



承 认 书

SPECIFICATION FOR APPROVAL

客户名称 Customer Name	熵基		
客户项目名 Customer Project Name	M2F Pro	盛邦尔料号 Surbaner P/N	160180-01072
客户编码 Customer P/N	/	工作频段 Working Band	2400-2500MHz
产品描述 Product description	2. 4G 天线：FPC, 33. 93*7. 40*0. 32MM, 1. 13 黑色线带一代端子，L=60mm		
版本号 Version	V01		
设计人信息/Designer Information			
射频工程师 RF Engineer	林德友	研发主管 R&D Diretor	朱浩奎
结构工程师 ME Engineer	张宇龙		

盛邦尔审批/Surbaner Approval				客户批准/Customer Approval	
	制作 Prepared By	审核 Checked By	批准 Approval By	审核 Checked By	批准 Approval By
签章 Signature	王海华林				
日期 Date	2024. 09. 03	9/3	2024-09-04 9/3		

受控技术文件

修订履历/Change Log

版本 Version	修订内容 Change Description	责任人 Person in Charge	核准 Approval By	日期 Date

地址: 深圳市宝安区西乡街道鹤洲社区恒丰工业城 B25 栋 2 楼 TEL: 0755-82790675 FAX: 0755-82809726

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1 /

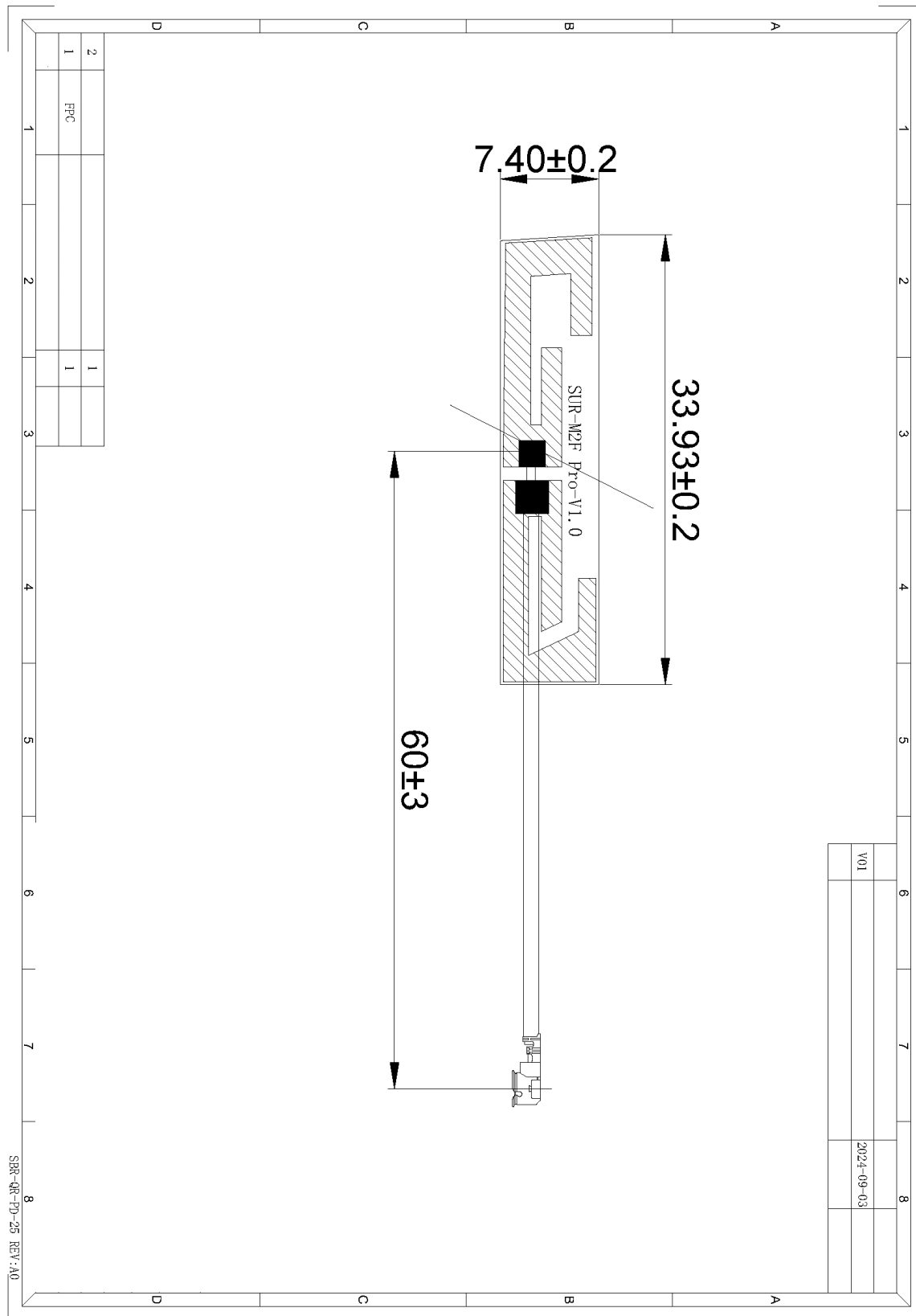
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目录/Catalogue

序号 No.	项目 Item	页码 Page No.
1	图纸或实物图片 Drawing or Product Image	3
2	技术参数 Technical Parameter	4
3	射频性能测试报告 RF Performance Test Report	5-10

一. 产品图纸或实物图片/Drawing or Product Image



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二. Technical Parameter /技术参数

1. Antenna/天线		
No/序号	Part Name/项目	SPEC/规格
1	Frequency Range/ 频率范围	2400-2500MHz
2	Impendence/阻抗	50 ohm nominal
3	Gain/增益	2.44dBi
4	Polarization/极化	LINE
5	VSWR/驻波比	<2.0
6	Efficiency/效率	≥50% AVG
7	RF Cable/射频连接线	1.13 60mm
8	RF Connector/连接器	1 代端子
2. Environmental Characteristics/环境特性		
No/序号	Part Name/项目	SPEC/规格
1	Operation Humidity /工作湿度	5~95%不冷凝
2	Operating Temperature/ 工作温度	-20~+60℃
3	Store Temperatuer/ 工作储存温度	-30~+70℃
4	Salt Spray Test/ 盐雾试验	24H

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射频性能测量报告

RF Performance Test Report

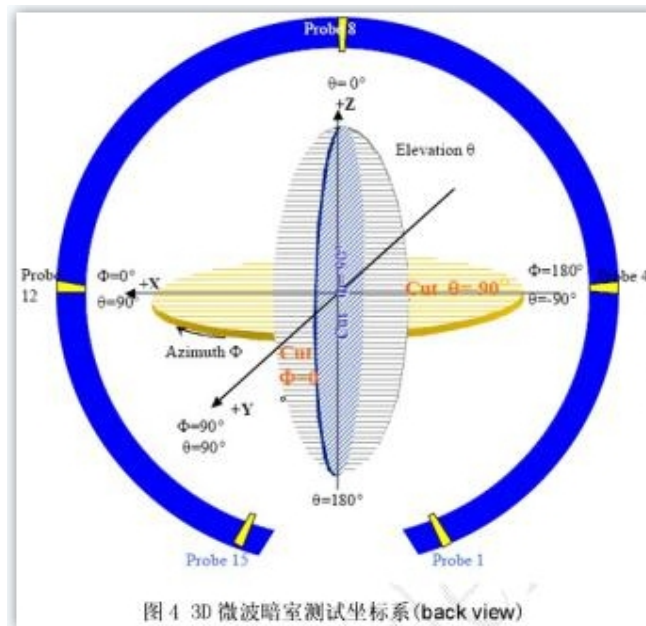
客户名称 Customer Name	熵基	项目名称 Project Name	M2F Pro	盛邦尔料号 Surbaner P/N	160180-01072
频段 Band	2400-2500MHz	测试日期 Test Date	2024/09/02	测试人 Inspector	

天线测试设备简介

Antenna Test Equipment Introduction

测试天线输入特性使用 Agilent E5071C and Agilent 5062A 矢量网络分析仪；辐射特性利用 Satimo 三维近场暗室进行测试，并分别使用 8960 E5515 和 Agilent E4438C 进行了分析。暗房的测试坐标如下：

Test of antenna input characteristics using Agilent E5071C and Agilent 5062A vector network analyzer; The radiation pattern of the antenna are tested using the Satimo starlab 3D near field Anechoic Chamber, and the instrument is used to agilent8960 E5515 and Agilent E4438C. The test coordinates of the darkroom are as follows:



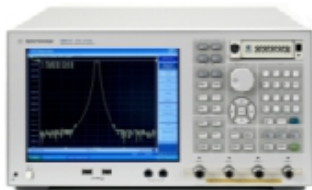
1. S11 参数测量/S11 Parameter-VSWR

使用一根 50 Ω 同轴电缆连接到天线，然后该电缆连接到网络分析仪测量 S11 参数，被测量产品远离金属至少 20 厘米。

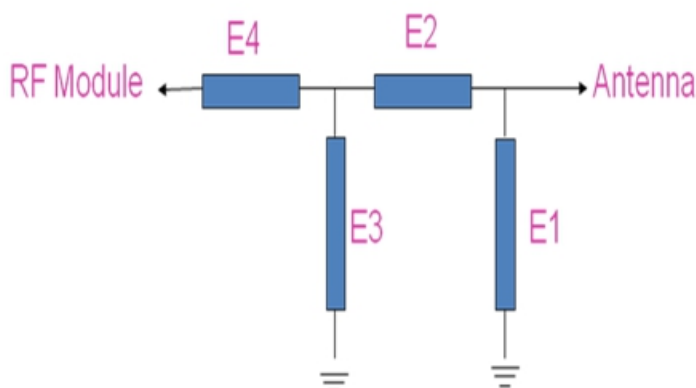
Measuring Method is a 50 Ω coaxial cable is connected to the antenna. Then this cable is connected to a network analyzer to measure the S11 parameter, Keeping this fixture away from metal at least 20cm.

Test System

Sequence Number	Test Item	equipment
S parameter	VSWR	Agilent 5071C & Agilent 5062A
OTA Test	TRP&TIS	Agilent 8960 E5515C& Agilent 4438C&CMW500 &CMW270 ETS&SATIMO
Gain & Efficiency	Gain & Efficiency	ETS&SATIMO Agilent 5071C



3.Antenna MatchingNetwork



Element	Capacitor	Inductor
E1	N/A	N/A
E2	N/A	N/A
E3	N/A	N/A
E4	N/A	N/A

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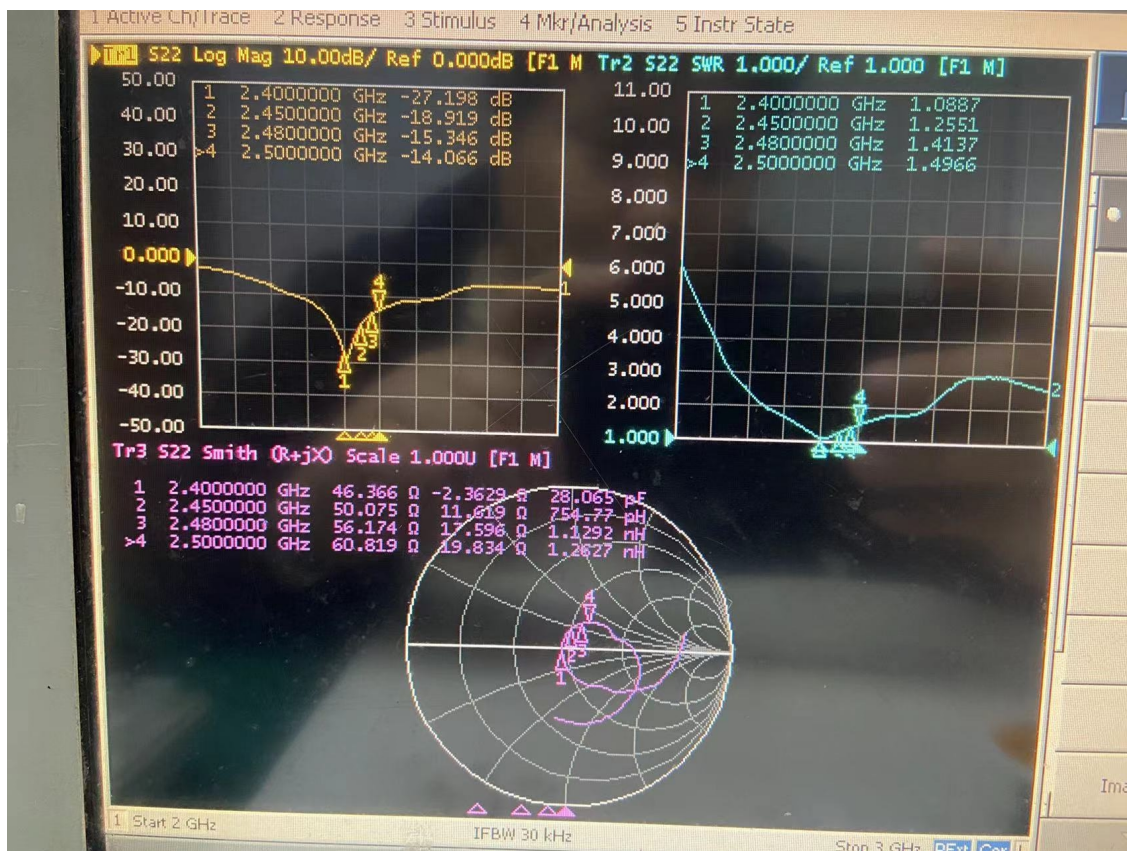
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6 /

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S11 Parameter-S11



Frequency	2400	2450	2500
VSWR	1.08	1.25	1.49

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7 /

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2. Gain & Efficiency

Frequency (MHz)	Efficiency (%)	Peak GAIN (dBi)
2400	51.6%	1.50
2410	52.3%	1.49
2420	54.6%	1.63
2430	53.7%	1.46
2440	51.7%	1.56
2450	52.6%	1.76
2460	54.8%	2.16
2470	53.1%	2.44
2480	50.0%	2.38
2490	50.6%	2.23
2500	51.8%	2.26

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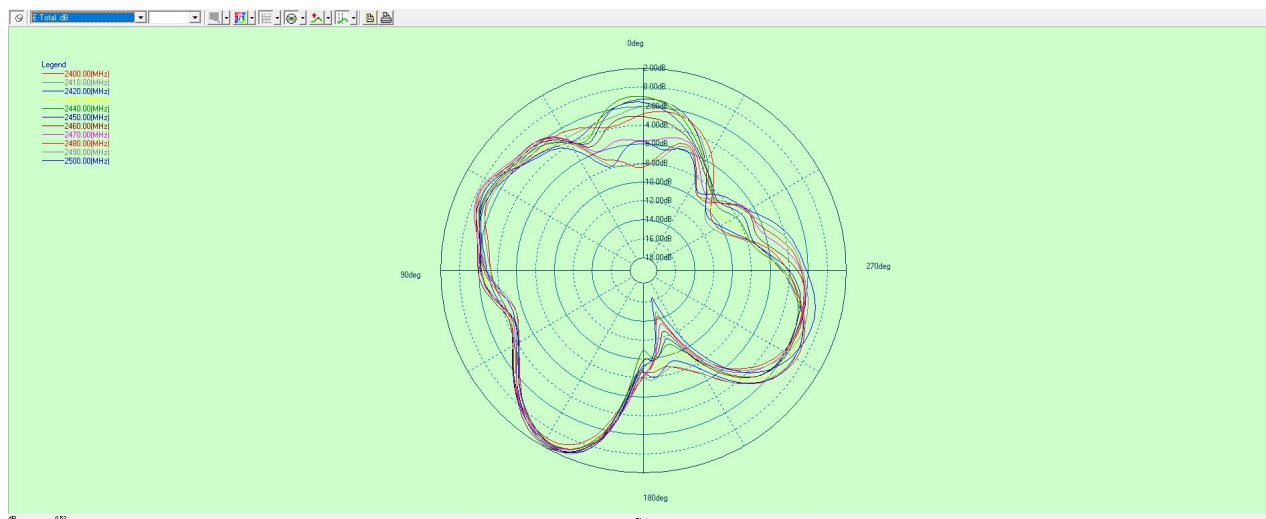
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8 /

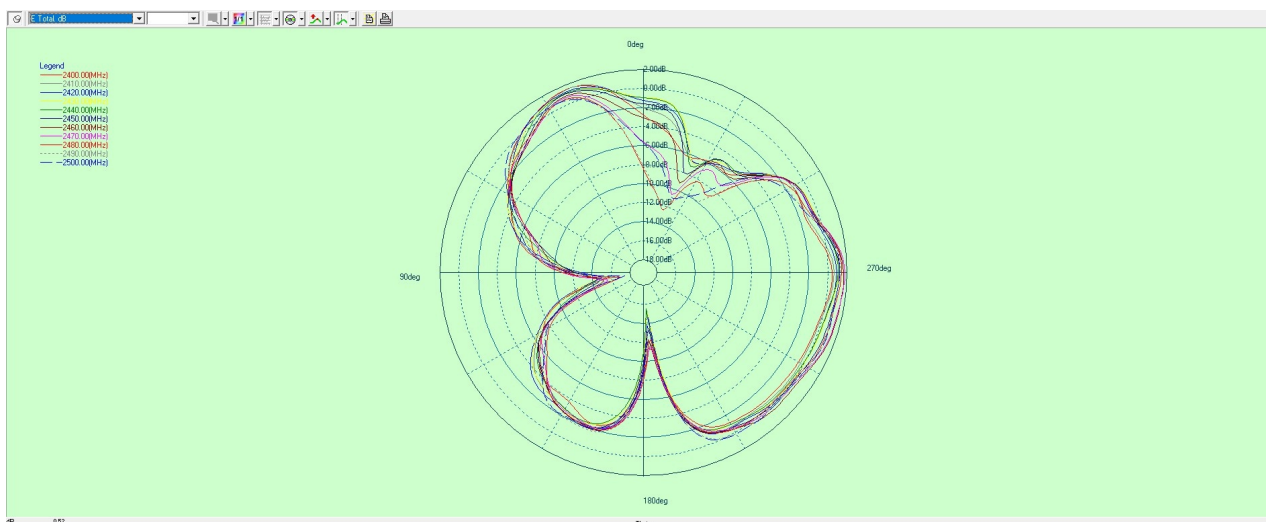
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2D Pattern

Phi =0



Phi =90



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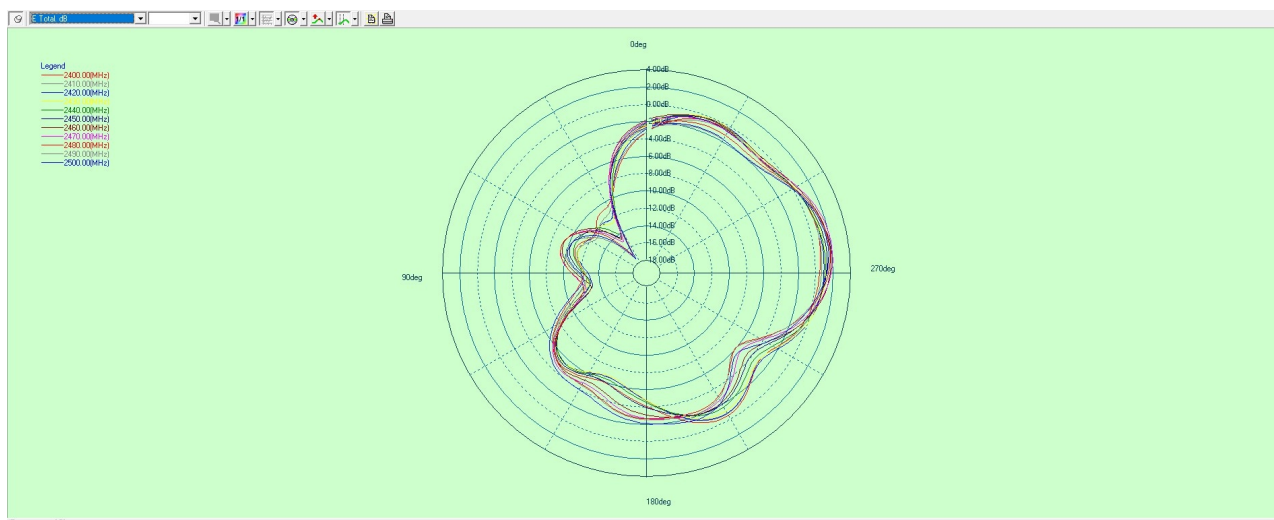
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9 /
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Theta =90



2. 4G OTA部分测试

ANTB 2. 4G	CCK -11Mbps			
	ch1	ch6	ch11	spec
TRP	15. 86	15. 83	15. 95	TRP $\geq$ 10 dbm
TIS	-82. 21	-79. 6	-84. 85	TIS $\leq$ -78dbm
	PASS	PASS	PASS	

ANTB 2. 4G	OFDM_54M			
	ch1	ch7	ch13	spec
TRP	14. 48	12. 43	14. 31	TRP $\geq$ 10 dbm
TIS	-71. 95	-67. 84	-74. 84	TIS $\leq$ -67dbm
	PASS	PASS	PASS	

ANTB 2. 4G	HT20-MCS7			
	ch1	ch7	ch13	spec
TRP	13. 42	11. 25	12. 82	TRP $\geq$ 7 dbm
TIS	-68. 07	-61. 06	-72. 73	TIS $\leq$ -62dbm
	PASS	PASS	PASS	

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