SPECIFICATIONS

NOTE : A fifteen minute warm up time shall apply.

1. Electrical Specifications

2. General Characteristics

3. Environmental Specifications

4. Safety & EMC Specifications

1. Electrical Specifications

1.0 Frequency

1.1 Frequency Range : 9kHz to 13.2GHz (2394A)

Range	Band	LO Harmonics
9kHz to 3GHz	0	1
2.9GHz to 6.4GHz	1	1
6.3GHz to 13.2GHz	2	2

Frequency Range : 9kHz to 26.5GHz (2395A)

Range	Band	LO Harmonics
9kHz to 3GHz	0	1
2.9GHz to 6.4GHz	1	1
6.3GHz to 13.2GHz	2	2
12.9GHz to 26.5GHz	3	4

1.2 Frequency Accuracy : SPAN x SPAN ACCURACY ± 0.5 x RBW

1.3 Frequency Counter

1.3.1 Accuracy : ±(Reference frequency error X Marker Frequency accuracy

+ Counter Resolution ± 1 LSB)

1.3.2 Resolution : 1Hz, 10Hz, 100Hz, 1kHz

1.3.3 Sensitivity : -70 dBm min

1.4 Frequency SPAN

1.4.1 Range : 10 Hz/Div to FULL SPAN,

ZERO SPAN

1.4.2 Accuracy : ≤ ±3%

1.5 Stability

1.5.1 Residual FM : ≤ 100Hzp-p in 200 ms @ 1kHz RBW ,1kHz VBW

1.5.2 Noise Sidebands : ≤ -90dBc/Hz + 20log N for Frequency 3.0GHz @ 10kHz offset

N = LO Harmonic mixing Mode

1.6 Frequency Ref. Accuracy

1.6.1 Long Term Drift : ≤ ±1 ppm/yr

≤ ±0.1 ppm/yr (option : High Stability Oscillator)

1.6.2 Short Term Drift : ≤ ± 2 ppm over temperature range

≤ ±0.2 ppm (option : High Stability Oscillator)

2.0 Amplitude

2.1 Measurement : +30 dBm to -110 dBm

2.2 Average Displayed Noise Level : [RBW : 300 Hz , VBW : 10 Hz]

≤ -105 dBm, 50 kHz to 100kHz

≤ -110 dBm, 100kHz to 2.8GHz

≤ -105 dBm, 2.8GHz to 3.0GHz

≤ -115 dBm, 3.0GHz to 13.2GHz (2394A)

≤ -110 dBm, 3.0GHz to 13.2GHz (2395A)

≤ -100 dBm, 13.2GHz to 26.5GHz (2395A)

2.3 1dB Compression Point : -10dBm @ Input ATT 0 dB

2.4 Displayed Range : 100 dB in 10 dB/div log scale

50 dB in 5 dB/div log scale

20 dB in 2 dB/div log scale

10 dB in 1 dB/div log scale

10 divisions with Linear scale

2.5 Amplitude Units

2.5.1 LOG Display Mode : dBm, dBmV, dBuV, Volts, Watts

2.5.2 LINEAR Display Mode : V(mV, uV) , dBmV

2.6 Display Linearity

LOG : ≤ ±1.0 dB over 10 divisions (5 or 10dB/div)

≤ ±0.5 dB over 10 divisions (1 or 2dB/div)

LINEAR : ≤ ±3% of Ref. Level over 10 divisions

2.7 Flatness over frequency : ≤ -3.0 ~ +1 dB, 9 kHz to 5 MHz

≤ ±1.0 dB, 5 MHz to 2.9 GHz

≤ ±1.5 dB, 3.0 GHz to 6.4 GHz

≤ ±2.2 dB 6.4 GHz to 13.2 GHz

≤ ±3.0 dB 13.2 GHz to 26.5 GHz

@ 10dB RF attenuation, room temperature (15℃ ~ 30℃)

2.8 Attenuator

2.8.1 Range : 0 to 55 dB (Manual or Auto)

2.8.2 Resolution : 5 dB steps

2.8.3 Accuracy : ±0.5 dB by steps,

±1 dB full steps

2.9 Reference Level

2.9.1 Range : +30 dBm to -110 dBm

2.9.2 Resolution : 0.1 dB step Minimum

2.9.3 Accuracy : ±1.0 dB (50 kHz to 13.2 GHz)

2.10 Residual Spurious : ≤ -85 dBm (Input terminated , 0 dB attenuator)

2.11 Harmonic Distortion : ≤ -60 dBc , -30 dBm input (0 dB Attenuator)

2.12 Intermodulation Distortion : ≤ -70 dBc , 100 MHz to 26.5 GHz

(-30 dBm input, 0 dB attenuation)

≤ -65 dBc , 10 MHz to 100 MHz

(-30 dBm input, 0 dB attenuation)

2.13 Other Input Related Spurious : ≤ -60 dBc , -30 dBm input

2.14 Resolution Bandwidth

2.14.1 Selections : 300Hz to 3MHz (1-3-10 steps),

9kHz, 120kHz (for Quasi Peak Detection Option)

10Hz, 30Hz, 100Hz (for Digital RBW Option)

2.14.2 Accuracy : ≤ ±20%

2.14.3 Selectivity : 60 dB / 3 dB < 15:1

60 dB / 6 dB < 12:1 (9kHz, 120kHz)

2.14.4 Switching Error : ≤ ±1.0 dB refer to 3 kHz RBW

2.15 Video Filter

2.15.1 Selections : 1 Hz to 1 MHz (1-3-10 steps plus None)

2.15.2 Accuracy : ≤ ±20%

3.0 Sweep

3.1 Rate : 20 ms to 1000s

5 ms to 15 s @ ZERO SPAN

25 us to 2 ms @ Fast ZERO SPAN

Auto coupled with SPAN, RBW, VBW

3.2 Accuracy : ≤ 20 % @ less then 100 ms

3.3 Trigger

3.3.1 Source : FREE RUN, VIDEO, LINE, EXT

3.3.2 Mode : Single , Continuous

4.0 Display

4.1 Type : 6.4" VGA TFT LCD

4.2 Resolution : 640 H X 480 V

5.0 Inputs

5.1 RF Input

5.1.1 Connector : Type N Female, 50 ohm nominal (2394A)

Type N Female, or Type 2.92mm Female (2395A)

5.1.2 VSWR : ≤ 2.0 : 1 (Type 2.92mm Female @ 10 dB ATT)

5.1.3 Max Input Level : ±50 VDC, +30 dBm @ 10dB ATT

5.1.4 LO Emission : ≤ -70 dBm @ 0dB ATT

6.0 Outputs

6.1 IF Output	:	10.7 MHz sweeped signal
6.2 Video Output	:	0 ~ 5VDC (TTL level)
6.3 Cal Signal Output	:	20MHz , -20dBm ± 0.3dB @ 50Ω Impedance
6.4 SWP Gate Output	:	0 ~ 5VDC (TTL level)
6.5 Power Probe	:	3 Pin connector (+15VDC, -12 VDC, GND)

7.0 Memory : 16 Mbytes (size of memory)

8.0 AM Demodulation

8.1 Demodulation Range	:	5% to 90% @ 1KHz, 50% modulation, -20dBm Input
8.2 Input Level Range	:	-2.0dBm to -75dBm @ 1KHz, 50% modulation
8.3 Frequency Response	:	20Hz to 30KHz @ -20dBm Input
8.4 Distortion	:	≤ 5% @ 90% modulation @ 1KHz , -20dBm Input
		≤ 2% @ 50% modulation @ 1KHz , -20dBm Input

9.0 FM Demodulation

9.1 Deviation Range : ≤ 80KHz

9.2 Input Level Range : -2.0dBm to -75dBm @ 50KHz deviation

9.3 Frequency Response : 20Hz to 100KHz @ -20dBm Input

9.4 Distortion : ≤ 5% @ 20KHz deviation @ 1KHz , -20dBm Input

≤ 2% @ 50% modulation @ 1KHz , -20dBm Input

10.0 External Trigger Input

10.1 Connector : BNC female, Rear Panel

10.2 Impedance : 10 kohm (nominal) , dc coupled

10.3 Trigger Level : TTL Level

10.4 Trigger Delay

Pre-trigger : Range : - Time Span to 0 sec

Resolution : Time Span / 500

Post-trigger : Range : 0 sec to + Time Span

Resolution : Time Span / 500

11.0 RS-232C Interface

11.1 Type	:	Null Modem
11.2 Baud Rate	:	600bps, 1200bps, 2400bps, 4800bps, 9600bps, 19200bps 38400bps, 57600bps, 115200bps
11.3 Data Length	:	7bits, 8bits
11.4 Stop Bit	:	1bit, 2bit
11.5 Parity Bit	:	None, Even, Odd, Mark, Space

12.0 GPIB Interface

12.1 Interface	:	SH1, AH1, T5, L3, SR1, RL1, PP1, DC1, DT1, C0, PP0 SR0, DC0, DT0, C1, C2, C3
12.2 Specifications	:	IEEE488.2 Can be controlled as device from external Host Controller

13.0 External Reference : Switchable between Internal / External

13.1	Frequency	:	10MHz
13.2	Level	:	-5 dBm to +15 dBm (@ Input Level)
			+5 dBm (@ Output Level)
13.3	Connector	:	BNC female

14.0 Printer

14.1	Type	:	HP-LaserJet
14.2	Function	:	Output data to printer
14.3	Connector	:	D-sub, 25 pin

2. General Characteristics

1.0 Dimensions : 150mm x 320mm x 330mm

2.0 Weight : 11.4 Kg (2394A, without option)

11.8 Kg (2395A, without option)

3.0 Power Requirements (standard)

3.1 Source Voltage and Frequency : 100VAC to 240VAC, 50/60Hz

3.2 Power Consumption : 100 Watts Maximum (without option)

3.3 Fuse Requirements : 3.15A, 250V, Type2, 2EA

4.0 Warm-up Time : 15 minutes

3. Environmental Specifications

1.0 Temperature Range

1.1 Storage : -20℃ to +60℃

1.2 Operating : 0℃ to +40℃

2.0 Humidity

2.1 Spec : Non-condensing (80% storage)

3.0 Shock & Vibration

3.1 Spec : MIL-T-28800E , type 2 , CLASS 5

4.0 Altitude : Operation up to 3000 meters

Non-Operating up to 40000 feet

4. Safety & EMC Specifications

1.0 Safety : EN61010-1 : 2001

1.1 Main Supply Voltage Fluctuations : Nominal Voltage ±10%

1.2 Transient Overvoltage : Installation Category II

1.3 Pollution Degree : 2

2.0 EMC

2.1 RF emissions : EN55011 : 1998+A1:1999+A2:2002 Group 1 Class A

2.2 RF immunity : EN61326 : 1997+A1:1998+A2:2001+A3:2003