

EPSON ASIC IP Lineup

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Gate Array & Standard Cell Macro cell list

Gate Array macro cell summary

✓:Supported

Macro Cell	S1L50K Series (0.35um)	S1L60K Series (0.25um)
Asynchronous SRAM 1port / 2 port	✓	✓
Synchronous SRAM 1port / 2 port	N.A.	✓
UART 16C550	✓	✓
USART 8251	✓	✓
PPI 8255	✓	N.A.
PIC 8259	✓	N.A.
PIT 8254	✓	✓
RTC SMC5242	✓	✓
PCMCIA Controller	✓	N.A.
DMA Controller 8237	✓	N.A.
USB1.1 Function Controller	✓	✓
Ethernet MAC 10/100 Mbps	✓	✓
I2C Interface	✓	N.A.
IrDA ver 1.1	✓	N.A.
PCI (3.3V)	✓	✓
PCI (5V)	✓	N.A.
TFT SS (Spread Spectrum)	✓	✓
Output Current Variable Buffer	✓	N.A.
PLL	✓	✓
Delay Cancel PLL	✓	✓

Gate Array PLL features

Macro Cell	Function	Available Technology
Phase Lock Loop for 0.35µm Gate Array	Operation voltage = 3.0V to 3.6V Input Frequency = 1MHz to 100MHz Multiplication Ratio = x1 to x200 Output Frequency = 50MHz to 200MHz Period Jitter = +-500 psec Duty = Min 30% Max 70% Lock Up Time = 1 msec Low Pass Filter = external Temperature Range = -40 to 85 Celcius	S1L50000 series
Phase Lock Loop for 0.25µm Gate Array	Operation voltage = 2.3V to 2.7V Input Frequency = 4MHz to 125MHz Multiplication Ratio = x2 x4 x8 x16 Output Frequency = 50MHz to 250MHz Period Jitter = +-500 psec Duty = Min 30% Max 70% Lock Up Time = 1 msec Low Pass Filter = external Temperature Range = -40 to 85 Celcius	S1L60000 series

S/C – E/A macro cell summary

✓:Supported

Category	Embedded Core Description	50K Series (0.35um)	60K Series (0.25um)	70K Series (0.18um)
32bit RISC	S1C33 std	✓	✓	TBD
	ARM7TDMI	✓ (rev2)	✓ (rev 3)	✓
	ARM720T	N.A.	✓ (rev 2)	✓
16bit DSP	OakDSP	N.A.	✓	N.A.
Memory (1)	SRAM	✓	✓	✓
	ROM	✓	✓	✓
	FLASH ROM	✓	✓	N.A.
	OTPROM	✓	N.A.	N.A.
Analog	Multiple PLL	✓	✓	✓
	Delay Cancel PLL	✓	✓	✓
	Multiple ADC	✓	✓	✓
	Multiple DAC	✓	✓	✓
Controller (2)	USB1.1 Function Controller (FS)	✓	✓	✓
	USB2.0 Function Controller (HS/FS)	✓	TBD	✓
	USB OTG (3)	N.A.	✓	N.A.
	LVDS Rx (25 to 115MHz)	✓ (rev 1.2a/b / rev.3.0)	✓	N.A.
	RSDS Tx	✓	✓	N.A.
	S1D13501 (LCDC)	✓	N.A.	N.A.
	S1D13502 (LCDC)	✓	N.A.	N.A.
	Fast Ethernet MAC (10/100)	✓	✓	✓
	Gigabit Ethernet MAC	N.A.	✓	TBD

(1): BIST is available for SRAM, ROM and Flash. Please consult to EPSON to get further details.

(2): All previous G/A macro cells have same status in 50K and 60K series. Please consult to EPSON about K70 status

(3): OTG is currently available as ASSP. For ASIC business, please consult to EPSON.

Analog – Mixed Signal Macro cell list

50K series (0.35um): Analog macro cells

S1X50000 Low Speed PLL Macro

Low Speed Phase Lock Loop for 0.35um Embedded Array

Macro Type	Low Speed
Operation Voltage	3.0V to 3.6V
Input Frequency	32KHz
Multiplication Ratio	x610 to x4000
Output Frequency	20MHz to 135MHz
Period Jitter	+/-250psec
Duty	50% +/- 10%
Lock Up Time	100msec
Low Pass Filter	On Chip
Temperature Range	-40 to 85 Celcius

S1X50000 High Speed PLL Macro

High Speed Phase Lock Loop for 0.35um Embedded Array

Macro Type	High Speed
Operation Voltage	3.0V to 3.6V
Input Frequency	5MHz to 40MHz
Multiplication Ratio	x2 to x26
Output Frequency	20MHz to 135MHz
Period Jitter	+/-250psec
Duty	50% +/- 10%
Lock Up Time	100µsec
Low Pass Filter	On Chip
Temperature Range	-40 to 85 Celcius

S1X50000 8bit DAC Macro

8bit Digital-to-Analog-Converter for 0.35 μ m Embedded Array

Operation Voltage	3.0V to 3.6V
Conversion Frequency	200kHz to 1MHz
Resolution	8bit

S1X50000 10bit DAC Macro

10bit Digital-to-Analog-Converter for 0.35 μ m Embedded Array

Operation Voltage	3.0V to 3.6V
Conversion Frequency	50MHz
Resolution	8bit 10bit

S1X50000 ADC Macro

Analog-to-Digital-Converter for 0.35 μ m Embedded Array

Operation Voltage	3.0V to 3.6V
Conversion Frequency	2MHz 30MHz 100kHz
Resolution	10bit

S1X50000 Flash Macro with Command I/F Erase/Program Interface

Flash for 0.35µm Embedded Array with command interface I/F erase/program interface

Operation Voltage	2.7 ~ 3.6V
Erase/Program Interface	Command I/F
Memory Size	256K 512K 1M 2M 4M
I/O	8bit 16bit
Sector Size	1K 4Kbyte/Sector
Chip Erase Time	100ms
Sector Erase Time	20ms
Byte Access Time	14µs
Read Access Time	45ns
Operating Current	15mA
Standby Current	10µs
Endurance Time	10000 cycle
Data Retention	10 years
Temperature Range	0 to 70°C

This product uses SuperFlash® technology licensed from Silicon Storage Technology, Inc

S1X50000 Flash Macro with Write Pulse Input Erase/Program Interface

Flash for 0.35 μ m Embedded Array with "Write Pulse Input" Erase/Program Interface

Operation Voltage	2.7 ~ 3.6V
Erase/Program Interface	Write Pulse Input
Memory Size	64K 128K 256K 512K 1M 2M
I/O	8bit 16bit
Sector Size	1Kbyte/Sector 4Kbyte/Sector
Chip Erase Time	100ms
Sector Erase Time	20ms
Byte Access Time	15 μ s
Read Access Time	50ns
Operating Current	15mA
Standby Current	10 μ s
Endurance Time	10000 cycle
Data Retention	10 years
Temperature Range	0 to 70°C

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S1X50000 High Density SRAM Macro

High Density SRAM for 0.35 μ m Embedded Array

Operation Voltage	1.8V to 3.6V
Memory Size/Module	32K to 512Kbit
Data Bus Width (bit)	x8 x16 x32
Circuitry Type	Dual Port
Byte Write Operation	No
Operation Frequency	76MHz
Temperature Range	-40 to 85°C
Operation Current Typ	0.86mW/MHz

S1X50000 Normal SRAM Macro

Normal SRAM for 0.35 μ m Embedded Array

Operation Voltage	1.8V to 3.6V
Memory Size/Module	128 to 64Kbit
Data Bus Width (bit)	x1 to x32 1bit step
Circuitry Type	Sync 1 Dual Port
Byte Write Operation	Yes
Operation Frequency	90MHz
Temperature Range	-40 to 85°C
Operation Current Typ	0.33mW/MHz

60K series (0.25um): Analog macro cells

S1X60000 ADC Macro

Analog-to-Digital-Converter for 0.25µm Embedded Array

Operation Voltage	2.3V to 2.7V
Conversion Frequency	30MHz 100kHz
Resolution	10bit

S1X60000 10bit DAC Macro

10bit Digital-to-Analog-Converter for 0.25µm Embedded Array

Operation Voltage	2.3V to 2.7V
Conversion Frequency	50MHz
Resolution	10bit

S1X60000 High Speed PLL Macro

High Speed Phase Lock Loop for 0.25µm Embedded Array

Macro Type	High Speed
Operation Voltage	2.3V to 2.7V
Input Frequency	5MHz to 150MHz
Multiplication Ratio	x1 to x16
Output Frequency	20MHz to 400MHz
Period Jitter	+/-250psec
Duty	50% +/- 10%
Lock Up Time	100µsec
Low Pass Filter	On Chip
Temperature Range	-40 to 85 Celcius

S1X60000 Low Speed PLL Macro

Low Speed Phase Lock Loop for 0.25µm Embedded Array

Macro Type	Low Speed
Operation Voltage	2.3V to 2.7V
Input Frequency	32KHz
Multiplication Ratio	Max 16000
Output Frequency	20MHz to 400MHz
Period Jitter	+/-250psec
Duty	50% +/- 10%
Lock Up Time	100msec
Low Pass Filter	On Chip
Temperature Range	-40 to 85 Celcius

S1X60000 Flash Macro with Command I/F Erase/Program Interface

Flash for 0.25µm Embedded Array with "Command I/F" Erase/Program Interface

Operation Voltage	2.3 ~ 2.7V
Erase/Program Interface	Command I/F
Memory Size	256K 512K 1M 2M 4M
I/O	8bit 16bit
Sector Size	1K 4Kbyte/Sector
Chip Erase Time	100ms
Sector Erase Time	20ms
Byte Access Time	14µs
Read Access Time	45ns
Operating Current	15mA
Standby Current	10µs
Endurance Time	10000 cycle
Data Retention	10 years
Temperature Range	0 to 70°C

This product uses SuperFlash® technology licensed from Silicon Storage Technology, Inc

S1X60000 Flash Macro with Write Pulse Input Erase/Program Interface

Flash for 0.25µm Embedded Array with "Write Pulse Input" Erase/Program Interface

Operation Voltage	2.3 ~ 2.7V
Erase/Program Interface	Write Pulse Input
Memory Size	64K 128K 256K 512K 1M 2M
I/O	8bit 16bit
Sector Size	1K 4Kbyte/Sector
Chip Erase Time	100ms
Sector Erase Time	20ms
Byte Access Time	15µs
Read Access Time	50ns
Operating Current	15mA
Standby Current	10µs
Endurance Time	10000 cycle
Data Retention	10 years
Temperature Range	0 to 70°C

This product uses SuperFlash® technology licensed from Silicon Storage Technology, Inc

S1X60000 High Density SRAM Macro

High Density SRAM for 0.25µm Embedded Array

Operation Voltage	1.8V to 2.7V
Memory Size/Module	32K to 512Kbit
Data Bus Width (bit)	x8 x16 x32
Circuitry Type	Sync 1 Dual Port
Byte Write Operation	No
Operation Frequency	100MHz
Temperature Range	-40 to 85°C
Operation Current Typ	0.5mW/MHz

S1X60000 Normal SRAM Macro

Normal SRAM for 0.25µm Embedded Array

Operation Voltage	1.8V to 2.7V (0.9V)
Memory Size/Module	128 to 64Kbit
Data Bus Width (bit)	x1 to x32 1bit step
Circuitry Type	Sync 1 Dual Port
Byte Write Operation	Yes
Operation Frequency	90MHz
Temperature Range	-40 to 85°C
Operation Current Typ	0.33mW/MHz

70K series (0.18um): Analog macro cells

S1K70000 10bit DAC Macro

10bit Digital-to-Analog-Converter for 0.18µm Standard Cell

Operation Voltage	1.65V to 1.95V
Conversion Frequency	50MHz 100MHz
Resolution	10bit

S1K70000 8bit DAC Macro

8bit Digital-to-Analog-Converter for 0.18µm Standard Cell

Operation Voltage	1.65V to 1.95V
Conversion Frequency	200kHz to 1MHz
Resolution	8bit

S1K70000 High Speed PLL Macro

High Speed Phase Lock Loop for 0.18µm Standard Cell

Macro Type	High Speed
Operation Voltage	3.0V to 3.6V
Input Frequency	5MHz to 150MHz
Multiplication Ratio	x1 to x16
Output Frequency	20MHz to 400MHz
Period Jitter	TBD
Duty	TBD
Lock Up Time	TBD
Low Pass Filter	On Chip
Temperature Range	-40 to 85 Celcius

S1K70000 Low Speed PLL Macro

Low Speed Phase Lock Loop for 0.18µm Standard Cell

Macro Type	Low Speed
Operation Voltage	1.65V to 1.95V
Input Frequency	32KHz
Multiplication Ratio	Max 16000
Output Frequency	20MHz to 400MHz
Period Jitter	TBD
Duty	TBD
Lock Up Time	TBD
Low Pass Filter	On Chip
Temperature Range	-40 to 85 Celcius

S1K70000 ADC Macro

Analog-to-Digital-Converter for 0.18µm Standard Cell

Operation Voltage	1.65V to 1.95V
Conversion Frequency	100MHz 30MHz 100kHz
Resolution	10bit

S1K70000 Normal SRAM Macro

Under development

Operation Voltage	TBD
Memory Size/Module	TBD to 4Mbit
Data Bus Width (bit)	x1 to x32 1bit step
Circuitry Type	Sync 1 Dual Port
Byte Write Operation	TBD
Operation Frequency	TBD
Temperature Range	TBD
Operation Current Typ	TBD