# Samsung Semiconductor, Inc.

## Product Selection Guide

**System LSI**

August 2007

## SYSTEM LSI

For more information on Samsung's dedicated 300mm logic foundry, go to
**www.samsung.com/global/business/semiconductor/products/strategicfoundry**

## ASIC LIBRARY

| Specialty | I/O Peripherals |
|---|---|
| SSTL2, SSTL18 | ARM PrimeCell Peripheral |
| LVDS | Samsung Peripheral |
| USB 1.1 | |
| MDDR | |

## ASIC PROCESS TECHNOLOGY

| Design Rule | 45nm | 65nm | | 90nm | |
|---|---|---|---|---|---|
| **Process Technology** | **L(D/R)4LP (=11LP)** | **L6G (=10FS)** | **L(D/R)6LP (=10LP)** | **L(D)9G (=9SF)** | **L(R)9LP (=9LP)** |
| Description | 45nm Low Power Process (with eDRAM/RFCMOS option) | 65nm Generic Process | 65nm Low Power Process (with eDRAM/RFCMOS option) | 90nm Generic Process (with eDRAM option) | 90nm Low Power Process (with RFCMOS option) |
| Vth Option | LVT/RVT/HVT | LVT/RVT/HVT | LVT/RVT/HVT | RVT/AVT/LVT/eMPU | sHVT/HVT/RVT/LVT |
| Core Voltage | 1.1V | 1.0V | 1.2V | 1.0~1.2V | 1.2V |
| I/O Voltage | 1.8~2.5V | 1.8~3.3V | 1.8~3.3V | 1.8~3.3V | 1.8~3.3V |
| SRAM Bit-cell | 0.29~0.359μm2 | 0.625μm2 | 0.54~0.676μm2 | 0.79~1.25μm2 | 0.79~1.25μm2 |
| eDRAM Bit-Cell | 0.11μm2 | | 0.189μm2 | 0.275μm2 | |
| Standard Cell Library | SS45LP (HVT/RVT/LVT) | SS65G (HVT/RVT/LVT) | SS65LP (HVT/RVT/LVT) | SS90G (RVT/LVT) | SS90LP (HVT/RVT/LVT) |
| Raw Gate Density | 1800kgate/mm2 (9 track) | 750kgate/mm2 (9 track) | 860kgate/mm2 (8 track) | 417kgate/mm2 (9 track) | 445kgate/mm2 (8 track) |
| Compiled Memory | RA1D-0.299<br>RA1S-0.374<br>RA2 (Dual-port SRAM) RF1 (1P REGFILE)<br>RF2 (2P REGFILE)<br>VROM | RA1-0.62<br>RA2 (Dual-port SRAM) RF1 (1P REGFILE)<br>RF2 (2P REGFILE)<br>VROM<br>SPSRAM (High-speed) | RA1-0.54<br>RA1-0.676<br>RA2<br>RF1 (1P REGFILE)<br>RF2 (2P REGFILE)<br>VROM<br>SPSRAM (High-speed)<br>UHD SPSRAM | VROM_HD | SPSRAM_HD<br>DPSRAM_HD<br>1P-REGFILE_HD<br>2P-REGFILE_HD<br>VROM_HD<br>SPSRAM_LP<br>DPSRAM_LP<br>1P-REGFILE_LP<br>2P-REGFILE_LP |
| GP I/O | 1.8/2.5/3.3V<br>40μm In-line CUP<br>25/50 Staggered CUP | 1.8/2.5/3.3V (5V tol)<br>50μm In-line CUP<br>30/60 Staggered CUP | 1.8/2.5/3.3V (5V tol)<br>50μm In-line CUP<br>30/60 Staggered CUP | 1.8/2.5/3.3V (5V tol)<br>50μm In-line CUP<br>30/60 Staggered CUP | 1.8/2.5/3.3V (5V tol)<br>50μm In-line CUP<br>30/60 Staggered CUP |

## ASIC IP

| Mixed Signal IP | | DSP IP | Processor IP | High Speed Interface IP | Embedded Memory IP |
|---|---|---|---|---|---|
| ADC | 10bit ~ 12bit, 0.5Msps ~ 140Msps | Teak-Lite | ARM7TDMI-S | PCI Express | Embedded DRAM |
| DAC | 10 ~ 12bit, 1M ~ 100Msps | Teak | ARM9 Series | USB 2.0 OTG | Psudo SRAM |
| PLL | ~600MHz FSPLL, ~2GHz FSPLL, SSCG PLL, Pixel PLL, DLL | | ARM11 Series | HDMI TX | |
| Audio CODEC | 8~96kHz Sigma-Delta audio CODEC | | ARM11 MPCore | MIPI | |
| DTV AFE | 12bit 150MHz ADC + A-Mux + Clamp + A-Buffer + Sync Slicer + PCG | | Cortex | SMIA | |
| PMU | | | | SATA PHY | |
| Voltage Regulator | | | | DDR/2/3 PHY | |
| | | | | | LVDS TX/RX |

## ASIC PROCESS DESCRIPTIONS

| Process | Geometry | Description |
|---|---|---|
| L13HS | 0.13μm | 1.2V High Speed Process |
| L(D/F)13G | 0.13μm | 1.2~1.5V Generic Process (with eDRAM/Flash option) |
| L13LP | 0.13μm | 1.5V Low Power Process |
| L(F)18 | 0.18μm | 1.8V Process (with Flash option) |
| L25 | 0.25μm | 2.5V Process |
| L35(H) | 0.35μm | 2.5V Process (with 5V dual gate oxide option) |

ASIC ORDERING INFORMATION http://www.samsung.com/Products/Semiconductor/Support/Label_CodeInfo/ASIC.pdf

# ASIC ORDERING INFORMATION

| S | 6 | X | X | X | X | X | X | X | X | - | X | X | X | X |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |

**1. System LSI (S)**

**2. Large Classification: ASIC (6)**

**3. Small Classification**

A : STN (Character)
B : STN (Graphic)
C : TFT (Large)
D : TFT (Mobile)
F : TFT (Midsmall)
E : OELD
P : PDI (DUAL)
T : TCON
V : Process Vehicle

**4~7.**

Serial No

**8. Version**

A~Z
***1st Version → X**

**9~10. Mask Option**

- STN (Character)
00~99 : Font
- STN (Graphic)
Mask Option
- TFT Device
Mask Option

**11. " - "**

**12~14. Package Type**

**- In Case of PKG**
(12) Package Type

A : SDIP
B : BUMP BIZ
C : CHIP BIZ
E : LQFP
J : ELP
K : TR
N : COB
Q : QFP
S : SOP
T : TQFP
W : WAFER
X : ETQFP

(13) Reserved

- PKG Option
0 : none

1 : Special Handling 1
2 : Special Handling 2
3 : Special Handling 3
A : Test Condition 1
B : Customer Option 1
C : Customer Option 2
D : Customer Option 3
E : Customer Option 4
G : Customer Option 6
H : Customer Option 7
J : Customer Option 8
K : Customer Option 9
L : Customer Option 10
M : Customer Option 11
N : Customer Option 12
P : Customer Option 13

- WAFER

0 : BUMP
1 : NO BUMP

(14) Packing

- In Case of TAB / COF
(12)(13) Film Type
00~49 → TAB
50~99 → COF

(14) Revision

1st Version → X

**15. Custom**

0 : No Grinding
1 : 250°æ10um
5 : 200±10um
8 : 300±10um (CHIP BIZ)
9 : 280°æ10um
A : 300±10um
C : 300±10um (Wafer)
G : 375±10um (CHIP BIZ)
J : 425±10um
K : 400±10um
L : 450±10um
M : 470±10um (Wafer)
N : 470±10um
R : 350±10um (Wafer)
U : 610±10um
V : 500±10um (CHIP BIZ)
W : 425±10um (Wafer)
X : 425±10um (CHIP BIZ)
Y : 470±10um (CHIP BIZ)
Z : No Grinding (CHIP / Wafer)

## CMOS IMAGE SENSORS

| Part Number | Type | Resol. | O/F | Pixels Horizontal | Pixels Vertical | Package | Production Status |
|---|---|---|---|---|---|---|---|
| S5KA3D | SOC | VGA | 1/10" | 640 | 480 | wafer or die | MP |
| S5K5AA | SOC | SXGA | 1/5" | 1280 | 1024 | wafer or die | MP |
| S5K4AA | SOC | SXGA | 1/4" | 1280 | 1024 | wafer or die | MP |
| S5K4BAF | SOC | UXGA | 1/4" | 1600 | 1200 | wafer or die | MP |
| S5K4B1F | CIS | UXGA | 1/4" | 1600 | 1200 | wafer or die | MP |
| S5K4CA | SOC | QXGA | 1/4" | 2048 | 1536 | wafer or die | Sampling |
| S5K4C1 | CIS | QXGA | 1/4" | 2048 | 1536 | wafer or die | Sampling |

NOTE: * O/F: Optical Format

## BW STN CHARACTER DISPLAY DRIVER IC FOR MOBILE DISPLAYS

| Part Number | Segment | Common | CGROM (Ch.) | CGRAM (Ch.) | Interface (Bits) | VDD (V) | Vlcd (Max V.) | DC/DC Convert (Times) | Package |
|---|---|---|---|---|---|---|---|---|---|
| S6A0031 | 80 | 8 | 10160 (254) | 80 (2) | 4 / 8 | 2.4~5.5 | 6 | 2~3 | Au bump chip |
| S6A0032 | 80 | 16 | 10160 (254) | 80 (2) | 4 / 8 | 2.4~5.5 | 6 | | Au bump chip |
| S6A0065 | | | 40 | | | 2.7~5.5 | 13 | | Bare die/64QFP |
| S6A0069 | 40 | 16 | 10080 (236) | 512 (8) | 4 / 8 | 2.7~5.5 | 13 | | Bare die/80QFP |
| S6A0070 | 80 | 16 | 8320 (224) | 512 (8) | 4 / 8 | 2.7~5.5 | 10 | | Bare die/Au bump chip |
| S6A0071 | 60 | 32 | 8400 (240) | 512 (8) | 4 / 8 | 2.4~5.5 | 13 | 2 | Au bump chip/TCP |
| S6A0072 | 40 | 16 | 9600 (240) | 160 (4) | 1 / 4 / 8 | 2.7~5.5 | 11 | | Au bump chip |
| S6A0073 | 60 | 34 | 9600 (240) | 512 (8) | 1 / 4 / 8 | 2.7~5.5 | 13 | 2~3 | Bare die |
| S6A0074 | 80 | 34 | 9600 (240) | 512 (8) | 1 / 4 / 8 | 2.7~5.5 | 13 | 2~3 | Bare die |
| S6A0075 | 100 | 34 | 9600 (240) | 512 (8) | 1 / 4 / 8 | 2.7~5.5 | 13 | 2~3 | Bare die |
| S6A0078 | 120 | 34 | 9600 (240) | 512 (8) | 1 / 4 / 8 | 2.7~5.5 | 13 | 2~3 | Bare die/TCP |
| S6A0079 | 120 | 34 | 9600 (240) | 512 (8) | 1 / 4 / 8 | 2.7~5.5 | 13 | 2~3 | Bare die |
| S6A0090 | 64 | 26 | 10240 (256) | 160 (4) | 1 / 4 / 8 | 2.4~5.5 | 11 | 2~3 | Au bump chip/TCP |
| S6A0093 | 80 | 26 | 10240 (256) | 320 (8) | 1 / 4 / 8 | 2.4~5.5 | 6 | 4 | Au bump chip/TCP |
| S6A0094* | 80 | 34 | 21760 (544) | 80 (6) | 1 / 4 / 8 | 2.2~3.6 | 7 | 4 | Au bump chip |
| S6A0067 | 80 | | | | | 2.7~5.5 | 10 | | Bare die/100QFP |
| S6A2068 | 60 | 16 | 8320 (224) | 512 (8) | 4 / 8 | 2.7~5.5 | 10 | | Bare die |

NOTES: Devices marked with an asterisk (*) are under development.
TCP (Tape Carrier Package)
Bare die is equivalent term with bare chip, pellet or die.
COF (Chip On Film) is available in case of TCP.

## BW STN GRAPHIC DISPLAY DRIVER IC FOR MOBILE DISPLAYS

| Part Number | Segment | Common | Interface (Bits) | DDRAM (Bits) | VDD (V) | Vlcd (Max V.) | DC/DC Convert (Times) | Package |
|---|---|---|---|---|---|---|---|---|
| S6B0107 | | 64 | 1 / 1 | | 4.5~5.5 | 17 | | |
| S6B0086 | | 80 | 1 / 4 | | 2.7~5.5 | 28 | | |
| S6B0715 | 100 | 33 | 1 / 8 | 8580 | 2.4~5.5 | 15 | 2~4 | Au bump chip/TCP |
| S6B0717 | 100 | 55 | 1 / 8 | 6500 | 2.4~5.5 | 15 | 2~5 | Au bump chip/TCP |
| S6B0718 | 104 | 81 | 1 / 8 | 9256 | 2.4~3.6 | 15 | 3~6 | Au bump chip/TCP |
| S6B0719 | 160 | 105 | 1 / 8 | 16800 | 2.4~3.6 | 15 | 3~6 | Au bump chip/TCP |
| S6B0723 | 132 | 65 | 1 / 8 | 8580 | 2.4~5.5 | 15 | 2~5 | TCP |
| S6B0724 | 132 | 65 | 1 / 8 | 8580 | 2.4~5.5 | 15 | 2~5 | Au bump chip |
| S6B0725 | 104 | 65 | 1 / 8 | 6860 | 2.4~3.6 | 15 | 2~5 | Au bump chip |
| S6B0728 | 132 | 128 | 1 / 8 | 16896 | 2.4~3.6 | 15 | 3~7 | Au bump chip/TCP |
| S6B0741 | 128 | 129 | 1 / 8 | 33024 | 1.8~3.3 | 15 | 3~6 | TCP |
| S6B0755 | 128 | 65 | 1 / 8 | 8320 | 1.8~3.3 | 15 | 3~5 | Au bump chip/TCP |
| S6B0756 | 96 | 65 | 1 / 8 | 6240 | 1.8~3.3 | 12 | 2~4 | Au bump chip |
| S6B0759 | 128 | 81 | 1 / 8 | 10368 | 1.8~3.3 | 15 | 3~6 | Au bump chip/TCP |
| S6B2400 | 96 | 65 | 1 / 8 | 12480 | 1.8~3.3 | 12 | 3~5 | Au bump chip |
| S6B0794 | 160 | 160 | 4 / 8 | | 2.4~5.5 | 32 | | Au bump chip/TCP |
| S6B0796 | 240 | 240 | 4 / 8 | | 2.4~5.5 | 32 | | Au bump chip/TCP |
| S6B1713 | 132 | 65 | 1 / 8 | 8580 | 2.4~5.5 | 15 | 2~5 | Au bump chip/TCP |

NOTES: Bare die is equivalent term with bare chip, pellet or die. TCP (Tape Carrier Package) COF (Chip On Film) is available in case of TCP.

## COLOR STN GRAPHIC DISPLAY DRIVER IC FOR MOBILE DISPLAYS

| Device Name | Segment | Common | Color Depth | DDRAM (Bits) | VDD (V) | Vlcd (Max V.) | DC/DC Convert (Times) | Package |
|---|---|---|---|---|---|---|---|---|
| S6B33A1 | 132 | 160 | 256/4k | 266,112 | 1.8~3.6 | 20 | 2, 3; -1; 2 | Au bump chip |
| S6B33A2 | 128 | 129 | 256/4k | 196,608 | 1.8~3.3 | 20 | 1, 1.5; -3; 2 | Au bump chip |
| S6B33B0 | 144 | 177 | 256/4k/65k | 405,504 | 1.8~3.3 | 20 | 1, 1.5; -3; 2 | Au bump chip |
| S6B3300* | 104 | 80 | 256/4k | 99,840 | 1.8~3.3 | 15 | 1, 1.5; -3; 2 | Au bump chip |

NOTES: Devices marked with an asterisk (*) are under development. TCP (Tape Carrier Package) Bare die is equivalent term with bare chip, pellet or die.
COF (Chip On Film) is available in case of TCP.

## COLOR STN GRAPHIC DISPLAY DRIVER IC FOR MOBILE DISPLAYS

| Part Number | RGB | Gate | Color Depth | Bit Map Area (RAM) | VCI (V) | Vlcd (Max V.) | Package |
|---|---|---|---|---|---|---|---|
| S6D0110 | 132 | 176 | 260K | 132*18*176 | 2.5~3.3 | 25V Max | Au bumped chip |
| S6D0114 | 132 | 176 | 260K | 132*18*176 | 2.5~3.3 | 25V Max | Au bumped chip |
| S6D0117 | 132 | 132 | 260K | 132*132*18 | 2.5~3.3 | 25V Max | Au bumped chip |
| S6D0118 | 176 | 240 | 260K | 176*18*240 | 2.5~3.3 | 25V Max | Au bumped chip |
| S6D0123 | 132 | 176 | 260K | 132*18*176 | 2.5~3.3 | 25V Max | Au bumped chip |
| S6D0129 | 240 | 320 | 260K | 240*18*320 | 2.5~3.3 | 30V Max | Au bumped chip |

NOTES: TCP (Tape Carrier Package) COF (Chip On Film) is available in case of TCP

# LCD DRIVER IC ORDERING INFORMATION

| S | 6 | X | X | X | X | X | X | X | X | - | X | X | X | X |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |

**1. System LSI (S)**

**2. Large Classification: LDI (6)**

**3. Small Classification**

A : STN (Character)
B : STN (Graphic)
C : TFT (Large)
D : TFT (Mobile)
F : TFT (Midsmall)
E : OELD
P : PDI (DUAL)
T : TCON
V : Process Vehicle

**4~7.**

Serial No.

**8. Version**

A~Z
***1st Version → X**

**9~10. Mask Option**

**- STN (Character)**
00~99: Font
**- STN (Graphic)**
Mask Option
**- TFT Device**
Mask Option

**11. " - "**

**12~14. Package Type**

**- In Case of PKG**

A : SDIP
B : BUMP BIZ
C : CHIP BIZ
E : LQFP
J : ELP
K : TR
N : COB
Q : QFP
S : SOP
T : TQFP
W : WAFER
X : ETQFP

(13) Reserved

- PKG Option
0 : none
1 : Special Handling 1
2 : Special Handling 2
3 : Special Handling 3
A : Test Condition 1
B : Customer Option 1
C : Customer Option 2
D : Customer Option 3
E : Customer Option 4
G : Customer Option 6
H : Customer Option 7
J : Customer Option 8
K : Customer Option 9
L : Customer Option 10
M : Customer Option 11
N : Customer Option 12
P : Customer Option 13

- WAFER
0 : BUMP
1 : NO BUMP

(14) Packing

**- In Case of TAB / COF**
(12)(13) Film Type
00~49 → TAB
50~99 → COF

(14) Revision

1st Version → X

**15. Back Lap**

0 : No Grinding
1 : 250±10um
5 : 200±10um
8 : 300±10um (CHIP BIZ)
9 : 280±10um
A : 300±10um
C : 300±10um (Wafer)
G : 375±10um (CHIP BIZ)
J : 425±10um
K : 400±10um
L : 450±10um
M : 470±10um (Wafer)
N : 470±10um
R : 350±10um (Wafer)
U : 610±10um
V : 500±10um (CHIP BIZ)
W : 425±10um (Wafer)
X : 425±10um (CHIP BIZ)
Y : 470±10um (CHIP BIZ)
Z : No Grinding (CHIP / Wafer)

## MOBILE APPLICATION PROCESSORS

| Part Number | Core (Cache) | Max Freq | Memory Inteface | Boot Option | Multimedia Features | Connectivity | Timer/PWM Counter | Serial Interface | DMA | Package |
|---|---|---|---|---|---|---|---|---|---|---|
| S3C3410 | ARM7TDMI (4KB) | 40MHz | ROM/SRAM SRDAM | NOR/ROM | LCD I/F 10-bit ADC x 8 | | WDT, RTC | UART/IIC 8/16-bit TCx5 | 2-ch SIOx2 | 128QFP |
| S3C44B0 | ARM7TDMI (8KB) | 66MHz | ROM/SRAM SDRAM | NOR/ROM | Mono/Color/Gray STN LCD I/F, IIS, 10-bit ADC x 8 | | WDT, RTC 16-bit TCx5 | UARTx2 IIC/IIS | 4-ch | 160LQFP 160FBGA |
| S3C2412 | ARM926EJ-S (8KB I/D) | 200MHz 266MHz | ROM/SRAM SDRAM/mSDRAM NAND | NOR /ROM NAND | TFT/STN(65K) LCD I/F, Touch Screen(ADC), IIS | USB host 1.1 USB device 1.1 SD(SDIO)/MMC CF/ATA | WDT, RTC 16-bit TC x4 | UARTx3(IrDA) SPIx2 IIC | 4-ch | 272FBGA |
| S3C2413 | ARM926EJ-S (8KB I/D) | 266MHz | ROM/SRAM SDRAM/mSDRAM DDR/mDDR x16 NAND/oneNAND | NOR/ROM NAND OneNAND | TFT/STN(65K) LCD I/F, Camera I/F 2MP, Touch Screen(ADC), IIS | USB host 1.1 USB device 1.1 SD(SDIO)/MMC, CF/ATA | WDT, RTC 16-bit TC x4 | UARTx3(IrDA) SPIx2 IIC | 4-ch | 289FBGA |
| S3C2410 | ARM920T (16KB-I,16KB-D) | 200MHz 266MHz | ROM/SRAM SDRAM/mSDRAM NAND | NOR/ROM NAND | TFT/STN LCD I/F, Touch Screen(ADC), IIS | USB host 1.1 USB device 1.1 SD(SDIO)/MMC | WDT, RTC 16-bit TC x4 | UARTx3(IrDA) SPIx2 IIC | 4-ch | 272FBGA |
| S3C2440 | ARM920T (16KB-I,16KB-D) | 300MHz 400MHz | ROM/SRAM SDRAM/mSDRAM NAND | NOR/ROM NAND | TFT/STN LCD I/F, Touch Screen(ADC), IIS, AC97, Camera I/F 16MP | USB host 1.1 USB device 1.1 SD(SDIO)/MMC | WDT, RTC 16-bit TC x4 | UARTx3(IrDA) SPIx2 IIC | 4-ch | 289FBGA |
| SC32442 | ARM920T (16KB-I,16KB-D) | 300MHz 400MHz | Stacked with 32/64MB mSDRAM, 64/128MB NAND | NOR/ROM NAND | TFT/STN LCD I/F, Touch Screen(ADC), IIS, AC97, Camera I/F 16MP | USB host 1.1 USB device 1.1 SD(SDIO)/MMC | WDT, RTC 16-bit TC x4 | UARTx3(IrDA) SPIx2 IIC | 4-ch | 332FBGA |
| S3C24A0 | ARM926EJ-S (16KB-I,16KB-D) | 266MHz | ROM/SRAM SDRAM/mSDRAM NAND | NOR/ROM NAND | TFT/STN LCD I/F, Touch Screen(ADC), IIS, AC97, Camera I/F 16MP Video CODEC(H.263/MPEG4) Modem I/F | USB host 1.1 USB device 1.1 SD(SDIO)/MMC Memory Stick | WDT, RTC 16-bit TC x4 | UARTx2(IrDA) SPIx2 IIC IrDA(v1.1) | 4-ch | 337FBGA |
| S3C2443 | ARM920T (16KB-I,16KB-D) | 400MHz 533MHz | ROM/SRAM SDRAM/mSDRAM DDR/mDDR x16 NAND/oneNAND | NOR/ROM NAND OneNAND | TFT(2-PIP)/STN LCD I/F, Camera I/F 8MP, IIS, AC97, Touch Screen(ADC) | USB host 1.1 USB device 1.1 SD(SDIO)/MMC x2 HS-MMC(CE-ATA) CF/ATA | WDT, RTC | UARTx4(IrDA) 16-bit TC x4 IIC IrDA(v1.1) | 6-ch SPIx2 | 400FBGA |
| S3C6400 | ARM1176JZF (16KB-I,16KB-D) (16KB I/D TCM) | 400MHz 533MHz 667MHz | ROM/SRAM DDR/mDDR x32 NAND/OneNAND | NOR/ROM NAND OneNAND MoviNAND Others | TFT(5-PIP) LCD I/F, Camera I/F 16MP, Touch Screen(ADC), 2D Graphic, IIS, AC97, PCM Video CODEC(H264,MPEG4,VC1) JPEG, TV-OUT | USB host 1.1, USB OTG 2.0 SD(SDIO)/MMC x3 HS-MMC(CE-ATA) CF/ATA Keypad, MIPI Modem Interface | WDT, RTC | UARTx4(IrDA) 32-bit TC x5 IIC IrDA(v1.1) | 32-ch SPIx2 | 424FBGA |

## HDTV/STB PRODUCTS

| Part Number | S3C2800 | S5H2000 | S5H2010 |
|---|---|---|---|
| Product Description | Co-Processor for DTV MPEG Decoder | DTV MPEG Decoder | DTV MPEG Decoder |
| Typical Applications | Set top box, HDTV, General Purpose | Low-Mid-Range HDTV/STB | Low-Mid-Range HDTV/STB |
| Package | 208 LQFP | 352 TBGA | 492 BGA |
| CPU Core | ARM920T | Uses External S3C2800 CPU | Uses External S3C2800 CPU |
| Max Frequency | 200MHz | 135MHz | 135MHz |
| Data Bus (bits) | 32 | 32 | 32 |
| Serial Interface | PCI (32 bits, 33MHz) | PCI (32 bits, 33MHz) | PCI (32 bits, 33MHz, UART, Smart Card |
| I/O Pins | | 244 | 276 |
| I/O Ports | 44 General Purpose | | |
| Interupts (Ext) | 34 | | |
| Timer | 3-Ch, 16-Bit Watchdog | | |
| Cache | 16KB-I, 16KB-D | | |
| DMA/UART | 4-Ch / 2-Ch | | |
| Other Features | On-Chip PLL Clock Generator | Display Processor (IPC, Scaler) | Display Processor (IPC, Scaler) |
| | | Digital HD (24bits)/SD (8bits) Input | Digital HD (24bits)/SD (8bits) input |
| | | CCIR 656-like input | CCIR 656-like input |
| | | Digital/Analog HD output | Digital/Analog HD output |
| | | Analog SD output | Analog SD output |
| | | 2 Sets of Triple 10 bit DAC | 2 Sets of Triple 10 bit DAC with enhanced CAS |
| | | 2D Graphics, TS Demux | 2D Graphics, TS Demux Enhanced |

## 4-BIT MICROCONTROLLER FAMILY

| Part Name | Package Type | ROM Kbytes | RAM Nibble | I/O Pins | Interrupt (Int/Ext) | Timer/ Counters | SIO | LCD (Seg/Com) | ADC (Bit x Ch) | PWM(1) (BitxCh) | DTMF | Max. OSC. Freq. | Vdd (V) | OTP Equivalent |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **SS3C7xxx (KS57) Series** | | | | | | | | | | | | | | |
| S3C70F4XZ0-AV94 | 30SDIP | 4 | 512 | 24 | 3/2 | BT/WT/8TC | Yes | | Comx4 | | | 6MHz | 1.8~5.5 | S3P70F4X |
| S3C70F4XZ0-SO94 | 32SOP | | | | | | | | | | | | | |
| S3C7235DZ0-QW85 | 80QFP | 16 | 512 | 40 | 3/3 | BT/WT/WDT/8T | Yes | 32/4 | | | | 6MHz | 1.8~5.5 | S3P7235X |
| S3C72H8XZ0-QT88 | 64QFP | 8 | 512 | 21 | 3/3 | BT/WT/WDT/8T/16T | | 26/4 | Comx2 | | | 6MHz | 1.8~5.5 | S3P72H8X |
| S3C72K8XZ0-QW88 | 80QFP | 8 | 1024 | 27 | 3/4 | BT/WT/8TC | Yes | 40/8 | Comx2 | | | 6MHz | 2.0~5.5 | S3P72K8X |
| S3C72M9XZ0-QA89 | 128QFP | 32 | 3840 | 51 | 5/4 | BT/WT/WDT/8T/16T | Yes | 80/16 | Comx3 | | | 6MHz | 1.8~5.5 | S3P72M9X |
| S3C72N5XZ0-QW85 | 80QFP | 16 | 512 | 40 | 3/3 | BT/WT/8TC | Yes | 32/4 | | | | 6MHz | 1.8~5.5 | S3P72N5X |
| S3C72P9XZ0-QX89 | 100QFP | 32 | 1056 | 39 | 4/4 | BT/WT/8TC/16TC | Yes | 56/16 | | | | 6MHz | 1.8~5.5 | S3P72P9X |
| S3C72Q5XZ0-QX85 | 100QFP | 16 | 5264 | 39 | 3/3 | BT/WT/8TCx2 | | 60/12 | | | | 6MHz | 1.8~5.5 | S3P72Q5X |
| S3C7335XZ0-QW85 | 80QFP | 16 | 512 | 56 | 4/4 | BT/WT/WDT/8T | Yes | 28/4 | 8x4 | | | 6MHz | 1.8~5.5 | S3P7335X |
| S3C7414DZ0-AQ94 | 42SDIP | 4 | 256 | 35 | 5/3 | BT/WT/WDT/8Tx2 | Yes | | 8x6 | (8x1) | | 6MHz | 1.8~5.5 | S3P7414D |
| S3C7414DZ0-QZ84 | 44QFP | | | | | | | | | | | | | |
| S3C7515DZ0-AT95 | 64SDIP | 16 | 512 | 55 | 4/3 | BT/WT/8Tx2 | Yes | | | | Yes | 6MHz | 2.0~5.5 | S3P7515D |
| S3C7515DZ0-QT85 | 64QFP | | | | | | | | | | | | | |
| S3C7528DZ0-AQ98 | 42SDIP | 8 | 768 | 35 | 3/3 | BT/WT/WDT/8Tx2 | | | | | Yes | 6MHz | 1.8~5.5 | S3P7528D |
| S3C7528DZ0-QZ88 | 44QFP | | | | | | | | | | | | | |
| S3C7544XZ0-AM94 | 24SDIP | 4 | 512 | 17 | 2/2 | BT/WDT/8T | | | | | | 6MHz | 1.8~5.5 | S3P7544X |
| S3C7544XZ0-SM94 | 24SOP | | | | | | | | | | | | | |
| S3C7559XZ0-AT99 | 64SDIP | 32 | 1024 | 55 | 4/3 | BT/WT/WDT/8Tx2 | Yes | | | | Yes | 6MHz | 1.8~5.5 | S3P7559X |
| S3C7559XZ0-QT89 | 64QFP | | | | | | | | | | | | | |
| S3C7588AZ0-C0C8 | 44Pellet | 8 | 768 | 25 | 4/4 | BT/WT/WDT/8TCx2 | | | | | Yes | 3.58MHz | 2.7~5.5 | S3P7588X |

NOTES: *Under development. Contact Samsung sales office for availability.
(1) ( ) S/W supported PWM
(2) SIO mode can be selected by S/W
(3) Flash: Writing endurance is 10K times
(4) MTP: Writing endurance is 100 times

Abbreviations:
ADC=Analog to Digital Converter
DTMF=Dual Tone Multi Frequency
CAS=CPE Alerting Signal
PWM=Pulse Width Modulation
SIO=Serial Input/Output
8T/16T=8-bit /16-bit Timer
BT/WT/WDT=Basic/Watch/Watchdog Timer
DAC=Digital to Analog Converter
ZCD=Zero Cross Detection circuit
Com=Comparator
FSK=Frequency Shift Keying

# 8-BIT MICROCONTROLLER FAMILY

| Part Name | Package Type | ROM Kbytes | RAM Bytes | I/O Pins | Interrupt (Int/Ext) | Timer/ Counter | Serial Interface | LCD (Seg/Com) | ADC (Bit x Ch) | PWM(1) (BitxCh) | Max. OSC. Freq. | Vdd (V) | OTP or Flash Equivalent |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **S3C9xxx (KS86) Series** | | | | | | | | | | | | | |
| S3C9228AZ0-AQ98<br>S3C9228AZ0-QZ88<br>S3C9228AZ0-LR88 | 42SDIP<br>44QFP<br>48ELP | 8 | 256 | 36 | 4/10 | BT/WT/8TCx2 | SIO | 16x8 | 10x4 | | 8MHz | 2.0~5.5 | S3P9228A |
| S3C9234XZ0-QT84 | 64QFP | 4 | 208 | 52 | 5/7 | BT/WT/8TCx2 | SIO | 32/4 | | | 8MHz | 2.0~5.5 | S3P9234X |
| S3C9404DZ0-AV94<br>S3C9404DZ0-SO94 | 30SDIP<br>32SOP | 4 | 208 | 22 | 3/3 | BT/WDT/8Tx2 | | | 8x8 | (10x1) | 10MHz | 2.7~5.5 | S3P9404D |
| S3C9428XZ0-SN98<br>S3C9428XZ0-SO98<br>S3C9428XZ0-AV98 | 28SOP<br>32SOP<br>30SDIP | 8 | 208 | 24 | 5/4 | BT/WDT/8Tx2 | IIC, SIO | | 10x12 | 12x2, (8x1) | 16MHz | 1.8~5.5 | S3P9428X |
| S3C9434XZ0-DI94<br>S3C9434XZ0-DK94<br>S3C9434XZ0-SK94 | 18DIP<br>20DIP<br>20SOP | 4 | 112 | 11/13 | 3/2 | BT/WDT/8T | SIO | | 10x5 | 12x1 | 16MHz | 3.0~5.5 | S3P9434X |
| S3C9444XZ0-SC94<br>S3C9444XZ0-DC94 | 8SOP<br>8DIP | 4 | 208 | 6 | 1/2 | BT/8TC | | | 10x3 | | 10MHz | 2.0~5.5 | S3F9444X(4) |
| S3C9454BZ0-DH94<br>S3C9454BZ0-SH94<br>S3C9454BZ0-RH94<br>S3C9454BZ0-DK94<br>S3C9454BZ0-SK94<br>S3C9454BZ0-VK94 | 16DIP<br>16SOP<br>16TSSOP<br>20DIP<br>20SOP<br>20SSOP | 4 | 208 | 14/18 | 2/2 | BT/8TC | | | 10x9 | 8x1 | 10MHz | 2.0~5.5 | S3F9454B(4) |
| S3C9488XZ0-AO98<br>S3C9488XZ0-SO98<br>S3C9488XZ0-AQ98<br>S3C9488XZ0-QZ88 | 32SDIP<br>32SOP<br>42SDIP<br>44QFP | 8 | 208 | 26/36/38 | 6/4 | BT/8T | UART | 19/8 | 10x9 | | 10MHz | 2.2~5.5 | S3F9488X(4) |
| S3C9498XZ0-SN98<br>S3C9498XZ0-SO98<br>S3C9498XZ0-AO98<br>S3C9498XZ0-AV98 | 28SOP<br>32SOP<br>32SDIP<br>30SDIP | 8 | 208 | 22/24/26 | 11/5 | BT/8TCx4/16TC | SIO, UART | | 10x8 | 12x1, (8x1) | 8MHz | 2.0~5.5 | S3F9498X(4) |
| S3C94A5XZ0-QZ85<br>S3C94A5XZ0-AQ95<br>S3C94A5XZ0-AO95 | 44QFP<br>42SDIP<br>32SDIP | 16 | 368 | 34 | 8/15 | BT/WT/8TC/16TCx2 | SIO | | 10x16 | 8x1, 16x2 | 12MHz | 2.0 ~5.5 | S3F94A5X(4) |
| S3C9688XZ0-AQ98<br>S3C9688XZ0-QZ88 | 42SDIP<br>44QFP | 8 | 208 | 32 | 15/14 | BT/WDT/8T | USB | | | | 6MHz | 4.0~5.25 | S3P9688X |
| **S3C8xxx (KS88) Series** | | | | | | | | | | | | | |
| S3C80A5BZ0-SM95<br>S3C80A5BZ0-AM95 | 24SOP<br>24SDIP | 16 | 272 | 19 | 5/8 | BT/WDT/8Tx2/16T | | | | 8x1 | 8MHz | 2.0~3.6 | S3P80A5A |
| S3C80B5XZ0-SM95<br>S3C80B5XZ0-AM95 | 24SOP<br>24SDIP | 16 | 272 | 19 | 5/8 | BT/WDT/8Tx2/16T | | | | 8x1 | 4MHz | 1.7~3.6 | S3P80B5X |
| S3C80C5XZ0-SM95<br>S3C80C5XZ0-AM95 | 24SOP<br>24SDIP | 16 | 272 | 19 | 5/8 | BT/WDT/8Tx2/16T | | | | 8x1 | 4MHz | 1.7~3.6 | S3P80C5X |
| S3C80F9BZ0-SO99<br>S3C80F9BZ0-AQ99<br>S3C80F9BZ0-QZ89<br>S3C80F9BZ0-LR89 | 32SOP<br>42SDIP<br>44QFP<br>48ELP | 32 | 272 | 38 | 5/16 | BT/8TC/16TC | | | | 8x1 | 8MHz | 2.0~5.0 | S3P80F9X |
| S3C80G9BZ0-SN99<br>S3C80G9BZ0-SO99<br>S3C80G9BZ0-AQ99<br>S3C80G9BZ0-QZ89 | 28SOP<br>32SOP<br>42SDIP<br>44QFP | 32 | 272 | 38 | 5/16 | BT/8TC/16TC | | | | 8x1 | 4MHz | 1.7~3.6 | S3P80G9X |
| S3C80J9XZ0-SO99<br>S3C80J9XZ0-SN99 | 32SOP<br>28SOP | 32 | 272 | 26 | 12/10 | BT/8T/16T | | | | 8x1 | 8MHz | 1.95~3.6 | S3F80J9X(3) |
| S3C80JBBZ0-QZ8B<br>S3C80JBBZ0-SO9B | 44QFP<br>32SOP | 64 | 272 | 38 | 14/10 | BT/8T/16Tx2 | | | COMx4 | 8x1 | 8MHz | 1.95~3.6 | S3F80JBB(3) |
| S3F80K5XZ0-SM95<br>S3F80K5XZ0-SN95 | 44QFP<br>32SOP | 16 | 272 | 22 | 16/8 | BT/8T/16Tx2 | | | | 8x1 | 8MHz | 1.65~3.6 | S3F80K5X(3) |
| S3F80K9XZ0-QZ89<br>S3F80K9XZ0-SO99<br>S3F80K9XZ0-SN99 | 44QFP<br>32SOP<br>28SOP | 32 | 272 | 38 | 16/8 | BT/8T/16Tx2 | | | | 8x1 | 8MHz | 1.65~3.6 | S3F80K9X(3) |
| S3F80KBXZ0-QZ8B<br>S3F80KBXZ0-SO9B | 44QFP<br>32SOP | 64 | 272 | 38 | 16/8 | BT/8T/16Tx2 | | | | 8x1 | 8MHz | 1.65~3.6 | S3F80KBX(3) |
| S3F80L4XZ0-AO94<br>S3F80L4XZ0-SO94<br>S3F80L4XZ0-SN94 | 32SDIP<br>32SOP<br>28SOP | 4 | 144 | 26 | 2/8 | BT/8TC | | | | 8x1 | 8MHz | 2.0~5.5 | S3F80L4X(4) |
| S3C80M4XZ0-DK94<br>S3C80M4XZ0-SK94<br>S3C80M4XZ0-DH94<br>S3C80M4XZ0-SH94 | 20DIP<br>20SOP<br>16DIP<br>16SOP | 4 | 128 | 15/11 | 2/4 | BT/8TC | | | | 8x1 | 10MHz | 2.0~5.5 | S3F80M4X(4) |

## 8-BIT MICROCONTROLLER FAMILY

| Part Name | Package Type | ROM Kbytes | RAM Bytes | I/O Pins | Interrupt (Int/Ext) | Timer/ Counter | Serial Interface | LCD (Seg/Com) | ADC (Bit x Ch) | PWM(1) (BitxCh) | Max. OSC. Freq. | Vdd (V) | OTP or Flash Equivalent |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **S3C8xxx (KS88) Series** | | | | | | | | | | | | | |
| S3C8235BZ0-QT85<br>S3C8235BZ0-ET85 | 64QFP<br>64LQFP | 16 | 552 | 32 | 8/8 | BT/8TCx2/16TC | | 24/8 | 10x8 | 8x2 | 8MHz | 2.0~5.5 | S3F8235X(4) |
| S3C8245AZ0-TW85<br>S3C8245AZ0-QW85 | 80TQFP<br>80QFP | 16 | 544 | 45 | 8/8 | BT/WDT/8Tx2/16Tx2 | SIO | 32/4 | 10x8 | (8x2, 16x1) | 10MHz | 1.8~5.5 | S3P8245X |
| S3C8249XZ0-TW89<br>S3C8249XZ0-QW89 | 80TQFP<br>80QFP | 32 | 1056 | 45 | 8/8 | BT/WDT/8Tx2/16Tx2 | SIO | 32/4 | 10x8 | (8x2, 16x1) | 10MHz | 1.8~5.5 | S3P8249X |
| S3C825ACZ0-TW8A<br>S3C825ACZ0-QW8A | 80TQFP<br>80QFP | 48 | 2096 | 67 | 11/12 | BT/WT/8TC/16TC | SIO, UART | 28/8 | 10x4 | (8x1, 16x1) | 8MHz | 2.0~5.5 | S3P825AX |
| S3C826AXZ0-QC8A | 144QFP | 48 | 2k | 128 | 9/12 | BT/8TCx3/16TC | SIO | 80/16 | 8x4 | 8x2 | 8MHz | 2.0~5.5 | S3P826AX |
| S3C8274XZ0-QT84<br>S3C8274XZ0-ET84 | 64QFP<br>64LQFP | 4 | 256 | 52 | 4/8 | WT/BT/8TCx2 | SIO | 32/4 | | | 8MHz | 2.0~3.6 | S3F8274X(4) |
| S3C8275XZ0-QT85<br>S3C8275XZ0-ET85 | 64QFP<br>64LQFP | 16 | 512 | | | | | | | | | | S3F8275X(3) |
| S3C8278XZ0-QT88<br>S3C8278XZ0-ET88 | 64QFP<br>64LQFP | 8 | 256 | | | | | | | | | | S3F8278X(4) |
| S3C8285XZ0-QW85<br>S3C8285XZ0-TW85 | 80QFP<br>80TQFP | 16 | 512 | 65 | 10/8 | BT/WT/8TCx2/16TCx2 | UART, SIO | 32/8 | 10x8 | 8x1,16x1 | 11.1MHz | 2.0~3.6 | S3F8285X(4) |
| S3C8289XZ0-QW89<br>S3C8289XZ0-TW89 | 80QFP<br>80TQFP | 32 | 1024 | | | | | | | | | | S3F8289X(4) |
| S3C828BXZ0-QW8B<br>S3C828BXZ0-TW8B | 80QFP<br>80TQFP | 64 | 2560 | | | | | | | | | | S3F828BX(3) |
| S3F82E5XZ0-QZ85<br>S3F82E5XZ0-TB85 | 44QFP<br>48TQFP | 16 | 208 | 38 | 5/4 | BT/WT/8TC | SIO | 23/4 | | | 8MHz | 2.0~3.6 | S3F82E5X(4) |
| S3F82F5XZ0-QX85<br>S3F82F5XZ0-TX85 | 100QFP<br>100TQFP | 16 | 2.5K | 44 | 6/12 | BT/WT/8TCx2/16TC | SIO | 60/16 | | 8x1 | 8MHz | 2.0~5.0 | S3F82F5X(4) |
| S3F82HBXZZ-QX8B<br>S3F82HBXZZ-TX8B | 100QFP<br>100TQFP | 64 | 2.5K | 83 | 17/12 | BT/WT/8TCx2/16TCx2 | UARTx2, SIO | 52/8 | 10x8 | 8x1, 16x2 | 12MHz | 2.0~3.6 | S3F82HBX(3) |
| S3F82I9XZZ-QW89<br>S3F82I9XZZ-TW89 | 80QFP<br>80TQFP | 32 | 1024 | 63 | 10/8 | BT/WT/8TCx2/16TCx2 | UART, SIO | 32/8 | 10X8 | 8x1, 16x2 | 12MHz | 2.0~3.6 | S3F82I9X (3) |
| S3C830AXZ0-QX8A | 100QFP | 48 | 2084 | 72 | 10/8 | BT/WDT/8Tx2/16T | SIOx2 | 40/4 | 8x4 | 8x1 | 4.5MHz | 3.0~5.5 | S3P830AX |
| S3F833BXZ0-QX8B | 100QFP | 64 | 2.5K | 86 | 13/8 | BT/WDT/WT/8Tx2/16T | SIOx2, UARTx2 | 40/8 | 10x12 | 8x1 | 12MHz | 2.0~3.6 | Flash Only<br>S3F833BX(4) |
| S3F834BXZ0-TX8B | 100TQFP | 64 | 2.5K | 86 | 13/8 | BT/WDT/WT/8Tx2/16T | SIOx2, UARTx2 | 40/8 | 10x12 | 8x1 | 12MHz | 2.0~3.6 | Flash Only<br>S3F834BX(4) |
| S3C8454XZ0-TW84<br>S3C8454XZ0-QW84 | 80TQFP<br>80QFP | 4 | 1040 | 42 | 8/8 | BT/WDT/8Tx2/16Tx2 | SIO | | 8x4 | 8x2, (16x2) | 25MHz | 4.5~5.5 | S3P8454X |
| S3C8469XZ0-AT99<br>S3C8469XZ0-QT89<br>S3C8469XZ0-LT89 | 64SDIP<br>64QFP<br>64ELP | 32 | 528 | 56 | 11/10 | BT/WDT/8Tx2/16Tx2 | UART, SIO | | 10x8 | 14x2, (8x2) | 12MHz | 2.7~5.5 | S3P8469X |
| S3C8475XZ0-AQ95<br>S3C8475XZ0-QZ85 | 42SDIP<br>44QFP | 16 | 272 | 36 | 6/8 | BT/WDT/8T/16T | UARTx2 | | 10x8 | (8x1, 10x1) | 12MHz | 2.7~5.5 | S3P8475X |
| S3C848AXZZ-AT9A<br>S3C848AXZZ-QT8A | 64SDIP<br>64QFP | 48 | 2064 | 56 | 15/14 | BT/8TCx4/16Tx2 | UARTx2 SIO | | 10x8 | 14x2, (8x2) | 12MHz | 2.7~5.5 | S3P848AX |
| S3C84BBXZ0-TW8B<br>S3C84BBXZ0-QW8B | 80TQFP<br>80QFP | 64 | 2064 | 70 | 14/10 | BT/8TCx2/16TCx2/8Tx2 | UARTx2, SIO | | 10x8 | 8*1 (DAC) | 10MHz | 2.7~5.5 | S3F84BBX(3) |
| S3C84DBXZ0-TW8B<br>S3C84DBXZ0-QW8B | 100TQFP<br>100QFP | 64 | 2064 | 90 | 14/10 | BT/8TCx4/16TCx2 | UARTx2, SIO | 48/8 | 10x8 | 8*1 (DAC) | 10MHz | 2.7~5.5 | S3F84DBX(3) |
| S3C84E9XZ0-AQ99<br>S3C84E9XZ0-QZ89 | 42SDIP<br>44QFP | 16 | 272 | 34/36 | 9/12 | BT/WT/8T/8TC/16TCx2 | UART | | 10x8 | (8x1) | 12MHz | 2.7~5.5 | S3P84E9X |
| S3C84H5XZ0-AO95<br>S3C84H5XZ0-SO95<br>S3C84H5XZ0-LO85<br>S3C84H5XZ0-AV95<br>S3C84H5XZ0-SN95 | 32SDIP<br>32SOP<br>32ELP<br>30SDIP<br>28SOP | 16 | 272 | 22/20/18 | 12/4 | BT/WT/8TCx2/16TCx2 | UART, SIO | | 10x8 | 10x1 | 10MHz | 2.4~5.5 | S3F84H5X(4) |
| S3C84I8XZ0-AQ98 | 42SDIP | 8 | 292 | 34/32 | 12/4 | BT/WT/8TCx2/16TCx2 | UART, SIO | 16/8 | 10x8 | 10x1 | 10MHz | 2.4~5.5 | S3F84I8X(4) |
| S3C84I8XZ0-QZ88 | 44QFP | | | | | | | | | | | | |
| S3C84I9XZ0-AQ99 | 42SDIP | 32 | 528 | | | | | | | | | | S3F84I9X(3) |
| S3C84I9XZ0-QZ89 | 44QFP | | | | | | | | | | | | |
| S3F84K4XZ0-DH94 | 16DIP | 4 | 208 | 11/18 | 2/2 | BT/16(8X2)T | | | 10x9 | 12x1 | 8MHz | 2.0~5.5 | Flash Only<br>S3F84K4X(4) |
| S3F84K4XZ0-SH94 | 16SOP | | | | | | | | | | | | |
| S3F84K4XZ0-RH94 | 16TSSOP | | | | | | | | | | | | |
| S3F84K4XZ0-DK94 | 20DIP | | | | | | | | | | | | |
| S3F84K4XZ0-SK94 | 20SOP | | | | | | | | | | | | |
| S3F84K4XZ0-VK94 | 20SSOP | | | | | | | | | | | | |

# 8-BIT MICROCONTROLLER FAMILY

| Part Name | Package Type | ROM Kbytes | RAM Bytes | I/O Pins | Interrupt (Int/Ext) | Timer/ Counter | Serial Interface | LCD (Seg/Com) | ADC (Bit x Ch) | PWM(1) (BitxCh) | Max. OSC. Freq. | Vdd (V) | OTP or Flash Equivalent |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **S3C8xxx (KS88) Series** | | | | | | | | | | | | | |
| S3F84MBXZ0-TW8B | 80TQFP | 64 | 2064 | 70 | 17/10 | BT/8TCx2/16TCx2/8Tx2 | UARTx3, SIOx2 | | 10x5 | 8x2 | 10MHz | 2.4~5.5 | Flash Only S3F84MBX(3) |
| S3F84MBXZ0-QW8B | 80QFP | | | | | | | | | | | | |
| S3F84NBXZ0-AT9B* | 64SDIP | 64 | 2064 | 56 | 15/14 | BT/8Tx316TCx2 | UARTx2, SIO | | 10x8 | | 10MHz | 2.4~5.5 | Flash Only S3F84MBX(3) |
| S3F84NBXZ0-QT8B* | 64QFP | | | | | | | | | | | | |
| S3F84P4XZ0-SC94 | 8SOP | 4 | 208 | 6 | 2/2 | BT/16(8X2)T | | | 10x4 | 12x1 | 10MHz | 2.0~5.5 | Flash Only S3F84P4X(4) |
| S3F84P4XZ0-DC94 | 8DIP | | | | | | | | | | | | |
| S3F84Q5XZZ-SN95* | 28SOP | 16 | 528 | 26 | 14/9 | BT/WT/8TCx2/16TCx2 | UART, SIO | | 10x8 | 14x1 | 10MHz | 2.0~5.5 | Flash Only S3F84Q5X (3)* |
| S3F84Q5XZZ-AV95* | 30SDIP | | | | | | | | | | | | |
| S3F84Q5XZZ-AO95* | 32SDIP | | | | | | | | | | | | |
| S3F84Q5XZZ-SO95* | 32SOP | | | | | | | | | | | | |
| S3F84S5XZZ-DH95* | 16DIP | 16 | 272 | 17/13 | 6 | BT/8T | | | 12x9 | 12x1 | 10MHz | 2.4~5.5 | Flash Only S3F84S5X (3)* |
| S3F84S5XZZ-DK95* | 20DIP | | | | | | | | | | | | |
| S3F84S5XZZ-SH95* | 16SOP | | | | | | | | | | | | |
| S3F84S5XZZ-SK95* | 20SOP | | | | | | | | | | | | |
| S3F84T5XZZ-SN95* | 28SOP | 16 | 272 | 18/20/22 | 16 | BT/WT/8TCx2/16TCx2 | UART, SIO | | 10x8 | 10x1 | 10MHz | 2.4~5.5 | Flash Only S3F84T5X (3)* |
| S3F84T5XZZ-AO95* | 32SDIP | | | | | | | | | | | | |
| S3F84T5XZZ-SO95* | 32SOP | | | | | | | | | | | | |
| S3F84UAXZZ-QZ8A* | 44QFP | 48 | 528 | 32/30 | 12/12 | BT/WDT/WT/ 8TCx3/16TCx2 | UARTx2, SIO | 20/8 | 10x8 | 8x3 | 12MHz | 1.8~5.5 | Flash Only S3F84UAX (3)* |
| S3F84UAXZZ-AQ9A* | 42SDIP | | | | | | | | | | | | |
| S3F84VBXZZ-QT8B* | 64QFP | 64 | 2064 | 54 | 12/12 | BT/WDT/WT/ 8TCx3/16TCx2 | UARTx2, SIO | | 10x8 | 8x3 | 12MHz | 1.8~5.5 | Flash Only S3F84VBX (3)* |
| S3F84VBXZZ-AT9B* | 64SDIP | | | | | | | | | | | | |
| S3F84V9XZZ-QT89* | 64QFP | 32 | 1040 | 54 | 12/12 | BT/WDT/WT/ 8TCx3/16TCx2 | UARTx2, SIO | | 10x8 | 8x3 | 12MHz | 1.8~5.5 | Flash Only S3F84V9X (3)* |
| S3F84V9XZZ-AT99* | 64SDIP | | | | | | | | | | | | |
| S3F84YBXZZ-QW8B* | 80TQFP | 64 | 2064 | 70 | 13/12 | BT/WDT/WT/ 8TCx4/16TCx2 | UARTx2, SIO | | 10x8 | 8x4 | 12MHz | 1.8~5.5 | Flash Only S3F84YBX (3)* |
| S3F84YBXZZ-TW8B* | 80QFP | | | | | | | | | | | | |
| S3F84ZBXZZ-TX8B* | 100TQFP | 64 | 2064 | 90 | 13/14 | BT/WDT/WT/ 8TCx4/16TCx2 | UARTx2, SIO | | 10x8 | 8x4 | 12MHz | 1.8~5.5 | Flash Only S3F84ZBX (3)* |
| S3F84ZBXZZ-QX8B* | 100QFP | | | | | | | | | | | | |
| S3C851BXZ0-QD8B | 160QFP | 64 | 1808 | 42 | 1/7 | BT/WDT/WT/8T/16T | UART, SIO | 56/34 | 10x4 | | 3.58MHz | 2.7~5.5 | S3P851BX |
| S3C863AXZ0-AQ9A | 42SDIP | 48 | 1040 | 27 | 7/3 | BT/8TC/8T/12C | M/M IIC, Slave IIC | | 8x4 | 8x7 | 12MHz | 3.0~5.5 | S3P863AX |
| S3C863AXZ0-QZ8A | 44QFP | | | | | | | | | | | | |
| S3C8647XZ0-AO97 | 32SDIP | 24 | 384 | 19 | 6/3 | BT/8TC/8T/12C | IIC | | 4x4 | 8x6 | 12MHz | 4.0~5.5 | S3F8647X(4) |
| S3C866BXZ0-AQ9B | 42SDIP | 64 | 1040 | 30 | 9/2 | BT/WDT/8TCx3 | IIC | | 8x8 | 8x7 | 24MHz | 2.3~3.6V | S3F866BX(4) |
| S3C866BXZ0-QZ8B | 44QFP | | | | | | | | | | | | |
| S3C866BXZ0-PZ9B | 44PLCC | | | | | | | | | | | | |
| S3C880AXZ0-AQ9A | 42SDIP | 48 | 336 | 26 | 5/4 | BT/8TCx2 | | | 8x4 | 14x2, 8x4(8x1) | 8MHz | 4.5~5.5 | S3F880AX(4) |
| S3C8849XZ0-AQ99 | 42SDIP | 32 | 272 | 26 | 5/4 | BT/WDT/8Tx2 | | | 4x4 | 14x2, 8x4(8x1) | 8MHz | 4.5~5.5 | S3P8849X |
| **S3CKxxx (Calm8) Series** | | | | | | | | | | | | | |
| S3FK11XZZ-QA8F | 128QFP | 256 | 1K | 90 | 13/8 | BT/WT/8TCx2/16TC | SIO | 64/16 | 10x1 | 8x1 | 8MHz | 2.4~3.6 | Flash Only S3FK11FX (4) |
| S3CK225XZ0-QT85 | 64QFP | 16 | 384 | 48 | 9/4 | BT/WT/8TCx2/16TC | SIO | 32/4 | 10x8 | 8x2, 16x1 | 8MHz | 2.4~3.6 | S3FK225X (4) |
| S3CK225XZ0-ET85 | 64LQFP | | | | | | | | | | | | |
| S3CK318XZ0-QZ88 | 44QFP | 8 | 256 | 36 | 7/7 | BT/WT/8TCx2/16TC | SIO | 16/8 | 10x4 | 16x1 | 8MHz | 2.4~3.6 | S3F318X (4) |

NOTES:
1 *Under Development. Contact Samsung sales office for availability
2 (1) ( ) S/W supported PWM
(2) SIO mode can be selected by S/W
(3) Flash: Writing endurance is 10K times
(4) MTP: Writing endurance is 100 times

3 Abbreviations:
LVR = Low Voltage Reset
ZCD=Zero Cross Detection circuit
FSK=Frequency Shift Keying
RDS=Radio Data System
DAC=Digital to Analog Converter
PWM=Pulse Width Modulation
SIO=Serial Input/Output
LIN=Local Interface Network
DTMF=Dual Tone Multi Frequency
DDC=Display Data Channel
SDT=Stuttered Dial Tone
BT/WT/WDT=Basic/Watch/Watchdog timer
8T/16T=8-bit /16-bit Timer
OSD=On Screen Display
ADC=Analog to Digital Converter
CAS=CPE Alerting Signal
LVD = Low Voltage Detector
PGM=Pattern Generation Module
Com=Comparator

# 16-BIT MICROCONTROLLER FAMILY

| Part Name | Package Type | ROM Kbytes | RAM Bytes | I/O Pins | Interrupt (Int/Ext) | Timer/ Counter | Serial Interface | LCD (Seg/Com) | ADC (Bit x Ch) | PWM(1) (BitxCh) | Max. OSC. Freq. | Vdd (V) | Other Features |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| S3FC11BXZZ-QX8F<br>S3FC11BXZZ-TX8F | 100QFP<br>100TQFP | 64 | 10k | 77 | 8/9 | BT/WT/8TCx3 | SIO | 36/8 | 10X4 | 8x1 | 40MHz | 2.0~3.6 | MAC1616 |
| S3CC34DXZZ-QX8D<br>S3CC34DXZZ-TX8D | 100QFP<br>100TQFP | 128 | 4 | 90 | 20/16 | BT/WT/8TCx3/16TCx3 | UART, SIOx4 | | 10X16 | 8x3, 16x3 | 12MHz | 2.4~5.5 | |
| S3FC40DXZZ-QX8D<br>S3FC40DXZZ-TX8D | 100QFP<br>100TQFP | 128 | 6 | 90 | 30/16 | BT/WT/8TCx2/16TCx8 | UARTx3, SIOx2 | | | 10X24 | 8x2, 16x8 | 12MHz | 2.4~5.5 |
| S3FC40DXZZ-QA8D | 128QFP | | | | | | | | | | | | |

NOTES:
1 *Under Development. Contact Samsung sales office for availability.
2 (1) ( ) S/W supported PWM
(2) SIO mode can be selected by S/W
(3) Flash: Writing endurance is 10K times
(4) MTP: Writing endurance is 100 times
3 Abbreviations:
LVR = Low Voltage Reset
ZCD=Zero Cross Detection circuit
FSK=Frequency Shift Keying
RDS=Radio Data System
DAC=Digital to Analog Converter
PWM=Pulse Width Modulation
SIO=Serial Input/Output
LIN=Local Interface Network
DTMF=Dual Tone Multi Frequency
DDC=Display Data Channel
SDT=Stuttered Dial Tone
BT/WT/WDT=Basic/Watch/ Watchdog timer
8T/16T=8-bit /16-bit Timer
OSD=On Screen Display
ADC=Analog to Digital Converter
CAS=CPE Alerting Signal
LVD = Low Voltage Detector
PGM=Pattern Generation Module
Com=Comparator

# 32-BIT MICROCONTROLLER FAMILY

## Network Application

| Part Name | CPU | Package Type | System Manager | I/O Pins | Interrupt (Int/Ext) | Ethernet (10/100M) | HDLC | USB | Timer Counter | Serial Interface | DES 3DES | PCI | SAR | GDMA | Max. OSC | Vopr |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| S3C4510B-QE80 | ARM7TDMI | 208QFP | SDRAM Memory (NOR,SRAM) IF | 18 | 17/4 | 1ch | 2ch | | 32bit 2ch | UARTx2, IIC | | | | 2ch | 50MHz | 3.3V |
| S3C4530A-QE80 | ARM7TDMI | 208QFP | SDRAM Memory (NOR,SRAM) IF | 26 | 17/4 | 1ch | 2ch | | 32bit 2ch | UARTx2, IIC | | | | 2ch | 50MHz | 3.3V |
| SS3C2510A-GB80 | ARM940T | 416PBGA | SDRAM Memory (NOR,SRAM) IF | 64 | 30/6 | 2ch | | 1 Device (F-speed) 1 Host (F-speed, support 2device) | 32bit 2ch, WDT | UARTx3, IIC | Yes | Yes | "UTOPIA I/F | 6ch | 166Mhz | 1.8/3/3V |

## Inverter Motor Application

| Part Name | CPU | Package Type | ROM / Flash (KByte) | RAM (KByte) | I/O Pins | Interrupt (Int/Ext) | IMC | ENC | Timer / Counter | Serial Interface | ADC | Max. OSC | Vopr |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| S3F401FXZZ-QX8F* | ARM7TDMI | 100QFP | 256 | 20 | 66 | 59/31 | 2ch | 2ch | BT/WDT/16BTx6 | UARTx2, SSPx2 | 12x15 | 90MHz | 3.0~3.6 |
| S3F401FXZZ-TX8F* | | 100TQFP | | | | | | | | | | | |

## CAN/LIN Application

| Part Name | CPU | Package Type | ROM/Flash (KByte) | Data Flash (KByte) | RAM (KByte) | I/O Pins | Interrupt (Int/Ext) | CAN / LIN | Stepper Motor | Timer / Counter | Serial Interface | LCD | ADC | PWM | Max OSC | Vopr |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| S3F4A0KRZZ-EC8K | ARM7TDMI | 144LQFP | 1024 | 32 | 32 | 111 | 44/20 | 4ch/3ch | "6ch (Driver 4ch) | WDT(16x1) ST0(16x2) ST1(16x2) ST2(16x2) GPT(16x3) STT(32x1) | SPI0(8X1) SPI1(16x1) IIC(2ch) | 40/4 | 10x16 | 8x12 16x2 | 40MHz | 3.0~5.5 |
| S3F4A0KJZZ-EC8K | | | | | | | | | | | | | | | | |
| S3F4A1HRZZ-TX8H | ARM7TDMI | 100TQFP | 512 | 32 | 16 | 74 | 52/12 | 2ch/3ch | 4ch | WDT(16x1) ST0(16x2) ST1(16x2) GPT(16x3) STT(32x1) | SPI0(8X1) SPI1(16x1) IIC(2ch) | 30/4 | 10x16 | 8X8 16x2 | 40MHz | 3.0~5.5 |
| S3F4A1HJZZ-TX8H | | | | | | | | | | | | | | | | |
| S3F4A2FRZZ-TW8F* | ARM7TDMI | 80TQFP | 256 | | 8 | 59 | 54/10 | 1ch/2ch | | WDT(16x1) ST0(16x2) ST1(16x2) GPT(16x3) STT(32x1) | SPI0(8X1) SPI1(16x1) IIC(2ch) | | 10x16 | 16x8 | 20MHz | 3.0~5.5 |
| S3F4A2FJZZ-TW8F* | | | | | | | | | | | | | | | | |

# 32-BIT MICROCONTROLLER FAMILY

## General Purpose Application

| Part Name | CPU | Package Type | ROM (KByte) | RAM (KByte) | I/O Pins | Interrupt (Int/Ext) | Timer / Counter | Serial Interface | ADC | PWM | Max OSC | Vopr |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| S3F441FXZZ-ETRF | ARM7TDMI | 64LQFP | 256 | 8 | 16 | 16/3 | BT/WDT/16TCx6 | UART | | | 40MHz | 3.0~3.6 |
| S3F443FXZZ-ET8F | ARM7TDMI | 64LQFP | 256 | 8 | 16 | 18/3 | BT/WDT/16TCx6 | UART | | 8x1 | 40MHz | 3.0~3.6 |
| S3F445HXZZ-TX8H | ARM7TDMI | 100TQFP | 512 | 16 | 73 | 22/8 | BT/WDT/16TCx6 | UARTx2 | 10x8 | | 40MHz | 3.0~3.6 |

NOTES:
1 *Under Development. Contact Samsung sales office for availability.
2 Abbreviations:
ADC=Analog to Digital Converter
BT/WT/WDT=Basic/Watch/ Watchdog timer
SST=Stamp Timer
GPT=General Purpose timer
SSP=Synchronous Serial Port
IMC=Inverter Motor Controller
ENC=Encoder Counter
LIN=Local Interface Network

# MICROCONTROLLER ORDERING INFORMATION

| S | 3 | X | X | X | X | X | X | X | X | - | X | X | X | X | X | X | X |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 |

### 1. System LSI (S)

### 2. Large Classification: Microcontroller(3)

### 3. Small Classification

C: MASK ROM
E: EVA-CHIP
F: FLASH
P: OTP
3: MCP

### 4. Core

1: 51 4-bit
2: 32-bit ARM9
3: 17 16-bit
4: 32 32-bit
5: 32-bit ARM10
6: 56 4-bit
7: 57 4-bit
8: 88 8-bit
9: 86 8-bit
A: 15 Other
B: 8-bit CALM RISC MAC
C: 16-bit CALM RISC MAC
D: 32-bit CALM RISC MAC
I: CUSTOM MCU
J: SC-200
K: 8-bit CALM RISC
L: 16-bit CALM RISC
R: 128-bit CALM RISC
S: SC-100

### 5~6. Application Category

0n: General Purpose
1n: Voice
2n: LCD
3n: Audio
4n: General A/D
5n: Telecom
6n: PC & Peripheral,OA
7n: VFD
8n: Video
9n: Special (IC Card)
An: General Purpose-1
Cn: C
Fn: Telecom-1
Nn: Intel Application
Zn: Assignment Code

*** "n": Serial No (1°„Z)**

### 7. Rom Master

0: 0K byte
1: 1K byte
2: 2K byte
3: 12K byte
4: 4K byte
5: 16K byte
6: 6K byte
7: 24K byte
8: 8K byte
9: 32K byte
A: 48K byte
B: 64K byte
C: 96K byte
D: 128K byte
F: 256K byte
G: 384K byte
H: 512K byte
J: 1M byte
K: 1M byte

### 8. Version

A~Z
***1st Version ˚ X**

### 9~10. Mask Option

### 11. (--)

### 12. Package Type

A: SDIP
B: LGA
C: CHIP BIZ
D: DIP
E: LQFP
F: WQFP
G: BGA
H: CSP
J: BQFP
K: UELP
L: ELP
M: QFPH
N: COB
P: PLCC
Q: QFP
S: SOP
T: TQFP
V: TEBGA
W: WAFER
Y: FBGA
Z: SBGA

### 13. Package Pin

Wafer/CHIP BIZ = 0(NONE)

**- SDIP**

B: 56 M: 24 O: 32
Q: 42 T: 64 V: 30

**- LGA**

A: 88 C: 83 J: 176

**- DIP**

C: 8 H: 16 I: 18
K: 20 N: 28 P: 40

**- LQFP**

C: 144 D: 160 E: 208
G: 256 J: 176 R: 48
T: 64 W: 80 X: 100

**- WQFP**

T: 64

**- BGA**

A: 272 B: 416

**- CSP**

J: 176

**- BQFP**

B: 132

**-UELP**

T: 64

**- ELP**

R: 48 T: 64

**- QFPH**

D: 160 F: 240

**- COB**

C: 8 D: 8CNCL

**- PLCC**

C: 52 Z: 44

**- QFP**

A: 128 C: 144 D: 160
E: 208 G: 256 R: 48
T: 64 U: 304 W: 80
X: 100 Z: 44

**- SOP**

C: 8 H: 16 I: 18
K: 20 M: 24 N: 28
O: 32

**- TQFP**

A: 128 T: 64 W: 80
X: 100

**- TEBGA**

X: 492

**- FBGA**

A: 337 B: 81 C: 144
D: 160 E: 208 F: 180
G: 285 H: 320 K: 105
L: 400 O: 272 P: 504
Q: 289 T: 64

**- SBGA**

A: 432

**- WAFER**

0: None 1: Cust1 2: Cust2

### 14. Packing

B: Tube
U: Bulk
R: Tray
T: Tape & Reel
S: Tape & Reel Reverse
C: Chip Biz
D: Chip Biz (3 Inch tray)
E: Chip Biz (4 Inch tray)
F: Chip Biz (Reverse)
W: WF Biz Draft Wafer
X: WF Biz Full Cutting
7: Tape & Reel (Pb-Free PKG)
8: Tray (Pb-Free PKG)
9: Tube (Pb-Free PKG)

### 15. ROM Size

0: 0K byte 1: 1K byte
2: 2K byte 3: 12K byte
4: 4K byte 5: 16K byte
6: 6K byte 7: 24K byte
8: 8K byte 9: 32K byte
A: 48K byte B: 64K byte
C: 96K byte D: 128K byte
E: Extended F: 256K byte
G: 384K byte H: 512K byte
J: 1M byte K: 1M byte
M: Military N: Industrial
X: Special MK3 Y: Special MK2
Z: Special MK1
* Smart Card IC: EEPROM Size
* X,Y,Z: Special Marking ( MASKROM)

## SERIAL EEPROMS

| | | | | Write Cycle | | |
|---|---|---|---|---|---|---|
| **Part Number** | **Density (bit)** | **Write Protection** | **Vopr (V)** | **Time (Max)** | **Interface** | **Package** |
| S524A40X20-RC70<br>S524A40X21-DC90<br>S524A40X21-SC90<br>S524A40X21-SC70 / | 2K | by Hardware & Software | 1.8 ~ 5.5 | 5 ms | | |
| S524A40X41-DC90<br>S524A40X41-SC90<br>S524A40X41-SC70 | 4K | by Hardware | 1.8 ~ 5.5 | 5 ms | I2C BUS | |
| S524A60X51-DC90<br>S524A60X51-SC90<br>S524A60X51-SC70 | 16K | by Hardware | 1.8 ~ 5.5 | 5 ms | | DC90 = 8DIP<br>SC90 = 8SOP<br>SC70 = 8SOP (T&R)<br>RC70 = 8TSSOP (T&R) |
| S524A60X81-DC90<br>S524A60X81-SC90<br>S524A60X81-SC70 | 8K | by Hardware | 1.8 ~ 5.5 | 5 ms | | |
| S524A90X91-DC90<br>S524A90X91-SC90<br>S524A90X91-SC70 | 32K | by Hardware | 1.8 ~ 5.5 | 5 ms | | |
| S524A90XB1-DC90<br>S524A90XB1-SC90<br>S524A90XB1-SC70 | 64K | by Hardware | 1.8 ~ 5.5 | 5 ms | | |
| S524AD0XF1-RC70 | 256K | by Hardware | 1.8 ~ 5.5 | 5 ms | | |
| S524AE0AH1-RC70 | 512K | by Hardware | 1.8 ~ 5.5 | 5 ms | | |

NOTES:
All listed products are in production
Temperature: -25 ~ 70c
All products offer 100-year data retention, a 16M page buffer and two-wired serial I2C-bus interfaces.
All products operate at 100KHz, 400KHz clock frequency.
Package: DCBO=8DIP

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