

# ABBREVIATIONS

## *Massachusetts Institute of Technology*

ACC .....Advanced Concepts Committee (MIT LL)  
 CAES .....Center for Advanced Engineering Study  
 ChE.....Department of Chemical Engineering  
 ChemE .....Department of Chemical Engineering  
 CICS .....Center for Integrated Circuits and Systems  
 CIPS.....Center for Integrated Photonic Systems  
 CMI .....Cambridge-MIT Institute  
 CMSE.....Center for Materials Science and Engineering  
 CSR .....Center for Space Research  
 DMA.....Dupont-MIT Alliance  
 DMSE.....Department of Materials Science and Engineering  
 EECS .....Department of Electrical Engineering and  
 Computer Science  
 HST .....Health Sciences and Technology, Harvard-MIT  
 ICL.....Integrated Circuits Laboratory  
 ISN.....Institute for Soldier Nanotechnologies  
 ITRC.....Intelligent Transportation Research Center  
 LEES.....Laboratory for Electromagnetic and Electronic  
 Systems  
 LFM.....Leaders for Manufacturing  
 MIG .....Microsystems Industrial Group  
 MIT .....Massachusetts Institute of Technology  
 MNSL.....Micro & Nano Systems Laboratory  
 MPC.....Materials Processing Center  
 MTL .....Microsystems Technology Laboratories  
 NSL .....NanoStructures Laboratory  
 RLE.....Research Laboratory of Electronics  
 SMA.....Singapore-MIT Alliance  
 SML .....Space Microstructures Laboratory  
 SOE .....School of Engineering  
 TRL.....Technology Research Laboratory  
 UROP.....Undergraduate Research Opportunities Program

## *Private Industry*

AMD .....Advanced Micro Devices  
 CSDL .....Charles Stark Draper Laboratory  
 HP .....Hewlett-Packard  
 IBM .....International Business Machines Corporation  
 KIMM.....Korea Institute of Machinery and Materials  
 MARCO.....Microelectronics Advanced Research Corporation  
 C2S2.....Center for Circuits and Systems Solutions  
 GSRC .....Gigascale Systems Research Center  
 IFC .....Interconnect Focus Center  
 MSD .....Center for Materials, Structures and Devices  
 MGH.....Massachusetts General Hospital  
 NTT.....Nippon Telephone and Telegraph  
 SIA.....Semiconductor Industry Association  
 SRC .....Semiconductor Research Corporation  
 TI.....Texas Instruments

## *Government*

AFOSR.....U.S. Air Force Office of Scientific Research  
 AFRL .....Air Force Research Laboratories  
 ARDA .....Advanced Research and Development Activity  
 ARL.....Army Research Laboratories  
 ARO MURI.....Army Research Office M  
 CSE .....Consortium on Superconducting Electronic  
 DARPA.....Defense Advanced Research Projects Agency  
 DOD .....Department of Defense  
 DOE .....Department of Energy  
 DURINT .....Defense University Initiative on Nanotechnology  
 JPL .....Jet Propulsion Laboratories  
 JSEP .....Joint Services Electronics Program  
 LANL.....Los Alamos National Laboratory  
 MDA .....Missile Defense Agency  
 MRSEC.....Materials Research Science and Engineering  
 Center  
 MURI .....Multi University Research Initiative  
 NASA .....National Aeronautics and Space Administration  
 NCIPT.....National Center for Integrated Photonics  
 Technology  
 NDSEG.....National Defense Science and Engineering  
 Graduate  
 NIH .....National Institutes of Health  
 NCI.....National Cancer Institute  
 NCRR .....National Center for Research Resources  
 NIDDK .....National Institute of Diabetes and Digestive and  
 Kidney Diseases  
 NIBIB .....National Institute of Biomedical Imaging and  
 BioEngineering  
 NHLBI.....National Heart, Lung, and Blood Institute  
 NIST.....National Institute of Standards and Technology  
 NOAA .....National Atmospheric and Oceanographic  
 Administration  
 NREL.....National Renewable Energy Laboratory  
 NRL.....Naval Research Laboratory  
 NSA .....National Security Administration  
 NSF.....National Science Foundation  
 CMSE .....Center for Materials Science and Engineering  
 MRSEC .....Materials Research Science and Engineering  
 Centers  
 NIRT .....Nanotechnology and Interdisciplinary Research  
 Initiative  
 SGER.....Small Grant for Exploratory Research  
 ONR .....Office of Naval Research

## *Other*

CFI.....CAD Framework Initiative  
 CIE.....Commission International de l'Eclairage  
 CIM .....Computer Integrated Manufacturing  
 IEEE .....Institute of Electrical and Electronics Engineers  
 IEDM .....International Electronic Devices Meeting

IME .....Institute of Microelectronics, Singapore  
 IMEC .....Interuniversity MicroElectronics Center  
 MCNC .....Microelectronics Center of North Carolina  
 MRS .....Materials Research Society  
 NATO .....North Atlantic Treaty Organization  
 NTCIP.....National Transportation Communications for  
 Intelligent Transportation  
 WiMAX.....Worldwide Interoperability for Microwave Access,  
 Inc.

**Technical**

AAO .....Anodic aluminum oxide  
 ACEO .....AC electro-osmosis  
 ACPR.....Adjacent channel power ratio  
 ADC .....Analog-to-digital converter  
 AFM .....Atomic force microscope  
 ALD.....Atomic layer deposition  
 AMOL .....Absorbance-two-wavelength scheme  
 APCVD .....Atmospheric pressure chemical vapor deposition  
 ASIC.....Application-specific integrated circuit  
 BEOL.....Back-end-of-line  
 BER.....Bit-error-rate  
 BiCMOS.....Bipolar complementary metal oxide semiconductor  
 BPSK .....Binary phase shift keying  
 BPV.....Back-propagation of variance  
 BTBT.....Band-to-band tunneling  
 CAD .....Computer aided design  
 CATV.....Category V  
 CBSC .....Comparator-based switched-capacitor circuit  
 CCD .....Charge couple device  
 CCR .....Critically coupled resonator  
 CDR .....Clock and data recovery  
 CFB.....Cartesian feedback  
 CFT .....Clock feed-through  
 CML .....Current mode latch  
 CMOS .....Complementary metal oxide semiconductor  
 CMP .....Chemical mechanical planarization  
 CNT .....Carbon nanotube  
 COC .....Cyclic olefin copolymer  
 COIL.....Chemical oxygen iodine laser  
 CV.....Capacitance voltage  
 CVD .....Chemical vapor deposition  
 DAC .....Digital-to-analog converter  
 DBR .....Dielectric Bragg reflector  
 DCA .....Dielectric continuum approximation  
 DCP .....Dielectrophoretic cell patterning  
 D-CAP.....Digitally-configurable analog processor  
 DEM.....Dynamic element matching  
 DEP .....Dielectrophoresis  
 DHI .....Digital holographic imaging  
 DIBL.....Drain-induced barrier lowering  
 DPD .....Digital predistortion  
 DRIE.....Deep reactive-ion etching  
 DSP .....Digital signal processing  
 DUT .....Devices-under-test  
 ECG .....Electrocardiogram

EEG .....Electroencephalogram  
 EEPROM.....Electrically erasable programmable read only  
 memory  
 EL.....Electroluminescence  
 EM .....Electromagnetic  
 ENOB .....Effective number of bits  
 EPD .....Endpoint detection  
 FACS.....Flow-assisted Cell Sorting  
 FDTD.....Finite difference time domain  
 FEOL .....Front-end-of-line  
 FET .....Field-effect transistor  
 FFT .....Fast Fourier transform  
 FIR .....Finite impulse response  
 FOM .....Figure of merit  
 FOV.....Field of view  
 FPGA.....Field programmable gate array  
 GeOI.....Germanium-on-insulator  
 GMR.....Giant magnetoresistance  
 GOI .....Germanium-on-insulator  
 GP .....Geometric programming  
 HD .....Harmonic distortion  
 HDQ .....Harmonic Differential Quadrature  
 HEMT .....High-electron mobility  
 HIC.....High-index-contrast  
 HM.....Herringbone mixer  
 HOI .....Heterostructure on insulator  
 HSQ .....Hydrogen silsesquioxane  
 ICEO .....Induced charge electro-osmosis  
 IDE.....Interdigitated electrodes  
 IMD .....Inter-modulation distortion  
 INL.....Integral nonlinearity  
 ISI .....Inter symbol interference  
 ISM .....Industrial, scientific, medical  
 ITO.....Indium-tin-oxide  
 IV .....Current voltage  
 KOH .....Potassium hydroxide  
 LED.....Light-emitting device  
 LINC.....Laboratory instrument computer  
 LNA.....Low noise amplifier  
 LPCVD.....Low pressure chemical vapor deposition  
 LSB.....Lower sideband  
 MAA .....methacrylic acid  
 MDLL .....Multiplying delay-locked loops  
 MEM .....Micro-electro-mechanical  
 M-HEMT.....Metamorphic high-electron-mobility transistor  
 MEMS .....Micro-electro-mechanical systems  
 MGA.....Micro gas analyzer  
 MMA .....Methylmethacrylate  
 MMSE .....Minimum mean square error  
 MMW.....Millimeter-wave  
 MOCVD.....Metalorganic chemical vapor deposition  
 MOR.....Model-order-reduction  
 MOS.....Metal-oxide-semiconductor  
 MOSFET .....Metal-oxide-semiconductor field-effect transistor  
 MPIE .....Mixed-potential-integral-equation  
 MRAM .....Magnetic-random-access memory

NEM.....	Nano-electro-mechanical	SNR .....	Signal-to-noise ratio
NIL.....	Nanoimprint lithography	SOA .....	Semiconductor optical amplifier
NMOS .....	Negative-channel metal-oxide semiconductor	SoC .....	System-on-chip
OEO .....	Optical-electronic-optical	SOG .....	Singlet oxygen generator
OFDM.....	Orthogonal frequency division multiplexing	SOI.....	Silicon on insulator
OFET.....	Organic field-effect transistor	SOLES .....	Silicon on lattice-engineered substrate
OFF .....	Off	SPLEBL .....	Spatial-phase-locked electron-beam lithography
OHC .....	Outer hair cells	SPM .....	Scanning probe micrograph
OLED .....	Organic light-emitting diode	SRAM .....	Static random access memory
OPL.....	Optical projection lithography	SSDSOI .....	Strained-silicon directly on insulator
PA.....	Power amplifier	STI.....	Shallow trench isolation
PAE .....	Power-added efficiency	TAT .....	Trap-assisted tunneling
PCR .....	Polymerase chain reaction	TDC .....	Time-to-digital
PDAC .....	poly diallyldimethylammonium chloride	TDD .....	Threading dislocation density
PDMS.....	Polydimethylsiloxane	TERS.....	Tip enhanced Raman spectroscopy
PECVD .....	Plasma enhanced chemical vapor deposition	TIPS .....	Thermal inkjet pico-fluidic drop dispensing system
PEM .....	Proton exchange membrane; polymer electrolyte membrane	TPV .....	Thermophotovoltaic
PFM .....	Pulse frequency modulation	TTTDD.....	Time-temperature threading dislocation density
PHEMT .....	Pseudomorphic high-electron mobility transistor	UHVCVD .....	Ultra high vacuum chemical vapor deposition
PHY.....	Physical layer	ULSI.....	Ultra Large Scale Integration
PIV .....	Particle image velocimetry	UWB.....	Ultra-wideband
PL.....	Photoluminescence	VCO .....	Voltage Controlled Oscillators
PLL .....	Phase-locked loops	VCSEL.....	Vertical-cavity Surface-emitting Laser
PMGI .....	Polymethylglutarimide	VDG .....	Voltage from Drain to Gate
PMMA.....	Polymethylmethacrylate	VLS .....	Vapor-liquid-solid
PMOR.....	Parameterized model reduction	VLSI .....	Very Large Scale Integration
PMOS.....	Positive channel metal oxide semiconductor	VPR.....	Versatile Place and Route
PPM .....	Pulse-position modulated	VSCSEL.....	Vertical cavity surface-emitting laser
PRF .....	Pulse-repetition frequency	WiGLAN .....	Wireless gigabit local area network
PROM.....	Parameterized reduced-order models	WLAN .....	Wireless local area network
PSV.....	Pseudo-spin-valve	WSP .....	Water soluble particles
PTM .....	Predictive technology models	YSZ.....	Yttria-stabilized zirconia oxide
QCL .....	Quantum-cascade laser	ZPAL .....	Zone-plate-array lithography
QD .....	Quantum dot		
RC .....	Resonant cavity		
RFID .....	Radio frequency identification		
RIE .....	Reactive-ion etching		
ROI.....	Regions of interest		
RSM .....	Response surface model		
RTNIL .....	Room-temperature nanoimprint lithography		
RVHI .....	Rainbow volume holographic imaging		
SAR.....	Successive approximation register		
SAW .....	Surface acoustic wave		
SBR .....	Saturable Bragg reflector		
SCE .....	Short-channel Effects		
SEBL.....	Scanning-electron-beam lithography		
SEM .....	Scanning-electron microscope		
SFDR.....	Spur-free dynamic range		
SGM.....	slanted groove mixer		
SHM.....	Staggered herringbone mixer		
SIMS .....	Secondary ion-mass spectrometry		
SiNW .....	Silicon nano-wire		
SiNWT .....	Silicon nanowire transistors		
SMR .....	Suspended microchannel resonator		
SMU.....	Sense-Measurement Unit		