AR221011

BLF978P, 352MHz

v1.0 — 3-Febr-2022

AMPLEON

Application Report

Status	Company Public
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Abstract	Measurement results of a Class AB design for the 352MHz band with the BLF978P

1. Revision History

Table 1: Report revisions

Revision	Date	Description	Author
1.0	20220203	Initial document	Harrie Rahangmetan

2. Contents

3. List of figures

4. List of tables

5. Introduction

5.1 General description

This document shows the measurement results of a 352MHz demo amplifier (Board AR221011) with 1x BLF978P.

5.2 Test object details

Transistor type:	BLF978P (Soldered down)
Production code:	0125 m2011 PHL
Package:	SOT539
Board:	BLF978P_PCB_352MHz
Demo number:	AR221011

5.3 Used Test signals

CW:	CW

5.4 Test circuit

A description of this circuit can be found in Appendix A.

The test circuit has been designed on Taconic RF35, h=0.762mm, er=3.48, input pcb=2x70um, output pcb=2x70um.

Supply voltage (drain-source) is 50V. Start with Vgs=1.5V each site. Increase Vgs until the total Idq will be 20mA (2x10mA).

6. Measurement Results

6.1 Summary CW measurement

Freq [MHz]	MaxGain [dB]	MaxEff [%]	G@MxEff [dB]	P1dB [dBm]*	P1dB [W]*	G@P1dB [dB]*	Eff@P1dB [%]*	P3dB [dBm]*	P3dB [W]*
350.00	25.2	80.1	22.1	61.3	1350.77	24.2	78.2	61.8	1501.88
352.00	25.4	80.1	22.2	61.2	1304.65	24.4	78.3	61.6	1448.57
354.00	25.5	80.1	22.4	61.0	1256.86	24.5	78.3	61.4	1392.32

Freq [MHz]	Gain [dB] @ 1150W	Eff [%] @ 1150W	Compr [dB] @ 1150W	IRL [dB] @ 1150W
350.00	25.0	73.6	-0.22	9.0
352.00	25.1	74.6	-0.33	10.7
354.00	25.1	75.7	-0.46	12.5

6.2 Gain & Efficiency @ Frequency=350-352-354MHz, CW

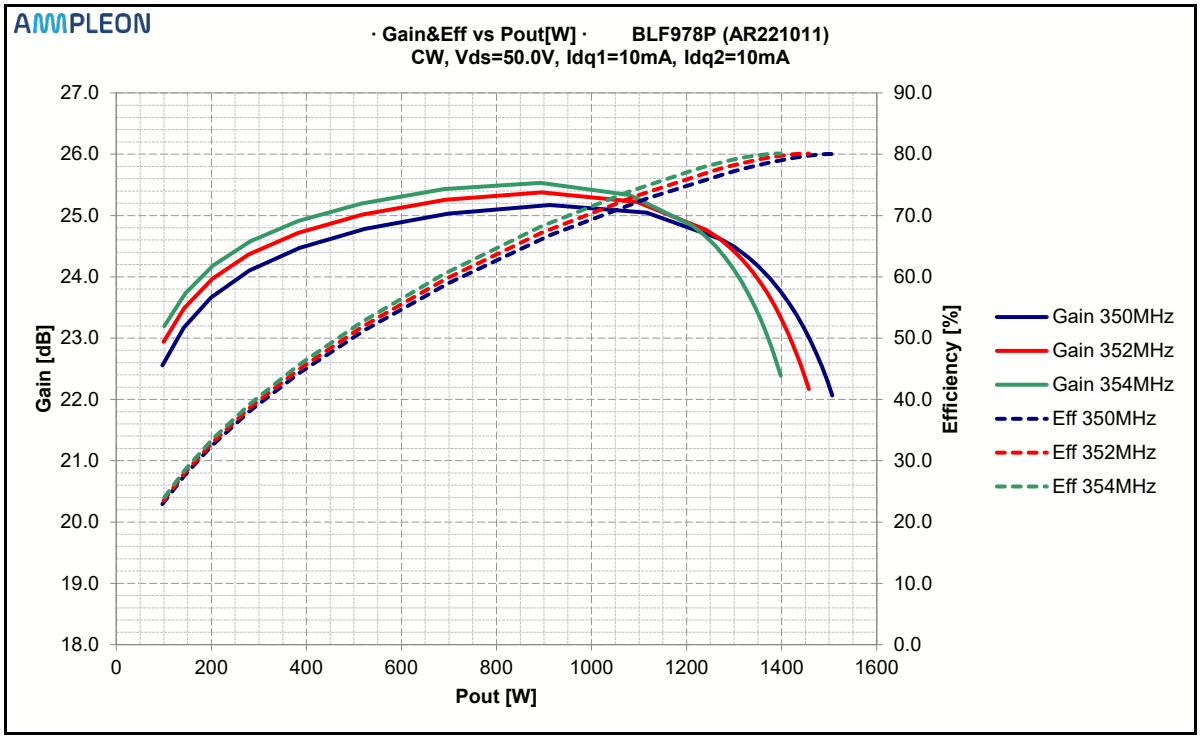

Figure 1 CW Gain and Efficiency vs Pout [W]

6.3 Thermal images of the demo board at P3dB (Base plate temp = 20-25ºC)

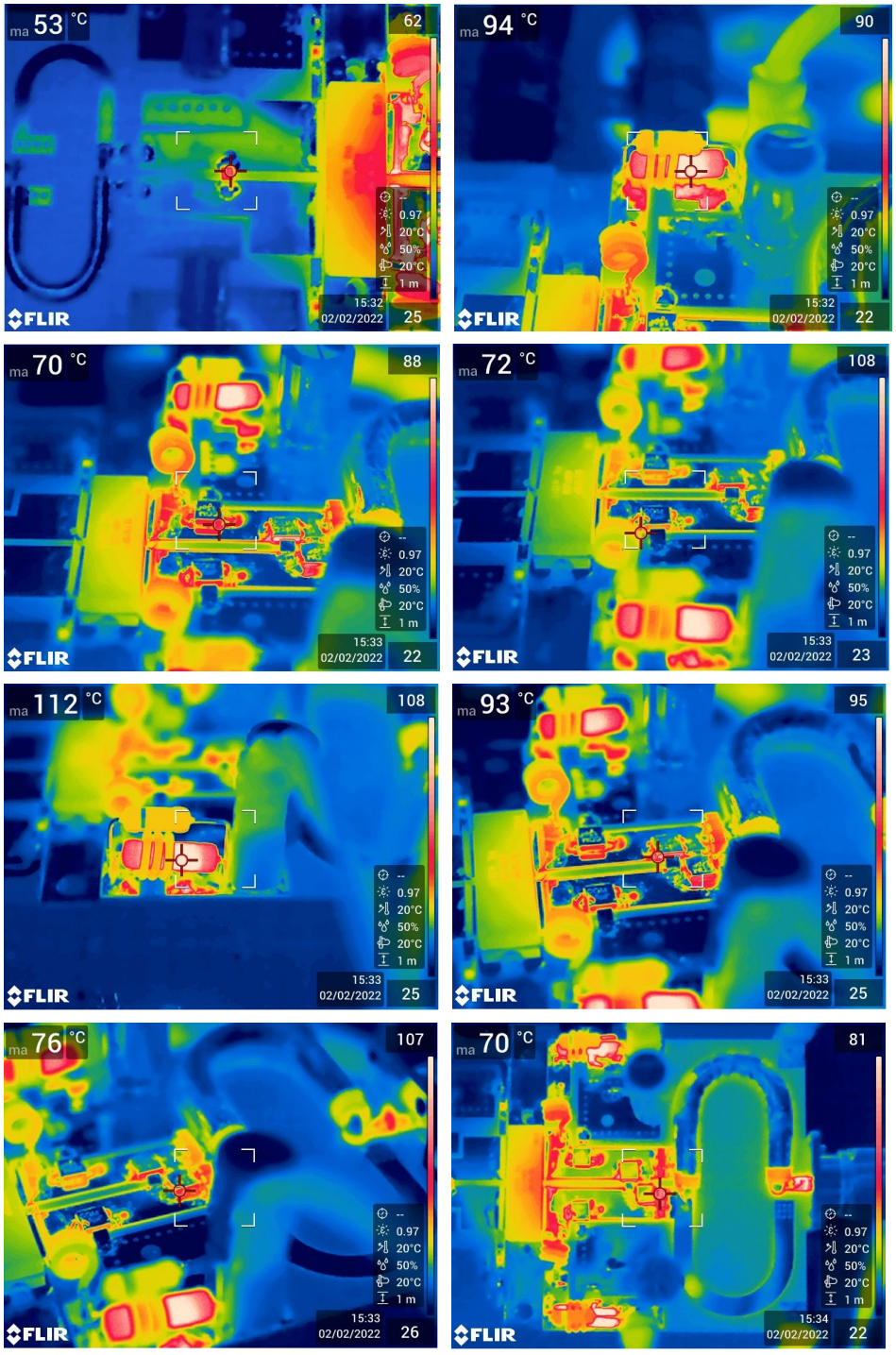

Figure 2 Thermal Images P3dB

7. Appendix A – PCB Layout and components

7.1 PCB Layout

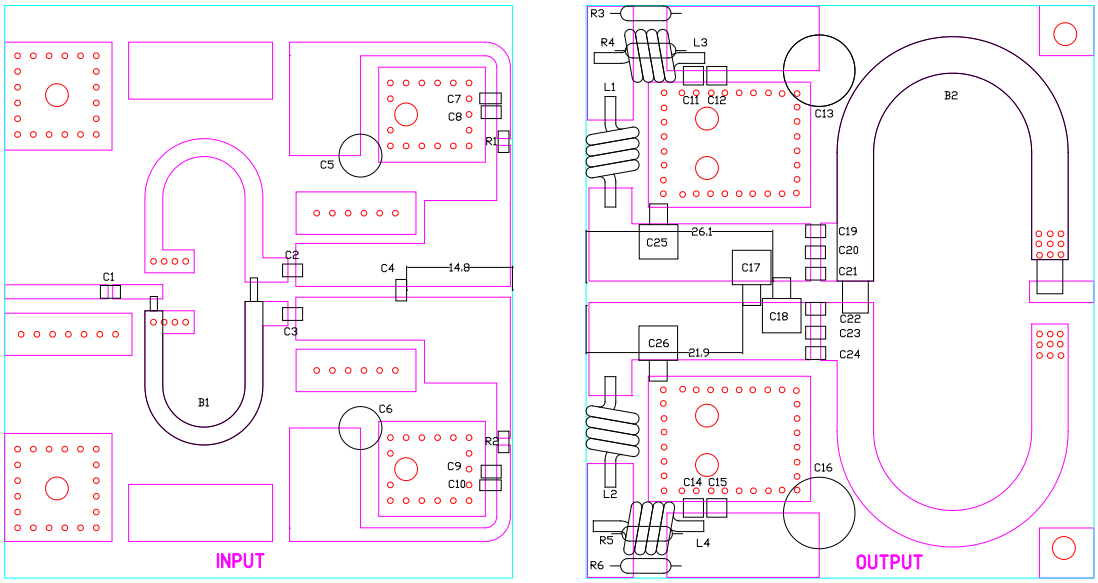

Figure 3 PCB Layout Drawing

7.2 Component list

Table 2: Component list

Description	Value	Case	Supplier	Remark
C1, C8, C9	100pF	ATC100B	ATC	Soldered on the side
C2, C3	56pF	ATC100B	ATC	Soldered on the side
C4	75pF	ATC100B	ATC	Soldered on the side
C5, C6	100uF/100V			Electrolytic capacitor
C7, C10	100nF	X7R	Murata	
C11, C14	100pF	ATC100B	ATC	Soldered on the side
C12, C15	1nF	ATC100B	ATC	Soldered on the side
C13, C16	470uF/63V			Electrolytic capacitor
C17, C18	22pF	MIN02	CDE	
C,19, C20, C21, C22, C23, C24	47pF	ATC100B	ATC	Soldered on the side
C25, C26	15pF	MIN02	CDE	
L1, L4	3 turns, 1.6mm, 5mm diameter, close wound, parallel to R4 and R5			inductor
L2, L4	3 turns, 1.6mm, 4mm diameter, close wound			
R1, R2	47Ω	1206 SMD		
R3, R6	15Ω/3W			resistor
R4, R5	8.2Ω/3W			resistor
Balun B1	UT-141C-25			Semirigid Zc=25
Balun B2	UT-300C-25			Semirigid Zc=25
T1	BLF978P			LDMOS transistor
Input PCB	H=0.762, Cu=2x70um, Er=3.48, RF35		Taconic	
Output PCB	H=0.762, Cu=2x70um, Er=3.48, RF35		Taconic	

7.3 Photo's Demo Board

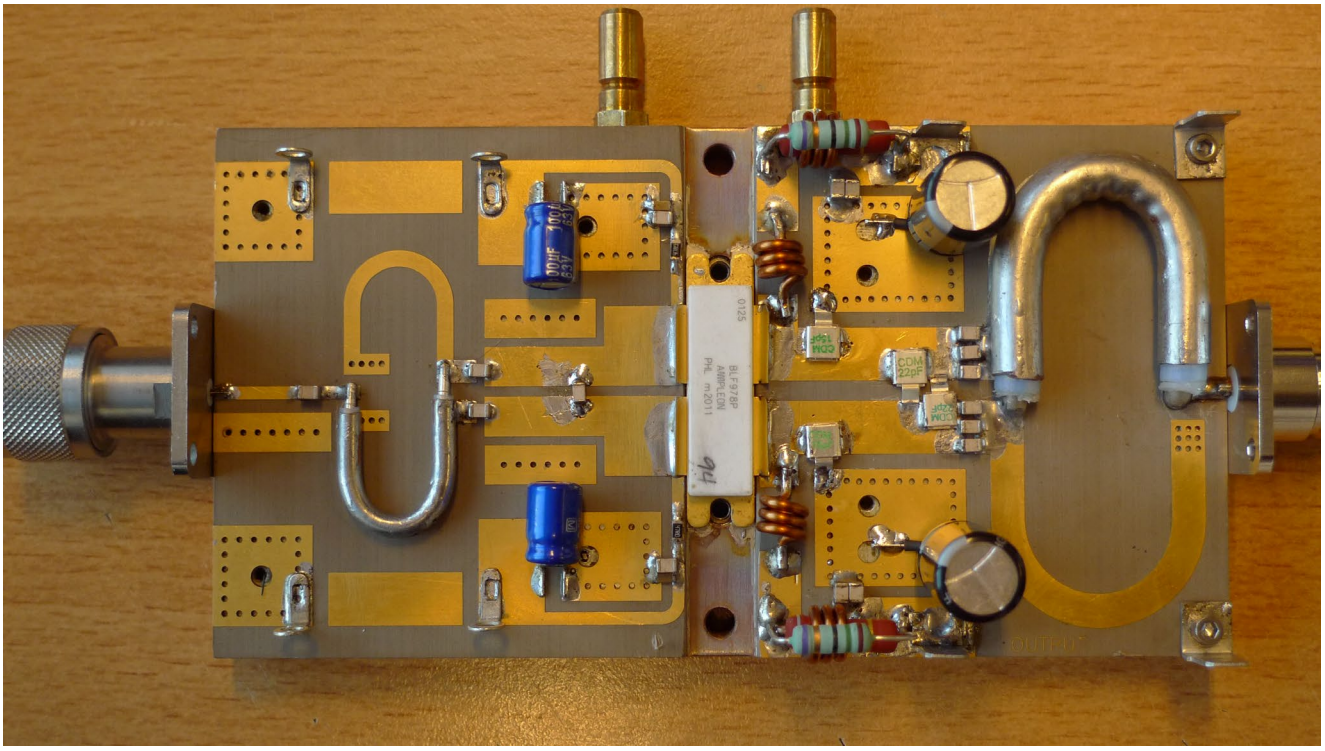

Figure 4 Picture Top View Demo Board

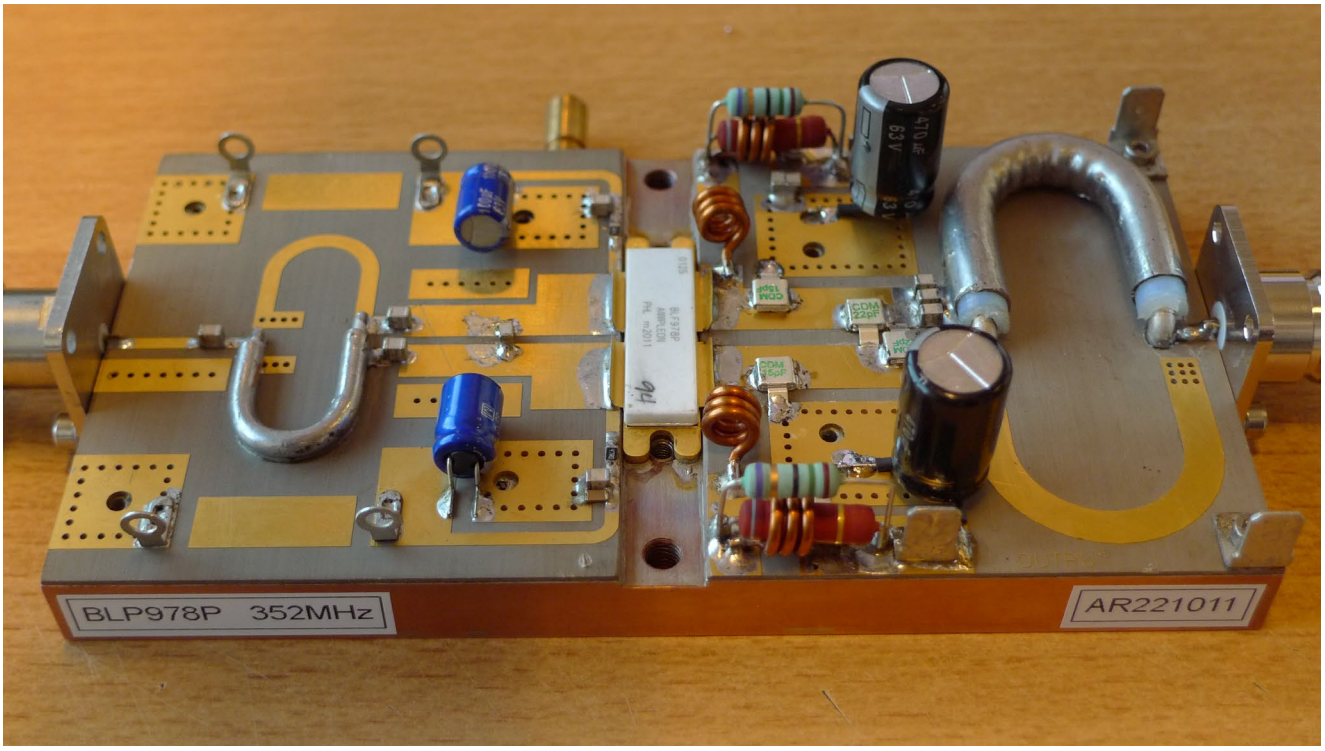

Figure 5 Side View Picture Demo Board

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