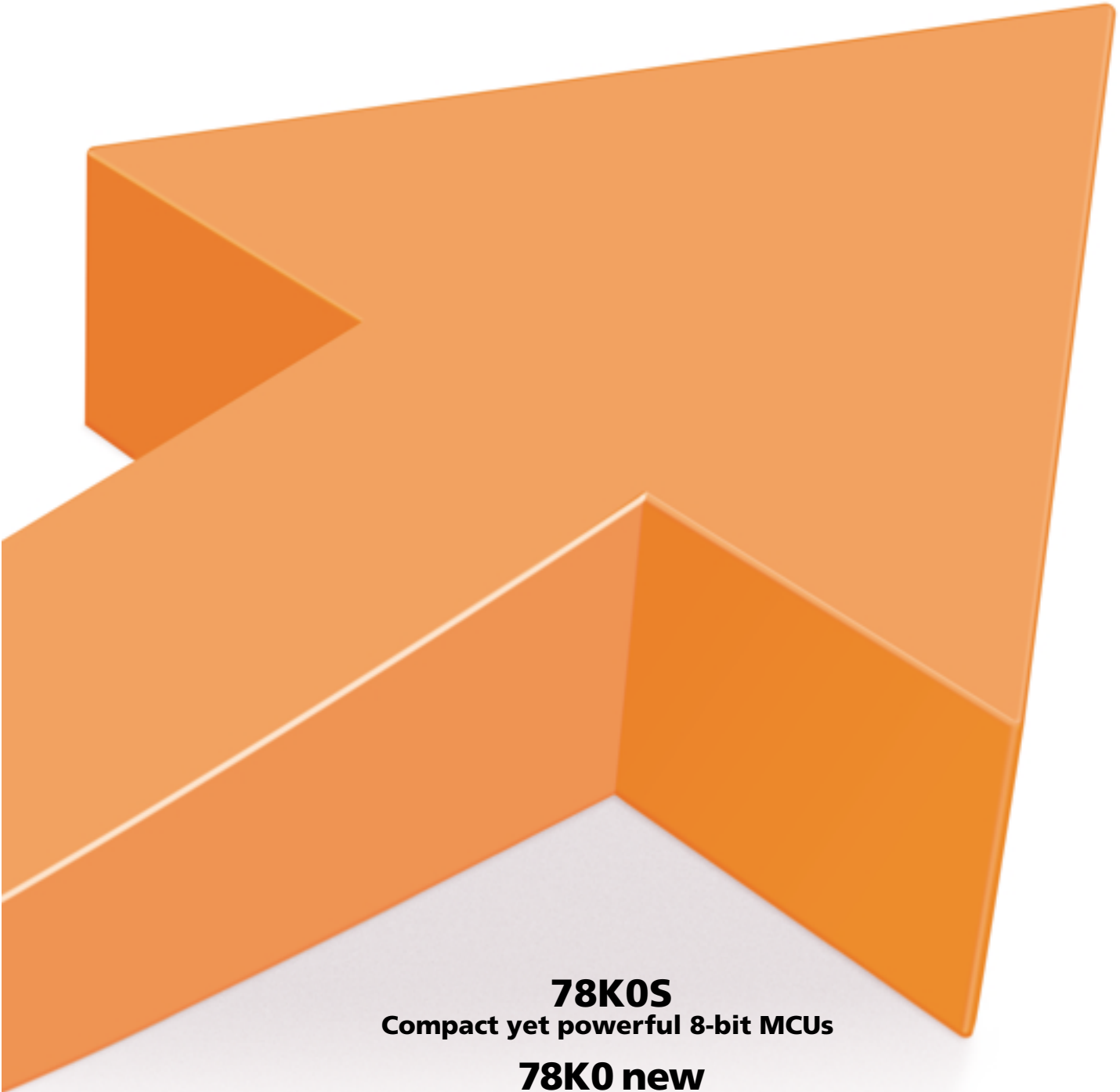


Two Great Forces in the 8-bit Realm



78K0S

Compact yet powerful 8-bit MCUs

78K0 new

Superior speed, memory and functionality

Empower your creativity

78K
Embedded Controller

**78K0S
and
78K0 new
families**

NEC will continue to provide the following benefits

Future-proof cost-performance

**Low power consumption
(one of the best of W/W vendors)**

**Smooth migration lineup and future's Roadmap
(new concept Kxx family in schedule)**

**By using the industry's most
advanced technology and
having market-oriented ideas**

78K0S

Ideal for upgrading from 4- to 8-bits

- Easy upgrade to our 78K0 family
- Best fit for compact applications, such as car accessories, remote controls, home appliances and PC peripherals
- Wide range of LCD-control functions such as power-on-reset, voltage booster and A/D converter
- On-chip flash memory versions
- Speed up current CORE from 4Q/01(5MHz→10MHz^{*1})

※1 D78907x/10xA/11xA/16x/17x

78K0 new

Enhanced performance for consumer and automotive electronics

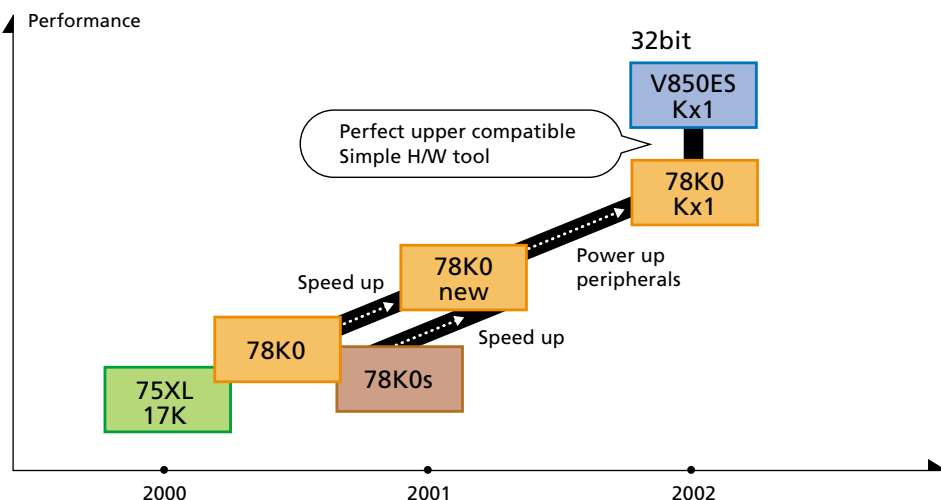
- Enhanced version of our best-selling 78K0 family
- Higher speed than 78K0(8.38MHz→12MHz^{*2})
- Ideal choice for consumer electronics, automotive use and other 8-bit applications
- Various ASSPs available: built-in functions include automotive bus, 10bit timer for inverter motor control
- On-chip flash memory versions
- Next generation 78K0/Kxx family in schedule

※2 D78002xA/003xA/007x/098x

MCU Features

	75X/75XL	78K0S	78K0	78K0 new
CPU	4-bit	8-bit	8-bit	8-bit
ROM	Internal ROM+RAM	Internal ROM+RAM	Internal ROM+RAM	Internal ROM+RAM
RAM	64K bytes(max)	64K bytes(max)	64K bytes(max)	64K bytes(max)
Multiplier	—	Hardware option	8×8=16 by inst.	8×8=16 by inst.
Instruction Cycle	0.96/0.67μs	0.4/0.2μs	0.4μs	0.24/0.17μs
Power Supply	2.7/1.8 to 5.5V	1.8 to 5.5V	1.8 to 5.5V	1.8 to 5.5V
C-language Compiler	—	○	○	○

Overview



78K0/Kx1 series K1 family

Brushed up peripherals POR/LVI

■ Unique and powerful reset functions

- Brown-out detect and reset
- Reset output for external ICs
- Fast start-up and watchdog by on-chip Ring oscillator

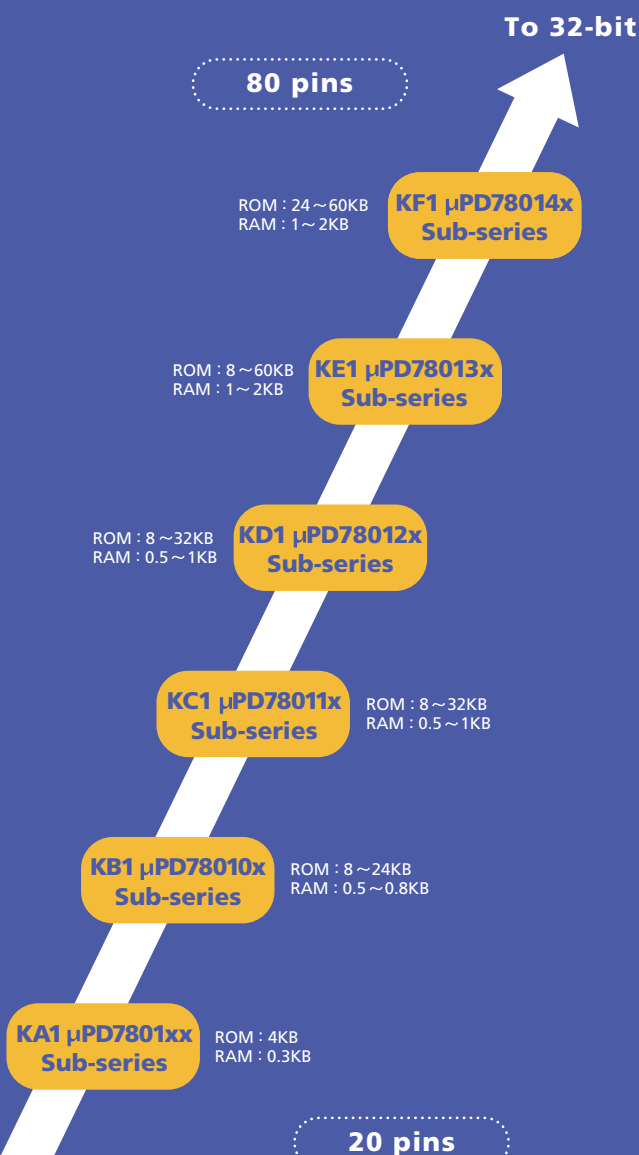
■ Power up serial I/O

- LIN-Bus on-chip(using special UART)

■ Higher speed, Lower EMI noise

- 10MHz, less than 70dBm(target)

Road map



Multi-purpose MCUs

75XL, 78K0

100-pin

D7807x ^A

ROM : 32/40/48/60KB
RAM : 1024B/2048B
A/D : 8-bit $\times$ 8
100-pin QFP/LQFP

80-pin

D7805x ^A

Serial I/O expansion

ROM : 16/24/32/40/48/60KB
RAM : 512B/1024B/2048B
A/D : 8-bit $\times$ 8
80-pin QFP/TQFP

64-pin

D7801xF ^A

Speed up

ROM : 8/16/24/32/40/48/60KB
RAM : 512B/1024B/2048B
A/D : 8-bit $\times$ 8
64-pin QFP/LQFP/SDIP

52-pin

44-pin

D75006x ^A

To 8-bit

ROM : 4/6/8KB
RAM : 512 nibbles
A/D : 8-bit $\times$ 8
42-pin SSOP/SDIP

D75000x

To 8-bit

ROM : 4/6/8KB
RAM : 512 nibbles
42-pin SDIP/44-pin QFP

28- to 36-pin

D75430x

To 8-bit

ROM : 2/4KB
RAM : 256 nibbles
36-pin SSOP

20-pin

78K0



78K0S



K1 family

D78005x/B

ROM : 24/32/40/48/60KB
RAM : 1024B/2048B
A/D : 8-bit × 8
80-pin LQFP/TQFP

Low noise, POR built-in

KF1 D78014x

ROM : 24/32/48/60KB
RAM : 1024B/2048B
A/D : 10-bit × 8
80-pin LQFP/TQFP

Speed up, RAM expansion

D780065

ROM : 40KB
RAM : 5120B
A/D : 8-bit × 8
80-pin LQFP

D78098x

ROM : 16/24/32/48/60KB
RAM : 1024B/2048B
A/D : 10-bit × 8
64-pin LQFP/TQFP/SDIP

Timer expansion

D78002xA

ROM : 8/16/24/32KB
RAM : 512B/1024B
A/D : 8-bit × 8
64-pin LQFP/TQFP/
SDIP/BGA

10-bit ADC

D78003xA

ROM : 8/16/24/32KB
RAM : 512B/1024B
A/D : 10-bit × 8
64-pin LQFP/TQFP/SDIP/
BGA (Under Development)

ROM, RAM expansion

D78007x

ROM : 48/60KB
RAM : 2048B
A/D : 10-bit × 8
64-pin LQFP/TQFP

POR built-in

KE1 D78013x

ROM : 8/16/24/32/48/60KB
RAM : 1024B/2048B
A/D : 10-bit × 8
64-pin LQFP/TQFP

D78916x

ROM : 16/24KB
RAM : 512B
A/D : 8-bit × 8
44-pin LQFP

10-bit ADC

D78917x

ROM : 16/24KB
RAM : 512B
A/D : 10-bit × 8
44-pin LQFP

POR built-in

KD1 D78012x

ROM : 8/16/24/32KB
RAM : 512B/1024B
A/D : 10-bit × 8
52-pin LQFP

D78902x

ROM : 4/8/12/16KB
RAM : 256B/512B
44-pin LQFP

10-bit ADC

D789046

ROM : 16KB
RAM : 512B
44-pin LQFP

KC1 D78011x

ROM : 8/16/24/32KB
RAM : 512B/1024B
A/D : 10-bit × 8
44-pin LQFP

D78910xA / 2xA

ROM : 2/4/8KB
RAM : 256B
A/D : 8-bit × 4
30-pin SSOP

10-bit ADC

D78911xA / 3xA

ROM : 2/4/8KB
RAM : 256B
A/D : 10-bit × 4
30-pin SSOP

POR built-in

KB1 D78010x

ROM : 8/16/24KB
RAM : 512B/768B
A/D : 10-bit × 4
30-pin SSOP

ADC built-in

D78901x

ROM : 2/4KB
RAM : 128B
28-pin SOP/SDIP

I/O, ROM/RAM expansion

D78907x

ROM : 2/4/8KB
RAM : 256B
I/O : 24
30-pin SSOP

POR built-in

D78908x

ROM : 16/32KB
RAM : 384B/576B
I/O : 24
30-pin SSOP

POR built-in

KA1 D7801xx

ROM : 4KB
RAM : 256B
A/D : 10-bit × 4
20-pin SSOP

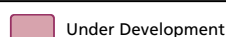
D789052 / 62

ROM : 4KB
RAM : 128B
I/O : 14
20-pin SSOP

POR built-in



MP



Under Development



Under Planning



Recommended

A

ADC

E

EEPROM™

P

POR

75XL, 78K0

78K0

n

78K0S

DOT LCD

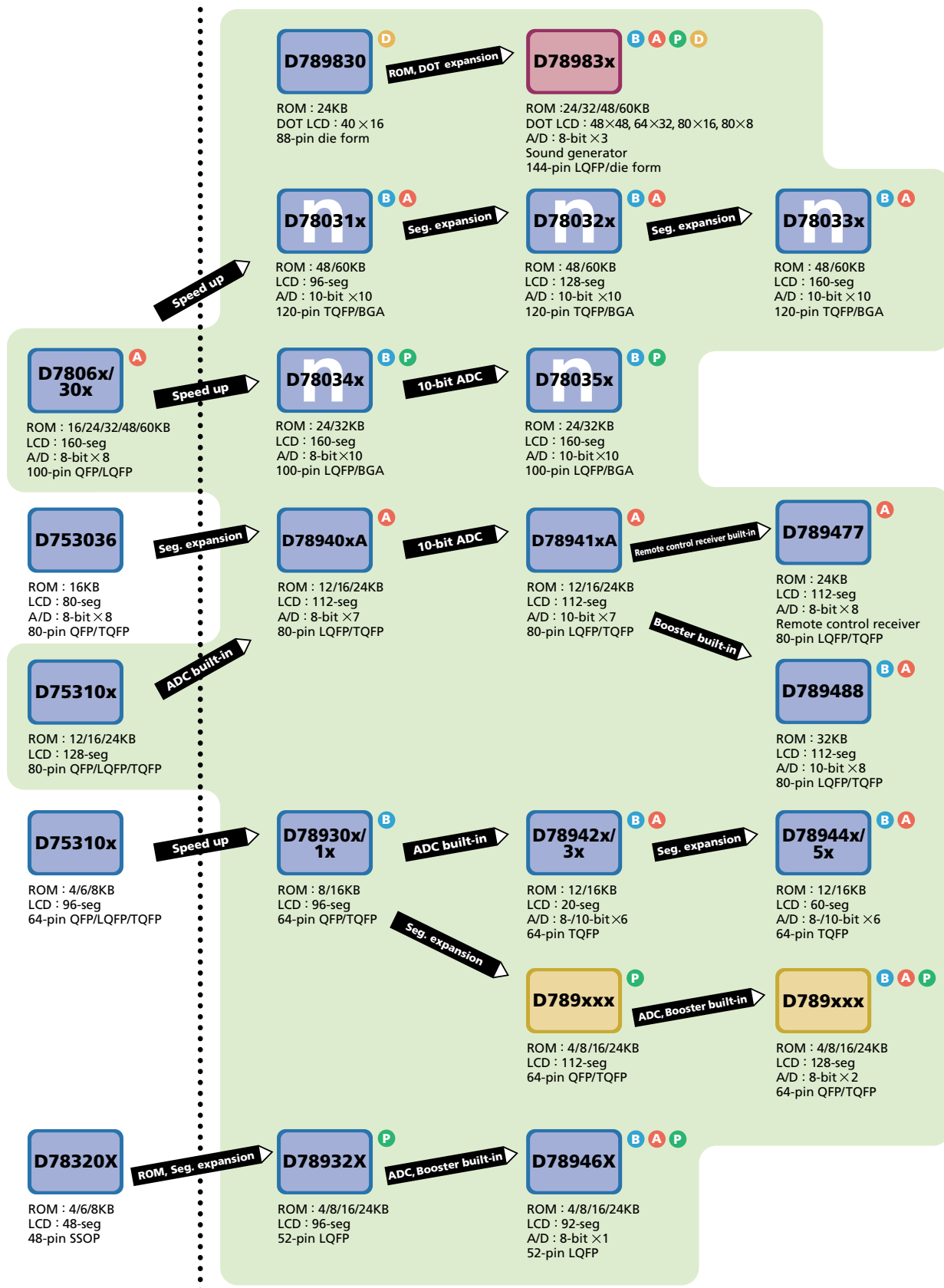
120-pin

100-pin

80-pin

64-pin

48-pin
to
52-pin



Under Development

Under Planning

Recommended

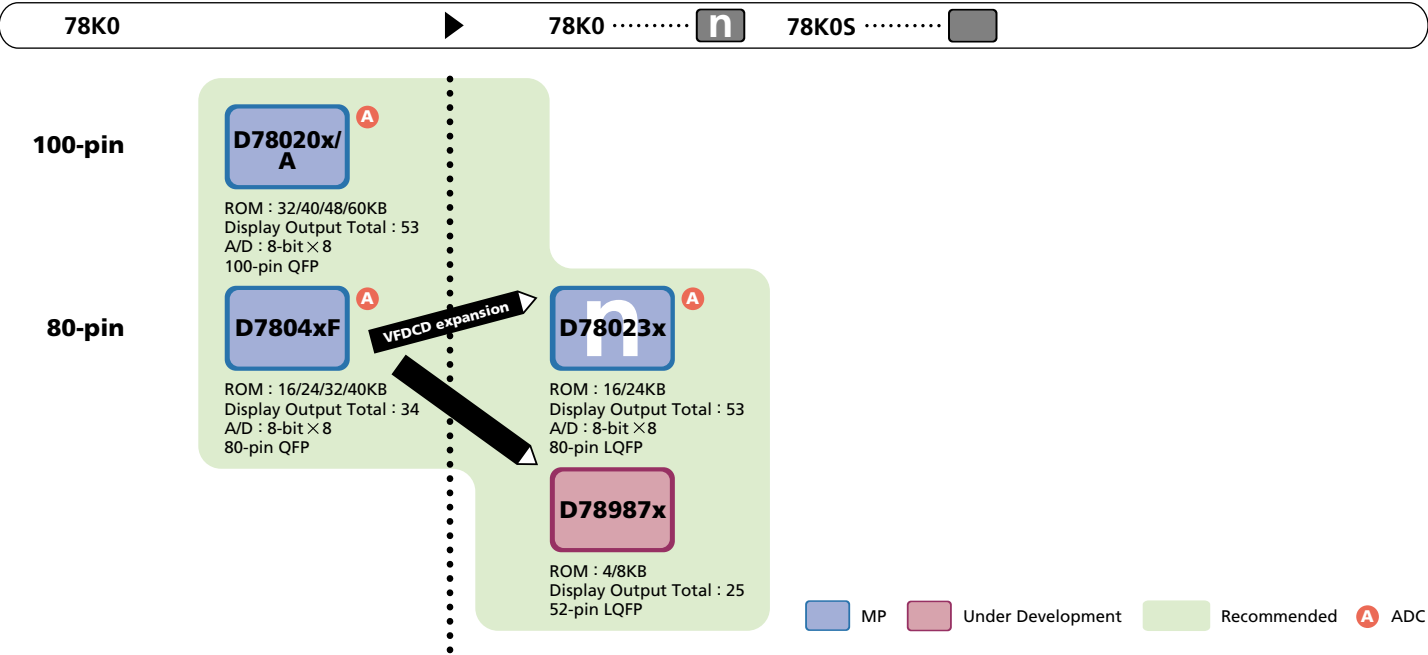
B Booster

A ADC

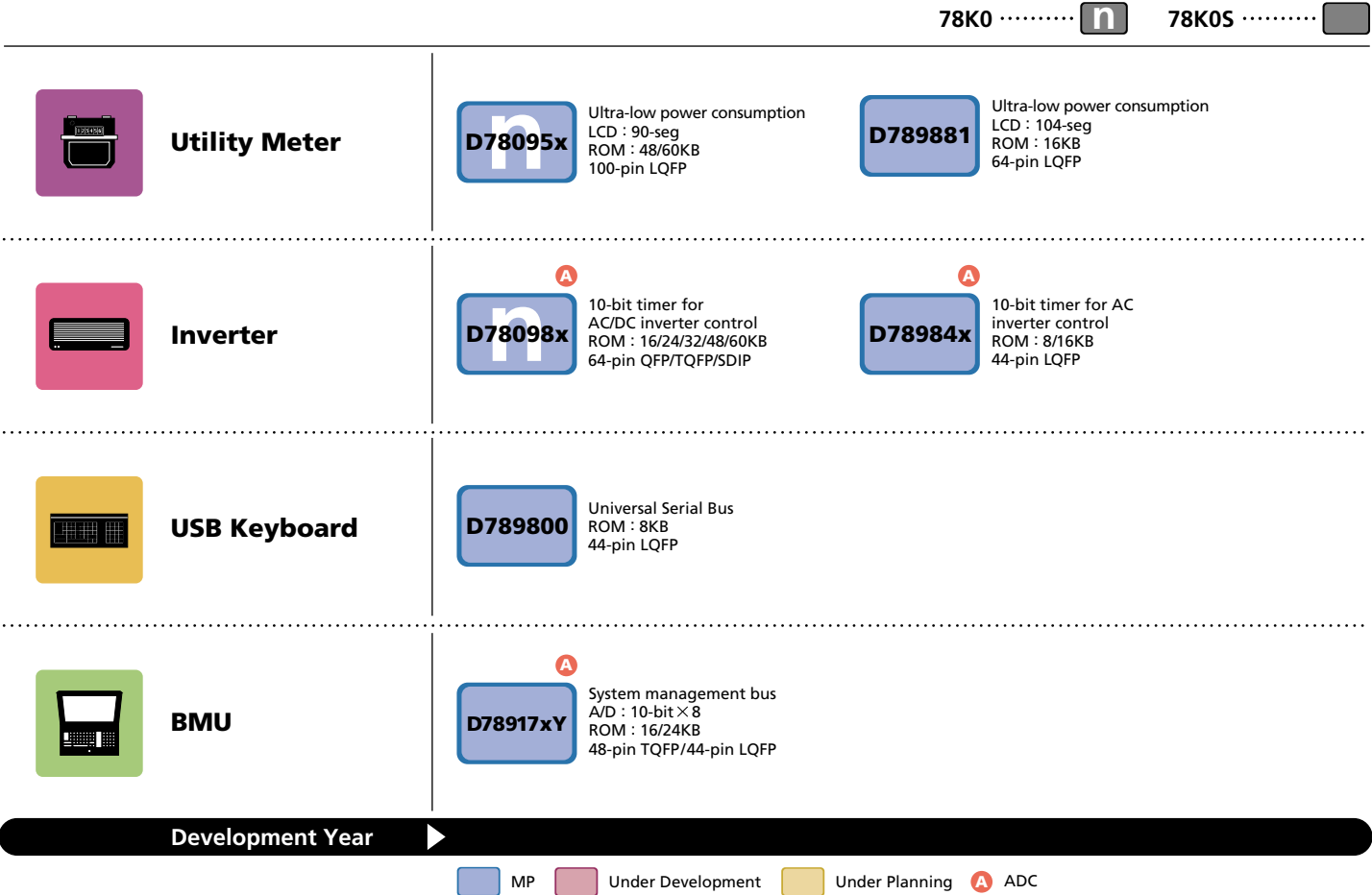
P POR

D DOT

VFD control



ASSPs





78K0 **n**

78K0S

CAN

D78081x ^B
DCAN(500Kbps)
ROM : 32/48KB
64-pin LQFP/TQFP

D78082x ^D
DCAN(500Kbps)
LCD : 112-seg
Stepper motor control/drive
Cross coil control/drive
ROM : 32/48KB
80-pin LQFP

D780703Y ^{B C}
DCAN(500Kbps)
ROM : 60KB
80-pin LQFP

D780948 ^D
DCAN(500Kbps)
LCD : 160-seg
Sound generator
ROM : 60KB
100-pin QFP

D789850 ^B
DCAN(500Kbps)
ROM : 16KB
30-pin SSOP

D789852 ^B
DCAN(500Kbps)
ROM : 24/32KB
44-pin LQFP

J1850

D780830/3Y ^{B C}
J1850 bus interface
ROM : 48/60KB
80-pin LQFP

D780834 ^D
J1850 bus interface
LCD : 160-seg
Stepper motor control/drive
Cross coil control/drive
ROM : 48KB
100-pin LQFP

IEBus™

D7809x/B ^C
IEBus interface
ROM : 40/48/60KB
80-pin QFP/LQFP

D780702Y ^C
IEBus interface
ROM : 60KB
80-pin LQFP

Dash Board

D78085x/A ^D
LCD : 80-seg
Stepper motor control/drive
Cross coil control/drive
ROM : 32/40KB
80-pin LQFP

Keyless Entry

D754144/244
ROM : 4KB
RAM : 128 nibbles
EEPROM : 16B
20-pin SSOP

D789860/61
ROM : 4KB
RAM : 128B
EEPROM : 32B
20-pin SSOP

D789862
ROM : 16KB
RAM : 512B
EEPROM : 256B
30-pin SSOP

CD Text

D780065 ^C
ROM : 40KB
RAM : 5120B
A/D : 8-bit × 8
80-pin LQFP

Development Year



Product List

Multi-purpose MCUs

Series	Part Number	Package	ROM (kbytes)	RAM (bytes)	EEPROM (bytes)	I/O	Timer	PWM	Serial I/O	ADC	LCD C/D	Sub Clock	Note
78K0/Kx1	KB1(78010x)	30-pin SSOP	8/16/24	512 768	—	22	5	8-bit×3	3(UART×2) ^{※1}	10-bit×4	—	—	LIN,POR,LVI, Ring-osc
	KC1(78011x)	44-pin LQFP	8/16/24/32	512 1K	—	32	7	8-bit×4	3(UART×2)	10-bit×8	—	○	LIN,POR,LVI, Ring-osc
	KD1(78012x)	52-pin LQFP	8/16/24/32	512 1K	—	39	7	8-bit×4	3(UART×2)	10-bit×8	—	○	LIN,POR,LVI, Ring-osc
	KE1(78013x)	64-pin LQFP/TQFP	8/16/24/ 32/48/60	512 1K/2K	—	51	8 ^{※2}	8-bit×4	4(UART×2) ^{※3}	10-bit×8	—	○	LIN,POR,LVI, Ring-osc
	KF1(78014x)	80-pin LQFP/TQFP	24/32/48/60	1K 2K	—	67	8 ^{※4}	8-bit×4	5(UART×2) ^{※5}	10-bit×8	—	○	LIN,POR,LVI, Ring-osc
78K0S	789052	20-pin SSOP	4	128	—	14	3	8-bit×1	—	—	—	—	Cera
	789062	20-pin SSOP	4	128	—	14	3	8-bit×1	—	—	—	—	RC
	789071/2/4	30-pin SSOP	2/4/8	256	—	24	3	8-bit×1	1(UART×1)	—	—	—	
	789086/8	30-pin SSOP	16/32	384 576	—	24	3	8-bit×1	1(UART×1)	—	—	—	POR
	789101/2/4A	30-pin SSOP	2/4/8	256	—	20	3	8-bit×1	1(UART×1)	8-bit×4	—	—	Cera
	789121/2/4A	30-pin SSOP	2/4/8	256	—	20	3	8-bit×1	1(UART×1)	8-bit×4	—	—	RC
	789111/2/4A	30-pin SSOP	2/4/8	256	—	20	3	8-bit×1	1(UART×1)	10-bit×4	—	—	Cera
	789131/2/4A	30-pin SSOP	2/4/8	256	—	20	3	8-bit×1	1(UART×1)	10-bit×4	—	—	RC
	789022/4/5/6	44-pin LQFP	4/8/12/16	256 512	—	34	3	—	1(UART×1)	—	—	—	
	789046	44-pin LQFP	16	512	—	34	4	8-bit×1	1(UART×1)	—	—	○	
	789166/7	44-pin LQFP	16/24	512	—	31	6	8-bit×3	1(UART×1)	8-bit×8	—	○	
	789176/7	44-pin LQFP	16/24	512	—	31	6	8-bit×3	1(UART×1)	10-bit×8	—	○	
78K0	780021/2/3/4AS	52-pin LQFP	8/16/24/32	512 1024	—	39	5	8-bit×2	3(UART×1)	8-bit×4	—	○	
	780031/2/3/4AS	52-pin LQFP	8/16/24/32	512 1024	—	39	5	8-bit×2	3(UART×1)	10-bit×4	—	○	
	780021/2/3/4A	64-pin LQFP/TQFP/ SDIP/BGA(U.D)	8/16/24/32	512 1024	—	51	5	8-bit×2	3(UART×1)	8-bit×8	—	○	
	780031/2/3/4A	64-pin LQFP/TQFP/ SDIP/BGA(U.D)	8/16/24/32	512 1024	—	51	5	8-bit×2	3(UART×1)	10-bit×8	—	○	
	780076/8	64-pin LQFP/TQFP	48/60	2048	—	52	6	8-bit×2	3(UART×2)	10-bit×8	—	○	
	780982/3/4/6/8	64-pin LQFP/ TQFP/SDIP	16/24/32/ 48/60	1024 2048	—	47	7	8-bit×2	3(UART×2)	10-bit×8	—	—	
	780053/4/5/6/8	80-pin LQFP/TQFP	24/32/48/60	1024 2048	—	68	5	14-bit×1	3(UART×1)	8-bit×8	—	○	
	780065	80-pin LQFP	40	5120	—	60	5	8-bit×2	4(UART×1)	8-bit×8	—	○	
	78074B/5B/6/8	100-pin QFP/LQFP	32/40/48/60	1024 2048	—	88	7	14-bit×1 8-bit×2	3(UART×1)	8-bit×8	—	○	

※1. UART×1(8K ROM) ※2.7ch(8K/16K ROM) ※3.3ch(8K/16K ROM) ※4.7ch(24K/32K ROM) ※5.4ch(24K/32K ROM)

LCD control

Series	Part Number	Package	ROM (kbytes)	RAM (bytes)	EEPROM (bytes)	I/O	Timer	PWM	Serial I/O	ADC	LCD C/D	Sub Clock	Note
78K0S	789322/4/6/7	52-pin LQFP	4/8/16/24	256 512	—	21	4	8-bit×1	1	—	24-seg×4	○	POR
	789462/4/6/7	52-pin LQFP	4/8/16/24	256 512	—	13	4	8-bit×1	—	8-bit×1	23-seg×4	○	Booster POR
	789304/6	64-pin QFP/TQFP	8/16	512	—	23	5	8-bit×1	2(UART×1)	—	24-seg×4	○	Booster
	789314/6	64-pin QFP/TQFP	8/16	512	—	23	5	8-bit×1	2(UART×1)	—	24-seg×4	○	Booster RC
	789425/6	64-pin LQFP/TQFP	12/16	512	—	40	5	8-bit×2	1(UART×1)	8-bit×6 10-bit×6	5-seg×4	○	Booster
	789435/6	64-pin LQFP/TQFP	12/16	512	—	40	5	8-bit×2	1(UART×1)	8-bit×6 10-bit×6	5-seg×4	○	Booster RC
	789445/6	64-pin LQFP/TQFP	12/16	512	—	30	5	8-bit×2	1(UART×1)	8-bit×6 10-bit×6	15-seg×4	○	Booster
	789455/6	64-pin LQFP/TQFP	12/16	512	—	30	5	8-bit×2	1(UART×1)	8-bit×6 10-bit×6	15-seg×4	○	Booster RC
	789405/6/7A	80-pin LQFP/TQFP	12/16/24	512	—	43	6	—	1(UART×1)	8-bit×7	28-seg×4	○	
	789415/6/7A	80-pin LQFP/TQFP	12/16/24	512	—	43	6	—	1(UART×1)	10-bit×7	28-seg×4	○	
	789477	80-pin LQFP/TQFP	24	768	—	45	6	—	2(UART×1)	8-bit×8	28-seg×4	○	Remote control receiver
	789488	80-pin LQFP/TQFP	32	1024	—	45	6	—	2(UART×1)	10-bit×8	28-seg×4	○	Booster
78K0	78062/3/4	100-pin QFP/LQFP	16/24/32	512/1024	—	57	5	14-bit×1	2(UART×1)	8-bit×8	40-seg×4	○	
	780306/8	100-pin QFP/LQFP	48/60	2048	—	57	5	14-bit×1	3(UART×1)	8-bit×8	40-seg×4	○	
	780343/4	100-pin LQFP/ FPBGA	24/32	1024	—	66	7	8-bit×3	3(UART×1)	8-bit×8	40-seg×4	○	

LCD control

Series	Part Number	Package	ROM (Kbytes)	RAM (bytes)	EEPROM (bytes)	I/O	Timer	PWM	Serial I/O	ADC	LCD C/D	Sub Clock	Note
78K0	780353/4	100-pin LQFP/FPBGA	24/32	1024	—	66	7	8-bit×3	3(UART×1)	10-bit×10	40-seg×4	○	
	780316/8	120-pin TQFP/FPBGA	48/60	2560	—	70	7	8-bit×3	2(UART×1)	10-bit×10	24-seg×4	○	Booster
	780326/8	120-pin TQFP/FPBGA	48/60	2560	—	62	7	8-bit×3	2(UART×1)	10-bit×10	32-seg×4	○	Booster
	780336/8	120-pin TQFP/FPBGA	48/60	2560	—	54	7	8-bit×3	2(UART×1)	10-bit×10	40-seg×4	○	Booster
78K0S	789830	88-pin die from	24	1024	—	30	4	—	1(UART×1)	—	40×16	○	DOT LCD
	789832/3/4/5	144-pin LQFP/die from	24/32/48	2000	—	28	8	8-bit×2	1(UART×1)	8bit	48×48 64×32 80×16 80×8	○	Booster POR, DOT LCD

VFD control

Series	Part Number	Package	ROM (Kbytes)	RAM (bytes)	EEPROM (bytes)	I/O	Timer	PWM	Serial I/O	ADC	LCD C/D	Sub Clock	Note
78K0S	789870/1	52-pin LQFP	4/8	512	—	33	5	—	1	—	—	○	
78K0	780232/3	80-pin LQFP	16/24	768	—	40	4	8-bit×2	2	8-bit×4	—	—	
	78042/3/4/5F	80-pin LQFP	16/24/32/40	624 1136	—	68	6	14-bit×1	2	8-bit×8	—	○	
	780204/5/6/8	100-pin LQFP	32/40/48/60	1168 2192	—	74	5	14-bit×1	2	8-bit×8	—	○	

ASSPs

Series	Part Number	Package	ROM (Kbytes)	RAM (bytes)	EEPROM (bytes)	I/O	Timer	PWM	Serial I/O	ADC	LCD C/D	Sub Clock	Note
78K0S	789841/2	44-pin LQFP	8/16	256	—	30	6	—	1(UART×1)	8-bit×8	—	—	for inverter
	789800	44-pin LQFP	8	256	—	31	3	—	2(USB×1)	—	—	—	for USB keyboard
	789176/7Y	44-pin LQFP 48-pin TQFP	16/24	512	—	31	6	8-bit×3	2(UART×1, SMB×1)	10-bit×8	—	○	for BMU
	789881	64-pin LQFP	16	512	—	28	4	8-bit×2	1(UART×1)	—	26-seg×4	○	for utility meter
78K0	780957/8	100-pin LQFP	48/60	2048	—	69	7	—	2(UART×1)	—	30-seg×3	○	for utility meter
	780982/3/4/6/8	64-pin QFP/TQFP/SDIP	16/24/32/48/60	1024/2048	—	47	7	8-bit×3	3(UART×2)	10-bit×8	—	—	for inverter

Automotive ASSPs

Series	Part Number	Package	ROM (Kbytes)	RAM (bytes)	EEPROM (bytes)	I/O	Timer	PWM	Serial I/O	ADC	LCD C/D	Sub Clock	Note
78K0S	789850	30-pin SSOP	16	768	—	18	3	8-bit×1	2(UART×1)	8-bit×4	—	○	for CAN
	789852	44-pin LQFP	24/32	1312	—	31	5	8-bit×3	3(UART×2)	10-bit×8	—	○	
78K0	780814/6	64-pin LQFP/TQFP	32/48	1504	—	46	6	8-bit×2	3(UART×1)	8-bit×12	—	○	
	780701Y/3Y	80-pin LQFP	60	3360	—	67	7	8-bit×3	4(UART×1, I ² C×1)	8-bit×16	—	—	
	780824/6B	80-pin LQFP	32/48	1504	—	59	6	8-bit×2	2(UART×1)	8-bit×5	28-seg×4	—	
	780948	100-pin QFP	60	2016	—	79	6	8-bit×2	3(UART×1)	8-bit×8	40-seg×3	—	
	780830/3Y	80-pin LQFP	40/60	2016	—	65	7	8-bit×3	4(UART×1, I ² C×1)	8-bit×16	—	—	for J1850
	780834	100-pin LQFP	48	3072	—	79	7	8-bit×4	2(UART×1)	8-bit×4	40-seg×3	—	
	78095/6/8B	80-pin QFP/LQFP	40/48/60	1024 3072	—	69	5	8-bit×2	3(UART×1)	8-bit×8	—	○	for IEBUS
	780702Y	80-pin LQFP	60	3072	—	67	7	8-bit×3	4(UART×1, I ² C×1)	8-bit×16	—	—	
	780851/2	80-pin LQFP	32/40	1536	—	56	6	8-bit×2	3(UART×1)	8-bit×5	20-seg×4	—	for dash board
78K0S	789860/1	20-pin SSOP	4	128	32	14	3	8-bit×1	—	—	—	—	for keyless entry
	789862	30-pin SSOP	16	512	256	22	4	8-bit×1	2(UART×1)	—	—	—	for keyless entry

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