



Time Electronics

7048 RF Signal Generator Module



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

Description

The 7048 is a synthesised RF signal generator module that incorporate 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 150kHz up to 2GHz 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 2GHz 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 10MHz source. The frequency can be set to a resolution of 10Hz 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 -127dBm to +7dBm (0.1 μ V to 500mV into 50 Ω). Setting resolution is 0.1dBm or 0.01 μ V. Output level steps can be set anywhere between 0.1dBm and 100dBm (or 0.01 μ V to 100mV 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.

Ease of use

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/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.

Full remote control

The 7048 provides full remote control facilities for all its functions using an RS-232 interface on the rear of the bench console.

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.

7048 Specifications

TECHNICAL SPECIFICATIONS

Specifications apply after 30 minute warm-up, ambient 5°C to 40°C

FREQUENCY

Frequency Range	150kHz to 2000MHz
Setting Resolution	10Hz by direct keyboard entry, or in user-set increments of 10Hz to 999.999MHz by rotary control or increment-decrement keys.
Display Resolution	10Hz
Phase Noise	-116dBc/Hz at 25kHz offset, 500MHz carrier.
Residual FM (FM Off)	Equivalent peak deviation for 300Hz to 3.4kHz B/W: 10Hz at 500MHz 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	< +/-1ppm/year ageing.
Internal Ref. Out	10MHz from 50 Ohms, amplitude 2V pk-pk into 50 Ohms.
External Ref In	10MHz into 50 Ohms, amplitude 2V pk-pk to 5V pk-pk.

OUTPUT LEVEL

Output Level Range	-127dBm to +7dBm (0.1µV to 500mV into 50Ω). -127dBm to +1dBm in AM mode.
Setting Resolution	0.1dB (or 0.01µV to 1mV) by direct keyboard entry, or in user-set increments of 0.1dB to 100dB (or 0.01µV to 100mV) by rotary control or increment-decrement keys.
Accuracy	Better than ± 2dBm.
Harmonics	< -25dBc at +7dBm.
Sub-Harmonics	< -25dBc at +7dBm.
Non-Harmonic Spurious	< -60dBc at > 62.5MHz, < -50dBc at < 62.5MHz.
Carrier Leakage	< 0.5µV generated into a 50Ω load by a 2 turn 25mm loop, at 25mm from the generator with output set to <-10dBm into a 50Ω sealed load.
Output Impedance	50Ω
Output Connector	TYPE N
Reverse Protection	50V DC, up to 25Ω 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	400Hz or 1kHz sine, signal also available as an output.
External	Calibrated for 1V rms sine, input impedance 600 Ohms.

FREQUENCY MODULATION

Max. Peak Deviation	See Table below.
Setting Resolution	0.5kHz by direct keyboard entry, rotary control or increment-decrement keys.
Deviation Accuracy	< ±10% ±0.5kHz for 1kHz Internal or 1kHz / 1Vrms External Modulation.
External Modulation	100Hz - 300kHz (± 2dB relative to 1kHz).
Distortion	< 2% at 1kHz modulation, max. deviation (300 - 3.4kHz 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	< ±10% ±0.05 rads for 1kHz Internal or 1kHz / 1Vrms External Modulation.
External Modulation	100Hz - 10kHz (±2dB relative to 1kHz).
Distortion	< 2% at 1kHz modulation, max. deviation (300 - 3.4kHz bandwidth).

AMPLITUDE MODULATION

Max Mod. Depth	100%.
Setting Resolution	0.5%.
Deviation Accuracy	< ± (5% setting +1%) for 1kHz Internal or 1kHz / 1Vrms External Modulation.
External Modulation	50Hz to 200kHz (±1dB relative to 1kHz).
Distortion	150kHz to 1GHz - < 3% at 30%, < 5% at 70% 1GHz to 2GHz - < 5% at 30%, < 10% at 70% at 1kHz modulation, max. deviation (300 - 3.4kHz bandwidth).

Max. Peak Deviation versus Carrier Frequency

	Frequency Modulation	Phase Modulation
1000MHz - 2000MHz	800kHz	80.0 rads
500MHz - 1000MHz	400kHz	40.0 rads
250MHz - 500MHz	200kHz	20.0 rads
125MHz - 250MHz	100kHz	10.0 rads
62.5MHz - 125MHz	50kHz	5.0 rads
150kHz - 62.5MHz	100kHz	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	295mm (primary console fitting only)

Ordering Information..... **7048: 2GHz RF Signal Generator Module**

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