Ordering number : ENA0204

SANYO Semiconductors
DATA SHEET

Monolithic Linear IC

LA1654FN — Time Code Reception IC

Overview

The LA1654FN 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 LA1654 FN.

Functions

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

Features

- Low-voltage operation (operating V_{CC} as low as 1.5V).
- Standby mode current drain less than or equal to 0.05µA.
  Japan : JJY 40/60kHz
  Germany : DCF77 77.5kHz

Specifications

Maximum Ratings at Ta = 25°C

Parameter	Symbol	Conditions	Ratings	Unit
Maximum supply voltage	V_{CC} max		5.0	V
Allowable power dissipation	Pd max	Ta ≤ 70°C	10	mW
Operating temperature	Topr		-20 to +70	°C
Storage temperature	Tstg		-40 to +125	°C

Operating Conditions at Ta = 25°C

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Recommended supply voltage	V_{CC}		1.5		3.0	V
Operating supply voltage range	V_{CC} op		1.1		3.6	V

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Operating Characteristics at Ta = 25°C, V_{CC} = 3.0V

Overall Characteristics

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Quiescent current	I_{CCO}	No input, Pin15 = 0V, Pin10 = 3V	30	37	50	μA
Standby mode current drain	I_{STB}	Pin15 = 3.0V			0.05	μA

AGC Amplifier Input Characteristics

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Input impedance	Z_I	Pin1		800		kΩ
Input frequency range	F_{IN}	Pin1	37.5		80.0	kHz
Minimum input voltage	V_{MIN}	Pin1 input level			1	μVrms
Maximum input voltage	V_{MAX}	Pin1 input level	100			mVrms

TCO Output Characteristics - Input signal = Pin1, fin = 40kHz, Pin10 = 3V, Pin15 = 0V

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
High-level output voltage	V_{OH}	Pin 11 output level	2.9		3.0	V
Low-level output voltage	V_{OL}	Pin 11 output level	0		0.1	V
Output pulse width (500 ms input)	T500	V_{IN} = 0 to 100dBμV, AM modulation (1Hz square wave, duty = 50%, 10:1 modulation)	400	520	600	ms
Output pulse width (800 ms input)	T800	V_{IN} = 0 to 100dBμV, AM modulation (1Hz square wave, duty = 80%, 10:1 modulation)	600	730	800	ms
Output pulse width (200 ms input)	T200	V_{IN} = 0 to 100dBμV, AM modulation (1Hz square wave, duty = 20%, 10:1 modulation)	200	300	400	ms

STB Control Characteristics

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Standby on voltage	V_{SH}	Pin15 DC voltage	2.9		3.0	V
Standby off voltage	V_{SL}	Pin15 DC voltage	0		0.1	V
High-level pin input current	I_{SH}	Pin15 = 3V			0.1	μA
Low-level pin input current	I_{SL}	Pin15 = 0V			0.3	μA

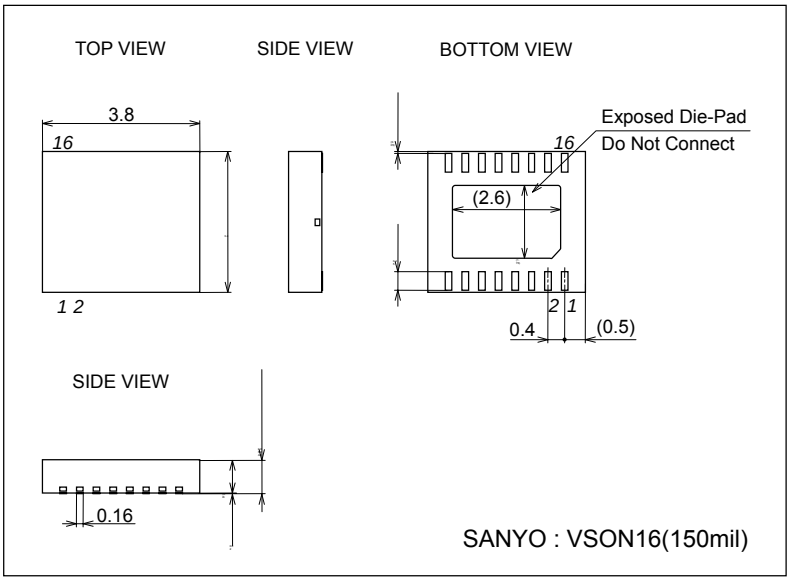
HOLD Control Characteristics - Pin15 = 0V

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Hold on voltage	V_{HL}	Pin10 DC voltage	0		0.1	V
Hold off voltage	V_{HH}	Pin10 DC voltage	2.9		3.0	V
High-level pin input current	I_{HH}	Pin10 = 3V			0.1	μA
Low-level pin input current	I_{HL}	Pin10 = 0V			0.3	μA

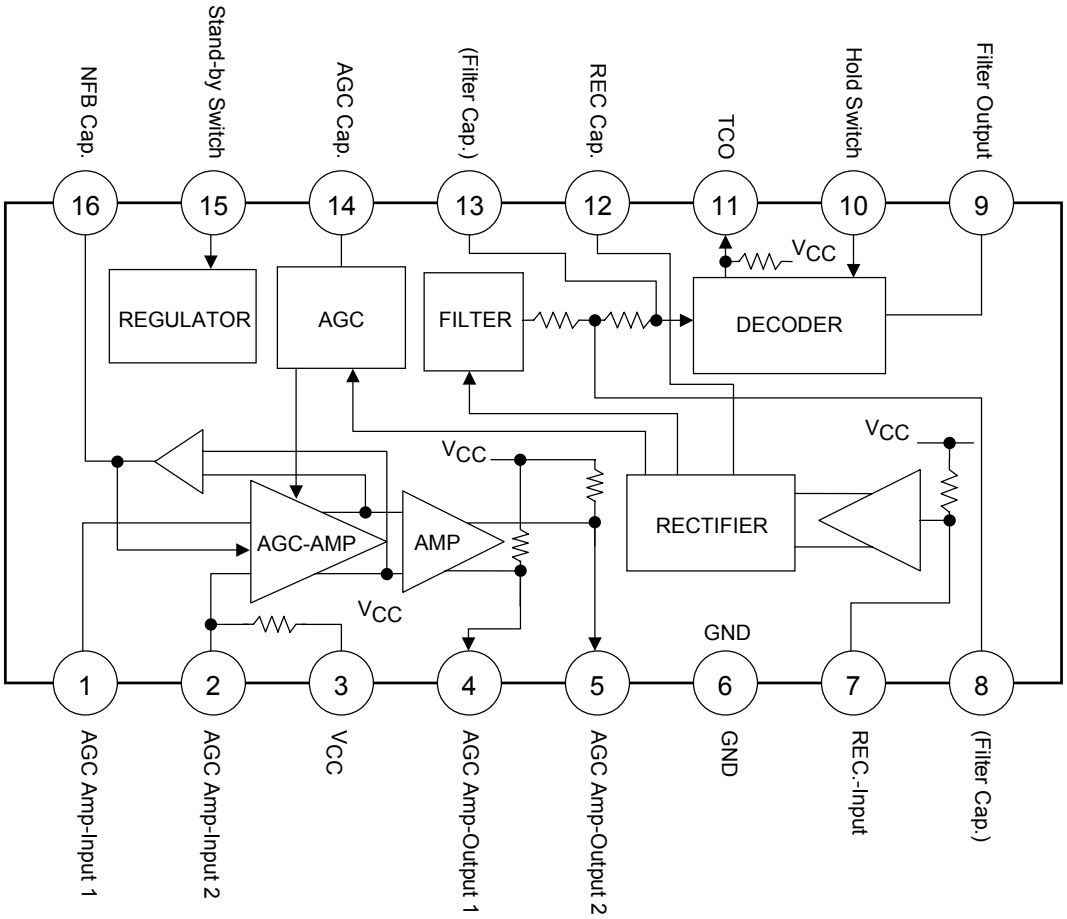
Package Dimensions

unit : mm

3319



Block Diagram



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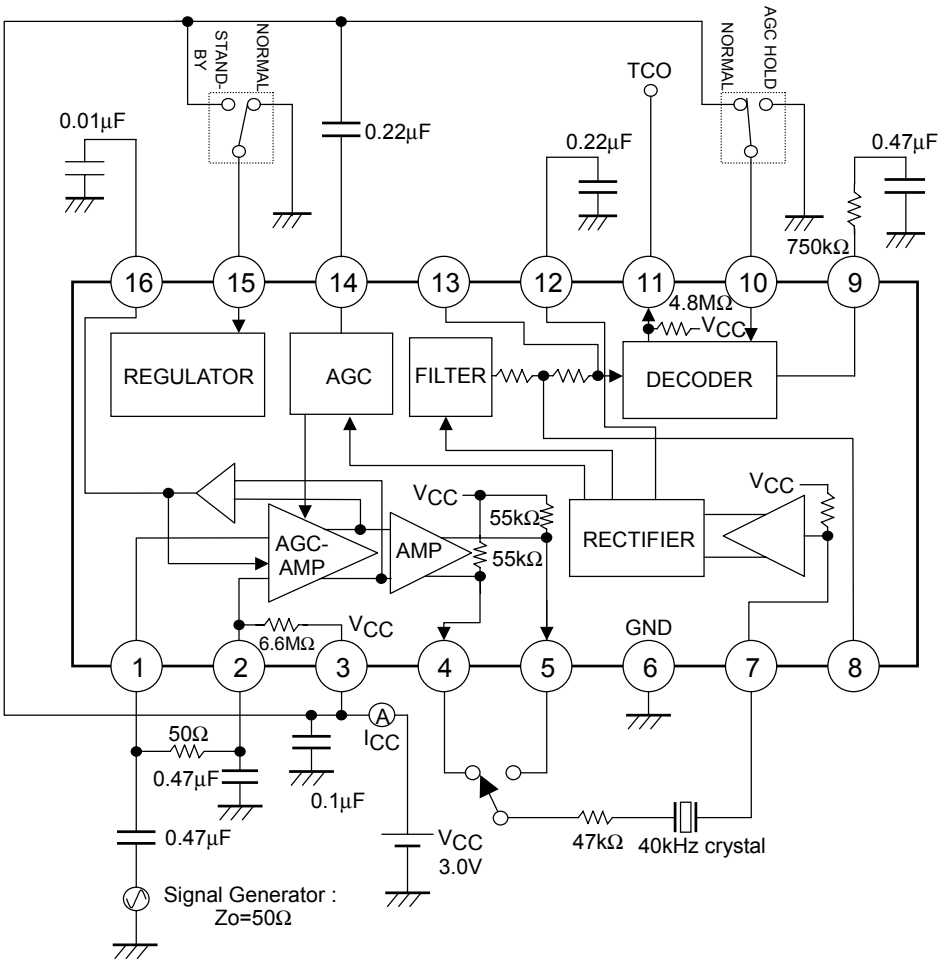
Test Circuit Diagram



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