Appendix A: Acronyms

Electronic Devices

ASIC = application-specific integrated circuit
CCD = charge-control device
CMOS = complimentary MOS
CPU = central processing unit
DRAM = dynamic RAM
DSP = digital signal processing
ECL = emitter-coupled logic
EEPROM (or E PROM) = electrically erasable and programmable
EPROM = erasable and programmable ROM
ESD = electrostatic discharge
FET = field effect transistor
FTR = functional throughput rate
GBW = gain-bandwidth
HIC = hybrid integrated circuit
1C = integrated circuit
I/O = input/output
IRED = infrared emitting diode
LCD = liquid crystal display
LD = laser diode
LED = light-emitting diode
LSI = large-scale integration
MLC - multilayer ceramic, multilayer capacitor
MOS = metal-oxide semiconductor
MOSFET = MOS FET
MS = microstrip
MSI = medium-scale integration
MSM = metal-semiconductor-metal
NMOS = n-channel MOS
NVRAM = nonvolatile RAM
PEL = pixel
PIN diode = p-intrinsic-diode
PMOS = p-channel MOS
PROM = programmable read-only memory
RAM = random-access memory
RISC = reduced-instruction set computer
ROM = read-only memory
SRAM = static RAM
SSC = spread-stacked capacitor
SSI = small-scale integration
STL = Schottky transistor logic
TTL = transistor-transistor logic
ULSI = ultra-large-scale integration
VHSIC = very high speed 1C
VLSI = very large scale integration
WSCL = water-soluble conductive layer
XMOS = high-speed MOS
ZMR = zone-melting recrystallization

Materials Processing (Semiconductors)

CMP = chemical-mechanical polishing
CVD = chemical-vapor deposition
LPE = liquid-phase epitaxy
LTE = low-temperature epitaxial [growth]
MBE = molecular beam epitaxy
RTF = rapid thermal processing
SCC = stress-corrosion cracking

Testing

AQL = acceptable quality level
ATE = automatic test equipment
CTE = coefficient of thermal expansion
DPA = destructive physical analysis
DTA = differential thermal analysis
ENR = excess noise ratio
FA = failure analysis
FACI = first article configuration inspection
FMEA = failure mode and effects analysis
FR = failure rate
HAST = highly accelerated stress testing
IRS = infrared scan
MTBF = mean time between failures
MTTF = mean time to failure
NDT = nondestructive test
NTL = low-level noise tolerance
PDA = percent defect allowable
PPM = parts per million
RGA = residual gas analysis
RI = receiving inspection

Testing (Continued)

RTD = resistance-temperature detector [probe]
SAM = scanning acoustic microscope
SEM = scanning electron microscopy
SLAM = scanning laser acoustic microscope
SRP = spreading resistance profiling [technique]
STM = scanning tunneling microscopy
TCC = temperature coefficient of capacitance
TCR = temperature coefficient of resistance
TEM = transmission electron microscopy
Tg = glass transition temperature
TGA = thermal gravimetric analysis
TLC = thin-layer chromatography
TMA = thermo-mechanical analysis
TSM = top side metallurgy
TTF = time to failure

Packaging

ATAB = area-array tape-automated bonding
BCW = bare-chip-and-wire [hybrid]
BLM = ball-limiting metallurgy
BSM = backside metallurgy
BTAB = bumped tape-automated bonding
C and W = chip and wire
CC = chip carrier
CCC = ceramic CC
CEEE = common electronics equipment enclosure
CERDIP = ceramic DIP
C4 = controlled-collapse chip connector
COB = chip-on-board
CSI = compliant solderless interface
DCA = direct chip attach
DIP = dual in-line [package]
DWF = dice-in-wafer form
FPC = fine-pitch CC
FRU = field replaceable unit
HCC = hermetic chip carrier
HDCM = high-density ceramic module
HDI = high-density interconnect
ILB = inner lead bond
LCC = leadless CC
LCCC = leadless ceramic CC
LMCH = leadless multiple-chip hybrids
LID = leadless inverted device
LMCH = leadless multiple-chip hybrid
LRU = line replacement unit or lowest repairable unit
MC = metallized ceramic
MCC = miniature CC
MCM = multichip module
MLB = multilayer board
MLC = multilayer ceramic
OLE = outer lead bond
PAA = pad area array
PCB = printed circuit board
PCC = same as PLCC
PCI = pressure contact interconnection
PCR = plastic CC, rectangular
PDIP = plastic DIP
PES = porcelain-enamel-steel
PET = porcelain-enamel technology
PGA = pin grid array [package]
PIP = pin insertion [package]
PLCC = plastic-leaded CC
PRN = priority ranking number
POS = porcelain-on-steel
PQFP = plastic quad flat package
PTF = polymer thick film
PTH = plated-through hole
PWB = printed wiring board
QFB = quad flat butt-leaded package
QUIP = quad in-line package
SCM = single-chip module
SIP = single in-line package
SLC = single-layer ceramic
SMA = surface-mounted assembly
SMD = surface-mounted device
SOB = small-outline butt leaded package
SMT = surface mount technology
SOIC = small-outline
SOJ = small-outline J-lead package
SOP = small-outline package
SOI = silicon-on-insulator
TAB = tape-automated-bonding
TC = thermo-compression bond
TCM = thermal conduction module
TS = thermosonic bond
TSOP = thin small outline package
TO = transistor outline package
US = ultrasonic bond
VSO = very small outline package
WSI = wafer-scale integration
ZIP = zero insertion force
ZIP = zigzag in-line package

Materials

AlGaAs = aluminum gallium arsenide
AlInAs = aluminum indium arsenide
AlN = aluminum nitride
Al_2O_3 = aluminum oxide (alumina)
AlSb = aluminum antimonide
As = arsenic
Au = gold
AuGe = gold-germanium
AuSi = gold-silicon
AuSn = gold-tin
B = boron
BN = boron nitride
Ba = barium
$BaTiO_3$ — barium titanate
Be = beryllium
BeO = beryllium oxide (beryllia)
C = carbon; graphite; diamond
CDA = clean dry air
CFC = chlorinated fluorocarbon
DI = deionized water
FR4 = epoxy resin glass laminate
Ga = gallium
GaAs = gallium arsenide
GaAsP = gallium arsenide phosphide
GaInAs = gallium indium arsenide
GaP = gallium phosphide
GaSb = gallium antimonide
Ge = germanium
H^+ = atomic hydrogen
H_2 = hydrogen molecule
H_2O = water
H_2O_2 = hydrogen peroxide
In = indium
MnO_2 = manganese dioxide
N_2 = nitrogen molecule
NO_2 = nitrogen peroxide
N_2O = nitrous oxide
O_2 = oxygen molecule
O_3 = ozone molecule
OH^- = hydroxyl ion
P = phosphorus
PLZT = lead-lanthanum-zirconate-titanate
PMMA = polymethyl methacrylate
PSG = phosphosilicate glass
PVC = polyvinyl chloride
PX = paraxylylene
PZT = lead-zirconate-titanate
Sb = antimony
Si = silicon
SiC = silicon carbide
SiN = silicon nitride
SiO = silicon monoxide
SiO_2 = silicon dioxide (silica)
= quartz (crystalline silica)
= fused silica (silica glass)
Sn = tin
Ta = tantalum
Ta_2O_5 = tantalum pentoxide
TEOS = tetraethoxysilane
Ti = titanium
TiN = titanium nitride
TiO_2 = titanium dioxide (titania)
$TiSi_2$ = titanium silicide
Y = yttrium
YAG = yttrium aluminum garnet
YIG = yttrium iron garnet
Zn = zinc
ZnO = zinc oxide
ZnS = zinc sulfide

Miscellaneous

ASME = American Soc. of Mechanical Engineers
BIU = bus interface unit
CAD = computer-aided design
CAE = computer-aided engineering
CIM = computer-integrated manufacturing
CRT = cathode ray tube
DoD = Department of Defense
HDTV = high-definition television
IR = infrared
IEEE = Inst. of Electrical and Electronics Engineers
IEPS = Intm;. Electronics Packaging Society
ISHM = Intnl. Soc. Hybrid Microelectronics
JEDEC = Joint Electronics Device Engr. Council
MIL-STD = military standard
RADC = Rome Air Development Center
SMTA = Surface Mount Technology Association