

# **Agilent 70612C K63 Switch Matrix**

**RF Input Drawer**

## **Hardware Reference Manual**

## Notices

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### Safety Notices

#### CAUTION

A **CAUTION** notice denotes a hazard. It calls attention to an operating procedure, practice, or the like that, if not correctly performed or adhered to, could result in damage to the product or loss of important data. Do not proceed beyond a **CAUTION** notice until the indicated conditions are fully understood and met.

#### WARNING

A **WARNING** notice denotes a hazard. It calls attention to an operating procedure, practice, or the like that, if not correctly performed or adhered to, could result in personal injury or death. Do not proceed beyond a **WARNING** notice until the indicated conditions are fully understood and met.

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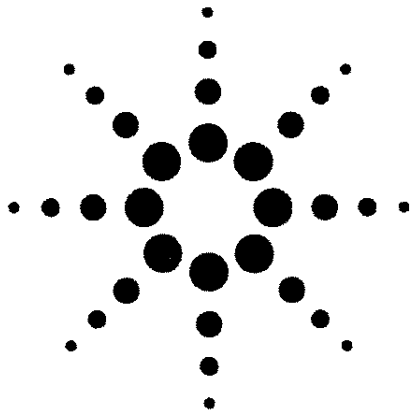
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# 1 General Information

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This chapter provides general information about the Agilent 70612C K63 environmental and mechanical specifications. It also provides switch drive information.



## Description

The Agilent 70612C K63 RF input drawer is a modified Agilent 70612C K08 with an F08 kit added.

The Agilent Technologies 70612C K63 contains a controller card and two relay driver cards to control the coaxial switches and variable step attenuators. The step attenuators (0 to 11 dB) are in the two main signal paths. All switch ports and attenuator sections are controlled separately for maximum flexibility.

The 70612C K63 control channel numbers remain the same as the control channel numbers in the 70612C K08.

The 70001A main frame and 70004A display module provide DC and logic commands.

The 70612C K63 brings together RF inputs and outputs from the various test instruments listed below:

- Noise source
- Spectrum analyzer
- Power sensor
- Network analyzer
- Signal sources
- Filter assemblies

This provides a total of 46 unique signal paths for taking measurements.

The 70612C K63 is housed in a standard, four unit width, MMS module.

## Modifications

The following changes to the 70612C K08 have been incorporated into the 70612C K63:

- The three-resistor power splitter (DC1), P/N 11636A, has been removed.
- The front-panel location for J5, labeled FA2-2 on the 70612C K08, has been used to route a cable from switch S4, port 3, and has been relabeled IM MONITOR.
- Connector J4, labeled FAI-1 on the 70612C K08, has been relabeled IM INPUT.
- Ports J4 and J5 have been regrouped on the front panel, as have FA2-1 and FA1-1.

## Features

- All RF connections are on the front panel.
- All RF connectors are 3.5 mm precision connectors.
- Internal RF paths use semirigid cables for maximum mechanical and electrical stability.
- All internal coaxial switches are high-isolation designs with latching drive circuits.
- All open ports are terminated to improve electrical isolation.

## Year 2000 Compliance

This product does *no* date related processing. Date related standards *do not* apply to this type of product.

## Specifications

**Table 1** 70612C K63 electrical specifications

<b>Frequency range:</b>	DC to 26.5 GHz
<b>Maximum input power:</b>	1 watt CW
No other RF specifications apply	

**Table 2** 70612C K63 mechanical specifications

<b>Altitude:</b>	Up to 4,572 meters (15,000 feet)
<b>Temperature:</b>	0 °C to 55 °C (unless otherwise specified)
<b>Max relative humidity:</b>	80% for temperatures up to 31 °C, decreasing linearly to 50% relative humidity at 40 °C.
<b>Height:</b>	147.2 mm (5.8 in)
<b>Width</b>	193 mm (7.6 in)
<b>Depth:</b>	467mm (18.4 in)
<b>Weight:</b>	≈4.5 kg (10 lbs)



## Switch Drive Information

**Table 3** 70612C K63 attenuator commands

70612C K63 Device	Attenuator Position	Attenuator Commands		
		Board	Command	Channel
AT1 Attenuator 0 to 11 dB (1 dB Step)	0 dB	A1	Open	100
	1 dB	A1	Close	
	0 dB	A1	Open	101
	2 dB	A1	Close	
	0 dB	A1	Open	102
	4 dB	A1	Close	
	0 dB	A1	Open	103
	4 dB	A1	Close	
AT2 Attenuator 0 to 11 dB (1 dB Step)	0 dB	A1	Open	104
	1 dB	A1	Close	
	0 dB	A1	Open	105
	2 dB	A1	Close	
	0 dB	A1	Open	106
	4 dB	A1	Close	
	0 dB	A1	Open	107
	4 dB	A1	Close	

**Table 4** Agilent 70612C K63 switch drive table

70612C K63 Device	Switch Position	Switch Driver Board		
		Board	Command	Channel
S1 SP6T Switch (port 3 not used)	1 to C	A1	Close	108
	2 to C	A1	Close	109
	4 to C	A1	Close	110
	5 to C	A1	Close	111
	6 to C	A1	Close	112

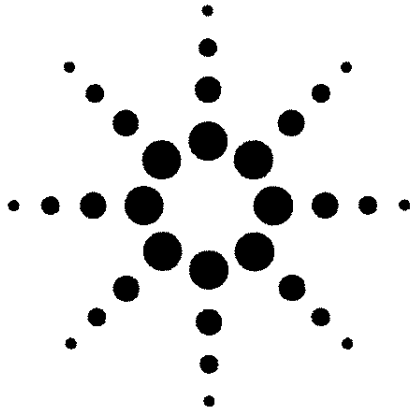
**Table 4** Agilent 70612C K63 switch drive table

70612C K63 Device	Switch Position	Switch Driver Board		
		Board	Command	Channel
<b>S2</b> SP6T Switch (port 6 not used)	1 to C	A1	Close	113
	2 to C	A1	Close	114
	3 to C	A1	Close	115
	4 to C	A1	Close	116
	5 to C	A1	Close	117
<b>S3</b> SP4T Switch	2 to C	A2	Close	200
	3 to C	A2	Close	201
	5 to C	A2	Close	202
	6 to C	A2	Close	203
<b>S4</b> SP6T Switch	1 to C	A2	Close	204
	2 to C	A2	Close	205
	3 to C	A2	Close	220
	4 to C	A2	Close	206
	5 to C	A2	Close	207
	6 to C	A2	Close	208
<b>S5</b> SP6T Switch (port 3 not used)	1 to C	A2	Close	209
	2 to C	A2	Close	210
	4 to C	A2	Close	211
	5 to C	A2	Close	212
	6 to C	A2	Close	213
<b>S6</b> SPDT Switch	1 to C	A2	Open	214
	2 to C	A2	Close	214
<b>S7</b> SPDT Switch	1 to C	A2	Open	215
	2 to C	A2	Close	215
<b>S78</b> SPDT Switch	1 to C	A2	Open	216
	2 to C	A2	Close	216
<b>S9</b> SPDT Switch	1 to C	A2	Open	217
	2 to C	A2	Close	217

**Table 4** Agilent 70612C K63 switch drive table

70612C K63 Device	Switch Position	Switch Driver Board		
		Board	Command	Channel
<b>S10 SPDT Switch</b>	1 to C	A2	Open	218
	2 to C	A2	Close	218
<b>S11 SPDT Switch</b>	1 to C	A2	Open	219
	2 to C	A2	Close	219

## **1 General Information**



## 2 Service

- Service Information
- Replaceable Parts Information
- Schematics and Diagrams

This chapter contains parts and service information for the Agilent 70612C K63 RF Input Drawer. It also contains a list of all of the replaceable parts with their reference designators, as well as the schematics and diagrams for servicing and reference.

## Service Information

- There are no user adjustable parts in this instrument.
- If your instrument requires service, or if you need to remove or replace a component, contact your local Agilent sales and service office.
- Fasteners in the instrument have both metric and inch threads, with a mix of TORX and pozidrive heads.

## Replaceable Parts Information

**Table 1** 70612C K63 Replaceable Parts

Reference Designator	Part Numbers	Qty	Description
A1, A2	70612-60049	2	Board, driver
A3	70611-60001	1	Board, controller
A3U7	70611-80013	1	EPROM
A3U8	70611-80014	1	EPROM
AT3 to AT6	0960-0053	3	Termination, SMA 50Ω
J1 to J16 SAVE 0	5062-6618	16	Connector, 3.5 mm bulkhead (f)
J17	70700-60001	1	Connector, 50-pin
S1 to S05	87106-60009	4	Switch, 1P6T, 26.5GHz
S3	87104-60001	1	Switch, 1P4T, 26.5 GHz
S6 to S11	33311-60050	6	Switch, 3PT, 3.5 mm, 24V
W1	70612-22607	1	Cable, RF
W2	70612-22608	1	Cable, RF
W3	70612-22609	1	Cable, RF
W4	70612-22610	1	Cable, RF
W5	70612-22963	1	Cable, RF
W6	70612-22964	1	Cable, RF
W7	70612-22965	1	Cable, RF
W8	70612-22614	1	Cable, RF
W9	70612-22615	1	Cable, RF
W10	70612-22616	1	Cable, RF
W11	70612-22617	1	Cable, RF
W12	70612-22618	1	Cable, RF
W13	70612-22619	1	Cable, RF
W14	70612-22620	1	Cable, RF
W15	70612-22621	1	Cable, RF

**Table 1** 70612C K63 Replaceable Parts (continued)

<b>Reference Designator</b>	<b>Part Numbers</b>	<b>Qty</b>	<b>Description</b>
W17	70612-22623	1	Cable, RF
W18	70612-22624	1	Cable, RF
W19	70612-22625	1	Cable, RF
W20	70612-22626	1	Cable, RF
W21	70612-22627	1	Cable, RF
W22	70612-22628	1	Cable, RF
W23	70612-22629	1	Cable, RF
W24	70612-22630	1	Cable, RF
W25	70612-22631	1	Cable, RF
W26	70612-22632	1	Cable, RF
W27	70612-22633	1	Cable, RF
W28	70612-22634	1	Cable, RF
W29	70612-22635	1	Cable, RF
W30	70612-22636	1	Cable, RF
W31	70612-22637	1	Cable, RF
W32	70612-22638	1	Cable, RF
W33	70612-22639	1	Cable, RF
W34	70612-22640	1	Cable, RF
W35	70612-22693	1	Cable, RF
W38, W39	11764-60006	2	Cable, 10C 10F-MLT
	0380-0029	4	Spacer
	08760-02011	1	Bracket, power sensor
	08760-02229	1	Bracket, noise source
	70594-00003	1	Panel, rear
	70611-22401	1	Frame, front
	70611-22402	1	Base
	70611-22403	1	Frame, rear
	70611-62031	1	Cable, 33 X 34



**Table 1** 70612C K63 Replaceable Parts (continued)

<b>Reference Designator</b>	<b>Part Numbers</b>	<b>Qty</b>	<b>Description</b>
	70612-02027	1	Cover, top
	70612-02150	1	Deck
	70612-02151	6	Bracket, switch
	70612-02153	2	Bracket, attenuator
	70612-02157	5	Bracket, switch
	70612-02237	1	Panel, front
	70700-40002	2	Guide, PC board
	84904K	2	Attenuator
	08510-1244	1	Clip
	0900-0012	1	O-ring
	1460-2095	4	Spring
	5001-5835	2	Connector bar
	5001-5840	1	Clip, ground
	5022-0051	1	Screw, latch
	70612-00020	4	Bracket, left
	70612-00025	1	Guard, PC board

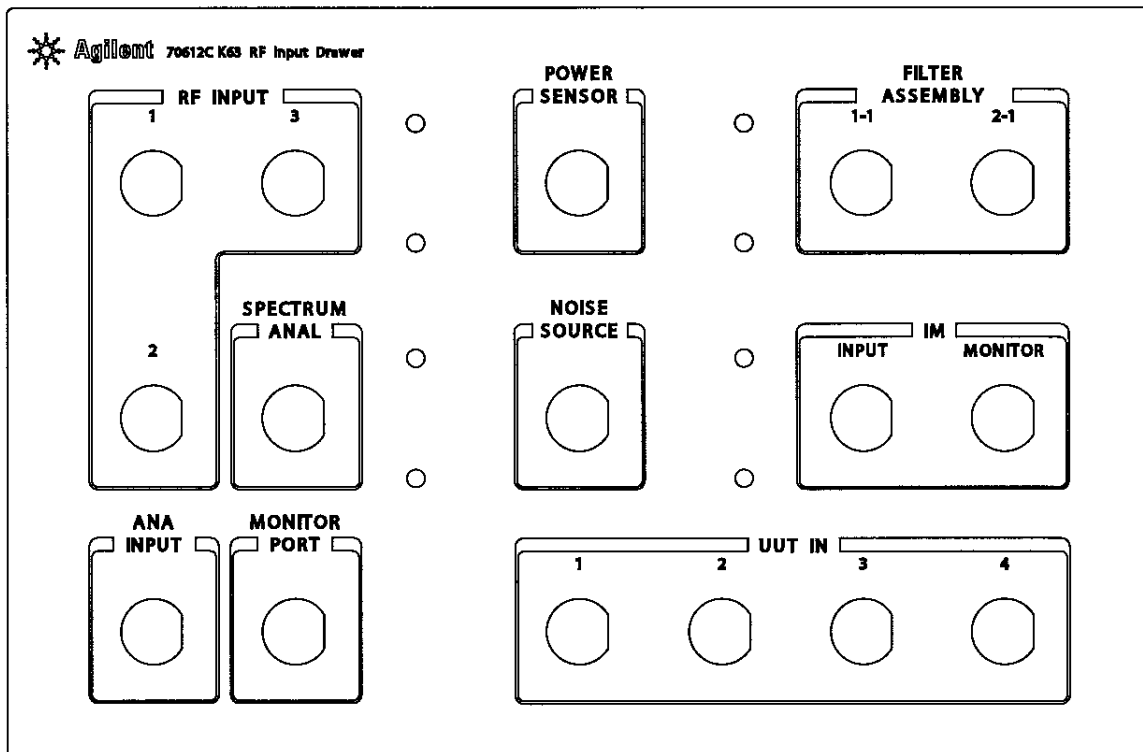
## Accessories

**Table 2** 70612C K63 Accessory Table

<b>Description</b>	<b>Part Number</b>
<i>70612C K63 Hardware Reference Manual</i>	70612-90029
Noise source bracket	08760-02229
<i>70611A, 70612C, 70613A, C Operating and Service Manual</i>	70611-90015
Power sensor bracket	08760-02011

## Schematics and Diagrams

- Figure 1, “Agilent 70612C K63 front panel diagram,” on page 20
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- Figure 3, “Agilent 70612C K63 switch drive schematic of A1 relay driver board,” on page 22
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- Figure 6, “Agilent 70612C K63 component layout diagram,” on page 25



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rev3 6/19/03

Figure 1 Agilent 70612C K63 front panel diagram

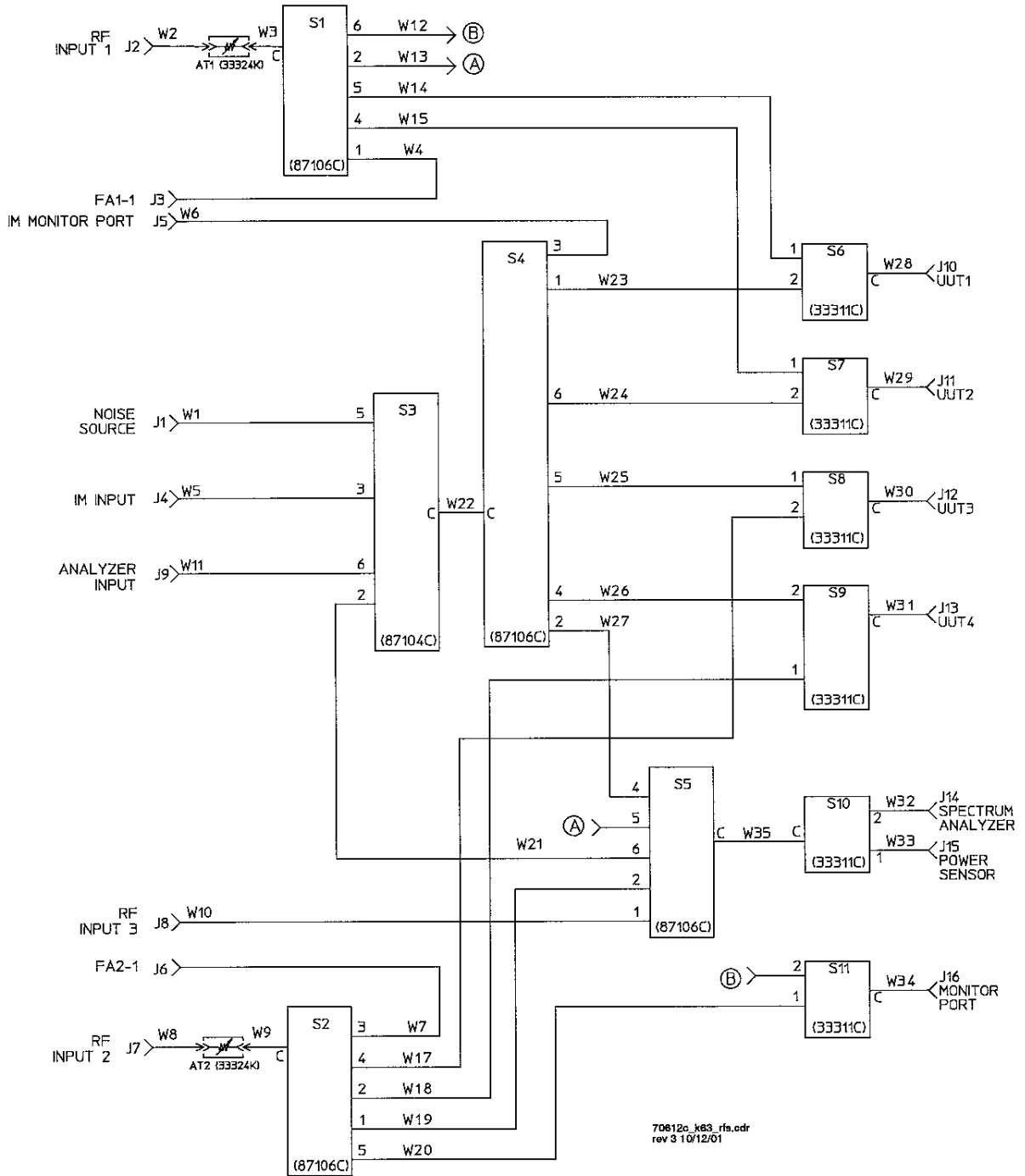
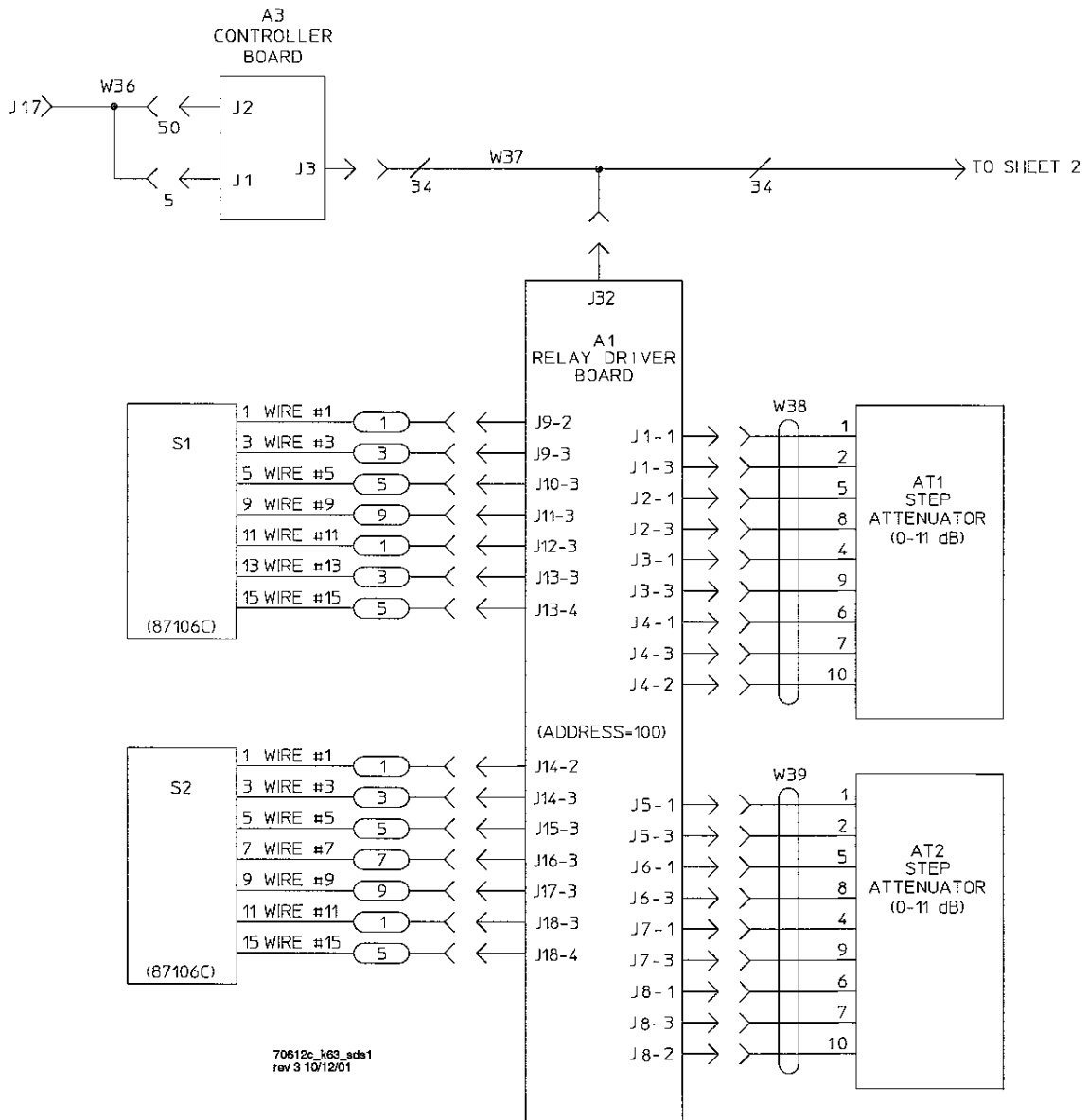


Figure 2 Agilent 70612C K63 RF schematic diagram

## 2 Service



**Figure 3** Agilent 70612C K63 switch drive schematic of A1 relay driver board

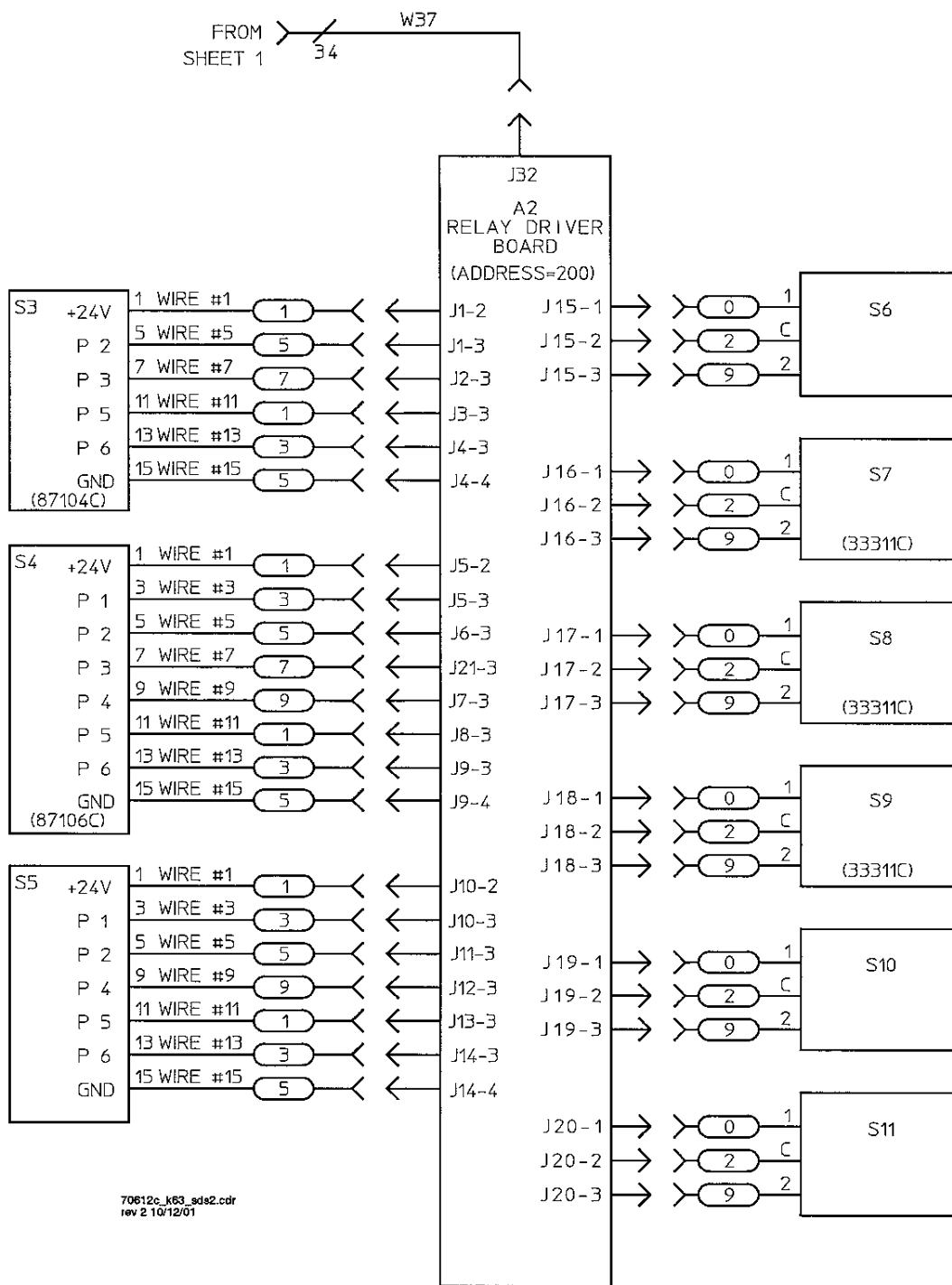
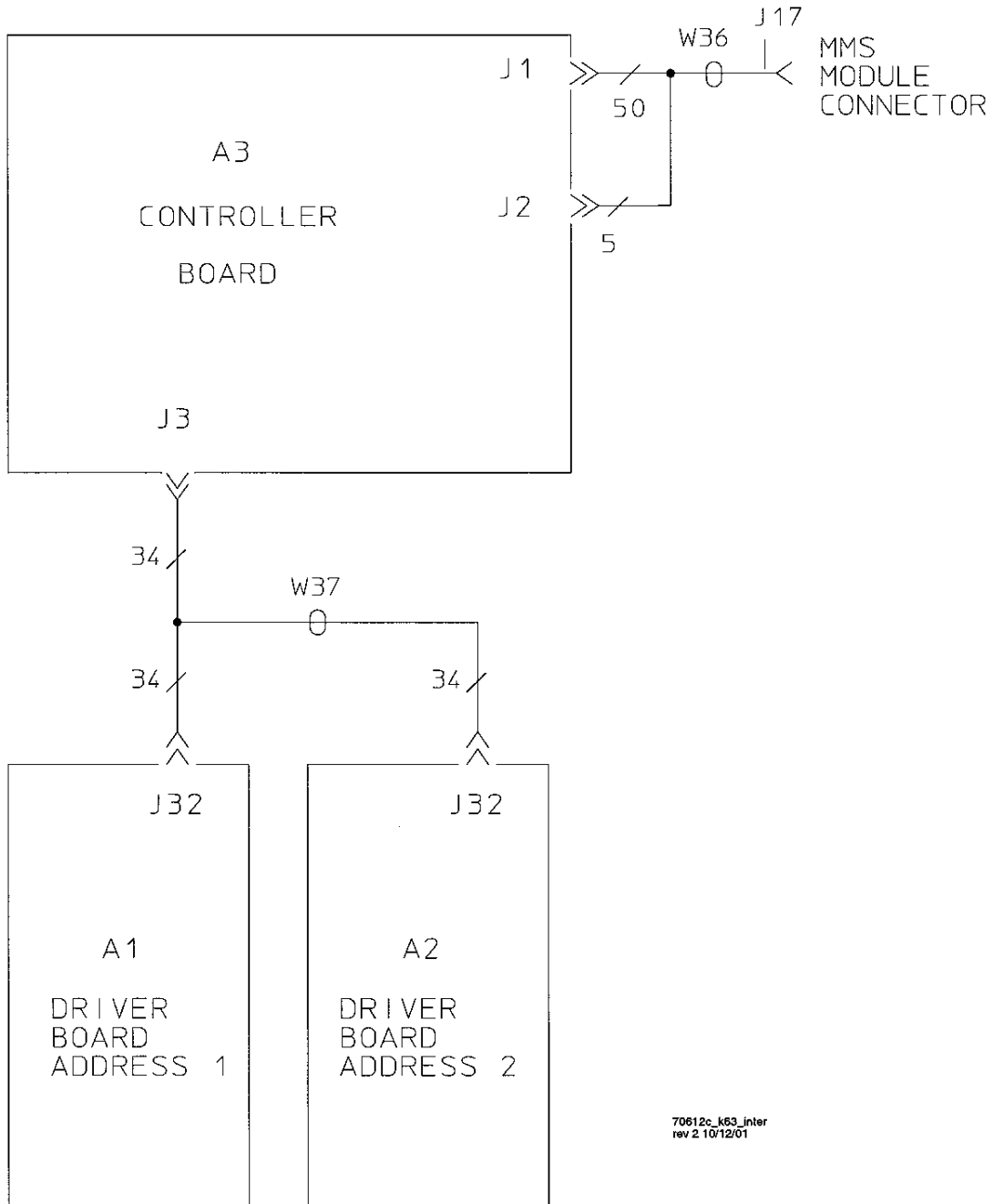


Figure 4 Agilent 70612C K63 switch drive schematic of A2 relay driver board



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Figure 5 Agilent 70612C K63 interconnect diagram



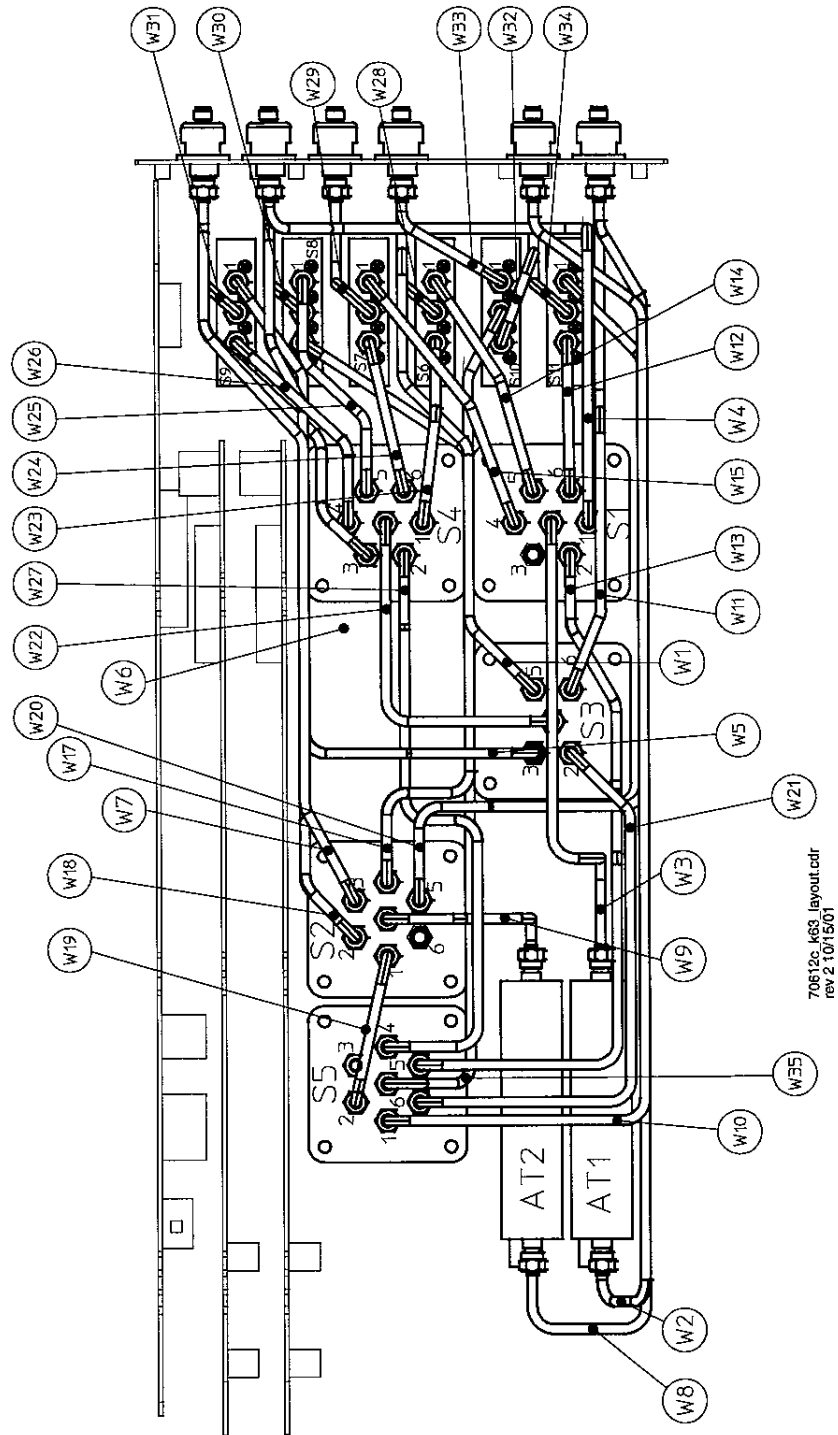
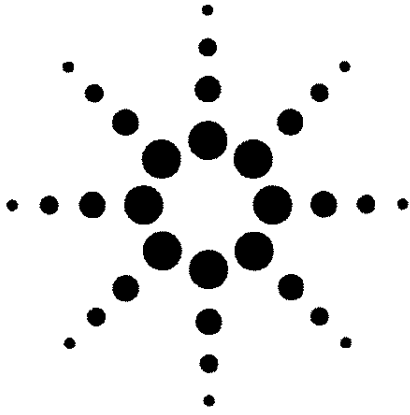


Figure 6 Agilent 70612C K63 component layout diagram





## **A**

# **Service, Support, and Safety Information**

Service and Support 28

Safety and Regulatory Information 29

This appendix includes information on servicing and obtaining support for your Agilent Technologies instrument. It also includes safety and regulatory information, which you should review prior to working with the instrument.

## Service and Support

Any adjustment, maintenance, or repair of this product must be performed by qualified personnel. Contact your customer engineer through your local Agilent Technologies Service Center.

### Agilent on the Web

You can find information about technical and professional services, product support, and equipment repair and service on the Web:

<http://www.agilent.com/contacts/English/noscript.html>

Double-click the **Test & Measurement** link. Select your country from the drop-down menu. The web page that appears next has contact information specific for your country.

### Agilent by phone

If you do not have access to the Internet, one of the Agilent Service Centers listed in the table below can direct you to your nearest representative.

<b>United States</b>	Test and Measurement Call Center (800) 452 4844 (toll-free in US)
<b>Canada</b>	(877) 894-4414
<b>Europe</b>	(31 20) 547 2111 (Netherlands)
<b>Japan</b>	Measurement Assistance Center (81) 426 56 7832
<b>Latin America</b>	(305) 269-7500 (in Miami, FL, USA)
<b>Australia/New Zealand</b>	1 800 629 485 (Australia)
<b>Asia-Pacific</b>	(852) 800 930 871 (Hong Kong)

## Safety and Regulatory Information

### Safety summary

The following general safety precautions must be observed during all phases of operation of this instrument. Failure to comply with these precautions or with specific warnings elsewhere in this manual violates safety standards of design, manufacture, and intended use of the instrument. Agilent Technologies, Inc. assumes no liability for the customer's failure to comply with these requirements.

#### General

This product has been designed and tested in accordance with the standards listed on the Manufacturer's Declaration of Conformity, and has been supplied in a safe condition. The documentation contains information and warnings that must be followed by the user to ensure safe operation and to maintain the product in a safe condition.

All light-emitting diodes (LEDs) used in this product are Class 1 LEDs per IEC 60825-1.

### Equipment Installation

Install the instrument so that the detachable power cord is readily identifiable and is easily reached by the operator. The detachable power cord is the instrument disconnecting device. It disconnects the mains circuits from the mains supply before other parts of the instrument. The front panel switch is only a standby switch and is not a LINE switch. Alternatively, an externally installed switch or circuit breaker (which is readily identifiable and is easily reached by the operator) may be used as a disconnecting device.

#### **WARNING**

**This is a Safety Class 1 Product (provided with a protective earthing ground incorporated in the power cord). The mains plug shall be inserted only in a socket outlet provided with a protective earth contact. Any interruption of the protective conductor inside or outside of the products is likely to make the product dangerous. Intentional interruption is prohibited (IEC 348 clauses 17.3.3 c and 17.3.4)**

#### **WARNING**

**DO NOT OPERATE IN AN EXPLOSIVE ATMOSPHERE**  
**Do not operate the instrument in the presence of flammable gases or flames.**

**WARNING**

**DO NOT REMOVE THE INSTRUMENT COVER**

Operating personnel must not remove instrument covers. Component replacement and internal adjustments must be made only by qualified service personnel.

Instruments that appear damaged or defective should be made inoperative and secured against unintended operation until they can be repaired by qualified service personnel.

**Environmental conditions**

**WARNING**

If this product is not used as specified, the protection provided by the equipment could be impaired. This product must be used only in a normal condition (in which all means for protection are intact).

**CAUTION**

Unless otherwise noted in the specifications, this instrument is intended for indoor use in an installation category II, pollution degree 2 environment per IEC 61010-1 and 664 respectively. It is designed to operate at a maximum relative humidity of 20% to 80% at 35 °C or less (non-condensing). This instrument is designed to operate at altitudes up to 2000 meters, and at temperatures between 0 °C and 40 °C.

**Before applying power**

**CAUTION**

Verify that the product is set to match the available line voltage, the correct fuse is installed, and all safety precautions are taken. Note the instrument's external markings described in Table 3, "Safety symbols and instrument markings," on page 31.

**Ground the instrument**

**WARNING**

To minimize shock hazard, the instrument chassis and cover must be connected to an electrical protective earth ground. The instrument must be connected to the AC power mains through a grounded power cable, with the ground wire firmly connected to an electrical ground (safety ground) at the power outlet. Any interruption of the protective (grounding) conductor or disconnection of the protective earth terminal will cause a potential shock hazard that could result in personal injury.

**CAUTION**

Always use the three-prong AC power cord supplied with this product. Failure to ensure adequate earth grounding by not using this cord may cause product damage.

**CAUTION**

The detachable power cord is the instrument disconnecting device. It disconnects the mains circuit from the mains supply before other parts of the instrument. The front panel switch is only a standby switch and is *not* a line switch.

## Fuses

**WARNING**

Use only fuses with the required rated current, voltage, and specified type (normal blow, time delay). Do not use repaired fuses or short-circuited fuse holders. To do so could cause a shock or fire hazard.

## Maintenance




**WARNING**

To prevent electrical shock, disconnect the Agilent Technologies instruments from mains before cleaning. Use a dry cloth or one slightly dampened with water to clean the external case parts. Do not attempt to clean internally.














## Safety symbols and instrument markings

Symbols and markings in manuals and on instruments alert you to potential risks, provide information about conditions, and comply with international regulations. Table 3 defines the symbols and markings you may find in a manual or on an instrument.

**Table 3** Safety symbols and instrument markings


Safety symbols	Definition
	Warning: risk of electric shock.
	Warning: hot surface.
	Caution: refer to instrument documentation.

**Table 3** Safety symbols and instrument markings (continued)

Safety symbols	Definition
	Laser radiation symbol: marked on products that have a laser output.
	Alternating current.
	Both direct and alternating current.
	Three-phase alternating current.
	Earth (ground) terminal.
	Protective earth (ground) terminal.
	Frame or chassis terminal.
	Terminal is at earth potential. Used for measurement and control circuits designed to be operated with one terminal at earth potential.
<b>N</b>	Terminal for neutral conductor on permanently installed equipment.
<b>L</b>	Terminal for line conductor on permanently installed equipment.
	Standby (supply); units with this symbol are not completely disconnected from AC mains when this switch is in the standby position. To completely disconnect the unit from AC mains, either disconnect the power cord, or have a qualified/licensed electrician install an external switch.
	OFF (supply); a switch with this symbol opens the instrument's power supply circuit, disconnecting it with the mains supply.
	ON (supply); a switch with this symbol closes the instrument's power supply circuit, connecting it with the mains supply.
Instrument markings	Definition
	The CE mark is a registered trademark of the European Community.
	The CSA mark is a registered trademark of the CSA-International.



**Table 3** Safety symbols and instrument markings (continued)

Safety symbols	Definition
 N10149	The C-tick mark is a registered trademark of the Spectrum Management Agency of Australia. This signifies compliance with the Australian EMC Framework regulations under the terms of the Radio Communications Act of 1992.
ISM1-A	This text indicates that the instrument is an Industrial Scientific and Medical Group 1 Class A product (CISPER 11, Clause 4).
ICES/NMB-001	This text indicates product compliance with the Canadian Interference-Causing Equipment Standard (ICES-001).

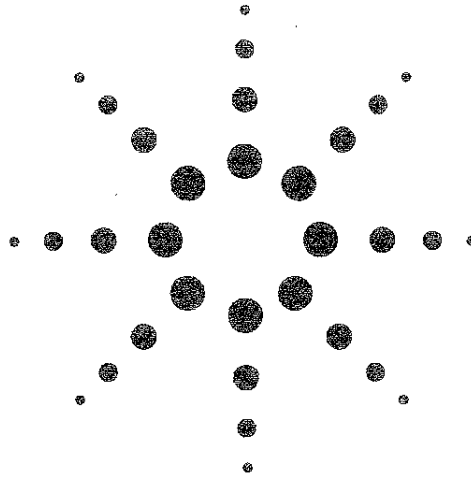
## Compliance with German noise requirements

This is to declare that this instrument is in conformance with the German Regulation on Noise Declaration for Machines (Laermangabe nach der Maschinenlaermrrerordnung –3.GSGV Deutschland).

**Table 4** German noise requirements summary

Acoustic Noise Emission/Geraeuschemission	
LpA <70 dB	LpA <70 dB
Operator position	am Arbeitsplatz
Normal position	normaler Betrieb
per ISO 7779	nach DIN 45635 t.19

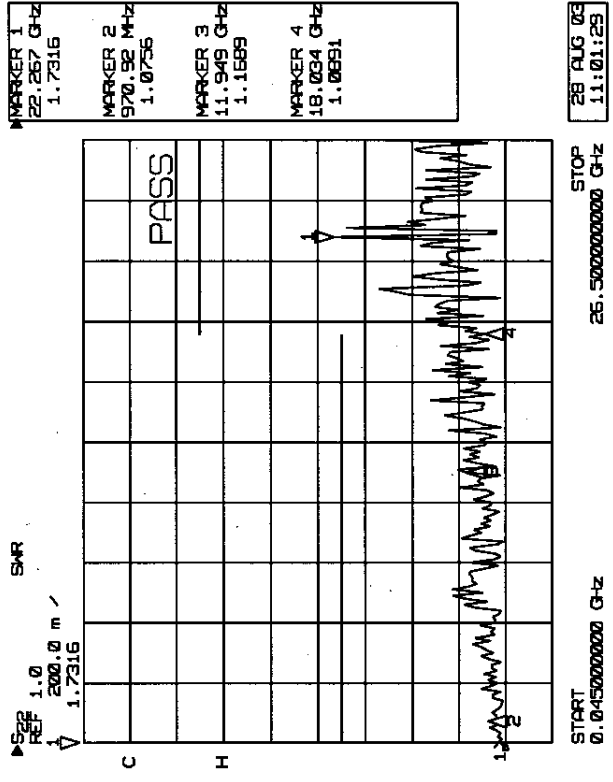
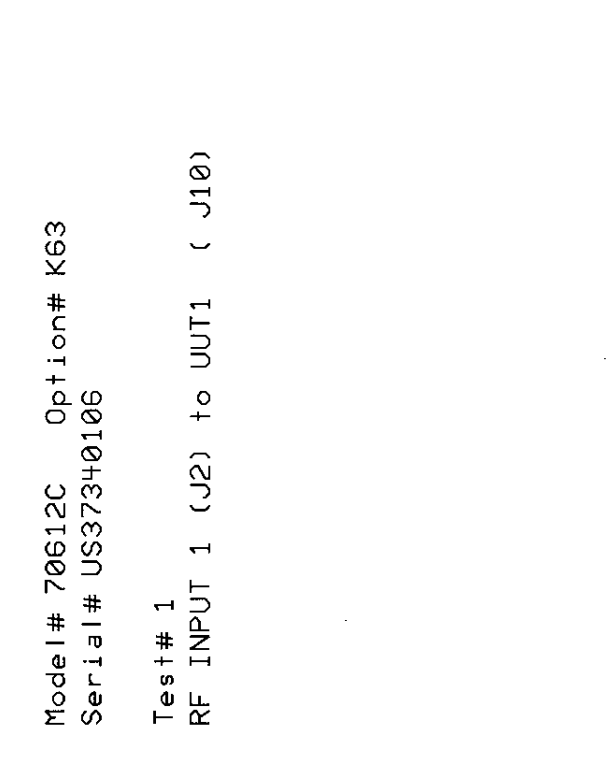
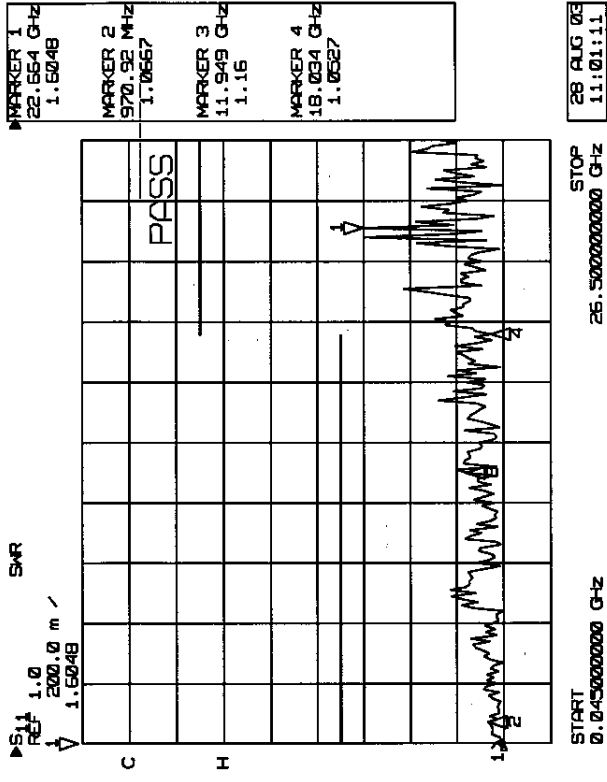
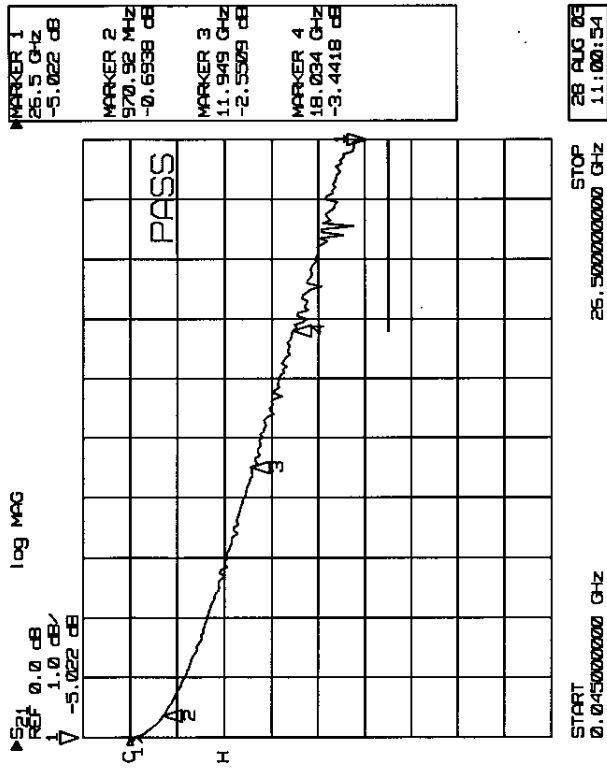
**A Service, Support, and Safety Information**



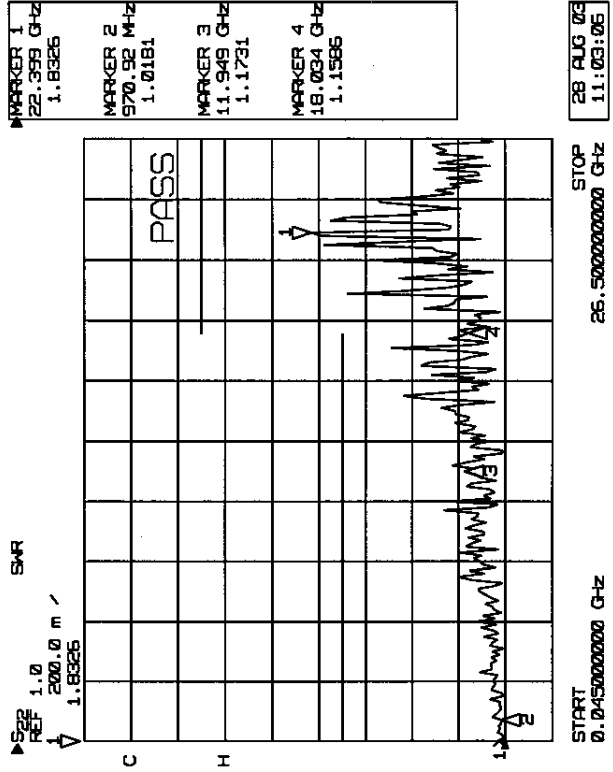
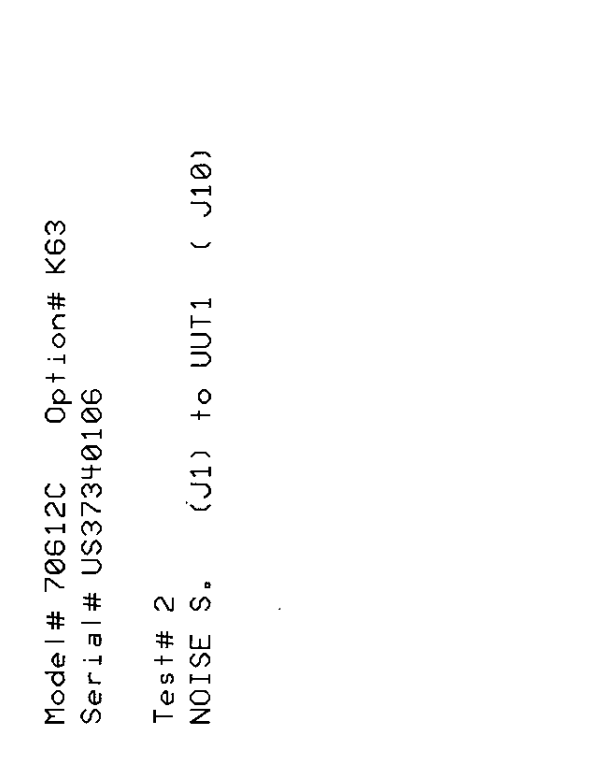
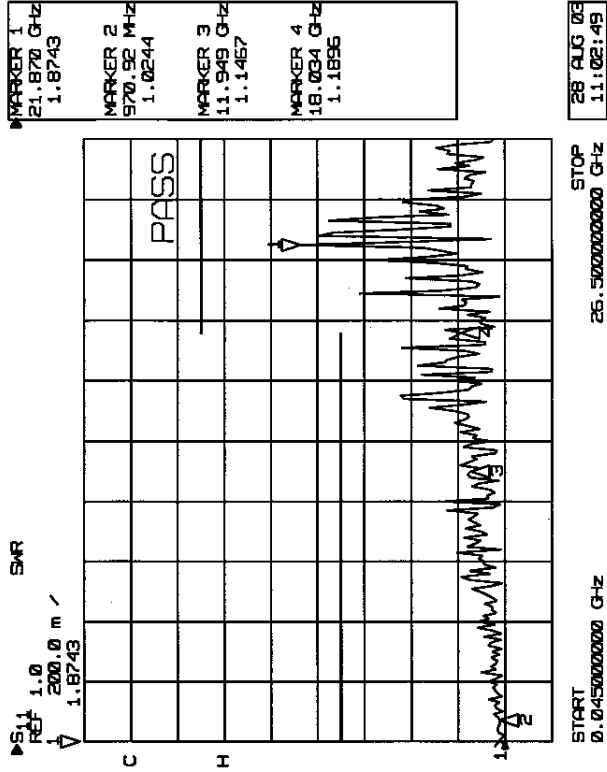
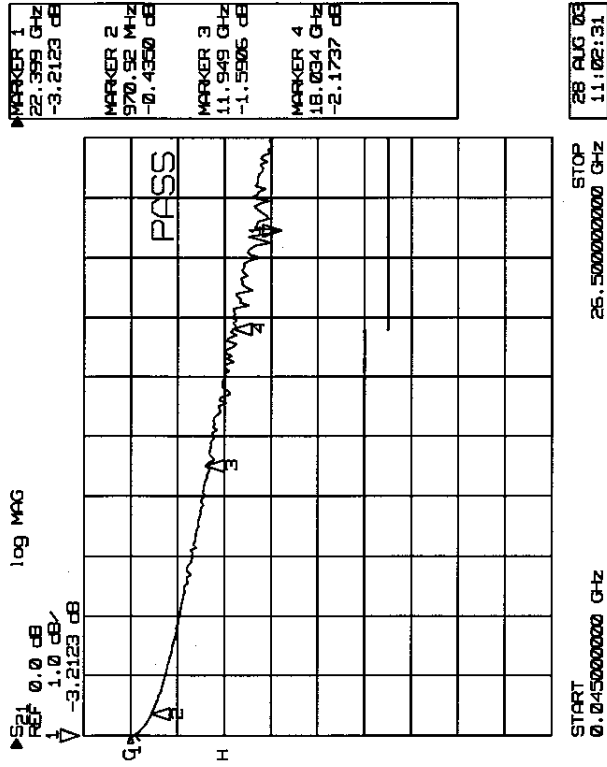
## Test Data

## Data Plots

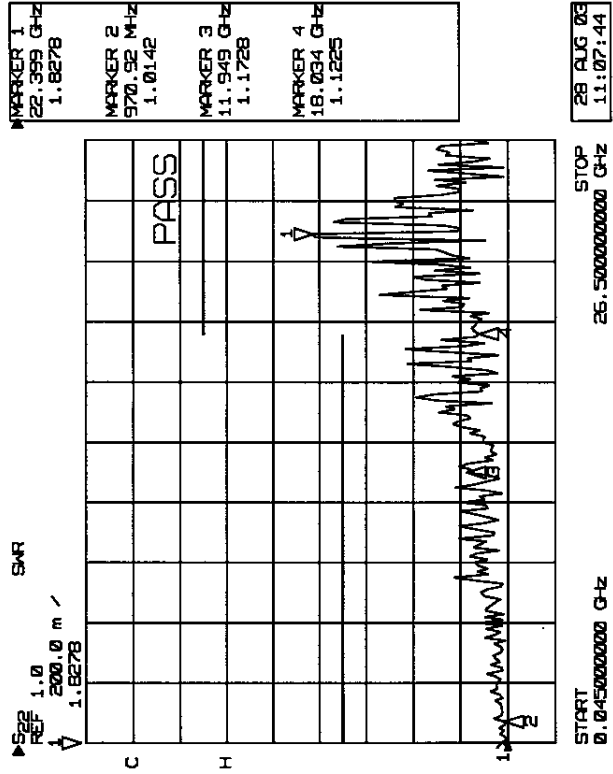
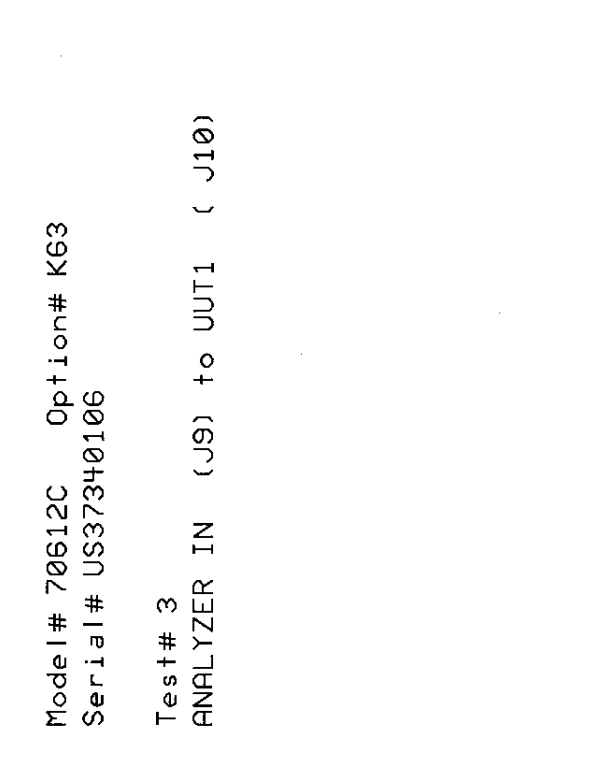
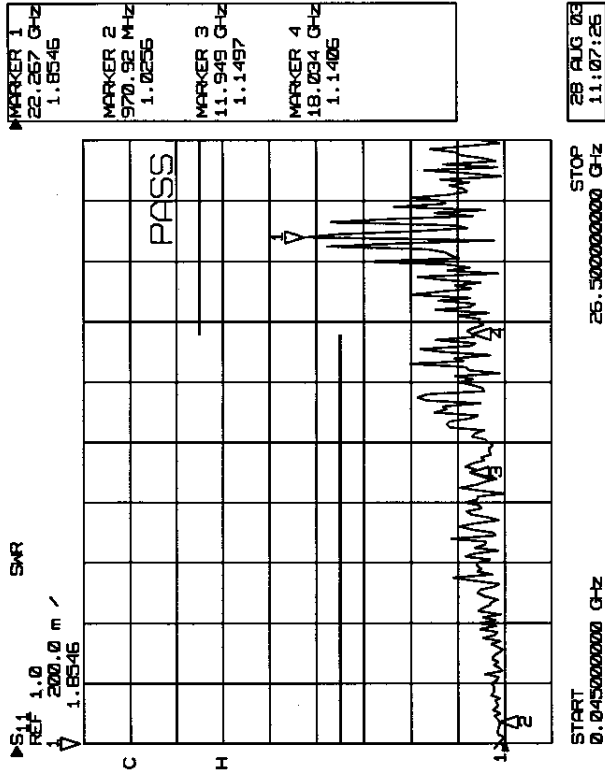
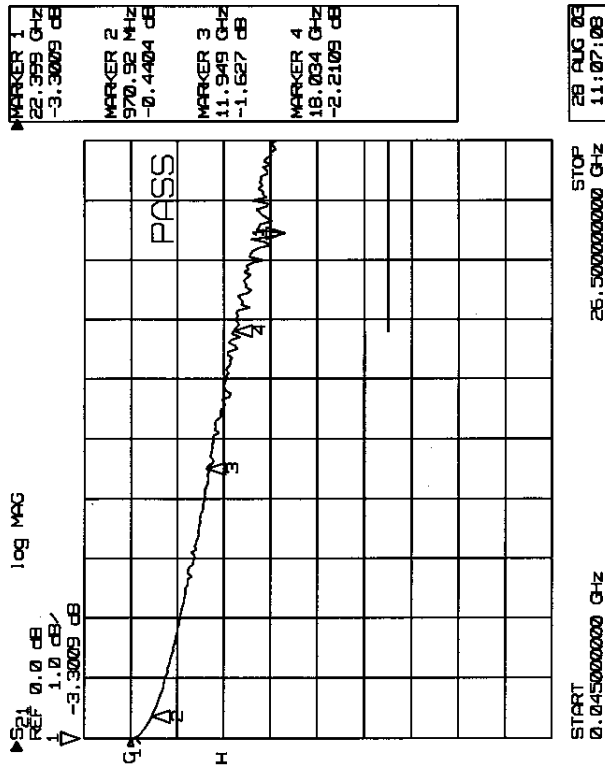
The graphs in this section show insertion loss and VSWR. The S-parameter reference line value, scale and value at marker are above each graph. Start and stop frequencies are shown below each graph. The reference line is marked by >.



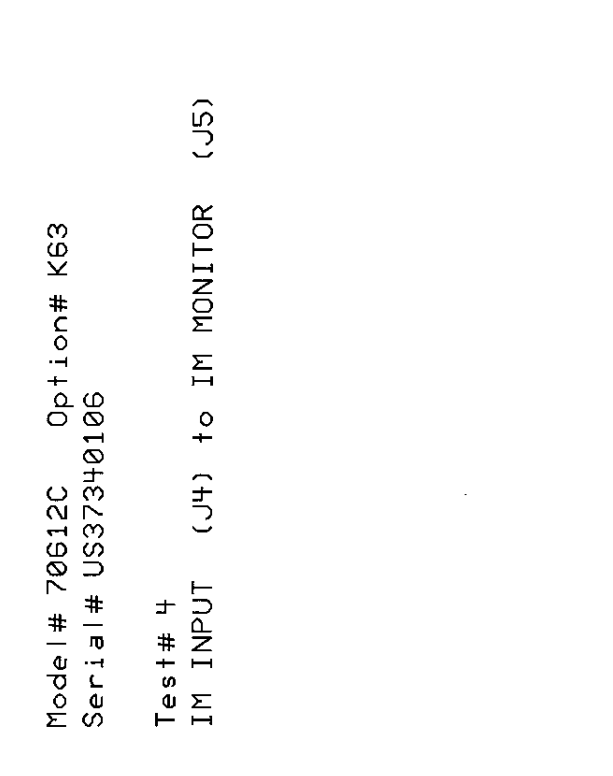
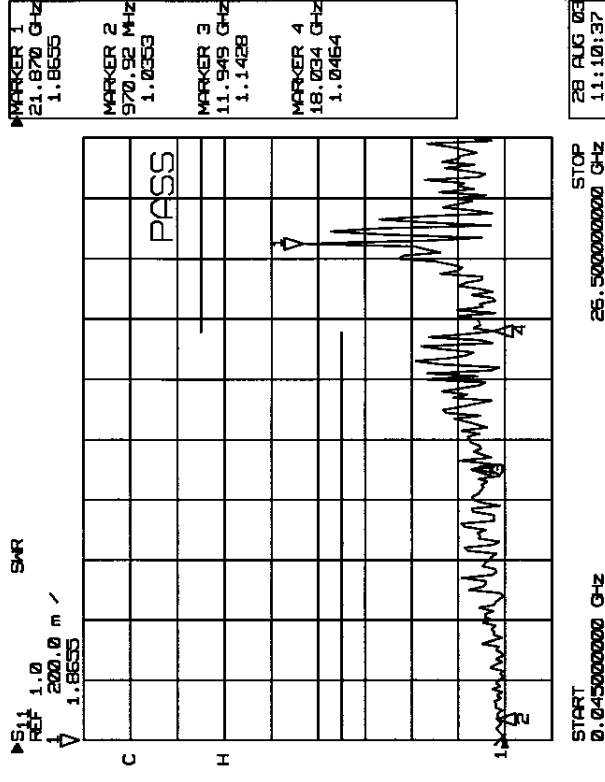
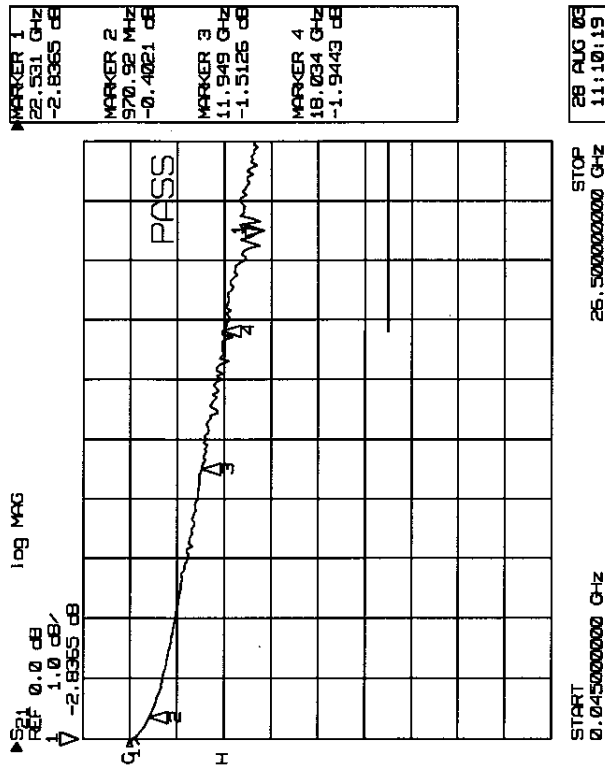
Model# 70612C Option# K63  
Serial# US37340106  
Test# 1  
RF INPUT 1 (J2) to UUT1 ( J10)



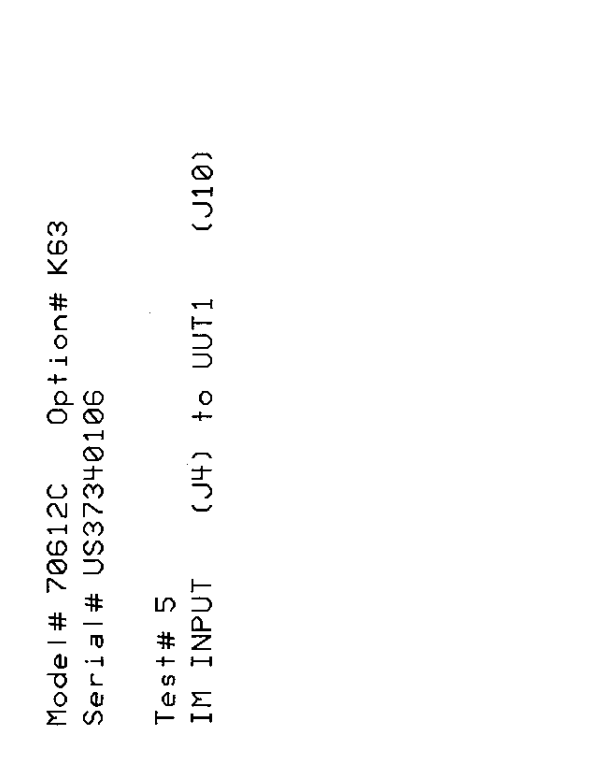
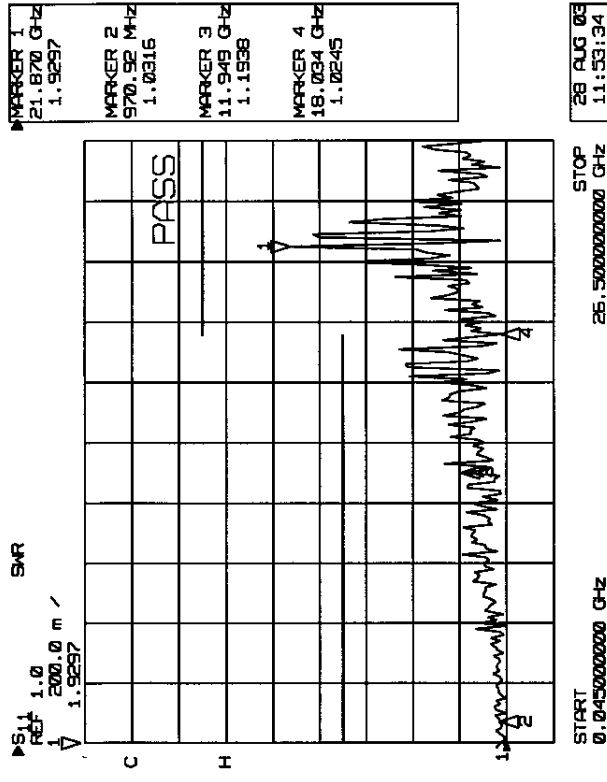
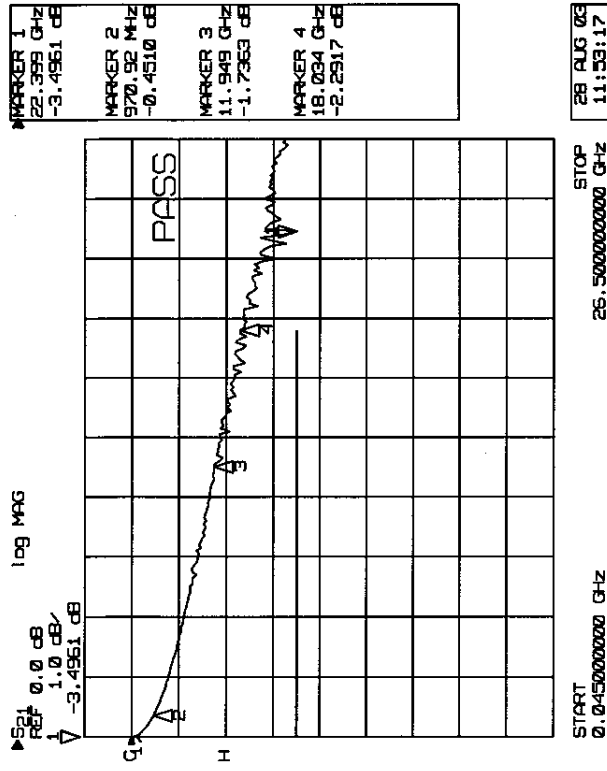
Mode l# 70612C Option# K63  
 Serial# US37340106  
 Test# 2  
 NOISE S. (J1) to UUT1 ( J10)



Model # 70612C Option # K63  
Serial # US37340106  
Test # 3  
ANALYZER IN (J9) to UUT1 ( J10)

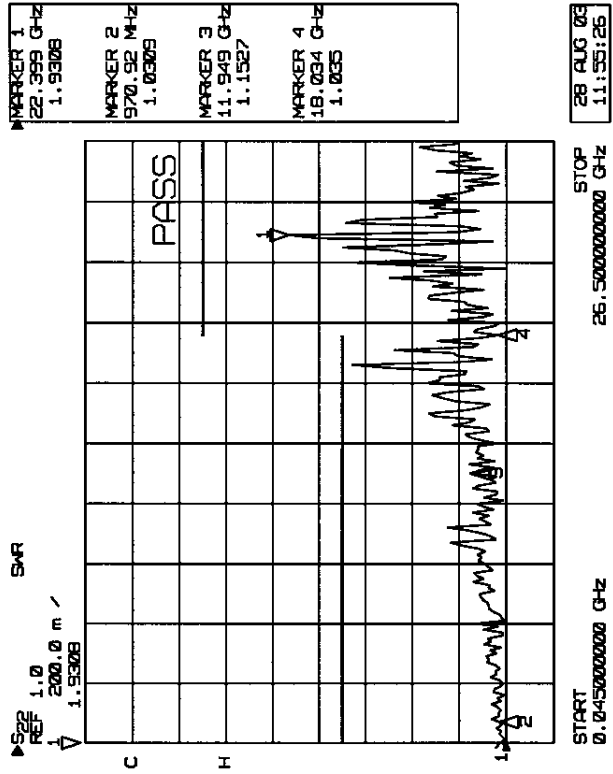
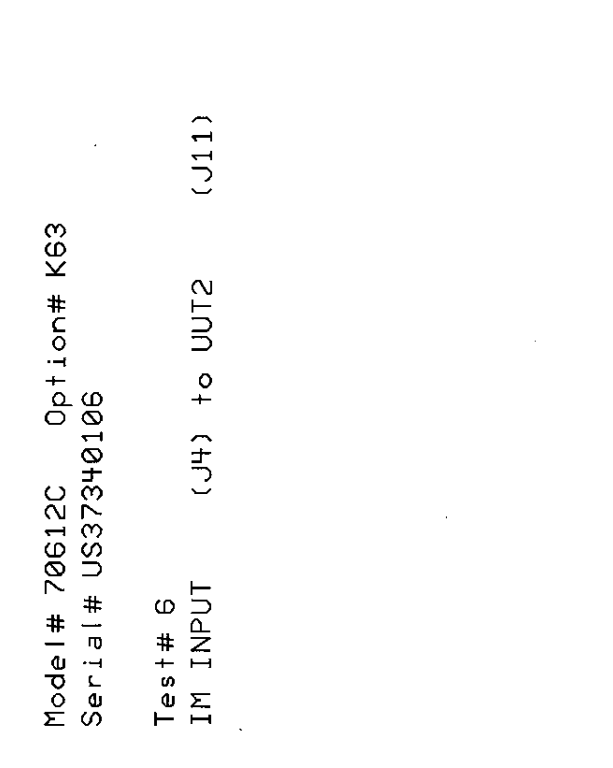
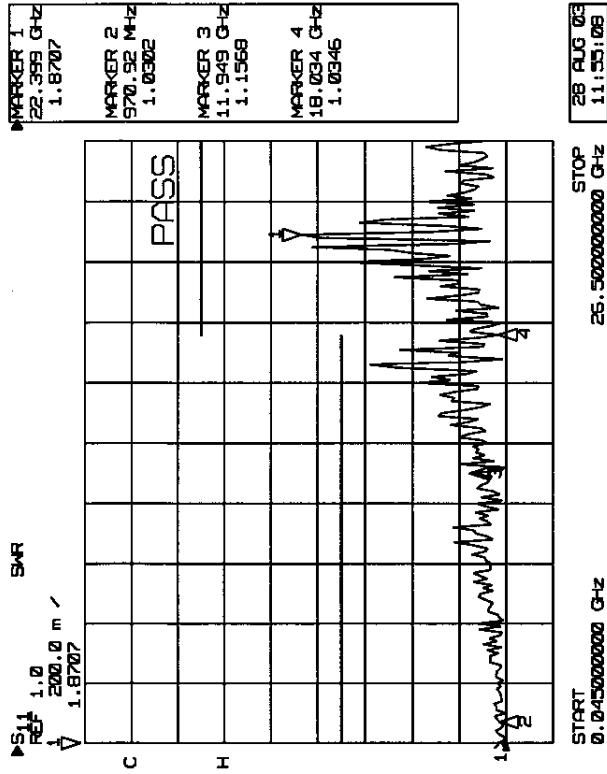
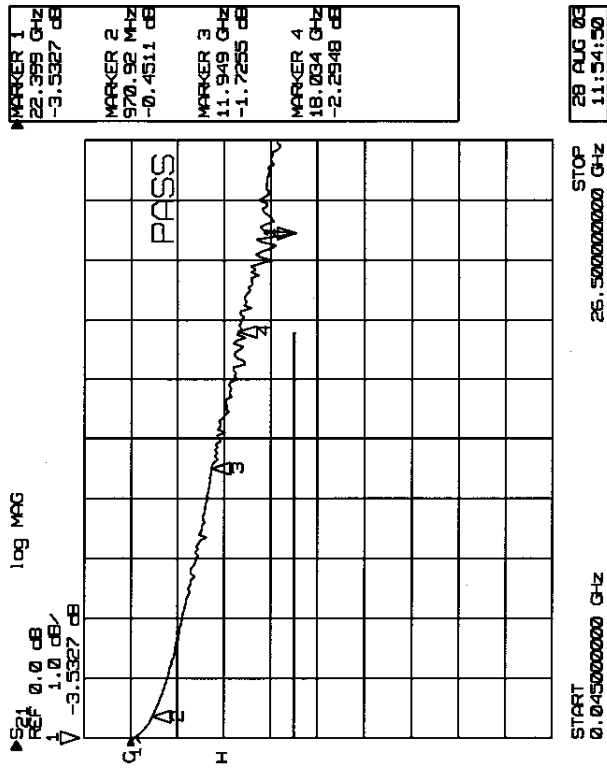


Model # 70612C Option # K63  
 Serial # US37340106  
 Test # 4  
 IM INPUT (J4) to IM MONITOR (J5)



Model# 70612C Option# K63  
Serial# US37340106  
Test# 5  
IM INPUT (J4) to UUT1 (J10)

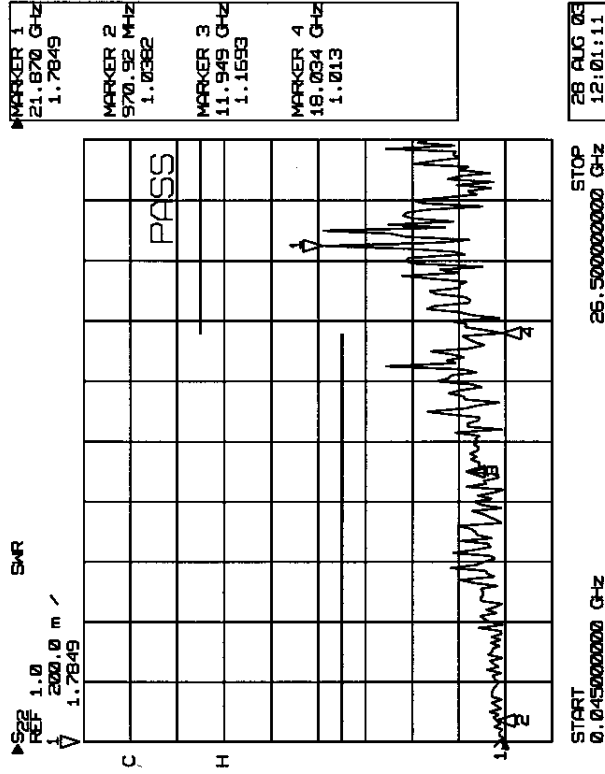
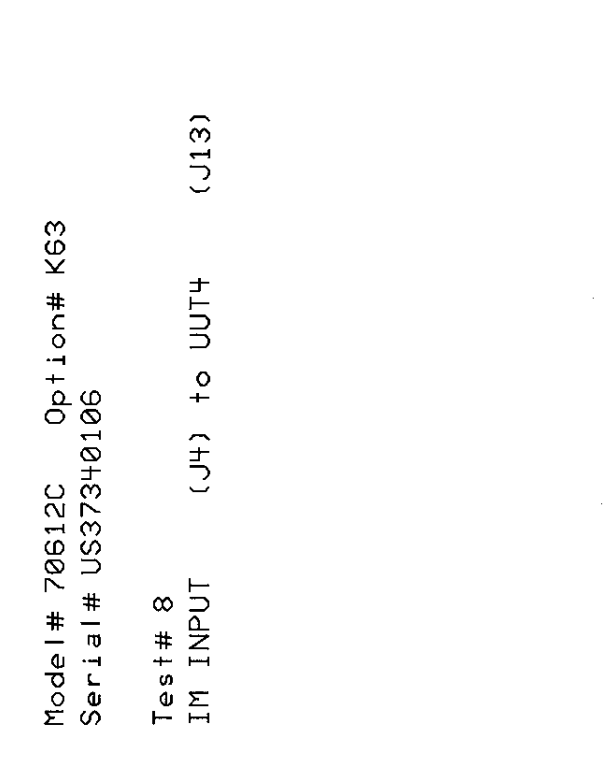
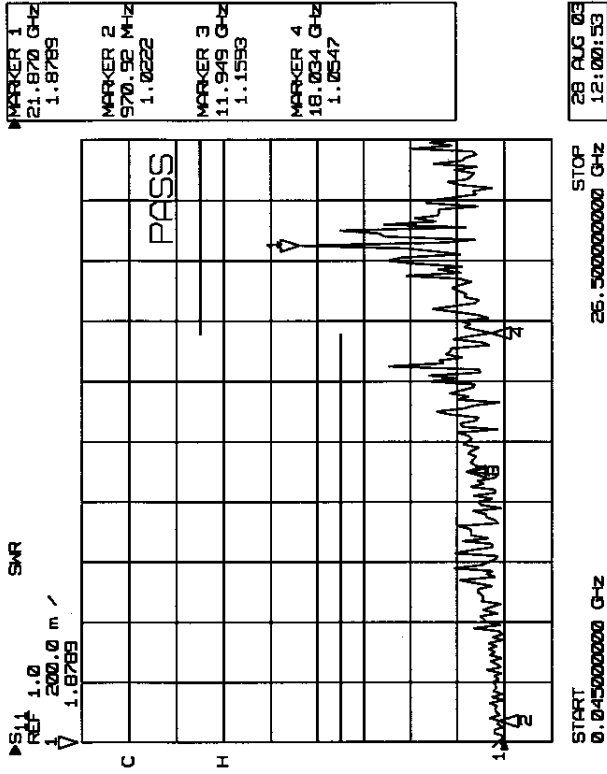
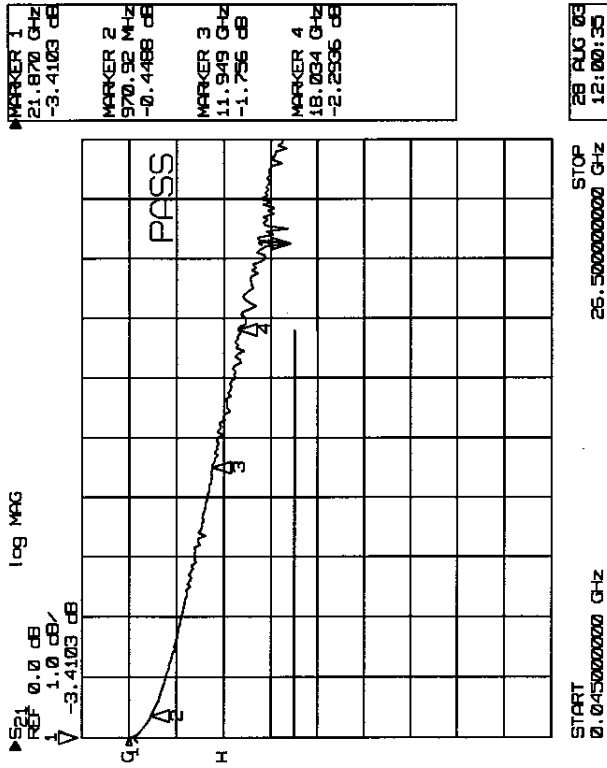




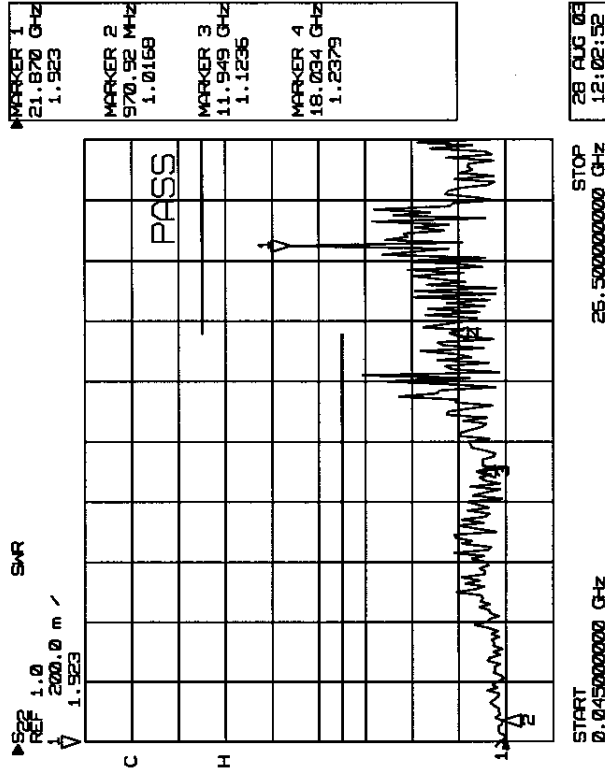
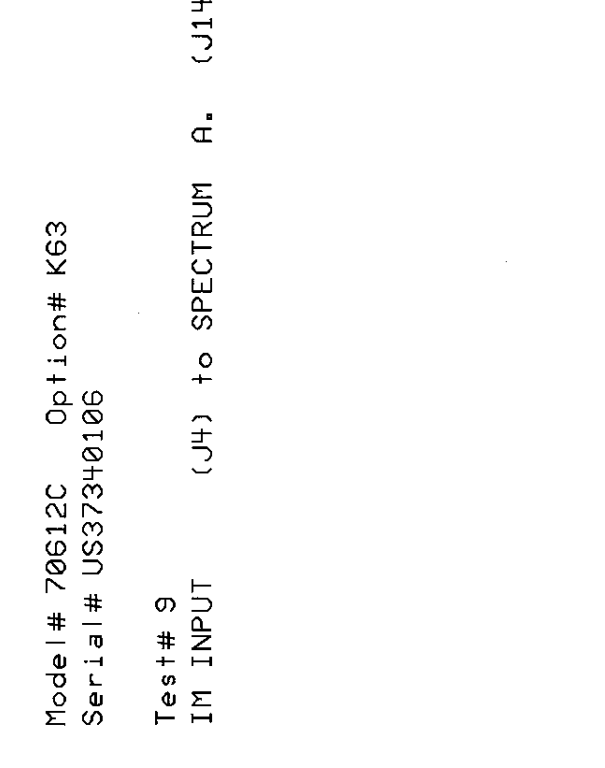
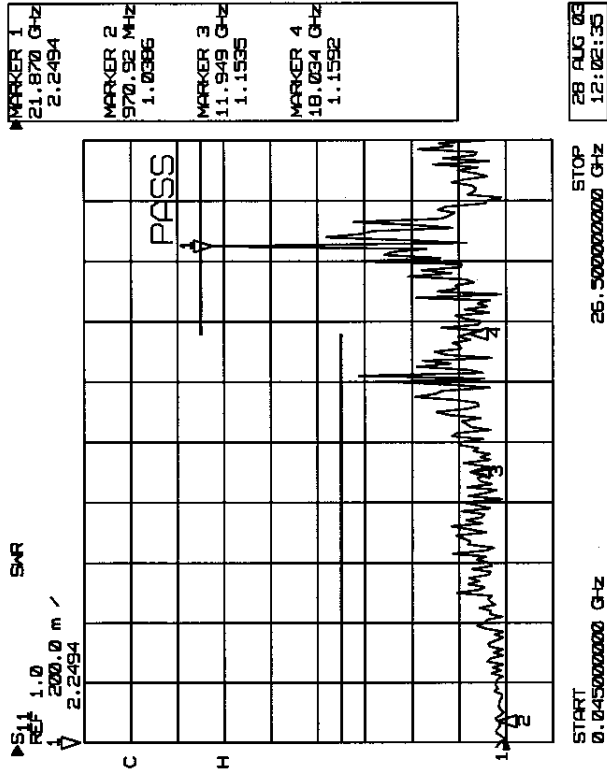
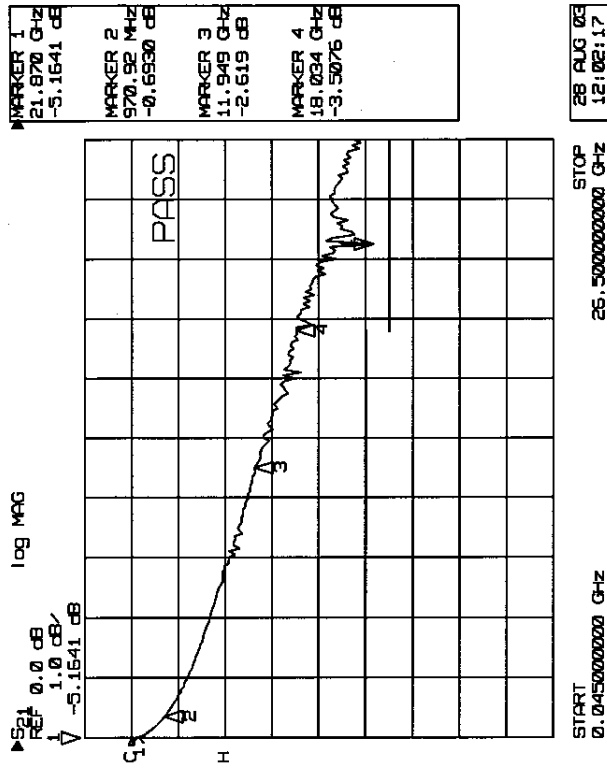
Model# 70612C Option# K63  
 Serial# US37340106

Test# 6  
 IM INPUT (J4) to UUT2 (J11)

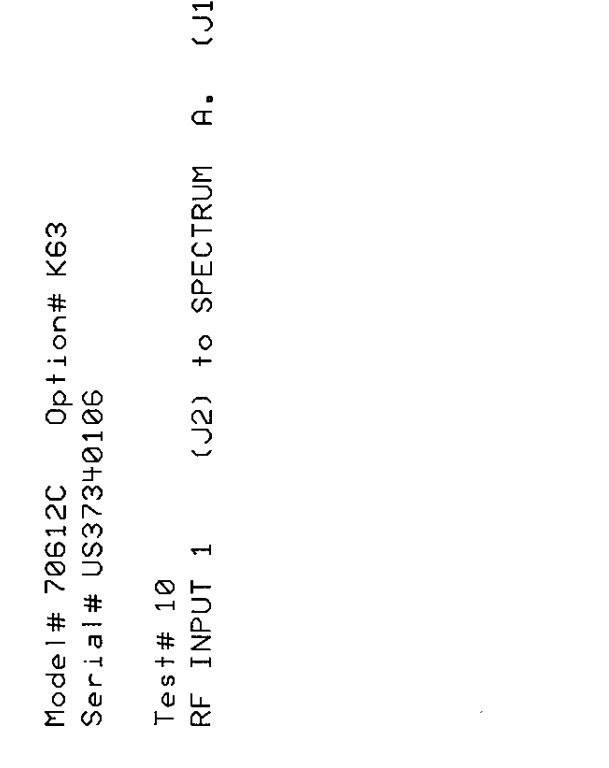
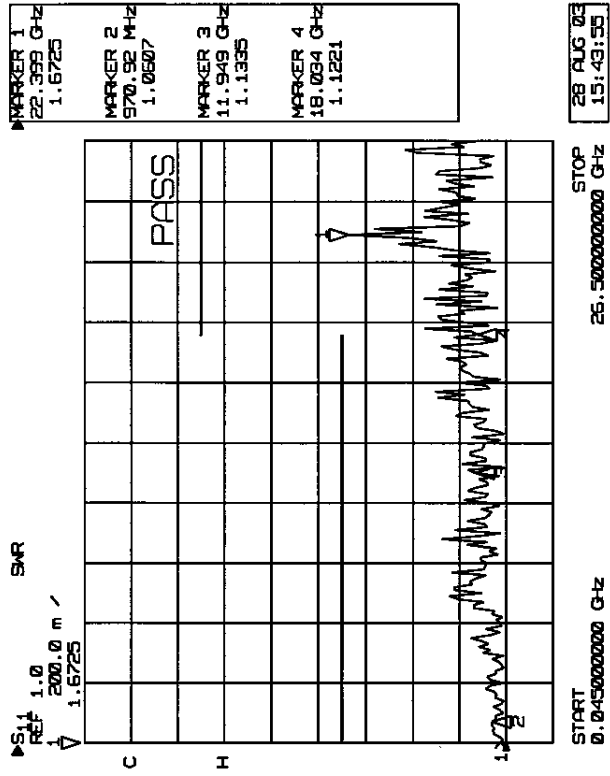
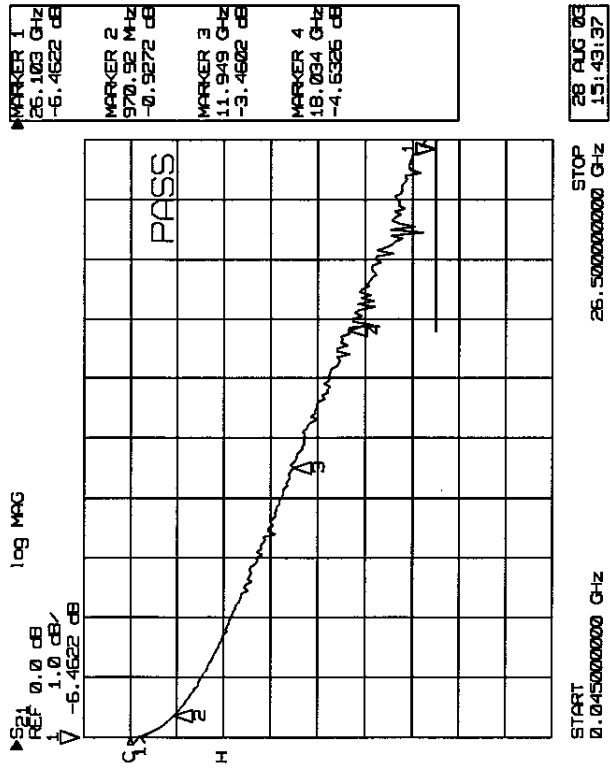




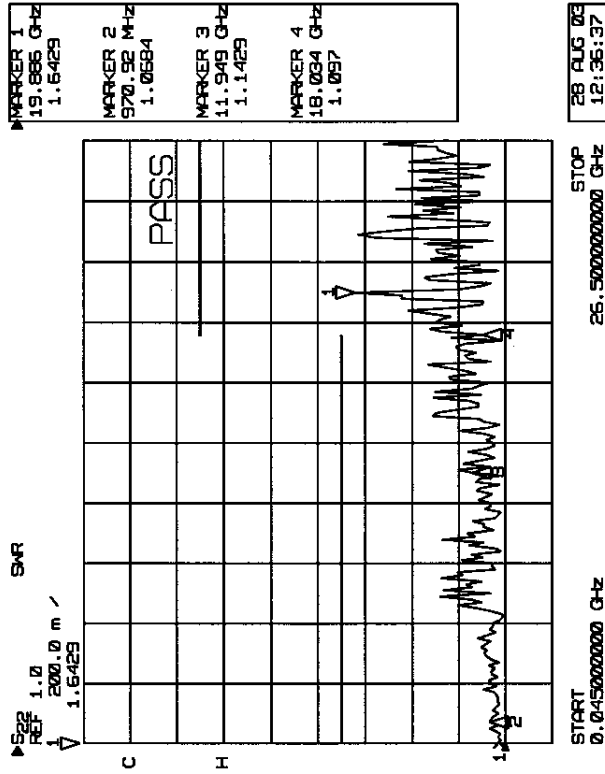
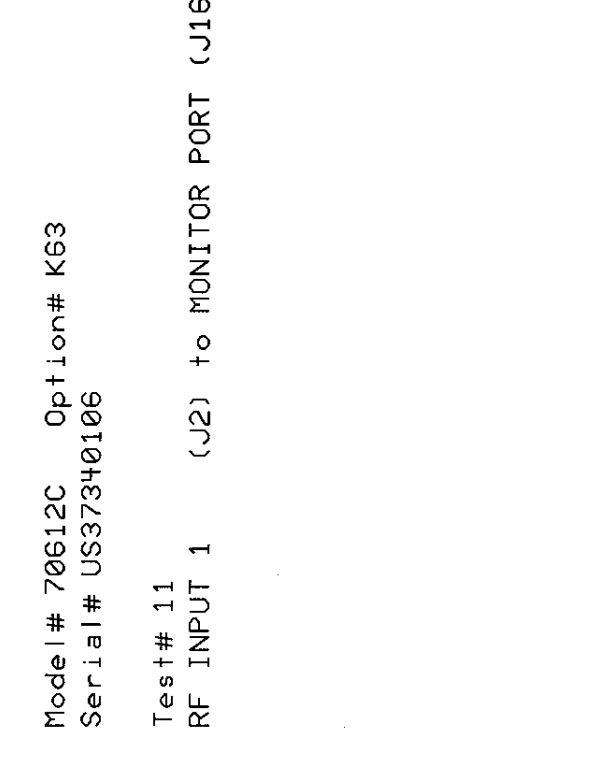
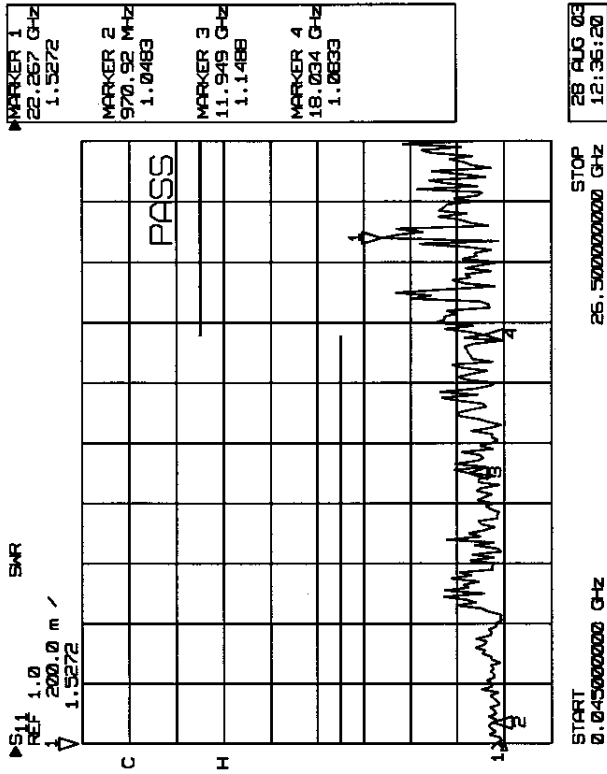
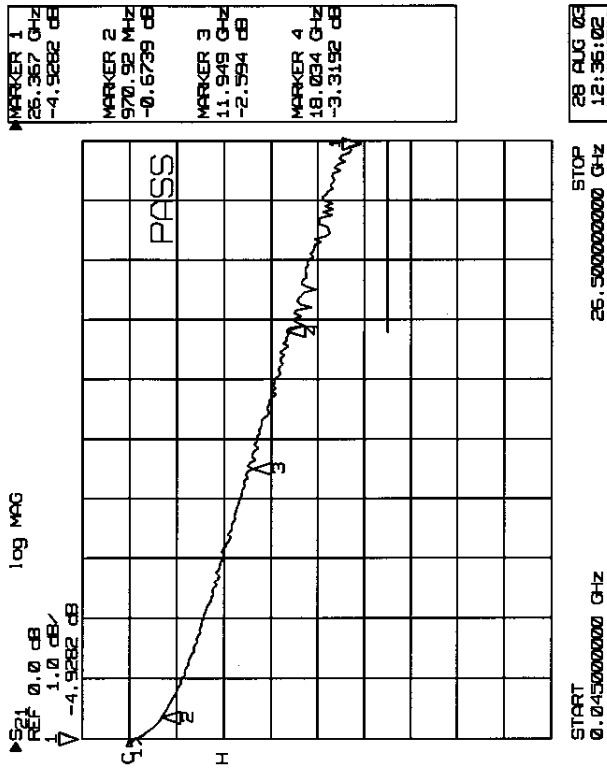
Model# 70612C Option# K63  
Serial# US37340106  
Test# 8  
IM INPUT (J4) to UUT4 (J13)



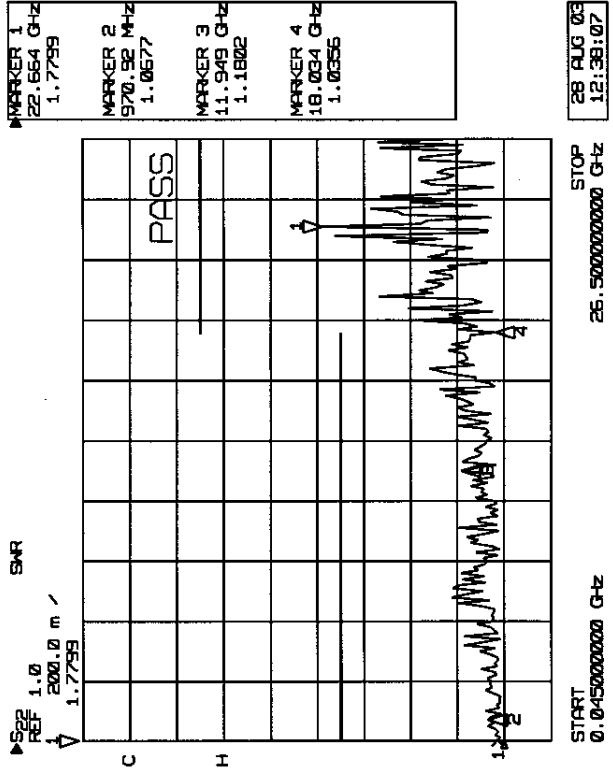
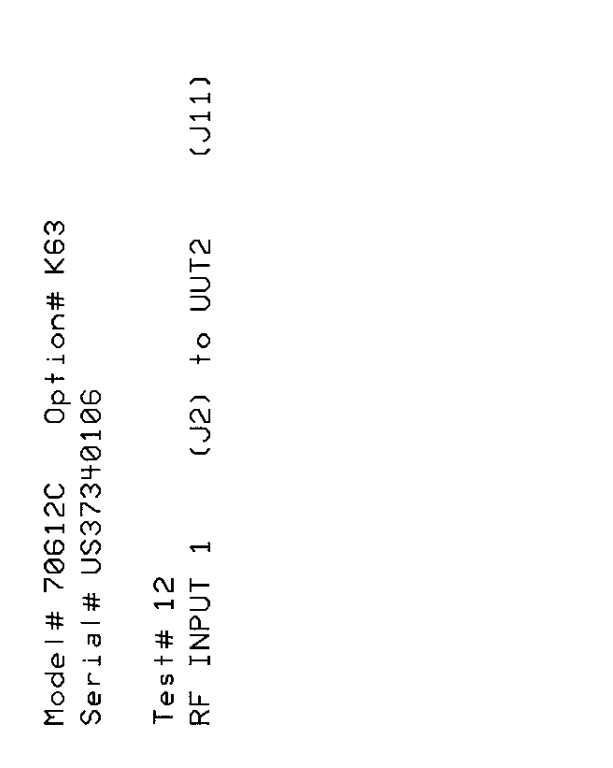
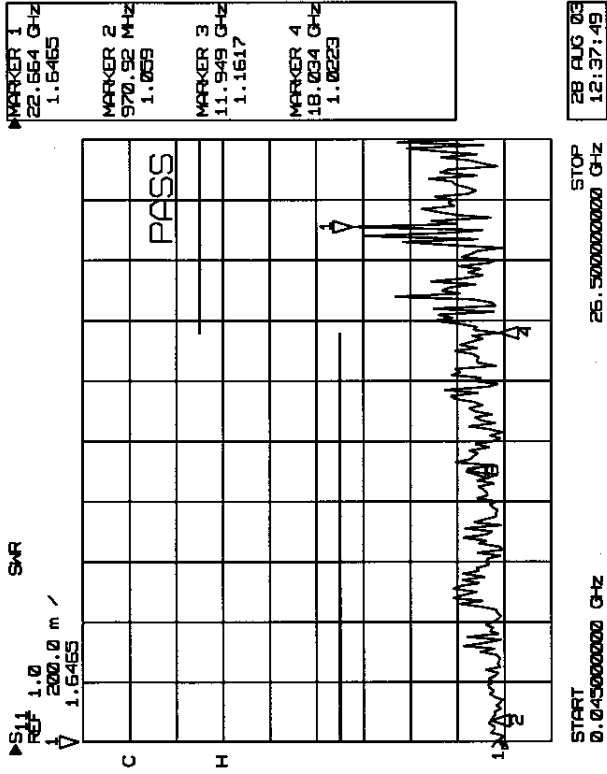
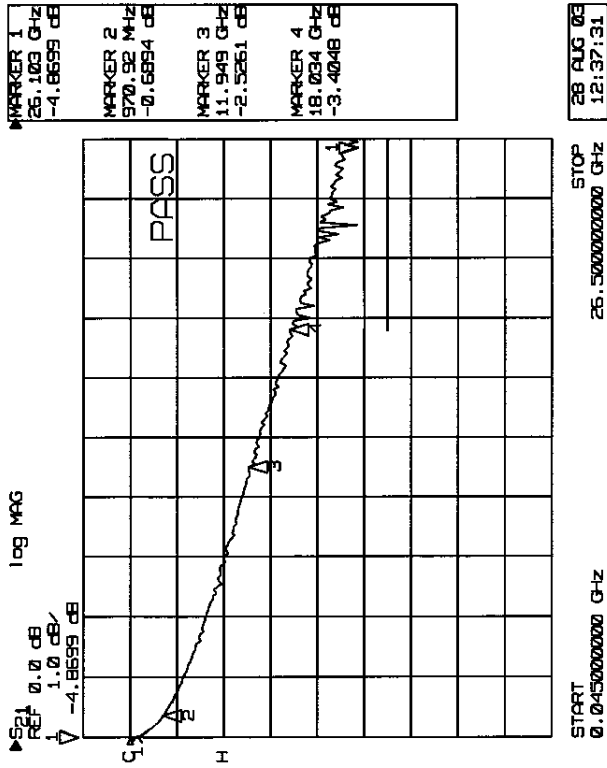
Model # 70612C Option # K63  
 Serial # US37340106  
 Test # 9  
 IM INPUT (J4) to SPECTRUM A. (J14)



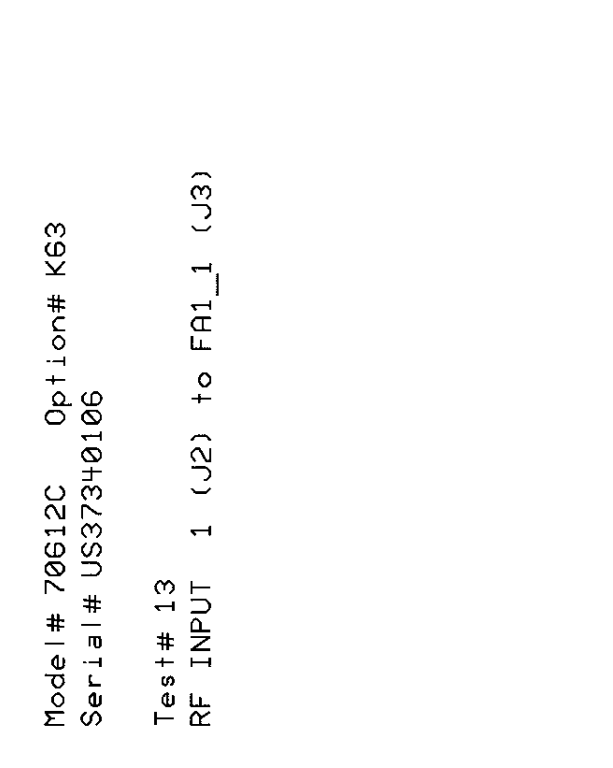
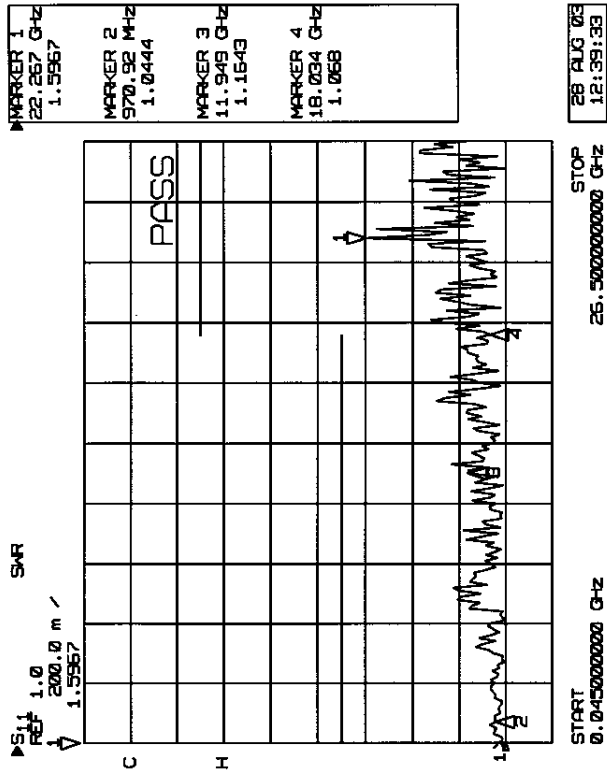
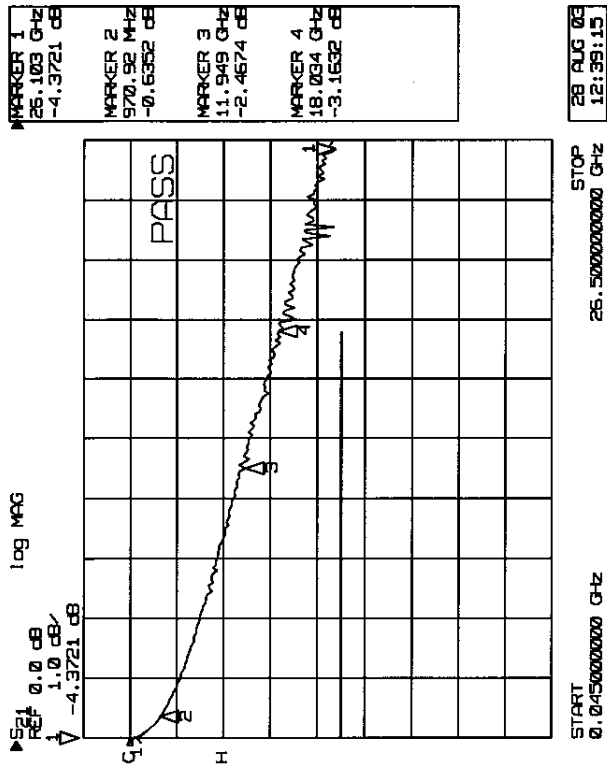
Model# 70612C Option# K63  
 Serial# US37340106  
 Test# 10  
 RF INPUT 1 (J2) to SPECTRUM A. (J14)



Model# 70612C Option# K63  
 Serial# US37340106  
 Test# 11  
 RF INPUT 1 (J2) to MONITOR PORT (J16)

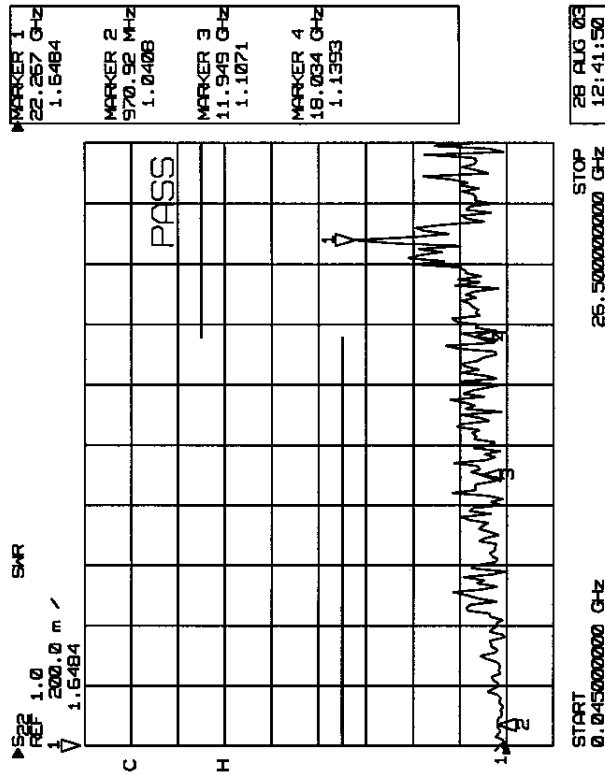
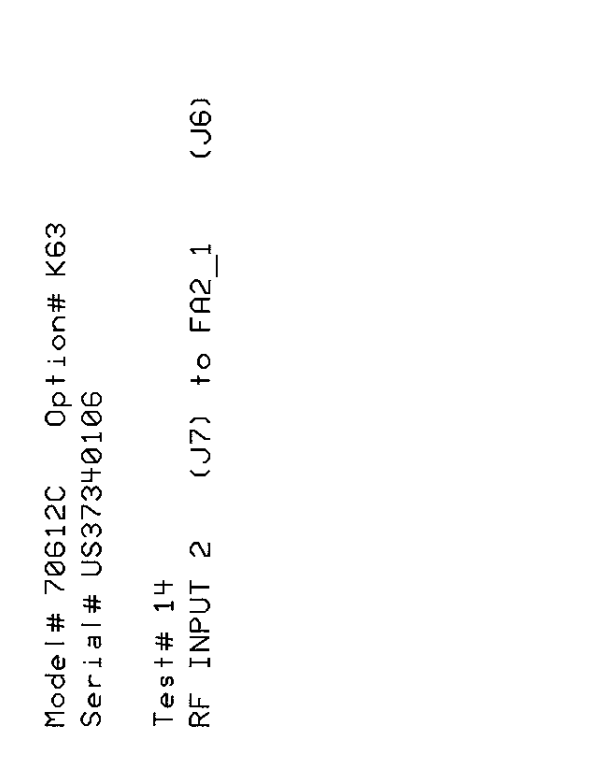
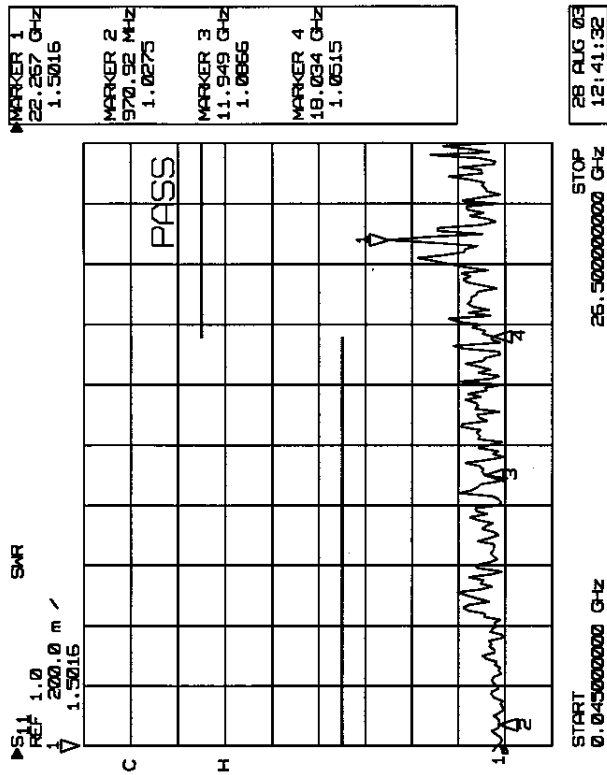
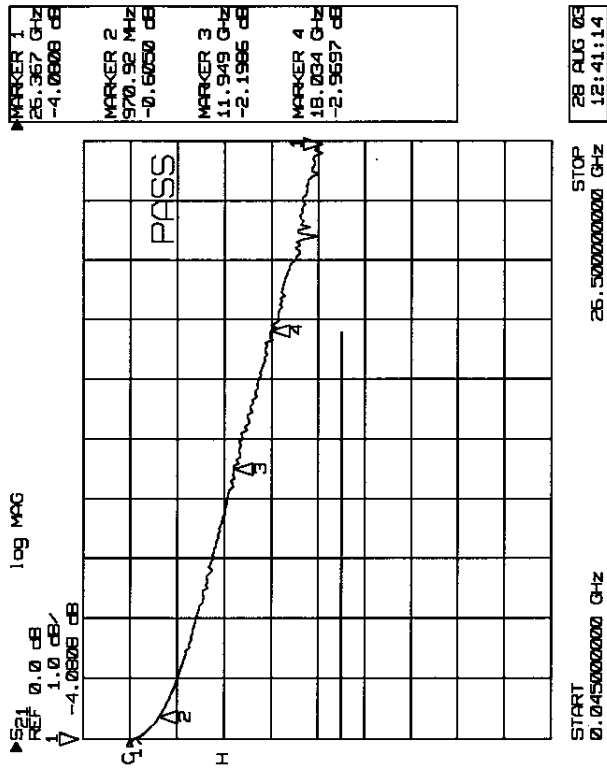


Mode l# 70612C Option# K63  
 Serial# US37340106  
 Test# 12  
 RF INPUT 1 (J2) to UUT2 (J11)

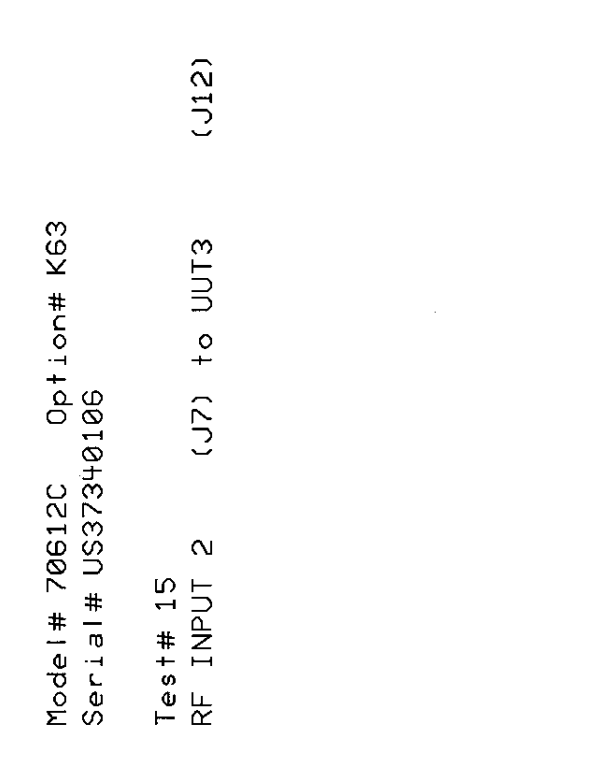
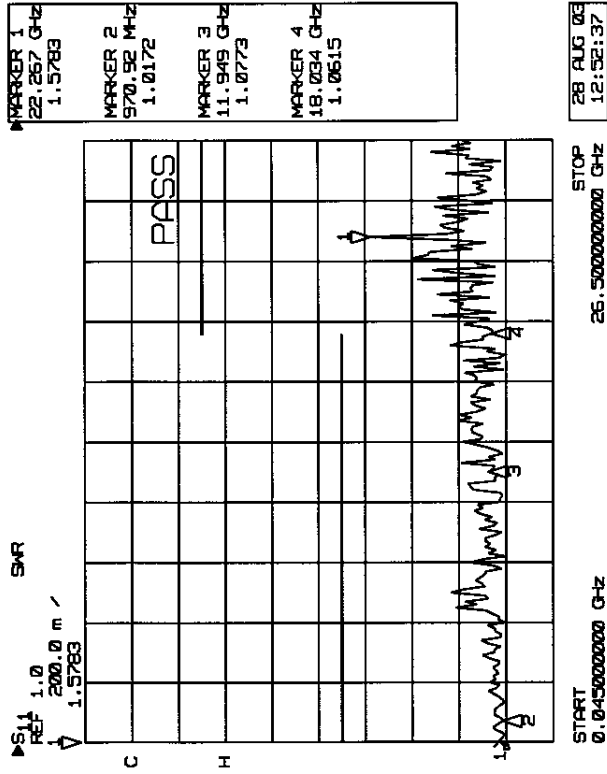
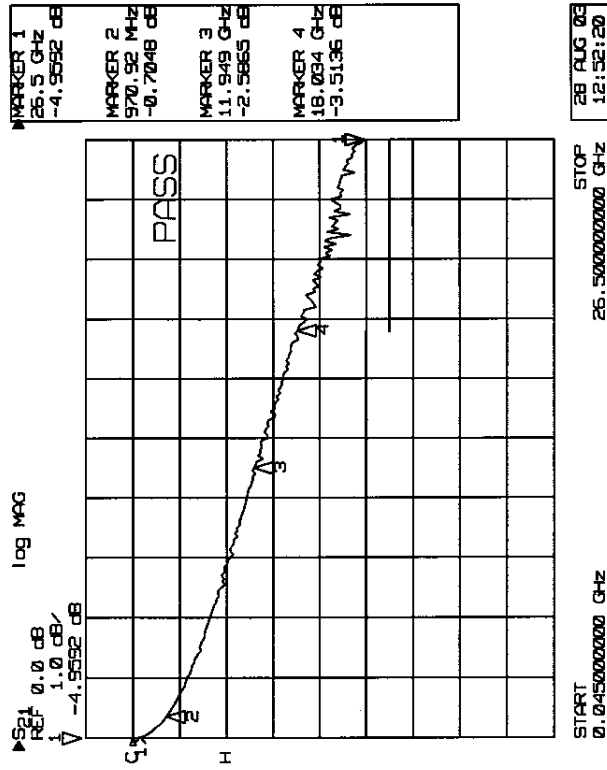


Model# 70612C Option# K63  
Serial# US37340106  
Test# 13  
RF INPUT 1 (J2) to FA1\_1 (J3)



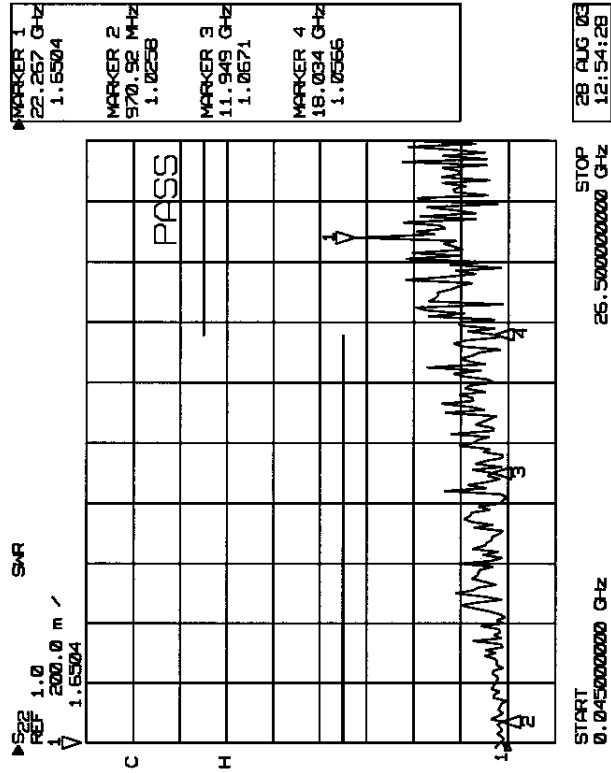
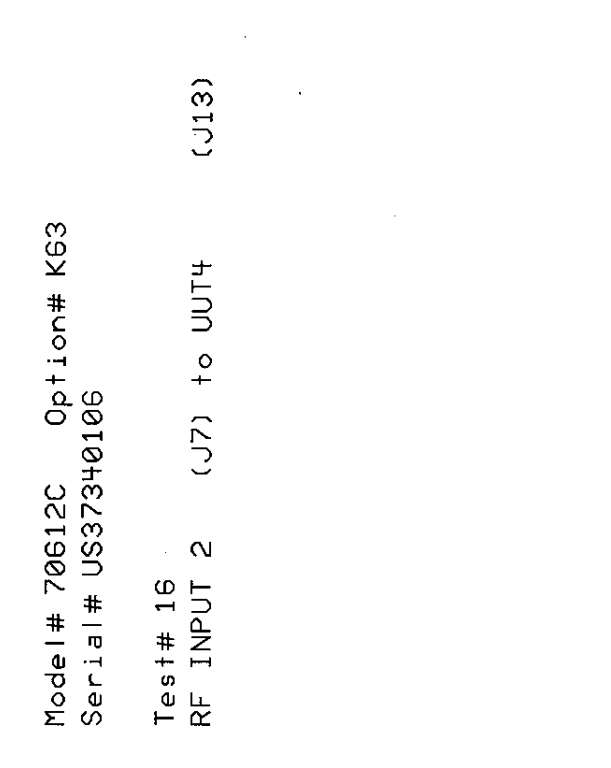
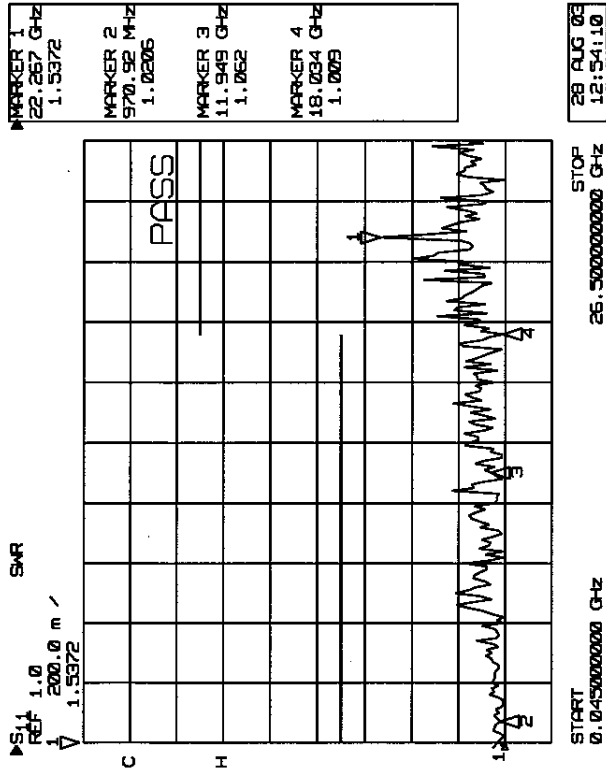
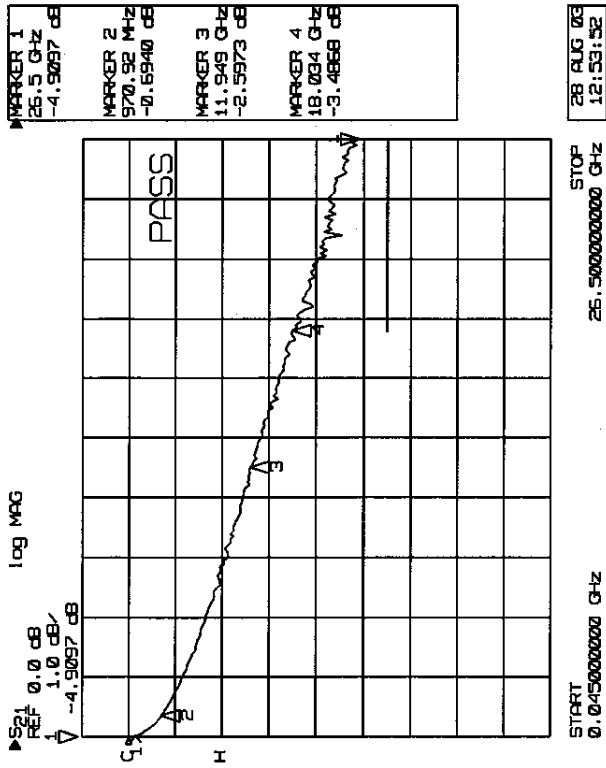


Model# 70612C Option# K63  
Serial# US37340106  
Test# 14  
RF INPUT 2 (J7) to FA2\_1 (J6)



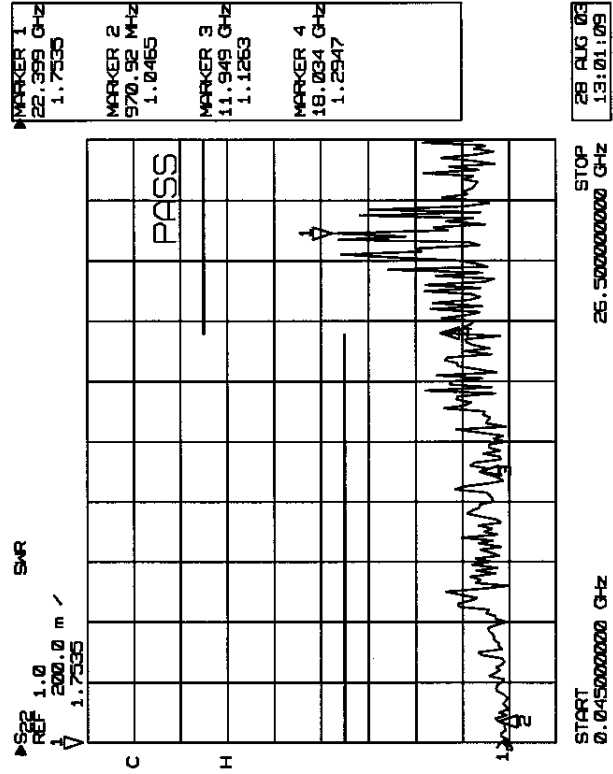
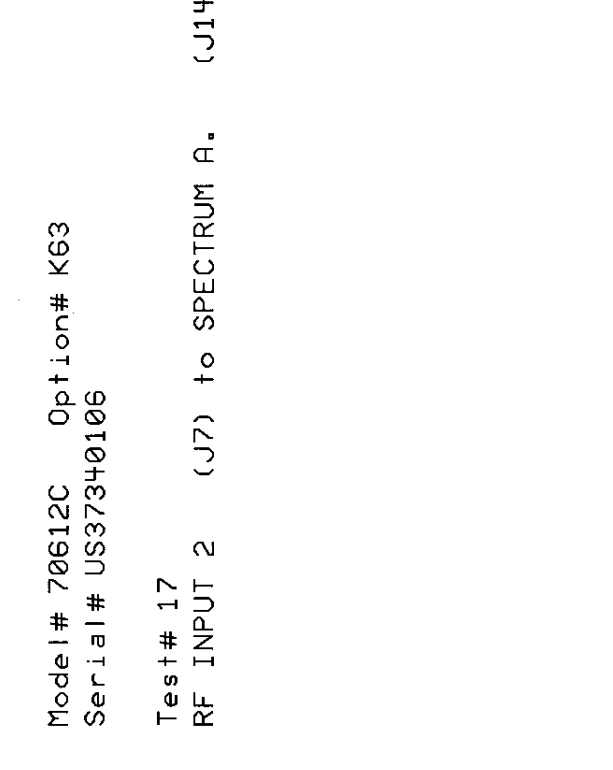
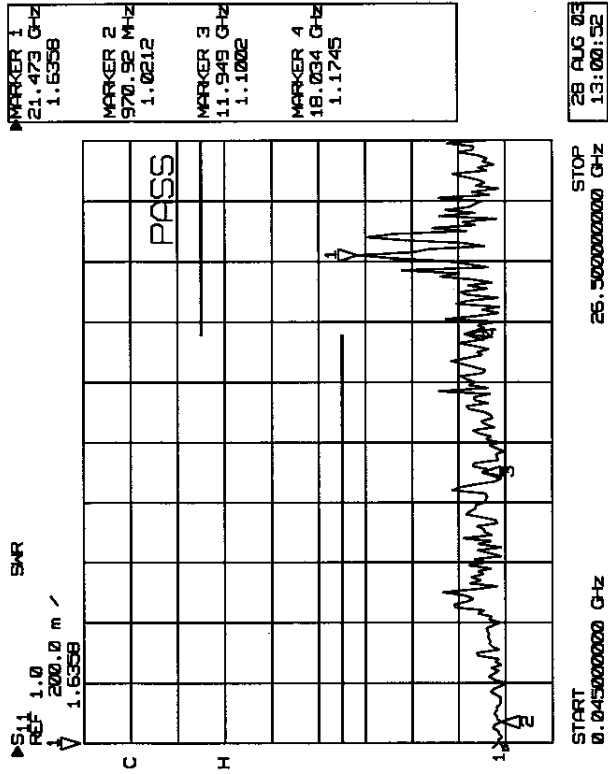
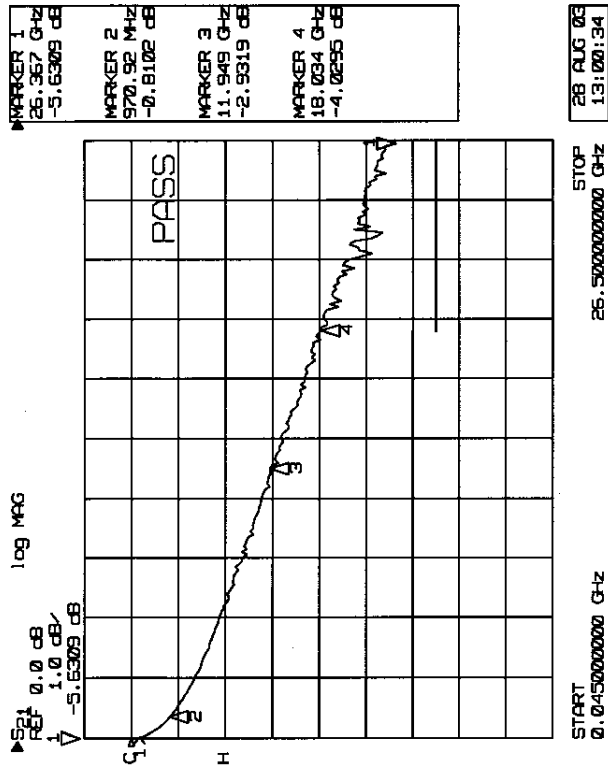
Model # 70612C Option # K63  
Serial # US37340106

Test # 15  
RF INPUT 2 (J7) to UUT3 (J12)

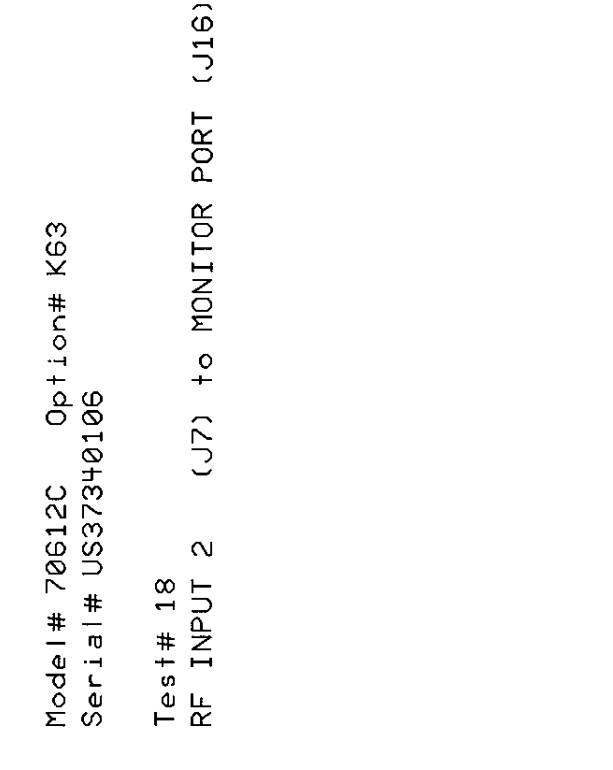
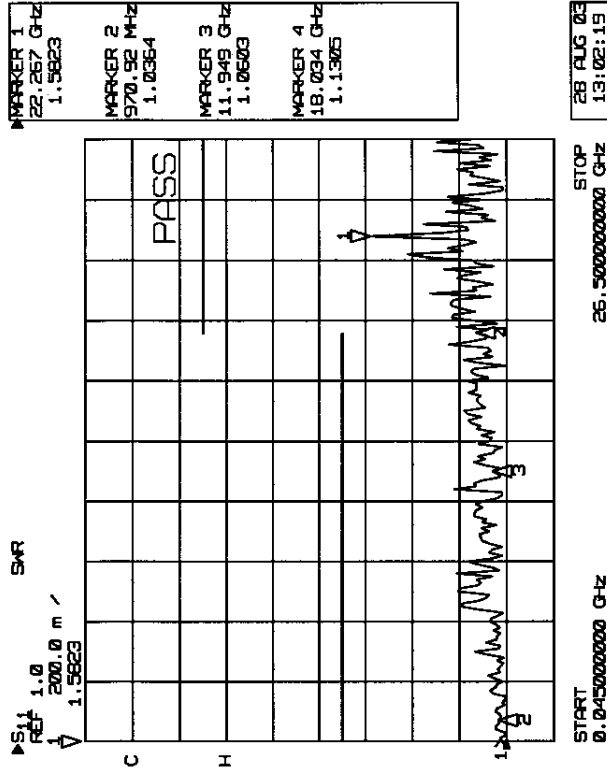
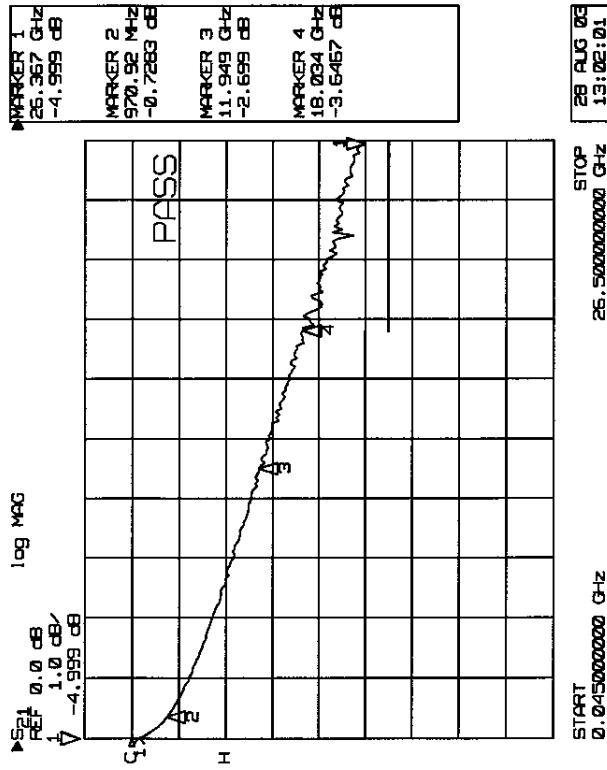


Model# 70612C Option# K63  
Serial# US37340106

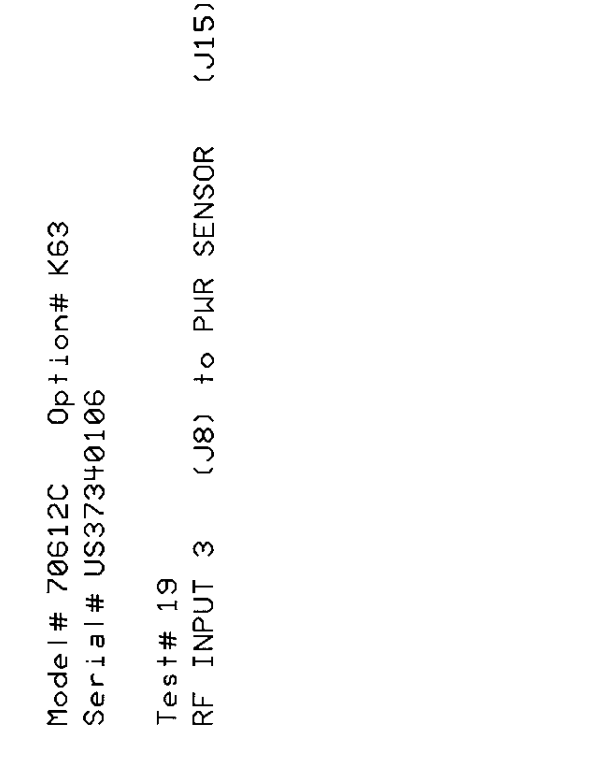
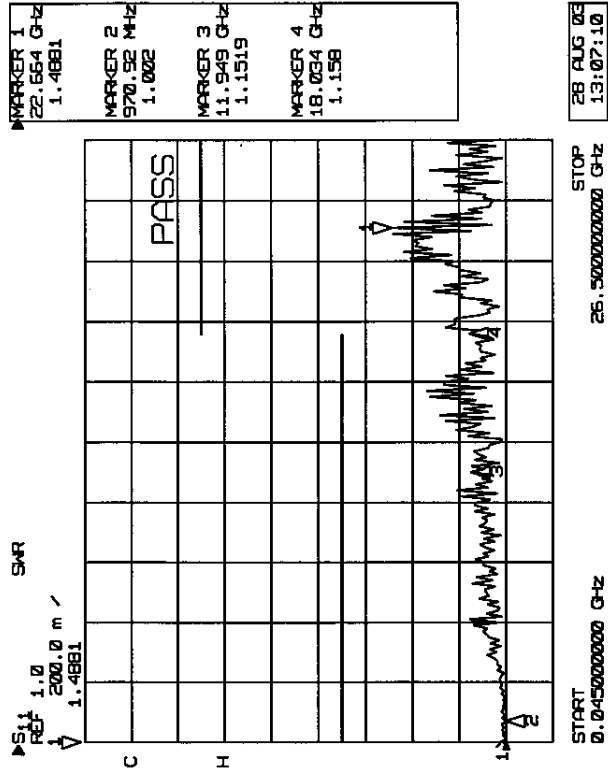
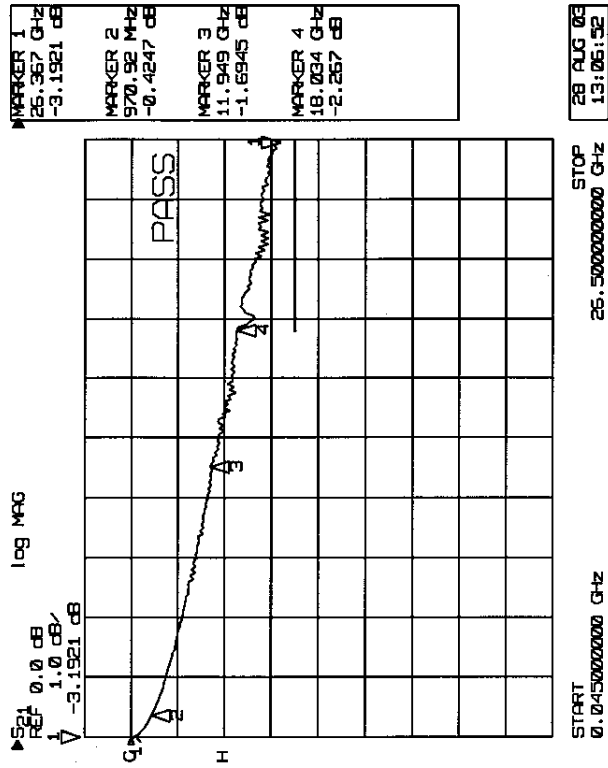
Test# 16  
RF INPUT 2 (J7) to UUT4 (J13)



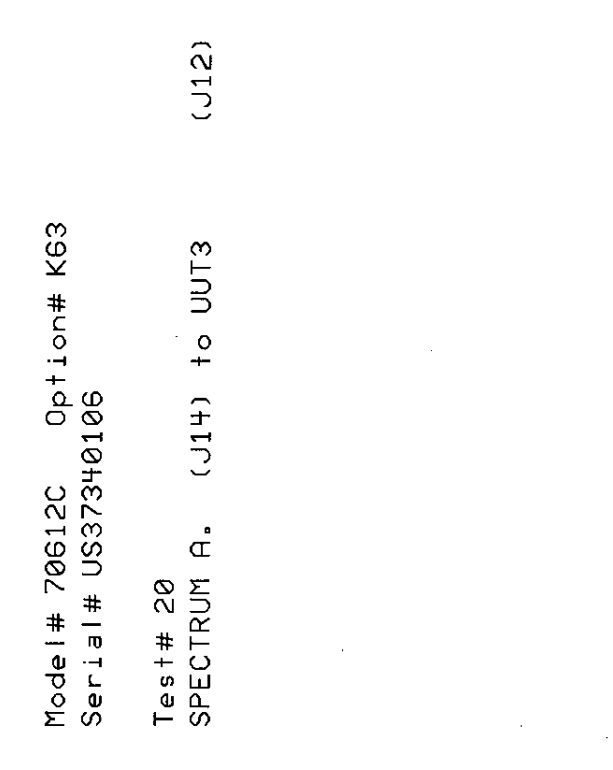
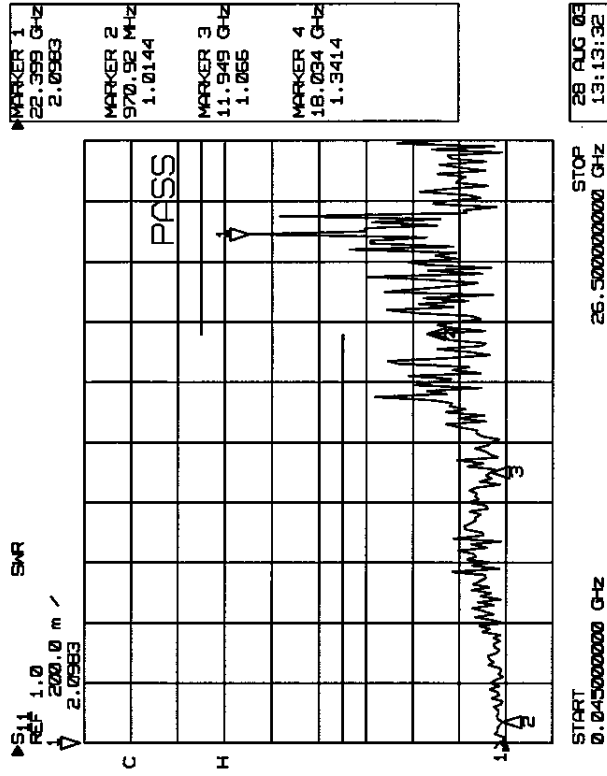
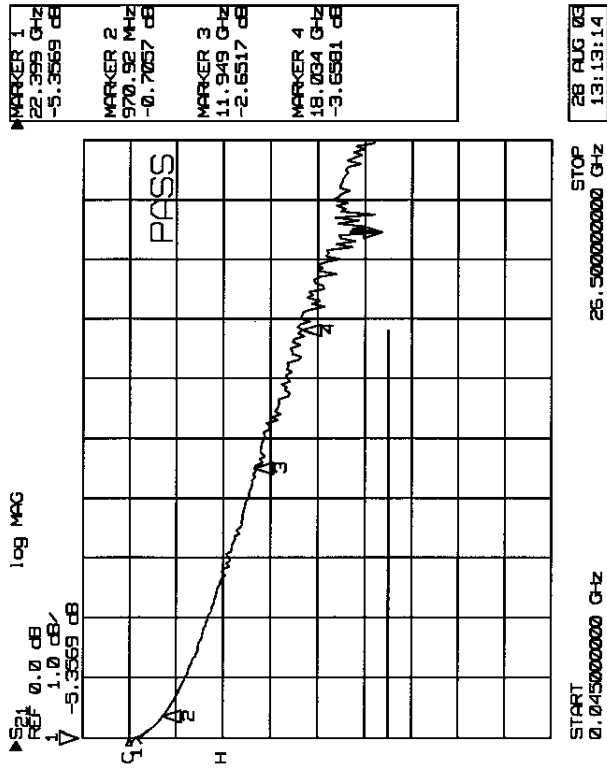
Model# 70612C Option# K63  
Serial# US37340106  
Test# 17  
RF INPUT 2 (J7) to SPECTRUM A. (J14)



Model # 70612C Option# K63  
Serial# US37340106  
Test# 18  
RF INPUT 2 (J7) to MONITOR PORT (J16)



Model # 70612C Option# K63  
 Serial# US37340106  
 Test# 19  
 RF INPUT 3 (J8) to PWR SENSOR (J15)



Model# 70612C Option# K63  
Serial# US37340106

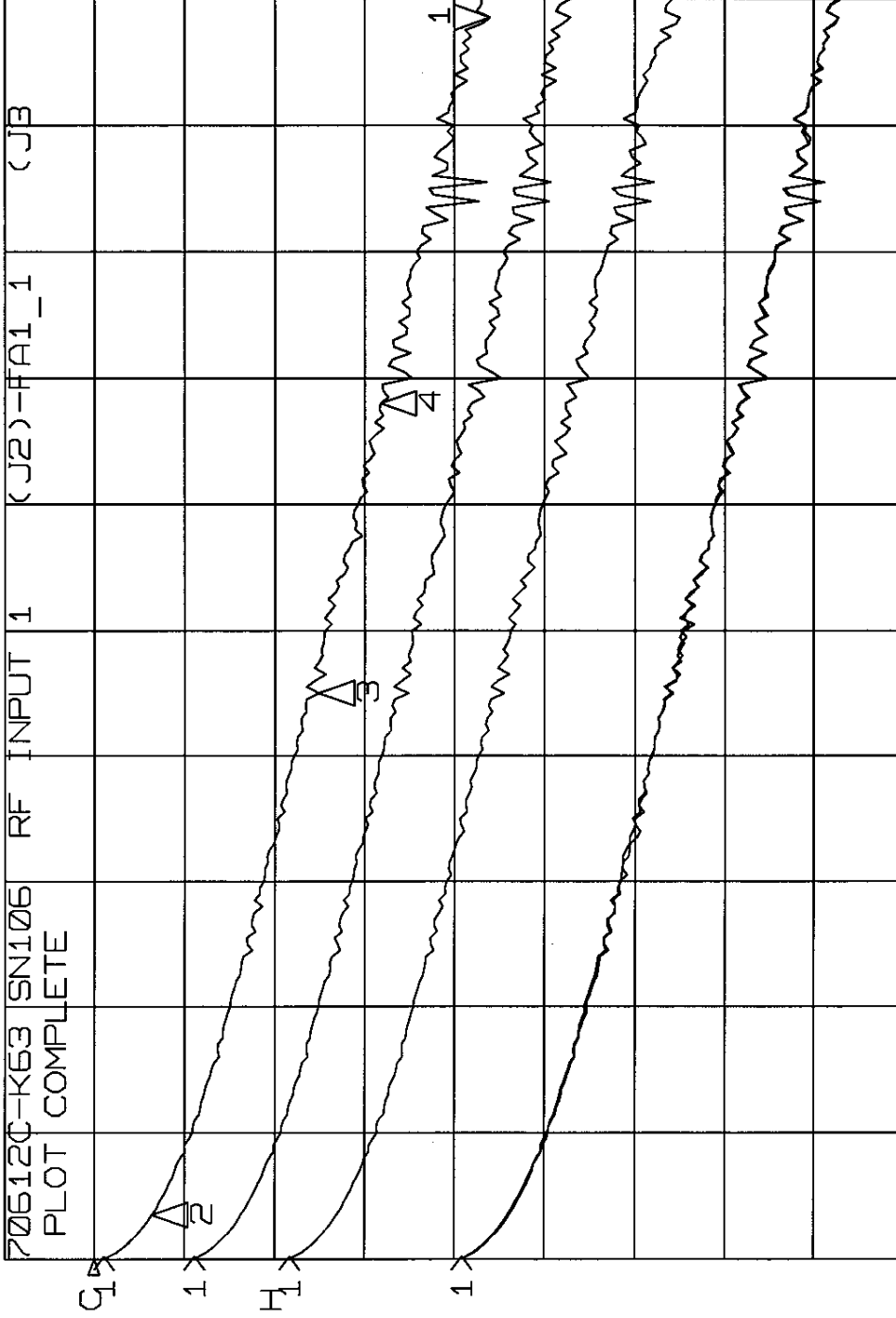
Test# 20  
SPECTRUM A. (J14) to UUT3 (J12)

▲ S21 109 MAG

REF 0.0 dB

1 1.0 dB

▼ -4.3987 dB



▲ MARKER 1  
26.103 GHz  
-4.3987 dB

MARKER 2  
970.92 MHz  
-0.6348 dB

MARKER 3  
11.949 GHz  
-2.4778 dB

MARKER 4  
18.034 GHz  
-3.1725 dB

START  
0.045000000 GHz

STOP  
26.500000000 GHz

28 AUG 03  
13:14:58

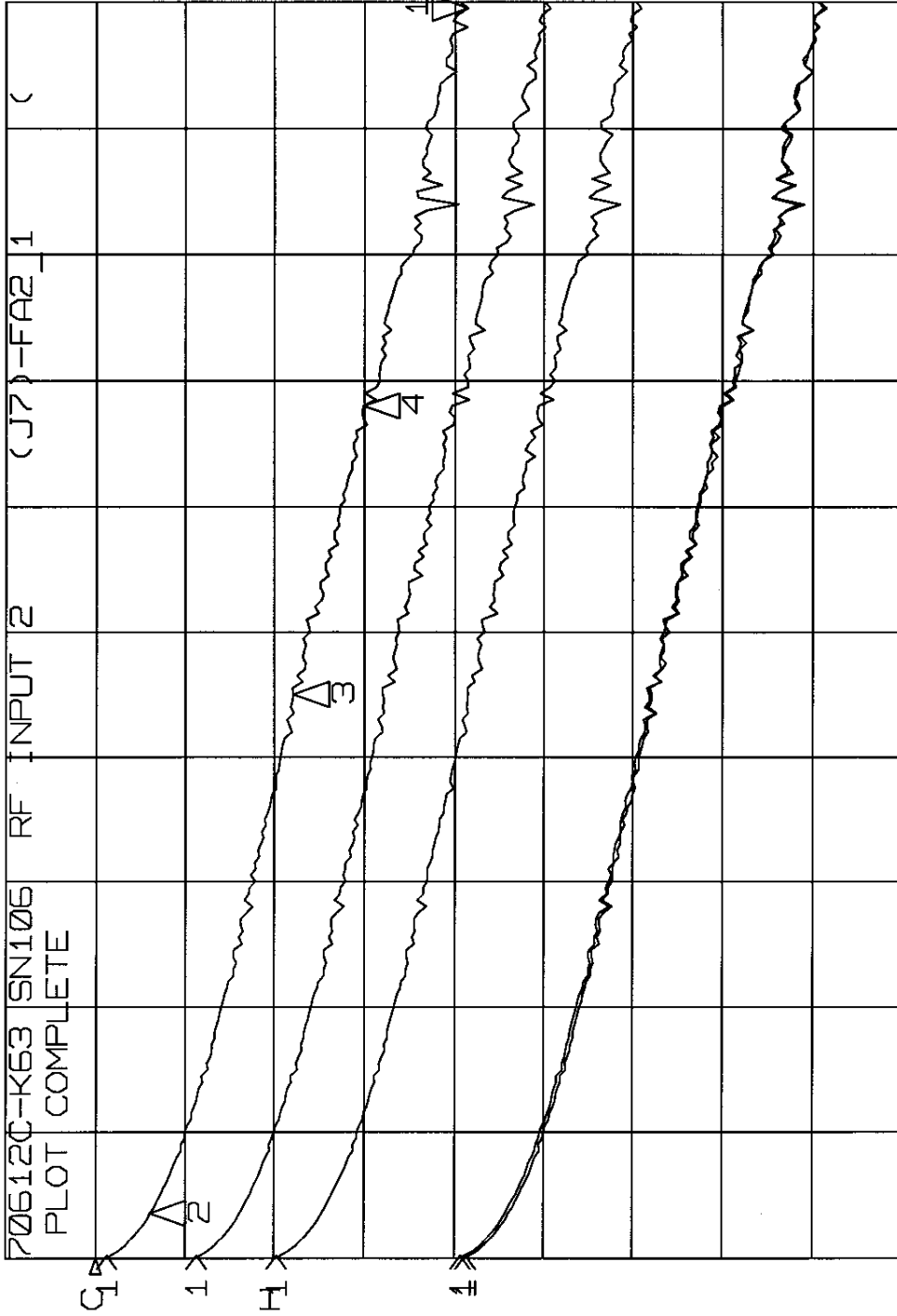


▲ S21 log MAG

REF 0.0 dB

1 1.0 dB

▼ -4.1394 dB



▲ MARKER 1  
26.367 GHz  
-4.1394 dB

MARKER 2  
970.92 MHz  
-0.6054 dB

MARKER 3  
11.949 GHz  
-2.2035 dB

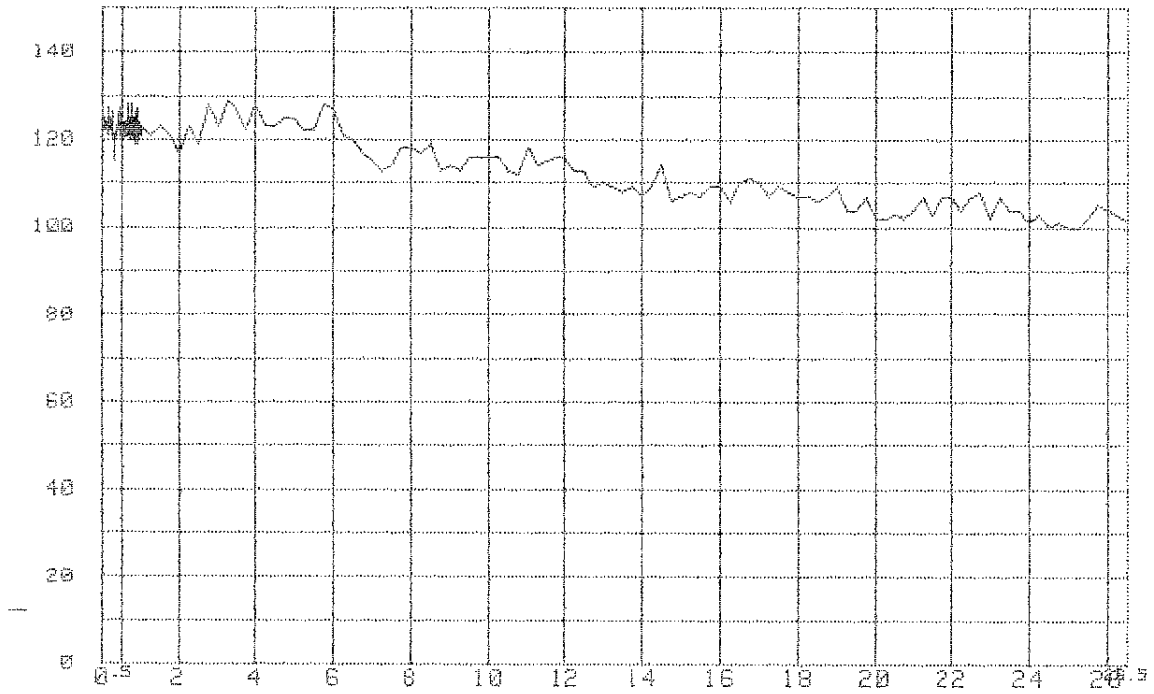
MARKER 4  
18.034 GHz  
-2.9801 dB

START  
0.045000000 GHz

STOP  
26.500000000 GHz

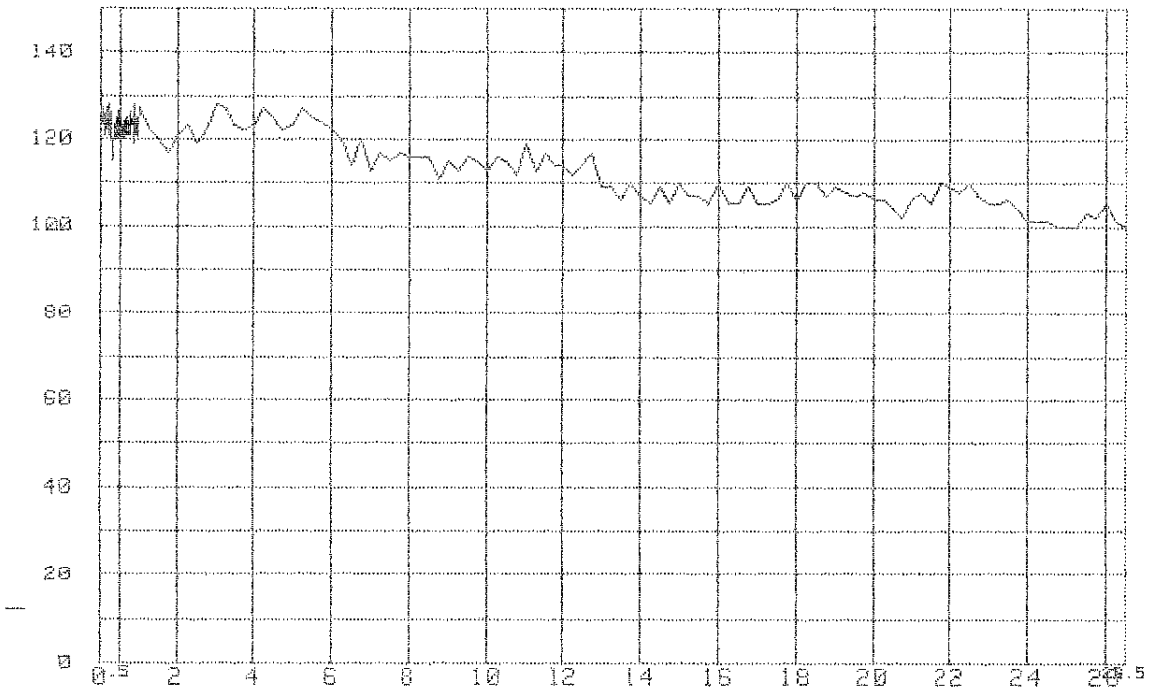
28 AUG 03  
13:19:07

29 Aug 2003 @ 10:35:15  
70612C-K63 s/n.106 (Ref)J2-J3/(Meas)J2-J15 (S1) .05 - 26.5 GHZ.



Frequency (Ghz)

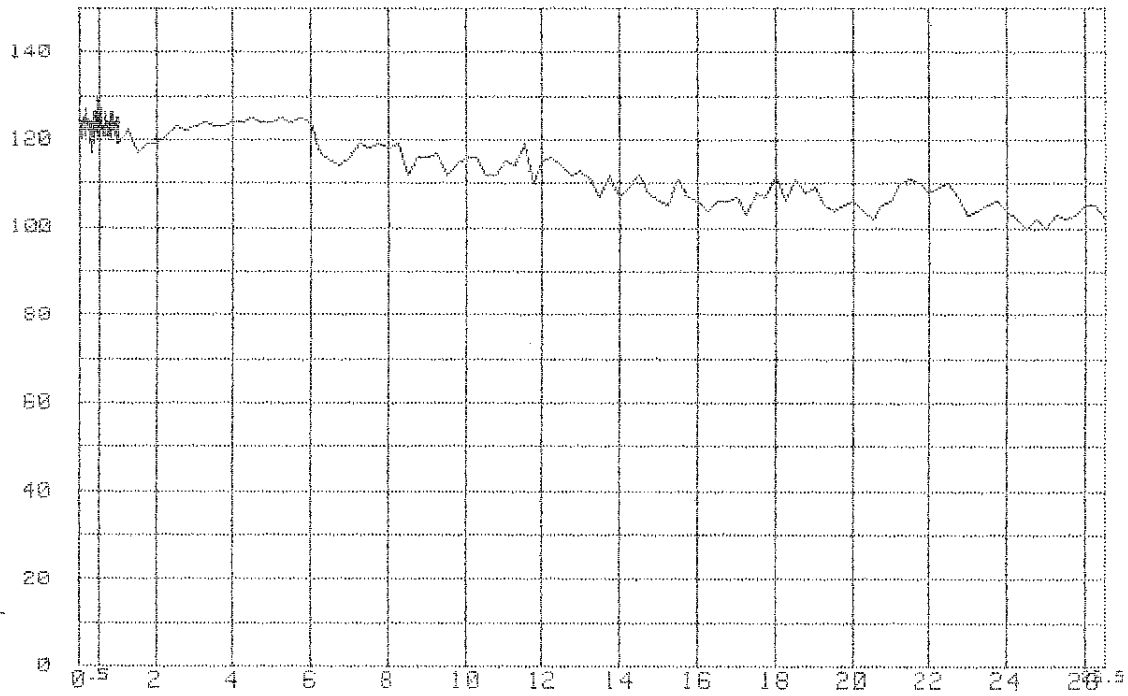
29 Aug 2003 @ 11:10:54  
70612C-K63 s/n.106 (Ref)J2-J3/(Meas)J2-J16 (S1) .05 - 26.5 GHZ.



Frequency (Ghz)

29 Aug 2003 @ 11:22:29

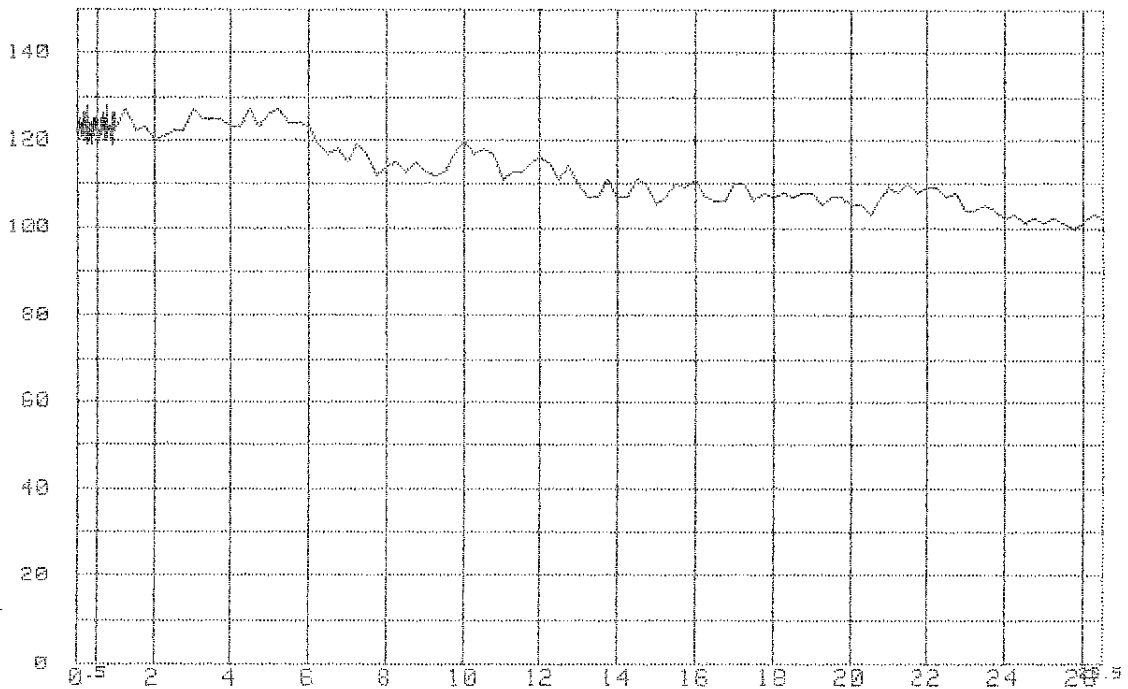
70612C-K63 s/n.106 (Ref)J2-J3/(Meas)J2-J10 (S1) .05 - 26.5 GHz.



Frequency (Ghz)

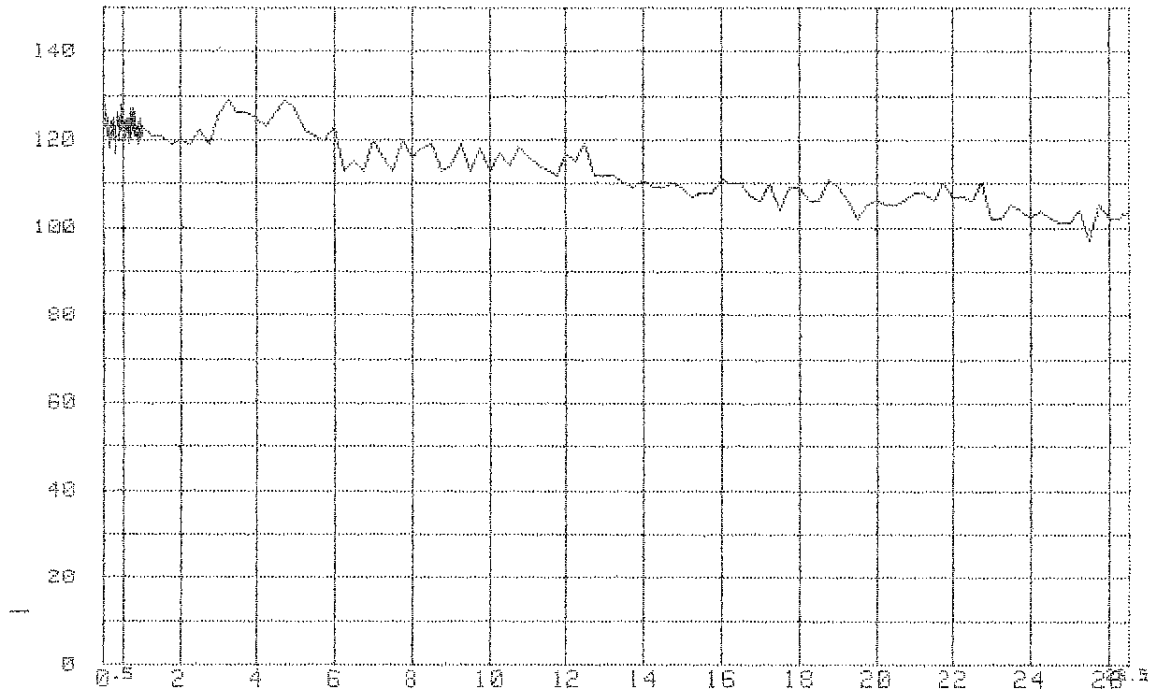
29 Aug 2003 @ 11:27:23

70612C-K63 s/n.106 (Ref)J2-J3/(Meas)J2-J11 (S1) .05 - 26.5 GHz.



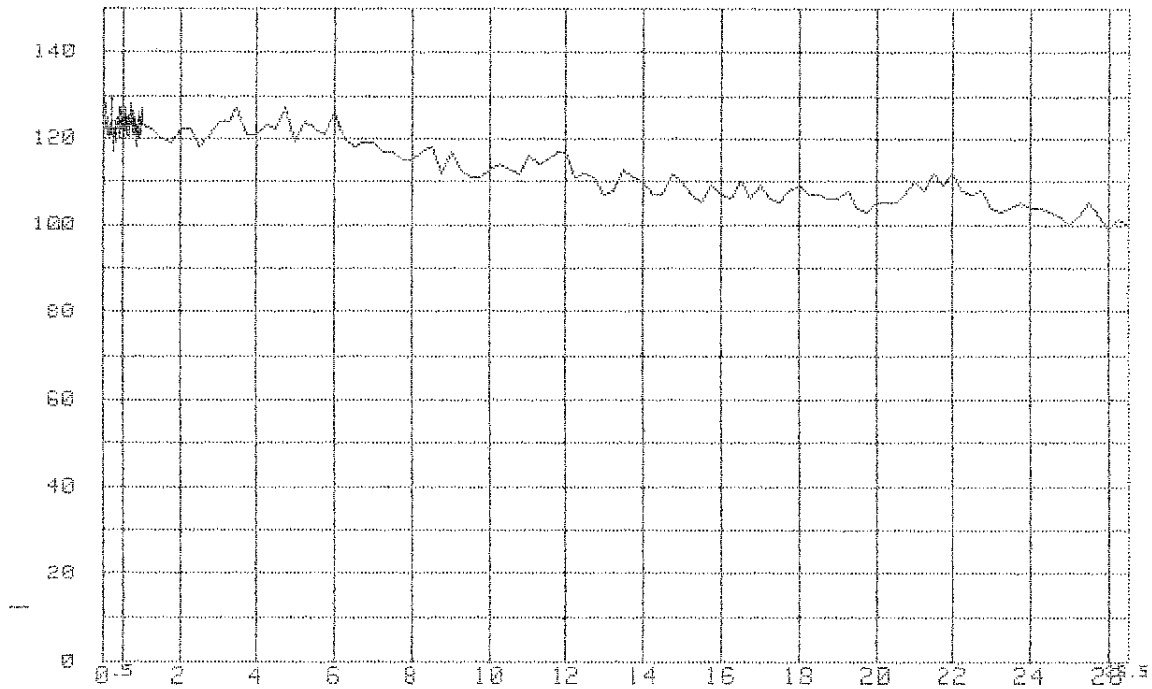
Frequency (Ghz)

29 Aug 2003 @ 11:32:01  
70612C-K63 s/n.106 (Ref)J7-J6/(Meas)J7-J15 (S2) .05 - 26.5 GHZ.



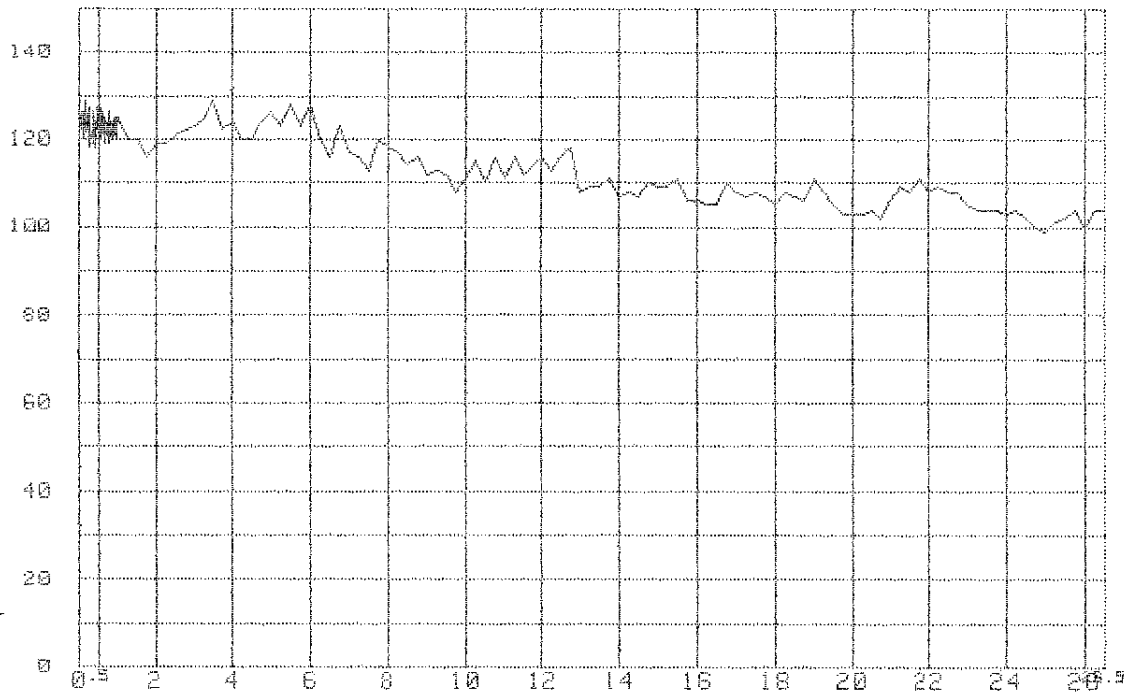
Frequency (Ghz)

29 Aug 2003 @ 11:36:32  
70612C-K63 s/n.106 (Ref)J7-J6/(Meas)J7-J13 (S2) .05 - 26.5 GHZ.



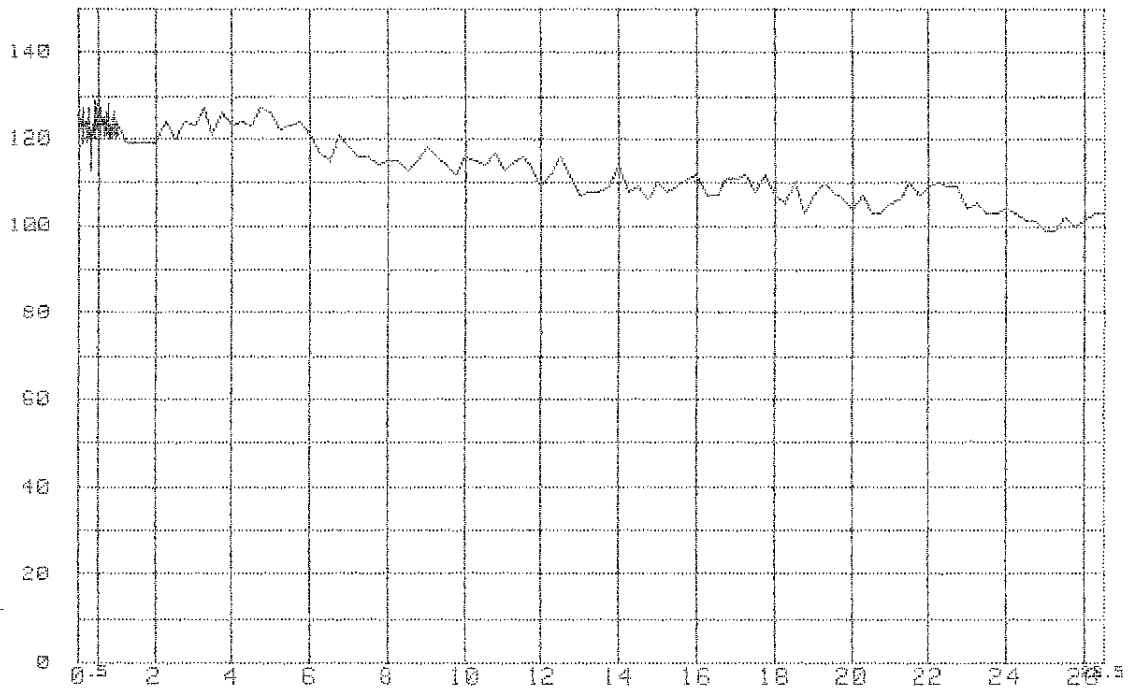
Frequency (Ghz)

29 Aug 2003 @ 11:41:58  
70612C-K63 s/n.106 (Ref)J7-J6/(Meas)J7-J12 (S2) .05 - 26.5 GHZ.



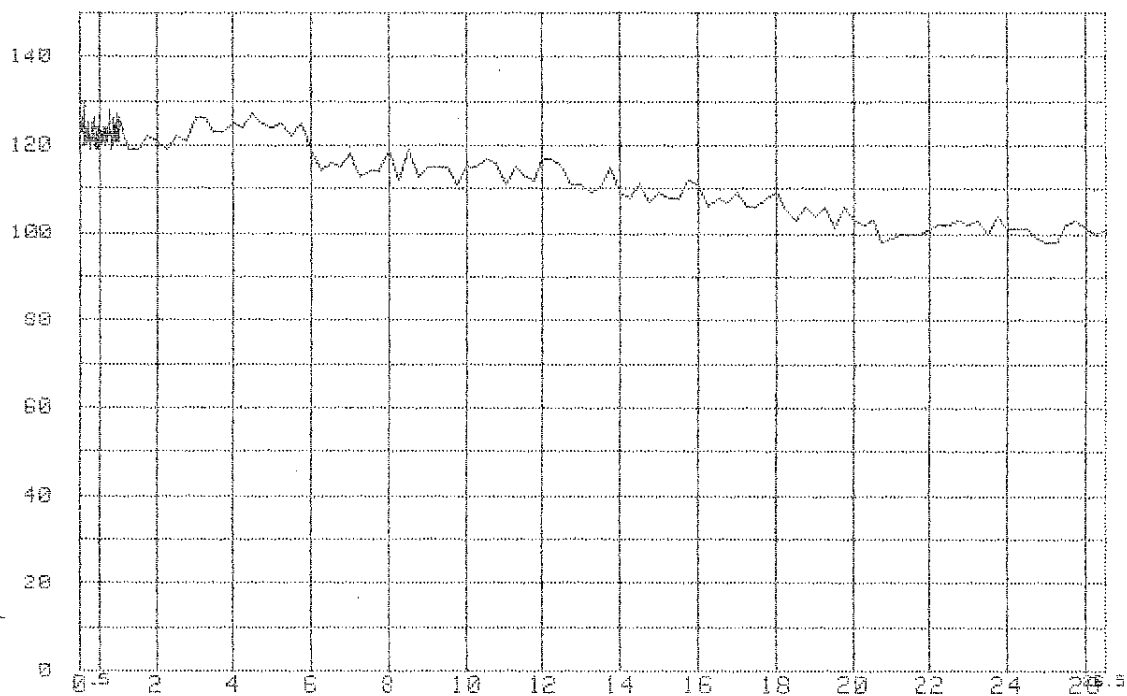
Frequency (Ghz)

29 Aug 2003 @ 11:48:28  
70612C-K63 s/n.106 (Ref)J7-J6/(Meas)J7-J16 (S2) .05 - 26.5 GHZ.



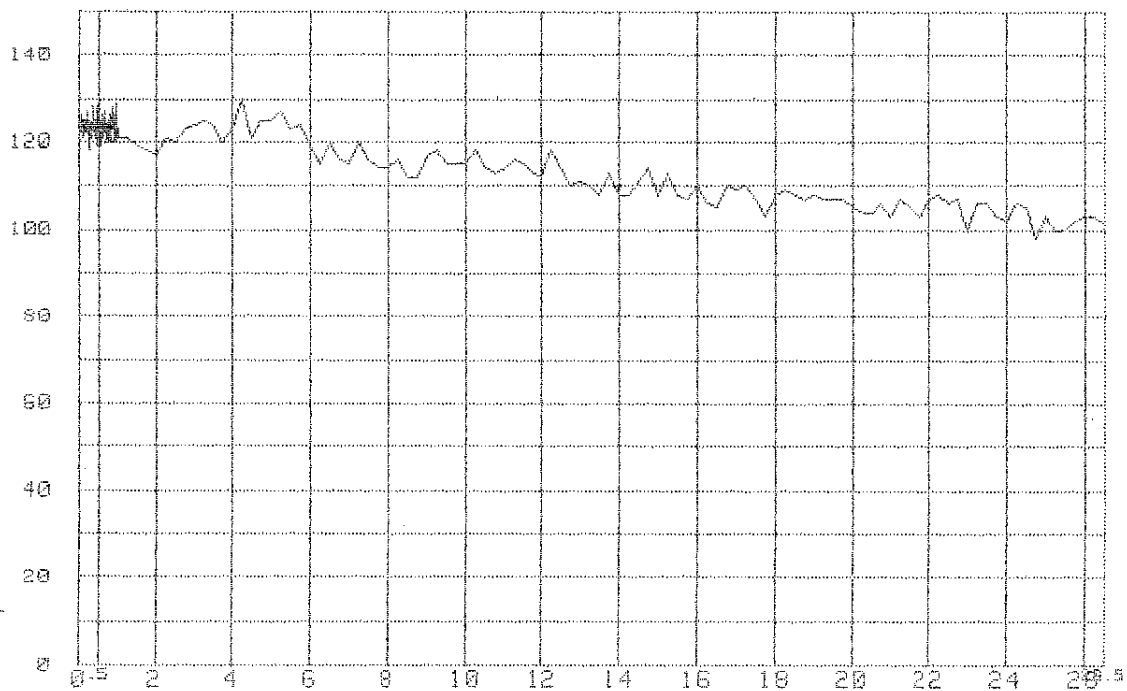
Frequency (Ghz)

29 Aug 2003 @ 11:56:33  
70612C-K63 s/n.106 (Ref)J9-J12/(Meas)J9-J1 (S3) .05 - 26.5 GHz.



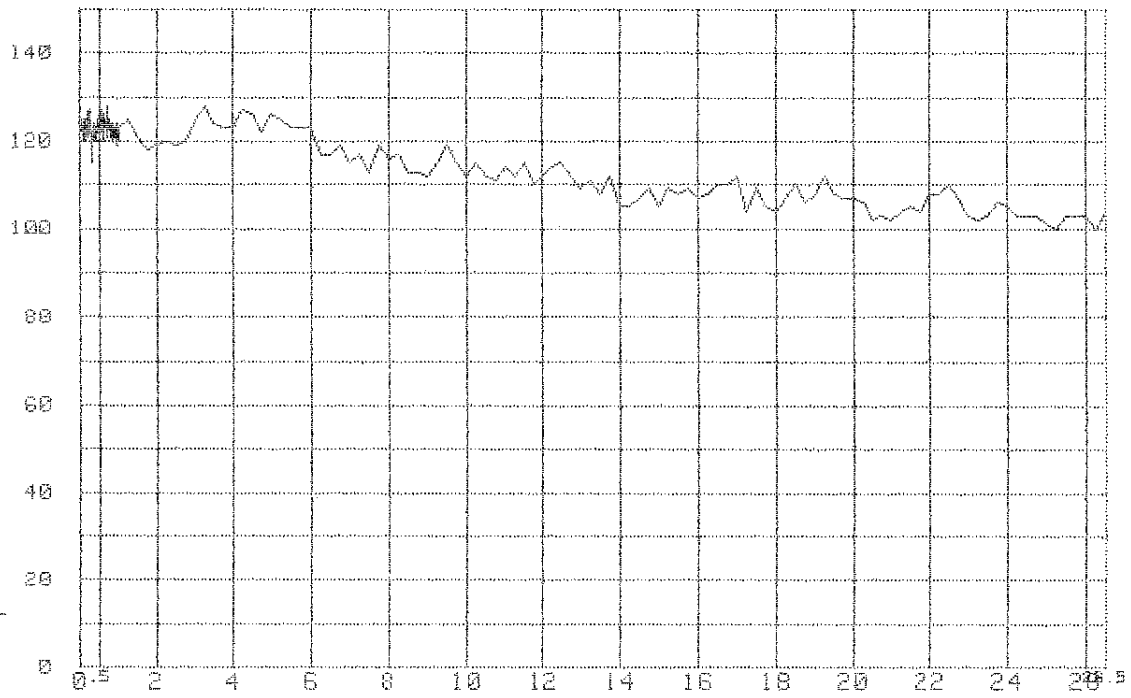
Frequency (Ghz)

29 Aug 2003 @ 12:07:39  
70612C-K63 s/n.106 (Ref)J9-J12/(Meas)J9-J4 (S3) .05 - 26.5 GHz.



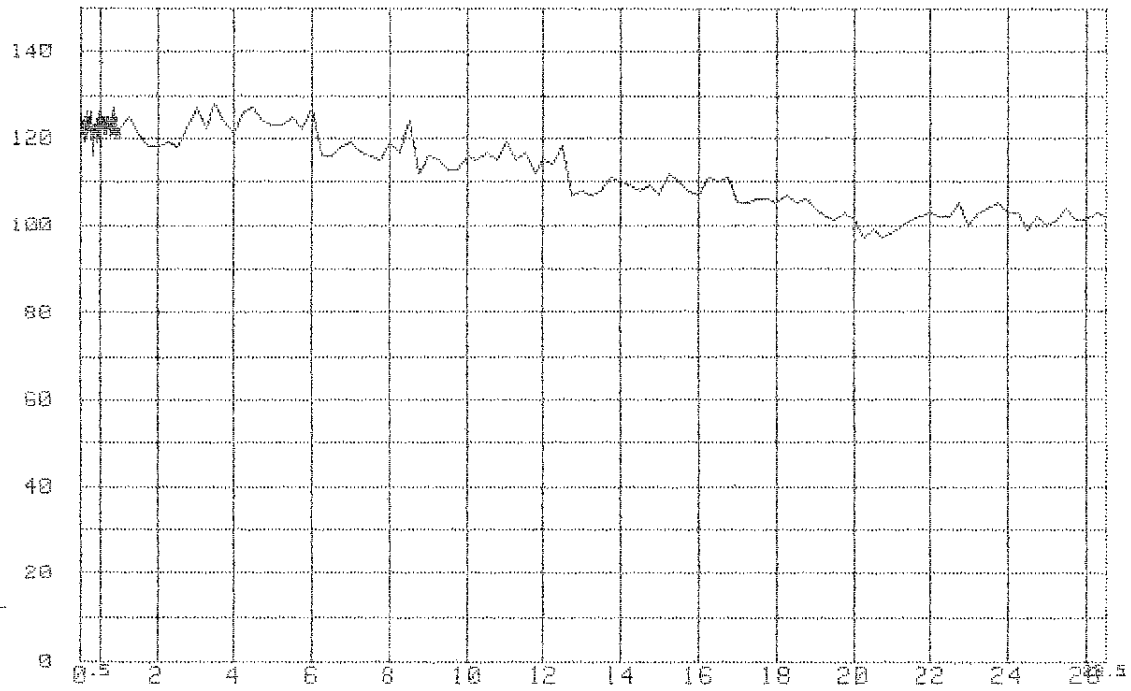
Frequency (Ghz)

29 Aug 2003 @ 12:13:08  
70612C-K63 s/n.106 (Ref)J1-J5/(Meas)J1-J10 (S4) .05 - 26.5 GHZ.



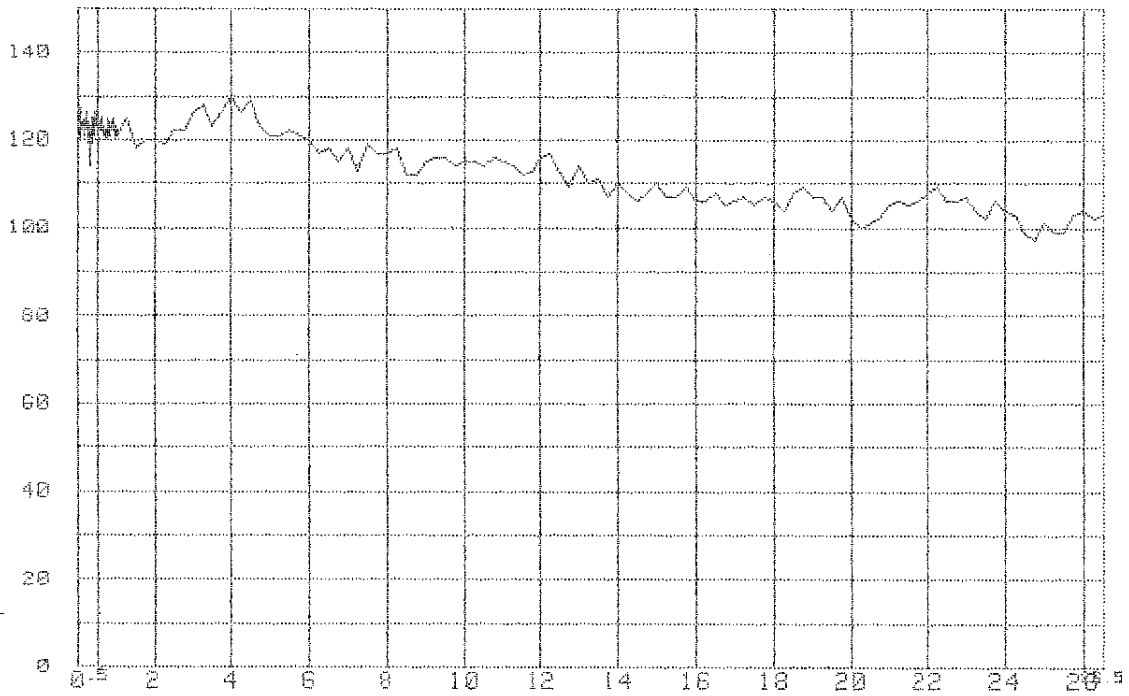
Frequency (Ghz)

29 Aug 2003 @ 12:16:48  
70612C-K63 s/n.106 (Ref)J1-J5/(Meas)J1-J11 (S4) .05 - 26.5 GHZ.



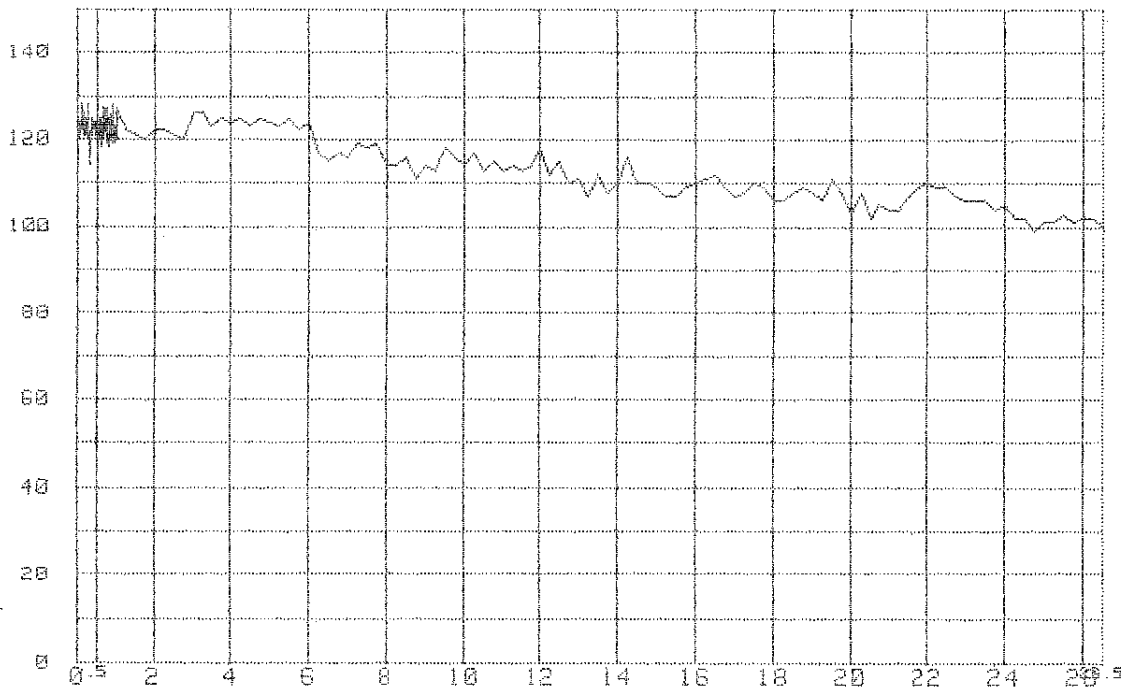
Frequency (Ghz)

29 Aug 2003 @ 12:21:29  
70612C-K63 s/n.106 (Ref)J1-J5/(Meas)J1-J12 (S4) .05 - 26.5 GHZ.



Frequency (Ghz)

29 Aug 2003 @ 12:25:10  
70612C-K63 s/n.106 (Ref)J1-J5/(Meas)J1-J13 (S4) .05 - 26.5 GHZ.



Frequency (Ghz)