■ KLCS-47E, 47, 470, 470A Series

■ Features

	47E Series	47 Series	470 Series	470A Series
Maximum ROM size	4K × 8		8K × 8	16K × 8
Maximum RAM size	256 × 4	768 × 4	1024 × 4	
Minimum instruction execution time	1.0μs(at 8㎒, V_{DD}=2.7V~5.5V) 1.3μs(at 8㎒, V_{DD}=4.5V~5.5V) 1.9μs(at 8㎒, V_{DD}=2.7V~5.5V) 3.2μs(at 8㎒, V_{DD}=2.7V~5.5V)	1.9μs(at 4.2㎒, V_{DD}=4.5V~6V)	1.3μs(at 6㎒, V_{DD}=4.5V~5.5V) 244μs(at 32.8㎑, V_{DD}=2.7V~5.5V)	
Number of instructions	90		92	105
Number of interrupts	5/6	6		
Packages	DIP16~20 SOP16~28 SDIP28~42 SSOP30 QFP44	SDIP30~42 QFP44~80	SDIP28~64 QFP44~100	SDIP42~64 QFP44~80

■ Basic functions

- Instructions: maximum 105, minimum instruction execution time: 1.0μs
- ROM table look-up instruction
- 5-bit to 8-bit data conversion instruction
- Subroutine nesting: maximum 15 levels
- Interrupt sources: 2 external, 4 internal
- Interval timer
- Serial interface

■ Additional functions

- VFT driver
- LCD driver
- LED driver
- Hold function (low power consumption mode)
- Multi-pin input/output
- D/A conversion (PWM) output
- A/D conversion input
- A/D converter input
- E^2PROM
- 16-bit high-speed event counter
- On-screen display circuit
- DTMF generator
- DTMF receiver
- Watchdog timer
- Pulse generator
- Remote control pulse detector
- High-speed timer/counter
- Dual clock system
- One-time PROM

■ KLCS-470, 470A Series Selection Guide

ROM (byte)	RAM (nibbles)	Product No	Driver			SIO 8-bit	UART	A/D converter	A/D conversion input	Pulse output			Remote control pulse detector	Watchdog timer	High-speed timer/counter	DTMF		OSD (character)	Dual clock	Hold function	Package			OTP type	(●: 2.7V,◉: 2.2V) Minimum operating voltage
			LED	LCD	VFT					PWM	PPG	Pulse				Generator	Receiver				SDIP(DIP)	QFP(SOP)	QFP(SSOP)		
2k	128	**KMP47C215N**	1		23	1			4					●					●	●	42			●	
		KMP47C216F	1		24	1			4					●					●	●		44		●	
4k	256	**KMP47C415N**	1		23	1			4					●					●	●	42			●	
		KMP47C416F	1		24	1			4					●					●	●		44		●	
	768	**KMP47C457N/F**				1						1		●		●			●	●	42	44		●	●
6k	384	**KMP47C620DF**	8	32		1						1		●	2				●	●		80		●	
		KMP47C623F	4	24		1						1		●	1				●	●		64		●	
		KMP47C637N	8			1			4	8		1	●	●				●	●	●	42			●	
		KMP47C640N/F	8			1		8					●	●					●	●	42	44		●	●
		KMP47C647F	8	32		1		8				1		●					●	●		80		●	
		KMP47C660AN/AF	8			1		8					●	●					●	●	64	64		●	
		KMP47C662AN	4		27	1		8			2		●	●					●	●	64			●	
		KMP47C670N	8		28	1			4	1			●	●					●	●	64			●	
	896	**KMP47C655F**		32		1						1		●		●			●	●		80		●	◉
8k	384	**KMP47C837N**	8			1			4	8		1	●	●				●	●	●	42			●	
	512	**KMP47C800N/F**	8			1								●					●	●	42	44		●	
		KMP47C820DF	8	32		1						1		●	2				●	●		80		●	
		KMP47C823F	4	24		1						1		●	1				●	●		64		●	
		KMP47C840N/F	8			1		8					●	●					●	●	42	44		●	
		KMP47C847F	8	32		1		8				1		●					●	●		80		●	
		KMP47C850N/F	16			1			4			2		●			●		●	●	64	64		●	
		KMP47C858F		44		1									●				●	●		100			●
		KMP47C860AN/AF	8			1		8					●	●					●	●	64	64		●	
		KMP47C862AN	4		27	1		8			2		●	●					●	●	64			●	
		KMP47C870N	8		28	1			4	1			●	●					●	●	64			●	
		* **KMP47E885IF**				1	●	8		2				●	1				●	●		44		●	
		* **KMP47E885WF**				1	●	8		2				●	1			●	●	●		44		●	
	1024	**KMP47C853N/F**				1						1		●		●			●	●	42	44		●	◉
		KMP47C855F		32		1						1		●		●			●	●		80		●	◉
		KMP47C857N/F				1						1		●		●			●	●	42	44		●	●
12k	512	**KMP47C1237N**	4			1			4	8		1	●	●				●	●	●	42			●	
		KMP47C1238AN	8			1			4	10		1	●	●				●	●	●	54			●	
	768	**KMP47C1220F**	8	32		1						1		●	2				●	●		80		●	
		KMP47C1260N/F	8			1		8					●	●					●	●	64	64		●	
		KMP47C1270AN	8		28	1			4	1			●	●					●	●	64			●	
16k	512	**KMP47C1637N**	4			1			4	8		1	●	●				●	●	●	42			●	
		KMP47C1638AN	8			1			4	10		1	●	●				●	●	●	54			●	
	768	**KMP47C1620F**	8	32		1						1		●	2				●	●		80		●	
		KMP47C1660N/F	8			1		8					●	●					●	●	64	64		●	
		KMP47C1670AN	8		28	1			4	1			●	●					●	●	64			●	

Note) * : Under Development

■ KLCS-470 Series

Product No	Function	ROM (bytes)	RAM (nibbles)	I/O port	Minimum instruction execution time (μs)	Power Supply Voltage (V)	Package	Built-in OTP
KMP47C800N/F	Standard (LED driver)	8k	512	36	1.3 (244)	4.5 to 6.0	SDIP42 QFP44	KMP47P800N/F
KMP47C620DF	LCD driver (32×4), hgih speed timer/counter	6k	384				QFP80	KMP47P820VDF
KMP47C820DF		8k	512					
KMP47C640N/F	A/D converter (8bits×8ch), Remote control pulse detector, LED driver	6k	384	34	1.3 (244)	2.7 to 5.5	SDIP42 QFP44	KMP47P840VN/VF
KMP47C840N/F		8k	512					
KMP47C647F	A/D converter (8bits×8ch), LCD driver (32×4)	6k	384	35		4.5 to 6.0	QFP80	KMP47P847VF
KMP47C847F		8k	512					
KMP47C850N/F	DTMF receiver, 4-bit A/D conversion input			52	2.23 (244)	4.5 to 5.5	SDIP64 QFP64	KMP47P850VN/VF
KMP47C655F	LCD driver (32×4), DTMF generator	6k	896	36	8.3 (244)	2.2 to 6.0	QFP80	KMP47P855VF
KMP47C855F		8k	1024					
KMP47C858F	LCD driver (44×10), DTMF generator		512			2.7 to 6.0	QFP100	-
KMP47C660AN/AF	A/D converter (8bits×8ch), Remote control pulse detector, LED driver	6k	384	56	1.3 (244)	4.5 to 5.5	SDIP64 QFP64	KMP47P860N/DF
KMP47C860AN/AF		8k	512					
KMP47C662AN	Pulse generator, VFT driver (16×11)	6k	384	55		4.5 to 6.0	SDIP64	KMP47P862VN
KMP47C862AN		8k	512					
KMP47C215N	VFT driver, 4-bit A/D conversion input	2k	128	36	1.0 (244)	4.5 to 5.5	SDIP42	KMP47P415VN
KMP47C415N		4k	256					
KMP47C216F		2k	128	38			QFP44	KMP47P416VF
KMP47C416F		4k	256					
KMP47C670N	VFT driver (16×12 to 12×16), D/A conversion (PWM) input, 4-bit A/D conversion input, Remote control pulse detector	6k	384	53	1.3 (244)	4.5 to 6.0	SDIP64	KMP47P870N
KMP47C870N		8k	512					

Note : ( ) ; the minimum instruction execution time when low-frequency clock is used.
☆ : These package types will be delivered in the short lead length package.

■ KLCS-470A Series

Product No	Function	ROM (bytes)	RAM (nibbles)	I/O port	Minimum instruction execution time (μs)	Power Supply Voltage (V)	Package	Built-in One-time PROM product
KMP47C623F	LCD driver (24 to 20×4), High-speed event counter	6k	384	32 to 28	1.3 (244)	4.5 to 6.0	QFP64	KMP47P823VF
KMP47C823F		8k	512					
KMP47C1220F	LCD driver (32×4), High-speed timer/counter	12k	768	36			QFP80	KMP47P1620VF
KMP47C1620F		16k						
KMP47C637N	On-screen display circuit, D/A conversion (PWM) output, 4-bit A/D conversion input, Remote control pulse detector	6k	384	32			SDIP42	KMP47P1637VN
KMP47C837N		8k						
KMP47C1237N		12k	512					
KMP47C1637N		16k						
KMP47C1238AN		12k		41			SDIP54	KMP47P1638VN
KMP47C1638AN		16k						
KMP47C853N/F	DTMF generator	8k	1024	35	8.3 (244)	2.2 to 6.0	SDIP42 QFP44	KMP47P853VN/VF
KMP47C457N/F		4k	768		2.1 (244)	2.7 to 6.0		KMP47P857VN/VF
KMP47C857N/F		8k	1024					
KMP47C1260N/F	A/D converter (8bits×8ch), Remote control pulse detector, LED driver	12k	768	56	1.3 (244)	4.5 to 6.0	SDIP64 QFP64	KMP47P1660VN/VF
KMP47C1660N/F		16k						
KMP47C1270AN	VFT driver (16×18 to 13×16), D/A conversion (PWM) output, 4-bit A/D conversion input, Remote control pulse detector	12k		53			SDIP64	KMP47P1670VN
KMP47C1670AN		16k						

note : ( ) ; the minimum instruction execution time when low-frequency clock is used.

Type N : Plastic shrink dual in-line package (SDIP) E : Ceramic shrink dual in-line package (SDIC)
F : Plastic flat package (QFP) G : Ceramic standard flat package (QFC)

■ KLCS-47E, 47, 470 series (Wide-temperature range/High-quality products)

Product No	Function	ROM (bytes)	RAM (nibbles)	I/O port	Minimum instruction execution time (μs)	Power Supply Voltage (V)	Operating temperature (℃)	Package	Built-in One-time PROM product (note 2)
* KMP47C101WP	LED driver	1k	64	11	1.3	2.2 to 5.5 (note 3)	-40 to 110	DIP16 SOP16	KMP47P201VP
* KMP47C201WP		2k	128				-40 to 110		
†KMP47E186M	E^2 PROM (16 bytes), SPI	1k	64			(note 4)	-40 to 85	SOP16	KMP47P186M (note 5)
KMP47E187M	E^2 PROM (16 bytes), SPI	1k	64			(note 4)	-40 to 85	SOP16	KMP47P187M
KMP47C241IN/IM	A/D converter LED driver	2k	128	21		2.7 to 6.0	-40 to 85	SDIP28 SOP28	KMP47P241VN/VM KMP47P241VN
KMP47C241WM							-40 to 110		
† KMP47E885IF	E^2 PROM (64 bytes), PWM, UART A/D converter 16-bit timer/counter Input Capture, Output compare	8k	512	36		4.5 to 5.5	-40 to 85	QFP44	KMP47P885F
† KMP47E885WF							-40 to 110		

* : Under development
†: USP4, 382, 279 owned by BULL CP8

Type suffix
P : Plastic dual in-line package (DIP)
M : Plastic small outline package (SOP)
N : Plastic shrink dual in-line package (SDIP)
F : Plastic flat package (QFP)

note 1 : If there is any further information you require when considering I/W version products, please contact our sales representative.
note 2 : OTP built-in type is under consideration for high-temperature range/high-quality applications.
note 3 : During CR oscillation (2.7 to 5.5V when oscillator is connected).
note 4 : 2.7 to 5.5V when oscillator is connected, 2.0 to 3.4V during CR oscillation.
note 5 : KMP47P186M (CR oscillation), KMP47P187M (oscillator version)