

levear

280 MHz シンセサイズド信号発生器シリーズ 仕様

VP-8131D/VP-8132D/VP-8133D SPECIFICATIONS

VP-8131D / VP-8132D / VP-8133D / Common Specification		280 MHz Synthesized Signal Generator Series	
パイロット信号 / Pilot Signal			
Frequency/Accuracy:	19 kHz/±1 Hz	プリセット機能 / Preset function	
Level setting/Resolution:	0 to 19.9 %/0.1 %	Assorted preset:	100 data (Panel condition, I/O condition, Output level)
Accuracy:	±1 %	インタフェース / Interface	
コンボジット出力 (内部変調に対する規定) / Composite output (Against the internal modulation)			
Level:	0 to 9.99 V [p-p] Open end ±5 %	GP-IB:	Listener/talker, Listen only, Talk only, Remote/local, Device clear
Output impedance:	Approx. 75 Ω		SH1, AH1, T7, L3, SR0, RL1, PP0, DC1, DT0, C0
Stereo separation:	≥ 60 dB, 90 % level ratio (AF: 1 kHz)	External control interface:	(1) Sequential recall (Up/Down/Clear)
Distortion:	0.01 % (RC oscillator)		(2) Modify (Freq./Level)
S/N:	≥ 90 dB, 100 % level ratio		(3) Direct recall
38 kHz sub carrier leakage:	≤ -50 dB		(4) 8 bits TTL control
			(5) 8 bits data read
			(6) Relay drive (Dummy antenna switching)
19 kHz出力信号 / 19 kHz output signal			
Level:	Approx. 1 V [rms]	その他 / Others	
Impedance:	Approx. 1 kΩ	Power requirement:	AC100/120/220/230 V
SCA信号 / SCA signal			
Frequency range:	20 to 99 kHz ±1 dB (57 kHz ref.)	Frequency:	50 Hz/60 Hz
Input level:	0.56 V [p-p] (0.2 V [rms])	Power consumption:	Approx. 90 V-A
	Equivalent to 10 % level ratio	Mass・Dimension:	W 426 x H 99 x D 400 mm
Input impedance:	Approx. 10 kΩ		Approx. 15 kg
		Accessories:	Output cable, GP-IB connector shield cap, Power cable, Spare fuse, Operation manual

* Windowsは米国Microsoft Corporationの登録商標です。
* Windows is the trade mark of Microsoft Corporation.

信号発生器シリーズ Signal Generator Series

140 MHz VP-8193D / VP-8194D

280 MHz VP-8131D / VP-8132D / VP-8133D



安全に関するご注意

●ご使用の際は、「取扱説明書」よくお読みの上 正しくお使いください。

●お問い合わせは……

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本カタログ掲載商品の仕様、デザイン等は性能改善のため予告なく変更させていただくことがあります。
Specifications are subject to change without notice for product improvement.

Sep. 2011 Printed in Japan

●カタログと実際の商品・画面の色は印刷インキの関係で多少異なって見えることがありますのでご了承ください。

140 MHz Signal Generator

高性能・長寿命を追求

本シリーズは、カーオーディオ、ポータブルオーディオ、ホームオーディオなどの生産ライン用に最適な高性能・低価格のAM/FM信号発生器です。100 kHz～140 MHz、162 MHz～163 MHz、の広帯域に加え、S/N 76 dB以上 (FM) の高純度信号源と電子アッテネータによって、0.1 dB分解能で126 dBμV[emf]の出力が得られます。また、周波数の高速切換え、長寿命のアッテネータを採用しているほか、外部制御インターフェースはGP-IB、RS-232-Cを標準装備、パソコンと連動使用も可能です。さらに、VP-8194Dは、FMステレオ変調に加え、RDSとARI信号発生源を一体化。生産工程での省スペース化と使いやすさを実現します。

This series provides a versatile choice of high performance, low cost, AM/FM signal generators ideal for use on car audio, portable audio and home audio production lines. In addition to a wide 100 kHz to 140 MHz, 162 MHz to 163 MHz bandwidth, the new series boasts functions and performance easily comparable to high-end conventional signal generators, featuring a high-purity signal source with S/N of 76 dB or more (FM), 0.1 dB resolution electronic attenuator giving up to 126 dBμV [emf] output, and a comprehensive range of standard interfaces including GP-IB and RS-232-C. With its high speed frequency switching and long-life attenuator, and the capability in the VP-8194D model to include an RDS + ARI signal source and FM stereo modulation in a single unit, the compact size of this powerful, yet simple to operate, instrument can save valuable production line space.

High-performance 140 MHz signal generator series. Two models a AM・FM modulator with FM stereo modulator and RDS+ARI generator/FM stereo modulator.

主な特徴 / FEATURES

- 高出力電子アッテネータ搭載** (-20 dBμV～126 dBμV [emf])
High output and equipped, with an electronic attenuator. -20 dBμV to 126 dBμV [emf] with 0.1 dB step control.
- 100 kHz～140 MHz、162 MHz～163 MHzの広帯域**
100 kHz to 140 MHz, 162 MHz to 163 MHz wide frequency range.
- AM/FM同時変調機能を搭載**
Simultaneous AM/FM modulation.
- FMステレオ変調機能を搭載**
FM stereo modulation function.
- RDS+ARI信号発生器を搭載** (VP-8194D)
RDS + ARI Signal Generator built in. (VP-8194D)
- DDSによる20 Hz～20 kHzのオーディオ信号源(オプション)**
20 Hz to 20 kHz DDS audio signal source. (Option)
- 多彩なI/O機能を標準装備** (GP-IB, RS-232-C, EXT I/O)
GP-IB, RS-232-C, EXT I/O interfaces as standard.

Option

DDSオーディオ信号発生器
DDS Audio Signal Generator

400 Hz/1 kHzの固定周波数に加えて、周波数可変の変調信号源として、20 Hz～20 kHz/分解能1 HzのDDS信号源を取り付けることができます。
In addition to 400 Hz/1 kHz fixed frequencies, a 20 Hz to 20 kHz/1 Hz resolution DDS signal source option can be installed to provide a variable frequency modulation signal source.

*DDS=ダイレクト・デジタル・シンセサイザ *DDS=Direct Digital Synthesizer

機能 / FUNCTION

変調 / Modulation

FM変調: 0.0 kHz～100 kHz、AM変調: 0%～80%。ひずみ率: FM 0.05%以下、AM 0.5%以下。
FM: 0.0 kHz to 100 kHz, AM: 0% to 80%. Distortion: FM 0.05% or less, AM 0.5% or less.

- 3桁デジタル表示によりFM変調は0.0 kHz～100 kHzを0.5 kHzステップで、AM変調は0%～80%を0.5%ステップで設定できます。
- 外部変調入力信号は適正レベル(1V[peak])に対するHIGH/LOWを表示。任意の変調度が設定できます。
- 内部/外部信号の組合せにより、4種類のAM/FM同時変調ができます。
- Three digit setting of modulation level, FM: 0 kHz to 100 kHz/0.5 kHz step and AM: 0% to 80%/0.5% step.
- Equipped HIGH/LOW indicator to 1 V[peak] for external modulation signal input. Modulation level setting correspond to internal modulation.
- Internal/External combination modulation of four kinds of simultaneous AM/FM modulation function.

周波数 / Frequency

広帯域: 100 kHz～140 MHz、162 MHz～163 MHz
シンセサイズド方式による100 Hzの分解能、5×10⁻⁸の高安定度。
Wide frequency range of 100 kHz to 140 MHz, 162 MHz to 163 MHz Synthesized system of 100 Hz resolution and 5×10⁻⁸ accuracy.

- 100 Hz分解能による7桁周波数表示。
- FM帯の最高イメージ周波数をカバー。
- FM帯域でS/N 76 dB以上の高品位の信号純度。
- 700 ms(代表値)の高速レスポンスを実現。
- 妨害や選択度特性試験に便利なΔF機能を搭載し、離調周波数などを簡単に直読できます。
- 100 Hz resolution 7-digit display.
- Support for highest FM band image frequencies measurement.
- Excellent high purity of S/N 76 dB or higher.
- 700 ms (Typical) of high setting speed.
- Convenient ΔF display function for interference and selectivity measurements

出力 / Output

高出力レベル(-20 dBμV～126 dBμV [emf])
マイクロプロセッサ補正による0.1 dBステップの高分解能。
High output level (-20 dBμV to 126 dBμV [emf]) microprocessor compensated high accuracy of 0.1 dB step.

- 電子アッテネータを搭載し、長寿命化を実現。
- 切れ目のない連続的なアッテネータ制御で、正しいAGC制御ができます。
- ΔdB機能によりAGCやリミッティング感度を直読できます。
- モディファイつまみによる簡単な可変操作機能。
- Electronic attenuator for long-term durability.
- Continuous attenuation control for correct AGC range measurement.
- ΔdB function allows direct AGC level and limiting sensitivity measurements.
- Easy operation of frequency modify knob.

メモリ & インタフェース / Memory & Interface

GP-IB・RS-232-Cインターフェースを標準装備
オートシーケンス/EXTコントロールI/Oでミニシステムを構築。
GP-IB and RS-232-C interfaces as standard. Auto sequence and EXT I/O for simple system.

- オートシーケンス機能: 外部のPCやコントローラを使用せずに、弊社のオーディオアナライザと組合せてミニシステムを構築できます。
- EXTコントロールI/O: 8ビットのTTL入出力を2ポートを持ち、本器の制御と同時に他の機器または測定治具を制御できます。
- GP-IB: 自動計測用として標準装備しています。
- RS-232-C: PCとの直接制御やRDSデータの変更にも使用できます。
- Auto sequence function: Use in combination with a Levear Audio Analyzer to create a simple automatic measurement system.
- No external PC or controller is required.
- EXT Control I/O: Two 8-bit ports for external control of system instruments and peripherals.
- GP-IB: Built-in as standard for use in automatic measurement systems.
- RS-232-C: Allows direct PC control and RDS data modification.

VP-8193D

FMステレオ変調信号搭載型
Standard model with AM/FM monaural + FM stereo modulator functions:



優れた信号純度を持つスタンダードモデルに、FMステレオ分離度55 dB以上の高性能ステレオ機能を搭載。

The standard model, featuring a high-purity signal source, plus an internal high performance FM stereo modulation function with a high stereo separation ratio better than 55 dB.

VP-8194D

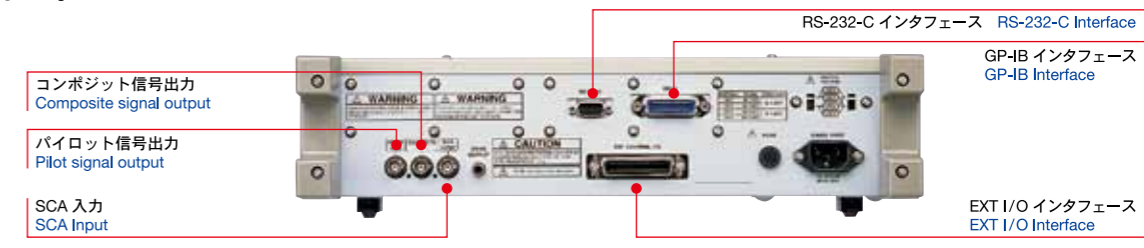
RDS+ARI信号・FMステレオ信号搭載型
Model with AM/FM monaural/FM stereo + RDS-ARI signal source:



VP-8194DはFMステレオ変調に加えて、欧州CENELEC規格に準拠したRDS+ARI信号源を一体化。16種類のRDSパターンを内蔵メモリにストア可能。付属のエディタソフトは、Windows OSを搭載したPC上でのRDSパターン作成可能。

The model VP-8194D signal generator with FM stereo modulator and RDS + ARI generator. Built-in CENELEC compliant RDS/ARI signal source and RDS 16-pattern memory. Included editor software (Windows) allows RDS data to be easily downloaded through RS-232-C interface and edited on a PC.

背面パネル / Rear Panel



280 MHz Synthesized Signal Generator

電子アッテネータ、DDS機能を搭載 (VP-8133D) の280 MHzシンセサイズド信号発生器は、多機能スタンダードから、AM/FMステレオ変調信号搭載型まで、3機種をラインアップ。用途に応じてお選びください。

Versatile three model lineup includes a DDS signal generator. these models feature electronic attenuation.

	Electronic ATT	F M	A M	FM stereo	AM stereo	DDS
VP-8131D	●	●	●	●		
VP-8132D	●	●	●	●	●	
VP-8133D	●	●	●	●		●

VP-8131D FMステレオ変調信号搭載 With FM stereo modulator



すぐれた信号純度を持つ基本モデルに、ステレオ分離度 60 dB以上の高性能FMステレオ変調信号を搭載。

Additional FM stereo modulation with 60 dB or more stereo separation.



VP-8132D FMステレオ・AMステレオ変調信号搭載 With FM /AM stereo modulator



FMステレオに加え、AMステレオ変調信号 (C-QUAM) を搭載した高性能信号源。

Additional High performance signal generator with FM and AM stereo (C-QUAM) modulation.



VP-8133D DDS信号搭載 With DDS Signal Source

*DDS=ダイレクト・デジタル・シンセサイザ *DDS=Direct Digital Synthesizer



FMステレオに加え、AF信号源としてDDS信号を搭載。周波数特性測定に有効。

Direct digital synthesizer for enhanced frequency response measurements.



機能 / FUNCTION

低FM変調ひずみ率、低スプリアス、高純度
基本性能重視

Low FM modulation distortion, low spurious, high purity source for all basic performance tests

- LW~VHF帯を幅広くカバー。
- 基本性能も高性能受信機を測定するにふさわしい0.01 %以下の低FMひずみ率、-60 dBcの低スプリアス、90 dB以上のS/Nを確保しました。
- Covers wide range from LW to VHF.
- Supports hi-fi receiver tests with low -60 dBc spurious and 90 dB or more S/N ratio.

FM/AM高純度信号 FM/AM high purity signals

- FM/AM高性能受信機のテストソースとして、FM変調ひずみ率0.01 %以下、AM変調ひずみ率0.1 %以下、非高調波スプリアス-60 dBcを実現。
- 残留変調成分として、FM成分90 dB以上、AM成分65 dB以上のS/Nを確保。
- Low FM (0.01% or less) and AM (0.1% or less) modulation distortion with -60 dBc non-harmonic spurious for testing hi-fi receivers.
- Residual distortion of better than 90 dB (FM) and 65 dB (AM).

2 V (19 dBm)の高出力 High 2 V output (19 dBm)

- -133~+19 dBm (50 Ω)の高出力。
- アッテネータの設定は0.1 dBの分解能で全域カバー。
- 7種類の単位表示を選択可能。
- 出力レベルステップ可変機能付。
- High output from -133 to +19 dBm (50 Ω).
- 0.1 dB attenuator setting resolution for all ranges.
- Results can be displayed in a choice of 7 units.
- Built-in output level sweep function.

10 Hzの高分解能 (10 kHz~140 MHz)

High 10 Hz RF resolution (10 kHz to 140 MHz)

- 周波数範囲0.01~280 MHzでLW、AM、FM帯に加え、VHFのTV帯をカバー。高級チューナやカーオーディオ機器から、ページャ、各種通信機器まで、幅広い用途で活躍します。
- 8桁の高分解能、140.000 02~280.000 00 MHzにおいて、20 Hz、140 MHz以下を10 Hzの分解能で設定できる高性能を実現しました。
- 周波数ステップ可変機能を標準装備しています。
- Frequency range of 0.01 to 280 MHz covers LW, AM, FM and VHF TV bands to allow testing of anything from hi-fi tuners, car audio and pagers to communications equipment.
- 8-digit high resolution setting: 20 Hz (140.000 02 to 280.000 00 MHz) and 10 Hz (below 140 MHz).
- Frequency sweep function provided as standard.

長寿命を実現した
電子アッテネータを全帯域に採用

VP-8131 series features Long-life electronic attenuation for all bands

- RF部には電子アッテネータを採用。高速自動検査装置などに要求される長寿命化を実現しました。
- RF section employs electronic attenuation to achieve the reliable long life required for high speed automated testing systems.

デジタル発振器 (DDS) 搭載 (VP-8133D)

Built-in direct digital synthesizer (VP-8133D)

- VP-8133Dは、400 Hz、1 kHzの内蔵発振器に加え、DDSを搭載。20 Hz~20 kHz、1 Hzステップで周波数特性の測定ができます。
- The VP-8133D features a DDS in addition to 400 Hz/1 kHz internal oscillators to allow 1 Hz step frequency response measurements from 20 Hz to 20 kHz.

すぐれたスペースファクタ
計測をシンプル化

Space saving design simplifies measurements

- AM/FM両ステレオ変調信号を搭載することで、測定器の構成が大幅にシンプルになり、最適な測定条件を創り出すことが可能です。(VP-8132D)それぞれの信号を切換えたり、変調系のさまざまな接続の手間を省きました。
- Built-in AM/FM stereo modulation (VP-8132D) makes it easy to configure measurement instruments and set up optimal measurement conditions. Switching signals and connecting instruments is greatly simplified.

高速レスポンス、GP-IB対応

High-speed GP-IB interface

- GP-IB標準装備。周波数セトリングタイム 70 msで、システムの高速度に対応します。
- Standard GP-IB interface with fast 70 ms frequency, settling time supports high-speed system automation.

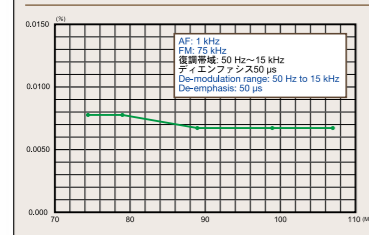
フレキシブルに対応する MEMORY & INTERFACE

Flexible memory and interfaces

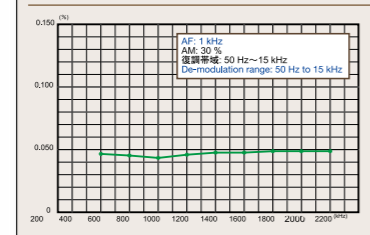
- オートシーケンス機能: 外部にコンピュータやコントローラを使用せずに、オーディオアナライザなどと組合せてミニシステムが容易に構築できます。また、パネルコンディショニングを100通りストアできるメモリ機能も標準装備しています。EXTコントロールI/O: 8ビットのTTL入出力を2ポート持ち、本器の制御と同時に、他の機器あるいは測定治具、表示器などの制御にご使用いただけます。
- An auto sequence function makes it simple to create an automatic measurement system by combining the SSG with an audio analyzer, etc. No external PC or controller is required. Standard memory can hold up to 100 combinations of panel settings. External control of other instruments and automated test system peripherals is supported by a 2-port, 8-bit TTL I/O external control interface.

代表特性例 / Typical data of performance

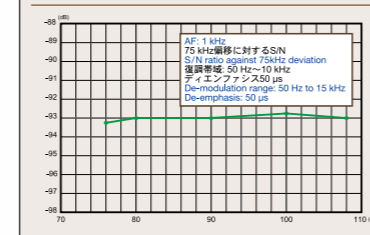
0.01 %以下のFM変調ひずみ
FM modulation distortion of 0.01 % or less



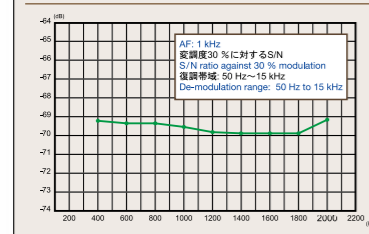
0.1 %以下のAM変調ひずみ
AM modulation distortion of 0.1 % or less



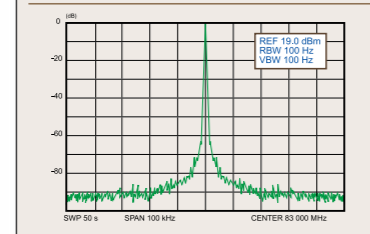
90 dB以上のFM残留変調 (S/N) 特性
FM residual modulation (S/N) of 90 dB or more



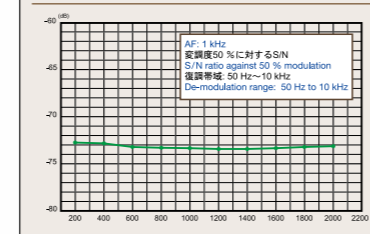
65 dB以上のAM残留変調 (S/N) 特性
AM residual modulation (S/N) of 65 dB or more



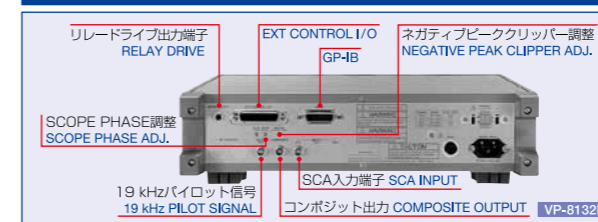
スプリアス
Spurious



AMステレオ残留変調 (S/N) 特性
AM stereo residual distortion (S/N)



背面パネル/Rear Panel



- リレードライブ端子 RELAY DRIVE
- EXT CONTROL I/O
- ネガティブピーククリッパー調整 NEGATIVE PEAK CLIPPER ADJ.
- SCOPE PHASE調整 SCOPE PHASE ADJ.
- 19 kHzパイロット信号 19 kHz PILOT SIGNAL
- SCA入力端子 SCA INPUT
- コンボジット出力 COMPOSITE OUTPUT

VP-8193D / VP-8194D / Common Specification	
周波数 / Frequency	
Frequency range	100 kHz to 140 MHz
Max. display / Resolution	7-digit / 100 Hz
Frequency band	Band 1: 0.100 0 MHz to 35.000 0 MHz Band 2: 35.000 1 MHz to 70.000 0 MHz Band 3: 70.000 1 MHz to 140.000 0 MHz
Accuracy	$\pm 5 \times 10^{-6}$
Temperature coefficient	$\pm 5 \times 10^{-8}$ 10 °C to 35 °C

Weather band	
Frequency range	162 MHz to 163 MHz
Resolution	100 Hz
Freq. accuracy	$\pm 5 \times 10^{-6}$
Weather band Mod. mode	FM monoral only

出力 / Output	
Output range	-20 dB μ V to 126 dB μ V[emf]
Display range / Resolution	4-digit / 0.1 dB
Accuracy	± 1.5 dB (RF \geq 0 dB μ V[emf]), ± 2.0 dB (RF<0 dB μ V[emf])
Output impedance	50 Ω
VSWR	≤ 1.3 (RF \leq +101 dB μ V[emf])
Unit	dB μ V[emf]
Attenuator construction	Semiconductor (Except 106 dB and 106.1 dB points)

信号純度 / Signal purity	
Harmonic spurious (2nd/3rd)	≤ -30 dBc
Non harmonics spurious	≤ -50 dBc (Band 2 to 3) ≤ -40 dBc (Band 1: 0.1 MHz \leq fs \leq 35 MHz) ≤ -30 dBc (Band 1: fs \geq 35,000 1 MHz) (At a point of 10 kHz or more from the carrier) (fs: Spurious output frequency)

残留変調 / Residual Modulation	
FM components	(AF 1 kHz, FM 75 kHz) ≥ 76 dB (10.7 MHz \pm 1 MHz / 76 MHz to 108 MHz) ≥ 73 dB (0.3 MHz to 140 MHz) (BW 50 Hz to 15 kHz, De-emphasis 50 μ s)
AM components	(AF 1 kHz, AM 30 %) ≥ 55 dB (0.4 MHz to 1.7 MHz) ≥ 50 dB (0.15 MHz to 140 MHz) (BW 50 Hz to 15 kHz) (Except beat element)

変調関係 / Modulation	
Internal signal source	RC oscillator 400 Hz / 1 kHz \pm 3 %
Ext. input impedance	Approx. 10 k Ω
Ext. input voltage	Approx. 1 V [peak]

オプション / Option	
DDS Oscillator [VQ-081G]	
Oscillator type	Direct Digital Synthesizer 12 bit
Frequency / Resolution	20 Hz to 20 kHz / 1 Hz
Freq. accuracy	± 0.1 %

振幅変調 (AM) / Amplitude modulation (AM) (RF: ≥ 150 kHz)			
Modulation range	0 % to 80 %		
Modulation setting range	0 % to 100 %		
Resolution	0.5 %		
Accuracy			
(0.4 MHz to 1.7 MHz)	\pm (setting \times 0.1 + 1) % (≤ 80 %)		
(0.15 MHz to 140 MHz)	\pm (setting \times 0.1 + 2) % (≤ 80 %) (BW 50 Hz to 15 kHz, AF 1 kHz)		
Freq. / Modulation	0 % to 30 %	30 % to 60 %	60 % to 80 %
(0.4 MHz to 1.7 MHz)	≤ 0.5 %	≤ 1.5 %	≤ 3 %
(0.15 MHz to 140 MHz)	≤ 1.5 %	≤ 3 %	≤ 5 %
	(Except beat element)		

Incidental FM (AF 1 kHz, AM 30 %)	
(0.4 MHz to 1.7 MHz)	≤ 150 Hz
(0.15 MHz to 140 MHz)	≤ 300 Hz
External modulation	$\leq \pm 1$ dB: 20 Hz to 10 kHz (1 kHz reference)
Frequency characteristics	Max. Modulation frequency should be lower than 2 % of carrier frequency at 30 % modulation condition

周波数変調 (FM) / Frequency modulation (FM) (RF: ≥ 0.3 MHz)	
Deviation range	0.0 kHz to 100 kHz
MAX. FM deviation	RF ≥ 35 MHz Up to 25 % of carrier frequency
Resolution	0.5 kHz
Accuracy	
(10.7 MHz \pm 1 MHz / 76 MHz to 108 MHz)	\pm (setting \times 0.1 + 0.5) kHz
(0.3 MHz to 140 MHz)	\pm (setting \times 0.1 + 1) kHz
Distortion	
(10.7 MHz \pm 1 MHz / 76 MHz to 108 MHz)	≤ 0.05 %
(0.3 MHz to 140 MHz)	≤ 0.1 %
	(AF 1 kHz, FM 75 kHz, BW 50 Hz to 15 kHz, De-emphasis 50 μ s)

Incidental AM	
≤ 0.5 %: 10.7 MHz \pm 1 MHz / 76 MHz to 108 MHz (AF 1 kHz, FM 75 kHz)	
Ext. modulation Frequency response	
MONO	$\leq \pm 1$ dB (20 Hz to 100 kHz, 1 kHz ref.)
STEREO	$\leq \pm 1$ dB (20 Hz to 15 kHz, 1 kHz ref.)
Pre-emphasis	25 μ s / 50 μ s / 75 μ s / OFF
FM-AM simultaneous modulation	(4 kinds)
	AM / FM mono modulation
	AM / FM stereo modulation

140 MHz Signal Generator Series

FM stereo modulation		
Frequency range	RF ≥ 0.3 MHz	
Main & Sub channel modulation mode		
Mode	Signal source	Contents
L = R, L, R, L = -R	INT/EXT	Single frequency, Stereo modulation
MONO	INT/EXT	Monophonic modulation
Modulation range	0 % to 127 % (at 75 kHz / 100 %)	
Modulation resolution	1 %	
Accuracy		
(10.7 MHz \pm 1 MHz / 76 MHz to 108 MHz)	\pm (setting \times 0.1 + 1) %	
(0.3 MHz to 140 MHz)	\pm (setting \times 0.1 + 1.5) %	
Stereo separation	≥ 55 dB (AF 1 kHz, 100 % Mod., 76 MHz to 108 MHz)	

パイロット信号 / Pilot signal	
Frequency / Accuracy	19 kHz / ± 1 Hz
Level range / Resolution	0.0 % to 15.0 % / 0.1 %
Accuracy	\pm (setting \times 0.1 + 1) % (10.7 MHz \pm 1 MHz / 76 MHz to 108 MHz)

コンポジット出力 / Composite output	
Level	5 V [p-p] ± 10 % (FM-MONO, 100 % Mod.)
Output impedance	Approx. 600 Ω
Stereo separation	≥ 55 dB (AF: 400 Hz, 1 kHz) (10.7 MHz \pm 1 MHz / 76 MHz to 108 MHz)
Distortion	≤ 0.05 %
38 kHz sub-carrier leakage	≤ -50 dB

19 kHz出力信号 / 19 kHz output signal	
Level	Approx. 1 V [rms]
Output impedance	Approx. 1 k Ω

SCA入力 / SCA input	
Input level	0.56 V [p-p] (0.2 V [rms]) (Equivalent to 10 % level ratio)
Frequency range	20 kHz to 99 kHz ± 1 dB (57 kHz ref.)
Input impedance	Approx. 10 k Ω

プリセット機能 / Preset function	
Assorted preset	100 data (Panel condition, I/O condition, Output level)

インタフェース / Interface	
GP-IB	Listener / talker /, Listen only, Talk only, Remote / local, Device clear SH1, AH1, T7, L3, RL1, DC1
RS-232-C	
Baud rate	38 400 bps
Character length	8 bit
Parity	EVEN
Flow control	Software flow control \times on / \times off
Stop bit	1 bit
External control interface	(1) Sequential recall, (2) Modify, (3) Direct recall, (4) TTL control, (5) Data read, (6) Relay drive

その他 / Others	
Power requirement	AC100 V / 120 V / 220 V / 230 V
Frequency	50 Hz / 60 Hz
Power consumption	Approx. 60 VA
Dimension / Mass	W 426 mm \times H 99 mm \times D 300 mm / Approx. 9 k g
Accessories	Power cable $\times 1$, Spare fuse $\times 1$, Operation manual $\times 1$ RDS editor software (VP-8194D only) $\times 1$

VP-8194D	
ARI Modulation	
SK signal	
Frequency	57 kHz ± 6 Hz
Level	0.0 % to 10 % (100 % = 75 kHz)
Resolution	0.1 %
Accuracy	\pm (setting \times 0.1 + 0.5) %
Phase	0 deg ± 10 deg (to the pilot signal)
DK signal	
Frequency accuracy	125 Hz ± 1 %
AM modulation range	0 % to 40 %
AM resolution	1 %
AM accuracy	± 5 %
AM distortion	≤ 1 % (SK=5.3 %, AM=30 %)
BK signal	
Frequency accuracy	Code A: 23.75 Hz ± 1 %, Code B: 28.27 Hz ± 1 % Code C: 34.93 Hz ± 1 %, Code D: 39.58 Hz ± 1 % Code E: 45.67 Hz ± 1 %, Code F: 53.98 Hz ± 1 %
AM modulation range	0 % to 80 %
AM resolution	1 %
AM accuracy	± 5 %
AM distortion	≤ 2 % (SK=5.3 %, AM=60 %)

RDS modulation	
Level range	0.0 % to 10 % (100 % = 75 kHz)
Resolution	0.1 %
Accuracy	\pm (setting \times 0.1 + 0.5) %
Spurious	≤ -50 dB (≤ 53 kHz, 10 % output), ≤ -40 dB (≥ 61 kHz, 10 % output)
Sub-carrier frequency	57 kHz ± 6 Hz
Phase	0 deg or 90 deg ± 10 deg (to the pilot)
Leakage	≤ -50 dB
Internal data	
Mode	Sub-carrier / Null / Internal
Pattern number	Max. 16
Pattern length	Max. 2 048 groups

VP-8131D / VP-8132D / VP-8133D / Common Specification			
周波数 / Frequency			
Frequency range:	0.01 to 280 MHz		
Display / Resolution:	0.010 00 to 280.000 00 MHz		
	Band	RF frequency	Resolution
	4	140.00002 to 280.00000	20
	3	70.00001 to 140.00000	10
	2	35.00001 to 70.00000	10
	1	0.01000 to 35.00000	10
	VP-8132D/AM ST	0.010000 to 2.000000	1

Switching speed:	70 ms or less (To be within 100 Hz to final frequency) Processing time: ≤ 15 ms Settling time: ≤ 55 ms
Accuracy:	$\pm 2 \times 10^{-6}$ ± 1 digit
Aging rate:	$\pm 2 \times 10^{-7}$ / week
Temperature coefficient:	$\pm 2 \times 10^{-6}$ / (10 to 35 °C)

出力 / Output Level	
Output level range:	-133 to +19 dBm (50 Ω) -134.8 to +17.2 dBm (75 Ω)
Resolution:	0.1 dB
Accuracy:	± 1 dB (≥ -113 dBm: 50 Ω) ± 1.5 dB (< -113 dBm: 50 Ω)
Flatness:	± 1 dB or less (Output level: +8 dBm, 50 Ω)
Output impedance:	50 Ω / 75 Ω
VSWR:	≤ 1.2 (Output level \leq +3 dBm: 50 Ω)
Radiation interference:	≤ 1 μ V (25 mm apart from the main body)
Unit:	dBm, dB μ V, dB μ V [emf], mV, μ V, mV [emf], μ V [emf]

信号純度 / Signal purity	
Spurious:	
Harmonics:	
RF: 0.01 to 35 MHz	≤ -30 dBc (Output $> +13$ dBm: 50 Ω)
RF: 0.01 to 35 MHz	≤ -40 dBc (Output $\leq +13$ dBm: 50 Ω)
RF: 35.000 1 to 280 MHz	≤ -30 dBc (Output $\leq +13$ dBm: 50 Ω)
Non-harmonics:	≤ -60 dBc (± 10 kHz offset from carrier)

残留変調 / Residual modulation	
FM component:	(AF 1 kHz, FM 75 kHz) ≥ 90 dB (10.7 ± 1 MHz, 76 to 108 MHz) ≥ 80 dB (0.3 to 280 MHz) (BW 50 Hz to 15 kHz) (De-emphasis 50 μ s)
AM component:	(AF 1 kHz, AM 30 %) ≥ 65 dB (0.4 to 1.7 MHz) ≥ 60 dB (0.15 to 280 MHz) (BW 50 Hz to 15 kHz) (Except beat element)

変調関係 / Modulation	
Internal modulation signal:	
RC oscillator:	400 Hz, 1 kHz ± 3 %
DDS:	VP-8133D only
Frequency range / Accuracy:	20 Hz to 20 kHz / ± 0.01 %
Resolution:	1 Hz
Flatness:	Same as ext. modulation frequency response
Ext. modulation input impedance:	Approx. 10 k Ω
Ext. modulation input voltage:	Approx. 1V [peak]

振幅変調 (AM) / Amplitude modulation (AM)			
Modulation depth:	0 to 100 % (Output level \leq +13 dBm, RF ≥ 0.15 MHz)		
Resolution:	0.5 % (0 to 100 %)		
Accuracy:	(AF 1 kHz) (0.4 to 1.7 MHz) \pm (Reading $\times 0.04 + 2$) % (≤ 80 %) (0.15 to 280 MHz) \pm (Reading $\times 0.06 + 2$) % (≤ 80 %)		
Distortion:	(Output level \leq +8 dBm, BW 50 Hz to 15 kHz, AF 1 kHz: RC)		
Modulation:	0 to 30 %	30 to 60 %	60 to 80 %
Band 1: 0.4 to 1.7 MHz	≤ 0.1 %	≤ 0.5 %	≤ 1 %
All band: 0.15 to 280 MHz	≤ 1 %	≤ 2 %	≤ 3 %
	(Except beat element)		

Incidental FM: (AF 1kHz AM 30 %)	
(0.4 to 1.7 MHz)	≤ 75 Hz
(0.15 to 280 MHz)	≤ 200 Hz
Ext. modulation frequency response:	$\leq \pm 1$ dB: 20 Hz to 10 kHz (Ref.: 1 kHz RF ≥ 0.15 MHz) (Max. modulation frequency is up to 2 % of carrier frequency at 30 % AM.)

周波数変調 (FM) / Frequency modulation (FM)			
Frequency deviation range:	0 to 9.99 kHz	10 to 99.9 kHz	100 to 300 kHz
Resolution:	10 Hz	100 Hz	1 kHz
	(Max. FM deviation is up to 25 % of carrier frequency)		
Accuracy:	\pm (Reading $\times 0.08 + 1$ digit)		
Distortion:	(AF 1 kHz, FM 75 kHz, BW 50 Hz to 15 kHz, De-emphasis 50 μ s) ≤ 0.01 % (10.7 ± 1 MHz, 76 to 108 MHz) ≤ 0.1 % (0.3 to 140 MHz) ≤ 0.5 % (140.000 02 to 280 MHz)		
Incidental AM:	(AF 1 kHz FM 75 kHz) ≤ 0.5 % (10.7 ± 1 MHz, 76 to 108 MHz)		
Ext. modulation frequency response:	MONO mode (20 Hz to 100 kHz, 1 kHz ref.) $\leq \pm 0.3$ dB (76 to 108 MHz) $\leq \pm 1$ dB (0.3 to 280 MHz)		

280 MHz Synthesized Signal Generator Series	
Ext. modulation frequency response:	Other than MONO mode (20 Hz to 15 kHz, 1 kHz ref.) $\leq \pm 1$ dB (2,000 01 to 280 MHz)
FM-AM simultaneous modulation:	4 kinds

FMステレオ / FM stereo	
Frequency range:	2.00001 to 280 MHz
Modulation mode:	

Mode	Modulation signal	Contents
OFF	-	Pilot signal only
L=R	INT L, EXT L	Setero modulation by single signal
L		
R		
L = -R		
MONO	INT/EXT L	Monophonic modulation
INT L	Lch: INT L	Stereo modulation by Int. & Ext.
EXT R	Rch: EXT R	
EXT L,R	Lch: EXT L Rch: EXT R	Stereo modulation by Ext. two signals

Specification of monophonic modulation mode is based on the common specification of this series.

信号レベル比 (M+S可変) / Signal level ratio (M+S variable)	
Range:	0 to 114 % (Other than Monophonic) 0 to 127 % (MONO)
Resolution:	1 %
Accuracy:	± 5 %
Pre-emphasis:	25 μ s / 50 μ s / 75 μ s / OFF
Stereo separation:	(AF 1 kHz 67.5 kHz deviation 76 to 108 MHz) ≥ 60 dB

VP-8132D	
AMステレオ / AM stereo	
AM stereo:	C-QUAM (Motorola system)
RF frequency:	0.400000 to 2.000000 MHz
Resolution:	1 Hz

残留変調 / Residual modulation	
AM component:	(AF 1 kHz, Main ch. 50 % modulation) ≥ 65 dB (BW 50 Hz to 10 kHz)