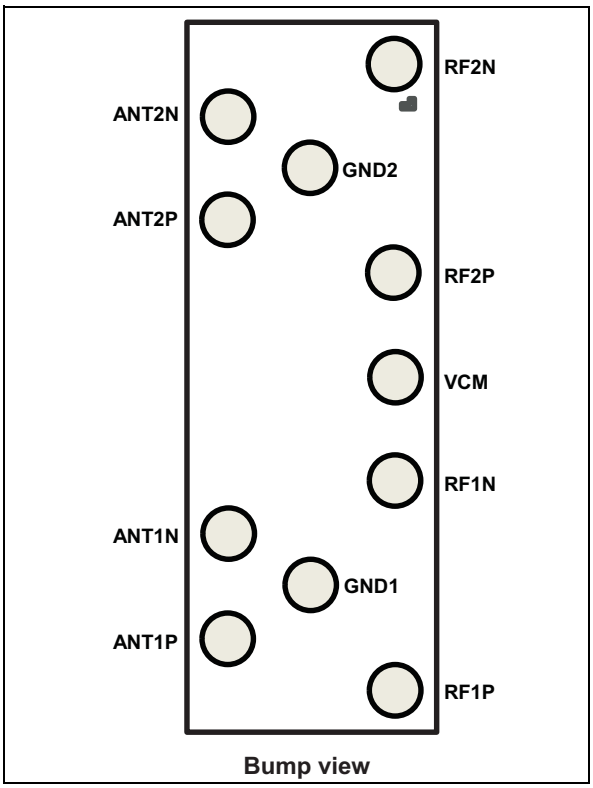
DLPF-GP-01D3

Dual differential filter with integrated matching for GreenPeak transceiver

Datasheet - production data



Bump view

Features

- Nominal Input / conjugate match to GreenPeak
- Low loss dual-channel differential filter
- Low loss dual-channel common-mode filter
- Small footprint < 1.2 x 3.4 mm²
- Very low profile (< 560 µm after reflow)
- High RF performance
- RF BOM and area reduction

Applications

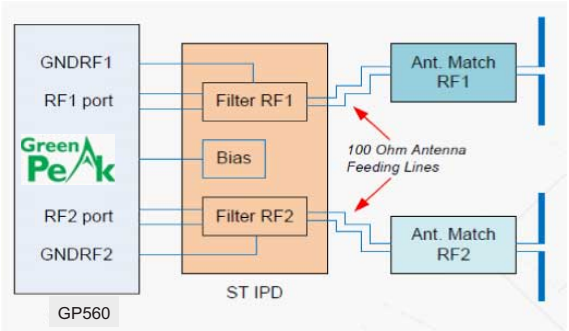
- 2.45 GHz impedance matched dual-differential filter
- Optimized for GreenPeak GP540 and GP561 circuits

Description

The DLPF-GP-01D3 is an ultra miniature dual differential filter tailored for GreenPeak Zigbee/RF4CE RF transceivers.

The DLPF-GP-01D3 integrates also matching network and replaces 16 SMD components. Matching impedance has been customized for GreenPeak Zigbee/RF4CE RF transceivers. It is using STMicroelectronics IPD technology on non-conductive Glass substrate which optimize RF performances.

Figure 1. Reference schematic(a)



a. Courtesy of GreenPeak.

1 Absolute maximum ratings

Table 1. Absolute maximum ratings (limiting value)

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 kΩ, Air discharge)	800			V
	ESD ratings machine model (MM: C=200 pF, R=25 Ω, L=500 nH)	550			V
T_{OP}	Operating temperature	-40		+80	ºC

2 Electrical characteristics

Table 2. Impedances

Symbol	Parameter	Value			Unit
		Min.	Typ.	Max.	
Z_{OUT}	Nominal differential output impedance	-	Conjugate match to GreenPeak IC	-	Ω
Z_{IN}	Nominal differential input impedance	-	100	-	Ω

Table 3. RF performance

Symbol	Parameter	Test condition	Value			Unit
			Min.	Typ.	Max.	
T_{OP}	Operating temperature	-	-40		+80	°C
f	Frequency range (bandwidth)	-	2400		2500	MHz
I_L	Insertion loss in bandwidth	T_j = 25 °C		-1.45	-1.7	dB
R_{L_ANT}	Return loss in bandwidth			-16	-11	dB
R_{L_IC}	Return loss in bandwidth			-15	-10.5	dB
2f0	2f0 attenuation			-41	-37	dB
3f0	3f0 attenuation			-34	-28	dB

2.1 RF measurements (on board)

Figure 2. Differential transmission

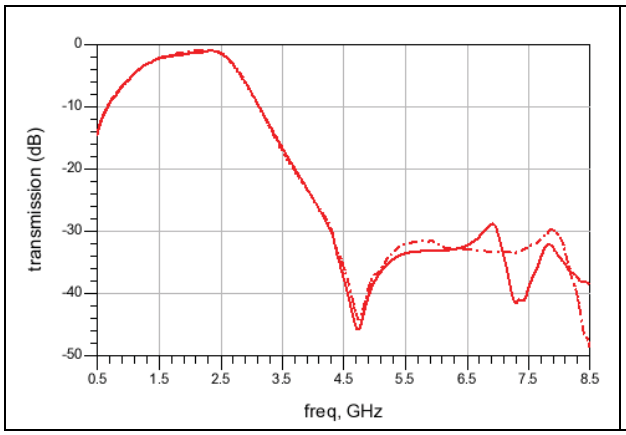


Figure 3. DIFF mode insertion loss (dB)

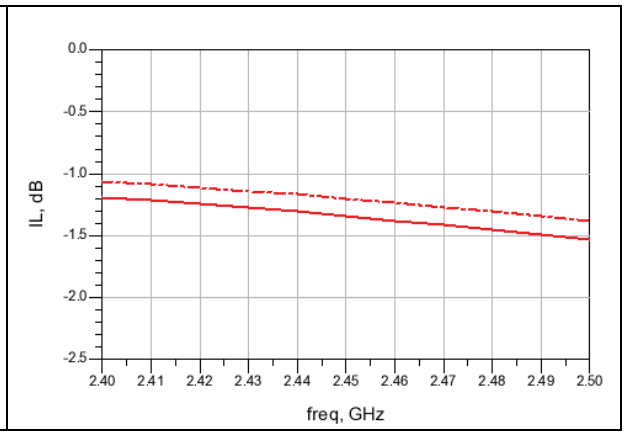


Figure 4. DIFF mode - 2f0 second harmonic (dB)

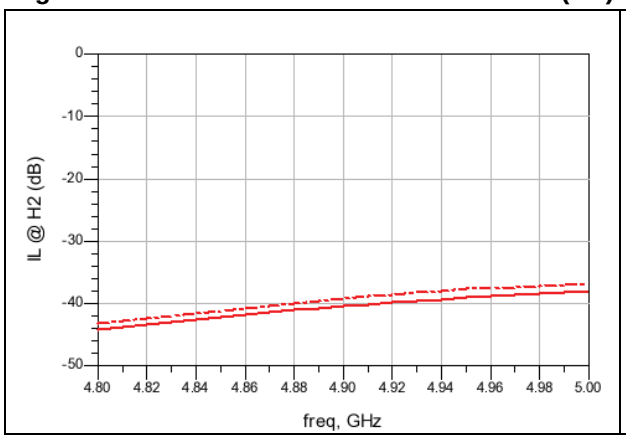


Figure 5. DIFF mode - 3f0 third harmonic (dB)

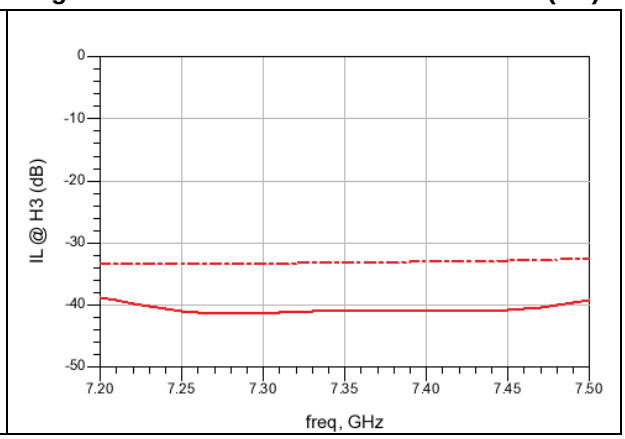


Figure 6. Return loss on ANT side (dB)

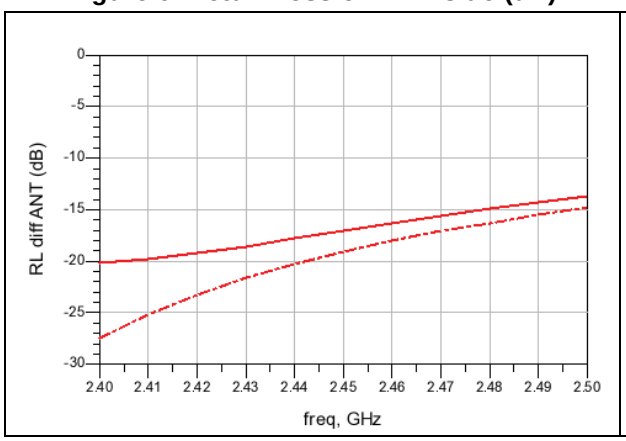
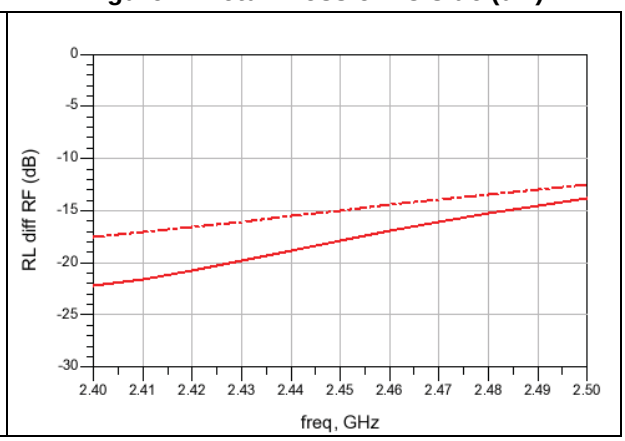


Figure 7. Return loss on IC side (dB)



3 Package mechanical data

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 8. Mechanical specifications (bump view)

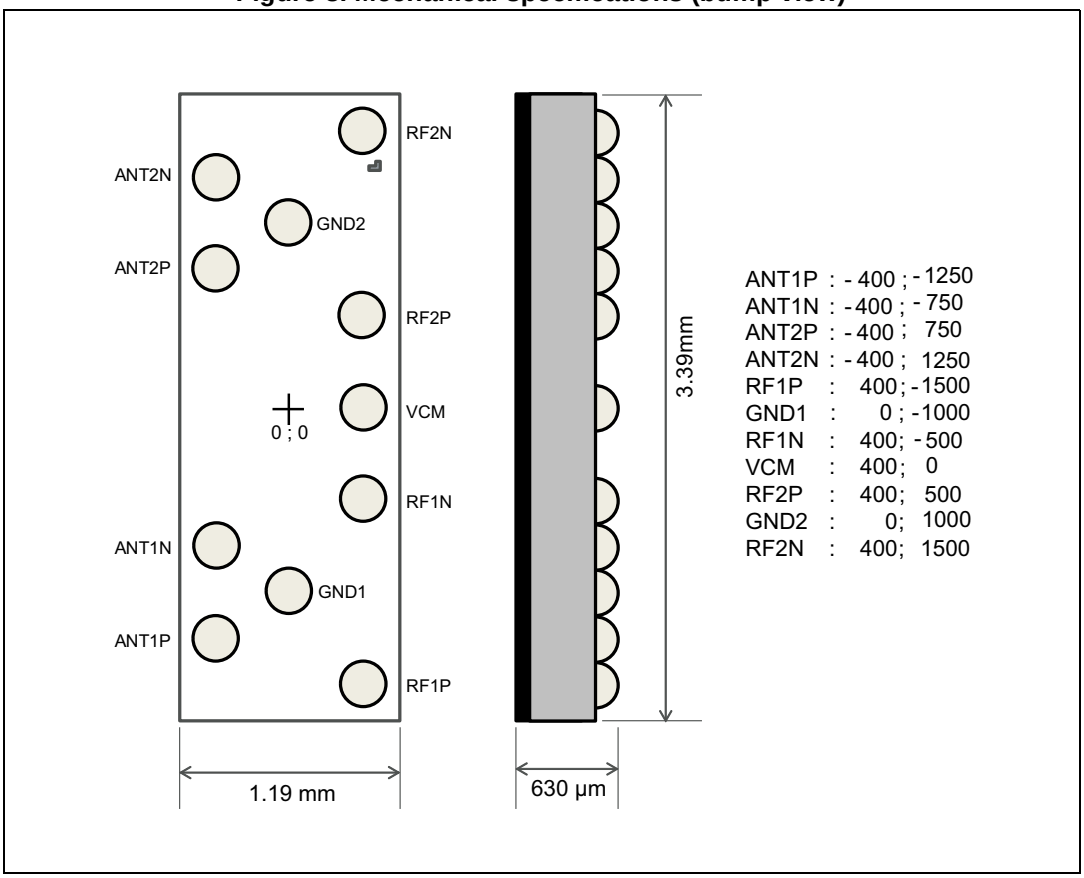
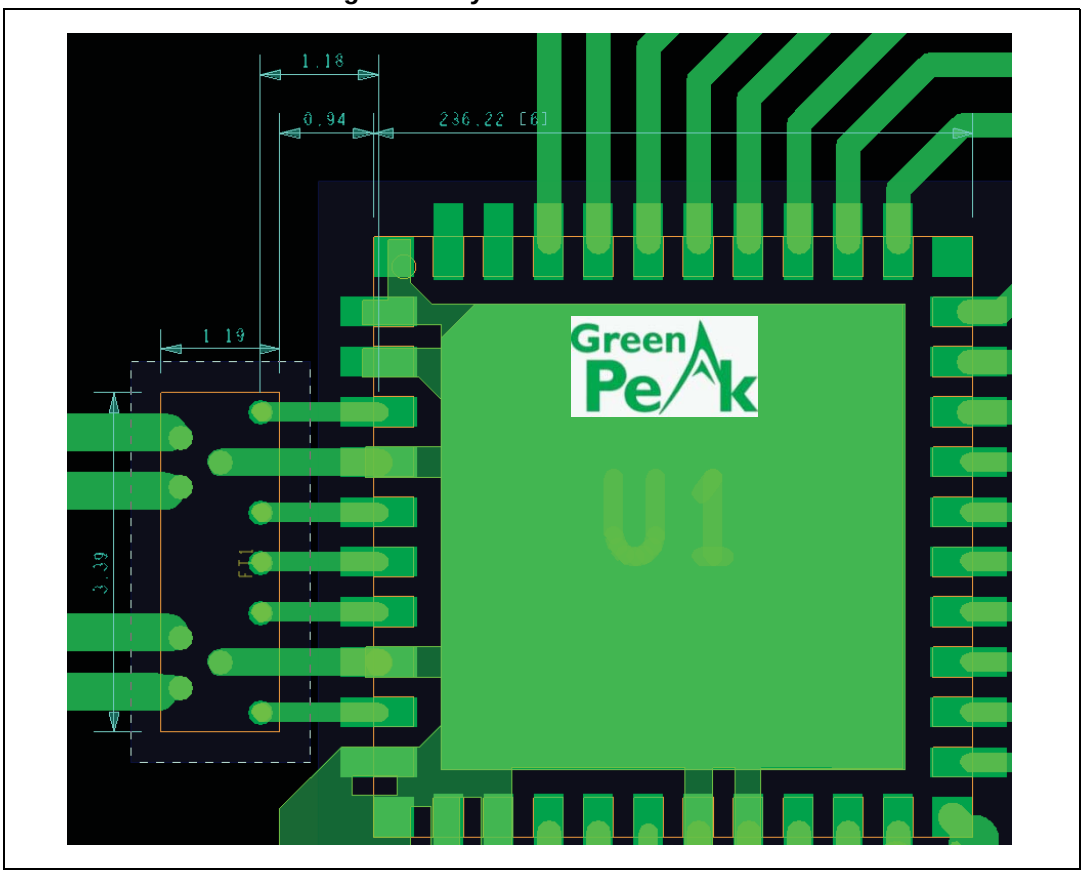


Figure 9. Layout recommendations



No extra components required thanks to DLPF-GP-01D3.

Dimensions (distances) from center pad to center pad (filter GP chip) shall be respected as much as possible in order to avoid any deviation in performances.

Figure 10. Footprint - non solder mask defined

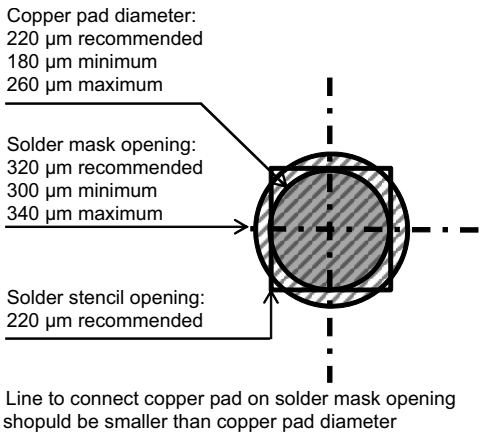


Figure 11. Footprint - solder mask defined

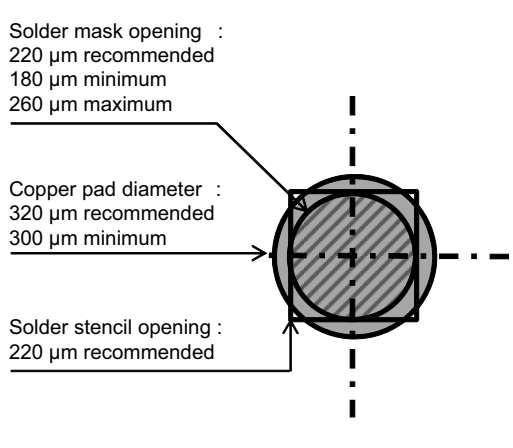


Figure 12. Marking specification

Figure 13. Footprint coordinates

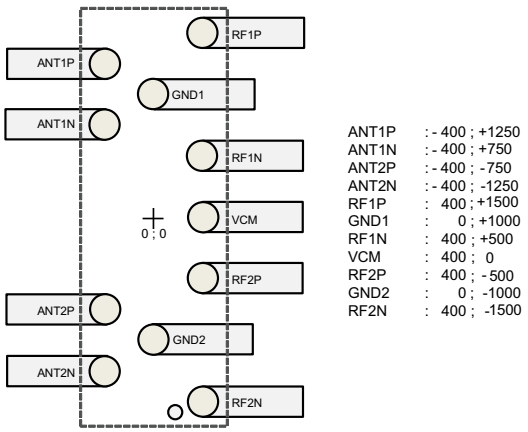
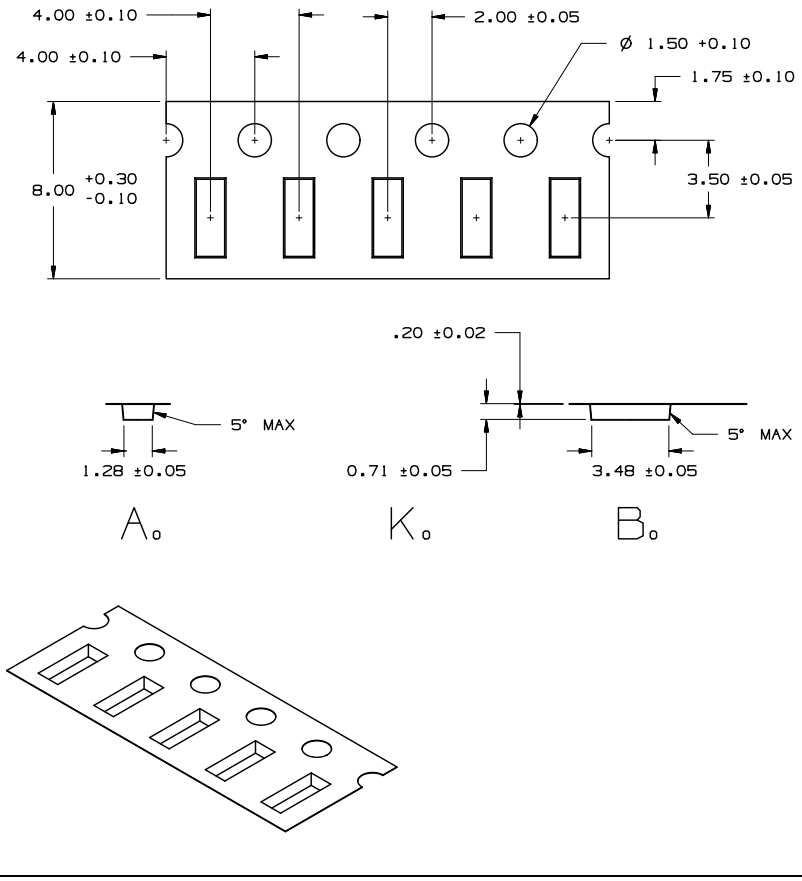


Figure 14. Tape and reel specification



Note: The dimensions shown on this proposed drawing are for illustrative purpose. Dimensions from actual carrier may vary slightly

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	Weight	Base qty	Delivery mode
DLPF-GP-01D3	SW	4.43 mg	5000	Tape and reel

5 Revision history

Table 5. Document revision history

Date	Revision	Changes
10-Oct-2014	1	Initial release.