



Description

The 7058 is a precision RF signal generator with a maximum frequency of 6 GHz. 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 spuri. The internal timebase has a 1 ppm 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 10 ms up to 10 s.

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. 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.

Features

- 10 MHz to 6000 MHz frequency range
- 10 Hz setability, ± 1 ppm frequency stability
- Locking to external frequency standard
- -110 dBm to +7 dBm amplitude, 0.1 dB 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

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.

Remote control: The 7058 incorporates remote control facilities for all its functions with connection internal to the CalBench control centre if ordered (software not included). An external RS-232 or USB port can be included under the console or at the rear, upon request.



Technical Specifications

Frequency

Frequency range	10 MHz to 6000 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	500 MHz Carrier: <-110 dBc/Hz (typ) @ 20 kHz offset; <-120 dBc/Hz (typ) @ 100 kHz. 3 GHz Carrier: <-95 dBc/Hz (typ) @ 20 kHz offset; <-110 dBc/Hz (typ) @ 100 kHz offset. 6 GHz Carrier: <-89 dBc/Hz (typ) @ 20 kHz offset; <-104 dBc/Hz (typ) @ 100 kHz offset.
Residual FM	Equivalent peak deviation for 300 Hz to 3.4 kHz B/W: 12 Hz at 500 MHz carrier.
Settling time	< 8 ms to settle within 100 Hz or 0.1 ppm of final frequency, if greater.

Reference frequency

Options	Internal or External.
Internal accuracy	± 1 ppm over temperature range 15 °C to 30 °C; ± 2 ppm over 5 °C to 40 °C.
Internal stability	< ± 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	-110 dBm to +7 dBm (0.1 μV to 500 mV into 50 Ω).
Setting resolution	0.1 dB (or 0.01 μV to 1 mV) by direct keyboard entry, or in user-set increments of 0.1 dB to 100 dB (or 0.01 μV to 100 mV) by rotary control or increment/decrement keys.
Accuracy	Better than ± 2 dBm.
Harmonics	<-25 dBc at +7 dBm. <-30 dBc@levels <=0 dBm 30 to 6000 MHz, <-25 dBc@levels <=0 dBm 10 to 30 MHz.
Sub-harmonics	<3000 MHz : None. >3000 MHz : <-40 dBc (typ) @ +7 dBm.
Non-harmonic spuri	<-50 dBc >10 kHz offset 10 to 3000 MHz (Note 1). <-44 dBc >10 kHz offset 3000 MHz to 6000 MHz (Note 2). Note 1: <-45 dBc >10 kHz offset 1900 to 2150 MHz. Note 2: <-39dBc >10 kHz offset 3800 to 4300 MHz.
Carrier leakage	< 0.5 μV generated into a 50 Ω load by a 2 turn 25 mm loop, at 25 mm from the generator with output set to <-10 dBm into a 50 Ω sealed load.
Output impedance	50 Ω.
Output connector	Type N.
Reverse protection	50 V 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 10.000 sec.
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 to 999.9 sec) 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.
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Other inputs/outputs

Trig in	DC coupled External Trigger Input signal used for step Sweep changes in Point Trigger mode.
Input threshold	1.65 V nominal. Trigger polarity can be set to Negative Edge or Positive Edge.
Input protection	Maximum/minimum external applied voltage is +6 V or -1 V.
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	+5 V (Active state set to 'Pos') or 0 V (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 +5 V.

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	295 mm (primary console fitting only).
Ordering information	7058: 6 GHz RF Signal Generator Module

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