**MECXKaUPConv**

**X-band to Ka-band UP-Converter**

---

### Main Features

- **RF Output Frequency:** 30 - 31 GHz
- **LO Input Frequency:** 22 GHz
- **IF Input Frequency:** 8 - 9 GHz
- **More than 11 dB Conversion Gain**
- **29 dBm OTOI**
- **30 dBc LO Isolation**
- **Bias:** $V_d = 2.8$ V, $I_{dq} = 320$ mA, $V_g = -0.4$ V Typical
- **Technology:** 0.25 µm GaAs pHEMT
- **Chip Dimensions:** 3.03 x 2.73 x 0.1mm

### Product Description

**MECXKaUPConv** is an up-converter with RF output frequencies in the band from 30 to 31 GHz. It contains a frequency mixer, a local oscillator (LO) buffer amplifier and a RF power amplifier. It operates at fixed LO input frequency of 22 GHz and IF input frequencies from 8 to 9 GHz. It is designed using a standard 0.25 µm GaAs pHEMT process.

**MECXKaUPConv** provides more than 11 dB Conversion Gain over the full RF output band, when operated with LO inputs from -2 to 0 dBm. It also achieves more than 30 dBc of LO isolation at the RF output port. Its high 1 dB compression point of more than 19 dBm besides its high OTOI of more than 29 dBm makes it very suitable to drive Ka band High Power Amplifiers in very linear operating condition.

**MECXKaUPConv** is particularly suited for Satcom On The Move applications.

### Applications

- Satcom On The Move
- Telecom
Main Characteristics

Test Conditions: $T_{\text{base_plate}} = 25^\circ\text{C}$

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Min</th>
<th>Typ</th>
<th>Max</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>RF Output Frequency</td>
<td>30</td>
<td>31</td>
<td></td>
<td>GHz</td>
</tr>
<tr>
<td>IF Input Frequency</td>
<td>8</td>
<td>9</td>
<td></td>
<td>GHz</td>
</tr>
<tr>
<td>LO Input Frequency</td>
<td>22</td>
<td></td>
<td></td>
<td>GHz</td>
</tr>
<tr>
<td>IF Input Power</td>
<td>-5</td>
<td>8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>LO Input Power</td>
<td>-2</td>
<td>-1</td>
<td>0</td>
<td>dBm</td>
</tr>
<tr>
<td>Conversion Gain</td>
<td>11</td>
<td>12.5</td>
<td></td>
<td>dB</td>
</tr>
<tr>
<td>Output Power at 1 dB Gain compression</td>
<td>19.2</td>
<td>19.8</td>
<td></td>
<td>dBm</td>
</tr>
<tr>
<td>Output Third Order Intercept</td>
<td>29</td>
<td>31</td>
<td></td>
<td>dBm</td>
</tr>
<tr>
<td>LO - RF Isolation</td>
<td>30</td>
<td></td>
<td></td>
<td>dBc</td>
</tr>
<tr>
<td>RF Matching</td>
<td>-15</td>
<td></td>
<td></td>
<td>dB</td>
</tr>
<tr>
<td>IF Matching</td>
<td>-20</td>
<td></td>
<td></td>
<td>dB</td>
</tr>
<tr>
<td>LO Matching</td>
<td>-15</td>
<td></td>
<td></td>
<td>dB</td>
</tr>
<tr>
<td>Drain Voltage</td>
<td>2.8</td>
<td></td>
<td></td>
<td>V</td>
</tr>
<tr>
<td>Supply Quiescent Drain Current</td>
<td>320</td>
<td></td>
<td></td>
<td>mA</td>
</tr>
<tr>
<td>Gate Voltage</td>
<td>-0.4</td>
<td></td>
<td></td>
<td>V</td>
</tr>
<tr>
<td>Gate Voltage (mixer)</td>
<td>-0.9</td>
<td></td>
<td></td>
<td>V</td>
</tr>
</tbody>
</table>

* Performances described in this document are based on preliminary test fixture characterization.
Typical Measured Performances

Unless otherwise stated the following typical performances have been measured at ambient temperature (25 °C) and with the following bias conditions:

- $V_{dd} = 3.2 \, V$;
- $I_d = 320 \, mA$ (Vgg = -0.4 V typical);
- $V_{gmxr} = -0.9 \, V$

**Conversion Gain Vs. Frequency**

If Input Power = -5 dBm @ Freq. = [8 - 9] GHz, LO Input Power = -1 dBm @ 22 GHz
Output Third Order Intercept Vs. Frequency

IF Input Power = -8 dBm/tone @ Freq. = [8 - 9] GHz +- 1 MHz, LO Input Power = -1 dBm @ 22 GHz

Conversion Gain Vs. Swept IF Input Power

IF Frequency of 8.0, 8.5 and 9.0 GHz, LO Input Power = -1 dBm @ 22 GHz
MECXKaUPConv
X-band to Ka-band UP-Converter

Port Return Loss Vs. Frequency
IF Input Power = -20 dBm @ Freq. = [8 - 9] GHz, LO Input Power = -1 dBm @ 22 GHz

---

Preliminary Data Sheet
CONFIDENTIAL

MEC – Microwave Electronics for Communications
www.mec-mmic.com
Contact Information

For additional technical Information and Requirements:
Email: contact.mec@mec-mmic.com    Tel: +39 0516333403

For sales Information and Requirements:
Email: sales@mec-mmic.com    Tel: +39 0637511124

Notice

The furnished information is believed to be reliable. However, performances and specifications contained herein are based on preliminary characterizations and then susceptible to possible variations. On the basis of customer requirements the product can be tested and characterized in specific operating conditions and, if needed, tuned to meet custom specifications.

The contents of this document are under the copyright of MEC srl. It is released by MEC srl on condition that it shall not be copied in whole, in part or otherwise reproduced (whether by photographic, reprographic, or any other method) and the contents thereof shall not be divulged to any person other than inside the company at which has been provided by MEC.