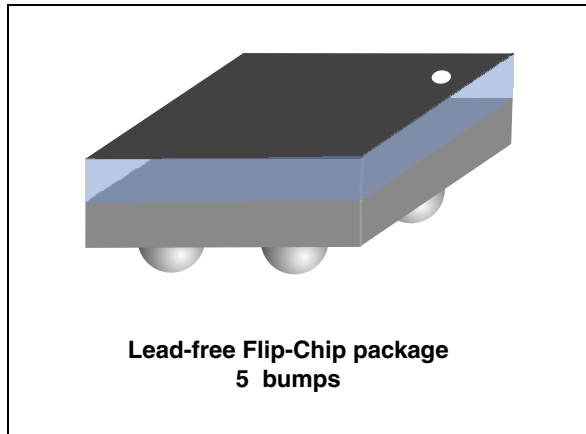


## Balun transformer with integrate matching

Datasheet – production data



### Features

- 50  $\Omega$  nominal input / match ST-Ericsson RF IC CW1250, CW1150, CW1260
- Low insertion loss
- Low amplitude imbalance
- Low phase imbalance
- DC blocking access on single RF input
- Small footprint: < 1.2 mm<sup>2</sup>

### Benefits

- Extremely low profile (< 550  $\mu$ m after reflow)
- Integrate matching network
- High RF performances
- RF components count and area reduction

### Applications

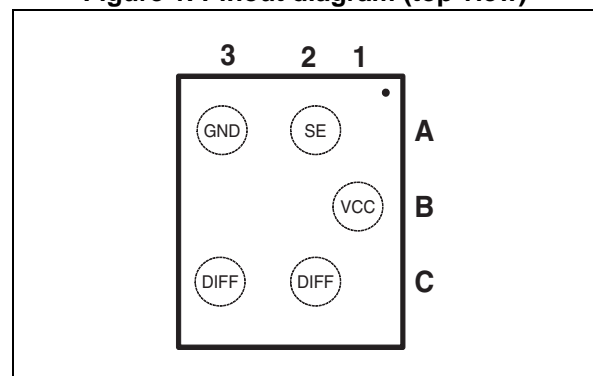
- Balun with integrated matching for ST-Ericsson RF IC CW1250, C1150, CW1260

### Description

STMicroelectronics BAL-CW1250D3 is a balun (balanced/unbalanced device) designed to transform a single ended signal to differential signals in WLAN application. This BAL-CW1250D3, with low insertion losses in the bandwidth 2400 MHz to 2500 MHz, has been customized for CW1250, CW1150, CW1260 transceiver. The differential output embeds an integrated matching network adapted to the transceiver.

The BAL-CW1250D3 has been designed using STMicroelectronics IPD (integrated passive device) technology on non-conductive glass substrate to optimize RF performances.

**Figure 1. Pinout diagram (top view)**



# 1 Characteristics

**Table 1. Absolute maximum ratings (limiting values)**

Symbol	Parameter	Value			Unit
		Min	Typ	Max	
$P_{IN}$	Average power $RF_{IN}$			24	dBm
$V_{ESD}$	ESD ratings MIL STD883C (HBM: C = 100 pF, R = 1.5 k $\Omega$ , air discharge)	2000			V
	ESD ratings charged device model (JESD22-C101-D)	500			
	ESD ratings machine model (MM: C = 200 pF, R = 25 $\Omega$ , L = 500 nH)	200			
$T_{OP}$	Operating temperature	-30 to +85			$^{\circ}C$

**Table 2. Impedances ( $T_{amb} = 25^{\circ}C$ )**

Symbol	Parameter	Value			Unit
		Min	Typ	Max	
$Z_{OUT}$	Nominal differential output impedance		matched		$\Omega$
$Z_{IN}$	Nominal input impedance		50		$\Omega$

**Table 3. RF performance ( $T_{amb} = 25^{\circ}C$ )**

Symbol	Parameter	Value			Unit
		Min	Typ	Max	
F	Frequency range (bandwidth)	2400		2500	MHz
IL	Insertion loss in bandwidth		0.97		dB
$RL_{SE}$	Single ended return loss in bandwidth		-21		dB
$RL_{DIFF}$	Differential return loss in bandwidth		-24		dB
$\phi_{imb}$	Phase imbalance	-10		10	$^{\circ}$
Aimb	Amplitude imbalance	-1	0.1	1	dB
$Att_{2f_0}$	2nd harmonic attenuation		-19		dB

Figure 2. Insertion loss

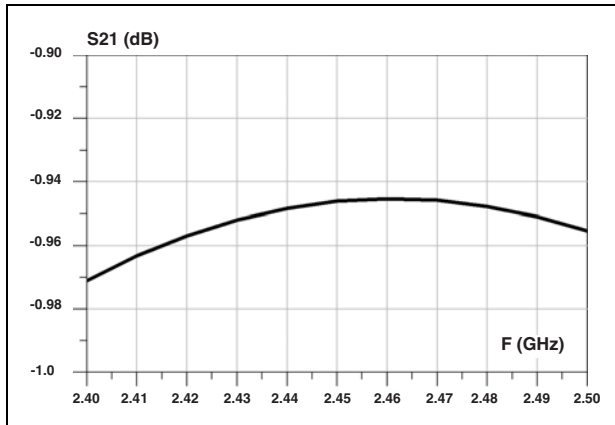


Figure 3. Single ended return loss

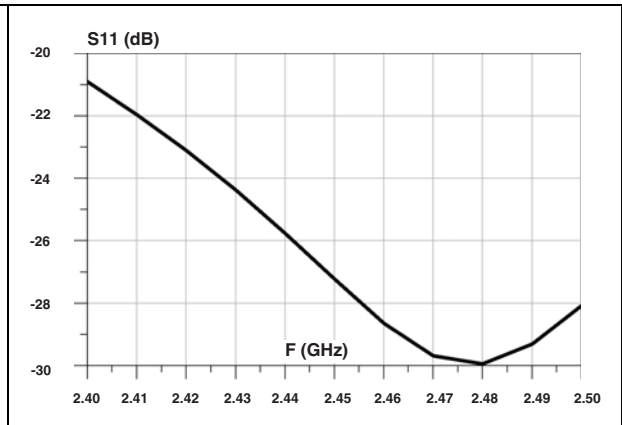


Figure 4. Differential return loss

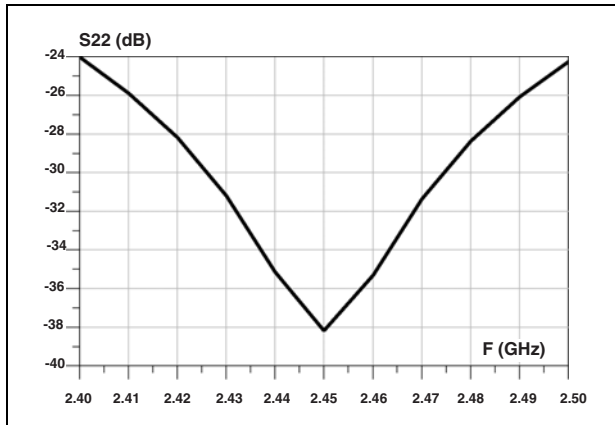


Figure 5. Amplitude imbalance

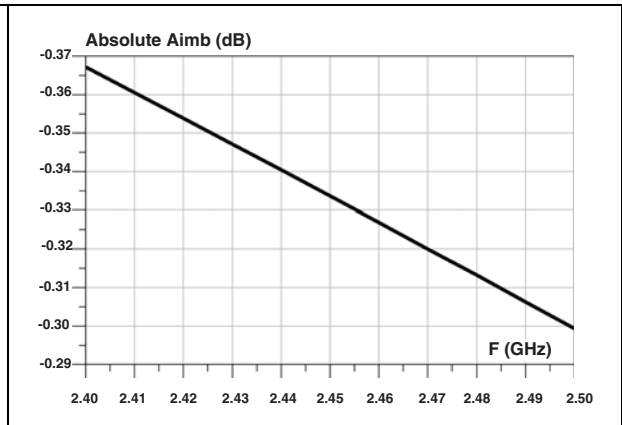


Figure 6. Phase imbalance

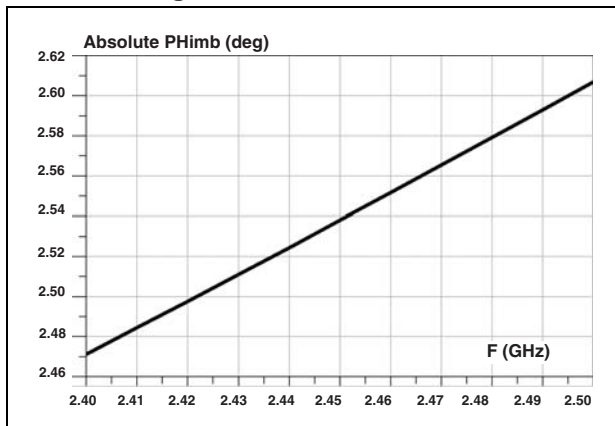
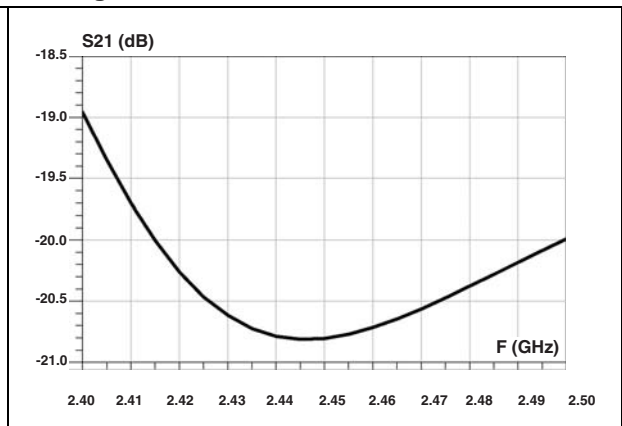
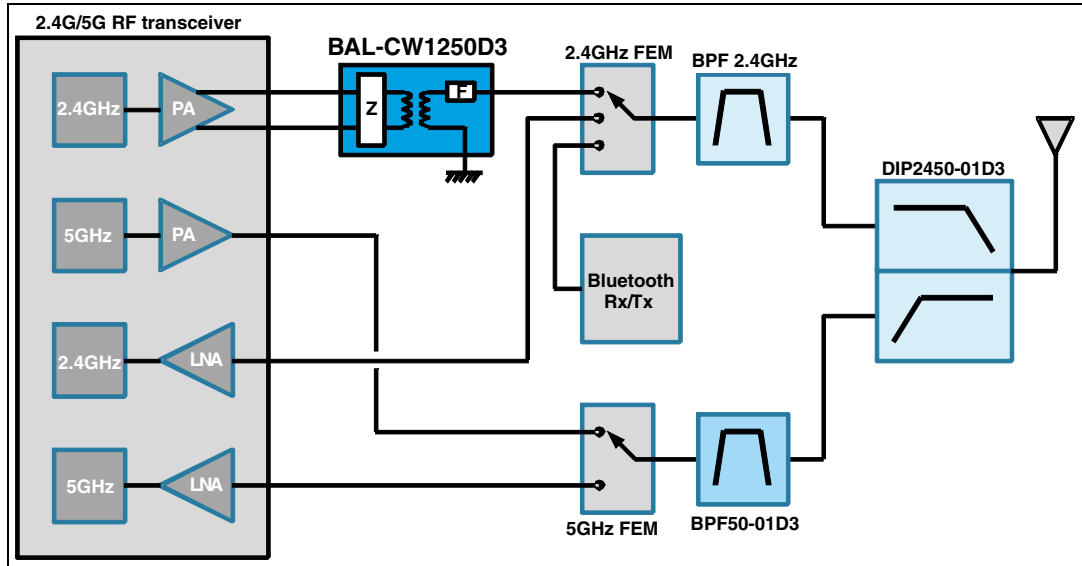


Figure 7. Second harmonic attenuation



## 2 Application information

Figure 8. Application schematic



### 3 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](http://www.st.com). ECOPACK® is an ST trademark.

Figure 9. Flip-chip package dimensions (top and side view)

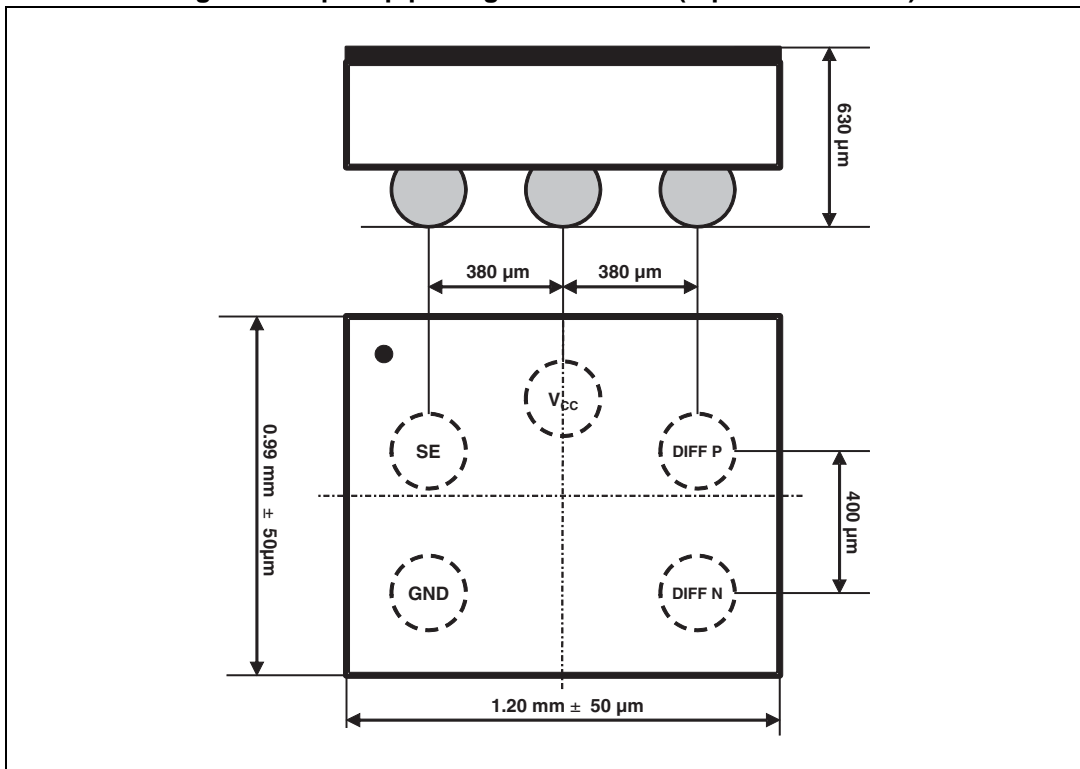


Figure 10. Footprint

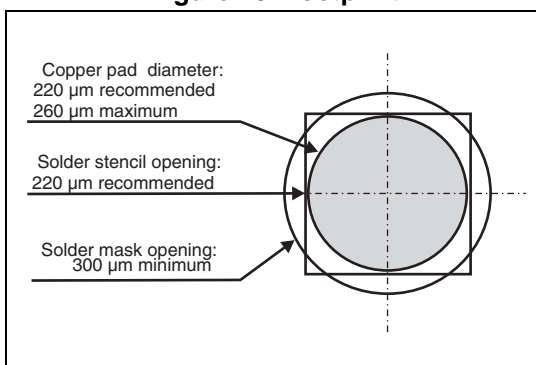


Figure 11. Marking

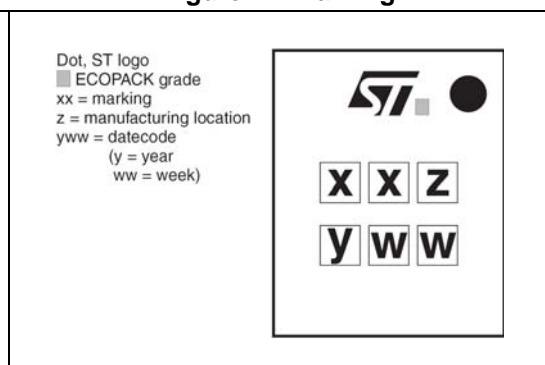


Figure 12. Recommended land pattern (used for balun characterization)

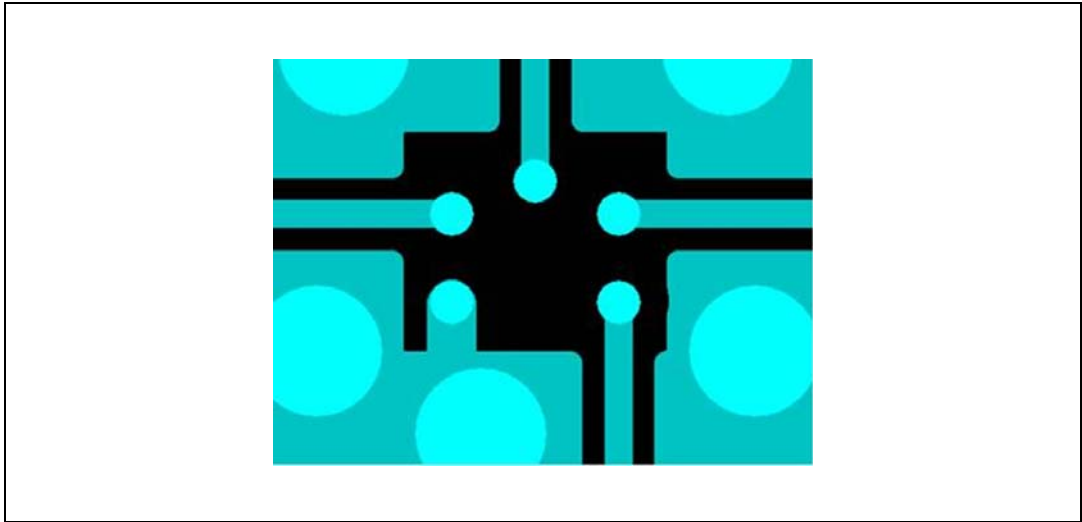
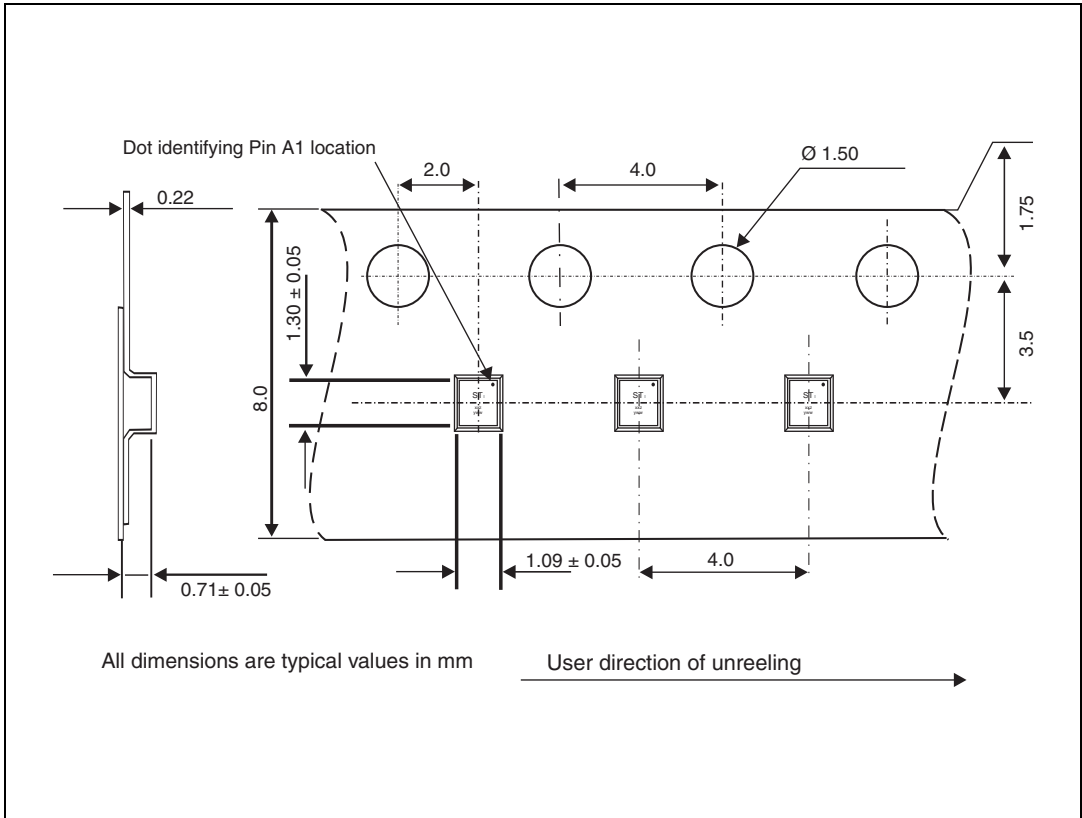


Figure 13. Flip Chip tape and reel specifications



Note: More information is available in the application notes:  
 AN2348 Flip-Chip package description and recommendations for use

## 4 Ordering information

Table 4. Ordering information

Part Number	Marking	Package	Weight	Base Qty	Delivery Mode
BAL-CW1250D3	SG	Flip Chip	1.46 mg	5000	Tape and Reel(7")

## 5 Revision history

Table 5. Document revision history

Date	Revision	Changes
23-May-2013	1	Initial release.

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