



EN 61543:1995+A11:2003+A12:2005+A2:2006

EMC MEASUREMENT AND REVIEWING REPORT

FOR

Zhejiang Changcheng Trading Co., Ltd.

No.2-1, Baixiang Road, Beibaixiang, Yueqing, Zhejiang

Name Of Sample.. Earth Leakage Moulded Case Circuit Breaker YCM1LE Model..... Ue:AC 400V, 50/60Hz Ratings..... **Date of Receipt...** 2018-12-13 2018-12-13 to 2018-12-28 Date of Test..... Test Engineer..... Sophia Yu Reviewed By..... Linda lin Approved By..... Cristine Fang * The above equipment was tested by Shanghai Global Testing to for compliance with the requirements set forth in the EMC Directive 2014/30/EU and tandards mentioned above. The results of testing in this report apply only to the product system, which was tested. Other due to production tolerance and similar equipment will not necessarily produce the same results measurement uncertainties.

Test Result

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GENERAL INFORMATION

Product Description for Equipment Under Test (EUT)

The product that is produced by **Zhejiang Changcheng Trading Co., Ltd.** test model: **YCM1LE.** the "EUT" as referred to in this report is a **Earth Leakage Moulded Case Circuit Breaker**

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Complete test was conducted on YCM1LE. Ue:AC 400V, 50/60Hz

A representative sample of the product covered by this report has been tested and complies with the applicable requirements of this standard.

Objective

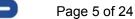
In order to meet the EMC requirements approved by CENELEC, the following standards will be cited:

1. EN 61543:1995+A11:2003+A12:2005+A2:2006, Residual current-operated protective devices (RCDs) for household and similar use Electromagnetic compatibility.

Note: The test data is only valid for the test sample. There is possible deviation from the original test data for other products

Equipment Modifications

No modification to the EUT was made by **Shanghai Global Testing Services Co.**, **Ltd** to make sure the EUT comply with applicable limits.



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1 – EN 61543(CISPR 14)

1.1 Continuous Disturbance Voltage at Mains Terminal.

1.1.1 Test Equipment List and Details

Item	Test Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due date
1	EMI test receiver	Rohde & Schwarz	ESCS25	1005426	2018-06-04	2019-06-03
2	Line impedance stabilization network	SCHWARZBECK	NSLK838	8127-350	2018-05-08	2019-05-07

1.1.2 Description of Measurement Conditions

Temperature: 21°C Humidity: 58% Pressure: 1033mbar

Electromagnetic environment: normal

1.1.3 Limits of Continuous Disturbance Voltage at Mains Terminal.

Equipment type	Frequency range	Limit values dBµV			
Equipment type	MHz	Quasi-peak	Average		
	0.15 to 0.5	66-56 ^a	56- 46 ^a		
Household appliance	0.5 to 5	56	46		
	5 to 30	60	50		
^a Decreasing linearly with logarithm of the frequency.					

Note: If the limit for the measurement with the average detector is met when using a receiver with a quasi-peak detector, the equipment under test shall be deemed to meet both limits and the measurement using the receiver with an average detector need not be carried out.



1.1.4 Test procedure and the test set-up

Procedure

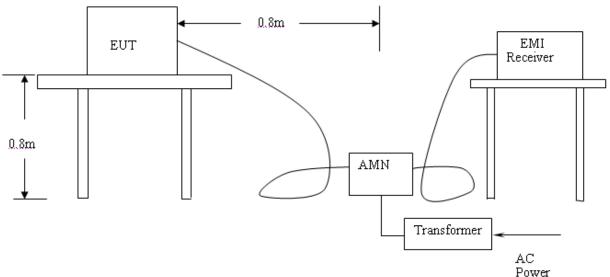
a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.

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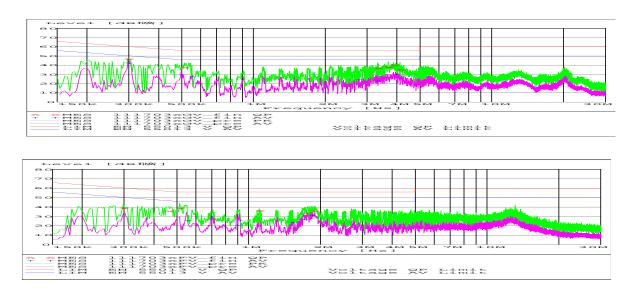
- b. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.
- c. The frequency range from 150 kHz to 30 MHz was searched. Emission levels under limit -20dB of the prescribed limits could not be reported.

Set-up

The configuration is in accordance with the requirement in EN61000-6-3, the sketch map as follow:



1.1.5 Test Data and Records





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1.1.6 Verdict

The EUT met the requirement.

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1.2 Radiation Disturbances

1.2.1 Test Equipment List and Details

Item	Test Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due date
1	EMI test receiver	Rohde & Schwarz	ESU40	100987	2018-12-03	2019-12-02
2	Antenna	SCHWARZBECK	VULB9168	9168-493	2018-12-03	2018-12-02
3	CONTROLLER	INNCO	CO200	722	/	1

1.2.2 Description of Measurement Conditions

Temperature: 20℃ Humidity: 60% Pressure: 1033mbar

Electromagnetic environment: normal

1.2.3 Limits of radiated disturbances of class B ITE at a measuring distance of 3m.

Frequency range MHz	Quasi-peak limits(3m) dB(µV/m)			
30 to 230	40			
230 to 1000	47			
NOTE: The lower limit shall apply at the transition frequency. NOTE: Additional provisions may be required for cases where interference occurs.				

1.2.4 Test procedure and the test set-up

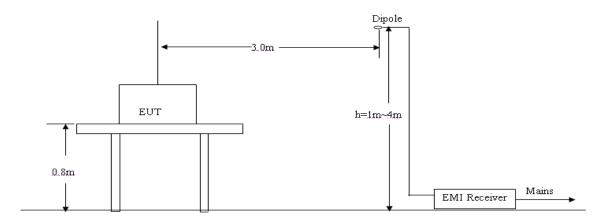
Procedure

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3m semi/full-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. The antenna is a broadband antenna, and its height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarization of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the turn table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- f. If the emission level of the EUT in peak mode was 10 dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10 dB margin would be retested one by one using the quasi-peak method or average method as specified and then reported In Data sheet peak mode and QP mode.

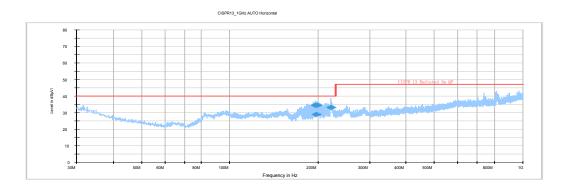


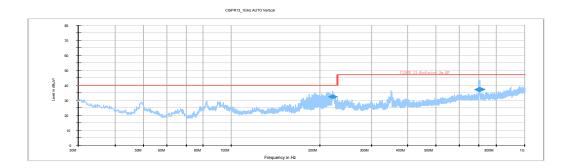
Set-up

The configuration is in accordance with the requirement in EN 55022, the sketch map as follow:



1.2.5 Test Data and Records







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1.2.6 Verdict

The EUT met the requirement.



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1.3 Disturbance Power

3.3.1 Test Equipment List and Details

Item	Test Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due date
1	EMI test receiver	Rohde & Schwarz	ESU40	100987	2018-12-03	2019-12-02

1.3.2 Description of Measurement Conditions

Temperature: 21°C Humidity: 56% Pressure: 1033mbar

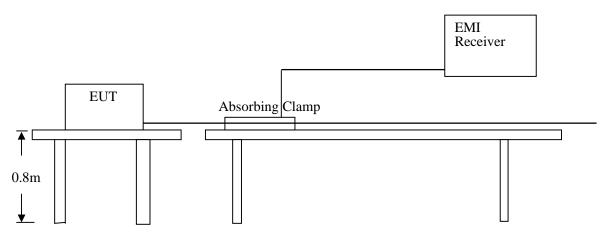
Electromagnetic environment: normal

1.3.3 Limits of Disturbance Power

Equipment type	Frequency range	Limit values (dBpW)		
Equipment type	MHz	Quasi-peak	Average	
Tools	30 to 300	55 to 65 ^a	45 to 55 ^a	
^a Increasing linearly with	frequency.			

1.3.4 Configuration

The configuration in accordance with the requirement in EN55014-1, the sketch map as follow:



1.3.5 Test Data and Records

Test case does not apply to the test object

1.3.6 Verdict

The EUT met the requirement.



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1.4 Discontinuous Disturbance Voltage at Mains Terminal (Click)

1.4.1 Test Equipment List and Details

Item	Test Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due date
1	lick Meter	AFJ	CL55C	5040019044	2018-12-03	2019-12-02

1.4.2 Description of Measurement Conditions

Temperature: 22°C Humidity: 56% Pressure: 1033mbar

Electromagnetic environment: normal

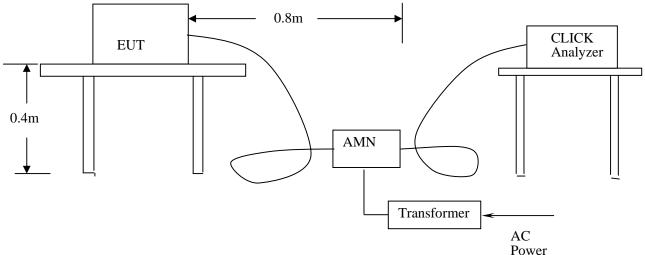
1.4.3 Limits of Click

For discontinuous disturbance, the click limit is attained by increasing the relevant limit of Continuous Disturbance Voltage with:

44dB for N < 0.2 or $20 \log(30/N)$ dB for $0.2 \le N < 30$

1.4.4 Configuration

The configuration in accordance with the requirement in EN55014-1, the sketch map as follow:



1.4.5 Test Data and Records

Test case does not apply to the test object

1.4.6 Verdict

The EUT met the requirement.

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2-EN 61543

Description of Performance Criterion

Performance Criterion A

The apparatus shall continue to operate as intended during the test. No degradation of performance or loss of function is allowed below a performance level (or permissible loss of performance) specified by the manufacturer, when the apparatus is used as intended. If the minimum performance level or the permissible performance loss is not specified by the manufacture, then either of these may be derived from the product description and documentation, and from what the user may reasonably expect from the apparatus if used as intended.

Performance Criterion B

The apparatus shall continue to operate as intended after the test. No degradation of performance or loss of function is allowed below a performance level (or permissible loss of performance) specified by the manufacturer, when the apparatus is used as intended. During the test, degradation of performance is allowed, however, no change of actual operating state or stored data is allowed. If the minimum performance level or the permissible performance loss is not specified by the manufacture, then either of these may be derived from the product description and documentation, and from what the user may reasonably expect from the apparatus if used as intended.

Performance Criterion C

Temporary loss of function is allowed, provided the function is self-recoverable or can be restored by the operation of the controls, or by any operation specified in the instructions for use.



2.1 SURGES

2.1.1 Test Equipment List and Details

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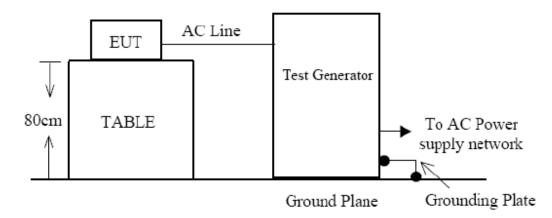
Item	Test Equipment	Manufacturer	Model No.	Series No.	Cal. Date	Cal. Due date
1	Ultra-compact simulator	EM test	UCS500M4	V050710012 2	2018-10-08	2019-10-07

2.1.2 Description of Measurement Conditions

Temperature: 21°C Humidity: 58% Pressure: 1033mbar

Electromagnetic environment: normal

2.1.3 Configuration



Remark: Test generator includes control center \(\) surge combination and coupler.

2.1.4 Test Data and Records

Level	Voltage	Poll	Phase angle	Path	Pass	Fail
1	5.0kV	<u>+</u>	0°, 90°, 180°, 270°,	L-N	В	
2	4.0kV	<u>+</u>	0°, 90°, 180°, 270°,	L-N	В	
3	2.0kV	<u>+</u>	0°, 90°, 180°, 270°,	L-N	В	

2.1.5 Verdict

The EUT was working as normal, the EUT met the requirement.



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2.2 ESD

2.2.1 Test Equipment List and Details

Item	Test Equipment	Manufacturer	Model No.	Series No.	Cal. Date	Cal. Due date
1	Electrostatic Discharge Simulator	KIKUSUI	KES4021	LL004798	2018-11-24	2019-11-23

2.2.2 Description of Measurement Conditions

Temperature: 21°C Humidity: 58% Pressure: 1033mbar

Electromagnetic environment: normal

2.2.3 Configuration

The configuration is in accordance with the requirement in EN61000-4-2, see the photo in appendix.

2.2.4 Test Data and Records

Air Discharge

	Test Levels															
EN61000-4-2 Test Points	-2 kV	+2 kV	-4 kV	+4 kV	-6 kV	+6 kV	-8 kV	+8 kV	-10 kV	+10 kV	-12.5 kV	+12.5 kV	-15 kV	+15 kV	-20 kV	+20 kV
EUT Front Side	В	В	В	В	В	В	В	В								
EUT Top Side	В	В	В	В	В	В	В	В								
EUT Back Side	В	В	В	В	В	В	В	В								
EUT Left Side	В	В	В	В	В	В	В	В								
EUT Right Side	В	В	В	В	В	В	В	В								



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Direct Contact

	Test Levels															
EN61000-4-2 Test Points	-2 kV	+2 kV	-4 kV	+4 kV	-6 kV	+6 kV	-8 kV	+8 kV	-10 kV	+10 kV	-12.5 kV	+12.5 kV	-15 kV	+15 kV	-20 kV	+20 kV
EUT Front Side	В	В	В	В	В	В										
EUT Top Side	В	В	В	В	В	В										
EUT Back Side	В	В	В	В	В	В										
EUT Left Side	В	В	В	В	В	В										
EUT Right Side	В	В	В	В	В	В										

2.2.5 Verdict

The EUT was working as normal, the EUT met the requirement.



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2.3 EFT/B

4.3.1 Test Equipment List and Details

Item	Test Equipment	Manufacturer	Model No.	Series No.	Cal. Date	Cal. Due date
1	Ultra-compact simulator	EM test	UCS500M4	V050710012 2	2018-09-04	2019-09-03

2.3.2 Description of Measurement Conditions

Temperature: 21 °C Humidity: 58% Pressure: 1033mbar

Electromagnetic environment: normal

2.3.3 Configuration

The configuration is in accordance with the requirement in EN61000-4-4, see the photo in appendix.

2.3.4 Test Data and Records

Test Levels (kV)									
EN61000-4-4 Test Points +1.0 -1.0 +2.0 -2.0 +3.0 -3.0 +4.0							-4.0		
	L	В	В	В	В	В	В	В	В
Power Port of EUT	N	В	В	В	В	В	В	В	В
01201	L+N	В	В	В	В	В	В	В	В

2.3.5 Verdict

The EUT was working as normal, so they met the requirement of performance criteria B.



2.4 INJECTED CURRENTS

2.4.1 Test Equipment List and Details

Item	Test Equipment	Manufacturer	Model No.	Series No.	Cal. Date	Cal.Due date
1	AM/FM signal generator	AEROFLEX	2023A	202306/668	2018-04-21	2019-04-20
2	PAMP Conducted RF test system	HAEFFLY	PAMP250	151730	2018-04-21	2019-04-20
3	CDN impedance and K-factor	LUTHI	L-801 M2/M3	9931	1	1

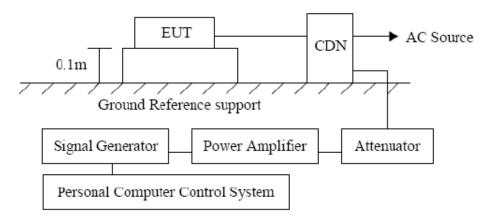
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2.4.2 Description of Measurement Conditions

Temperature: 22°C Humidity: 59% Pressure: 1033mbar

Electromagnetic environment: normal

2.4.3 Configuration



2.4.4 Test Data and Records

EN61000-4-6 Test Points	Frequency range MHz	Levels	Voltage Level (e.m.f.)V	Pass	Fail
		1	1		
D I :	0.15 00MH_	2	3	A	
Power Line	0.15-80MHz	3	10		
		X	Special		

2.4.5 Verdict

The EUT was working as normal, the EUT met the requirement.



2.5 VOLTAGE DIPS AND INTERRUPTIONS

2.5.1 Test Equipment List and Details

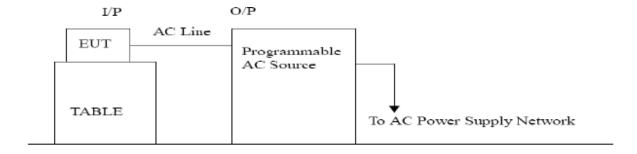
Item	Test Equipment	Manufacturer	Model No.	Series No.	Cal. Date	Cal. Due date
1	Ultra-compact simulator	EM test	UCS500M4	V0507100789	2018-10-08	2019-10-07
2	Motorised Variac	EM test	MV2616	V0507100459	2018-10-08	2019-10-07

2.5.2 Description of Measurement Conditions

Temperature: 21 °C Humidity: 58% Pressure: 1033mbar

Electromagnetic environment: normal

2.5.3 Configuration



2.5.4 Test Data and Records

	Environmental phenomena		Duration (in periods of the rated frequency)	Phase Angle	Pass	Fail
Interruption	ons	0	0.5T	0/180	C	
Voltage	60	40	10T	0/180	C	
dips in %	30	70	50T	0/180	C	
U_T	0.85	1.1	50T	0/180	C	

2.5.5 Verdict

The EUT was working as normal, the EUT met the requirement.



2.6 Radio-frequency electromagnetic field

2.6.1 Test Equipment List and Details

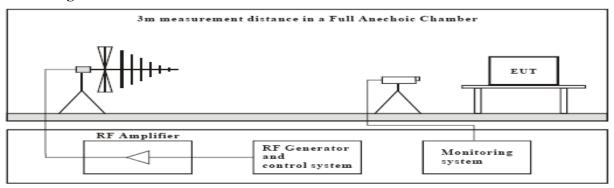
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due date
1	Ultra broadband antenna	Rohde & Schwarz	HL562	100944	2018-12-8	2019-12-7
2	amplifier	AR	30W1000B	0327284		
3	amplifier	AR	30S1G3	0324978		
4	power meter	Rohde & Schwarz	NRP	101641	2018-08-05	2019-08-04
5	Signal generator	Rohde & Schwarz	SMR40	100657	2018-10-08	2019-10-07

2.6.2 Description of Measurement Conditions

Temperature: 20°C Humidity: 60% Pressure: 1033mbar

Electromagnetic environment: normal

2.6.3 Configuration



2.6.4 Test Data and Records

Frequency Range (MHz)	Front Side (10 V/m)		Rear Side (10V/m)		Left Side (10V/m)		Right Side (10V/m)	
00.1000	VERT	HORI	VERT	HORI	VERT	HORI	VERT	HORI
80-1000	A	A	A	A	A	A	A	A

2.6.5 Verdict

The EUT was working as normal, the EUT met the requirement.



2.7 Power-frequency magnetic field

2.7.1 Test Equipment List and Details

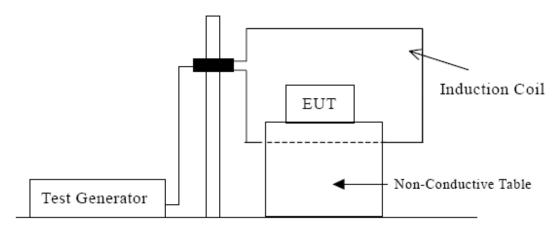
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due date
1	Magnetic field tester	HAEFELY TEST AG	MGA 100	152676	2018-12-8	2019-12-7
2	Active loop	EMCO	6502	9003-2484	2018-12-8	2019-12-7

2.7.2 Description of Measurement Conditions

Temperature: 22°C Humidity: 59% Pressure: 1033mbar

Electromagnetic environment: normal

2.7.3 Configuration



2.7.3 Test Data and Records

Power Frequency Magnetic Field	Testing Duration	Coil Oritentation	Pass
50Hz/60 Hz 10A/m	1 Min	X-axis	A
50Hz/60 Hz 10A/m	1 Min	Y-axis	A
50Hz/ 60 Hz 10A/m	1 Min	Z-axis	A

2.7.4 Verdict

The EUT was working as normal, so it met the requirement of performance criteria A.

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2.8 Current oscillatory transients(ring wave)

2.8.1 Test Data and Records

Levels	Current Level (A)	Pass	Fail	
	200A	A		

2.8.2 Verdict

The EUT was working as normal, the EUT met the requirement.



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2.9 Conducted common mode disturbances in the frequency range lower than 150 kHz

2.9.1 Test Data and Records

EN61000-4-16 Test Points	Frequency range MHz	Levels	Crent Level	Pass	Fail
Power Line	0.001-0.15MHz	1	1		
		2	20 mA	A	
		3	66 mA	A	

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2.9.2 Verdict

The EUT was working as normal, the EUT met the requirement.



PHOTOGRAPH



--- End of Test Report ---