



**SF1091A**

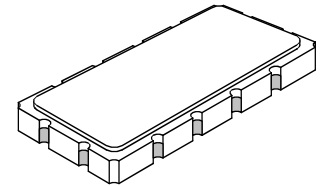
- **Designed for GSM BTS Transmitter Applications**
- **Low Insertion Loss**
- **Excellent Size-to-Performance Ratio**
- **Hermetic 13.3 X 6.5 mm Surface-Mount Case**
- **Unbalanced Input and Output**
- **Complies with Directive 2002/95/EC (RoHS)**



**211 MHz  
SAW Filter**

**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 |       |



**SM13365-12**

**Electrical Specification**

| Characteristic   | Sym    | Notes   | Min       | Typ       | Max | Units               |
|--|--------|---------|-----------|-----------|-----|---------------------|
| Nominal Center Frequency   | $f_c$  | 1       |           | 211.000   |     | MHz                 |
| Passband<br>Insertion Loss at $f_c$<br>3 dB Passband<br>Group Delay Variation over $f_c \pm 150$ kHz   | IL     | 1, 2    |           | 7         | 8.0 | dB                  |
|  | $BW_3$ |         | $\pm 450$ | $\pm 500$ |     | kHz                 |
|  | GDV    |         |           | 200       | 250 | $n_{SP-P}$          |
| Rejection<br>$f_c - 2.0$ to $f_c - 1.05$ and $f_c + 1.05$ to $f_c + 2.0$ MHz<br>$f_c - 80$ to $f_c - 2.0$ and $f_c + 2.0$ to $f_c + 80$ MHz<br>$n \times f_c$ over 291 to 2000 MHz |        | 1, 2, 3 | 10        | 21        |     | dB                  |
|  |        |         | 30        | 33        |     |                     |
|  |        |         | 40        | 60        |     |                     |
| Operating Temperature Range  | $T_A$  | 1       | -10       |           | +85 | °C                  |
| Frequency Temperature Coefficient  | FTC    | 1       |           | 0.32      |     | ppm/°C <sup>2</sup> |

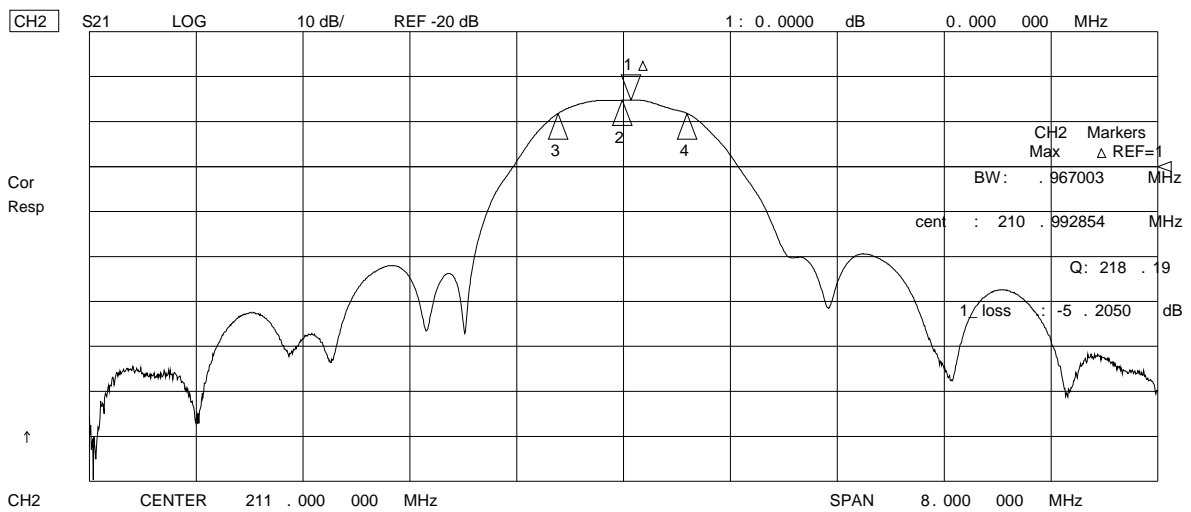
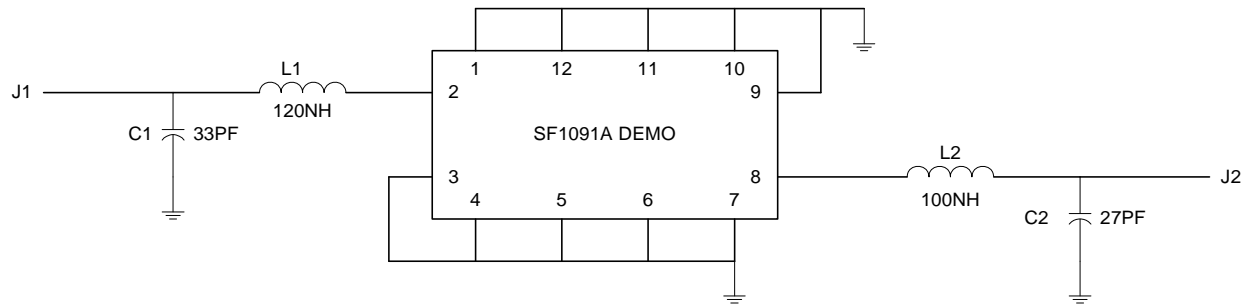
|  |  |
|--|--|
| Impedance Matching to 50 $\Omega$ unbalanced   | External L-C                               |
| Case Style                                     | SM13365-12 13.3 x 6.5 mm Nominal Footprint |
| Lid Symbolization (XX = 2 character date code) | RFM SF1091A XX                             |



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

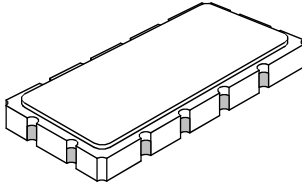
**Notes:**

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 oon PCB layout and external impedance matching design. See Application Note No. 42 for details.
4. The turnover temperature,  $T_o$ , is the temperature of maximum (or turnover) frequency,  $f_o$ . The nominal frequency at any case temperature,  $T_c$ , may be calculated from:  $f=f_o[1-FTC(T_o-T_c)^2]$ .
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.



# SM13365-12 Case

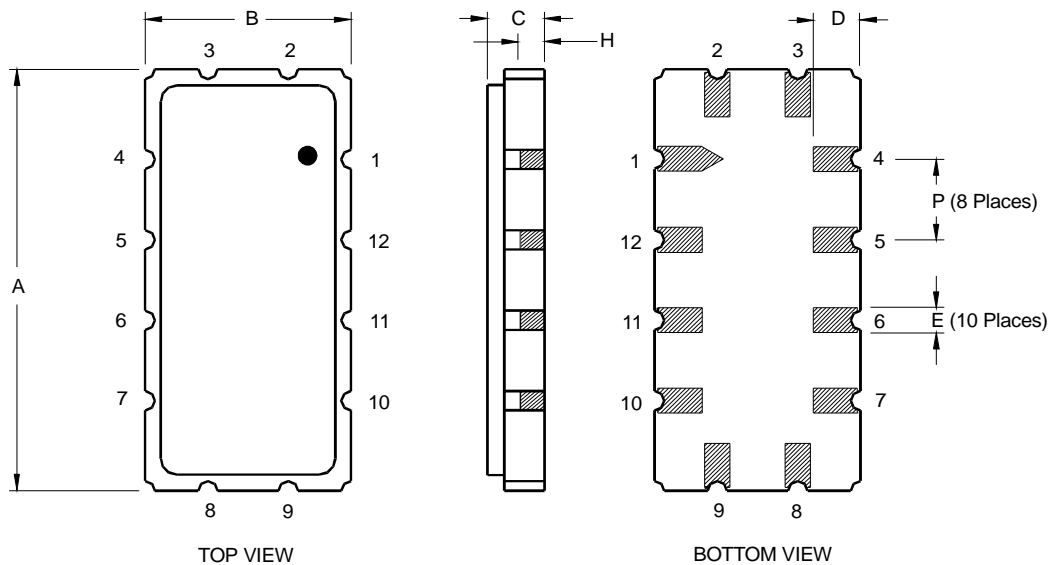
## 12-Terminal Ceramic Surface-Mount Case 13.3 x 6.5 mm Nominal Footprint



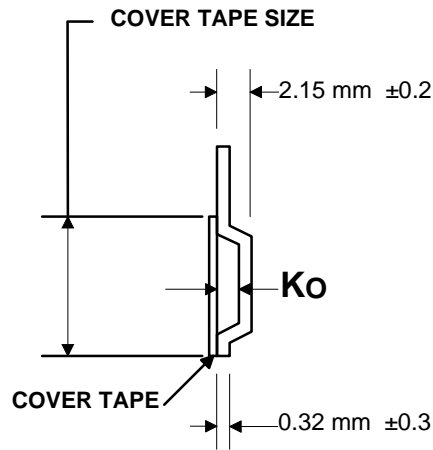
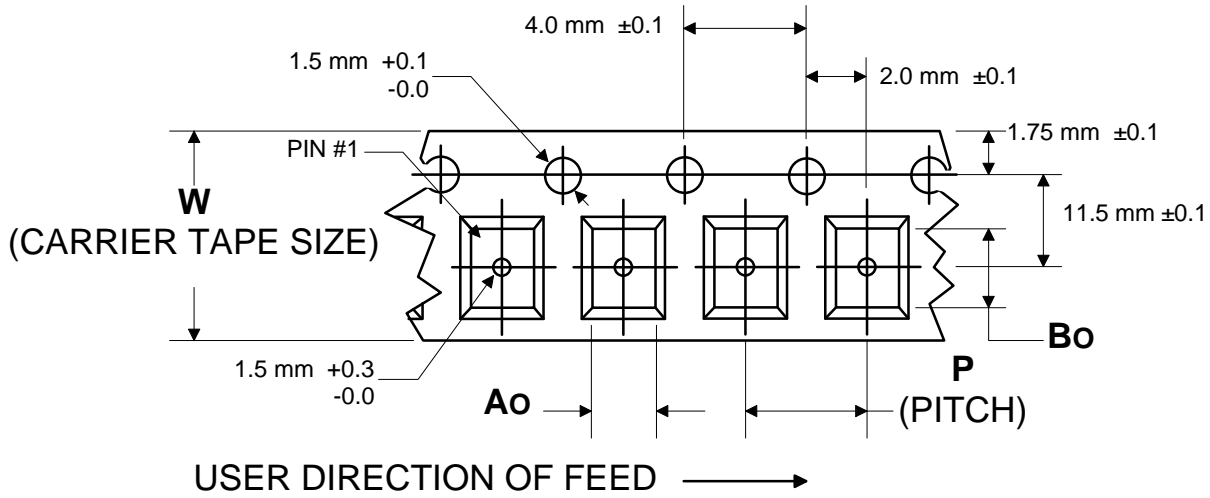
| Case Dimensions |       |       |       |        |       |       |
|-----------------|-------|-------|-------|--------|-------|-------|
| Dimension       | mm    |       |       | Inches |       |       |
|                 | Min   | Nom   | Max   | Min    | Nom   | Max   |
| A               | 13.08 | 13.31 | 13.60 | 0.515  | 0.524 | 0.535 |
| B               | 6.27  | 6.50  | 6.80  | 0.247  | 0.256 | 0.268 |
| C               |       | 1.91  | 2.00  |        | 0.075 | 0.079 |
| D               |       | 1.50  |       |        | 0.059 |       |
| 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  | 2                       |
|                               | Return or Input  | 3                       |
| Port 2                        | Output or Return | 8                       |
|                               | Return or Output | 9                       |
| Ground                        |                  | All others              |
| <b>Single Ended Operation</b> |                  | <b>Return is ground</b> |
| <b>Differential Operation</b> |                  | <b>Return is hot</b>    |



## COMPONENT ORIENTATION and DIMENSIONS



| Carrier Tape Dimensions |         |      |
|-------------------------|---------|------|
| <b>Ao</b>               | 7.0 mm  | ±0.1 |
| <b>Bo</b>               | 13.8 mm | ±0.1 |
| <b>Ko</b>               | 2.2 mm  | ±0.1 |
| <b>Pitch</b>            | 12.0 mm | ±0.1 |
| <b>W</b>                | 24.0 mm | ±0.3 |