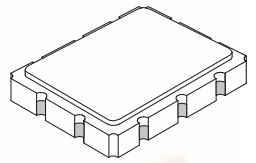




# SF1059A

## 350.0 MHz SAW Filter



SM9171-10

- **Designed for WLAN IF Applications**
- **Low Insertion Loss**
- **9.1 x 7.1 mm Version of SF1059A-1**
- **Unbalanced Input and Output**
- **Complies with Directive 2002/95/EC (RoHS)**



### Absolute Maximum Ratings

| Rating   | Value          | Units |
|--|----------------|-------|
| Maximum Incident Power in Passband                       | +10            | dBm   |
| Max. DC voltage between any 2 terminals                  | 30             | VDC   |
| Storage Temperature Range                                | -40 to +85     | °C    |
| Suitable for lead-free soldering - Max Soldering Profile | 260°C for 30 s |       |

### Electrical Characteristics

| Characteristic  | Sym    | Notes   | Min       | Typ       | Max  | Units             |
|---|--------|---------|-----------|-----------|------|-------------------|
| Nominal Center Frequency  | $f_C$  | 1       | 350.00    |           |      | MHz               |
| Passband<br>Insertion Loss at $f_C$<br>3 dB Passband<br>Amplitude Variation over $f_C \pm 250$ kHz<br>Group Delay Variation over $f_C \pm 400$ kHz    | IL     | 1, 2    |           | 8         | 10.0 | dB                |
|   | $BW_3$ |         | $\pm 400$ | $\pm 600$ |      | kHz               |
|   |        |         |           | 0.5       | 1.0  | dB <sub>p-p</sub> |
|   | GDV    |         |           | 200       | 250  | nS <sub>p-p</sub> |
| Rejection<br>$f_C - 8.0$ to $f_C - 2.0$ and $f_C + 2.0$ to $f_C + 8.0$ MHz<br>$f_C - 50$ to $f_C - 8.0$ and $f_C + 8.0$ to $f_C + 50$ MHz<br>Ultimate |        | 1, 2, 3 | 35        | 40        |      | dB                |
|   |        |         | 40        | 45        |      |                   |
|   |        |         |           | 50        |      |                   |
| Operating Temperature Range   | $T_A$  | 1       | -20       |           | +70  | °C                |

|  |                |                                |  |  |  |  |
|--|----------------|--------------------------------|--|--|--|--|
| Impedance Matching to 50 $\Omega$ unbalanced   | External L-C   |                                |  |  |  |  |
| Case Style                                     | SM9171-10      | 9.1 x 7.1 mm Nominal Footprint |  |  |  |  |
| Lid Symbolization (XX = 2 character date code) | RFM SF1059A XX |                                |  |  |  |  |

### Electrical Connections

| Connection                    |                  | Terminals               |
|-------------------------------|------------------|-------------------------|
| Port 1                        | Input or Return  | 5                       |
|                               | Return or Input  | 6                       |
| Port 2                        | Output or Return | 10                      |
|                               | Return or Output | 1                       |
| Ground                        |                  | All others              |
| <b>Single Ended Operation</b> |                  | <b>Return is ground</b> |
| <b>Differential Operation</b> |                  | <b>Return is hot</b>    |

#### Notes:

1. Unless noted otherwise, all specification apply over the operating temperature range with filter soldered to the specified demonstration board with impedanced matching to 50  $\Omega$  network analyzer.
  2. Unless noted otherwise, all frequency specifications are referenced to the nominal center frequency,  $f_C$ .
  3. Rejection is measured as attenuation below the minimum IL point in the passband. Rejection in final user application is dependent on PCB layout and external impedance matching design. See Application Note No. 42 for details.
  4. "LRIP" or "L" after the part number indicates "low rate initial production" and "ENG" or "E" indicates "engineering prototypes."
  5. The design, manufacturing process, and specifications of this filter are subject to change.
  6. Either Port 1 or Port 2 may be used for either input or output in the design. However, impedances and impedance matching may vary between Port 1 and Port 2, so that the filter must always be installed in one direction per the circuit design.
  7. US and international patents may apply.
  8. RFM stylized RFM logo, and RF Monolithics, Inc. are registered trademarks of RF Monolithics, Inc.
- Electrostatic Sensitive Device. Observe precautions for handling.

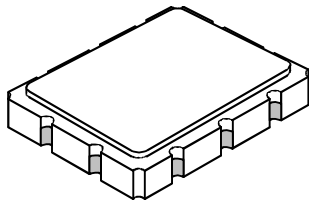


**350.0 MHz**

**SAW Filter**

**SM9171-10 Case**

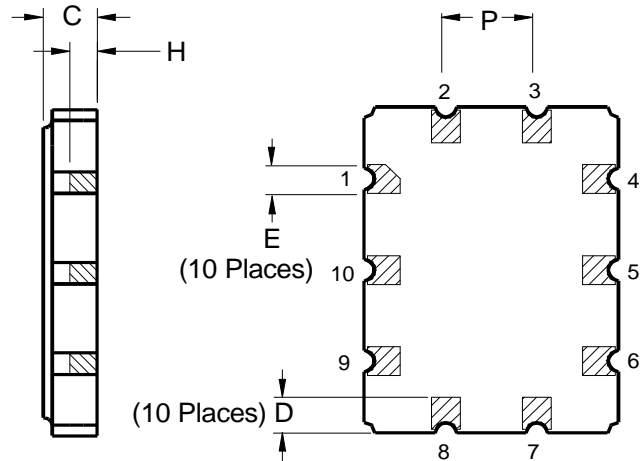
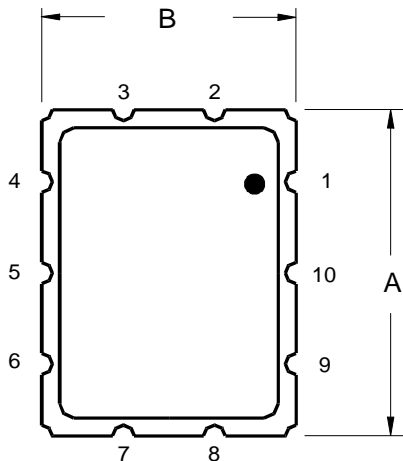
**10-Terminal Ceramic Surface-Mount Case  
9.1 x 7.1 mm Nominal Footprint**



| Case Dimensions |      |      |      |        |       |       |
|-----------------|------|------|------|--------|-------|-------|
| Dimension       | mm   |      |      | Inches |       |       |
|                 | Min  | Nom  | Max  | Min    | Nom   | Max   |
| A               | 8.86 | 9.09 | 9.40 | 0.349  | 0.358 | 0.370 |
| B               | 6.88 | 7.11 | 7.40 | 0.271  | 0.280 | 0.291 |
| C               |      | 1.91 | 2.00 |        | 0.075 | 0.079 |
| D               |      | 0.99 |      |        | 0.039 |       |
| E               |      | 0.79 |      |        | 0.031 |       |
| H               |      | 1.0  |      |        | 0.039 |       |
| P               |      | 2.54 |      |        | 0.100 |       |

| Materials              |  |
|------------------------|--|
| Solder Pad Termination | Au plating 30 - 60 ulnches (76.2-152 uM) over 80-200 ulnches (203-508 uM) Ni.    |
| Lid                    | Fe-Ni-Co Alloy Electroless Nickel Plate (8-11% Phosphorus) 100-200 ulnches Thick |
| Body                   | Al <sub>2</sub> O <sub>3</sub> Ceramic   |
| Pb Free                |  |

| Electrical Connections |                  |                  |
|------------------------|------------------|------------------|
| Connection             |                  | Terminals        |
| Port 1                 | Input or Return  | 5                |
|                        | Return or Input  | 6                |
| Port 2                 | Output or Return | 10               |
|                        | Return or Output | 1                |
| Ground                 |                  | All others       |
| Single Ended Operation |                  | Return is ground |
| Differential Operation |                  | Return is hot    |



**REVISIONS**

| REV | ECN   | DESCRIPTION     | DATE     |
|-----|-------|-----------------|----------|
| A   | 12256 | INITIAL RELEASE | 06/18/04 |
|     |       |                 |          |
|     |       |                 |          |

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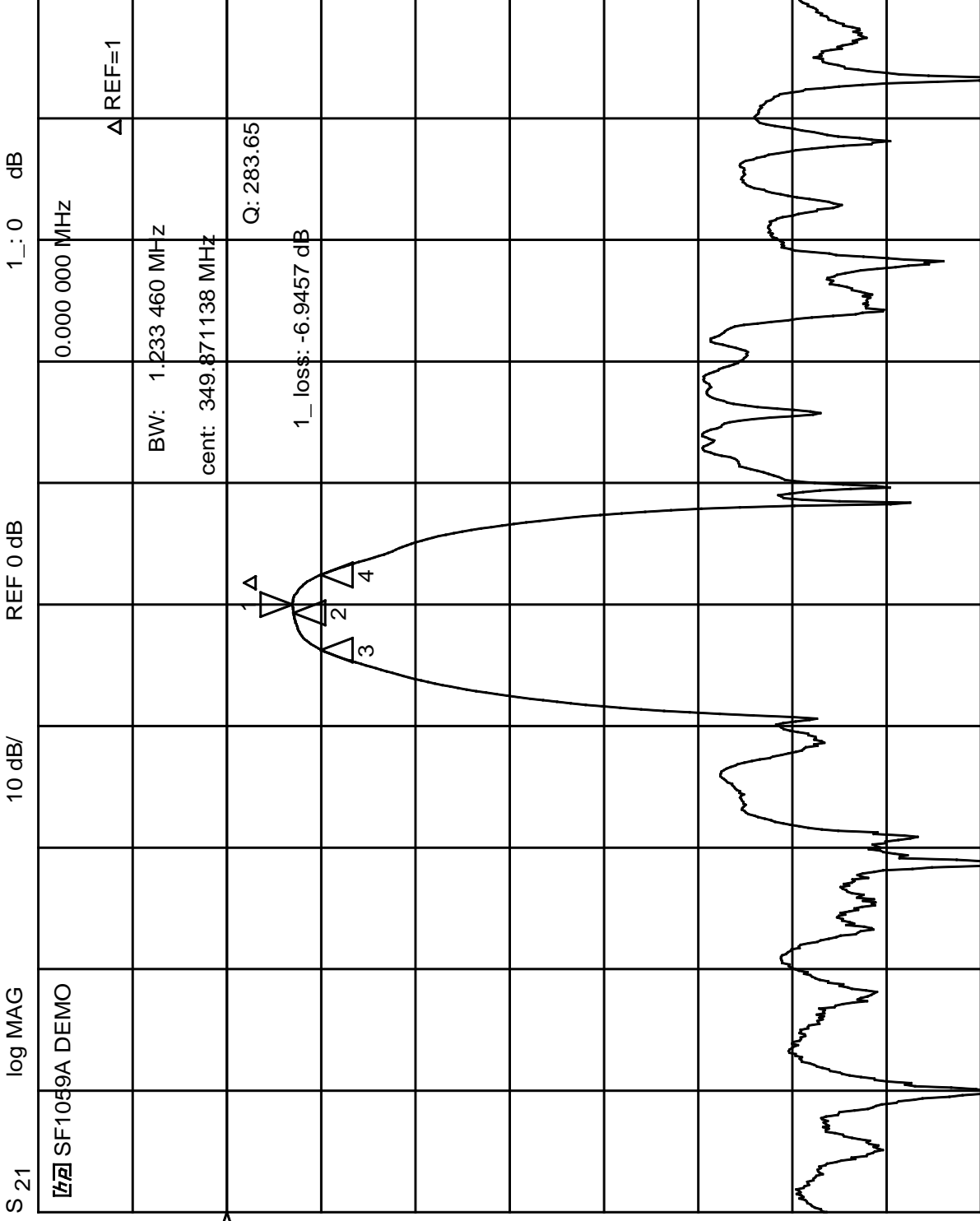
|   |
|---|
| <b>DRAWN BY/DATE:</b><br>D. GLAVIN<br>06/18/04      |
| <b>CHECKED/APPROVED BY:</b><br>J. GRANT<br>06/18/04 |

|   |
|---|
| <b>TITLE</b><br><br><b>CALIBRATION PLOTS,<br/>SF1059A-DEMO_TD</b> |
|---|

|   |                  |                          |                                |                 |
|---|------------------|--------------------------|--------------------------------|-----------------|
|  <b>RFMonolithics, Inc.</b> | <b>SIZE</b><br>A | <b>FSCM NO.</b><br>2U874 | <b>DWG. NO.</b><br>SF1059A-013 | <b>REV</b><br>A |
|---|------------------|--------------------------|--------------------------------|-----------------|

SF1059A  
Demo Board Plots

16 Jun 2004 08:03:04



|       |      |          |             |     |
|-------|------|----------|-------------|-----|
|       | SIZE | FSCM NO. | DWG NO.     | REV |
|       | A    | 2U874    | SF1059A-013 | A   |
| SCALE | NONE | ECN NO.  | SHEET       | OF  |
|       |      |          | 12256       | 2   |
|       |      |          |             | 5   |

SF1059A  
Demo Board Plots

16 Jun 2004 08:13:06

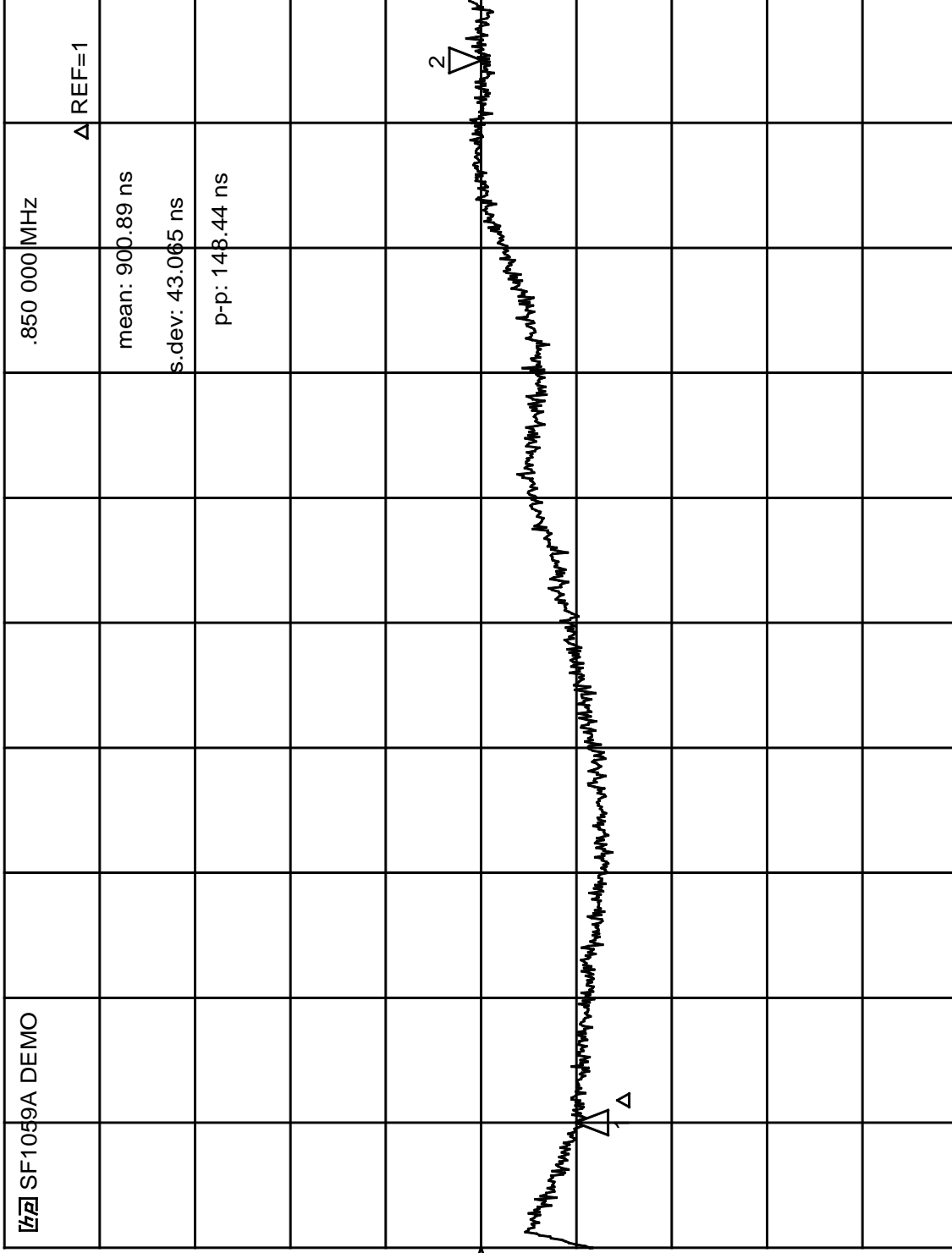
REF 975.3 ns

100 ns/

delay

S 21

CH1



CENTER 350.000 000 MHz

SPAN 1.000 000 MHz



SIZE A

FSCM NO. 2U874

DWG NO.

SF1059A-013

REV A

SCALE NONE

ECN NO.

12256

SHEET

3

OF

5

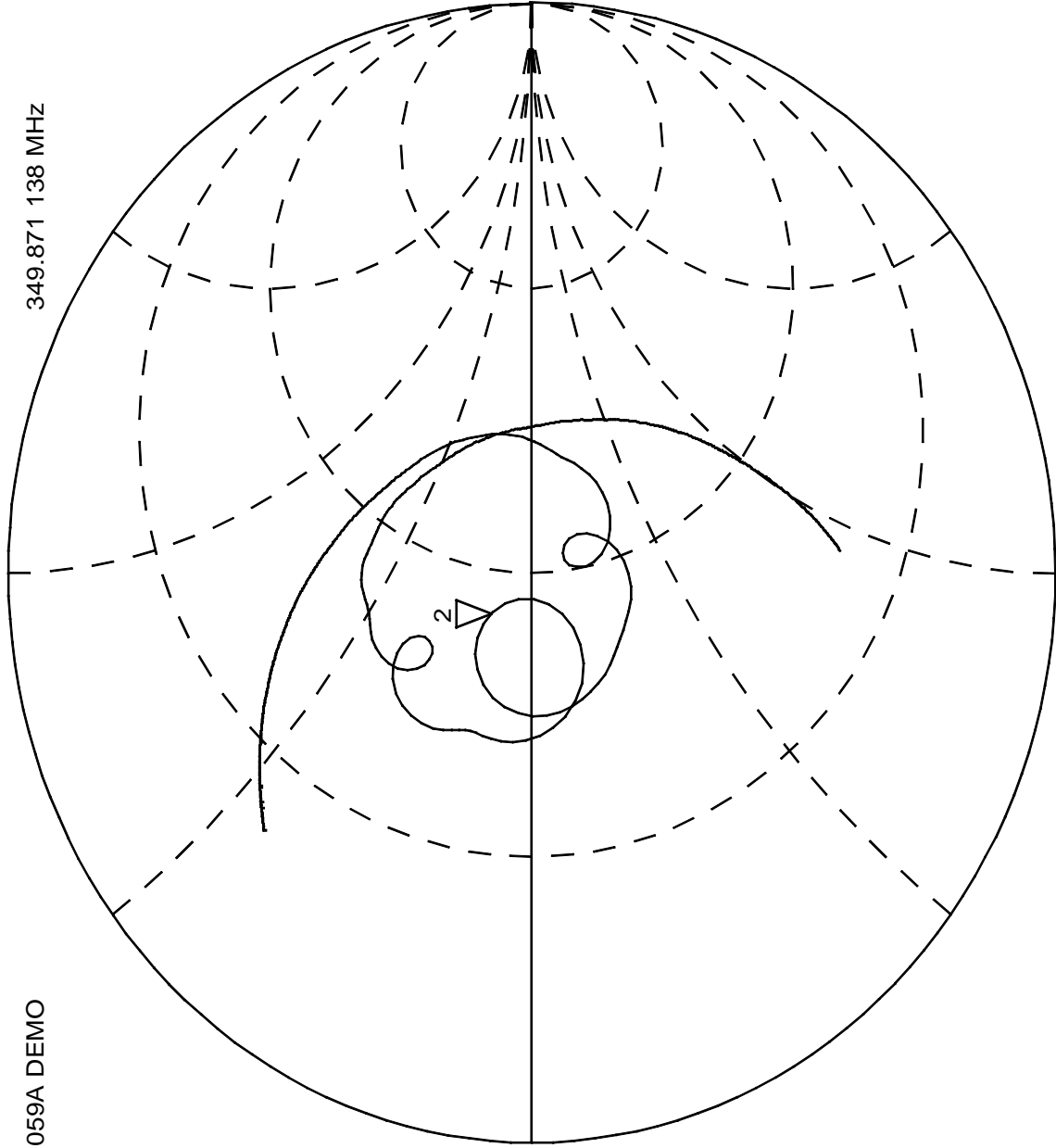
SF1059A  
Demo Board Plots

16 Jun 2004 08:04:43  
 $\Omega$  6.6855       $\Omega$  3.0412 nH  
 2.: 42.813      349.871 138 MHz

CH1 S 11  
 PRM SF1059A DEMO


PRm  
 Cor

Hld



CENTER 350.000 000 MHz

SPAN 20.000 000 MHz

|   |       |          |             |     |
|---|-------|----------|-------------|-----|
|  | SIZE  | FSCM NO. | DWG NO.     | REV |
|   | A     | 2U874    | SF1059A-013 | A   |
|   | SCALE | ECN NO.  | SHEET       | OF  |
|   | NONE  | 12256    | 4           | 5   |

**SF1059A**  
**Demo Board Plots**

16 Jun 2004 08:05:16  
 $\Omega$  5.3166 nH  
 349.871 138 MHz

$\Omega$  11.688

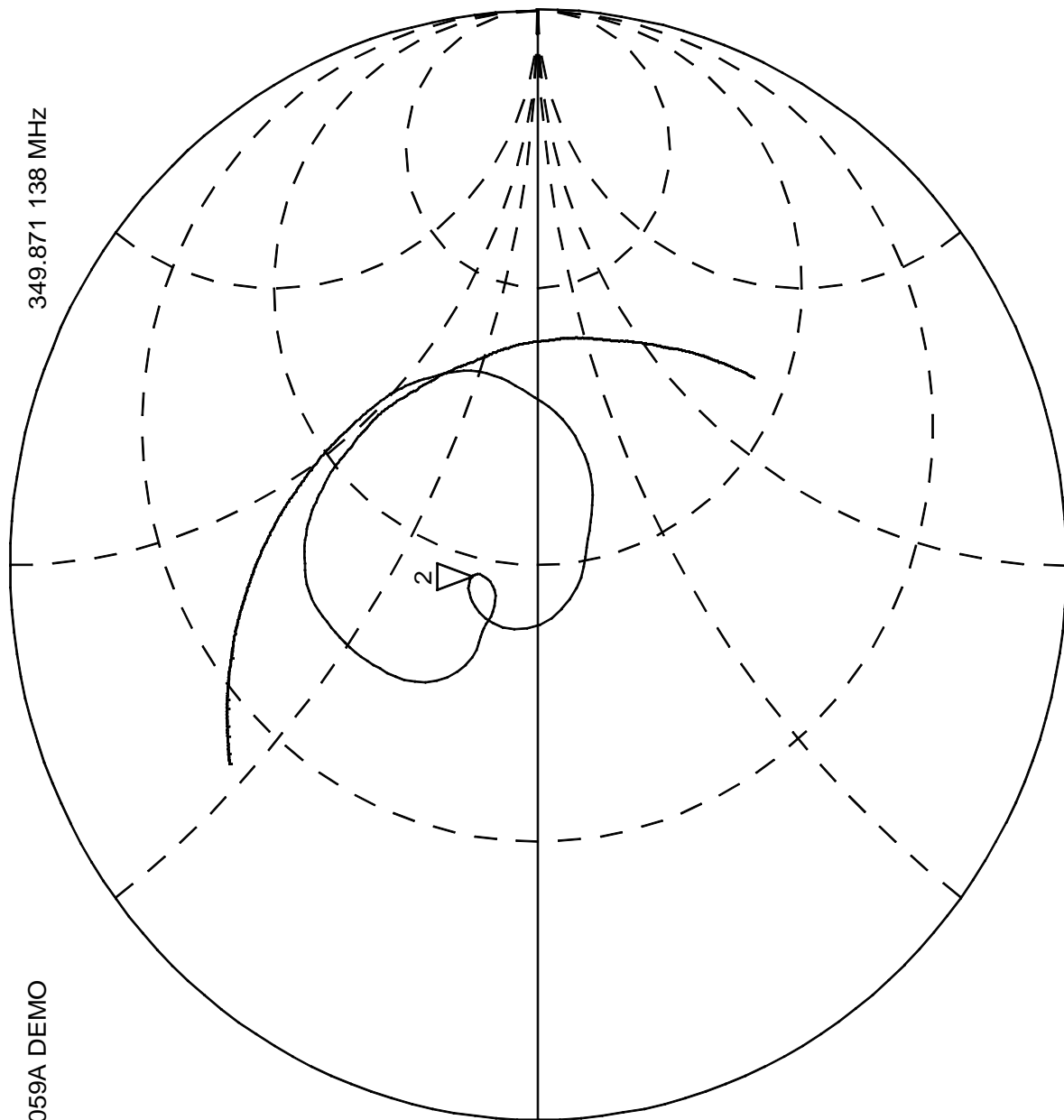
2\_: 46.6

CH1 S<sub>22</sub> 1 UFS  
 SF1059A DEMO

PRm


Cor

Hld



CENTER 350.000 000 MHz

SPAN 20.000 000 MHz

|   |      |          |             |     |
|---|------|----------|-------------|-----|
|  | SIZE | FSCM NO. | DWG NO.     | REV |
|   | A    | 2U874    | SF1059A-013 | A   |
| SCALE   | NONE | ECN NO.  | SHEET       | OF  |
|   |      |          | 12256       | 5   |

| REV | ECON NO. | DESCRIPTION                          | APP/DA   |
|-----|----------|--------------------------------------|----------|
| A   | 3887     | REL TO MFG                           | FR 6/19  |
| B   | 4631     | CHANGE ADJUSTABLE CAPS TO FIXED CAPS |          |
| C   | 12256    | REVISED                              | 17 Jun00 |

BILL OF MATERIALS

| ITEM | QTY | P/N          | DESCRIPTION                     | REF DES | REMARKS |
|------|-----|--------------|---------------------------------|---------|---------|
| 1    | 1   | 400-0845-001 | PCB                             | PCB1    |         |
| 2    | 1   | SF1059A      | FILTER                          | FLTR1   |         |
| 3    | 1   | 500-0003-270 | CAP, 27pF                       | C1      |         |
| 4    | 1   | 500-0003-220 | CAP, 22pF                       | C2      |         |
| 5    | 2   | 500-0967-330 | CHIP INDUCTOR, 33nH, 1008CS     | L1,L2   |         |
| 6    | 2   | 500-0248-001 | CONN, COAX, FLANGE MNT          | J1,J2   |         |
| 7    | AR  | SF1059A-013  | CALIBRATION PLOTS, SF1059A-DEMO | .       |         |

DRAWN BY/DATE: J.F.Christopherson 25apr95

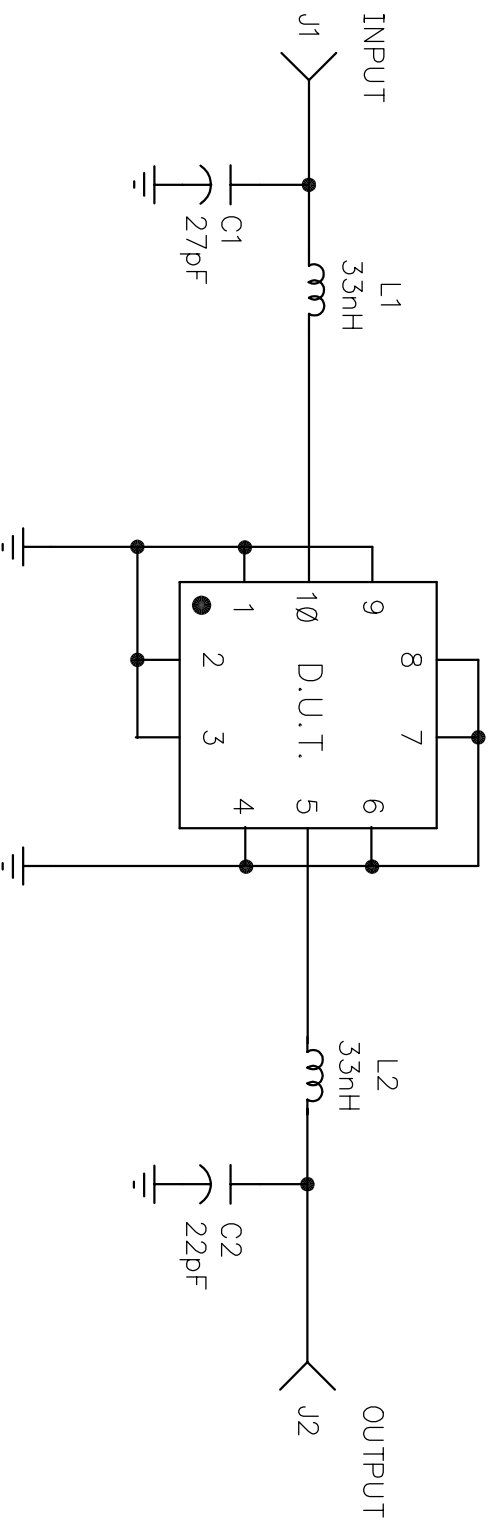
TITLE: DEMO BOARD, SF1059A

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DALLAS, TEXAS 75244

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|                  |                            |                                 |                 |                      |
|------------------|----------------------------|---------------------------------|-----------------|----------------------|
| SIZE<br><b>A</b> | CODE IDENT<br><b>2U874</b> | DWG. NO.<br><b>SF1059A-DEMO</b> | REV<br><b>C</b> | SHEETS<br><b>1 /</b> |
|------------------|----------------------------|---------------------------------|-----------------|----------------------|

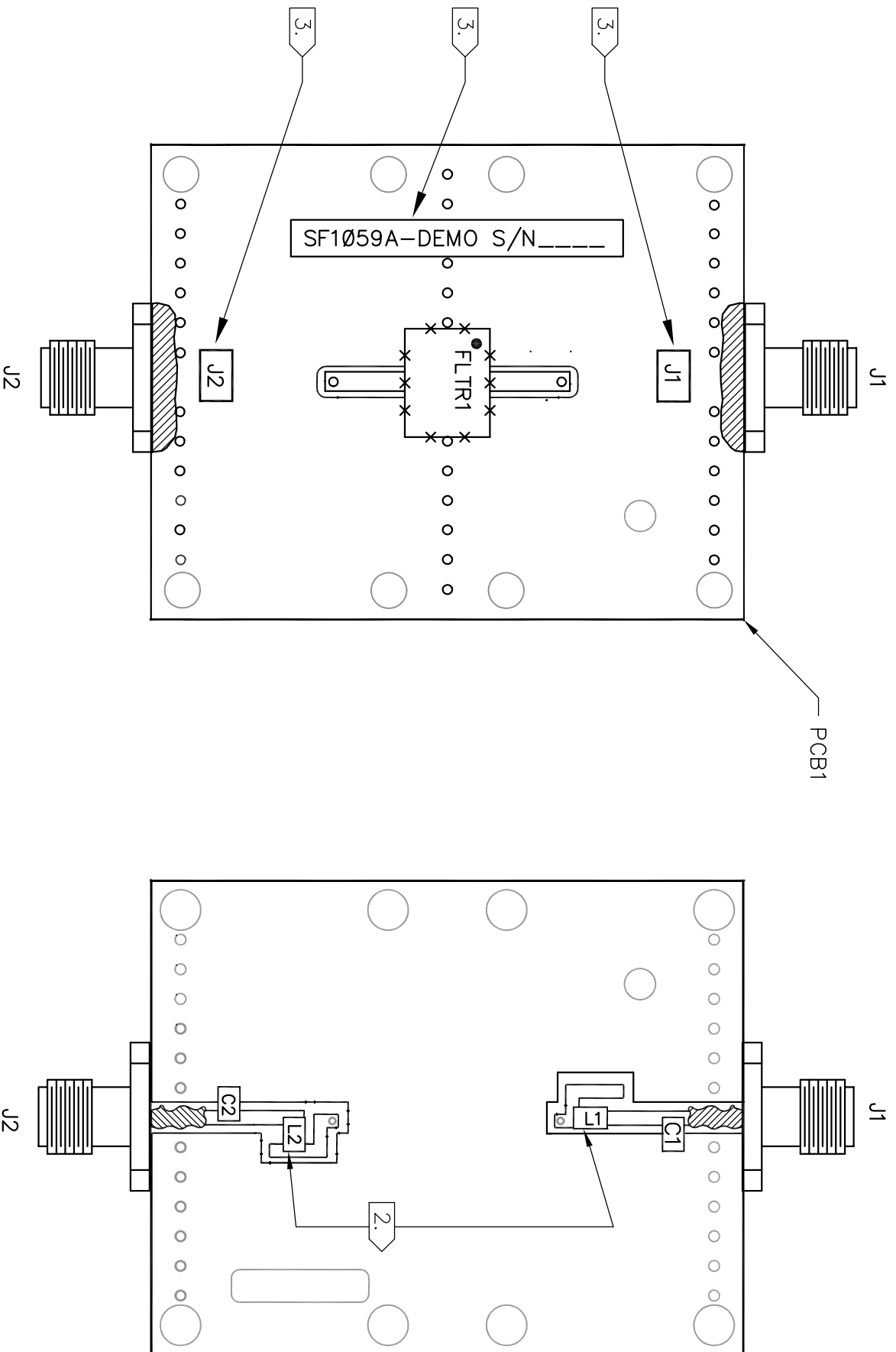




SCHEMATIC

NOTES:

1. SOLDER MOUNT COMPONENTS, CONNECTORS, TO PCB1
2. NOTE PROPER ORIENTATION OF INDUCTORS [L1, L2] SHOULD BE 90° TO EACH OTHER.
3. LABEL DEMO BOARD AS INDICATED. ADD SERIAL NUMBER AS INDICATED.



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SIZE  
**A**

CODE IDENT  
**2U874**

DWG.  
NO.

**SF1059A-DEMO**

REV  
**C**

SHE

TUNING PROCEDURE:

1. DUE TO TOLERANCE VARIATIONS IN THE VALUES OF CAPACITORS AND INDUCTORS, IT MAY BE IMPOSSIBLE TO DUPLICATE TUNING POSITIONS AS DOCUMENTED. IT MAY REQUIRE USING EITHER A SLIGHTLY HIGHER OR SLIGHTLY LOWER VALUE CAPACITOR OR INDUCTOR. THIS WILL DEPEND ON EACH INDEPENDANT PART.
2. USE THE S-PARAMETER PLOTS TO GET AN IDEA AS TO WHERE TO TUNE THE PART.

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SIZE  
**A**

CODE IDENT  
**2U874**

DWG.  
NO. **SF1Ø59A-DEMO**

REV  
**C**

SHE  
2