

Calibration Certificate

Certificate Number **0001-300611141**

Kalibrierschein

Zertifikatsnummer

Unit Data

Item
Gegenstand **FS-Z75 HARMONIC MIXER 50-75GHZ**

Manufacturer
Hersteller **ROHDE & SCHWARZ**

Type
Typ **FS-Z75**

Material Number **3638.2240.02** **Serial Number** **101575**
Materialnummer Seriennummer

Asset Number
Inventarnummer

Order Data

Customer
Auftraggeber **Rohde & Schwarz USA Inc**
Benjamin Franklin Dr 6821
21046-2663 Columbia
US

Order Number **8800008410 10, 1853**
Bestellnummer

Date of Receipt **2021-08-03**
Eingangdatum

Performance

Place and Date of Calibration
Ort und Datum der Kalibrierung

Werk Memmingen, 2021-08-09

Scope of Calibration
Umfang der Kalibrierung

Standard Calibration

Statement of Compliance (Incoming)
Konformitätsaussage (Anlieferung)

All measured values are within the data sheet specifications.

Statement of Compliance (Outgoing)
Konformitätsaussage (Auslieferung)

All measured values are within the data sheet specifications.

Extent of Calibration Documents
Umfang des Kalibrierdokuments

3 Pages Calibration Certificate
6 Pages Outgoing Results
6 Pages Incoming Results

This calibration certificate documents, that the named item is tested and measured against defined specifications. Measurement results are located usually in the corresponding interval with a probability of approx. 95% (coverage factor $k = 2$). Calibration is performed with test equipment and standards directly or indirectly traceable by means of approved calibration techniques to the PTB/DKD or other national / international standards, which realize the physical units of measurement according to the International System of Units (SI). In all cases where no standards are available, measurements are referenced to standards of the R&S laboratories. Principles and methods of calibration correspond and are conformant with EN ISO/IEC 17025, ANSI/NCSL Z540.1-1994 and ANSI/NCSL Z540.3-2006. The applied quality system is certified to EN ISO 9001. This calibration certificate may not be reproduced other than in full. Calibration certificates without signatures are not valid. The user is obliged to have the object recalibrated at appropriate intervals.

Dieser Kalibrierschein dokumentiert, dass der genannte Gegenstand nach festgelegten Vorgaben geprüft und gemessen wurde. Die Messwerte lagen im Regelfall mit einer Wahrscheinlichkeit von annähernd 95% im zugeordneten Werteintervall (Erweiterte Messunsicherheit mit $k = 2$). Die Kalibrierung erfolgte mit Messmitteln und Normalen, die direkt oder indirekt durch Ableitung mittels anerkannter Kalibriertechniken rückgeführt sind auf Normale der PTB/DKD oder anderer nationaler/internationaler Standards zur Darstellung der physikalischen Einheiten in Übereinstimmung mit dem Internationalen Einheitensystem (SI). Wenn keine Normale existieren, erfolgt die Rückführung auf Bezugsnormale der R&S-Laboratorien. Grundsätze und Verfahren der Kalibrierung beziehen sich auf und entsprechen EN ISO/IEC 17025, ANSI/NCSL Z540.1-1994 und ANSI/NCSL Z540.3-2006. Das angewandte Qualitätsmanagement-System ist zertifiziert nach EN ISO 9001. Dieser Kalibrierschein darf nur vollständig und unverändert weiterverbreitet werden. Kalibrierscheine ohne Signifizierungen sind ungültig. Für die Einhaltung einer angemessenen Frist zur Wiederholung der Kalibrierung ist der Benutzer verantwortlich.

Rohde & Schwarz Messgerätebau GmbH

Date of Issue
Ausstellungsdatum

Head of Laboratory
Laborleitung

Person Responsible
Bearbeiter

2021-08-10

Steigmüller

Johannes Negele

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Calibration Method
Kalibrieranweisung

See first page of Outgoing Results

Relative Humidity 20%-60%
Relative Luftfeuchte

Ambient Temperature (23⁺¹₋₁) °C
Umgebungstemperatur

Working standards used (having a significant effect on the accuracy) Verwendete Gebrauchsnormale (mit signifikantem Einfluss auf die Genauigkeit)				
Item Gegenstand	Type Typ	Serial Number Seriennummer	Calibration Certificate Number Kalibrierscheinnummer	Cal. Due Kalibr. bis
Therm.Power Sensor DC-44GHz	NRP-Z55	140170	0023 D-K-15195-01-00 2020-12	2022-02-28
Thermal Waveguide Power Sensor	NRP75TWG	900002	100018 D-K-15195-01-00 2020-10	2021-10-31
Vect. Netw. Analyzer 4PORT	ZVA67	101175	0023 D-K-15195-01-00 2021-03	2022-03-31

Conformity statements take the measurement uncertainties into account.
Die Konformitätsaussagen berücksichtigen die Messunsicherheiten.

Notes
Anmerkungen

Installed options are included in calibration. Depending on installed options, numbers of pages of the record are not consecutive.

Hints

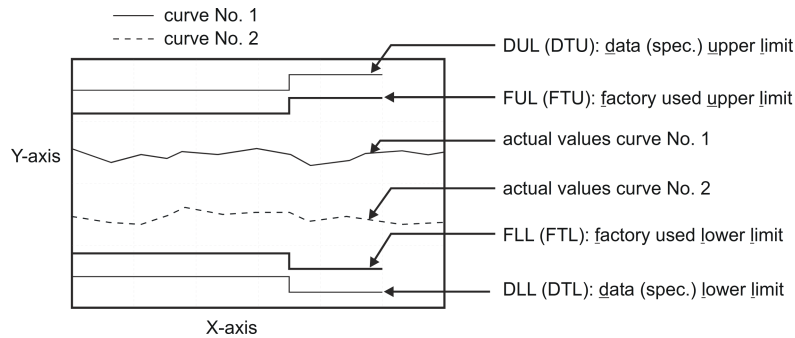
Hinweise

factory used limit = data specification - uncertainty of actual value

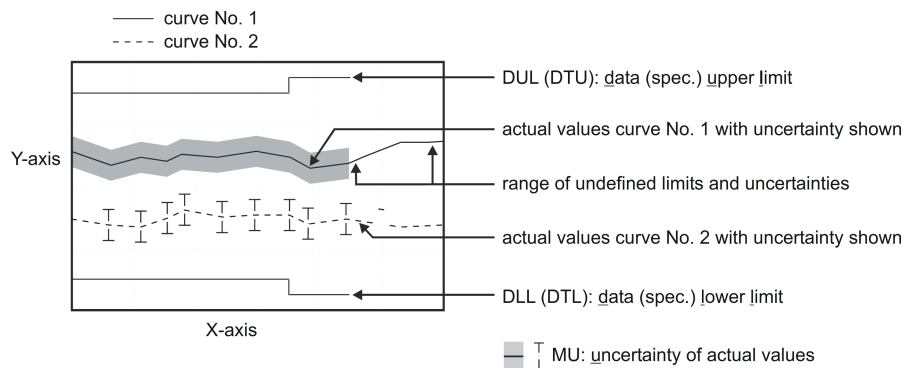
DL or DT: Data Limit for symmetrical tolerance limits

FL or FT: Factory Limit for symmetrical tolerance limits

1. In case uncertainties are part of the appendix



2. In case uncertainties are part of the respective graphic



— T MU: uncertainty of actual values

Outgoing Results

Designation:	HARMONIC MIXER
Type:	FS-Z75
Material No.:	3638.2240.02
Serial No.:	101575
Certificate No.:	0001-300611141
Referring to Test Documentation:	5038.8323.01-PB-01.04

Test Department:	3MME3
Name:	Johannes Negele
Date:	2021-08-09



The following abbreviations may be used in this document

{a}	No measurement uncertainty stated because the errors always add together. So it is sure that a measurement result evaluated as "PASS" is pass.
{b}	The measurement uncertainty depends on the measurement result. The stated measurement uncertainty is valid for the close area around the specification. Measurement results outside the close area have a higher measurement uncertainty but are within the specification.
{c}	Functional test, therefore no measurement uncertainty is stated.
{d}	Typical value, refer to performance test.
{e}	The measurement uncertainty is taken into account when setting the measuring system.
{f}	Verification of specified requirements. Technical operation that consist of the determination of one or more characteristics to a specified procedure.
DL or DT	Data Limit for symmetrical tolerance limits
DLL	Datasheet Lower Limit
DUL	Datasheet Upper Limit
MU	Symmetrical Measurement Uncertainty
MLL or MLV	Measurement Uncertainty Lower Value
MUL or MUV	Measurement Uncertainty Upper Value
Nom.	Nominal Value
Dev.	Deviation
Act.	Actual Value
UGB	Uncertainty Guard Band: Measuring uncertainty violates the data (spec.) limit.
UGB1	A compliance statement may be possible where a confidence level of less than 95 % is acceptable.
UGB2	A non-compliance statement may be possible where a confidence level of less than 95 % is acceptable.
DU	Datasheet Uncertainty

Explanation of charts

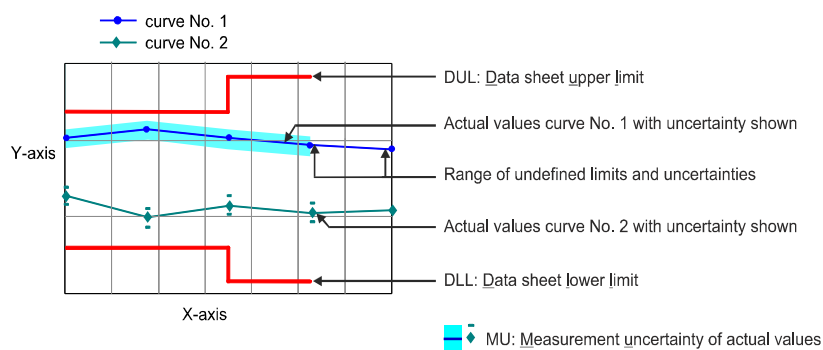


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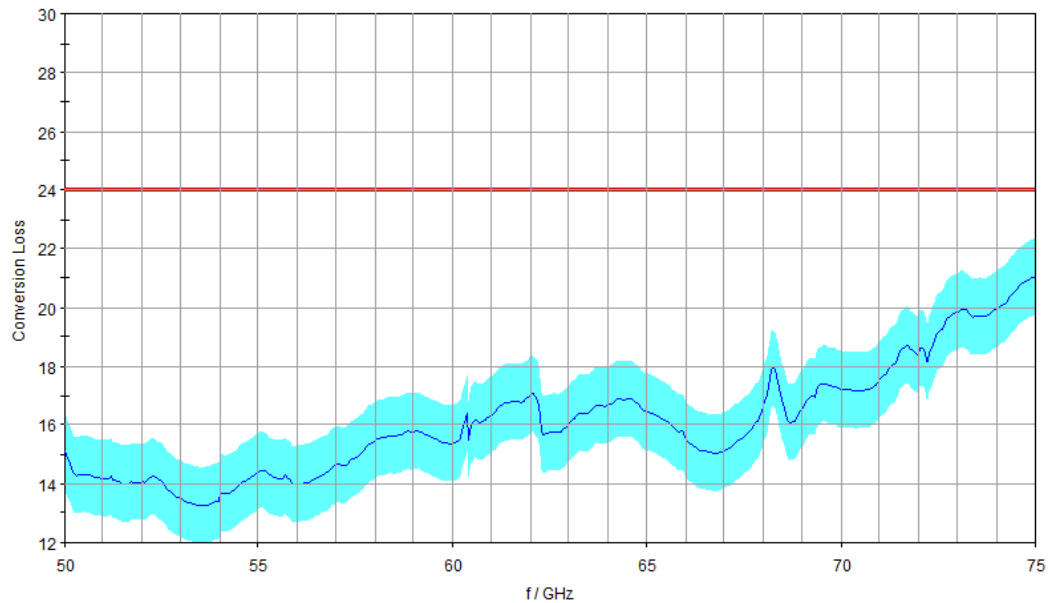
Software used for measurement	4
1. Conversion Loss (6. Harmonic)	5
1.1 Conversion Loss (IF = 404.4 MHz)	5
1.2 Conversion Loss (IF = 729 MHz)	5
1.3 Conversion Loss (IF = 1330 MHz)	6
1.4 Continuity response within 1 GHz	6

Software used for measurement			
Item	Type	Version	Remark
Suite	Setup	V12.10.02	Test Management Software G5
Test Program (7012.8706.00_)	Component	V01.05	

1. Conversion Loss (6. Harmonic)

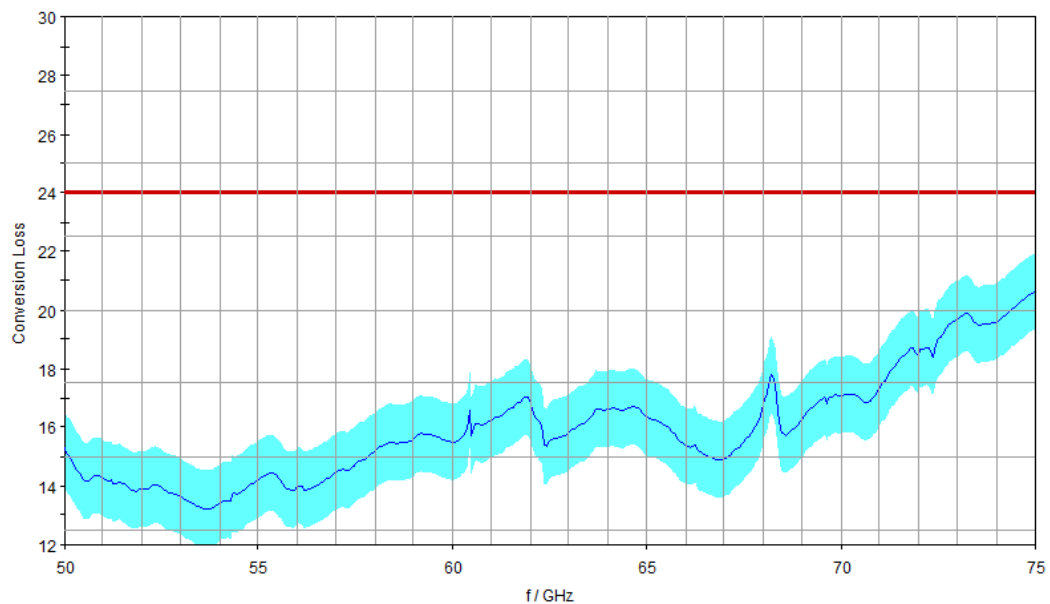
1.1 Conversion Loss (IF = 404.4 MHz)

IF = 404.4 MHz, 6. Harmonic



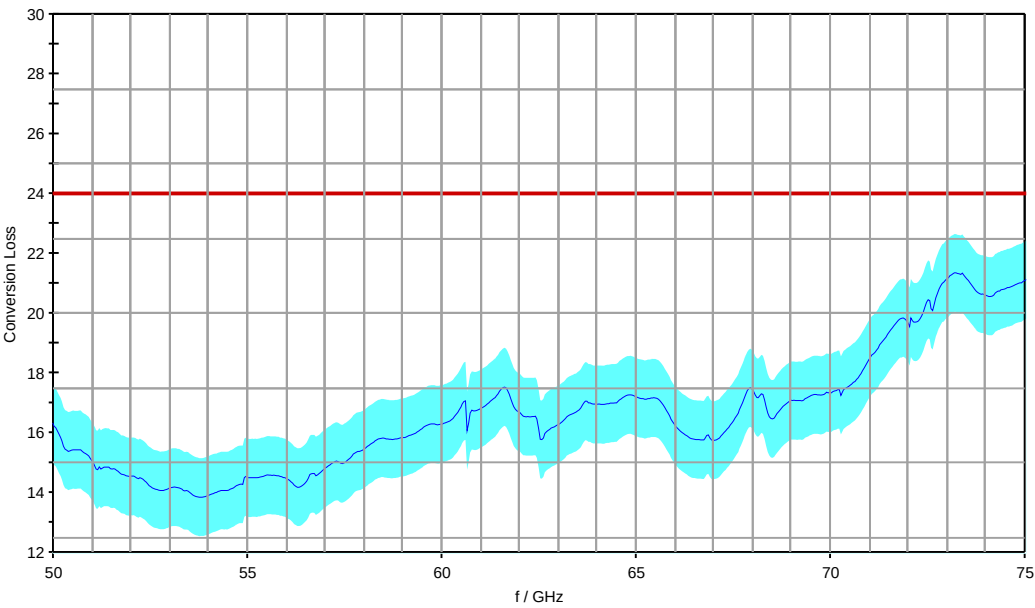
1.2 Conversion Loss (IF = 729 MHz)

IF = 729 MHz, 6. Harmonic



1.3 Conversion Loss (IF = 1330 MHz)

IF = 1330 MHz, 6. Harmonic



1.4 Continuity response within 1 GHz

Continuity response within any 1 GHz Band, 6. Harmonic

	DUL	Continuity
	/dB	/dB
max. at IF = 404.4 MHz:	6.0	2.62
max. at IF = 729 MHz:	6.0	2.65
max. at IF = 1330 MHz:	6.0	1.85

Incoming Results

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Explanation of charts

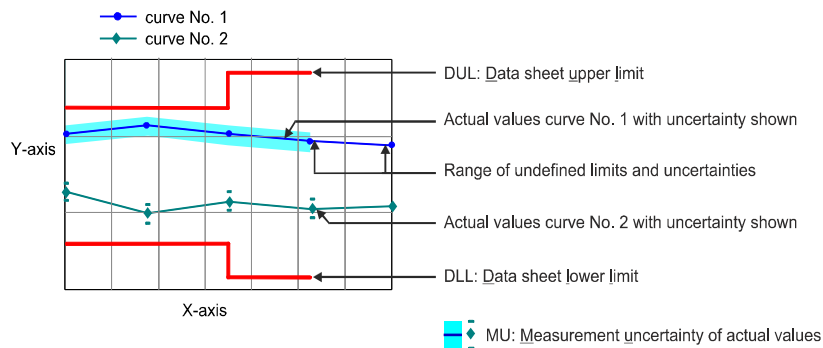


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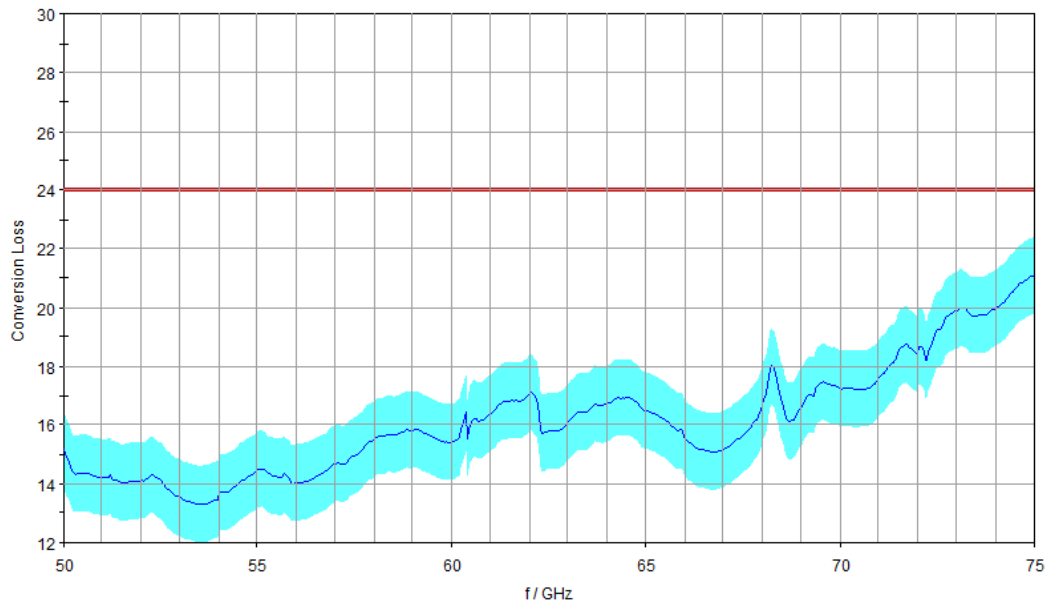
Incoming Results

Software used for measurement			
Item	Type	Version	Remark
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Test Program (7012.8706.00_)	Component	V01.05	

1. Conversion Loss (6. Harmonic)

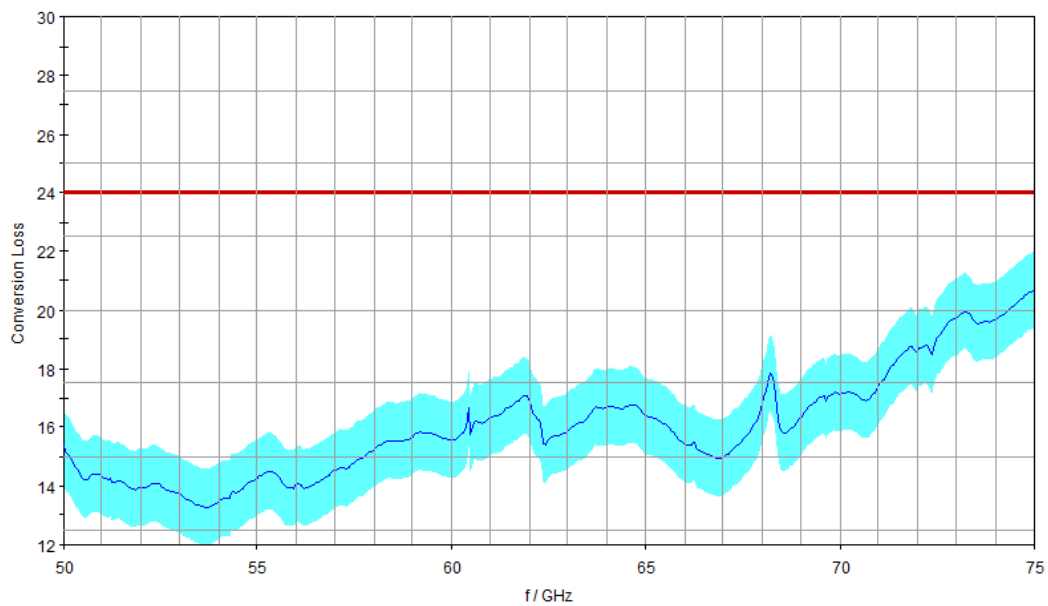
1.1 Conversion Loss (IF = 404.4 MHz)

IF = 404.4 MHz, 6. Harmonic



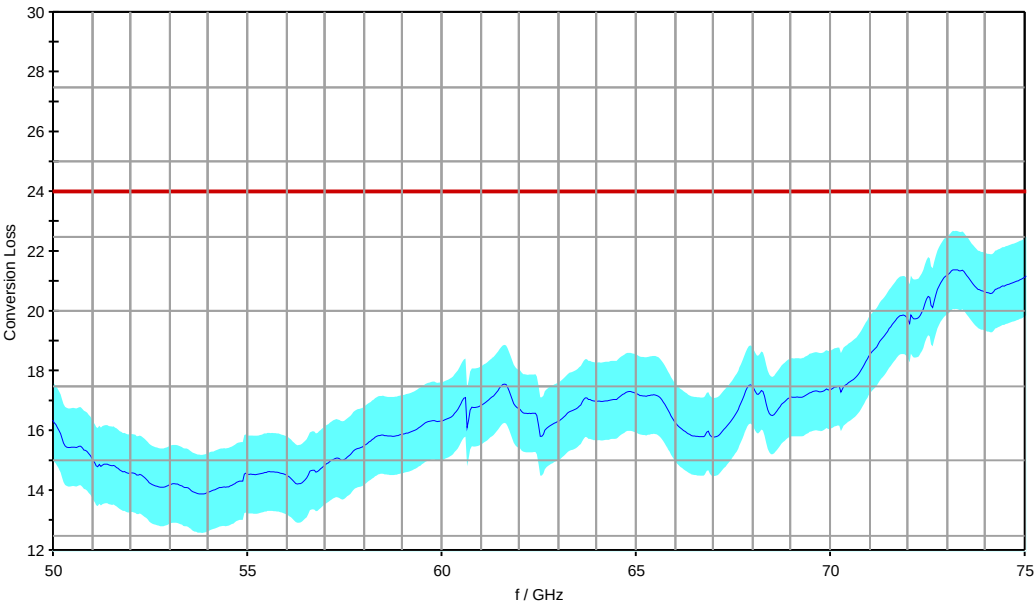
1.2 Conversion Loss (IF = 729 MHz)

IF = 729 MHz, 6. Harmonic



1.3 Conversion Loss (IF = 1330 MHz)

IF = 1330 MHz, 6. Harmonic



1.4 Continuity response within 1 GHz

Continuity response within any 1 GHz Band, 6. Harmonic

	DUL /dB	Continuity /dB
max. at IF = 404.4 MHz:	6.0	2.61
max. at IF = 729 MHz:	6.0	2.65
max. at IF = 1330 MHz:	6.0	1.86

Incoming Results