30 dB EMI filter with up to 30 kV IEC contact
ESD protection in leadless packages

These highly integrated, space-saving devices, housed in NXP’s Ultra Thin Leadless Plastic (ULTP) package, combine high-level ESD protection with EMI filtering of all relevant 2G and 3G mobilephone, WLAN and Bluetooth frequencies. The ESD protection exceeds the requirements of the IEC 61000-4-2 level 4 standard. NXP has 1.000 shot-proven ESD solutions that protect all kinds of portable applications over their full lifetimes, and provides a complete in-house production flow for added supply reliability.

**Key features of new family**
- Up to 30 dB insertion loss at mobile-phone frequencies (800 MHz to 3 GHz)
- High ESD protection exceeding IEC 61000-4-2 level 4
- Available as 1-, 2-, 4-, 6- or 8-channel filter
- Dark Green-compliant (RoHS-compliant and halogen-/antimony-free)
- Ultra-thin leadless package, less than 0.5 mm height
- Terminal pitch of 0.4 mm

**Key applications**
- EMI/RFI filtering and downstream ESD protection in mobile and portable applications
- Camera interface
- Display and LCD interface
- Memory card interface (SD, MMC, etc.)
- Touch or keypad interface
- Bottom connector

**Key benefits**
- Reduced component count
- Reduced board space
- Easy routing

NXP multi-channel ESD protection and EMI filter
IP425xCZ8-4/CZ12-6/CZ16-8
IP4256CZ3-M/CZ5-W/CZ6-F

1.35 x 3.3 x 0.45 mm
8-channel

1.35 x 2.5 x 0.45 mm
4-channel

1.35 x 3.3 x 0.45 mm
6-channel
EMI filter family in plastic packages

<table>
<thead>
<tr>
<th>Package</th>
<th>UTLP SOT983/984/985</th>
<th>UTLP SOT983/984/985</th>
<th>UTLP SOT983/984/985</th>
<th>UTLP SOT983/984/985</th>
<th>SOT883</th>
<th>SOT865</th>
<th>SOT886</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of channels</td>
<td>4, 6, 8</td>
<td>4, 6, 8</td>
<td>4, 6, 8</td>
<td>4, 6, 8</td>
<td>1</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Width (mm)</td>
<td>1.35</td>
<td>1.35</td>
<td>1.35</td>
<td>1.35</td>
<td>0.6</td>
<td>1.2</td>
<td>1</td>
</tr>
<tr>
<td>Length (mm)</td>
<td>1.7, 2.5, 3.3</td>
<td>1.7, 2.5, 3.3</td>
<td>1.7, 2.5, 3.3</td>
<td>1.7, 2.5, 3.3</td>
<td>1</td>
<td>1.6</td>
<td>1.45</td>
</tr>
<tr>
<td>Max. height (mm)</td>
<td>0.5</td>
<td>0.5</td>
<td>0.5</td>
<td>0.5</td>
<td>0.5</td>
<td>0.6</td>
<td>0.5</td>
</tr>
<tr>
<td>Channel resistance (Ω, typ.)</td>
<td>100</td>
<td>40</td>
<td>200</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>Line capacitance (pF @ 0.0 V, typ.)</td>
<td>15</td>
<td>18</td>
<td>45</td>
<td>45</td>
<td>30</td>
<td>30</td>
<td>30</td>
</tr>
<tr>
<td>Line capacitance (pF @ 2.5 V, typ.)</td>
<td>10</td>
<td>12</td>
<td>30</td>
<td>30</td>
<td>19</td>
<td>19</td>
<td>19</td>
</tr>
<tr>
<td>ESD IEC 61000-4-2 (kV contact, typ.)</td>
<td>15</td>
<td>15</td>
<td>30</td>
<td>30</td>
<td>25</td>
<td>25</td>
<td>25</td>
</tr>
<tr>
<td>Robustness at ESD level 4 (1000 shots, IEC 61000-4-2)</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
</tr>
</tbody>
</table>

**Why integrated silicon solutions?**

- No degradation – full ESD protection even after 1000 IEC level strikes
- Predictable, reliable suppression of relevant 2G and 3G mobile-phone frequencies while minimizing signal loss
- Very low clamping voltage due to optimized π-filter structures (C-R-C structure)
  - Prevent damage of ESD-sensitive circuits during an ESD event (IEC testing only ensures the device will survive)
  - Protect against soft errors caused by non-destructive transients
- Protect sensitive system chips

**Application example**

4-channel integrated EMI filter with ESD protection

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**Clamping voltage of IP4254CZ16-8 at ±8 kV IEC 61000-4-2, level 4 pulse**

- Integrated π-filter (C-R-C) structure assures excellent ESD pulse transient response

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