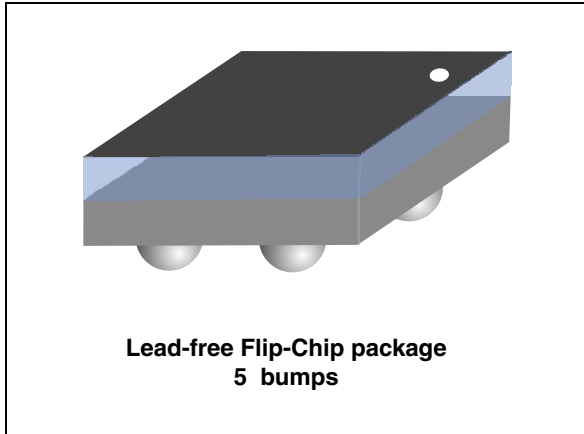


Balun transformer with integrate matching

Datasheet — production data



Features

- 50 Ω 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 mm²

Benefits

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

Applications

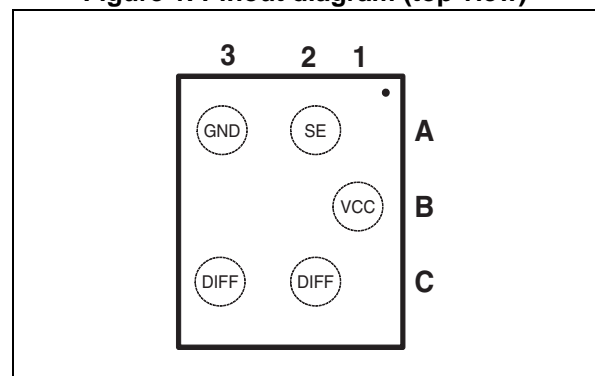
- Balun with integrated matching for ST-Ericsson RF IC CW1250, C1150, CW1260

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 Ω , air discharge) | 2000 | | | V |
| | ESD ratings charged device model (JESD22-C101-D) | 500 | | | |
| | ESD ratings machine model (MM: C = 200 pF, R = 25 Ω , L = 500 nH) | 200 | | | |
| T_{OP} | Operating temperature | -30 to +85 | | | $^{\circ}\text{C}$ |

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

| Symbol | Parameter | Value | | | Unit |
|-----------|---------------------------------------|-------|---------|-----|----------|
| | | Min | Typ | Max | |
| Z_{OUT} | Nominal differential output impedance | | matched | | Ω |
| Z_{IN} | Nominal input impedance | | 50 | | Ω |

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

| 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 |
| ϕ_{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

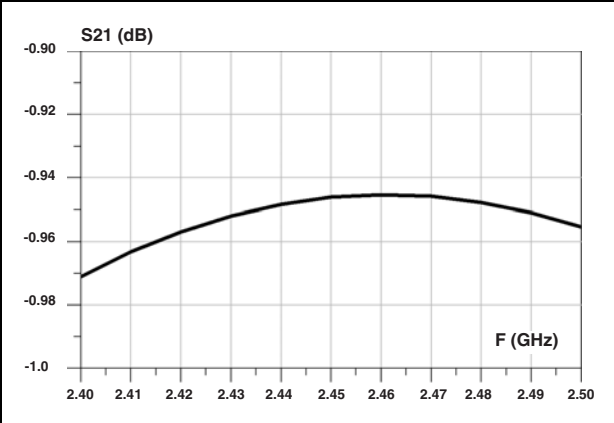


Figure 3. Single ended return loss

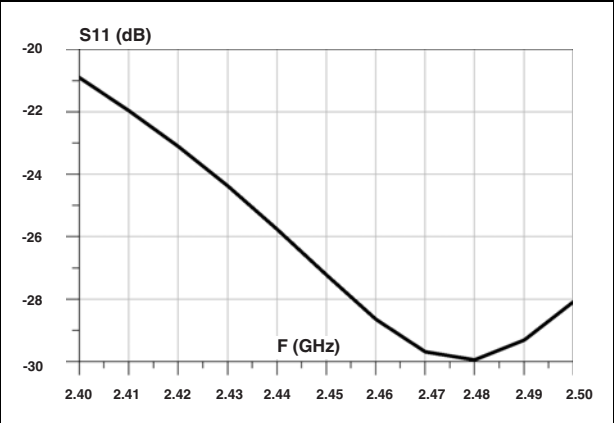


Figure 4. Differential return loss

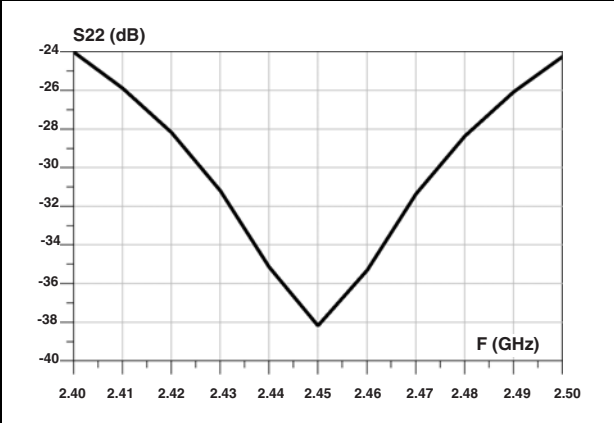


Figure 5. Amplitude imbalance

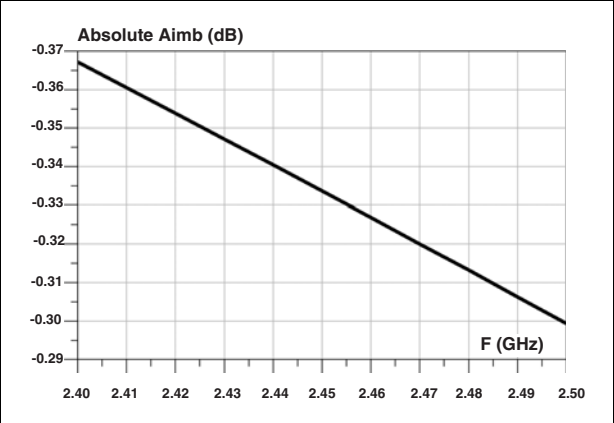


Figure 6. Phase imbalance

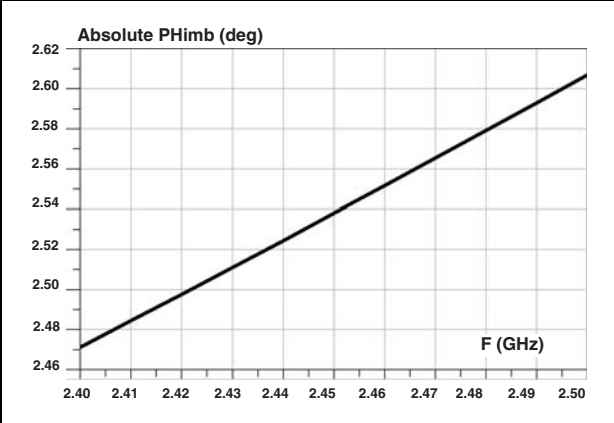
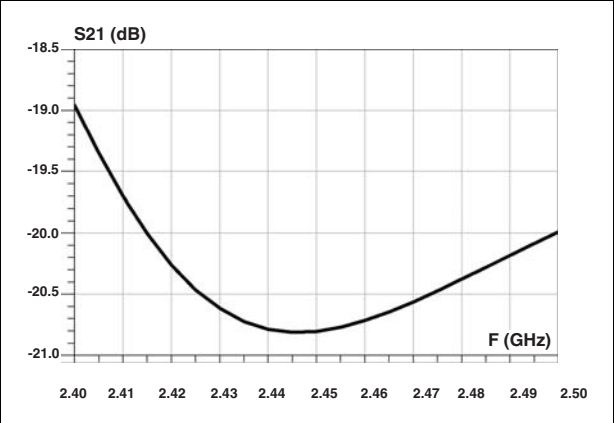
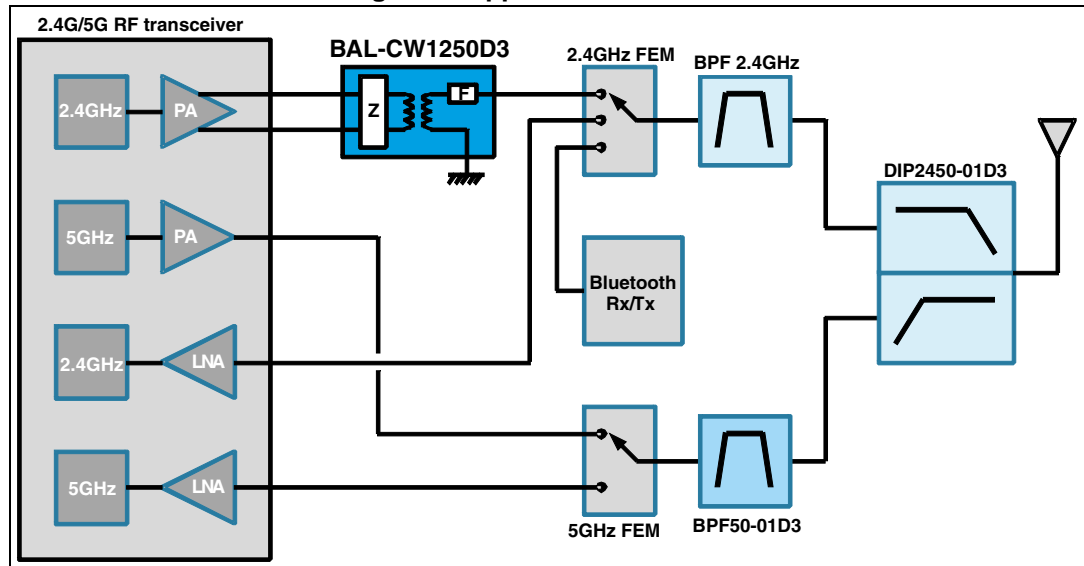


Figure 7. Second harmonic attenuation



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. ECOPACK® is an ST trademark.

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

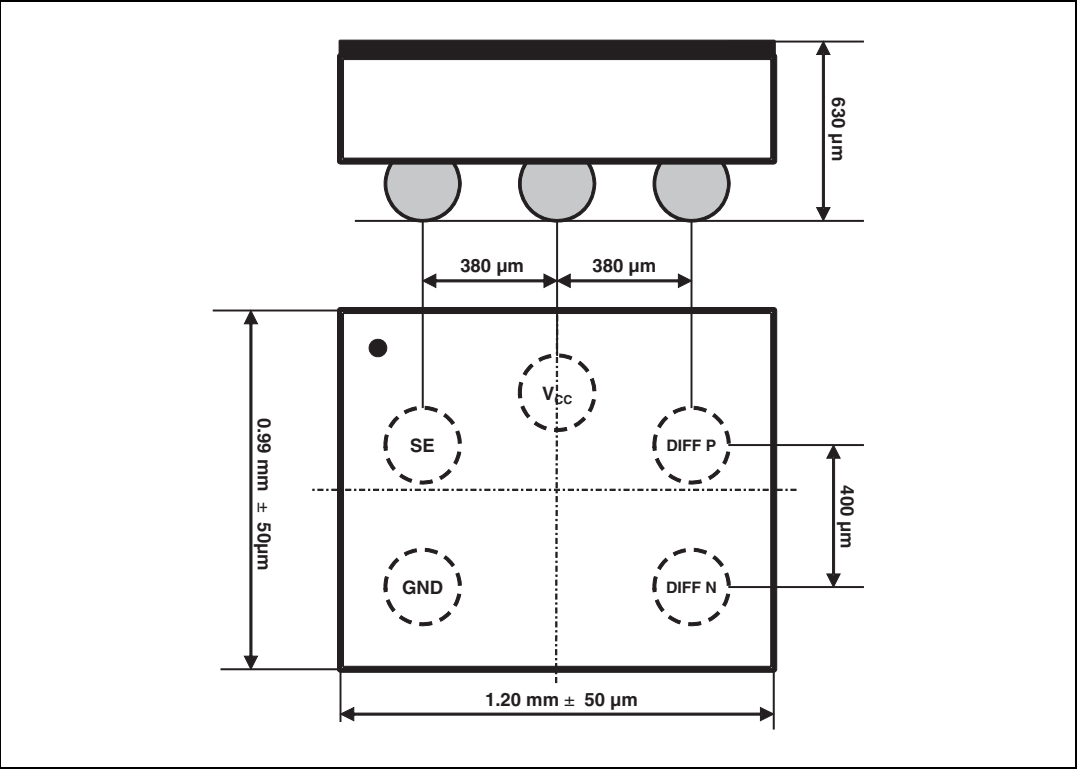


Figure 10. Footprint

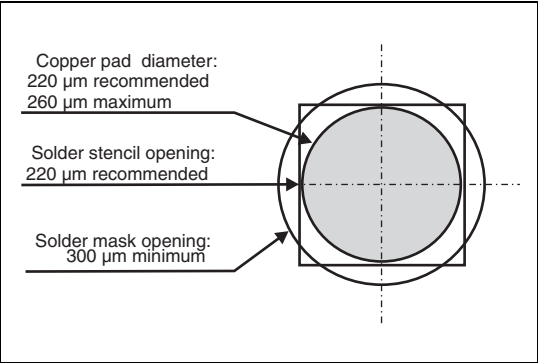


Figure 11. Marking

Dot, ST logo
■ ECOPACK grade
xx = marking
z = manufacturing location
yww = datecode
(y = year
ww = week)



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

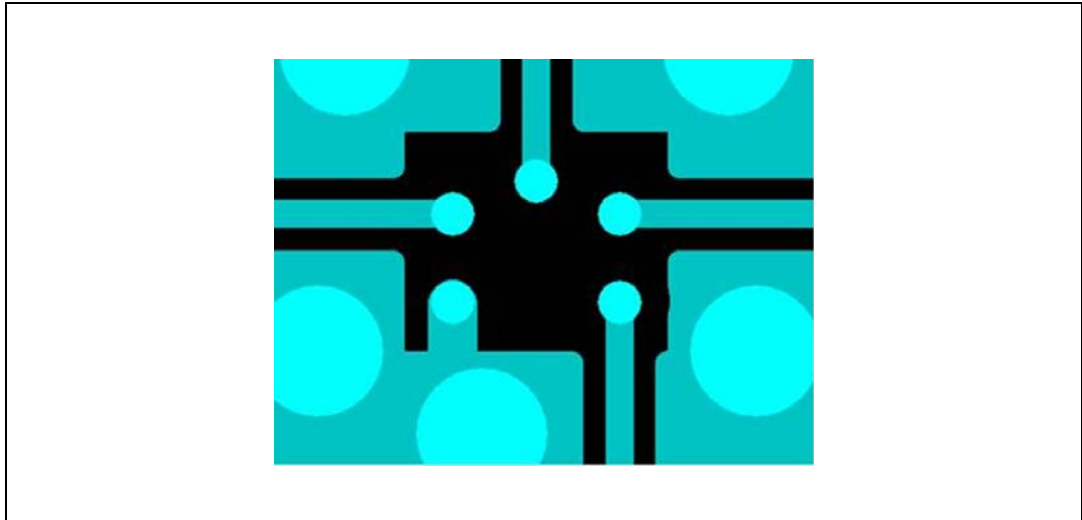
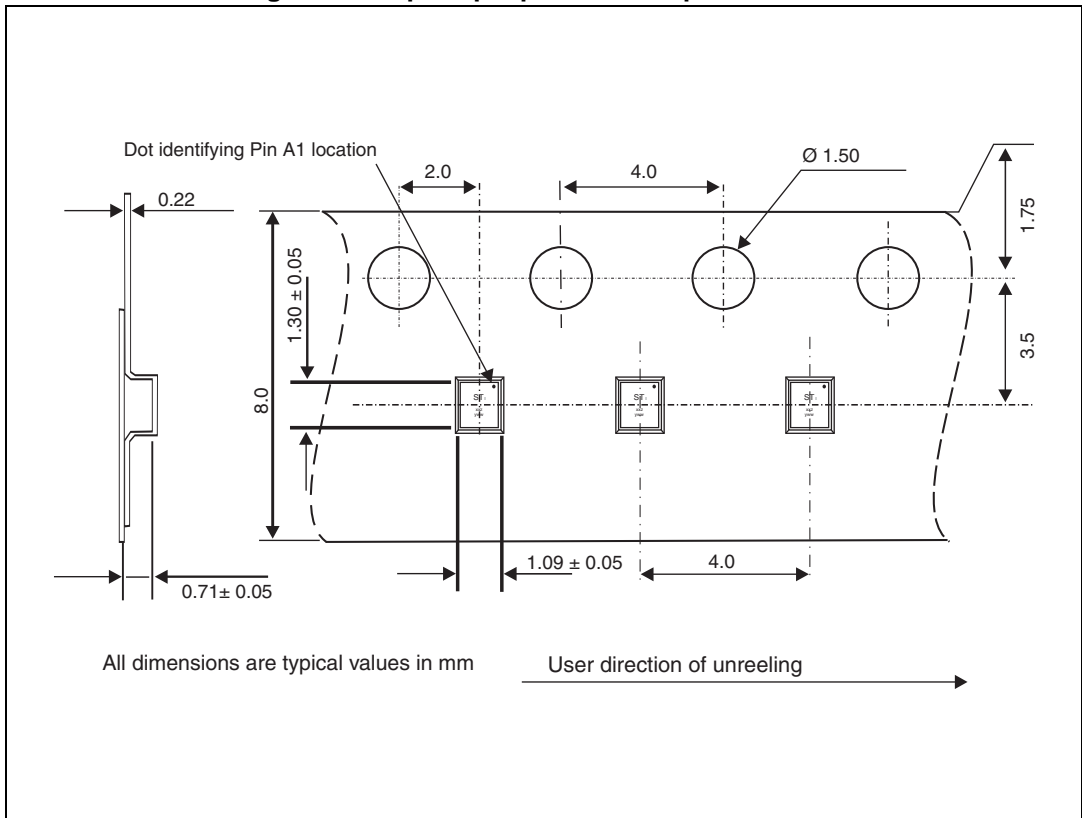


Figure 13. Flip Chip tape and reel specifications



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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