

- **Ideal Front-End Filter for European Wireless Receivers**
- **Low-Loss, Coupled-Resonator Quartz Design**
- **Simple External Impedance Matching**
- **Complies with Directive 2011/65/EU (RoHS)**
- **AEC-Q200 qualified**

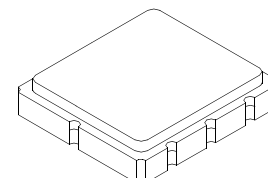


The RF3417E is a low-loss, compact, and economical surface-acoustic-wave (SAW) filter designed to provide front-end selectivity in 315.0 MHz receivers. Receiver designs using this filter include superhet with 10.7 MHz or 500 kHz IF, direct conversion and superregen. Typical applications of these receivers are wireless remote-control and security devices operating in Europe under ETSI I-ETS 300 220, in Germany under FTZ 17 TR 2100, in the United Kingdom under DTI MPT 1340 (for automotive only), in France under PTT Specifications ST/PAA/TPA/AGH/1542, and in Scandinavia.

This coupled-resonator filter (CRF) uses selective null placement to provide suppression, typically greater than 40 dB, of the LO and image spurious responses of superhet receivers with 10.7 MHz IF. Murata's advanced SAW design and fabrication technology is utilized to achieve high performance and very low loss with simple external impedance matching (not included).

**RF3417E**

**315.00 MHz  
SAW Filter**



**SM3030-6 Case  
3.0 x 3.0**

| Characteristic                                           |                                                              | Sym              | Notes   | Minimum          | Typical | Maximum | Units               |
|----------------------------------------------------------|--------------------------------------------------------------|------------------|---------|------------------|---------|---------|---------------------|
| Center Frequency @ 25°C                                  | Absolute Frequency                                           | f <sub>C</sub>   | 1, 2, 3 | 314.900          | 315.00  | 315.100 | MHz                 |
| Insertion Loss                                           |                                                              | IL               | 1       |                  | 1.8     | 2.5     | dB                  |
| 3 dB Bandwidth                                           |                                                              | BW <sub>3</sub>  | 1, 3    | 525              | 600     | 675     | kHz                 |
| 1 dB Bandwidth                                           |                                                              | BW <sub>1</sub>  | 1, 3    |                  | 450     |         | kHz                 |
| Rejection                                                | 10 - 275 MHz                                                 | 1, 3, 10, 11     |         | 40               | 60      |         | dB                  |
|                                                          | 275 - 306 MHz                                                |                  |         | 40               | 45      |         |                     |
|                                                          | 306 - 313.2 MHz                                              |                  |         | 25               | 30      |         |                     |
|                                                          | 313.2 - 314.2 MHz                                            |                  |         | 7                | 15      |         |                     |
|                                                          | 315.8 - 317 MHz                                              |                  |         | 12               | 15      |         |                     |
|                                                          | 317 - 321.8 MHz                                              |                  |         | 25               | 30      |         |                     |
|                                                          | 321.8 - 326 MHz                                              |                  |         | 12               | 17      |         |                     |
|                                                          | 326 - 355 MHz                                                |                  |         | 37               | 45      |         |                     |
|                                                          | 355 - 1000 MHz                                               |                  |         | 50               | 55      |         |                     |
| Temperature                                              | Freq. Temp. Coefficient                                      | FTC              | 3, 4    |                  | 0.032   |         | ppm/°C <sup>2</sup> |
| Turnover Temperature                                     |                                                              | To               | 3, 4    | 10               |         | 40      | °C                  |
| Frequency Aging                                          | Absolute Value during the First Year                         | fA               | 5       |                  | <±10    |         | ppm/yr              |
| Impedance @ f <sub>C</sub>                               | Input Z <sub>IN</sub> = R <sub>IN</sub> /C <sub>IN</sub>     | Z <sub>IN</sub>  | 1       | 3.7kΩ // 2.03pF  |         |         |                     |
|                                                          | Output Z <sub>OUT</sub> = R <sub>OUT</sub> /C <sub>OUT</sub> | Z <sub>OUT</sub> |         | 5.4kΩ // 2.17pF  |         |         |                     |
| Lid Symbolization (in addition to Lot and/or Date Codes) |                                                              | 696 // YWWS      |         |                  |         |         |                     |
| Standard Reel Quantity                                   | 7 Inch Reel                                                  |                  | 9       | 500 Pieces/Reel  |         |         |                     |
| Standard Reel Quantity                                   | 13 Inch Reel                                                 |                  |         | 3000 Pieces/Reel |         |         |                     |



**CAUTION: Electrostatic Sensitive Device. Observe precautions for handling.**

## NOTES:

- Unless noted otherwise, all measurements are made with the filter installed in the specified test fixture which is connected to a 50 Ω test system with VSWR ≤ 1.2:1. The test fixture L and C are adjusted for minimum insertion loss at the filter center frequency,  $f_c$ . Note that insertion loss and bandwidth are dependent on the impedance matching component values and quality.
- The frequency  $f_c$  is defined as the midpoint between the 3dB frequencies.
- Where noted, specifications apply over the entire specified operating temperature range of -40 to 90°C.
- The turnover temperature, T<sub>O</sub>, is the temperature of maximum (or turnover) frequency,  $f_o$ . The nominal frequency at any case temperature, T<sub>c</sub>, may be calculated from:  
 $f = f_o [1 - FTC (T_o - T_c)^2]$ .
- Frequency aging is the change in  $f_c$  with time and is specified at +65°C or less. Aging may exceed the specification for prolonged temperatures above +65°C. Typically, aging is greatest the first year after manufacture, decreasing significantly in subsequent years.
- The design, manufacturing process, and specifications of this device are subject to change without notice.
- One or more of the following U.S. Patents apply: 4,54,488, 4,616,197, and others pending.
- All equipment designs utilizing this product must be approved by the appropriate government agency prior to manufacture or sale.
- Tape and Reel Standard for ANSI / EIA 481.
- These values are attainable by using the optional pin out.
- Typical rejection is defined as the typical rejection at the worst frequency in the band.

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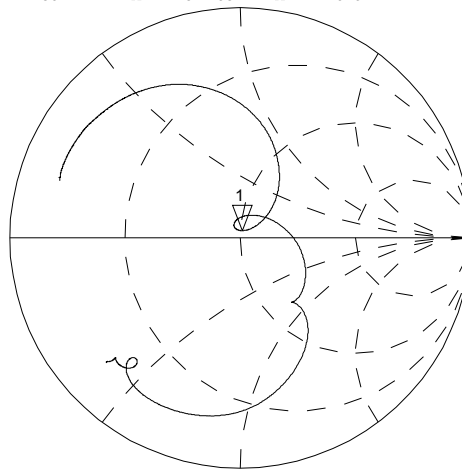
CH1 S11 1 UFS 1: 50.721  $\Omega$  3.2051  $\Omega$  1.6194 nH 315.000 000 MHz

$h_P$   
RF3417E DEMO  
FULL 2 PORTS CAL.

Cor

Full

↑

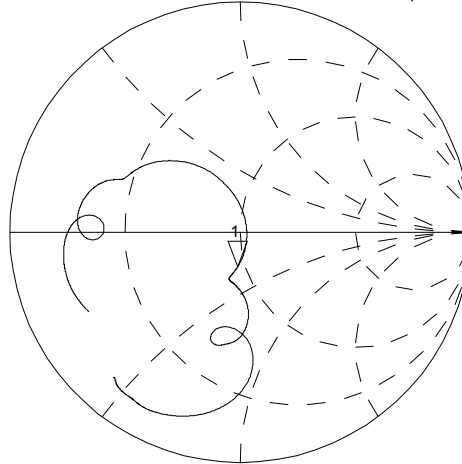


CH2 S22 1 UFS 1: 46.738  $\Omega$  -14.436  $\Omega$  35.001 pF 315.000 000 MHz

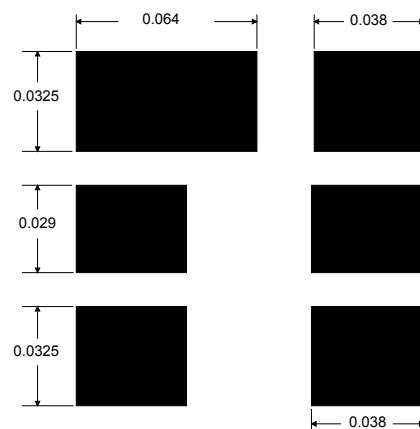
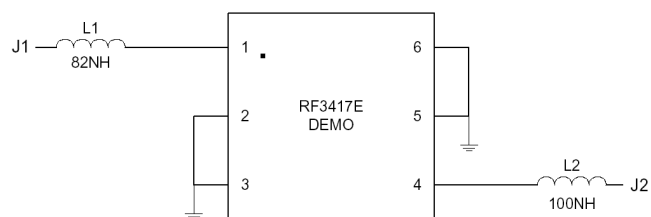
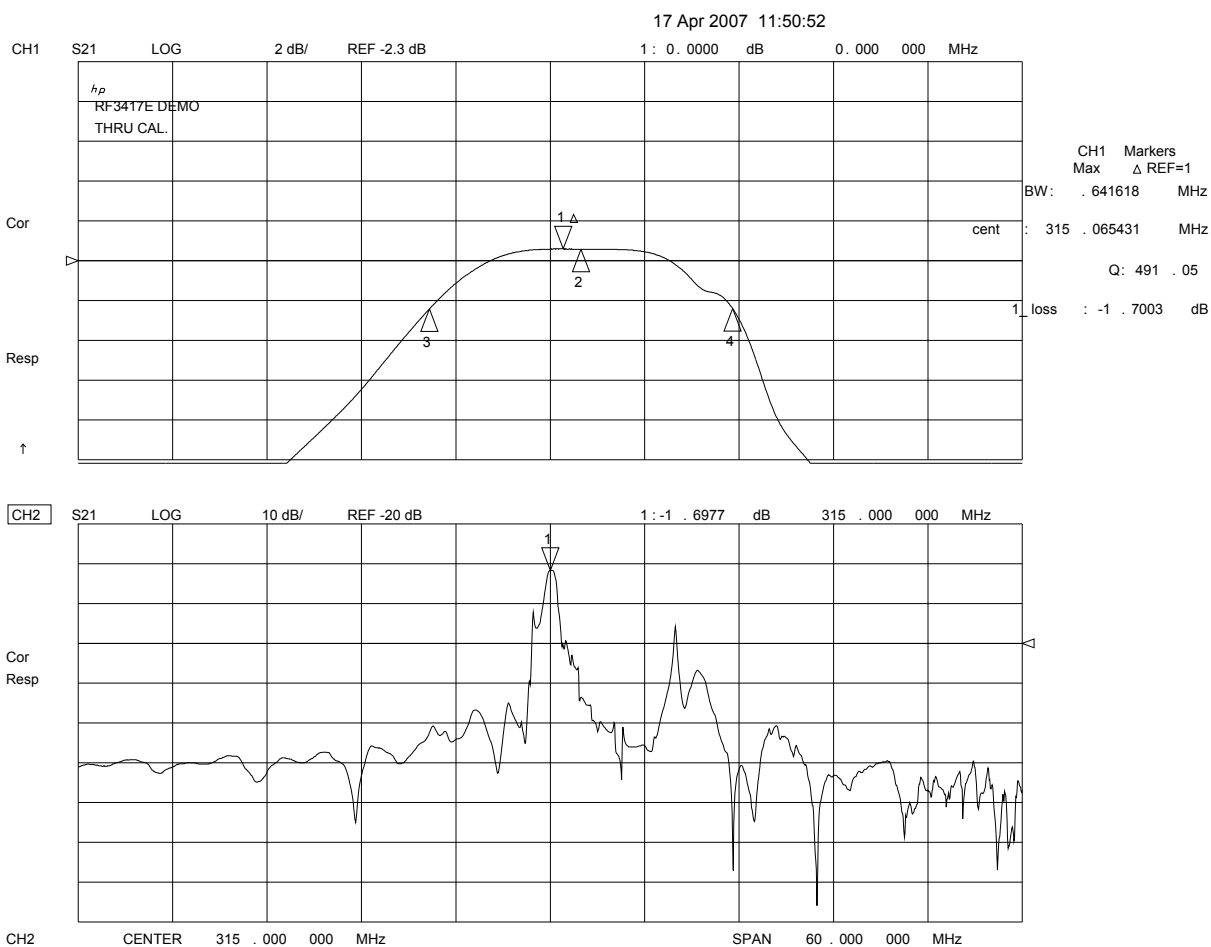
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Full

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CENTER 315.000 000 MHz SPAN 2.000 000 MHz

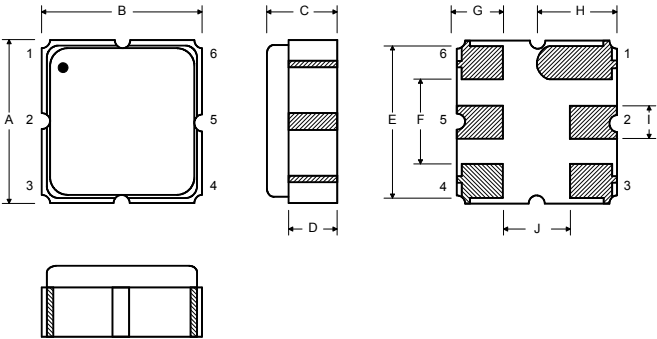


PCB Pad Layout in Inches

| Rating                     | Value                        | Units  |
|----------------------------|------------------------------|--------|
| Input Power Level          | 10                           | dBm    |
| DC Voltage                 | 12                           | VDC    |
| Storage Temperature        | -40 to +125                  | °C     |
| Operable Temperature Range | -40 to +125                  | °C     |
| Soldering Temperature      | (10 seconds / 5 cycles max.) | 260 °C |

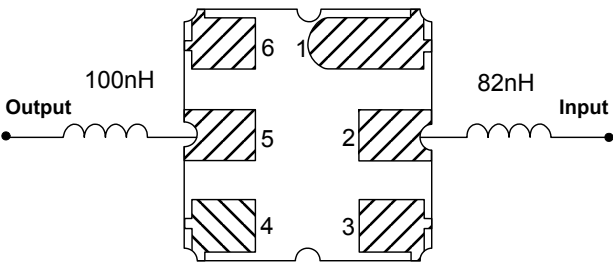
### Electrical Connections

| Pin | Connection    |
|-----|---------------|
| 1   | Input Ground  |
| 2   | Input         |
| 3   | Ground        |
| 4   | Output Ground |
| 5   | Output        |
| 6   | Ground        |



Case Dimensions

### Matching Circuit to 50Ω



| Dimension | mm   |      |      | Inches |       |       |
|-----------|------|------|------|--------|-------|-------|
|           | Min  | Nom  | Max  | Min    | Nom   | Max   |
| A         | 2.87 | 3.0  | 3.13 | 0.113  | 0.118 | 0.123 |
| B         | 2.87 | 3.0  | 3.13 | 0.113  | 0.118 | 0.123 |
| C         | 1.12 | 1.25 | 1.38 | 0.044  | 0.049 | 0.054 |
| D         | 0.77 | 0.90 | 1.03 | 0.030  | 0.035 | 0.040 |
| E         | 2.67 | 2.80 | 2.93 | 0.105  | 0.110 | 0.115 |
| F         | 1.47 | 1.6  | 1.73 | 0.058  | 0.063 | 0.068 |
| G         | 0.72 | 0.85 | 0.98 | 0.028  | 0.033 | 0.038 |
| H         | 1.37 | 1.5  | 1.63 | 0.054  | 0.059 | 0.064 |
| I         | 0.47 | 0.60 | 0.73 | 0.019  | 0.024 | 0.029 |
| J         | 1.17 | 1.30 | 1.43 | 0.046  | 0.051 | 0.056 |

### Optional Electrical Connections

| Pin | Connection    |
|-----|---------------|
| 1   | Input         |
| 2   | Input Ground  |
| 3   | Ground        |
| 4   | Output        |
| 5   | Output Ground |
| 6   | Ground        |

### Matching Circuit to 50Ω

