

## GPS/GLONASS and 2.4 GHz diplexer

### Features

- Low insertion loss
- High attenuation levels
- Input power for GPS: 25 dBm max
- Input power for WLAN: 28 dBm max
- High power capacity
- Lead-free, Flip-Chip package
- Small footprint
- Very low profile (< 630 µm thickness)
- High RF performance

### Applications

- Multi-band power amplifier module
- Multi-band front end module
- Multi-band GSM/WCDMA mobile phone
- PC (netbooks, tablet) and smartphones

### Description

The DIP1524-01D3 is a diplexer designed to separate the RF received signals of the GPS-GLONASS from the RF received signals in the 2.4 to 2.7 GHz band.

The DIP1524-01D3 has been designed using STMicroelectronics IPD (Integrated Passive Device) technology on non conductive glass substrate to optimize RF performance.

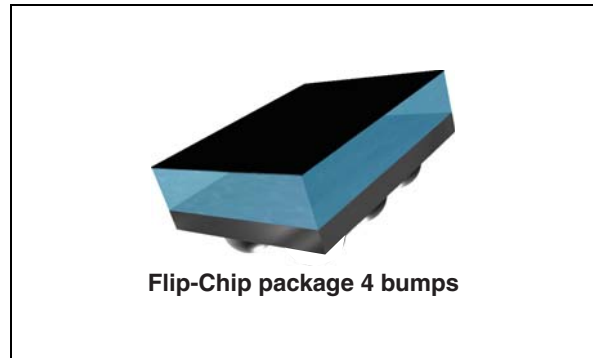
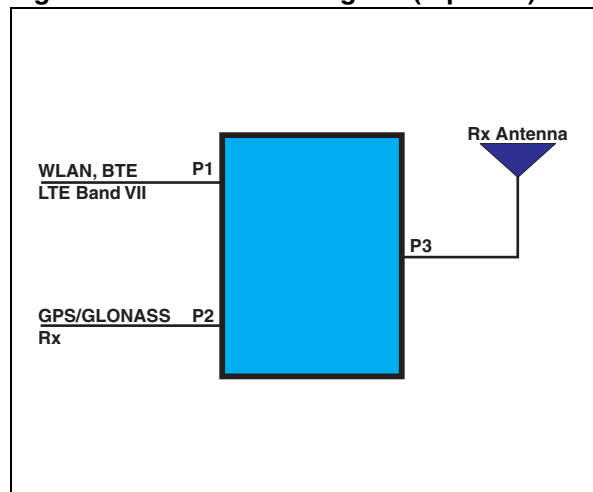


Figure 1. Schematic diagram (top view)



# 1 Characteristics

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

Symbol	Parameter	Value			Unit
		Min.	Typ.	Max.	
P <sub>IN</sub>	Input power P <sub>1</sub>			28	dBm
	Input power P <sub>2</sub> (GPS)			25	
V <sub>ESD</sub> (HBM)	Human body model, JESD22-A114-B, all I/O			300	V
V <sub>ESD</sub> (MM)	Machine model, JESD22-A115-A, all I/O			100	V
V <sub>ESD</sub> (CDM)	Charge device model, JESD22-C101-C, all I/O			500	V
T <sub>OP</sub>	Operating temperature range	-30		+85	°C

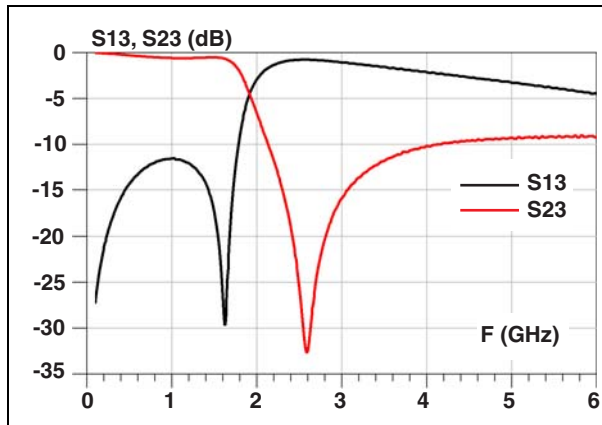
**Table 2. Electrical characteristics and RF performance (T<sub>amb</sub> = 25° C)**

Symbol	Parameter	Test condition	Value			Unit
			Min	Typ	Max	
f1	Pass band range	WLAN, BT, LTE BAND VII	2400		2700	MHz
f2		GPS: 1573.42 – 1577.42 MHz GLONASS: 1597.55 – 1605.89 MHz	1573.42		1605.89	MHz
IL	P1-P3	In f1: WLAN, BT, LTE BAND VII		0.85	0.90	dB
	P2-P3	In f2: GPS		0.60	0.65	
		In f2: GLONASS		0.65	0.75	
Attenuation	P1-P3	In f2	20			
	P2-P3	In f1	18			
Return loss	P1	In f1			-10	
	P2	In f2			-20	
	P3	In f1 and f2			-9.5	

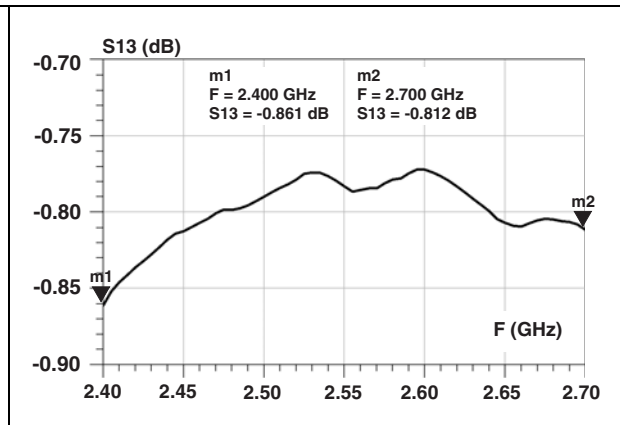
## 1.1 RF measurement

Measurements performed at component level.

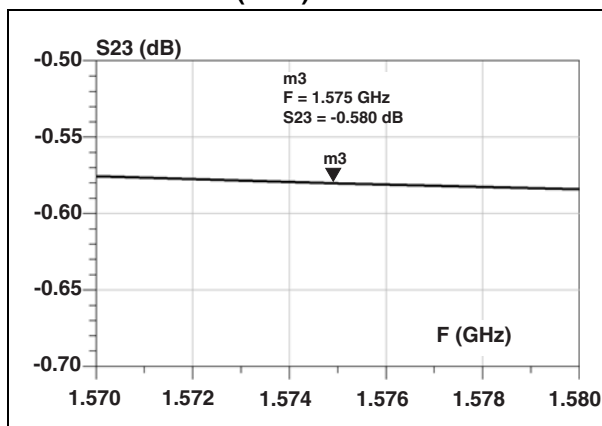
**Figure 2. P1-P3 and P2-P3 - S13 and S23 forward transmission**



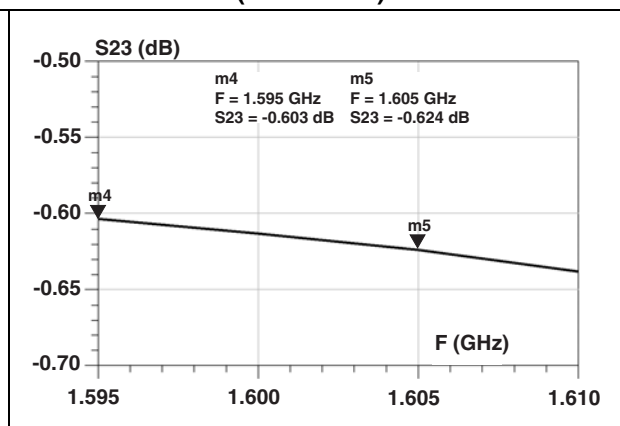
**Figure 3. P1-P3 - S13 insertion loss in f1 band**



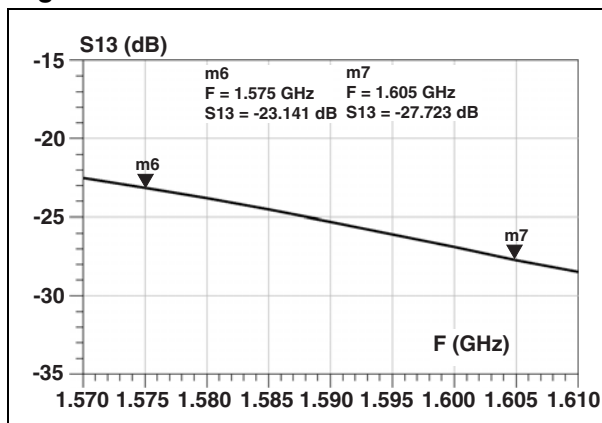
**Figure 4. P2-P3 - S23 insertion loss in f2 band (GPS)**



**Figure 5. P2-P3 - S23 insertion loss in f2 band (GLONASS)**



**Figure 6. P1-P3 - S13 attenuation in f2 band**



**Figure 7. P2-P3 - S23 attenuation in f1 band**

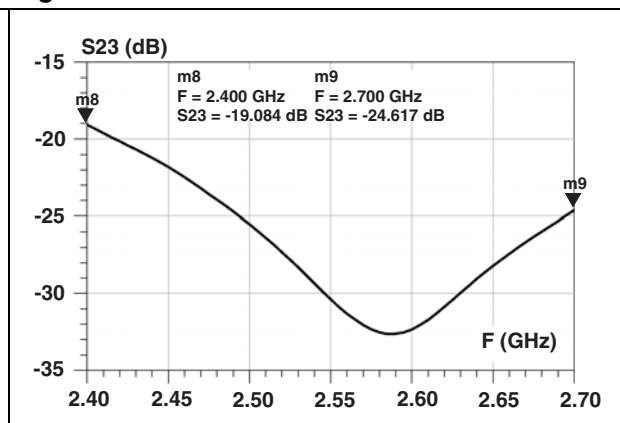


Figure 8. P1, P2, P3 - Sxx reflection coefficient

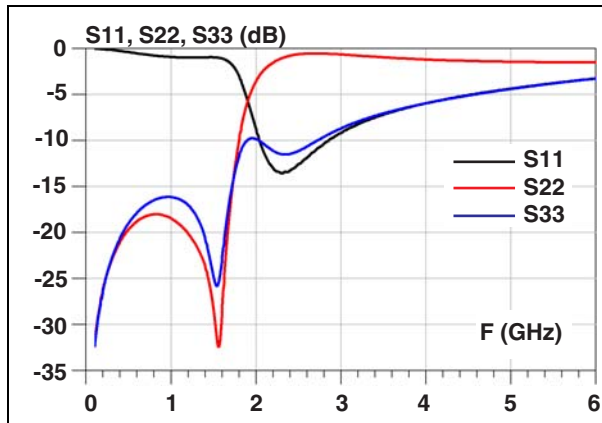


Figure 9. P1 - S11 return loss in f1 band

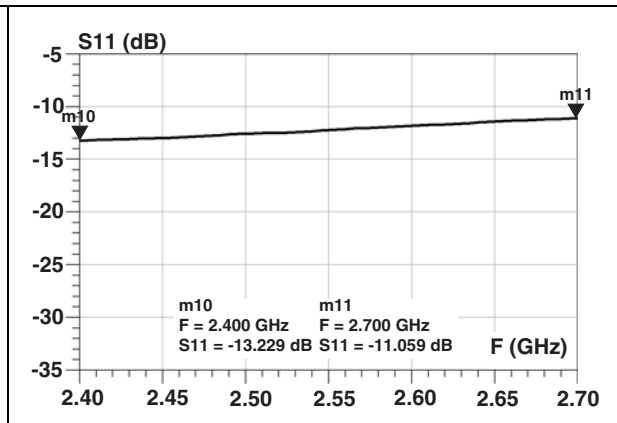


Figure 10. P2 - S22 return loss in f2 band

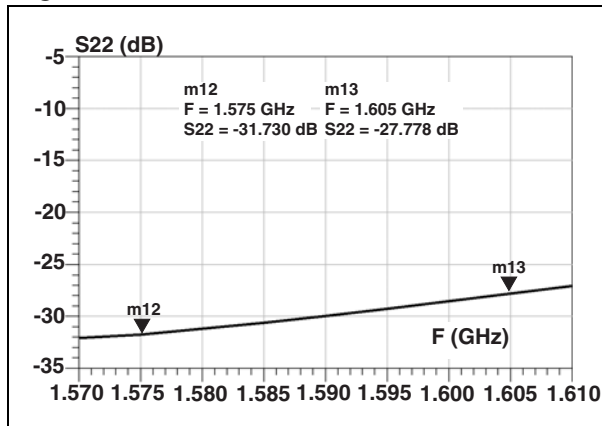


Figure 11. P3 - S33 return loss in f1 band

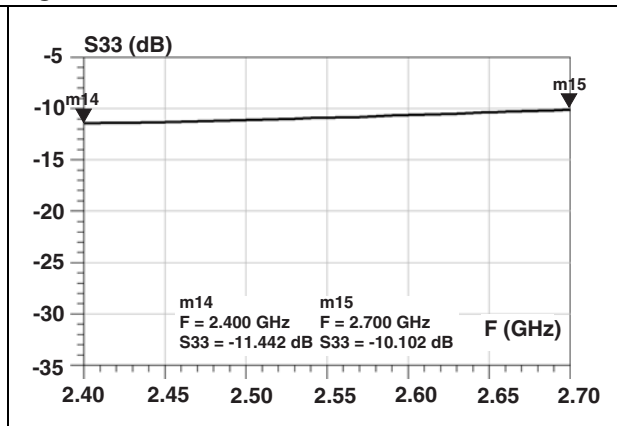


Figure 12. P3 - S33 return loss in f2 band

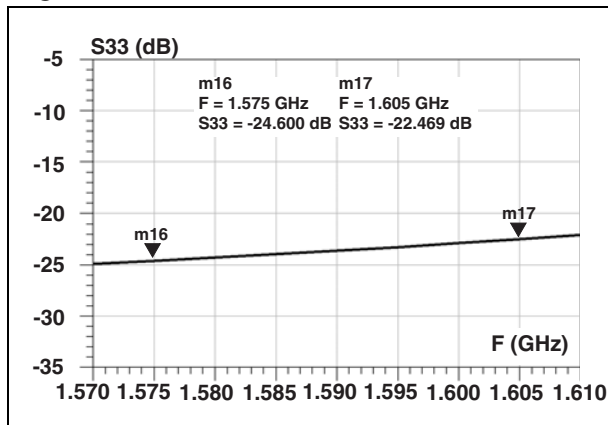


Figure 13. P1-P2 - S12 isolation

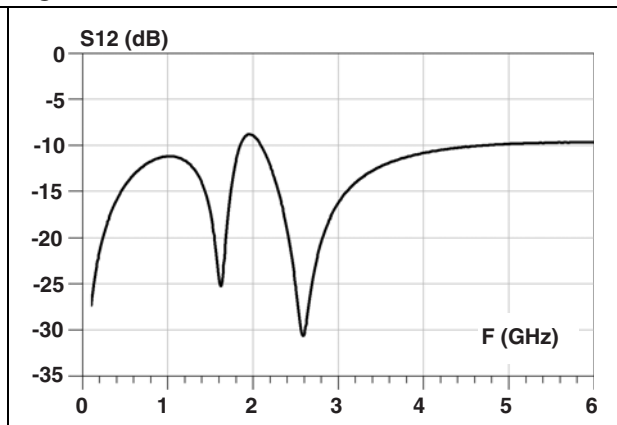


Figure 14. P1-P2 - S12 isolation in f1 band

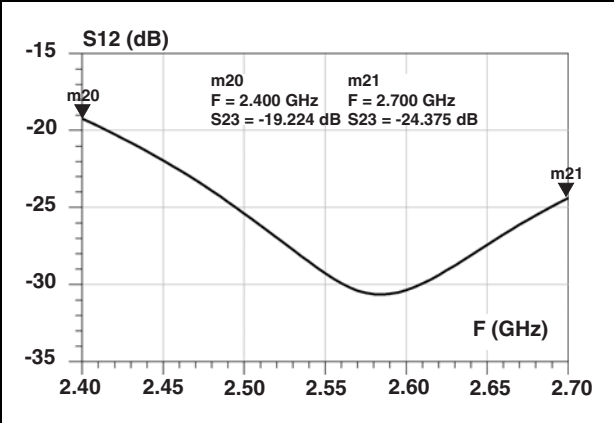
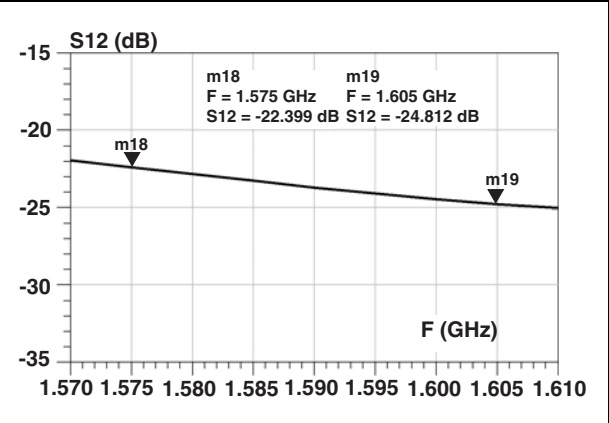
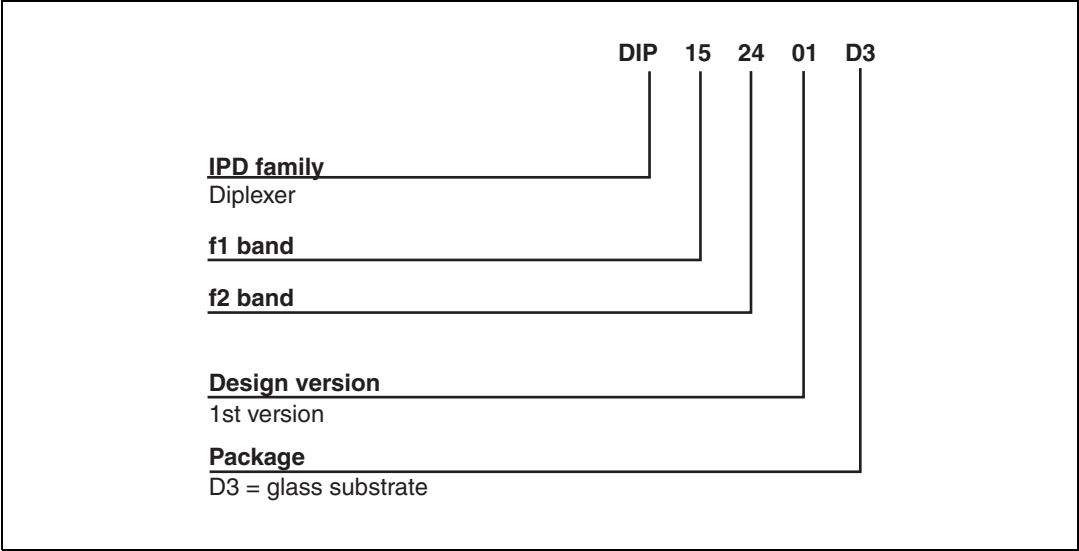


Figure 15. P1-P2 - S12 isolation in f2 band



## 2 Ordering information scheme

Figure 16. Ordering information scheme



### 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 17. Package dimensions

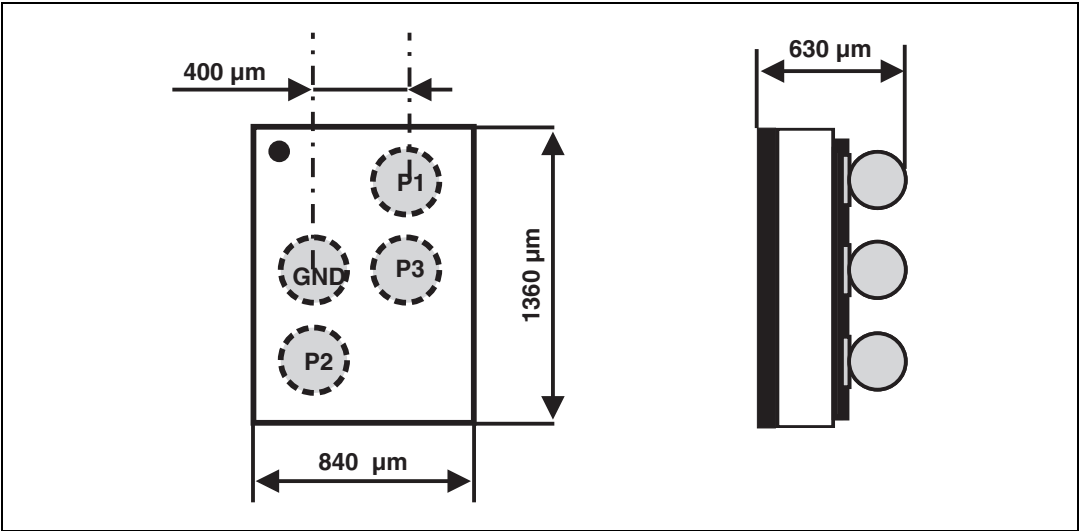


Figure 18. Footprint

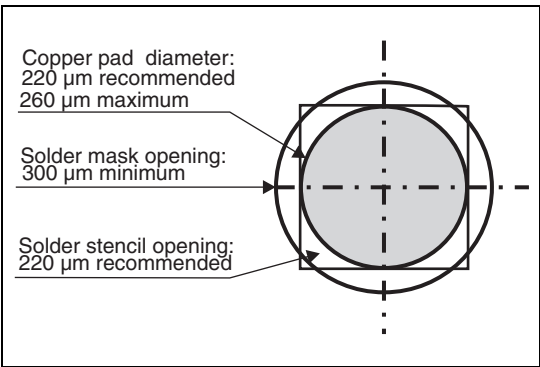
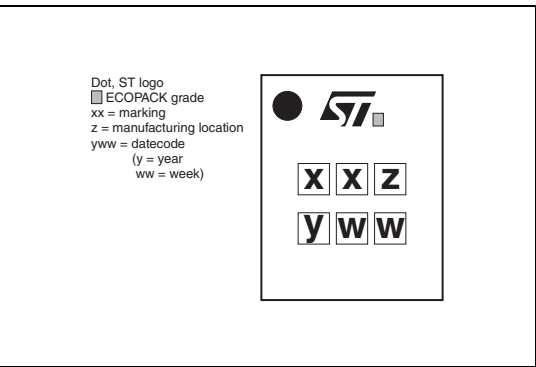
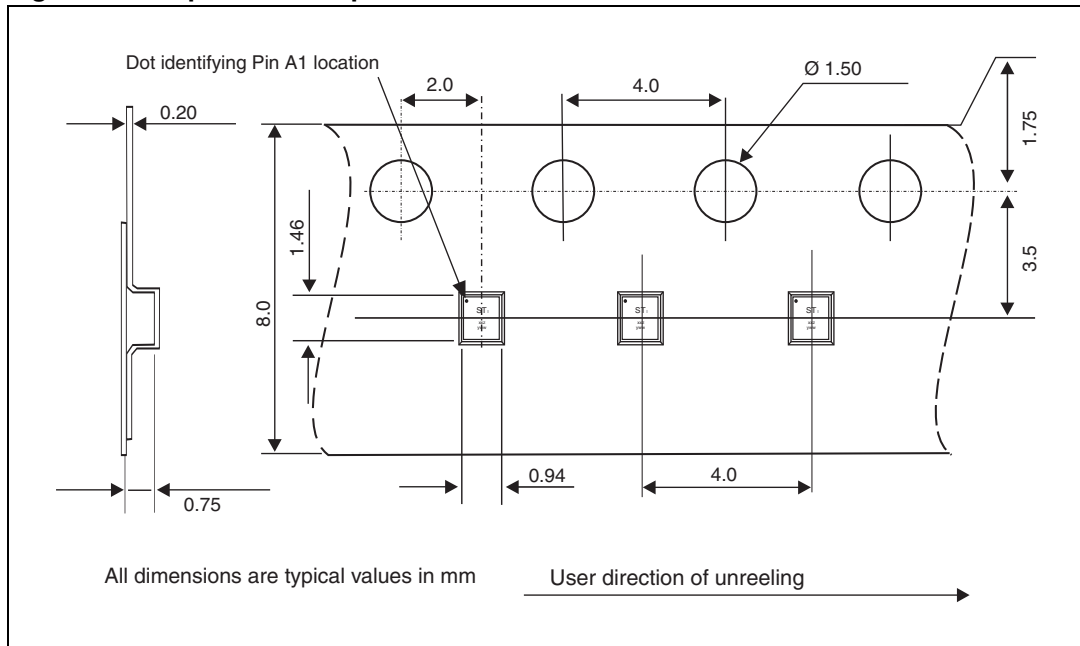


Figure 19. Marking



**Figure 20. Tape and reel specifications**

**Note:** More information is available in the application note:  
 AN2348, "IPAD™ 400  $\mu$ m Flip Chip: package description and recommendations for use"

## 4 Ordering information

**Table 3. Ordering information**

Order code	Marking	Package	Weight	Base qty	Delivery mode
DIP1524-01D3	RT	Flip Chip	1.35 mg	5000	Tape and reel (7")

## 5 Revision history

**Table 4. Document revision history**

Date	Revision	Changes
14-Feb-2012	1	Initial release



**Please Read Carefully:**

Information in this document is provided solely in connection with ST products. STMicroelectronics NV and its subsidiaries ("ST") reserve the right to make changes, corrections, modifications or improvements, to this document, and the products and services described herein at any time, without notice.

All ST products are sold pursuant to ST's terms and conditions of sale.

Purchasers are solely responsible for the choice, selection and use of the ST products and services described herein, and ST assumes no liability whatsoever relating to the choice, selection or use of the ST products and services described herein.

No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted under this document. If any part of this document refers to any third party products or services it shall not be deemed a license grant by ST for the use of such third party products or services, or any intellectual property contained therein or considered as a warranty covering the use in any manner whatsoever of such third party products or services or any intellectual property contained therein.

**UNLESS OTHERWISE SET FORTH IN ST'S TERMS AND CONDITIONS OF SALE ST DISCLAIMS ANY EXPRESS OR IMPLIED WARRANTY WITH RESPECT TO THE USE AND/OR SALE OF ST PRODUCTS INCLUDING WITHOUT LIMITATION IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE (AND THEIR EQUIVALENTS UNDER THE LAWS OF ANY JURISDICTION), OR INFRINGEMENT OF ANY PATENT, COPYRIGHT OR OTHER INTELLECTUAL PROPERTY RIGHT.**

**UNLESS EXPRESSLY APPROVED IN WRITING BY TWO AUTHORIZED ST REPRESENTATIVES, ST PRODUCTS ARE NOT RECOMMENDED, AUTHORIZED OR WARRANTED FOR USE IN MILITARY, AIR CRAFT, SPACE, LIFE SAVING, OR LIFE SUSTAINING APPLICATIONS, NOR IN PRODUCTS OR SYSTEMS WHERE FAILURE OR MALFUNCTION MAY RESULT IN PERSONAL INJURY, DEATH, OR SEVERE PROPERTY OR ENVIRONMENTAL DAMAGE. ST PRODUCTS WHICH ARE NOT SPECIFIED AS "AUTOMOTIVE GRADE" MAY ONLY BE USED IN AUTOMOTIVE APPLICATIONS AT USER'S OWN RISK.**

Resale of ST products with provisions different from the statements and/or technical features set forth in this document shall immediately void any warranty granted by ST for the ST product or service described herein and shall not create or extend in any manner whatsoever, any liability of ST.

ST and the ST logo are trademarks or registered trademarks of ST in various countries.

Information in this document supersedes and replaces all information previously supplied.

The ST logo is a registered trademark of STMicroelectronics. All other names are the property of their respective owners.

© 2012 STMicroelectronics - All rights reserved

STMicroelectronics group of companies

Australia - Belgium - Brazil - Canada - China - Czech Republic - Finland - France - Germany - Hong Kong - India - Israel - Italy - Japan - Malaysia - Malta - Morocco - Philippines - Singapore - Spain - Sweden - Switzerland - United Kingdom - United States of America

[www.st.com](http://www.st.com)