

# Normes génériques CEM

- Extraits des normes génériques EN 50081-1 / -2 et EN 50082-1 / -2

# Normes génériques

## ■ EN 50081-1 – Limites d'émission – Habitat et artisanat

Port	Frequency range	Limits	Basic Standard	Applicability note	Remarks
Enclosure	30-230 MHz 230-1000 MHz	30 dB( $\mu$ V/m) at 10 m 37 dB( $\mu$ V/m) at 10 m	EN 55022 Class B	See Note 1	The statistical evaluation in the basic standard applies
AC Mains	0-2 kHz	-	EN 60555-2 EN 60555-3	See Note 2	-
	0.15-0.5 MHz limits decrease linearly with log frequency	66-56 dB( $\mu$ V) quasi peak 56-46 dB( $\mu$ V) average	EN 55022 Class B	-	The statistical evaluation in the basic standard applies
	0.5-5 MHz	56 dB( $\mu$ V) quasi peak 46 dB( $\mu$ V) average			
	5-30 MHz	60 dB( $\mu$ V) quasi peak 50 dB( $\mu$ V) average			
	0.15-30 MHz	See basic standard Clause: discontinuous interference	EN 55014	-	

■ NOTE 1: Applicable only for apparatus containing processing devices, e.g. microprocessors, operating at frequencies greater than 9 kHz.

■ NOTE 2: Applicable to apparatus covered within the scope of EN 60555-2 and EN 60555-3. Limits for apparatus not currently covered by EN 60555-2 and EN 60555-3 are under consideration.

■ Implementation dates of the mains harmonics and flicker standards (EN61000-3-2 and -3) have been clarified. Manufacturers have until 1 January 2001 before compliance with this standard is necessary.

# Normes génériques

## ■ EN 50081-2 – Limites d'émission – Industrie

Port	Frequency range	Limits	Basic Standard	Applicability note	Remarks
Enclosure	30-230 MHz	30 dB( $\mu$ V/m) quasi peak, measured at 30 m distance	EN 55011	See Note 1	May be measured at 10 m distance using the limits increased by 10 dB if the provisions of EN 55011 are met
	230-1000 MHz	37 dB( $\mu$ V/m) quasi peak, measured at 30 m distance			
AC Mains	0.15-0.5 MHz	79 dB( $\mu$ V) quasi peak 66 dB( $\mu$ V) average	EN 55011	See Note 2 See Note 3	-
	0.5-5 MHz	73 dB( $\mu$ V) quasi peak 60 dB( $\mu$ V) average			
	5-30 MHz	73 dB( $\mu$ V) quasi peak 60 dB( $\mu$ V) average			

- NOTE 1: In situ measurements are excluded from this standard.
- NOTE 2: Impulse noise (clicks) which occurs less than 5 times per minute is not considered. For clicks appearing more often than 30 times per minute the limits of AC Mains apply. For clicks appearing between 5 and 30 times per minute, a relaxation of the limits of AC Mains is allowed of  $20 \log 30/N$  dB (where N is the number of clicks per minute). Criteria for separated clicks may be found in EN 55014.
- NOTE 3: Applies only to apparatus operating at less than  $1000 V_{rms, AC}$ .

# Normes génériques

## ■ EN 50082-1 – Limites d'immunité – Habitat et artisanat

### Immunity - Enclosure port

1	Environmental Phenomena	Test Specification	Units	Basic Standard	Remarks	Performance Criteria
1.1	Power-frequency magnetic field.	50 3	Hz A/m	EN 61000-4-8	See note 1 & 2	A
1.2	Radio-frequency electromagnetic field. Amplitude Modulated.	80-1000 3 80	MHz V/m %AM (1kHz)	EN 61000-4-3	The test level specified is the rms value of the unmodulated carrier.	A
1.3	Radio-frequency electromagnetic field. Keyed carrier.	900 ± 5 3 50 200	MHz V/m Duty cycle % Rep. frequency Hz	ENV 50204	The test level specified is prior to keying. The test shall be carried out at one frequency within the indicated range.	A
1.4	Electrostatic discharge.	± 4 Contact discharge  ± 8 Air discharge	kV (charge voltage)  kV (charge voltage)	EN 61000-4-2	See basic standard for applicability of contact and/or air discharge test.	B  B

■ NOTE 1: Applicable only to apparatus containing devices susceptible to magnetic fields, such as Hall elements, electrodynamic microphones, magnetic field sensors, etc.

■ NOTE 2: For CRTs the acceptable jitter depends upon the character size and is computed for a test level of 1A/m as follows:

$$\text{jitter (mm)} = (3 \cdot \text{character size (mm)} + 1)/40.$$

As jitter is linearly proportional to the magnetic field strength tests can be carried out at other test levels extrapolating the maximum jitter level appropriately.

### Immunity - Ports for signal lines and control lines

2	Environmental Phenomena	Test Specification	Units	Basic Standard	Remarks	Performance Criteria
2.1	Radio-frequency common mode.	0.15-80 3 80	MHz V rms %AM (1kHz)	EN 61000-4-6	See notes 1 & 2. The test level specified is the rms value of the unmodulated carrier.	A
2.2	Fast transients	± 0.5 5/50 5	kV (charge voltage) Tr/Th ns Rep. frequency kHz	EN 61000-4-4	See note 2. Capacitive clamp used.	B

■ NOTE 1: The test level can also be defined as the equivalent current into a 150 ohm load.

■ NOTE 2: Applicable only to ports interfacing with cables whose total length according to the manufacturers functional specification may exceed 3 m.

# Normes génériques

- EN 50082-1 – Limites d'immunité – Habitat et artisanat

Immunity - DC input and DC output power ports

3	Environmental Phenomena	Test Specification	Units	Basic Standard	Remarks	Performance Criteria
3.1	Radio-frequency common mode.	0.15-80 3 80	MHz V rms %AM (1kHz)	EN 61000-4-6	See notes 1 & 2. The test level specified is the rms value of the unmodulated carrier.	A
3.2	Fast transients	± 0.5 5/50 5	kV (charge voltage) Tr/Th ns Rep. frequency kHz	EN 61000-4-4	See note 3.	B
3.2	Surges line to ground line to line	1.2/50 (8/20) ± 0.5 ± 0.5	Tr/Th µs kV (charge voltage) kV (charge voltage)	EN 61000-4-5	See note 3.	B

■ NOTE 1: The test level can also be defined as the equivalent current into a 150 ohm load.

■ NOTE 2: Applicable only to ports interfacing with cables whose total length according to the manufacturers functional specification may exceed 3 m.

■ NOTE 3: Not applicable to input ports intended for connection to a battery or a rechargeable battery which must be removed or disconnected from the apparatus for recharging. Apparatus with a DC power input port intended for use with an AC-DC power adapter shall be tested on the AC power input of the AC-DC power adapter specified by the manufacturer or where none is so specified using a typical AC-DC power adapter. The test is applicable to DC power input ports intended to be connected permanently to cables longer than 10 m.

# Normes génériques

- EN 50082-1 – Limites d'immunité – Habitat et artisanat  
Immunity - input and output AC power ports

4	Environmental Phenomena	Test Specification	Units	Basic Standard	Remarks	Performance Criteria
4.1	Radio-frequency common mode.	0.15-80 3 80	MHz V rms %AM (1kHz)	EN 61000-4-6	The test level specified is the rms value of the unmodulated carrier. See note 1.	A
4.2	Fast transients	± 1 5/50 5	kV (charge voltage) Tr/Th ns Rep. frequency kHz	EN 61000-4-4	-	B
4.3	Surges line to ground line to line	1.2/50 (8/20) ± 2 ± 1	Tr/Th µs kV (charge voltage) kV (charge voltage)	EN 61000-4-5	See note 2.	B
4.4	Voltage dips	30 10 60 100	% reduction ms % reduction ms	EN 61000-4-11	Voltage shift at zero crossing  See note 2.	B C
4.5	Voltage interruptions	>95 % 5000	% reduction ms	EN 61000-4-11	Voltage shift at zero crossing See note 2.	C

■ NOTE 1: The test level can also be defined as the equivalent current into a 150 ohm load.

■ NOTE 2: Applicable only to input ports.

## Immunity - Functional earth ports

5	Environmental Phenomena	Test Specification	Units	Basic Standard	Remarks	Performance Criteria
5.1	Radio-frequency common mode.	0.15-80 3 80	MHz V rms %AM (1kHz)	EN 61000-4-6	See notes 1. The test level specified is the rms value of the unmodulated carrier.	A
5.2	Fast transients	± 0.5 5/50 5	kV (charge voltage) Tr/Th ns Rep. frequency kHz	EN 61000-4-4	See note 2. Capacitive clamp used.	B

■ NOTE 1: The test level can also be defined as the equivalent current into a 150 ohm load.

■ NOTE 2: Applicable only to ports interfacing with cables whose total length according to the manufacturers functional specification may exceed 3 m.

# Normes génériques

## ■ EN 50082-2 – Limites d'immunité – Industrie

### Immunity - Enclosure port

1	Environmental Phenomena	Test Specification	Units	Basic Standard	Test Set-up	Remarks	Performance Criteria
1.1	Radio-frequency electromagnetic field. Amplitude Modulated.	80-1000 10 80	MHz V/m (unmodulated, rms) %AM (1kHz)	ENV 50140	ENV 50140	See note 1. The test level specified is prior to modulation.	A
1.2	Radio-frequency electromagnetic field. Pulse modulated.	900 ± 5 10 50 200	MHz V/m (unmodulated, rms) Duty cycle % Rep. frequency Hz	ENV 50204	ENV 50140	Spot frequency within the indicated range.	A
1.3	Power-frequency magnetic field.	50 30	Hz A/(rms)/m	EN 61000-4-8	EN 61000-4-8	See note 2	A CRT display interference is allowed above 3A/m
1.4	Electrostatic discharge.	± 4 Contact discharge  ± 8 Air discharge	kV (charge voltage)  kV (charge voltage)	EN 61000-4-2	EN 61000-4-2	See basic standard for applicability of contact and/or air discharge test.	B  B

■ NOTE 1: Except for the ITU broadcast frequency bands: 87 MHz - 108 MHz, 174 MHz - 230 MHz, and 470 MHz - 790 MHz where the level shall be 3 V/m.

■ NOTE 2: Applicable only to apparatus containing devices susceptible to magnetic fields, such as Hall elements, electrodynamic microphones, magnetic field sensors, etc.

# Normes génériques

## ■ EN 50082-2 – Limites d'immunité – Industrie

### Immunity - Ports for signal lines and data buses not involved in process control, etc.

2	Environmental Phenomena	Test Specification	Units	Basic Standard	Test Set-up	Remarks	Performance Criteria
2.1	Radio-frequency common mode. Amplitude modulated.	0.15-80 10 80 150	MHz V (rms, unmodulated) %AM (1kHz) Source impedance ohms	ENV 50141	ENV 50141	See notes 1, 2 & 3. The test level specified is prior to modulation.	A
2.2	Fast transients	± 1 5/50 5	kV (peak) Tr/Th ns Rep. frequency kHz	EN 61000-4-4	EN 61000-4-4 (Capacitive clamp)	See note 3.	B

- NOTE 1: The test level can be defined as the equivalent current into a 150 ohm load.
- NOTE 2: Except for the ITU broadcast frequency band: 47 MHz - 68 MHz where the level shall be 3 V.
- NOTE 3: Applicable only to ports interfacing with cables whose total length according to the manufacturers functional specification may exceed 3 m.

### Immunity - Ports for process, measurement and control lines, and long bus and control lines

3	Environmental Phenomena	Test Specification	Units	Basic Standard	Test Set-up	Remarks	Performance Criteria
3.1	Radio-frequency common mode. Amplitude modulated.	0.15-80 10 80 150	MHz V (rms, unmodulated) %AM (1kHz) Source impedance ohms	ENV 50141	ENV 50141	See notes 1 & 2. The test level specified is prior to modulation.	A
3.2	Fast transients	± 2 5/50 5	kV (peak) Tr/Th ns Rep. frequency kHz	EN 61000-4-4	EN 61000-4-4 (Capacitive clamp)	-	B

- NOTE 1: The test level can be defined as the equivalent current into a 150 ohm load.
- NOTE 2: Except for the ITU broadcast frequency band: 47 MHz - 68 MHz where the level shall be 3 V.



# Normes génériques

## ■ EN 50082-2 – Limites d'immunité – Industrie

### Immunity - DC input and DC output power ports

4	Environmental Phenomena	Test Specification	Units	Basic Standard	Test Set-up	Remarks	Performance Criteria
4.1	Radio-frequency common mode. Amplitude modulated	0.15-80 10 80 150	MHz V/m (rms, unmodulated) %AM (1kHz) Source impedance ohms	ENV 50141	ENV 50141	See notes 1 & 2. The test level specified is prior to modulation.	A
4.2	Fast transients	±2 5/50 5	kV (charge voltage) T <sub>r</sub> /T <sub>h</sub> ns Rep. frequency kHz	EN 61000-4-4	EN 61000-4-4 (Direct injection)	See note 3.	B

- NOTE 1: The test level can be defined as the equivalent current into a 150 ohm load.
- NOTE 2: Except for the ITU broadcast frequency band: 47 MHz - 68 MHz where the level shall be 3 V.
- NOTE 3: Not applicable to input ports intended for connection to a battery or a rechargeable battery which must be removed or disconnected from the apparatus for recharging.

### Immunity - AC input and AC output power ports

5	Environmental Phenomena	Test Specification	Units	Basic Standard	Test Set-up	Remarks	Performance Criteria
5.1	Radio-frequency common mode. Amplitude modulated.	0.15-80 10 80 150	MHz V (rms, unmodulated) %AM (1kHz) Source impedance ohms	ENV 50141	ENV 50141	See notes 1 & 2. The test level specified is prior to modulation.	A
5.2	Fast transients	±2 5/50 5	kV (peak) T <sub>r</sub> /T <sub>h</sub> ns Rep. frequency kHz	EN 61000-4-4	EN 61000-4-4 (Direct injection)	-	B

- NOTE 1: The test level can be defined as the equivalent current into a 150 ohm load.
- NOTE 2: Except for the ITU broadcast frequency band: 47 MHz - 68 MHz where the level shall be 3 V.

# Normes génériques

- EN 50082-2 – Limites d'immunité – Industrie

## Immunity - Functional earth ports

6	Environmental Phenomena	Test Specification	Units	Basic Standard	Test Set-up	Remarks	Performance Criteria
6.1	Radio-frequency common mode. Amplitude modulated.	0.15-80 10 80 150	MHz V (rms, unmodulated) %AM (1kHz) Source impedance ohms	ENV 50141	ENV 50141	See notes 1 & 2. The test level specified is prior to modulation.	A

- NOTE 1: The test level can be defined as the equivalent current into a 150 ohm load.
- NOTE 2: Except for the ITU broadcast frequency band: 47 MHz - 68 MHz where the level shall be 3 V.