



Description

The 7048 is a synthesised RF signal generator module that incorporates the essential features required for most development, test and service work, including high frequency accuracy and stability, wide dynamic range, low phase noise and leakage, and flexible modulation capabilities.

The 7048 covers from 150 kHz up to 2 GHz and incorporates AM, FM and Phase modulation (internal and external). The wide frequency range and comprehensive modulation capabilities make it suitable for most tasks within the 2 GHz spectrum. The generator can be operated using either numeric or rotary controls, and can be remotely controlled via an RS-232 interface positioned on the rear of the CalBench console.

Features

High precision and stability: The 7048 uses a fully synthesised source locked to a temperature compensated crystal oscillator. This provides excellent signal frequency stability against temperature and ageing. The 7048 adds the further capability of locking to an external 10 MHz source. The frequency can be set to a resolution of 10 Hz across the whole frequency range. Frequency steps can be set to any value and stepping can be done with up/down keys or the rotary encoder. The frequency stepping system makes operations such as precise amplitude response characterisation particularly easy.

Wide amplitude range & low leakage: The 7048 provides an amplitude range of -127 dBm to +7 dBm (0.1 μ V to 500 mV into 50 Ω). Setting resolution is 0.1 dBm or 0.01 μ V. Output level steps can be set anywhere between 0.1 dBm and 100 dBm (or 0.01 μ V to 100 mV depending on the entry mode). Stepping the level is useful for quick assessment of circuit linearity and dynamic range for instance. The advanced attenuator design provide excellent flatness over the whole frequency range. Meticulous internal screening provides very low output leakage enabling accurate low level measurements in sensitive circuits such as receivers.

Full remote control: The 7048 provides full remote control facilities for all its functions with connection internal to the CalBench control centre if ordered (software not included). An external RS-232 port can be included under the console or at the rear, upon request.

Comprehensive modulation: The 7048 offers AM, FM and Phase modulation using either an internal or external source. Wide modulation range and low distortion make the 7048 suitable for most modulated signal test procedures.

Features

- 150 kHz to 2000 MHz frequency range
- 10 Hz setability, ± 1 ppm frequency stability
- Locking to external frequency standard
- -127 dBm to +7 dBm amplitude, 0.1 dB steps
- AM, FM & Phase modulation, internal/external
- 80 character back-lit LCD display
- Keyboard and rotary encoder control
- Full remote control through RS-232

Simple operation: The 7048 incorporates a simple and straightforward user interface. The back-lit four line display shows all the major signal parameters simultaneously. Data can be entered numerically using 0 - 9 keys or can be incremented or decremented using up/down keys or the rotary encoder.

Both frequency and output level can be adjusted in steps of user programmed size. Output level can be set either in dBm or linear units of μ V or mV. A single button press will translate from one to the other.

The 7048 can store nine full instrument set-ups in non-volatile memory. This allows repetitive testing procedures to be undertaken quickly and accurately.



Technical Specifications

Frequency

Frequency range 150 kHz to 2000 MHz
 Setting resolution 10 Hz by direct keyboard entry, or in user-set increments of 10 Hz to 999.999 MHz by rotary control or increment–decrement keys.
 Display resolution 10 Hz.
 Phase noise -116 dBc/Hz at 25 kHz offset, 500 MHz carrier.
 Residual FM (FM Off) Equivalent peak deviation for 300 Hz to 3.4 kHz B/W: 10 Hz at 500 MHz carrier.

Reference frequency

Internal accuracy ± 1 ppm over temperature range 15 °C to 30 °C; ± 2 ppm over 5 °C to 40 °C.
 Internal stability $< \pm 1$ ppm/year ageing.
 Internal ref. out 10 MHz from 50 Ω , amplitude 2 V pk-pk into 50 Ω .
 External ref in 10 MHz into 50 Ω , amplitude 2 V pk-pk to 5 V pk-pk.

Output level

Output level range -127 dBm to +7 dBm (0.1 μ V to 500 mV into 50 Ω). -127 dBm to +1 dBm in AM mode.
 Setting resolution 0.1 dB (or 0.01 μ V to 1 mV) by direct keyboard entry, or in user-set increments of 0.1 dB to 100 dB (or 0.01 μ V to 100 mV) by rotary control or increment–decrement keys.
 Accuracy Better than ± 2 dBm.
 Harmonics < -25 dBc at +7 dBm.
 Sub-harmonics < -25 dBc at +7 dBm.
 Non-harmonic spurious < -60 dBc at > 62.5 MHz, < -50 dBc at < 62.5 MHz.
 Carrier leakage $< 0.5 \mu$ V generated into a 50 Ω load by a 2 turn 25 mm loop, at a distance of 25 mm from the generator with the output set to < -10 dBm into a 50 Ω sealed load..
 Output impedance 50 Ω .
 Output connector Type N.
 Reverse protection 50 V DC, up to 25 Ω from 50 Ohm source, LED indication.
 Output switch RF OUT on-off switch with LED for ON status.

Modulation Source

Type Internal from built-in sine wave generator, or external from front panel BNC.
 Internal 400 Hz or 1 kHz sine, signal also available as an output.
 External Calibrated for 1 V rms sine, input impedance 600 Ω .

Frequency Modulation

Max. peak deviation See table below.
 Setting resolution 0.5 kHz by direct keyboard entry, rotary control or increment–decrement keys.
 Deviation accuracy $< \pm 10\% \pm 0.5$ kHz for 1 kHz Internal or 1 kHz / 1 Vrms External Modulation.
 External modulation 100 Hz - 300 kHz (± 2 dB relative to 1 kHz).
 Distortion $< 2\%$ at 1 kHz modulation, max. deviation (300 to 3.4 kHz bandwidth).

Phase Modulation

Max. peak deviation See table below.
 Setting resolution 0.05 rads for < 10.0 rads deviation, 0.1 rads for > 10.0 rads deviation.
 Deviation accuracy $< \pm 10\% \pm 0.05$ rads for 1 kHz Internal or 1 kHz / 1 Vrms External Modulation.
 External modulation 100 Hz - 10 kHz (± 2 dB relative to 1 kHz).
 Distortion $< 2\%$ at 1 kHz modulation, max. deviation (300 to 3.4 kHz bandwidth).

Amplitude Modulation

Max mod. depth 100 %.
 Setting resolution 0.5 %.
 Deviation accuracy $< \pm (5\% \text{ setting} + 1\%)$ for 1 kHz Internal or 1 kHz / 1 Vrms External Modulation.
 External modulation 50 Hz to 200 kHz (± 1 dB relative to 1 kHz).
 Distortion 150 kHz to 1 GHz - $< 3\%$ at 30 %, $< 5\%$ at 70 % 1 GHz to 2 GHz - $< 5\%$ at 30 %, $< 10\%$ at 70 % at 1 kHz modulation, maximum deviation (300 to 3.4 kHz bandwidth).

Max. peak deviation versus carrier frequency

	Frequency Modulation	Phase Modulation
1000 MHz to 2000 MHz	800 kHz	80.0 rads
500 MHz to 1000 MHz	400 kHz	40.0 rads
250 MHz to 500 MHz	200 kHz	20.0 rads
125 MHz to 250 MHz	100 kHz	10.0 rads
62.5 MHz to 125 MHz	50 kHz	5.0 rads
150 kHz to 62.5 MHz	100 kHz	10.0 rads

General Specifications and Ordering Information

Display 20 character x 4 row alphanumeric LCD.
 Interface RS-232, full remote control facilities.
 Data entry Keyboard selection of frequency, amplitude, etc.; value entry by numeric keys or by rotary control.
 Stored settings Up to 9 complete instrument set-ups may be stored in battery-backed memory.
 Module width 295 mm (primary console fitting only).
 Ordering information **7048: 2 GHz RF Signal Generator Module**

Due to continuous development Time Electronics reserves the right to change specifications without prior notice.