

**STK311-110****RDS Demodulator**

## Overview

The STK311-110 is an RDS demodulator hybrid IC for the Radio Data System (RDS), or multiplexed FM broadcasting of various kinds of data, introduced within the European Broadcasting Union (EBU). It demodulates the multiplexed data modulating signal to recover the RDS signal. In combination with an LC7070 series LSI (for sync handling, error detection and correction), a low-cost high-performance RDS data decode system can be constructed. Further, low-profile packaging is realized using Sanyo's insulated metal substrate technology (IMST) for the base, SC system and photoresist technologies and folded board construction.

## Applications

- Car stereos
- Home stereos

## Features

- 57kHz BPF built-in for adjustment-free operation
- Few external components required for a complete RDS data demodulation system
- ARI-SK/DK decoder built-in

## Specifications

**Maximum Ratings** at  $T_a = 25^\circ\text{C}$

Parameter	Symbol	Ratings	Unit
Maximum supply voltage	$V_{CC\text{max}}$	6.3	V
Operating temperature	$T_{opr}$	-30 to +85	$^\circ\text{C}$
Storage temperature	$T_{stg}$	-40 to +100	$^\circ\text{C}$

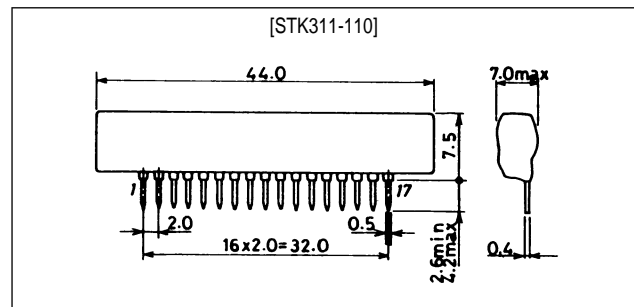
**Recommended Operating Voltages** at  $T_a = 25^\circ\text{C}$

Parameter	Symbol	Ratings	Unit
Supply voltage	$V_{CC}$	5	V
Operating supply voltage range	$V_{CCOP}$	4.7 to 5.5	V

## Package Dimensions

unit: mm

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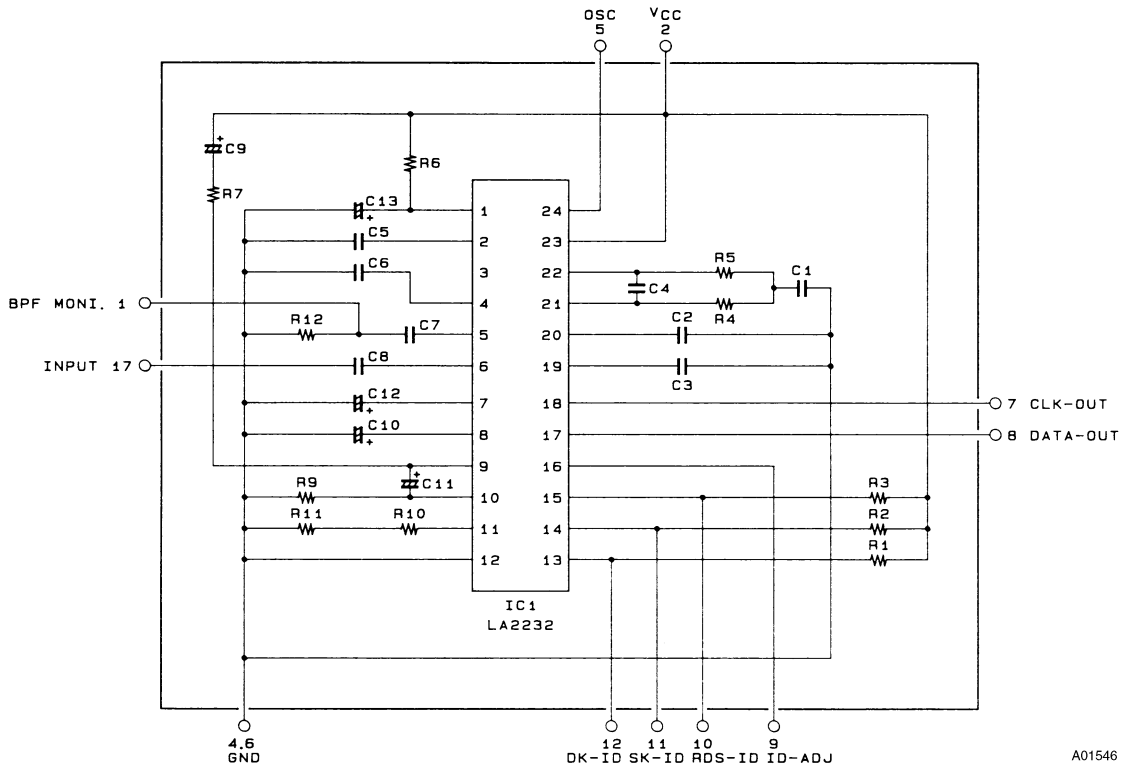


## STK311-110

**Operating Characteristics** at  $T_a = 25^\circ\text{C}$ ,  $V_{CC} = 5\text{V}$

Parameter	Symbol	Conditions	min	typ	max	Unit
Quiescent current	$I_{\text{QD}}$		–	22	30	mA
Band-pass filter gain	$V_{G_{\text{BPF}}}$	$f = 57\text{kHz}$	9	12.5	17	dB
Center frequency			55.8	57	58.2	kHz
Q			–	9	–	
Band-pass filter selectivity		$f = 90\text{kHz}$ ( $57\text{kHz} = 0\text{dB}$ )	–50	–38	–20	dB
		$f = 60\text{kHz}$ ( $57\text{kHz} = 0\text{dB}$ )	–4	–2.5	0	dB
		$f = 54\text{kHz}$ ( $57\text{kHz} = 0\text{dB}$ )	–5	–3.5	0	dB
		$f = 38\text{kHz}$ ( $57\text{kHz} = 0\text{dB}$ )	–50	–39	–35	dB
PLL capture range	CR	5mVrms, CW input	–	–0.5 +1.1	–	%
RDS detector sensitivity		Pin 10 low, input on pin 17	0.15	0.4	1.0	mVrms
SK detector sensitivity		Pin 11 low, input on pin 17	0.3	1.0	2.0	mVrms
DK detector sensitivity		Pin 12 low, input on pin 17	0.8	1.5	2.6	mVrms
RDS input dynamic range		Pin 10 low, (ARI + RDS) signal maximum input on pin 17	30	50	–	mVrms
DK input dynamic range		Pin 12 low, ARI signal maximum input on pin 17	75	100	–	mVrms
VCO free-running frequency	$f_{\text{OSC}}$		453	456	459	kHz

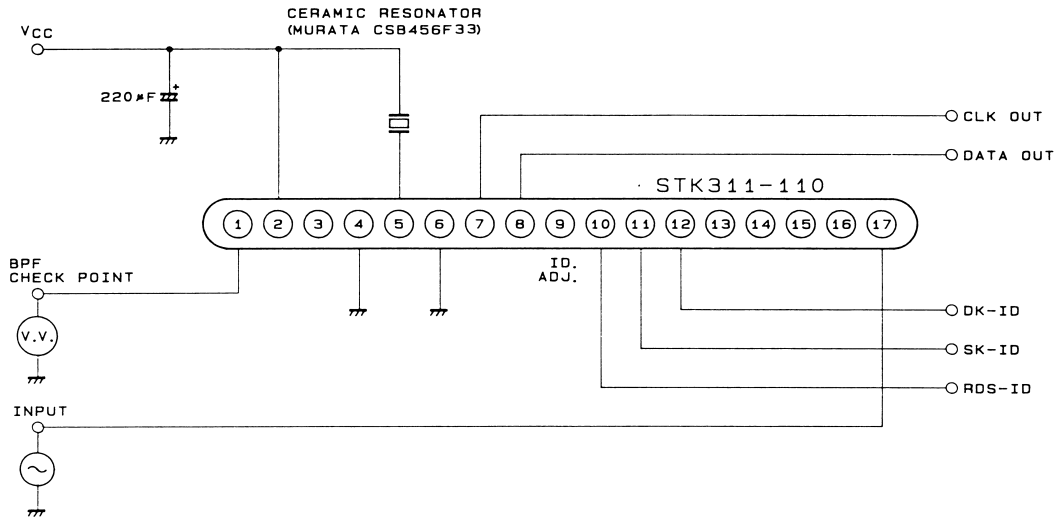
## Equivalent Circuit



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R11 is a function trimming resistor.  
Pins 3, 13 to 16 are no connection pins.

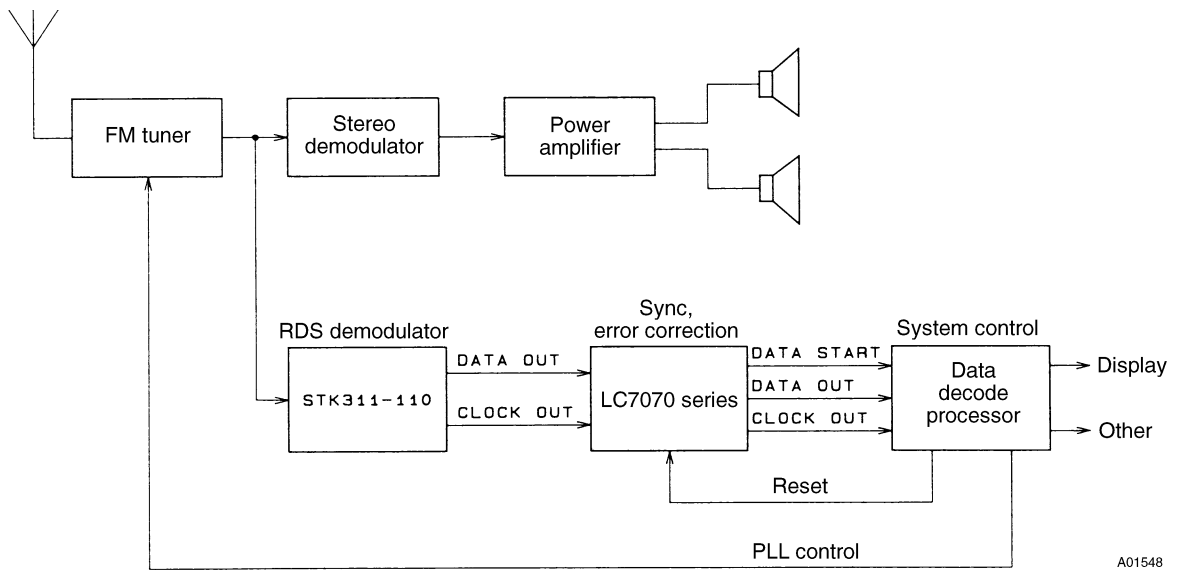
### Sample Application Circuit



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Pins 3, 13 to 15 are left open.

### Sample System Configuration

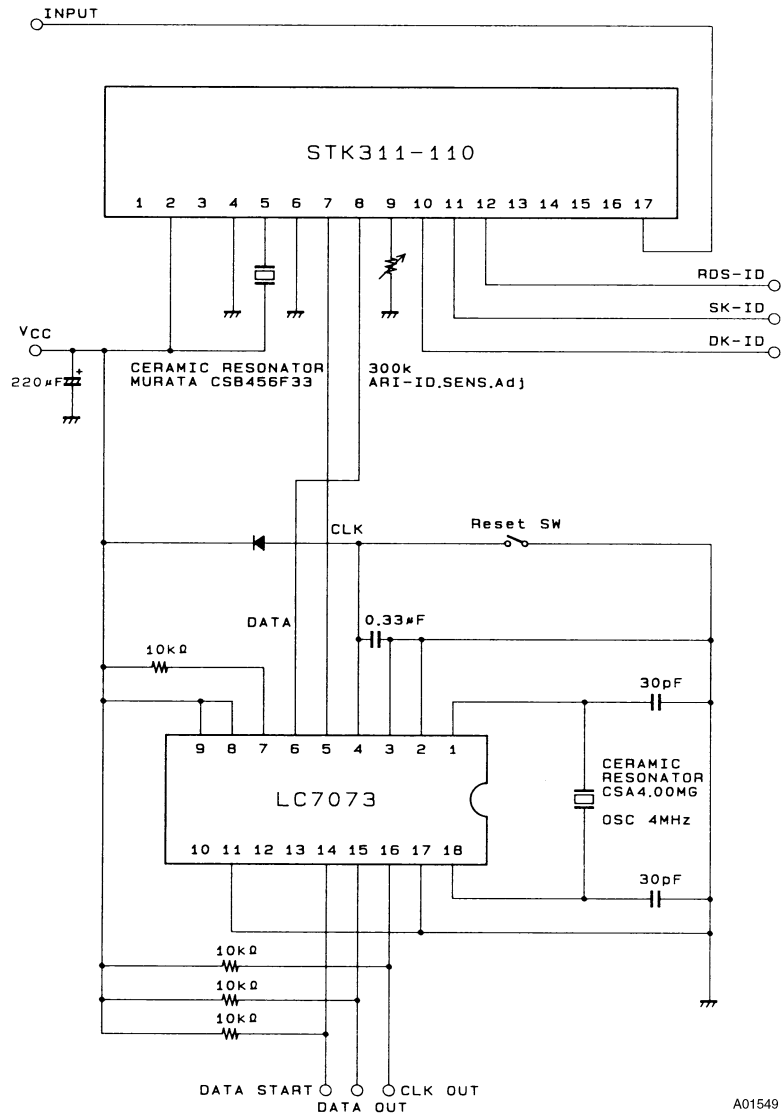


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Pin Functions

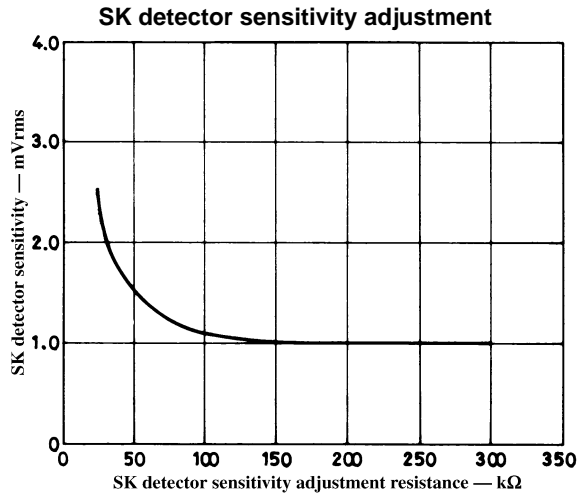
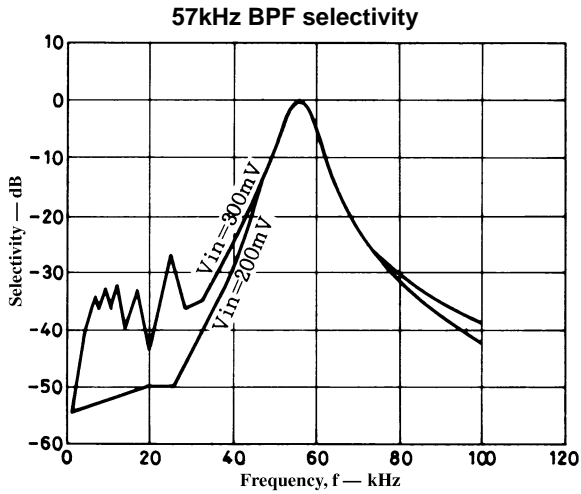
Number	Name	Function
1	MONI	BPF (for adjustment) monitor output
2	V <sub>CC</sub>	Supply pin
4, 6	GND	Ground pins
5	OSC	VCO ceramic oscillator pin (456kHz)
7	CLK OUT	Clock output
8	DATA OUT	Data output
9	ID-ADJ	SK detector sensitivity adjustment pin
10	RDS-ID	RDS signal detector indicator output. Low-level output when an RDS signal is detected, and high-level when not detected.
11	SK-ID	SK signal detector indicator output. Low-level output when an SK signal is detected, and high-level when not detected.
12	DK-ID	DK signal detector indicator output. Low-level output when an DK signal is detected, and high-level when not detected.
17	INPUT	Input pin

Sample RDS Data Decoder Circuit



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**Characteristics Data**



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