

1GHz Synthesized Signal Generator



Features

- ★ Single-chip Microcomputer Controlled Modular Design
- ★ Single Loop Syth
- ★ Fine Spectral Purity
- ★ Reverse Power Protection
- ★ IEEE488 GPIB Optional
- ★ SMT Assembled, Compact Structure
- ★ Front Panel State Save / Access
- ★ High stability Oven Crystal Xtal Oscillator
- ★ High Performance / Price Ratio, High Reliability

Description

APLAB Model 2131 covers the frequency range of 100KHz to 1GHz has a RF output range of +13 to -127dBm with minimum settable resolution of 0.1dB. It is designed for applications which require good modulation, frequency, and output level performance with better spectral purity for a low price. The 2131 is well suited for testing a wide variety of RF receivers and RF devices, such as filters, amplifiers, and mixers etc. in departments like R&D laboratories, Army workshops, Air Force, Navy, Production line, Telecom Maintenance Lab, Educational Institutes and many others.

Specifications

FREQUENCY

Range	: 100KHz ~ 1003.999999MHz.
Resolution	: 1Hz.
Stability	: 3×10^{-9} /day.
Switching Speed	: <150ms.
INT Ref. Oscillator	: 10MHz.

OUTPUT

Range	: -127dBm ~ +13dBm (Reduce for 3dB in pulse modulation option).
Resolution	: 0.1dB.
Accuracy	: ± 2 dB (>-115dBm and <+10dBm).

Flatness

: ± 1 dB.
(+4dBm output level and >400kHz).

R.P.P.

: 1W (50 Ω load).

S.W.R.

: <1.5.
(carrier frequency >400kHz, level <-6dBm).

Impedance

: 50 Ω nominal.

RF Leakage

: <3 μ V (<1000MHz, <-6dBm).
(rear panel not included).

SPECTRAL PURITY

Harmonics

: <-30dBc. (output level \leq +4dBm)

Non-harmonics	: (output level $\leq +4\text{dBm}$, offset from carrier freq. $\geq 5\text{kHz}$) $< -50\text{dBc}$ ($< 251\text{MHz}$) $< -60\text{dBc}$ ($\geq 251\text{MHz}$).
Sub-harmonics	: (output level $\leq +4\text{dBm}$) $< -50\text{dBc}$.
SSB Phase Noise	: -110dBc/Hz (at 1000MHz , offset $> 20\text{kHz}$).
Residual FM (0.3 ~ 3kHz rms)	: $< 20\text{Hz}$ ($< 251\text{MHz}$) $< 10\text{Hz}$ ($< 502\text{MHz}$) $< 20\text{Hz}$ ($\geq 502\text{MHz}$).
AM MODULATION	
Radio Frequency	: $\geq 1.5\text{MHz}$.
AM Depth	: 0~70% (output level $\leq +4\text{dBm}$, int. mod) 0~100% (output level $\leq +4\text{dBm}$, ext. mod).
Resolution	: 0.10%.
Accuracy	: $\pm 7\%$ of setting $\pm 1.5\%$. (internal 1kHz modulation rate, modulation depth $\leq 30\%$).
Distortion	: 2% (carrier $< 1004\text{MHz}$) (modulation rate 1kHz , modulation depth 30%, BW : 0.3~3kHz).
INT Modulation AM	: 1KHz, 400Hz.
EXT Modulation AM (3dB Bandwidth)	
External DC	: DC~25KHz.
External AC	: 20Hz~25KHz.
Residual FM (0.05~15kHz, AVG)	: $< 0.1\%$.
FM MODULATION	
Peak Frequency	: 0 ~ 100KHz ($< 251\text{MHz}$)
Offset (AC FM), Rate $> 25\text{Hz}$)	: 0 ~ 50KHz ($< 502\text{MHz}$) 0 ~ 100KHz ($\geq 502\text{MHz}$).
FM specification are not available when (radio freq. – freq. offset) $< 100\text{kHz}$.	
Resolution	: 10Hz ($\leq 10\%$ max. peak freq. offset) 100Hz ($> 10\%$ max. peak freq. offset).
Accuracy	: $\pm 7.5\%$ of FM deviation $\pm 50\text{Hz}$.
Distortion	: $< 1\%$ (peak freq. offset $> 4\text{kHz}$).
INT Modulation FM	: 1KHz, 400Hz.
EXT Modulation FM (3dB bandwidth)	
External DC	: DC ~ 50KHz.
External AC	: 50Hz ~ 50KHz.
Mixed Modulation	: Int. Source (1kHz or 400Hz) + ext. source (ext. source $\leq 0.5\text{Vpk}$ or 0.5Vdc).
PHASE MODULATION	
Max Phase Deviation	: 0 ~ 10 rad ($< 251\text{MHz}$) 0 ~ 5 rad ($< 502\text{MHz}$) 0 ~ 10 rad ($\geq 502\text{MHz}$).

Resolution	: 0.1 rad.
Accuracy (Internal 1KHz)	: $\pm 7.5\%$ of setting ± 0.05 rad.
Modulation Rate	
Internal	: 1KHz or 400Hz.
External AC	: 50Hz ~ 10KHz (3dB BW).
Modulation Distortion:	$\pm 2\%$ (phase offset ≥ 3 rad) (Modulation Rate 1kHz, BW : 0.3~3kHz)

INTERNAL MODULATION SOURCE OUTPUT

Rate	: 1kHz or 400Hz.
Amplitude	: 1Vpk.

EXTERNAL MODULATION SOURCE INPUT

Impedance	: 600 Ω (BNC).
Amplitude	: 1Vpk (Full Scale Modulation).
High / Low Level indicated when modulation frequency 10kHz.	

STANDARD FREQ. OUTPUT

Frequency	: 10MHz.
Waveform	: Sine Wave.
Amplitude	: $> 0.3\text{Vrms}$ (50 Ω load).
Stability	: 3×10^{-8} / day.

EXTERNAL FREQUENCY STANDARD INPUT

Frequency	: 5MHz, 10MHz.
Amplitude	: 0.3Vrms ~ 1Vrms (50 Ω load).

PULSE MODULATION (OPTION)

Rising / Falling Time	: $< 15\text{ns}$.
On / Off Ratio	: $> 55\text{dB}$.

Ext Modulation Signal

Pulse Repetition Rate	: DC~10MHz
Pulse Input Amplitude	: TTL Level.

Remote Programming

Interface (Optional)	: IEEE488 GPIB.
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GENERAL

Power Voltage	: 220V $\pm 10\%$.
Power Frequency	: 50Hz $\pm 5\%$.
Power Consumption	: No more than 100VA.

ENVIRONMENTAL REQUIREMENT

Comform to Group II for environment and Class 3 for transportation in Standard GB6587.

Storage Temperature : -10°C ~ $+60^{\circ}\text{C}$.

Operating Temperature : 0°C ~ $+40^{\circ}\text{C}$.

WE PURSUE A POLICY OF CONTINUOUS DEVELOPMENT AND PRODUCT IMPROVEMENT. THUS THE SPECIFICATIONS IN THIS DOCUMENT AND THE LOCATION OF CONTROLS ON THE FRONT PANEL MAY BE CHANGED WITHOUT NOTICE.

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