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Test & Measurement

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Complimentary Reference Material

This PDF has been made available as a complimentary service for you to assist in evaluating this model for your testing requirements.

TMG offers a wide range of test equipment solutions, from renting short to long term, buying refurbished and purchasing new. Financing options, such as Financial Rental, and Leasing are also available on application.

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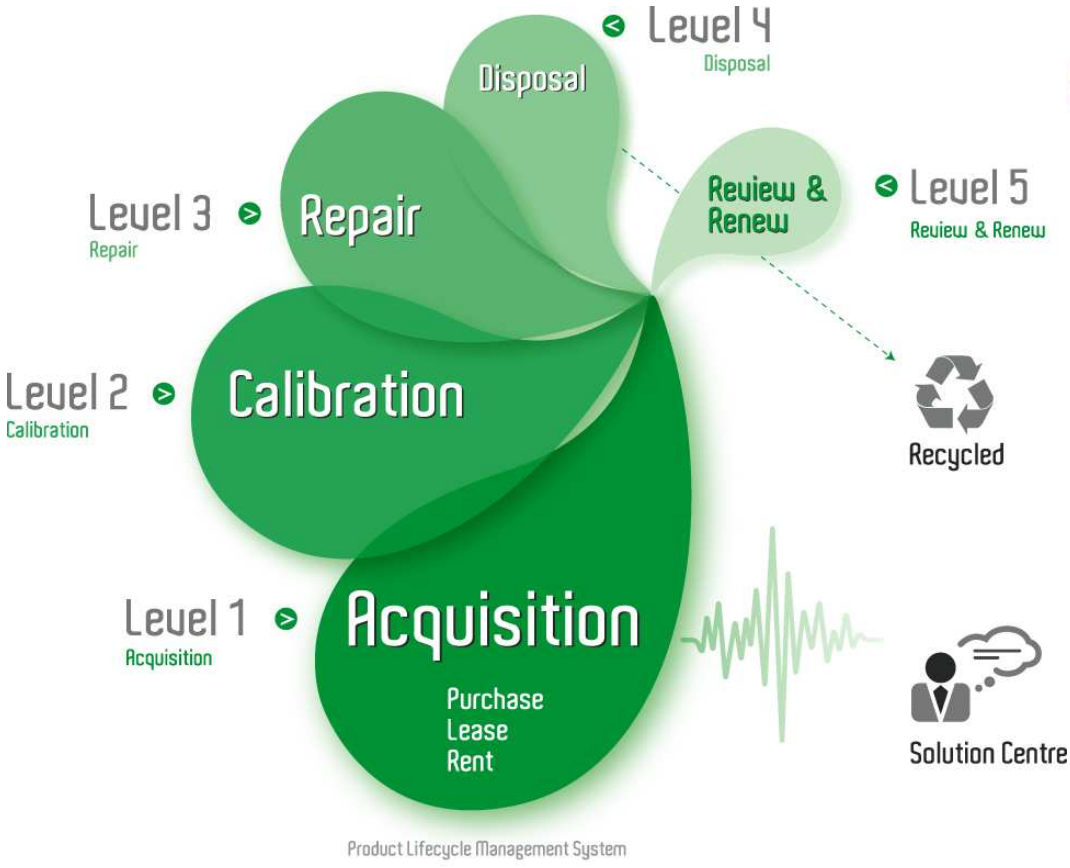
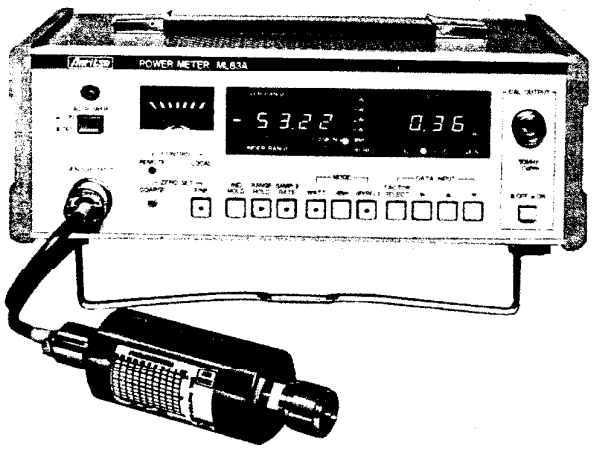


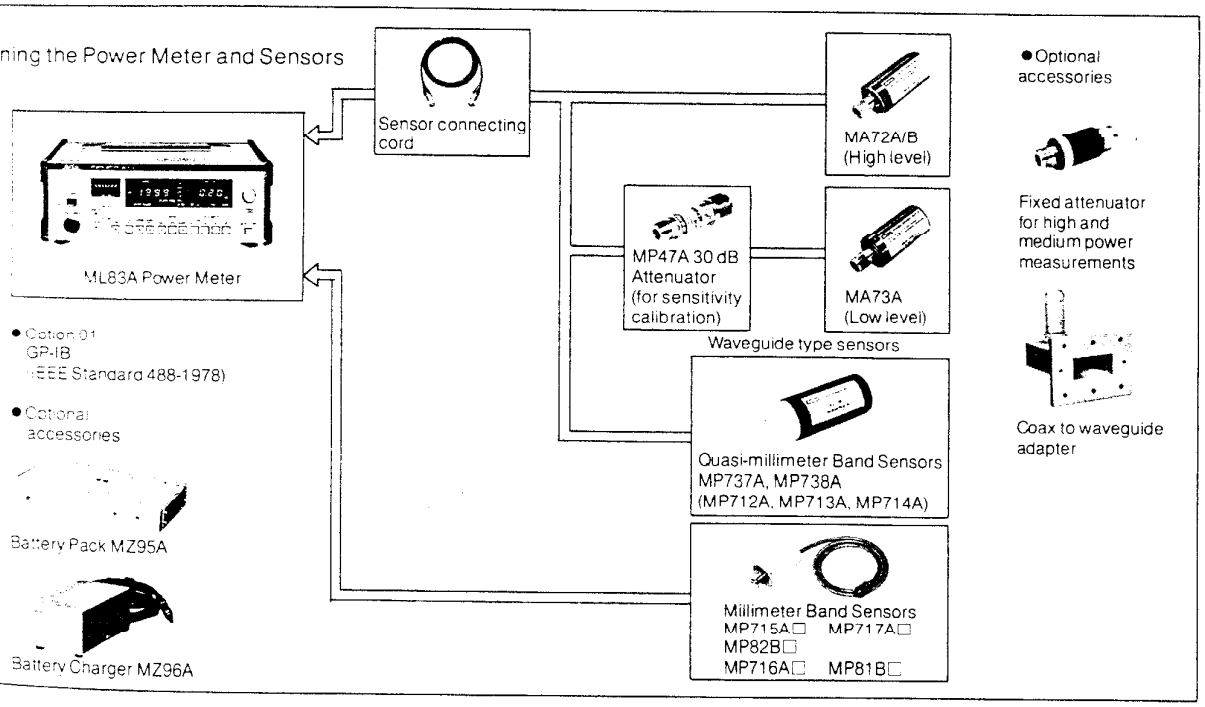
POWER METER
ML83A
10MHz to 140GHz

Versatile
AC, DC, Battery Operation



《GP-IB》
OPTION

Combining the Power Meter and Sensors



The Power Meter ML83A is a digital power meter of high performance with a microprocessor, having multiple functions for the variety of applications. In particular, it has the averaging function and is capable of reading low levels with high accuracy. The GP-IB interface is available by option for automatic measurement.

With several types of sensors, the Power Meter can measure the power ranging from 10MHz to 140GHz.

The sensors types of sensors available are the MA72A/B (−20dBm) and the MA73A (−60 to −20dBm) for VHF to microwave band, the MP737A, the MP738A, the MP712A, the MP713A, and the MP714A for quasi-millimeter wave band, the MP715A, the MP716A, the MP717A, the MP81B and MP82B for millimeter wave band.

The MA72A/B and the sensors for the millimeter wave band use a thin-film thermo couple element to have excellent VSWR characteristic over a wide band for power measurements of high accuracy.

The MA73A is a high-sensitivity sensor using a diode for measuring low levels.

Features

- **Wide frequency range**
  Several types of sensors cover the range from 10MHz to 140GHz.
- **Wide level range**
  Two types of sensors cover levels ranging from −60dBm to +20dBm over the frequency range from 10MHz to 18GHz.
- **Multiple functions**
  - O Averaging to improve readout accuracy of low levels
  - O Automatic zero adjustment
  - O Setting on the front panel of calibration coefficient, attenuation and gain compensation value of the measuring system.
  - O Measurement of relative power.
  - O Holding of the indicated value.
  - O Holding in measurement range as well as in autorange.
  - O Usable anyplace because of operation with a power supply of AC, DC, or the battery pack.
- **GP-IB interface (option)**
  For automatic measurement by remote control.
- **Battery operation**
  The battery pack MZ95A is exclusively used.
- **Excellent interchangeability**
  The power meter can be connected to any sensor without adjustment, which can be selected to suit the purpose.
- **Small dimensions and light weight**
  Convenient shape and light weight for good portability.

Specifications

Power meter

Model	ML83A
Sensors	MA72A/B, MA73A, MP737A, MP738A, MP712A□, MP713A□, MP714A□, MP715A□, MP716A□, MP717A□, MP81D□, MP82B□
Display	W/dBm/dB (REL) selectable Digital in 4 digits With a small analog meter (without numerical readout capacity)
Setting of calibration coefficient and compensating value	Calibration coefficient of the sensor and compensation for attenuation and gain can be inputted by the pushbuttons in 0.01dB steps over the range from 0 to 79.99dB
Ranges	MA72A/B, MP737A/MP738A/MP712A□/MP713A□/MP714A□/MP715A□/MP716A□/MP717A□/MP81B□/MP82B□: −10, 0, +10, +20dBm full scale MA73A: −50, −40, −30, −20dBm full scale
Range switching	Automatic ranging and the range holding can be performed according to the input power.
Zero adjustment	Coarse and fine adjustment (automatically performed by depressing the pushbutton).
Zero shift between the ranges	±0.2% of full scale after setting the zero in the maximum sensitivity range.
Response time	Typical value till the displayed value gets 99% of the final value (at the recorder output terminal) Max. sensitivity range: <12 sec. Other ranges: <3.5 sec.
Drift	For 10 minutes under a constant temperature upon one hour's warm-up: Max. sensitivity range: ≦3% Other ranges: ≦1%
Calibrating oscillator	Frequency: 50MHz Output power: 0dBm (1mW) Accuracy: ±1.2% Output connector: N(J)
Averaging	Sampling rate time can be set in 3 stages.
Holding indicated value	The indicated value can be held.
Zero set signal output	When FINE zero is selected, the output becomes a TTL low level (0 to 0.25V). When the zero setting is released, the output becomes a TTL high level (+5 ±0.25V). Connector: BNC
Recorder output	Output impedance 1kΩ; A DC voltage output, 0 to 1V, in proportion to meter deflection. Connector: BNC
Remote control	GP-IB interface incorporated (option 01)
Power	AC: 100V $^{+10}_{-15}$%, 50/60Hz≦20VA DC: +7 to +12V, 12VA When GP-IB is incorporated: AC≦23VA, DC≦14.4VA Continuous operation duration by an external battery: 4 hours
Dimensions	99H, 282W, 200D mm
Weight	≦3.5kg

VOLTMETER, POWER METERS AND LEVEL METERS

Sensors for VHF to microwave bands

Model	MA72A	MA72B	MA73A
Frequency range	10MHz to 14GHz	10MHz to 18GHz	10MHz to 18GHz
Impedance	50Ω	50Ω	50Ω
Max. VSWR	1.4	10MHz to 14GHz 1.4 14GHz to 18GHz 1.5	10MHz to 50MHz 1.6 50MHz to 14GHz 1.4 14GHz to 18GHz 1.6
Measuring power range	−20 to +20dBm (10μW to 100mW)	−20 to +20dBm (10μW to 100mW)	−60 to −20dBm (1nW to 10μW)
Safety power	+22dBm (160mW)	+22dBm (160mW)	+23dBm (200mW)
Calibration accuracy	10MHz to 12.4GHz 0.15dB (3.5%) 12.4GHz to 14.0GHz 0.23dB (5.5%)	10MHz to 12.4GHz 0.15dB (3.5%) 12.4GHz to 14.0GHz 0.23dB (5.5%) 14.0GHz to 18.0GHz 0.3dB (7.0%)	10MHz to 50MHz 0.27dB (6.5%) 50MHz to 12.4GHz 0.19dB (4.5%) 12.4GHz to 14.0GHz 0.29dB (7.0%) 14.0GHz to 18.0GHz 0.33dB (8.0%)
RF input connector	N(P)		
Dimensions	43H, 46W, 88D mm		
Weight	≦300g		

Sensors for quasi-millimeter wave band

Model	MP737A	MP738A	MP712A□	MP713A□	MP714A□
Frequency range	17 to 22GHz	21.7 to 33GHz	18 to 26.5GHz	26.5 to 40GHz	33 to 50GHz
Flange	Refer to flange list				
Max. VSWR	1.6	1.5	1.6	1.5	
Measuring power range	−20 to +20dBm (10μW to 100mW)				
Safety power	+22dBm (160mW)				
Calibration frequency (GHz)	17, 18, 19, 20, 21, 22	21.7, 23, 25, 27, 29, 31, 33	18, 20, 22, 24, 26.5	26.5, 28, 30, 34, 36, 38, 40	33, 40, 50
Dimensions	ϕ51 x 103L mm				ϕ50 x 75 L mm
Weight	≦450g				≦700g*2

Sensors for millimeter wave band

Model	MP715A□	MP716A□	MP717A□	MP81B□	MP82B□
Frequency range	40 to 60GHz	50 to 75GHz	60 to 90GHz	75 to 110GHz	90 to 140GHz
Flange	Refer to flange list				
Max. VSWR	1.4	1.4	1.4	1.5	1.5
Measuring power range	−20 to +20dBm (10μW to 100mW)				
Safety power*1	+23dBm (200mW)				
Calibration frequency	40, 50, 60GHz	50, 60, 75GHz	60, 75, 90GHz	75, 90, 110GHz	90, 110, 140GHz
Dimensions	50ϕ x 75L mm				
Weight	≦700g*2				

*1 Tested with AC equivalent power
*2 Includes the cable attached to each sensor

Flange

Sensor model	Flange									Equivalent waveguide		
	Type	Dimensions							Fig.			
		A	B	C or φC	D or φD	E	F or φF	H	φd			
MP737A	FUBR-180	12.954 +0.026	6.477 +0.026	30.5	30.5	10.285 ±0.025	11.250 ±0.025	4.8	4 +0.10 +0.07	R-180	–	WR-51
MP712A	FUBR-220	10.668 ±0.021	4.318 ±0.021	22.4	22.4	8.13 ±0.02	8.51 ±0.02	4	3 +0.085 +0.060	R-220	–	WR-42
MP738A	FUBR-260	8.636 ±0.02	4.318 ±0.02	21.1	21.1	7.495 ±0.02	7.875 ±0.02	4	3 +0.085 +0.060	R-260	–	WR-34
MP713A	FUBR-320	7.112 ±0.02	3.556 ±0.02	19.1	19.1	6.35 ±0.02	6.73 ±0.02	3	3 +0.085 +0.060	R-320	–	WR-28
MP714A	BRJ-40-MOD	5.690 ±0.02	2.845 ±0.02	–	–	–	–	–	2.6 +0.06 +0.02	R-400	–	WR-22
MP715A	BRJ-50-MOD	4.775 ±0.02	2.388 ±0.02	–	–	–	–	–	2.6 +0.06 +0.02	R-500		WR-19
MP716A	BRJ-60-MOD	3.759 ±0.02	1.880 ±0.02	–	–	–	–	–	2.6 +0.014 0	R-620	RG-98/U	WR-15
MP717A	BRJ-75-MOD	3.099 ±0.02	1.549 ±0.02			–	–	–	2.6 +0.014 0	R-740	RG-99/U	WR-12
MP719	BRJ-95	2.540 ±0.02	1.270 ±0.02	–	–	–	–	–	2.6 +0.014 0	R-900	–	WR-10
MP720	BRJ-MOD	2.032 ±0.01	1.016 ±0.01	–	–	–	–	–	2.6 +0.014 0	R-1200	RG-138/U	WR-8
MP714A	MUBR-3922-675-005	5.690 ±0.02	2.845 ±0.02	12.7 ±0.13	28.58 0 -0.05	–	23.81	–	–	R-400	–	WR-22
MP715A	MUBR-3922-675-007	4.775 ±0.02	2.388 ±0.02	12.7 ±0.13	28.58 0 -0.05	–	23.81	–	–	R-500	–	WR-19
MP716A	MUBR-3922-675-009	3.759 ±0.02	1.88 ±0.02	9.53 ±0.13	19.05 0 -0.05	–	14.29	–	–	R-620	RG-98/U	WR-15
MP717A	MUBR-3922-675-011	3.099 ±0.02	1.549 -0.02	9.53 ±0.13	19.05 0 -0.05	–	14.29	–	–	R-740	RG-99/U	WR-12
MP719	MUBR-3922-675-013	2.540 ±0.02	1.270 ±0.02	9.53 ±0.13	19.05 0 -0.05	–	14.29	–	–	R-900	–	WR-10
MP720	MUBR-3922-675-015-MOD	2.032 ±0.010	1.016 ±0.010	5.334 ±0.051	9.576 +0.015 0	–	7.11	–	–	R-1200	RG-138/U	WR-8
MP712A	UBR-220	10.668 ±0.021	4.318 ±0.021	22.22 ±0.3	22.22 ±0.3	8.13 ±0.03	8.51 ±0.03	4.78 ±0.3	2.95 +0.05 0	R-220	–	WR-42
MP738A	UBR-260	8.636 ±0.02	4.318 ±0.02	19.05 ±0.1	19.05 ±0.1	6.35 ±0.03	6.73 ±0.03	4.75 ±0.1	2.95 +0.05 0	R-320	–	WR-28
MP713A	UBR-320	7.112 ±0.02	3.556 ±0.02	10.31 ±0.076	28.58 ±0.076	8.407 ±0.006	23.80	2.896	–	R-400	–	WR-22
MP714A	UBR-400-MOD	5.690 ±0.020	2.845 ±0.020	10.31 ±0.076	28.58 ±0.076	8.407 ±0.006	23.80	2.896	–	R-500	–	WR-19
MP715A	UBR-500-MOD	4.775 ±0.020	2.388 ±0.020	8.33 ±0.076	19.05 ±0.076	5.055 ±0.006	14.275	3.20	–	R-620	RG-98/U	WR-15
MP716A	UBR-620-MOD	3.759 ±0.020	1.880 ±0.020	7.52 ±0.076	19.05 ±0.076	5.055 ±0.006	14.275	3.20	–	R-740	RG-99/U	WR-12
MP717A	UBR-740-MOD	3.099 ±0.020	1.549 ±0.020	7.52 ±0.076	19.05 ±0.076	5.055 ±0.006	14.275	3.20		R-900	–	WR-10
MP719	UBR-900-MOD	2.540 ±0.020	1.270 ±0.020	7.52 ±0.076	19.05 ±0.076	5.055 ±0.006	14.275	3.20	–	R-1200	RG-138/U	WR-8
MP720	UBR-1200-MOD	2.032 ±0.010	1.016 ±0.010	7.52 ±0.076	19.05 ±0.076	5.055 ±0.006	14.275	3.20	–	R-1200	RG-138/U	WR-8