

Specifications

Frequency	
Frequency Range	9 kHz to 3.0 GHz
Frequency Readout Accuracy	Start, Stop, CF, Marker $\pm (\text{freq readout} \times \text{freq ref error} + 5\% \times \text{span} + 15\% \times \text{RBW} + 10 \text{ Hz})$
Count Frequency Marker Resolution	1 Hz to 1 kHz
Count Accuracy	$\pm (\text{marker freq} \times \text{freq reference accuracy} + 1 \text{ LSD} \pm 5 \text{ Hz})$
Accuracy	(S/N $\geq 25 \text{ dB}$, RBW $\geq 3 \text{ kHz}$, 1 kHz $\leq \text{SPAN} \leq 200 \text{ MHz}$)
Frequency Reference Accuracy	$\pm 2 \times 10^{-6}/\text{year}$ $\pm 1 \times 10^{-5}$ (at 0°C to 50°C)
Frequency Span Range	1 kHz to 3.2 GHz, ZERO span
Accuracy	$\leq \pm 5\%$
Frequency Stability Residual FM	$\leq 60 \text{ Hz}_{\text{p-p}}/100 \text{ ms}$ (ZERO span, RBW = 100 Hz)
Frequency Drift	$< 150 \text{ Hz/min}$ (SPAN $\leq 10 \text{ kHz}$) After warm up 30min, At stable temperature
Noise Sidebands	$\leq -105 \text{ dBc}$, at 20 kHz offset $\leq -100 \text{ dBc}$, at 10 kHz offset
Resolution Bandwidth Range	(3 dB) 1 kHz to 3 MHz 1–3 sequence 100 Hz, 300 Hz (OPT.26)
Bandwidth Accuracy	$\leq \pm 20\%$ (1 kHz to 1 MHz) $\leq \pm 25\%$ (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 dB μ V to displayed Average Noise Level
Maximum Input Level	$\pm 50 \text{ V DC max.}$	
Preamplifier OFF (Input atten $\geq 10 \text{ dB}$)	+27 dBm	+134 dB μ V
Preamplifier ON (Input atten $\geq 10 \text{ dB}$)	+13 dBm	+120 dB μ V
Display Range	10 \times 10 div 10, 5, 2, 1 dB/div 10% of reference level/div, RBW $\geq 3 \text{ kHz}$	
Reference Level Range		
Preamplifier OFF Log	(Input Atten 0 dB to 50 dB) –64 dBm to +40 dBm (0.1 dB step)	+46 dB μ V to +150 dB μ V
Linear	+141.1 μ V to +22.36 V (Input Atten 0 dB to 10 dB)	+198.4 μ V to 31.44V
Preamplifier ON Log	–89 dBm to –25 dBm (0.1 dB step)	+21 dB μ V to +85 dB μ V
Linear	+7.934 μ V to +12.57 mV	+11.16 μ V to +17.68mV
Input Attenuator Range	0 dB to 50 dB (10 dB step)	

Sweep	
Sweep Time	50ms to 1000s 50 μ s to 1000s(ZERO span)
Accuracy	$\leq \pm 5\%$
Trigger mode	FREE RUN, SINGLE, VIDEO, EXT, TV

Demodulation	
Spectrum Demodulation	
Modulation Type	AM and FM (FM is at RBW $\geq 3 \text{ kHz}$)
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, $f \geq 1 \text{ MHz}$)	
Preamplifier OFF	–117 dBm+ 2.7f (GHz) dB	–8 dB μ V + 2.7f (GHz) dB
Preamplifier ON	–135 dBm + 4.3f (GHz) dB	–22 dB μ V + 3.0f (GHz) dB
Gain Compression	(Input atten 0dB, $f \geq 10 \text{ MHz}$)	
Preamplifier OFF (mixer input level)	$> -10 \text{ dBm}$	$> +100 \text{ dB}\mu\text{V}$
Preamplifier ON (RF input level)	$> -40 \text{ dBm}$	$> +80 \text{ dB}\mu\text{V}$
Spurious Response	(Input atten 0 dB, $f \geq 10 \text{ MHz}$)	
Preamplifier OFF		
Second Harmonic Distortion	$\leq -70 \text{ dB}(-30 \text{ dBm input})$	$\leq -70 \text{ dB}(+78 \text{ dB}\mu\text{V input})$
Third Order Intermodulation Distortion	$\leq -70 \text{ dB}(-30 \text{ dBm input})$	$\leq -70 \text{ dB}(+78 \text{ dB}\mu\text{V input})$
2-tone frequency separation $> 10 \text{ kHz}$		
Residual Responses	(Input atten 0 dB, $f \geq 1 \text{ MHz}$)	
Preamplifier OFF	$\leq -100 \text{ dBm}$, 50 Ω	$\leq +10 \text{ dB}\mu\text{V}$, 75 Ω
Preamplifier ON	$\leq -105 \text{ dBm}$, 50 Ω	$\leq +5 \text{ dB}\mu\text{V}$, 75 Ω

Amplitude Accuracy	U3641	U3641N
Frequency Response	20°C to 30°C, referenced to 30MHz and after calibration	
Preamplifier OFF (Input atten 10dB)	$\leq \pm 1.0 \text{ dB}$ (100 kHz to 2.7 GHz)	$\leq \pm 1.0 \text{ dB}$ (100 kHz to 2.2 GHz)
Preamplifier ON (Input atten 0dB)	$\leq \pm 2.0 \text{ dB}$ (9 kHz to 3.0 GHz) $\leq \pm 1.0 \text{ dB}$ (100 kHz to 2.7 GHz) $\leq \pm 2.0 \text{ dB}$ (9 kHz to 3.0 GHz)	$\leq \pm 1.0 \text{ dB}$ (100 kHz to 2.2 GHz)
Calibration Signal Accuracy	–20 dBm $\pm 0.3 \text{ dB}$	+90.5dB μ V $\pm 0.3 \text{ dB}$
IF Gain Uncertainty	$< \pm 0.5 \text{ dB}$ (after automatic calibration)	
Scale Fidelity	(after automatic calibration)	
Log	$\leq \pm 1.5 \text{ dB}/90 \text{ dB}$ $\leq \pm 1.0 \text{ dB}/10 \text{ dB}$ $\leq \pm 0.2 \text{ dB}/1 \text{ dB}$ $\leq \pm 5\%$ of reference level, RBW $\geq 3 \text{ kHz}$	
Linear		
Input Attenuator Switching Accuracy	(10dB reference, 20dB to 50dB setting) $\leq \pm 1.0 \text{ dB}$ (100 kHz to 2.7 GHz) $\leq \pm 1.5 \text{ dB}$ (9kHz to 3.0 GHz)	$\leq \pm 1.0 \text{ dB}$ (100 kHz to 2.2 GHz)
Resolution Bandwidth Switching Uncertainty	(after automatic calibration) $\leq \pm 1.0 \text{ dB}$ 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)) (Input atten $\geq 10 \text{ dB}$ to 50dB)
Preamplifier ON	VSWR ≤ 2.5 (10 MHz to 3.0 GHz (U3641) / 2.2 GHz(U3641N), Input atten $\geq 0 \text{ dB}$)
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 Impedance Trigger Level	BNC jack, rear panel 10 k Ω (nominal) DC coupled TTL level
Gate Input Connector Impedance Sweep Stop Sweep Continue	BNC jack, rear panel 10 k Ω (nominal) during TTL low level during TTL high level
Phone Output Connector Power Output	Subminiature Monophonic jack, front panel 0.2 W, 8 Ω (nominal)
GPIO interface Plotter Printer	IEEE-488, bus Connector HP-GL commands (682-XA) PCL commands
RS232C Printer	D-SUB 9 pin, rear panel 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	GPIO : 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	$\leq \pm 20$ %
Selectivity	$\leq 15:1$ (60 dB : 3 dB)

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

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 : 105dB μ V to 74 dB μ V, 1dB step
Output level accuracy	$\leq \pm 0.5$ dB (at 30 MHz, -10dBm(U3641)/95dBV(U3641N), 20°C to 30°C)
Output level flatness	$\leq \pm 0.7$ dB (100 kHz to 1 GHz) $\leq \pm 1.5$ dB (100 kHz to 2.2 GHz) (U3641 : at -10 dBm, 30 MHz reference) (U3641N : at 95dB μ V, 30MHz reference)
Output level switching accuracy	$\leq \pm 1.0$ dB (100 kHz to 1 GHz) $\leq \pm 2.0$ dB (100 kHz to 2.2 GHz) (U3641; at -10 dBm reference) (U3641N ; at 95dB μ V reference)
Output spurious	Harmonic < -20 dBc Non-harmonic < -30 dBc
TG leakage	U3641 : ≤ -95 dBm U3641N : ≤ 16 dB μ V
TG output Connector Impedance (≤ 10 dBm output)	N type jack U3641 : 50 Ω (nominal) U3641N : 75 Ω (normal) VSWR ≤ 1.5 (100 kHz to 2 GHz) VSWR ≤ 2.0 (100 kHz to 2.2GHz) (U3641 : ≤ 10 dBm output) (U3641N ; ≤ 95 dB μ 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 the OPT 60.

CDMA Measurement (OPT 60 only)	
Measurement standard	Conforms to CDMA standard IS95 and J-STD-008
Channel input function US cellular KOREA cellular CHINA cellular JAPAN cellular US PCS KOREA PCS USER TABLE	1 to 799, 990 to 1023 1 to 799, 990 to 1023 0 to 1000, 1329 to 2047 1 to 799, 801 to 1039, 1041 to 1199 0 to 1199 0 to 1300 99 channels can be created.
Channel power measurement Absolute accuracy Relative accuracy	(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 $\leq \pm 2.0$ dB (15 °C to 35 °C) $\leq \pm 2.5$ dB (0 °C to 50 °C) $\leq \pm 0.5$ dB (15 °C to 35 °C) $\leq \pm 0.8$ 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.

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

Specifications/Options/Accessories

General Specifications	
Environment Temperature Operating Temperature Non-operating Temperature	0°C to 50°C, humidity 85% or less -20°C to +60°C
Power Supply External DC Input AC Input Power consumption	Connector XLR 4 pin Voltage +10V to +16V 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 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	
<ul style="list-style-type: none"> 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 	

Options

Options (sold separately)

OPT 3641 +15 controller option
 OPT 3641N +15 controller option
 OPT 3641 +20 High-stability reference option
 OPT 3641N + 20 High -stability reference option
 OPT 3641 +26 Narrow RBW option
 OPT 3641N + 26 Narrow RBW option
 OPT 3641 + 60 CDMA option
 OPT 3641 + 72 TV demodulation option
 OPT 3641N + 72 TV demodulation option
 OPT 3641 + 74 Tracking generator option
 OPT 3641N + 74 Tracking generator option
 OPT 3641 + 78 Channel input setting option
 OPT 3641N + 78 Channel input setting option

Accessories



Accessories (sold separately)

R16072 Transit case
 R16216A Carrying case
 R16601 Display hood
 A02806 Front cover
 PROPAC14BATT Batteries
 DUAL2402CHARGER Chargers
 A09507 64K byte SRAM memory card
 A09508 256K byte SRAM memory card
 A09509 2M byte SRAM memory card
 A01434 DC cable

Application software (sold separately)

GSM/DCS1800-MS software	PU36410300-IC
GSM/DCS1800-BS software	PU36410310-IC
DCS1900-MS software	PU36410500-IC
DCS1900-BS software	PU36410510-IC

