

Material Confirmation Letter

Yidao	brand name	Venus8.7-WiFi+GPS Antenna
	material number	01. WF7.T8631OHT000
	Specification	WiFi+GPS Antenna, Antenna FPC+Backing, Silk Screen Message, 25.51*11.30*0.12mm, RoHS+REACH+HF
	models	Venus 8.7
supplier	company identification	Etheta Communication Technology (shenzhen) co.,Ltd
	brand name	RD022408-3IN1-FPC
	material number	RD022408NB87-3
	Specification	Antenna FPC
	Material Description	Surface black half-and-half PI cover film, half-and-half substrate, electrolytic copper, Ni $\geq$ 3-8um Au $\geq$ 0.03um, adhesive backing 3M467, half-cut packaging
	production date	2024.06.20

Acknowledgement of signature	Confirmation by the supplier						
	plait		audits		approvals		
	EVERYTHING acknowledges that						
	procure	framework	software	beta	hardware	NPI	DQA

Supplier's address, contact details	Etheta Communication Technology (shenzhen) co.,Ltd Liu Qifu 18688794456 B and D, 3/F, Building 1, Baysha Science and Technology Industrial Park, No.3011 Shahe West Road, Nanshan District, Shenzhen, China.
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Description:
1. This cover is used uniformly for all material acknowledgements;
2. Five copies of the acknowledgement of electronic material and five copies of the acknowledgement of assembled material, which are consistent with the acknowledgement of electronic filing;
3. The content pages must be placed in the order of the catalogue (e.g. cover, drawings, package gauge, dimensional CPK, salt spray test report, film thickness test report, physical property test report, etc.);
4. Drawings are clear, no omissions, errors, product appearance and colour, size, material, plating, plating specifications, tolerance range, etc. to be marked;
5. All reports should be in Chinese or in both English and Chinese.



ShenZhen Etheta Communication Technology Co., LTD.

Specification for Approval

Client Name: TCL

Brand Name: Etheta

Part No: RD022408NB87-3

Part Description: Venus8.7-WiFi+GPS Antenna

Manufacturer: Etheta

Part Name: FPC

Materiel No.: 01. WF7. T86310HT000

Supplier Signature		dates	Customer Signature
framework			Acknowledged:
RF			
recognition			

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1.Project Pictures

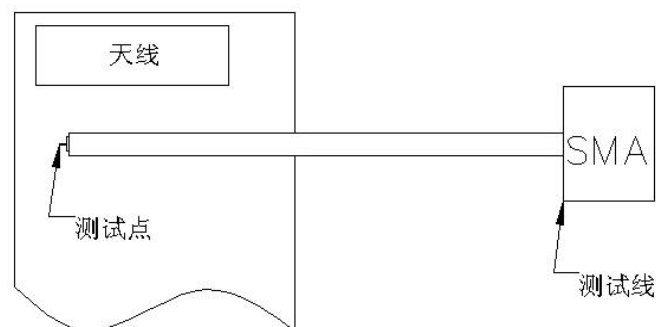


2. Test Fixture

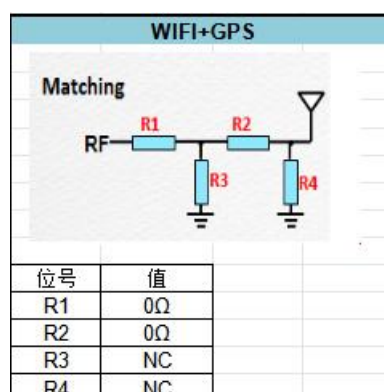
Purpose: To test the passive parameters of the antenna as accurately as possible.

Production method: The mobile phone fixture is a 50 ohm coaxial cable, one end of which is connected to the back end of the matching circuit of the mobile phone's main board (the front end of the RF test hole).

(One end of the cable is connected to the back end of the matching circuit of the main board of the mobile phone (the front end of the RF test hole) and the other end is connected to the SMA connector. The diagram is as follows:



3. Matching circuits



4. RF Test Data:

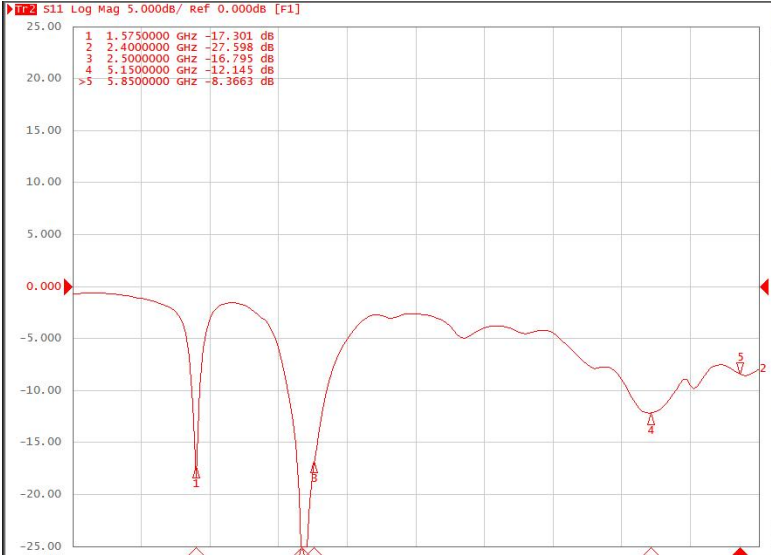
4.1 PIO releases

GPS	0	-143.56					
2.4-B 模	1	14.45	-83.5	5G-A 模	40	13.61	-90.85
	6	14.81	-83.61		56	13.87	-91.93
	11	14.55	-83.26		157	12.06	-88.78

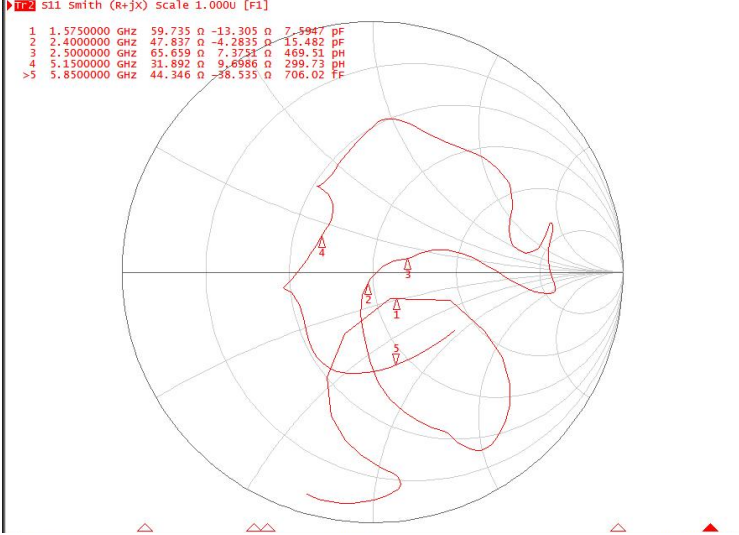
设备			+5GWiFi		
			f(MHz)	E (%)	E (dB)
			2400	52%	-2.87
			2410	54%	-2.67
			2420	55%	-2.63
			2430	56%	-2.48
			2440	58%	-2.40
			2450	57%	-2.41
			2460	59%	-2.32
			2470	59%	-2.30
			2480	59%	-2.28
			2490	59%	-2.32
f(MHz)	E (%)	E (dB)	2500	58%	-2.35
1550	51%	-2.95	5150	38%	-4.23
1560	50%	-2.97	5200	39%	-4.06
1570	49%	-3.08	5250	37%	-4.28
1575	48%	-3.14	5300	34%	-4.69
1580	46%	-3.34	5350	36%	-4.38
1590	43%	-3.67	5400	42%	-3.73
1600	39%	-4.13	5450	46%	-3.40
1610	34%	-4.69	5500	44%	-3.53
1620	30%	-5.21	5550	46%	-3.39
1630	26%	-5.84	5600	45%	-3.47
1640	22%	-6.61	5650	44%	-3.52
1650	19%	-7.24	5700	43%	-3.69
1660	16%	-8.07	5750	42%	-3.80
			5800	40%	-3.93
			5850	37%	-4.33

Antenna specification			
Antenna	Band	Pattern	Gain(dBi)
WBG ANT	GPS	PIFA	0.87
	WIFI 2.4G/BT		1.92
	WIFI 5G		0.58

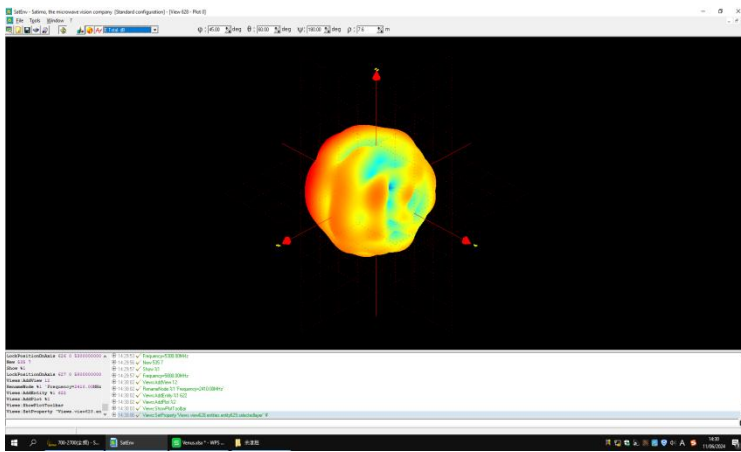
S11



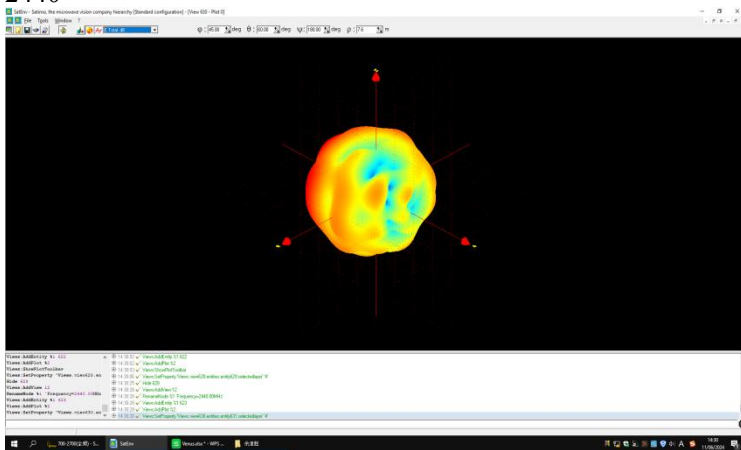
Smith



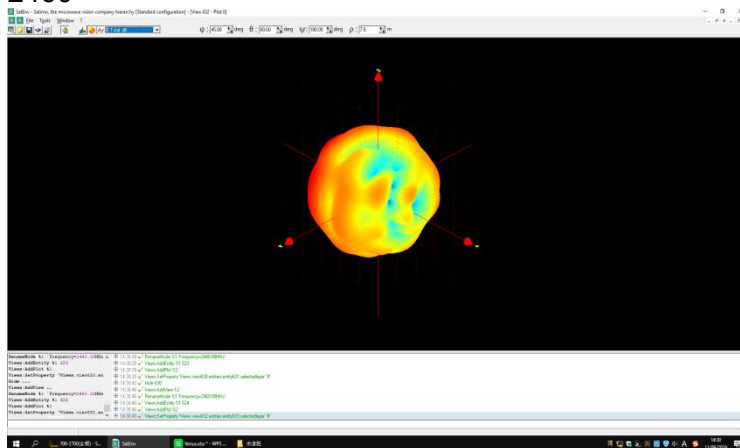
3D 图
2410



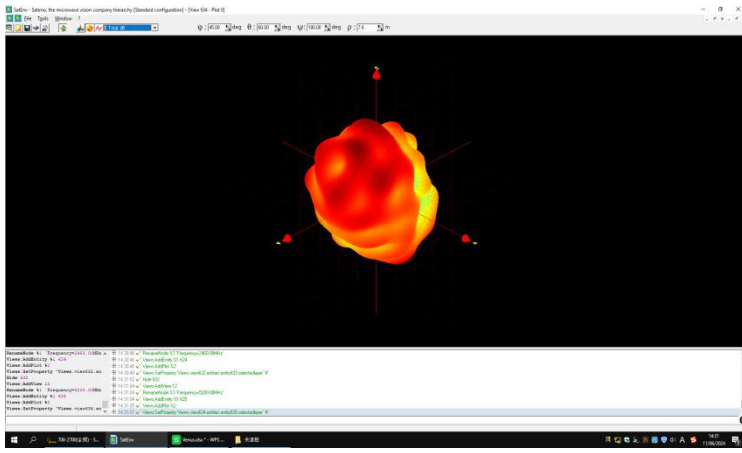
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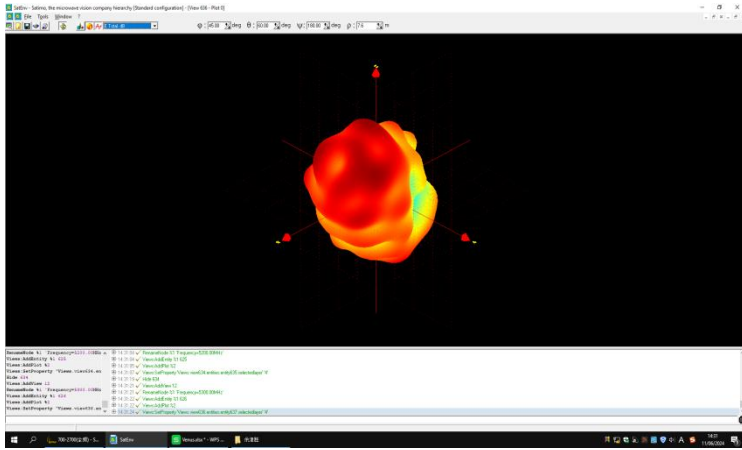
2460



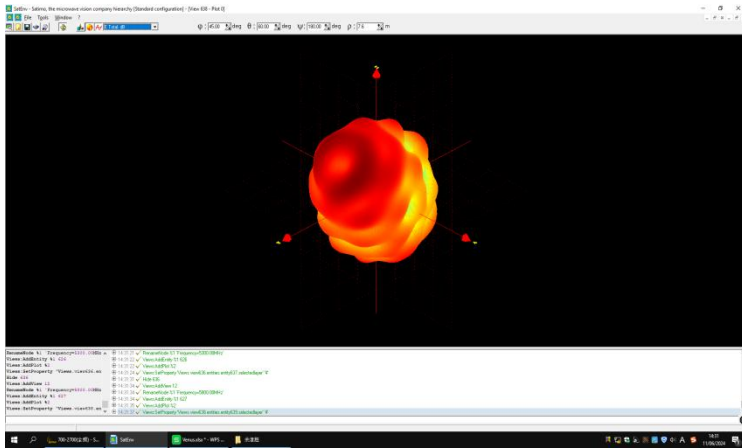
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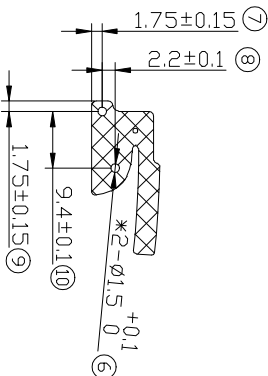
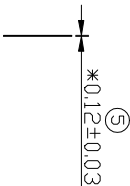
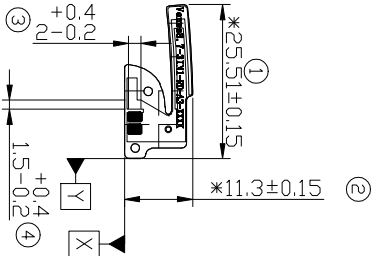
5300



5800



Version		Modifications		Modifier	Date
TA		Proto trial production drawings		Deng Ping	24.04.08
TB		PI0 trial production drawing TB version antenna routing modification		Deng Ping	24.04.20
TC		PPT trial production drawing TC version antenna routing modification		Deng Ping	24.04.20
RA		Mass production and release		Deng Ping	24.06.13



Front copper wire

Reverse adhesive backing

technical requirement

- Single panel, black PI covering film on the surface, T=27.5um, white characters (10um~15um);
- Use PI as the substrate, T=12.5um, half to half substrate;
- Electrolytic copper, with a copper foil thickness of 0.5oz;
- Use 3M 467 adhesive for backing;
- The gold plating thickness in the gold-plated area is above 0.03um, and the nickel plating thickness is 3-8um;
- Sizes marked with “*” are the key dimensions
- The unmarked rounded corners are all 0.2, and the process edge is 0.2mm;
- For unmarked dimensions, follow the 2D drawing, and for unmarked tolerances, follow the general tolerance table.
- The material must meet the requirements of ROHS2.0+halogen-free+REACH, and there should be no oxidation phenomenon after 48 hours of salt spray test.
- Packaging method: Full page half cut, layout should refer to the requirements of the shell factory, and the recommended weight for release film (transparent film) is $\leq 20g$.



Adhesive backing area



Copper foil area (line)



Black PI cover film



Surface gold plating

Etheta Communication Technology (shenzhen) co. Ltd

		PART NAME: RD022408-3IN-FPC		DATE:	24.06.13
TOLERANCE X.X ± 0.20 .XX ± 0.10 .XXX ± 0.05 ANGULAR $\angle \pm 0.5^\circ$		PART NO: RD022408NB87-3 RD022408NB17-3	DROWN:	Deng Ping	
		MATERIAL: ED	CHECKED:	Yu Jinsheng	
		FINISHING: Au/Ni	APPROVED:	Guan Wei	
UNIT: mm		COLOUR: black	SCALE: 1:1	TER: R:A	

Etheta Communication Technology (shenzhen) co.,Ltd

Final Shipment Inspection Record

Factory number	Customer Model	Product number	client version	Sample delivery date
RD022408-3in1	Venus8.7-WiFi+GPS天线	RD022408NB17-3	/	2024. 6. 19

Size (Unit:MM)

[illegible]

Preparation; Wan

Audit: Zhou Zheng

Focus Size CPK Report

Etheta Communication Technology (shenzhen) co.,Ltd

[illegible]

Nickel and Gold Thickness Measurement Report

Customer	Yidao	DateCode	/	PartNO	Venus8.7-WiFi+GPS
CJ Ppart NO	RD022408-3in1	SampleSiae	10PCS	DATE	2024.6.19
Requiremment	NickelThickness	GoldThickness		Remark	
	3-8um	>0.03um			
1	5.336	0.048			
2	5.495	0.056			
3	5.406	0.056			
4	5.300	0.060			
5	5.355	0.048			
6	5.325	0.042			
7	5.202	0.044			
8	5.281	0.042			
9	5.260	0.045			
10	5.293	0.045			
MAX	5.495	0.060			
MIN	5.202	0.042			
AVG	5.329	0.049			
Disposition	ACC	ACC			

Disposition: ☒Accept ☐Reject

Preparation; Wang Qin

Audit: Zhou Zheng

Packaging Practice

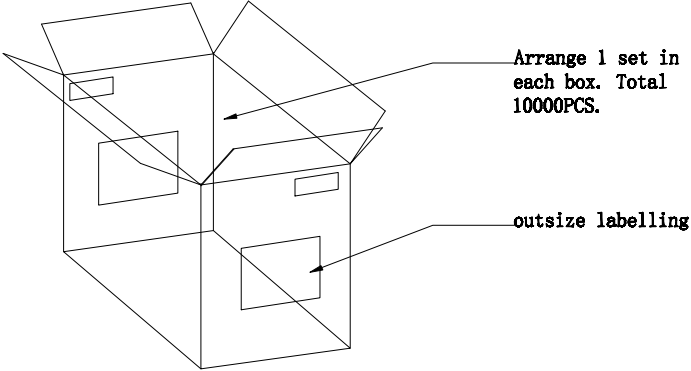
Customer:TCL Package Name: Venus8.7-WiFi+GPS Packaging code: RD022408NB87-3 Packaging Version:R:A

Package material details	No.	name of product	Specification	dosage	Packaging product illustration
		Semi-Cut Packaging	300*195mm		
	C009	Inner box labelling	80*60mm	1/1000	
	B018	Carton Boxes	325*215*210mm	1/10000	
	C001	ROHS labelling	30*20mm	1/10000	



operating procedure	1. Prepare the required packages and place them in a position favourable to work.	delivery label	现品票标签			
	2. Packed in cartons (B018) according to RD022408; half-cut. 260*260=252PCS/sheet*39+172PCS=10000PCS Each PE bag is labelled with C001(ROHS) in the upper right corner.		客 户			
	3. 10,000PCS per carton. After filling the carton, seal the carton with transparent tape and stick a label on one side of the carton, and fill in the total quantity on the C009 label.		客户P/O		客户P/N	
	4. Require the packer to carefully review the quantity of each bag before operation to prevent short shipment.		规格型号		物料名称	
			物料编码		数 量	
caveat	1. Operators should wear gloves.		出厂日期		批 次	
	2. Pay attention to the number of boxes, not more, less. The last number of boxes should be specified(i.e. green 'end number' labels on the top left corner of both sides of the carton to differentiate).		供 应 商	深圳市睿德通讯科技有限公司		
	3. Cartons should not be stacked too high (within three layers) to prevent deformation under heavy pressure.		备注: (空)	品质检验:		

illustrate	Half-cut package size: 260*260=252PCS/sheet	ROHS labelling:	
	Carton size:		



Criteria	Audit	Production	Date
Ma Chao	Liu Fei Ming	Liu Qi Fu	2024. 06. 19

Salt spray test report

our customers	Yidao	Surface treatment type	/
model number	Venus8.7-WiFi+GPS天线	sample size	5PCS
Test standard: APC-TM-650			
Salt Spray Test Specifications	NSS Neutral Salt Spray Test	solution value	5%NaCl
atmospheric pressure	1Mpa	Temperature of Salt Spray Chamber	47℃
Spraying method	contiguity	Salt spray deposition number (h.80cm)	2ml
Hydrochloric Acid Ingredients	NSS	Material	FPC
Remarks: Commonly used salt spray test methods are: NSS neutral salt spray test: AASS Acidic Salt Spray Test (add glacial acid to NSS neutral salt spray test to adjust PH=3.0 3.3) CASS ketoacid accelerated test (add 0.26g/L copper chloride to NSS neutral salt spray test solution)			
Test results:			
Spray start time	2024.6.13	Test end time	2024.6.15
Test observation date	Test Observation Time	observation of phenomena	
2024.6.13	16:25	The boards are checked and entered into the lab without any abnormalities	
2024.6.14	16:25	Continuous spraying for 24h without any abnormality	
2024.6.15	16:25	Continuous spraying for 48h without any abnormality	
			in the end
			PASS

Preparation; Wang Qin

Audit: Zhou Zheng

Harmful material questionnaire

No.	Parts Name	Part Number	Vendor Part Number	Disassembly Unit/component description (e.g. Resistor, Capacitor, Inductor)	Substance Name (e.g. Copper (Cu))	CAS No	Content (%)	Lab analysis	Test report No	Test report date	*The test items of the report (unit: ppm)																ICP Data	MSDS																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
											Cd	Pb	Hg	Cr+6	PBB	PBDE	Br	Cl	As	Be	PFOS	PFOA	BBP	DBP	DEHP	DIBP																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
1				Half to half adhesive of epoxy resin copper electrolytic	Polyimide film Copper foil Halogen-free adhesive of epoxy resin Bisphenol-A type rubber Curing agent PI Film Bisphenol-A type epoxy resin ATH	25038-81-7 7440-50-8 Trade secret 25085-99-8 9003-18-3 80-08-0 62929-02-6 61788-97-4 21645-51-2	13.00% 55.00% 16.00% 6.45% 8.25% 1.29% 44.50% 22.59% 8.87%	CTI CTI CTI CTI CTI SGS SGS SGS	A2240082746101006E	2024.3.1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND</