



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.

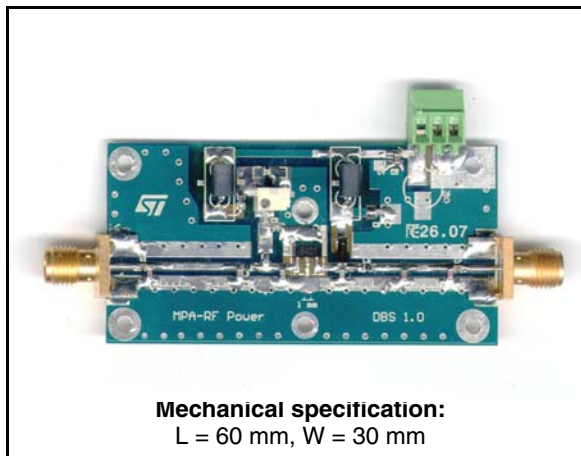


Table 1. Device summary

Part number
STEVAL-TDR017V1

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1 Electrical characteristics

$T_A = +25\text{ }^{\circ}\text{C}$, $V_{DD} = 7.2\text{ V}$, $I_{dq} = 50\text{ mA}$

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

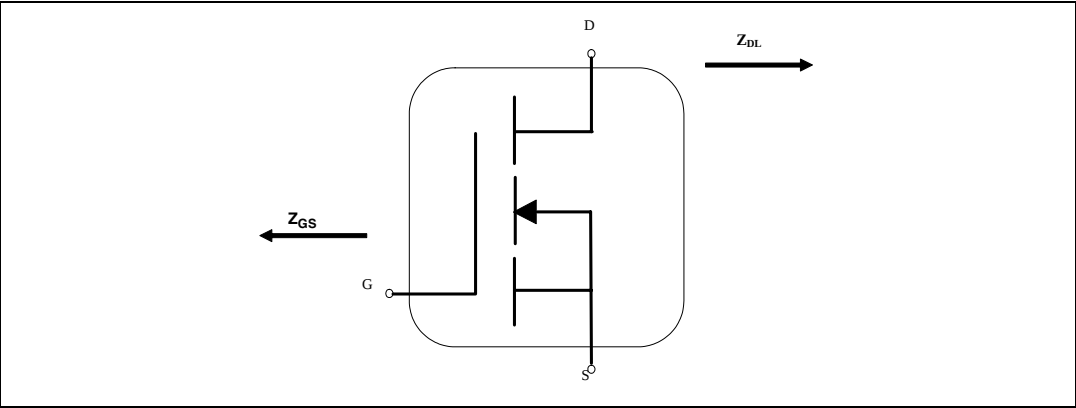
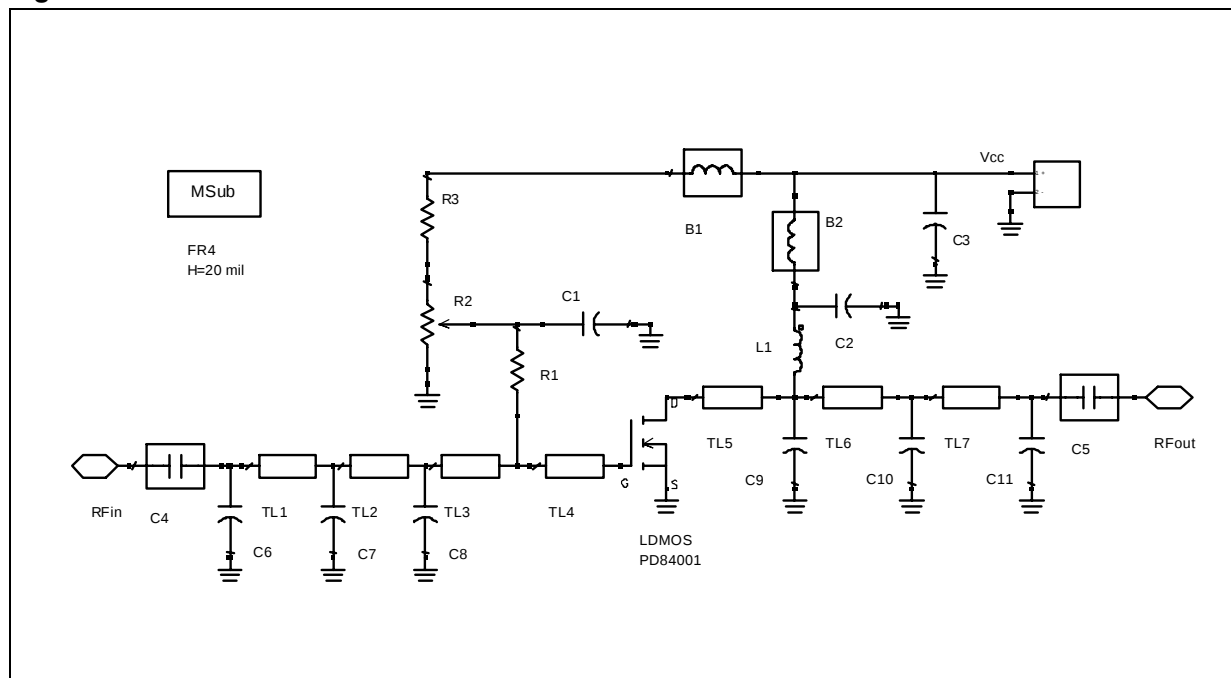


Table 3. Impedance data

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

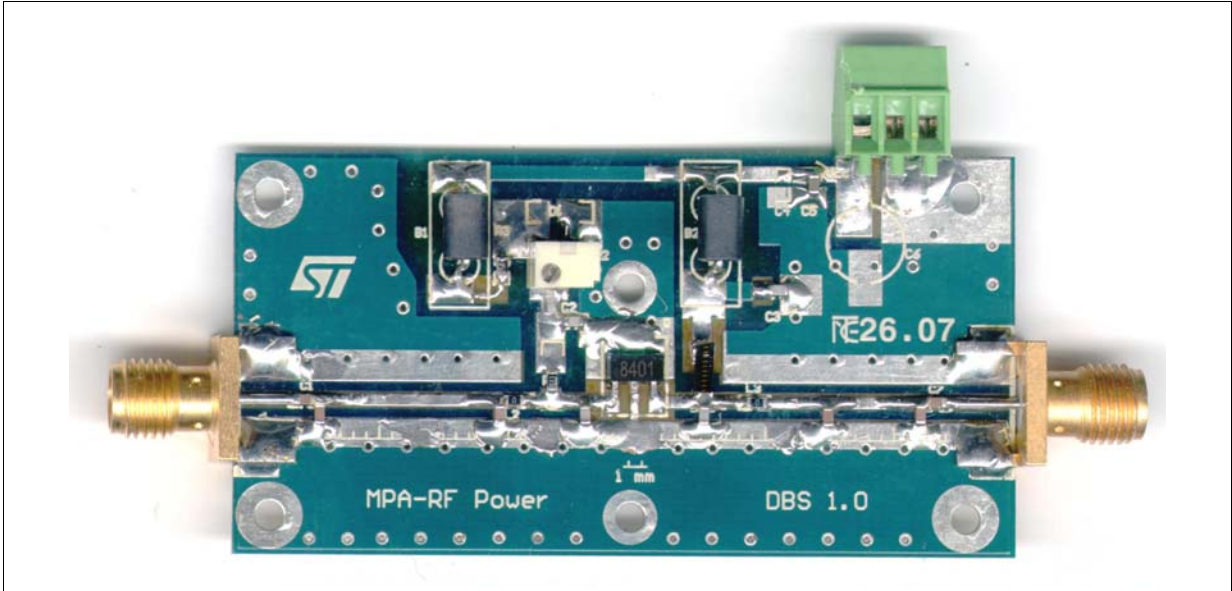
**Table 4. Part list**

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 electronics	
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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