

Jan-2020

ICP (G3) Family Programmers: Programming Times

##	Device	Interface	Time sec	Flash Memory bytes	EEPROM bytes	Gap Eliminator™	Operations	Clock, MHz	Notes
1.	ATtiny412	UPDI	1.4	4,096	128	OFF (full range)	Chip erase + program + verify	Auto	-
2.	ATtiny20	TPI	3.6	2,048	-	OFF (full range)	Chip erase + program + verify	Auto	-
3.	ATtiny84A	SPI	2.5	4,096	512	OFF (full range)	Chip erase + program + verify	Auto	-
4.	ATSAMD21E16B	SWD	2.2	65,536	2,048	OFF (full range)	Chip erase + program + verify	10MHz	
			0.9	65,536	2,048	ON: - flash eliminated: 75% - EEPROM eliminated: 94%	Chip erase + program + verify	10MHz	RWW EEPROM
5.	ATSAME54P20A	SWD	18.4	1MByte	-	OFF (full range)	Chip erase + program + verify	10MHz	Chip erase = 5 sec
			9.3	1MByte	-	ON: flash eliminated 75%	Chip erase + program + verify	10MHz	
6.	ATSAME70Q21	SWD	33	2MByte	-	OFF (full range)	Chip erase + program + verify	10MHz	Chip erase = 8 sec
			9.2	2MByte	-	ON: flash eliminated 75%	Sector erase + program + verify	10MHz	Sector erase
7.	ATMEGA328PB	SPI	4.6	32,768	1,024	OFF (full range)	Chip erase + program + verify	Auto	
			2.0	32,768	1,024	ON: - flash eliminated: 75% - EEPROM eliminated: 94%	Chip erase + program + verify	Auto	
8.	ATXMEGA128A1U	PDI	4.7	139,264	2,048	OFF (full range)	Chip erase + program + verify	10MHz	
		JTAG	5.1	139,264	2,048	OFF (full range)	Chip erase + program + verify	10MHz	
		PDI	2.3	139,264	2,048	ON: - flash eliminated: 75% - EEPROM eliminated: 94%	Chip erase + program + verify	10MHz	
9.	PIC10F200	ICSP	0.9	510	-	OFF (full range)	Chip erase + program + verify	Auto	
10.	PIC16LF1933	ICSP	4.1	8192	excluded	OFF (full range)	Erase + Program + Verify	Auto	
			5.8	8192	256	OFF (full range)	Erase + Program + Verify	Auto	
11.	PIC16LF18877	ICSP	8.8	65536	256	OFF (full range)	Erase + Program + Verify	2.5MHz	
12.	PIC18F85J10	ICSP	4.6	32,760	-	OFF (full range)	Erase + Program + Verify	2.5MHz	
13.	dsPIC33FJ128GP708	ICSP	7.1	132,096	-	OFF (full range)	Erase + Load PE + Program + Verify	5MHz	Enhanced ICSP™
14.	dsPIC33CH512MP508	ICSP	18.5	540,288	-	OFF (full range)	Erase+Load PE+Program+Verify	1.67MHz	Enhanced ICSP™
			8.2	540,288	-	ON: flash eliminated 75%	Erase+Load PE+Program+Verify	1.67MHz	Enhanced ICSP™
15.	PIC32MX795F512L	ICSP	15.5	536,560	-	OFF (full range)	Erase+Load PE+Program+Verify	10MHz	Enhanced ICSP™
			5.0	536,560	-	ON: flash eliminated 75%	Erase+Load PE+Program+Verify	10MHz	Enhanced ICSP™

ICP2 Family: Programming Times

##	Device	Interface	Time sec	Flash Memory bytes	EEPROM bytes	Gap Eliminator™	Operations	Clock, MHz	Notes
16.	PIC32MZ2048EFH100	ICSP	36.7	2,097,152	-	OFF (full range)	Erase+Load PE+Program+Verify	10MHz	Enhanced ICSP™
			12.6	2,097,152	-	ON: flash eliminated 75%	Erase+Load PE+Program+Verify	10MHz	Enhanced ICSP™
17.	SST26VF032B	SPI	39.0	4MByte	-	OFF (full range)	Chip erase + program + verify	10MHz	-
			2.7	4Mbyte	-	ON: flash eliminated 94%	Chip erase + program + verify	10MHz	-
18.	STM32F100RB	SWD	8.0	131,072	-	OFF (full range)	Chip erase + program + verify	10MHz	-
19.	STM32F207ZG	SWD	33.0	1MByte	-	OFF (full range)	Chip erase + program + verify	10MHz	Chip erase = 8 sec
		JTAG	32.0	1MByte	-	OFF (full range)	Chip erase + program + verify	10MHz	Chip erase = 8 sec
		SWD	9.9	1MByte	-	ON: flash eliminated 75%	Sector erase + program + verify	10MHz	Sector erase
20.	STM32F401RE	SWD	17.2	0.5MByte	-	OFF (full range)	Chip erase + program + verify	10MHz	-
			5.8	0.5MByte	-	ON: flash eliminated 75%	Sector erase + program + verify	10MHz	Sector erase
21.	STM32L011F4	SWD	2.9	16,384	1,024	OFF (full range)	Chip erase + program + verify	10MHz	-
			1.2	16,384	1,024	ON: - flash eliminated: 75% - EEPROM eliminated: 94%	Chip erase + program + verify	10MHz	-
22.	STM32L100RC	SWD	12.4	262,144	4,096	OFF (full range)	Chip erase + program + verify	10MHz	-
			3.8	262,144	4,096	ON: - flash eliminated: 75% - EEPROM eliminated: 94%	Chip erase + program + verify	10MHz	-
23.	LPC804	UART	5.2	32,640	-	OFF (full range)	Chip erase + program + verify	Auto	-
		SWD	3.5	32,640	-	OFF (full range)	Chip erase + program + verify	10MHz	-
		UART	1.9	32,640	-	ON: flash eliminated: 75%	Chip erase + program + verify	Auto	-
24.	MKL17Z64	SWD	3.7	65,536	-	OFF (full range)	Chip erase + program + verify	10MHz	-
			1.1	65,536	-	ON: flash eliminated: 75%	Chip erase + program + verify	10MHz	-
25.	CY8C4127	SWD	6.3	131,072	-	OFF (full range)	Chip erase + program + verify	10MHz	-
			2.1	131,072	-	ON: flash eliminated: 75%	Chip erase + program + verify	10MHz	-

Notes:

- VddOff=20ms (defines a delay between power OFF and power ON)
- Vdd-to-Vpp=4ms
- Programming times are measured on ICP2(G3) programmer in the following conditions (if not specified):
 - standalone mode
 - hardware activation of programming by GO input
- All results are also applicable to ICP2-GANG(G3), ICP2-COMBO(G3) and ICP2-Portable(G3)
- Programming times depend on implemented programming algorithms. Softlog Systems reserves the right to change programming algorithms at any time without notice