SAW Components

SAW resonator
Short range devices

Series/type: R820
Ordering code: B39431R 820H210
Date: February 04, 2013
Version: 2.1
SAW Components
SAW resonator

Data sheet

SAW Components
SAW resonator

R820
433.92 MHz

Application
- 1-port resonator
- Provides reliable, fundamental mode, quartz frequency stabilization i.e. in transmitters or local oscillators

Features
- Package size 5.0 x 3.5 x 1.45 mm³
- Package code QCC4A
- RoHS compatible
- Approximate weight 0.1 g
- Package for Surface Mount Technology (SMT)
- Ni, gold-plated terminals
- Lead free soldering compatible with J - STD20C
- Passivation layer Elpas
- AEC-Q200 qualified component family
- Electrostatic Sensitive Device (ESD)

Pin configuration
- 1 Input
- 3 Output, grounded in 1-port conf.
- 2,4 Ground (case)

Please read cautions and warnings and important notes at the end of this document.
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**R820**  
**433.92 MHz**

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**Characteristics**

Reference temperature: \( T_A = 25 \, ^\circ C \)
Terminating source impedance: \( Z_S = 50 \, \Omega \)
Terminating load impedance: \( Z_L = 50 \, \Omega \)

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>min.</th>
<th>typ.</th>
<th>max.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Center frequency</strong> (^1) ( f_C )</td>
<td>433.845</td>
<td>433.920</td>
<td>433.995</td>
</tr>
<tr>
<td><strong>Minimum insertion attenuation</strong></td>
<td>( \alpha_{\text{min}} )</td>
<td>1.2</td>
<td>1.7</td>
</tr>
<tr>
<td>Unloaded quality factor ( Q_U )</td>
<td>7500</td>
<td>11500</td>
<td>—</td>
</tr>
<tr>
<td><strong>Ageing of</strong> ( f_C ) (^{-} )</td>
<td>—</td>
<td>—</td>
<td>(-50/+50)</td>
</tr>
</tbody>
</table>

**Equivalent circuit elements**

- Motional capacitance \( C_1 \): — 2.13 — fF
- Motional inductance \( L_1 \): — 63.16 — µH
- Motional resistance \( R_1 \): — 14 22 Ω
- Parallel capacitance \(^2\) \( C_0 \): — 2.5 — pF

| Temperature coefficient of frequency \(^3\) \( T_C_f \) | — 0.032 — | ppm/K² |
| Turnover temperature \( T_0 \) | 10 | 40 °C |

\(^1\) Center frequency is defined as maximum of the real part of the admittance.
\(^2\) If used in two port configuration (pin 2 - input, pin 5 - output) \( C_0 \) is reduced by approx. 0.3 pF.
\(^3\) Temperature dependence of \( f_C \): \( f_C(T_A) = f_C(T_0) \left(1 + T_C_f (T_A - T_0)^2 \right) \)

**Maximum ratings**

| Operable temperature range \( T \) | \(-45/+125\) °C |
| Storage temperature range \( T_{\text{stg}} \) | \(-45/+125\) °C |
| DC voltage \( V_{DC} \) | 12 V |
| Source power \( P_S \) | 0 dBm |
## References

<table>
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<th>Type</th>
<th>R820</th>
</tr>
</thead>
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<tr>
<td>Ordering code</td>
<td>B39431R 820H210</td>
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<tr>
<td>Marking and package</td>
<td>C61157-A7-A86</td>
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<tr>
<td>Packaging</td>
<td>F61074-V8120-Z000</td>
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<tr>
<td>Date codes</td>
<td>L_1126</td>
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<tr>
<td>Soldering profile</td>
<td>S_6001</td>
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<td>RoHS compatible</td>
<td>RoHS-compatible means that products are compatible with the requirements according to Art. 4 (substance restrictions) of Directive 2011/65/EU of the European Parliament and of the Council of June 8th, 2011, on the restriction of the use of certain hazardous substances in electrical and electronic equipment (&quot;Directive&quot;) with due regard to the application of exemptions as per Annex III of the Directive in certain cases.</td>
</tr>
<tr>
<td>Coils</td>
<td>See Inductor pdf-catalog <a href="http://www.tdk.co.jp/tefe02/coil.htm#aname1">http://www.tdk.co.jp/tefe02/coil.htm#aname1</a> and Data Library for circuit simulation <a href="http://www.tdk.co.jp/etvcl/index.htm">http://www.tdk.co.jp/etvcl/index.htm</a></td>
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