

EMC and ESD Equipment

Equipment

The EMC and ESD test facility for immunity and emission of radiated and conducted high frequency electrical fields comprises equipment for:

| | |
|-------------------|--|
| Emission Test: | radiated: 80 MHz to 1000MHz conducted: (9 kHz) 150 kHz to 30 MHz |
| Immunity Test: | radiated: 80 MHz to 1000 MHz, field strength up to 22 V/m conducted: 150 kHz to 230 MHz, field strength up to 10 V (CDN) resp. 15 V (EM-Clamp) |
| EMC disturbances: | Three different disturbance can be applied a) Electric Fast Transients EFT, Burst Up to 4.4 kV, typically 5 kHz bursts during 15ms b) Surge Immunity Up to 4kV, 1/50 μ s and 6.4/16 μ s c) Power Fail 0-250 V, 0.1 ms -10s |
| ESD Test: | ESD Test generator NSG 432 (Test pistol) Up to 25 kV |

Tests

Emission test

For the determination of the emission of conducted and radiated electromagnetic fields the measured variable is the field strength pattern measured by a peak detector (see CISPR 22 chap. 9 and 10) over the whole frequency range. At frequencies where standard emission limits are exceeded additional measurements with a quasi peak detector are required (see CISPR 16-1).

Immunity test

For the determination of the immunity against conducted and radiated electromagnetic fields the test passed parameters are the frequency range and field strength. If the test is not passed additional information about the critical frequencies and the failure mode are required (see IEC 61000-4-3, -6).

Immunity to disturbances (Burst, Surge, ESD and power fail):

Similar to immunity against conducted and radiated electromagnetic fields the test parameters serve as measured variables.

ESD test

With the ESD test generator NSG 432 electrostatic contact and air discharges up to 25 kV can be applied.

Stress level according to IEC 61000-4-2

| Contact discharge | | Air discharge | |
|-------------------|-------------|---------------|-------------|
| Level | Voltage [V] | Level | Voltage [V] |
| 1 | 2000 | 1 | 2000 |
| 2 | 4000 | 2 | 4000 |
| 3 | 6000 | 3 | 8000 |
| 4 | 8000 | 4 | 15000 |

Standards

IEC 61000-4-2 Electrostatic discharge immunity test

IEC 61000-4-3 Radiated, radio-frequency, electromagnetic field immunity test

IEC 61000-4-4 Electrical fast transient/burst test

IEC 61000-4-5 Surge immunity test

IEC 61000-4-6 Immunity to conducted disturbances, induced by radio-frequency fields

IEC 61000-4-11 Voltage dips, short interruptions and voltage variations immunity tests

EN 55011 CISPR 11 Industrial, scientific and medical (ISM) radio-frequency equipment – Electromagnetic disturbance characteristics – Limits and methods of measurement

EN 55022 CISPR 22 Information Technology Equipment - Radio disturbance characteristics - Limits and methods of measurement

CISPR 16-1, CISPR 16-2 Specification for radio disturbance and immunity measuring apparatus and methods - Methods of measurement of disturbances and immunity