

# CA-013-13

BLF6G13L-250P at 1080-1100 MHz

Rev. 3 — 05 October 2015

AMPLEON

Application Measurement  
Report

## Document information

| Info            | Content   |
|-----------------|---|
| <b>Keywords</b> | BLF6G13L-250P, AB, Pulse                              |
| <b>Abstract</b> | RF Performance BLF6G13L-250P, 1080-1100MHz; Board2173 |

## Revision history

| Rev | Date     | Description  |
|-----|----------|--|
| 1   | 20120115 | Original   |
| 2   | 20150424 | Update for web publication   |
| 3   | 20151005 | The format of this document has been redesigned to comply with the new identity guidelines of Ampleon.<br>Legal texts have been adapted to the new company name where appropriate. |

### 1. Demo and Transistor Details

|                |                     |
|----------------|---------------------|
| Frequency Band | 1080-1100MHz        |
| Modulation     | Pulsed 100uSec 10%, |
| Transistor     | BLF6G13L-250P       |
| Date Code      | M1136               |
| Board Number   | 2173                |

#### 1.1 Introduction

This report gives the test results for a BLF6G13L-250P, 350W, LDMOS, class AB demo amplifier.

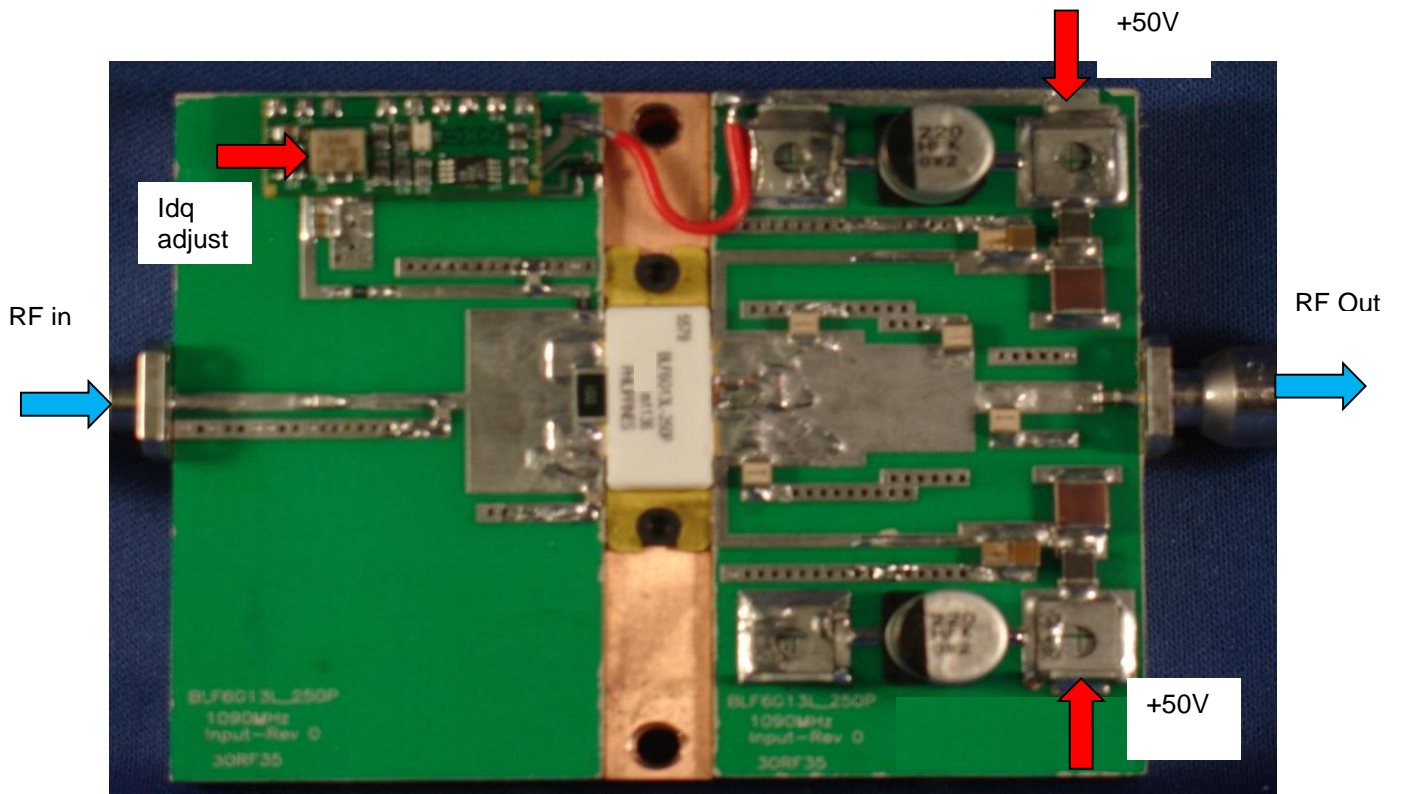


Fig 1. Board

The following tests have been performed:

- NWA - Gain/ Return loss (CW)
- Pulsed Peak Power sweep

All testing has been performed at  $V_{DS} = 50V$ ,  $I_{DQ} = 100mA$ , and  $T_H = 25^{\circ}C$  unless otherwise specified.

## 2. Test Circuit

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A description of this circuit can be found in **chapter 4**. The test circuit has been designed on Taconic RF35 30mil  $\epsilon_r=3.5$

Supply voltage (drain-source) is typically 50V. An external bias module supplies the gate bias voltage and can be found in CA-330-11

### 3. RF Performance

| Frequency (MHz) | Gain (dB)              | Eff(%) | P <sub>3dB</sub> (dBm) | P <sub>PEAK</sub> (W) | $\eta_{pk}$ (%) |
|-----------------|------------------------|--------|------------------------|-----------------------|-----------------|
|                 | @ Pout= 355W (55.5dBm) |        |                        |                       |                 |
| 1080            | 17.2                   | 63.2   | 56.14                  | 411                   | 65.2            |
| 1090            | 17                     | 65     | 56                     | 395                   | 66.2            |
| 1100            | 16.5                   | 65.5   | 55.72                  | 374                   | 65.8            |

Table 1. RF Performance Summary V<sub>ds</sub> = 50V, I<sub>dq</sub> = 100mA, Pulsed 100usec 10% duty cycle

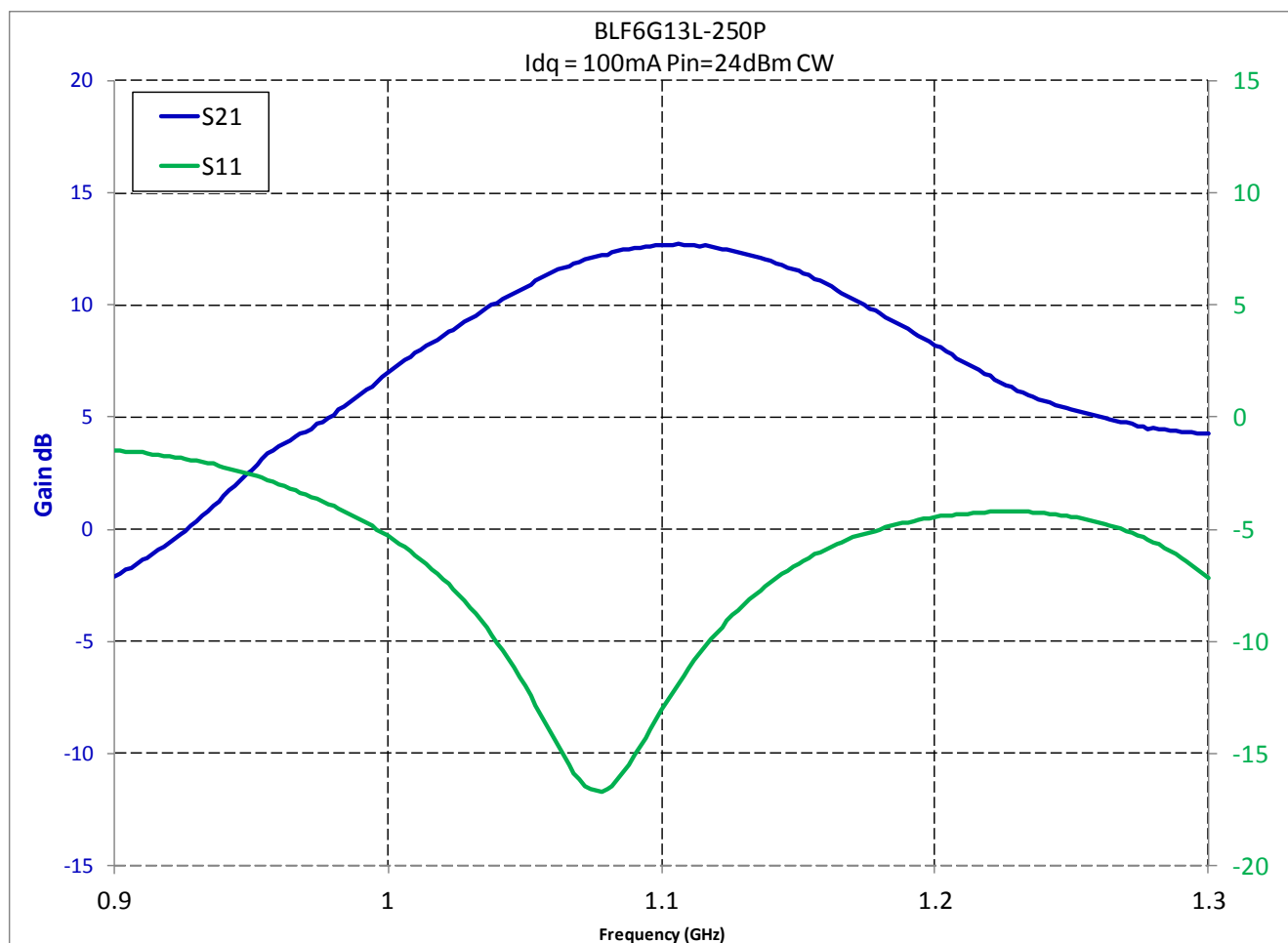


Fig 2. Gain RL pin = 24dBm, CW, V<sub>d</sub>=50V, I<sub>dq</sub>=100mA

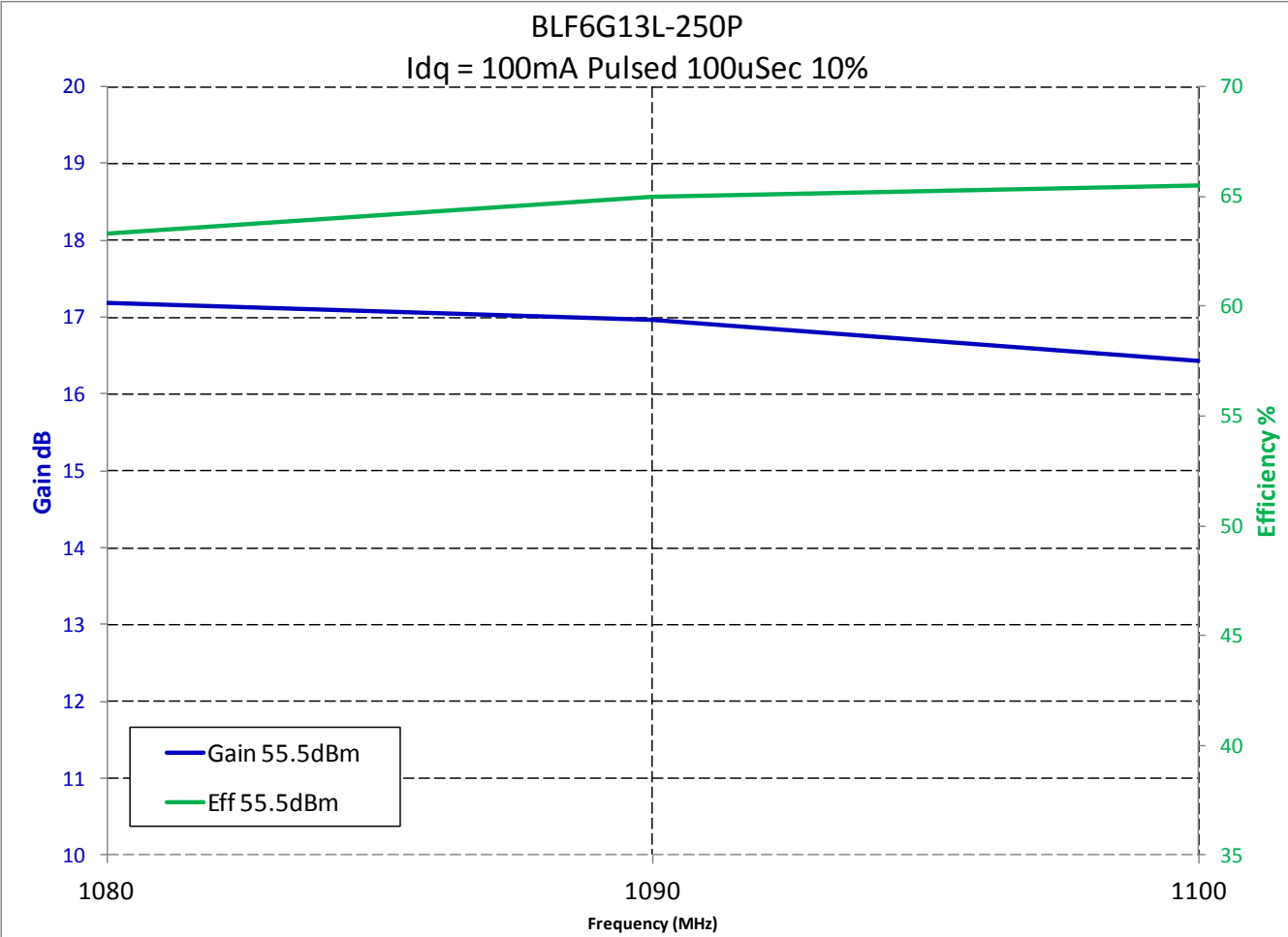


Fig 3. Gain and efficiency at Pout = 55.5dBm, Vd=50V, Idq=100mA

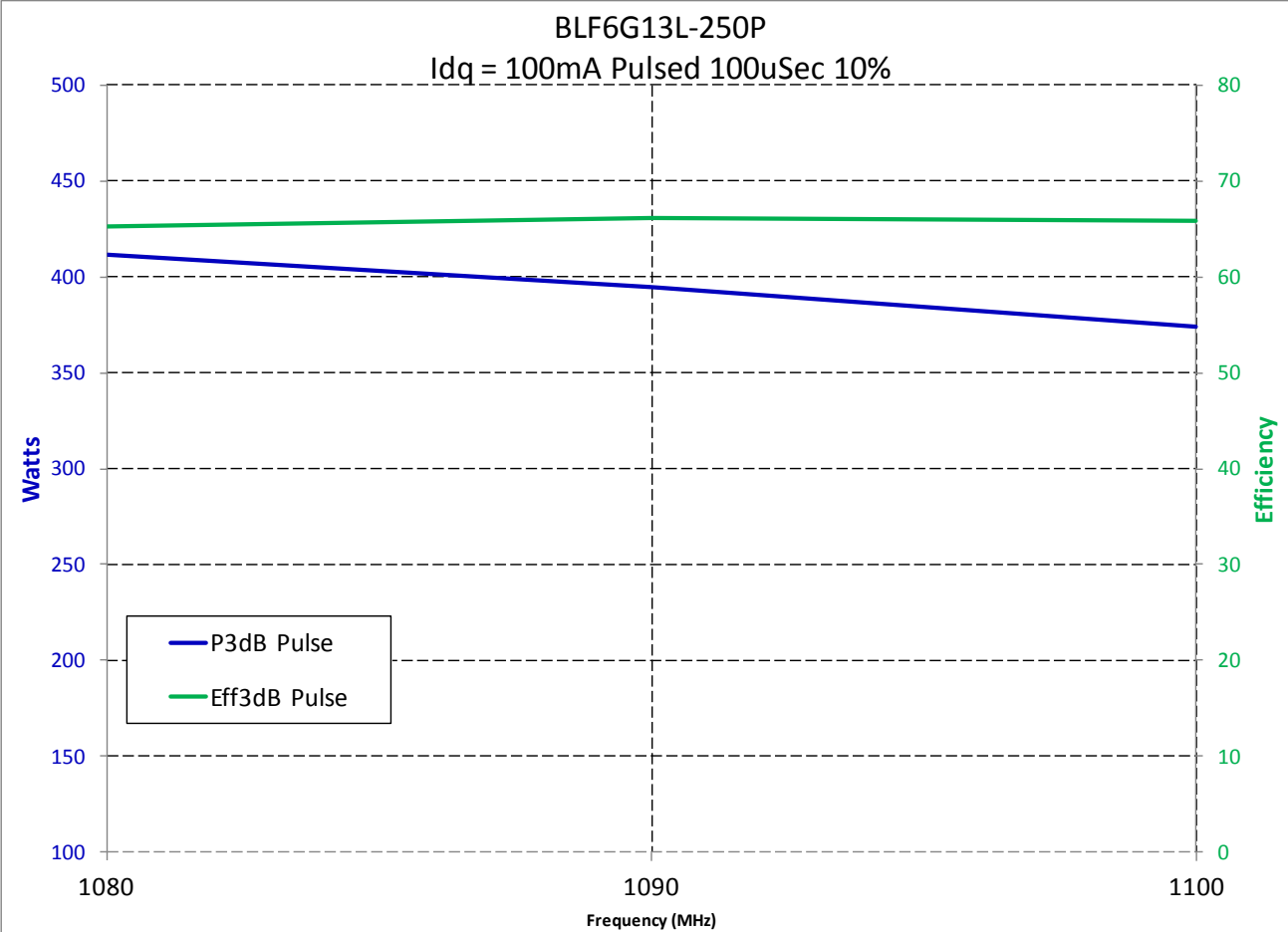


Fig 4. Peak Power / peak efficiency, Vd=50V, Idq=100mA

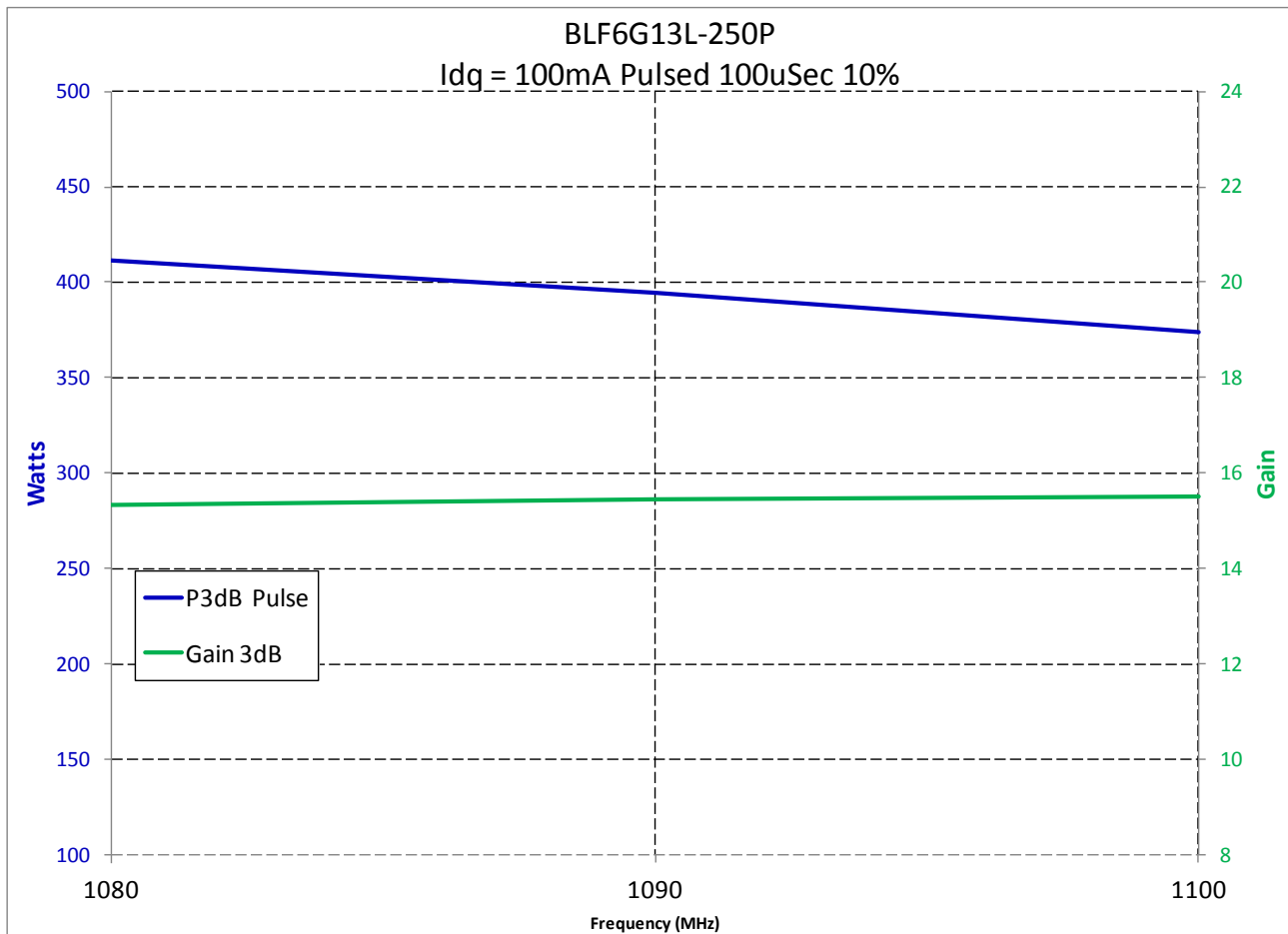


Fig 5. Gain and Power at P3dB,  $V_d=50\text{V}$ ,  $I_{dq}=100\text{mA}$



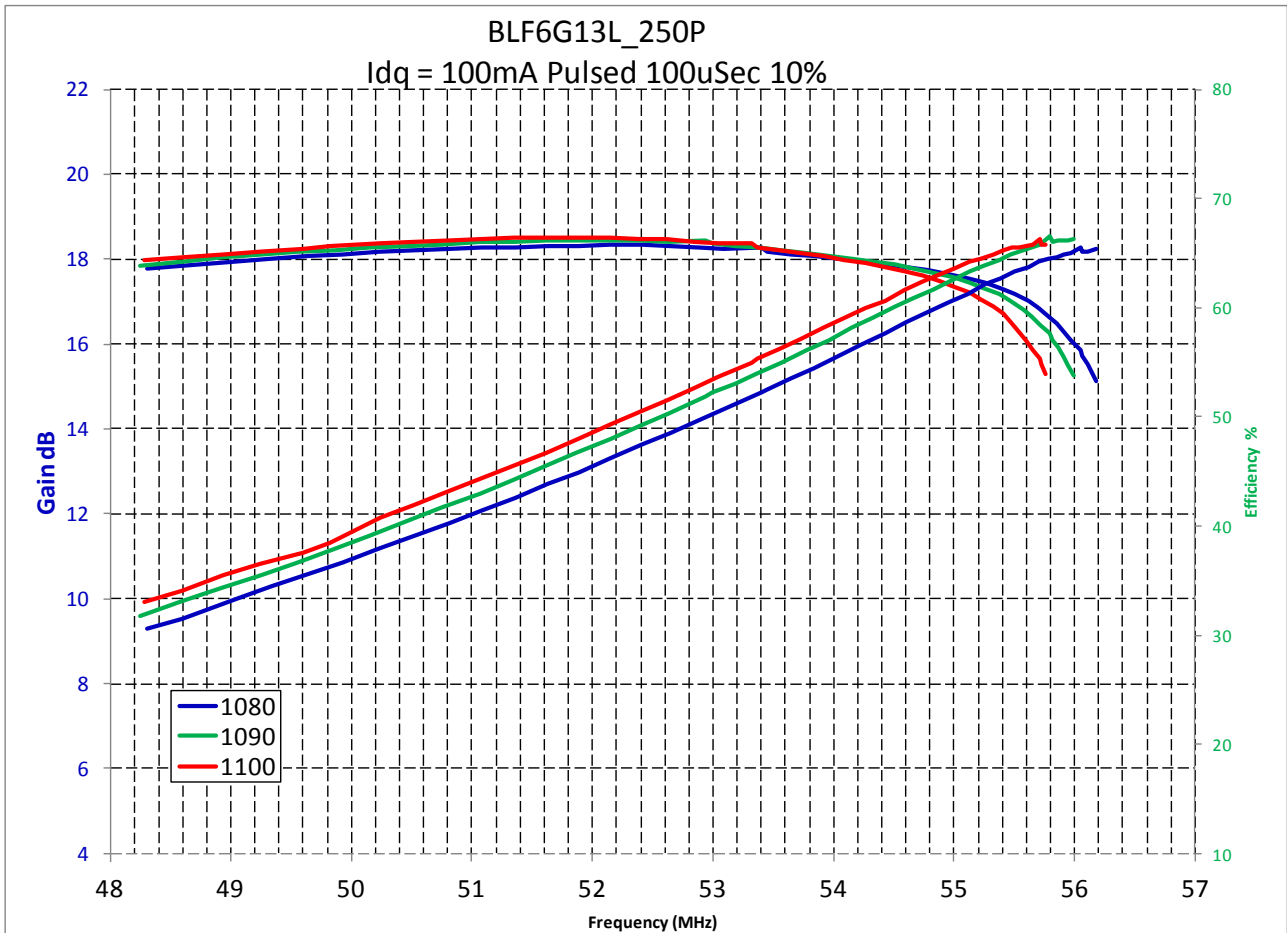


Fig 6. AM-AM VDS = 50V, Idq = 100mA, Pulsed 100uSec 10% duty

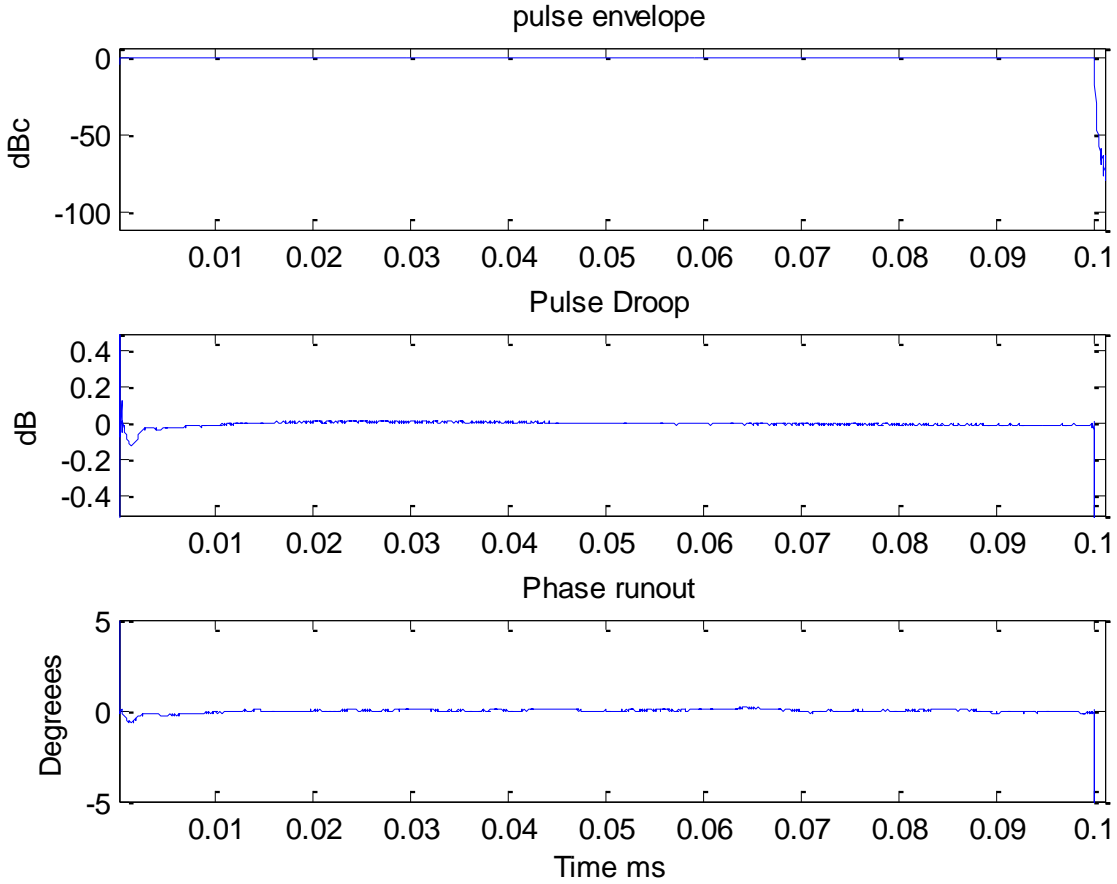


Fig 7. Pulse Profile Vds=50V, Idq=100mA, Pout = 55.5dBm

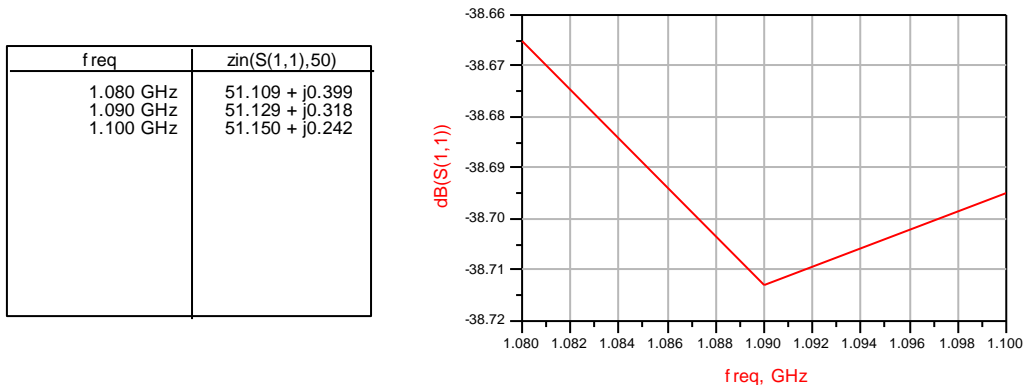


Fig 8. Test Attenuator Load match

4. Test Circuit and Component List

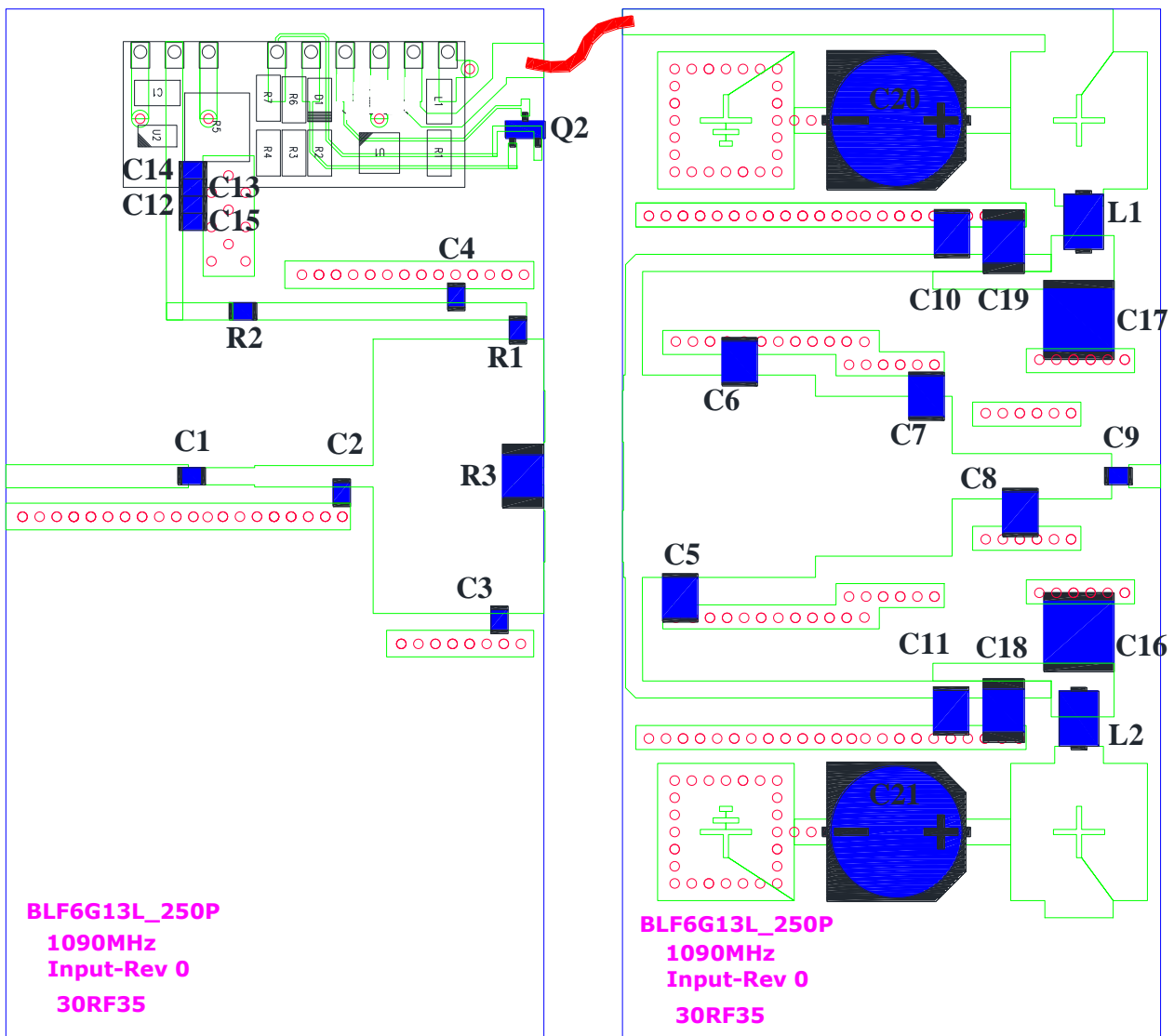


Fig 9. Test Circuit

| Designator  | Description                        | Manufacturer | Part #              |
|---|------------------------------------|--------------|---------------------|
| Input PCB   | BLF6G13L_250P                      | Avanti       | 1090MHz Input Rev0  |
| Output PCB  | BLF6G13L_250P                      | Avanti       | 1090MHz Output Rev0 |
| Q1  | 250W LDMOS                         | Ampleon      | BLF6G13L-250P       |
| Q2  | Transistor, NPN 2N222              | NXP          | BC847               |
| R1,R2   | 5.1Ω                               | Vishay Dale  | 0805                |
| R3  | 10Ω                                | Vishay Dale  | 2512                |
| C20,C21   | 220uF                              | Panasonic    | PCE3474CT-ND        |
| C1  | 12pF                               | Passive Plus | 0805N               |
| C2  | 6.8pF                              | Passive Plus | 0805N               |
| C3  | 8.2pF                              | Passive Plus | 0805N               |
| C4  | 18pF                               | Passive Plus | 0805N               |
| C9  | 20pF                               | Passive Plus | 0805N               |
| C13   | 22pF                               | Passive Plus | 0805N               |
| C5  | 8.2pF                              | Passive Plus | 1111N               |
| C6,C7   | 4.7pF                              | Passive Plus | 1111N               |
| C8  | 2.0pF                              | Passive Plus | 1111N               |
| C10,C11   | 56pF                               | Passive Plus | 1111N               |
| C15   | 100nF Capacitor, 50V 10% X7R, 0805 | Generic      |                     |
| C12   | 10nF Capacitor, 50V 10% X7R, 0805  | Generic      |                     |
| C14   | 1nF Capacitor, 100V 5% NP0, 0805   | Generic      |                     |
| C18,C19   | 2.2uF Capacitor, 100V, 1210        | Murata       | GRM32ER72A225KA35L  |
| C16,C17   | 10uF Capacitor, 100V 10% X7S, 2220 | TDK          | C5750X7S2A106M      |
| L1,L2   | Ferrite bead, 10A                  |              |                     |
| PC-board Material: Taconic RF35A, $\epsilon_r = 3.5$ , thickness 30mils, 1oz copper each side |                                    |              |                     |

Table 2. BOM

## 5. Attachments

Please see the attachment for the support files.

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