



PRODUCT SPECIFICATION

TITLE

4 IN 1 EXTERNAL ANTENNA

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2144500750	Cooper Zhou	Andy Zhang	Horace Ma

4IN1 INTERNAL ANTENNA

1.0 SCOPE

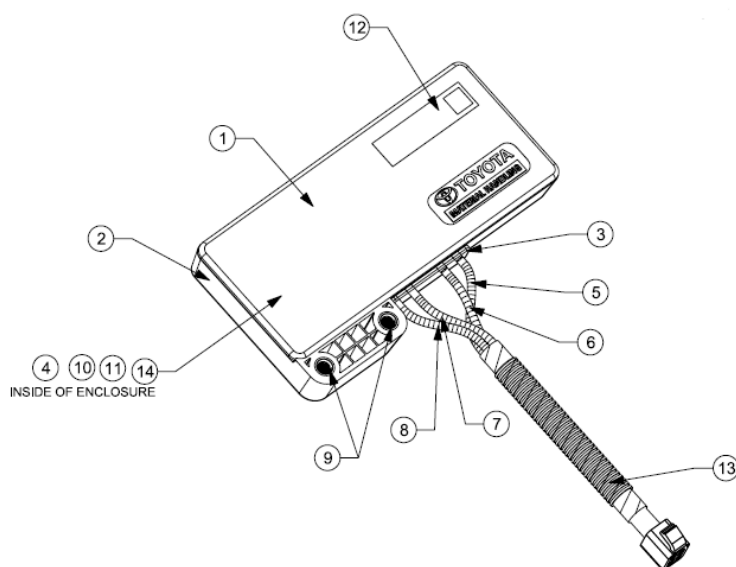
This Product Specification covers the mechanical, electrical and environmental performances specification for 4in1 external antenna.

2.0 PRODUCT DESCRIPTION

Series 214450 is 4 in 1 external antenna including 2x LTE, WIFI and GNSS.

FEATURES

- Antenna Size:155x65x20mm
- Connector options: AMP Mini-Fakra
- RoHS Compliant

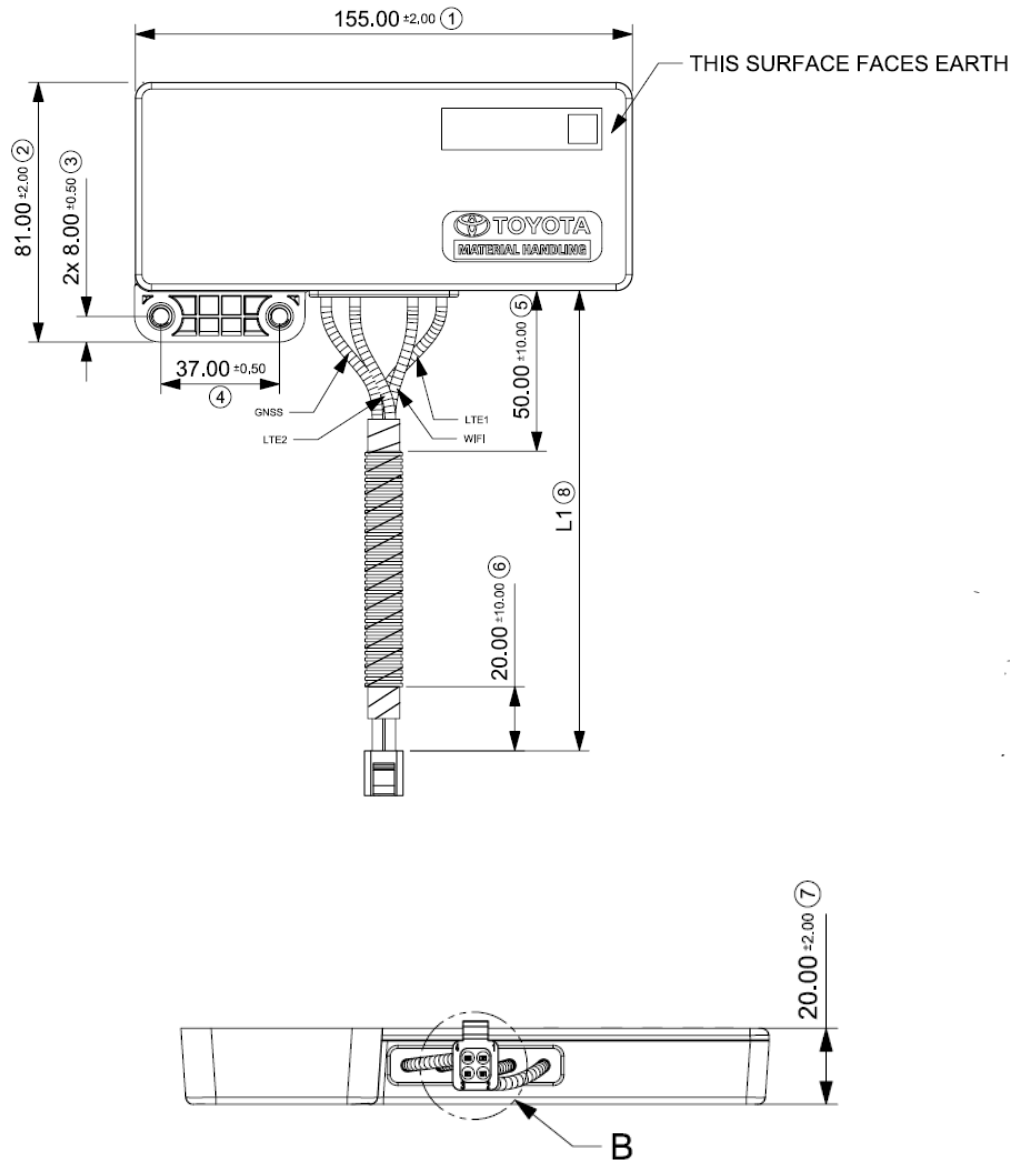


Antenna 3D VIEW

ITEM	DESCRIPTION	MATERIAL	QTY	NOTES
1	TOP COVER	PC,BLACK	1	
2	BOTTOM HOUSING	PC,BLACK	1	
3	SIDE CAP FOR 4 IN 1	SILICONE ,BLACK	1	
4	4 IN 1 PCB	FR4	1	INSIDE OF ENCLOSURE
5	CABLE1 FOR 4 IN 1 LTE1	KARBLE302 CABLE, SEALED MINI-QUAD-FAKRA (Amphenol #FM4-NZSJ-C30E0)	1	CABLE LENGTH CONFIGS PER TABLE IN SHEET2
6	CABLE2 FOR 4 IN 1 WIFI		1	
7	CABLE3 FOR 4 IN 1 LTE2		1	
8	CABLE4 FOR 4 IN 1 GNSS		1	
9	SCREW M6X1	BRASS,NI PLATED	2	
10	GNSS ANT WITH ADHESIVE-17DB	CERAMIC+FR4+,COMPONENTS+VHB	1	INSIDE OF ENCLOSURE
11	SHIELDING FOR GNSS	SPT	1	INSIDE OF ENCLOSURE
12	ANT TRACKER LABEL	PET	1	
13	SLIT CORRUGATED TUBE + TAPE	CONDUIT: NYLON,TAPE:PVC	1	
14	GNSS SUPPORT	FOAM	1	

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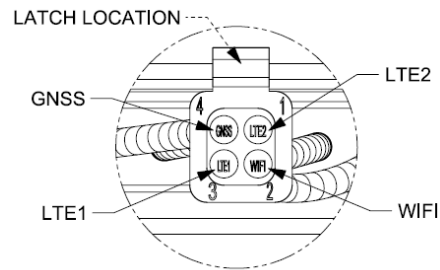
PRODUCT STRUCTURE INFORMATION



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PRODUCT SPECIFICATION

PORT DEFINITION FOR MINI FAKRA



CODE IN 4-IN-1 FAKRA	ANT PORT
1	LTE2(DIV)
2	WIFI
3	LTE1(PRI)
4	GNSS

DETAIL B
SCALE 2:1

ANTENNA CONFIGS PER CABLE LENGTH AS BELOW			
CONFIGS	TOYOTA PN	MOLEX PN	ASSY CABLE LENGTH "L1"(MM)
1	57300-H1TY1-71-B	2144500750	750+20/-5
2	57310-H1TY1-71-B	2144501600	1600+20/-5
3	57320-H1TY1-71-B	2144502300	2300+23/-6.9
4	57330-H1TY1-71-B	2144502500	2500+25/-7.5
5	57340-H1TY1-71-B	2144502700	2700+27/-8.1
6	57350-H1TY1-71-B	2144503800	3800+38/-11.4
7	57360-H1TY1-71-B	2144502000	2000+20/-5

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PRODUCT SPECIFICATION

3.0 GENERAL SPECIFICATION

Product name	4 in 1 external antenna
Frequency	LTE1: 698-960MHz/1710-2690MHz LTE2: 698-960MHz/1710-2690MHz WIFI: 2400-2500MHz/5150-5850MHz GNSS: 1561-1602MHz
Polarization	Linear/RHCP
Operating with matching	-40°C to 85°C
Storage with matching	-40°C to 85°C
RF Power	2 Watts
Impedance with matching	50 Ohms
Cable	Karble 302 (Ø3.30mm)
Connector type	SMA STRAIGHT CABLE PLUGS (MALE)

4.0 ANTENNA PERFORMANCE(TYPICAL)

All measurements are done of the antenna in free space with VNA Agilent E5071C and Over-The-Air (OTA) chamber. All measurements in this document are done with Karble 302 cable length of 0.75m.

Description	Equipment	LTE1 Antenna (Cable Length:0.75m)			
Frequency Range	VNA E5071C	698-960MHz	1710-2170MHz	2300-2400MHz	2500-2690MHz
Return Loss	VNA E5071C	< -5 dB	< -5 dB	< -5 dB	< -5 dB
Peak Gain	OTA Chamber	2.6dBi	3.3dBi	2.7dBi	2.0dBi
Average Total Efficiency	OTA Chamber	50%	55%	47%	42%
Polarization	OTA Chamber	Linear			
Input Impedance	VNA E5071C	50 ohms			

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PRODUCT SPECIFICATION

Description	Equipment	LTE2 Antenna (Cable Length:0.75m)			
Frequency Range	VNA E5071C	698-960MHz	1710-2170MHz	2300-2400MHz	2500-2690MHz
Return Loss	VNA E5071C	< -5 dB	< -5 dB	< -5 dB	< -5 dB
Peak Gain	OTA Chamber	2.5dBi	2.6dBi	1.8dBi	2.0dBi
Average Total Efficiency	OTA Chamber	50%	48%	46%	36%
Polarization	OTA Chamber	Linear			
Input Impedance	VNA E5071C	50 ohms			

Description	Equipment	WIFI Antenna (Cable Length:0.75m)	
Frequency Range	VNA E5071C	2400-2500MHz	5150-5850MHz
Return Loss	VNA E5071C	< -5 dB	< -5 dB
Peak Gain	OTA Chamber	2.7dBi	2.0dBi
Average Total Efficiency	OTA Chamber	51%	41%
Polarization	OTA Chamber	Linear	
Input Impedance	VNA E5071C	50 ohms	

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GNSS Patch Antenna (Typical)				
1	Frequency Range	1561.098±2.046 MHz	1575.42±1.023 MHz	1602±5 MHz
2	Return Loss	≤-6dB		
3	Impedance	50 Ohm		
4	Peak Gain	2.5dBi	0.4dBi	2.2dBi
5	Efficiency	55%	40%	50%
6	Polarization	RHCP		
GNSS LNA (Cable Length:0.75m)				
1	Frequency Range	1561.098±2.046 MHz	1575.42±1.023 MHz	1602±5 MHz
2	DC Voltage	3 to 5.5V		
3	Gain	27.5±3dB		
4	VSWR	≤2.0		
5	Noise Figure	≤2.5dB		
6	DC Current	9±3mA (at 3.3V)		
7	Out-of-Band Attenuation	500-1300MHz	>45dB	
		1300-1400MHz	>30dB	
		1700-3600MHz	>40dB	
		3600-6000MHz	>45dB	

GNSS Cable Length(meter)	0.75	1.6	2	2.3	2.5	2.7	3.8
GNSS LNA Gain with cable (dB)	27.5±3	26.9±3	26.6±3	26.4±3	26.3±3	26.1±3	25.3±3

Note that the above antenna performance is measured in free space with VNA Agilent E5071C and Over-The-Air (OTA) chamber. When implement into the system, the frequency resonant might be off-tune due to the loading of surrounding components especially metal plane.

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