

Test report No: 4390416.55

TEST REPORT

Electromagnetic Field Exposure (EMF)

Identification of item tested	Split-Type Air-Conditioner	
Trademark	TCL	
Model and /or type reference	TAC-09CHSD/*I3A, TAC-12CHSD/*I3A, TAC-18CHSD/*I3A, TAC-24CHSD/*I3A (* = TP11, TP21, TP31, TP41, TP51, TP61, TP71, TP72, TP81, TP91, TPA1, TPB1, TPC1, TPC2, TPD1, TPD2, TPE1, TPE2, TPG11, TPG21, TPG31)	
Features	220-240 V~, 50 Hz, Class I	
Applicant's name / address	TCL Air Conditioner (Zhong Shan) Co., Ltd. No.59 Nantou Road West, Nantou Town, Zhongshan City, Guangdong, China	
Test method requested, standard	EN 50665: 2017	
Verdict Summary	COMPLIANCE	
Tested by (name / signature)	Kenny Liang	
Approved by (name / signature)	Tim Yan	
Date of issue	2022-10-17	
Report template No	TRF_EMG 2017-06-others	

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GENERAL CONDITIONS

1. This report is only referred to the item that has undergone the test.
2. This report does not constitute or imply on its own an approval of the product by the Certification Bodies or Competent Authorities.
3. This document is only valid if complete; no partial reproduction can be made without previous written permission of DEKRA.
4. This test report cannot be used partially or in full for publicity and/or promotional purposes without previous written permission of DEKRA.
5. This report will not be used for social proof function in China market.

UNCERTAINTY

For all measurements where guidance for the calculation of the instrumentation uncertainty of a measurement is specified in EN 55016-4-2 (CISPR 16-4-2), EN/IEC 61000-4 series or a product standard, the measurement instrumentation uncertainty has been calculated and applied in accordance with these standards.

Uncertainties have been calculated according to the DEKRA internal document. The reported expanded uncertainties are based on a standard uncertainty multiplied by a coverage factor of $k=2$, providing a level of confidence of approximately 95%.

ENVIRONMENTAL CONDITIONS

The climatic conditions during the tests are within the limits specified by the manufacturer for the operation of the EUT and the test equipment. The climatic conditions during the tests were within the following limits:

Ambient temperature	-10 °C – 40 °C
Relative Humidity air	30% - 60%
Atmospheric pressure	86 kPa – 106 kPa

If explicitly required in the basic standard or applied product / product family standard the climatic values are recorded and documented separately in this test report.

POSSIBLE TEST CASE VERDICTS

Test case does not apply to test object	N/A
Test object does meet requirement	P (Pass) / PASS
Test object does not meet requirement	F (Fail) / FAIL
Not measured	N/M

DEFINITION OF SYMBOLS USED IN THIS TEST REPORT

<input checked="" type="checkbox"/> Indicates that the listed condition, standard or equipment is applicable for this report/test/EUT.
<input type="checkbox"/> Indicates that the listed condition, standard or equipment is not applicable for this report/test/EUT.

Decimal separator used in this report	<input checked="checked" type="checkbox"/>	Comma (,)	<input type="checkbox"/>	Point (.)
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ABBREVIATIONS

For the purposes of the present document, the following abbreviations apply:

EUT	: Equipment Under Test
QP	: Quasi-Peak
CAV	: CISPR Average
AV	: Average
CDN	: Coupling Decoupling Network
SAC	: Semi-Anechoic Chamber
OATS	: Open Area Test Site
BW	: Bandwidth
AM	: Amplitude Modulation
PM	: Pulse Modulation
HCP	: Horizontal Coupling Plane
VCP	: Vertical Coupling Plane
U_N	: Nominal voltage
Tx	: Transmitter
Rx	: Receiver
N/A	: Not Applicable
N/M	: Not Measured

DOCUMENT HISTORY

Report nr.	Date	Description
4390416.55	2022-10-17	First release.

REMARKS AND COMMENTS

The equipment under test (EUT) does meet the essential requirements of the stated standard(s)/test(s).

This report for WIFI wireless characteristics.

1 GENERAL INFORMATION

1.1 General Description of the Item(s)

Description of the item	Split-Type Air-Conditioner
Trademark	TCL
Model / Type number	TAC-09CHSD/*I3A, TAC-12CHSD/*I3A, TAC-18CHSD/*I3A, TAC-24CHSD/*I3A (* = TP11, TP21, TP31, TP41, TP51, TP61, TP71, TP72, TP81, TP91, TPA1, TPB1, TPC1, TPC2, TPD1, TPD2, TPE1, TPE2, TPG11, TPG21, TPG31)
Ratings	220-240 V~, 50 Hz, Class I
Manufacturer.....	Same as applicant
Factory	TCL Air conditioner (Zhong Shan) Co., Ltd. No. 59, Nantou Road West, Nantou, Zhongshan, Guangdong, China

Rated power supply	Voltage and Frequency		Reference poles				
			L1	L2	L3	N	PE
	<input checked="" type="checkbox"/>	AC: 220-240 V, 50 Hz	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	<input type="checkbox"/>	AC:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	DC:					
	<input type="checkbox"/>	Battery:					
Clock frequencies	Less than 15MHz						
Mounting position.....	<input type="checkbox"/>	Table top equipment					
	<input type="checkbox"/>	Wall/Ceiling mounted equipment					
	<input checked="" type="checkbox"/>	Floor standing equipment					
	<input type="checkbox"/>	Hand-held equipment					
	<input type="checkbox"/>	Other:					

According to customer's declaration, the products contain RF wireless module(WIFI+BLE) and the characteristics are:

For BLE characteristics:

Operating frequency range(s) – Tx :	2402-2480 MHz
Operating frequency range(s) – Rx :	2402-2480 MHz
Type of Modulation	GFSK
Maximum RF output power	6 dBm
Antenna type.....	Integral Antenna
Antenna gain.....	2,5 dBi
Adaptivity	Adaptive
Geo-location Capability	Not Support
Number of channel.....	40
Operating Temperature Range.....	-10 - +40 °C

For WIFI characteristics:

Operating frequency range(s) – Tx :	2412-2472 MHz
Operating frequency range(s) – Rx :	2412-2472 MHz
Type of Modulation	IEEE 802.11b: DSSS(CCK, DQPSK, DBPSK) IEEE 802.11g: OFDM(64-QAM, 16-QAM, QPSK, BPSK) IEEE 802.11n-HT20: OFDM(64-QAM, 16-QAM, QPSK, BPSK)
Data Rate	IEEE 802.11b: Up to 11 Mbps IEEE 802.11g: Up to 54 Mbps IEEE 802.11n-HT20: Up to MCS7
Geo-location Capability	Not Support
Adaptivity	Adaptive
Maximum RF output power(EIRP) . :	20 dBm
Antenna type.....	Integral Antenna
Antenna gain.....	2,5 dBi
Number of channel.....	IEEE 802.11b: 13 IEEE 802.11g: 13 IEEE 802.11n-HT20: 13
Operating Temperature Range.....	-10 – +40 °C

Intended use of the Equipment Under Test (EUT)
<p>The apparatus as supplied for the test are split type air conditioners which have cooling and heating functions and intended for residential use. The products contain electronic control circuitry and earth connection.</p> <p>Models TAC-09CHSD/*I3A, TAC-12CHSD/*I3A, TAC-18CHSD/*I3A, TAC-24CHSD/*I3A have similar construction except for the size and components. In the model name, * = TP11, TP21, TP31, TP41, TP51, TP61, TP71, TP72, TP81, TP91, TPA1, TPB1, TPC1, TPC2, TPD1, TPD2, TPE1, TPE2, TPG11, TPG21, TPG31 which indicates different panel of indoor unit.</p> <p>Hence, model TAC-09CHSD/ TP11I3A was chosen for full test and the corresponding data are also representative for other models as well.</p>

Copy of marking plate:
<p>The artwork below may be only a draft. The use of certification marks on a product must be authorized by the respective NCBs that own these marks.</p> <p>Not provided.</p>

1.2 Test data

Test Location	DEKRA Testing and Certification (Shanghai) Ltd. Guangzhou Branch Block 5, No.3, Qiyun Road, Huangpu District, Guangzhou, Guangdong, China
Date of receipt of test item	2022-05-26
Date (s) of performance of tests	2022-05-26 to 2022-07-27

1.3 The environment(s) in which the EUT is intended to be used

The equipment under test (EUT) is intended to be used in the following environment(s):

<input checked="" type="checkbox"/>	Residential (domestic) environment.
<input checked="" type="checkbox"/>	Commercial and light-industrial environment.
<input type="checkbox"/>	Industrial environment.

2 DESCRIPTION OF TEST SETUP

2.1 Operating mode(s) used for tests

During the tests the following operating mode(s) has(have) been used.

Operating mode	Operating mode description	Used for methods	
		Conducted	Radiated
1	Transmitting	<input checked="" type="checkbox"/>	<input type="checkbox"/>
2		<input type="checkbox"/>	<input type="checkbox"/>
Supplemental information: ---			

2.2 Support / Auxiliary equipment / unit / software for the EUT

The EUT has been tested with the following auxiliary equipment / unit / software:

Auxiliary equipment / unit / software	Type / Version	Manufacturer	Supplied by
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Supplemental information: ---			

2.3 Test Configuration / Block diagram used for tests

Refer to Annex 3.

3 VERDICT SUMMARY SECTION

This chapter presents an overview of standards and results. Refer to the next chapters for details of measured test results and applied test levels.

3.1 Standards

Standard	Year	Description
EN 50665	2017	Generic standard for assessment of electronic and electrical equipment related to human exposure restrictions for electromagnetic fields (0 Hz - 300 GHz)

3.2 Normative references

Standard	Year	Description
EN 62311	2008	On the limitation of exposure of the general public to electromagnetic fields (0 Hz to 300 GHz)

3.3 Deviation(s) from the Standard(s) / Test Specification(s)

The following deviation(s) was / were made from the published requirements of the listed standards: N/A.

3.4 Overview of results

TRANSMITTER TESTS		
Requirement	Verdict	Remark
EMF Exposure Levels Evaluation	PASS	---
Supplementary information: ---		

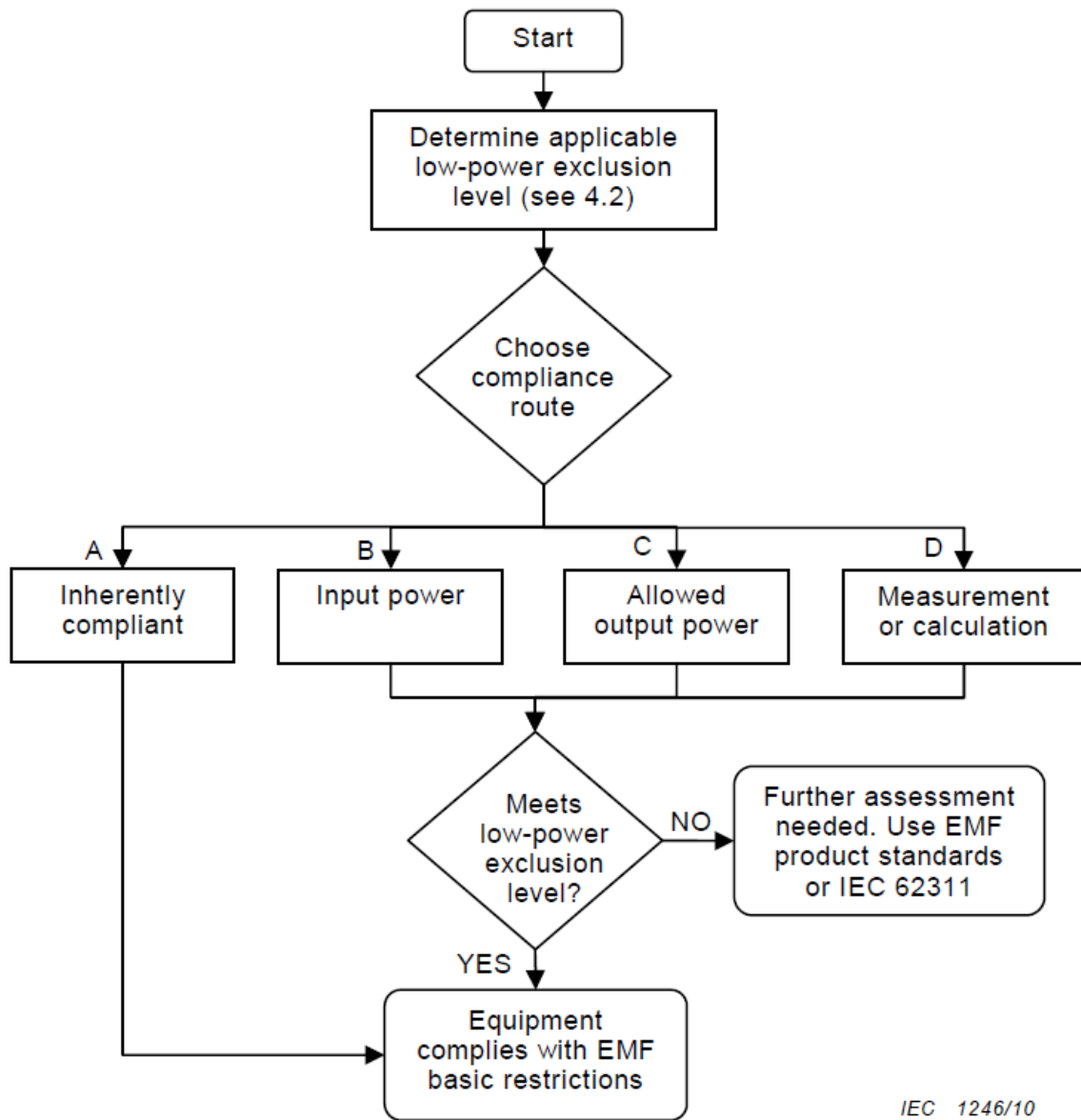
The measurement result is considered in conformance with the requirement if it is within the prescribed limit, It is not necessary to calculate the uncertainty associated with the measurement result.

3.5 Conformity assessment methods

Compliance of electromagnetic emission from electronic and electrical equipment with the basic restrictions usually is determined by measurements and in some cases, calculation of the exposure level. If the electrical power used by or radiated by the equipment is sufficiently low, the electromagnetic fields emitted will be incapable of producing exposures that exceed the basic restrictions.

Four routes, as illustrated in Figure 1 and described as follows, can be used to demonstrate compliance with this standard:

- A Typical usage, installation and the physical characteristics of equipment make it inherently compliant with the basic restriction as specified in Annex II of Council Recommendation 1999/519/EC. This low-power equipment includes unintentional (or non-intentional) radiators, for example incandescent light bulbs and audio/visual (A/V) equipment, information technology equipment (ITE) and multimedia equipment (MME) that does not contain radio transmitters.
- B The input power level to electrical or electronic components that are capable of radiating electromagnetic energy in the relevant frequency range is so low that the available antenna power and/or the average total radiated power cannot exceed the low-power exclusion level.
- C The available antenna power and/or the average total radiated power are limited by product standards for transmitters to levels below the low-power exclusion level.
- D Measurements or calculations show that the available antenna power and/or the average total radiated power are below the low-power exclusion level.



IEC 1246/10

Figure 1 – Routes to show compliance with low-power exclusion level

3.6 EMF basic restriction

Basic restrictions for electric, magnetic and electromagnetic fields
(0 Hz to 300 GHz)

Frequency range	Magnetic flux density (mT)	Current density (mA/m ²) (rms)	Whole body average SAR (W/kg)	Localised SAR (head and trunk) (W/kg)	Localised SAR (limbs) (W/kg)	Power density, S (W/m ²)
0 Hz	40	—	—	—	—	—
>0-1 Hz	—	8	—	—	—	—
1-4 Hz	—	8/f	—	—	—	—
4-1 000 Hz	—	2	—	—	—	—
1 000 Hz-100 kHz	—	f/500	—	—	—	—
100 kHz-10 MHz	—	f/500	0,08	2	4	—
10 MHz-10 GHz	—	—	0,08	2	4	—
10-300 GHz	—	—	—	—	—	10

Notes

- 1, f is the frequency in Hz.
- 2, the basic restriction on the current density is intended to protect against acute exposure effects on central nervous system tissues in the head and trunk of the body and includes a safety factor. The basic restrictions for ELF fields are based on established adverse effects on the central nervous system. Such acute effects are essentially instantaneous and there is no scientific justification to modify the basic restriction for exposure of short duration. However, since the basic restriction refers to adverse effects on the central nervous system, this basic restriction may permit higher current densities in body tissues other than central nervous system under the same exposure conditions.
- 3, because of electrical inhomogeneity of the body, current densities should be averaged over a cross section of 1 cm² perpendicular to the current direction.
- 4, for frequencies up to 100 KHz, peak current density values can be obtained by multiplying the rms value by $\sqrt{2}$ (~1,414). For pulses of duration t_p the equivalent frequency to apply in the basic restrictions should be calculated as $f = 1 / (2t_p)$.
- 5, for frequencies up to 100 kHz and for pulsed magnetic fields, the maximum current density associated with the pulses can be calculated from the rise/fall times and the maximum rate of change of magnetic flux density. The induced current density can then be compared with the appropriate basic restriction.
- 6, all SAR values are to be averaged over any six-minute period.
- 7, localised SAR averaging mass is any 10 g of contiguous tissue; the maximum SAR so obtained should be the value used for the estimation of exposure. These 10 g of tissue are intended to be a mass of contiguous tissue with nearly homogeneous electrical properties. In specifying a contiguous

mass of tissue, it is recognised that this concept can be used in computational dosimetry but may present difficulties for direct physical measurements. A simple geometry such as cubic tissue mass can be used provided that the calculated dosimetric quantities have conservative values relative to the exposure guidelines.

- 8, for pulses of duration t_p the equivalent frequency to apply in the basic restrictions should be calculated as $f = 1/(2t_p)$. Additionally, for pulsed exposures, in the frequency range 0,3 to 10 GHz and for localised exposure of the head, in order to limit and avoid auditory effects caused by thermoelastic expansion, an additional basic restriction is recommended. This is that the SA should not exceed 2 mJ/kg averaged over 10 g of tissue.

3.7 Reference level

Frequency range	E-field strength (V/m)	H-field strength (A/m)	B-field (μT)	Equivalent plane wave power density Seq (W/m ²)
0-1 Hz	-	3.2×10^4	4×10^4	-
1-8 Hz	10000	$3.2 \times 10^4/f^2$	$4 \times 10^4/f^2$	-
8-25 Hz	10000	4000/f	5000/f	-
0.025-0.8 kHz	250/f	4/f	5/f	-
0.8-3 kHz	250/f	5	6.25	-
3-150 kHz	87	5	6.25	-
0.15-1 MHz	87	0.73/f	0.92/f	-
1-10 MHz	$87/f^{1/2}$	0.73/f	0.92/f	-
10-400 MHz	28	0.073	0.095	2
400-2000 MHz	$1.375 f^{1/2}$	$0.0037 f^{1/2}$	$0.0046 f^{1/2}$	f/200
2-300 GHz	61	0.16	0.2	10

4 TRANSMITTER TEST RESULTS

4.1	EMF EXPOSURE LEVELS EVALUATION	VERDICT: PASS
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Standard	EN 62311
<p>The antenna of the product, under normal use condition is at least 20cm away from the body of the user. Warning statement of the user for keeping 20cm separation distance and the prohibition of operating to a person has been printed on the user manual. So, this product under normal use is located on electromagnetic far field between the human body.</p> <p style="text-align: center;">Far Field Calculation Formula</p> $E = \frac{\sqrt{30PG(\theta, \phi)}}{r}$ <p> G = antenna gain relative to an isotropic antenna θ, ϕ = elevation and azimuth angles to point of investigation r = distance from observation point to the antenna </p>	
<p>Remark:</p> <p>PG – RF Output power (W).</p> <p>r – The disturbance which the body of the user away from the antenna of the product (m).</p>	

Performed measurements

Port under test	Antenna port	
Test method applied	<input checked="" type="checkbox"/>	Conducted measurement
	<input type="checkbox"/>	Radiated measurement
Test setup	Refer to the Annex 3 for test setup photo(s).	
Operating mode(s) used	Mode 1	
Remark	---	

Results

Max. RF Output Power (dBm)	Gain(dBi)	E.I.R.P (dBm)	Output Power (mW)	E Field Strength (V/M)	E Field Strength Limit (V/M)	Verdict
17,40	2.5	19,90	97,72	8,56	61	Pass

Remark: r=0,2 m.

5 IDENTIFICATION OF THE EQUIPMENT UNDER TEST

The photographs show the tested device.



Indoor unit view of TAC-09CHSD/ TP11I3A



Outdoor unit view of TAC-09CHSD/ TP11I3A



Indoor unit view of TAC-12CHSD/ TP11I3A



Outdoor unit view of TAC-12CHSD/ TP11I3A



Indoor unit view of TAC-18CHSD/ TP11I3A



Outdoor unit view of TAC-18CHSD/ TP11I3A



Indoor unit view of TAC-24CHSD/ TP11I3A



Outdoor unit view of TAC-24CHSD/ TP11I3A

ANNEX 1 – MEASUREMENT UNCERTAINTY

Test Item	Uncertainty
RF Output power, conducted	$\pm 0,6\text{dB}$

ANNEX 2 – USED EQUIPMENT

Instrumentation	Manufacturer	Model	Serial no.	DEKRA No.	Cal Due date
Spectrum analyzer	R&S	FSV	SN101012	G/L1235	2023/01/17
Chamber	ETS	/	/	G/L856	2024/06/04
Antenna (1GHz-18GHz)	R&S	HF907	102306	G/L1236	2023/03/14
Horn antenna preamplifier	Schwarzbeek	SCU-18	102234	G/L1236-1	2023/02/22
EMI receiver	R&S	ESCI	101205	G/L857	2023/07/07
Antenna (30MHz-3GHz)	SCHWARZBECK	VULB9163	506	G/L864	2022/10/25
OSP	R&S	OSP 150	101907	GZ1894	2023/03/03
Signal generator	R&S	SMB 100A	181317	GZ1895	2023/03/03
Vector signal generator	R&S	SMBV100A	263671	GZ1896	2023/03/03
Wireless connectivity tester	R&S	CMW 270	100990	GZ1893	2023/03/03
Manual step attenuator (11dB)	Keysight	8494B	TH60074118	GZ2086	2022/07/24
Manual step attenuator (70dB)	Keysight	8495D	TH60074471	GZ2087	2022/07/24
Programmable Temperature & Humidity Chamber	ASTUOD	TT-5166	52689	G/L2209	2023/05/10
Test software	R&S	EMC32	---	---	Version 11.30.00

ANNEX 3 - TEST PHOTOS

Conducted measurements



Normal condition test setup



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