



MULTIMETER EMC TESTS

ELECTRO MAGNETIC COMPATIBILITY

IEC 61000-4-2:2008 4-3:2006 4-4:2012 4-6:2013 4-8:2009

EN 61326-1:2013 2-2:2013

CISPR 11:2009

TESTS

- **EMISSION**

- CISPR 11:2009+A1:2010
- Radiated Disturbance
- Group 1 (general purpose)
- Class B (residential)

- **IMMUNITY**

- IEC 61000-4-2:2008

Electrostatic discharge (ESD)

IEC 61000-4-3:2006

RF, continuous radiated disturbance

- IEC 61000-4-8:2009

Power Frequency Magnetic Field

EMISSION TEST (CISPR 11:2009+A1:2010)

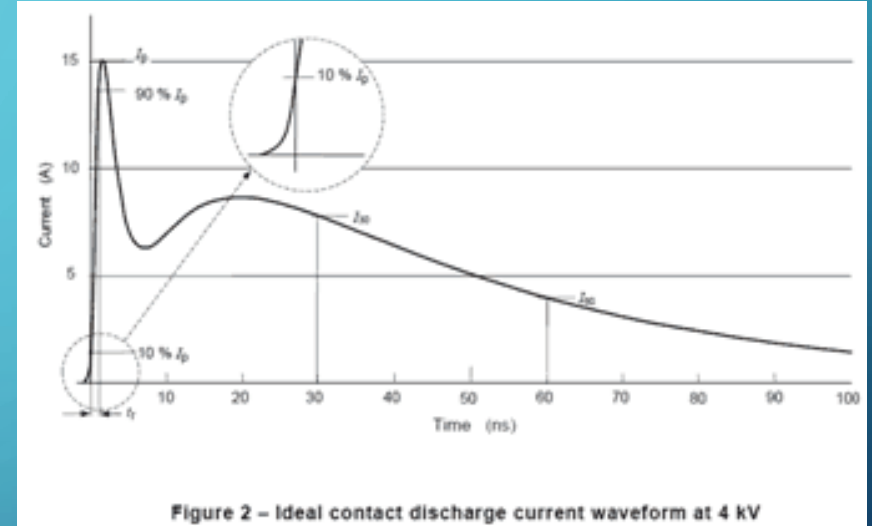
- Group 1 Class B
- Frequency 30-20 MHz 3 meters Field strength limit 40 dBuV/m
- Frequency 230-1000 MHz 3 meters Field strength limit 47 dBuV/m
- 3 meters (distance between antenna and multimeter)
- Multimeter modes tested: voltage, current, frequency, resistance, PC connect
- Investigated frequencies: 30MHz to 1000MHz
- Pass limits 40 and 47 dBuV/m

IMMUNITY PERFORMANCE CRITERIA

- **Criterion A:** The multimeter shall continue to operate as intended without operator intervention
- **Criterion B:** Temporary loss of function or degradation of performance and recovery without operator intervention
- **Criterion C:** Temporary loss of function or degradation of performance and recovery with operator intervention
- **Criterion D:** Loss of function or degradation of performance with no recovery with operator intervention (damage to hardware, software or loss of data)
- **Commercial standards for the European Union (CE) require A, B or C minimum**

1. ELECTROSTATIC DISCHARGE IMMUNITY TEST (EN 61326-1:2013)

- IEC 61000-4-2:2008
- Severity level 3 Air discharge +/- 8 kV
- Severity level 2 Contact discharge +/- 4kV
- Performance criterion: A (target)
- Multimeter modes: Voltage, Frequency, Resistance, Current, PC connect
- ESD generator 150pF and 330 ohms



TEST PROCEDURE (DIRECT DISCHARGE)

• Air Discharge

- on non-conductive surface
- round discharge tip
- fast approach speed
- 10 times for each test point

• Contact Discharge

- on non-conductive surface (buttons, slots)
- Sharp discharge tip
- Tip in contact with surface
- 10 times for each test point

TEST PROCEDURE (INDIRECT DISCHARGE) COUPLING PLANE (50CM X 50CM)

- **Horizontal coupling plane**

- 10 single discharges
- 10 cm from the meter

- **Vertical coupling plane**

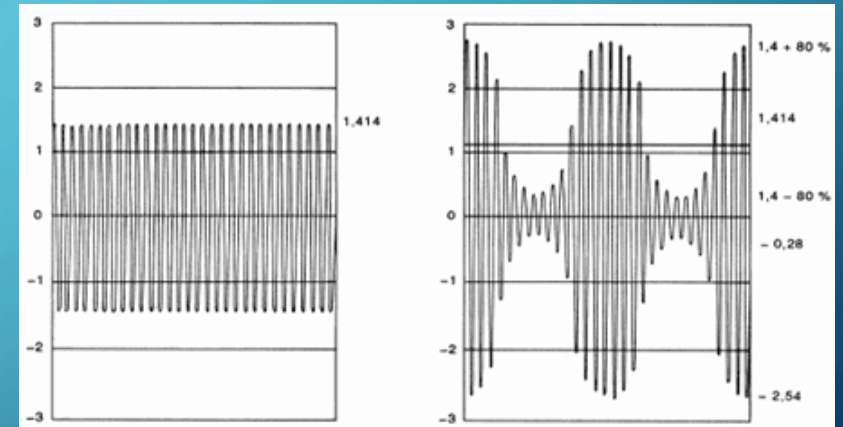
- 10 single discharges
- 10 cm from the meter
- 4 faces exposed in turn

2. RF FIELD STRENGTH SUSCEPTIBILITY TEST

- EN 61326-1:2013 IEC 61000-4-3:2006+A1:2007+A2:2010
- Severity Level 2: 3V/m 80MHz-2GHz
- Severity Level 1: 1V/m 2-2.7GHz
- Performance criterion: A (target)
- Multimeter modes: Voltage, Frequency, Resistance, Current, PC connect

RF FIELD STRENGTH TEST PROCEDURE

- Multimeter on table 80cm high
- Antenna tower 3 meters away from multimeter
- 4 sides exposed in turn
- CCD camera to monitor meter performance
- Modulated radiated signal



3. MAGNETIC FIELD SUSCEPTIBILITY TEST

EN 61326-1:2013 IEC 61000-4:2009

- Severity Level 2 3 A/m
- Performance criterion: A (target)
- Multimeter modes: Voltage, Frequency, Resistance, Current, PC connect
- Multimeter placed inside induction coil (1mx1m)
- Coil orientation XYZ in turn
- Test duration 5 minutes in each direction