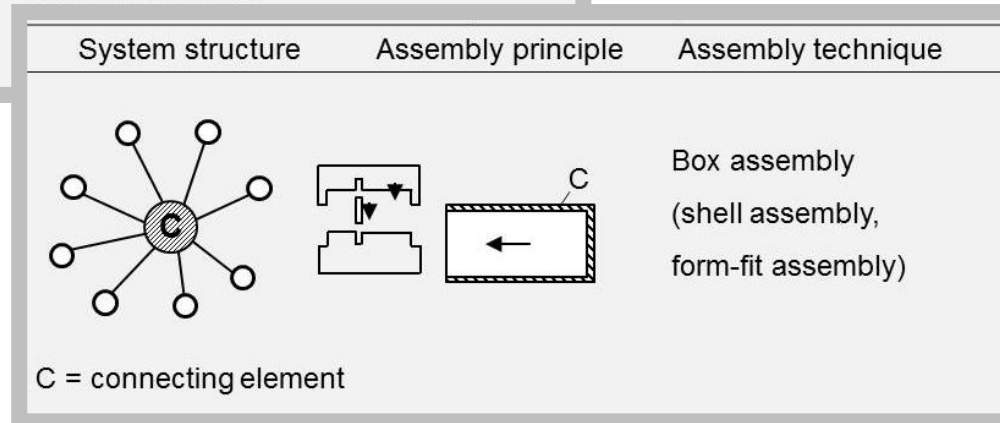
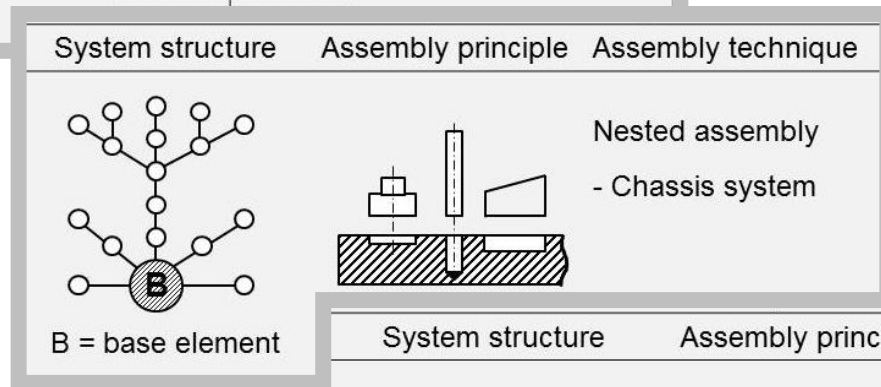
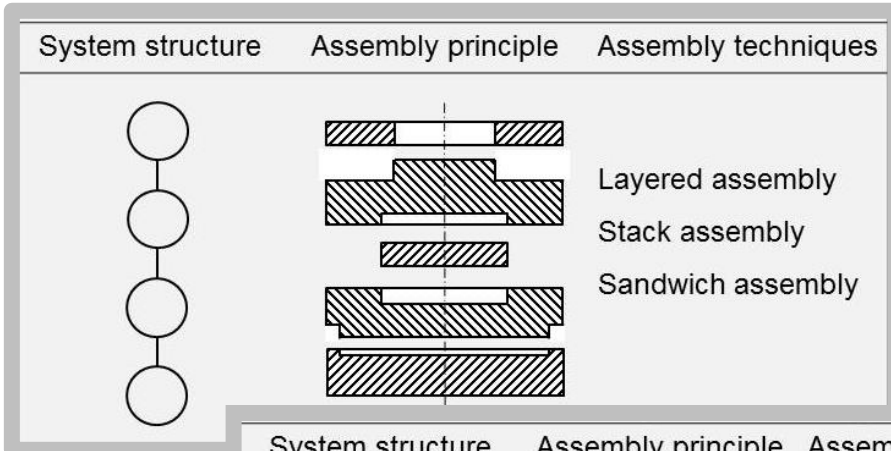


| Level | Standard items | Standard |
|----------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------|
| Level 1: - printed circuit boards - components - connectors | printed circuit boards: printed circuits, substrates, grids, holes, nominal sizes PCB measurements components: connectors: | IEC 60097 IEC 60249 IEC 60297 IEC 60326 IEC 60603 |
| Level 2: - modules | modules: PCB cassette, plug-in package | IEC 60297 |
| Level 3: - front panels - subrack | front panels: width 482.6 mm (19") subrack heights and mounting dimensions rack installation dimensions subrack: dimensions with indirect connectors | IEC 60297 IEC 60297 |
| Level 4: - enclosure - racks - panels | enclosure: installation dimensions enclosure stack racks: installation dimensions panels: panel dimensions, frame row pitch | IEC 60297 IEC 60297 IEC 60297 |



System levels

Level 0:
Monolithic silicon die
(integrated circuit, IC)

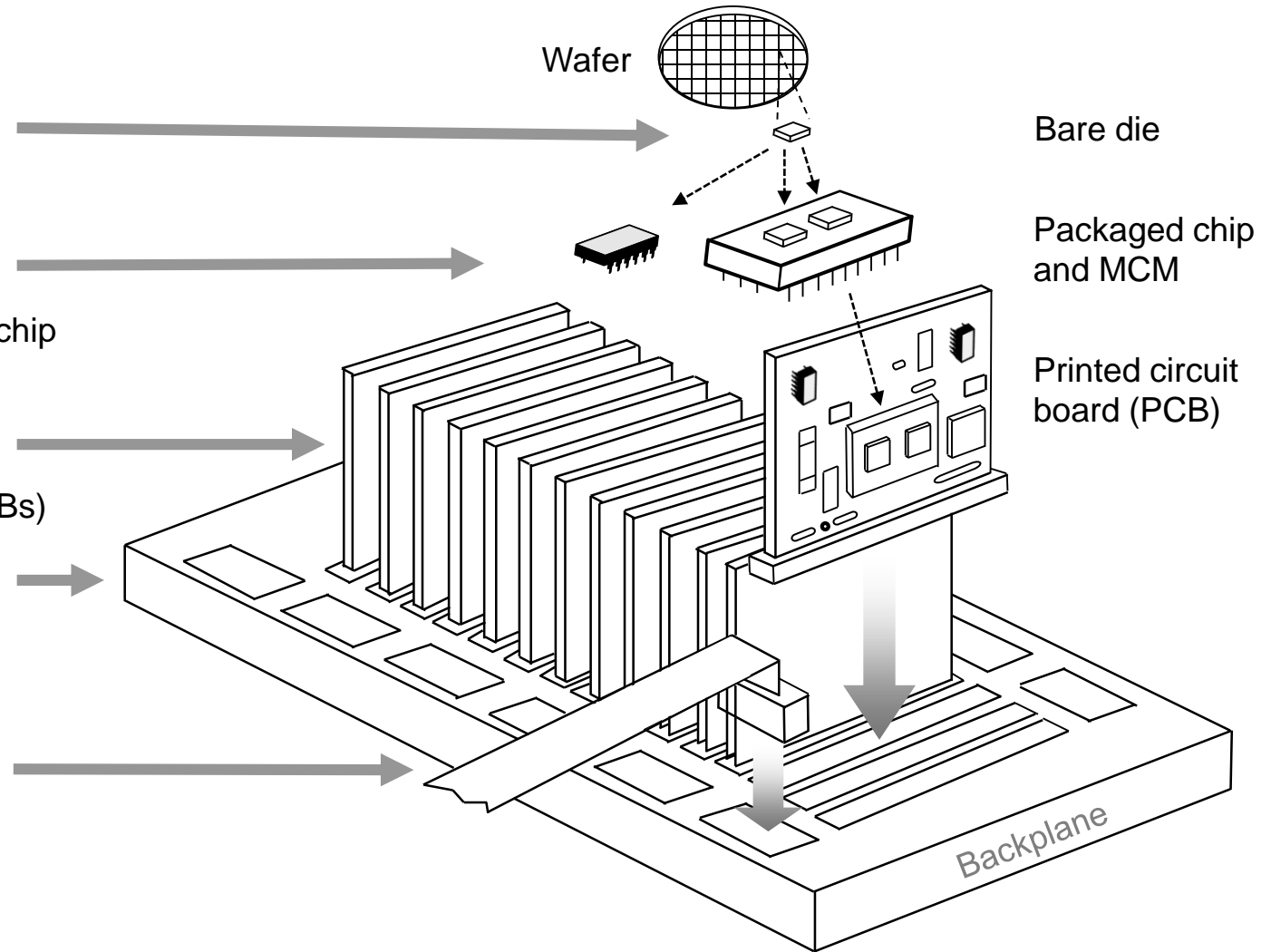
Level 1:
IC packaging and wiring
components and ICs in multichip
modules (MCM)

Level 2:
Wiring components and ICs
on printed circuit boards (PCBs)

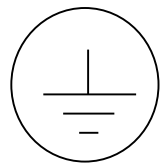
Level 3:
Wiring between PCBs
(backplane wiring)

Level 4:
Wiring between
subassemblies (cabinets)

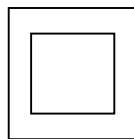
Level 5:
Wiring between systems



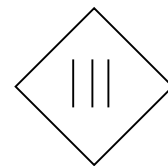
CE



Protection class I



Protection class II



Protection class III

| Digit | First digit x_1 | | Second digit x_2 |
|-------|-------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------|--------------------------------------------------------------------------------------------------|
| | Shock protection | Protection against ingress of foreign bodies | Protection against ingress of water |
| 0 | no protection | no protection | no protection |
| 1 | protection against random contact with the hand; protection against access to dangerous parts with the back of the hand | protection against solid foreign bodies 50 mm and more in diameter | protection against vertically dripping water |
| 2 | protection against contact with the fingers; protected against access to dangerous parts with the fingers | protection against solid foreign bodies 12.5 mm and more in diameter | protection against vertically dripping water when the enclosure is tilting at an angle up to 15° |
| 3 | protection against contact with tools; protected against access to dangerous parts with a tool | protection against solid foreign bodies 2.5 mm and more in diameter | protection against spraying water |
| 4 | protection against contact with tools and wires; protected against access to dangerous parts with a wire | protection against solid foreign bodies 1.0 mm and more in diameter | protection against splashwater from any direction |
| 5 | complete protection against contact; protected against access to dangerous parts with a wire | protection against dust (dust-proof) | protection against water jets |
| 6 | complete protection against contact; protected against access to dangerous parts with a wire | protection against dust (dust-proof) | protection against high-pressure water jets |
| 7 | - | - | protection against temporary immersion in water |
| 8 | - | - | protection against continuous immersion in water |

| Application | Operating conditions | Typical locations | Protection type |
|----------------------|-----------------------------------------------------------------------------|----------------------------------------------------------------------------------|-----------------------------|
| Low-level protection | dry building interiors with no condensation | offices, apartments and business premises, showrooms | IP 10, IP 20 |
| Average protection | building interiors where condensation can occur or devices in farm vehicles | kitchens, deep freeze rooms, cellars, closed stables, automobiles, closed trucks | IP 30, IP 40, IP 41, IP 22 |
| Medium protection | outdoor rooms, temporary outdoor operation | all weather shelters, tents, roofed surfaces, open-cast mining | IP 22C, IP 34, IP 43, IP 44 |
| Strong protection | continuous operation outdoors | locations where the harmful effects of ambient weather conditions are permanent | IP 54, IP 56, IP 65, IP 66 |
| Total protection | temporary or permanent flooding with water | | IP 67, IP 68 |