International partnerships and joint ventures in the semiconductor industry, 1989-1996				
HITACHI	LG		1989	Hit. agrees to give LG technical assistance at its 1Mb plant and on future generations (first Japan-Korea tie-up)
HITACHI	LG		1990	Hit. agrees to transfer 0.8-micron 4Mb technology (buys some on OEM basis)
HITACHI	LG		1993	Hit. agrees to transfer 16Mb technology (buys some on OEM basis)
HITACHI	TEXAS INSTR.		1989	agreement for joint development of 16Mb DRAM
HITACHI	TEXAS INSTR.		1991	10-yr agreement to develop 64Mb, 0.35-micron chip
HITACHI	TEXAS INSTR.		1992	Hitachi becomes second source for TI's Advanced BiCMOS chips
HITACHI	TEXAS INSTR.		1993	agreement reached on 256Mb generation (0.25 micron)
HITACHI	TEXAS INSTR.		1994	joint fab announced for Texas (0.35 micron, 16 and 64 Mb)
HITACHI	HEWLETT-PAC		1989	Hit. licensed HP's PA-RISC chip in exchange for Hitachi's design know-how
HITACHI	RAMTRON		1992	joint development of large FRAM chips
TOSHIBA	SAMSUNG		1992	8-yr agreement for joint development of 16 Mb flash chips based on Toshiba design; comprehensive IC cross-license reached at same time
TOSHIBA	SAMSUNG		1995	agreement extended to 64Mb flash generation
TOSHIBA	SAMSUNG		1996	agreement extended to 128Mb flash generation
TOSHIBA	MOTOROLA		1987	joint production in Japan of 1Mb DRAM and successive generations plus Motorola MPUs and MCUs; Toshiba DRAM tech exchanged for Motorola MPU tech until 1993, when Moto started paying royalties instead
TOSHIBA	MOTOROLA	NATIONA	1993	joint development of low-voltage CMOS logic devices
TOSHIBA	IBM		1992	joint development of flash memory cards (IBM develops controller)
TOSHIBA	IBM	SIEMENS	1992	joint development of 0.25 micron 256 Mb DRAM (announced in '95, at which time Motorola joined)
TOSHIBA	IBM		1995	joint production in the US of 16Mb DRAMs
TOSHIBA	NATIONAL		1992	5-yr agreement for joint development of flash chips; plus licensing of related technologies by National from Toshiba
TOSHIBA	NATIONAL		1992	parallel development of gate arrays to be produced by both firms
TOSHIBA	SIEMENS		1991	7-yr agreement to co-develop and co-source MIPS derivative MPUs
TOSHIBA	IDT		1992	agreement to co-develop and co-source MIPS derivative MPUs
TOSHIBA	WINBOND		1995	licensing of 1Mb SRAM and 16 Mb DRAM design and mfg know-how in exch for royalties (3rd Japan-Taiwan tie-up)
TOSHIBA	WINBOND		1996	agreement extended to 64Mb DRAM
TOSHIBA	DEC		1995	joint development of chips to "speed flow of info around networks"
TOSHIBA	RAMTRON		1995	Toshiba licensed FRAM technology
INTEL	FUJITSU		1990	memory cards (Intel chip design plus Fujitsu card know-how)
FUJITSU	RAMTRON		1995	joint development of 1Mb FRAM
FUJITSU	SUN		1994	joint devt. of workstation MPUs (32-bit first, then 64-bit)

FUJITSU	AMD		1992	joint devt (in the US) and production (in Japan) of EPROMs and flash chips
FUJITSU	TSMC		1996	Fujitsu agrees to transfer 0.35 micron tech to TSMC, which will produce 16Mb DRAM fro Fujitsu
FUJITSU	HYUNDAI		1993	transfer of DRAM tech FROM Hyundai TO Fujitsu plus joint devt.
NEC	SAMSUNG		1994	sharing of info on structure of memory cells in hi-integration chips
NEC	SAMSUNG		1995	Samsung licenses NEC's 16-bit MCU tech.
NEC	AT&T		1990	AT&T licenses NEC's CMOS gate-array tech in exch for its IC CAD tech.
NEC	AT&T		1991	joint devt of 0.35 micron process tech.
NEC	AT&T		1992	joint devt. of 0.5-micron SRAMs for production by NEC
NEC	AT&T		1992	NEC becomes a 2nd source for AT&Ts Hobbit MPU
NEC	AT&T		1993	probable joint development of 0.25 micron process
NEC	NATIONAL		1993	joint devt. of low-power Ethernet controller
NEC	SANDISK		1994	3-yr joint devt of 256Mb flash devices combining SanDisk design and NEC process tech.
AMD	TSMC		1994	AMD transfers process tech in exch for TSMC's production of its MPUs
INTEL	NIPPON STEEL		1991	flash foundry deal (ended in 1995 with shift to 0.6 micron process)
INTEL	SHARP		1992	10-yr agreement to co-develop 0.6 and 0.4 micron processes and for Sharp to produce flash chips on a foundry basis
MOTOROLA	SIEMENS		1996	joint fab in the US for 64Mb and 256 Mb DRAMs
MOTOROLA	MITSUBISHI		1996	mutual sharing of memory and MPU tech related to embedded products (confliucting reports as to joint development)
MOTOROLA	PHILIPS		1993	joint design (in Europe) of ICs for multimedia products
MOTOTOLA	MOSEL	WINWIN	1996	Moto agreed to transfer technology for TMOS power transistors to Mosel's HK fab in exch. for share of output; Mosel turned around and sold a 51% interest to a local trading company
NATIONAL	ACER		1989	joint devt. of I/O controller to be produced by National
TEXAS INST	SAMSUNG		1992	joint venture assembly plant in Portugal and co-development of unspecified IC mfg.processes (NOTE: in 1996, they cross-sued for patent infringement)
TEXAS INST	SAMSUNG	FUJITSU	1996	co-development of "synch-link" memory chips? (don't understand; couldn't confirm)
TEXAS INST	ACER		1989	joint fab in Taiwan for DRAMs
TEXAS INST	KOBE STEEL		1990	joint fab in Japan for memory chips
TEXAS INST	HEWLETT-P/	CANON	1991	joint fab in Singapore for memory chips
TEXAS INST	SONY		1994	TI licensed Sony's MCU core for use in microcontrollers with plans for joint development of future versions
TEXAS INST	HYUNDAI		1989	TI transferred 256K and 1Mb DRAM tech to Hyundai which produced the chips on an OEM basis
SGS	MITSUBISHI		1993	joint devt of 16Mb flash chips
SGS	OKI		1989	much was planned but it all fell apart in 1993
SGS	NORTEL		1993	joint devt of 0.5 micron BiCMOS process for telecom switches

SGS	SANYO		1993	joint devt and mktg of chips for multimedia (data compression)
SGS	SEAGATE		1993	joint devt of read-channel and motor-drive chips
SGS	SAMSUNG		1996	joint devt of "micro cores" for embedded logic chips
MITSUBISHI	AT&T		1991	joint devt of telecom chips
MITSUBISHI	SAMSUNG		1993	Samsung to be 2nd source for cache DRAMs
MITSUBISHI	UMAX		1994	transferring 16Mb DRAM tech to a minority-owned jv fab in Taiwan
SIEMENS	AMD		1988	12-yr agreement for co-devt and mktg of ICs for ISDN
SIEMENS	LG		1994	joint devt of MCUs using Siemens tech.
SIEMENS	MOSEL		1996	jv fab in Taiwan for 64- and 256-Mb DRAM
DEC	MITSUBISHI		1993	Mitsu. became second source for Alpha (appears to be winding down)
DEC	SAMSUNG		1996	Samsung licenses Alpha chip technology
NEC	TEXAS INSTR.		1996	joint devt of combined MPU-DSP chip
SAMSUNG	CHIPS&TECH		1996	joint devt of PC display controller combining mem & graphics
				Information compiled by Greg Linden, Berkeley Roundtable on the International Economy