

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 | | | $^{\circ}\text{C}$ |

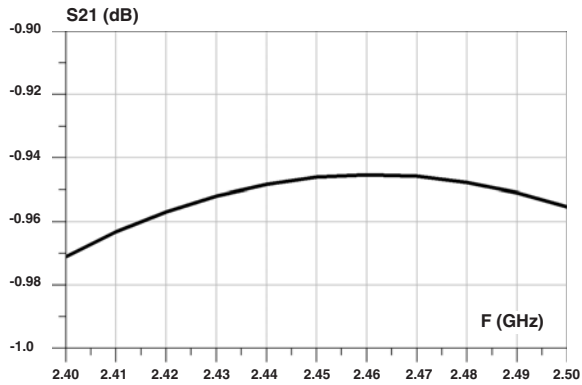
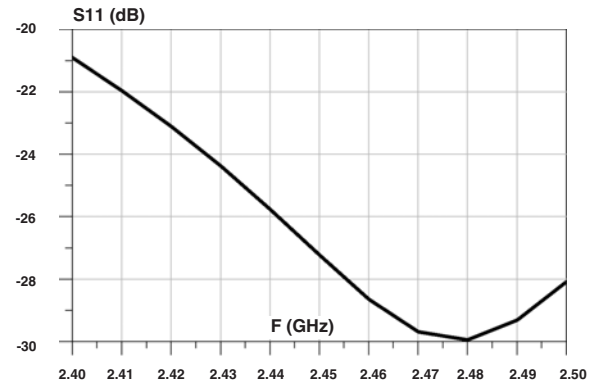
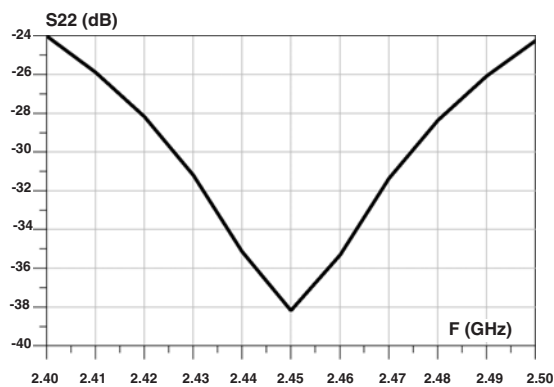
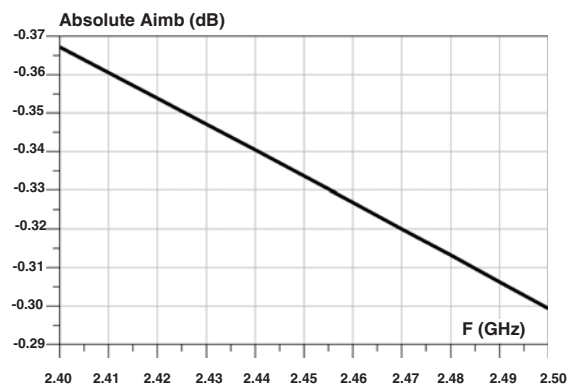
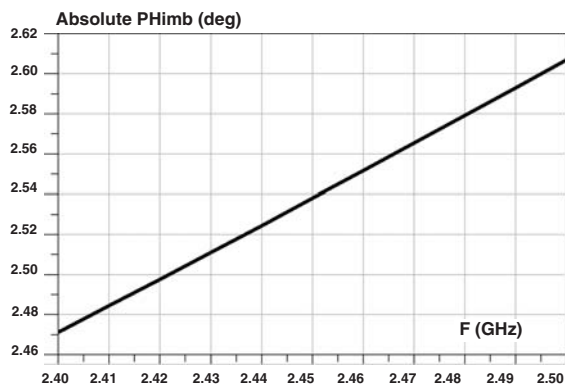
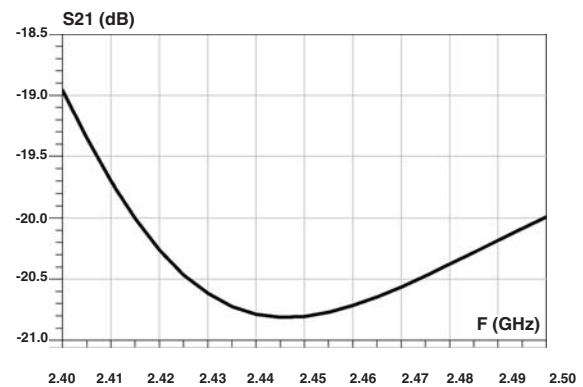
Table 2. Impedances ($T_{amb} = 25^{\circ}\text{C}$)

| 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 |

1.1 Measurements

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 Package information

- Epoxy meets UL94, V0
- Lead-free package

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 package information

Figure 8. Flip-Chip package outline

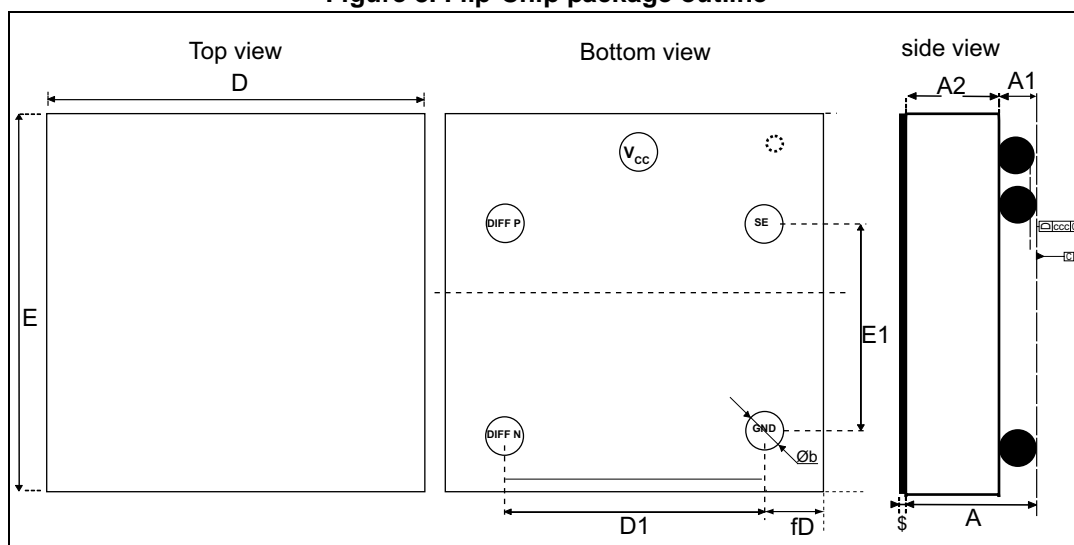


Table 4. Flip-Chip package mechanical data

| Parameter | Description | Min. | Typ. | Max. | Unit |
|-----------|---|-------|-------|-------|------|
| A | Bump height + substrate thickness | 0.570 | 0.630 | 0.690 | mm |
| A1 | Bump height | 0.155 | 0.205 | 0.255 | mm |
| A2 | Substrate thickness | | 0.400 | | mm |
| b | Bump diameter | 0.215 | 0.255 | 0.295 | mm |
| D | Y dimension of the die | 1.150 | 1.200 | 1.250 | mm |
| D1 | Y pitch | | 0.760 | | mm |
| E | X dimension of the die | 0.940 | 0.990 | 1.040 | mm |
| E1 | X pitch | | 0.400 | | mm |
| fD | Distance from bump to edge of die on Y axis | | 0.105 | | mm |
| ccc | | | | 0.05 | mm |
| \$ | | | 0.025 | | mm |

Figure 9. Footprint

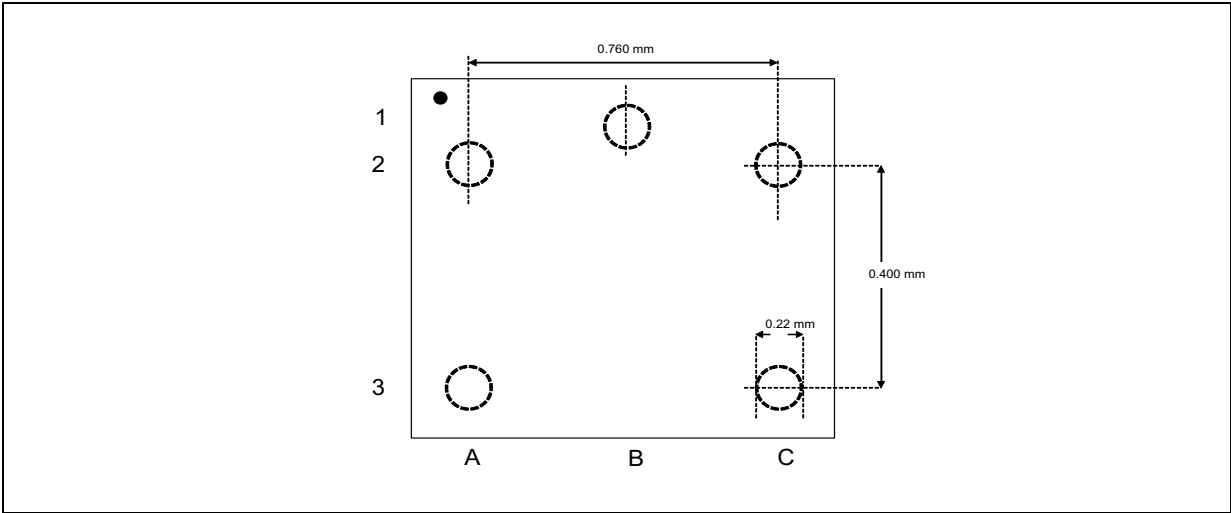


Figure 10. Footprint - 3 mils stencil - non solder mask defined

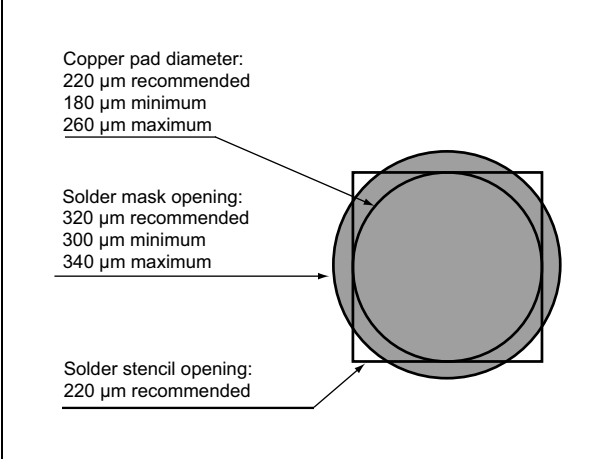


Figure 11. Footprint - 3 mils stencil - solder mask defined

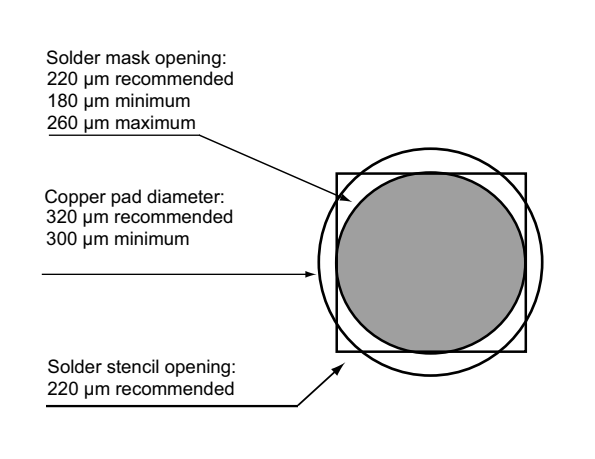


Figure 12. Footprint - 5 mils stencil - non solder mask defined

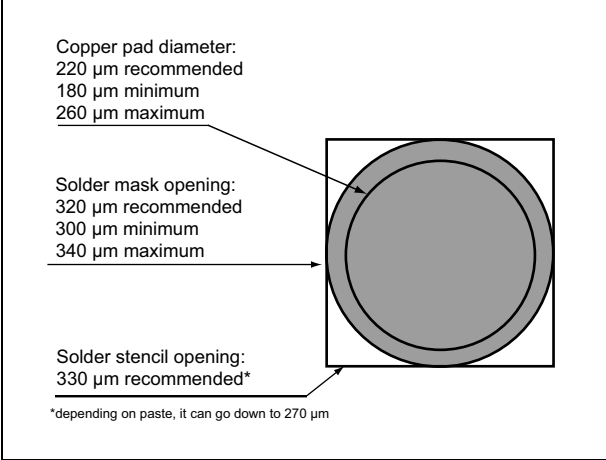


Figure 13. Footprint - 5 mils stencil - solder mask defined

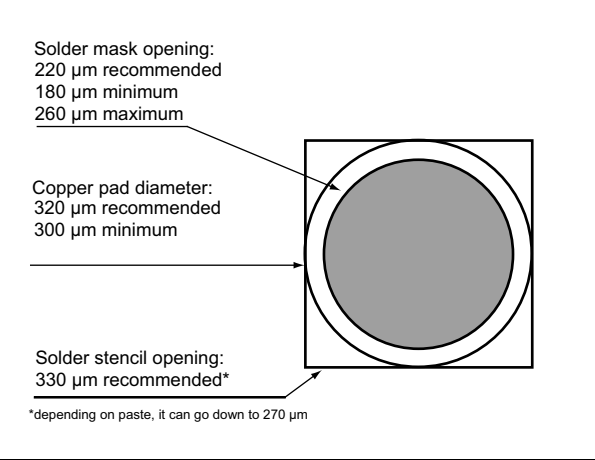


Figure 14. Recommended land pattern (used for balun characterization)

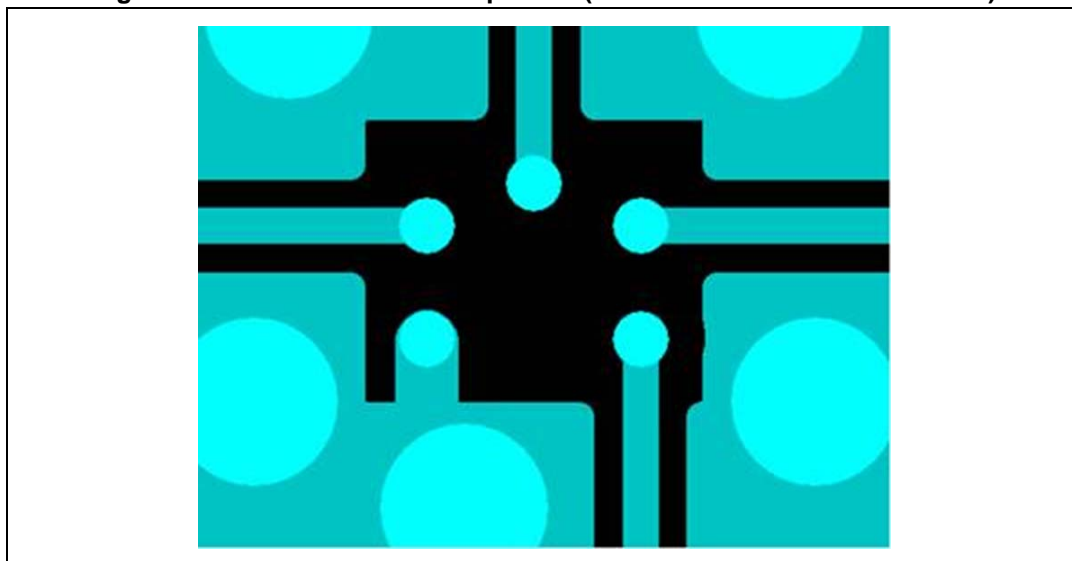


Figure 15. Marking

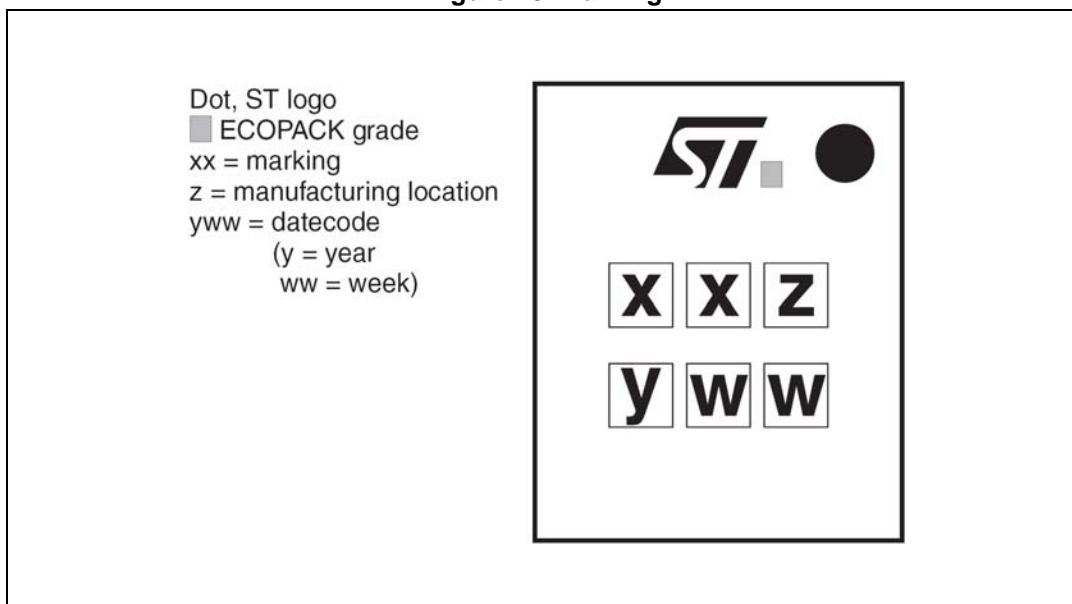
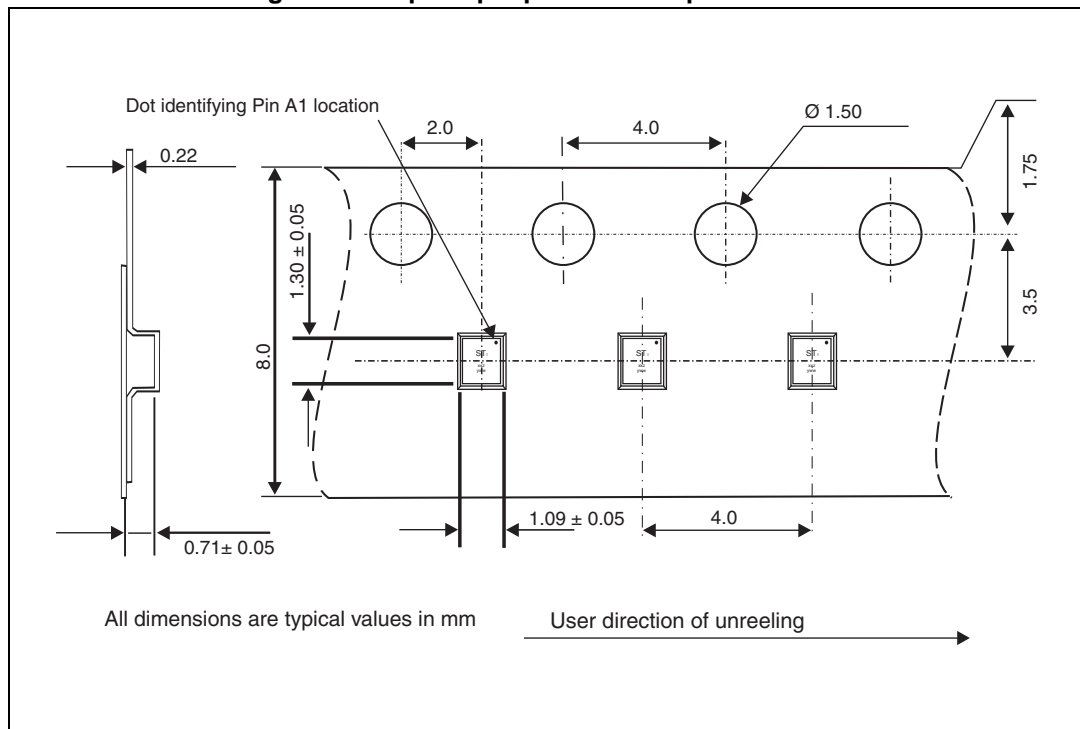


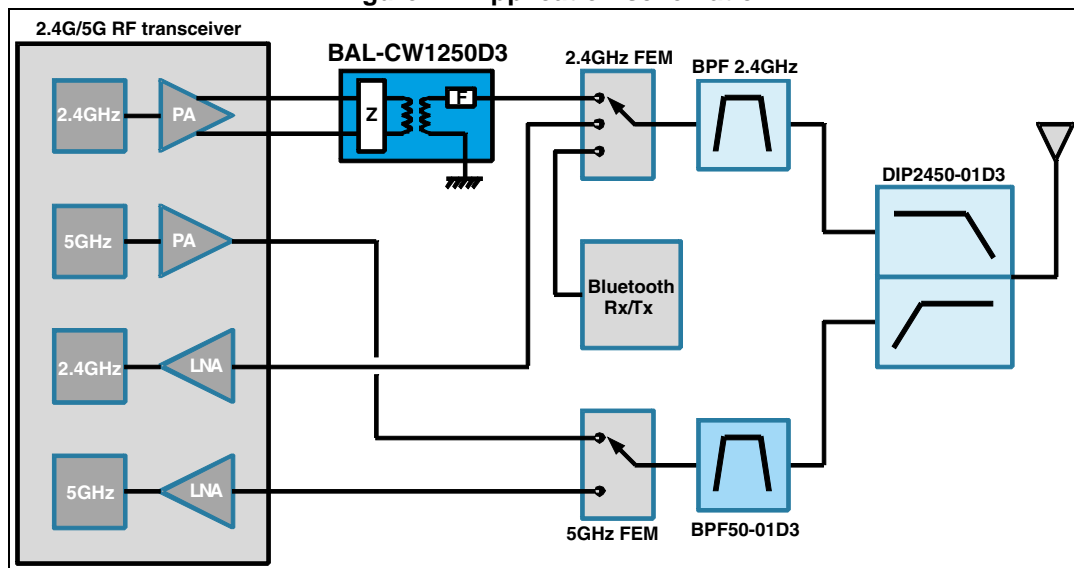
Figure 16. Flip-Chip tape and reel specifications



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

3 Application information

Figure 17. Application schematic



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

4 Ordering information

Table 5. 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 6. Document revision history

| Date | Revision | Changes |
|-------------|----------|--|
| 23-May-2013 | 1 | Initial release. |
| 23-Sep-2015 | 2 | Updated Figure 8 . Added Figure 10 , Figure 11 , Figure 12 , Figure 13 and Table 4 . Reformatted to current standards. |

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