

MITSUBISHI ICs (VCR)
M52062AFP

S-VHS SYSTEM VCR CHROMA SIGNAL PROCESSOR

DESCRIPTION

The M52062AFP processes VHS and S-VHS VCR color signals.
This circuit consists of main and sub B.M.'s, burst-up/down switch, VCXO, 320-fh VCO, ACC, APC, AFC, killer circuit, side lock detector, burst error correcter (PAL), pilot burst set/cancellation switch and pilot APC.

FEATURES

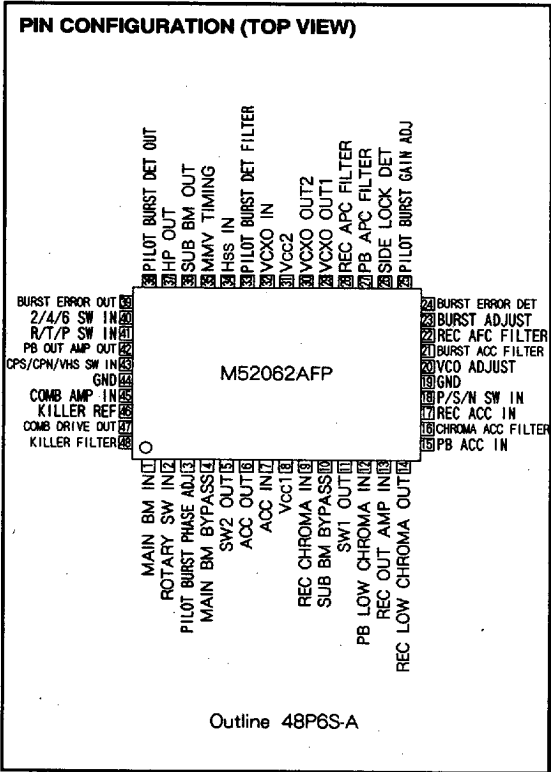
- Can be tuned to NTSC, PAL including S-VHS and modified SECAM.
- Provided with all signal processing circuits required for S-VHS PAL.
- Has a chroma ACC circuit that improves S/N when signals of low color saturation are processed in recording.
- The LC tank system VCO circuit betters PM S/N.
- Low power dissipation. (200mW for playback)

APPLICATION

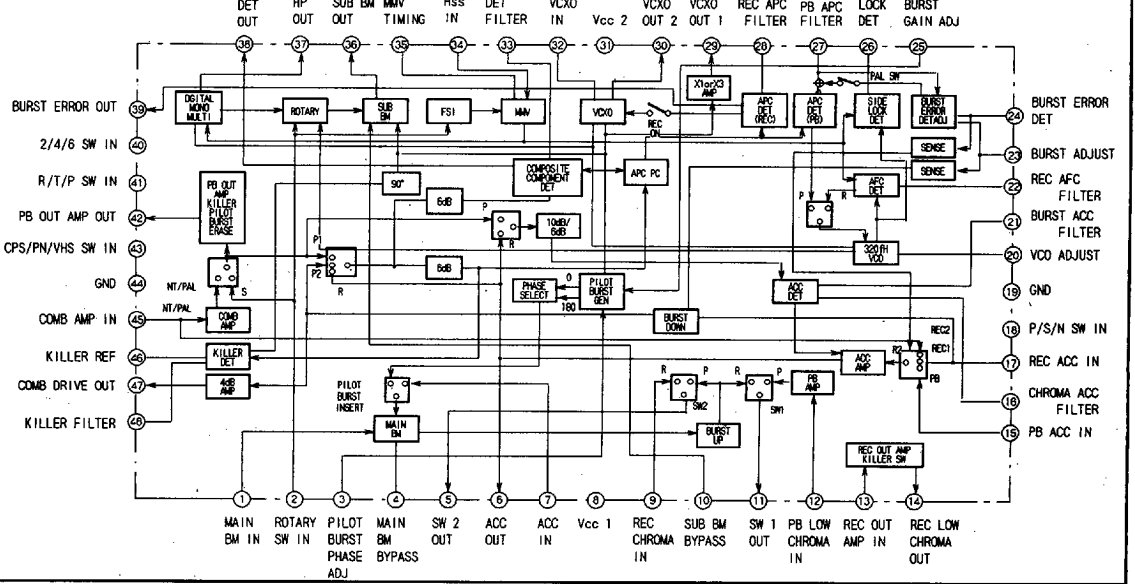
VCR

RECOMMENDED OPERATING CONDITION

Supply voltage 4.5~5.5V
Rated supply voltage 5.0V



BLOCK DIAGRAM



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ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Ratings	Unit
V _{CC}	Supply voltage	6	V
P _d	Power dissipation	1.0	W
T _{opr}	Operating temperature	-20~75	°C
T _{stg}	Storage temperature	-40~125	°C
K _θ	Thermal derating	10	mW/°C

ELECTRICAL CHARACTERISTICS (T_a = 25°C, unless otherwise noted)

Symbol	Parameter	Test No.	Test conditions	Remark	Limits			Unit
					Min.	Typ.	Max.	
I _{CC}	Circuit current	1	Measure the amperage of the current that flows to pins ⑧ and ⑨.		32	40	48	mA
G _{PI}	PB amplifier gain	2	Pin ②: Input a 630-kHz 0.4-V _{p-p} sine wave. Pin ③: Measure the gain.		10	12	14	dB
G _{RO}	REC output amplifier gain	3	Pin ②: Input a 630-kHz 0.25-V _{p-p} sine wave. Pin ③: Measure the gain.		2.8	3.8	4.8	dB
G _{BP}	Burst-down PB output amplifier gain	4	Pin ②: Input a 4.43-MHz 0.2-V _{p-p} sine wave. Pin ③: Measure the gain.		14.5	16.5	18.5	dB
G _{CPN}	COMB PB output amplifier gain 1	5	Pin ②: Input a 4.43-MHz 0.2-V _{p-p} sine wave. Pin ⑧: 0 V; set to NTSC. Pin ⑨: Measure the gain.	NTSC	11.0	13.0	15.0	dB
G _{CPP}	COMB PB output amplifier gain 2	6	Pin ②: Input a 4.43-MHz 0.11-V _{p-p} sine wave. Pin ⑧: 2.5 V; set to PAL. Pin ⑨: Measure the gain.	PAL	17.0	19.0	21.0	dB
ACC _R	REC ACC output amplitude	7	Pin ②: Input chroma signals. (Burst, 0.2 V _{p-p} ; chroma, 0.4 V _{p-p}) Pin ③: Input 15.625-KHz SYNC. Pin ④: Measure the chroma section amplitude.		0.4	0.6	0.8	V _{p-p}
ACC _C	Chroma ACC increase	8	Pin ②: Input chroma signals. (Burst, 0.2 V _{p-p} ; chroma, 0.4 V _{p-p} and 0 V _{p-p}) Pin ③: Input SYNC Pin ④: Measure the burst section amplitude.		2	3	4	dB
ACC _P	PB ACC output amplitude	9	Pin ②: Input reference low-freq. chroma signals. (Chroma: 0.1V _{p-p} , 630 kHz) Pin ③: Input SYNC. Pin ④: Measure the chroma section amplitude.		0.75	0.88	1.01	V _{p-p}
ACC _{P1}	PB ACC control range 1	10	Pin ②: Input reference low-freq. chroma signals (-18dB) Pin ③: Input SYNC Pin ④: Measure the chroma section amplitude.		-3		0	dB
ACC _{P2}	PB ACC control range 2	11	Pin ②: Input reference low-freq. chroma signals, (+6 dB) Pin ③: Input SYNC Pin ④: Measure the chroma section amplitude.		0		3	dB
G _{MB}	MAIN BM gain	12	Pin ②: Input a 3.58-MHz, 0.5-V _{p-p} sine wave. Pin ①: Ground at "R18 K" and offset. Pin ③: Measure the gain.		5	6	7	dB
CL _{MB}	MAIN BM carrier leak	13	Pin ②: Input a 630-kHz, 0.5-V _{p-p} sine wave. Pin ①: Input a 5.06-MHz, 1.25-V _{p-p} sine wave. Pin ③: Measure 4.43-MHz and 5.06-MHz elements.		-45	-38		dB
G _{SB}	SUB BM output amplitude	14	Pin ③: Measure the amplitude.		0.65	0.85	1.05	V _{p-p}
CL _{SB}	SUB BM carrier leak	15	Pin ③: Measure 4.43-MHz and 5.06-MHz elements.		-40	-34		dB
BU	Burst-up increase	16	Pin ②: Input a 630-KHz, 0.25V _{p-p} sine wave. Pin ③: Input SYNC. Pin ④: Measure the amplitude at the burst section and chroma section.		5	6	7	dB
β _{VCO_R}	320fH VCO β1	17	Pin ②: Apply 3.1 V, 3.5 V. Pin ③: Perform measurement.	REC	0.8	1.3	1.8	kHz/ mV
β _{VCO_P}	320fH VCO β2	18	Pin ②: Apply 3.1 V, 3.5 V. Pin ③: Perform measurement.	PB	1.25	1.6	1.7	kHz/ mV

Note 1: The ambient temperature is 25°C.

2: The supply voltage is 5.0 V.

3: The direction of a current that flows toward the IC is regarded as plus.

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ELECTRICAL CHARACTERISTICS (cont.)

Symbol	Parameter	Test No.	Test conditions	Remark	Limits			Unit
					Min.	Typ.	Max.	
BV_{cxo}	VCXOB	19	Pin ②: Apply 3.6V, and 4.0 V. Pin ③: Perform measurement.		3	5	7	Hz/ mV
μ APCR	REC APCDET μ	20	Pin ①: 4.45MHz 0.1 Vp-p. Pin ②: 4.45MHz 0.5Vp-p. Pin ③: Input SYNC Pin ④: Measure the voltage.	The phase are synchronous.	13	18	23	mV/ deg
μ APCP1	PB APCDET μ 1	21	Pin ②: 4.43MHz 0.22 Vp-p. Pin ③: 4.43MHz 0.5Vp-p. Pin ④: Input SYNC Pin ⑤: Ground at 0.1 μ m. Pin ⑥: Measure the voltage.	The phase are synchronous. Burst APC	200	280		mV/ deg
μ APCP2	PB APCDET μ 2	22	Pin ②: 4.43MHz 0.22 Vp-p. Pin ③: 4.43MHz 0.5Vp-p. Pin ④: Input SYNC Pin ⑤: 5 V. Pin ⑥: Measure the voltage.	The phase are synchronous. Pilot burst APC.	200	280		mV/ deg
TH KILLR	REC color killer threshold	23	Pin ③: Input chroma signal (input ATT) Pin ④: Input SYNC. Pin ⑤: Measure the threshold.		-36	-31	-26	dB
TH KILLP	PB color killer threshold	24	Pin ③: Input low-freq. chroma signals (input ATT) Pin ④: Input SYNC Pin ⑤: Measure the threshold		-36	-31	-26	dB
SLD	SIDE LOCKDET dead zone	25	Pin ③: IVP-P, frequency variable. Pin ④: Input SYNC. Pin ⑤: Measure.		-10		10	kHz
TH PSN1	P/S/N switching threshold	26	Pin ③: Applied voltage variable. Pin ④: Input a 630-kHz, 0.25-Vp-p sine wave. Pin ⑤: Input SYNC Pin ⑥: Measure the amplitude.	NTSC → PAL	0.9	1.1	1.3	V
TH PSN2	P/S/N switching threshold	27	Pin ③: Applied voltage variable. Pin ④: Measure.	PAL → SECAM	3.0	3.2	3.4	V
TH SLE1	2/4/6 switching threshold 1	28	Pin ④: Input a 630kHz, 0.25-Vp-p sine wave. Pin ⑤: Input SYNC. Pin ⑥: Applied voltage variable. Pin ⑦: Measure.	2H → 4H	0.9	1.1	1.3	V
TH SLE2	2/4/6 switching threshold 2	29	Pin ④: Input a 630-kHz, 0.25-Vp-p sine wave. Pin ⑤: Input SYNC. Pin ⑥: Applied voltage variable. Pin ⑦: Measure.	4H → 6H	3.0	3.2	3.4	V
TH RTP1	R/T/P switching threshold 1	30	Pin ③: Input a 630-kHz, 0.25-Vp-p sine wave. Pin ④: Measure	REC → TRICK	0.9	1.1	1.3	V
TH RTP2	R/T/P switching threshold 2	31	Pin ③: Input reference low-freq. chroma signals. Pin ④: Input SYNC. Pin ⑤: Applied voltage variable. Pin ⑥: Measure.	TRICK → PB	3.0	3.2	3.4	V

Note 1: The ambient temperature is 25°C.

2: The supply voltage is 5.0 V.

3: The direction of a current that flows toward the IC is regarded as plus.

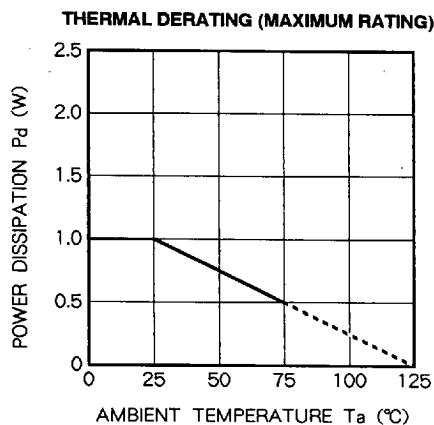
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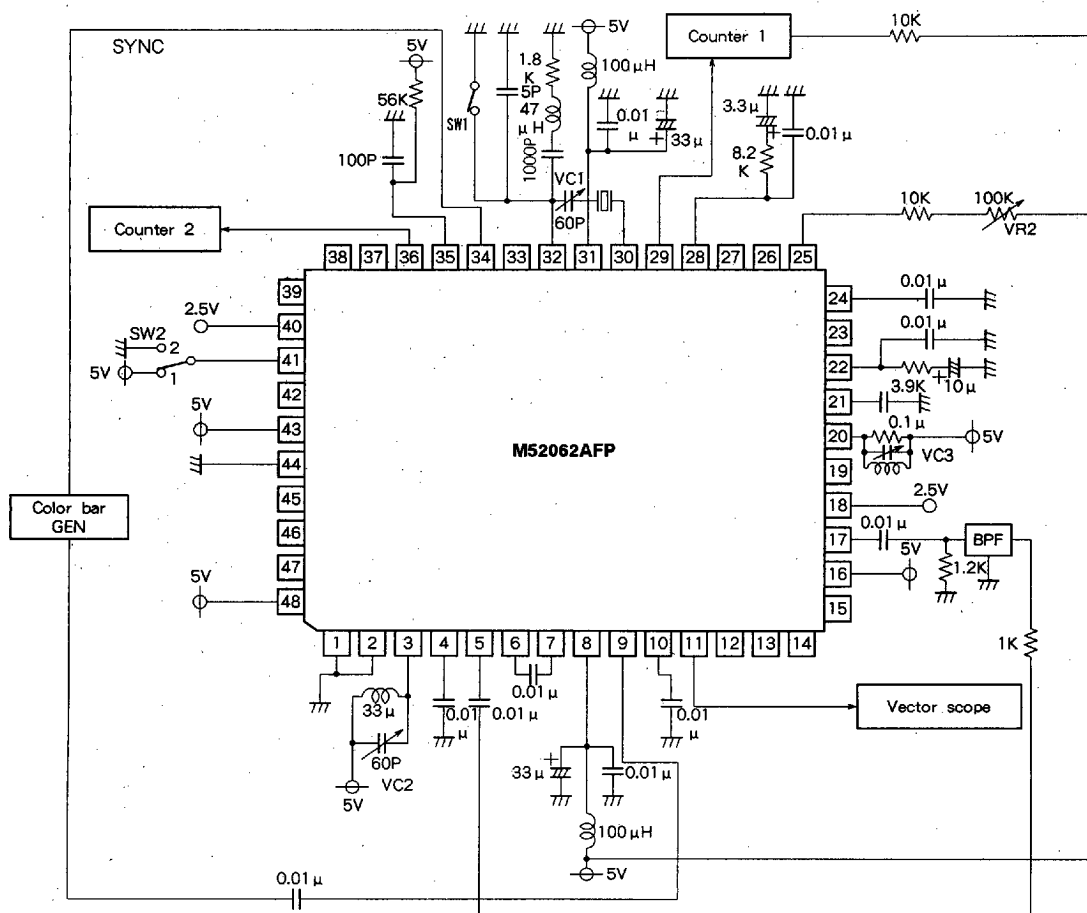
TYPICAL CHARACTERISTICS



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ADJUSTING CIRCUIT FOR MEASUREMENT



Units Resistance : Ω
Capacitance : F

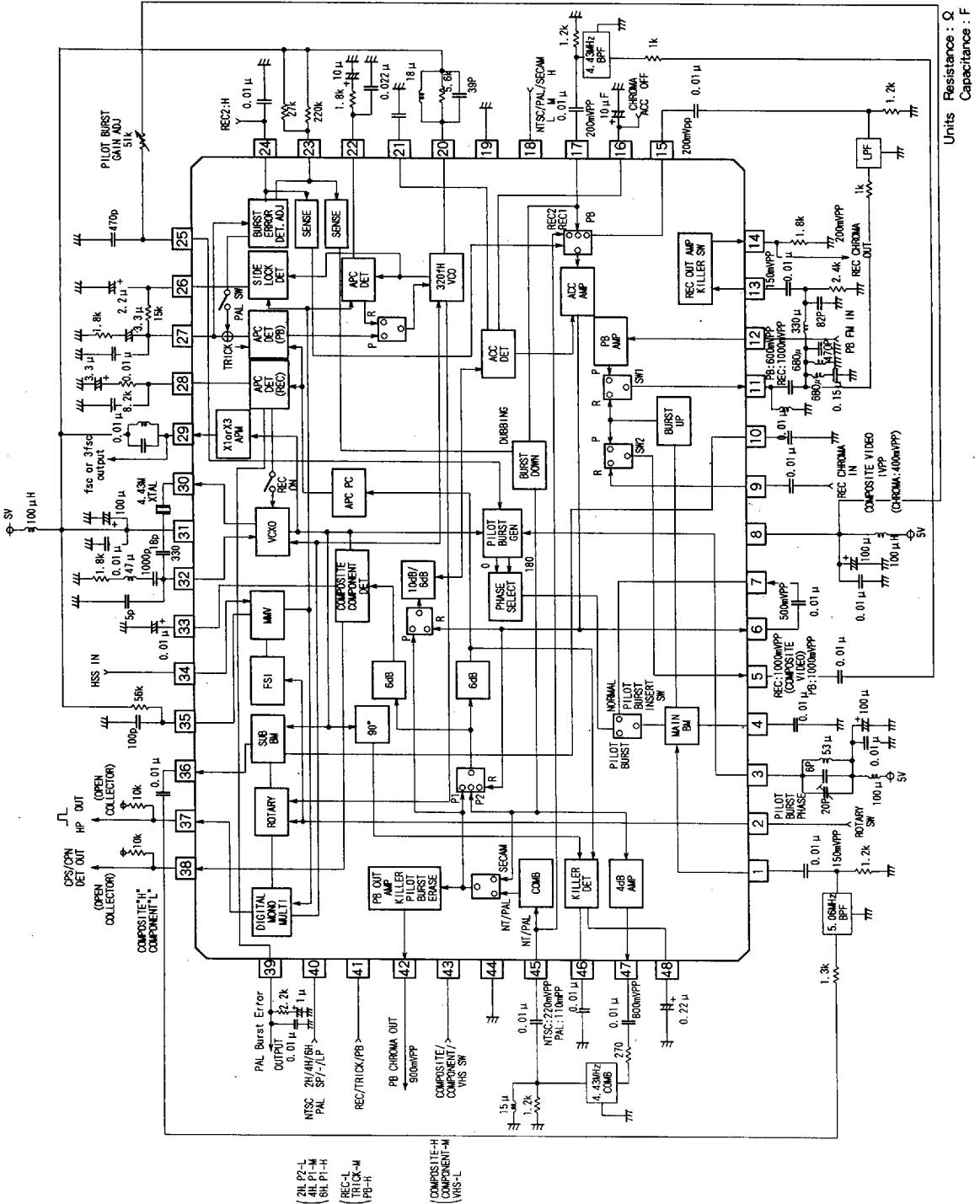
1. VCXO free run frequency adjustment
Set SW1 to OFF and SW2 to 1. Adjust the counter 1 frequency to 4.433619MHz using VC1.
2. 320-fH VCO free run frequency adjustment
Set SW1 to ON and SW2 to 1. Adjust the counter 2 frequency to 627.0kHz using VC3.
3. Pilot burst phase adjustment
Set SW1 to OFF and SW2 to 2. Adjust VC2 such that the pilot burst phase will meet axis V as in the vector scope.
4. Pilot burst amplitude adjustment
Set SW1 to OFF and SW2 to 2. Adjust VR2 such that the pilot burst amplitude will meet the burst as in the vector scope.



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APPLICATION EXAMPLE



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