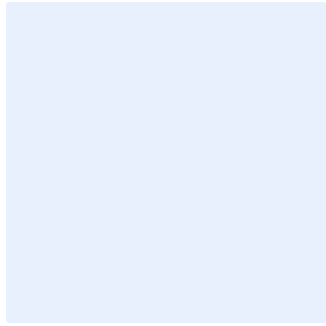


Prüfbericht-Nr.: <i>Test report no.:</i>	IN2500H5 001	Auftrags-Nr.: <i>Order no.:</i>	146989299 0010	Seite 1 von 3 Page 1 of 3	
Kunden-Referenz-Nr.: <i>Client reference no.:</i>	2339983	Auftragsdatum: <i>Order date:</i>	2024-11-26		
Auftraggeber: <i>Client:</i>	MOMAGIC TECHNOLOGIES PRIVATE LIMITED 206, FF, PLOT NO. 190-191, NEELKANTH PALACE, 252-A, SANT NAGAR, NEW DELHI 110 065.				
Prüfgegenstand: <i>Test item:</i>	TW1318 BLE MODULE				
Bezeichnung <i>Identification</i>	TW1318	Serien -Nr.: <i>Serial no.:</i>	TW02AC000025010000001		
Auftrags-Inhalt: <i>Order content:</i>	Maximum Permissible Exposure				
Prüfgrundlage: <i>Test specification:</i>	FCC 1.1310 KDB 447498 D01				
Wareneingangsdatum: <i>Date of sample receipt:</i>	2024-12-02				
Prüfmuster-Nr.: <i>Test sample no:</i>	A003878404-001 A003878404-002				
Prüfzeitraum: <i>Testing period:</i>	2024-12-06 - 2024-12-09				
Ort der Prüfung: <i>Place of testing:</i>	Wireless laboratory, Bangalore				
Prüflaboratorium: <i>Testing laboratory:</i>	TÜV Rheinland (India) Pvt. Ltd. 27/B, 2nd cross road, Electronic city Phase1, Bangalore-560100, India FCC Test Site Registration No: 496599				
Prüfergebnis*: <i>Test result*:</i>	Pass				
geprüft von: <i>tested by:</i>	genehmigt von: <i>authorized by:</i>				
Datum: <i>Date:</i> 2025-01-20	Ausstellatum: <i>Issue date:</i> 2025-01-21				
Stellung / Position:	Likhithesh M D Senior Engineer	Stellung / Position:	Madhu K.N Assistant Manager		
Sonstiges / Other:	FCC ID: 2A2OT-TW1318				
Zustand des Prüfgegenstandes bei Anlieferung: <i>Condition of the test item at delivery:</i>	Prüfmuster vollständig und unbeschädigt <i>Test item complete and undamaged</i>				
* Legende:	1 = sehr gut	2 = gut	3 = befriedigend	4 = ausreichend	5 = mangelhaft
	P(ass) = entspricht o.g. Prüfgrundlage(n)	F(ail) = entspricht nicht o.g. Prüfgrundlage(n)	N/A = nicht anwendbar	N/T = nicht getestet	
* Legend:	1 = very good	2 = good	3 = satisfactory	4 = sufficient	5 = poor
	P(ass) = passed a.m. test specification(s)	F(ail) = failed a.m. test specification(s)	N/A = not applicable	N/T = not tested	
Dieser Prüfbericht bezieht sich nur auf das o.g. Prüfmuster und darf ohne Genehmigung der Prüfstelle nicht auszugsweise vervielfältigt werden. Dieser Bericht berechtigt nicht zur Verwendung eines Prüfzeichens. <i>This test report only relates to the a. m. test sample. Without permission of the test center this test report is not permitted to be duplicated in extracts. This test report does not entitle to carry any test mark.</i>					

V05

1 RF Exposure Report

1.1 RF Exposure Measurement

The limit for Maximum Permissible Exposure (MPE) specified in FCC 1.1310. The gain of the antennas used in the product is extracted from the Antenna data sheets provided and also the maximum total power input to the antenna is measured. Through the Friis transmission formula and the maximum gain of the antenna, we can calculate the distance, away from the product, where the limit of MPE is reached.

Although the Friis Transmission formula is far field assumption, the calculated result of that is an over-prediction for near field power density. It is taken as worst case to specify the safety range.

1.2 RF Exposure Limit

1.2.1 For FCC

According to FCC 1.1310: The criteria listed in the following table shall be used to evaluate the environmental impact of the human exposure to radio-frequency (RF) radiation as specified in 1.1307 (b) showed in Table 1.

Table 1: Limits for Maximum Permissible Exposure (MPE) as per FCC

Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm ²)
Limits for Occupational / controlled Exposures			
300 - 1500	--	--	F/300
1500 – 100000	--	--	5.0
Limits for General population / Uncontrolled Exposure			
300 - 1500	--	--	F/1500
1500 – 100000	--	--	1.0

F or f = Frequency in MHz

1.2.2 Friis Formula

Friis Transmission Formula: $P_d = (P_{out} * G) / (4 * \pi * r^2)$

Where

P_d = power density in mW/cm²

P_{out} = output power to antenna in mW

G = gain of antenna in linear scale

π = 3.1416

R = Distance between observation point and the center of radiator in cm

If we know the maximum gain of the antenna and the total output power to the antenna, through calculation, we will know MPE value at distance 20 cm.

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1.3 Compliance criteria

The Radio frequency Human Exposure Evaluation specification, method, and procedures for **TW1318 BLE MODULE** is in accordance with the following standard **FCC 1.1310**.

1.4 Test Results

Protocol: BLE

Data Rate: 1Mbps

Antenna types	Antenna gain
PCB Antenna	0.5

MPE calculations :

Protocol	Channel Frequency (MHz)	Maximum output power including the Tune-up tolerance (dBm)	Output Power to Antenna (mW)	Antenna gain in linear scale	Power Density (Pd) (mW/cm ²)	FCC Limit (mW/cm ²)
BLE	2440	8.64	7.3113	1.1220	0.0016	1.0

Note:

1. MPE evaluation is performed for 20 cm separation distance.
2. *Note: Manufacturer declared Tune-up tolerance of ± 1 dB is considered in the calculation

1.5 Conclusion:

The Power density of the EUT is less than defined limit as shown above, hence EUT is exempted from routine SAR evaluation.