STEVAL-TDR017V1

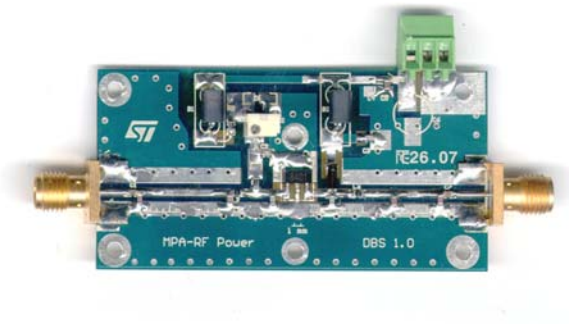
Demonstration board using the PD84001 for UHF RFID reader and 2-way radio

Features

- Excellent thermal stability
- Frequency: 860 - 960 MHz
- Supply voltage: 7.2 V
- Output power: 1 W
- Power gain: 14.6 ±0.4 dB
- Efficiency: 51 % - 53 %
- Load mismatch: 20:1
- BeO-free amplifier

Description

The STEVAL-TDR017V1 is a demonstration board using the PD84001 LDMOS transistor. It is designed for UHF RFID reader and 2-way radio applications.



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

Table 1. Device summary

Part number
STEVAL-TDR017V1

Contents

1 Electrical characteristics

T_A = +25 °C, V_{DD} = 7.2 V, I_{dq} = 50 mA

Table 2. Electrical specifications

Symbol	Test conditions	Min	Typ	Max	Unit
Freq	Frequency range	860		960	MHz
P_{OUT}			1		W
Gain	@ P_{IN} = 16 dBm		14.6 ±0.4		dB
ND	@ P_{IN} = 16 dBm		51 - 53		%
H2	2nd harmonic @ P_{IN} = 16 dBm		-44 / -47		dBc
H3	3rd harmonic @ P_{IN} = 16 dBm		-51 / -57		dBc
VSWR	Load mismatch all phases @ P_{OUT} =1 W			20:1	

2 Impedance

Figure 1. Impedance illustration

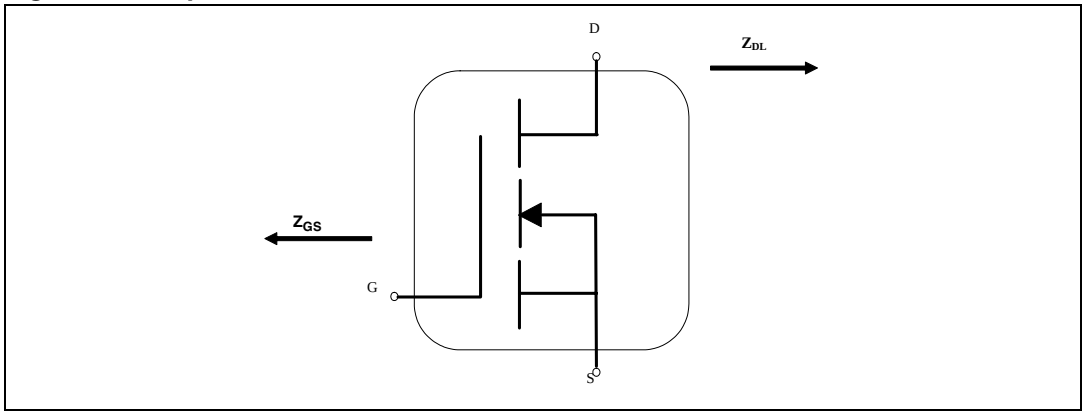


Table 3. Impedance data

F(MHz)	Z_{GS}	Z_{DL}
860	4,36 + j1,91	5,67 - j0,89
870	4,41 + j2,00	5,58 - j0,69
880	4,46 + j2,07	5,52 - j0,43
890	4,48 + j2,15	5,41 - j0,20
900	4,51 + j2,19	5,32 + j0,03
910	4,53 + j2,22	5,26 + j0,25
920	4,57 + j2,30	5,203 + j0,47
930	4,51 + j2,31	5,07 + j0,68
940	4,53 + j2,34	5,05 + j0,93
950	4,53 + j2,34	4,99 + j1,13
960	4,49 + j2,34	4,92 + j1,31

3 Test circuit

Figure 2. Test circuit schematic

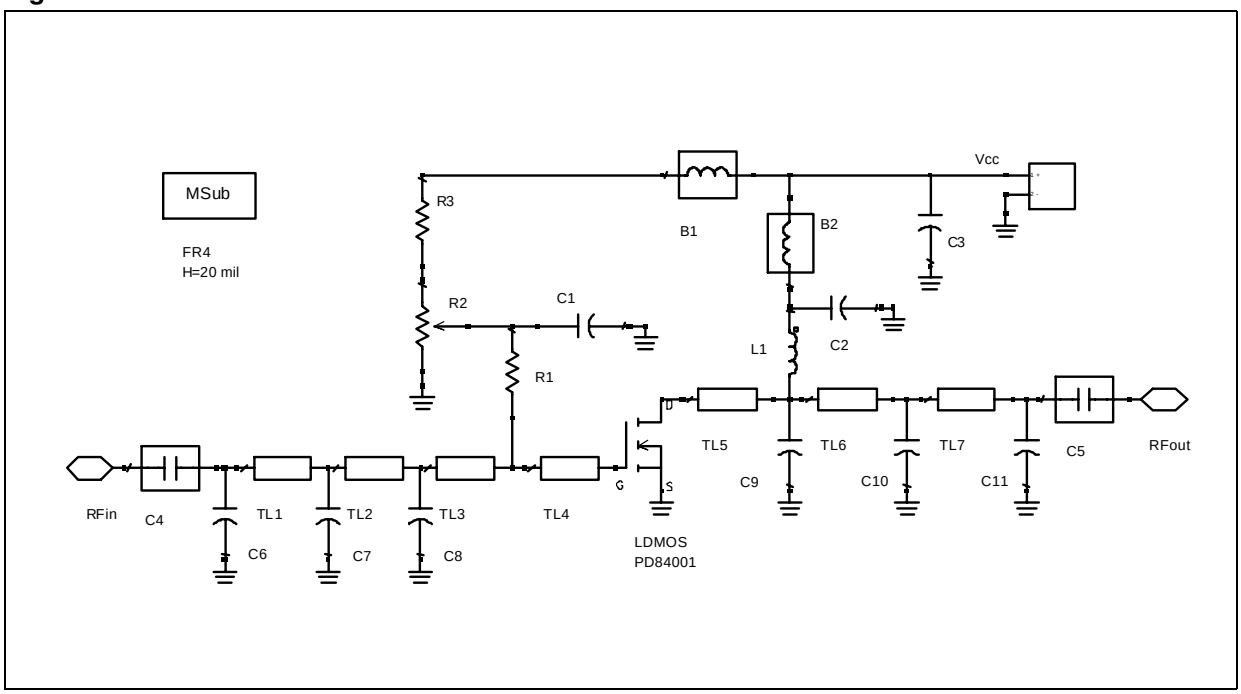


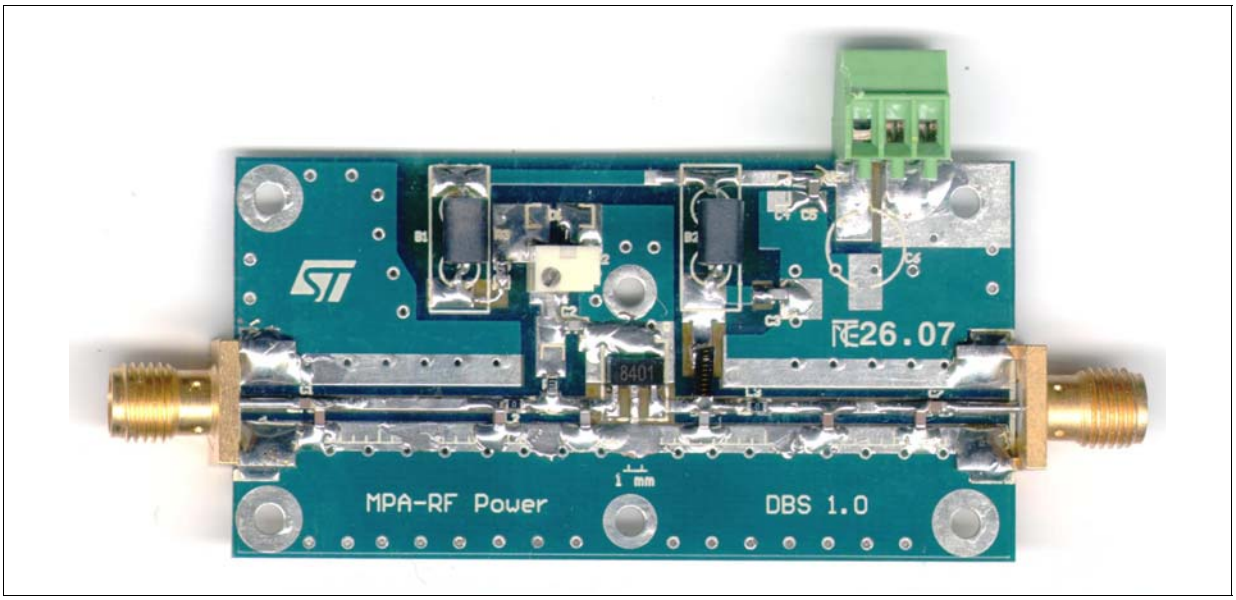
Table 4. Part list

Component ID	Description	Value	Case size	Manufacturer	Part code
B1	Ferrite Bead			Panasonic	EXCELDRC35C
B2	Ferrite Bead			Panasonic	EXCELDRC35C
C1, C2	Capacitor	120 pF	0603	Murata	GRM39-C0G121J50D500
C3	Capacitor	1 µF	0603	Murata	GRM39-X5R105K16D52K
C4, C5	Capacitor	39 pF	0603	Murata	GRM39-C0G390J50D500
C6	Capacitor	2.7 pF	0603	Murata	GRM39-C0G2R7C50Z500
C7	Capacitor	6,8 pF	0603	Murata	GRM39-C0G6R8D50Z500
C8	Capacitor	15 pF	0603	Murata	GRM39-C0G150J50D500
C9	Capacitor	10 pF	0603	Murata	GRM39-C0G100D50D500
C10	Capacitor	2.7 pF	0603	Murata	GRM39-C0G2R7C50Z500
C11	Capacitor	1 pF	0603	Murata	GRM39-C0G010C50Z500
L1	Inductor	12.55 nH		Coilcraft	1606-10
R1	Resistor	510 Ω	0603	Tyco lectronics	
R2	Potentiometer	10 KΩ		Bourns electronics	3214W-1-103E
R3	Resistor	1 K	0603	Tyco electronics	01623440-1

Table 4. Part list (continued)

Component ID	Description	Value	Case size	Manufacturer	Part code
TL1	Transmission line	W = 0.92mm	L = 12,6 mm		
TL2	Transmission line	W = 0.92mm	L = 3,55 mm		
TL3	Transmission line	W = 0.92mm	L = 2,55 mm		
TL4	Transmission line	W = 0.92mm	L = 1,8 mm		
TL5	Transmission line	W = 0.92mm	L = 3.1 mm		
TL6	Transmission line	W = 0.92mm	L = 8,8 mm		
TL7	Transmission line	W = 0.92mm	L = 6,4 mm		
RF in, RF out	SMA-CONN	50 Ω	60 mils	JOHNSON	142-0701-801
PD84001	LDMOS			STMicroelectronics	PD84001
Board	FR-4 THk=0.020" 2OZ Cu both sides				

Figure 3. Demonstration board photo



4 Revision history

Table 5. Document revision history

Date	Revision	Changes
11-Oct-2010	1	Initial release.

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