1 Characteristics

Table 1. Absolute maximum rating (limiting values)

Symbol	Parameter	Value			Unit
		Min.	Typ.	Max.	
P_{IN}	Input power RF_{IN}			20	dBm
V_{ESD}	ESD ratings MIL STD883G (HBM: C = 100 pF, R = 1.5 kΩ, air discharge)	2000			V
	ESD ratings machine model, (MM: C = 200 pF, R = 25 Ω, L = 500 nH)	500			
	ESD ratings charged device model (JESD22-C101D)	500			
T_{OP}	Operating temperature	-40		+125	°C

Table 2. Electrical characteristics - RF performance (T_{amb} = 25 °C)

Symbol	Parameter		Value			Unit
			Min.	Typ.	Max.	
Z_{OUT}	Nominal differential output impedance			30 + j25		Ω
Z_{IN}	Nominal input impedance			50		
F	Frequency range (bandwidth)		2402	2441	2480	MHz
I_L	Insertion loss in bandwidth			0.8	1.1	dB
Ripple	Ripple in bandwidth				0.6	dB
R_L	Return loss in bandwidth		14			dB
Φ_{imb}	Phase imbalance		-10		10	°
A_{imb}	Amplitude imbalance		-1		1	dB
R_{CMRR}	Common mode rejection ratio (S_{SC12})		20			dB
S_{CC22}	Magnitude for common mode harmonic rejection coefficient at 2fo	From 4804 MHz to 4960 MHz, 25 Ω is considered as reference for CM	0.7		1	dB
	Phase for common mode harmonic rejection coefficient at 2fo		-45		0	°

1.1 Measurements

Figure 3. Insertion loss (T_{amb} = 25 °C)

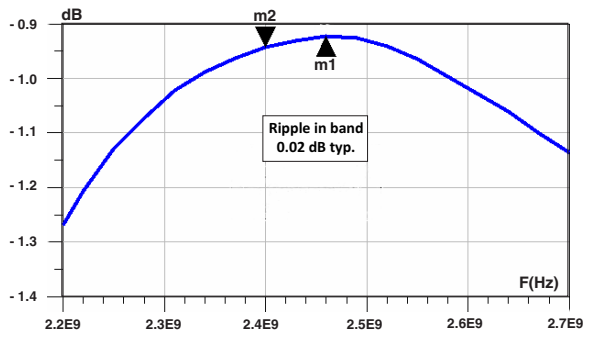


Figure 4. Return loss (T_{amb} = 25 °C)

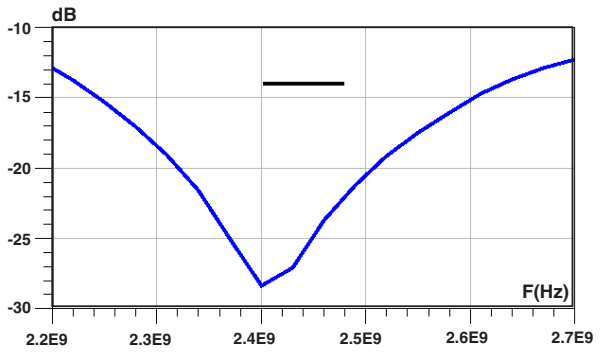


Figure 5. Amplitude imbalance (T_{amb} = 25 °C)

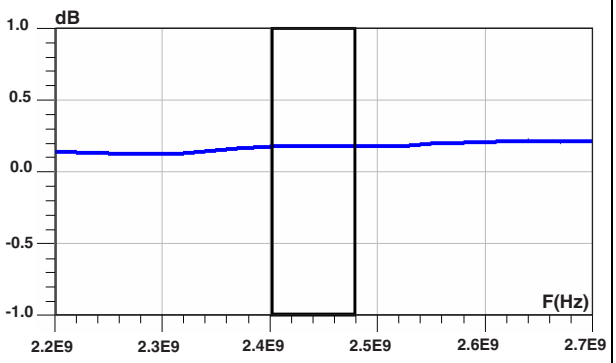


Figure 6. Phase imbalance (T_{amb} = 25 °C)

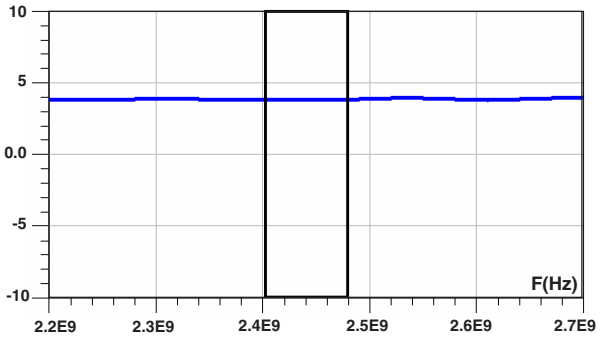


Figure 7. Scc22 magnitude at 2f0 (Tamb = 25 °C)

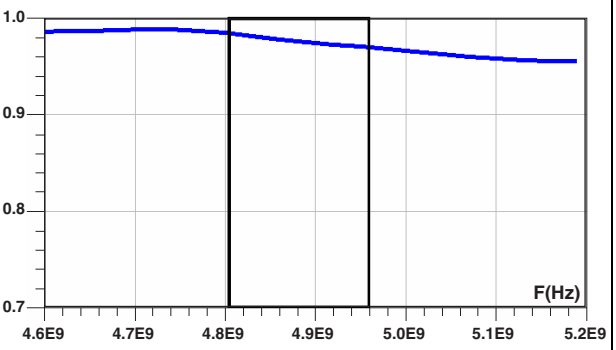
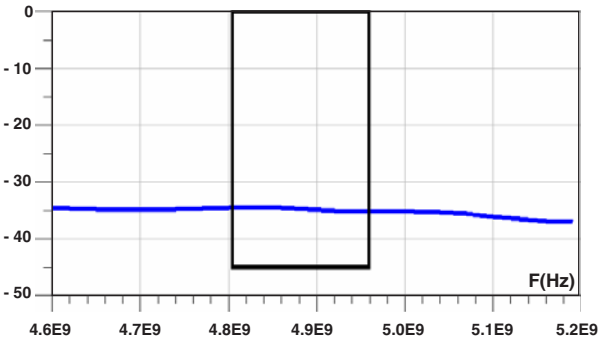


Figure 8. Scc22 phase 2f0 (Tamb = 25 °C)



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 9. Flip-Chip package outline

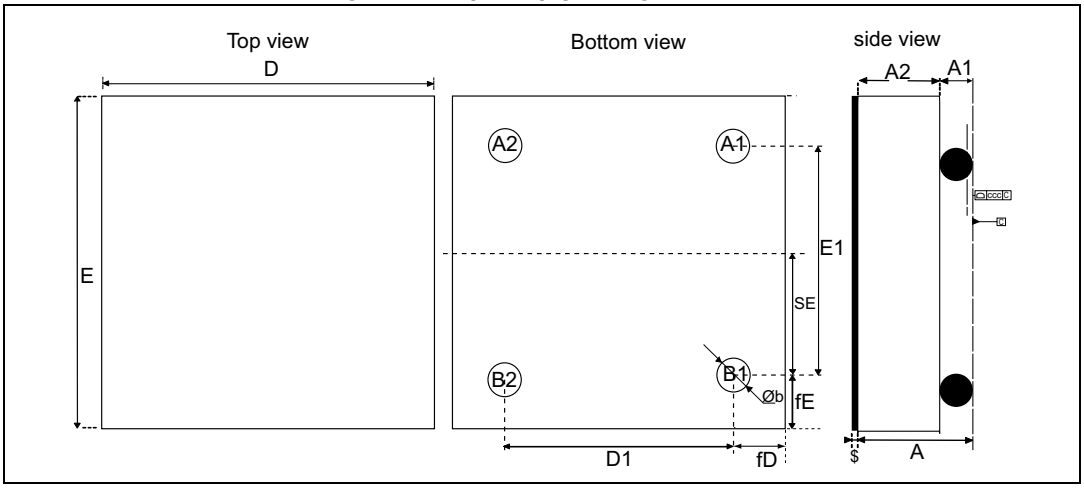


Table 3. Flip-Chip package mechanical data

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	0.860	0.910	0.960	mm
D1	Y pitch		0.474		mm
E	X dimension of the die	0.860	0.910	0.960	mm
E1	X pitch		0.474		mm
SE			0.237		mm
fD	Distance from bump to edge of die on Y axis		0.213		mm
fE	Distance from bump to edge of die on X axis		0.213		mm
ccc				0.05	mm
$			0.025		mm

Figure 10. Footprint

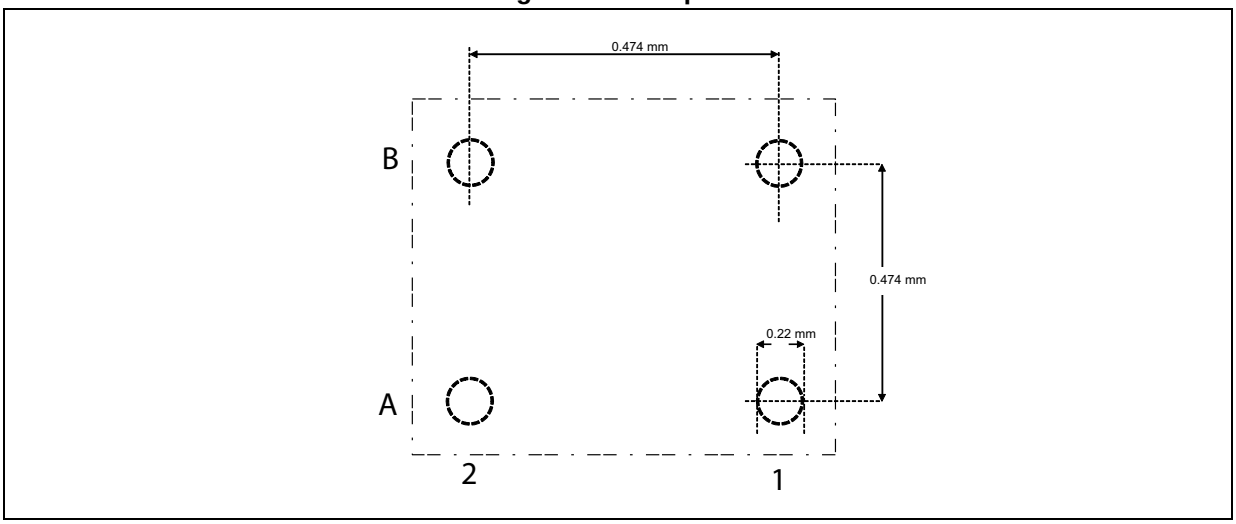


Figure 11. Footprint - 3 mils stencil -non solder mask defined

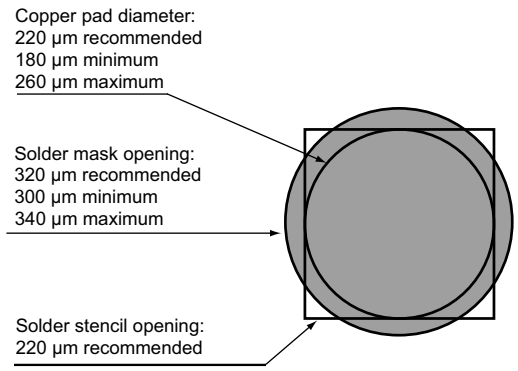


Figure 12. Footprint - 3 mils stencil - solder mask defined

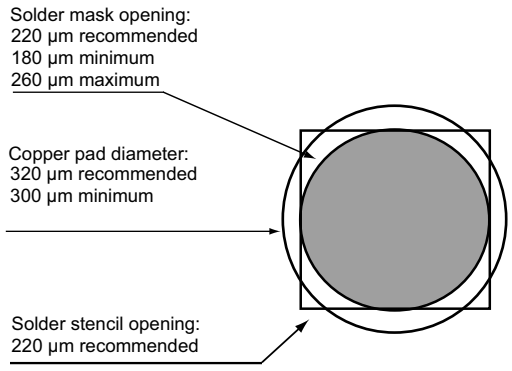


Figure 13. Footprint - 5 mils stencil -non solder mask defined

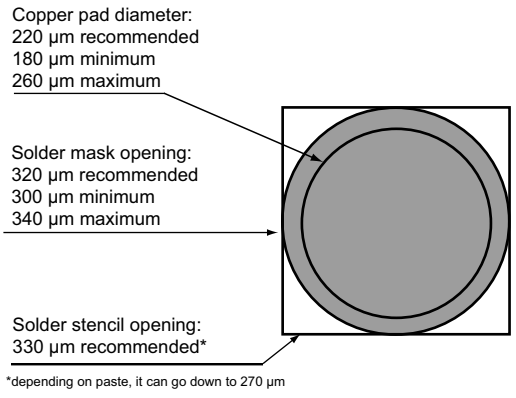


Figure 14. Footprint - 5 mils stencil - solder mask defined

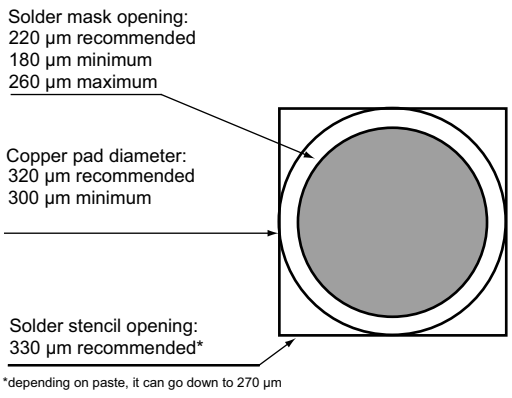


Figure 15. Recommend land pattern (used for balun characterization)

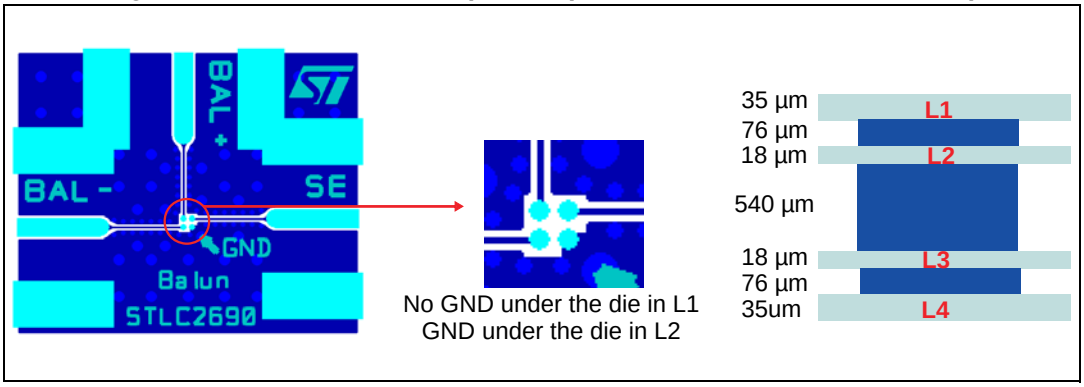


Figure 16. Example of transceiver application board land pattern

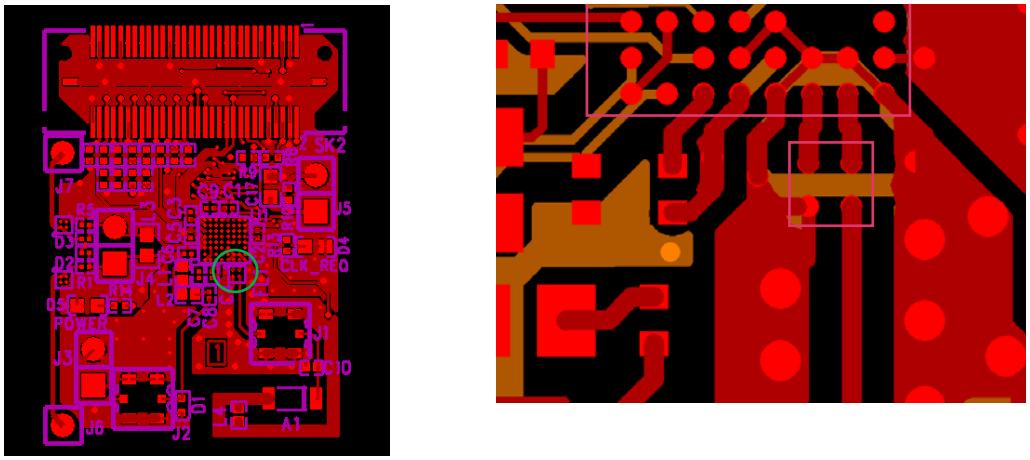


Figure 17. Marking

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

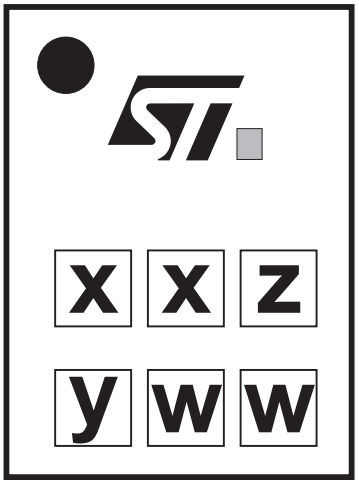
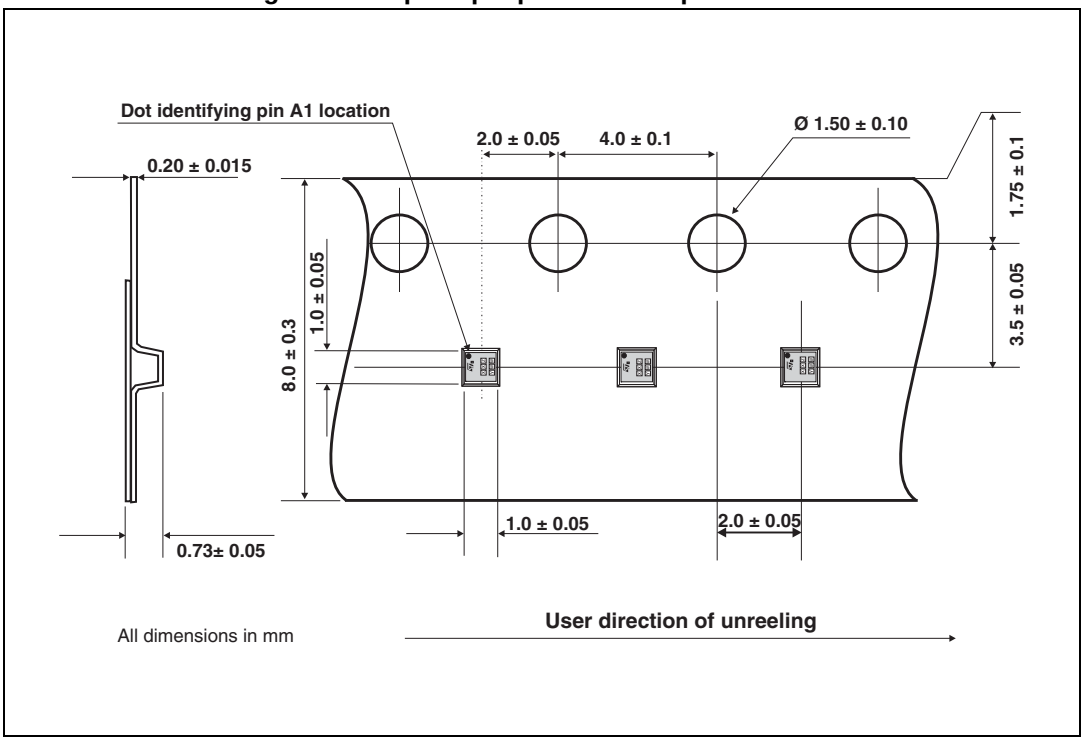


Figure 18. Flip Chip tape and reel specifications



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-2690D3U	RP	Flip-Chip	1.02 mg	5000	Tape and reel

4 Revision history

Table 5. Document revision history

Date	Revision	Changes
25-Jan-2010	1	First issue.
08-Feb-2010	2	Updated *Table 1* and *Figure 16.*
21-Sep-2015	3	Updated *Figure 9* and *Figure 9*. Added *Figure 11*, *Figure 12*, *Figure 13*, *Figure 14* and *Table 3*.

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