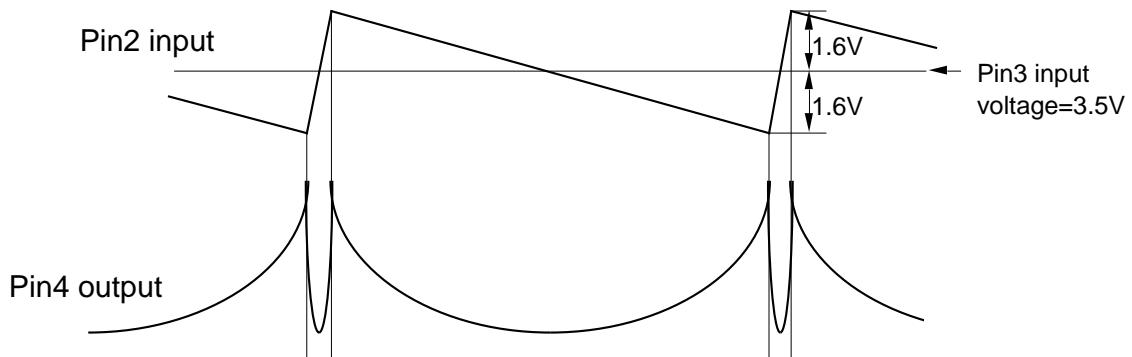


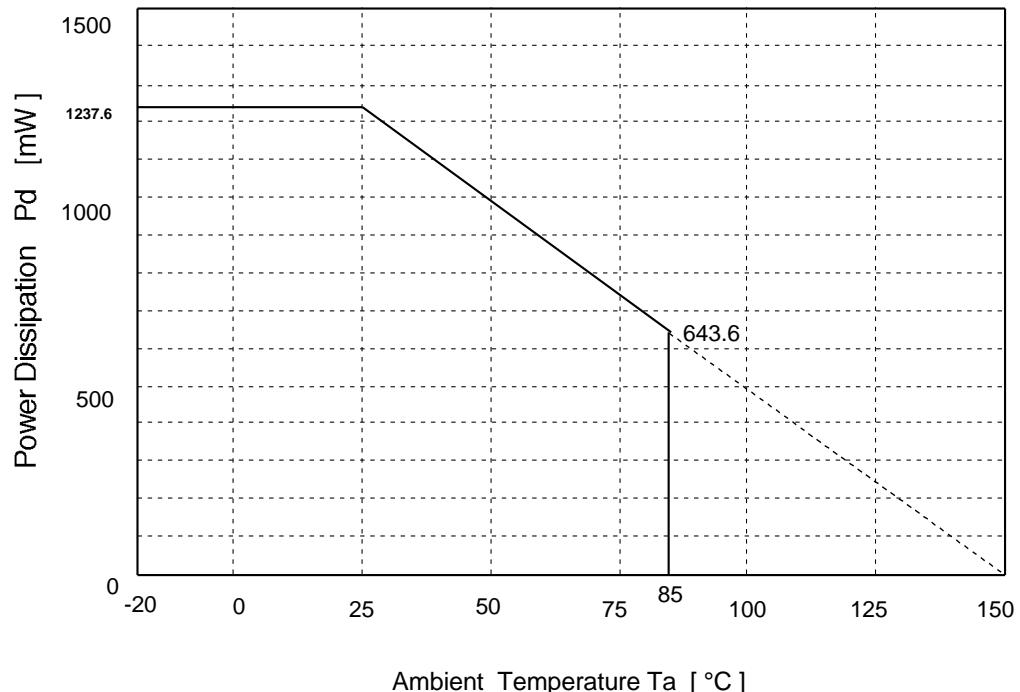
FIG2. TIMING CHART**HORIZONTAL BLOCK****VERTICAL BLOCK**

1. ABSOLUTE MAXIMUM RATING

(Ta = 25°C, Surge capacity=200pF)

Parameter	Symbol	Min.	Typ	Max	Unit
Supply voltage	Vcc	-	-	13.0	V
Power dissipation	Pd	-	-	1237.6	mW
Operating temperature	Topr	-20	-	+85	°C
Storage temperature	Tstg	-40	-	+150	°C
Recommended operating voltage	Vopr	-	12.0	-	V
Recommended operating voltage range	Vopr'	11.5	-	12.5	V
Surge	Vsurge	±200	-	-	V

Fig.3 THERMAL DERATING



2.ELECTRICAL CHARACTERISTICS

(Ta=25°C, Vcc=12V, unless otherwise noted)

No	Parameter	Symbol	Test conditions	Pin	Limits			Unit
					MIN	TYP	MAX	
1	Circuit current1	I _{CCH}	(10) Measure	(10)	15.1	21.5	27.9	mA
2	Circuit current2	I _{CCV}	(20) Measure	(20)	5.2	7.4	9.6	mA
3	Reference voltage output	V _{REF}	(14) Measure	(14)	6.75	6.95	7.15	V
4	Reference voltage temperature drift	D _{REF}	(14) Measure	(14)	—	49	—	ppm/deg

HORIZONTAL BLOCK

No	Parameter	Symbol	Test conditions	Pin	Limit			Unit
					MIN	STYP	MAX	
5	H-pulse low input range	V _{IL}	(6)2.4V in (7)Measure (15)3.0V in (17)fH=96KHz H-pulse in (19)6.1V in	(7)	0.0	—	2.0	V
6	H-pulse high input range	V _{IH}	(6)2.4V in (7)Measure (15)3.0V in (17)fH=96KHz H-pulse in (19)6.1V in	(7)	3.0	—	VCC -2.0	V
7	H-pulse low input current	I _{IL}	(17)0V in,measure	(17)	-5.0	-0.6	-0.1	μA
8	H-pulse high input current	I _{IH}	(17)5V in,measure	(17)	-1.0	0.0	1.0	μA
9	H parabola width	T _W	(6)2.4V in (7)Measure (15)3.0V in (17)fH=96KHz H-pulse in (19)6.1V in	(7)	0.6	0.8	1.0	μsec
10	H parabola delay 1	T _{D1}	(6)2.4V in (7)Measure (15)0V in (17)fH=96KHz H-pulse in (19)6.1V in	(7)	0.1	0.3	0.5	μsec
11	H parabola delay 2	T _{D2}	(6)2.4V in (7)Measure (15)1.3V in (17)fH=96KHz H-pulse in (19)6.1V in	(7)	0.4	0.6	0.8	μsec
12	H parabola delay 3	T _{D3}	(6)2.4V in (7)Measure (15)4.0V in (17)fH=96KHz H-pulse in (19)6.1V in	(7)	2.9	3.1	3.3	μsec
13	Delay temperature drift	D _D	(6)2.4V in (7)Measure (15)3.0V in (17)fH=96KHz H-pulse in (19)6.1V in	(7)	—	0.08	—	ns/deg
14	Pin(15)input current	I ₍₁₅₎	(17)2.5V in,measure	(15)	-5.0	-0.3	-0.1	μA

PROVISINAL INFORMATION

M52759SP

UNIFORMITY FOR CRT DISPLAY MONITOR

No	Parameter	Symbol	Test conditions	Pin	Limits			Unit
					MIN	TYP	MAX	
15	H para. unbalance control1	UHP1	⑥1.8V in ⑦Measure ⑯0V in ⑯fH=96KHz H-pulse in ⑯5.7V in	(7)	-2.6	-2.2	-1.8	V
16	H para. unbalance control2	UHP2	⑥2.4V in ⑦Measure ⑯0V in ⑯fH=96KHz H-pulse in ⑯6.1V in	(7)	0.1	0.5	0.9	V
17	H para. unbalance control3	UHP3	⑥1.8V in ⑦Measure ⑯0V in ⑯fH=96KHz H-pulse in ⑯6.4V in	(7)	1.7	2.1	2.5	V
18	H para. unbalance Vcc. character1	VUHP1	⑥2.4V in ⑦Measure ⑯0V in ⑯⑯11.5V in ⑯fH=96KHz H-pulse in ⑯6.1V in	(7)	-0.2	0.0	0.2	V
19	H para. unbalance Vcc. character2	VUHP2	⑥2.4V in ⑦Measure ⑯0V in ⑯⑯12.5V in ⑯fH=96KHz H-pulse in ⑯6.1V in	(7)	-0.2	0.0	0.2	V
20	H para. unbalance temperature drift	DUHP	⑥2.4V in ⑦Measure ⑯0V in ⑯fH=96KHz H-pulse in ⑯6.1V in	(7)	—	-2.2	—	mV /deg
21	H para. gain control1	GHP1	⑥1.0V in ⑦Measure ⑯3.0V in ⑯fH=96KHz H-pulse in ⑯6.1V in	(7)	0.2	0.4	0.6	Vp-p
22	H para. gain control2	GHP2	⑥2.5V in ⑦Measure ⑯3.0V in ⑯fH=96KHz H-pulse in ⑯6.1V in	(7)	2.9	3.3	3.7	Vp-p
23	H para. gain control3	GHP3	⑥4.0V in ⑦Measure ⑯3.0V in ⑯fH=96KHz H-pulse in ⑯6.1V in	(7)	5.3	6.0	6.7	Vp-p
24	H para. freq. characteristics1	FHP1	⑥4.0V in ⑦Measure ⑯3.0V in ⑯fH=24KHz H-pulse in ⑯6.1V in	(7)	-0.2	0.0	0.2	V
25	H para. freq. characteristics2	FHP2	⑥4.0V in ⑦Measure ⑯3.0V in ⑯fH=120KHz H-pulse in ⑯6.1V in	(7)	-0.2	0.0	0.2	V
26	H para. Vcc. characteristics1	VVHP1	⑥4.0V in ⑦Measure ⑯3.0V in ⑯⑯11.5V in ⑯fH=96KHz H-pulse in ⑯6.1V in	(7)	-0.2	0.0	0.2	V
27	H para. Vcc. characteristics2	VVHP2	⑥4.0V in ⑦Measure ⑯3.0V in ⑯⑯12.5V in ⑯fH=96KHz H-pulse in ⑯6.1V in	(7)	-0.2	0.0	0.2	V
28	H para. size temperature drift	DHP	⑥4.0V in ⑦Measure ⑯3.0V in ⑯fH=96KHz H-pulse in ⑯6.1V in	(7)	—	-1.3	—	mV/deg
29	Pin⑯ input current	I⑯	⑥2.4V in,measure	(6)	-5.0	-0.3	-0.1	µA
30	Pin⑯ input current	I⑯	⑯6.1V in,measure	(19)	0.1	0.3	5.0	µA

VERTICAL BLOCK

No	Parameter	Symbol	Test conditions	Pin	Limits			Unit
					MIN	TYP	MAX	
31	V parabola accuracy 1	AVP1	② 3.5V in ③ 3.5V in ④ Measure ⑤ 2.3V in	(4)	4.5	5.0	5.5	V
32	V parabola accuracy 2	AVP2	② 1.9V in ③ 3.5V in ④ Measure ⑤ 2.3V in	(4)	2.5	3.0	3.5	V
33	V parabola accuracy 3	AVP3	② 2.7V in ③ 3.5V in ④ Measure ⑤ 2.3V in	(4)	20	25	30	%
34	V parabola accuracy 4	AVP4	② 4.3V in ③ 3.5V in ④ Measure ⑤ 2.3V in	(4)	20	25	30	%
35	V parabola accuracy 5	AVP5	② 5.1V in ③ 3.5V in ④ Measure ⑤ 2.3V in	(4)	90	100	110	%
36	V para. unbalance control1	UVP1	② fv=70Hz, 3.2Vpp saw wave in ③ 2.8V in ④ Measure ⑤ 1.6V in	(4)	-2.8	-2.5	-2.2	V
37	V para. unbalance control2	UVP2	② fv=70Hz, 3.2Vpp saw wave in ③ 3.5V in ④ Measure ⑤ 2.3V in	(4)	-0.3	0	0.3	V
38	V para. unbalance control3	UVP3	② fv=70Hz, 3.2Vpp saw wave in ③ 4.2V in ④ Measure ⑤ 1.6V in	(4)	2.2	2.5	2.8	V
39	V unbalance. Vcc. characteristics 1	VUVP1	② fv=70Hz, 3.2Vpp saw wave in ③ 3.5V in ④ Measure ⑤ 2.3V in ⑩ ⑪ ⑫ ⑬ ⑭ 11.5V in	(4)	-0.1	0.0	0.1	V
40	V unbalance. Vcc. characteristics 2	VUVP2	② fv=70Hz, 3.2Vpp saw wave in ③ 3.5V in ④ Measure ⑤ 2.3V in ⑩ ⑪ ⑫ ⑬ ⑭ 12.5V in	(4)	-0.1	0.0	0.1	V
41	V unbalance. temperature drift	DUVP	② fv=70Hz, 3.2Vpp saw wave in ③ 3.5V in ④ Measure ⑤ 2.3V in	(4)	—	0.5	—	mV/deg
42	V parabola amplitude 1	GVP1	② fv=70Hz, 3.2Vpp saw wave in ③ 3.5V in ④ Measure ⑤ 1.0V in	(4)	0	0	0.3	Vp-p
43	V parabola amplitude 2	GVP2	② fv=70Hz, 3.2Vpp saw wave in ③ 3.5V in ④ Measure ⑤ 2.0V in	(4)	2.1	2.4	2.7	Vp-p
44	V parabola amplitude 3	GVP3	② fv=70Hz, 3.2Vpp saw wave in ③ 3.5V in ④ Measure ⑤ 3.0V in	(4)	4.2	4.7	5.2	Vp-p
45	V para. freq. characteristics 1	FVP1	② fv=50Hz, 3.2Vpp saw wave in ③ 3.5V in ④ Measure ⑤ 3.0V in	(4)	-0.1	0.0	0.1	V
46	V para. freq. characteristics 2	FVP2	② fv=185Hz, 3.2Vpp saw wave in ③ 3.5V in ④ Measure ⑤ 3.0V in	(4)	-0.1	0.0	0.1	V
47	V para. Vcc. characteristics 1	VVP1	② fv=70Hz, 3.2Vpp saw wave in ③ 3.5V in ④ Measure ⑤ 3.0V in ⑩ ⑪ ⑫ ⑬ ⑭ 11.5V in	(4)	-0.1	0.0	0.1	V
48	V para. Vcc. characteristics 2	VVP2	② fv=70Hz, 3.2Vpp saw wave in ③ 3.5V in ④ Measure ⑤ 3.0V in ⑩ ⑪ ⑫ ⑬ ⑭ 12.5V in	(4)	-0.1	0.0	0.1	V
49	V para. temperature drift	DVP	② fv=70Hz, 3.2Vpp saw wave in ③ 3.5V in ④ Measure ⑤ 3.0V in	(4)	—	-2.2	—	mV/deg
50	Pin② input current	I②	② 3.5V in, measure	(2)	-5.0	-0.3	-0.1	μA
51	Pin③ input current	I③	③ 3.5V in, measure	(3)	-5.0	-0.3	-0.1	μA
52	Pin⑤ input current	I⑤	⑤ 2.3V in, measure	(5)	-5.0	-0.3	-0.1	μA

Switch and Voltage Condition

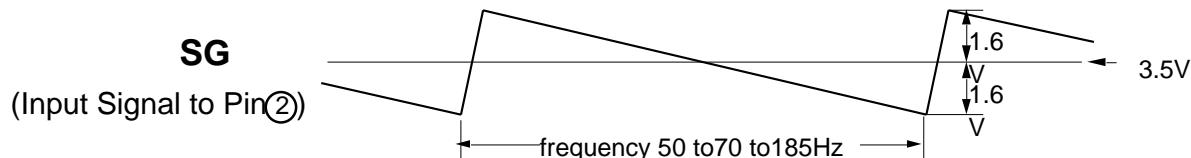
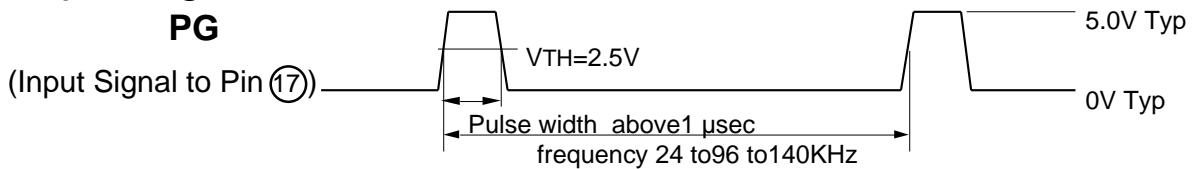
No	Symbol	Switch									Voltage [V]							
		SW2	SW3	SW5	SW6	SW10	SW15	SW17	SW19	SW20	Vcc	V2	V3	V5	V6	V15	V17	V19
1	I _{CCH}	a	a	a	a	b	a	b	a	a	12.0	3.5	3.5	2.5	2.4	3.0	0	6.1
2	I _{CCV}					a				b								
3	V _{REF}									a								
4	D _{REF}									▼								
5	V _{IL}								a							-		
6	V _{IH}								▼								▼	
7	I _{IL}								b							0		
8	I _{IH}								▼							5.0		
9	T _W								a							▼	-	
10	T _{D1}															0		
11	T _{D2}															1.3		
12	T _{D3}															4.0		
13	DD						▼	▼								3.0	▼	
14	I ₍₁₅₎					b	b									▼	-	0
15	U _{HPI}					a	a									1.8	0	-
16	U _{HPS}															2.4		6.1
17	U _{HPT}										▼					1.8		6.4
18	V _{UHP1}										11.5					2.4		6.1
19	V _{UHP2}										12.5							
20	D _{UHP}										12.0					▼	▼	
21	G _{HPI}															1.0	3.0	
22	G _{HPS}															2.5		
23	G _{HPT}															4.0		
24	F _{HPI}																	
25	F _{HPS}										▼							
26	V _{VHP1}										11.5							
27	V _{VHP2}										12.5							
28	D _{HPS}							▼		▼	12.0					▼	▼	
29	I ₍₆₎					b			b	▼						-	0	▼
30	I ₍₁₉₎					▼	▼	▼	a	▼	▼	b	▼	▼	▼	2.4	▼	▼

PROVISINAL INFORMATION

M52759SP

UNIFORMITY FOR CRT DISPLAY MONITOR

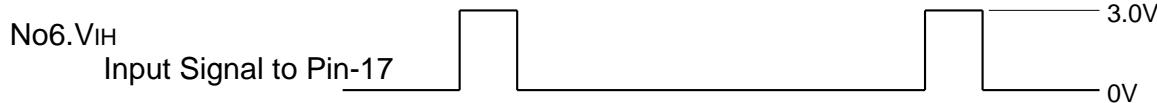
No	Symbol	Switch										Voltage [V]							
		SW2	SW3	SW5	SW6	SW10	SW15	SW17	SW19	SW20	Vcc	V2	V3	V5	V6	V15	V17	V19	
31	AVP1	a	a	a	a	a	a	b	a	a	12.0	3.5	3.5	2.3	2.4	3.0	0	6.1	
32	AVP2											1.9							
33	AVP3											2.7							
34	AVP4											4.3							
35	AVP5											5.1							
36	UVP1	b										-	2.8	1.6					
37	UVP2												3.5	2.3					
38	UVP3											↓	4.2	1.6					
39	VUVP1											11.5		3.5	2.3				
40	VUVP2											12.5							
41	DUVP											12.0							
42	GVP1														1.0				
43	GVP2														2.0				
44	GVP3														3.0				
45	FVP1																		
46	FVP2											↓							
47	VVP1											11.5							
48	VVP1											12.5							
49	DVP	↓										12.0	↓		↓				
50	I _②	c	↓										3.5		2.3				
51	I _③	a	b	↓											↓				
52	I _⑤		↓	a	b	↓	↓	↓	↓	↓		↓	↓	↓	↓	-	↓	↓	↓

Input Signal**The way to measure**

- No1.ICCH Measure the input current to Pin-10.
- No2.ICCV Measure the input current to Pin-20.
- No3.VREF Measure the output voltage at Pin-14
- No4.VREF Measure temperature drift of Pin-14 .(-20°C to 85°C)



Input horizontal pulse which low level is 2V in Pin-17 and confirm output horizontal signal at Pin-7.

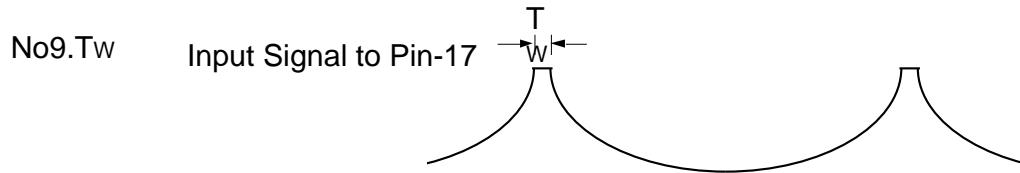


Input horizontal pulse which high level is 3V in Pin-17 and confirm output horizontal signal at Pin-7.

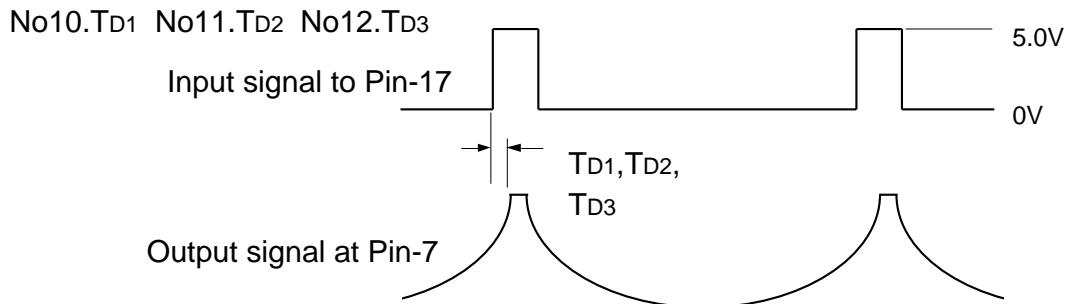
PROVISINAL INFORMATION

M52759SP

UNIFORMITY FOR CRT DISPLAY MONITOR



Measure the time width of retrace period at Pin-7.

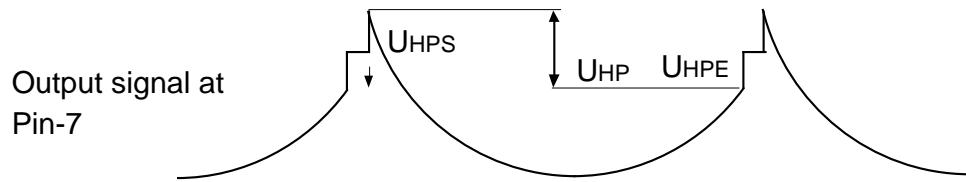


Measure the delay time from rise time of input signal to start of retrace period of output signal when the voltage of Pin-15 is 0V, 1.3V, and 4V.

NO13.D D Measure the temperature drift of the delay time. (-20°C to 85°C)

NO14.I-15 Measure the input current to Pin-15 when the voltage of Pin-15 is 2.5V.

No15.UHP1 No16.UHP2 No17.UHP3



UHPS is defined as the voltage of parabola start point . UHPE is defined as the voltage of parabola end point .UHP1 UHP2 UHP3 is defined as follows

$$UHP1 \ UHP2 \ UHP3 = UHPS - UHPE$$

Measure the unbalance of parabola waveform at Pin-4 when the voltage of Pin-19 is 5.7V, 6.1V, and 6.4V. Pin-6 is controled so that the amplitude of parabola is 3Vp-p constant.

PROVISINAL INFORMATION

M52759SP

UNIFORMITY FOR CRT DISPLAY MONITOR

No18.VUHP1 When the supply voltage of Pin-10,20 is 11.5V, the unbalance of parabola waveform at Pin-7 is defined as U_{HP}11.5V.

$$V_{UHP1} = U_{HP2} - U_{HP11.5V}$$

No19.VUHP2 When the supply voltage of Pin-10,20 is 12.5V, the unbalance of parabola waveform at Pin-7 is defined as U_{HP}12.5V.

$$V_{UHP2} = U_{HP2} - U_{HP12.5V}$$

No20.D_{UHP} Measure temperature drift of U_{HP}2 . (-20°C to 85°C)

No21.G_{HP1} Measure the amplitude of parabola waveform at Pin-7 and it is defined as HP_{-6,1.0V}

No22.G_{HP2} The amplitude of parabola waveform at Pin-7 is defined as HP_{-6,2.5V}.

No23.G_{HP2} The amplitude of parabola waveform at Pin-7 is defined as HP_{-6,4.0V}.

NO24.F_{HP1} When the frequency of input signal in Pin-17 is 96kHz , the amplitude of parabola waveform at Pin-7 is defined as HP_{96KHZ}. When the frequency of input signal is 24kHz , the amplitude of parabola waveform is defined as HP_{24KHZ}.

$$F_{HP1} = HP_{96KHZ} - HP_{24KHZ}$$

NO25.F_{HP2} When the frequency of input signal in Pin-17 is 140kHz , the amplitude of parabola waveform at Pin-7 is defined as HP_{120KHZ}.

$$F_{HP2} = HP_{96KHZ} -$$

$$HP_{140KHZ}$$

NO26.Vv_{HP1} When the supply voltage of Pin-10,20 is 12.0V, the amplitude of parabola waveform at Pin-7 is defined as HP_{12.0V}. When the supply voltage is 11.5V, the amplitude of parabola waveform is defined as HP_{11.5V}.

$$V_{vHP1} = HP_{12.0V} - HP_{11.5V}$$

NO27.Vv_{HP2} When the supply voltage of Pin-10,20 is 12.5V, the amplitude of parabola waveform at Pin-7 is defined as HP_{12.5V}.

$$V_{vHP2} = HP_{12.0V} - HP_{12.5V}$$

No28.D_HP Measure the temperature drift of HP_{96KHZ}. (-20°C to 85°C)

No29.I-6 Measure the input current to Pin-6 when voltage of Pin-6 is 2.4V.

No30.I-19 Measure the input current to Pin-19 when voltage of Pin-19 is 6.1V.

PROVISINAL INFORMATION

M52759SP

UNIFORMITY FOR CRT DISPLAY MONITOR

No31.AVP1 Measure the output voltage at Pin-4 and it is defined as VP_{-2,3.5V}.

No32.AVP2 The output voltage at Pin-4 is defined as VP_{-2,1.9V}.

$$\text{AVP2} = \text{VP}_{-2,1.9\text{V}} - \text{VP}_{-2,3.5\text{V}}$$

No33.AVP3 The output voltage at Pin-4 is defined as VP_{-2,2.7V}.

$$\text{AVP3} = \frac{\text{VP}_{-2,2.7\text{V}} - \text{VP}_{-2,3.5\text{V}}}{\text{VP}_{-2,1.9\text{V}} - \text{VP}_{-2,3.5\text{V}}} \times 100 \text{ (%)}$$

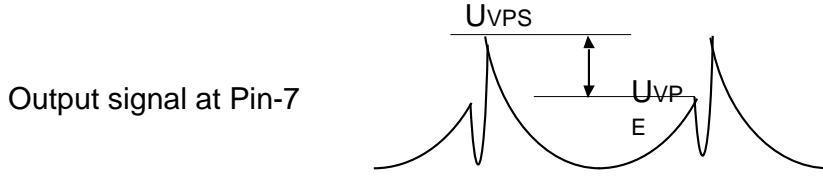
No34.AVP4 The output voltage at Pin-4 is defined as VP_{-2,4.3V}.

$$\text{AVP4} = \frac{\text{VP}_{-2,4.3\text{V}} - \text{VP}_{-2,3.5\text{V}}}{\text{VP}_{-2,1.9\text{V}} - \text{VP}_{-2,3.5\text{V}}} \times 100 \text{ (%)}$$

No35.AVP5 The output voltage at Pin-4 is defined as VP_{-2,5.1V}.

$$\text{AVP5} = \frac{\text{VP}_{-2,5.1\text{V}} - \text{VP}_{-2,3.5\text{V}}}{\text{VP}_{-2,1.9\text{V}} - \text{VP}_{-2,3.5\text{V}}} \times 100 \text{ (%)}$$

No36.UVP1 No37.UVP2 No38.UVP3



UVPS is defined as the voltage of parabola start point . UVE is defined as the voltage of parabola end point .UVP1 UVP2 UVP3 is defined as follows

$$\text{UVP1 UVP2 UVP3} = \text{UVPS} - \text{UVE}$$

Measure the unbalance of parabola waveform at Pin-4 when the voltage of Pin-3 is 2.8V,3.5V, and 4.2V. Pin-5 is controled so that the amplitude of parabola is 3Vp-p constant

No39.VVP1 When the supply voltage of Pin-10,20 is 11.5V, the unbalance of parabola waveform at Pin-4 is defined as UVP11.5V.

$$\text{VUHP1} = \text{UVP2} - \text{UVP11.5V}$$

No40.VVP2 When the supply voltage of Pin-10,20 is 12.5V, the unbalance of parabola waveform at Pin-4 is defined as UVP12.5V.

$$\text{VUVP2} = \text{UVP2} - \text{UVP12.5V}$$

No41.DVP Measure temperature drift of UVP2 .(-20°C to 85°C)

No42.GVP1 No43.GVP2

No44.GVP3 Measure the amplitude of parabola waveform at Pin-4 when the voltage of Pin-5 is 1V,2V, and 3V.

No45.FVP1 When the frequency of input signal in Pin-2 is 70Hz ,the amplitude of parabola waveform at Pin-4is defined as VP_{70Hz} . When the frequency of input signal is 50Hz ,the amplitude of parabola waveform is defined as VP_{50Hz} .
 $FVP1 = VP_{70Hz} - VP_{50Hz}$

No46.FVP2 When the frequency of input signal in Pin-2 is185Hz ,the amplitude of parabola waveform at Pin-4 is defined as VP_{185Hz} .

$$FVP2 = VP_{70Hz} - VP_{185Hz}$$

No47.VVP1 When the voltage of Pin-10,20 is 12.0V,the amplitude of parabola waveform is defined as $VP_{12.0V}$. When the voltage is 11.5V,the amplitude of parabola waveform is defined as $VP_{11.5V}$.

$$VVP1 = VP_{12.0V} - VP_{11.5V}$$

No48.VVP2 When the voltage of Pin-10,20 is 12.5V,the amplitude of parabola waveform is defined as $VP_{12.5V}$.

$$VVP2 = VP_{12.0V} - VP_{12.5V}$$

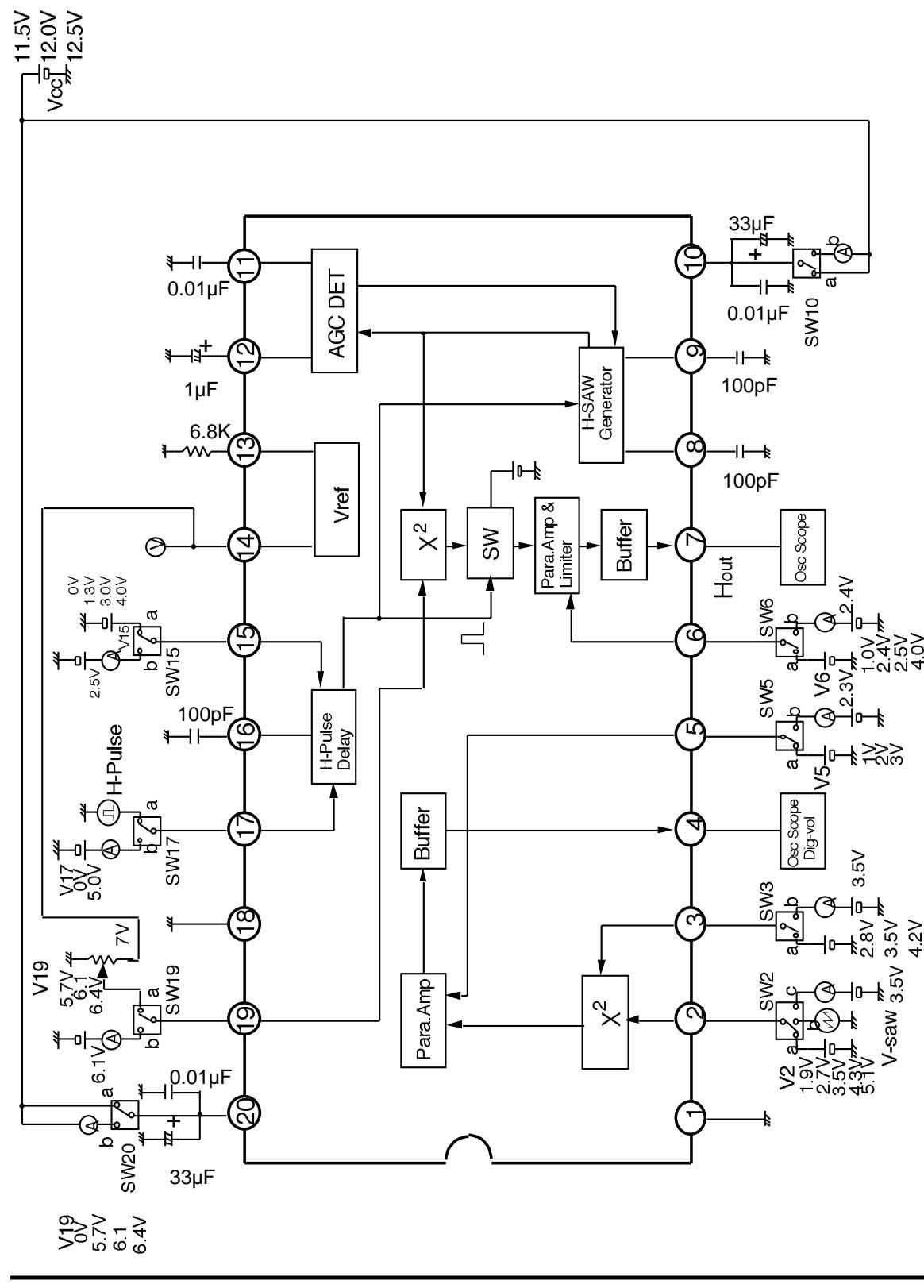
No49.DuVP Measure temperature drift of VP_{70Hz} . (-20°C to 85°C)

No50.I-2 Measure the input current to Pin-2 when the voltage of Pin-2 is 3.5V.

No51.I-3 Measure the input current to Pin-3when the voltage of Pin-3 is 3.5V.

No52.I-5 Measure the input current to Pin-5when the voltage of Pin-5 is 2.4V.

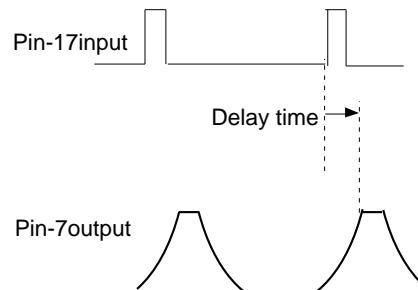
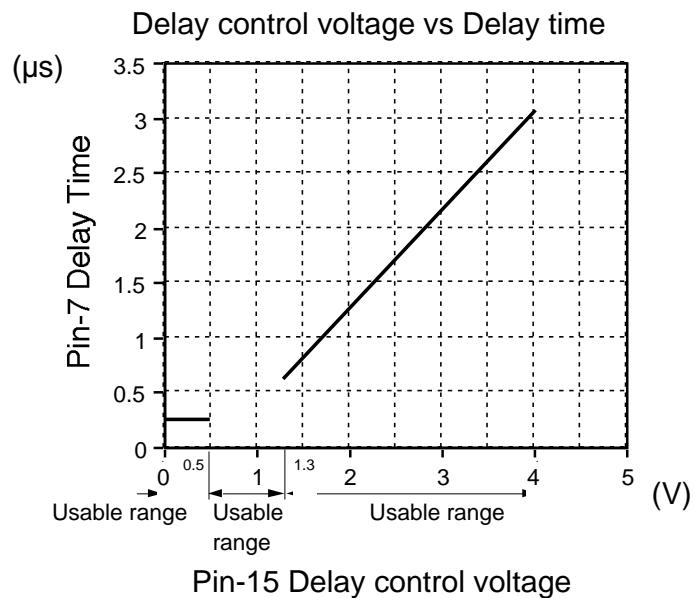
TEST CIRCUIT



3.TYPICAL CHARACTERISTICS

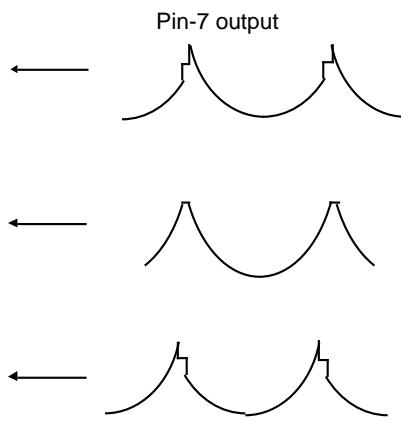
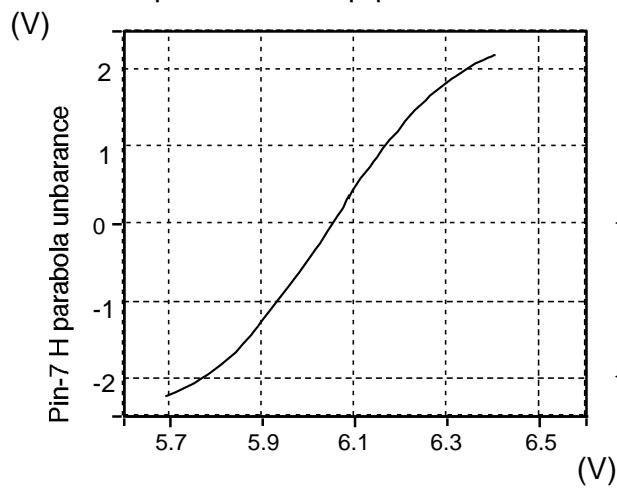
Note: This is not final characteristics.

Horizontal Block

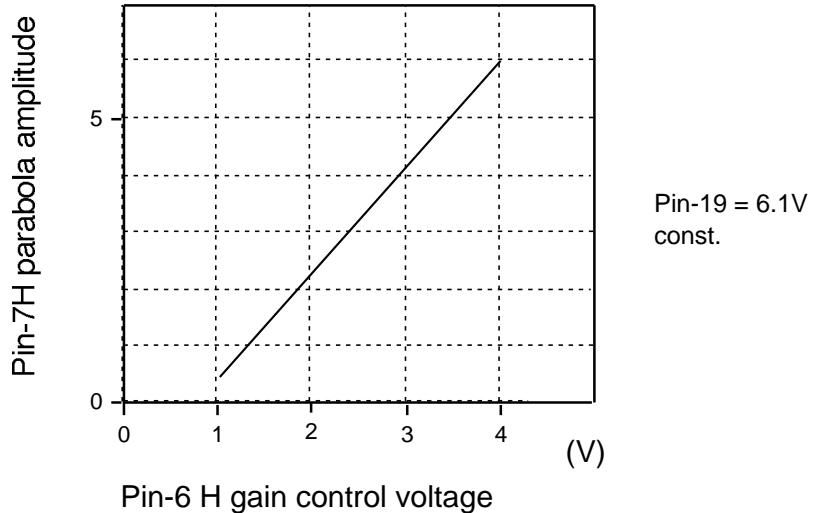


H unbarance control bias voltage vs H parabola unbarance

Pin-6 is controled as the amplitude of parabola is 3Vp-p constant

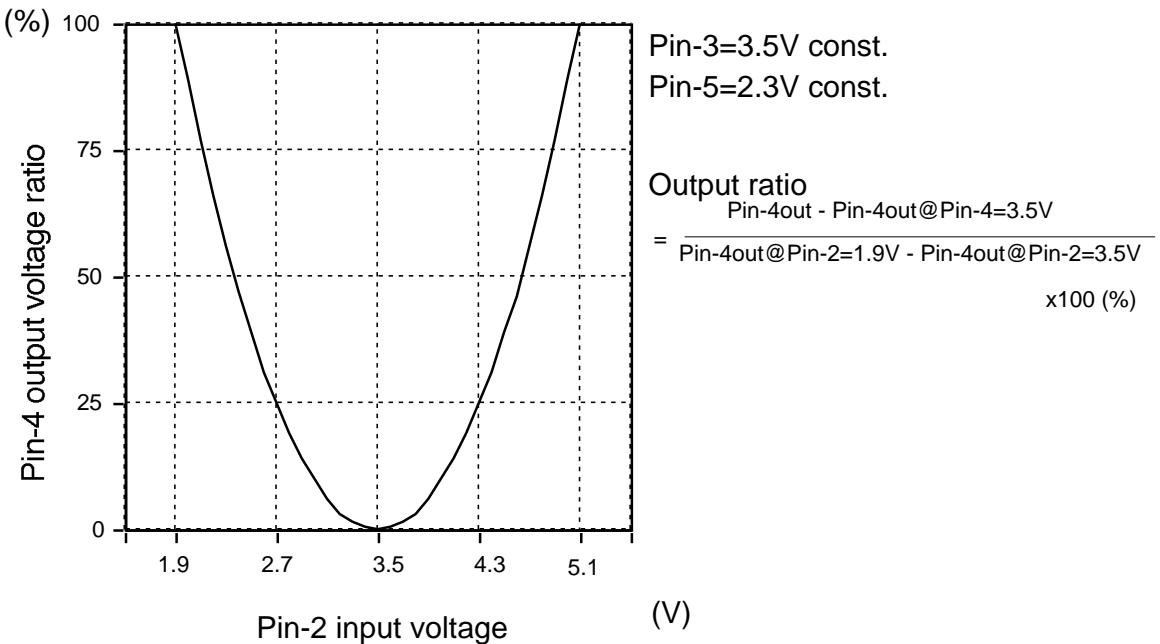


H gain control voltage vs H parabola amplitude

(V_{p-p})

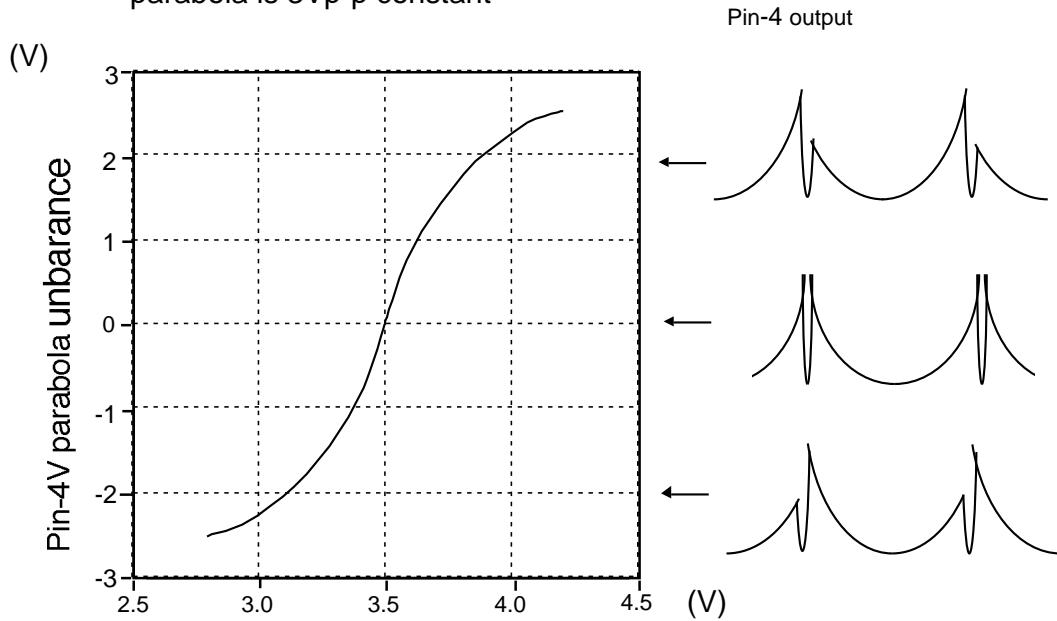
Vertical Block

V para DC output voltage ratio



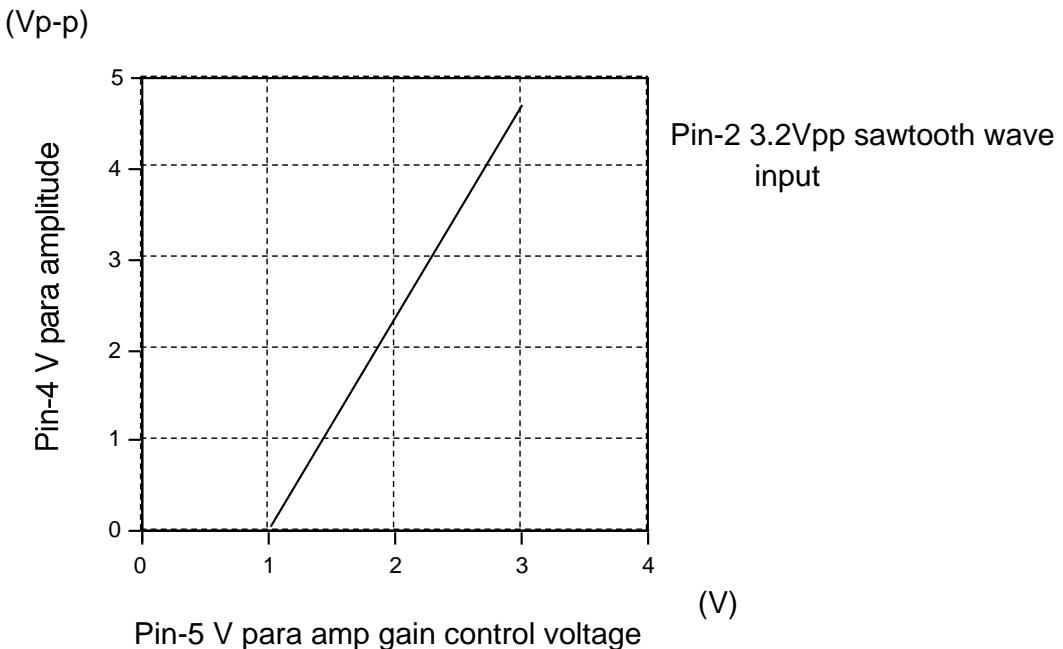
V unbarance control bias voltage vs V parabola unbarance

Pin-5 is controled as the amplitude of
parabola is 3Vp-p constant

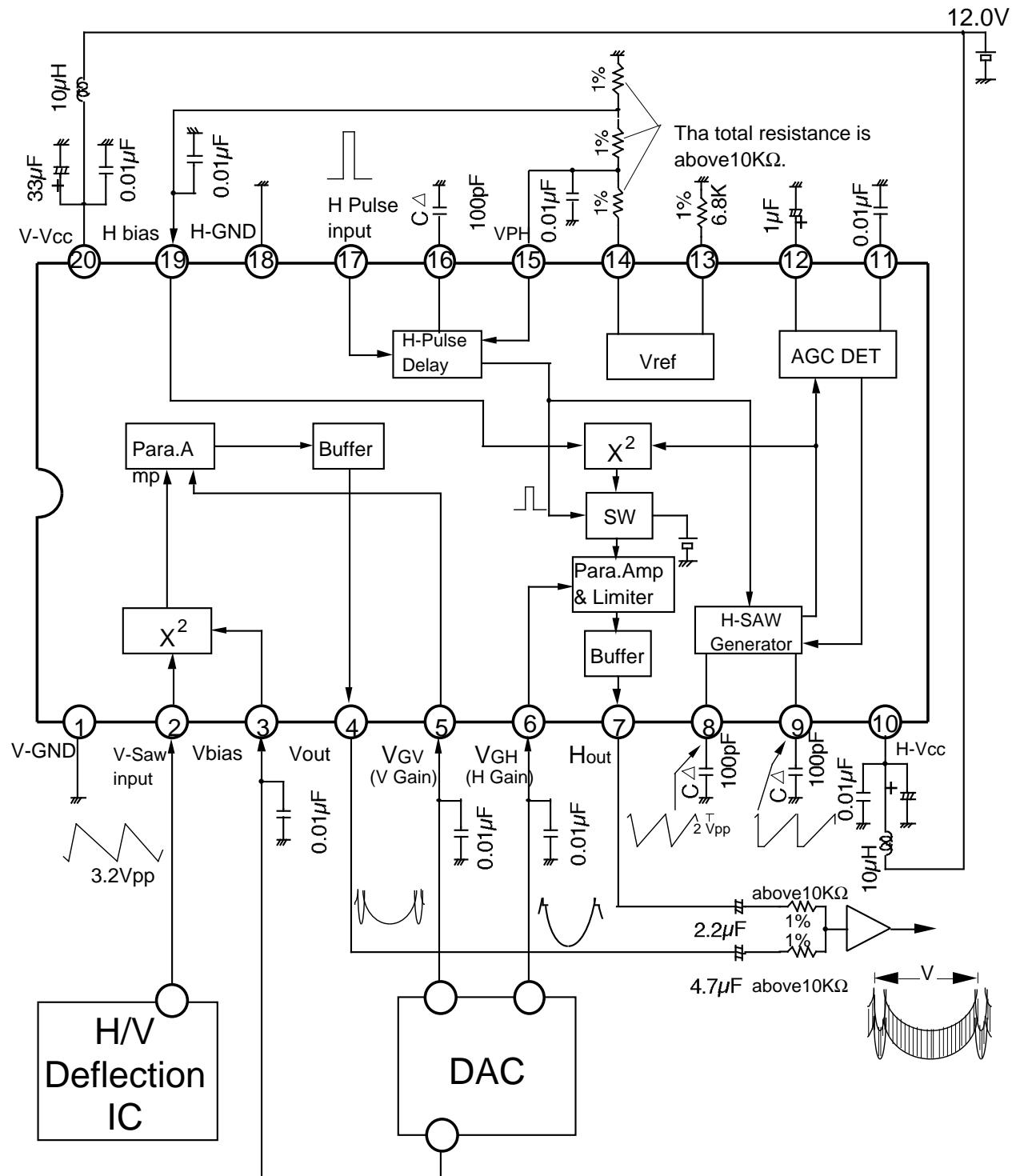


Pin-3 V unbarance control bias voltage

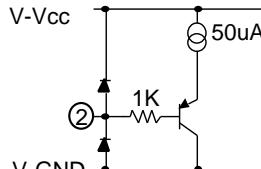
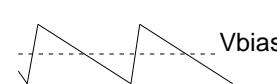
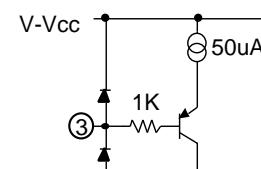
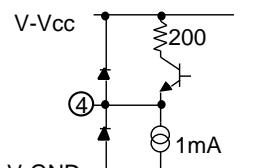
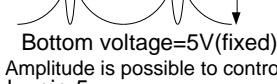
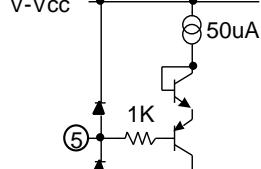
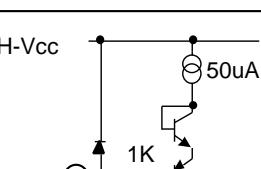
V para amp gain control voltage vs output amplitude



APPLICATION EXAMPLE

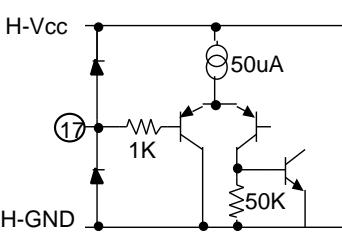
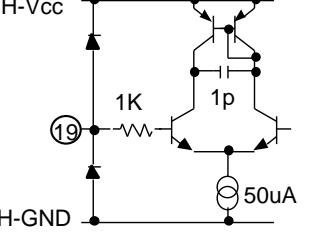


4.DESCRIPTION OF PIN

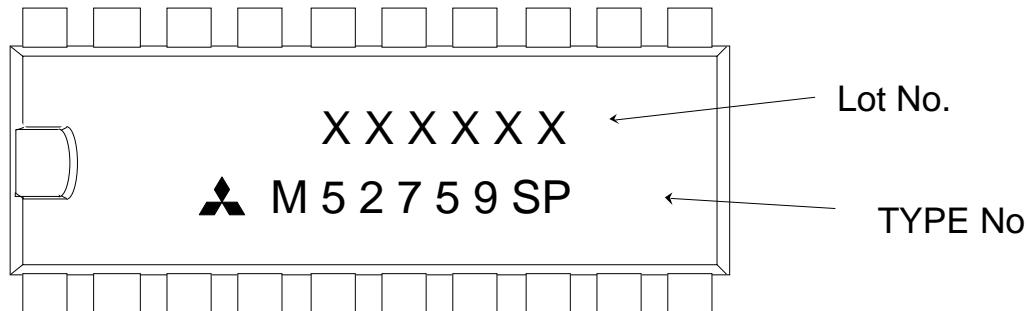
Pin NO	Name	DC Voltage	Equivalent circuit of pin	Remarks
1	V-GND			GND of vertical block
2	Vsawi	3.5V		Vertical sawtooth wave input pin. 
3	Vbias	2.8 to 4.2V		Vertical parabola unbalance control bias voltage input pin. Input voltage range is 2.8 to 4.2V
4	Vout	5V (Bottom)		Vertical parabola wave output pin.  Bottom voltage=5V(fixed) Amplitude is possible to control by pin-5
5	VGV	1.0 to 3.0V		Vertical parabola wave gain control voltage input pin. Input voltage range is 1.0 to 3.0V.
6	VGH	1.0 to 4.0V		Horizontal parabola wave gain control voltage input pin. Input voltage range is 1.0 to 4.0V.

Pin NO	Name	DC Voltage	Equivalent circuit of pin	Remarks
7	Hout	2.4 to 9.2V	<p>Pin 7 is a horizontal parabola wave output pin. The amplitude is controllable via Pin 6.</p>	horizontal parabola wave output pin. Amplitude is possible to control by pin-6.
8	Cret	7.1V (Top) 4.9V (Bottom)	<p>Pin 8 is a connection pin for the horizontal retrace capacitor. Recommended capacitance is 100pF.</p>	Connection pin of horizontal retrace capacitor. Recommended capacitance is 100pF.
9	Ctrc	7.1V (Top) 4.9V (Bottom)	<p>Pin 9 is a connection pin for the horizontal trace capacitor. Recommended capacitance is 100pF.</p>	Connection pin of horizontal trace capacitor. Recommended capacitance is 100pF.
10	H-Vcc	12.0V		Vcc of horizontal block.
11	CAGCR	2.5V	<p>Pin 11 is a connection pin for the horizontal sawtooth wave AGC retrace capacitor. Recommended capacitance is 0.01μF.</p>	Connection pin of horizontal sawtooth wave AGC retrace capacitor. Recommended capacitance is 0.01μF

Pin NO	Name	DC Voltage	Equivalent circuit of pin	Remarks
12	CAGC	4.0V		Connection pin of horizontal AGC capacitor. Recommended capacitance is 1μF.
13	Vrefr	1.28V		Connection pin of reference current source register. Recommended resistance is 6.8kΩ.
14	Vrefo	7.0V		Reference voltage output for horizontal pulse delay circuit. Should be connect more than 10kΩ external resistor.
15	VPH	0 to 0.5V 1.34. to V		Delay adjustment voltage input pin of horizontal pulse. Input voltage range is 1.3 to 4.0V. At 0 to 0.5V, delay is minimized. (0.5 to 1.3V is unusable range.)
16	Chpd	0V (Bottom)		Connection pin of horizontal pulse delay timing capacitor. Recommended capacitance is 100pF.

Pin NO	Name	DC Voltage	Equivalent circuit of pin	Remarks
17	HPin			Horizontal pulse input pin. Low input level is less than 2.0V, and high is 3.0 to 10V(at Vcc=12V).
18	H-GND			GND of horizontal block
19	Hbias	5.7 to 6.4V		Horizontal parabolall unbalance control bias voltage input pin. Input Voltage range is 5.7 to 6.4V.
20	V-Vcc	12.0V		Vcc of vertical block

5. MARK



6. Material

Frame	Copper alloy
Lead plating	Solder plating
Resin	Epoxy resin

7. Factory of massproduction

FUKUOKA Factory