The Tekcem series of measuring instruments for EMC

Electric field antenna EX2712A with Power feeding splitter EX2713A

User's Guide

June 2000

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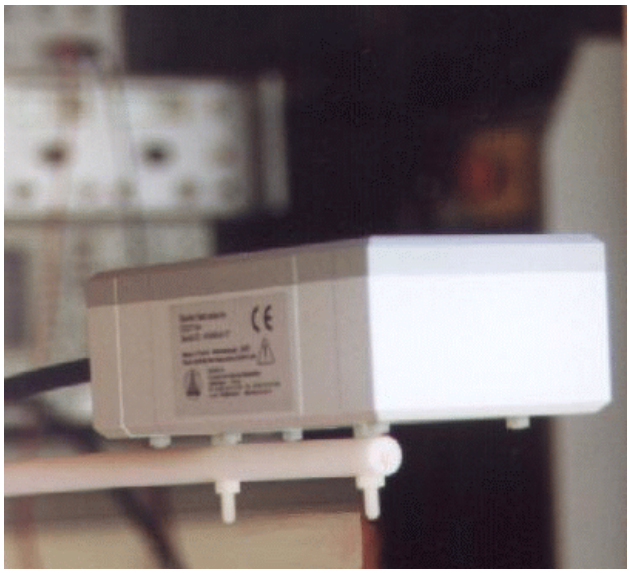


The EX2712A electric field antenna attached to a POMC rod

1. Foreword

1.1 Intended use

The EX2712A antenna is intended for low-level electric field measurements in the 50 kHz to 500 kHz frequency range.

The EX2712A is an active antenna. It is made of two symmetrical plates connected to a very high impedance differential amplifier providing a high common-mode rejection. The output of the antenna is a N receptacle. It is intended to be connected to an EX2713A power feeding splitter for connection to a source of DC power and a 50 Ω spectrum analyser.

1.2 This User's guide, copyrights, trademarks

This User's guide is edited by Excem, a company specialized in electronic instruments design and electromagnetic compatibility (EMC).

Excem
12, chemin des Hauts de Clairefontaine,
78580 Maule
France

tel: 33 1 34 75 13 65
fax : 33 1 34 75 13 66
e-mail : info@excem.fr
site : excem.fr

1.3 Terms of sale and warranty

Unless otherwise specified in your contract with Excem, our “General Terms of Sale” applicable at the date of the invoice shall apply to the deliverables (“conditions générales de vente”). They are printed on the back of the invoice. They include the definition and the limitation of warranty.

2. Specifications

■ The EX2712A antenna is an electric field antenna, therefore sensitive to electrostatic discharges.

■ DC power: 14 V to 20 V DC to be connected to the banana receptacles of the EX2713A power feeding splitter (red for positive, black for negative).

■ Power consumption: 18 mA.

■ CE marked for EMC.

■ The Intended DC source is two PP3 9 V batteries in series. THE DC SOURCE MUST BE FLOATING OR WITH THE NEGATIVE CONNECTION REFERENCED TO GROUND.

■ VERY IMPORTANT: the N male receptacle of the EX2713A is intended to be connected to the spectrum analyser. THE N FEMALE RECEPTABLE OF THE EX2713A power feeding splitter IS INTENDED TO BE CONNECTED TO THE EX2713A antenna. If these connections are reversed, some spectrum analyser might be damaged by the DC voltage delivered by the power feeding splitter. The most convenient practice is to connect the EX2713A power feeding splitter N male receptacle directly to the input of the spectrum analyser.

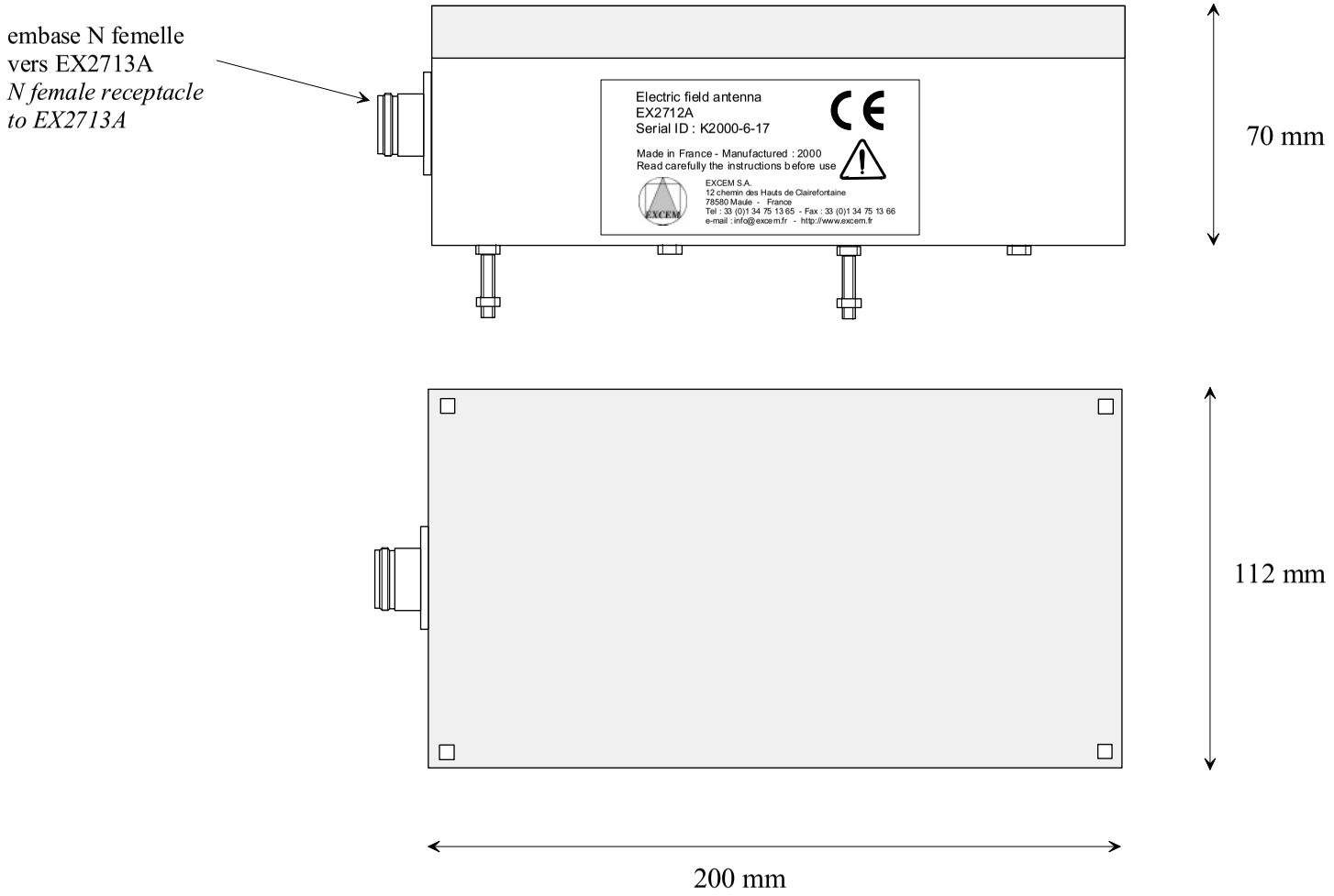
■ Nominal load at the output (N male receptacle) of the power feeding splitter: 50 Ω.

■ This antenna has been calibrated in the middle of an asymmetrical (microstrip) TEM cell with 112,5 Ω nominal characteristic impedance, with a plate distance of 50 cm. The antenna axis was at a high of 24 cm above the ground plate of the TEM cell. The curves at the end of this document show the effective length in dB above 1 meter (this is the opposite of the antenna factor):
– the top curve (curve 1) shows the effective length for the field orthogonal to the antenna plates,
– the top curve (curve 2) shows the effective length for the field parallel to the antenna plates.
The rejection of cross-polarization exceeds 35 dB in the 50 kHz to 500 kHz frequency range.

■ Gain compression and clipping occur when either channel of the internal differential amplifier of the antenna receives a signal that would give rise to an output of about 107 dB(µV), in the frequency range 50 kHz to 500 kHz. This corresponds to a field of about 130 dB(µV/m).

3. Schematics and plots

The three following pages show:
— a drawing of the EX2712A antenna,
— a drawing of the EX2713A power feeding splitter,
— a calibration curve for a typical EX2712A and EX2713A set-up, showing the sensitivity to an electric field parallel to the plates, and the sensitivity to a field orthogonal to the plates.



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Antenne champ électrique (Electric field antenna)

Page

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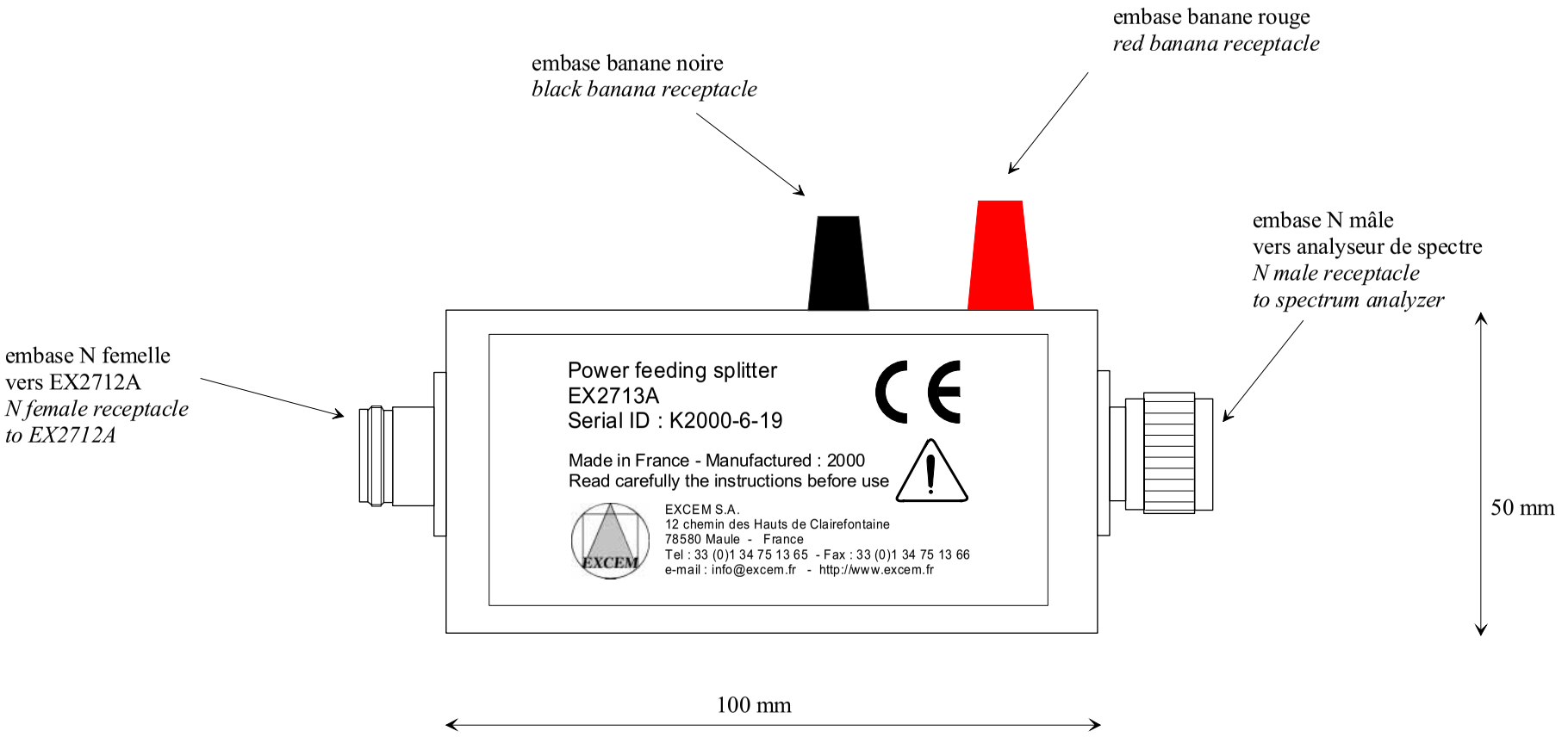

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Séparateur d'alimentation (Power feeding splitter)

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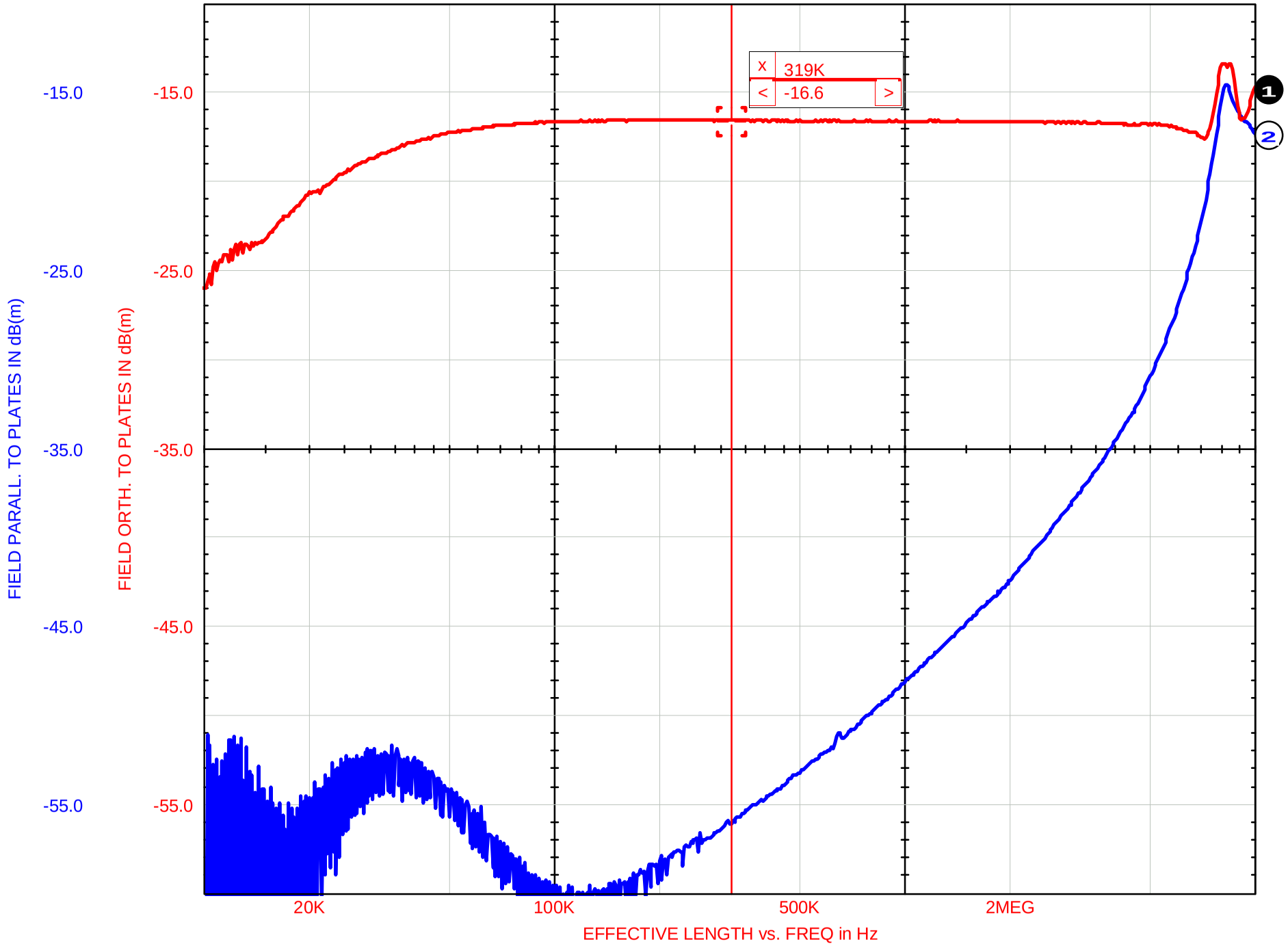
x 319K
< -16.6 >
-15.0
-25.0
-35.0
-45.0
-55.0
FIELD PARALL. TO PLATES IN dB(m)
FIELD ORTH. TO PLATES IN dB(m)
20K
100K
500K
2MEG
EFFECTIVE LENGTH vs. FREQ in Hz
1
2