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Investment Banking for Semiconductors, IT & Electronics Supply

Semiconductor Industry Coverage Landscape

July 2020

SEMICONDUCTORS & EQUIPMENT LANDSCAPE 2020

ASIC

MARVELL · BROADCOM · dialog SEMICONDUCTOR · Infineon · intel · IMPINJ · REALTEK · ON · NORDIC SEMICONDUCTOR

Sensors & Actuators

Amkor Technology · DIODES INCORPORATED · NXP · UMC · NVE CORPORATION · Infineon · maxim integrated · AKOUSTIS · RENESAS · DSP GROUP · dialog SEMICONDUCTOR · Moortec Global In-chip Monitoring · Texas Instruments · ROHM SEMICONDUCTOR · KLA · KEYSIGHT TECHNOLOGIES · knowles · ANALOG DEVICES AHEAD OF WHAT'S POSSIBLE™ · SILICON LABS · MICROCHIP · life.augmented · XPERI · SiTime · AOI APPLIED OPTOELECTRONICS, INC. · VISHAY · MPS

Equipment

SATS

Amkor Technology · onto innovation · Brooks · SANMINA · tsmc · TEL · PHOTRONICS · KLA · UMC · PDF SOLUTIONS · Texas Instruments · Ultra Clean Technology · NeoPhotonics · ichor · Kulicke & Soffa · Veeco · TERADYNE · MagnaChip · LB Semicon · ASML · Besi · Mentor A Siemens Business · XPERI · MICROCHIP · FormFactor · ADVANTEST · SCREEN · ASM Pacific Technology · Lam RESEARCH · MEDIATEK · ASE Technology Holding Co., Ltd. · Entegris · ChipMOS · CYBEROPTICS Technology Leadership. Global Solutions. · KEYSIGHT TECHNOLOGIES · HANA MICRON

EDA

NOVA PROCESS INSIGHT · AEHR TEST SYSTEMS · LATTICE SEMICONDUCTOR · XILINX · SYNOPSYS · Altium · Mentor A Siemens Business · cadence · PDF SOLUTIONS · MICROCHIP · SiFive · zGlue · tsmc · intel

IP

Himax · dialog SEMICONDUCTOR · PDF SOLUTIONS · intel · tsmc · cadence · LATTICE SEMICONDUCTOR · XPERI · Mentor A Siemens Business · Rambus · SYNOPSYS · Moortec Global In-chip Monitoring · MICROCHIP · SiFive · DOVER MICROSYSTEMS

MOS Micro

MPU

RENESAS · NVIDIA · AMD · Qualcomm · MICROCHIP · intel · Ambarella · life.augmented

MCU

TEXAS INSTRUMENTS · Infineon · NXP · MICROCHIP · QuickLogic · RENESAS · ABOV SEMICONDUCTOR · SanKen · life.augmented · maxim integrated · REALTEK · SILICON LABS · ROHM SEMICONDUCTOR · ON

DSP

CEVA · TEXAS INSTRUMENTS · CIRRUS LOGIC · Inphi Think fast.

Analog

Amplifiers

ANALOG DEVICES AHEAD OF WHAT'S POSSIBLE™ · SKYWORKS · ROHM SEMICONDUCTOR · DIODES INCORPORATED · RENESAS · MICROCHIP · TEXAS INSTRUMENTS · ON · life.augmented · MACOM Partners from RF to Light · qorvo · Airbeam

Application Specific

atomera · Inphi Think fast. · BROADCOM · SEQUANS · maxim integrated · SUMMIT MICROELECTRONICS · RENESAS · MPS · REALTEK

Signal Conversion

SUMMIT MICROELECTRONICS · MICROCHIP · Tower Semiconductor Where Analog and Value Meet · dialog SEMICONDUCTOR · SKYWORKS · life.augmented · TEXAS INSTRUMENTS · ON · maxim integrated · TERADYNE · Lam RESEARCH · MaxLinear · VISHAY · METHODE ELECTRONICS

Interface

DIODES INCORPORATED · MICROCHIP · maxim integrated · RENESAS · NXP · MaxLinear · SILICON LABS · IMPINJ · TEXAS INSTRUMENTS · ROHM SEMICONDUCTOR

Power Management

dialog SEMICONDUCTOR · life.augmented · Infineon · ANALOG DEVICES AHEAD OF WHAT'S POSSIBLE™ · NXP · DIODES INCORPORATED · NVE CORPORATION · MaxLinear · axcelis · SILICON LABS · ON · maxim integrated · SanKen · MPS · power integrations · ROHM SEMICONDUCTOR · intel · Himax · Tower Semiconductor Where Analog and Value Meet · CREE · MICROCHIP · TEXAS INSTRUMENTS · SEMTECH · atomera · VISHAY · RENESAS · Veeco · KEYSIGHT TECHNOLOGIES · METHODE ELECTRONICS · EPC EFFICIENT POWER CONVERSION

Memory

SRAM

axcelis · intel · RENESAS · MICROCHIP · MARVELL · AMD · TECHNOLOGY · ON · atomera

Flash

SiliconMotion · TERADYNE · MICROCHIP · ON · UMC · SMART Modular Technologies · SK hynix

EEPROM

MICROCHIP · ON · RENESAS · TERADYNE · dialog SEMICONDUCTOR · ROHM SEMICONDUCTOR

MRAM

APPLIED MATERIALS · EVERSPIN TECHNOLOGIES · SMART Modular Technologies

DRAM

axcelis · TERADYNE · SK hynix · ROHM SEMICONDUCTOR · MARVELL · SMART Modular Technologies · atomera · Rambus · TECHNOLOGY · AMD · intel · RENESAS

Optoelectronics

Displays

BROADCOM · ROHM SEMICONDUCTOR · MagnaChip · KLA · LB Semicon · Brooks · Amkor Technology · dialog SEMICONDUCTOR · SCREEN · KOPIN · Himax · APPLIED MATERIALS · MPS

Image Sensors

axcelis · ON · Himax · XPERI · UMC · ASM Pacific Technology · life.augmented · Tower Semiconductor Where Analog and Value Meet · Ambarella · AOI APPLIED OPTOELECTRONICS, INC. · axt · SK hynix

Light

SEMILEDS · ROHM SEMICONDUCTOR · dialog SEMICONDUCTOR · SKYWORKS · Amkor Technology · axt · METHODE ELECTRONICS · VISHAY · neonode

Laser

MACOM Partners from RF to Light · AOI APPLIED OPTOELECTRONICS, INC. · RENESAS · NeoPhotonics · CORNING · nLIGHT · ROHM SEMICONDUCTOR · emcore · LUMENTUM · COHERENT · axt · Veeco · II-VI · IPG PHOTONICS

Fiber Optic

ANALOG DEVICES AHEAD OF WHAT'S POSSIBLE™ · AOI APPLIED OPTOELECTRONICS, INC. · BROADCOM · METHODE ELECTRONICS

Solar

APPLIED MATERIALS · axt

Discrete

Thyristors

DIODES INCORPORATED · ON · Infineon · VISHAY · RENESAS · life.augmented

Rectifiers

DIODES INCORPORATED · ON · SEMTECH · VISHAY

Diodes

DIODES INCORPORATED · Infineon · life.augmented · SanKen · MACOM Partners from RF to Light · ROHM SEMICONDUCTOR · SKYWORKS · ON · VISHAY

P. Transistors

ANALOG DEVICES AHEAD OF WHAT'S POSSIBLE™ · ROHM SEMICONDUCTOR · MACOM Partners from RF to Light · SanKen · RENESAS · DIODES INCORPORATED · Infineon · ALPHA & OMEGA SEMICONDUCTOR · MagnaChip · power integrations · maxim integrated

Small Signal

SanKen · ROHM SEMICONDUCTOR · ANALOG DEVICES AHEAD OF WHAT'S POSSIBLE™ · MACOM Partners from RF to Light · dialog SEMICONDUCTOR · NeoPhotonics · ASM Pacific Technology · DIODES INCORPORATED · RENESAS · Infineon · METHODE ELECTRONICS

Logic

Bipolar

Infineon · ON

General Purpose

QuickLogic · EFINIX · TEXAS INSTRUMENTS · zGlue · XILINX · intel · MICROCHIP · LATTICE SEMICONDUCTOR · MoSys · flexlogix

Special Purpose

SUMMIT MICROELECTRONICS · SEQUANS · REALTEK · SYNTIANT · Airbeam · neonode · DSP GROUP · Ambarella · ON · NORDIC SEMICONDUCTOR

Touch Screen

ASM Pacific Technology · life.augmented · neonode · METHODE ELECTRONICS · Himax · ON

Display Drivers

power integrations · QuickLogic · METHODE ELECTRONICS · life.augmented · RENESAS · ROHM SEMICONDUCTOR · pixelworks · RENESAS · LATTICE SEMICONDUCTOR · TEXAS INSTRUMENTS · IMPINJ · ABOV SEMICONDUCTOR

APPLICATION SPECIFIC INTEGRATED CIRCUITS

Application specific integrated circuits (ASICs) are related to, but not limited to, consumer, computer and peripherals, wireless communication, wired communication, automotive infotainment, other automotive, IC card, and multipurpose. They include all application specific ICs not outlined in other semiconductor segments.

BROADCOM

dialog SEMICONDUCTOR

ENPHASE

IMPINJ™

infineon

intel®

MARVELL™

NETLIST™

NORDIC® SEMICONDUCTOR

ON

REALTEK

SENSORS & ACTUATORS

Sensors and Actuators are semiconductor devices whose electrical properties are designed to correlate to temperature, pressure, displacement, velocity, acceleration, stress, strain or any other physical, chemical or biological property.

AKOUSTIS
Amkor Technology
Amphenol
ANALOG DEVICES
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APPLIED OPTOELECTRONICS, INC.
arlo
ASE Technology Holding Co., Ltd.
ASTRONICS CORPORATION
dialog SEMICONDUCTOR
DIODES INCORPORATED
DSP GROUP
emcore
flex
FREQUENCY ELECTRONICS, INC.
Hitachi High-Tech
immersion
Infineon
KEYSIGHT TECHNOLOGIES
KLA
knowles
KVH
maxim integrated
MICROCHIP
MicroVision
MPS
Moortec Global In-chip Monitoring
MTS
muRata INNOVATOR IN ELECTRONICS
NVE NVE CORPORATION
NXP
RENESAS
ROHM SEMICONDUCTOR
Sensata Technologies
SILICON LABS
SiTime
life.augmented
TE connectivity
Texas Instruments
UMC
VISHAY
XPERI

SEMICONDUCTOR EQUIPMENT

SATS include semiconductor Testing, Measurement, and Assembly operations in Semiconductor Equipment Manufacturing. These functions include Lithography, Metrology, Etching, and Casting.

ADVANTEST, AEHR TEST SYSTEMS, Amkor Technology, Amphenol, AMTECH SYSTEMS, INC., ASE Technology Holding Co., Ltd., ASM Pacific Technology, ASML, ASTRONICS CORPORATION, Besi, Brooks, ChipMOS, COHERENT, CORNING, CYBEROPTICS Technology Leadership. Global Solutions., DAIFUKU Always an Edge Ahead, SCREEN, Entegris, EXFO, FormFactor, HANA MICRON, Hitachi High-Tech, ichor, inTEST Corporation, keytronic, KEYSIGHT TECHNOLOGIES, KLA, Kulicke & Soffa, Lam RESEARCH, LB Semicon, MagnaChip, MEDIATEK, Mentor A Siemens Business, MICROCHIP, NeoPhotonics, NOVA PROCESS INSIGHT, Ultra Clean Technology, onto innovation, PDF/SOLUTIONS, PHOTRONICS, SANMINA, TERADYNE, TEXAS INSTRUMENTS, TEL, TOPPAN, tsmc, UMC, Veeco, VIAVI, XPERI

Electronic Design Automation (EDA) are software tools for designing electronic systems such as integrated circuits and printed circuit boards. The tools work together in a design flow that chip designers use to design and analyze entire semiconductor chips.

Altium, cadence, intel, LATTICE SEMICONDUCTOR, Mentor A Siemens Business, MICROCHIP, PDF/SOLUTIONS, SiFive, SYNOPSYS, tsmc, XILINX, zGlue

Intellectual Property (IP) is a reusable unit of logic, cell, or integrated circuit layout design.

cadence, dialog SEMICONDUCTOR, DOVER MICROSYSTEMS, Himax, intel, LATTICE SEMICONDUCTOR, Mentor A Siemens Business, MICROCHIP, Moortec Global in-chip Monitoring, PDF/SOLUTIONS, Rambus, SiFive, SYNOPSYS, tsmc, XPERI

MOS MICRO

The microprocessor (MPU) category includes ICs which execute external instructions and perform system control functions as programmed via software with the assembly language instructions retrieved from external memory with data read from and written to external RAM devices to perform system functions. These include CISC, RISC, CPUs, and GPUs.

Microcontrollers (MCUs) perform dedicated or embedded computer functions within an overall electronic system without the need of other support circuits. They contain some form of ROM, EPROM or Flash Memory, and also incorporates read-write memory (RAM) for temporary storage.

Digital Signal Processors (DSPs) use parallel multipliers with separate program and data areas (Harvard type architecture), which provide very high-speed performance required in "Sum-of-Product" operations.

ANALOG INTEGRATED CIRCUITS

Amplifiers & Comparators condition or modify the incoming analog signal to enhance it for further processing such as signal conversion or interfacing. This category includes devices which provide functions such as signal filtering, signal amplification, level shifting, buffering or comparison.

Airbeam, Amphenol, Analog Devices, ASM Pacific Technology, Diodes Incorporated, Frequency Electronics, Inc., II-VI, LGL Group, MACOM, Microchip, mks, ON Semiconductor, Qorvo, Renesas, ROHM Semiconductor, Skyworks, STMicroelectronics, Texas Instruments

Signal Conversion's role is to convert the signal from one form to another including digital ICs such as an MPU or FPGA. The signal before or after conversion should be analog.

Analog Devices, dialog Semiconductor, Frequency Electronics, Inc., Lam Research, maxim integrated, MaxLinear, Methode Electronics, Microchip, ON Semiconductor, Skyworks, STMicroelectronics, Summit Wireless, TE connectivity, Teradyne, Texas Instruments, Tower Semiconductor, VISHAY

Interface's function is to modify or shape the signal in order to ensure signal integrity for transmission over a distance through a physical medium such as a wire, cable, waveguide, or tracks within a printed circuit board.

Analog Devices, Diodes Incorporated, IDENTIV, IMPINJ, maxim integrated, MaxLinear, Microchip, NXP, Renesas, ROHM Semiconductor, Silicon Labs, Texas Instruments

Power Management's function is to convert, control or distribute DC power.

Amphenol, Analog Devices, ASML, Astronics Corporation, atomera, axcelis, CREE, dialog Semiconductor, Diodes Incorporated, EPC Efficient Power Conversion, Enphase, flex, Frequency Electronics, Inc., Himax, Infineon, intel, KEYSIGHT TECHNOLOGIES, maxim integrated, MaxLinear, Methode Electronics, Microchip, MPS, muRata Innovator in Electronics, NVE Corporation, NXP, ON Semiconductor, power integrations, Renesas, ROHM Semiconductor, SanKen, SEMTECH, Silicon Labs, STMicroelectronics, Texas Instruments, Tower Semiconductor, Veeco, VISHAY

Application Specific includes any analog IC that is not part of the general-purpose lineup.

atomera, Broadcom, Inphi, maxim integrated, MPS, Realtek, Sequans, Summit Wireless

MEMORY

Dynamic Random Access Memory (DRAM) devices allow bit words to be written, stored and read randomly in any desired sequence. The memory information is volatile and is lost when the power supply voltage is removed.

AMD, atomera, axcelis, FUJITSU, GSI TECHNOLOGY, intel, MARVELL, NETLIST, Rambus, RENESAS, ROHM SEMICONDUCTOR, SAMSUNG ELECTRONICS, SK hynix, SMART Modular Technologies, TERADYNE

Static Random Access Memory (SRAM) devices are based on a minimum four transistor memory cell which is configured into a flip-flop circuit.

AMD, atomera, axcelis, GSI TECHNOLOGY, intel, MARVELL, MICROCHIP, RENESAS, ON

Electrically Erasable Programmable Read Only Memory (EEPROM) devices are non-volatile circuits with the memory data pattern programmed by electrical means rather than a fixed mask.

dialog SEMICONDUCTOR, MICROCHIP, ON, RENESAS, ROHM SEMICONDUCTOR, TERADYNE

Flash memory is a type of EEPROM in which the memory data is electrically erased by large arrays of bits rather than by fractions such as bit by bit.

IBM, MICROCHIP, NEC, NetApp, NETLIST, ON, OSS ONE STOP SYSTEMS, SiliconMotion, SK hynix, SMART Modular Technologies, TERADYNE, UMC

Magnetoresistive Random Access Memory (MRAM) devices are non-volatile circuits in which data is stored in magnetic domains using electron spin.

APPLIED MATERIALS, EVERSPIN TECHNOLOGIES, SMART Modular Technologies

OPTOELECTRONICS

Displays are single or multiple digit character displays reported as complete assemblies.

Amkor Technology, Applied Materials, Broadcom, Brooks, Corning, Screen, dialog Semiconductor, Himax, KLA, Kopin, LB Semicon, MPS, MagnaChip, ROHM Semiconductor

Lasers are devices generating coherent radiation mainly used for optical disk drives and optical communications.

AOI Applied Optoelectronics, Inc., axt, Coherent, Corning, emcore, II-VI, IPG Photonics, Lumentum, MACOM Partners from RF to Light, NeoPhotonics, nLIGHT, Renesas, ROHM Semiconductor, Veeco

Image Sensors are monolithic ICs capable of translating light into electrical voltages or currents for generating an image. These include circular and linear types using device structures such as CCD, CID, CCP, CPD, MOS, CMOS, and SSP.

Ambarella, AOI Applied Optoelectronics, Inc., ASM Pacific Technology, axcelis, axt, Cognex, Himax, iteris, MicroVision, Mitsubishi Electric Changes for the Better, ON, SK hynix, ST life.augmented, Tower Semiconductor Where Analog and Value Meet, UMC, XPERI

Light Sensors are monolithic and assembled modules that detect presence of light and change it into electrical voltages or currents. Such devices include discrete and combo sensors, such as ALS, Proximity, RGB, Ultraviolet, and Heart Rate Sensors.

Amkor Technology, arlo, axt, dialog Semiconductor, emcore, INTEVAC, LightPath Technologies, Methode Electronics, Mitsubishi Electric Changes for the Better, neonode, ROHM Semiconductor, SemiLEDs, Skyworks, Vishay

Fiber Optic encompasses both the sensing element ("intrinsic sensors"), and a means of relaying signals from a remote sensor to the electronics that process the signals ("extrinsic sensors").

Amphenol, Analog Devices Ahead of What's Possible™, Applied Materials, AOI Applied Optoelectronics, Inc., Broadcom, Coherent, Corning, DZS, emcore, Infinera, Luna, Methode Electronics, NEC, TE connectivity, VIAVI

DISCRETE

Diodes include general-purpose signal and switching, Zener, transient protection, and RF & microwave diodes.

Small Signal & Switching Transistors have a power dissipation of less than 1W, including all RF and microwave small signal, dual, FET, and all general purpose bipolar small signal transistors.

Power Transistors have a power dissipation of more than 1W, including RF and microwave, bipolar, FET, IGBT, Darlington, and multiple chip devices.

Rectifiers include all discrete rectifiers (rated at 0.5 AMPS average or greater) and assemblies/modules composed thereof.

Thyristors include all unidirectional and bi-directional thyristors and assemblies/modules composed primarily thereof.

LOGIC

Digital Bipolar includes all digital logic and memory product that is made with bipolar integrated circuitry technology (TTL, ECL, DTL, IIL, RTL).

Infineon, ON

General Purpose devices are standard commodity catalog products, usually simple gates, flip-flop circuits, and registers. Some examples include FPGA, PLD, and PAL.

EFINIX, flexlogix, intel, LATTICE SEMICONDUCTOR, MICROCHIP, MoSys, QuickLogic, Texas Instruments, XILINX, zGlue

Display Drivers: Devices specifically designed to control and drive flat panel displays such as LCDs and PDPs.

Amphenol, ASTRONICS CORPORATION, COHERENT, GARMIN, METHODE ELECTRONICS, pixelworks, power integrations, QuickLogic, RENESAS, ROHM SEMICONDUCTOR, life.augmented, Synaptics

Touch Screen Controllers accompany touch screen displays and are capable of determining the location of single or multi-touch gestures, styli and gloves, using capacitive, resistive or other sensing technologies.

Amphenol, ASM Pacific Technology, ASTRONICS CORPORATION, FUJITSU, Himax, immersion, METHODE ELECTRONICS, neonode, ON, life.augmented, Synaptics

Special Purpose devices are either ASSPs designed by semiconductor manufacturer or CSICs designed by the customer.

ABOV SEMICONDUCTOR, Airbeam, Ambarella, Amphenol, DSP GROUP, flex, GARMIN, IMPINJ, LATTICE SEMICONDUCTOR, neonode, NORDIC, ON, REALTEK, RENESAS, SEQUANS, SUMMIT WIRELESS, Synaptics, SYNTIANT, Texas Instruments

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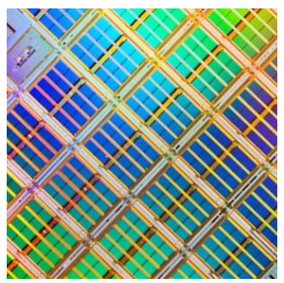

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