



Time Electronics

7058 RF Signal Generator Module



- 10MHz to 6000MHz frequency range
- 10Hz setability, +/-1ppm frequency stability
- Locking to external frequency standard
- -110dBm to +7dBm amplitude, 0.1dB steps
- Custom level trim of up to 100 points
- 20 character x 4 row back-lit LCD display
- Fast full-range sweep using step or list modes
- Full remote control via RS-232 or USB

Description

The 7058 is a precision RF signal generator with a maximum frequency of 6GHz. It is intended for CW (carrier wave) applications where modulation is not required. Low phase noise is matched by low leakage, low residual FM and spurious. The internal timebase has a 1ppm stability, and an external frequency reference can be used for higher precision.

The output amplitude and/or frequency can be swept over the full range of each in a single sweep. The instrument can be set up to perform two types of sweep. The first sweep type is a Step Sweep in which the start and stop conditions are defined, together with the number of points in the sweep, linear or logarithmic spacing between points, and a dwell time at each point.

The other sweep type is a List Sweep in which up to 1000 points are defined in a list, with the frequency, level and dwell time specified for each point. Both types of sweep can be free run or triggered by a Sweep Trigger from a variety of sources; in addition, a Point Trigger can be defined for each individual step of the sweep. A rear panel SYNC output signal indicates when the output is stable, and can be user-programmed to be high or low.

The output level can be adjusted to correct for external equipment frequency response using the TRIM function. The TRIM function consists of a user programmable list of up to 100 amplitude adjustment /frequency pairs.

Features

Flexible Sweep Modes

The 7058 incorporates an advanced stepped sweep system which allows both frequency and amplitude to be swept. The sweep can be defined in terms of start and stop frequency/amplitude points with linear or logarithmic interpolation between them. The total number of points can be set from 2 to 1000 and the dwell time between points can be set from 10ms up to 10s.

Sweeps can be triggered manually, from an internal timer or from the remote interfaces. If required, each point within the sweep can be stepped via a trigger event rather than a fixed time. In List Sweep mode, the sweep is defined by a table of up to 1000 frequency/amplitude points which can be stepped between either by trigger events or by an individual dwell time for each point.

This system provides the flexibility to generate changes in frequency and amplitude to match virtually any required test pattern.

Lists can be generated within the instrument, or on a PC and downloaded via the interfaces. Up to 16 user lists can be stored permanently within the instrument's memory.

User Compensation Table (Trim)

The Trim function enables the output level to be adjusted in order to calibrate an entire test set up. The Trim function consists of a user programmable list of up to 100 amplitude adjustment /frequency pairs. When turned on, it adjusts the output level by an amount linearly interpolated between the frequencies specified in the list.

Ease of Use

The 7058 is both simple and intuitive to use. Frequency and level can be entered directly from the keyboard in whichever units are preferred. Alternatively values can be changed in user defined increments using the spin wheel or up/down keys. The four line display has soft key functionality for setting up more complex functions such as sweep lists.

Set-up and Sweep List Storage

The generator has internal storage for up to 12 complete instrument set-ups and up to 16 sweep lists. Set-ups and sweep lists can be given user defined names if required.

Full Remote Control

The 7058 incorporates full remote control using USB or RS-232, with connection via the rear of the bench console.

7058 Specifications

TECHNICAL SPECIFICATIONS

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

FREQUENCY

Frequency Range: 10MHz to 6000MHz

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: 500MHz Carrier: <-110dBc/Hz (typ) @ 20kHz offset; <-120dBc/Hz (typ) @ 100kHz

3GHz Carrier: <-95dBc/Hz (typ) @ 20kHz offset; <-110dBc/Hz (typ) @ 100kHz offset

6GHz Carrier: <-89dBc/Hz (typ) @ 20kHz offset; <-104dBc/Hz (typ) @ 100kHz offset

Residual FM: Equivalent peak deviation for 300Hz to 3.4kHz B/W: 12Hz at 500MHz carrier

Settling Time: <8ms to settle within 100Hz or 0.1ppm of final frequency, if greater.

REFERENCE FREQUENCY

Options: Internal or External (via rear panel BNC)

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: -110dBm to +7dBm (0.1µV to 500mV into 50W).

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. <-30dBc@levels <=0dBm 30 to 6000MHz, <-25dBc@levels <=0dBm 10 to 30MHz

Sub-Harmonics: <3000MHz : None. >3000MHz : <-40dBc (typ) @ +7dBm.

Non-Harmonic Spuri: <-50dBc >10kHz offset 10 to 3000MHz (Note 1). <-44dBc >10kHz offset 3000MHz to 6000MHz (Note 2).

Note 1 - <-45dBc >10kHz offset 1900–2150MHz

Note 2 - <-39dBc >10kHz offset 3800–4300MHz.

Carrier Leakage: <0.5µV generated into a 50W load by a 2 turn 25mm loop, at 25mm from the generator with output set to <-10dBm into a 50W sealed load.

Output Impedance: 50W

Output Connector: TYPE N

Reverse Protection: 50V DC

Output Switch: RF OUT on-off switch with LED for ON status.

FREQUENCY and AMPLITUDE SWEEP

Step Sweep: Step frequency and/or amplitude according to a formula over a specified number of points.

Formula Specifies: Frequency start/stop. Amplitude start/stop. Dwell time at each step – programmable 0.01 to 10.000sec

Max Points: 1000

Sweep Run: Continuous or single. Sweep up or down

Step Spacing: Linear or logarithmic

Sweep Triggering: Manual, Ext. signal, timed (0.1 – 999.9sec) or via remote interface

Sync Signal: (Output Stable) available during dwell time. Programmable to be high or low

List Sweep: As for Step Sweep except that a user defined table of frequency, amplitude and dwell time values defines the steps. The table can be created within the instrument or downloaded via the remote interfaces.

Max Points: 1000

List Storage: Up to 16 Sweep Lists can be stored permanently within the instrument

Point Trigger: Each point in a sweep (step or list) can be subject to a trigger event rather than a dwell time.

Point Triggering: Manual, Ext. signal or via remote interface.

TRIM (User Level Compensation Tables)

A table of frequency/gain pairs allows the user to modify the generator output level with respect to frequency to calibrate an entire test set up or improve the calibration of the generator alone. The table can be created within the instrument or downloaded via the remote interfaces.

Max Points: 100

OTHER INPUTS/OUTPUTS

Trig In: DC coupled External Trigger Input signal used for step Sweep changes in Point Trigger mode

Input Threshold: 1.65V nominal. Trigger polarity can be set to Negative Edge or Postive Edge

Input Protection: Maximum/minimum external applied voltage is +6V or -1V.

Sync Out: Rear panel output SYNC signal goes to its active state when generator output frequency & level have settled within specification after a step change during Sweep. SYNC returns to inactive state at end of specified dwell period

Active Output Level: +5V (Active state set to 'Pos') or 0V (Active state set to 'Neg')

Output Impedance: 50 Ohm Minimum load impedance is also 50 Ohm

Output Protection: Output will withstand accidental short circuit to ground and applied external voltages up to +5V.

GENERAL SPECIFICATIONS and ORDERING INFORMATION

Display 20 character x 4 row alphanumeric LCD

Interface RS-232 and USB, full remote control facilities

Data Entry Keyboard selection of all major parameters. Value entry by character scroll using rotary control or up/down keys, or value stepping in user-selected increment values using rotary control or up/down keys

Stored Settings Up to 12 complete instrument set-ups plus 16 sweep lists may be stored in non volatile memory.

Module Width 295mm (primary console fitting only)

Ordering Information **7058: 6GHz RF Signal Generator Module**

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