

Glossary

3G Technology	3rd generation LCD technology
Absorber	Layers in a solar cell used to absorb light and convert it to electricity. Can be a wide variety of semiconducting materials or combination of c-Si, p-Si, CIGS, CIS, a-Si, uc-Si, etc.
Acceptance Test Procedure (ATP)	Used by equipment manufacturers to officially confirm performance of machines before shipment
Active Matrix (AM)	Used in reference to both LCDs and OLEDs, refers to the ability to control each individual pixel with an dedicated drive switching TFT, as opposed to passive matrix
Active Matrix Liquid Crystal Display (AMLCD)	see "thin film transistor"
Advanced Display of the Year award (ADY)	At FINETECH Japan, every year awards are given to innovative display technologies for panels, materials and equipment
Advanced Lateral Crystal Growth (ALCG)	Acronym used by SHI to described their two laser, double pulse solid state laser crystallization technique
Advanced LCD Technologies Development Center (ALTEDEC)	Consortium of six Japanese companies (Sharp, Toshiba, NEC, Hitachi, Matsushita, DNP) with a charter to develop Japan unique next generation LCD technologies that would be difficult to accomplish by one company
Advanced Polysilicon Technology (APT)	Product name for Corning pre-annealed glass that minimizes shrinkage and warp problems associated with relatively high LTPS process temperatures
The Advanced Television Systems Committee (ATSC)	An international, non-profit organization developing voluntary standards for digital television. ATSC member organizations represent the broadcast, broadcast equipment, motion picture, consumer electronics, computer, cable, satellite and semiconductor industries. In 1996, the US Federal Communications Commission (FCC) adopted the major elements of the ATSC Digital Television (DTV) Standard (A/53). The ATSC Digital TV Standard has been adopted by Canada, South Korea, Mexico, Honduras and El Salvador. Pilot transmissions are active in Guatemala.
After Development Inspection (ADI)	Typically refers to location of AOI inspection after the photo development process and before any other process steps to locate defects in patterned photo resist created by lithography or development
After Etch Inspection (AEI)	Typically refers to location of AOI inspection after the etch or strip process steps to locate defects created by either the wet or dry etch process
Automated Guided Vehicles (AGV)	Used as part of factory automation systems to move cassettes of substrates between process steps
Alternating Magnetic Field Crystallization (AMFC)	Type of SPC that uses magnetic fields to improve crystallization uniformity. No metal catalyst is used, avoiding metal contamination and high leakage current problems
Amorphous Silicon (a-Si)	Silicon material having no definite or regular crystal structure. The semi-conducting material in a-Si active matrices for displays, and also a light-absorbing photo-active semiconducting material that enables many thin film solar batteries for PV cells
Amorphous Silicon Thin Film Transistors (a-Si TFT)	Amorphous silicon, an amorphous solid, is used to make thin-film transistors, the dominant active matrix technology.
Analog-to-Digital Converter (A/D Converter)	Circuit to convert analog signals to digital, may be used in display driving or sensing applications
Anhydrous Hydrogen Fluoride (AHF)	F2 liquid precursor that can be used with an on-site fluorine generator to generate F2 for CVD chamber cleaning applications to reduce tool COO and because it is more environmentally friendly than conventional cleaning gases such as SF6 or NF3
Anisotropic Conductive Films (ACF)	

Aperture Ratio	Actual area of a sub-pixel that transmits light, expressed as a percentage; higher aperture ratio designs enable brighter displays or lower power
Applied Komatsu Technologies (AKT)	A wholly owned subsidiary of Applied Materials. Equipment maker with very dominant market share in CVD, also make a variety of other machines
Atmospheric Plasma (AP Plasma)	Gas plasma generated in an ambient environment rather than vacuum chamber. Used for cleaning applications in LCD manufacturing
Atmospheric Pressure CVD (APCVD)	Type of CVD that runs at ambient pressure, thus potentially high throughput and low cost, but typically film qualities are insufficient for TFT production
Atomic Force Microscopy (AFM)	A technique for analyzing a surface material to extremely high precision level of the atom. AFM uses a mechanical probe to magnify surface features up to 100,000,000 times, and produce 3-D computer modeled images
AU Optronics (AUO)	Leading Taiwanese LCD maker, 3 largest capacity in Q4'05
Automated Material Handling Systems (AMHS)	Hardware (stockers, AGVs, RGVs, OHS, etc) and CIM systems used to move substrates through the fab process
Automated Optical Inspection (AOI)	Line scan CCD sensor Image capture and cell-to-cell, etc. image processing to inspect for defects on the substrate. Used at multiple process steps
Automated Test Equipment (ATE)	Acronym for semiconductor test equipment that provides parametric and a variety of other tests
Automatic Defect Classification (ADC)	Refers to AOI, or other inspection tool, algorithms and capability to automatically and correctly categorize detected anomalies as into varies predefined categories or as certain defect types
Automatic Pressure Controller (APC)	Connected usually to exhaust valve of vacuum system before pump to control chamber pressure
Automatic Visual Inspection (AVI)	Automated inspection, such as in the cell process, that relies on a machine vision system to capture image data and process to determine quality of the device under test. This is opposed to inspection processes performed by human inspectors.
Average Selling Price (ASP)	The average price at which a product sells across multiple distribution channels; For equipment, DisplaySearch assumes a three-year average, across all makers and technology
Back-channel Etch (BCE)	Commonly used a-Si TFT bottom-gate process in which the S/D metal and n+ layer are removed from the TFT channel region by a single PEP and typically 2 dry etch steps, with the n+ etched and slightly over etching the channel, called the back-channel etch.
Backlight Unit (BLU)	Entire backlight assembly including light source, films, inverters, etc. system components
Ball Grid Array (BGA)	
Bi-directional Shift Register (BDSR)	A shift register circuit that can send a signal in one of two directions allowing for the placement of the source drivers at either the top or bottom of a display panel
Bill Of Materials (BOM)	Detailed list of materials and components that make up an assembly. Building block of central manufacturing information system and often used in cost accounting.
Black Matrix (BM)	Patterned on CF to prevent light leakage, improve contrast, etc. Can be chrome or resin. Resin gaining share for large displays.
Board of Directors (BOD)	Governing group of directors of any company
Brightness Enhancing Film (BEF)	Prism film that increases a display's brightness
Cadmium Telluride (CdTe)	Compound semiconductor used as an absorber in a type of Thin Film solar cell, which has a relatively high conversion efficiency and low \$/W. First Solar is leading CdTe maker.
Capacitance of Gate to Drain (Cgd)	An undesired or parasitic capacitance between the gate and drain of a TFT
Capacitance of Liquid Crystal (CLC)	The measure of the Liquid Crystal layers ability to store charge
Capacitance of Storage Capacitor (CSC)	An additional capacitor that stores charge in parallel with the LC capacitor
Capital Expenditures (Cap-Ex or CapEx)	Total amount of money spent on capital for manufacturing tools. Often used as a metric to measure market size for capital equipment
Carbon Nanotubes (CNT)	Nano regime structures that provide a wide variety of potentially very useful electrical and physical properties. Use in the display industry has focused on using CNTs are electron emitters for FED type displays.
Cash Costs	DisplaySearch defines as Manufacturing Total Cost minus Depreciation Cost

Cathode-Ray Tube (CRT)	A monitor that contains a vacuum tube in which a beam of electrons is projected on a fluorescent screen to produce a luminous spot. Where the spot appears on the screen is determined by the effect on the electron beam of a variable magnetic field within the tube. Synonym: Braun tube.
Cavitation	The phenomenon where small and largely empty cavities are generated in a fluid, which expand and then rapidly collapse. Produced by cavitation jets and generate a mechanical cleaning effect when bubbles collapse, focus energy, emit shock waves. Used in various LCD cleaning processes.
CDMA2000 1x	Samsung product name
Centipoise (cP)	A unit of measurement for viscosity equivalent to one-hundredth of a Poise. (Water has a viscosity of 1.002 cP, which is very close to 1.) Viscosity is the ratio of shear stress to shear rate, giving the traditional unit of dyne-sec/cm ² for Poise. In metric units, one cP is one millipascal-second.
Central Processing Unit (CPU)	Core processing device of a computer
Chemical Vapor Deposition (CVD)	Process of depositing thin films via a precursor gas and generating a high frequency plasma in a vacuum chamber. Used widely in LCD, semiconductor and other high tech processes. Typically used to deposit Si based films.
Chi Mei Optoelectronics (CMO)	Leading Taiwanese LCD maker, 4th largest capacity in Q4'05, close to AUO
Chip-On-Film (COF)	Mounting of driver, etc. IC s on flexible film, which is then bonded to display terms on the glass. Allows chips to be folded back behind the display
Chip-On-Glass (COG)	Direct mounting of driver, etc. ICs onto the glass substrate for a low profile package.
Code division multiple access (CDMA)	CDMA is a coding scheme used as an access method that can enable carriers from different stations to use the same transmission equipment by employing a wider bandwidth than individual carriers.
Chip-on-Flex (COF)	
Chip-on-Glass (COG)	
Cold Cathode Fluorescent Lamps (CCFL)	Standard lamp used as LCD backlight
Color Filter (CF)	Passive upper substrate that device that creates RGB colors using colored resins
Common Interface (CI)	An expansion port mandated on all TVs sold in the EU. It is identical to a PCMCIA card slot and allows a decrypt card to be inserted. A more cryptographically secure version (CI+) was standardized in 2008 and is beginning to gain acceptance.
Common Voltage (VCOM)	Voltage applied to common electrode on color filter of an LCD
Complex Orthogonal Frequency Division Multiplexing (COFDM)	The modulation technique common to DVB, ISDB and DMBT broadcast. They are detail variations of a common technology.
Complimentary Metal Oxide Semiconductor (CMOS)	Device utilizing both p-channel and n-channel transistors
Composite video (CVBS)	Combines brightness information (luma), color information (chroma) and synchronizing signals on one cable; the audio signal is transferred separately. The connector is typically an RCA jack. CVBS stands for Composite Video Blanking and Sync; or Color, Video, Blanking and Sync; or Composite Video Baseband Signal.
Compound Annual Growth Rate (CAGR)	The year-over-year growth rate of an investment over some specified period of time, $\left(\frac{\text{data}_2}{\text{data}_1}\right)^{\frac{1}{(\text{year}_2 - \text{year}_1)}} - 1$, commonly used to show average growth rates over a range of years
Computer Assisted Design (CAD)	An acronym that is widely used to refer to any computer generated designs across all industries and applications. In displays, it may refer to the array pixel design, etc.
Continuous Grain Silicon (CGS)	Name Sharp has given to its unique crystallization process that combines SPC+ELA
Continuous Wave Lateral Crystallization (CLC)	Fujitsu technology to laterally grow p-Si grains via multiple solid state laser beams and scans different parts of the panel at different rates to control mobility
Copper Indium Gallium Selenide (CIGS)	Alternative PV technology that does not use Si, can be produced cheaply, but has lower efficiency than Si. Use of Indium is potentially a concern.

Copper Indium Selenium (CIS)	Alternative PV technology that does not use Si, can be produced cheaply, but has lower efficiency than Si. Use of Indium is potentially a concern. Similar to CIGS, but may not use Gallium as part of the absorber layer.
Cost Of Ownership (COO)	Total cost of owning an asset over its lifetime. Important metric for capital equipment. Includes initial price, consumable costs, maintenance, utilization, etc.
CPT	Can refer to cathode picture tube, color picture tube, or the company Chunghwa Picture Tubes
Critical Dimension (C/D)	Smallest feature dimension in a device, minimum resolvable feature, defines the device critical dimension
Critical Dimension/Overlay (CDO)	Acronym that refers to metrology measurements of CD and accuracy of overlay
Crystal Cycle	The boom and bust cycle seen in the liquid crystal display industry; the cycles result from alternating periods of oversupply and shortage, creating downward and upward pressures on panel prices. When prices are high, manufacturers invest in production facilities. Overproduction results and prices drop, creating more demand. Manufacturers then invest to satisfy the demand.
Crystalline Silicon (c-Si)	Si with a defined crystal structure; Includes both poly (multi) crystalline silicon as well as mono (single grain) crystalline silicon.
Dai Nippon Screen (DNS)	Large Japanese equipment company making coater developers, etc. Also, known just as "Screen."
De-ionized (DI)	Usually refers to DI water. Pure water, with ions neutralized used for cleaning and multiple rising steps. Water used in processing DI.
Demultiplexer Circuit (DeMUX)	Logic circuit that separates each signal that have been multiplexed together on the receiving end
Density of Interface States (Dit)	Measure of density of interface states between p-Si and gate insulator that trap electrons, reducing current flow and degrading TFT performance by lowering mobility
Deposition (Depo)	Abbreviation used for CVD, PVD, other deposition process
Depth Of Focus (DOF)	Vertical area that is considered from a lens or projection system. Important metric for such machines as crystallization and lithography. Larger depth of focus usually translates to a wider process window
Diamond Like Carbon (DLC)	Carbon material that can be deposited in thin or thick films using CVD. The material can be transmissive. It is used for a wide variety of hard coating applications, on magnetic media heads, and can be used in the LCD cell process as an alignment film.
Digital Light Processor (DLP)	Reflective MEMs based micro display, modulates light by either reflecting to light absorber or through projection optics, gray scale achieved by pulse width modulation, from Texas Instruments
Digital Micromirror Device (DMD)	Reflective MEMs based micro display, modulates light by either reflecting to light absorber or through projection optics, gray scale achieved by pulse width modulation, from Texas Instruments
Digital Multimedia Broadcasting (DMB)	This standard is primarily used in Korea for mobile DTV applications. It can operate via satellite (S DMB) or terrestrial (T DMB) transmission.
Digital Still Camera (DSC)	Commonly used acronym referring to digital still cameras and their displays
Digital Video Broadcast-Handheld (DVB H)	A standard primarily used in Europe and other adopter countries for mobile DTV applications.
Digital Video Broadcast-Terrestrial (DVB T)	A digital broadcast standard primarily used in Europe, Asia and the Middle East. The GE 06 treaty committed Europe, Africa and the Middle East to digital-only broadcast from 2015 with DVB as the intended standard. The ASEAN bloc, Australia, New Zealand and Panama and Uruguay have also selected DVB T.
Digital Video Camera (DVC)	Commonly used acronym referring to digital video cameras and their displays
Digital Video Interface (DVI)	A video interface standard developed by an industry consortium, the Digital Display Working Group (DDWG). It is designed for carrying uncompressed digital video data to a display. It is partially compatible with the High-Definition Multimedia Interface (HDMI) standard in digital mode (DVI D). VESA has approved DisplayPort as the new license-free successor to DVI.
Digital-Data Driver Circuit (DDTC)	NEC's implementation of the data driver circuit with 59 sets of level-shifters, a 1-to-6 serial/parallel converter and a latch circuit
Digital-To-Analog-Converter (DAC)	Device that converts digital input signals to analog output signals. Common device in LCD drive electronics and in SOG LTPS panels often integrated
Diluted Hydrofluoric Acid (DHF)	Used as a cleaning agent for wet, light etching. May be used in LTPS processes to remove unwanted SiO ₂ . E.g. 0.5%, 3%, etc. HF may be used.

Dimethyl Sulfoxide (DMSO)	Used as a resist remover, has low alkalinity and can prevent corrosion of Al and other metals
Diode Pumped Solid State (DPSS)	Solid state laser, with single wavelength generated by high power diode. Used in a variety of FPD applications, like repair and ablation
DisplayPort	An emerging digital display interface specification designed to reduce display complexity and accelerate the adoption of protected digital outputs on PCs to support the viewing of high definition and other types of protected content with an optional content protection capability. It was developed by members of the industry who saw the need for extreme display performance that could be implemented ubiquitously across complete product lines.
Dots Per Inch (DPI)	Measure of resolution
Double Gate Design (Double Gate)	TFT with two gates that reduces leakage current by reducing chance that grain boundary will occur near the drain in LTPS devices
Drain Current (ID)	Current measured on the drain side of a TFT in the ON state
Dual Brightness Enhancement Film (DBEF)	3M product that increases brightness by as much as 60% by angle, reflection, and polarization light recycling
Duty Ratio (DR)	$1/N$, where N equals the number of energized or unenergized rows selected by one complete cycle
Dynamic Random Access Memory (DRAM)	
Digital Television (DTV)	
Excimer Laser Annealing (ELA)	Part of the LTPS process, an older process
Electro Static Charge (ESC)	Acronym used by TEL to describe system used to reduce abnormal plasma discharges and arcing in dry etchers
Electro Static Discharge (ESD)	Build up/release of static electricity that can damage circuits and create failures. Significant problem during movement and processing large glass substrates
Electro-Luminescence (EL)	In construction they consist of an upper and lower substrate and upper and lower electrodes sandwiching a material which will give off light when high frequency voltage is applied. The whole assembly can be as little as two millimeters in depth, is very light, can switch states in about a millisecond, requires very little power has a wide viewing angle and can be quite rugged. Meko.
Electro-magnetic Interference (EMI)	Unwanted electrical signals caused by the rapid or high frequency switching of signals.
Electromigration	Undesirable transfer of electrons from the applied electric on a metal to interconnect materials via imperfections in the lattice. Electron scattering occurs which causes increase in resistance in the metal
Electron Cyclotron Resonance (ECR)	A type of plasma CVD that uses magnets to generate a high density plasma. Used experimentally to deposit high quality gate dielectrics.
Electronics & Optoelectronics Research Laboratories (EOL)	The Taiwanese government R&D organization conducting FPD research. Previously was ERSO, but under 2005 reorganization became part of EOL
Electronics Research and Services Organization (ERSO)	Taiwanese government organization under which state sponsored FPD related research is conducted, part of the larger ITRI organization. Under reorganization at the end of 2005, group became EOL
Electro Magnetic Interference (EMI)	
End of Life (EOL)	Marketing acronym used described discontinuation of a product
Enhanced Capacitive Coupled Plasma (ECCP)	Acronym used by TEL to described chamber redesigns that increase plasma efficiency in dry etchers
Ethernet	The IEEE 802.3 standard, the most widespread wired LAN technology. It has been in use from the 1990s to the present, largely replacing competing LAN standards such as token ring, FDDI and ARCNET. In recent years, WiFi, the wireless LAN standardized by IEEE 802.11, is prevalent in home and small office networks and augmenting Ethernet in larger installations.
Excimer Laser Anneal (ELA)	Conventional technique of using pulsed excimer laser to crystallize a-Si to p-Si in a LTPS process
Exposure system Guided by Image Sensor (EGIS)	Vtechnology alternative lithography tool that reduces inspection costs by replacing large, expensive photo masks with multiple small low cost masks scanned over the substrate
Extended Graphics Array (XGA)	Resolution of 1024 × 768 pixels commonly used in notebook PC and monitor applications.

External Electrode Fluorescent Lamp (EEFL)	Lamp type used in some LCD backlights where electrode is on outside of the lamp. Main advantage is that multiple lamps can be driven by single inverter, lowering cost
Field Emission Display (FED)	Similar in principle to a CRT, the FED uses a beam of electrons to excite phosphors, which then emit visible light. Unlike a CRT, it uses multiple electron emitters for each pixel in the display. The basic concept therefore requires no beam steering circuitry and can be made as shallow as the depth of 10 mm. Another bonus is that the electrons in a FED are not produced by heat, as they are in a CRT, so the display does not need to warm up and does not produce large amounts of unwanted heat. It has several advantages over LCDs as well: it requires no back light, is very light, has a very wide viewing angle, its response time is very short, it has a very high contrast ratio and has excellent color properties.
Federal Communications Commission (FCC)	A US government agency, created, directed and empowered by Congressional statute, with the majority of its commissioners appointed by the current president. The FCC was established by the Communications Act of 1934 and is charged with regulating interstate
Field Enhanced Rapid Thermal Processing System (FE-RTA)	Acronym used by Korean RTA equipment vendor Viatron to describe their thermal system that uses multiple heating stages and magnetic field induction to rapidly heat Si films for crystallization, activation, etc. LTPS applications
Field Of Vision (FOV)	Area that is scanned, captured, etc. by a camera, electron beam, etc.
Fine Filtration Unit (FFU)	Filtration system used in a variety of manufacturing systems to clean intake air to high level
Flat Fluorescent Lamp (FFL)	A type of backlight lamp that is mercury-free, has long life, simple, low cost inverter; concerns remain about luminous efficiency, heat generation and power consumption
Flat Panel Display (FPD)	Any electronic display that has minimum depth (basically two dimensions) regardless of technology
Footprint	Area inside clean room a manufacturing tool requires, increases length × width × height, plus maintenance space. Because clean room space is expensive, minimizing footprint is a goal
Frame Rate Conversion (FRC)	The conversion of video from 24, 50 or 60 to 100, 120, 200 or 240 per second. This involves computing the intermediate frames. Algorithms compare successive frames, compute and predict the movement of objects within the image and then create synthetic frames to insert. Also known as Up-conversion.
Frame Time (Tframe)	The time needed to refresh the entire display or $1/(\text{refresh rate (typ. 60 Hz)}) = 16.6 \text{ msec}$.
Full Pin Contact (FPC)	Type of probe card that contacts every gate and data line to drive in process panels for test and inspection purposes.
Gas Rapid Thermal Anneal (GRTA)	Acronym for IHI's gas type RTP system
Gate to Source Voltage (VGS)	Voltage bias between Gate and Source electrodes
g-line	Photolithography using high intensity 436 nm UV radiation produced by Hg lamp
Gigawatt (GW)	Common unit to measure power
Global Depository Receipts (GDR)	A bank certificate issued in more than one country for shares in a foreign company. The shares are held by a foreign bank of an international bank. The shares trade as domestic shares, but are offered for sale globally through the various bank branches. Have been used extensively by Taiwanese LCD makers raise capital in US\$.
Graphical User Interface (GUI)	Software window between user and computer algorithms that allows user to input data, change parameters, view results, etc. interact with the computer system.
Gray-Tone Mask (GTM)	Photo mask that permits partial exposure of some areas and full exposure of others to enable 2 etch process with one lithography step, reducing mask steps per process. E.g. reduce 5 mask process to 4 mask process
High-Definition Television (HDTV)	
Hexa Methyl Di Silazane (HMDS)	Chemical sprayed on glass substrate to improve resist adhesion on some types of metal layers
High Definition Multimedia Interface (HDMI)	The first and only industry-supported, uncompressed, all-digital audio/video interface. HDMI supports standard, enhanced or high-definition video, plus multi-channel digital audio on a single cable. It transmits all ATSC HDTV standards and supports 8 channel, 192 kHz, uncompressed digital audio and all currently-available compressed formats (such as Dolby Digital and DTS).

H.264	An advanced standard for video compression used by various H.264 based codec implementations by Nero Digital AVC, by QuickTime 7, and by next-gen DVD formats like HD DVD and Blu ray Disc. It is also known as MPEG-4 Part 10, or AVC (Advanced Video Coding). It was written by the ITU-T Video Coding Experts Group (VCEG) together with the ISO/IEC Moving Picture Experts Group (MPEG) as the product of a partnership effort known as the Joint Video Team (JVT). The ITU-T H.264 standard and the ISO/IEC MPEG-4 Part 10 standard (formally, ISO/IEC 14496-10) are jointly maintained so that they have identical technical content.
High Density Plasma (HDP)	Generic acronym referring to all types of decoupled high density plasma sources that allow high power to plasma but low damage to substrate, including ECR, ICP, TCP, etc.
High Pressure Annealing (HPA)	Acronym used to describe IHI's unique batch pressure furnace used to form a oxide layer or for hydrogenation applications in LTPS manufacturing
High Temperature p-Si (HTPS)	Process of creating Polysilicon films at high temperatures above 600°C, above the melting point of non-alkali glass, so quartz must be used. HTPS LCDs are small, micro displays
h-line	Photolithography using high intensity 405 nm UV radiation produced by Hg lamp
Hot Electronics or Hot Carrier Stress	Injection of energetic electrons into the gate oxide that degrades reliability, particular to high leakage current of LTPS devices
Hot Plate/Cool Plate (HP/CP)	Acronym commonly used to refer to the Heating and Cooling plate system in coater/developers for FPDs
Hydro-Fluoric Acid (HF)	Acid used as a cleaning liquid in various LCD manufacturing applications, like LTPS
i-line	Photolithography using high intensity 365 nm UV radiation produced by Hg lamp
Install Date	Word frequently used by DisplaySearch to refer to manufacturing equipment installation timing for a fab or a fab phase
In Plane Switching (IPS)	Wide viewing angle technology pioneered by Hitachi. Both pixel electrodes are manufactured on array plate
Inconel	A nickel-chromium alloy with an addition of aluminum for outstanding resistance to oxidation and other forms of high-temperature corrosion
Indium Tin Oxide (ITO)	Transparent metal used as the electrode material in LCDs, typically sputtered on
Indium Zinc Oxide (IZO)	An alternative transparent metal used to replace ITO, manufactured by Idemitsu Kosan. It is much easier to etch than ITO so strong acids are not required and there is less concern with corrosion of Al lines
Inductively Coupled Plasma (ICP)	High density plasma technology. Uses a planar coil on top side of the etch chamber to couple RF power into plasma, biases lower electrode to control ion energy. Similar technology to ICP. Used by TEL on their HDP dry etchers.
Industrial Technology Research Institute (ITRI)	Non-profit Taiwanese government organization set up to support indigenous research and development in a variety of fields, includes 15 technology groups. ERSO (and now EOL) are part of ITRI
Infrared (IR)	Radiation in the wavelengths from about 750 nanometers, just longer than red in the visible spectrum, to 1 millimeter, on the border of the microwave region. Infrared lamps are used in various FPD thermal manufacturing applications, such as RTP
Integrated Circuit (IC)	Any semiconductor die containing multiple solid state circuits that work in conjunction to form a complete device with certain functions
Integrated Services Digital Broadcasting (ISDB)	The digital TV and radio format that Japan has created to allow radio and television stations there to convert to digital broadcasting.
Intellectual Property (IP)	An acronym used to describe a patent portfolio and/or other proprietary information, know-how, technology, etc.
Inter-Layer Dielectric (ILD)	Common in LTPS devices, film between gate and data lines/ITO. TEOS SiO2 common
International Display Workshop (IDW)	SID Japan event, held annually in December at different locations in Japan. One of the highest level academic display conferences of the year
International Electrotechnical Commission (IEC)	The world's leading organization that prepares and publishes International Standards for all electrical, electronic and related technologies
International Standards Organization (ISO)	
International Telecommunication Union (ITU)	
Inverter (DC to AC) (INV)	Used to power electroluminescent lamps. Converts DC to AC voltage at a high frequency 300 Hz-1 kHz

Ishikawajima Harima Heavy Industries (IHI)	Large Japanese heavy industry conglomerate. For LCDs mainly focused on the LTPS equipment market, particularly ion doping showers
Isopropyl Alcohol (IPA)	Used to rinse stripper liquids before water rinsing to avoid Al and other metal corrosion. If not rinsed, water will combine with the stripper which can cause corrosion
Joint Photography Experts Group (JPEG)	A still picture image compression standard
Joint Venture (JV)	A partnership or conglomerate, formed often to share risk or expertise
Jusung Engineering Ltd. (JELL)	Acronym for Korean equipment company. For LCDs mainly focused on PECVD for large a-Si applications. LPL is their main customer.
Keiretsu	A network of businesses that own stakes in one another as a means of mutual security, especially in Japan, and usually including large manufacturers and their suppliers of raw materials and components
Kickback Voltage (dVp)	A voltage lowering (always negative) of the LC pixel voltage during turning off of pixel TFT
Kilowatt (kW)	1000W; Measure of power, or the rate at which energy is generated or consumed. A watt is one joule per second
Labor Overhead Profit (LOP)	Acronym sometimes used by DisplaySearch and others in cost structure numbers
Large Scale Integration (LSI)	IC containing 1000 < circuits < 100,000. But the term is often used loosely to refer to an IC as much greater than 100,000 circuits are now very common
LaserFront Technologies (LFT)	Leading Japanese laser repair vendor
LC saturation Voltage (Vmax)	The voltage at which all the LC molecules (except for the top molecular layer) are aligned parallel to the electric field and reach 90% of transmittance
LC threshold Voltage (VLC)	The voltage that overcomes the intermolecular forces of a LC with 10% transmittance
LCD Innovated Precision Spire (LiPS)	Probe technology developed by MJC for fine pitch applications which feature 40 μm and smaller probe bumps on a film that are form with a lithographic process. Use in cell process but can also be used for array test
Leak Current (Leakage Current)	Measure of ability of capacitor to hold a charge. Leakage occurs at grain boundaries in the high electric field of the drain region. Also expressed as IL or IOFF
Least Significant Bit (LSB)	In reference to missing LSB, a type of driver performance issue that can manifest as a defect
Letter of Credit (LC)	Payment method that utilizes third party banking system to ensure payment on shipment. Often a sales condition of capital equipment.
Letter of Intent (LOI)	Formally letter stating intent to perform a function. Often provided to equipment vendors before placing official PO. May build tool on LOI, but not usually legally binding
LG Philips LCD (LPL)	Acronym for leading LCD manufacturer. Located in Korea, JV between LG Electronics and Philips
Light Emitting Diode (LED)	Solid state light source. Efficiency (energy in, light out) continues to rise making an effective source of illumination for huge number of applications. For FPD manufacturing many inspection systems use LEDs to illuminate devices under test.
Light Emitting Polymer (LEP)	OLED polymer type material that emits light when an electrical current is applied.
Light Guide Plate (LGP)	Sheet used in back light unit to shine light up through the unit
Lightly Doped Drain (LDD)	Technique of reducing typically high leakage currents of LTPS TFTs by doping of the drain region.
Line Time (Tline)	The maximum time allowed to address one row (Tframe/No. of rows)
Liquid Crystal (LC)	Material that changes polarization of light when voltage applied
Liquid Crystal Display (LCD)	FPD that uses the polarization properties of LC to act as a light valve on a backlight to modulate illumination and generate images
Liquid Crystal Module (LCM)	LCM line, backend processing lines including LC fill and module assembly
Liquid Crystal on Silicon (LCOS)	Reflective micro display that uses Si backplane, with module similar to transmissive LCDS
Low Pressure Chemical Vapor Deposition (LPCVD)	Process pressure 30-250 Pa and higher temperatures than PECVD
Low Iron Glass (Low-Fe)	Type of high quality glass that may be used to manufacture TF solar cells instead of soda lime glass, but at least twice as expensive as soda lime. More likely to be used in multiple junction cells. Fe reflects light in a various spectrum, particularly that absorbed by $\mu\text{-Si}$.

Low Temperature Poly-Silicon (LTPS)	Process for crystallizing amorphous-Si below the strain point of glass to create high mobility Si that can be used to integrate circuits directly onto the display substrate
Low Voltage Differential Signaling (LVDS)	A generic interface standard for high-speed data transmission that uses high-speed analog circuit techniques to provide multi gigabit data transfers on copper interconnects. The ANSI/TIA/EIA 644 1995 standard specifies the physical layer as an electronic interface. This standard defines driver and receiver electrical characteristics only. It does not define protocol, interconnect or connector details because these details are application-specific.
Megawatts (MW)	Device Common unit to measure power, particularly the output of a solar cell fab
Mass Flow Controller (MFC)	Device used to precisely control gas flow rates in CVD and other manufacturing equipment
Mass Production (MP)	Date that manufacturer moves from test to actual production of panels
Mean Time Before Failure (MTBF)	Metric typically used by equipment vendors to evaluate the average running time before system needs to be maintained or repaired
Mean Time To Repair (MTTR)	Metric typically used by equipment vendors to evaluate the average amount of time required to fix, maintain and reset a machine after it has been fixed of a problem
Mega Hertz (MHz)	High frequencies in the range of millions of cycles per second. Used in reference to variety of display manufacturing processes, such as megasonic cleaning
Mega Pascal (Mpa)	Unit of measure of force, used for example to measure jet pressure in wet processor systems
Metal Induced Lateral Crystallization (MILC)	Enhanced form of SPC crystallization that uses a metal catalyst, often Ni, to grown lateral grains more uniformly and at lower temperatures than conventional SPC
MHEG-5	DVB interactivity standard adopted in the UK, Australia, New Zealand and on some satellite services
MHP	Interactivity standard adopted in some countries in Europe; similar to OCAP cable interactivity in the US
Microcrystalline Si ($\mu\text{-Si}$)	Microcrystalline Si layer used in Thin Film solar cells to extend energy absorption to wider spectrum and increase conversion efficiency, by 6% for conventional a-Si to 8% or more for a Si/ $\mu\text{-Si}$ Tandem solar cell
Ministry of Economy, Trade, and Industry (METI)	Used to be called MITI
Mitsui Engineering and Shipbuilding (MES)	Acronym and now official company name for the large Japanese company who makes ion doping equipment for FPDs
Mixed Signal	Type of circuit having both analog and digital circuits.
Mobility	The effective velocity that electrons flow through a given material
Monochrome Video Graphics Array (MVGA)	Resolution 160 × 120 pixels, or 1/4 the number of pixels of QVGA, found in small displays such as in cell phones
Motion Estimation	See FRC.
Motion Picture Experts Group (MPEG)	A working group of the International Standards Organization (ISO) and International Electrotechnical Commission (IEC) in charge of the development of standards for coded representation of digital audio and video
MPEG-4	A developing standard divided into a number of parts. The key parts to be aware of are MPEG-4 part 2 (MPEG-4 SP/ASP, used by codecs such as DivX, XviD, Nero Digital and by QuickTime 6) and MPEG 4 part 10, which is described in the entry for H.264.
Multicrystalline Si	Processed silicon where the material consists of several small (typically 1–20 mm) crystal grains
Multi-Domain Vertical Alignment (MVA)	Common wide viewing angle enhancement. Rather than rubbing to form alignment layer uses protrusions patterned onto the CF
Multiplexer Circuit (MUX)	A logic circuit that combines several different signals onto a single communication channel for transmission
Mura Defects	A Japanese word meaning "blemish" that has become widely used in the industry to describe a large area, non-uniformity that range tremendously in size, shape and severity making them hard to categorize. Often assumed a defect
N-channel Metal Oxide Semiconductor (NMOS)	Field effect transistor that flows electrons between metal through a semiconducting material controlled by the electrical field of a gate. Channel is predominantly negatively charged, source and drain are N-type

Nameplate or Nominal Capacity	STRONG> Refers to maximum capacity for an entire year. Does not account for when machines were installed and how long it takes to set them up and ramp them. For example, if a company installs 60 MW capacity in June, they might say their nameplate capacity for the year is 60 MW, but their ramped capacity could be no more than 30 MW, as they only had the machines for six months.
National Television Standards Committee (NTSC)	The US analog TV standard, based on 525 lines (480i)
Numerical Aperture (NA)	An optics term that refers to measure of the diameter versus the focal length of a lens. Higher NA lenses can resolve finer details than lower NA lenses while transmitting more light. NA is a value used in relationship to lithography tool lenses
OLED TV	TV that uses an Organic Light Emitting Diode display
Offset TFT Design (Offset)	Over-etching gate to provide an offset region in the channel between the source, gate, and drain areas; High resistance area, effectively relaxing the electric field
One Drop Fill (ODF)	Method of applying LC, seal, aligning, curing LCD cells
Open Shorts Tester (O/S Tester)	Electrical tester that have conventionally used FPC probing to drive and sense current to gate and source lines in process to test for gross open/short defects. Non-contact O/S testers have also been developed by OHT
Optically Compensated Bend (OCB)	High speed LC that is able to achieve response times of 5 ms or better. Also known as Optically Compensated Birefringence
Organic Light Emitting Diode (OLED)	FPD that is self emitting from matrix of diodes and organic light emitting phosphors; also, transparent OLED (TOLED), stacked OLED (SOLED), active matrix organic light emitting diode (AMOLED)
Organic Photovoltaics or Organic Solar Cells (OPV or OSCs)	Solar cells that incorporate organic semiconducting materials in thin layers generating current when light shines on them. This is the opposite phenomenon of OLED materials.
Original Equipment Manufacturer (OEM)	Company that assembles components into completed products for other companies
Outer Lead Bond (OLB)	Acronym for area around cell where driver electronics are attached to the display
Parts Per Million (PPM)	A unit of measure used like a percentage, and useful when counting small amounts. 1 ppm = 1/1,000,000. Used for a variety of measurements, particularly for solutions.
Passive Matrix (PM)	Used in reference to both LCDs and OLEDs, refers to the drive architecture where only data and gate lines are controlled, lower performance, higher power consumption compared to active matrix
Patterned Vertical Alignment (PVA)	Samsung VA technology that adds an etch step to create alignment patterns, no protrusions
P-channel Metal Oxide Semiconductor (PMOS)	Field effect transistor that uses holes to conduct current through a semiconducting material controlled by the electrical field of a gate. Channel is predominantly charged positive during conduction
PDP TV	A TV that uses a plasma panel as the display
Personal Digital Assistant (PDA)	Type of small personal computer, mobile and with limited function compared regular PCs; displays tend to be 3.5" range
Phase Alternating Line (PAL)	Analog TV standard. Usually 625 lines (576i), it is the most popular analog broadcast standard.
Phase Modulate ELA (PMELA)	Crystallization technique that employs a phase shift mask to control melt regimes to laterally grow p-Si grains
Photo Engraving Process (PEP)	Refers to exposure process, particularly number of times a substrate is exposed
Photon Dynamics Incorporated (PDI)	Non-official acronym for the leading TFT array test equipment vendor
Physical Vapor Deposition (PVD)	Deposition method used commonly for metal layers through bombardment of target by gas plasma. Also often called "Sputtering"
Pixels Per Inch (PPI)	Measure of resolution
Plasma Display Panels (PDP)	A type of flat panel display based on plasma technology, which employs the principles of fluorescent lighting. In plasma displays an electric field passes through a gas that is maintained at a low pressure inside a glass tube. The electric charge ionizes the gas, which changes state, becoming plasma and giving off ultraviolet radiation. The radiation strikes the outside of a glass tube coated with phosphor, causing the phosphor to produce visible light.
Plasma Enhanced Chemical Vapor Deposition (PE-CVD)	Deposition method used commonly for Si and ITO layers through disassociation of precursor by gas plasma

Plasma Etch Mode (PE Mode)	Standard plasma etch mode where top electrode is powered. No control of ion energy to bottom electrode/substrate so etch is primarily chemical and isotropic
Plasma Flood Gun (PFG)	Ion neutralization system used in Ion Doping systems that uses a special gas to create a DC plasma
Point Of Sales (POS)	Often used to refer to displays used for retail applications
Polarity (POL)	Refers to a positive or negative input signal to a DAC that controls the Polarity of the output signal for a selecting dot, line or column inversion
Polyimide (PI)	Transparent polymer used as a base film for the LC alignment layer
Poly-crystalline Silicon (p-Si)	Common substrate for Si based PV cells, often called multi-crystalline Si in the PV industry. Typically slightly lower conversion efficiencies than monocrystalline c-Si based cells
Poly-Silicon (p-Si)	Silicon material having crystallized structure, but irregular, and exhibits boundaries between grains. The semiconducting material in p-Si active matrices
Poly-Vinyl Alcohol Film (PVA)	Film used in manufacture of polarizers, soaked in iodine or dye to form polarizing elements
Pressure Sensitive Adhesive (PSA)	Film used to apply and attach polarizers to LCD glass in module process
Preventive Maintenance (PM)	Periodic maintenance performed on manufacturing equipment to replace consumables, clean, tune, etc. to prevent system failure
Printed Circuit Board (PCB)	A resin board with usually copper circuits used to mount a variety of electronic components and ICs used in a huge variety of electronic applications.
Purchase Order (PO)	Official contract, frequent used to refer to purchases of capital equipment
QFHD	3840 × 2160, Quad Full HD
QSXGA	2560 × 2048, 5 megapixels
Quarter Common Intermediate Format Plus (QCIF+)	Resolution of 220 × 176 pixels, commonly used for cell phone and mobile applications. QCIF is 176 × 144.
Quarter VGA (QVGA)	Resolution of 320 × 240 pixels, 1/4 number of pixels of standard VGA, now a relatively common resolution for cell phone and other mobile applications
QUXGA	3200 × 2400, 8 megapixels
QXGA	2048 × 1536, 3 megapixels
Radio Frequency (RF)	High frequency AC plasma used in CVD and PVD equipment to assist in film deposition. Often RF Sputter, RF plasma, etc.
Rail Guided Vehicle (RGV)	Transportation vehicle used as part of factory automation systems to move cassettes of substrates between process steps. Follow a fixed path on a rail.
Rapid Thermal Anneal or Processing (RTA or RTP)	Method of heating substrate to very high temperatures, usually one at a time with process times around 1 minute. Various techniques, for LTPS LCDs hot gas, lamp, resistive heaters are used to raise temperatures to the strain point of glass to activate dopants.
Reactive Ion Etching (RIE)	Plasma based technology that uses ion bombardment and reactive chemistry to etch features circuit features
Red, Green, Blue (RGB)	A video signal that consists of three signals—red, green and blue—carried on three separate cables/pins. Extra cables are sometimes needed to carry synchronizing signals. RGB signal formats are often based on modified versions of the RS 170 and RS 343 standards for monochrome video. This type of video signal is widely used in Europe since it is the best quality signal that can be carried on the standard SCART connector and is also the form of analog connection to monitors (the VGA socket.)
Red, Green, Blue, White (RGBW)	Adds 4th white sub-pixel to conventional RGB triads to increase brightness
Reduced swing Differential Signaling (RSDS)	Defines the output characteristics of a transmitter and inputs of a receiver along with the protocol for a chip-to-chip interface between flat panel timing controllers and column drivers.
Refractory Metals (Refractory Metals)	A class of metals extraordinarily resistant to heat, wear and corrosion. Five metals: W, Mo, Nb, Ta, Re
Reliable a-Si Scan Driver (RASD)	The name for Wintek's row or scan driver circuit architecture deploying a-Si TFTs that maintains reliable operation by compensating for threshold voltage shifts of a-Si TFTs
Resistive Capacitive delay (RC Delay)	An important metric in LCD panel design. The time it takes to charge and settle a pixel to the required signal accuracy to achieve the desired gray scale value is often called the settling time budget, which is a function of the RC delay. Lower RC delay is desirable
Reticle	Term used to describe exposure mask, typically 6" like those used in semiconductor lithography. Used in display lithography for step and repeat type machines used on gen 4 and smaller glass and particularly for LTPS

Return-On-Investment (ROI)	Earnings to investment ratio
Radio Frequency Identification (RFID)	
Scanning Electron Microscope (SEM)	Electronic based imaging to provide extremely high resolution, common used in electronics analysis as features are more readily resolved by electron beam than optically
Scanning White Light Interferometer (SWLI)	Metrology tool that relies on offset laser reflections to measure very small increments
SCART	A French-originated standard and associated 21 pin connector for connecting audio-visual (AV) equipment. It is also called a Euro-connector and is compulsory on all TVs sold in the EU. The signals carried by SCART include both composite and RGB (with composite synchronization) video, stereo audio input/output and digital signaling. The standard was extended at the end of the 1980s to support the new S Video signals. In addition, a TV can be awakened from standby mode or switched to video mode through a SCART connector.
SECAM	French analog TV standard, 625 line (576i) used also in Eastern Europe and North Africa.
Selectability	The ability to etch a specific material at a high rate, with minimal affect on other materials
Selectively Enlarging Laser X'tallization (SELAX)	Developed by Hitachi, a hybrid crystallization technique that combines ELA and solid state laser to achieved high mobility.
Self Aligned TFT Structure	No overlap between TFT Source/Drain and gate. Common LCD TFT structure that minimizes parasitic capacitance, can use gate as mask, such as for doping drain
Selling, General and Administrative Expenses (SG&A)	Salaries, commissions, and travel expenses for executives and salespeople, marketing, advertising costs, payroll expenses. Direct and indirect selling costs, etc. Not counted in panel cash costs, but included in total costs
Semiconductor Energy Laboratory (SEL)	Japanese technology development company who developed and licensed the original CGS technology to Sharp
Sequential Lateral Solidification (SLS)	Crystallization technology developed by Columbia University that achieves lateral crystal growth with an excimer laser and mask optics that allows location controlled melt regimes
Severed Available Market (SAM)	Marketing term used to define applicable market segment of a particular product, a subset of TAM
Sheet Resistance (Rs)	Measured in Ohms per square, used to determine the activation level of LTPS dopants, lower value is better
Signal-to-Noise Ratio (S/N Ratio)	Reference value used in relationship to sensing applications. Higher ratio indicates higher fidelity signal
Silane (SiH4)	Gas typically used in PECVD processes to deposit SiO2 or SiNx
Single Crystal Silicon (SCS)	Silicon material exhibiting a continuous, regular crystalline lattice structure without internal grain boundaries.
Super Lateral Solidification (SLS)	part of the LTPS process
Society for Information Display (SID)	Leading organization industry association of display professionals. Main forum for industry technical discussions. Sponsor multiple conferences every year.
Solid Phase Crystallization (SPC)	Crystallizing a-Si to p-Si through furnace annealing at temperatures 450-600°C for 12-40 hrs
Sony Toyota Mobile Display (STMD)	JV formed by Sony and Toyota in Q4'04 that includes the former IBM Yasu line in Japan, which is in the process of being converted from a-Si to LTPS production
Source/Drain (S/D)	Abbreviation used to delineate source/drain areas of TFT or the metal used to send data signal to TFT, or connect TFT output to pixel electrode
Sputtering	see PVD
Standard Cubic Centimeters per Minute (SCCM)	Used as a measure of gas flow rates usually through a MFC. An important process parameter for gas plasma recipes for ion doping, CVD, dry etch, PVD, etc.
Standard Test Conditions (STC)	Conditions for measuring solar cells (temperature, angle of irradiance, amount of light and so on) that are widely accepted throughout the solar industry
Statistical Process Control (SPC)	Statistical method of used in yield management strategy to inspect, calculate process parameters and watch for statistical deviations
Subthreshold Slope (S-Factor)	Measure of performance of TFT in subthreshold region, where measure amount of additional current attained from increasing gate voltage. Higher performance device has low S factor (or steep slope (1/S))
Sumitomo Heavy Industries (SHI)	Large Japanese company that has developed and commercialized multiple crystallization technologies

Super High Aperture (SHA)	High aperture ratio pixel design with reduced TFT size and overlapping ITO over bus lines to allow higher transmissivity
Super Lateral Growth (SLG)	Growth of large crystals under optimum ELA conditions when Si is raised to the near complete melt regime, resulting high performance p-Si.
Super Twisted Nematic (STN)	Nematic is a type of thermotropic liquid crystal that has molecules arranged in definite patterns (rather than randomly as in the isotropic type of thermotropic liquid crystal). There is a particular kind of nematic liquid crystal that is called twisted nematic (TN) because it is naturally twisted (90° twist). When these crystals have an electric current applied to them, they untwist to varying degrees, depending on the current's voltage. Nematic liquid crystals are used in LCDs because they have predictable responses to electric current, controlling the passage of light. Super twisted nematics have a twist of over 180°. Two kinds of STNs are often used in LCDs, monochrome super twisted nematics (MSTN) and color super twisted nematics (CSTN).
Super/Giant Grain Silicon (SGS or GGS)	Name Samsung SDI has given to one of the lateral growth technologies they have developed, similar to that announced by Hyung Hee University in description
Surface-conduction Electron-emitter Display (SED)	Unique FED like display technology developed jointly by Toshiba & Canon that uses a emitter source and phosphor at each pixel to create images. Reportedly excellent image quality. Targeting large size TVs but late to market.
Surfactant	Surfactants are wetting agents that lower the surface tension of a liquid, allowing easier spreading, and lower the interfacial tension between two liquids. "Surface active agent" used in cleaning applications.
SVGA	800 × 600
SXGA	1280 × 1024, 1 megapixel
SXGA+	1400 × 1050
Synchronous Dynamic Random Access Memory (SDRAM)	
System-On-Chip (SoC)	A single chip implementation integrating many functions
System On Glass (SOG)	Fabrication of drivers, power supply, timing controller, Digital-to-Analog Converter (DAC), etc. IC devices, which provide important functionality to the display, directly onto the glass substrate. Also called SOP, System-On-Panel, System LCD, etc.
Total Available Market (TAM)	
Tape Automated Bonding (TAB)	Method of attaching drive electronics to display via a flexible polyimide cable with fine pitch wires bonded to the display leads
Tape Carrier Package (TCP)	Material is used to attach driver ICs to LCDs, being replaced with COF on higher resolution panels
Temperature Control Modules (TCM)	Acronym used by Korean RTA equipment vendor Viatron to described various heating modules in their thermal system, that are IR, magnetic field, or cooling
Test Element Group (TEG)	Suite of parametric test that can include mobility, V _{th} , Ion, I _{off} , resistance, etc. More widely used in LTPS than a-Si
Tetra Ethyl Ortho Silicate (TEOS)	C ₈ H ₂₀ O ₄ Si, a liquid precursor for SiO _x deposited by CVD, common in LTPS processes. Good step coverage.
Tetra methyl ammonium hydroxide (TMAH)	Chemical solution diluted down to 2.38% to develop positive photo resist, commonly used in LCD array and CF photo processes
Thermal Cycling	When a cold robot end effector picks up a hot substrate, it causes the substrate to warp, which can cause the end effector to lose contact with the substrate.
Thin Film (TF)	Type of PV cell (Compare to c-Si, etc.)
Thin Film Diode (TFD)	Diode used to turn on/off LCD pixels. A Metal-Insulator-Metal device that can be formed with 3 masks. Sanyo Epson has TFD capacity, but is the only LCD manufacturing using in mass production.
Thin Film Transistor (TFT)	A transistor used in high-performance active matrix LCDs. In TFT technology, transistors are built into each pixel of the screen. DisplaySearch segments TFT LCD displays into three sub-technologies: a-Si TFT LCD, LTPS TFT LCD and HTPS TFT LCD.
Thin-beam X'tallization (TDX)	Crystallization Technology developed by Cymer and Carl Zeiss that grows lateral p-S grains by high repetition pulsing of an excimer laser over a constantly scanned substrate, which melts, then remelts seeded Si
Threshold Voltage (V _{th})	Value of V _{th} , or threshold voltage where enough electrons accumulate in the channel of a TFT to turn the device on.
Time Delayed Integration (TDI)	Acronym that refers to a type of line scan CCD sensor often used in AOI applications

Timing Controller (TCON)	IC used in all LCDs to do to calculate the correct timing of signal generation, which is sent to the level shifters to ramp to proper display drive voltage
Tokyo Electron (TEL)	Large Japanese equipment company making coater developers and dry etchers
Tokyo Institute of Technology (TIT)	Japanese university that has developed PMELA crystallization technology in conjunction with ALTEDEC
Total Available Cycle Time (TACT)	Process time per substrate
Total Available Market (TAM)	Entire market size in units or revenue for specific product. Definition varies by user.
Total Costs	DisplaySearch defines as Yielded Material and Component Total Cost + Personnel Cost + Depreciation Cost + Indirect Expenses + SG&A (including R&D)
Total Internal Reflection (TIR)	Concept employed on Holotronic's submicron exposure technology
Transformer Coupled Plasma (TCP)	Originally Lam Research patented, and trade marked name, high density plasma technology. Licensed by YAC and used for their display etch tools. Uses a planar coil on top side of the etch chamber to couple RF power into plasma, biases lower electrode to control ion energy. Similar technology to ICP.
Transition Minimized Differential Signaling (TMDS)	A technology for transmitting high-speed serial data used by the DVI and HDMI video interfaces, as well as other digital communication interfaces.
Transistor Transistor Logic (TTL)	Logic signal format where circuits switch between the low and high voltage levels, inadequate for higher resolution displays because of the EMI generated at high frequencies
Transmission Electron Microscope (TEM)	Electron light source microscope that creates images via transmitted electrons. Angstrom level resolution, often used in LCD and other display related research
Transmissive (Transmissive)	The most common type of LCD configuration which uses a backlight as a light source.
Tri-acetate Cellulose (TAC)	Film used as base material for polarizers, protects polarizing PVA on both top and bottom and improve adhesion
Turbo Molecular Pump (TMP)	High speed turban vacuum pump used to evacuate process chambers on vacuum based tools like CVD, PVD, Dry Etch, etc.
Turbo Molecular Pump (TMP)	High speed turban vacuum pump used to evacuate process chambers on vacuum based tools like CVD, PVD, Dry Etch, etc.
Turn Around Time (TAT)	Used broadly to describe time from order to delivery, time in process, etc.
Twisted Nematic (TN)	Standard LC mode, used for example in laptop displays, poor viewing angle characteristics; see also Super Twisted Nematic
Twisted Nematic Liquid Crystal Display (TNLCD)	see super twisted nematic entry
Up-Conversion	Also known as Frame Rate Conversion. See FRC.
United States Display Consortium (USDC)	US government sponsored organization initially set up to bootstrap the US display industry. The consortium supports member companies and provides grants for cost share projects to develop new display related technologies
UXGA	1600 × 1200, 2 megapixels
van der Waals forces	A weak attractive force between atoms or nonpolar molecules caused by a temporary change in dipole moment arising from a brief shift of orbital electrons to one side of one atom or molecule, creating a similar shift in adjacent atoms or molecules.
Vertical Alignment (VA)	LC mode that increases viewing angle. Multiple iterations of the technology that include MVA, PVA, ASV, etc.
VGA	640 × 480
Vestigial Side Band (8-VSB)	The 8 level Trellis coded Vestigial Side Band Modulation developed by Zenith and adopted for FCC and ATSC (Advanced Television Systems Committee) standard of DTV in the US. HDTV uses this for terrestrial broadcast transmission.
Video Electronics Standards Association (VESA)	An international non-profit corporation that supports and sets industry-wide interface standards for the PC, workstation and consumer electronics industries
Visible Image Size (VIS)	Actual area of a display that is active and contains image information, rather than the size of the monitor or TV, or a rounded up number to imply a larger panel size
Voltage Imaging Optical System (VIOS)	Acronym for proprietary imaging head that includes light source, optics, modulator, and reflection optics used on Photon Dynamics array test tool

Voltage Reference Bus (Vref)	The signal lines in a commonly used circuit architecture that carry the voltage levels for all the gray scales (requiring 2N signal lines for N-bits of gray scale), not commonly used for current 6- and 8-bit gray scale designs.
Vth	Threshold voltage where enough electrons accumulate in the channel of a TFT to turn the device on
Wi-Fi	A wireless technology brand owned by the Wi Fi Alliance intended to improve the interoperability of wireless local area network products based on the IEEE 802.11 standards. Common applications for Wi Fi include Internet and VoIP phone access, gaming and network connectivity for consumer electronics such as televisions, DVD players and digital cameras. 802.11g is suitable for reliable transmission of SD video, 802.11n for HD video.
WIP	Work in progress
Work In Process (WIP)	Refers to number of substrates, panels, etc. within part of a manufacturing process. For example a batch furnace may have 20 substrates in WIP, that is anneals an entire lot at the same time, an hour or so
WQXGA	3840 × 2400, a wide aspect resolution, 9.2 megapixels
WQXGA+	2560 × 1600, a wide aspect resolution
WSXGA	1366 × 768, a wide aspect resolution
WSXGA	1600 × 1024, a wide aspect resolution
WSXGA+	1680 × 1050, a wide aspect resolution
WUXGA	1920 × 1200, a wide aspect resolution
WXGA	1280 × 768, a wide aspect resolution
WXGA+	1366 × 768 for TVs, a wide aspect resolution
WXGA++	1440 × 900 for monitors, a wide aspect resolution
XGA	1024 × 768
YAG Laser Annealing (YAL)	Refers to solid state annealing system for LTPS crystallization, ULVAC often uses this acronym
YPbPr	A color space used in video electronics, for component video cables. YPbPr is the analog version of the YCbCr color space; the two are numerically equivalent, but YPbPr is designed for use in analog systems, and YCbCr is intended for digital video. Also referred to as "Y/Pb/Pr", "YPrPb", "PrPbY", "Y/R-Y/B-Y", "Y(R-Y)(B-Y)", "Y, R-Y, B-Y", and "PbPrY"—all are exactly the same thing.

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