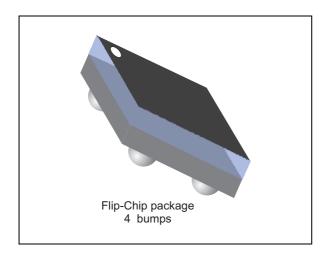
# life.augmented

## BAL-CC1101-01D3

# 50 ohm nominal input / conjugate match balun to CC1101 / CC1150 (868-928 MHz), with integrated harmonic filter

Datasheet - production data



#### **Features**

- 50 Ω nominal input / conjugate match to CC1101 / CC1150
- · Low insertion loss
- · Low amplitude imbalance
- Low phase imbalance
- Coated Flip-Chip on glass
- Small footprint: < 2.1 mm<sup>2</sup>

#### **Benefits**

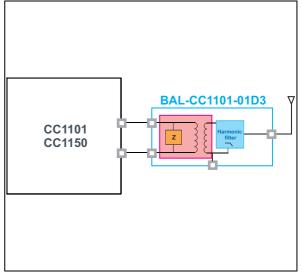
- Extremely low profile (< 550 µm after reflow)</li>
- High RF performance
- RF BOM and area reduction

### **Description**

STMicroelectronics BAL-CC1101-01D3 is an ultra miniature balun which integrates a matching network in a monolithic glass substrate. This has been customized for the CC1101 / CC1150 TI transceiver.

It's a design using STMicroelectronics IPD (integrated passive device) technology on non-conductive glass substrate to optimize RF performance.

Figure 1. Application schematic



Characteristics BAL-CC1101-01D3

## 1 Characteristics

Table 1. Absolute maximum rating (limiting values)

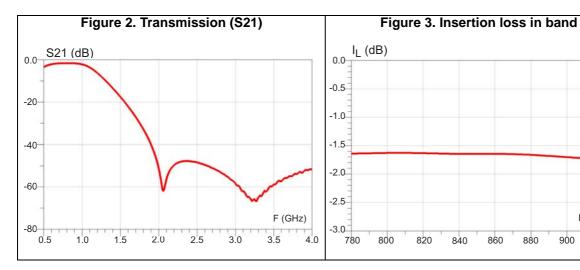
Symbol	Parameter	Value	Unit
P <sub>IN</sub>	Input power RF <sub>IN</sub>		dBm
	ESD ratings human body model (JESD22-A114C), all I/O one at a time while others connected to GND	2000	
V <sub>ESD</sub>	ESD ratings machine model, all I/O	500	V
	ESD ratings charged device model (JESD22-C101D)	500	
T <sub>OP</sub>	Operating temperature	-40 to +125	°C

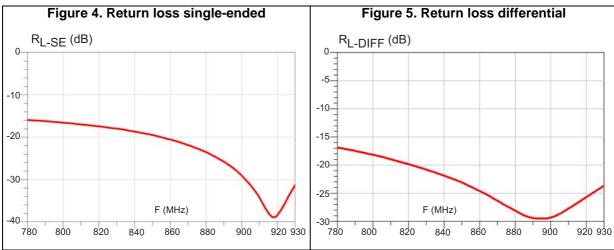
Table 2. Electrical characteristics - RF performance (T<sub>amb</sub> = 25 °C)

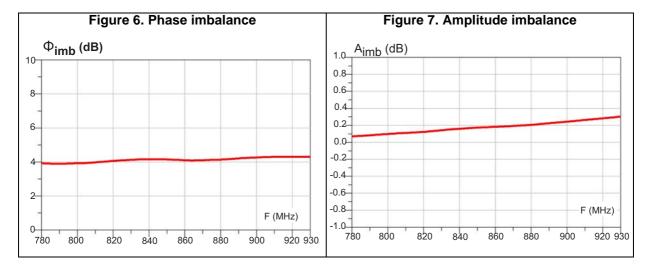
Cumbal	Parameter		Unit		
Symbol	Parameter		Тур.	Max.	Unit
Z <sub>OUT</sub>	Nominal differential output impedance		Conjugate match to CC1101 / CC1150		Ω
Z <sub>IN</sub>	Nominal input impedance	50			
F	Frequency range (bandwidth)	779		928	MHz
ΙL	Insertion loss in bandwidth		1.7	1.9	dB
R <sub>L_SE</sub>	Single ended return loss in bandwidth		15		dB
$R_{L\_DIFF}$	Differential ended return loss in bandwidth		15		dB
$\Phi_{imb}$	Phase imbalance	-10		10	o
A <sub>imb</sub>	Amplitude imbalance	-1		1	dB
Att	Harmonic levels (TX filter) Attenuation at 2fo Attenuation at 3fo		-25 -50		dB

BAL-CC1101-01D3 Characteristics

#### 1.1 Measurements



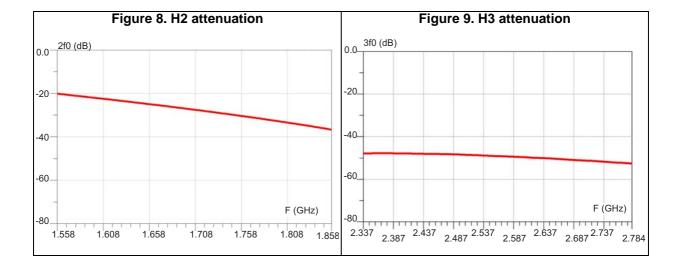




F (MHz)

920 930

Characteristics BAL-CC1101-01D3



BAL-CC1101-01D3 Package information

## 2 Package information

- Epoxy meets UL94, V0
- Lead-free package

In order to meet environmental requirements, ST offers these devices in different grades of ECOPACK<sup>®</sup> packages, depending on their level of environmental compliance. ECOPACK<sup>®</sup> specifications, grade definitions and product status are available at: <a href="https://www.st.com">www.st.com</a>. ECOPACK<sup>®</sup> is an ST trademark.

### 2.1 Flip-Chip package information

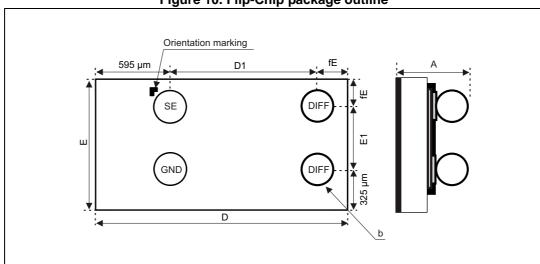
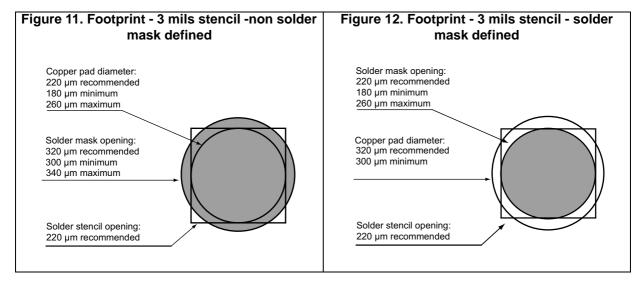


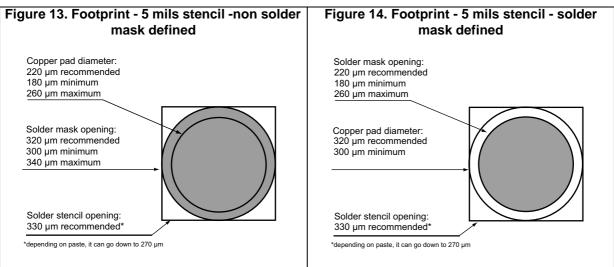
Figure 10. Flip-Chip package outline

Table 3. Flip-Chip package mechanical data

Parameter	Description	Min.	Тур.	Max.	Unit
А	Bump height + substrate thickness	0.570	0.630	0.690	mm
b	Bump diameter	0.215	0.255	0.295	mm
D	Y dimension of the die	1.970	2.020	2.070	mm
D1	Y pitch		1.200		mm
Е	X dimension of the die	1.000	1.050	1.100	mm
E1	X pitch		0.500		mm
fE	Distance from bump to edge of die on X axis			0.225	mm

Package information BAL-CC1101-01D3





BAL-CC1101-01D3 Package information

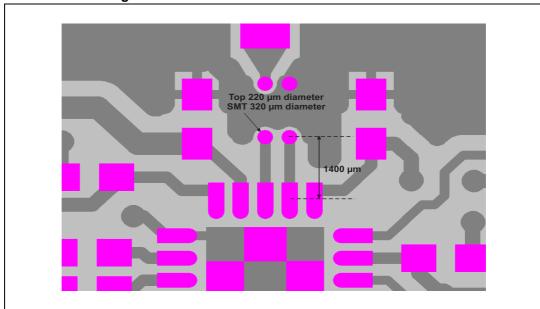


Figure 15. PCB view CC1101 with BAL-CC1101-01D3

Figure 16. Marking

Dot, ST logo

ECOPACK grade

xx = marking

z = manufacturing
location

yww = datecode
(y = year, ww = week)

XXXZ

YWW

Package information BAL-CC1101-01D3

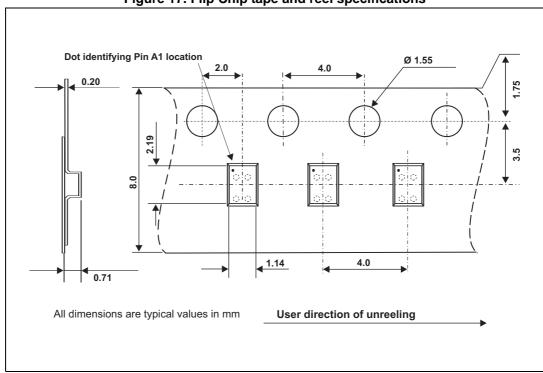


Figure 17. Flip Chip tape and reel specifications

Note: More information is available in the STMicroelectronics Application note: AN2348 Flip-Chip: "Package description and recommendations for use"

## 3 Ordering information

**Table 4. Ordering information** 

Order code	Marking	Package	Weight	Base qty	Delivery mode
BAL-CC1101-01D3	SS	Flip-Chip	2.21 mg	5000	Tape and reel (7")

## 4 Revision history

**Table 5. Document revision history** 

Date	Revision	Changes
23-Jan-2014	1	Initial release
18-Sep-2015	2	Updated Figure 10. Added Figure 11, Figure 12, Figure 13, Figure 14 and Table 3.
02-May-2016	3	Updated Figure 10 and Table 3.

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