Anritsu

Technical Data Sheet

20 GHz High Performance Handheld Spectrum Analyzer

MS2724B
Spectrum Master™

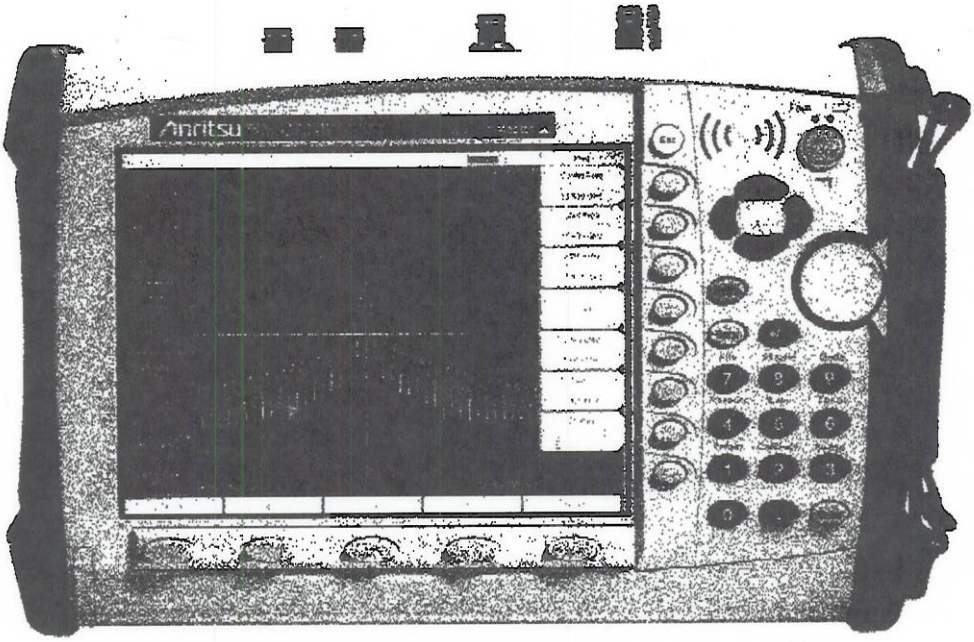
Introduction

Continuous frequency coverage from 9 kHz to 20 GHz gives the wireless professional the performance needed for the most demanding measurements in harsh RF and physical environments.

Whether you need spectrum monitoring, WiFi and WiFi5 installation and testing, RF and microwave signal measurements or cellular signal measurements, the MS2724B Spectrum Master is the tool to make your job easier and more productive.

High Performance Highlights

- 9 kHz to 20 GHz Input
- 1 Hz to 3 MHz RBW Range
- Very Low Phase Noise (–104 dBc/Hz typical at 10 kHz offset at 2 GHz)
- Built-in AM/FM/SSB Demodulator
- Built-in Preamplifier
- 65 dB Step Attenuator
- True RMS Detection
- 2+ Hours of Battery Life
- 3.4 kg (7.5 lb)
- 3G Modulation options
- GPS Receiver option
- Quasi-peak detector and CISPR bandwidths



The Anritsu MS2724B is the most advanced ultra-portable spectrum analyzer on the market, featuring unparalleled performance at a modest price.

Features and Options

Functions

Multiple Marker: Display up to six markers on screen. Each marker includes a delta marker, effectively allowing up to 12 markers on screen. The user may also set marker 1 to be the reference for 6 delta markers.
Marker Table: Display a table of up to six marker frequency and amplitude values plus delta marker frequency offset and amplitude.

Upper/Lower Limit

Fixed and segmented: Each upper and lower limit can be made up of between one and 40 segments.

Smart Measurements

Occupied Bandwidth: Measures 99% to 1% power channel of a signal.
Channel Power: Measures the total power in a specified bandwidth.
C/I: Measures carrier to interference ratio.
ACPR: Measures power levels in the channels immediately above and below the center channel.
Field Strength: Uses antenna calibration tables to measure dBm/meter^2 or dBmV/meter.

Specifications

Frequency

Frequency Range: 9 kHz to 20 GHz
Preamp: 100 kHz to 4 GHz
Tuning Resolution: 1 Hz
Frequency Reference:
Aging: ±1 ppm per 10 years
Accuracy: ±0.3 ppm (25 °C ± 25 °C) + aging
Frequency Span: 10 Hz to 20 GHz plus 0 Hz (zero span)
Span Accuracy: Same as frequency reference accuracy
Sweep Time:
Zero span: 10 µs to 600s
Spans >0 Hz: Sweep time is automatically optimized.
Can be manually increased
Sweep Time Accuracy: ±2% in zero span
Sweep Trigger: Free run, Single, Video, External
Resolution Bandwidth: (–3 dB) 1 Hz to 3 MHz in 1-3 sequence ±10%, 200 Hz, 9 kHz, 120 kHz when quasi-peak detector selected, 10 MHz demodulation bandwidth
Video Bandwidth: (–3 dB) 1 Hz to 3 MHz in 1-3 sequence
SSB Phase Noise:

Offset from carrier	Max 9 kHz to 13 GHz	Max 13 GHz to 20 GHz
10, 20 and 30 kHz	–95 dBc/Hz	–91 dBc/Hz
100 kHz	–97 dBc/Hz	–93 dBc/Hz
1 MHz	–105 dBc/Hz	–102 dBc/Hz
10 MHz	–120 dBc/Hz	–116 dBc/Hz

Amplitude

Measurement Range: DANL to +30 dBm
Display Range: 1 to 15 dB/div in 1 dB steps. Ten divisions displayed.
Amplitude Units:
Log Scale Modes: dBm, dBV, dBmv, dBµV
Linear Scale Modes: nV, µV, mV, V, kV, nW, µW, mW, W, kW
Attenuator Range: 0 to 65 dB
Attenuator Resolution: 5 dB steps

Overall Amplitude Accuracy
(20 °C to 30 °C, 30 minute warmup):
±1.3 dB
Full Temperature Range: –10 to +55 °C add
±1.2 dB
Frequency Flatness: >4 GHz add
±1.5 dB
Conditions: 50 Ω source, single sinewave input ≤Reference Level, and ≥DANL, 60 minute warm-up, auto-attenuation
Second Harmonic Distortion
(0 dB input attenuation, –30 dBm input):

50 to 500 MHz	–50 dBc
500 to 800 MHz	–45 dBc
800 to 3000 MHz	–60 dBc
>3 GHz	–70 dBc

Third Order Intercept (TOI):
(–20 dBm tones 100 kHz apart, –20 dBm Ref level, 0 dB input attenuation, preamplifier off)

Frequency	Min
2.4 GHz	+12 dBm
Frequency	**Typical**
50 MHz to 500 MHz	>6 dBm
500 MHz to 2 GHz	>8 dBm
2 to 6 GHz	>10 dBm
6 to 20 GHz	>12 dBm

Dynamic Range 2/3 (TOI-DANL) in 1 Hz RBW:
2.4 GHz 101 dB min
Displayed Average Noise Level (DANL) in 1 Hz RBW:

Frequency	Preamplifier On	Equivalent Noise Figure, 23 °C
10 MHz to 1 GHz	–159 dBm	15 dB
1 GHz to 3 GHz	–156 dBm	18 dB
3 to 4 GHz	–154 dBm	20 dB
Frequency	**Preamplifier Off**	**Equivalent Noise Figure, 23 °C**
10 MHz to 4 GHz	–139 dBm	35 dB
4 GHz to 10 GHz	–136 dBm	38 dB
10 GHz to 13 GHz	–130 dBm	44 dB
13 GHz to 20 GHz	–136 dBm	38 dB

(0 dB input attenuation, RMS detection, Reference level = –20 dBm for preamplifier off and –50 dBm for preamplifier on)
Note: Discrete spurious signals are not included in the measurement of DANL as they are covered by the residual spurious specification.
Input-Related Spurious:
(–30 dBm input, 0 dB input attenuation, Span <1.7 GHz)
–70 dBc typical –60 dBc max
except input frequency 3275 MHz, –50 dBc max
Residual Spurious:
(Preamplifier off, RF input terminated, 0 dB input attenuation)
–90 dBm max
–85 dBm max, >13 GHz
(Preamplifier on, RF input terminated, 0 dB input attenuation)
–100 dBm max

Options Specifications

Demodulation Hardware (Option 9)

Hardware needed to run any of the demodulation options

High Accuracy Power Meter (Option 19) Specifications using PSN50

PSN50 Sensor:

Measurement Range: –30 dBm to +20 dBm
Frequency Range: 50 MHz to 6 GHz
Input Connector: Type N, male, 50 Ω
Max Input Without Damage: +33 dBm, ±25 VDC
Input Return Loss: 50 MHz to 2 GHz: ≥26 dB
2 GHz to 6 GHz: ≥20 dB

PSN50 Accuracy:

Total RSS Measurement Uncertainty (0 °C to 50 °C): ±0.16 dB*
Noise: 20 nW max
Zero Set: 20 nW
Zero Drift: 10 nW max**
Sensor Linearity: ±0.13 dB max
Sensor Cal Factor Uncertainty: ±0.06 dB
Temperature Compensation: ±0.06 dB max
Continuous digital modulation uncertainty: ±0.06 dB (+17 to +20 dBm)

PSN50 System:

Measurement Resolution: 0.01 dB
Offset Range: ±60 dB
Power Requirements:
Supply Voltage: 8 to 18 Vdc (supplied by instrument via USB connector)
Supply Current: <100 mA

High Accuracy Power Meter (Option 19) Specifications using MA24106A

Sensor

Measurement Range: –40 to +23 dBm
Frequency Range: 50 MHz to 6 GHz
Input Connector: Type N, male, 50 Ω
Max Input Without Damage: +33 dBm, ±25 VDC
Input Return Loss: 50 MHz to 2 GHz: >26 dB
2 GHz to 6 GHz: >20 dB

Accuracy

Total RSS Measurement Uncertainty (0 to 50 °C): ±0.16 dB*
Noise: 2.5 nW max
Zero Set: 10 nW
Zero Drift: 3 nW max**
Sensor Linearity: ±0.18 dB max
Instrumentation Accuracy: 0.00 dB
Sensor Cal Factor Uncertainty: ±0.06 dB
Temperature Compensation: ±0.06 dB max
Continuous Digital Modulation Uncertainty:
±0.02 dB (< +18 dBm)
±0.10 dB (>= +18 dB)

Interference Analyzer (Option 25)

Signal Strength: Gives visual and aural indication of signal strength
RSSI: Collect data up to 72 hours
Spectrogram: Collect data up to 72 hours
Signal ID: Monitors one particular frequency or scan the span and identify up to 12 signals. Identifies CDMA, GSM and WCDMA signals with Signal-to-noise ratio greater than 10 dB.

Channel Scanner (Option 27)

Number of Channels: 1 to 20

GPS (Option 31)

GPS Location Indicator: Latitude, Longitude and Altitude on display
Latitude, Longitude and Altitude with trace storage
GPS High Frequency Accuracy when GPS antenna is connected: ±25 ppb with GPS ON, 3 minutes after satellite lock in the selected operating mode
Internal High Accuracy, when GPS antenna is not connected: Better than ±50 ppb for 3 days from a High Accuracy GPS Lock and within 0 °C to 50 °C ambient temperature
Connector: Reverse polarity BNC

cdmaOne and CDMA2000 1xRTT Over The Air (Option 33) and EVDO Over The Air (Option 34)

Over the Air Measurement: Nine strongest pilots with Tau and Ec/Io
Six multipaths relative to strongest pilot

GSM/GPRS/EDGE RF Measurements (Option 40)

Occupied Bandwidth: Bandwidth within which 99% of the power transmitted on a single channel lies
Burst Power: ±1 dB typical for –50 dBm to +20 dBm (±1.5 dB max)
Frequency Error: ±10 Hz + time base error, 99% confidence level

GSM/GPRS/EDGE Demodulator (Option 41)

GSMK Modulation Quality (RMS Phase) Measurement Accuracy: ±1 deg
Residual Error (GSMK): 1 deg
8PSK Modulation Quality (EVM) Measurement Accuracy: ±1.5%
Residual Error (8PSK): 2.5%

CDMA RF Measurements (Option 42) and EVDO RF Measurements (Option 62)

Channel Power Accuracy: ±1 dB typical for RF input from +20 dBm to -50 dBm (±1.5 dB maximum)

cdmaOne and CDMA2000 1xRTT Demodulator (Option 43)

Residual Rho: >0.995 typical for RF input from +20 dBm to -50 dBm (>0.99 dB maximum)
Rho Accuracy: ±0.005 for Rho > 0.9
Frequency Error: ±10 Hz + Time base error, 99% confidence level (in slow mode)
PN Offset: within 1 x 64 chips
Pilot Power Accuracy: ±1 dB typical, relative to Channel Power
Tau: ± 0. 5 µs typical (±1 µs maximum)

WCDMA/HSDPA OTA (Option 35)

Resolution: 0.1 dB

* Excludes mismatch errors.
Excludes noise, zero set, zero drift for levels <–20 dBm.
Excludes digital modulation uncertainty between +17 and +20 dBm.
** After 30 min warm-up
*** Depends on reference level, input signal level and single channel conditions
**** Will vary with amount of data burst traffic

WCDMA/HSDPA RF Measurements (Option 44)

Frequency Ranges: 824 to 894 MHz, 1710 to 2170 MHz, 2300 to 2700 MHz

RF Channel Power (Temperature range 15 °C to 35 °C):
±0.7 dB typical ±1.25 dB max

Occupied Bandwidth Accuracy: ±100 kHz

Residual Adjacent Channel Leakage Ratio (ACLR)***
(824 to 894 MHz, 1710 to 2170): –51 dB typical at 5 MHz offset
–59 dB typical at 10 MHz offset

Leakage Ratio (ACLR)***
(2300 to 2700 MHz): –51 dB typical at 5 MHz offset
–57 dB typical at 10 MHz offset

ACLR Accuracy (Single Channel Active)
(824 to 894 MHz, 1710 to 2170 MHz):
±0.8 dB for ACLR ≥–45 dB at 5 MHz offset
±0.8 dB for ACLR ≥–50 dB at 10 MHz offset

ACLR Accuracy (Single Channel Active) (2300 to 2700 MHz):
±1.0 dB for ACLR ≥–45 dB at 5 MHz offset
±1.0 dB for ACLR ≥–50 dB at 10 MHz offset

Frequency Error:
±10 Hz + time base error, 99% confidence level

WCDMA Demodulation and WCDMA/HSDPA Demodulator (Options 45 and 65)

Option 45 is for measuring W-CDMA. Option 65 is for measuring both W-CDMA and HSDPA. All the capability of option 45 is included in option 65.

EVM Accuracy* (824 to 894 MHz, 1710 to 2170 MHz):**
(3GPP Test Model 4) ±2.5%; 6 ≤EVM ≤25%

EVM Accuracy* (2300 MHz to 2700 MHz):**
(3GPP Test Model 5) ±2.5%; 6 ≤EVM ≤20%

Residual EVM: 2.5% typical

Code Domain Power: ±0.5 dB for code channel power >–25 dB
16, 32, 64 DCPH (test model 1)
16, 32 DCPH (test model 2, 3)

CPICH (dBm) Accuracy: ±0.8 dB typical

Scrambling Code: 3 seconds

EVDO Demodulator (Option 63)

Demodulator Measurements are EVDO Rev A compatible.

Residual Rho: >0.995 typical for RF Input from +20 dBm to -50 dBm
(>0.99 dB maximum)

Rho Accuracy: ±0.01 for Rho >0.9

Frequency Error: ±20 Hz + Time base error, 99% confidence level

PN Offset: within 1 x 64 chips

Pilot Power Accuracy: ±1 dB typical relative to Channel Power

Tau: ± 0. 5 µs typical (±1 µs maximum)

Fixed WiMAX RF Measurements (Option 46)

Channel Power Accuracy**:** ±1 dB Typical for +20 dBm to –50 dBm
(±1.5 dB max)

Fixed WiMAX Demodulator (Option 47)

Residual EVM (rms): 3% for +20 dBm to –50 dBm (3.5% max.)

Frequency Error: ±0.1 ppm + time base error, 99% confidence level

Mobile WiMAX Over the Air (OTA) Measurements (Option 37)

Time Interval: 1sec – 60 sec

Measurement duration: 72 hours max

Auto Save: Yes

GPS logging: Yes

Mobile WiMAX RF Measurements (Option 66)

Channel Power Accuracy: ±1 dB Typical (±1.5 dB max)
for +20 dBm to –50 dBm

Mobile WiMAX Demodulator (Option 67)

For +20 dBm to –50 dBm, Residual EVM (rms): 2.5% typical (3% max)

Frequency Error: ±0.02 ppm + time base error, 99% confidence level

TD-SCDMA RF Measurements (Option 60)

Channel Power (RRC): ±1 dB typical, 1.5 dB max
(slot power from +10 dBm to –40 dBm)

TD-SCDMA Demodulator (Option 61)

Residual EVM (rms): 3% typical (for P-CCPCH slot, slot power >–50 dBm)

Freq Error Accuracy: ±10 Hz typical + time base error
(in the presence of a downlink slot)

Timing Error (Tau) for dominant SYNC-DL code:
±0.2 µs (external trigger)

Supported Modulation: QPSK

Spreading Factor: 1, 16

TD-SCDMA Over the Air (OTA) Measurements (Option 38)

32 codes displaying Ec/Io, Tau

IF Output (Option 89)

This option adds an IF output connector and used in zero span to see the signals present in the user-selected IF Bandwith.

IF Frequency: 37.8 MHz typical for signal at center frequency

IF Bandwidth: 7 MHz, 10 MHz, 16 MHz, typical.

Output Power Level:
–20 to –45 dBm typical given:
RF Input Level = +30 to –43 dBm with Preamp OFF
–40 to –60 dBm with Preamp ON
Reference Level set at RF Input Level
Auto RF Attenuation

Gated Sweep (Option 90)

The option adds gated sweep to the spectrum analyzer mode, giving the user the capability to view pulsed or burst signals only when they are on, or conversely look at the spectrum only when a signal is off.

Trigger Signal: External TTL input, user selectable high of low level

Gate Delay: 0 to 65 ms typical

Gate Length: 1 µs to 65 ms typical

* Excludes mismatch errors.
Excludes noise, zero set, zero drift for levels <–20 dBm.
Excludes digital modulation uncertainty between +17 and +20 dBm.
** After 30 min warm-up
*** Depends on reference level, input signal level and single channel conditions
**** Will vary with amount of data burst traffic

General

RF Input VSWR: (≥10 dB input attenuation)

1.5:1 typical	<13 GHz
2:1 typical	13 to 20 GHz

Maximum Continuous Input: (≥10 dB input attenuation) +30 dBm

Input Damage Level:

≥10 dB input attenuation, >+30 dBm, ±50 Vdc

ESD Damage Level: (≥10 dB input attenuation) >10 kV

External Reference Frequencies: 1, 1.2288, 1.544, 2.048, 2.4576, 4.8, 4.9152, 5, 9.8304, 10, 13 and 19.6608 MHz at −10 dBm to +10 dBm

Battery Life: 2.3 hours typical

Display

Bright daylight-viewable color transmissive LCD: Full SVGA, 8 in.

Languages

Built-in English, Spanish, Italian, French, German, Japanese, Korean, and Chinese. The instrument also has the capability to have two customized languages installed from Master Software Tools.

Marker Modes

6 Markers, 9 Modes: Normal, Delta, Marker to Peak, Marker to Center, Marker to Reference Level, Next Peak Left, Next Peak Right, All Markers Off, Noise Marker, Frequency Counter Marker (1 Hz resolution), Markers Tracking or Fixed, Marker 1 reference for all deltas.

Sweeps

Full span, Zero span, Span Up/Span Down

Detection

Peak, Negative peak, Sample, RMS, Quasi-peak

Memory

Trace and Setup storage is limited only by the capacity of the installed Compact Flash card or USB Flash drive. For a 256 MB card, storage is greater than 13000 spectrum analyzer traces and over 10000 setups.

Traces

Displayed Traces: Three Traces with trace overlay. Trace A is always the live data; Traces B and C can be either stored data or traces which have been mathematically manipulated. Also Trace C can show max hold or min hold.

Interfaces

Type N female RF connector for Spectrum Analyzer input
Reverse polarity BNC jack for optional GPS antenna connector
BNC female connectors for ext. reference and ext. trigger
5-pin Mini-B USB 2.0 for data transfer to a PC
USB 2.0 Host connector used with PSN50 High Accuracy Power Meter and USB Flash Drives
RJ45 connector for Ethernet 10/100 Base T
2.5 mm 3-wire headset connector

Size and Weight

Size: 313W x 211H x 77D mm (12W x 8H x 3D in.)

Weight: 3.4 kg (<7.5 lbs.) typical

Environmental

MIL-PRF-28800F class 2

Operating: −10° C to 55° C, humidity 85% or less

Storage: −51° C to 71° C

Altitude: 4600 meters, operating and non-operating

Safety

Conforms to EN 61010-1 for Class 1 portable equipment

Electromagnetic Compatibility

Meets European Community requirements for CE marking.

Ordering Information

Model

MS2724B Handheld Spectrum Analyzer
9 kHz to 20 GHz

Options

Option MS2724B-009	IQ Demodulation Hardware
Option MS2724B-019	High Accuracy Power Meter (Power Sensor not included)
Option MS2724B-025	Interference Analysis
Option MS2724B-027	Channel Scanner
Option MS2724B-031	GPS (includes GPS antenna)
Option MS2724B-033	cdmaOne and CDMA2000 1xRTT (OTA) (requires Opt. 009, 031)
Option MS2724B-034	EVDO Over The Air (OTA) Measurement (requires Option 009, 031)
Option MS2724B-035	W-CDMA/HSDPA OTA (requires Opt. 009)
Option MS2724B-037	Mobile WiMAX Over The Air (OTA) Measurement (requires Opt. 009)
Option MS2724B-038	TD-SCDMA Over The Air (OTA) Measurements (requires Opt. 009)
Option MS2724B-040	GSM/GPRS/EDGE RF Meas (requires Opt. 009)
Option MS2724B-041	GSM/GPRS/EDGE Demod (requires Opt. 009)
Option MS2724B-042	CDMA RF Measurement (requires Opt. 009)
Option MS2724B-043	cdmaOne and CDMA2000 1xRTT demodulator (requires Opt. 009)
Option MS2724B-044	W-CDMA/HSDPA RF Measurement (requires Opt. 009)
Option MS2724B-045*	W-CDMA Demodulation (requires Opt. 009)
Option MS2724B-046	Fixed WiMAX RF Measurement (requires Opt. 009)
Option MS2724B-047	Fixed WiMAX Demodulation (requires Opt. 009)
Option MS2724B-060	TD-SCDMA RF Measurement (requires Opt. 009)
Option MS2724B-061	TD-SCDMA Demodulation (requires Opt. 009)
Option MS2724B-062	EVDO RF Measurement (requires Opt. 009)
Option MS2724B-063	EVDO Demodulator (requires Opt. 009)
Option MS2724B-065*	W-CDMA/HSDPA Demodulation (requires Opt. 009)
Option MS2724B-066	Mobile WiMAX RF Measurement (requires Opt. 009)
Option MS2724B-067	Mobile WiMAX Demodulator (requires Opt. 009)
Option MS2724B-090	Gated Sweep

Standard Accessories Include:

10580-00175	User's Guide
65729	Soft Carrying Case
40-168-R	AC – DC Adapter
806-141	Automotive Cigarette Lighter/12 Volt DC Adapter
2300-498	CD ROM containing Master Software Tools
2000-1371	Ethernet Cable
3-806-152	Cross-over Ethernet Cable
633-44	Rechargeable battery, Li-Ion
1091-27	Type-N male to SMA female adapter
1091-172	Type-N male to BNC female adapter
2000-1520-R	2 GB USB Flash Drive
3-2000-1498	USB Type A to Mini-B Cable
	One Year Warranty

* All the capability of option 45 is included in option 65. They cannot be ordered together.

Optional Accessories:

3-2000-1567	512 MB Compact Flash
2000-1520-R	2 GB USB Flash Drive
42N50A-30	30 dB, 50 watt, Bi-directional, DC to 18 GHz, N(m) to N(f) Attenuator
34NN50A	Precision Adapter, DC to 18 GHz, 50 Ω, N(m) to N(m)
34NFNF50C	Precision Adapter, DC to 18 GHz, 50 Ω, N(f) to N(f)
15NNF50-1.5B	Test port cable, armored, 1.5 meter N(m) to N(f) 18 GHz
15NN50-1.5C	Test port cable armored, 1.5 meter, N(m) to N(m), 6 GHz
15NN50-3.0C	Test port cable armored, 3.0 meter, N(m) to N(m), 6 GHz
15NN50-5.0C	Test port cable armored, 5.0 meter, N(m) to N(m), 6 GHz
15NNF50-1.5C	Test port cable armored, 1.5 meter, N(m) to N(f), 6 GHz
15NNF50-3.0C	Test port cable armored, 3.0 meter, N(m) to N(f), 6 GHz
15NNF50-5.0C	Test port cable armored, 5.0 meter, N(m) to N(f), 6 GHz
15ND50-1.5C	Test port cable armored, 1.5 meter, N(m) to 7/16 DIN(m), 6.0 GHz
15NDF50-1.5C	Test port cable armored, 1.5 meter, N(m) to 7/16 DIN(f), 6.0 GHz
510-90	Adapter, 7/16 DIN(f) to N(m), DC to 7.5 GHz, 50 Ω
510-91	Adapter, 7/16 DIN(f) to N(f), DC to 7.5 GHz, 50 Ω
510-92	Adapter, 7/16 DIN(m) to N(m), DC to 7.5 GHz, 50 Ω
510-93	Adapter, 7/16 DIN(m) to N(f), DC to 7.5 GHz, 50 Ω
510-96	Adapter 7/16 DIN(m) to 7/16 DIN(m), DC to 7.5 GHz, 50 Ω
510-97	Adapter 7/16 DIN(f) to 7/16 DIN(f), DC to 7.5 GHz, 50 Ω
1030-105-R	Band Pass Filters, 890-915 MHz, N(m) to N(f), 50 Ω
1030-106-R	Band Pass Filters, 1710-1790 MHz, N(m) to N(f), 50 Ω
1030-107-R	Band Pass Filters, 1910-1990 MHz, N(m) to N(f), 50 Ω
1030-109-R	Band Pass Filters, 824-849 MHz, N(m) to SMA(f), 50 Ω
1030-110-R	Band Pass Filters, 880-915 MHz, N(m) to SMA(f), 50 Ω
1030-111-R	Band Pass Filters, 1850-1910 MHz, N(m) to SMA(f), 50 Ω
1030-112-R	Band Pass Filters, 2400-2484 MHz, N(m) to SMA(f), 50 Ω
1030-114-R	Band Pass Filters, 806-869 MHz, N(m) to SMA(f), 50 Ω
65729	Spare soft carrying case
40-168-R	Spare AC/DC adapter

806-141	Spare automotive cigarette lighter/12 Volt DC adapter
760-243-R	Transit case with wheels and retractable handle for Anritsu MS2724B Handheld Spectrum Analyzer
2300-498	Anritsu Master Software Tools
10580-00175	Anritsu HHSA User's Guide, Model MS2724B (spare)
10580-00176	Anritsu HHSA Programming Manual, Model MS2724B
10580-00177	Anritsu HHSA Maintenance Manual, Model MS2724B
633-44	Rechargeable battery, Li-Ion
2000-1374	Dual battery charger, Li-Ion with universal power supply
2000-1411-R	Portable Yagi Antenna, 10 dBd, N(f) 822 to 900 MHz
2000-1412-R	Portable Yagi Antenna, 10 dBd, N(f) 885 to 975 MHz
2000-1413-R	Portable Yagi Antenna, 10 dBd, N(f) 1.71 to 1.88 GHz
2000-1414-R	Portable Yagi Antenna, 9.3 dBd, N(f) 1.85 to 1.99 GHz
2000-1415-R	Portable Yagi Antenna, 10 dBd, N(f) 2.4 to 2.5 GHz
2000-1416-R	Portable Yagi Antenna, 10 dBd, N(f) 1.92 to 2.17 GHz
2000-1030	Portable Antenna, SMA(m) 1.71 to 1.88 GHz, 50 Ω
2000-1031	Portable Antenna, SMA(m) 1.85 to 1.99 GHz, 50 Ω
2000-1032	Portable Antenna, SMA(m) 2.4 to 2.4835 GHz, 50 Ω
2000-1035	Portable Antenna, SMA(m) 896 to 941 MHz, 50 Ω
2000-1200	Portable Antenna, SMA(m) 806 to 866 MHz, 50 Ω
2000-1361	Portable Antenna, SMA(m) 5725 to 5825 MHz, 50 Ω
2000-1473	Portable Antenna, SMA(m) 870 to 960 MHz, 50 Ω
2000-1474	Portable Antenna, SMA(m) 1.71 to 1.88 GHz, 50 Ω
2000-1475	Portable Antenna, SMA(m) 1.92 to 1.98 GHz and 2.11 to 2.17 GHz, 50 Ω
61532	Antenna Kit: 2000-1030, 2000-1031, 2000-1032, 2000-1035, 2000-1200, and 2000-1361

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