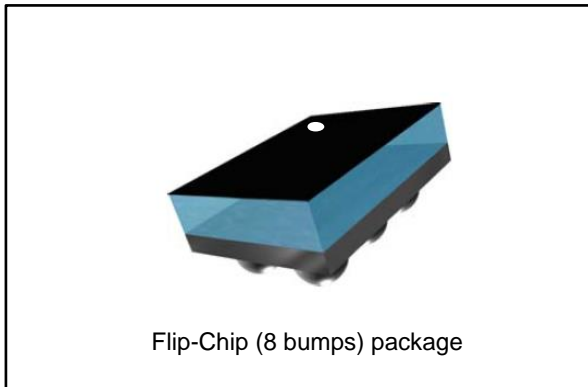


50 ohm nominal input / conjugate match balun CC1120, CC1125 (868-928 MHz), with integrated harmonic filter

Datasheet - production data



Description

STMicroelectronics' BALF-112X-01D3 is an ultra-miniature balun, integrating both matching network and harmonics filter.

Matching impedance has been customized for the CC1120, CC1125, CC1175 and CC1200 transceivers from Texas Instruments. The device uses STMicroelectronics' IPD technology on a non-conductive glass substrate, which optimizes RF performance.

Features

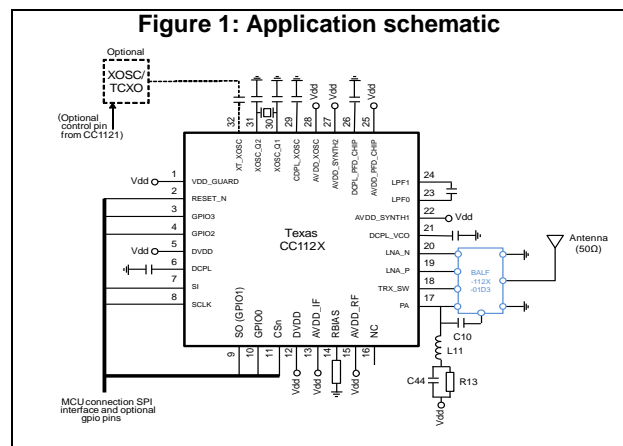
- 50 Ω nominal input / conjugate match to CC1120, CC1125
- Low insertion loss
- Low amplitude imbalance
- Low phase imbalance
- Small footprint

Benefits

- Very low profile (< 670 μm thickness)
- High RF performance
- RF BOM and size reduction

Applications

- 868 MHz and 928 MHz impedance-matched balun filter optimized for Texas Instruments® CC1120, CC1125, CC1175, CC1200 sub-GHz RFICs.



C10 is a DC block capacitor: 0402/100 pF/50 V

1 Characteristics

Table 1: Absolute maximum ratings (limiting values)

Symbol	Parameter	Value			Unit
		Min.	Typ.	Max.	
P _{IN}	Input power RFIN		-	20	dBm
V _{ESD}	ESD ratings MIL STD883C (HBM: C = 100 pF, R = 1.5 Ω, air discharge)	500	-		V
	ESD ratings machine model (MM: C = 200 pF, R = 25 W, L = 500 nH)	250	-		
T _{OP}	Operating temperature	-40	-	+85	°C

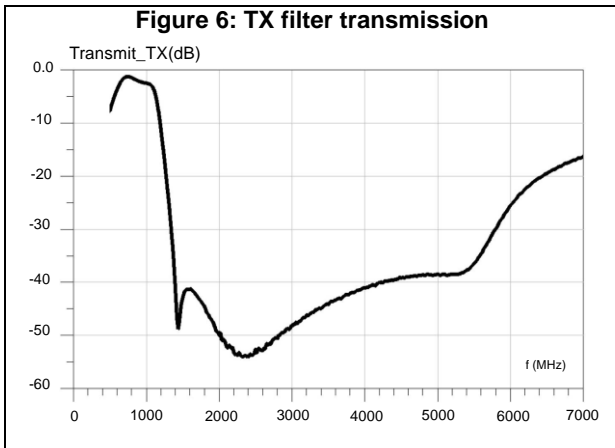
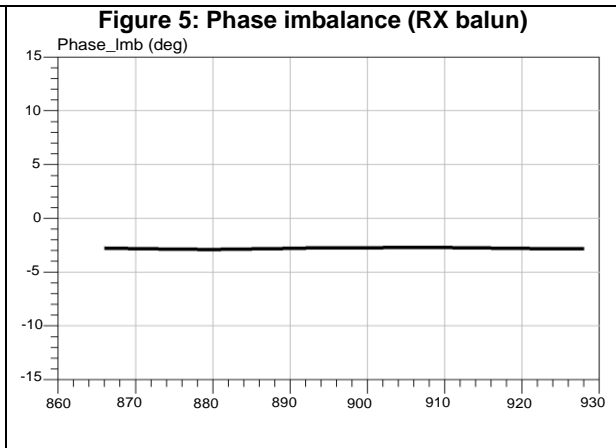
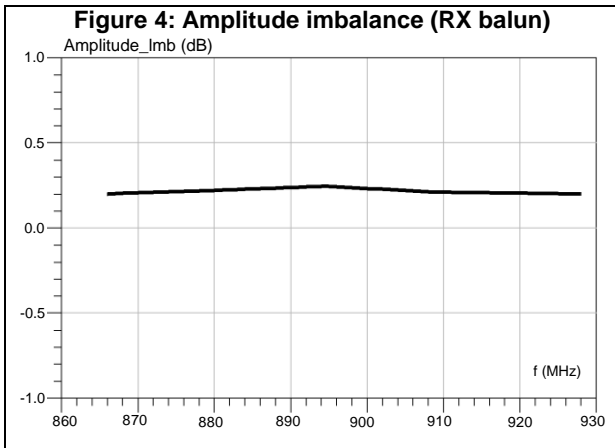
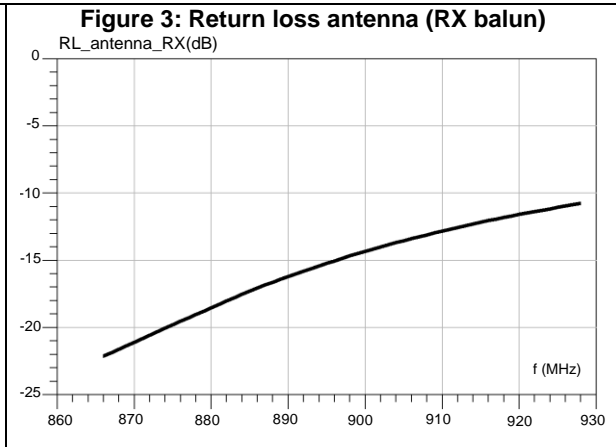
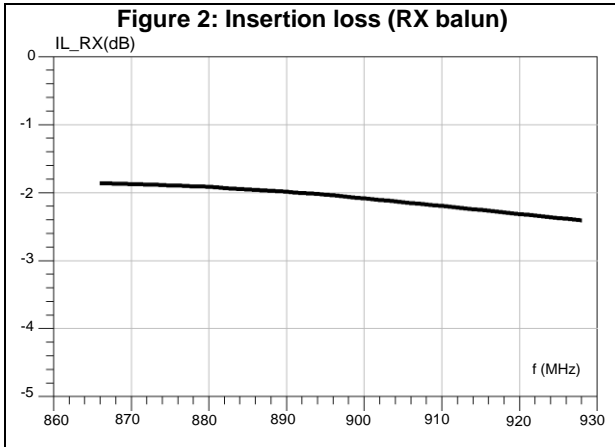
Table 2: Electrical characteristics and RF performance (T_{amb} = 25 °C) RX balun

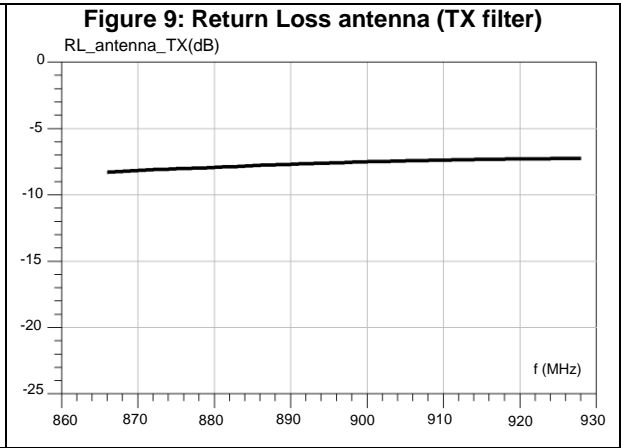
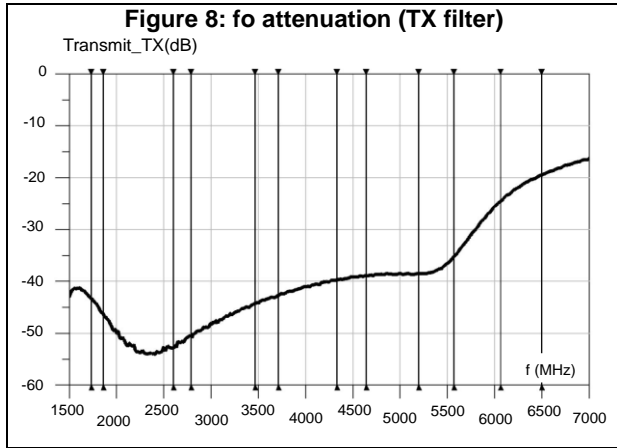
Symbol	Parameter	Test condition	Value			Unit
			Min.	Typ.	Max.	
Z _{RX}	Nominal differential impedance			Match to CC112X		Ω
Z _{ANT}	Antenna impedance			50		Ω
f	Frequency range (bandwidth)		866		928	MHz
S _{21RX-ANT}	Insertion loss in bandwidth	at 868 MHz	-2.3	-1.9		dB
		at 928 MHz	-2.8	-2.4		
S _{11ANT}	Input return loss in bandwidth	at 868 MHz		-22	-20	dB
		at 928 MHz		-11	-9	
Phase_imbal	Output phase imbalance		-10	-2.9	10	°
Ampl_imbal	Output amplitude imbalance		-1	-0.3	1	dB

Table 3: Electrical characteristics and RF performance ($T_{amb} = 25\text{ °C}$) TX filter

Symbol	Parameter	Test condition	Value			Unit
			Min.	Typ.	Max.	
Z_{TX}	Nominal TX impedance			Match to CC112X		Ω
Z_{ANT}	Antenna impedance			50		Ω
f	Frequency range (bandwidth)		866		928	MHz
$S_{21_{TX-ANT}}$	Insertion loss in bandwidth	at 868 MHz	-2.3	-1.9		dB
		at 928 MHz	-2.7	-2.3		
$S_{11_{ANT}}$	Input return loss in bandwidth	at 868 MHz		-8	-6	dB
		at 928 MHz		-7	-5	
Att	Harmonic levels	Attenuation at 2 fo		-43	-41	dBm
		Attenuation at 3 fo		-50	-46	
		Attenuation at 4 fo		-43	-40	
		Attenuation at 5 fo		-39	-37	
		Attenuation at 6 fo		-35	-33	
		Attenuation at 7 fo		-19	-17	

1.1 RF measurement





2 Package information

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

2.1 Flip-Chip CSPG 0.4 package information

Figure 10: Flip-Chip CSPG 0.4 package outline

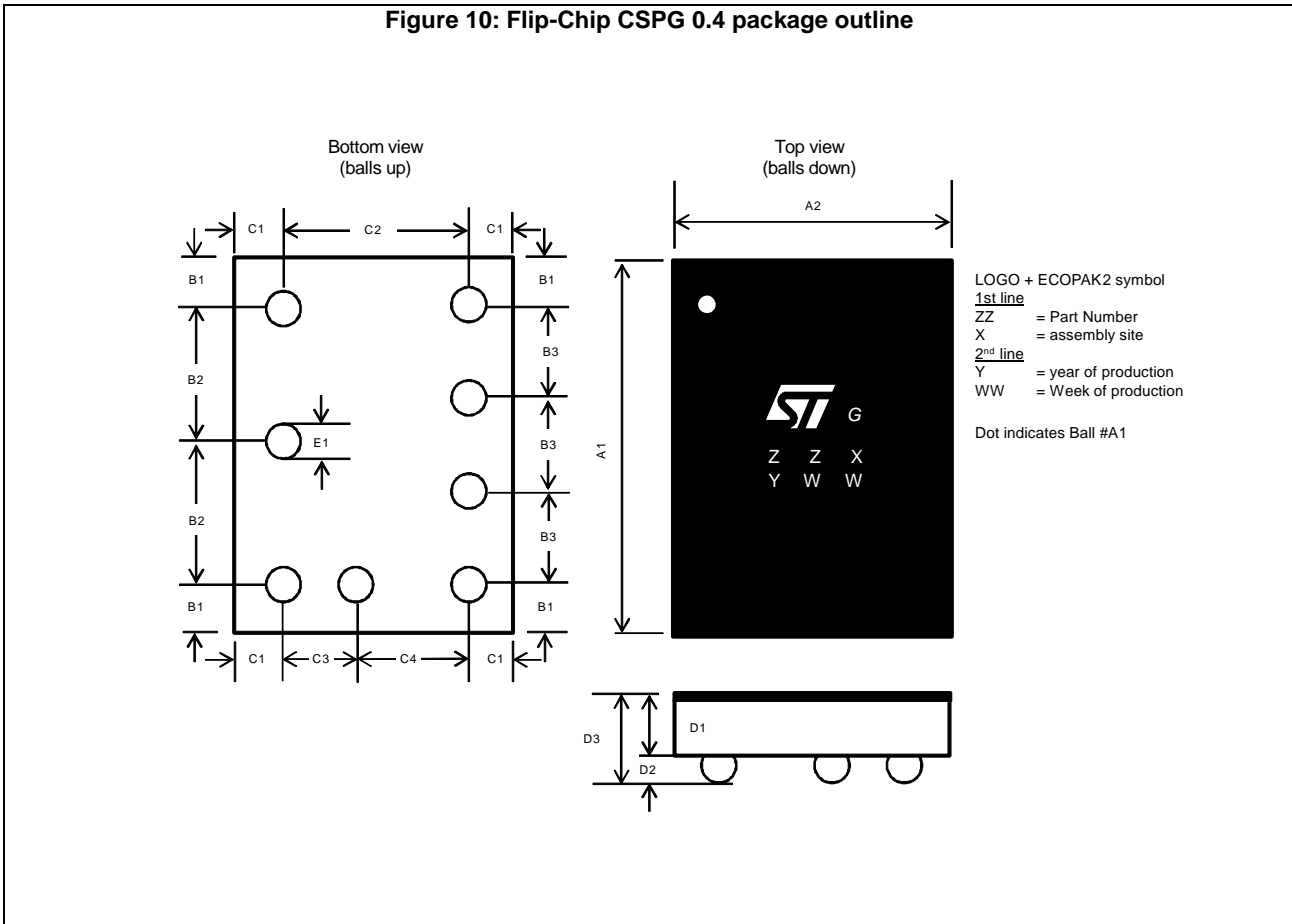


Table 4: Flip-Chip CSPG 0.4 mechanical data

Dimensions	Frequency	A1	A2	B1	B2	B3	C1	C2	C3	C4	D1	D2	D3	E1
BAL-112X-01D3	868 MHz	1950	1450	225	750	500	223	1004	400	604	425	205	630	255

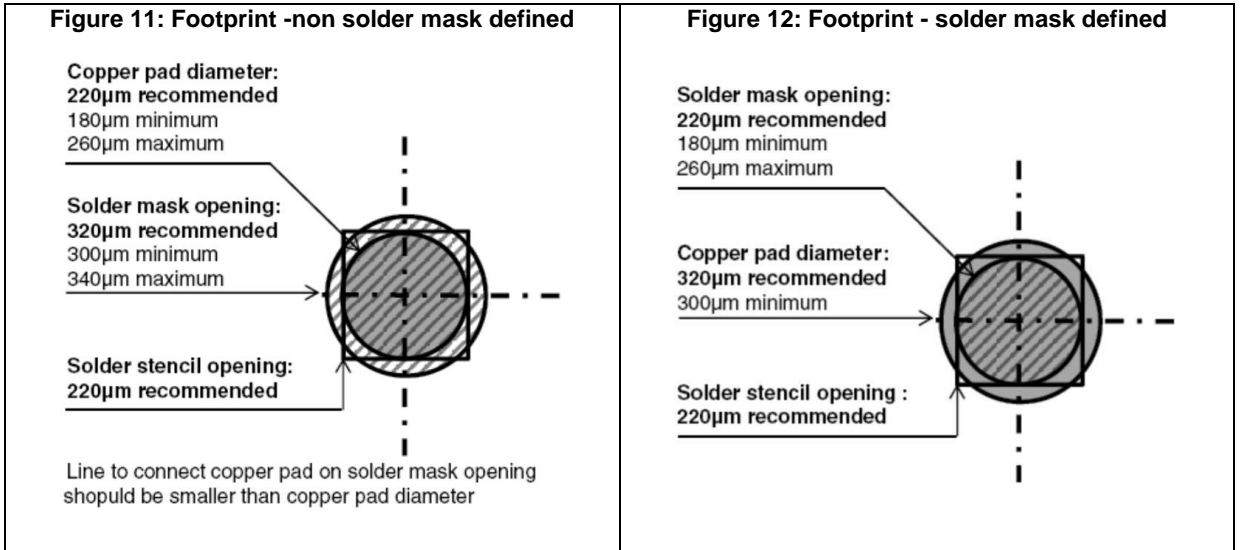
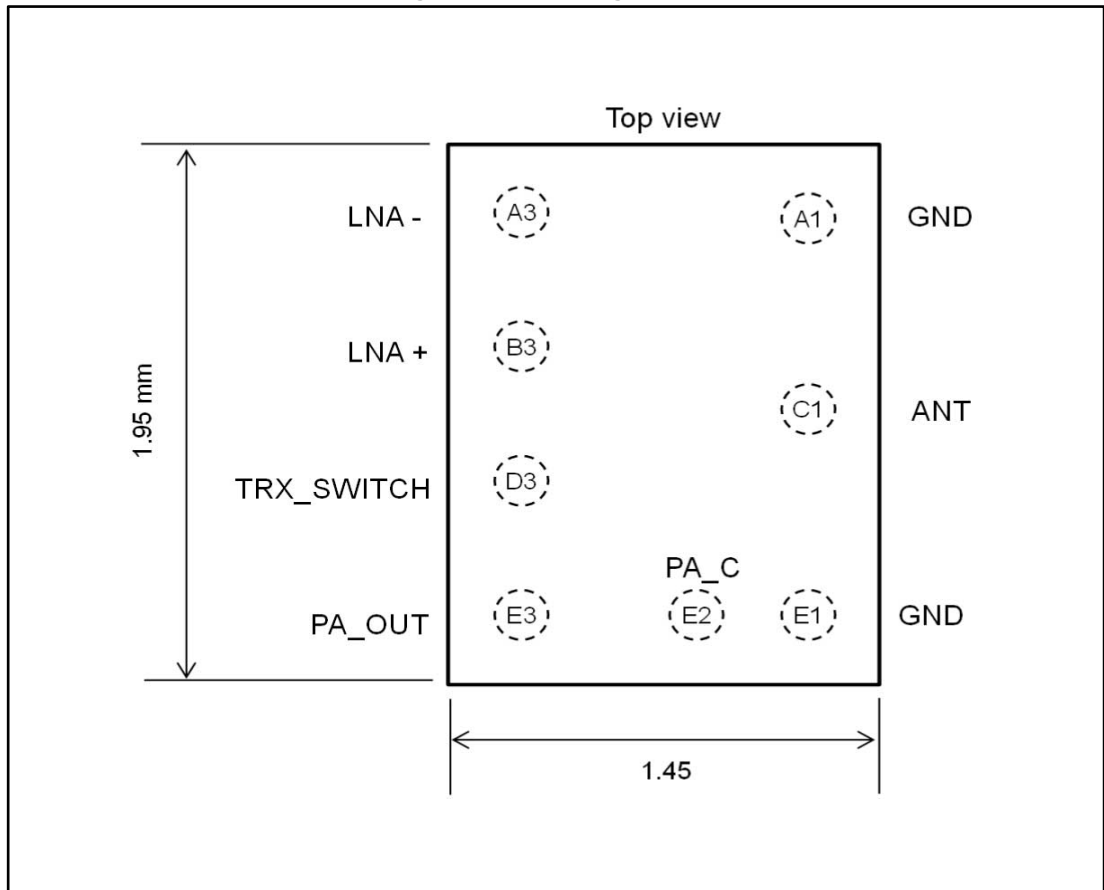


Figure 13: Ball assignment



3 Ordering information

Table 6: Ordering information

Order code	Marking	Package	Weight	Base qty.	Delivery mode
BALF-112X-01D3	TF	CSPG	3.02 mg	5000	Tape and reel

4 Revision history

Table 7: Document revision history

Date	Revision	Changes
04-Jul-2016	1	First issue.
20-Feb-2017	2	Updated Front page.

IMPORTANT NOTICE – PLEASE READ CAREFULLY

STMicroelectronics NV and its subsidiaries ("ST") reserve the right to make changes, corrections, enhancements, modifications, and improvements to ST products and/or to this document at any time without notice. Purchasers should obtain the latest relevant information on ST products before placing orders. ST products are sold pursuant to ST's terms and conditions of sale in place at the time of order acknowledgement.

Purchasers are solely responsible for the choice, selection, and use of ST products and ST assumes no liability for application assistance or the design of Purchasers' products.

No license, express or implied, to any intellectual property right is granted by ST herein.

Resale of ST products with provisions different from the information set forth herein shall void any warranty granted by ST for such product.

ST and the ST logo are trademarks of ST. All other product or service names are the property of their respective owners.

Information in this document supersedes and replaces information previously supplied in any prior versions of this document.

© 2017 STMicroelectronics – All rights reserved