

**EMISSION MEASUREMENTS IN ACCORDANCE
WITH FCC PART 15 AND ANSI C63.4-1992 OF A
TRANSPONDER, BRAND AMB,
TYPE AMBrc F102RP-5.**

FCC ID: NXYAMBGP3

FCC report layout endorsed by the FCC by
Public Notice of March 11, 1992.

Accredited by	:STERLAB accreditation number L029 D.A.R., TTI-P-G.127/96-00
Competent body	:Article 10-2 EMC Directive
Notified body nr. 0122	:Article 10-5 EMC Directive Low Voltage Directive TTE Directive
Certification body	:Electrical Products Safety regulation, Hong Kong
Designated laboratory	:TTE Directive
Notified test service	:Automotive Directive
FCC listed	:31040/SIT
VCCI registered	:R-592 C-607

**Nederlands Meetinstituut
P.O. Box 15
9822 ZG Niekerk (NL)
Smidshornerweg 18
9822 TL Niekerk (NL)**

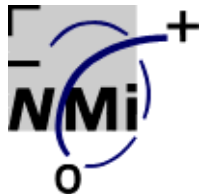
Telephone: +31 594 505005
Telefax: +31 594 504804

E-mail: NMI@NMI.nl

NMI B.V. (Chamber of Commerce Haaglanden No. 27228701)

Offices:
Delft, Bergum, Dordrecht, Niekerk, Utrecht, Tinton Falls NJ (USA),
Kawasaki (Japan), Hortolândia SP (Brazil)

Subsidiary companies:
NMI Certin B.V. (27233418)
NMI Van Swinden Laboratorium B.V. (27228703)
NMI International B.V. (27239176)



Description of EUT: RF Transponder
Manufacturer: AMB i.t. Holding B.V.
Brand mark: AMB
Type: AMBrc F102RP-5
FCC ID: NXYAMBGP3

MEASUREMENT/TECHNICAL REPORT

AMB i.t. Holding B.V.

FCC ID: NXYAMBGP3

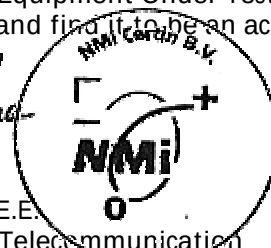
Date: June 14, 2000

This report concerns: Verification / Notification / Certification																												
Equipment type: Intentional radiator																												
Deferred grant requested per 47 CFR 0.457(d)(1)(ii) No																												
If yes defer until: not applicable																												
Transition Rules Request per 15.37: No																												
Report prepared by:	<table><tr><td>Name</td><td>:</td><td>D.S. Sariredjo, B.Sc.E.E.</td></tr><tr><td>Company name</td><td>:</td><td>NMi Certin B.V.</td></tr><tr><td>Address</td><td>:</td><td>Smidshornerweg 18</td></tr><tr><td>Telephone number</td><td>:</td><td>+ 31 594 505005</td></tr><tr><td>Telefax number</td><td>:</td><td>+ 31 594 504804</td></tr><tr><td>Mailing address</td><td>:</td><td>P.O. Box 15</td></tr><tr><td>City/Place/Postal cd.</td><td>:</td><td>9822 ZG NIEKERK</td></tr><tr><td>Country</td><td>:</td><td>The Netherlands</td></tr><tr><td>Email</td><td>:</td><td>et-desk@nmi.nl</td></tr></table>	Name	:	D.S. Sariredjo, B.Sc.E.E.	Company name	:	NMi Certin B.V.	Address	:	Smidshornerweg 18	Telephone number	:	+ 31 594 505005	Telefax number	:	+ 31 594 504804	Mailing address	:	P.O. Box 15	City/Place/Postal cd.	:	9822 ZG NIEKERK	Country	:	The Netherlands	Email	:	et-desk@nmi.nl
Name	:	D.S. Sariredjo, B.Sc.E.E.																										
Company name	:	NMi Certin B.V.																										
Address	:	Smidshornerweg 18																										
Telephone number	:	+ 31 594 505005																										
Telefax number	:	+ 31 594 504804																										
Mailing address	:	P.O. Box 15																										
City/Place/Postal cd.	:	9822 ZG NIEKERK																										
Country	:	The Netherlands																										
Email	:	et-desk@nmi.nl																										

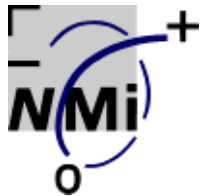
The data taken for this test and report herein was done in accordance with FCC Part 15 and ANSI C63.4-1992 measurements. NMi Certin B.V., location Niekerk, The Netherlands, certifies that the data is accurate and contains a true representation of the emission-profile of the Equipment Under Test (EUT) on the date of the test noted in the test report. I have reviewed the test report and find it to be an accurate description of the test(s) performed and the EUT so tested.

Date: June 14, 2000

Signature:

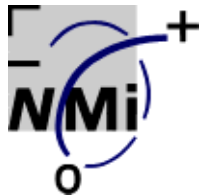
P.A.J.M. Robben, B.Sc.E.E.
Department EMC and Telecommunication



Description of EUT: RF Transponder
Manufacturer: AMB i.t. Holding B.V.
Brand mark: AMB
Type: AMBrc F102RP-5
FCC ID: NXYAMBGP3

Table of contents

1	General Information.....	4
1.1	Product description.	4
1.2	Related Submittal(s)/grant(s).	4
1.3	Test Methodology.	4
1.4	Test facility.	4
1.5	List of measurement equipment.....	4
1.6	Bandwidth and antenna factors.	5
2	Product labelling.....	5
3	System test configuration.	6
3.1	Justification.....	6
3.2	Equipment modifications.	6
3.3	Description of tested EUT.....	7
3.3.1	Transponder AMBrc_DP.	7
4	Conducted and radiated measurement photos.	8
5	Radiated emission data.	11
5.1	Radiated field strength measurement (30 MHz - 1000 MHz, E-field).....	11
5.1.1	AMBrc F102RP-5.	11
5.2	Radiated field strength measurement (9 kHz - 30 MHz, H-field).	12
5.2.1	AMBrc F102RP-5 (x-orientation).	12
5.2.2	AMBrc F102RP-5 (y-orientation).	13
5.2.3	AMBrc F102RP-5 (z-orientation).	14
6	Photos of tested EUT.	15



Description of EUT: RF Transponder
Manufacturer: AMB i.t. Holding B.V.
Brand mark: AMB
Type: AMBrc F102RP-5
FCC ID: NXYAMBGP3

1 General Information.

1.1 Product description.

The product tested is part of an inductive laptiming system. The inductive laptiming system may include transponders, brand AMB, model number AMBrc Transponder, AMBrc_DP, AMBrc F102RP-5, a receiver model AMBrc Decoder and a battery charger, brand AMB, model number Charge Rack.

1.2 Related Submittal(s)/grant(s).

The related similar submittals are: FCC ID: NXYAMBGP1 (transponder type AMBrc Transponder) and NXYAMBGP2 (transponder type AMBrc_DP), NXYAMBGP3 (Transponder type AMBrc F102RP-5) NXYAMBGP4 (receiver type AMBrc Decoder).

1.3 Test Methodology.

The Test methodology of ANSI C63.4-1992 has been applied to provide adequate measuring data.

Complete data of the tested model has been recorded.

According to FCC Part 15, § 101 the EUT shall be classified as an intentional radiator and is therefore subject to certification.

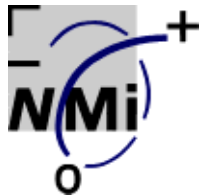
1.4 Test facility.

The FCC has per Public Notice declared that the measurement facilities located at the NMI Certin B.V. testsite Niekerk, Smidshornerweg 18, The Netherlands, have been reviewed and found to be in compliance with the requirements of section 2.948 (previously section 15.38) of the FCC rules per August 4, 1994.

The description of the measuring facilities have been filed with reference 31040/SIT, 1300B3 at the FCC's Offices.

1.5 List of measurement equipment.

NMI number	Description	Marketing name	Type
14277	Antennamast 4m	Heinrich Deisel	HD100
14278	Controller OATS	Heinrich Deisel	MA240
14340	Biconilog antenna 20MHz - 1100MHz	EMCO	3143
12473	Log-per antenna 200MHz - 1000MHz	Eaton	96005
12471	Biconical antenna 20MHz - 200MHz	Eaton	94455-1
12636	Plastic measurement room	Polyforce	-
13886	Open Area Test Site	Comtest	-
99108	Turntable OATS	Heinrich Deisel	HD050
15667	Measuring receiver 9kHz - 2750MHz	Rohde & Schwarz	ESCS30
12507	Artificial mains network 3-phase	Rohde & Schwarz	ESH2-Z5
13313	Impuls limiter	Rohde & Schwarz	ESH3Z2.357...
99115	Voltage probe	Schwarzbeck	TK9416



Description of EUT:	RF Transponder
Manufacturer:	AMB i.t. Holding B.V.
Brand mark:	AMB
Type:	AMBrC F102RP-5
FCC ID:	NXYAMBG3

1.6 Bandwidth and antenna factors.

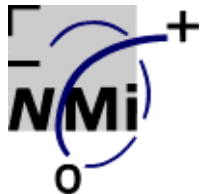
The utilized measuring equipment is stated in § 1.5. The bandwidth of the receiver switches automatically to the right bandwidth in accordance with CISPR 16. This is implemented in the receiver. Also the antennafactors are included in the testreceiver. The receiver automatically calculates the appropriate correction factor for the utilized antenna and also the appropriate correction factor for the cable loss. The total correction is automatically added to the measured value.

2 Product labelling.

The following text shall be attached to the EUT, by means of a label, or -in case the enclosure is too small- on a prominent location in the users manual.

**This device complies with part 15 of the FCC Rules.
Operation is subject to the following two conditions: (1)
This device may not cause harmful interference, and (2)
this device must accept any interference received,
including interference that may cause undesired
operation.**

The dimensions of the label, the location of the label and the type of font can be found in the FCC regulation book CFR 47, parts 0 to 19, revised as per October 1, 1997.



Description of EUT:	RF Transponder
Manufacturer:	AMB i.t. Holding B.V.
Brand mark:	AMB
Type:	AMBrC F102RP-5
FCC ID:	NXYAMBGP3

3 System test configuration.

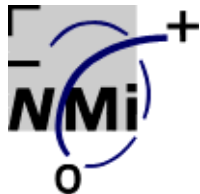
3.1 Justification.

During all measurements the transponders were transmitting continuously. The RF signal, generated by the transponder, is a CW signal. During radiated emission measurements the turntable was rotated in order to find the maximum radiated emission on each frequency.

In accordance with § 11.2.4. of ANSI C63.4-1992 the placing and manipulation of interface cables has been carried out.

3.2 Equipment modifications.

Not applicable.

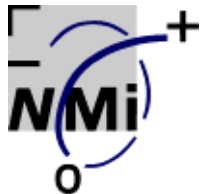


Description of EUT: RF Transponder
Manufacturer: AMB i.t. Holding B.V.
Brand mark: AMB
Type: AMBrc F102RP-5
FCC ID: NXYAMBGP3

3.3 Description of tested EUT.

3.3.1 Transponder AMBrc_DP.

Unit title	:	Transponder
Model number	:	AMBrc F102RP-5
Part number	:	Not applicable
FCC ID number	:	NXYAMBGP3
Operating frequency	:	5.0 MHz
Description/details	:	see section 3.1 of this report and exhibits to the application
Power supply	:	4 x 3.6 VDC Litium cells
Clock Oscillator(s)	:	5.0 MHz
Cabinet & Screening	:	Plastic
Interface Cable(s)	:	Not applicable
Method of screening	:	Not applicable
Method of grounding	:	Not applicable
Operating configuration	:	Transponder is continously transmitting
Applicant's representative	:	F. Hin
Company	:	AMB i.t. Holding B.V.
Address	:	Herenweg 29A
Postal code and city	:	2105 MB HEEMSTEDE
Country	:	The Netherlands
Telephone number	:	+31 (0)23 5291893
Telefax number	:	+31 (0)23 5290156



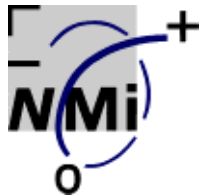
Description of EUT:	RF Transponder
Manufacturer:	AMB i.t. Holding B.V.
Brand mark:	AMB
Type:	AMBrC F102RP-5
FCC ID:	NXYAMBGP3

4 Conducted and radiated measurement photos.

On pages 08 to 10 the conducted and radiated emission measurements photos are given:

Page 08: AMBrC F102RP-5 (radiated emission, front, x-orientation)

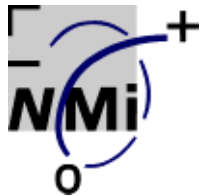




Description of EUT: RF Transponder
Manufacturer: AMB i.t. Holding B.V.
Brand mark: AMB
Type: AMBrc F102RP-5
FCC ID: NXYAMBGP3

Page 09: AMBrc F102RP-5 (radiated emission, front, y-orientation)

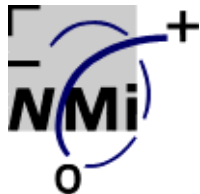




Description of EUT: RF Transponder
Manufacturer: AMB i.t. Holding B.V.
Brand mark: AMB
Type: AMBrc F102RP-5
FCC ID: NXYAMBGP3

Page 10: AMBrc F102RP-5 (radiated emission, back, y-orientation)





Description of EUT: RF Transponder
Manufacturer: AMB i.t. Holding B.V.
Brand mark: AMB
Type: AMBrc F102RP-5
FCC ID: NXYAMBGP3

5 Radiated emission data.

5.1 Radiated field strength measurement (30 MHz - 1000 MHz, E-field).

5.1.1 AMBrc F102RP-5.

Frequency (MHz)	Measurement results dB(μV)/m 3 metres QP		Limits dB(μV)/m @ 3 metres QP section 209
	Vertical	Horizontal	
30.0 - 88.0	< 20.0	< 20.0	40.0
88.0 - 216.0	< 20.0	< 20.0	43.5
216.0 - 425.0	< 20.0	< 20.0	46.0
425.0 - 630.0	< 25.0	< 25.0	46.0
630.0 - 960.0	< 30.0	< 30.0	46.0
960.0 - 1000.0	< 31.0	< 31.0	54.0

QP = Quasi-peak

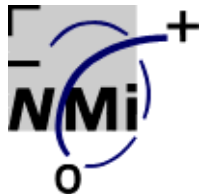
Measured levels on frequencies not stated in this report have been measured more than 20 dB below the applicable limit.

Table 1

Results of the radiated field strength (E-field) measurements on the transponder, brand AMB products, type AMBrc F102RP-5, carried out in accordance with FCC Part 15, section 209 and ANSI C63.4-1992 in the configuration and operation mode(s) as stated in this testreport, are depicted in table 1. Measurement results are quasi-peak results.

Test engineer : O. H. Hoekstra Date: June 8, 2000

Tester signature :



Description of EUT: RF Transponder
 Manufacturer: AMB i.t. Holding B.V.
 Brand mark: AMB
 Type: AMBrc F102RP-5
 FCC ID: NXYAMBGP3

5.2 Radiated field strength measurement (9 kHz - 30 MHz, H-field).

5.2.1 AMBrc F102RP-5 (x-orientation).

Frequency	Measurement results (QP) 1m	Measurement results (QP) 3m	Measurement results (QP) 10m	Antenna factor	Cable loss	Measurement results (QP, 30 m.)	Limits FCC Part 15 section 209
(MHz)	dBμV	dBμV		dB	dB	(dBμV/m)	(dBμV/m)
0.009 - 0.490	< <	< <	< <	17	1	< 18.0	48.5 - 13.8 (300 m.)
0.490 - 1.705	< <	< <	< <	17	1	< 18.0	33.8 - 22.9 (30 m.)
1.705 - 5.000	< <	< <	< <	17	1	< 18.0	29.5 (30 m.)
5.000	59.3	38.4	n.m.	17	1	< 18.0	29.5 (30 m.)
5.000 - 30.000	< <	< <	< <	17	1	< 18.0	29.5 (30 m.)

QP = Quasi-peak, n.m. = could not be measured

Measured levels on frequencies not stated in this report have been measured more than 20 dB below the applicable limit.

Table 2

Results of the radiated field strength (H-field) measurements, carried out in accordance with FCC Part 15, section 209 (Edition 10-1-97) and ANSI C63.4-1992, on a transponder, brand AMB, model number AMBrc F102RP-5, are depicted in table 2. Orientation of the transponder during measurement was x-orientation.

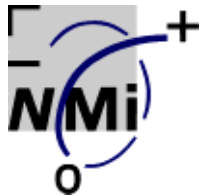
Notes: -Frequency range: 9-90 kHz Average detector used during measurements
 110-490 kHz Average detector used during measurements

-The radiated field strengths were measured at a distance of 1, 3 and 10 metres.

-A plot of the carrier bandwidth can be found in appendix A.

Test engineer : O. H. Hoekstra Date: June 8, 2000

Tester signature :



Description of EUT: RF Transponder
 Manufacturer: AMB i.t. Holding B.V.
 Brand mark: AMB
 Type: AMBrc F102RP-5
 FCC ID: NXYAMBGP3

5.2.2 AMBrc F102RP-5 (y-orientation).

Frequency	Measurement results (QP) 1m	Measurement results (QP) 3m	Measurement results (QP) 10m	Antenna factor	Cable loss	Measurement results (QP, 30 m.)	Limits FCC Part 15 section 209
(MHz)	dB μ V	dB μ V		dB	dB	(dB μ V/m)	(dB μ V/m)
0.009 - 0.490	< <	< <	< <	17	1	< 18.0	48.5 - 13.8 (300 m.)
0.490 - 1.705	< <	< <	< <	17	1	< 18.0	33.8 - 22.9 (30 m.)
1.705 - 5.000	< <	< <	< <	17	1	< 18.0	29.5 (30 m.)
5.000	67.8	40.6	n.m.	17	1	< 18.0	29.5 (30 m.)
5.000 - 30.000	< <	< <	< <	17	1	< 18.0	29.5 (30 m.)

QP = Quasi-peak, n.m. = could not be measured

Measured levels on frequencies not stated in this report have been measured more than 20 dB below the applicable limit.

Table 3

Results of the radiated field strength (H-field) measurements, carried out in accordance with FCC Part 15, section 209 (Edition 10-1-97) and ANSI C63.4-1992, on a transponder, brand AMB, model number AMBrc F102RP-5, are depicted in table 3. Orientation of the transponder during measurement was y-orientation.

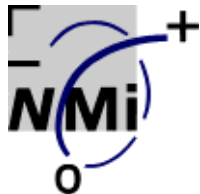
Notes: -Frequency range: 9-90 kHz Average detector used during measurements
 110-490 kHz Average detector used during measurements

-The radiated field strengths were measured at a distance of 1, 3 and 10 metres.

-A plot of the carrier bandwidth can be found in appendix A.

Test engineer : O. H. Hoekstra Date: June 8, 2000

Tester signature :



Description of EUT: RF Transponder
 Manufacturer: AMB i.t. Holding B.V.
 Brand mark: AMB
 Type: AMBrc F102RP-5
 FCC ID: NXYAMBGP3

5.2.3 AMBrc F102RP-5 (z-orientation).

Frequency	Measurement results (QP) 1m	Measurement results (QP) 3m	Measurement results (QP) 10m	Antenna factor	Cable loss	Measurement results (QP, 30 m.)	Limits FCC Part 15 section 209
(MHz)	dB μ V	dB μ V		dB	dB	(dB μ V/m)	(dB μ V/m)
0.009 - 0.490	< <	< <	< <	17	1	< 18.0	48.5 - 13.8 (300 m.)
0.490 - 1.705	< <	< <	< <	17	1	< 18.0	33.8 - 22.9 (30 m.)
1.705 - 5.000	< <	< <	< <	17	1	< 18.0	29.5 (30 m.)
5.000	68.2	42.0	n.m.	17	1	< 18.0	29.5 (30 m.)
5.000 - 30.000	< <	< <	< <	17	1	< 18.0	29.5 (30 m.)

QP = Quasi-peak, n.m. = could not be measured

Measured levels on frequencies not stated in this report have been measured more than 20 dB below the applicable limit.

Table 4

Results of the radiated field strength (H-field) measurements, carried out in accordance with FCC Part 15, section 209 (Edition 10-1-97) and ANSI C63.4-1992, on a transponder, brand AMB, model number AMBrc F102RP-5, are depicted in table 4. Orientation of the transponder during measurement was z-orientation.

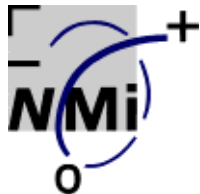
Notes: -Frequency range: 9-90 kHz Average detector used during measurements
 110-490 kHz Average detector used during measurements

-The radiated field strengths were measured at a distance of 1, 3 and 10 metres.

-A plot of the carrier bandwidth can be found in appendix A.

Test engineer : O. H. Hoekstra Date: June 8, 2000

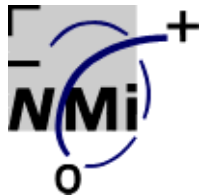
Tester signature :



Description of EUT:	RF Transponder
Manufacturer:	AMB i.t. Holding B.V.
Brand mark:	AMB
Type:	AMBrC F102RP-5
FCC ID:	NXYAMBG3

6 Photos of tested EUT.

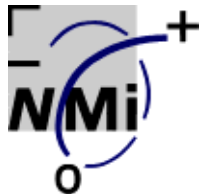
Photo's of exterior and interior are included in separate annex.



Description of EUT:	RF Transponder
Manufacturer:	AMB i.t. Holding B.V.
Brand mark:	AMB
Type:	AMBrC F102RP-5
FCC ID:	NXYAMBGP3

APPENDIX A

Plots of carrier bandwidth



Description of EUT: RF Transponder
Manufacturer: AMB i.t. Holding B.V.
Brand mark: AMB
Type: AMBrc F102RP-5
FCC ID: NXYAMBGP3

14: 59: 17 JUN 07, 2000

hp

REF .0 dBm

AT 10 dB

PEAK

LOG

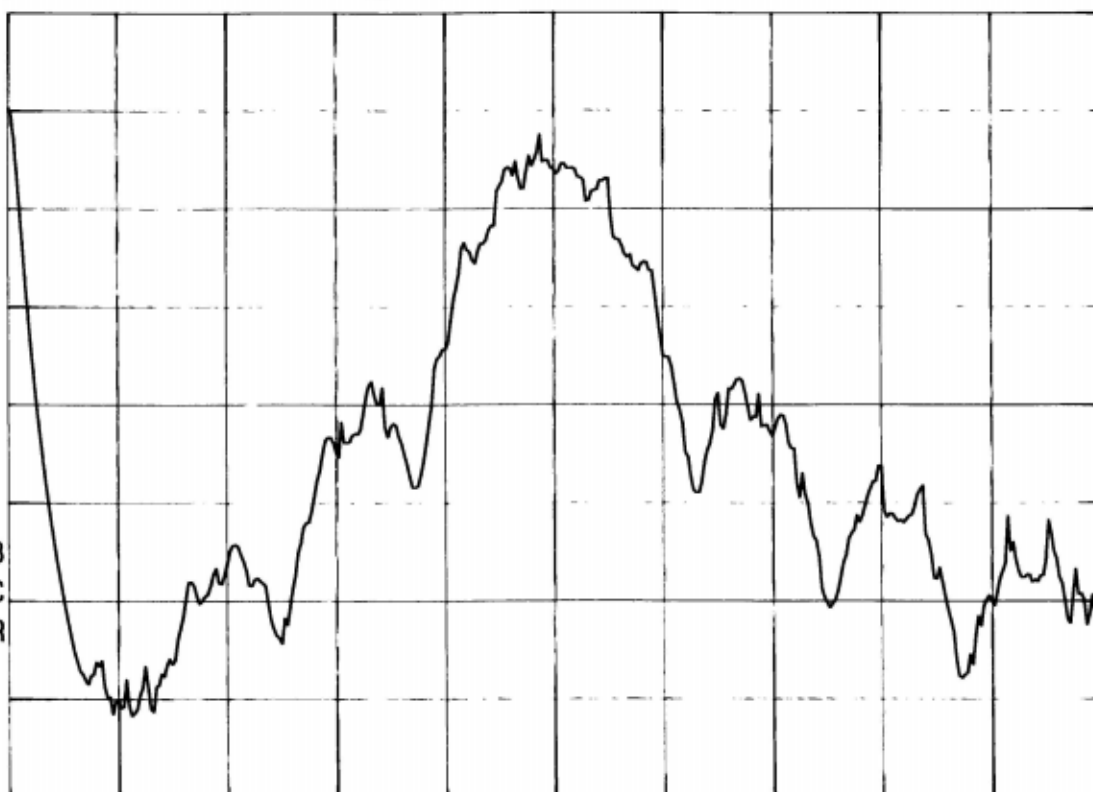
10

dB/

VA SB

SC FC

CORR



CENTER 5.00 MHz

RES BW 100 kHz

VBW 30 kHz

SPAN 10.00 MHz

#SWP 20.0 msec

Plot 1 - Carrier bandwidth AMBrc F102RP-5