MICROCONTROLLER AND DEVELOPMENT TOOLS SELECTOR GUIDE



8-Bit Timer/Event Counter D/A Converter Microcontroller Options

1/0

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2 The NEC Advantage

With over 400,000,000¹ units shipped in 2001, NEC Electronics is the world's second-largest supplier of microcontrollers. Our broad product offering comprises a selection of 4-, 8-, 16- and 32-bit devices, all fabricated with either 0.35 µm or 0.25 µm process technology. A particular focus on the 8- and 32-bit areas has resulted in advantages that give NEC microcontrollers the flexibility required to meet the needs of your individual designs.

8-Bit Microcontrollers

NEC Electronics' three 8-bit series, the KO, KOS and KO/Kx1, are based on a common architecture with over 700 variations. Each series offers a large selection of integrated peripherals that complement a variety of memory sizes and types. A large selection of memory configurations and ROM, flash, OTP and E^2 options also are available.

NEC Electronics' 8-bit microcontrollers range from 28-pin, low-end products to 120-pin, high-end products. The devices operate between 1.8V and 5.5V over standard temperature ranges between -40 and 85°C.

All three of the 8-bit series have software-controlled CPU clock prescalers to control power consumption by decreasing the clock rate. Additionally, on-chip pull-up resistors for port pins reduce circuit complexity.

8-Bit KOS Series

Targeted at cost-sensitive applications, the KOS series offers 2 KB to 48 KB of ROM or flash memory on many devices, on-board LCD drivers and controllers. For very low-cost systems, derivatives with RC oscillators also are available.

8-Bit KO Series

The KO series supports applications requiring larger amounts of memory—8 KB to 60 KB—and offers numerous peripherals including LCD drivers and controllers. KO devices also provide low power consumption, down to a few microamps, in a variety of operating modes with up to eight adjustable energy-saving settings.

Many KO devices are unique in that they feature internal expansion RAM in addition to normal on-board SRAM. This internal expansion RAM can be used for storing either code or data, and for loading and executing instructions while simultaneously storing data.

Ultra-Low-Power Operation with LCD Controller

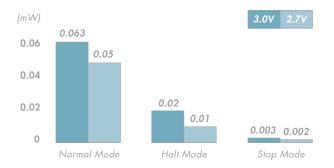
Especially suited for battery-operated devices, the new μ PD789881 microcontroller features extremely low power consumption with an integrated 26 x 4 LCD controller/driver. Typical power consumption for this device in full-speed operation is only 18 μ A at 2.7V, with a typical standby current of 0.9 μ A.

This device uses an external 32 kHz clock that operates the on-chip peripherals and an internally generated 500 kHz clock to control CPU operation. Dynamic switching of CPU operation between the two clock speeds is possible to accommodate the performance and power consumption requirements of a specific design. The traditional power-saving modes of HALT and STOP also are available.

The µPD789881 contains a hardware multiplier, 8- and 16-bit timers, watchdog timer, UART and 512-byte SRAM and is available in 32 KB flash or 16 KB ROM versions.

NEC's µPD789881 microcontroller with integrated LCD controller and driver is designed to meet the power-efficiency needs of handheld battery-powered devices.

μPD789881 Power Consumption



The K1 Family of Microcontrollers— The Next-Generation Design Platform

The new $K1^{\text{TM}}$ family bridges the gap between 8- and 32-bit performance and builds on the strengths of each.

The 8-bit KO/Kx 1^{TM} and the 32-bit V850ES/Kx 1^{TM} series feature identical peripherals with identical special-function registers employing the same software. Designs can be migrated easily across the 8- and 32-bit boundaries as application needs change.

PERIPHERAL COMMONALITY

K0/Kx1 (10 MHz)	V850ES/Kx1 (16 MHz)
₽ 16-bit timer	
₽ 8-bit timer	
₽ 8-bit timer ¹	
🖶 Real-time clock	
₩atchdog timer	
₽ SPI	
	₽ CSI
₽ UART	
LIN bus	
♣ A/D Converter	
Switch detection	
₽ Subclock	
₽ Power-on reset/	
low-voltage indicator	
♣ On-chip clock	
Clock output/buzzer	
Hardware MUL/DIV	
	ROM correction

¹ Contains additional features

The KO/Kx1 Series

This 8-bit series features a variety of flash memory and ROM options and operates from 2.7 to $5.5\,\text{V}$ over temperatures ranging from -40 to $+85^{\circ}\text{C}$ at speeds between 2 and 10 MHz to maximize low power performance. These devices generate less than 100 dB for minimal electromagnetic interference. High-end Kx1 devices have 16×16 multiply and 32/16 divide hardware.

Advanced peripherals in the 8-bit Kx1 devices include an on-board fail-safe clock, power-on reset (POR) circuitry and low-voltage indicator (LVI) to provide solutions for both industrial and safety-critical applications. A local interconnect network (LIN) interface also is included for small communication networks.

The fail-safe clock features circuitry consisting of both a clock monitor and a 240 kHz on-board clock that is independent of the main clock, allowing for both internal and system reset when failures are detected. The clock controls full CPU operation after a quick $70\,\mu s$.

The V850ES/Kx1 Series

With a 32-bit RISC core running at $20\,\text{MHz}$, the V850/Kx1 series executes $24\,\text{MIPS}$ using only $9\,\text{mW}$ of power. Low-end 32-bit Kx1 devices provide a solution comparable in cost to 16-bit devices while also providing paths for upward migration.

The V850/Kx1 series features an integrated phase-locked loop (PLL), allowing for a less costly 5 MHz resonator rather than a 20 MHz oscillator. Tuned to generate very low noise, these microcontrollers are ideal for use in EMI-sensitive applications.

POWER-ON RESET

Power-on reset (POR), available on our Kx1 series, puts the microcontroller into a known state when power is first applied and performs an internal reset when voltage drops below a certain user-selected level. This reset signal also is available on a port pin to reset the entire system.

LOW-VOLTAGE INDICATOR

Available on the $\mu PD789881$ and the KO/Kx1 series, the low-voltage indicator (LVI) assists in determining when the voltage drops below a certain user-selected level that is not low enough to cause a POR.

This low-voltage condition causes a flag to be set in memory so the user can determine whether the contents of internal memory are still valid. The microcontroller stays in control during a lowvoltage or brown-out period, and can take corrective action even in cases where it may not be affected.

Kx1 FAIL-SAFE CLOCK

Designed for applications requiring high reliability, the Kx1 failsafe clock provides an extra level of protection. If an external clock failure is detected, both an internal and external system reset are generated automatically and an internal 240 kHz clock takes control.

SUBCLOCK OPERATION

Many of NEC's 8-bit and 32-bit devices come with a subclock that maximizes power reduction. The 32 kHz subclock is separate from the main clock and permits a real-time clock to operate while in SLEEP mode, the lowest power-consuming mode.

LOCAL INTERCONNECT NETWORK (LIN) BUS

The LIN bus provides a low-cost, short-distance, slow-speed network implemented over a single wire. The bus is designed for simple control functions such as switches, sensors and actuators.

Derived as a low-cost alternative to the CAN bus, which was pioneered by Bosch and European automotive companies, the LIN bus is used for simple on/off devices and other applications where high speed is not a requirement, for example in simple motor control systems. The bus is now finding new applications in appliance control.

The LIN bus transmits at 20 kb/s and uses a 7-bit protocol. The master initiates each data transfer and the slave nodes answer only when interrogated, eliminating a large amount of bus traffic. The slave nodes have a resynchronizing mode to lock to the master node when receiving or sending data.

The LIN bus allows new slave nodes to be added to the network without any hardware or software changes. In addition, the bus also has built-in error checking.

For motor control applications, significant savings are possible by replacing the typical AC induction motor with the lower-cost electronically controlled, switched-reluctance (SR) motors controlled by the LIN bus.

Using the LIN bus in appliances or other embedded applications extends the diagnostic capabilities of the design.

32-bit V850 Microcontrollers

The V850[™] devices comprise three varieties of embedded controllers targeted at various embedded applications.

With a wide assortment of peripherals, these devices operate at speeds ranging from 16 MHz to 50 MHz and include ROM or flash memory ranging in size from 32 KB to 256 KB.

V850/S—Low Power

Designed for applications that need low power (51 mW at 17 MHz at 3.0V) and subclock capabilities, the V850/S $^{\text{TM}}$ microcontrollers offer a full complement of flash memory and ROM sizes and a variety of peripherals at a price point that enables these devices to compete successfully against 16-bit products.

V850E—Higher Performance

Created for embedded applications that need higher performance, V850E™ microcontrollers include off-board access to flash memory or SDRAM without additional logic and an on-board 32-bit x 32-bit hardware multiplier with a 64-bit result to address the needs of computationally intense designs. Peripherals such as CAN controllers also are available.

V850ES/Kx1—Compatibility

Ideal for applications that may need to migrate between 8-bit and 32-bit platforms, the V850ES/Kx1 devices can be used in multiple designs to reuse working code.

Development Tools

With the demand to get products to market as rapidly as possible, productive and cost-effective tools are a must. NEC Electronics understands this need and makes a variety of tools available for these purposes. All microcontroller development tools from NEC Electronics have the same user interface and benefit from high-level language support.

NEC microcontrollers are designed to provide efficient software development in C-language programs, resulting in rapidly developed, well-documented and readily modifiable code. Additionally, the C compiler provides for minimal expansion over assembly code size, thus offering many cost-effective benefits.

Simulators with Virtual Hardware Support

With both the KO and KOS series, NEC simulators allow interfacing of peripherals and virtual hardware such as keypads, LCDs, switches, LEDs, analog inputs and other devices. Timing waveforms also can be viewed.

While the hardware designer is buying resistors and wire, software engineers can write and debug code in major parts of the project. If development bugs arise, it is much easier to determine whether the problem is hardware-or software-based

The user interfaces for the simulator and NEC emulators are virtually identical. This significantly helps collaboration among groups. Files used by the simulator are usable by the emulator.

Programming Examples on the Web

To aid in rapid code development, engineers may go to www.necelam.com and download programming examples for 8-bit KO and KOS microcontroller peripherals.

If peripherals can operate in multiple modes, which is often the case, we provide examples for each. For example, for a UART, we provide routines that cover initialization and transmission of data in two-wire mode, three-wire mode and with full UART capabilities. The programs are available in C language and assembly language with corresponding documentation.

Low-Cost Emulators



NEC Electronics has been a pioneer in reducing tool costs. We offer a variety of low-cost emulators (LCEs) for our 8-bit KO and KOS series.

Designed with a motherboard/daughterboard architecture, the LCE provides the functionality of a standard emulator at the price of a low-end development board.

The emulators connect to the parallel interface on the host computer for fast uploading and downloading speeds. Breakpoints, trace events, single-step operation and time measurements are just a few of the many features found on these emulators

Most significantly, the LCE contains a built-in flash programmer capable of in-circuit programming to simplify prototype development. NEC Electronics also offers additional flash programmers for production programming.

DEDICATED DEVELOPMENT TOOLS SITE

Evaluation versions of the C compiler and assembler can be downloaded from the NEC Electronics web site, where updated device files and other software updates are also available: www.necelam.com/microcontrollers/devtools.asp

Third-Party Support

NEC Electronics works with a variety of third parties to provide support for our microcontrollers.

In the 8-bit area, IAR supports both the KO and KOS devices with C compilers and assemblers. These are available in addition to NEC's proprietary tools.

In the 32-bit area, Green Hills Software, Accelerated Technology and Red Hat offer C compilers, real-time operating systems and other software development support.



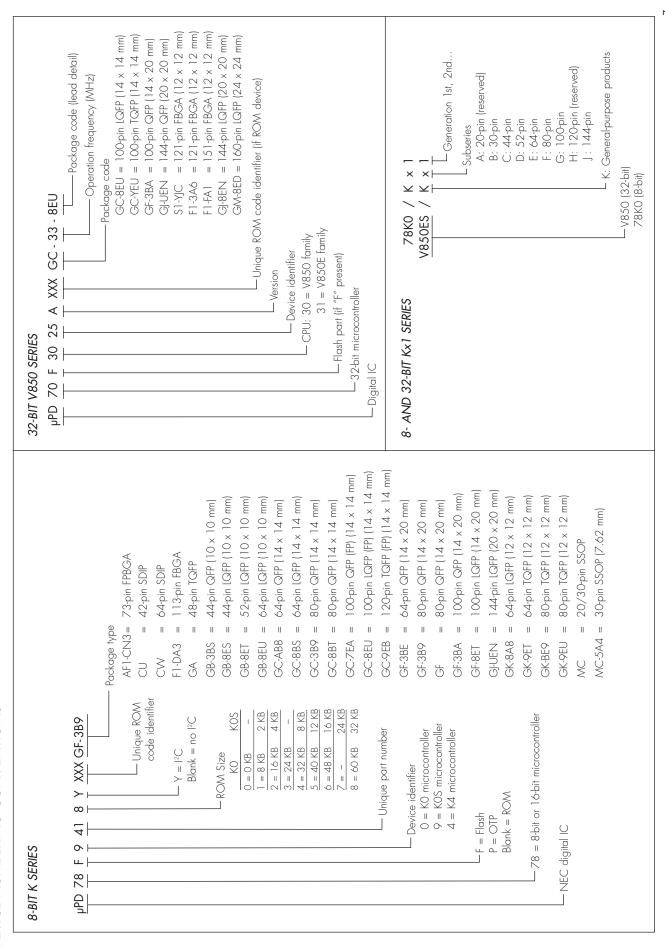
EM NEC Electronics is a proud member of EEMBC, the Embedded Microprocessor Benchmark

Consortium. The consortium was formed in 1997 to develop meaningful performance benchmarks for microcontrollers and microprocessors in embedded applications. The result is a collection of "algorithms" organized into benchmark suites targeting telecommunications, networking, automotive/ industrial, consumer and office equipment products.

NEC Electronics has benchmarked three microcontrollers, the 8-bit KO and the 32-bit V850E[™] and V832.[™] Five 64-bit microprocessors also were benchmarked. The ECL certified scores can be found at www.eembc.org.

For more information about NEC microcontrollers and what they can offer your designs, call 1.800.366.9782 or visit www.necelam.com/microcontrollers.

DEVICE NUMBERING CONVENTIONS



8-BIT KO GENERAL-PURPOSE MICROCONTROLLERS

	WE	MEMORY	SS	SPEED		F	TIMERS			-		S	SERIAL INTERFACE					
SUBSERIES	ROM (KB)	RAM (B)	\vdash	MHz MIET (µs)	8-BIT	16-BIT	RTC	WATCHDOG	PWW	A/D	D/A	₽C	UART/3-WIRE	OSC. TYPE	SUBCLOCK	I/O PINS	OP. VOLIAGE	PACKAGE
PD78002×																		
X200019 IA																		
prD/ 80021A(Y)	io l	512											-					64 Sis CDID
pPD780022A(Y)	91		1	0 147 22h	400	-(>	>	4040	8-ch	ı	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	I-ch UARI	 c ₄ X	Š	15	1 8-5 5	OFP /TOFP or
µPD780023A(Y)	24		7	<u>.</u>	7	5	<u></u>	Ď	10-0 10-0	8-bit		<u>Ď</u>	0-ch or 1-ch 12C	5	3	-	<u>.</u>	73-pin FPBGA
µPD780024A(Y)	32	1024																-
0000																		
provocax																		
pPD780031A(Y)	∞	512																
µPD780032A(Y)	16	0																64-pin SDIP,
µPD780033A(Y)	24		12	0.167	2-ch]-c	/es	Yes	2-ch 8-bit		I	Yes ²	1-ch UART	Xtal	Yes	51	1.8-5.5	QFP/TQFP or
pPD780034A(Y)	32	1024								10-bit			I-ch 3-wire					73-pin PFBGA
pPD78F0034A(Y)	32 (flash)																	
µPD78005x																		
µPD780053(Y)	24																	
µPD780054(Y)	32												1-ch UART/3-wire					
µPD780055(Y)	40	1024	Ų		ر بار ر	-{	Š	>	1-ch 1/-bi+	ά	2-ch	Voc2	1-ch 3-wire	C+X	Š	α	7 7 7	80-pin QFP
µPD780056(Y)	48)	t O	7		3	3	† - - -	5	8-bit	3	1-ch 2-wire/3-wire	Š	2)))	or TQFP
pPD780058(Y)	09	0																
µPD78F0058(Y)	60 (flash)	2048																
рРD789006х																		
µPD7890065	40					-	>	>	-					>>		C	1	
рРD7890066	48 (flash)	2010	χ Σ	0.24	Zch	p	Yes	Yes	Z-ch 8-bit	8-bit	I	I	I-ch Z-wire Z-ch 3-wire	Xtal	I	50	2.7-2.5	80-pin QFF
	_										-							
pPD78007x																		
µPD780076(Y)	48								-	-			-					()
µPD780078(Y)	09	2048	2048 8.38	0.24 2-ch 1-ch	2-ch		Yes	Yes	2-ch 8-bit	8-ch	I	Yes ²	Z-ch UAKI	Xtal	Yes	52	1.8-5.5	04-pin IQFP
IIPD78F0078[Y]	60 (flosh)								1-cn 14-bit	<u></u>			Z-cn 3-wire					5

Notes: 1. MIET=minimum instruction execution time. 2. Yes=Y version has $1^{\circ}C$. 3. Operating temperature is -40° to $+85^{\circ}C$.

60 (flash) 09

pPD78F0078(Y) µPD780078(Y)

8-BIT KO GENERAL-PURPOSE MICROCONTROLLERS (CONT.)

SUBSERIES		MEMORY	SPE	SPEED		F	TIMERS					-	SERIAL INTERFACE		0	4	L C	200
	ROM (KB)	ROM (KB) RAM (B) MHz MIET (μs) 8-BIT	MHz .	MIET' (µs)	$\overline{}$	16-BIT	RTC	WATCHDOG	W.W.	A/D	D/A	P.C	UART/3-WIRE	OSC. IYPE	SUBCLOCK I/O PINS	I/O MINS	OF. VOLIAGE	PACKAGE
рРD7807×																		
pPD78070A(Y)	ROMless 1024	1024										Yes ²				61	2.7-5.5	
µPD78074B	32	10.54									1		1-ch IIADT / 3-wire					
µPD78075B	40	0000	Ų				>	>	2-ch 8-bit 8-ch	8-ch	2-ch	I	1-ch 3-wire	X	×ď	00	1 8-5 5	100-pin QFP
µPD78076(Y)	48		n	4	4 2		í		1-ch 14-bit	8-bit	8-bit		1-ch 2-wire/3-wire		3))	or IQFP
µPD78078(Y)	09	2048										Yes ²	Och or I-ch I ² C					
µPD78P078(Y)	60 OTP																	

рРD78908x																		
µPD789086	16	256																
µPD789088	32	000	5	0.4	3-ch 1-ch	-h	ı	Yes	I	ı	ı	ı	1-ch UART/3-wire	Xtal	ı	24	1.8-5.5	30-pin SSOP
µРD78F9088	32 (flash)																	

Notes: 1. MIET=minimum instruction execution time. 2. Yes=Y version has IPC. 3. Operating temperature is -40° to $+85^\circ$ C.

8-BIT KOS GENERAL-PURPOSE MICROCONTROLLERS

	MEMORY		SPEED			TIMFRS	55				SFRI	SERIAL INTERFACE					
SUBSERIES	ROM (KB) RAM (B)		Hz ME	MHz MIET (µs) 8-BIT		16-BIT R		WATCHDOG	PW/M	A/D	I ² C Note 2	UART/3-WIRE	OSC. TYPE	SUBCLOCK	I/O PINS	OP. VOLTAGE	PACKAGE
pr.D/ 07U2X						-	-										
µPD789022	4	. 4															
µPD789024	8																
µPD789025	12						1					-		I			
µPD789026	16	-,	5	0.4	- -		<u> </u>	1-ch 8-bit	4-ch 8-bit	ı	ı	l-ch HART / 3-wire	Xtal		32	1.8-5.5	44-pin
µPD78F9026	16 (flash) 512	2															3
µPD789046	16																
µPD78F9046	16 (flash)					-	Yes							Yes			
µРD78907×																	
JPD789071	2																
11PD789072	4											<u>-</u>					.!
2 % % % % Id		256	0	0.2	اب اب	اب اب	1	ام اح	1-ch 8-bit	ı	ı	11ADT /2izo	Xta	I	24	1.8–5.5	aC/V
JFD/ 890/4	00											UAKI / 3-WIFE					5
pPD78F9076	16 (flash)				_												
pPD78910xA/911xA	4																
µPD789101A	2																
µPD789102A	4									4-ch 8-bit							
µPD789104A	∞											-					
pPD789111A	8 25	256	01	0.2	- - - - -	- - -	ı	Yes	1-ch 8-bit		1	I-ch	Xtal	I	20	1.8-5.5	30-pin
µPD789112A	4									-							SSOP
pPD789114A	00									4-ch 10-bit							
pPD78F9116A	16 (flash)																
UPD78912xA/913xA	V																
µPD789121A	2																
µPD789122A	4									4-ch 8-bit							
uPD789124A	∞																
µPD789131A	2 256		4	0.5	- - - -	-F	1	Yes	1-ch 8-bit		1	1-ch	R	ı	20	1.8–5.5	30-pin
µPD789132A	4									4-ch 10-bit							SSOP
pPD789134A	∞																
µPD78F9136A	16 (flash)																
H H	:	1	-	1													

Notes: 1. MIET=minimum instruction execution time. 2. Yes=Y version has I²C. 3. Operating temperature is -40° to $+85^{\circ}$ C.

8-BIT KOS GENERAL-PURPOSE MICROCONTROLLERS (CONT.)

2110120112	MEMORY	ORY	SP	SPEED		Ï	TIMERS			í	S	SERIAL INTERFACE	, C	()	()	i i	()
SUBSERIES	ROM (KB) RAM (B) MHz MIET' (μs) 8-BIT 16-BIT RTC	RAM (B)	MHz	MIET¹ (µs)	8-BIT	16-BIT	RTC	WATCHDOG	PWM	A/D	₽C	UART/3-WIRE	OSC. LYPE	SUBCLOCK I/O PINS	10 PINS	OF VOLIAGE	PACKAGE
pPD78916x/917x																	
µPD789166(Y)	16									- -							
µPD789167(Y)	24									&-cn &-bit		1-ch UART/3-wire					44-nin I OFP
µPD789176(Y)	16	512	0	0.2	3-ch	3-ch 1-ch	Yes	Yes	3-ch 8-bit		Yes	O-ch or 1-ch I ² C	Xtal	Yes	31	1.8-5.5	or 48-pin
µPD789177(Y)	24									8-ch 10-bit							TQFP
pPD78F9177(Y) 24 (flash)	24 (flash)																

рРD78986х																
µPD789860	4		ις	, C								\ \				
µPD78E9860	4 E ²	128			7-ch							Aīdi		-		20-pin
µPD789861	4	-	-			I	Š	:- - - - - - -	ı	ı	I	D _Q		4	0	SSOP
µPD78E9861	4 E ²		_	C			2)))	I		0.0.0	
µPD789862	16	0.17	Ų		1-						1 - L L L L L L L L L L	\ \ \ \		C		30-pin
µPD78E9862	16E ²	2 7)		Z							AIGI		77		SSOP

Notes: 1. MET = minimum instruction execution time. 2. Yes = Y version has PC. 3. Operating temperature is -40° to $+85^{\circ}$ C.

8-BIT KO MICROCONTROLLERS WITH LCD CONTROLLER

	WEN	MEMORY		SPEED			TIMERS							SERIALINTERFACE					
SUBSERIES	ROM (KB)	RAM (B)	-	MHz MIET¹ (µs)		8-BIT 16-BIT		RTC WATCHDOG	PWW	A/D	D/A	03	I ₂ C	UART/3-WIRE	OSC. TYPE	SUBCLOCK	I/O PINS	OP. VOLTAGE	PACKAGE
рРD7806х																			
µPD78062(Y)	16	512																	
µPD78063(Y)	24																		
µPD78064(Y)	32		5	0.4	2-ch	1-ch	Kes	Yes	1-ch 14-bit 8-ch 8-bit	8-ch 8-bit	I	40x4	Yes ²	1-ch UART/3-wire O-ch or 1-ch I²C/3-wire	Xtal	Yes	57	2.0-6.0	or IQFP
µPD78064B(Y)	32	1024																	
µPD78P064(Y)	32 OTP																		
pPD78030x																			
µPD780306(Y)	48													1-ch IIART/3-wire					(
µPD780308(Y)	09	2048	5	0.4	l-ch	l-ch	Kes	Yes	1-ch 14-bit 8-ch 8-bit	8-ch 8-bit	I	40x4	Yes ²	1-ch 3-wire	Xtal	Yes	57	2.0-5.5	OC-pin QFP
pPD78P0308(Y)	60 OTP	I												0-ch or 1-ch 1 ² C/3-wire				2.7-5.5	; ;
рРD78035х																			
µPD780343(Y)	24									8-ch									
µPD780344(Y)	32	1007							2-ch 8-bit	8-bit				1-ch UART					100-nin GEP
µPD780353(Y)	24	1024	2	0.2	4-ch	1-ch	Kes	Yes	1-ch 18-bit		I	40x4	Yes²	2-ch 3-wire	Xtal	Yes	99	1.8–5.5	or 113-pin
µPD780354(Y)	32									10-bit				0-ch or 1-ch 1²C					BGA
µPD78F0354(Y)	32 (flash)	1536																	
pPD78033x																			
µPD780316	48											24.7					70		
µPD780318	09											7474					>		
µPD780326	48								-	(-	3001					42		::
µPD780328	09	2560	2	0.2	3-ch	2-ch	Kes	Yes	3-ch 8-bit 1-ch 16-bit	10-ch	- - - - - - - - - - - - - - - - - - -	† ************************************	ı	2-ch Jakira	Xtal	Yes	02	1.8–5.5	TQFP
µPD780336	48								5		5)))			·		
µPD780338	09											40x4					54		
µPD78F0338	60 (flash)																		
рРD78085×																			
µPD780851	32	1604			c		>	>	: 10	5-ch				1-ch UART	\/		7 2	7	80-pin
µPD780852	40	020	ω 	0.24	Z-CN	ς P	Yes	res	Z-cn 8-bit	8-bit	I	70x4	I	2-ch 3-wire	Afai	0 Z	0	4.0-5.3	QFP
	a city and a city																		

Notes: 1. MIET = minimum instruction execution time.
2. Yes=Y version has P.C.
3. Operating temperature is -40° to +85°C.

8-BIT KOS MICROCONTROLLERS WITH LCD CONTROLLER

	MEMORY		SPEED		TIMERS	ERS					SERIAL I/O				_		
SUBSERIES	ROM (KB) RAM (BYTE) MHz MIET! (µs)	TE) MH.	z MIET¹ (με	s) 8-BIT	16-E	RTC	WATCHDOG	DWW.	A/D	9	UART/3-WIRE	OSC. TYPE	SUBCLOCK	I/O PINS	OP. VOLTAGE	PACKAGE	OTHER
µPD78930x																	
µPD789304	- 8											- >					
µPD78F9306	16 (flash)	<u>م</u>	0.4	C		-	-				1-ch UART/3-wire	Xtal	>	C	0 -	64-pin QFP	
µPD789316	8			U2-Z	ρ	Ş	5	1-cn &-bit	I	74×4	1-ch 3-wire	(res	23	0.0-8.1	or TQFP	booster
µPD78F9316	16 (flash)	4	0.0))					
µРD78932x																	
µPD789322	4	L															
µPD789324	8																
µPD789326	16	5	0.4	2 ch	I	무	1-ch	1ch 8-bit	I	24×4	1-ch UART/3-wire	Xtal	Xes	18	1.8-5.5	32-pin IQFP	POR
µPD789327	24 512																
µРD78F9328	32 (flash)																
uPD78940xA/941x																	
pPD789405A/415A	12	_															
pPD789406A/416A	16					-	-		7-ch 8-bit		· · · · · · · · · · · · · · · · · · ·	- >	>	(, ,	80-pin QFP	
pPD789407A/417A	24 312	Λ	O	λ-ch	Ϋ́	ξ -	- -	I	or 7-ch 10-bit	78×4	I-ch UAKI/ 3-wire	Afal	Yes	4 ک	0.0-8.	or TQFP	
µPD78F9418A	32																
pPD78942x/943A																	
pPD789425	12							-									
µPD789426	16							0-cn &-bit									
µPD789435	12 512	5	0.4	2-ch	J-ch	무	اب ا		6-ch 10-bit	5×4	1-ch UART/3-wire	Xtal	Yes	40	1.8-5.5	O4-pin LWFP	
µPD789436	16							2-ch 8-bit								5	
µPD78F9436	16 (flash)																
pPD78944x/945x																	
pPD789445	12								: 0								
µPD789446	16								o-ch &-bit								
µPD789455	12 512	5	0.4	2-ch	1-ch	Yes	/es	1-ch 8-bit		15×4	1-ch UART/3-wire	Xtal	Xes	30	1.8-5.5	64-pin TQFP	
µPD789456	16								6-ch 10-bit							5	
µPD78F9456	16 (flash)																
F-1144		-	-														

Notes: 1. MIET=minimum instruction execution time. 2. Yes=Yversion has IPC. 3. Operating temperature is -40° to $+85^{\circ}$ C.

8-BIT KOS MICROCONTROLLERS WITH LCD CONTROLLER (CONT.)

01000	MEMORY	ORY	SPEED	Q.		TIMERS		1			SERIAL I/O	1	0		1		1
SUBSERIES	ROM (KB) RAM (BYTE)		MHz	MHz MIET' (μs) 8-BIT	T 16-BIT	BIT RTC	WATCHDOG	WW.	A/D	CD	UART/3-WIRE	OSCIYPE	SUBCLOCK	NO PINS	OSC TYPE SUBCLOCK 1/O PINS OP. VOLIAGE	PACKAGE	OIHEK
рРD78946x																	
µPD789462	4	730															
µPD789464	8	0007														(- (
µPD789466	16		2	0.4 2-ch	ا ا	- Yes	Yes	1-ch 8-bi	1-ch 8-bit 1-ch 8-bit	23×4		Xtal	Yes	8	1.8–5.5	52-pin	POR and
µPD789467	24	512														3	VOII. DOOOSIG
µPD78F9468	32 (flash)																
pPD78947x/948x																	
µPD789477	24	768							- C								
µPD78F9478	32 (flash)		4	C	-	>		0	IIQ-0 UD-0		1 -L 11APT /2		>	7			
µPD789488	32	1024	ი	0.4 5-cn 1-cn 7es	<u>-</u> 	Tes Cu	Tes	3-CN 6-DII		7 × 0 × 4	I -ch UAKI / 3-WIFE	Yal	res		0.0-0.	80-pin QFP	
µPD78F9488	32 (flash)										0-Cn 10-bit					or TQFP	

р78983x																		
µPD789830P	24	1024			-	-				71.08	C/ TO VI 1		>	30	7 7 7 7	88-pin die		
µPD78F9831	48 (flash) 2048	2048			up-I	Б -			I	0 0	40x10 I-cn UARI/ 3-wire	Nai	res	38	C.C=/.Z	100-pin [QFP		
µPD789832	24																	
µDP789833	32	2240	5	0.4		Yes	Yes	I							0		Dot matrix	
µPD789834	48				1ch	1			3-ch 8-bit	80×16	80x16 1-ch UART/3-wire	Xtal	Yes	37	0.510	144-pin [QFP		
pPD789835	09	3264																
µPD78F9835	60 (flash)														3.0-3.6			
PD78988x																		
JPD789881	16	712	У	70 05	7		>			7,77	7 1 ch 11 ADT / 2 in	 	>	00	7 2 2	44 212 1000	7 7 5 5 64 cin CEB 11 1 1 1 1 1 1 1 1	
µPD78F9882	16 (flash)	7 0		4	ZCII	і Б	S S	I	I	70X4	I-ch OAKI/ 5-wire		Se les	0 7	J. S X X	O4-pin L&rr	Oilia-iow power	

|--|

^{2.} Yes=Y version has $\ensuremath{^{1}\!\text{C}}$. Operating temperature is -40° to $+85^\circ\mbox{C}$.

8-BIT KO MICROCONTROLLERS WITH VACUUM FLUORESCENT DISPLAY

	MEA	MEMORY	75	SPEED		NE	TIMERS										
SUBSERIES	ROM (KB)	RAM (BYTE)	MHz	MIET' (µs)	8-BIT	16-BIT	-	WATCHDOG	PWM	A/D	FIP⁴	UART/3-WIRE	OSC. TYPE	SUBCLOCK	I/O PINS	OP. VOLTAGE	PACKAGE
μPD78045x																	
pPD78042	16	0.17															
µPD78043	24	7 0														7	
µPD78044	32		5	0.4	-l]ch	Yes	Yes	1-ch 14-bit	1-ch 14-bit 8-ch 8-bit	24×16	2-ch 3-wire	Xtal	Yes	89	C.C=7.7	80-pin QFP
µPD78045	48	1024															
µPD78048A	60 OTP	2048														2.7-6.0	
pPD78023x																	
µPD780232	16																
µPD780233		768	5	0.4	3-ch	ı	/es	Yes	I	8-ch 8-bit	51×16	1-ch 3-wire	Xtal	I	40	4.5-5.5	80-pin QFP
µPD78F0233	24											1-ch 2-wire					
μPD78020x																	
µPD780204	32	0															
µPD780205	40	1024															
µPD780206	48		5	0.4	2-ch	1ch	Yes	Yes	1-ch 14-bit	1-ch 14-bit 8-ch 8-bit	40x16	2-ch 3-wire	Xtal	Yes	74	2.7-5.5	100-pin QFP
µPD780208	09	2048															
µPD78P0208	60 OTP																
рРD78987x																	
µPD789870	4																
JPD789871	∞	512	5	0.4	2	ı	Kes	Yes	I	I	25	1-ch 3-wire	Xtal	ı	33	2.7-5.5	52-pin LQFP
µPD78F9872	16 (flash)																
						1	1										

Notes: 1. MFT = minimum instruction execution time. 2. Yes = Y version has I°C.
3. Operating temperature is -40° to +85°C.
4. FIP = fluorescent indicator panel.

8-BIT ASSPs

		MEM	MEMORY	SPEED	_		TIMERS	SS						SERIAL INTERFACE	OSC	SUB-	0/	Ö			_
	SUBSERIES	ROM (KB)	ROM (KB) RAM (BYTE) MHz MIET (µs) 8-BIT 16-BIT RTC WATCHDOG	Hz	ET' (µs) 8	-BIT 16	-BIT RT	C WATCHI	DOG PWM		A/D D/A	P CD	PC PC		TYPE	_	PINS	VOLT	PACKAGE	OTHER	_
Motor Control	рРD78098x																				_
	µPD780982	16																			_
	µPD780983	24	1024																		
	µPD780984	32	c			-				8-bit 8-				2-ch UART	>		1	, ,	64-pin	3-ch 10-bit	
	µPD780986	48	o	۵.50 	0.24 3-cn 2-cn	7 U2:0	Ι Ερ	Les Les		1-ch 16-bit 10-bit	- ţq		I	1-ch 3-wire/2-wire	YIQI	I	74	. d – 0. J	SDIP	inverter	_
	µPD780988	09	2048																		
	pPD78F0988A 60 (flash)	60 (flash)																			
	рРD78403x																				_
	µPD784035	48	2048						-	-				-							_
	µPD784036	64	<u>ო</u>	32 0	0.125	- 4	4-ch -	Yes		2-ch 12-bit 8-	8-ch 8-bit 8-bit	2-ch 8-bit	- Yes	Yes ² 2-ch UART 1-ch 3-wire	Xtal		49	64 2.7–5.5	80-pin		
	µPD784037	96	3584						, N	5				7 /5 7 7 7 7 7 7 7 7 7					3		
	μPD78403xY																				
	µPD784035Y	48	0.00							'				-							
	µPD784036Y	49	2048	32 0	0.125	- 4	4-ch Ye	ss 2-ch 1.	Yes 2-ch 12-bit 2-ch 16-bit	16-bit 8-ch		2-ch	- Yes	Yes ² 12-ch UART	Xtal		49	2.7-5.5	80-pin		
	µPD784037Y	96	3584							·				7 />====================================					5		
	рРD78984x									-											
	µPD789841	8																			
	µPD789842	16	256 8.	8.38	0.24 3-ch 1-ch Yes	3ch -	-ch	Yes			8-ch	- -	I	1-ch UART	Xtal	I	30	4.0-5.5	30 4.0-5.5 44-pin QFP		_
	µPD78F9842	16 (flash)					TIQ-C			ò	IIQ								ار ا		

	46 2.7–5.5		2.7-5.5
			64 2.7–5.5
	Xtal -		Xtal -
	2-ch UART Yes ² 1-ch 3-wire/2-wire		$\frac{2\text{-ch UART}}{\text{Yes}^2}$ 1-ch 3-wire
İ	Yes²		Yes ²
	İ		İ
	2-ch		2-ch 8-bit
	8-ch 8-bit		8-ch 8-bit
	Yes 2-ch 12-bit 8-ch 2-ch 16-bit 8-bit		2-ch 12-bit 8-ch 2-ch 2-ch 16-bit 8-bit
	Yes 2-ch 16-bit		Yes
	I		I
	4-ch		4-ch
	I		I
	0.125		0.125
	32		32
	2048		4352
	ROMIess 2048 32 0.125		128 (OTP) 4352 32 0.125 -
рРD78403x	pPD784031 pPD784031Y	рРD78Р403x	µРD78Р4038 µРD78Р4038Ү
Stepper Motor pPD78403x	:		

Notes: 1. MIET= minimum instruction execution time. 2. Yes=Y version has I²C. 3. Operating temperature is -40° to $+85^\circ$ C.

8-BIT ASSPs (CONT.)

											-										
APPLICATION	SUBSERIES	ROM (KB) RAM (BYTE) MHz MIET' (µs)	MEMORY (KB) RAM (BYTE	S WHz	SPEED MET¹ (µs)	A N	8-BIT 16-	TIMERS BIT RTC	(S WATCHDOG	PWW	A/D	D/A	9	I ₂ C	SERIAL INTERFACE UART/3-WIRE	OSC.	SUB- 1/O CLOCK PINS	0 N SN SN	OP.	PACKAGE	OTHER
CAN Bus	μPD78081x																				
	µPD780814	32	1504																		
	pPD780816	48	1504	8.38	0.24		2-ch 2-	2-ch Yes	Yes	1-ch 8-bit	12-ch	I	I	I	1-ch UART	Xtal	Yes	46	4.0-5.5	64-pin TOFP	SOO Khos
	µPD78F0818	60 (flash)	3036				- - - 2			5	=				200					<u></u>	
	pPD78070xY																				
	PD780701Y	09	0,400		0	_	2.	2-ch		1-ch 8-bit	_			\ \	1-ch UART	- 5			7 7 7 0	80-pin	CAN
	pPD78F0701Y 60 (flash)	(flash)	3300		0.29		- S	Pww res	Yes	1-ch 16-bit	LO-Ch	I	I	Yes	2-ch 3-wire	Afal	I	ò	3.0-0.0	QFP -	390 kbps
	рРD78094x								-	_		_									
	pPD780948																				
	pPD78F0948	4	4100	C		-		-		1-ch 8-bit	0 1		(1-ch UART	Xtal			4	100-pin	CAN
	µPD780949	0	0107	α.υ	0.74	_	-7-ch	Z-ch Yes	Yes	1-ch 14-b	1-ch 14-bit 8-ch 8-bit	I .	40×4	I	I-ch 3-wire I-ch 2-wire	2	Yes	<u>,</u>	4.0-5.5	QFP	500 kbps
	pPD78F0949																				
	µPD78985 х																				
	pPD789850	7	613				1-ch			1 - 1 0 1:	11 0 7- 11				1-ch UART/1-ch 3-wire			18	(*)	30-pin SSOP	
	pPD78F9850	2	7 7	0	0					5	0-0-10-4				-	>	>		\ \ \	/ /	
	µPD789852	32	0101	0	0.23	-	- -	Г Б	5	2-ch 8-bit	101 40	1	I	I	1-ch 3-wire 2-ch HART	D N	S S	3.1		70FP	
	pPD78F9852	32 (flash)				,	UD-C														
:	uPD78095x																				
Metering	µPD780955	40	1024	0.384	52	-	6-ch 1-	1-ch		L			19×1		2-ch UART	Xtal	ı	50		80 QFP	3.4 µA
	µPD780957	48	0.00	-	c	ı		-	Yes	l-ch		ı	C	ı	1-ch UART	۷	>		2.2–3.5	100-pin	4
	µPD780958	09	2040		7	`	-Z	UD-7			I		n N N		1-ch 3-wire)	Les Les))		QFP.	0.0 M
a <u>v</u>	рРD78980x								-	_		-									
200	pPD789800	80		7	7											Xtal		31		44-pin QFP	
	µPD78F9801	16 (flash)	256	0	0.0																
	µPD789802	∞			0.125	1	2-ch	1	Yes	ı	I	I	I	I	1-ch 3-wire		Yes		4.0-5.5	64-pin	
	µPD789803	16	512	∞	73													- t		구 구	
	µPD78F9803	16 (flash)) -																
																	l	ı			

Notes: 1. MFT= minimum instruction execution time. 2. Yes=Y version has P.C. 3. Operating temperature is -40° to $+85^{\circ}$ C.

16-BIT K4 MICROCONTROLLERS

														-				
SUBSERIES	ROM (KB) RA	ORY RAM (BYTE)	MHz	SPEED MIET' (µs)	8-BIT	18-8IT	IIMERS V	WATCHDOG	PWW	A/D	D/A	PC SER	SERIAL INTERFACE UART SY	N N	SUBCLOCK	I/O PINS	OP. VOLTAGE	PACKAGE
pPD78F4046																		
pPD78F4046	64 (flash)	2048	32	0.125	I	5-ch	ı	Kes	2-ch 16-bit	16-ch 10-bit	I	I	2-ch	I	I	65	4.5-5.5	80-pin QFP
pPD78F4225																		
µPD78F4225	128 (flash)	4352	12.5	091.0	4-ch	1-ch	Yes	Yes	2-ch 8-bit	1-ch 16-bit	2-ch 8-bit	Yes ²	2-ch	1-ch	Yes	29	1.9–5.5	80pin QFP/TQFP
pPD78F4225Y																		
µPD78F4225Y	128 (flash)	4352	12.5	0.160	4-ch	1-ch	×es	Yes	2-ch 8-bit 1-ch 16-bit	8-ch 8-bit	2-ch 8-bit	Yes ²	2-ch	ļ.	Kes	29	1.9–5.5	80-pin QFP/TQFP
pPD784044																		
µРD784044	32	1024	32	0.125	I	5-ch	ı	Yes	2-ch 16-bit	16-ch 10-bit	ı	ı	2-ch	ı	I	65	4.5-5.5	80-pin QFP
pPD784046																		
рРD784046	49	2048	32	0.125	I	5-ch	ı	Yes	2-ch 16-bit	16-ch 10-bit	ı	I	2-ch	ı	ı	65	4.5-5.5	80-pin QFP
pPD784054																	-	
µPD784054	32	1024	32	0.125	I	3-ch	ı	Yes	I	16-ch 10-bit	I	I	2-ch	ı	I	64	4.5-5.5	80-pin QFP
μPD78422x																		
pPD784224	96	3584	(7	-		>	>	2-ch 8-bit	- -	-	>	-	-	>	7	4	
µPD784225	128	4352	C.7	<u> </u>	4-cn	Б Б	Se Les	ies	1-ch 16-bit	11Q-0 II)-0	7-cn 0-bil	res	Z-CII	Ę	s e e s	ò		
μPD78422×Y																		
pPD784224Y	96	3584	(7	_	-	>	>	2-ch 8-bit	-	- -	>	-	-	>	7		
µPD784225Y	128	4352	C.21	0	4-cn 1-cn	Ç P	 Les	Tes	1-ch 16-bit	Q-CN Q-DII	Z-Cn &-DII	res	7-CN	Ę.	, es	ò	0.0-8.	Sopin Gry I Gry
pPD78421xA																		
µPD784214A	96	3584																
pPD784215A	000	5120							4 - 4 - 4									
pPD784216A	07	8192	12.5	0.16	6-ch	- -	Kes	Kes	0-cm 0-bm	8-ch 8-bit	2-ch 8-bit	I	2-ch	l-ch	Kes	98	1.8-5.5	
pPD784217A	192	0000																3
µPD784218A	256	7000																
μ PD78421xAY																		
pPD784214AY	%	3584																
µPD784215AY	000	5120							4 - 4 - 4									
µPD784216AY	07	8192	12.5	0.16	6-ch 1-ch	- -	/es	Kes	1-ch 16-bit	8-ch 8-bit	2-ch 8-bit	Yes	2-ch	-t	×es	98	1.8-5.5	OFP / IOFP
pPD784217AY	192	00001)									5
µPD784218AY	256	70007																

Notes: 1. MET= minimum instruction execution time. 2. Yes=Y version has I°C. 3. Operating temperature is -40° to $+85^\circ$ C.

16-BIT K4 MICROCONTROLLERS (CONT.)

331033013	MEMORY	ORY		SPEED	1	TIMERS	i i	-	į	:	SERI	SERIAL INTERFACE	E)	2000	0.44	L C	()
SUBSERIES	ROM (KB)	ROM (KB) RAM (BYTE)	MHz	MIET¹ (μs) 8-BIT 16-BIT	8-BIT i	16-BIT RTC	C walchbog	hww	A/D	D/A	PC UART	UART	SYNC	SUBCLOCK	I/O PINS	I/O PINS OF VOLIAGE	PACKAGE
pPD78F421xA																	
pPD78F4216A 128 (flash)	128 (flash)	8192	10.5	7- 7- 7 - 71 - 0	7- 7		×	8-bit	0 -1 0 1:1	"-10 1-6		7-1	7- 1	~~^	70	1055	100-pin
μΡD78F4218A 256 (flash) 12800	256 (flash)	12800	C.7	2	5 5		Tes Tes	1-ch 16-bit	0-011	10-0 U2-7	I	Z-CII	5	Tes	0	J. J.	LQFP
pPD78F421xAY																	
pPD78F4216AY 128 (flash)	128 (flash)	8192	4	7- 7- 7- 0	7			8-bit	0 1- 0	1 0 1 - 0	>	-1	-	>	70	4	100-pin QFP
μPD78F4218AY 256 (flash) 12800	256 (flash)	12800	C.7	2	5 5			1-ch 16-bit	0-011	10-0 U2-7	Tes		5	Tes	0		or LQFP

Notes: 1. MET = minimum instruction execution time. 2. Yes = Y version has I²C. 3. Operating temperature is -40° to $+85^{\circ}$ C.

8-BIT Kx1 MICROCONTROLLERS

	AAE	>dC Y45Y		CDEED			TIAMEDO						SEDIAL INITEDEACE					
SUBSERIES	ROM (KB)	RAM (BYTE)	WHz	MIET' (µs)	8-BIT	8-BIT 16-BIT	RTC W	RTC WATCHDOG	PWW	A/D	POC and	POC and FAILSAFE	UART	3-WIRE	SUBCLOCK	I/O PINS	OP. VOLTAGE	PACKAGE
0.00204																		
PPD/8010x (KB)	11																	
µPD780101	∞	512																
µPD780102	16			C	-	-		>	3-ch 8-bit	-	>	>	1-ch UART/IIN	-		C	1	
pPD780103	24	768	2	7.0	ე ე	Ş -	I	Les Les	1-ch 16-bit	4-cn 10-bit	Tes	Tes	O or 1-ch UART	Ģ.	I	77	C.C-/.2	SO-pin SSOR
pPD78F0103	24 (flash)																	
"PD78011v (KC1	11.																	
או או וספים ול																		
pPD780111	∞	512																
µPD780112	16								40 40 1				1 1 1 NDT / 1 N					
pPD780113	24	1024	10	0.2	4-ch	- - - -	Yes	Yes	1-ch 16-bit	8-ch 10-bit	Yes	Yes	1-ch UART	1-ch	Yes	32	2.7-5.5	44-pin LQFP
pPD780114	32																	
pPD78F0114	32 (flash)																	
pPD78012x (KD1)	_																	
pPD780121	∞	512																
µPD780122	16								4-ch 8-bit	α-ch 10-bit	>	>	1-ch UART/LIN					
pPD780123	24	7001	0	0.2	4-ch	اب اب	Yes	Yes	1-ch 16-bit	5		Ď	1-ch UART	1-ch	Yes	39	2.7-5.5	52-pin LQFP
pPD780124	32	1024																
µPD78F0124	32 (flash)																	
pPD78013x (KE1)	E1)																	
µPD780131	8	512																
µPD780132	9	1001																
pPD780133	24	770																
pPD780134	32	2048		C	7	-1	>	>	4-ch 8-bit	101	>	>	1-ch UART/LIN	4	>	. 7	7 7 7 7	64-pin QFP
pPD78F0134	32 (flash)	1024	2	7.0	4-cn	Z-CII	Les	O_	0- or 1-ch 16-bit	8-Cn 10-bil	Les	Tes	1-ch UART	Z-CII	Se .	<u>_</u>	C.C-/.Z	or TQFP
µPD780136	48																	
µPD780138	09	2048																
pPD78F0138	60 (flash)																	
Notes: 1. MET = minimum instruction execution time.	imum instruction	execution time.																

Votes: 1. MIET=minimum instruction execution time. 2. Yes=Y version has ${\rm PC}$. 3. Operating temperature is -40° to $+85^{\circ}$ C.

8-BIT Kx1 MICROCONTROLLERS (CONT.)

OI ID CEDIEC	MEA	MEMORY	SP	SPEED			TIMERS		1		POC and	FAILSAFE	SERIAL INTERFACE	ACE	000	4	1	
SOBSERIES	ROM (KB)	ROM (KB) RAM (BYTE) MHz MIET¹ (µs) 8-BIT 16-BIT RTC	MHz	MIET¹ (µs)	8-BIT	16-BIT		WATCHDOG	W.W.	A/D	Σ	IMI CLOCK	UART	3-WIRE	SUBCLOCK		OF VOLIAGE	PACKAGE
pPD78014x (KF1)	7																	
pPD780143	24	1024				-								-				
pPD780144	32					ب ا			4-ch 8-bit					Ş				.!
pPD780146	48	Ç	01	0.2	4-ch		Yes	Yes	1-ch or	8-ch 10-bit	Yes	Yes	1-ch UART/UN		Kes	29	2.7-5.5	
pPD780148	09	2040				2-ch			2-ch 16-bit				I-ch UAKI	2-ch				
pPD78F0148 60 (flash)	60 (flash)	_																

Notes: 1. MIET = minimum instruction execution time. 2. Yes = Y version has PC. 3. Operating temperature is -40° to $+85^\circ$ C.

32-BIT Kx1 MICROCONTROLLERS

	VAEAAODV	Vac	Ö	CDEED		-	TIAMEDS				-		SEDIAL INTEDEACE				
SUBSERIES	ROM (KB)	RAM (BYTE)	WHz	MIET' (ps)	8-BIT	16-BIT	\vdash	WATCHDOG	PWW	A/D	POC and	CLOCK		SUBCLOCK I/O PINS	I/O PINS	OP. VOLTAGE	PACKAGE
μΡD70320x (KF1)	_																
µPD703208(Y)	64	Ò															
µPD703209(Y)	96	0,04	C	Ç	-	-	>	>	4-ch 8-bit	-			2-ch UART	>	1	1	80-pin QFP
pPD7032010(Y)	128	77.	0 7	200	4-cn 4-cn	4-cn	Les Les	Les Les	2-ch 16-bit		I	I	3-cn C31 Och or 1-ch 1 ² C	Tes	0	7.7-2.3	or TQFP
µPD7032010(Y) 128 (flash)	128 (flash)	0 444															
11PD70321x (KG1)																	
µPD703212(Y)	64																
pPD703213(Y)	96	4096	(Ĺ	-	-		>	4-ch 8-bit	: (-	-		2-ch UART		(1	
pPD703214(Y)	128		07.	20	4-ch	4-ch 4-ch Yes	Yes	Yes	4-ch 16-bit	8-ch 10-bit Z-ch 8-bit	Z-ch 8-bit	I	4-ch (SI O-ch or 1-ch 1 ² ()	Yes	24	2.7-5.5	2.7-5.5 100-pin [QFP
pPD70F3214(Y) 128 (flash)	128 (flash)	0 44											5				
1000200	_																
provostix (NJI)																	
pPDZ03216(Y)	96								40 40				3-ch UART				
µPD703216(Y)	128	6144	20	20	4-ch 6-ch		Yes	Yes	4-cn o-bli 6-ch 16-bit	16-ch 10-bit 2-ch 8-bit	2-ch 8-bit	ı	5-ch CSI	Yes	128	2.7-5.5	144-pin [QFP
pPD70F3217(Y) 128 (flash)	128 (flash)								5				O-ch or 1-ch 1²C				
Notes: 1 MIET = minimum instruction execution time	mim instruction ex	secution time															

Notes: 1. MIET= minimum instruction execution time. 2. Yes=Y version has I°C. 3. Operating temperature is -40° to $+85^\circ$ C.

32-BIT V850 MICROCONTOLLERS

	_				140	4		F	,					Ę			-	-	-	
CORE	SUBSERIES	ROM (KB)	MEMORY ROM (KB) FLASH (KB) RAM (KB)	RAM (KB)	SPEED MHz	hs	8-BIT	IIMEKS 16-BIT	RS PWM	RTC	WATCHDOG	A/D	D/A	I ² C	SEKIAL IN IEKFACE UART	SUB- CLOCK	CAN PINS	OP.		PACKAGE
V850	V853A																			
	µPD703003A	128																		
	µPD703004A	96		4											() 					
	µPD703025A	256		8	33	30	ı	5 2-	2-ch 8-/12-bit	ı	ı	8-ch 10-bit	2-ch 8-bit	I	Z-ch UAKI/CSI 2-ch CSI	1	- 76	5		100-pin LQFP
	µPD70F3003A		128	4											2					
	µPDZ0F3025A		256	8																
	V850/SA1																	-		
	pPD703014A(Y)	77																	121	121-pin FBGA
	µPDZ03014B(Y)	70		_															<u> </u> 02	100-pin LQFP
	pPD703015A(Y)	000		4					1-10						1 -L IIADT				121-	121-pin FBGA
	µPD703015B(Y)	87			20	50	4	2	4-ch 8-bit 2-ch 16-bit	Yes	Kes	12-ch 10-bit	I	Yes	I-ch UART/CSI	Yes	— П	85 3.3		
	pPD703017A(Y)	256		∞											2-ch CSI				001	100-pin [QFP
	µPDZ0F3015B(Y)		128	4																
	pPD70F3017A(Y)		256	8																
	V850/SB1																			
	µPD703030A(Y)	000		C																
	µPD703030B(Y)	504		07																
	pPD703031A(Y)	100		12																
	µPD703031B(Y)	07		8					4.0 do											
	µPD703032A(Y)	512		24	20	90	9	7	0-cl 0-bli	_	_	12-ch 10-bit	ı	Yes	2-ch UART/CSI	Yes	- 83	3 5		100-pin LQFP
	µРD703033A(Y) µРD703033B(Y)	256		16					5						<u></u>					
	pPD70F3032A(Y)		510	27																
	µPD70F3032B(Y)		7	†																
	µPDZ0F3033A(Y)		256	16																
	pPD/ OF3033B(Y)																4	_	_	
	V850/SF1																			
	µPD703075AY	128		12											2-ch UART/CS	1-ch	-F3			(
	µPD703076AY	- 1		1	91	62.5	ı	∞	7-ch 16-bit	_	_	1-ch 10-bit	I	Yes	1-ch-CSI/I²CI	Yes 2-c	2-ch 8	84 3.5-	5.5	3.5-5.5 100-pin LQFP
	µPD703078AY	256		16											1-ch CSI	1-1	1-ch		5	5
	-																			

Notes: 1. Yes=Y version has $\rm l^2C$. Operating temperature is -40° to $+85^\circ C$.

32-BIT V850 MICROCONTROLLERS (CONT.)

			()		i i	,		i						ľ				-		
CORE	SUBSERIES	ROM (KB)	MEMORY FLASH (KB) RAM (KB)	RAM (KB)	MHz	sh	8-BIT	16-BIT	PWM	RTC	WATCHDOG	A/D	D/A	" ∑	SEKIAL INI EKFACE UART	SUB- CLOCK	CAN	O SM	OP. VOLT.	PACKAGE
0300	V850/SE1 (cont.)																			
(cont.)	µPD703079AY	256													2-ch UART/CS			_		100-pin QFP
	, pPD70F3079AY		256	9	9	62.5	ı	∞	7-ch 16-bit	_	_	1-ch 10-bit	I	es es	1-ch-CSI/I°CI 1-ch CSI	es es	2-ch	84	3.5-5.5	or LQFP
	V850/SC3																			
	µPD703088Y	017													2-ch UART					
	µPD703089Y	7 7		24	20	90	ı	10-ch	10-ch 10-ch 16-bit Yes	Yes	Yes	12-ch 10-bit	I	Yes	2-ch UART/CSI	Kes	- 	82 3	.5-5.5	3.5-5.5 144-pin LQFP
	µPD70F3089Y		512												2-ch CSI/I²C		2-ch			
1/040EC	V850FS/SA2																			
400CF3	µPD703201	256						Г												
	pPD70F3201		256		1	Ć	-	(4-ch 8-bit	>	>	-	- - -	>	I-ch UART I-ch UART/CSI	>			1	(H
	µPD703201Y	256		0		<u>ک</u>	4	.7	2-ch 16-bit	Yes	Yes	Z-ch U-bit Z-ch 8-bit Yes	Z-ch 8-bit	Yes	2-ch or 3-ch CSI	Yes	ı	7.8	1 /-7-7:	2.2-2.7 100-pin 19FP
	µPD70F3201Y		256												0-ch or 1-ch CSI/1²C					
	V850ES/SA3																			
	µPD703204	256													TAN II 40 L					
	pPD70F3204		256	1		C	_	C	4-ch 8-bit	>	>	14 4 5 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	0 40	>	I-ch UART/CSI	>		C	7	CO C C C C C C C C C C C C C C C C C C
	µPD703204Y	256		2		>	4	٧	2-ch 16-bit	res	Les		7-cn 6-bil	Tes	3-ch or 4-ch CSI	Tes	- I	7 70	/:7_7:	ZI-TFBGA
	µPD70F3204Y		256												0-ch or 1-ch CSI/1²C					
	V850E/IA1																			
	pPD703116	256		(C	Ç		o	10-1-14 1:1			1 4 - L 10 L:			3-ch UART				7 / 0	11.1
	pPD70F3116		256	2	2	2	ı	ι O	1 3-cn 10-bit	ı	I		I	I	3-ch CSI	I	Ę	ე ე		3.3/ 3.0 144-pin Larr
	V850E/IA2																			
	pPD703114	128		4	É	7			12 ch 14 hit			1 4 ch 10 h;			2-ch UART			7	٠,	100-pin QFP
	pPD70F3114		128)	5	۲۷	ı			1	ı	2	ı	I	2-ch CSI	ı	1	,		or LQFP
	V850E/MA1																			
	pPD703103																			
	µPD703103A)		_											1 UART					
	pPD703105		0	4	90	20	ı	∞	2-ch 8/12-bit	1	I	8-ch 10-bit	I	I	1 UART/CSI	I	<u> </u>	119	3.3	144-pin LQFP
	pPD703105A	128													1CSI					
	рРД703106			10																

Notes: 1. Yes=Y version has I²C. 2. Operating temperature is -40° to $+85^\circ$ C.

32-BIT V850 MICROCONTROLLERS (CONT.)

CORE	SUBSERIES	ROM (KB)	MEMORY ROM (KB) FLASH (KB) RAM (KB)	RAM (KB)	SPI	SPEED z µs	8-BIT	TIN-91	TIMERS	RTC	RTC WATCHDOG	A/D	D/A	SE I²C	SERIAL INTERFACE UART	SUB- CLOCK	SUB- CLOCK CAN PINS	I/O PINS	OP. VOLT.	PACKAGE
V850ES (cont.)	_µ РD703106A	128																		
	µРD703107 µРD703107A	256	I	10	50	20	I	∞	2-ch 8/12-bit -	1	I	8-ch 10-bit	1	I	1 UART 1 UART/CSI 1 CSI	I	I	119	3.3	144-pin LQFP or FBGA
	µРDZOF310Z µРDZOF310ZA	1	256												<u></u>					
V850E																				
	уРD7О31О8	0	0	4	40	25	I	9	2-ch 16-bit	ı	I	4-ch 10-bit	Ι	I	2 UART/CSI	I	ı	62	3.3	100-pin [QFP
	µPD703100	0	0		40	25			2-ch 16-bit			4-ch 10-bit						79	3.3	144-pin LQFP
	µPD703101	96		_	00	CC		4	10 ch 14 h;			1011			IOU/ HOVII C					144-pin [QFP
	µPD703102	128	ı	4	?	2	I	 o	12-CH 10-DI	I	I	10-0 10-0	I	I	Z UARI/CSI	I	I	123	3.3/5.0	3.3/5.0 or 157-pin
	µPD70F3102		128																	FBGA
	µPD703130	0	0	4	30	34	I	9	8-ch 16-bit	ı	1	4-ch 10-bit	1	ı	2 UART/CSI	1	-	81	3.3/5.0	3.3/5.0 100-pin QFP
	µPD703111	0	0	16	150	9.9	I	0	10 2-ch 16-bit	I	I	8-ch 8-bit	I	I	1 UART 1 UART/CSI 1 CSI	I	I		3.3	3.3 176-pin LQFP
										1							1	1		

8- and 16-Bit K0, K0S, K4 and Kx1 Microcontrollers

NEC Electronics America offers a tools that can be used to efficiently version sockets, program adapters, diverse selection of development boards, emulation probes, con-Development environments are development boards, software microcontroller-based systems. PC-based and include design in-circuit emulators, emulation assemble, compile, or debug software developed for NEC packages, control programs, and PROM programmers.









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SOFTWARE TOOLS Assembler, C compiler, simulator, debugger and device files Assembler, C compiler and device files CA78KOS Simulator and device files CL78KOS CL78KOS CL78KOS

IE-70000-PCI-IF-A	IE-70000-PCHF-A	IE-70000-PCI-IF-A	IE-70000-PCI-IF-A
IE-70000-CD-IF-A	IE-70000-CD-IF-A	IE-70000-CD-IF-A	IE-70000-CD-IF-A
I	IE-78KO-NS-PA	I	IE-78KO-NS-PA
NP-XXXX	NP-XXXX	NP-XXXX	XXXX-dN
LCE-78KOS	ICE-78K0	I	ICE-78K0
ICE-78XXXX-EM	ICE-78XXXX-EM	I	ICE-78XXXX-EM
LCP-XXXX-250	LCP-XXXX-250	I	LCP-XXXX-250
PG-FP4	PG-FP4	PGFP4	PGFP4
PG-1500	PG-1500	PG-1500	I
	IE-70000-PCHF-A IE-70000-CD-IF-A — NP-XXXX ICE-78KOS ICE-78XXXX-EM ICP-XXXX-2.50 PG-FP4 PG-1500		IE-70000PCHFA IE-70000-CDIFA IE-78KO-NS-PA NP-XXXX NP-XXXX ICE-78KO ICE-78XXX-EM ICP-XXXX-250 PG-1500

Low-Cost Emulators

America, you get complete in-circuit the price of a low-end development ware in NEC 8-bit microcontrollers. With low-cost emulators (LCE-KOS and LCE-KO) from NEC Electronics debugging of hardware and softfull-function emulation for efficient on-board flash programming, for emulation functionality, including board. The LCEs offer real-time,

Emulation System + Flash Programmer Flash Program Adapter Motherboard Ribbon Cables Daughterboard Supply Power | **☐** Integrated Debugger NoTE 1 Parallel Interface Assembler C Compiler System Simulator Host Machine PC-Compatible PG-FP4 Controller + Parameter File □ Device File RS-232-C or USB

FA-XXXX

Emulation Probe (optional)

Target System

Typical Low-Cost Emulator Development Environment for NEC 8-Bit Microcontrollers

NOTES:

Integrated debugger included with emulator
 Optional

Flash Programming NOTE 2

PG-FP4 + FA-XXXX

NEC New Smile In-Circuit Emulators

microcontrollers. The NS system is emulation boards for each specific from NEC Electronics, you get all subfamily. This modular configuration exchanging the emulation boards. ware and software in NEC 8-bit KOS main boards and dedicated With New Smile (NS) emulators designed with universal KO and the standard emulation features for efficient debugging of hardallows for easy emulation of additional devices by simply

Typical New Smile Emulator Development Environment for NEC 8- and 16-Bit Microcontrollers

Emulation System Emulation Probe Target System Emulator + Emulation Board Power Supply Integrated Debugger NOTE 1 PC Interface Board Assembler C Compiler System Simulator Flash Programming PG-FP4 + FA-XXXX Host Machine PC-Compatible PG-FP4 Controller + Parameter File □ Device File RS-232-C or USB

NOTE:1. Integrated debugger included with emulator

EMULATOR COMPARISONS

The following table shows the differences between the New Smile emulators and the newer low-cost emulators for NEC 8-bit KO and KOS families.

FEATURES		IE-78KO-NS NEW SMILE	LCE-78K0 LOW-COST EMULATOR	LCE-78KOS LOW-COST EMULATOR
Target Device		μPD780xxxx	Select appropriate daughterboard	Select appropriate daughterboard
Flash Programming		Not included	On-board, in-circuit programming (uses 3-wire mode)	On-board, in-circuit programming (uses 3-wire mode)
Emulation Clock	Internal	Fixed clock (max. chip frequency)	Fixed clock (5 or 10 MHz)	Fixed clock (5 or 10 MHz)
	External	User installed ceramic or Xtal clock	Userinstalled Xtal clock	Userinstalled Xtal clock
Emulation Voltage	Internal	5V	5V or 3.3V	5V or 3.3V
	External	Usersupplied	User-supplied	Not available
Memory Mapping	Internal ROM	Up to 60 KB	Up to 60 KB	Up to 48 KB
	Internal RAM	Up to 1 KB data RAM; up to 2 KB internal expansion RAM	Up to 1 KB data RAM; up to 2 KB internal expansion RAM	Up to 1 KB
	Target memory	On target system	On target system	On target system
	Stack	Illegal stack access detection	Illegal stack access detection	Not available
Event Setting		Address, data, status (program run, data read, data write, data read/write)	Address, data, status (program run, data read, data write, data read/write)	Address, data, status (program run, data read, data write, data read/write)
	Events	Up to 6 simultaneous events (4 bus, 2 execution, 1 external trigger)	Up to 6 simultaneous break or trace- triggered events	Up to 3 simultaneous break or trace- triggered events
Time Measurement	External trigger	Supported	Not supported	Not supported
	Total time of last execution	Max time: 14.5 minutes Resolution: 125 ns	Max. time: 7.15 min. $w/100$ ns resolution or 14.32 min. $w/200$ ns resolution	Max time: 7.15 min. execution w/100 ns resolution or 14.32 min. w/200 ns resolution
Trace	Buffer size	8 KB x 32 bits wide	$64 \text{ KB} \times 48 \text{ bits wide}$	$64 \text{ KB} \times 64 \text{ bits wide}$
	Time stamp	Available with option board	Included	Included
	qualifier	Unconditional, qualified, sectional	Unconditional, qualified, sectional	Unconditional, qualified, sectional
Break	Hardware event- based breaks	Up to 32K fetch or data events can be specified with up to 10 simultaneously active	Up to 32K fetch events (100 simultaneously active) and up to 32K data events (5 simultanteously active)	Up to 32K fetch events (100 simultaneously active) and up to 32 K data events (5 simultanteously active)
	Software breaks	Unlimited number of software breaks	Not supported	Not supported
Execution Options		Real-time, single-step, multiple-step take/ignore branch or jumps	Real-time, single-step, multiple-step take/ignore branch or jumps	Real-time, single-step, multiple-step take/ignore branch or jumps
Code Coverage		Available with option board	Not available	Not available

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PROGRAM ADAPTER

SOCKET

PROBE

FA-64GC-8BS-A

064SA*

ICP-64GC-250

ICE-780034-EM

LCE-78K0

NP-64GC-TQ

IE-780034-NS-EM1

IE-78KO-NS

64-pin QFP (14 × 14 mm)

pPD780022AYGC-8BS

pPD780022AGC-8BS

µPD780023AGC-8BS

pPD780021AYGC-8BS

pPD780021AGC-8BS

µPD780023AYGC-8BS

pPD780024AGC-8BS

pPD780024AYGC-8BS

FA-64GB-8EU-A

064SD*

₹ Z

ICE-780034-EM

ICE-78K0

NP-G4GB-TQ

IE-780034-NS-EM1

IE-78KO-NS

64-pin [QFP (10 × 10 mm)

µPD780022AYGB-8EU

µPD780022AGB-8EU

pPD780021AYGB-8EU

pPD780021AGB-8EU

pPD780023AYGB-8EU

pPD780024AGB-8EU

pPD780023AGB-8EU

pPD780024AYGB-8EU

pPD780021AGK-9ET

FA-64GC-8B5-A

064SA*

ICP-64GC-250

ICE-780034-EM

ICE-78K0

NP-64GC-TQ

IE-780034-NS-EM1

IE-78KO-NS

64-pin QFP (12 × 12 mm)

pPD780032AYGC-8BS

pPD780033AGC-8BS

pPD780031AYGC-8BS

pPD780032AGC-8BS

FA-64GK-9ET

064SB*

LCP-64GK-250

ICE-780034-EM

LCE-78K0

NP-64GK

IE-780034-NS-EM1

IE-78KO-NS

64-pin TQFP (12 × 12 mm)

pPD780022AYGK-9ET

pPD780021AYGK-9ET

pPD780022AGK-9ET

pPD780023AYGK-9ET

pPD780023AGK-9ET

pPD780024AYGK-9ET pPD780031AGC-8BS

pPD780024AGK-9ET

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DEVICE NAME	PACKAGE	EMULATOR	EMULATION BOARD	PROBE	EMULATOR	DAUGHTERBOARD	PROBE	SOCKET	PROGRAM ADAPTER
pPD780033AYGC-8BS pPD780034AGC-8BS pPD780034AYGC-8BS pPD78F0034AGC-ABS	64-pin QFP (14 × 14 mm)	IE-78KO-NS	IE-780034-NS-EM1	NP-64GC-TQ	LCE-78K0	ICE-780034-EM	ICP64GC:250	064SA*	FA64GC-8BS-A
pPD780031AGB-8EU pPD780031AYGB-8EU pPD780032AGB-8EU pPD780033AYGB-8EU pPD780033AYGB-8EU pPD780034AGB-8EU	64-pin (QFP (10 × 10 mm)	IE-78KO-NS	IE-780034-NS-EM1	NP64GB-TQ	LCE-78K0	LCE-780034-EM	∀ Z	064SD*	FA-64GB-8EU-A
pPD780031AGK-9ET pPD780031AYGK-9ET pPD780032AGK-9ET pPD780032AYGK-9ET pPD780033AGK-9ET pPD780033AYGK-9ET pPD780033AYGK-9ET pPD780034AGK-9ET pPD780034AGK-9ET	64-pin TQFP (12 × 12 mm)	IE-78KO-NS	IE-780034-NS-EM1	NP64GK	LCE-78K0	ICE-780034-EM	ICP64GK:250	064SB *	FA-64GK-9ET
µРD78F0034ACW µРD78F0034AYCW	64-pin SDIP (750 mil)	IE-78KO-NS	IE-780034-NS-EM1	NP-64CW	ICE-78K0	ICE-780034-EM	LCP-64CW-250	64-pin SDIP	FA-64CW
pPD780053GC-8BT pPD780053YGC-8BT pPD780054YGC-8BT pPD780054YGC-8BT pPD780055GC-8BT pPD780055GC-8BT pPD780056GC-8BT pPD780056GC-8BT pPD780056GC-8BT pPD780058GC-8BT pPD780058GC-8BT pPD780058GC-8BT	80-pin QFP (14 × 14 mm)	IE78KONS	IE-780308-NS-EM1	NP-80GC-1Q	LCE78K0	LCE-780308-EM	LCP80GC:250	080SB *	FA-80G-C-8BT

8-Bit K0 MCUs (cont.) **DEVELOPMENT TOOLS**











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	PROGRAM ADAPTER
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FA-64GC-8BS-A

064SA*

ICP-64GC-250

ICE-780078-EM

LCE-78K0

NP-64GC-TQ

IE-780078-NS-EM1

IE-78KO-NS

(14 × 14 mm)

µPD780078YGC-ABS

pPD78F0078GC-ABS

pPD780076YGC-ABS

pPD780078GC-ABS

pPD780076GC-ABS

pPD78F0078YGC-ABS

µPD780076YGK-9ET

pPD780076GK-9ET

64-pin QFP

FA-80GK-9EU

080SD*

LCP-80GK-250

ICE-780308-EM

LCE-78K0

TEC-080SD

IE-780308-NS-EM1

IE-78KO-NS

(12 x12 mm)

µPD780058BYGK-9EU

µPD78F0058GK-9EU

pPD78F0058YGK-9EU

80-pin TQFP

µPD780055YGK-9EU

µPD780056YGK-9EU µPD780056GK-9EU

µPD780058GK-9EU

µPD780053YGK-9EU

pPD780053GK-9EU

DEVICE NAME

pPD780054YGK-9EU

JPD780055GK-9EU

µPD780054GK-9EU

PA-78P0308GC-8EU

100SD*

LCP-100GC-250

ICE-780308-EM

ICE-78K0

NP-100GC

IE-780308-NS-EM1

IE-78KO-NS

100-pin [QFP (14 × 14 mm)

JPD78P0308YGC-8EU

pPD78P0308GC-8EU

FA-80GC-8BT

080SB*

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NP-80GC-TQ

IE-780233-NS-EM4+ IE-78KO-NS-P01

IE-78KO-NS

80-pin QFP (14 × 14 mm)

pPD78F0233GC-8BT µPD780306GC-8EU µPD780308GC-8EU

µPD780232GC-8BT

PA-78P0208GF

100RB*

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NP-100GF-TQ

IE-780208-NS-EM1

IE-78KO-NS

100-pin QFP (14 × 20 mm)

µPD78P0208GF-3BA

FA-64GK-9ET

064SB*

LCP-64GK-250

ICE-780078-EM

LCE-78K0

NP-64GK

IE-780078-NS-EM1

IE-78KO-NS

 $(12 \times 12 \text{ mm})$

µPD780078YGK-9ET pPD78F0078GK-9ET

µPD780078GK-9ET

pPD78F0078YGK-9ET

pPD780204GF-3BA pPD780205GF-3BA µPD780206GF-3BA µPD780208GF-3BA

64-pin TQFP









































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DEVICE NAME	PACKAGE EMULATOR	EMULATOR EMULATION BOARD	PROBE	EMULATOR DAUGHTERBOARD	PROBE	SOCKET	Program adapter		
µPD780306GF µPD780308GF µPD78P0308GF-3BA	100-pin QFP (14 × 20 mm)	IE-78KO-NS	IE-780308-NS-EM1	NP-100GF-TQ	ICE-78K0	ICE-780308-EM	ICP-100GF-250	100RB*	PA-78P0308GF
µPD780316GC-9EB µPD780318GC-9EB	120-pin TQFP (14 × 14 mm)	IE-78KO-NS	IE-780338+NS-EM1	SWEX-120SE-1	ICE-78K0	ICE-780338-EM	LCP-120GC-YQ	120SE*	FA-120GC-9EB
µPD780326GC-9EB µPD780328GC-9EB	120-pin TQFP (14 × 14 mm)	IE-78KO-NS	IE-780338-NS-EM1	SWEX-120SE-1	ICE-78K0	ICE-780338-EM	ICP-120GC-YQ	120SE*	FA-120GC-9EB
µPD780336CC-9EB µPD780338GC-9EB µPD78F0338GC-9EB	120-pin TQFP (14 × 14 mm)	IE-78KO-NS	IE-780338-NS-EM1	SWEX-120SE-1	ICE-78K0	ICE-780338-EM	ICP-120GC-YQ	120SE*	FA-120GC-9EB
µPD780343GC-8EU µPD780343YGC-8EU µPD780344GC-8EU µPD780344YGC-8EU	100-pin QFP (14 × 14 mm)	IE-78KO-NS	IE-780354-NS-EM1	NP-100GC	∢ Z	∢ Z	∢ Z	100SD*	FA-100GC-8EU
µРD780343F1-DA3 µРD780343YF1-DA3 µРD780344F1-DA3	113-pin FPBGA (9 × 9 mm)	IE-78KO+NS	IE-780354-NS-EM1	NP-113F1-DA3	∢ Z	∢ Z	Υ V	TBD	FA-113F1-DA3-A
pPD780353GC-8EU pPD780353YGC-8EU pPD780354CG-8EU pPD780354YGC-8EU pPD78F0354CG-8EU	100-pin QFP (14 × 14 mm)	IE78KONS	IE-780354-NS-EM1	NP-100GC	∢ Z	∀ 	∀ Z	1005D*	FA-100GC-8EU
µPD780353F1-DA3 µPD780353YF1-DA3 µPD780354F1-DA3 µPD780354YF1-DA3 µPD78F0354F1-DA3	113-pin FPBGA (9 x 9 mm)	IE78KONS	IE-7803541NS-EM1	NP-113F1-DA3	∢ Z	∢ Z	∢ Z	J BD	FA-113F1-DA3-A
pPD78042FGF-3B9 pPD78043FGF-3B9 pPD78044FGF-3B9 pPD78045FGF-3B9 pPD78P048AGF-3B9	80-pin GFP (14 x 20 mm)	IE-78KO-NS	IE-78048-NSEM1	NP-80GF-TQ	∀ Z	Z Z	Z/Z	080RA*	PA-78P048GF

8-Bit K0 MCUs (cont.)













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PROGRAM ADAPTER

SOCKET

PA-78P0308GC-8EU

100SD*

LCP-100GC-250

ICE-780308-EM

LCE-78K0

NP-100GC

IE-780308-NS-EM1

IE-78KO-NS

(14 × 14 mm) 100-pin LQFP

µPD78062YGC-8EU

µPD78062GC-8EU

DEVICE NAME

µPD78063YGC-8EU

JPD78063GC-8EU

pPD78064GC-8EU

pPD78064YGC-8EU pPD78P064GC-8EU PA-78P0308GF

100RB*

LCP-100GF-250

ICE-780308-EM

LCE-78K0

NP-100GF-TQ

E-780308-NS-EM1

IE-78KO-NS

100-pin QFP (14 × 20 mm)

FA-64GC-8BS-A

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NP-64GC-TQ

IE-780988-NS-EM4 +

IE-78KO-NS

(14 × 14 mm)

pPD78F0988AGC-8BS

64-pin QFP

pPD780984GC-8BS pPD780986GC-8BS µPD780988GC-8BS

IE-78KO-NS-P01

FA-100GF-3BA

100RB*

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 $\stackrel{\forall}{\sim}$

NP-100GF-TQ

IE-780948-NS-EM4 +

IE-78KO-NS

E-78KO-NS-P04

FA-80GC-8BT

080SB*

ICP-80GC -250

ICE-780703-EM

LCE-78K0

NP-80GC-TQ

E-780701-NS-EM1

IE-78KO-NS

(14 × 14 mm) 100-pin QFP (14 × 20 mm)

pPD78F0701YGC-8BT

µPD78F0948GF

JPD780948GF

pPD780701YGC-8BT

µPD78070AYGF-3BA

pPD78070AGF-3BA

80-pin QFP

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100RB*

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NP-100GF-TQ

IE-78078-NS-EM1

IE-78KO-NS

 $(14 \times 20 \text{ mm})$

100-pin QFP

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NP-100GC

IE-78078-NS-EM1

IE-78KO-NS

100-pin QFP (14 × 14 mm)

PD78070AYGC-7EA

PD78070AGC-7EA

pPD78P064GF-3BA

pPD78064YGF

JPD78063YGF

µPD78064GF

µPD78062YGF µPD78062GF

µPD78063GF

FA-100GC-8EU

100SD*

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NP-100GC

IE-780958-NS-EM4 +

IE-78KO-NS-P02

IE-78KO-NS

100-pin LQFP (14 × 14 mm)

pPD78F0958GC(A)-8EU pPD780957GC(A)-8EU

µPD780982GC-8BS µPD780983GC-8BS







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STANDARD IN-CIRCUIT EMULATOR

IE-780988-NS-EM4 IE-78KO-NS-P01	IE-78KO-NS

DEVELOPMENT TOOLS 8-Bit Kx1 MCUs

























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PROGRAM ADAPTER

SOCKET

PROBE

DAUGHTERBOARD

EMULATOR

FA-30MC

30BK*

Q2'03

Q2'03

Q2′03

NP-30MC

IE-780148-NS-EM1

IE-78KO-NS

30-pin SSOP

pPD780102MC-5A4 pPD780103MC-5A4

pPD780101MC-5A4

(300 mil)

pPD78F0103MC-5A4

FA-44GB-8ES

044SA*

Q2'03

Q2'03

Q2'03

NP-44GB-TQ

IE-780148-NS-EM1

IE-78KO-NS

44-pin QFP (10 × 10 mm)

pPD780113GB-8ES pPD780114GB-8ES

µPD780112GB-8ES

µPD780111GB-8ES

KC1

µPD78F0114GB-8ES

FA-52GB-8ET

052SB*

Q2'03

Q2'03

Q2′03

NP-52GB-TQ

IE-780148-NS-EM1

IE-78KO-NS

52-pin QFP (10 × 10 mm)

pPD78F0124GB-8ET

pPD780131GB-8EU µPD780132GB-8EU µPD780133GB-8EU

pPD780124GB-8ET

µPD780123GB-8ET

pPD780121GB-8ET pPD780122GB-8ET

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FA-64GB-8EU-A

064SD*

Q2'03

Q2'03

Q2'03

NP-64GB-TQ

IE-780148-NS-EM1

IE-78KO-NS

64-pin QFP (10 × 10 mm)

µPD780134GB-8EU

µPD780136GB-8EU

pPD78F0134GB-8EU µPD78F0138GB-8EU

µPD780138GB-8EU

FA-80GC-8BT

080SB*

Q2′03

Q2'03

Q2'03

NP-80GC-TQ

IE-780148-NS-EM1

IE-78KO-NS

80-pin QFP (14 × 14 mm)

pPD780146GC-8BT pPD780148GC-8BT

pPD780143GC-8BT pPD780144GC-8BT

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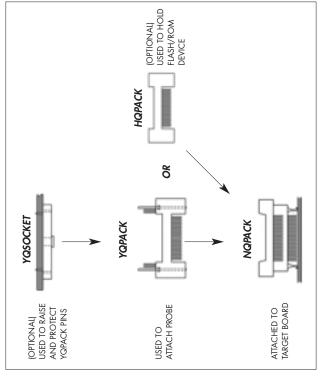




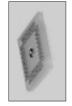


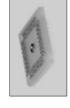


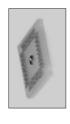
KO AND Kx1 CONVERSION SOCKETS











	HEIGHT (YQSOCKET)	EV-YSSOCKET30BKF	EV-YQSOCKET044SAF	EV-YQSOCKET048SDF	EV-YQSOCKET052SBF	EV-YQSOCKET064SAF	EV-YQSOCKET064SBF	EVYQSOCKET064SDF	EV-YQSOCKET080SBF	EV-YQSOCKET080SDF	EV-YQSOCKET100SDF	EV-YQSOCKET100RBF	
	CHIP ADAPTER (HQPACK)	EVHSPACK30BK	EV-EV-HQPACK044SA	EV-HQPACK048SD	EV-HQPACK052SB	EV-HQPACK064SA	EVHQPACK064SB140	EV-HQPACK064SD	HQPACK080SB	EV-HQPACK080SD	EV-HQPACK100SD	EV-HQPACK100RB	
1	PROBE ADAPTER (YQPACK)	EV-YSPACK30BK	EV-YQPACK044SA	EV-YQPACK048SD	EV-YQPACK052SB	EV-YQPACK064SA	EV-YQPACK064SB	EV-YQPACK064SD	EV-YQPACK080SB	EV-YQPACK080SD	EV-YQPACK 100SD	EV-YQPACK100RB	
	BOARD SOCKET (NQPACK)	EV-NSPACK30BK	EV-NQPACK044SA	EV-NQPACK048SD	ev-napack052SB	EV-NQPACK064SA	EV-NQPACK064SB	EV-NQPACK064SD	EV-NQPACK080SB	ev-napack080SD	EV-NQPACK100SD	EV-NQPACK 100RB	
)BK *	14SA*	*QS81	.2SB*	4SA*	.4SB*	,4SD*	30SB*	30SD*	*QSO	ORB *	

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DEVELOPMENT TOOLS

8-Bit KOS MCUs









STANDARD IN-CIRCUIT EMULATOR





















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PROGRAM ADAPTER

SOCKET

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FA-44GB-8ES

044SA*

ICP-44GB-250

ICE-789026-EM

ICE-78K0S

NP-44GB-TQ

IE-789026-NS-EM1

IE-78KOS-NS

44-pin QFP (10 × 10 mm)

JPD78F9026AGB-8ES

µPD789026GB-8ES

pPD789024GB-8ES µPD789025GB-8ES

pPD789022GB-8ES

FA-44GB-8ES

044SA*

ICP-44GB-250

ICE-789046-EM

ICE-78K0S

NP-44GB-TQ

IE-789046-NS-EM1

IE-78KOS-NS

44-pin QFP (10 × 10 mm)

FA-30MC

30BK*

ICP-30MC-250

ICE-789046-EM

ICE-78K0S

NP-30MC

IE-789046-NS-EM1+

NP-K907

IE-78KOS-NS

30-pin SSOP (300 mil)

FA-30MC

30BK*

ICP-30MC-250

ICE-789136-EM

ICE-78K0S

NP-30MC

IE-789136-NS-EM1

IE-78KOS-NS

30-pin SSOP (300 mil)

pPD789101AMC-5A4 pPD789102AMC-5A4

pPD78F9076MC-5A4

pPD789071MC-5A4 pPD789072MC-5A4 pPD789074MC-5A4

µPD78F9046GB-8ES

pPD789046GB-8ES

pPD789104AMC-5A4 pPD789111AMC-5A4 FA-30MC

30BK*

ICP-30MC-250

ICE-789136-EM

ICE-78K0S

NP-30MC

IE-789136-NS-EM1

IE-78KOS-NS

30-pin SSOP (300 mil)

pPD78F9116AMC-5A4

pPD78F9116MC-5A4

pPD789121AMC-5A4

pPD789124AMC-5A4 pPD789131AMC-5A4 pPD789132AMC-5A4 pPD789134AMC-5A4

pPD789122AMC-5A4

pPD789114AMC-5A4

pPD789112AMC-5A4

FA-30MC

30BK*

ICP-30MC-250

ICE-789136-EM

ICE-78K0S

NP-30MC

IE-789136-NS-EM1

IE-78KOS-NS

30-pin SSOP (300 mil)

FA-30MC

30BK*

ICP-30MC-250

ICE-789136-EM

ICE-78K0S

NP-30MC

IE-789136-NS-EM1

IE-78KOS-NS

30-pin SSOP (300 mil)

pPD78F9136AMC-5A4

pPD78F9136MC-5A4

pPD789166YGB-8ES

µPD789167GB-8ES

pPD789166GB-8ES

FA-44GB-8ES

044SA*

ICP-44GB-250

ICE-789177-EM

ICE-78K0S

NP-44GB-TQ

IE-789177-NS-EM1

IE-78KOS-NS

44-pin LQFP (10 × 10 mm)

FA-48GA

048SD*

ICP-48GA-250

ICE-789177-EM

ICE-78K0S

NP-48GA

IE-789177-NS-EM1

IE-78K0S-NS

48-pin TQFP (7 × 7 mm)

pPD789166YGA-9EU pPD789167YGA-9EU

pPD789167YGB-8ES

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DEVICE NAME

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DEVELOPMENT TOOLS

8-Bit KOS MCUs (cont.)









STANDARD IN-CIRCUIT EMULATOR



















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PROGRAM ADAPTER

SOCKET

PROBE PROBE

FA-64GK-9ET

064SB*

ICP-64GK-250

ICE-789436-EM

.CE-78K0S

NP-64GK

IE-789436-NS-EM1

IE-78KOS-NS

64-pin TQFP (12 × 12 mm)

pPD78F9436GK-9ET

µPD789435GK-9ET pPD789436GK-9ET pPD789445GK-9ET

JPD789446GK-9ET

pPD789455GK-9ET JPD789456GK-9ET pPD78F9456GK-9E1 pPD789462GB-8ET

EMULATOR

PACKAGE

DEVICE NAME

FA-64GK-9ET

064SB*

ICP-64GK-250

ICE-789456-EM

.CE-78K0S

NP-64GK

IE-789456-NS-EM1

IE-78KOS-NS

64-pin TQFP (12 × 12 mm)

FA-64GK-9ET

064SB*

ICP-64GK-250

ICE-789456-EM

.CE-78K0S

NP-64GK

IE-789456-NS-EM1

IE-78KOS-NS

64-pin TQFP (12 × 12 mm)

FA-80GC-8BT

080SB*

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NP-80GC-TQ

IE-789488-NS-EM1

IE-78KOS-NS

14 × 14 mm)

pPD78F9478GC-8B1 pPD789477GK-9EU

80-pin QFP

FA-52GB-8ET

052SB*

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NP-52GB-TQ

IE-789468-NS-EM1

IE-78KOS-NS

52-pin [QFP (10 × 10 mm)

JPD78F9468GB-8ET pPD789477GC-8BT -A-80GK-9EU

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TEC-080SD

IE-789488-NS-EM1

IE-78KOS-NS

80-pin TQFP (12 × 12 mm)

pPD78F9478GK-9EU

FA-80GK-9EU

080SD*

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TEC-080SD

IE-789488-NS-EM1

IE-78KOS-NS

80-pin TQFP (12 × 1mm)

µPD78F9488GK-9EU

pPD789488GK-9EU

FA-80GC-8BT

080SB*

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NP-80GC-TQ

IE-789488-NS-EM1

IE-78KOS-NS

80-pin QFP (14 × 1mm)

pPD78F9488GC-8BT

pPD789488GC-8BT

FA-44GB-8ES

044SA*

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NP-44GB-TQ

IE-789801-NS-EM1

IE-78KOS-NS

44-pin [QFP (10 × 10 mm)

JPD78F9801GB-8ES

UPD789830P

µPD789800GB-8ES

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TBD

E-789831-NS-EM1

IE-78KOS-NS

88-pin bare chip

FA-100GC-8EU

100SD*

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 $\stackrel{\forall}{\sim}$

NP-100GC

IE-789831-NS-EM1

IE-78KOS-NS

100-pin LQFP (14 × 14 mm)

pPD78F9831GC

pPD789841GB uPD78F9842GB

FA-44GB-8ES

044SA*

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NP-44GB-TQ

IE-789842-NS-EM1

IE-78KOS-NS

44-pin QFP (10 × 10 mm)

FA-30MC

30BK*

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NP-30MC

IE-789850-NS-EM1

IE-78KOS-NS

30-pin SSOP (300 mil)

pPD789850MC-5A4

FA-44GB-8ES

044SA*

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NP-44GB-TQ

IE-789852-NS-EM1

IE-78KOS-NS

44-pin QFP (10 × 10 mm)

FA-20MC

GS-20*

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NP-20GS

IE-789860-NS-EM1

IE-78KOS-NS

20-pin SSOP (300 mil)

pPD78E9860MC-5A4 pPD78E9861MC-5A4

pPD789860MC-5A4 pPD789861MC-5A4

pPD78F9852GB-8ES

µPD789852GB-8ES

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EV-YQSOCKET100SDF

EV-HQPACK080SD EV-HQPACK100SD

EV-YQPACK100SD

HQPACK080SB

EV-YQPACK080SB EV-YQPACK080SD

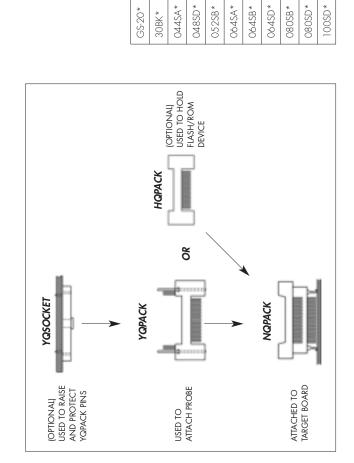
EV-NQPACK080SB EV-NQPACK100SD EV-NQPACK100SD

EV-YQSOCKET064SDF
EV-YQSOCKET080SBF
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EV-YQSOCKET064SBF

PROGRAM ADAPTER	FA-64GB-8EU
SOCKET	064SD*
PROBE	ĕ/Z
DAUGHTERBOARD	₹ Z
EMULATOR	X/X
PROBE	NP-64GB-TQ
EMULATION BOARD	IE-789882-NS-EM1
EMULATOR	IE-78K0S-NS
PACKAGE	64-pin QFP (10 × 10 mm)
DEVICE NAME	µРD789881GB-8EU µРD78F9882GB-8EU

KOS CONVERSION SOCKETS





EV-YQSOCKET044SAF
EV-YQSOCKET048SDF
EV-YQSOCKET052SBF
EV-YQSOCKET064SAF

EV-YSSOCKET30BKF

HEIGHT (YQSOCKET)

DEVELOPMENT TOOLS





















HARDWARE TOOLS



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EMULATION BOA	

EMULATOR

PACKAGE

DEVICE NAME









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		IE-784038-N







PA-78P4038GC-8BT

080SB*

NP-80GC-TQ



pPD784037YGC-8BT

pPD784036YGC-8BT

pPD784037GC-8BT

pPD784035YGC-8BT pPD784035GC-8BT

pPD784036GC-8BT

pPD784031YGC-8BT

pPD784031GC-8BT





















pPD78P4038YGK

pPD78P4038GK

PA-78P4038GK

080SD*

TEC-080SD

IE-784038-NS-EM1

IE-78K4-NS

80-pin TQFP (12 × 12 mm)

DEVICE NAME	PACKAGE	EMULATOR	EMULATION BOARD	PROBE	SOCKET	PROGRAM ADAPTER
µPD784044GC-3B9 µPD784046GC-3B9 µPD78F4046GC-3B9	80-pin QFP (14 x 14 mm)	IE-78K4-NS	IE-784046-NSEM1	NP-80GC-TQ	080SB*	FA-80GC
µPD784054GC-3B9	80-pin QFP (14 x 14 mm)	IE-78K4-NS	IE-784046-NS-EM1	NP-80GC-TQ	080SB*	FA-80GC
ppD784214AGC-8EU ppD784214AYGC-8EU ppD784215AGC-8EU ppD784215AGC-8EU ppD784216AGC-8EU ppD784216AGC-8EU ppD784216AGC-8EU ppD784217AGC-8EU ppD784217AGC-8EU ppD784218AYGC-8EU ppD784218AYGC-8EU ppD784218AYGC-8EU ppD784218AYGC-8EU ppD784218AYGC-8EU ppD784218AGC-8EU ppD784218AYGC-8EU ppD784218AYGC-8EU	100-pin LQFP (14 x 14 mm)	IE-78K4-NS	IE-784225-NSEM1	NP-100GC	100SD*	FA-100GC-8EU

16-Bit K4 MCUs (cont.) DEVELOPMENT TOOLS



















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PROGRAM ADAPTER

FA-100GF-3BA

100RB*

NP-100GF-TQ

IE-784225-NS-EM1

IE-78K4-NS

100-pin QFP (14 × 20 mm)

pPD78F4216AYGF-3BA

pPD784217AYGF-3BA

pPD784217AGF-3BA

pPD784218AGF-3BA

pPD784218AYGF-3BA pPD78F4218AGF-3BA

pPD784216AYGF-3BA pPD78F4216AGF-3BA

pPD784216AGF-3BA

pPD784215AYGF-3BA

pPD784215AGF-3BA

pPD78F4218AYGF-3BA

pPD784224YGC-8BT

pPD784224GC-8BT

FA-80GK-9EU

080SD*

TEC-080SD

IE-784225-NS-EM1

IE-78K4-NS

80-pin TQFP (12 × 12 mm)

pPD78F4225YGK

pPD784225YGK pPD78F4225GK

FA-80GC-8BT

080SB*

NP-80GC-TQ

IE-784225-NS-EM1

IE-78K4-NS

80-pin QFP (14 × 14 mm)

pPD78F4225YGC-8BT

pPD784224YGK

pPD784224GK

pPD784225GK

pPD784225YGC-8BT pPD78F4225GC-8BT

pPD784225GC-8BT

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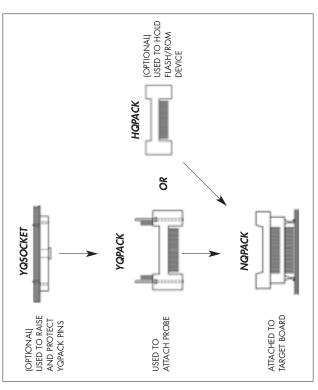




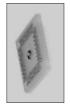


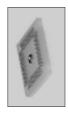


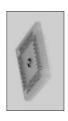
K4 CONVERSION SOCKETS





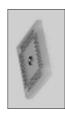








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DEVELOPMENT TOOLS	32-Bit V850 MCUs













HARDWARE TOOLS











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PROGRAM ADAPTER

PROGRAMMER

SOCKET

PROBE

FA-100GC-8EU-A

FA-100GC or

Set 100 GC*

SC100SDN or

IE-703003-MC-EM1

GC-8EU

100

µPD703025A

µPD703003A µPD703004A

V850

µPD70F3003A pPD70F3025A

µPD703003A

SWEX100SD

FA-100GC or FA-100GC-8EU-A

Set 100 GC*

SC100SDN or SWEX100SD

IE-703017-MC-EM1

E-70000-PCI-IF-A

GC-8EU

100

µPD703014B µPD703015B µPD703017A

/850/SA1

µPD70F3015B pPD70F3017A

(PCI) or

IE-70000-CD-IF-A (PCMCIA)

IE-703002-MC

F1-EA6

121

µPD703014A pPD703015A µPD703017A FA-100GC-8EU-A

FA-100GF-3BA

Set 100 GF

SWEX100SD but always

GF-3BA

100

µPD703031B

µPD703032A µPD703033B

µPD703030B

µPD70F3032B µPD70F3033B

SC100SDN or

IE-703037-MC-EM1

NEXB-100SD/R

FA-100GC or

Set 100 GC*

SC100SDN or

GC-8EU

100

µPD703031B µPD703033B

V850/SB1

µPD70F3033B

pPD70F3017A

SWEX100SD

FA-121FPBGA

Set B_121*

SWEX120SD

PGFP4







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DEVICE

For SC100SDN, SWEX100 SD or Yamaichi sockets, please contact TPS.

µPD70F3079A

FA-100GC-8EU-A

FA-100GC or

Set 100 GC*

SC100SDN or

IE-703079-MC-EM1

GC-8EU

100

µPD703075A µPD703076A µPD703078A pPD703079A

V850/SF1

SWEX100SD1

CORE	SERIES/PART NO.	PINS	PACKAGE	ICE	PC INTERFACE	EMULATION BOARD	PROBE	SOCKET	PROGRAMMER	PROGRAM ADAPTER
V850 (cont.)	V850/SC3 µPDZ03088 µPDZ03089 µPDZ03089	144	GJ-UEN	IE-7030024MC	IE-70000-PCI-IF-A (PCI) or IE-70000-CD-IF-A (PCMCIA)	IE-703089-MC-EM1 IF.FA (PCMCIA)	SC 144SDN or SWEX 144SD	Set 144*	PGFP4	FA-144GJUEN
V850ES	V850ES/SA2 µPD703201 µPD70F3201	100	GC-8EU			IE-703204-€1-EM1	SWEX100SD	Set 100 GC*		FA-100GC or FA-100GC-8EU-A
	V850ES/SA3 µPD703204 µPD70F3204		F1-EA6				SWEX120SE	Set B 121*		FA-121FPBGA
	V850ES/KF1 pPD703208		Ldo (IE-V850ES-G1			TBD	Set 80 GC*		FA-80GC-8BT
	prD703207 pPD703210 pPD70F3210	C			IE-70000-PCI-IF-A (PCI)	IE-703217-G1-EM1				
	µPD703208 µPD703209 µPD703210 µPD7053210	8	GK-9EU		or IE-70000-CD-IF-A (PCMCIA)		TBD	Set 80 GK*	PGFP4	FA-80GK-9EU
	V850E5/KG1 µPD703212 µPD703213 µPD703214 µPD7053214	100	GC-8EU				TBD	Set 100 GC*		FA-100GC or 100GC-8EU-A
	V850E5/KJ1 µPD703216 µPD703217 µPD703217	144	GJ-UEN	IE-V850ES-G1		IE-703217-G1-EM1	TBD	Set 144*		FA-144GJ-UEN
V850E	V850E/IA1 µPD703116 µPD70F3116	144	G-uen		IE-70000-PCI-IF-A (PCI)	IE-703116-MC-EM1	SC144SDN or SWEX144SD	Set 144*	9	FA-144GJ-UEN
	V850E/IA2 µPD703114 µPD70F3114	100	GC-8EU		or IE-70000-CD-IF-A (PCMCIA)	IE-703114-MC-EM1	SC100SDN or SWEX100SD	Set 100 GC*	5	FA-100GC or FA-100GC-8EU-A

DEVICE

32-Bit V850 MCUs (cont.) DEVELOPMENT TOOLS





















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PACKAGE

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µPD703103A pPD703105A µPD703106A µPD703107A pPD70F3107

V850E/MA1

V850E



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PROGRAM ADAPTER

PROGRAMMER

SOCKET

PROBE

FA-144GJ-UEN

Set 144*

or SWEX144SD

SC144SDN

IE-703107-MC-EM1

IE-V850E-MC-A

GJ-UEN

144

pPD70F3107A

µPD703106A µPD703107A pPDZ0F310ZA

µPD703106A PD703107A FA-100GC or FA100GC-8EU-A

Set 100 GC*

SC100SDN or SWEX100SD

IE-703107-MC-EM1+ VPV850E/MA1-MA2

FA-161FPBGA

PGFP4

Set B 161*

SC144SDN or SWEX144SD

IE-70000-PCI-IF-A (PCI) or IE-70000-CD-IF-A (PCMCIA)

F1-EN4

161

pPDZ0F3107A

FA-144GJ-UEN

Set 144*

SC144SDN or SWEX144SD

IE-703 102-MC-EM1 (5V)

IE-703102-MC

GJ-UEN

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pPD703100

pPD703101

µPD703100

V850E/MS1

pPD703102

GC-8EU

9

µPD703108

V850E/MA2

FA-100GC or FA-100GC-8EU-A

Set 100 GC*

SC100SDN or SWEX100SD

IE-703102-MC-EM1+ VP-V850E/MS1-MS2

GC-8EU

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µPD703130

V850E/MS2

















































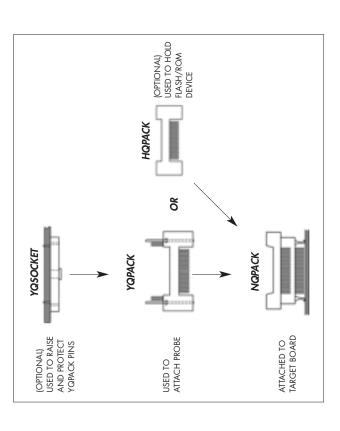




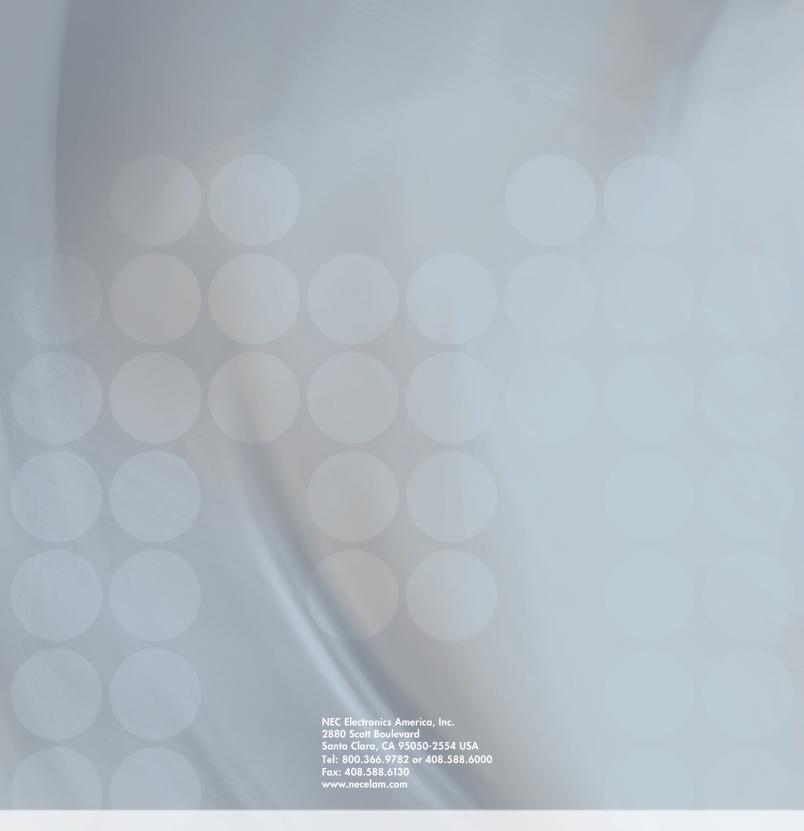




V850 CONVERSION SOCKETS



GUIDE PINS	YQPACKGUIDEPINS	YQPACKGUIDEPINS	YQPACKGUIDEPINS	YQPACKGUIDEPINS	YQPACKGUIDEPINS	YQPACKGUIDEPINS	I	I	I	I	1
HEIGHT ADAPTER	YQSOCKET080SBF (1x socket)	TQSOCKET080SD-W (1x socket)	YQSOCKET100SDF (1x socket) or YQSOCKET100SD+F2 (2x socket)	YQSOCKET100RB-F (1x socket) or YQSOCKET100RB-F2 (2x socket)	YQSOCKET128SD220F (1x socket) or YQSOCKET128SD220F2 (2x socket)	YQSOCKET144SDF (1x socket) or YQSOCKET144SDF2 (2x socket)	I	ı	1	ı	ı
PROBE ADPTER	YQPACK080SB	NONE	YQPACK100SD	YQPACK100RB	YQPACK128SD220	YQPACK144SD	I	I	-	I	ı
CHIP ADAPTER	HQPACK080SB	NONE	HQPACK100SD	HQPACK100RB	HQPACK128SD220	HQPACK144SD	I	I	-	I	ı
ICE SOCKET	I	1	ı	ı	I	ı	CSICE121A1312N02	CSICE157A1614N01	ICSICE161A1413N02	CSICE157A1614N01	CSICE161A1413N02
BOARD SOCKET	NQPACK080SB	TGK-080SDW	NQPACK100SD	NQPACK 100RB	NQPACK128SD220	NQPACK144SD	CSPACK121A1312N02	LSPACK157A1614N01	CSSOCKET161A1413N01+ LSPACK161A1413N01	LSPACK157A1614N01	CSSOCKET161A1413N01+ LSPACK161A1413N01
	Set 80GC*	Set 80GK*	Set 100GC*	Set 100GF*	Set 128*	Set 144*	Set B_121	Set B_157	Set B_161	Set B_157	Set B_161



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