

CONFIDENTIAL

Technical Data Sheet for BLE

Measurement result(3D)

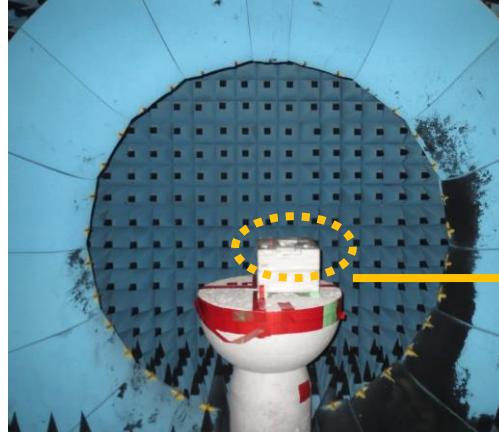
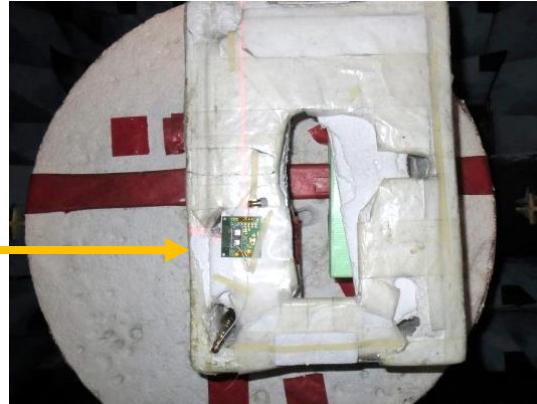
Kanazawa Murata Mfg. Co., Ltd
Antenna Technical Support Section



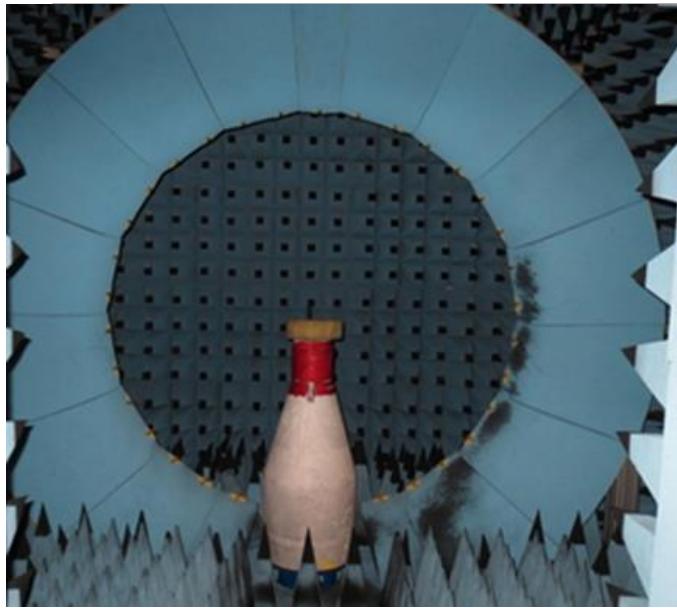
Test method for antenna gain measurement

Model Name	Type2DK_BLE_ANT
Frequency Range	2400~2484MHz
Antenna type	$\lambda/4$ Monopole Antenna
Antenna gain(dBi)	BLE: -4.8
External photo	

Test method for antenna gain measurement

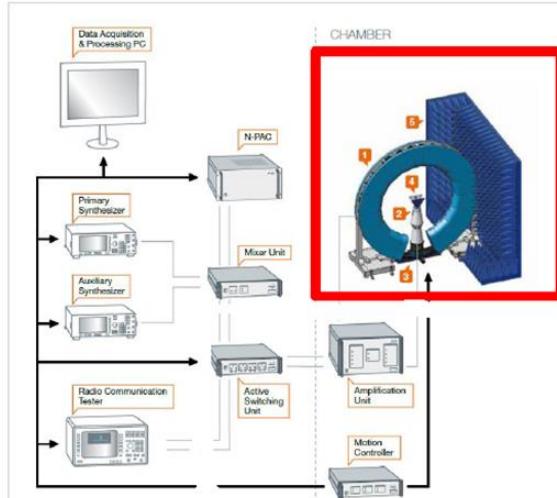
Test method	Standard antenna method (comparative method) * Comparing a measured antenna to a standard antenna with a known gain factor	
Equipment used for antenna gain measurement	Model name	Measurement system : Microwave Vision Group (former SATIMO) SG32 (details next page) Equipment PAC E4438C E4428C
	Serial number	PAC : MW 000021H-0068 E4438C : MY45090139 E4428C : MY45280466
	Calibration date	October 18, 2022
Antenna gain measurement date	December 13, 2022	
Measurement person	Harumi Matsuoka	
Setup photo	 	

Details of SG32



Anechoic chamber size		Approximately 3.5m x 3.5m x 3m (H)		
Frequency band		800~6000MHz (18~40GHz compatible with Option)		
Measurement time		Elevation 1 cut	Real time	
Measurement time		Global surface measurement	< Approx. 20 seconds (when measuring 10 frequencies)	
Measurement uncertainty		Peak gain	< +/-0.75dB (1.0~6.0GHz) < +/-1.0dB (0.8~1.0GHz)	
Dynamic range		Low gain	< +/-2dB (@-20dB from peak)	
Cross Polar Isolation		70dB		
DUT size		0.8 GHz 75 cm	1.8 GHz 75 cm	2.5 GHz 65 cm
		6 GHz 30 cm		

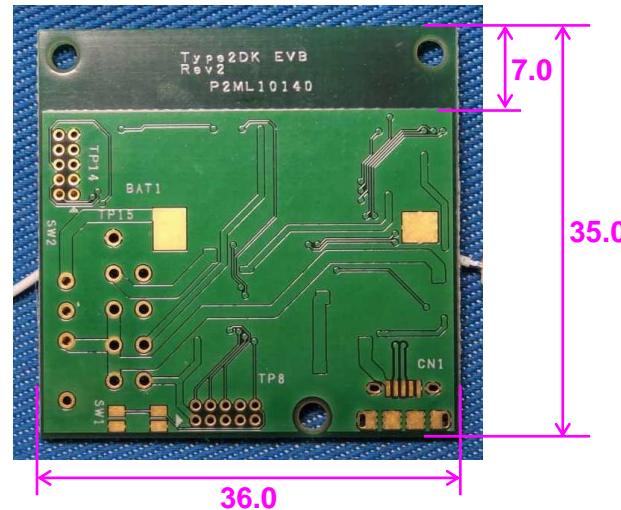
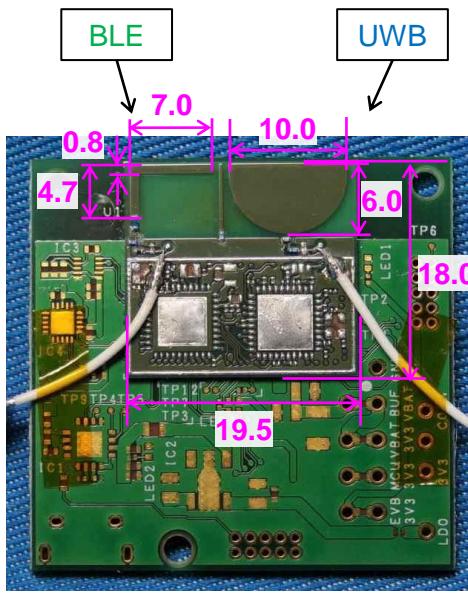
System overview



Peak gain variation is secured within ± 0.75 dB by system calibration.

1. Appearance
2. Measurement condition
3. Measurement result

1. Appearance



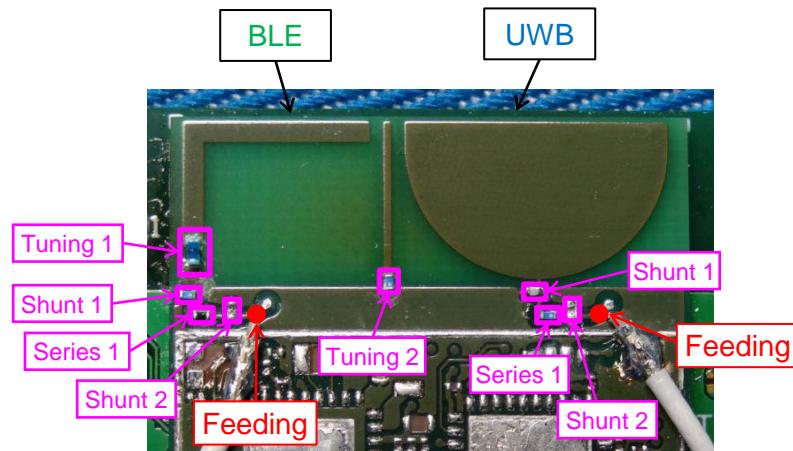
UNIT : mm

2. Measurement condition

Condition	Memo	Antenna	Tuning 1	Tuning 2	Matching circuit		
					Shunt 1	Series 1	Shunt 2
Condition 1	Optimized matching	BLE	2.9nH	8.2nH	2.4nH	0ohm	None
					0.1pF	0.6nH	None

Size:1005 LQW15AN

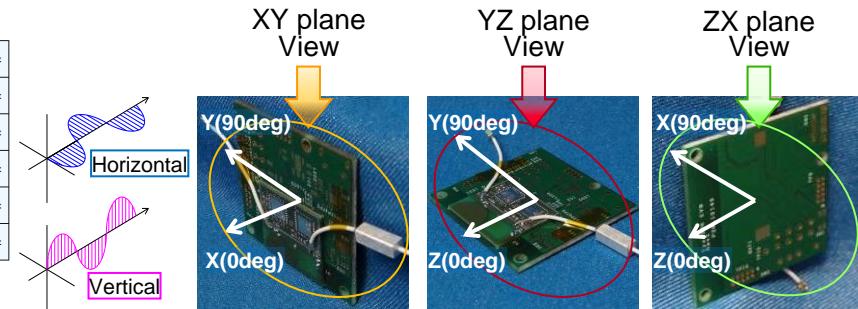
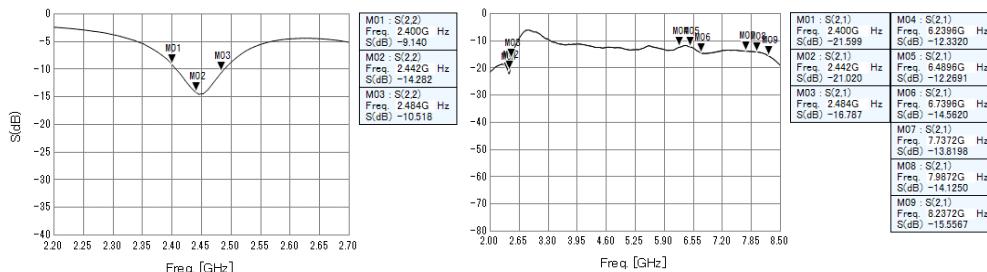
Size:0603 LQP03 / GRM03 / Resistor



3. Measurement result

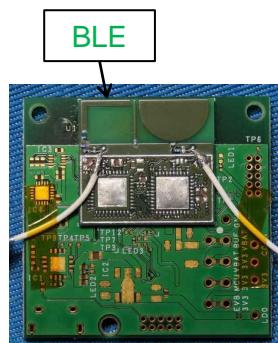
Condition 1: Optimized matching(BLE)

<Return Loss>



<Efficiency>

LINEAR POLARIZATION		XY-plane		YZ-plane		ZX-plane		Total Efficiency
		hor.	ver.	hor.	ver.	hor.	ver.	
2400 MHz	MAX.	-11.2	-5.0	-5.2	-19.2	-8.7	-9.3	-7.6
	AVE.	-14.3	-7.1	-8.2	-23.0	-12.1	-11.2	
2442 MHz	MAX.	-9.1	-4.8	-4.8	-17.3	-8.5	-9.0	-7.4
	AVE.	-13.6	-6.9	-7.9	-21.4	-12.0	-11.1	
2484 MHz	MAX.	-9.2	-5.7	-5.7	-16.9	-9.5	-9.0	-8.0
	AVE.	-13.3	-7.9	-8.4	-20.7	-13.0	-11.1	



<Directivity>

