INTERNATIONAL STANDARD

IEC 61988-1

First edition
2003-05

Plasma display panels –

Part 1:
Terminology and letter symbols

Panneaux d'affichage à plasma –

Partie 1:
Terminologie et symboles littéraux

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

PLASMA DISPLAY PANELS –

Part 1: Terminology and letter symbols

FOREWORD

1) The IEC (International Electrotechnical Commission) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of the IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, the IEC publishes International Standards. Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. The IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
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International Standard IEC 61988-1 has been prepared by subcommittee 47C: Flat panel display devices, of IEC technical committee 47: Semiconductor devices.

The text of this standard is based on the following documents:

FDIS	Report on voting
47C/289/FDIS	47C/296/RVD

Full information on the voting for the approval on this standard can be found in the report on voting indicated in the above table.

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

IEC 61988 will consist of the following parts, under the general title *Plasma display panels*:

Part 1: Terminology and letter symbols;
Part 2-1: Measuring methods – Optical;
Part 2-2: Measuring methods – Optoelectrical;
Part 3: Guidelines of mechanical interface;
Part 4: Environmental, endurance and mechanical test methods.

The committee has decided that the contents of this publication will remain unchanged until 2008. At this date, the publication will be

- reconfirmed;
- withdrawn;
- replaced by a revised edition, or
- amended.

A bilingual version of this standard may be issued at a later date.

PLASMA DISPLAY PANELS –

Part 1: Terminology and letter symbols

1 Scope

This part of IEC 61988 gives the preferred terms, their definitions and symbols for colour AC plasma display panels (AC PDP); with the object of using the same terminology when publications are prepared in different countries. Guidance on the technology is provided in the annexes.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 61988-2-1, *Plasma display panels – Part 2-1: Measuring methods – Optical*

IEC 61988-2-2, *Plasma display panels – Part 2-2: Measuring methods – Optoelectrical* [1]

CIE 15.2:1986, *Colorimetry, 2nd Edition*

3 Terms and definitions

For the purposes of this document, the following definitions apply.

3.1
AC PDP
NOTE See AC plasma display panel.

3.2
AC plasma display panel
AC PDP
plasma display panel in which the gas discharge region is insulated from the electrodes that are driven with AC voltage pulses

3.3
address bias
Vba
data bias
common voltage applied to all address electrodes during addressing

3.4
address cycle period
time interval between initiation of the closest spaced successive address pulses

3.5
address discharge
discharge that changes the state of a PDP subpixel

[1] To be published.

3.6
address electrode
data electrode
electrode, orthogonal to the scan electrode, that is used in driving the subpixels with the image data

3.7
address pulse
data pulse
incremental voltage pulse applied to a single address (data) electrode for addressing, to select a subpixel according to an image to be displayed

NOTE See scan pulse.

3.8
address voltage
Va
data voltage
amplitude of the voltage pulses applied to the address (data) electrode during addressing (excludes the address bias on the electrode)

3.9
address while display method
AWD method
grey scale drive technique that addresses only a portion of the pixels of the panel in any time within a sustain period

NOTE See also ADS.

3.10
addressability
number of pixels in the horizontal and vertical directions, that can have their luminance changed

NOTE Usually expressed in the number of horizontal pixels by the number of vertical pixels. This term is not synonymous with resolution. See resolution.

3.11
addressing
setting or changing the state of a subpixel with an address pulse

3.12
ADS method
address, display-period separation method
grey scale drive technique that consists of addressing all the pixels in the panel in one time period and sustaining all the pixels in the panel in a separate time period

3.13
ageing
manufacturing process consisting of operating the panel under conditions that stabilize its performance

3.14
annealing
process of heating the glass above its annealing point and cooling at a controlled rate to minimize dimensional changes during subsequent high temperature cycles

3.15
anode
positively charged surface of a device that collects electrons from the discharge

NOTE In an AC PDP, the cathode and anode exchange their roles on alternate half-cycles.

3.16
aspect ratio
ratio of screen width to screen height

3.17
auto power control
APC
circuit means to control the peak and/or average power of the display

3.18
auxiliary anode
anode in a DC PDP whose discharge contributes to supply priming particles to ignite a discharge in a cell

3.19
back plate
rear plate
plate furthest from the viewer

3.20
back-filling

NOTE See filling.

3.21
bake

NOTE See bakeout, baking.

3.22
bakeout
high temperature processing of a vacuum system and/or PDP to assist in achieving low pressures

3.23
baking
high temperature process used to evaporate water and decompose organic materials

NOTE Baking is used to clean the parts by dispersing unwanted material into the atmosphere.

3.24
barrier rib
rib that separates the cells of the panel, electrically, optically and physically

NOTE The barrier ribs may extend from the front plate to the back plate and control the spacing between the plates.

3.25
binder burnout
process during which organic binders are remove by decomposition and/or oxidation

3.26
black level luminance
luminance of the panel in its minimum luminance state in a dark ambient

NOTE See IEC 61988-2-1, subclause 6.3.3.b

3.27
black matrix
black material placed in the space between subpixel areas in order to improve contrast by reducing reflectivity

3.28
black stripe
black material placed in the space between subpixel areas in order to improve contrast by reducing reflectivity, having the form of stripes

NOTE Black stripe is a specific type of black matrix contrast enhancement.

3.29
black uniformity, sampled
uniformity of the black level luminance expressed in terms of the percentage non-uniformity (difference in luminance between measuring points divided by the average black level luminance) at the specified measuring points

3.30
BRCR-#/#
NOTE See bright room contrast ratio #/#.

3.31
breakdown voltage
smallest voltage between the cathode and the anode causing a gas discharge to grow to a breakdown condition

3.32
bright defect
defect in the image reproduction that appears brighter than the correct image

3.33
bright room contrast ratio #/#
BRCR-#/#
contrast ratio with ambient illumination on the screen other than the nominal 100/70 levels

NOTE The symbol #/# describes the ambient illumination on the vertical plane/horizontal plane (see IEC 61988-2-2, subclause 6.1).

3.34
bright room contrast ratio 100/70
BRCR-100/70
contrast ratio with an ambient illumination on the screen of 100 lx on the vertical plane and 70 lx on the horizontal plane

NOTE See IEC 61988-2-2, subclause 6.1

3.35
brightness
visual and subjective quality of how bright an object appears, or how much visible light is coming off the object being perceived by the eye

NOTE See luminance.

3.36
bulk erase
operation of applying a voltage pulse to the panel that switches all of the cells in the panel to the off-state

3.37
bulk write
operation of applying a voltage pulse to the panel that switches all of the cells in the panel to the on-state

3.38
burn-in
process of increasing the reliability performance of hardware employing functional operation of every item in a prescribed environment with successive corrective maintenance at every failure during the early failure period

3.39
bus electrode
high conductivity electrode intimately connected along its length to the transparent electrode in order to reduce total resistance

3.40
cathode
negatively charged surface of a device that emits secondary electrons to the discharge

NOTE In an AC PDP, the cathode and anode exchange their roles on alternate half-cycles.

3.41
cell
physical structure of a subpixel or a subpixel itself (adjective – referring to the characteristics of a single cell)

3.42
cell pitch
subpixel pitch

3.43
cell voltage
Vc
time-dependent voltage across the gas in a plasma display cell

3.44
centre firing voltage
average of the first-on voltage and the last-on voltage

3.45
centre minimum sustain voltage
average of the first-off voltage and the last-off voltage

3.46
chromatic uniformity
uniformity of the chromaticity produced by different areas of the PDP

NOTE Usually expressed in the inverse sense of the nonuniformity, as Δx_i and Δy_i, or the difference between the chromaticity at the specified measuring points and the chromaticity at the centre of the display screen. See luminance uniformity and IEC 61988-2-1, subclause 6.4.

3.47
column electrode
address electrode

NOTE The column electrode was historically continuous in the vertical direction. When the panel is oriented in portrait orientation, the column electrode can be aligned horizontally. See row electrode.

3.48
contrast ratio
ratio of white luminance to black luminance of the image, including light reflected from the display

NOTE This ratio is strongly dependent on the ambient light and two forms are reported, bright room contrast ratio (BRCR) and dark room contrast ratio (DRCR). See IEC 61988-2-1, subclauses 6.3 and 6.1.

3.49
contrast ratio, sampled
CR
ratio of a white luminance to a black luminance at the specified measuring points

NOTE See IEC 61988-2-1, subclause 6.3 and IEC 61988-2-2, subclause 6.1.

3.50
coplanar PDP
NOTE See surface discharge PDP.

3.51
crosstalk
phenomenon initiated by a discharge in one cell that causes an unwanted discharge in a neighbouring cell

3.52
dark defect
defect in the image reproduction that appears less bright than the correct image

3.53
dark room contrast ratio
DRCR
contrast ratio measured in a dark room ambient, typically less than 1 lx

NOTE See IEC 61988-2-1, subclause 6.3.

3.54
data bias

NOTE See address bias.

3.55
data electrode

NOTE See address electrode.

3.56
data pulse

NOTE See address pulse.

3.57
data voltage

NOTE See address voltage.

3.58
DC PDP

NOTE See DC plasma display panel.

3.59
DC plasma display panel
DC PDP
plasma display panel in which the conductive electrodes are directly in contact with the gas discharge

3.60
dielectric layer
layer or layers of non-conductive material that cover the electrodes, on which charges are accumulated from the discharge

NOTE The accumulated charge allows the memory function in AC PDPs.

3.61
dielectric voltage
Vd
voltage across a dielectric layer due to the wall charge that usually varies with time

$Vd = Qw/Cd$

where Qw is the wall charge and Cd is the effective dielectric layer capacitance

NOTE Charges other than wall charges may also appear on the dielectric surfaces, so that the total voltage across a dielectric can be greater than its dielectric voltage.

3.62
diffuse reflection
reflection of incident light back in all directions

3.63
discharge current
component of current of a gas discharge resulting from the flow of electrons and ions in the gas

3.64
displacement current
current flowing through the capacitance of a plasma display panel resulting from the changing voltage applied to the electrodes

NOTE Does not include the discharge current.

3.65
display anode
anode electrode of a DC PDP that is driven with positive DC voltage for the display discharge

3.66
display diagonal
diagonal dimension of the addressable screen area

3.67
display electrode
scan and/or sustain electrodes in a three-electrode type PDP that provide the principal power for the plasma discharge

3.68
driving waveform
time-dependent voltage of a driving signal

3.69
drying process
manufacturing process that removes water and other volatile materials from the PDP sub-assemblies

NOTE This often involves heating in an oven.

3.70
dynamic false contour
phenomenon wherein moving images create false contours

3.71
dynamic margin
margin that remains when addressing is active

NOTE This term can be applied to various margins such as sustain margin or write margin, etc.

3.72
dynamic sustain range
sustain voltage range that allows proper addressing of all pixels over the entire range of write voltage

3.73
efficacy
NOTE See luminous efficacy.

3.74
energy recovery circuit
circuitry that recaptures the reactive power of the plasma display panel capacitance by means of an inductance

3.75
erase
change the state of a subpixel from on to off

3.76
erase pulse
voltage waveform applied to an electrode pair to selectively change the state of a subpixel from on to off

3.77
erase voltage
V_{er}
voltage amplitude of the erase pulse

3.78
evacuating
manufacturing process of removing the atmospheric gases by a vacuum process

3.79
exhaust tube
exhaust tubulation
exhaust pipe
tubular port in the device envelope that is connected to an external vacuum pump to evacuate the air from the device during processing

NOTE This is typically a glass tube that can be closed after filling with the appropriate gas by melting.

3.80
field
time interval during which a subset of all of the pixels is addressed and sustained at the full range of grey levels

NOTE See subfield.

EXAMPLE In the case of an interlaced display, half of the pixels are addressed during the odd field and the other half are addressed during the even field.