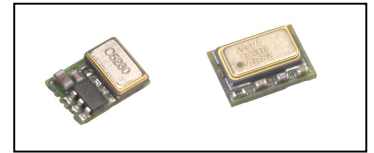


Typical Applications

Base Stations
 Test Equipment
 Switching
 Portable Equipment

Features

Surface Mount FR4 based Package
 Reflow Process Compatible
 AT-Cut Crystal
 Low Phasenoise



Frequency range

1 MHz – 160 MHz

Standard frequencies

16.384; 30.720; 32.768; 38.880 MHz;
 51.840; 52.00; 68.736; 77.760; 155,52 MHz

Frequency stabilities¹

| Parameter | Min | Typ | Max. | Units | Operating temp range | Ordering Code ⁵ |
|--|-------|-----|-------|-------|----------------------|----------------------------|
| vs. operating temperature range (Referenced to +25°C) | -15.0 | | +15.0 | ppm | -20 ... +70°C | D105 |
| Parameter | Min | Typ | Max. | Units | Condition | |
| Initial tolerance | -10.0 | | +10.0 | ppm | @vc=Vs/2 | |
| vs. supply voltage change | -3.0 | | +3.0 | ppm | Vs ± 5% | |
| vs. load change | -1.0 | | +1.0 | ppm | Load ± 10% | |
| vs. aging /1. Year | -3.0 | | +3.0 | ppm | | |
| vs. aging / year (following Years) | -1.0 | | +1.0 | ppm | | |

Frequency stabilities¹

| Parameter | Min | Typ | Max. | Units | Operating temp range | Ordering Code ⁵ |
|--|-------|-----|-------|-------|----------------------|----------------------------|
| vs. operating temperature range (Referenced to +25°C) | -30.0 | | +30.0 | ppm | -40 ... +85°C | F305 |
| Parameter | Min | Typ | Max. | Units | Condition | |
| Initial tolerance | -15.0 | | +15.0 | ppm | @vc=Vs/2 | |
| vs. supply voltage change | -3.0 | | +3.0 | ppm | Vs ± 5% | |
| vs. load change | -2.0 | | +2.0 | ppm | Load ± 10% | |
| vs. aging /1. Year | -3.0 | | +3.0 | ppm | | |
| vs. aging / year (following Years) | -1.0 | | +1.0 | ppm | | |

Supply voltage

| Parameter | Min | Typ | Max. | Units | Condition | Ordering Code ⁵ |
|---------------------|-------|-----|-------|-------|-----------|----------------------------|
| Supply voltage (Vs) | 4.75 | 5.0 | 5.25 | VDC | | SV050 |
| Current consumption | | | 40 | mA | @ HCMOS | |
| Current consumption | | | 90 | mA | @ PECL | |
| Supply voltage (Vs) | 3.135 | 3.3 | 3.465 | VDC | | SV033 |
| Current consumption | | | 30 | mA | @ LVHCMOS | |
| Current consumption | | | 80 | mA | @ LVPECL | |
| Current consumption | | | 25 | mA | @ LVDS | |

RF output

| Parameter | Min | Typ | Max. | Units | Condition | Ordering Code ⁵ |
|--------------------|-----|-------|------|-------|------------------------------|----------------------------|
| Signal | | HCMOS | | | | RFH |
| Load | | 15.0 | | pF | @ 15 pF 10 to 90 % @ Vs/2 | |
| Rise and Fall time | | | 5 | ns | | |
| Duty cycle | 40 | | 60 | % | | |
| Signal | | PECL | | | | RFP |
| Load | | 50 | | Ω | Vs - 2V 20 to 80 % | |
| Rise and Fall time | | | 1 | ns | | |
| Duty cycle | 45 | | 55 | % | | |
| Signal | | LVDS | | | | RFL |
| Load | | 100 | | Ω | 10 to 90 % | |
| Rise and Fall time | | | 1 | ns | | |
| Duty cycle | 40 | | 60 | % | | |

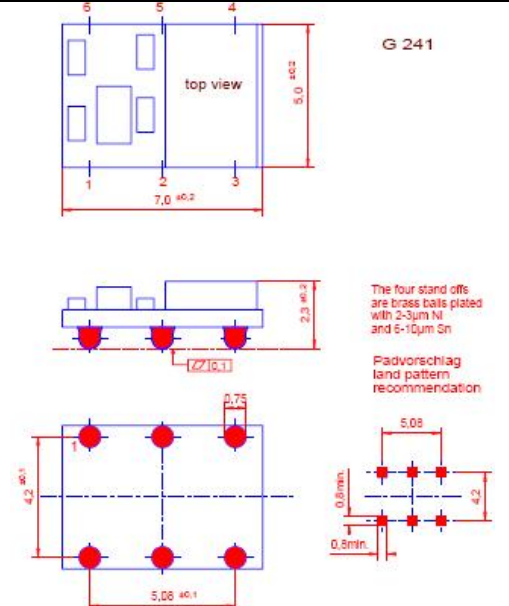
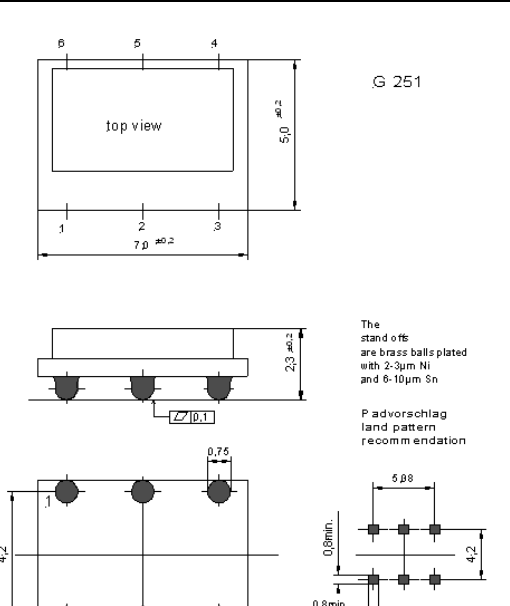
Frequency Tuning (EFC)

| Parameter | Min | Typ | Max. | Units | Condition |
|-----------------------------------|-----------------|-----------------|------------------|------------|--|
| Tuning Range | ±75.0 ±100.0 | ±90.0 ±140.0 | +200.0 ±200.0 | ppm ppm | Frequency > 53MHz Frequency < 53MHz |
| Linearity | | | 10 | % | |
| Tuning Slope | Positive | | | | |
| Control Voltage Range | 0.0 0.5 | 1.65 2.5 | 3.3 4.5 | VDC VDC | with Vs=3.3VDC with Vs=5.0VDC |
| Frequency control input impedance | 10 | | | k Ω | |

Additional parameters

| Parameter | Min | Typ | Max. | Units | Condition |
|----------------------|--------------------------|------|------|--------|--------------------|
| Phase Noise | | -75 | | dBc/Hz | 10 Hz @ 155 MHz |
| | | -110 | | dBc/Hz | 100 Hz PECL |
| | | -135 | | dBc/Hz | 1 kHz 3,3V |
| | | -142 | | dBc/Hz | 10 kHz |
| | | -142 | | dBc/Hz | 100 kHz |
| Jitter | | 1 | | ps RMS | @ 10 kHz to 20 MHz |
| Weight | | | 2 | g | |
| Processing & Packing | handling&processing note | | | | |

Enclosures

| Type G241 < 53 MHz | | | Type G251 > 53 MHz | | |
|---|----------------------|--|--|----------------------|--|
| Package Codes: | | | | | |
| Code A1 | Height "H" 2,3 mm | | Code B1 | Height "H" 2,3 mm | |
|  <p>Dimensions: mm</p> | | |  <p>Dimensions: mm</p> | | |

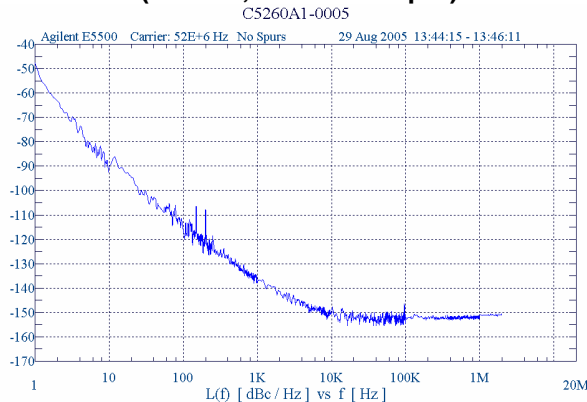
| Pin Connections | Pin Connections | | | | |
|--|--|---------------|---------------|---------------|-------------|
| 1 Control Voltage (Vc) 2 N/C / Enable (optional) 3 Ground 4 RF Output 5 N/C 6 Supply Voltage Input (Vs) | 1 Control Voltage (Vc) 2 N/C / Enable (optional) 3 Ground 4 RF Output 5 Complementary RF Output 6 Supply Voltage Input (Vs) | | | | |
| | true table | LVDS | | LVPECL | |
| | Pin 2 | Pin 4 | Pin 5 | Pin 4 | Pin 5 |
| | High | Data | compl. Data | Low | High |
| | Open | Data | compl. Data | Data | compl. Data |
| | Low | High Tristate | High Tristate | Data | compl. Data |
| Marking | | | | | |
| 5A1-xxx frequency * VI AYYWW | | | | | |

Absolute Maximum Ratings

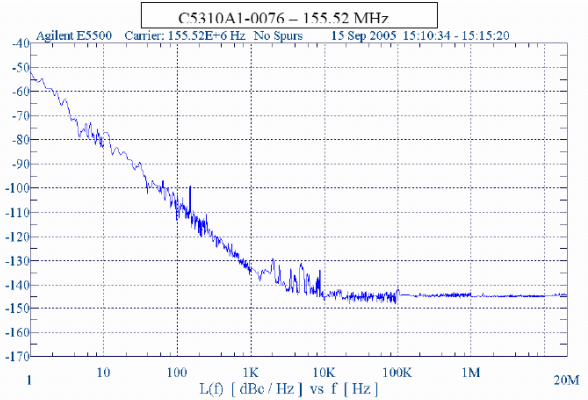
| Parameter | Min | Typ | Max. | Units | Condition |
|----------------------------|-----|-----|------|-------|-----------|
| Supply voltage (Vs) | | | 7 | V | |
| Operable temperature range | -30 | | +80 | °C | |
| Storage temperature range | -40 | | +90 | °C | |

Typical Phase Noise and Jitter

(52 MHz; HCMOS output)

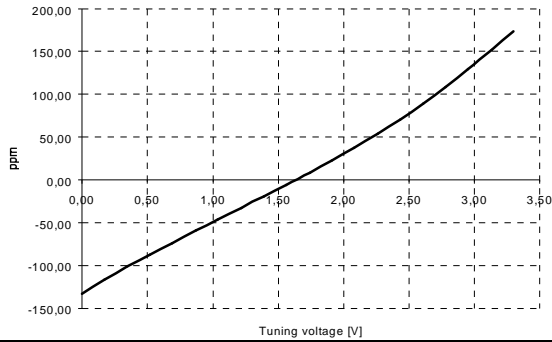


(155,52 MHz; PECL output)

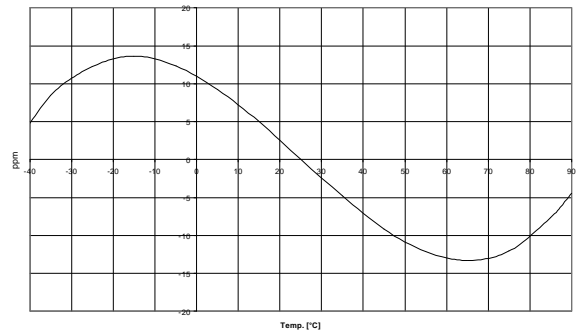


| Frequency range [Hz] | S _φ (f) [dB] | Jitter [ps rms] | Frequency range [Hz] | S _φ (f) [dB] | Jitter [ps rms] |
|----------------------|-------------------------|-----------------|----------------------|-------------------------|-----------------|
| 100Hz to 1.5MHz | -81dB | 0.26ps | 500Hz to 1.5MHz | -73.96dB | 0.205ps |
| 50kHz to 1.5MHz | -87dB | 0.14ps | 65kHz to 1.5MHz | -75.87dB | 0.165ps |
| 12kHz to 20MHz | -85dB | 0.16ps | 12kHz to 20MHz | -65.34dB | 0.553ps |

Typical tuning slope



Typical frequency stability vs temperature



Standard Shipping Method

*bei W ≤ 24 mm nur untere Lochreihe
*by W ≤ 24 mm only lower hole line

| Enclosure Type | Tape width W [mm] | Quantity per meter | Quantity per reel | Dimension P | Production tolerance complying |
|----------------|-------------------|--------------------|-------------------|-------------|--------------------------------|
| G241 / G251 | 12 | 125 | tbd | 8 | DIN IEC 286-3 |

