PHILIPS

MANUAL

1:1 PROBE PM9335

9444 093 35011

9499 440 10011

720315/1/01

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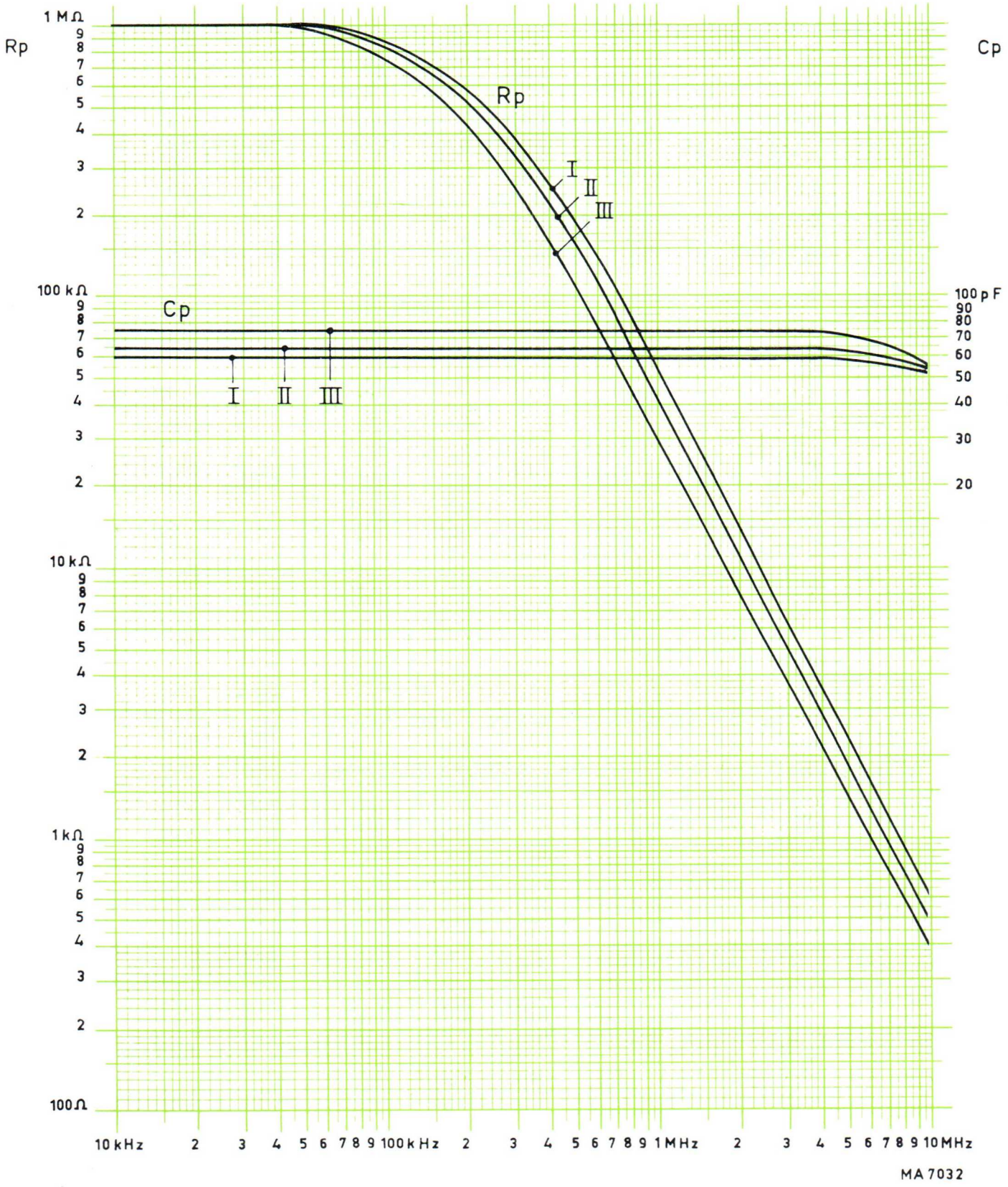
1. GENERAL INFORMATION

1.1. INTRODUCTION

The PM 9335 is a passive probe without signal attenuation for use with oscilloscope, counters and voltmeters having a high input impedance and a BNC input socket.
The cable design is such that the reflections due to the instrument's capacitive load are absorbed.
The useful frequency range of this probe is restricted to d.c. and l.f. applications (up to 10 MHz).

1.2. TECHNICAL DATA

Electrical characteristic	Specified performance	Additonal information
1.2.1. Input resistance		
d.c. and a.c. < 20 kHz	1 MOhm	Probe connected to instrument
a.c. > 20 kHz	See curve Fig. 1	with 1 MOhm input resistance
1.2.2. Input capacitance		
frequencies < 4 MHz	45 ±5 pF + input cap. of measuring instr.	
frequencies > 4 MHz	See curve Fig. 1	
1.2.3. Rise time		
probe termination:		
1 MOhm//15 pF	≤ 12 ns	Probe only. Measured between
1 MOhm//20 pF	≤ 14 ns	10 % and 90 % of pulse amplitude
1 MOhm//30 pF	≤ 20 ns	
1.2.4. Bandwidth		
probe termination:		
1 MOhm//15 pF	d.c. - ≥ 30 MHz	Probe only. Measured at 70 %
1 MOhm//20 pF	d.c. - ≥ 25 MHz	(-3 dB) point
1 MOhm//30 pF	d.c. - ≥ 18 MHz	
1.2.5. Aberrations (tilt, ringing, rounding, overshoot)	≤ ±3 % of pulse amplitude	Probe only. Rise time of applied pulse 5 ns, measured on a 50 MHz oscilloscope.
1.2.6. Max. allowable input voltage		Probe terminated in R ≥ 1 MOhm in parallel with C ≤ 50 pF.
d.c.	500 V	Max. voltage applicable between
a.c. peak-to-peak	500 V divided by freq. in MHz, or 500 V whichever is smaller	probe tip and earthed part of probe body.
a.c. peak + d.c.	500 V	
1.2.7. Test voltage	1,500 V d.c. during 1 s	Test conditions: probe terminated in ≥ 1 MOhm temperature +15 °C to +25 °C relative humidity ≤ 80 % altitude sea level



I. Probe terminated in 1 MOhm//15 pF
II. Probe terminated in 1 MOhm//20 pF
III. Probe terminated in 1 MOhm//30 pF

Fig. 1. Parallel input resistance R_p and capacitance C_p as functions of frequency

Environmental characteristic		Specified performance	Additonal information
1.2.8.	Temperature		
	(storage)	-40 °C to +70 °C	Test procedure IEC 68 tests Ab and Bb. Recovery time from -40 °C to room temperature 1 hour.
	(operating)	-25 °C to +70 °C	Test procedure IEC 68 tests Ab and Bb. Probe operates in accordance with specified performance.
1.2.9.	Humidity (non-operating)	Probe withstands 21 cycles of damp heat test. Temp. +25 °C to +45 °C Rel. hum. 90 % to 100 % Cycle time 24 hours	Test procedure IEC 50 B (CO) 142
1.2.10.	Altitude		
	(operating)	Up to 5,000 m	In accordance with specified performance
	(storage)	Up to 15,000 m	
1.2.11.	Vibration (operating)	45 minutes each axis; further ten minutes each axis at any resonance point. Constant displacement 0.7 mm peak to peak up to 60 Hz; constant acceleration from 60 Hz to 150 Hz 5 g; frequency varied 10 Hz - 150 Hz - 10 Hz in ten minute cycles. Attachment of probe to vibration platform by means of BNC connector and tube over probe tip.	In accordance with specified performance. Test procedure IEC 68 test F
1.2.12.	Shock (operating)	1,000 Bumps each axis: half sine wave, peak acceleration 10 g. Probe connected to shock platform by means of BNC connector and tube over probe tip.	In accordance with specified performance. Test procedure IEC 50 A (CO) 110.
1.2.13.	Transport		Probe withstands these tests when it is packed in its original shipping package
	package drop	1 m	
	package toppling	10 minutes each axis: frequency 7 Hz, amplitude 7 mm.	

Mechanical characteristic	Specified quantity				Additional information
1.2.14. Dimensions	L	W	H		
probe body	105			mm	
cable	1.5			m	
carrying case	230	104	24	mm	
1.2.15. Standard accessories	1 test hook				
	2 spare hook sleeves				
	2 spare probe tips				
	1 protective cap				
	1 earthing lead				
	1 manual				
	1 carrying case				
	1 probe holder				

1.3. INFORMATION ON THE ACCESSORIES (Fig. 2)

Item 1 — Test-hook

The test-hook is slid over the probe tip; by pushing the probe tip deeper in the test-hook, the hook will protrude, so that the test point can be gripped.

Item 2 — Spare test-hook sleeve

These test-hook sleeves are supplied with the probe, to serve as replacements for damaged parts. The test-hook sleeve is screwed on to the test-hook holder. Insert the wire hook so that the opening is formed by its tip and the longer side of the sleeve.

Item 3 — Spare probe tip

These tips are supplied with the probe to replace a damaged probe tip. The damaged tip can either be pulled out by means of a pair of pliers or be pushed out by means of a rod. A new tip must be firmly pushed in.

Item 4 — Protective cap

If the probe is not in use, one of the protective caps should be fitted in order to prevent damage to the probe pin.

Item 5 — Earth lead

The fork of the earth lead is pushed into the slot in the middle of the probe body. The crocodile clip is connected to the earthing point of the circuit under test.

Item 6 — Probe holder

The probe holder is pushed over the probe cable close to the measuring instrument. During a break in the measurements, the probe cable at the side of the measuring probe can be pushed into the vacant slit of the probe holder. It can also be used to take the weight off the probe when the latter is permanently connected to a circuit.

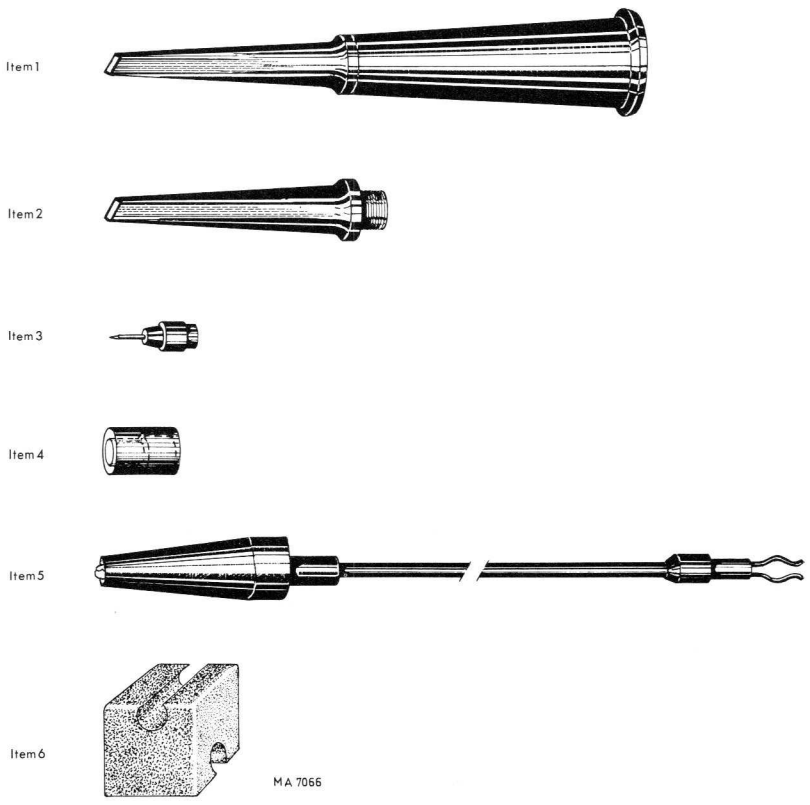


Fig. 2. Accessories

2. SERVICE DATA

2.1. DISMANTLING THE PROBE (Fig. 3)

The foremost part (item 8) of the probe can be screwed from the rearmost part. Items 8 and 9 can then be slid from the inner conductor.

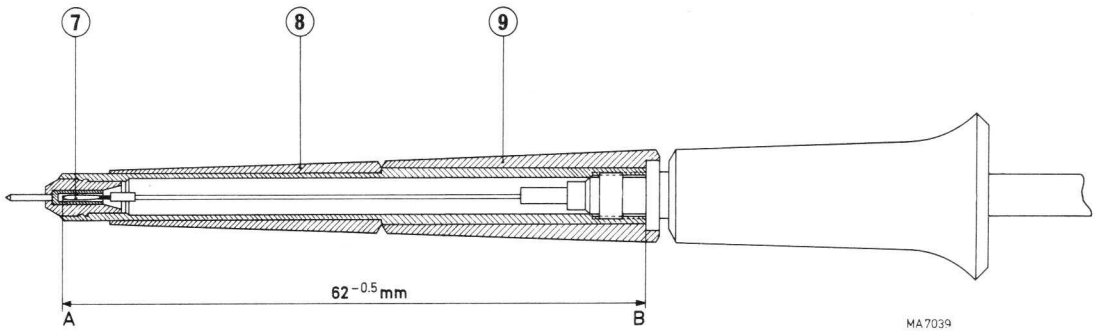


Fig. 3. Cross-section of the probe

2.2. ASSEMBLING THE PROBE (Fig. 3)

During the assembling of the probe, the inner conductor must be at dead centre in the sleeve. Ensure that the correct distance between the top of plug 7 (A) and the frontside of the earthing ring (B) is maintained, especially after replacement of plug 7.
The distance AB must be 62 mm - 0.5 mm.

2.3. PARTS LIST

Item	Fig.	Order number	Description
1	2	5322 264 20024	Test-hook
2	2	5322 264 20028	Test-hook sleeve
3	2	5322 268 14017	Probe tip
4	2	5322 532 60535	Protective cap
5	2	5322 321 20223	Earth lead
6	2	5322 265 94034	Probe holder
7	3	5322 268 10023	Plug
8	3	5322 264 20025	Probe-tip assembly
9	3	5322 532 70126	Sleeve
10	4	5322 320 14005	Probe assembly
11	-	5322 600 34002	Box

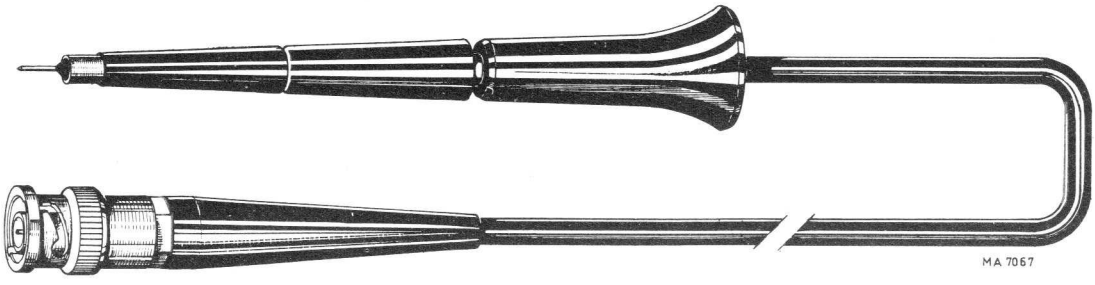


Fig. 4. Probe assembly

TEST AND MEASURING INSTRUMENTS

The PM 9335L is a passive probe without signal attenuation, which is similar to the PM 9335 model, but with a cable length of 2,5 m instead of 1,5 m. The useful frequency range of the PM 9335L is restricted to d.c. and l.f. applications up to 5 MHz. The manual 9499 440 10011 of the PM 9335 probe also applies to the PM 9335L, if the following changes resulting from the elongation of the cable are taken into account.

1.2. TECHNICAL DATA

1.2.2. Input capacitance

at frequencies < 2 MHz	76 ± 8 pF plus input cap. of measuring instrument
at frequencies > 2 MHz	See Fig. 1 overleaf

1.2.3. Rise time

probe termination:

1 MOhm//15 pF	≤ 20 ns
1 MOhm//20 pF	≤ 25 ns
1 MOhm//30 pF	≤ 30 ns

1.2.4. Bandwidth

probe termination:

1 MOhm//15 pF	d.c. - ≥ 17 MHz
1 MOhm//20 pF	d.c. - ≥ 14 MHz
1 MOhm//30 pF	d.c. - ≥ 12 MHz

1.2.14. Cable length 2,5 m

2.3. PARTS LIST

Item 10 is cancelled for this probe.

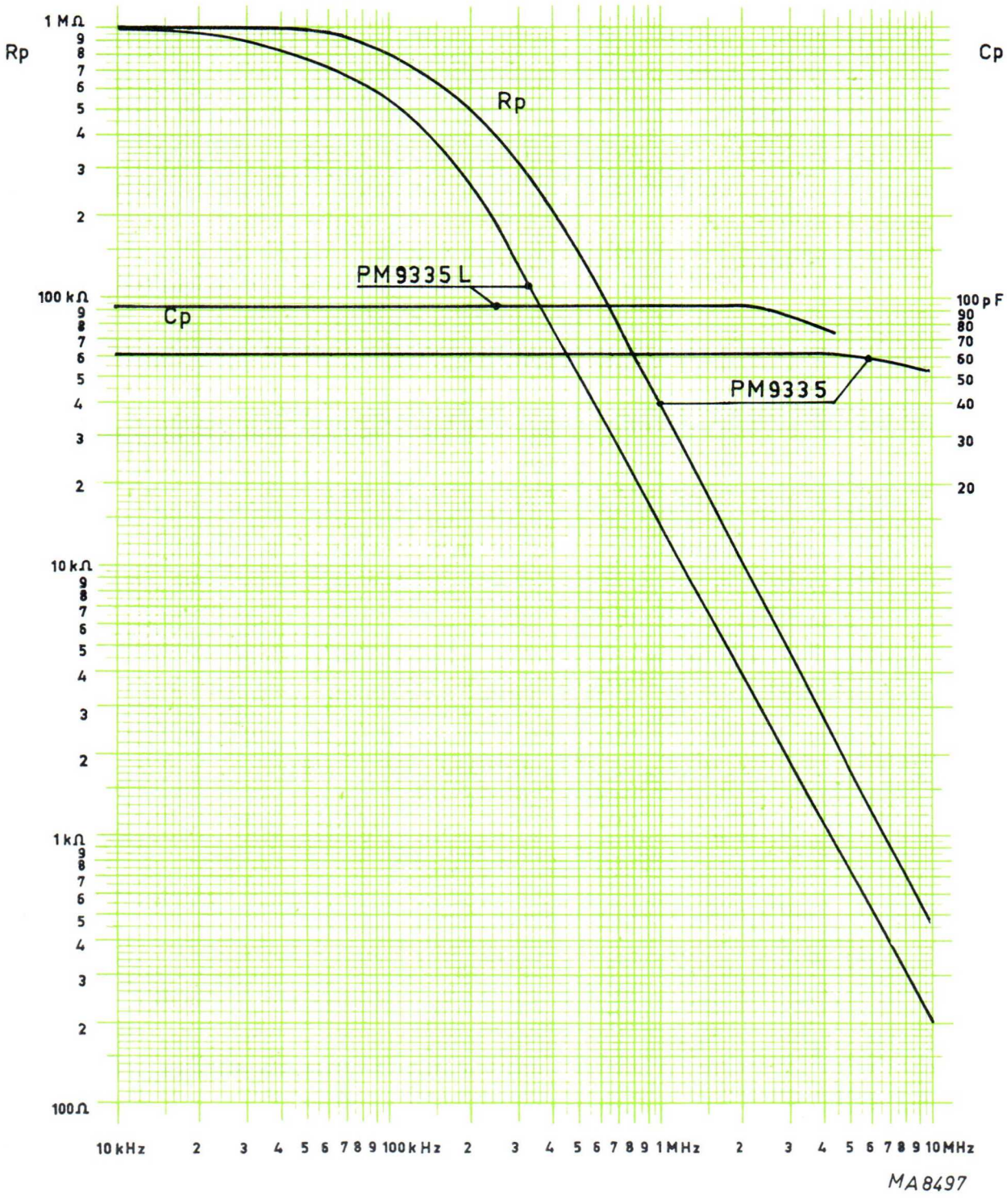


Fig. 1 Parallel input resistance Rp and capacitance Cp as functions of frequency (Probe terminated in 1 MΩ//20 pF)