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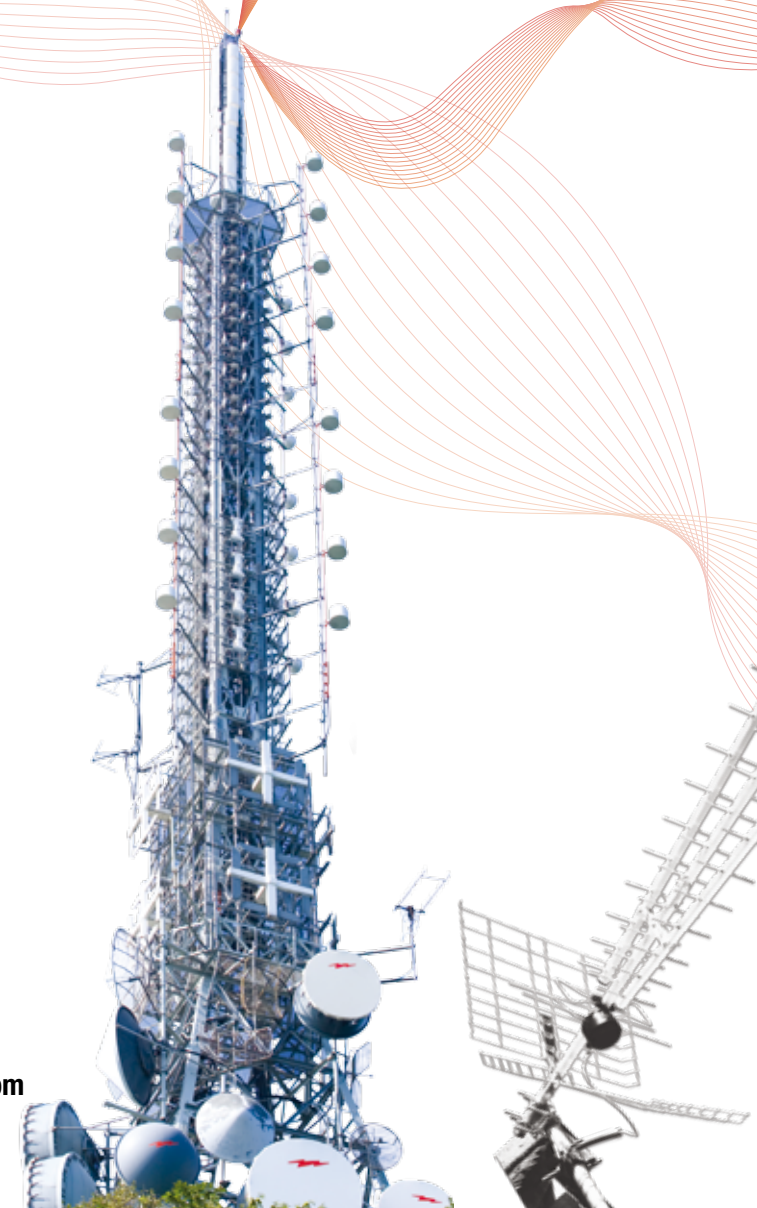
Portable PIM Analyzers - PP Series
PIM S1L MK2 Analyzer - TETRA & UHF
S1L Series PIM Analyzers for Lab & QA

PEM Series - Expandable PIM Analyzers
PEM42A Series - Multi Band PIM Analyzers
ATC Antenna Test Chamber

Low PIM Accessories
Shield Box

PIM Testers
(Passive Intermodulation)



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Products Guide

Portable PIM Analyzers

- Multiple Test Modes: Field Diagnostic, Analyzer with Multi PIM, PIM over Time, Rx Sweep, Single Carrier Mode for System Return Loss measurements, Distance to Faulty PIM.
- Embedded DTP, DTF. No need to re-connect DUT when switching between PIM and DTP, DTF measurements.
- Variable output power 15 dBm to 44 dBm. Ideal for Macro BTS and DAS.
- Very high PIM sensitivity: -172 dBc @ 2 x 43 dBm carriers.
- PIM vs. Time graph, Min & Max hold feature. Perfect for static & dynamic PIM measurements.

AWT portable PP Series PIM analyzers are powerful tools for analyzing telecommunication infrastructure. These PIM testers provide constant CW Power and with that, are in full conformance to PIM standard IEC 62037. The ruggedized analyzers are built to work under tough conditions and will perform reliably. PP Analyzers offer variable output power from 15 dBm to 44 dBm The market leading dynamic range and low receiver noise level makes them ideal for pinpointing and eliminating PIM at macro BTS sites and in-building DAS installations. Measurement results can be stored as PDF document, BMP screen shots, PDF protocol with embedded screen shot or as alphanumerical CSV files. Distance-to-PIM (DTP) measurements are accurate due to a patented technology. DTP, DTF performed conveniently with the push of a button, no need to install external hardware and to re-connect the DUT.

Models

Model	Description	Tx Range (MHz)	Rx Range (MHz)
PP700L	LTE700(low)	728 ~ 759	698 ~ 716
PP700U	LTE700(up)	728 ~ 759	776 ~ 788
PP700APT	APT700, 3GPP-28	728 ~ 803	703 ~ 748
PP800	LTE800	791 ~ 821	832 ~ 862
PP850	AMPS/CDMA	869 ~ 896	824 ~ 851
PP900	GSM900	935 ~ 960	890 ~ 915
PP900E	E-GSM & GSM900	925 ~ 960	880 ~ 915
PP1800	DCS 1800/GSM1800	1805 ~ 1880	1710 ~ 1785
PP1900	PCS1900	1930 ~ 1990	1850 ~ 1910
PP2000TD	TD-SCDMA(2000)	2010 ~ 2025	1900 ~ 1920
PP2100UMTS	UMTS/W-CDMA	2110 ~ 2170	1920 ~ 2060
PP2100AWS	AWS	2110 ~ 2155	1710 ~ 1755
PP1921PA	PCS & AWS	1930 ~ 1990 / 2110 ~ 2155	1710 ~ 1755 / 1850~1910
PP2160JP	W-CDMA-JP	2150 ~ 2170	2110 ~ 2140
PPWBKR	WiBro-KR	2110 ~ 2170 / 2300 ~ 2390	1910 ~ 1990
PP2600LTE	IMT-E(2600), LTE2600	2620 ~ 2690	2500 ~ 2570
PP800SMR	SMR800	851~ 869	806 ~ 824

RF & Microwave Technology

AWT provides advanced telecommunication technology products and analyzers for a variety of RF and Microwave applications.

Portable PIM Test Systems

Field use demands ruggedized yet accurate test instruments. Our portable PIM testers are designed exactly for these conditions. The wide Tx power range from 15dBm to 44dBm makes the PIM S1P analyzer ideal for Macro BTS sites and DAS installations. DTF (opt) can be measured with the push of a button.

PIM Analyzers for Production

Production analyzers have to perform permanently. AWT offers single and dual band PIM analyzers that are build for 24/7 operation. Also available are expandable systems for up to four frequency bands.

PP Series

Technical Specifications

System

Measurement Method	Reverse (reflected) PIM, 3rd, 5th, 7th, 9th, 11th and 13th order
Residual PIM (typ.) **(PP1921PA**	< -129 dBm / -172 dBc < -125 dBm / -168 dBc)
User Interface Ports	3x USB 1x LAN, 1x RF Output (7-16 DIN female)
Display	10.2 inch, touch screen

Transmitter

Frequencies	See table
Frequency increments	100 kHz
Frequency accuracy	2 ppm
Power (per tone)	15 - 44 dBm adjustable
Power Accuracy	+/- 0.35 dB
Reverse Pwr. Protection	+43 dBm for 5 sec

Receiver

Residual PIM	< -129 dBm (typ.) (-172 dBc @ 2 x 43 dBm)
Noise Floor **(PP1921PA**	< -138 dBm typ. @ 300 Hz < -134 dBm typ. @ 300 Hz)
Dynamic Range (typ.)	90 dB
Input Power without Damage	0 dBm (max.)
Measurement Accuracy	+/- 1.0 dB (typ.)

Distance to PIM / Distance to VSWR (Opt)

DTP / DTF resolution	0.1 m
DTP Accuracy	0.5 m (typ.), 1.5 m (max.)
DTF Accuracy	0.5 m (typ.), 1.5 m (max.)
Cable Types	Pre stored types & user can add new cable types

Electrical

Main Power	100-240V, 50/60Hz
Power consumption	750 VA (max.)

Dimensions / Weight

Dimensions	457 x 305 x 500 (mm) 18.0 x 12.0 x 19.7 (inch)
Weight	25~29 kg
POPT1	1 kg

Environmental

Operating Temperature	0° C to +40° C
Storage Temperature	-20° C to +60° C
Ingress Protection	IP66 (lid closed) IP20 (lid open)
Relative humidity	5% to 85% (non condensing)
Mechanical shock rating	40G

Options & Accessories

Type	Description
POPT1	Embedded option for distance-to-PIM (DTP), Return Loss, VSWR and distance-to-fault
PACC2	Accessory Kit: Low PIM cable 1 m, 3 m DIN(m)-DIN(m), low PIM load 50 W/ 10W dual port DIN(m)-DIN(f), (4) low PIM adaptors, torque wrench, hand carry case
PIMGEN	PIM generator, preset PIM value -80 dBm (+/-10) for quick system tests
PLOAD100	Low PIM load 100W, PIM < -165 dBc @ 2 x 43 dBm, 690 - 2800 MHz, with handle, DIN(f)
PLOAD50	Low PIM load 50W / 20W (30 mins / permanent), PIM < -165 dBc @ 2 x 43 dBm, 690 - 2800 MHz, dual port DIN(m)-DIN(f), with ear for carabiner or strap
ADA-DMDF	Low PIM Adaptor, PIM < -165dBc @ 2 x 43 dBm, DIN(m)-DIN(f), Connector Saver
LIC308DMDM-2M	Low PIM cable 2m, PIM < -165dBc @ 2 x 43 dBm, DIN(m)-DIN(m)
LIC308DMDM-1M	Low PIM cable 1m, PIM < -165dBc @ 2 x 43 dBm, DIN(m)-DIN(m)

PIM S1L MK2 Analyzer

- Test Modes: Field Mode, Analyzer, multi PIM display, Rx sweep, PIM vs. Time, Single Carrier for insertion loss (IL) measurements.
- Embedded DTP, DTF option. Distance to PIM, VSWR, DTF.
- High PIM sensitivity: -165 dBc @ 2x 43 dBm carriers.
- Data recording: CSV, PDF, BMP screen shots.
- Output power adjustable: 2 x 15 dBm to 44 dBm.
- Large 10.2" Touch Screen Display.
- One-Body solution.

PIM S1L TETRA & UHF analyzers are important tools for analyzing telecommunication infrastructure, like antennas, cables and components. They are ideal for component testing in laboratory and quality assurance, but are also valuable field tools, providing vital test results in TETRA & UHF networks. Specifications and measurement accuracy are exceptional and of PIM S1L analyzers deliver reliable results. They are very easy to operate; just the touch of a button to start predefined tests.

Models

Model	Description	Tx Range (MHz)	Rx Range (MHz)
PS1L400 MK2	TETRA 400	390 ~ 400	380 ~ 385
PS1L400E MK2	E-TETRA	420 ~ 430	410 ~ 412
PS1L385 MK2	TETRA 385	410 ~ 425	385 ~ 400

Other TETRA & UHF frequency combinations can be provided. Contact AWT Global or your next customer representative for more information.

Our PIM S1L analyzers deliver constant CW Power signals during PIM measurements. This makes them fully conform to PIM specification IEC 62037, the standard for PIM testing. PIM S1L analyzers offer variable measurement signal output power from 15 dBm to 44 dBm. They provide even a Single-Carrier-Mode, ideal for Insertion Loss and coverage measurements.

Market leading dynamic range and low receiver noise level makes these analyzers perfect for testing, pinpointing and eliminating PIM. Results can be stored as PDF, BMP screen shots, or as CSV files. Our patented DTP measurement is highly accurate, and immediately available just at the push of a button.

"When public safety officers assign their staff to critical missions, they rely on the performance of their TETRA & UHF networks. Communication and data transmission must not experience any PIM distortion. PIM S1L MK2 TETRA & UHF helps to establish highest quality networks".

RF & Microwave Technology
AWT offers advanced telecommunication technology products and analyzers for a variety of RF and Microwave applications.

TETRA
TETRA (TErrestrial Trunked RAdio) has been designed to fulfill the requirements of users in Private Mobile Radio (PMR), Land Mobile Radio (LMR), Public-Access Mobile Radio (PAMR) and public safety and security applications such as police, border patrol and coast guard, fire departments and ambulances. This ETSI based standard is applied in most regions of the world.

PIM Analyzers -Types
AWT offers a wide variety of PIM analyzers for many different applications. These include single, double, triple and quadruple band analyzers for standard frequencies and customized frequency bands.

TETRA & UHF

Technical Specifications

Transmitter

Frequencies	Model dependent
Frequency increments	100 kHz
Frequency accuracy	2 ppm
Power (per tone)	15 - 44 dBm adjustable
Power Accuracy	+/- 0.35 dB
Reverse Pwr. Protection	+43 dBm for 5 sec

Receiver

Measurement Method:	Reverse (reflected) PIM IM 3rd, 5th, 7th, 11th, 13th, 15th ,17th order (up to 4 simultaneously)
Residual PIM (typ.)	< -122 dBm (-165 dBc @ 2 x 43 dBm)
Noise Floor	< -132 dBm typ. @ 300 Hz
Dynamic Range (typ.)	90 dB
Input Power without Damage	0 dBm (max.)
Measurement Accuracy	+/- 1.0 dB (typ.)

Interfaces

RF Port	DIN 7/16 (f)
Internal Data Storage	SSD
Communication & External Data Storage	3x USB
LAN	Ethernet
Display	Touch Screen 10.2”

Distance to PIM / Distance to VSWR (Opt)

DTP / DTF resolution	0.1 m
DTP Accuracy	1.0 m (typ.)
DTF Accuracy	1.0 m (typ.)
Cable Types	Pre stored types & user can add new cable types

Electrical

Main Power	100 to 240 V, 50 / 60 Hz
Power Consumption	750 VA (max.)

Dimensions / Weight

Dimensions	504 x 398 x 276 (mm) 19.8 x 15.7 x 10.9 (inch)
Weight / with POPT1	28.5 kg / 30.5 kg

Environmental

Operating Temperature	0° C to +40° C
Storage Temperature	-20° C to +60° C
Ingress Protection	IP20
Relative humidity	85% (max.) (non condensing)
Mechanical shock rating	40G

Options & Accessories

Type	Description
POPT1	Embedded option for Distance-to-PIM (DTP), Return Loss, VSWR and Distance-to-Fault
PACC2	Accessory Kit: Low PIM cable 1 m, 3 m DIN(m)-DIN(m), low PIM load 50 W/ 10W dual port DIN(m)-DIN(f), (4) low PIM adaptors, torque wrench, hand carry case
PIMGEN	PIM generator, preset PIM value -80 dBm (+/-10) for quick system tests
PLOAD100L	Low PIM load 100W, PIM < -165 dBc @ 2 x 43 dBm, 380 - 2800 MHz, with handle, DIN(f)
ADA-DMDF	Low PIM adapter, PIM < -165 dBc @ 2 x 43 dBm, DIN(m)-DIN(f), Connector Saver
LIC308-DMDM-2M	Low PIM cable, Length: 2 meter (6 ft), PIM < -165 dBc @ 2 x 43 dBm, DIN(m)-DIN(m)
LIC308-DMDM-1M	Low PIM cable, Length: 1 meter (3 ft), PIM < -165 dBc @ 2 x 43 dBm, DIN(m)-DIN(m)

S1L Series PIM Analyzers

- Test Modes Include: Diagnostic, Analyzer with Multi PIM, PIM-over-Time, Sweep Mode, Single Carrier Mode for System Return Loss measurements, Distance to PIM, VSWR, Distance to Fault.
- Variable output power 15 dBm to 44 dBm.
- Very high PIM sensitivity: -172 dBc @ 2 x 43 dBm carriers.
- Intermodulation Products: IM3, IM5, IM7, IM9, IM11 and IM13.
- PIM vs. Time graph and Min & Maxhold feature. Perfect for static & dynamic PIM measurements.

PIM S1L analyzers are ideal for component testing in the laboratory and/or during quality control. They offer variable output power from 15 dBm to 44 dBm per channel, and provide a wealth of features that deliver accurate and reliable results. These systems are very easy to operate; it takes just one click to start a predefined test. S1L analyzers are conform to PIM standard IEC 62037. Their market leading dynamic range and low receiver noise level makes them ideal for testing and analyzing RF components for telecommunication networks. Measurement results can be stored as PDF document, BMP screen shots, PDF protocol with embedded screen shot or as alphanumerical CSV files.

Models

Model	Description	Tx Range (MHz)	Rx Range (MHz)
PS1L700L	LTE700 (low)	728 ~ 759	698 ~ 716
PS1L700U	LTE700 (high)	728 ~ 759	776 ~ 788
PS1L700APT	APT700, 3GPP-28	758 ~ 803	703 ~ 748
PS1L800	LTE800	791 ~ 821	832~ 862
PS1L800SMR	SMR800	851 ~ 869	806 ~ 824
PS1L850	AMPS/CDMA	869 ~ 896	824 ~ 851
PS1L900	GSM900	935 ~ 960	890 ~ 915
PS1L900E	E-GSM & GSM900	925 ~ 960	880 ~ 915
PS1L1800	DCS 1800 /GSM1800	1805 ~ 1880	1710 ~ 1785
PS1L1900	PCS1900	1930 ~ 1990	1850 ~ 1910
PS1L2000TD	TD-SCDMA(2000)	2010 ~ 2025	1900 ~ 1920
PS1L2100UMTS	TS/W-CDMA	2110 ~ 2170	1920 ~ 1980 / 2060
PS1L2100AWS	AWS	2110 ~ 2155	1710 ~ 1755
PS1L1921PA	PCS & AWS	1930 ~ 1990 2110 ~ 2155	1850 ~ 1910 1710 ~ 1755
PS1L2160JP	W-CDMA-JP	2150 ~ 2170	2110 ~ 2140
PS1LWBKR	WiBro-KR	2110 ~ 2170 2300 ~ 2390	1910 ~ 1990
PS1L2600LTE	IMT-E(2600), LTE2600	2620 ~ 2690	2500 ~ 2570

RF & Microwave Technology
AWT provides advanced telecommunication technology products and analyzers for a variety of RF and Microwave applications.

S1L Series PIM Analyzers
Modern telecommunication technologies demand lowest passive intermodulation distortion of network installations.
Selection of very low PIM components are particularly important when wireless signals of different frequencies share one RF path.

Signal degradation caused by PIM causes loss of network capacity. This translates directly into dissatisfied customers and reduced revenues
for the operators. Low PIM components are key to optimal network operation.

Lab & QA

Technical Specifications

System

Measurement Method	Reverse (reflected) PIM, 3rd, 5th, 7th, 9th, 11th and 13th order
Reverse IM (typ.) (PS1L1921PA	< -129 dBm / -172 dBc < -125 dBm / -168 dBc)
User Interface Ports	3x USB 1x LAN, 1x RF Output (7-16 DIN female)
Display	7/10.2 inch, touch screen

Transmitter

Frequencies	See table
Frequency increments	100 kHz
Frequency accuracy	2 ppm
Power (per tone)	15 - 44 dBm adjustable
Power Accuracy	+/- 0.35 dB
Reverse Pwr. Protection	+43 dBm for 5 sec

Receiver

Noise Floor (PS1L1921PA	< -138 dBm typ. @ 300 Hz < -134 dBm typ. @ 300 Hz)
Dynamic Range (typ.)	90 dB
Input Power without Damage	0 dBm (max.)
Measurement Accuracy	+/- 1.0 dB (typ.)

Distance to PIM / Distance to VSWR (Opt)

DTP / DTF resolution	0.1 m
DTP Accuracy	0.5 m (typ.), 1.5m (max.)
DTF Accuracy	0.5 m (typ.), 1.5m (max.)
Cable Types	Pre stored types & users can add new cable types

Electrical

Main Power	100-240 V, 50/60 Hz
Power Consumption	750 VA (max.)

Dimensions / Weight

Dimensions	**7inch (excl. EGSM)** 504x397x237 (mm), 19.8x15.6x9.3 (inch)
	7inch (EGSM) 589X397X237 (mm) 23.1x15.6x9.3 (inch)
	10.2 inch 504 x 398 x 276 (mm) 19.8 x 15.7 x 10.9 (inch)
Weight	24 ~ 30 kg

Environmental

Operating Temperature	0° C to +40° C
Storage Temperature	-20° C to +60° C
Ingress Protection	IP20
Relative humidity	85% (max.) (non condensing)
Mechanical shock rating	40G

Options & Accessories

Type	Description
POPT1	Embedded option for distance-to-PIM (DTP), Return Loss, VSWR and distance-to-fault
PACC2	Accessory Kit: low PIM cable 3m DIN(m)-DIN(m), low PIM Load 50W / 10W, dual port DIN(m)-DIN(f), PIM < -168dBc, torque wrench DIN7/16, (4) adaptors, cleaning tabs, carrying case IP66
PIMGEN	PIM generator, preset PIM value 80 dBm (+/-10) for quick system tests
PLOAD100	Low PIM load 100W, PIM < -165 dBc, 690-2700 MHz, with handle, DIN(f)
PLOAD50	Low PIM load 50W / 20W (30 mins / permanent), PIM < -165 dBc, 690 - 2700 MHz, dual port DIN(m)-DIN(f), with ear for carabiner or strap
LIC308DMDM-2M	Low PIM cable 2m, PIM < -165dBc, DIN(m)-DIN(m)

PEM Series - Expandable

- Expandable PIM Analyzer for Manufacturing and Laboratory.
- One Master Control Unit controls up to 4 different RF Units.
- 3 Measurement Modes: Multi PIM, PIM over Time, PIM over Frequency (Frequency Sweep).
- RF Units measure reverse and forward PIM (2-port).
- Measures intermodulation products: IM3, IM5, IM7, IM9, IM11, IM13, IM15, IM 17 (4 strongest simultaneously.)

AWT's PEM Series expandable PIM analyzers are ideal when multi frequency measurement are required. They are scalable, new frequencies can be added with increasing requirements. This makes them a cost effective solution for component and antenna testing. The PEM Control Unit can manage up to four RF Units with different frequency bands, any frequency combination is possible. PEM Series analyzers are designed for true 24/7 operation - no overheating, no drifting. They are fully conform to the international PIM standard IEC 62037. PEM analyzers are compact and require minimal rack height.

RF & Microwave Technology
AWT offers advanced telecommunication technology products and analyzers for a variety of RF and Microwave applications.

Expandable PIM Analyzers
Production testing requires fast and highly reliable PIM analyzers. As the spectrum of manufactured products widens, PIM analysis may have to be performed on additional frequencies. Our expandable PIM analyzer can be equipped with up to four RF Units.

PIM Analyzers -Types
AWT offers a wide variety of PIM analyzers for many different applications. These include single, double, triple and quadruple band analyzers for standard frequencies and customized frequency bands.

Models

Model	Description	Tx Range (MHz)	Rx Range (MHz)
PEMCTRL	Master Control Unit for up to 4 RF Units	All	All
PEM385	TETRA 385 (only reverse)	410 ~ 425	385 ~ 400
PEM400	TETRA 400 (only reverse)	390 ~ 400	380 ~ 385
PEM400E	E-TETRA (only reverse)	420 ~ 430	410 ~ 412
PEM700L	LTE700 (lower band)	728 ~ 759	698 ~ 716
PEM700U	LTE700 (upper band)	728 ~ 759	776 ~ 788
PEM800	LTE800	791 ~ 821	832~ 862
PEM850	AMPS/CDMA	869 ~ 896	824 ~ 851
PEM900E	E-GSM & GSM900	925 ~ 960	880 ~ 915
PEM1800	DCS 1800 /GSM1800	1805 ~ 1880	1710 ~ 1785
PEM1900	PCS1900	1930 ~ 1990	1850 ~ 1910
PEM2000TD	TD-SCDMA(2000)	2010 ~ 2025	1900 ~ 1920
PEM2100AWS	AWS	2110 ~ 2155	1710 ~ 1755
PEM2100UMTS	UMTS/W-CDMA	2110 ~ 2170	1920 ~ 1980 / 2060
PEM2160JP	W-CDMA-JP	2150 ~ 2170	2110 ~ 2140
PEMWBKR	WiBro-KR	2110 ~ 2170 / 2300 ~ 2390	1910 ~ 1990
PEM2600LTE	IMT-E(2600), LTE2600	2620 ~ 2690	2500 ~ 2570

PIM Analyzers

Technical Specifications

Transmitter

Frequency band	depends on RF Unit
Frequency increments	100 kHz
Frequency accuracy	2 ppm
Power (per tone)	+20 to +44 dBm adjustable
Power Accuracy	+/- 0.35 dB

Receiver

Reverse IM @ 2x43dBm	< -129 dBm (typ.) < -172 dBc
Forward IM @ 2x43dBm	< -125 dBm (typ.) < -168 dBc
Noise Floor	< -134 dBm (typ.)
Dynamic Range (typical)	90 dB
Input Power without Damage	0 dBm (max.)
Measurement Accuracy	+/- 1.0 dB (typ.)

Dimensions / Weight

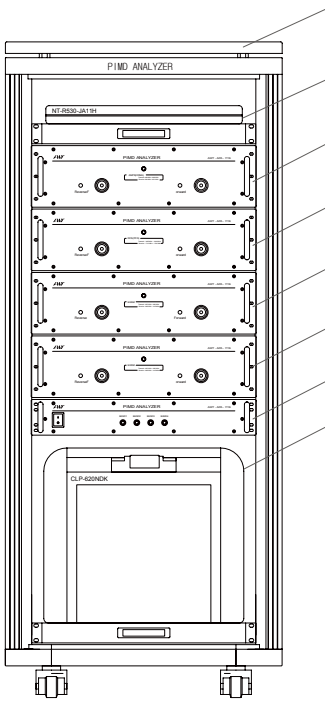
Dimensions	**Control unit**	483 x 652 x 89 (mm) 18.8 x 25.6 x 3.5 (inch)
	RF Units (excl. EGSM,TETRA)	483 x 667 x 146 (mm) 18.8 x 26.5 x 5.7 (inch)
	RF Unit (EGSM)	483 x 756 x 146 (mm) 18.8 x 29.8 x 5.7 (inch)
	RF unit (TETRA/ E-TETRA)	483 x 756 x 267 (mm) 18.8 x 29.8 x 10.5 (inch)
Weight	**Control Unit**	11.7 kg / 25.7 lbs
	RF units	24 - 30 kg / 52 - 66 lbs

Electrical

Main Power	100 to 240V, 50 / 60Hz
Control Unit	88 VA (max.)
RF Units (@ RF power 2 x 44 dBm)	700 VA (max.)

Environmental

Operating Temperature	0° C to +40° C
Relative humidity	80% RH (max.) (non condensing)



Example:
19" rack
set up with
printer & PC

Accessories

Type	Description
PLOAD100	Low PIM load 100W, PIM < -165 dBc, 690 - 2700 MHz, with handle, Connector DIN(f)
ADA-DMDF	Low PIM adapter, PIM < -165 dBc, DIN(m)-DIN(f), Connector Saver
LIC308-DMDM-2M	Low PIM cable, Length: 2 meter (6 ft), PIM < -165 dBc, DIN(m)-DIN(m)
LIC308-DMDM-1M	Low PIM cable, Length: 1 meter (3 ft), PIM < -165 dBc, DIN(m)-DIN(m)
PACC2	Accessory Kit: low PIM cable 3m DIN(m)-DIN(m), low PIM Load 50 W / 10 W, dual port DIN(m)-DIN(f), PIM < -168 dBc, torque wrench DIN7/16, (4) low PIM adaptors, cleaning tabs, hard carrying case IP66
PIMGEN	PIM generator, preset PIM value 80 dBm (+/-10) for quick system tests

PEM42A Series

- Single connection Passive Intermodulation and S-parameter measurements.
- Uses Keysight E5072A ENA series network analyzers.
- Up to 4 PIM frequency bands for multi-band testing.
- Measures PIM, return loss and insertion loss.
- Verifies complete performance of passive components in one measurement run.
- Cost effective solution for high volume production.
- Well suited for R&D, Production & QA

RF & Microwave Technology

AWT offers advanced telecommunication technology products and analyzers for a variety of RF and Microwave applications.

PIM Analyzers -Types

AWT offers a wide variety of PIM analyzers for many different applications. These include single, double, triple and quadruple band analyzers for standard frequencies and customized frequency bands.

Multi Band PIM Analyzers

Time is money. Production testing requires fast and highly reliable PIM analyzers. With PEM42A PIM and S-parameter measurements require only one connection to the DUT - even when multiple frequency bands are examined.

Achieve fast, accurate, single connection PIM and S-Parameter testing of passive components

Both PIM and S-parameters, such as return loss or insertion loss, are essential measurements for passive components. Both must be tested in order to fully qualify a passive device. Conventional test systems require a network analyzer and separate PIM analyzers to test a device completely. If different test stations are used, the time required to connect and disconnect components can significantly exceed actual testing time.

AWT's new integrated solution PEM42A allows you to measure PIM and Sparameters with a single DUT connection. It utilizes the Keysight E5072A ENA series network analyzer to perform S-parameter measurements together with AWT's PEM42A multi band PIM analyzers.

Whether for R&D, production or QA , this system is well suited for testing wideband components. Conventional PIM analyzers are designed for a specific frequency band. Testing wide band devices requires several PIM analyzers. PEM42A multi band systems combine up to four frequency bands to one unified system. All instruments are controlled by a PEM42ACTRL Control & Switch Master Unit for synchronized measurements.

PEM42A systems are a cost-effective solution, providing very fast and accurate measurements. Repeated connect / disconnect cycles for measuring PIM of DUTs in different frequency bands is a thing of the past. Both PIM and S-parameters are now measured without changing the physical connection. This results in a major reduction of overall test time and increases test throughput significantly.

Multi Band PIM Analyzers

Models

Model	Description	Tx Range (MHz)	Rx Range (MHz)
PEM42A-CTRL	Master Control & Switch Unit for up to four PEM42ARF Modules	All	All
PEM42A-385	TETRA 385	385 ~ 400	410~ 425
PEM42A-400	TETRA 400	390 ~ 400	380 ~ 385
PEM42A-400E	E-TETRA	420 ~ 430	410 ~ 412
PEM42A-700L	LTE700 (lower band)	728 ~ 759	698 ~ 716
PEM42A-700U	LTE700 (upper band)	730 ~ 759	776 ~ 788
PEM42A-800	LTE800	791 ~ 821	832~ 862
PEM42A-850	AMPS/CDMA	869 ~ 896	824 ~ 851
PEM42A-900E	E-GSM & GSM900	925 ~ 960	880 ~ 915
PEM42A-1800	DCS 1800 /GSM1800	1805 ~ 1880	1710 ~ 1785
PIM42A-1900	PCS1900	1930 ~ 1990	1850 ~ 1910
PEM42A-2000TD	TD-SCDMA(2000)	2010 ~ 2025	1900 ~ 1920
PEM42A-2100AWS	AWS	2110 ~ 2155	1710 ~ 1755
PEM42A-2100UMTS	UMTS/W-CDMA	2110 ~ 2170	1920 ~ 1980 / 2060
PEM42A-2160JP	W-CDMA-JP	2150 ~ 2170	2110 ~ 2140
PEM42A-WBKR	WiBro-KR	2110 ~ 2170, 2300 ~ 2390	1910 ~ 1990
PEM42A-2600LTE	IMT-E(2600), LTE2600	2620 ~ 2690	2500 ~ 2570

PEM42A Series

Keysight

Order Number	Description
PEM42A-E5072A -245-1E5-1CP	Keysight Network Analyzer, 2-port, 30k to 4.5 GHz, configurable test set, opt 008: frequency offset mode, opt 1E5: high stability timebase, opt 1CP: rack mount kit. Prices and delivery might vary and dependent on Keysight policies. Sold only with PEM42A PIM analyzers.
PEM42A-E5072A -285-1E5-1CP	Keysight Network Analyzer, 2-port, 30k to 8.5 GHz, configurable test set, opt 008: frequency offset mode, opt 1E5: high stability timebase, opt 1CP: rack mount kit. Prices and delivery might vary and dependent on Keysight policies. Sold only with PEM42A PIM analyzers.
PEM42A-U2001A	Keysight USB power sensor, 10 MHz - 6 GHz. Required for user calibration of E5072A network analyzers. Prices and delivery might vary and dependent on Keysight policies. Sold only with PEM42A PIM analyzers.
PEM42A-85032A	Keysight mechanical calibration kit for Network Analyzer E5072A. DIN 7/16, 50 O hms, DC-7.5 GHz. Required for user calibration of E5072A network analyzers. Prices and delivery might vary and dependent on Keysight policies. Sold only with PEM42A PIM analyzers.
PEM42A-85032F-100	Keysight mechanical calibration kit for Network Analyzer E5072A. Type-N with adaptor (f)-(f), 50 Ohms, DC-9GHz. Required for user calibration of E5072A network analyzers. Prices and delivery might vary and dependent on Keysight policies. Sold only with PEM42A PIM analyzers.

Technical Specifications

System

Application usage	Lab & Production
Measurement Method	3rd, 5th, 7th to 27th order IM. Fixed Frequency Mode, Frequency Sweep, Spectrum Mode
User Interface Ports	(At PEM42A-CTRL) Port 1/Reverse and Port 2/Forward DIN 7/16 (f) (At E5072A) 2 x USB on front panel 4 x USB on rear panel 1 x LAN on rear panel 1 x Video on rear panel 1 x GPIB on rear panel
Display	10.2 inch touch screen at E5072A
Type	19" Rack Mount
Warm up Time(min.)	30 minutes (ENA Dependent)

Accessory Quality

AWT accessories are designed to meet the highest quality standards to fulfill the strongest PIM requirements. Every individual accessory is tested for performance to ensure that AWT customers receive the highest quality products.

Multi Band PIM Analyzers

Transmitter

Frequency band	depends on RF Unit
Frequency increments	100 kHz
Frequency accuracy	2 ppm
Power (per tone)	20 - 44 dBm adjustable
Power Accuracy	+/- 0.65 dB
Reverse Pwr. Protection	+43 dBm for max 5 sec
Adjustable Resolution	0.25 dB

Receiver

Reverse IM @ 2x43dBm	-122 dBm (Typ. -165 dBc @ 43 dBm x 2tones)
Forward IM @ 2x43dBm	-120 dBm (Typ. - 163 dBc @ 43 dBm x 2tones)
Noise floor	< -135 dBm Typ.
Dynamic Range (typical)	125 dB
Max Input Power	-10 dBm
Measurement Accuracy	+/- 1.0 dB Typ.

Electrical

Main Power	100 to 240 V, 50 / 60 Hz
Power Consumption	PEM42A-CTRL & PEM42A 750 VA max.
	E5072A , 305 VA max

Environmental

Operating Temperature	+5 °C to +40 °C
Storage Humidity	-10 °C to +60 °C
Relative Humidity	20% to 80% (non condensing)

Dimensions / Weight

Rack (with Auto-Caster)

Dimensions	600 x 1400 x 900 to 600 x 1533 x 1000 (mm) 23.6 x 55.1 x 35.4 to 23.6 x 60.4 x 39.4 (in)
Weight	90 (kg) - 198.4 (lbs)

Unit Dimensions

PEM42A-CTRL	483 x 222 x 664 (mm) - 19 x 8.7 x 26.1 (in)
PEM42A	483 x 133 x 657 (mm) - 19 x 5.2 x 25.9 (in)
TETRA	483 x 266.4 x 742 (mm) - 19 x 10.5 x 29.2 (in)
EGSM	483 x 133 x 742 (mm) - 19 x 5.2 x 29.2 (in)
E-TETRA	483 x 266.4 x 742 (mm) - 19 x 10.5 x 29.2 (in)
E5072A	483 x 222 x 472 (mm) - 19 x 8.7 x 18.6 (in)

Unit Weight

PEM42A-CTRL	29 (kg) - 63.9 (lbs)
PEM42A	25 to 28 (kg) - 55.1 to 61.7 (lbs)
TETRA	34 to 35 (kg) - 74.9 to 77.2 (lbs)
EGSM	34 to 35 (kg) - 74.9 to 77.2 (lbs)
E-TETRA	34 to 35 (kg) - 74.9 to 77.2 (lbs)
E5072A	19.8 (kg) - 43.7 (lbs)

Accessories

Type	Description
PLOAD100	Low PIM Termination 100W, PIM < -165 dBc, 380 - 2800 MHz, Connector DIN(f)
ADA-DMDF	Low PIM adapter, PIM < -165 dBc @2x43 dBm, DIN(m)-DIN(f), Connector Saver
LIC308-DMDM-2M	Low PIM cable, Length: 2 meter (6 ft), PIM < -165 dBc, DIN(m)-DIN(m)
LIC308-DMDM-1M	Low PIM cable, Length: 1 meter (3 ft), PIM < -165 dBc, DIN(m)-DIN(m)
PACC2	Accessory Kit: low PIM cable 3m DIN(m)-DIN(m), low PIM Load 50W / 10W, Frequency 698 to 2800 MHz, dual port DIN(m)-DIN(f), PIM < -165dBc dBm, torque wrench DIN7/16, (4) low PIM adaptors, cleaning tabs, hard carrying case IP66
PIMGEN	PIM generator, preset PIM value 80 dBm (+/-10) for quick system tests
PACC2L	Accessory Kit: low PIM cable 3m DIN(m)-DIN(m), low PIM Load 100W, Frequency 380 to 2800 MHz, DIN(f), PIM < -165dBc dBm, torque wrench DIN7/16, (4) low PIM adaptors, cleaning tabs, hard carrying case IP66

ATC Antenna Test Chamber

- Special design for low PIM antenna measurements
- Shielding > 90 dB
- Frequency Range 700 MHz to 6 GHz
- Residual PIM up to -165 dBc @ 2 x 43 dBm (DUT dependent).
- Up to 6 antenna ports for multi-band and MIMO antennas
- Models up to 3.9m length
- Customized solutions available on request

AWT's new ATC series low PIM Antenna Test Chambers are especially designed for testing RF devices and antennas from 700 MHz to 6 GHz. Not only are today's antennas required to show excellent transmission and S-parameters characteristics, due to modern modulation technologies, these antennas have to come with very low passive intermodulation distortion (PIM). Standard shielded chambers may provide good shielding, but they are often not suited for low PIM antenna measurements; due to their own high residual PIM. Besides the high shielding factor of more than 90 dB, our ATC series provide lowest residual passive intermodulation. Properly designed pyramidal electromagnetic absorbing material and special manufacturing techniques guarantee best results.

Our new low PIM Antenna Chambers (ATC) are compact and can be moved easily due to their wheeled frame. They are available in different lengths to suite customer specific applications

Absorber material 18 inch at the door and head ends and 12 inch at the main body provide outstanding ATC shielding factors and PIM ratings.

RF & Microwave Technology
AWT provides advanced telecommunication technology products and analyzers for a variety of RF and Microwave applications.

PIM Test Systems
AWT offers a variety of PIM analyzers including portable and laboratory units with single port (reverse PIM). We offer also expandable multi band, dual port units. All our PIM Analyzers are conform to specification IEC 62037, the global standard for PIM measurements.

Customized Solutions
Measurement requirements are often challenging. We offer customized Antenna Chambers and complete turnkey ATE solutions for PIM and S-parameter measurements.

Models

Model	Description
ATC27B	Length 2.7 m, Diameter 1.8 m
ATC32B	Length 3.2 m, Diameter 1.8 m
ATC35B	Length 3.5 m, Diameter 1.8 m
ATC37B	Length 3.7 m, Diameter 1.8 m
ATC39B	Length 3. 9m, Diameter 1.8 m

Image shows ATC with option ATCPORT4

Technical Specifications

Shielding Effectiveness

ATCxx	> 90 dB (700-6000 MHz)

PIM

Residual PIM(typ.)	up to -165 dBc (@2x43 dBm) Depends on DUT type and options

Electrical (LED light)

Main Power for AC/DC 50/60Hz	Converter 100-240 V/ 5 V,
Power consumption	10 Watts

RF Port (s)

ATCxx	Panel 4-Hole DIN 7/16 (f)-(f)

Dimensions

Length, cylinder diameter, height	
ATC27B	2.7 m x Dia 1.8 m x 2.1 m
ATC32B	3.2 m x Dia 1.8 m x 2.1 m
ATC35B	3.5 m x Dia 1.8 m x 2.1 m
ATC37B	3.7 m x Dia 1.8 m x 2.1 m
ATC39B	3.9 m x Dia 1.8 m x 2.1 m

Weight(Approx.)

ATC27B	550 kg
ATC32B	630 kg
ATC35B	700 kg
ATC37B	770 kg
ATC39B	840 kg

Models & Options

Model	Description
ATC27B	Antenna Chamber, shielding >90 dB, frequency range 700-6000 MHz, absorber material: body 12 inch, head & door 18 inch, length 2.7 m, diameter 1.8 m, max antenna length 1.2 m, door size: 61 x 61 cm.
ATC32B	Antenna Chamber, shielding >90 dB, frequency range 700-6000 MHz, absorber material: body 12 inch, head & door 18 inch, length 3.2 m, diameter 1.8 m, max antenna length 1.9 m, door size: 61 x 61 cm.
ATC35B	Antenna Chamber, shielding >90 dB, frequency range 700-6000 MHz, absorber material: body 12 inch, head & door 18 inch, length 3.5 m, diameter 1.8 m, max antenna length 2.2 m, door size: 61 x 61 cm.
ATC37B	Antenna Chamber, shielding >90 dB, frequency range 700-6000 MHz, absorber material: body 12 inch, head & door 18 inch, length 3.7 m, diameter 1.8 m, max antenna length 2.4 m, door size: 61 x 61 cm.
ATC39B	Antenna Chamber, shielding >90 dB, frequency range 700-6000 MHz, absorber material: body 12 inch, head & door 18 inch, length 3.9 m, diameter 1.8 m, max antenna length 2.6 m, door size: 61 x 61 cm.
ATCABS12HD	Head /door absorber material only 12" (instead of 18"), increases usable length by 0.4 m, reduces PIM performance of ATC.
ATCPORT4	4 Antenna ports at ATC (instead of 1)
ATCPORT6	6 Antenna ports at ATC (instead of 1)
ATCWG	WaveGuide port with removable RF -tight lid for cable lead-through.

Accessories

Type	Description
PLOAD100	Low PIM load 100W, PIM < -165 dBc @ 2 x 43 dBm, 690-2800 MHz, with handle, Connector DIN 7/16(f)
LIC308-DMDM-1M	Low PIM cable 1 m (3ft), PIM < -165dBc @ 2 x 43 dBm, Connectors DIN(m)-DIN(m)
LIC308-DMDM-2M	Low PIM cable 2 m (6ft), PIM < -165dBc @ 2 x 43 dBm, Connectors DIN(m)-DIN(m)

Specifications subject to change without further notification

Low PIM Accessories

Cables

Low PIM cable type LIC308 for challenging test & measurement applications. This cable has extra long metal collars, protecting the cable connection against mechanical stress and maintain its low PIM performance. This cable is ideal for laboratory, production or field applications.

Adapters

Our adapters come with guaranteed PIM of less than -165 dBc @ 2 x 43 dBm and are available in any DIN 7/16 or Nconfiguration. Connector savers protect valuable equipment, like PIM analyzers and Low PIM loads, against port connector wear.

Loads

Whether for production or in the field, our low PIM loads excel. These loads are especially developed for challenging test & measurement applications, that demand accuracy and repeatability. PLOAD100(L) is used in production and for long duration PIM test runs. This 100 W load offers PIM ratings better than -165 dBc @2x43 dBm. It comes with DIN 7/16 (f) connector and has a convenient carrying handle. PLOAD100(L) loads are appreciated by customers for their reliability and stable performance. PLOAD100(L)-F minimize degradation for the termination and use 12V adapter certified CE, UL, FCC.

PLOAD50 has been designed with field applications in mind. This 50/10W load offers PIM ratings better than -165 dBc @2x43 dBm. It comes with two connectors, DIN 7/16 (m) and DIN 7/16 (f). This is very convenient because users need less adaptors when conducting their measurements on systems in the field. The load comes with an ear for carabiner or sleeve.

PIM Generator

PIM Generator is useful for quick functional test and training of a PIMD analyzer. Rugged design, DIN7/16(m)-DIN7/16(f) adapter type.

RF & Microwave Technology

AWT provides advanced telecommunication technology products and analyzers for a variety of RF and Microwave applications.

Reliable Accessories

Accessories are as important for performing acurate and repeatable measurements as test & measurement systems. Our accessories are state of the art and designed especially for test and measurement applications. All cables and loads are 100% tested and come with serial numbers to ensure quality.

Technical Specifications and Order Information

Low PIM Cables

Specifications

Frequency	DC - 3 GHz
PIM (@2x43 dBm)	< -165 dBc (typ.)
VSWR	1.25:1
Power rating	100 W
Attenuation	< 0.25 dBm/m
Velocity	81%
Operating temperature:	0 to 50° C

Connectors	Cable Length	Order Information
DIN(m) - DIN(m)	1m (3 ft)	LIC308-DMDM-1M
DIN(m) - DIN m)	2m (6 ft)	LIC308-DMDM-2M
DIN(m) - DIN(f)	2m (6 ft)	LIM308-DMDF-2M
N(m) - N(m)	1m (3 ft)	LIC308-NMNM-1M
N(m) - N(m)	2m (6 ft)	LIC308-NMNM-2M

Other connector configurations or cable lengths are available on request. Please consult AWT.

Low PIM Adapters

Specifications

Frequency	DC - 3 GHz
PIM (@2x43 dBm)	< -165 dBc (typ.)
VSWR	1.25:1
Power rating	100 W
Operating temperature	0 to 50° C

Connection Types	Order Information
DIN(m) - DIN(f)	ADA-DMDF
DIN(m) - DIN(m)	ADA-DMDM
DIN(f) - DIN(f)	ADA-DFDF
DIN(m) - N(f)	ADA-DMNF
DIN(f) - N(f)	ADA-DFNF
N(f) - N(f)	ADA-NFNF
DIN(f) - N(m)	ADA-DFNM
DIN(m) - N(m)	ADA-DMNM
N(m) - N(f)	ADA-NMNF
N(m) - N(m)	ADA-NMNM

Low PIM Accessories

Low PIM Loads

Description	Order Information
Low PIM Load 50W*/10W, Frequency 690-2800 MHz, PIM < -165 dBc @ 2 x 43 dBm, DIN 7/16 (m) and DIN 7/16 (f)	PLOAD50
Low PIM Load 50W*/10W, 690-2800 MHz, PIM < -165 dBc @ 2 x 43 dBm, DIN7/16(f)	PLOAD50E
Low PIM Load 100W, Frequency 690-2800 MHz, PIM < -165 dBc @ 2 x 43 dBm, DIN 7/16 (f) with handle	PLOAD100
Low PIM Load 100W, Frequency 380-2800 MHz, PIM < -165 dBc @ 2 x 43 dBm, DIN 7/16 (f) with handle	PLOAD100L
Low PIM Load 100W, Frequency 690-2800 MHz, PIM < -165 dBc @ 2 x 43 dBm, DIN 7/16 (f) with handle & fan	PLOAD100-F
Low PIM Load 100W, Frequency 380-2800 MHz, PIM < -165 dBc @ 2 x 43 dBm, DIN 7/16 (f) with handle & fan	PLOAD100L-F

*50W power rating for 25min, 10W permanent

Accessory Kit

Description	Order Information
(1)low PIM Cables 3m/10ft, (1)low PIM cable 1m/3ft, (1)low PIM load 50W/10W, dual port DIN(m)-DIN(f), PIM -165 dBc (typ.), (1)torque wrench DIN7/16, (4)low PIM adaptors, cleaning tabs, hard carry case IP66	PACC2
(1)low PIM Cables 3m/10ft, (1)low PIM cable 1m/3ft, (1)low PIM load 100W(PLOAD100L), DIN(f), PIM -165 dBc (typ.), (1)torque wrench DIN7/16, (4)low PIM adaptors, cleaning tabs, hard carry case IP66	PACC2L

Analyzers & Generators

AWT carries a wide variety of PIM test systems. Whether for field, applications, laboratory or production, we have the right PIM analyzers. Very low noise floor, high sensitivity, great accuracy, or widest dynamic range, our PIM analyzers excel.

PIM Generator

Description	Order Information
PIM value -80dBm (+/-10) generation, DIN(m)-DIN(f)	PIMGEN

Shield Box

- Strong durability and excellent shielding performance
- Opening/closing with air spring
- EMI filters are applied to all data and DC line
- Easy to test
- Compact design

AWT's shield boxes are intended to test and measure for mobile phones, PDAs, mobile devices, Bluetooth devices, DMB/DAB, RFID, or Zigbees. These products shield effectively RF interferences from noisy environments.

These products are useful for services and development as well as production because it is robust and excellent in shield capabilities.

Models	Dimensions (W x D x H)	Weight(Approx.)
AWT0510	390 x 220 x 232 (mm) 15.4 x 8.6 x 9.1 (in)	10 (kg) -22 (lbs)
AWT0520	360 x 214 x 190 (mm) 14.2 x 8.4 x 4.5 (in) (except handle)	8 (kg) -17.6 (lbs)
AWT0520-006	270 x 200 x 165.5 (mm) 10.6 x 7.9 x 6.5 (in) (except handle)	8 (kg) -17.6 (lbs)

Typical RF shielding

Shielding performance	> 75 dB
Frequency	700 MHz to 2700 MHz