

TOSHIBA BIPOLAR LINEAR INTEGRATED CIRCUIT SILICON MONOLITHIC

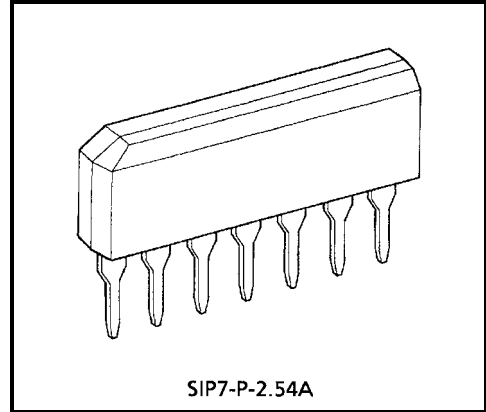
TA8710S

SIF CONVERTER FOR TV AND VTR

The TA8710S incorporates a 500kHz oscillator and mixer in a 7-pin SIP package, which converts each of the sound carrier, 5.5, 6.0 and 6.5MHz into 6.0MHz.

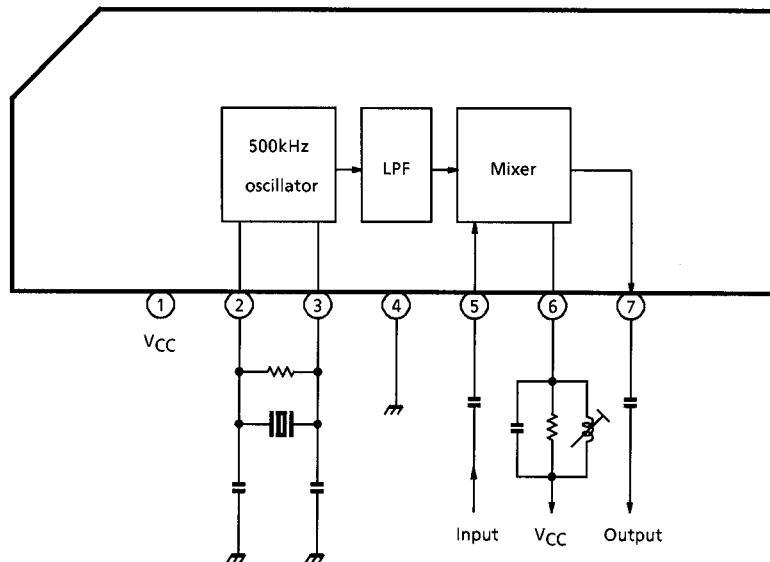
Since this can process 5.5 and 6.6MHz SIF signals as 6.0MHz signals, the sound signal processing stage of multi standard TV and VTR can be simplified.

The recommended supply voltage range is $\pm 10\%$ for $V_{CC} : 9V$



Weight: 0.72g (Typ.)

BLOCK DIAGRAM



000707EBA1

- TOSHIBA is continually working to improve the quality and reliability of its products. Nevertheless, semiconductor devices in general can malfunction or fail due to their inherent electrical sensitivity and vulnerability to physical stress. It is the responsibility of the buyer, when utilizing TOSHIBA products, to comply with the standards of safety in making a safe design for the entire system, and to avoid situations in which a malfunction or failure of such TOSHIBA products could cause loss of human life, bodily injury or damage to property. In developing your designs, please ensure that TOSHIBA products are used within specified operating ranges as set forth in the most recent TOSHIBA products specifications. Also, please keep in mind the precautions and conditions set forth in the "Handling Guide for Semiconductor Devices," or "TOSHIBA Semiconductor Reliability Handbook" etc..
- The TOSHIBA products listed in this document are intended for usage in general electronics applications (computer, personal equipment, office equipment, measuring equipment, industrial robotics, domestic appliances, etc.). These TOSHIBA products are neither intended nor warranted for usage in equipment that requires extraordinarily high quality and/or reliability or a malfunction or failure of which may cause loss of human life or bodily injury ("Unintended Usage"). Unintended Usage include atomic energy control instruments, airplane or spaceship instruments, transportation instruments, traffic signal instruments, combustion control instruments, medical instruments, all types of safety devices, etc.. Unintended Usage of TOSHIBA products listed in this document shall be made at the customer's own risk.
- The products described in this document are subject to the foreign exchange and foreign trade laws.
- The information contained herein is presented only as a guide for the applications of our products. No responsibility is assumed by TOSHIBA CORPORATION for any infringements of intellectual property or other rights of the third parties which may result from its use. No license is granted by implication or otherwise under any intellectual property or other rights of TOSHIBA CORPORATION or others.
- The information contained herein is subject to change without notice.

TERMINAL FUNCTION

PIN No.	PIN NAME	FUNCTION	INTERFACE CIRCUIT
1	V _{CC}	V _{CC} = 9V (Typ.)	—
2	500kHz oscillator	Connect a 500kHz Ceramic resonator between this pin and pin 3.	
3	500kHz oscillator	Connect a 500kHz Ceramic resonator between this pin and pin 2.	
4	GND	—	—
5	Mixer input	This is an SIF signal input terminal of 5.5, 6.0 and 6.5MHz signals. This will be mixed with a 500kHz oscillator output and converted to 6.0MHz signal.	
6	6MHz tuning coil	This is a 6.0MHz tuning coil connection terminal for converters.	
7	Mixer output	This will output an SIF signal converted to 6.0MHz by converter.	

MAXIMUM RATINGS (Ta = 25°C)

CHARACTERISTIC	SYMBOL	RATING	UNIT
Supply Voltage	V _{CC}	15.0	V
Input Pin Voltage	V _{in}	GND - 0.3~V _{CC} + 0.3	V
Input Pin Voltage	e _{in}	3.0	V _{p-p}
Power Dissipation	P _D (Note 1)	0.4	W
Operating Temperature	T _{opr}	-20~65	°C
Storage Temperature	T _{stg}	-55~150	°C

Note 1: When using the device at above Ta = 25°C, decrease the power dissipation by 4mW for each increase of 1°C.

Note 2: Handle with care as this product is weak at surge voltage.

ELECTRICAL CHARACTERISTICS

DC CHARACTERISTICS (Unless otherwise specified, V_{CC} = 9V, Ta = 25°C)

CHARACTERISTIC	SYMBOL	TEST CIR-CUIT	TEST CONDITION	MIN	TYP.	MAX	UNIT
Supply Voltage	I _{CC}	1	Total current consumption of pins 1 and 6.	5.0	7.1	9.3	mA
Pin Voltage	V ₂	1	—	4.0	4.4	4.8	V
	V ₃		—	3.9	4.3	4.7	
	V ₅		—	3.4	3.7	4.0	
	V ₇		—	6.4	6.8	7.3	

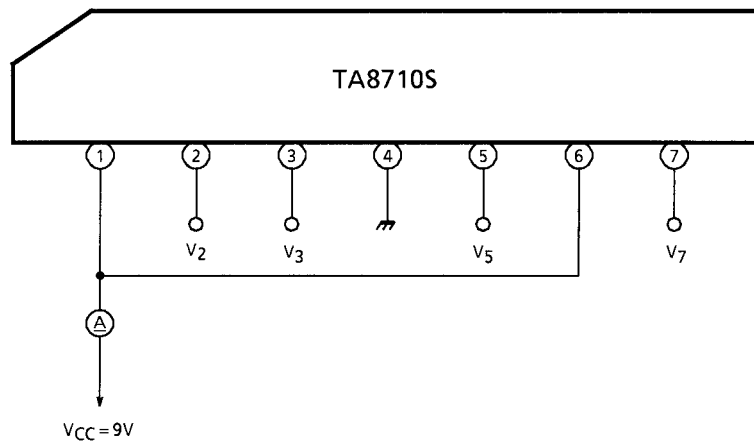
AC CHARACTERISTICS

(When using the specified parts, unless otherwise specified, $V_{CC} = 9V$, $T_a = 25^{\circ}C$)

CHARACTERISTIC		SYMBOL	TEST CUR-CUIT	TEST CONDITION	MIN	TYP.	MAX	UNIT
500kHz Oscillation Level		V_{OSC}	2	Measure amplitude of pin 3 oscillation waveform.	0.9	1.2	1.5	V_{p-p}
500kHz Oscillation Total Harmonic Level		I_{OSC}	2	(1)Measure pin 3 by spectrum analyzer. (2)Calculate the difference between 500kHz oscillation level and total harmonic level.	—	40	35	dB
500kHz Oscillation Supply Voltage Drift		Δf_V	2	(1)Measure the frequency drift by using the frequency counter and the buffer amplifier, which is connected with pin 3. (2)Calculate the amount varied when changing V_{CC} from 10~6V.	—	0.002	0.5	kHz / V
500kHz Oscillation Temperature Drift		Δf_{θ}	2	(1)Measure the frequency drift by using the frequency counter and the buffer amplifier, which is connected with pin 3. (2)Calculate the amount varied when changing temperature from $-10\sim 60^{\circ}C$	—	0.023	0.063	kHz/ $^{\circ}C$
SIF Converter Conversion Ratio	5.5MHz	$G_{m5.5}$	2	(1) $V_{MIX} : 36mV_{rms}$ (2)Measure pin 7 by spectrum analyzer. (3)Calculate the 6.0MHz output gain when each 5.5, 6.0 and 6.5MHz is input.	22	27	32	dB
	6.0MHz	$G_{m6.0}$			24	28	31	
	6.5MHz	$G_{m6.5}$			22	27	32	
MIX Total Harmonic Level		I_m	2	(1) $V_{MIX} : 6MHz, 36mV_{rms}$ (2)Measure pin 7 by spectrum analyzer. (3)Calculate the input level of which the total harmonic level against 6MHz output level.	—	—	40	dB
MIX Input Dynamic Range		V_{im}	2	(1) $V_{MIX} : 6MHz$ (2)Measure pin 7 by spectrum analyser. (3)Calculate the input level of which the total harmonic level against 6MHz output level will be bigger than $-40dB$.	100	—	—	mV_{p-p}
MIX Input Impedance		$R_{in 5}$	2	Measure the MIX input (pin 5) by impedance meter.	2.1	3.0	3.9	k Ω

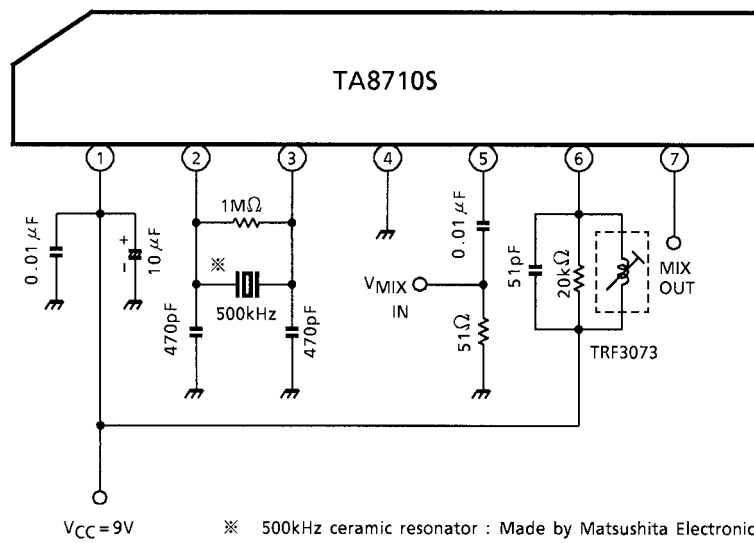
TEST CIRCUIT 1

DC characteristics



TEST CIRCUIT 2

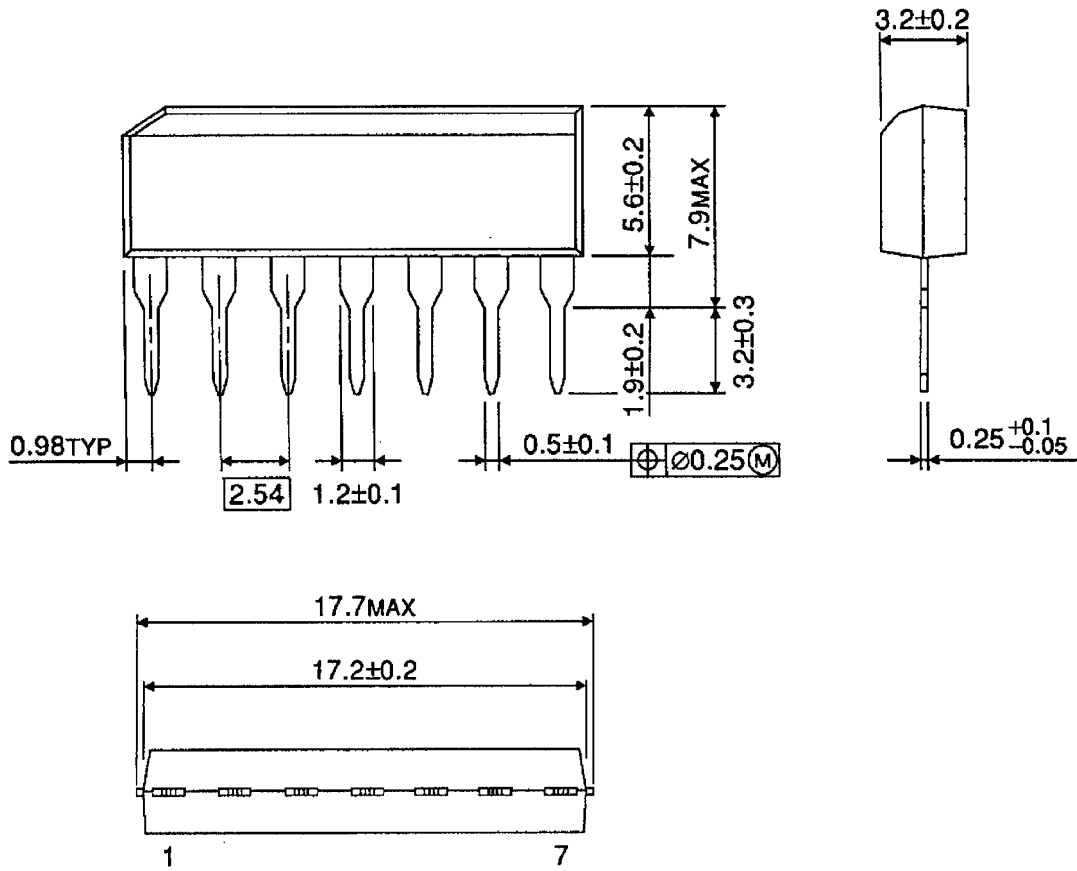
AC characteristics



PACKAGE DIMENSIONS

SIP7-P-2.54A

Unit : mm



Weight: 0.72g (Typ.)