

## SANYO Semiconductors DATA SHEET

# LA1652C

## Monolithic Linear IC Time Code Reception IC

## Overview

The LA1652C time code reception IC receives long-wave time standard broadcasts (such as the Japanese JJY and German DCF77 standards) and detects and outputs the time code superposed on the long-wave signal. Applications can automatically correct their clock's time setting by using the time code received by the LA1652C. Note that the LA1652C is a bare chip product that is not packaged.

## **Functions**

• RF amplifier, rectifier, detector, time code output, and standby circuit.

## Features

- Low-voltage operation (operating V<sub>CC</sub> as low as 1.8V).
- Standby mode current drain less than or equal to 0.1µA. Japan : JJY 40/60kHz Germany : DCF77 77.5kHz

## **Specifications**

#### **Maximum Ratings** at $Ta = 25^{\circ}C$

Parameter	Symbol	Conditions	Ratings	Unit
Maximum supply voltage	V <sub>CC</sub> max		5.0	V
Operating temperature	Topr		-20 to +70	°C
Storage temperature	Tstg		-40 to +125	°C

#### **Operating Conditions** at $Ta = 25^{\circ}C$

Parameter	Symbol	Conditions	Ratings			1.1 14
			min	typ	max	Unit
Recommended supply voltage	VCC			3.0		V
Operating supply voltage range	V <sub>CC</sub> op		1.8		3.6	V

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## SANYO Semiconductor Co., Ltd. TOKYO OFFICE Tokyo Bldg., 1-10, 1 Chome, Ueno, Taito-ku, TOKYO, 110-8534 JAPAN

## **Operating Characteristics** at $Ta = 25^{\circ}C$ , $V_{CC} = 3.0V$

\* : Packaged in an SSOP16 package and measured using the IC51-0162-911 socket (Yamaichi Electronics Co., Ltd.)

## **Overall Characteristics**

Parameter	Symbol	Conditions	Ratings			11-34
		Conditions		typ	max	Unit
Quiescent current	Icco	No input		55	70	μΑ
Standby mode current drain	I <sub>STB</sub>	PAD15 = 3.0V		0.01	0.1	μΑ

#### Amplifier Input Characteristics

Parameter	Symbol	Conditions	Ratings			11-3
			min	typ	max	Unit
Input impedance	Zl	PAD1		2.0		MΩ
Input frequency range	F <sub>IN</sub>		37.5		80.0	kHz
Minimum input voltage	VMIN	PAD1 input level		1	2	μVrms
Maximum input voltage	VMAX	PAD1 input level	50	100		mVrms

#### **TCO Output Characteristics** - Input pad = PAD1, fin = 40kHz

Parameter	Symbol	Conditions	Ratings			Unit
	Symbol	min	typ	max	Unit	
High-level output voltage	VOH		2.90	2.95		V
Low-level output voltage	VOL			0.05	0.10	V
Output pulse width	T500	$V_{IN} = 0$ to 100dBµV, AM modulation	350	450	550	ms
(500 ms input)		(1Hz square wave, duty = 50%, 10:1 modulation)				
Output pulse width	T800	$V_{IN} = 0$ to 100dBµV, AM modulation	650	750	850	ms
(800 ms input)		(1Hz square wave, duty = 80%, 10:1 modulation)				
Output pulse width	T200	$V_{IN} = 0$ to 100dBµV, AM modulation	100	200	300	ms
(200 ms input)		(1Hz square wave, duty = 20%, 10:1 modulation)				

## **Chip Specifications**

Parameter	Conditions	Ratings	Unit
Chip size		1.73×2.60	mm <sup>2</sup>
Chip thickness		330(±20)	μm
Pad size		140×140	μm²
Pad opening		115×115	μm²

## **PAD Coordinates**

PAD	X-Axis	Y-Axis	PAD	X-Axis	Y-Axis
P1	664	150	P9	1293	2450
P2	180	180	P10	1580	2330
P3A	150	864	P11	1580	2103
P3B	150	372	P12	1580	1754
P4	150	1034	P13	1580	1360
P5	150	1563	P14	1580	1108
P6A	150	2269	P15	1570	160
P6B	150	1733	P16	974	150
P7	160	2440			
P8	876	2450			

Notes

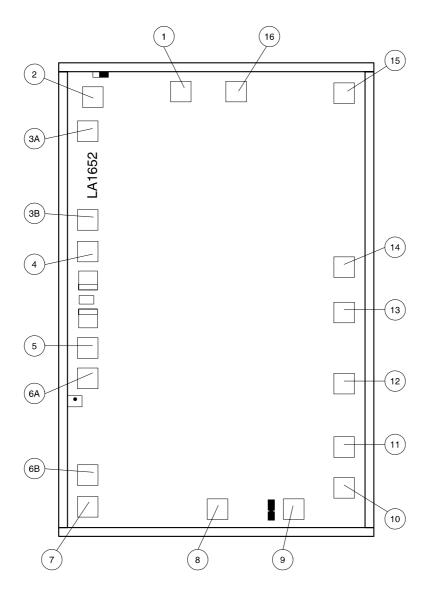
1. The left upper corner of the Pad Layout Diagram on the following page is the origin, the X axis increases to the right and the Y axis increases in the downward direction.

2. Units : µm

3. The pad coordinates give the coordinate values of the center of the pads.

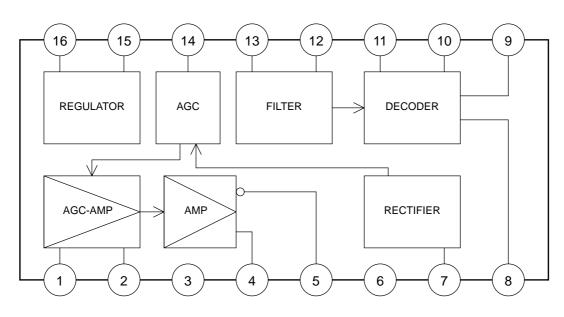
4. Both of each of the pairs P3A/P3B (VCC) and P6A/P6B (ground) must be bonded.

## Pad Layout Diagram



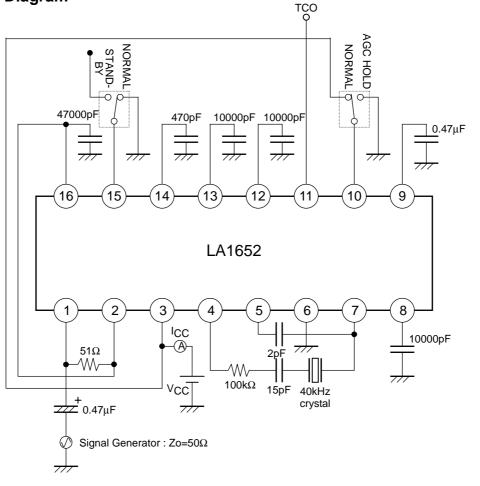
PCA00615

## Block Diagram



PCA00616

## **Test Circuit Diagram**



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