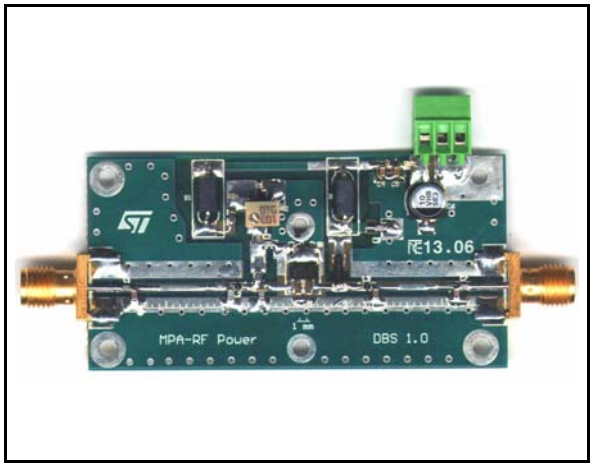
STEVAL-TDR019V1

Demonstration board using the PD85004 for 900 MHz 2-way radio

Features

- Excellent thermal stability
- Frequency: 860 - 960 MHz
- Supply voltage: 13.6 V
- Output power: 4 W
- Power gain: 17.4 ±0.3 dB
- Efficiency: 56 % - 65 %
- Load mismatch: 20:1
- BeO-free amplifier



Description

The STEVAL-TDR019V1 is a demonstration board using the PD85004 LDMOS transistor. It is designed for 2-way radio applications.

Table 1. Device summary

Part number	Mechanical specification
STEVAL-TDR019V1	L = 60 mm, W = 30 mm

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1 Electrical characteristics

T_A = +25 °C, V_{DD} = 13.6 V, I_{dq} = 50 mA

Table 2. Electrical specifications

Symbol	Test conditions	Min	Typ	Max	Unit
Frequency	Frequency range	860		960	MHz
P_{OUT}			4		W
Gain	@ P_{IN} = 19 dBm		17.4 ±0.3		dB
ND	@ P_{IN} = 19 dBm		56 - 65		%
H2	2nd harmonic @ P_{OUT} = 4 W		-30 / -38		dBc
H3	3rd harmonic @ P_{OUT} = 4 W		-50 / -62		dBc
VSWR	Load mismatch all phases @ P_{OUT} = 4 W			20:1	

2 Impedance

Figure 1. Impedance illustration

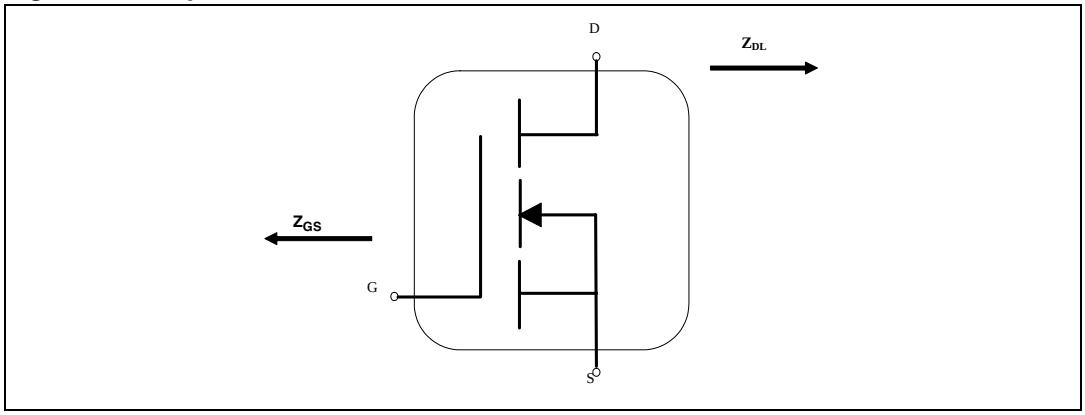


Table 3. Impedance data

F (MHz)	Z_{GS}	Z_{DL}
860	2,460 + j6,634	8,383 + j2,828
870	2,489 + j6,787	8,222 + j3,179
880	2,588 + j6,833	8,075 + j3,456
890	2,581 + j6,913	7,884 + j3,797
900	2,629 + j6,970	7,773 + j4,100
910	2,601 + j7,063	7,609 + j4,449
920	2,570 + j7,091	7,495 + j4,773
930	2,529 + j7,134	7,360 + j5,069
940	2,423 + j7,171	7,152 + j5,365
950	2,385 + j7,246	7,079 + j5,709
960	2,265 + j7,338	6,952 + j6,071

3 Test circuit

Figure 2. Test circuit schematic

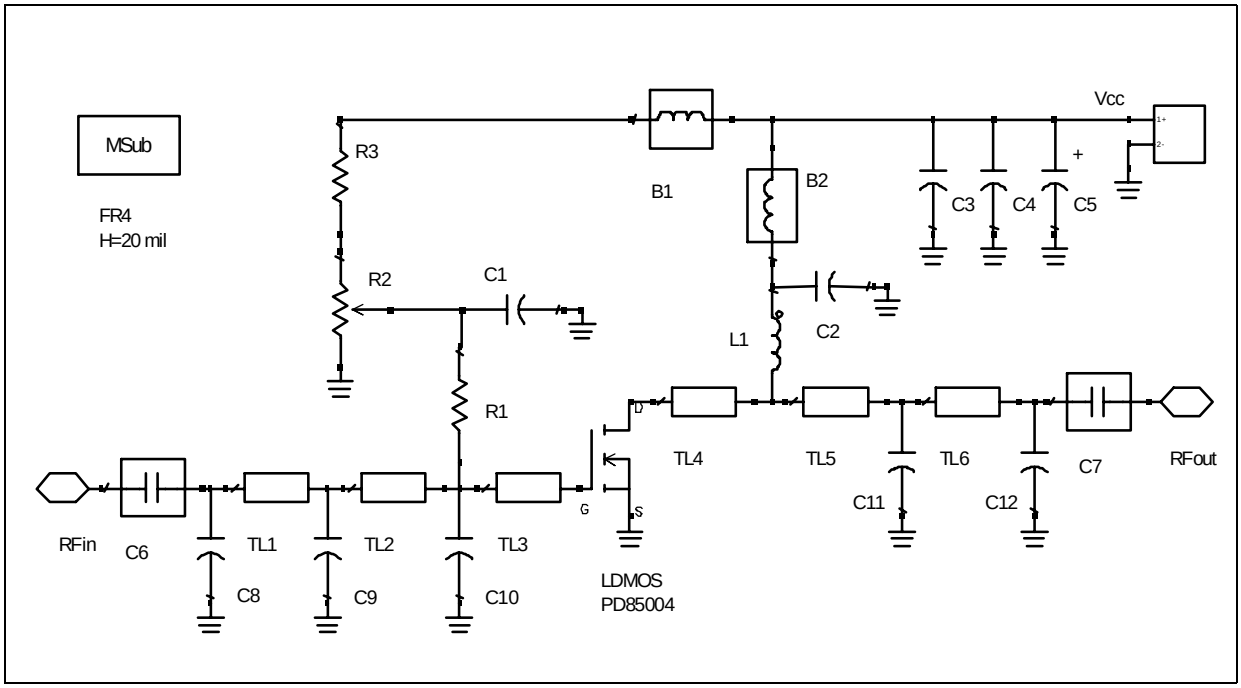


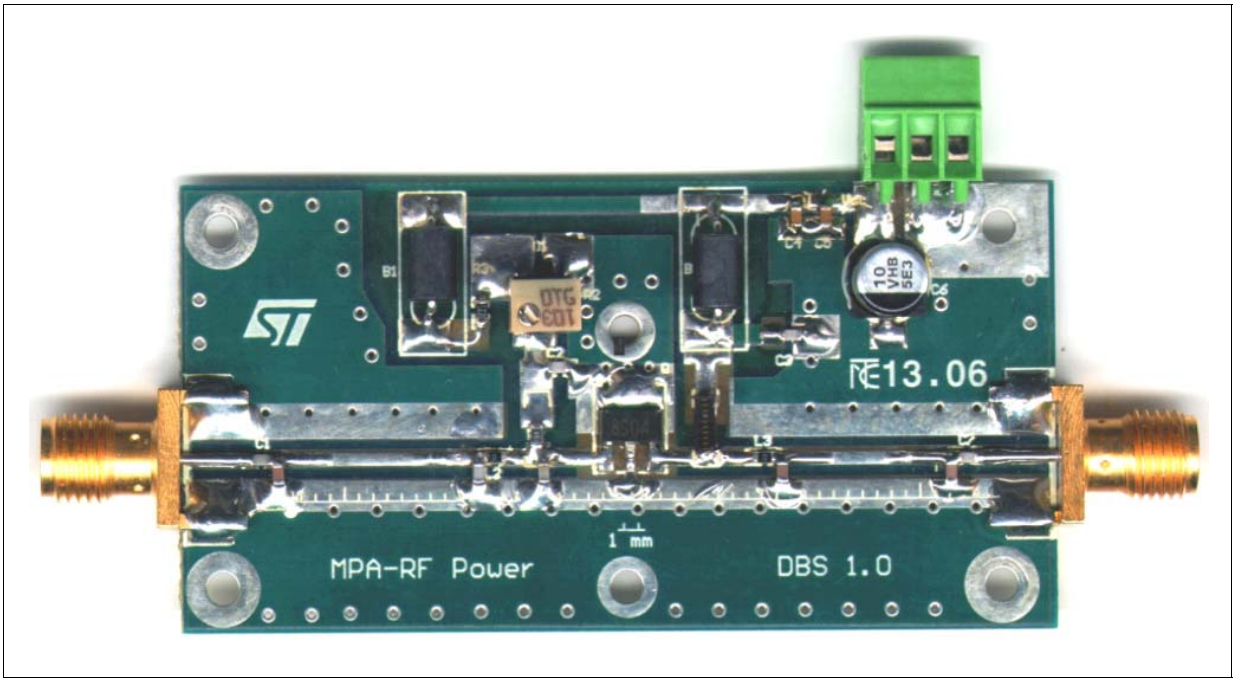
Table 4. Part list

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 nF	0603	Murata	GRM39-X7R102K50C560
C4	Capacitor	10 nF	0603	Murata	GRM39-X7R103K50C560
C5	Capacitor	10 uF	SMT	Panasonic	EEVHB1V100P
C6, C7	Capacitor	39 pF	0603	Murata	GRM39-C0G390J50D500
C8	Capacitor	3.3 pF	0603	Murata	GRM39-C0G3R3C50Z500
C9	Capacitor	12 pF	0603	Murata	GRM39-C0G120J50D500
C10	Capacitor	22 pF	0603	Murata	GRM39-C0G220J50D500
C11	Capacitor	6,8 pF	0603	Murata	GRM39-C0G6R8D50Z500
C12	Capacitor	1,5 pF	0603	Murata	GRM39-C0G1R5C50Z500
L1	Inductor	12.55 nH		Coilcraft	1606-10

Table 4. Part list (continued)

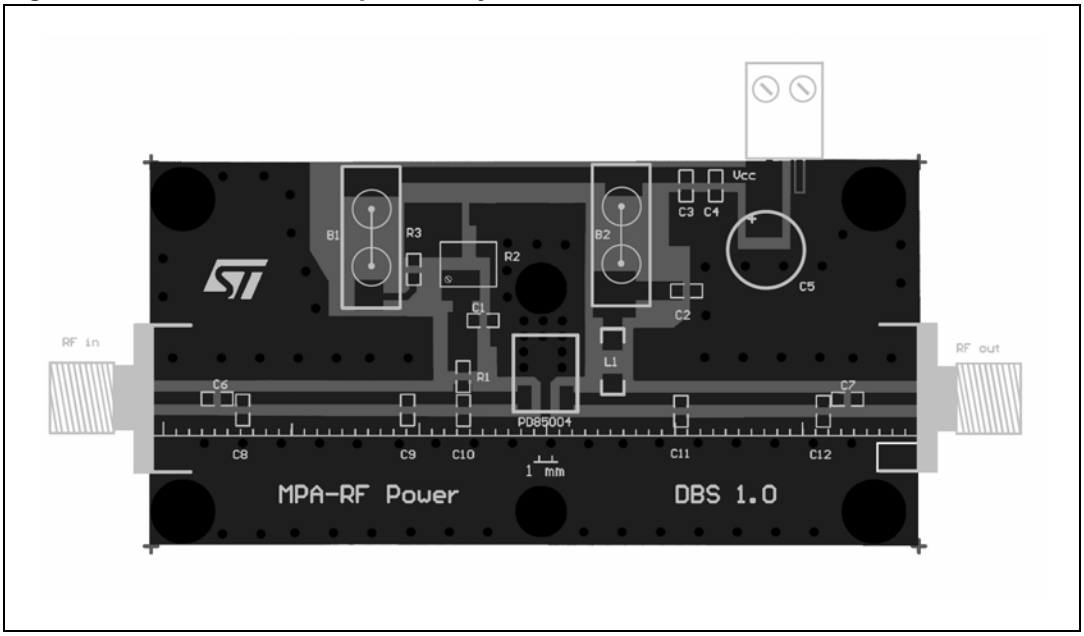
Component ID	Description	Value	Case size	Manufacturer	Part code
R1	Resistor	150 Ω	0603	Tyco electronics	
R2	Potentiometer	10 kΩ			3214W-1-103E
R3	Resistor	1 K	0603		01623440-1
TL1	Transmission line	W = 0.92 mm	L=13.6 mm		
TL2			L=3.5 mm		
TL3			L=4.2 mm		
TL4			L=3.8 mm		
TL5			L=4.2 mm		
TL6			L=11.3 mm		
RF in, RF out	SMA-CONN	50 Ω	60 mils	Johnson	142-0701-801
PD85004	LDMOS			STMicroelectronics	PD85004
Board	FR-4 THk=0.020" 2 OZ Cu both sides				

Figure 3. Demonstration board photo



4 Circuit layout

Figure 4. Test fixture component layout



5 Revision history

Table 5. Document revision history

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

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