



DB-84008L-950

Evaluation board using PD84008L-E for 900 MHz 2-way radio

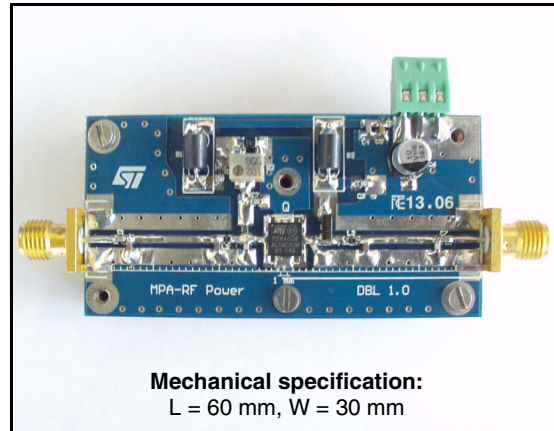
Features

- Excellent thermal stability
- Frequency: 740 - 950 MHz
- Supply voltage: 7.2 V
- Output power: 5 W
- Power gain: 11 ± 1.0 dB
- Efficiency: 48 % - 54%
- Load mismatch: infinite
- BeO free amplifier

Description

The DB-84008L-950 is an evaluation board using PD84008L-E LDMOS transistor and designed for 2 Ways 900 MHz portable radio.

For additional informations on PD84008L-E please refer to its datasheet.



Mechanical specification:
L = 60 mm, W = 30 mm

Table 1. Device summary

Order code
DB-84008L-950

Contents

1	Electrical data	3
	1.1 Maximum ratings	3
2	Electrical characteristics	3
3	Impedance	4
4	Typical performance	5
5	Test circuit	7
6	Circuit layout	9
7	Mounting indications - PD84008L-E	10
8	Package mechanical data - PD84008L-E	11
9	Revision history	14

1 Electrical data

1.1 Maximum ratings

Table 2. Absolute maximum ratings

Symbol	Parameter	Value	Unit
V _{DD}	Supply voltage	16	V
I _D	Drain current	2.5	A
T _{CASE}	Operating case temperature	-20 to +85	°C
T _A	Max. Ambient Temperature	+55	°C

2 Electrical characteristics

T_A = +25 °C, V_{DD} = 7.5 V, I_{dq} = 50 mA

Table 3. Electrical specification

Symbol	Test conditions	Min	Typ	Max	Unit
Freq	Frequency range	740		950	MHz
P _{OUT}			5		W
Gain	@ P _{IN} = 26 dB		11 ± 1.0		dB
ND	@ P _{IN} = 26 dB		49 - 54		%
H2	2 ND Harmonic @ P _{IN} = 26 dB		-46 / -60		dBc
H3	3 RD Harmonic @ P _{IN} = 26 dB		-54 / -60		dBc
VSWR	Load mismatch all phases @ P _{OUT} = 5 W		Infinite		

3 Impedance

Figure 1. Impedance graphic

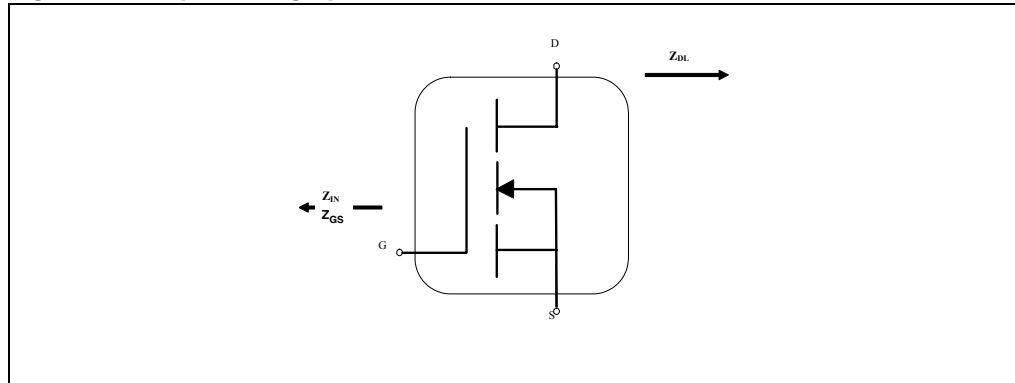


Table 4. Impedance data

F(MHz)	Z_{GS}	Z_{DL}
740	1.87 - j5.74	3.04 - j6.19
750	1.84 - j5.65	3.10 - j6.13
760	1.83 - j5.55	3.17 - j6.09
770	1.81 - j5.43	3.26 - j6.04
780	1.79 - j5.30	3.35 - j5.60
790	1.74 - j5.19	3.43 - j5.98
800	1.70 - j5.13	3.51 - j6.02
810	1.67 - j5.05	3.61 - j6.09
820	1.68 - j4.97	3.70 - j6.20
830	1.69 - j4.89	3.82 - j6.32
840	1.69 - j4.80	3.91 - j6.48
850	1.68 - j4.72	3.94 - j6.70
860	1.67 - j4.68	3.90 - j6.96
870	1.66 - j4.61	3.82 - j7.22
880	1.66 - j4.54	3.67 - j7.48
890	1.66 - j4.48	3.47 - j7.65
900	1.61 - j4.37	3.17 - j7.74
910	1.54 - j4.26	2.85 - j7.79
920	1.48 - j4.18	2.48 - j7.81
930	1.43 - j4.12	2.12 - j7.77
940	1.36 - j4.04	1.77 - j7.67
950	1.33 - j3.98	1.49 - j7.51

4 Typical performance

Figure 2. Output power vs frequency
Vdd = 7.2 V - Idq = 200 mA

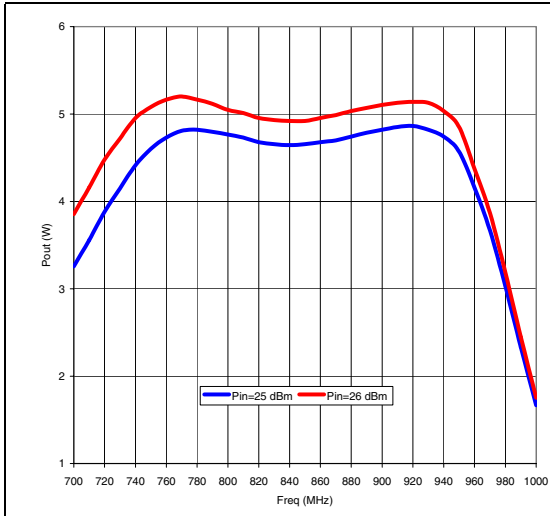


Figure 3. Gain vs frequency
Vdd = 7.2 V - Idq = 200 mA

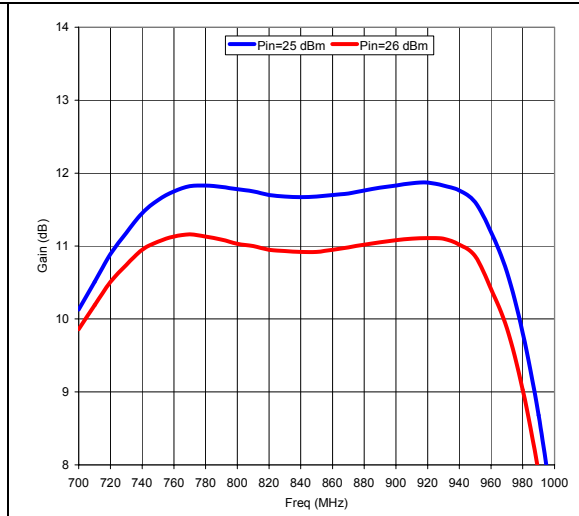


Figure 4. Input return loss vs frequency
Vdd = 7.2 V - Idq = 200 mA

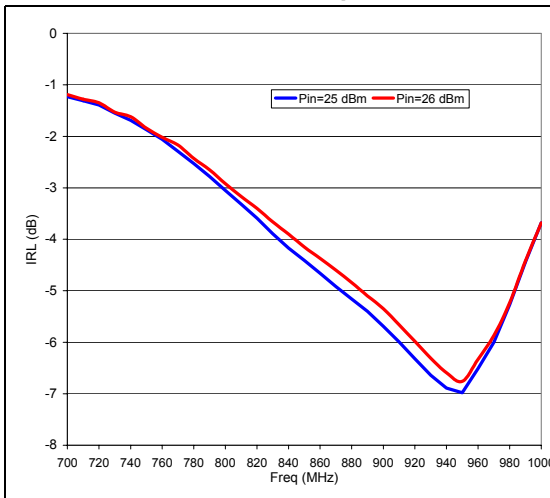


Figure 5. Efficiency vs frequency
Vdd = 7.2 V - Idq = 200 mA

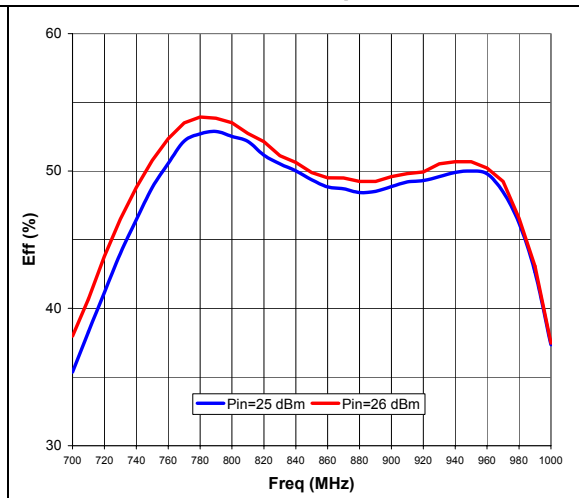


Figure 6. Gain vs output
Vdd = 7.2 V - Idq = 200 mA

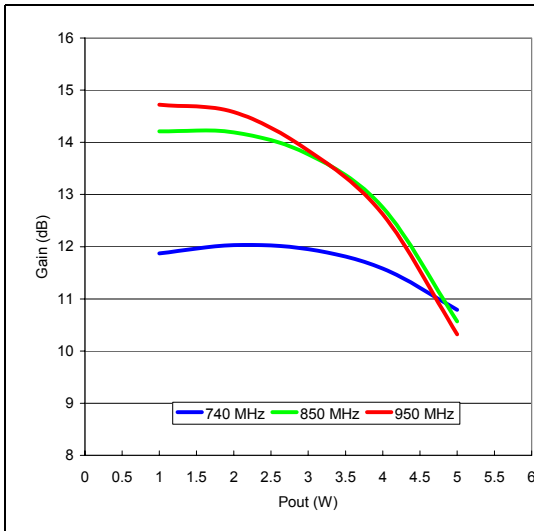
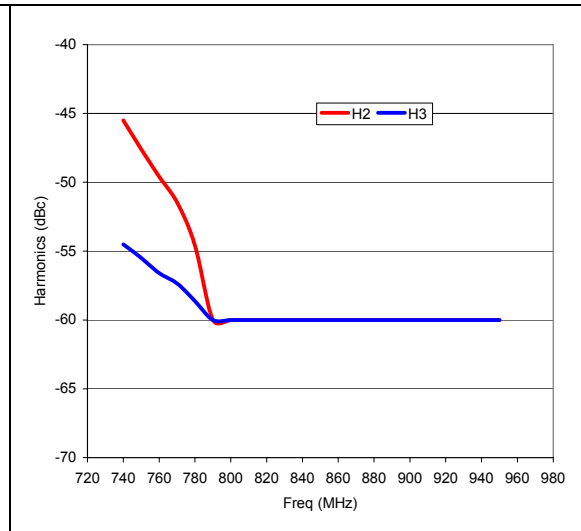


Figure 7. Harmonics vs frequency
Pin = 26 dBm
Vdd = 7.2 V - Idq = 200 mA



5 Test circuit

Figure 8. Test circuit schematic

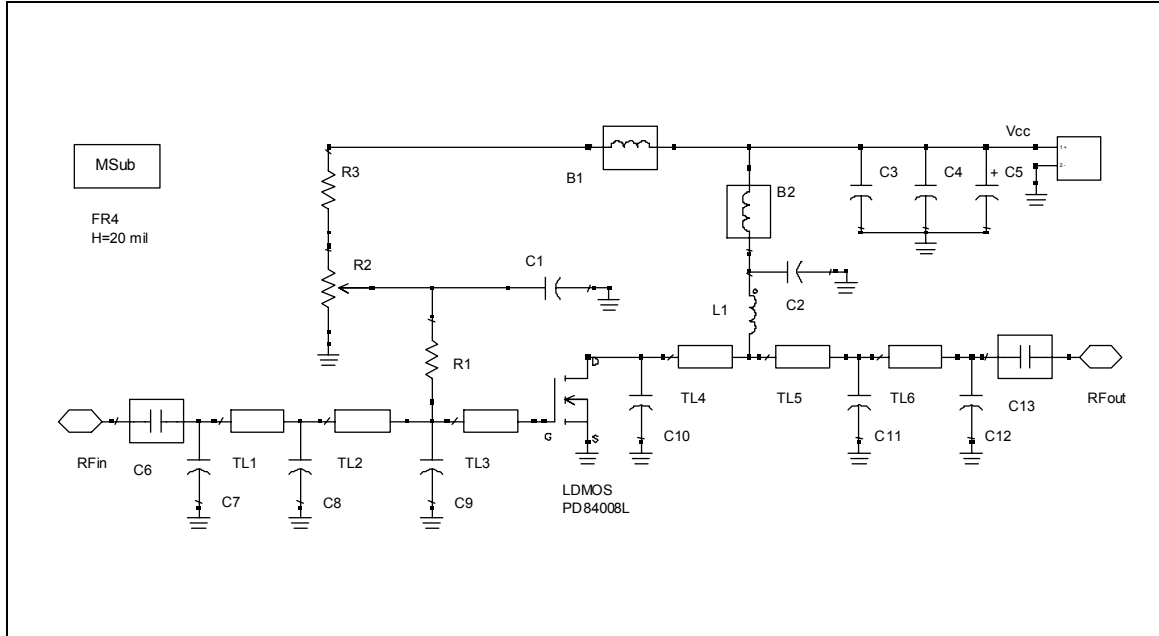


Table 5. Component part list

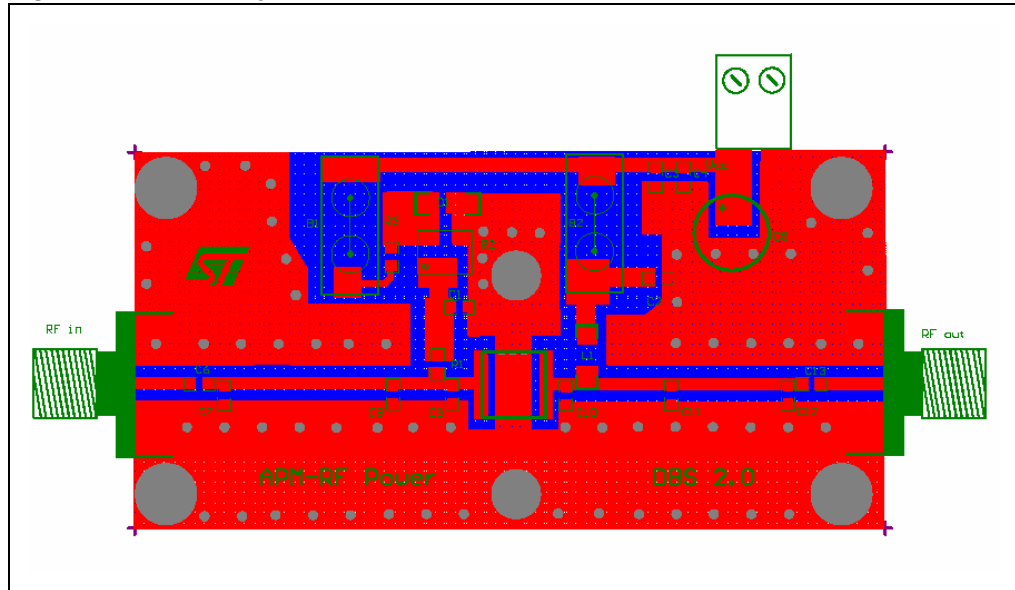
Component ID	Description	Value	Case size	Manufacturer	Part code
B1	Ferrite bead			Panasonic	EXCELDRC35C
B2	Ferrite bead			Panasonic	EXCELDRC35C
C1, C2	Capacitor	150 pF	0603	Murata	GRM39-C0G151J50D500
C3	Capacitor	1 nF	0603	Murata	GRM39-COG102J50D500
C4	Capacitor	10 nF	0603	Murata	GRM39-X7R103K50C560_
C5	Capacitor	10 uF	SMT	Panasonic	EEVHB1V100P
C6, C13	Capacitor	39 pF	0603	Murata	GRM39-C0G390J50D500
C7, C8	Capacitor	3,9 pF	0603	Murata	GRM39-C0G3R9C50Z500
C9, C10	Capacitor	18 pF	0603	Murata	GRQ706-C0G180J50K500
C11	Capacitor	8.2 pF	0603	Murata	GRM39-C0G8R2D50Z500

Table 5. Component part list (continued)

Component ID	Description	Value	Case size	Manufacturer	Part code
C12	Capacitor	2 pF	0603	Murata	GRQ706-C0G020C100K500
L1	Inductor	12.55 nH		Coilcraft	1606-10
R1	Resistor	510 Ω	0603	Tyco electronics	
R2	Potentiometer	1 K Ω		Bourns electronics	3224W-1-102
R3	Resistor	100 Ω	0603	Tyco electronics	01623440-1
TL1	Transmission Line	W=0.92mm	L=12,5 mm		
TL2	Transmission Line	W=0.92mm	L=3,5 mm		
TL3	Transmission Line	W=0.92mm	L=2,6 mm		
TL4	Transmission Line	W=0.92mm	L=1,8 mm		
TL5	Transmission Line	W=0.92mm	L=5,3 mm		
TL6	Transmission Line	W=0.92mm	L=10.0 mm		
RF in, RF out	SMA-CONN	50 Ω	60 mils	Johnson	142-0701-801
PD84008L-E	LDMOS			STMicroelectronics	PD84008L-E
Board	FR-4 THk=0.020" 2OZ Cu both sides				

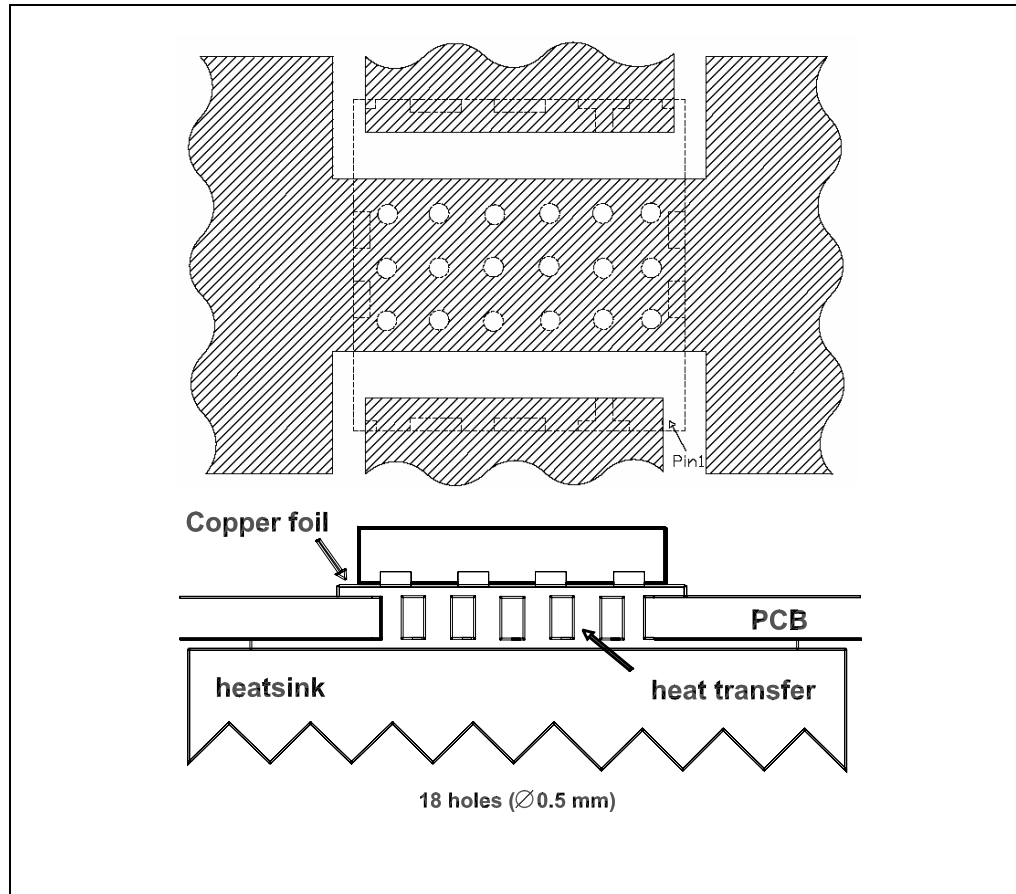
6 Circuit layout

Figure 9. Circuit layout



7 Mounting indications - PD84008L-E

Figure 10. Standard SMD mounting



8 Package mechanical data - PD84008L-E

In order to meet environmental requirements, ST offers these devices in ECOPACK® packages. These packages have a Lead-free second level interconnect . The category of second level interconnect is marked on the package and on the inner box label, in compliance with JEDEC Standard JESD97. The maximum ratings related to soldering conditions are also marked on the inner box label. ECOPACK is an ST trademark. ECOPACK specifications are available at: www.st.com

Table 6. PowerFLAT™ mechanical data - PD84008L-E

Dim.	mm			inch		
	Min	Typ	Max	Min	Typ	Max
A		0.90	1.00		0.035	0.039
A1		0.02	0.05		0.001	0.002
A3		0.24			0.009	
AA	0.15	0.25	0.35	0.006	0.01	0.014
b	0.43	0.51	0.58	0.017	0.020	0.023
c	0.64	0.71	0.79	0.025	0.028	0.031
D		5.00			0.197	
d		0.30			0.011	
E		5.00			0.197	
E2	2.49	2.57	2.64	0.098	0.101	0.104
e		1.27			0.050	
f		3.37			0.132	
g		0.74			0.03	
h		0.21			0.008	

Figure 11. PowerFLAT™ package dimensions

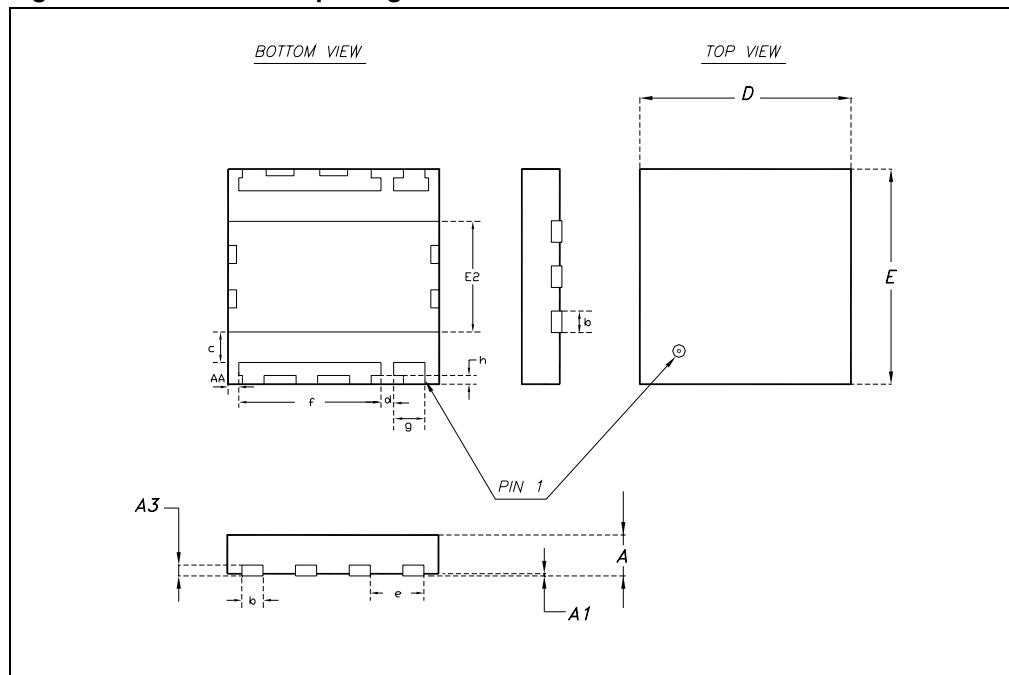
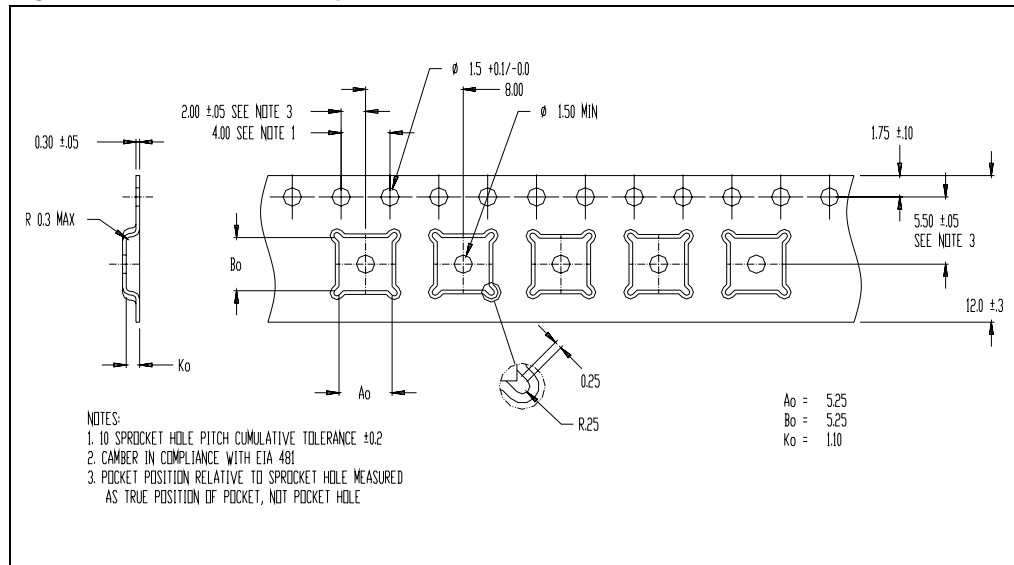


Table 7. PowerFLAT™ tape and reel dimensions - PD84008L-E

Dim.	mm			inch		
	Min	Typ	Max	Min	Typ	Max
Ao	5.15	5.25	5.35	0.12	0.13	0.13
Bo	5.15	5.25	5.35	0.12	0.13	0.13
Ko	1.0	1.1	1.2	0.02	0.02	0.02

Figure 12. PowerFLAT™ tape and reel



9 Revision history

Table 8. Document revision history

Date	Revision	Changes
06-Dec-2007	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 AN AUTHORIZED ST REPRESENTATIVE, 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.

© 2007 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 - Singapore - Spain - Sweden - Switzerland - United Kingdom - United States of America

www.st.com

