



ShenZhen VLG Wireless TECHNOLOGY CO., LTD

## SPECIFICATION

Project	LSD7RF-MINI1352 868MHz/915MHz ANTENNA			Frequency Band	868/915MHz		
VLG SCT P/N	V1468-024-A-1			Version	A		
RF	zhihua.ge	Check	zhihua. ge	QC	shengyong. xu	Check	
ME	xiaorui.chai		xiaorui. chai	PM	chunxin. wang		
Date	April 4, 2019						
Customer item P/N	Customer Project Name: LSD7RF-MINI1352 868MHz/915MHz ANTENNA Customer item no:						
Customer Remark							
VLG Wireless Technology							
R&d project customer satisfaction survey (Customer please according to our research and development, a comment or PM management staff, supervise and urge us serve you better)							
RF	<input type="checkbox"/> satisfaction		<input type="checkbox"/> largely satisfactory		<input type="checkbox"/> Not satisfied		
ME	<input type="checkbox"/> satisfaction		<input type="checkbox"/> largely satisfactory		<input type="checkbox"/> Not satisfied		
PM	<input type="checkbox"/> satisfaction		<input type="checkbox"/> largely satisfactory		<input type="checkbox"/> Not satisfied		
Customer Suggestions:							
The antenna images :							

Design Specifications	Typical	Units
Antenna form	The outer glue stick and F-SMA adaptors antenna	
working Frequency	868、915	MHz
Gain	1.46 ~ 5.33	DBi
Antenna efficiency	45.00 ~ 80.10	%
VSWR	<3.5	
Polarization	linear polarization	
Axial Ratio	When the antenna is circularly polarized, the axial ratio of the remarks in the working bandwidth	N/A
Radiation pattern	omnidirectional antenna	
impedance	50 ohm	
Power handling	33	dBm
Interface	SMA contact	
Overall dimensions	See the drawing section	mm
Weight	No requirements	
Operatin Temp	-30 ----- 70	°C
Storing Temp	-30 ----- 70	°C

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## 1. Indication

This report summarizes the electrical performance results of the proposed Internal antenna to support the LSD7RF-MINI1352 868MHz/915MHz ANTENNA. The antenna is an assembly 868、915MHz band.



## 2. Electrical Performance

### 2.1 Specification

LSD7RF-MINI1352 Ant. (free)						
Band	Frequency (MHz)	VSWR	Gain (dBi) Free Space	Frequency (MHz)	VSWR	Gain (dBi) Free Space
	TX		TX			
	868、915	$\leq 3.5$	$\geq 5.33$			

### 2.2 Matching Circuit Description

The motherboard comes with a matching circuit

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### 2.3.1 VSWR

VSWR measurements (S11) were performed using Agilent E5071B Network Analyzer and the previously described test fixture. A ferrite-loaded coaxial cable was used to mitigate surface currents on the outside of the cabling. The testing was performed in free space ETS AMP8500S chamber.

### 2.4 Measurement Data

#### 2.4.1 VSWR

LSD7RF-MINI1352 868MHz/915MHz ANTENNA		
Frequency (MHz)	868	915
VSWR	2.12	1.77

#### 2.4.2 Peak gain& Efficiency

FEITUKEJI	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Frequency ID	820.0	830.0	840.0	850.0	860.0	870.0	880.0	890.0	900.0	910.0	920.0	930.0	940.0	950.0	960.0
Point Values															
Ant. Port Input Pwr. (dBm)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tot. Rad. Pwr. (dBm)	-3.46	-2.93	-2.76	-2.27	-2.26	-2.01	-1.72	-1.72	-1.67	-1.38	-0.98	-1.03	-0.96	-0.91	-1.35
Peak EIRP (dBm)	1.46	1.90	2.34	3.14	3.39	3.93	4.68	5.04	5.24	5.33	5.29	4.95	4.94	4.84	4.45
Directivity (dBi)	4.93	4.84	5.10	5.41	5.65	5.94	6.40	6.76	6.91	6.71	6.27	5.97	5.90	5.75	5.80
Efficiency (dB)	-3.46	-2.93	-2.76	-2.27	-2.26	-2.01	-1.72	-1.72	-1.67	-1.38	-0.98	-1.03	-0.96	-0.91	-1.35
Efficiency (%)	45.00	50.90	53.00	59.20	59.40	62.90	67.30	68.10	72.70	79.70	79.00	80.10	81.10	73.30	
Gain (dBi)	1.46	1.90	2.34	3.14	3.39	3.93	4.68	5.04	5.24	5.33	5.29	4.95	4.94	4.84	4.45
NHPRP ± Pi/4 (dBm)	-6.70	-6.37	-6.05	-5.49	-5.47	-5.07	-4.62	-4.50	-4.44	-4.56	-4.60	-4.84	-4.77	-4.77	-5.17
NHPRP ± Pi/6 (dBm)	-8.65	-8.31	-7.99	-7.42	-7.36	-6.91	-6.39	-6.22	-6.10	-6.15	-6.17	-6.39	-6.29	-6.30	-6.68
NHPRP ± Pi/8 (dBm)	-9.96	-9.67	-9.41	-8.84	-8.75	-8.25	-7.67	-7.48	-7.31	-7.33	-7.34	-7.56	-7.47	-7.46	-7.85
Upper Hem. PRP (dBm)	-6.67	-6.09	-5.88	-5.40	-5.42	-5.22	-4.99	-5.05	-5.07	-4.86	-4.56	-4.63	-4.56	-4.47	-4.89
Lower Hem. PRP (dBm)	-6.29	-5.81	-5.66	-5.17	-5.13	-4.83	-4.49	-4.43	-4.32	-3.97	-3.49	-3.52	-3.46	-3.43	-3.89
Upper Hem. PRP (%)	21.53	24.63	25.83	28.85	28.72	30.04	31.68	31.23	31.12	32.64	34.98	34.47	35.00	35.73	32.47
Lower Hem. PRP (%)	23.51	26.25	27.15	30.40	30.67	32.86	35.57	36.08	37.01	40.07	44.76	44.50	45.11	45.36	40.80

### 3. Suggestions and Conclusion

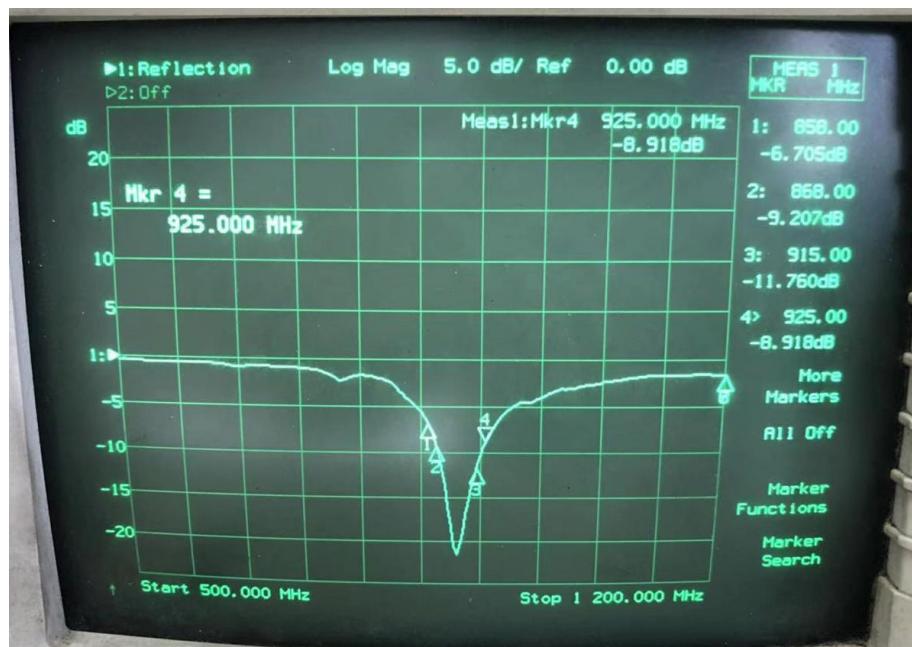
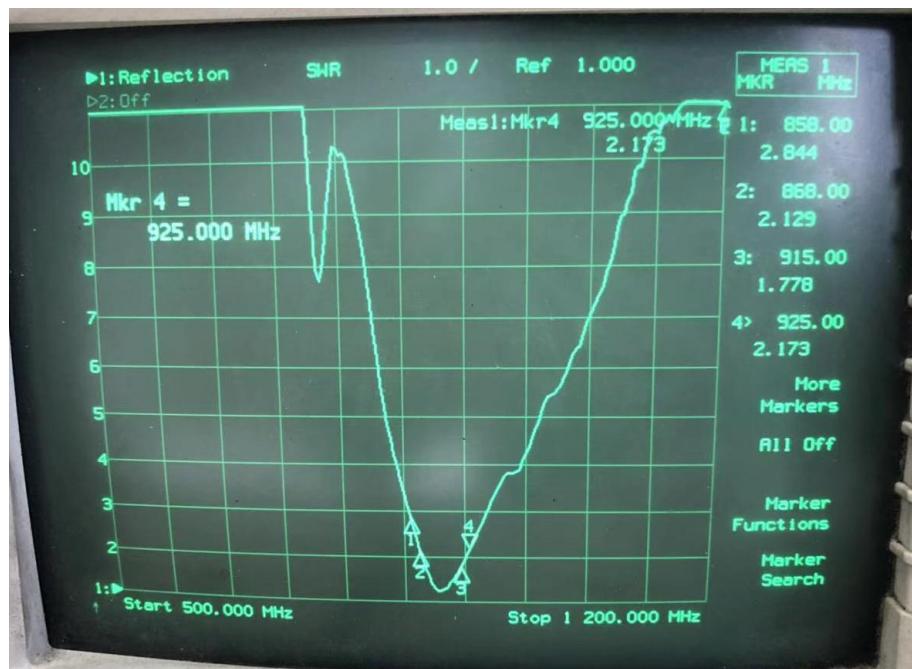
This report summarizes the electrical performance of internal PIFA antenna for LSD7RF-MINI1352 868MHz/915MHz ANTENNA .The antenna was tested using the customer provided bar phone test fixture.

In order to get best performance, we tune the resonance frequency higher of 868 、 915MHz band. VLG team is looking forward to getting your approval.

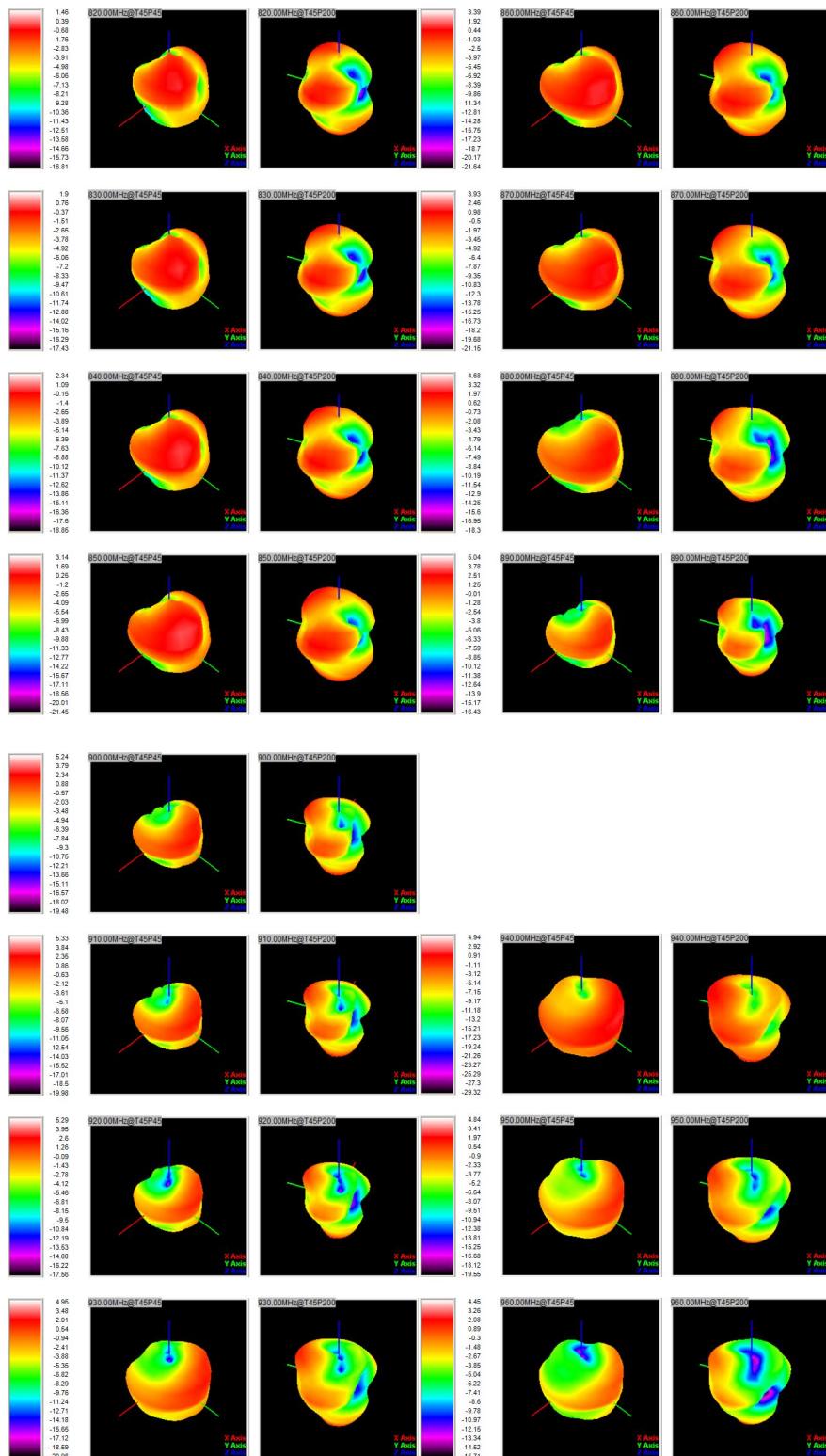
Thanks for your cooperation.

#### 4.Attachment

##### 4.1 S11 Parameter



## 4.2 3D pattern



## 4.3 Appearance drawing

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## 5. Reliability Report

### 5. 1. Constant Temperature and Humidity Test

Project	Constant Temperature and Humidity Test		Check ID	
Product Name	LSD7RF-MINI1352 868MHz/915MHz ANTENNA		Quantity:5PCS	
Date Of Test: March 25, 2019		Date of Complete: 2019. 03. 26		
<b>Equipment For Test</b> <ul style="list-style-type: none"> <li>1. Programmable Constant Temperature And Humidity Test Box</li> <li>2. 8753ES Network Analyser</li> </ul>				
<b>Condition For Test:</b> <ul style="list-style-type: none"> <li>1. Under room temperature, 65% humidity</li> <li>2. Under 80° , 85%~90% humidity , 2 hour per circulation, total 24 hours</li> </ul>				
<b>Test Result</b>				
<b>Standard</b> <ul style="list-style-type: none"> <li>1、Shedding-free, Non-cracking, No separation on the surface of metal ;Non-fading, Non-cracking, Non-deforming on the surface of nonmetal</li> <li>2、Test result meet the technical requirements</li> </ul>				
Project	Before Test	After Test	Problem	Result
Appearance	shedding-free, Non-cracking, No separation	Non-fading, Non-cracking, Non-deforming	Void	Pass
电性能 performance	VSWR Pass	VSWR Pass	Void	Pass
<b>Result:</b> <input checked="" type="checkbox"/> PASS <input type="checkbox"/> FAIL <input type="checkbox"/> Unable to judge				
Tester: feilong. yao			Check: shengyong. xu	
			Approval: hong. yu	

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## 5. 2. Salt Spray Test

Project	Salt Spray Test	Test ID																		
Project Name	LSD7RF-MINI1352 868MHz/915MHz ANTENNA	quantity: 5PCS																		
Date of test: March 26, 2019		Date of complete: March 27, 2019																		
Test equipment: 1. HL-60-SS Salt Spray Test Tester																				
Test Condition: 1. $35 \pm 2^\circ\text{C}$ in the salt spray test box; $22 \sim 30^\circ\text{C}$ in the laboratory 2. PH=6.5/7.2, the concentration of the sodium chloride decade to 50 $\pm 10\text{g/L}$ after 24 hours on per 80 square centimeter																				
Test Result: Pass																				
<table border="1"><thead><tr><th>Number</th><th>Result</th><th>Problem</th></tr></thead><tbody><tr><td>1</td><td>Pass</td><td>Void</td></tr><tr><td>2</td><td>Pass</td><td>Void</td></tr><tr><td>3</td><td>Pass</td><td>Void</td></tr><tr><td>4</td><td>Pass</td><td>Void</td></tr><tr><td>5</td><td>Pass</td><td>Void</td></tr></tbody></table>			Number	Result	Problem	1	Pass	Void	2	Pass	Void	3	Pass	Void	4	Pass	Void	5	Pass	Void
Number	Result	Problem																		
1	Pass	Void																		
2	Pass	Void																		
3	Pass	Void																		
4	Pass	Void																		
5	Pass	Void																		
Result: <input checked="" type="checkbox"/> PASS <input type="checkbox"/> FAIL <input type="checkbox"/> Unable to judge																				
Tester: feilong.yao Check: shengyong.xu Approval: hong.yu																				