emc（EMC）

EMC test

Electromagnetic compatibility (EMC) of electronic products in terms of size of electromagnetic interference (EMI) and anti-jamming capability (EMS) of the comprehensive evaluation, is one of the most important indicators of the quality of the products, the measurement of electromagnetic compatibility test and site test instrument composed by.

Catalog

1 Overview

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2 Introduction

Electromagnetic compatibility (EMC) is a discipline that studies all kinds of electrical equipment (including the broad range of organisms) that can coexist without causing degradation in the limited space, time and spectrum resources. It includes electromagnetic interference and electromagnetic sensitivity of two parts, electromagnetic interference test is the electromagnetic wave signal by measuring equipment in normal working condition and send out the magnitude of the response to the disturbance to the surrounding electronic equipment strength. The electromagnetic susceptibility test is to measure the anti-interference ability of the equipment under test to the electromagnetic disturbance. Electromagnetic interference mainly includes radiation emission and conduction emission.

Radiation emission:

Electromagnetic interference that propagates through space in the form of electromagnetic waves.

Conduction emission:

Electromagnetic interference that travels along a conductor.

Test site:

Open field, semi anechoic chamber, shielding room.

Main equipment for EMI test:

1, anechoic chamber 2, receiver 3, receive antenna 4, artificial power network

5, power absorption into 6, turntable, lifting platform 7, turntable, lift console

EMC test items, EMC test items, charging standards,

EMC test fee

Test fee standard

Conduction conduction emission (9kHz-30MHz) 450 yuan / hour

Power radiation power clamp (30MHz-300MHz) 450 yuan / hour

The magnetic field radiation magnetic emission (9kHz-30MHz) 400 yuan / hour

The space radiation radiated emission (30MHz-18GHz) 600 yuan / hour

Intermittent conduction interference click 400 yuan / hour

Harmonic harmonics, class, a, B, C, D, 400 yuan / hour

Voltage flicker flicker PLT.Pst 400 yuan / hour

Electrostatic ESD (+ 0.1- + 16.5kV) 400 yuan / hour

Radiation immunity (below 1GHz) 800 yuan / hour

Radiation immunity (above 1GHz) 1000 yuan / hour

Fast pulse group EFT/B (+ 0.1- + 4.4kV) 400 yuan / hour

Surge surge (0.1-6.6kV) 400 yuan / hour

Conducted immunity is CS (0.1-30V) 400 yuan / hour

Anti magnetic field interference MS (0-120A/m) 400 yuan / hour

Power off Dips (0%-100%) 400 yuan / hour

Oscillation wave surge Oscillatory, Waves, Surge, 0.1-6.6kV waveform 100kHz 400 yuan / hour

Harmonic and harmonic interference, Harmonic, interharmonic, immunity, 400 yuan / hour

Magnetic field EFM 10Hz-400kHz (EN50366) 500 yuan / A Report

3 constitute

EMC contains two major items: EMI (interference) and EMS (sensitivity, anti-interference)

The EMI test items include: RE (radiation, emission)

CE (conducted interference)

Harmonic (harmonic)

Flicker (blinking)

The EMS test items include: ESD (electrostatic)

EFT (transient pulse interference)

DIP (voltage sag)

CS (conducted interference immunity)

RS (radiation immunity)

Surge (surge, lightning)

PMS (power frequency magnetic field immunity)

4 Classification

1.EMI (Electro-Magnetic, Interference) - Electromagnetic harassment test

The purpose of this test is to detect the effects of electromagnetic radiation produced by electrical products on the human body, the public power grid and other electrical products that work normally.

What does the EMI test contain?

Radiated Emission radiation emission test

Conducted Emission conducted emission test

Harmonic harmonic current disturbance test

Flicker voltage change and flicker test

2. EMS (Electro-Magnetic, Susceptibility) - electromagnetic immunity test

The purpose of this test is to check whether the electric appliance can work stably in the electromagnetic environment without any influence.

What does the EMS test contain?

ESD electrostatic immunity test

RS radio frequency electromagnetic radiation immunity test

Measurement of conducted disturbance immunity of CS radio frequency field induction

DIP voltage dips, short interruptions, and voltage change immunity tests

SURGE surge (impact) immunity test

Immunity test of EFT electrical fast transient pulse swarm

PFMF power frequency magnetic field immunity test

Stray definition: refers to the use of standard test signal modulation, in addition to carrier frequency and due to normal modulation and switching transients caused by the sideband and adjacent channels outside the discrete frequency radiation (both remote radiation). Stray radiation can be divided into two types: conduction type and radiation type according to their sources.

Stray spur: the level power of any discrete signal measured at the junction of the antenna at 50 ohm load.

Stray radiation: spurious disturbances caused by enclosures, structures, and interconnecting cables of test equipment. Test conditions are preferred in anechoic chambers or outdoors.

5 guidelines

One, EMI (electromagnetic harassment), sub radio frequency and power frequency two kinds of tests

L RF testing project:

1.1, radio frequency conduction and radiation two tests

RF transmission (shielding room test)

1.1.1 conduction, voltage, and power are two tests

1.1.2 conduction voltage standards: CISPR11, 14, 15, 22

1.1.3 conduction power standard: CISPR11, 14

Radio frequency radiation (anechoic chamber test)

1.1.4 radio frequency standards: CISPR11, 22, IEC60571

L power frequency test item (laboratory test)

1.2 power frequency, harmonic and scintillation two tests

Power frequency harmonic 1.2.1 IEC6100-3-2

Power frequency flicker 1.2.2 IEC6100-3-3

Two, EMS (electromagnetic susceptibility), sub transient, RF, low-frequency magnetic field, power quality

L transient class testing project (lab test)

2.1 transient electrostatic, transient pulse and surge three tests

Transient electrostatic IEC6100-4-2

Transient pulse IEC6100-4-4

Transient surge IEC6100-4-5

L radio frequency project

2.2, radio frequency conduction and radiation two tests

Radiofrequency conduction IEC61004-6 (laboratory test)

Radio frequency radiation IEC6100-4-3 (anechoic chamber test)

L low frequency magnetic field testing project (laboratory test)

2.3 low frequency magnetic field, pulse magnetic field and power frequency magnetic field two tests

Pulsed magnetic field IEC6100-4-9

Power frequency magnetic field IEC6100-4-8

Power quality testing project (lab test)

2.4 points drop, interrupt, voltage changes three tests

IEC6100-4-11

Note: 1. conduction power test area > 7x1M

2. conduction voltage test table: recommended 2x1.5x0.8

Consider the test area of a cabinet type device.

3. harmonic and scintillation test area >2x2

4. ESD test table: recommended 2x1.5x0.8

5. transient and power quality test table: recommended 2x1.5x0.8

4., 5., you can use the same test table

6. RF sensitivity test table: recommended 2x1.5x0.8

5., 6., you can use the same test table

7., shielding room and laboratory should have corresponding temperature and humidity requirements

8. there is no sensitive equipment around the sensitivity test

9. when testing in the laboratory, there is no emission or interference equipment

Otherwise, the test will be done in the shielded room.

10. in addition to power amplifier and harmonic, flicker system for three-phase power supply, the other

The equipment is single-phase power supply.

11., there are standards for the current standard of hand.

More than 12. for minimum test environment requirements!!!!

13., all test standards, such as the need for national standards, please compare the standard control table!!!!

6 test standard

EN, 55014-1:, household appliances, radiation

EN, 55014-2:, household appliances, radiation immunity

EN, 55011:, industry, science, medical equipment, radiation

EN 55013/20: audio and video products

EN 55015: lighting, appliances, radiation

Radiation immunity of EN 61547: lighting appliances

EN 55022: 信息技术设备辐射

信息技术设备辐射抗扰度 EN 55024:

In 医疗电子设备电磁兼容 60601-1-2:

In 居住、商业和轻工业环境使用的通用设备辐射 61000-6-1:

En 61000-6-3: 居住、商业和轻工业环境使用的通用设备辐射抗扰度

EN 61326: 测量用仪器设备电磁兼容

IEC 61000 - 4 - 4 - 2004 电磁兼容 试验和测量技术 电快速瞬变脉冲群抗扰度试验

IEC 61000 - 4 - 4 - 2005 电磁兼容 试验和测量技术 浪涌（冲击）抗扰度试验

IEC 61000 - 4 - 11 - 2004 电磁兼容 试验和测量技术 电压暂降、短时中断和电压变化的抗扰度试验

IEC 61000 - 4 - 2 - 2001 电磁兼容 试验和测量技术 静电放电抗扰度试验