



## RAPPORTO DI PROVA

### TEST REPORT

Rif. / Ref. n.	<b>MPETR_183527-0</b>	Data / Date:	<b>26/10/2023</b>	Pagine / Pages:	<b>11</b>
Scopo delle prove Test object	Prove di tipo in accordo alla Norma Type test according to standards <b>FCC Cfr 47 part 2 - §2.1093</b>				
Richiedente Applicant	<b>DATALOGIC S.r.l.</b> Via S. Vitalino 13 - 40012 Lippo Di Calderara Di Reno - Bologna - Italy Phone. +39 051 3147196 Fax +39 051 3147561				
Marchio commerciale Trade mark					
Fabbricante Manufacturer	DATALOGIC S.r.l.				
Prodotto Product	Bluetooth radio module				
Modello testato Testing model	<b>BT-MRY-A1</b>				
Identificativo FCC FCC ID	<b>U4FBT-MRY-A1</b>				
Data ricevimento campioni Date of test samples receipt	02/10/2023				
Campioni verificati No. of tested samples	1 – Sampled by the manufacturer				
Data verifiche Testing date	From 02/10/2023 to 10/10/2023				
Sito di prova Testing site	PRSLAB S.r.l. Unipersonale - Via Campagna 92 - 22020 Faloppio - Como - Italy				
Esito delle valutazioni Assessment results	<b>CONFORME / COMPLIANT</b>				
Verifiche effettuate da Verifications carried out by	<b>Daniele AOSANI</b> Tecnico laboratorio EMC & RADIO EMC & RADIO Test Engineer				
Approvato Approved by	<b>Riccardo PFEIFFER</b> Responsabile laboratori EMC & RADIO EMC & RADIO Laboratory manager				

I risultati delle prove riportati nel presente rapporto di prova si riferiscono solo ai campioni esaminati.

The test results reported in this test report shall refer only to the samples tested.

Questo Report non può essere riprodotto in modo parziale, salvo espressa autorizzazione scritta da parte del Laboratorio

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## 0. RELEASE CONTROL RECORD


TEST REPORT NUMBER	REASON OF CHANGE	DATE OF ISSUE
MPETR_183527-0	Original Release	26/10/2023

## 1. TECHNICAL INFORMATION OF EQUIPMENT UNDER TEST (EUT)

### 1.1 EUT Identification

<b>DESCRIPTION</b>	Bluetooth radio module
<b>MODEL NAME</b>	BT-MRY-A1
<b>FCC ID</b>	U4FBT-MRY-A1
<b>SERIAL NO.</b>	B23PAAGRU
<b>PRSLAB INTERNAL REFERENCE</b>	BC 264/2023 3/4
<b>TRADEMARK</b>	
<b>MANUFACTURER</b>	DATALOGIC S.r.l.
<b>COUNTRY OF MANUFACTURER</b>	Italy
<b>SINGLE UNIT OR SYSTEM</b>	Single
<b>POWER SOURCE</b>	DC power from board
<b>SUPPLY VOLTAGE</b>	1.8Vdc  3.3Vdc 
<b>MAX POWER OR MAX ABSORBED CURRENT</b>	70mA
<b>OPERATING TEMPERATURE</b>	-30°C ~ +85°C
<b>HARDWARE VERSION</b> (Information provided by Customer)	A
<b>FIRMWARE VERSION</b> (Information provided by Customer)	A
<b>DIMENSIONS</b>	See photographic documentation
<b>EUT STANDING</b>	<input checked="" type="checkbox"/> WALL; <input type="checkbox"/> CEILING; <input checked="" type="checkbox"/> TABLE; <input type="checkbox"/> FLOOR; <input type="checkbox"/> RACK MOUNTED; <input type="checkbox"/> BODY WORN; <input type="checkbox"/> HANDELD; <input checked="" type="checkbox"/> PORTABLE; <input type="checkbox"/> MOBILE
<b>HIGHEST INTERNAL FREQUENCY</b> (Information provided by Customer)	<input type="checkbox"/> <108MHz; <input type="checkbox"/> 108MHz<F<500MHz; <input type="checkbox"/> 500MHz<F<1GHz; <input checked="" type="checkbox"/> F>1GHz; F = 2480MHz

## 1.2 Classic BT Module technical data


<b>MODULE MANUFACTURER</b>			
<b>CHIP MANUFACTURER</b>	CYPRESS		
<b>CHIP TYPE</b>	CYW20706		
<b>ETS CATEGORY</b>	Classic Bluetooth - Basic Rate & Enhanced Data Rate		
<b>TYPE OF RADIO DEVICE</b>	Transceiver		
<b>FREQUENCY BAND</b>	2400 – 2483.5MHz		
<b>NUMBER OF CHANNELS</b>	79		
<b>CHANNEL BANDWIDTH</b>	1MHz		
<b>CHANNEL SPACING</b>	1MHz		
<b>MODE</b>	Basic Rate mode (BR)		Enhanced Data Rate (EDR)
<b>TYPE OF MODULATION</b>	GFSK	$\pi/4$ -DQPSK	8DQPSK
<b>PACKET TYPE</b>	DH5	2DH5	3DH5
<b>SENSITIVITY</b>	-89.5dBm		
<b>TRANSFER RATES (Mbit/s)</b>	Up to 3		
<b>ANTENNA TYPE</b> (Information provided by Customer)	PCB Antenna		
<b>ANTENNA GAIN</b> (Information provided by Customer)	+0.5dBi		

### 1.2.1 Classic Bluetooth Channels list

CHANNEL	FREQUENCY	CHANNEL	FREQUENCY	CHANNEL	FREQUENCY	CHANNEL	FREQUENCY
0	2402	20	2422	40	2442	60	2462
1	2403	21	2423	41	2443	61	2463
2	2404	22	2424	42	2444	62	2464
3	2405	23	2425	43	2445	63	2465
4	2406	24	2426	44	2446	64	2466
5	2407	25	2427	45	2447	65	2467
6	2408	26	2428	46	2448	66	2468
7	2409	27	2429	47	2449	67	2469
8	2410	28	2430	48	2450	68	2470
9	2411	29	2431	49	2451	69	2471
10	2412	30	2432	50	2452	70	2472

11	2413	31	2433	51	2453	71	2473
12	2414	32	2434	52	2454	72	2474
13	2415	33	2435	53	2455	73	2475
14	2416	34	2436	54	2456	74	2476
15	2417	35	2437	55	2457	75	2477
16	2418	36	2438	56	2458	76	2478
17	2419	37	2439	57	2459	77	2479
18	2420	38	2440	58	2460	78	2480
19	2421	39	2441	59	2461		

### 1.3 Bluetooth Low Energy module technical data

<b>MODULE MANUFACTURER</b>	
<b>CHIP MANUFACTURER</b>	CYPRESS
<b>CHIP TYPE</b>	CYW20706
<b>ETS CATEGORY</b>	Bluetooth Low Energy
<b>TYPE OF RADIO DEVICE</b>	Transceiver
<b>FREQUENCY BAND</b>	2400 – 2483.5MHz
<b>NUMBER OF CHANNELS</b>	40
<b>CHANNEL BANDWIDTH</b>	2MHz
<b>CHANNEL SPACING</b>	2MHz
<b>TYPE OF MODULATION</b>	GFSK
<b>SENSITIVITY</b>	-96.5dBm
<b>TRANSFER RATES (Mbit/s)</b>	Up to 1
<b>ANTENNA TYPE</b> (Information provided by Customer)	PCB Antenna
<b>ANTENNA GAIN</b> (Information provided by Customer)	+0.5dBi

#### 1.3.1 Channel List Bluetooth Low Energy

CHANNEL	FREQUENCY	CHANNEL	FREQUENCY	CHANNEL	FREQUENCY	CHANNEL	FREQUENCY
37	2402	9	2422	18	2442	28	2462
0	2404	10	2424	19	2444	29	2464
1	2406	38	2426	20	2446	30	2466
2	2408	11	2428	21	2448	31	2468
3	2410	12	2430	22	2450	32	2470
4	2412	13	2432	23	2452	33	2472
5	2414	14	2434	24	2454	34	2474
6	2416	15	2436	25	2456	35	2476
7	2418	16	2438	26	2458	36	2478
8	2420	17	2440	27	2460	39	2480

## 1.4 Ports identification

PORT	DESCRIPTION	CONNECTION	NOTES
<input type="checkbox"/> Enclosure	Electronic board	---	---
<input type="checkbox"/> AC power port	Port not present	---	---
<input checked="" type="checkbox"/> DC power port	1.8Vdc	Strip	<3m
<input type="checkbox"/> Signal/control port	Port not present	---	---
<input type="checkbox"/> Telecommunication port	Port not present	---	---
<input type="checkbox"/> Antenna port	<input checked="" type="checkbox"/> Internal; <input type="checkbox"/> External	---	---

Note: During the tests all cables must be what provided the manufacturer or the same that used in the real employment of the EUT.

## 1.5 Modifications incorporated in E.U.T.

The following items are the modifications introduced in the equipment under test:

- None

## 1.6 Auxiliary equipment

- Auxiliary laboratory laptop to set radio channels.
- Auxiliary Board used to supply radio module and communicate with it.

## 2. REFERENCE STANDARDS

REFERENCE STANDARD	
<b>Title 47 Part 1 Subpart I § 1.1310</b>	Procedures Implementing the National Environmental Policy Act of 1969. Radiofrequency radiation exposure limits.
<b>Title 47 Part 2 Subpart J § 2.1093</b>	Radiofrequency radiation exposure evaluation: portable devices.
<b>ANSI C63.4</b>	American National Standard for Methods of Measuring of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz – 40 GHz
<b>KDB 447498 D01 v06</b>	RF EXPOSURE PROCEDURES AND EQUIPMENT AUTHORIZATION POLICIES FOR MOBILE AND PORTABLE DEVICES



## 3. MEASUREMENTS AND CALCULATION RESULTS

### 3.1 SAR exemption

This device has been excluded from SAR testing based on source-based time-averaged conducted output power and KDB 447498 D01 section 4.3.1 1). This document serves as the RF exposure exhibit in the FCC Form 731 application in lieu of a SAR report.

### 3.1 Operational Description

The **Module** is a communication device based on Bluetooth technology intended to be used in multiple portable applications. It is necessary a calculation for portable use demonstrating that the transmitter can be excluded from SAR testing.

### 3.2 RF Exposure Conditions

The device is intended for use as portable.

### 3.3 RF Output Power

TX frequency Range: 2400-2480MHz

Max measured EIRP with PCB Antenna (BT Low Energy): 4.91 dBm (3.1mW)

Max measured EIRP with PCB Antenna (BT Classic): 5.68 dBm (3.7mW)

Tune Up Tolerance:  $\pm 1$ dB

### 3.4 FCC Calculation method and limits

SAR Test Exclusion Thresholds:

$[(\text{max. power of channel, including tune-up tolerance, mW}) / (\text{min. test separation distance, mm})] \cdot [\sqrt{f(\text{GHz})}] \leq 3.0$  (for 1-g body SAR) or  $7.5$  (for 10-g extremity SAR)

where respectively

- $f(\text{GHz})$  is the RF channel transmit frequency in GHz
- Power and distance are rounded to the nearest mW and mm before calculation
- The result is rounded to one decimal place for comparison

### 3.5 FCC Calculation results

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Measured Output Power (included tune up tolerance): 4.6mW  
Min Test separation distance: 5mm  
f: 2440MHz (as worst case)

Exclusion Threshold Extremity SAR: 7.5 (10-g extremity SAR)

$$\frac{4.6mW}{5mm} * \sqrt{2.44} = 1.43 \leq 7.5$$

Exclusion Threshold body: 3 (10-g extremity SAR)

$$\frac{4.6mW}{5mm} * \sqrt{2.44} = 1.43 \leq 3$$

**RESULT: The device is excluded from SAR testing.**

**END OF TEST REPORT**