



STEVAL-TDR022V1

RF power amplifier using the PD85025-E
for UHF OFDM and 2-way mobile radios

Features

- Excellent thermal stability
- Frequency: 340 - 520 MHz
- Supply voltage: 15 V
- Output power: 10 WPEP
- Gain: 16.5 dB min.
- IMD3 < -27 dBc at 10 WPEP
- Load mismatch: 20:1
- BeO free amplifier

Description

The STEVAL-TDR022V1 is an demonstration board using PD85025-E LDMOS transistor and designed for UHF OFDM and 2-way mobile radios.

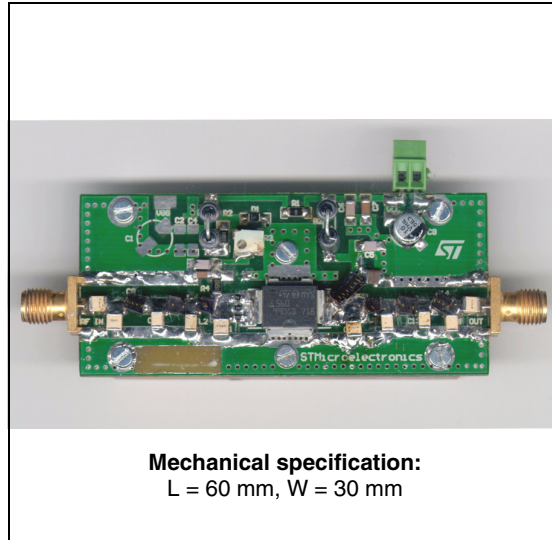


Table 1. Device summary

| Order code |
|-----------------|
| STEVAL-TDR022V1 |

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1 Electrical characteristics

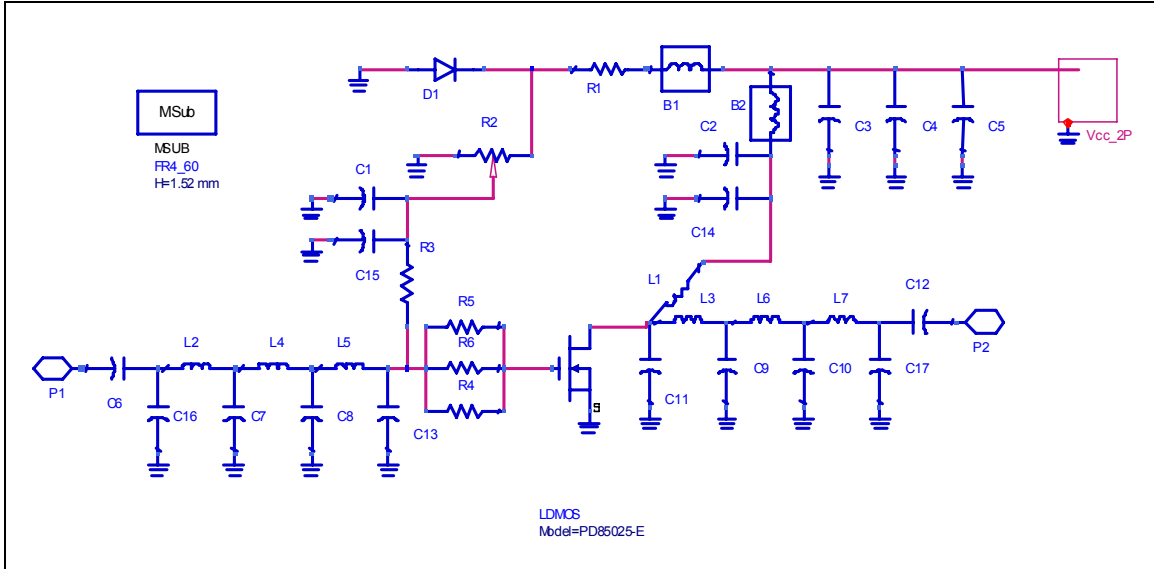
$T_A = + 25\text{ }^\circ\text{C}$, $V_{DD} = 15\text{ V}$, $I_{dq} = 220\text{ mA}$

Table 2. Electrical specification

| Symbol | Test conditions | Min. | Typ. | Max. | Unit |
|-----------|---|------|-----------|------|------|
| Freq | Frequency range | 340 | | 520 | MHz |
| P_{OUT} | 2 Tones test - DF = 600 kHz | | 10 | | WPEP |
| Gain | @ $P_{OUT} = 10\text{ WPEP}$ | 16.5 | | | dB |
| I_D | Drain current @ 10W PEP | | | 1.25 | A |
| H2 | 2 nd harmonic @ $P_{OUT} = 10\text{ WPEP}$ | | -37 / -60 | | dB |
| H3 | 3 rd harmonic @ $P_{OUT} = 10\text{ WPEP}$ | | -60 / -68 | | dB |
| VSWR | Load mismatch all phases @ $P_{OUT} = 10\text{ W}$ | | 20:1 | | |

2 Test circuit

Figure 1. Test circuit schematic



3 Circuit layout

Figure 2. Circuit layout

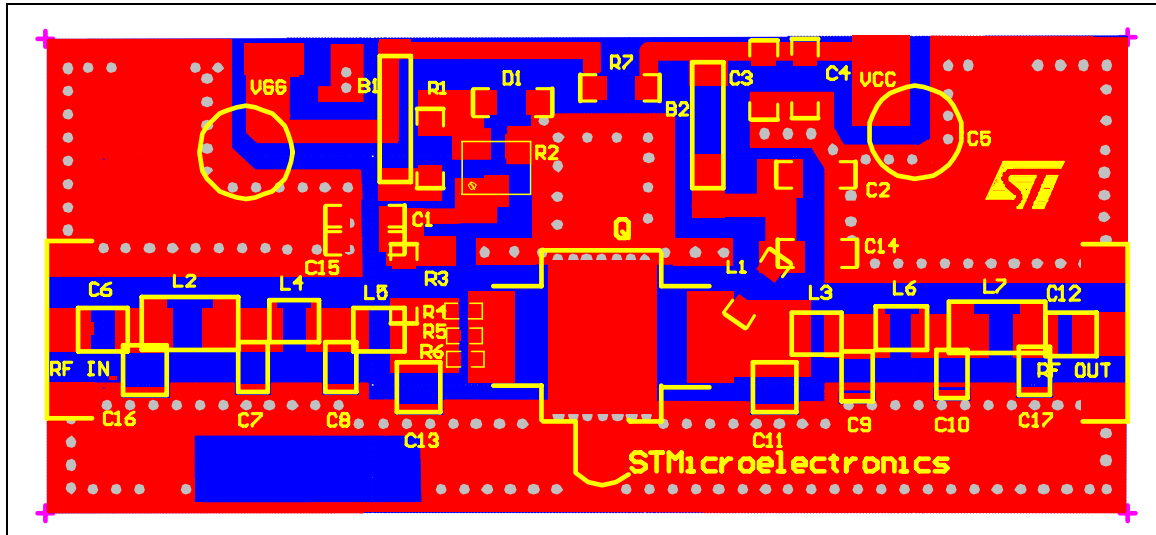


Table 3. Component part list

| Component ID | Description | Value | Case size | Manufacturer | Part code |
|--------------|--------------|--------|-----------|--------------|----------------------|
| B1 | Ferrite bead | | | Panasonic | EXCELDR35C |
| B2 | Ferrite bead | | | Panasonic | EXCELDR35C |
| C1, C2 | Capacitor | 120 pF | 1206 | Murata | GRM42-6 COG 121J 50_ |
| C3 | Capacitor | 1 nF | 1206 | Murata | GRM42-6 COG 102J 50 |
| C4 | Capacitor | 100 nF | 1206 | Murata | GRM42-6_X7R 104K 50_ |
| C5 | Capacitor | 10 µF | SMT | Panasonic | EEVHB1V100P |
| C6, C12 | Capacitor | 180 pF | 100B | ATC | ATC 100B 181JW |
| C7 | Capacitor | 22 pF | 100B | ATC | ATC 100B 220JW |
| C8 | Capacitor | 47 pF | 100B | ATC | ATC 100B 470JW |
| C9 | Capacitor | 36 pF | 100B | ATC | ATC 100B 360JW |
| C10 | Capacitor | 22 pF | 100B | ATC | ATC 100B 220JW |
| C11 | Capacitor | 47 pF | 100B | ATC | ATC 100B 470 JW |
| C16 | Capacitor | 6.8 pF | 100B | ATC | ATC 100B 6R8BW |
| C13 | Capacitor | 51 pF | 100B | ATC | ATC 100B 510JW |
| C14 | Capacitor | 10 µF | | Murata | GRM32NF51E106ZA01B |
| C15 | Capacitor | 330 nF | 1206 | Murata | GRM42-6_X7R 334K 50_ |
| C17 | Capacitor | 9.1 pF | 100B | ATC | ATC 100B 9R1JW |
| D1 | Zener diode | 5.1 V | SOD110 | Philips | BZX284C5V1 |
| L1 | Inductor | 22 nH | | Coilcraft | B07TJLB |

Table 3. Component part list (continued)

| Component ID | Description | Value | Case size | Manufacturer | Part code |
|--------------|-----------------------------------|---------------|---------------|--------------------|--------------|
| L2, L7 | Inductor | 12.5 nH | | Coilcraft | A04TJLB |
| L3, L5 | Inductor | 2,5 nH | | Coilcraft | A01TKLB |
| L4, L6 | Inductor | 5 nH | | Coilcraft | A02TJLB |
| R1 | Resistor | 1 k Ω | 1206 | Tyco Electronics | 01623440-1 |
| R2 | Potentiometer | 10 k Ω | | Bourns Electronics | 3214W-1-103E |
| R3 | Resistor | 16 Ω | 1206 | Bourns Electronics | |
| R7 | Resistor | 0 Ω | 1206 | Bourns Electronics | |
| R4, R5, R6 | Resistor | 2.2 Ω | 603 | VISHAY | D11/CRCW0603 |
| Vcc_2P | Connector DC | 2 poli | 2.54mm | Phoenix Contact | 1725656 |
| P1_P2 | RF Connector | SMA_Female | Flange solder | | 1.54 mm |
| Q | LD MOS | PD85025-E | | STMicroelectronics | PD85025-E |
| Board | FR-4 THk=0.060" 2OZ Cu both sides | | | | |

4 Revision history

Table 4. Document revision history

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

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