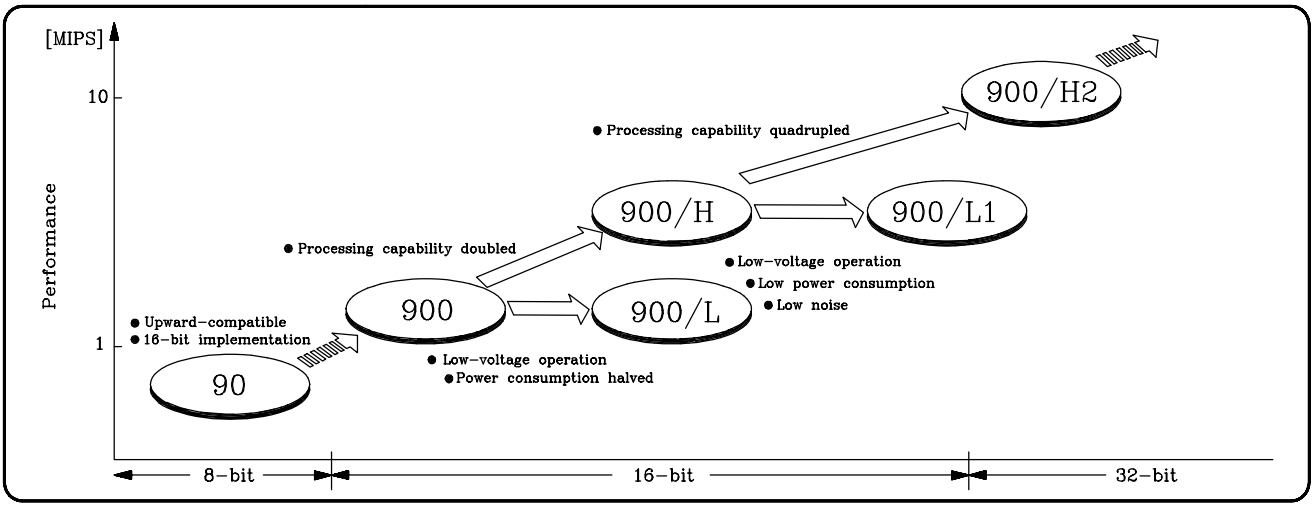
KLCS-900 Series

16/32-bit microcontrollers developed for C language code efficiency

The **900 Series** is comprised of highly functional mocrocontrollers combining the best of Toshiba technologies. The microcontrollers in this family are available as the processor core for a wide variety of applications, including office equipment, such as printers and facsimiles, complex electronic household appliance, such as VCRs and video cameras and cellular'phones and other information-based equipment.

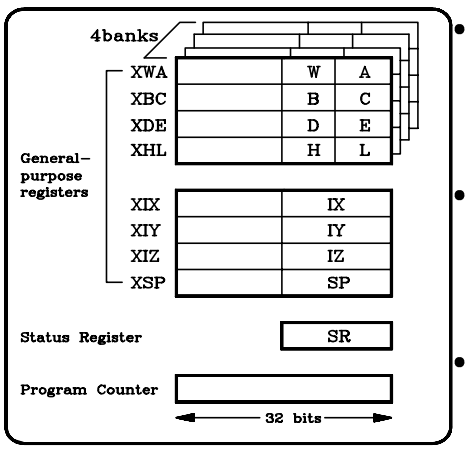
Core expansion keeping pace with applications



Core expansion keeping pace with applications

	900/H2 Series	**900/H, 900/L1** Series	**900, 900/L** Series
Maximum operating frequency (@input frequency)	20MHz (@10 MHz)	12.5MHz (@25 MHz)	10MHz (@20 MHz)
Minimum instruction execution time	50 ns	160 ns	200 ns
Address space	16 Mbytes of linear address space(for program and data)		
Data transfer rate (Micro DMA)	0.25μs	0.64μs	1.6μs
Instructions for processing 32-bit data	Transfer, arithmetic/ logic operations and shift instructions		
Bit-processing instructions	Transfer, logic operations, Test, Set, Reset, Search		
Multiply instruction execution time (16-bit operands, 32-bit result)	600 ns	960 ns	2.6μs
Dynamic bus sizing	8-/16-/32-bit	8-/16-bit	

Register model



- **32-bit wide general-purpose registers**
  Can be used for address calculations.
  Code size reduction is possible.
- **Abundant general-purpose registers**
  Flexible code generation by complier.
  Code size reduction is possible
- **Regiater bank method**
  Ideal for real-time processing

Main applications

Office equipment

- Printers
- FAX machines

Office equipment

- DVD players
- Digital video cameras

Office equipment

- PICS
- Cellular phones
- PCS

900 series Selection Guide

ROM (byte)	RAM (byte)	Product No.	Minimum Instruction Execution Time (μs) 5V±10%	Minimum Instruction Execution Time (μs) 3V±10%	SIO/UART	Synchronous SIO	I²C Bus/ SIO	DRAM Controller	A/D Converter 6-bit Channels	A/D Converter 8-bit Channels	A/D Converter 10-bit Converter	8-Bit DA Converter	LCD Driver	VFT Driver	Timer/Counter 8-bit Channels	Timer/Counter 16-bit Channels	Clock Timer	Time Base Counter	Pattern Generator	Stepping Motor Controller	8-Bit PWM Timer	14-Bit PWM Timer	CS/Wait Controller	VCR Servo Controller	Watchdog Timer	Dual Clock	Clock Gear	I/O Port	Operating Temperature (°C)	Built-in OTP	Package
900 Series																															
NA	NA	KMP96C041BF	Note2 200	–	2	–	–	–	–	–	4	–	–	–	2	2	–	–	2	–	2	–	3	–	●	–	–	47	-40~85	–	QFP80 (14×20mm)
		KMP96C031ZF			2	–	–	1	4	–	–	–	–	–	4	1	–	–	2	–	–	–	4	–	●	–	–	37		–	QFP64 (14×20mm)
	1K	KMP96C141BF			2	–	–	–	–	–	4	–	–	–	2	2	–	–	2	–	2	–	3	–	●	–	–	47		–	QFP80 (14×20mm)
32K		KMP96CM40F			2	–	–	–	–	–	4	–	–	–	2	2	–	–	2	–	2	–	3	–	●	–	–	65		KMP96PM40F	
900/L Series																															
NA	2K	*KMP93CS41F/DF	200	320	2	–	–	–	–	–	8	–	–	–	2	2	–	–	2	–	2	–	3	–	●	●	●	61	-40~85	–	QFP100 (14×14mm)
		KMP93CS45F			2	–	1	–	–	–	8	–	–	–	4	2	–	–	–	–	–	–	–	–	●	●	●	44		–	QFP80 (12×12mm)
	4K	KMP93CW41DF			2	–	–	–	–	–	8	–	–	–	2	2	–	–	2	–	2	–	3	–	●	●	●	61		–	QFP100 (14×14mm)
	8K	KMP93C071F		–	1	2	1	–	–	10	–	–	–	●	1	5	–	●	–	–	–	3	–	●	●	●	–	69	-10~70	–	QFP120 (28×28mm)
8K	1K	*KMP93C852F		320	–	6	–	–	–	–	–	–	–	–	–	–	–	–	–	4	–	–	3	–	●	–	●	88	-40~85	–	QFP160 (28×28mm)
32K	2K	KMP93CM40F		400	2	–	–	–	–	–	8	–	–	–	2	2	–	–	2	–	2	–	3	–	●	●	●	79		KMP93PS40F/DF	QFP100 (14×14mm)
64K	2K	*KMP93CS20F		320	2	–	1	–	–	–	8	–	●	–	4	4	●	–	–	–	–	–	–	–	●	●	●	88		*KMP93PW20F	QFP144 (16×16mm)
		KMP93CS32F			2	1	–	–	–	–	6	–	–	–	4	2	–	–	–	–	–	–	–	–	●	–	●	49		KMP93PW32F	QFP64 (14×14mm)
		KMP93CS40F/DF			2	–	–	–	–	–	8	–	–	–	2	2	–	–	2	–	2	–	3	–	●	●	●	79		KMP93PS40F/DF	QFP100 (14×14mm)
		KMP93CS42AF			2	–	–	–	–	–	5	–	–	–	2	2	–	–	–	–	2	–	3	–	●	–	●	80		KMP93PS42AF	
		KMP93CS44F			2	–	1	–	–	–	8	–	–	–	4	2	–	–	–	–	–	–	–	–	●	●	●	62		KMP93PS44F	QFP80 (12×12mm)
72K	1.8K	KMP93CT75F	250	–	–	1	1	–	–	10	–	–	–	●	1	5	–	●	–	–	–	3	–	●	●	●	–	85	-10~70	KMP93PT75F	QFP100 (14×20mm)
128K	4K	KMP93CW40DF	200	320	2	1	–	1	–	–	8	–	–	–	2	2	–	–	2	–	2	–	3	–	●	●	●	79	-40~85	KMP93PW40DF	QFP100 (14×14mm)
		KMP93CW46AF			5	–	–	–	–	–	8	–	–	–	2	2	–	–	–	–	2	–	3	–	●	●	●	79		KMP93PW46AF	
		★KMP93CW44DF			2	–	1	–	–	–	8	–	–	–	4	2	–	–	–	–	–	–	–	–	●	●	●	62		★KMP93PW44DF	QFP80 (14×20mm)
900/H Series																															
NA	NA	KMP95C001F	160	320	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	4	–	–	–	–	0	-20~70	–	QFP64 (14×14mm)
		KMP95C061BF		–	2	–	–	1	–	–	4	–	–	–	4	2	–	–	2	–	–	–	4	–	●	–	–	56		–	QFP100 (14×14mm)
		KMP95C063F			2	–	–	2	–	–	8	2	–	–	8	2	–	–	2	–	–	–	4	–	●	–	–	91		–	QFP144 (20×20mm)
	2K	KMP95C265F		400	3	–	–	–	–	–	8	2	–	–	8	2	–	–	–	–	–	–	4	–	●	–	–	55		–	QFP100 (14×14mm)
64K		KMP95CS64F			3	–	–	–	–	–	8	2	–	–	8	2	–	–	–	–	–	–	4	–	●	–	–	81		KMP95PW64F	
Note3 128K		★KMP95FW86F	200	–	3	–	–	–	–	–	12	–	–	–	–	3	–	–	–	–	3	–	3	–	●	–	–	77		–	QFP100 (22×22mm)
128K		★KMP95CW64F	160	400	3	–	–	–	–	–	8	2	–	–	8	2	–	–	–	–	–	–	4	–	●	–	–	81		KMP95PW64F	QFP100 (14×14mm)
Note3 128K		*KMP95FW64F		–	3	–	–	–	–	–	8	2	–	–	8	2	–	–	–	–	–	–	4	–	●	–	–	81		–	
900/L1 Series																															
96K	3K	KMP91CU10F	–	250	3	–	–	–	–	–	8	–	–	–	8	2	–	–	–	–	–	–	3	–	●	●	●	80	-40~85	KMP91PW10F	QFP100 (14×14mm)
128K	4K	KMP91CW11F	160	320	3	2	1	–	–	–	8	–	–	–	2	2	●	–	–	–	2	–	3	–	●	●	●	79		KMP91PW11F	
		*KMP91CW12F	–	250	2	–	1	–	–	–	8	–	–	–	8	2	●	–	–	–	–	–	4	–	●	●	●	81		*KMP91CW12F	
900/H2 Series																															
NA	2K	KMP94C241F	50	–	2	–	–	2	–	–	8	2	–	–	4	4	–	–	–	–	–	–	6	–	●	–	–	64	-20~70	–	QFP160 (28×28mm)

*: Under development ★: Samples available

Note 1: The suffix F in a product number denotes a quade flat package(QFP)

Note 2: Guaranteed minimum instruction execution time is 200ns when operating at temperatures of -20℃ to 70℃, or 250ns when operating at temperatures of -40℃ to 85℃.

Note 3: Flash E^2PROM(USP 4,382,279 owned by BULL CP8)