Specifications

Frequency	
Frequency Range	9 kHz to 3.0 GHz
Frequency Readout	Start, Stop, CF, Marker
Accuracy	± (freq readout × freq ref error + 5% × span + 15% × RBW + 10 Hz)
Count Frequency Marker	
Resolution	1 Hz to 1 kHz
Count Accuracy	± (marker freq × freq reference accuracy + 1 LSD ±5 Hz)
Accuracy	(S/N ≥ 25 dB, RBW ≥ 3 kHz, 1 kHz ≤ SPAN ≤ 200 MHz)
Frequency Reference Accuracy	$\pm 2 \times 10^{-6}$/year $\pm 1 \times 10^{-5}$ (at 0°C to 50°C)
Frequency Span	
Range	1 kHz to 3.2 GHz, ZERO span
Accuracy	≤±5%
Frequency Stability	
Residual FM	≤60 Hz_{p-p}/100 ms (ZERO span, RBW = 100 Hz)
Frequency Drift	<150 Hz/min (SPAN ≤ 10kHz) After warm up 30min, At stable temperature
Noise Sidebands	≤ –105 dBc, at 20 kHz offset ≤ –100dBc, at 10kHz offset
Resolution Bandwidth	(3 dB)
Range	1 kHz to 3 MHz 1–3 sequence 100 Hz, 300 Hz (OPT.26)
Bandwidth Accuracy	≤ ±20% (1 kHz to 1 MHz) ≤ ±25% (3 MHz)
Selectivity	< 15:1 (60 dB : 3 dB, 1kHz to 3MHz)
Video Bandwidth	10 Hz to 3 MHz (1–3 step)

Amplitude Range	U3641	U3641N
Amplitude Range	+20 dBm to displayed Average Noise Level	+130 dBµV to displayed Average Noise Level
Maximum Input Level	±50 V DC max.	
Preamplifier OFF (Input atten ≥ 10 dB)	+27 dBm	+134 dBµV
Preamplifier ON (Input atten ≥ 10 dB)	+13 dBm	+120 dBµV
Display Range		
Log Linear	10 × 10 div 10, 5, 2, 1 dB/div 10% of reference level/div, RBW ≥ 3kHz	
Reference Level Range		
Preamplifier OFF	(Input Atten 0 dB to 50 dB)	
Log	–64 dBm to +40 dBm (0.1 dB step)	+46 dBµV to +150 dBµV
Linear	+141.1 µV to +22.36 V	+198.4µV to 31.44V
Preamplifier ON	(Input Atten 0 dB to 10 dB)	
Log	–89 dBm to –25 dBm (0.1 dB step)	+21 dBµV to +85 dBµV
Linear	+7.934 µV to +12.57 mV	+11.16 µV to +17.68mV
Input Attenuator Range	0 dB to 50 dB (10 dB step)	

Sweep	
Sweep Time	50ms to 1000s 50 µs to 1000s(ZERO span)
Accuracy	≤ ±5%
Trigger mode	FREE RUN, SINGLE, VIDEO, EXT, TV

Demodulation	
Spectrum Demodulation	
Modulation Type	AM and FM (FM is at RBW ≥ 3kHz)
Audio Output	Speaker and phone jack with volume control

Dynamic Range	U3641	U3641N
Displayed Average Noise Level	(RBW 1 kHz, VBW 10 Hz, Input atten 0 dB, f ≥ 1 MHz)	
Preamplifier OFF	–117 dBm+ 2.7f (GHz) dB	–8 dBµV + 2.7f (GHz) dB
Preamplifier ON	–135 dBm + 4.3f (GHz) dB	–22 dBµV + 3.0f (GHz) dB
Gain Compression	(Input atten 0dB, f ≥ 10MHz)	
Preamplifier OFF (mixer input level)	> –10 dBm	> +100 dBµV
Preamplifier ON (RF input level)	> –40 dBm	> +80 dBµV
Spurious Response	(Input atten 0 dB, f ≥ 10MHz)	
Preamplifier OFF		
Second Harmonic Distortion	≤–70 dB(–30 dBm input)	≤–70 dB(+78 dBµV input)
Third Order Intermodulation Distortion	≤–70 dB(–30 dBm input) 2-tone frequency separation > 10kHz	≤–70 dB(+78 dBµV input)
Residual Responses	(Input atten 0 dB, f ≥ 1MHz)	
Preamplifier OFF	≤ –100 dBm, 50 Ω	≤ +10 dBµV, 75 Ω
Preamplifier ON	≤ –105 dBm, 50 Ω	≤ +5 dBµV, 75 Ω

Amplitude Accuracy	U3641	U3641N
Frequency Response	20°C to 30°C, referenced to 30MHz and after calibration	
Preamplifier OFF (Input atten 10dB)	≤±1.0 dB (100 kHz to 2.7 GHz) ≤±2.0 dB (9 kHz to 3.0 GHz)	≤±1.0 dB (100 kHz to 2.2 GHz)
Preamplifier ON (Input atten 0dB)	≤±1.0 dB (100 kHz to 2.7 GHz) ≤±2.0 dB (9 kHz to 3.0 GHz)	≤±1.0 dB (100 kHz to 2.2 GHz)
Calibration Signal Accuracy	–20 dBm ±0.3 dB	+90.5dBµV ±0.3dB
IF Gain Uncertainty	<±0.5 dB (after automatic calibration)	
Scale Fidelity	(after automatic calibration)	
Log	≤ ±1.5 dB/90 dB ≤ ±1.0 dB/10 dB ≤ ±0.2 dB/1 dB	
Linear	≤ ± 5% of reference level, RBW ≥ 3kHz	
Input Attenuator Switching Accuracy	(10dB reference, 20dB to 50dB setting)	
	≤ ±1.0 dB (100 kHz to 2.7 GHz) ≤ ±1.5 dB (9kHz to 3.0 GHz)	≤ ±1.0 dB (100 kHz to 2.2 GHz)
Resolution Bandwidth Switching Uncertainty	(after automatic calibration) ≤ ±1.0 dB at RBW 3 MHz as reference	

Inputs & Outputs	
RF Input	
Connector	N type jack
Impedance	U3641 : 50 Ω (nominal) U3641N : 75 Ω (nominal)
Preamplifier OFF	VSWR ≤ 1.5 (100 kHz to 2 GHz) VSWR ≤ 2.0 (9 kHz to 3.0 GHz (U3641) /2.2 GHz(U3641N))
Preamplifier ON	(Input atten ≥ 10dB to 50dB) VSWR ≤ 2.5 (10 MHz to 3.0 GHz (U3641) / 2.2 GHz(U3641N), Input atten ≥ 0dB)
10 MHz Reference Input	
Connector	BNC jack, rear panel
Impedance	500 Ω (nominal)
Input Range	0 dBm to +16 dBm
Video Output	
Connector	BNC jack, rear panel
Impedance	75 Ω (nominal) AC coupled
Amplitude	approx. 1 V_{P-P}, 75 Ω (Composite video signal)

Specifications

Inputs & Outputs	
External Trigger Input	
Connector	BNC jack, rear panel
Impedance	10 kΩ (nominal) DC coupled
Trigger Level	TTL level
Gate Input	
Connector	BNC jack, rear panel
Impedance	10 kΩ (nominal)
Sweep Stop	during TTL low level
Sweep Continue	during TTL high level
Phone Output	
Connector	Subminiature Monophonic jack, front panel
Power Output	0.2 W, 8 Ω (nominal)
GPIB interface	IEEE-488, bus Connector
Plotter	HP-GL commands (682-XA)
Printer	PCL commands
RS232C	D-SUB 9 pin, rear panel
Printer	ESC/P commands
Power Input	
Battery mounter	AC/ DC adapter(A08364) or battery (option)

Controller (OPT15 only)	
BASIC program loading	Loads a program from a memory card (JEIDA-Ver.4.1/PCMCIA Rel. 2.0 or later).
BASIC program execution	Executes a BASIC program from a memory card or the flash memory in the unit.
BASIC program creation and editing	With an external terminal connected, programs can be created and edited.
I/O	GPIB : Allows control of external instruments and control from external hosts. RS232C : Allows programs to be created and edited with an external terminal connected.
Recording/storage	Allows data and programs to be recorded/stored in and loaded from a memory card (JEIDA-Ver.4.1/PCMCIA Rel. 2.0 or later).

High-Stability Reference Source(OPT20 only)	
Frequency	10MHz
Frequency Accuracy	$\pm 2 \times 10^{-8}$ / day $\pm 1 \times 10^{-7}$ / year

Narrow RBW (OPT26 only)	
Resolution Bandwidth (3 dB)	
Range	300Hz, 100Hz
Bandwidth accuracy	≤ ±20 %
Selectivity	≤15:1 (60 dB : 3 dB)

TV Demodulation Function (OPT 72 only)	
TV demodulation	
Demodulation type	NTSC, PAL, SECAM
TV standard	M, B/G, D/K/K', I, L/L'
Demodulation output	Video, Sound
TV Image Demodulation Output	
Connector	BNC jack, rear panel
Inpedance	75 Ω (nominal) DC coupled
Amplitude	approx. 1 V_{P-P}, 75 Ω
TV Sound Demodulation Output	
Connector	pin jack, rear panel
Inpedance	1 k Ω (nominal) AC coupled
TV Image Signal Input	
Connector	BNC jack, rear panel
Inpedance	75 Ω (nominal) AC coupled
Input level	about 1 V_{P-P}
TV Sound Signal Input	
Connector	pin jack, rear panel
Inpedance	1k Ω (nominal) AC coupled

Cannot be mounted at the same time as the OPT 60.

Tracking Generator Function (OPT 74 only)	
Frequency range	100 kHz to 2.2 GHz
Output level range	U3641 ; 0 dBm to -31 dBm, 1 dB steps U3641N ; 105dBμV to 74 dBμV, 1dB step
Output level accuracy	≤ ±0.5 dB (at 30 MHz, –10dBm(U3641)/95dBV(U3641N), 20°C to 30°C)
Output level flatness	≤ ±0.7 dB (100 kHz to 1 GHz) ≤ ±1.5 dB (100 kHz to 2.2 GHz) (U3641 ; at –10 dBm, 30 MHz reference) (U3641N ; at 95dBμV, 30MHz reference)
Output level switching accuracy	≤ ±1.0 dB (100 kHz to 1 GHz) ≤ ±2.0 dB (100 kHz to 2.2 GHz) (U3641; at –10 dBm reference) (U3641N ; at 95dBμV reference)
Output spurious	Harmonic < –20 dBc Non-harmonic < –30 dBc
TG leakage	U3641 ; ≤ –95 dBm U3641N ; ≤ 16dBμV
TG output	
Connector	N type jack
Impedance	U3641 ; 50 Ω (nominal)
(≤ 10 dBm output)	U3641N ; 75Ω(normal) VSWR ≤ 1.5 (100 kHz to 2 GHz) VSWR ≤ 2.0 (100 kHz to 2.2GHz) (U3641 ; ≤ 10dBm output) (U3641N ; ≤ 95dBμ output)

Channel Input Setting (OPT 78 only)	
Channel setting	Channel setting for VHF, UHF, CATV, BS and CS. Two user channels are available and 99 channels can be registered for each channel

OPT 78 is included in OPT 72.
Cannot be mounted at the same time as fhe OPT 60.

CDMA Measurement (OPT 60 only)	
Measurement standard	Conforms to CDMA standard IS95 and J-STD-008
Channel input function	
US cellular	1 to 799, 990 to 1023
KOREA cellular	1 to 799, 990 to 1023
CHINA cellular	0 to 1000, 1329 to 2047
JAPAN cellular	1 to 799, 801 to 1039, 1041 to 1199
US PCS	0 to 1199
KOREA PCS	0 to 1300
USER TABLE	99 channels can be created.
Channel power measurement	(After automatic calibration, automatic setting, preamplifier OFF, -50 dBm/ 1.23MHz to +20 dBm/1.23 MHz, within 80 dB range) BNC jack, rear panel
Absolute accuracy	≤ ±2.0 dB (15 °C to 35 °C) ≤ ±2.5 dB (0 °C to 50 °C)
Relative accuracy	≤ ±0.5 dB (15 °C to 35 °C) ≤ ±0.8 dB (0 °C to 50 °C)
Occupied frequency bandwidth (OBW) measurement	Occupation ratio can be set to 10.0% to 99.8%
Adjacent channel leakage power (ACP) measurement	Template display (After making measurement the specified number of times, calculates the reference power and draws a template.) Standard template, user template selectable PASS/FAIL function
Spurious emission (in-band) measurement (relative value)	Template display (After making measurement the specified number of times, calculates the reference power and draws a template.) Standard template, user template selectable PASS/FAIL function

The OPT 72 and OPT 78 cannot be mounted at the same time.

Specifications/Options/Accessories

General Specifications	
Environment Temperature	
Operating Temperature	0°C to 50°C, humidity 85% or less
Non-operating Temperature	–20°C to +60°C
Power Supply	
External DC Input	Connector XLR 4 pin Voltage +10V to +16V
AC Input	Automatically selections between 100 VAC and 200 VAC Operation at 100 VAC : Voltage 100 V to 120 V Frequency 50 Hz / 60 Hz Operation at 220 VAC: Voltage 220 V to 240 V Frequency 50 Hz / 60 Hz
Power consumption	Operation at DC : 60 W or less AC adaptor use : 100VA or less
Mass	(Without options, accessories, carrying belts, batteries AC adaptor) 6.9 kg or less
Dimensions	approx. 148 (H) × 291 (W) × 330 (D) mm (without feet or connector)
IC Memory Card connector	2 slots JEIDA–Ver.4.1 PCMCIA Rel.2.0 Type 1

Standard accessories

- Power cable : A01412
- N-BNC connector adaptor : JUG-201A/U (U3641; One)
- NC-BNC connector adaptor : BA-A165 (U3641N; One)
- N-C15 connector adaptor : NCP-NFJK (U3641N; One)
- AC-DC adaptor : A08364
- Carrying belt
- Operation manual