ONE-CHIP TV SOUND MPX (KOREA TWO-CARRIER SYSTEM)

The KA2268N is a silicon monolitic integrated circuit designed for demodulating Korea two-carrier TV-MPX broadcasts. The use of PLL makes reed filters unnecessary.

FUNCTIONS

- 1st Sound IF
- 2nd Sound IF
- Matrix for Stereo
- Pilot Amp and Detector
- Pilot Decoder
- Mode Change Switch
- Indicators (Stereo, Bilingual)

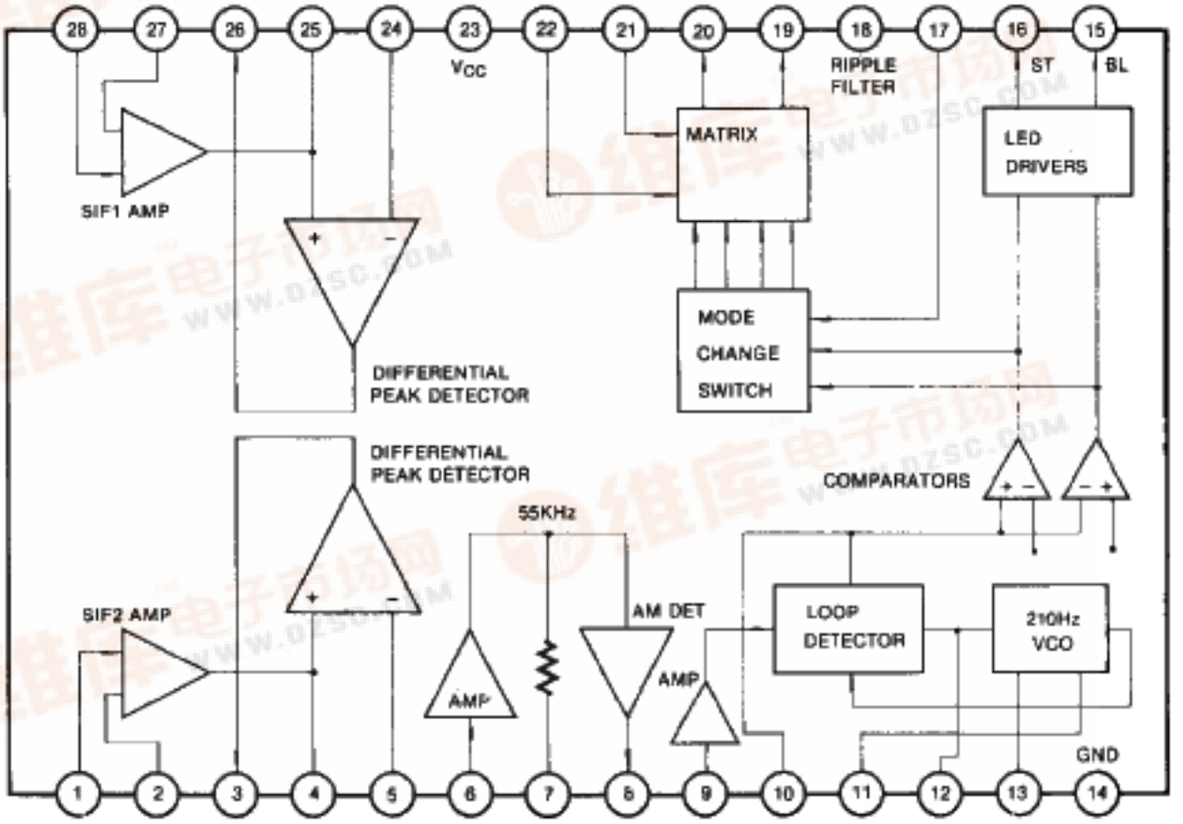
FEATURES

- **One input mode change switch**
- **Auto pilot decording by phase detector**
- **Minimum number of external parts required**

ORDERING INFORMATION

Device	Package	Operating Temperature
KA2268	28 DIP	−20 ~ +70°C

BLOCK DIAGRAM



ABSOLUTE MAXIMUM RATINGS (Ta = 25°C)

Characteristics	Symbol	Condition	Value	Unit
Maximum Supply Voltage	V_{CC} max	$V_I = 0$	15	V
Pin 15 Output Current	I_{15}		30	mA
Pin 16 Output Current	I_{16}		30	mA
Maximum Mode SW Voltage	V_{17}		$-0.3 \sim V_{CC}$	V
Power Dissipation	P_D		1.5	W
Operating Temperature	T_{opr}		$-20 \sim +70$	°C
Storage Temperature	T_{stg}		$-40 \sim +125$	°C

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RECOMMENDED OPERATING CONDITIONS

Characteristics	Symbol	Min	Typ	Max	Unit
Operating Voltage	V_{opr}	9	12	15	V

ELECTRICAL CHARACTERISTICS

SIF SECTION (V_{CC} = 12V, f_m = 400Hz, V_i = 100dBμ, Ta = 25°C △f = ±30KHz, unless otherwise specified)

Characteristics	Symbol	Condition	Min	Typ	Max	Unit
Total Circuit Current	I_{CC}	$V_I = 0$		40	60	mA
Input Limiting Voltage 1	$V_{lim}1$	f_0 = 4.5MHz, V_o = −3dB			52	dBμ
Input Limiting Voltage 2	$V_{lim}2$	f_0 = 4.72MHz, V_o = −3dB			52	dBμ
Detector Output 1	V_o1	f_0 = 4.5MHz	0.7	0.9	1.3	V_{rms}
Detector Output 2	V_o2	f_0 = 4.72MHz	0.7	0.9	1.3	V_{rms}
T.H.D. 1	THD1	f_0 = 4.5MHz	—	0.5	2	%
T.H.D. 2	THD2	f_0 = 4.72MHz	—	0.5	2	%
AM Rejection Ratio 1	AMR1	f_0 = 4.5MHz, AM = 30%	35	45	—	dB
AM Rejection Ratio 2	AMR2	f_0 = 4.72MHz, AM = 30%	35	45	—	dB
Input Impedance of Pin 28	$Z_{in}28$	f = 4.5MHz		40		Kohm
Input Impedance of Pin 1	$Z_{in}1$	f = 4.72MHz		40		Kohm
Output Resistance of DET Output	Z26			1.2		Kohm
Output Resistance of DET Output	Z3			1.2		Kohm
Cross Talk (SIF1→SIF2)	CT1	SIF1 f_0 = 4.5MHz, f_m = 400Hz-5KHz SIF2 f_0 = 4.72MHz △f = 0	50	55	—	dB

ELECTRICAL CHARACTERISTICS (Continued)

Characteristics	Symbol	Condition	Min	Typ	Max	Unit
Cross Talk (SIF1→SIF2)	CT1	SIF1 $f_0 = 4.5MHz$, $f_m = 400Hz\text{-}5KHz$ SIF2 $f_0 = 4.72MHz$ $\triangle f = 0$	50	55	—	dB
Cross Talk (SIF2→SIF1)	CT2	SIF1 $f_0 = 4.5MHz$ SIF2 $f_0 = 4.72MHz$ $f_m = 400Hz\text{-}5KHz$	50	55	—	dB
Frequency Response of Detector	F_1	$f_0 = 4.5MHz$ $f_m = 40Hz\text{-}55KHz$	−3	0	1.5	dB
Frequency Response of Detector	F_2	$f_0 = 4.724MHz$ $f_m = 40Hz\text{-}55KHz$	−3	0	1.5	dB
Detector Output Balance	C.B.	SIF1 = 4.5MHz SIF2 = 4.724MHz	−2	0	2	dB

PILOT AMP AND DETECTOR

($V_{CC} = 12V$, $f_c = 55.125KHz$, $f_m = 150$ or $276Hz$, AM = 50%, unless otherwise specified)

Characteristics	Symbol	Condition	Min	Typ	Max	Unit
Input Resistance of Pin 6	$Z_{in}6$		—	30	—	Kohm
Maximum Pilot Input	V_{in}, P_{max}	$V_o = -3dB$, 0dB: $V_i = 10mV$		100	—	mV
Detector Gain	A_{VD}		30	36		dB
Detector Output	V_{OD}	$V_{in} = 10mV$		270		mV
Output Resistance of Pin 8	$Z_{out}8$		—	700	—	ohm

PILOT DECODER ($V_{CC} = 12V$, f = 150 or 276Hz, unless otherwise specified)

Characteristics	Symbol	Condition	Min	Typ	Max	Unit
Input Sensitivity	V_{sens}	f = 150 or 276Hz		10	20	mV_{rms}
Input Resistance of Pin 9	$Z_{in}9$		—	47	—	Kohm
Capture Range	f_c	$V_i = 50mV$		± 5		Hz
Lock Range	f_L	$V_i = 50mV$		± 10		Hz
Stereo Range	f_{ST}	$V_i = 100mV$		150 ± 10		Hz
Bilingual Range	f_{BL}	$V_i = 100mV$		276 ± 10		Hz

INDICATOR (V_{CC} = 12V)

Characteristics	Symbol	Condition	Min	Typ	Max	Unit
Saturation Voltage	V_{sat}	I_{15}, I_{16} = 30mA		0.7		V
LED On Time	t_{ON}	f = 150, 276Hz V_i = 0mV→50mV	—	100	200	mS
LED Off Time	t_{OFF}	f = 150, 276Hz V_i = 50mV→0mV	—	100	200	mS

MODE CHANGE SWITCH CIRCUIT

Characteristics	Symbol	Condition	Min	Typ	Max	Unit
Main/Main Resistance	R (m/m)	SW = 2	3.1	4.7	7.0	Kohm
Forced Mono Voltage	V_{mono}	SW = 1		0	1.0	V
Main/Sub Supply Current	$I_{m/s}$	SW = 3	−0.2	0	0.2	mA
Sub/Sub Supply Voltage	$V_{s/s}$	SW = 4	11	12		V

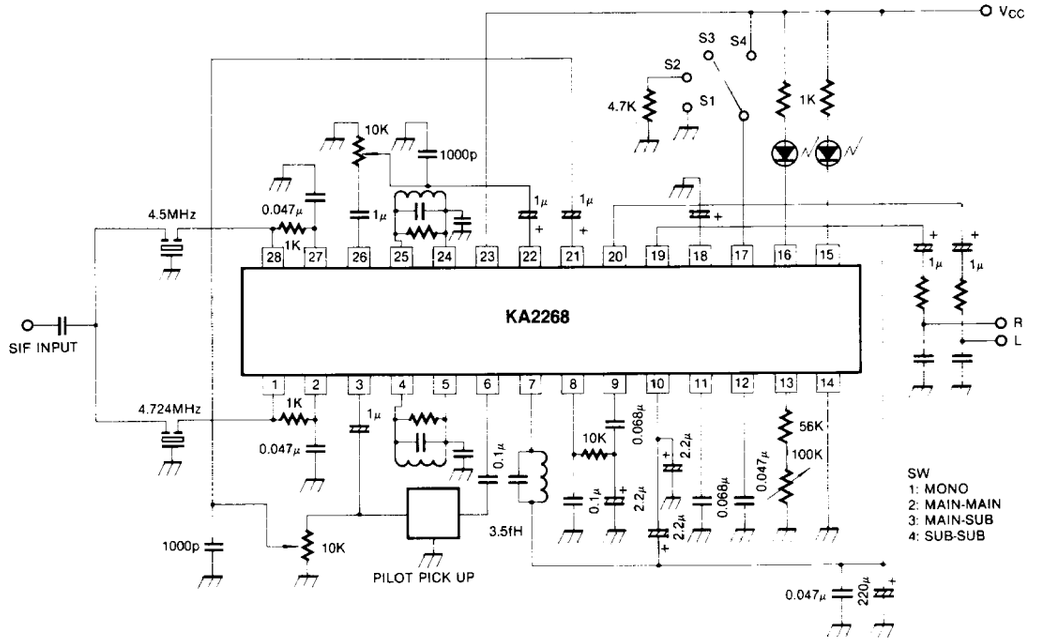
MATRIX CIRCUIT

Characteristics	Symbol	Condition	Min	Typ	Max	Unit
T.H.D. In Main Mode	THD_M	V_i = 50mV	—	0.3	1.0	%
T.H.D. In Sub Mode	THD_S	V_i = 50mV	—	0.3	1.0	%
T.H.D. In Stereo Mode	THD_{ST}	V_i = 50mV	—	0.3	1.0	%
Cross Talk (M/M→S/S)	$CT_{MM→SS}$	V_i = 50mV	50	55	—	dB
Cross Talk (S/S→M/M)	$CT_{SS→MM}$	V_i = 50mV	50	55	—	dB
Cross Talk (M→S)	$CT_{M→S}$	V_i = 50mV	50	55	—	dB
Cross Talk (S→M)	$CT_{S→M}$	V_i = 50mV	50	55	—	dB
Separation (L→R)	$SEP_{L→R}$	V_i = 50mV	30	35	—	dB
Separation (R→L)	$SEP_{R→L}$	V_i = 50mV	30	35	—	dB
Voltage Gain of Matrix	A_V	V_i = 50mV	8	10	12	dB

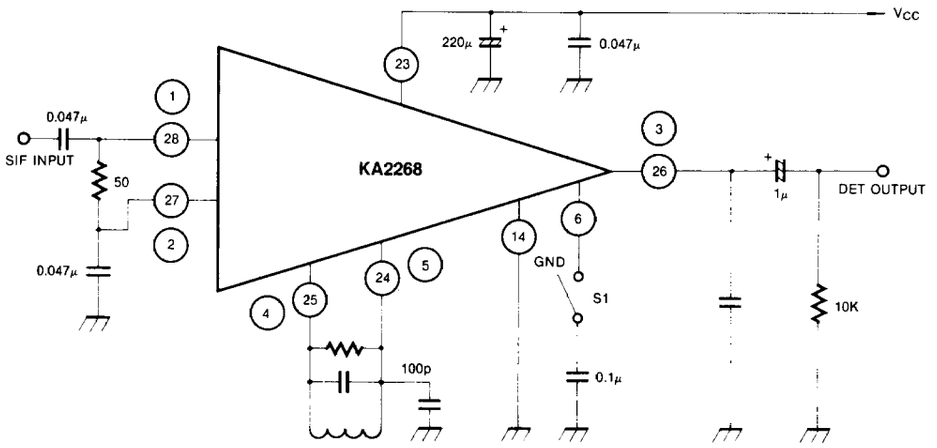
PIN CONFIGURATION

Pin No	Description	Pin No	Description
1	SIF2 Input	15	Indicator (Bilingual)
2	SIF2 Bias	16	Indicator (Stereo)
3	SIF2 DET Output	17	Mode Switch
4	SIF2 Coil	18	Ripple Filter
5	SIF2 Coil	19	R (Sub) Output
6	Pilot Input	20	L (Main) Output
7	3.5fH Coil	21	Sub Input
8	Pilot DET Output	22	Main Input
9	PLL Input	23	V_{CC}
10	Phase DET Filter	24	SIF1 Coil
11	Loop Filter	25	SIF1 Coil
12	C-Time	26	SIF1 DET Output
13	R-Time	27	SIF1 Bias
14	GND	28	SIF1 Input

TYPICAL APPLICATION CIRCUIT

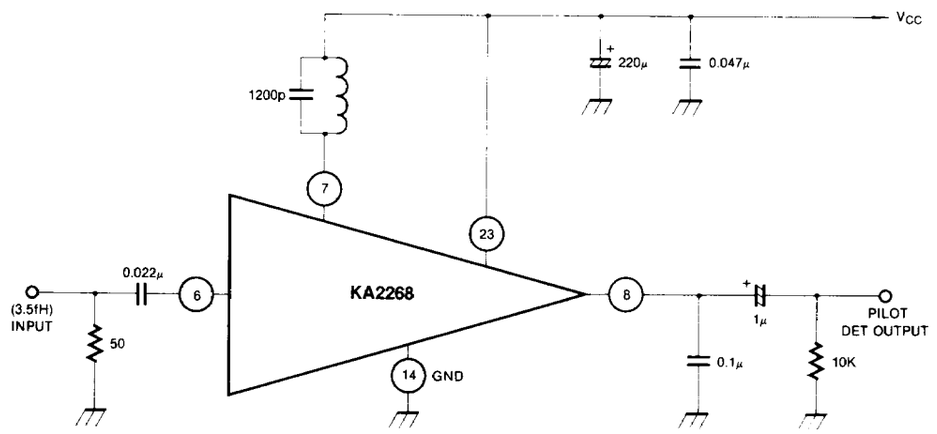


TEST CIRCUIT 1 SIF SECTION

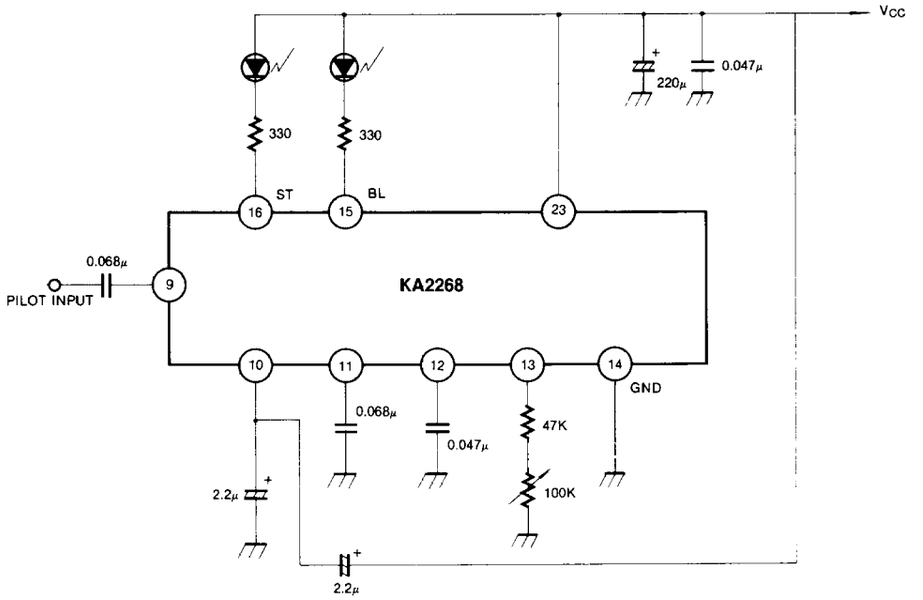


S1: PILOT INPUT NOISE BYPASS

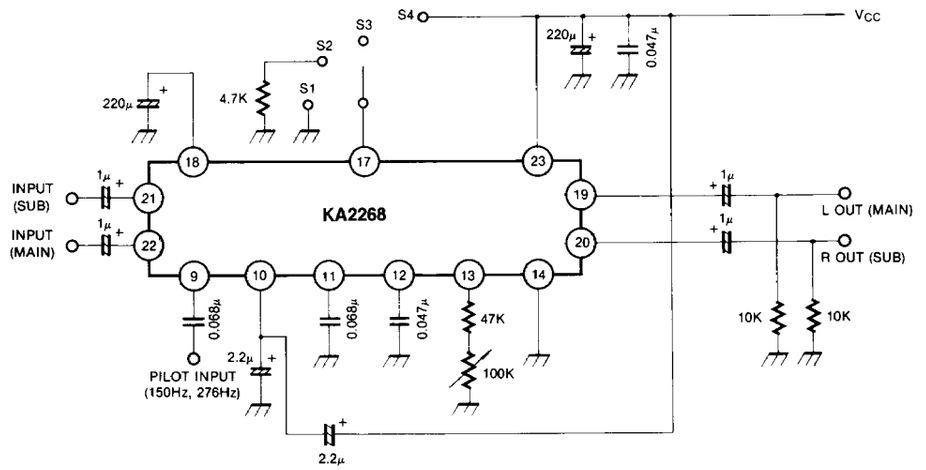
TEST CIRCUIT 2 PILOT AMP/DET SECTION



TEST CIRCUIT 3 PILOT PLL/INDICATOR SECTION



TEST CIRCUIT 4 MATRIX MODE SECTION



TEST CIRCUIT 5