
FOURTH QUARTER 1999

SONY

***semiconductor
product guide***

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Sony Electronics Inc. Semiconductor Business Division

Sony Electronics Inc. is a recognized leader in a number of major electronics markets including consumer, broadcast, commercial, components, media, energy and communications. In 35 years of North American operations, Sony has created numerous products that have helped make customers' lives easier, more enjoyable and more productive. To address its own needs for advanced technology, Sony began designing and manufacturing semiconductors. In the early 1980s, Sony expanded these operations by creating a component products division and began supplying integrated circuits to the OEM market, including U.S. based companies in 1983. By 1993, worldwide semiconductor sales exceeded \$2 billion, leading Sony to consolidate its resources into a single domestically-based organization in 1995.

Sony Electronics Inc.'s Semiconductor Business Division (SBD) combines the diverse strengths of Sony's semiconductor design, engineering, marketing and sales operations in a vertically integrated company. It enables Sony to respond quickly in the rapidly changing and competitive North American semiconductor marketplace and supports Sony's global efforts in developing innovative value-added products.

The division has approximately 200 employees in design, marketing and sales operations located in San Jose, California and includes a state-of-the-art design center. A nationwide customer service and support network complements the organization.

Today Sony is recognized as a leading manufacturer and supplier of integrated circuits. The company is a technology leader in the development of semiconductor solutions for newly-emerging and cutting-edge high performance markets in multimedia, communications and workstation cache memory. Currently it offers a diverse array of innovative products ranging from memory to multimedia, communications, networking and wireless ICs.

CCD Area Sensor — Color

CCD Image Sensor	System		NTSC	ICX038DNA/DNB	ICX248AK ⁽³⁾	ICX054BK ⁽¹⁾	ICX254AK ⁽³⁾	
			PAL	ICX039DNA/DNB	ICX249AK ⁽³⁾	ICX055BK ⁽¹⁾	ICX255AK ⁽³⁾	
	Optical Size (inch)				1/2	1/2	1/3	1/3
	Effective Pixels (H x V)		NTSC	768 x 494	768 x 494	510 x 492	510 x 492	
			PAL	752 x 582	752 x 582	500 x 582	500 x 582	
	Unit Cell Size (H x V)		NTSC	8.4μm x 9.8μm	8.4μm x 9.8μm	9.6μm x 7.5μm	.6μm x 7.5μm	
			PAL	8.6μm x 8.3μm	8.6μm x 8.3μm	9.8μm x 6.3μm	9.8μm x 6.3μm	
	Vertical Driver				CXD1267AN	CXD1267AN	CXD1267AN	
Timing Driver	Horizontal Driver				Built into T.G.	Built into T.G.	Built into T.G.	
	Timing Generator				CXD1265R	CXD1265R	CXD2401R	
	Sync Signal Generator				CXD1217M	CXD1217M	CXD1217M	
	Sample and Hold/AGC				CXA1390AR	CXA1390AR	CXA1390AR	
Signal Processing	Matrix, Process				CXA1391R	CXA1391R	CXA1391R	
	Encoder				CXA1592R	CXA1592R	CXA1592R	
	CCD Delay Line for Chroma				CXL1517M	CXL1517M	CXL1518M	
	CCD Delay Line for Y				CXL5504M	CXL5504M	CXL5504M	

CCD Image Sensor	System		NTSC	ICX058CK ⁽¹⁾	ICX258AK ⁽³⁾	ICX206AK ⁽¹⁾ /AKB ⁽¹⁾	
			PAL	ICX059CK ⁽¹⁾	ICX259AK ⁽³⁾	ICX207AK ⁽¹⁾ /AKB ⁽¹⁾	
	Optical Size (inch)				1/3	1/3	1/4
	Effective Pixels (H x V)		NTSC	768 x 494	768 x 494	510 x 492	
			PAL	752 x 582	752 x 582	500 x 582	
	Unit Cell Size (H x V)		NTSC	6.35μm x 7.4μm	6.35μm x 7.4μm	7.15μm x 5.55μm	
			PAL	6.5μm x 6.25μm	6.5μm x 6.25μm	7.3μm x 4.7μm	
	Vertical Driver				CXD1267AN	CXD1267AN	CXD1267AN
Timing Driver	Horizontal Driver				Built into T.G.	Built into T.G.	Built into T.G.
	Timing Generator				CXD1265R	CXD1265R	CXD2401R
	Sync Signal Generator				CXD1217M	CXD1217M	CXD1217M
	Sample and Hold/AGC				CXA1390AR	CXA1390AR	CXA1390AR
Signal Processing	Matrix, Process				CXA1391R	CXA1391R	CXA1391R
	Encoder				CXA1592R	CXA1592R	CXA1592R
	CCD Delay Line for Chroma				CXL1517M	CXL1517M	CXL1518M
	CCD Delay Line for Y				CXL5504M	CXL5504M	CXL5504M

CCD Image Sensor	System		NTSC	ICX208AK ⁽¹⁾ /AKB ⁽¹⁾	ICX076AK ⁽²⁾	ICX096AKE ⁽¹⁾	
			PAL	ICX209AK ⁽¹⁾ /AKB ⁽¹⁾	ICX077AK ⁽²⁾	ICX097AKE ⁽¹⁾	
	Optical Size (inch)				1/4	1/5	1/6
	Effective Pixels (H x V)		NTSC	768 x 494	362 x 492	510 x 492	
			PAL	752 x 582	358 x 583	500 x 582	
	Unit Cell Size (H x V)		NTSC	4.75μm x 5.55μm	8.1μm x 4.45μm	4.8μm x 3.75μm	
			PAL	4.85μm x 4.65μm	8.2μm x 3.75μm	4.9μm x 3.15μm	
	Vertical Driver				CXD1267AN	CXD1267AN	CXD1267AN
Timing Driver	Horizontal Driver				Built into T.G.	Built into T.G.	Built into T.G.
	Timing Generator				CXD1265R	N/A	CXD2401R
	Sync Signal Generator				CXD1217M	N/A	CXD1217M
	Sample and Hold/AGC				CXA1390AR	N/A	CXA1390AR
Signal Processing	Matrix, Process				CXA1391R	N/A	CXA1391R
	Encoder				CXA1592R	N/A	CXA1592R
	CCD Delay Line for Chroma				CXL1517M	N/A	CXL1518M
	CCD Delay Line for Y				CXL5504M	N/A	CXL5504M

NOTES:

1. Super HAD CCD™ — Super HAD CCD is a trademark of Sony Corporation. The Super HAD CCD is a version of Sony's high performance CCD HAD (Hole Accumulation Diode) sensor with sharply improved sensitivity by the incorporation of a new semiconductor technology developed by Sony Corporation.
2. No system IC for ICX076AK/ICX077AK.
3. EXview HAD CCD™ — EXview HAD CCD is a trademark of Sony Corporation. The EXview HAD CCD is a version of Sony's high performance CCD HAD (Hole Accumulation Diode) sensor with sharply improved sensitivity by the incorporation of a new semiconductor technology developed by Sony Corporation.

CCD Area Sensor — Black & White

CCD Image Sensor	System	EIA	ICX082AL	ICX038DLA	ICX248AL ⁽²⁾	ICX054BL ⁽¹⁾
		CCIR	ICX083AL	ICX039DLA	ICX249AL ⁽²⁾	ICX055BL ⁽¹⁾
	Optical Size (inch)		2/3	1/2	1/2	1/3
	Effective Pixels (H x V)	EIA	768 x 494	768 x 494	768 x 494	510 x 492
		CCIR	752 x 582	752 x 582	752 x 582	500 x 582
Unit Cell Size (H x V)	EIA	11.6µm x 13.5µm	8.4µm x 9.8µm	8.4µm x 9.8µm	9.6µm x 7.5µm	
	CCIR	11.6µm x 11.2µm	8.6µm x 8.3µm	8.6µm x 8.3µm	9.8µm x 6.3µm	
Timing Driver	Vertical Driver		CXD1268M	CXD2463R	CXD2463R	CXD2463R
	Horizontal Driver		74HC04	CXD2463R	CXD2463R	CXD2463R
	Timing Generator		CXD1261AR	CXD2463R	CXD2463R	CXD2463R
	Sync Signal Generator		Built into T.G.	CXD2463R	CXD2463R	CXD2463R
Signal Processing	Sample and Hold AGC		CXA1310AQ	CXA1310AQ	CXA1310AQ	CXA1310AQ
	AGC		CXA1310AQ	CXA1310AQ	CXA1310AQ	CXA1310AQ
	Matrix, Process		CXA1310AQ	CXA1310AQ	CXA1310AQ	CXA1310AQ
	Encoder		CXA1310AQ	CXA1310AQ	CXA1310AQ	CXA1310AQ

CCD Image Sensor	System	EIA	ICX254AL ⁽³⁾	ICX058CL ⁽¹⁾	ICX258AL ⁽³⁾	ICX206AL ⁽¹⁾
		CCIR	ICX255AL ⁽³⁾	ICX059CL ⁽¹⁾	ICX259AL ⁽³⁾	ICX207AL ⁽¹⁾
	Optical Size (inch)		1/3	1/3	1/3	1/4
	Effective Pixels (H x V)	EIA	510 x 492	768 x 494	768 x 494	510 x 492
		CCIR	500 x 582	752 x 582	752 x 582	500 x 582
Unit Cell Size (H x V)	EIA	9.6µm x 7.5µm	6.35µm x 7.4µm	6.35µm x 7.4µm	7.15µm x 5.55µm	
	CCIR	9.8µm x 6.3µm	6.5µm x 6.25µm	6.5µm x 6.25µm	7.3µm x 4.7µm	
Timing Driver	Vertical Driver		CXD2463R	CXD2463R	CXD2463R	CXD2463R
	Horizontal Driver		CXD2463R	CXD2463R	CXD2463R	CXD2463R
	Timing Generator		CXD2463R	CXD2463R	CXD2463R	CXD2463R
	Sync Signal Generator		CXD2463R	CXD2463R	CXD2463R	CXD2463R
Signal Processing	Sample and Hold AGC		CXA1310AQ	CXA1310AQ	CXA1310AQ	CXA1310AQ
	AGC		CXA1310AQ	CXA1310AQ	CXA1310AQ	CXA1310AQ
	Matrix, Process		CXA1310AQ	CXA1310AQ	CXA1310AQ	CXA1310AQ
	Encoder		CXA1310AQ	CXA1310AQ	CXA1310AQ	CXA1310AQ

CCD Image Sensor	System	EIA	ICX208AL ⁽¹⁾	ICX076AL
		CCIR	ICX209AL ⁽¹⁾	ICX077AL
	Optical Size (inch)		1/4	1/5
	Effective Pixels (H x V)	EIA	768 x 494	362 x 492
		CCIR	752 x 582	358 x 583
Unit Cell Size (H x V)	EIA	4.75µm x 5.55µm	8.1µm x 4.45µm	
	CCIR	4.85µm x 4.65µm	8.2µm x 3.75µm	
Timing Driver	Vertical Driver		CXD2463R	CXD1267AN
	Horizontal Driver		CXD2463R	Built into T.G.
	Timing Generator		CXD2463R	CXD2409R
	Sync Signal Generator		CXD2463R	Built into T.G.
Signal Processing	Sample and Hold AGC		CXA1310AQ	CXA1310AQ
	AGC		CXA1310AQ	CXA1310AQ
	Matrix, Process		CXA1310AQ	CXA1310AQ
	Encoder		CXA1310AQ	CXA1310AQ

NOTES:

1. Super HAD CCD™ — Super HAD CCD is a trademark of Sony Corporation. The Super HAD CCD is a version of Sony's high performance CCD HAD (Hole Accumulation Diode) sensor with sharply improved sensitivity by the incorporation of a new semiconductor technology developed by Sony Corporation.
2. No system IC for ICX076AK/ICX077AK.
3. EXview HAD CCD™ — EXview HAD CCD is a trademark of Sony Corporation. The EXview HAD CCD is a version of Sony's high performance CCD HAD (Hole Accumulation Diode) sensor with sharply improved sensitivity by the incorporation of a new semiconductor technology developed by Sony Corporation.

CCD Area Sensor — Progressive Scan

	Classification	AK: Color		AL: Black/White	
CCD Image Sensor	System	ICX085AK ⁽¹⁾ /AL	ICX074AK ⁽¹⁾ /AL	ICX084AK ⁽¹⁾ /AL	ICX098AK ⁽¹⁾
		—	ICX075AK ⁽¹⁾ /AL	—	—
	Optical Size (inch)	2/3	1/2	1/3	1/4
	Effective Pixels (H x V)	1300 x 1030	659 x 494	659 x 494	659 x 494
		—	782 x 582	—	—
Unit Cell Size (H x V)		6.7μm x 6.7μm	9.9μm x 9.9μm	7.4μm x 7.4μm	5.6μm x 5.6μm
		—	8.3μm x 8.3μm	—	—
Timing Driver	Vertical Driver	CXD1268M x 2	CXD1268M	CXD1267AN	Built into T.G.
	Horizontal Driver	74AC04	74HC04	—	Built into T.G.
	Combination Driver	—	CXD1250M	—	Built into T.G.
	Timing Gen. & Sync Gen.	CXD2437TQ	CXD2408AR(074) CXD2424R(075)	CXD2434ATQ	CXD2450R
Signal Process	CDS & AGC	CXA2006Q	CXA1690Q x 2	CXA2006Q	CXA2006Q
	A/D Converter	CXD2311AR	CXD2311AR	CXD2311AR	CXD2311AR

	Classification	AK: Color	AL: Black/White
CCD Image Sensor	System	ICX204AK ⁽¹⁾ / AL ⁽¹⁾	ICX205AK ⁽¹⁾ / AL ⁽¹⁾
		—	—
	Optical Size (inch)	1/3	1/2
	Effective Pixels (H x V)	1034 x 779	1392 x 1040
		—	—
Unit Cell Size (H x V)		4.65μm x 4.65μm	4.65μm x 4.65μm
		—	—
Timing Driver	Vertical Driver	Built into T.G.	Built into T.G.
	Horizontal Driver	Built into T.G.	Built into T.G.
	Combination Driver	Built into T.G.	Built into T.G.
	Timing Gen. & Sync Gen.	CXD2457R	CXD2460R
Signal Process	CDS & AGC	CXA2006Q	CXA2006Q
	A/D Converter	CXD2311AR	CXD2311AR

NOTE:

1. WfineCCD™ — Wfine CCD is a trademark of Sony Corporation. It represents a CCD adopting progressive scan, primary color filter, and square pixel.

MicroUnit CCD Board Module

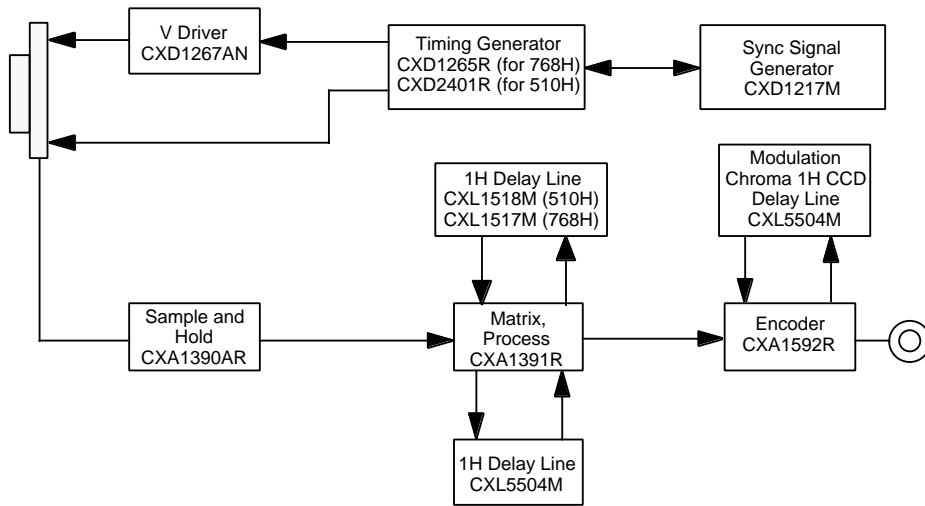
	MCB100	MCB101	MCB120	MCB121
Lens	Fixed Focus, F2.8/f = 2.9mm	Fixed Focus, F2.8/f = 4.0mm	Fixed Focus, F2.8/f = 2.9mm	Fixed Focus, F2.8/f = 4.0mm
Angle of View	H: 53°, V: 41°	H: 40°, V: 30°	H: 53°, V: 41°	H: 40°, V: 30°
CCD	1/5", 362(H) x 492(V) Color CCD			
Focus Range	20cm to Infinity			
Resolution	220 TV Lines			
Minimum Illumination	40 lux (AGC: ON)			
Video Output	VBS: 1Vp-p, 75 Ohms Drive		Digital 16-bit Y, U/V Output	
Supply Voltage	DC 4.75 ~ 5.25V			
Power Consumption	1.2W		850mW	
Operation Temperature	0 ~ +40°C		0 ~ +80°C	
Dimensions	40.0 x 36.5 x 8.37mm	40.0 x 36.5 x 9.57mm	32.0 x 32.0mm	

CCD Color Camera Block Diagram for 1/2", 1/3", 1/4", 1/6" Optical Size

CCD Color Image Sensor
 ICX038DNA/ICX039DNA (768H), 1/2"
 ICX038DNB/ICX039DNB (768H), 1/2"
 ICX248AK/ICX249AK (768H), 1/2"

ICX054BK/ICX055BK (510H), 1/3"
 ICX254AK/ICX255AK (510H), 1/3"
 ICX058CK/ICX059CK (768H), 1/3"
 ICX258AK/ICX259AK (768H), 1/3"

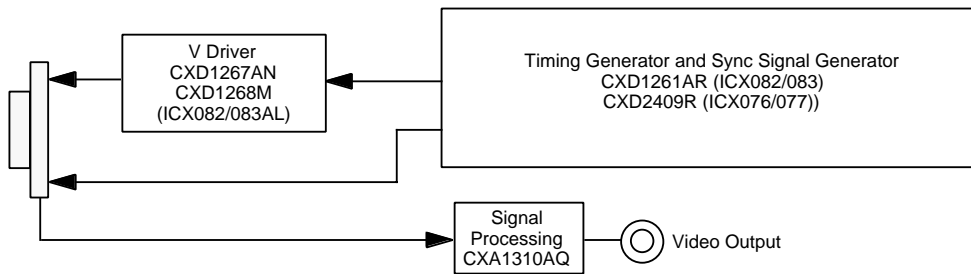
ICX206AK/ICX207AK (510H), 1/4"
 ICX208AK/ICX209AK (768H), 1/4"
 1/4"ICX206AKB/ICX207AKB (510H), 1/4"
 ICX208AKB/ICX209AKB (768H), 1/4"
 ICX096AKE/ICX097AKE (510H), 1/6"



CCD Black/White Camera Block Diagram for 2/3", 1/5" Optical Size

CCD B/W Image Sensor
 ICX082AL/ICX083AL (768H), 2/3"

ICX076AL/ICX077AL (362H), 1/5"

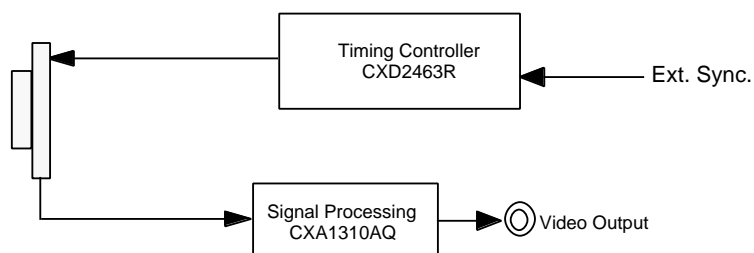


CCD Black/White Camera Block Diagram for 1/2", 1/3", 1/4" Optical Size

CCD B/W Image Sensor
 ICX038DLA/ICX039DLA (768H), 1/2"
 ICX248AL/ICX249AL (768H), 1/2"

ICX054BL/ICX055BL (510H), 1/3"
 ICX254AL/ICX255AL (510H), 1/3"
 ICX058CL/ICX059CL (768H), 1/3"

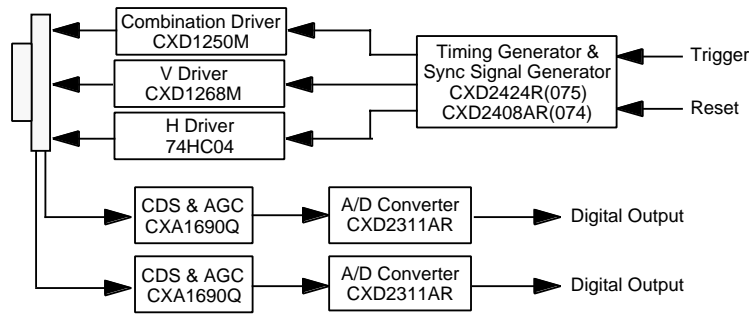
ICX258AL/ICX259AL (768H), 1/3"
 ICX206AL/ICX207AL (510H), 1/4"
 ICX208AL/ICX209AL (768H), 1/4"



Progressive Scan CCD System Block Diagram for 1/2" Optical Size

ICX074AL/ICX075AL, B/W

ICX074AK/ICX075AK, Color



Progressive Scan CCD System Block Diagram for 1/3" and 1/4" Optical Size

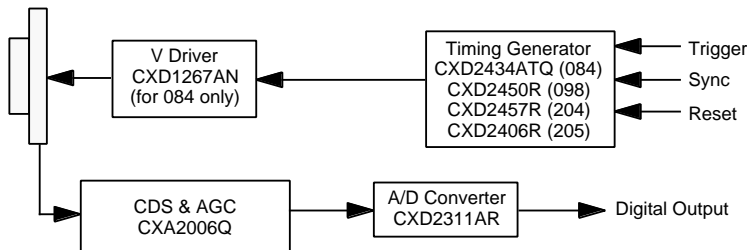
ICX084AL, B/W

ICX084AK, Color

ICX098AK, Color

ICX204AK, Color
ICX204AL, B/W

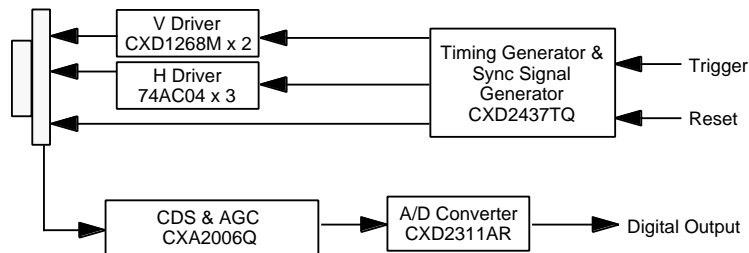
ICX205AK, Color
ICX205AL, B/W



Progressive Scan CCD System Block Diagram for 2/3" Optical Size

ICX085AL, B/W

ICX085AK, Color



CCD Linear Image Sensor

	Product Name	Effective Pixels	Pixel Size (μm)	Sensitivity (V/[lx • s])	Max. Data (MHz)	Resolution (DPI)	Package	Pins	
B/W	ILX503A	2048	14 x 14	30	5	B4 200	CERDIP	22	
	ILX505A	2592	11 x 11	21	5	A3 200	CERDIP	22	
	ILX703A ⁽²⁾	2048	14 x 14	30	5	B4 200	CERDIP	22	
	ILX506	5000	7 x 7	10.8	12.5	A3 400	DIP	22	
	ILX514	3918	7 x 7	10.8	5	A4 400	CERDIP	22	
	ILX523A	2700	11x11	95	5	A4 300	CERDIP	22	
	ILX531A	5150	7 x 7	12	40	A4 600/A3 400	CERDIP	22	
	ILX511	2048	14 x 200	200	2	—	CERDIP	22	
	ILX532A	7500	7 x 7	12	40	A3 600	DIP	24	
	ILX508A	7926	7 x 7	10.8	12.5	A3 600	DIP	24	
	ILX526A ⁽²⁾	3000	7 x 200	300	1	—	CERDIP	22	
	ILX521A ⁽¹⁾	256	14 x 14	18	2	—	SDIP	12	
	Color (RGB)	ILX524K	2700 x 3	8 x 8 (8μm pitch)	R 2.0 G 3.2 B 2.5	5 x 3 (R,G,B)	A4 300	CERDIP	22
ILX724K ⁽²⁾		2700 x 3	A4 300				CERDIP	22	
ILX516K		3648 x 3	A4 400				CERDIP	22	
ILX716K ⁽²⁾		3648 x 3	A4 400				CERDIP	22	
ILX518K		5363 x 3	A4 600				CERDIP	22	
ILX718K ⁽²⁾		5363 x 3	A4 600				CERDIP	22	
ILX520K		7078 x 3	A3 600				DIP	24	
ILX734LA ⁽²⁾		10500 x 3	3 x 3 (R,G,B)			A4 1200	DIP	24	
ILX533K		2700 x 3	R 10 G 18 B 11			3 x 3 (R,G,B)	A4 300	CERDIP	22
ILX535K		5300 x 3	A4 600			CERDIP	22		

NOTES:

1. Under development.
2. Provided with shutter function.

CAVD Multimedia Products

Video Processing

• MPEG Video Decoder

Part Number	Applications	Features	Package
CXD1930Q	DVD Player, DVB Set-Top Box	<ul style="list-style-type: none"> • MPEG2 (MP@ML) and MPEG1 video decoder • MPEG1, MPEG2 (layer I, II: 5+1 channels) and Dolby AC3 audio decoder (5+1 channels), linear PCM output • DVD, VCD, DVB demultiplexing: up to 72Mbps • DVD standard compliant decoder • Letter box pan-scan output • On-screen display up to 256 colors • Sub-picture decoding 	208 Pin QFP

• MPEG Video Encoder

Part Number	Applications	Features	Package
CXD1922Q	Storage Media, Communications, Authoring, Consumer Products	<ul style="list-style-type: none"> • MPEG2 encoder, motion estimation and system rate controller on a single chip • Support MPEG2 MP@ML encoding compliant with ISO/IEC 13818-2 for frame structure encoding • High quality, real-time encoding (I, B, P) • Supports MP@ML, SP@ML with an image size of: <ul style="list-style-type: none"> — up to NTSC 720x480 @ 30fps — up to PAL 720x576 @ 25fps • MPEG2 Video Elementary Stream Output • Wide motion vector search range: <ul style="list-style-type: none"> — Horizontal: -288 to +287.5 — Vertical: -96 to +95.5 	208 Pin QFP

• NTSC/PAL Video Encoder

Part Number	Features	Input	Output	Package
CXD1915R ⁽¹⁾	Built-in 10-bit, 6 channel D/A converter, closed caption encode, VBID encode, WSS encode, Macrovision Pay-Per-View copy protection system, rev. 7.01	Y, Cb, Cr	Composite Video S-Video RGB/YUV	80 Pin LQFP
CXD1916R	Built-in 10-bit, 6 channel D/A converter, closed caption encode, VBID encode, WSS encode	Y, Cb, Cr	Composite Video S-Video RGB/YUV	80 Pin LQFP

NOTE:

1. The license contract for the Macrovision pay-per-view copy protection system is required.

Laser Diode

Red Laser Diode

Part Number	Applications	Features	Typ. Wavelength (nm)	Max. Optical Power Output (mW)	Package	Pins
SLD1131VS	Bar code reader	Small astigmatism, low current consumption	670	6	ø5.6mm	3
SLD1132VS	Laser pointer	Short wavelength	635	5		
SLD1133VL	Bar code reader	Index guided, small astigmatism	650	7		
SLD1135VS	Laser pointer	Index guided, small astigmatism	650	5		
SLD1137VS	Bar code reader	Index guided, small astigmatism, low power	650	7		

High Power Al GaAs Laser Diode

Part Number	Typ. Wavelength (nm)	Max. Optical Output (mW)	Package	Pins
SLD234VL	785	50	ø5.6mm, VL	3

Super High Power Laser Diode⁽¹⁾

Part Number	Typ. Wavelength (nm)	Max. Optical Power Output (mW)	Packages Available
SLD301	770 to 840	100	B, V, WT, XT
SLD304	770 to 840	1000	B, V, XT
SLD322	790 to 840	550	V, XT
SLD323	790 to 840	1100	V, XT
SLD324	790 to 840	2200	ZT
SLD326	795 to 840	4400	YT
SLD327 ⁽²⁾	795 to 840	3300	YT

NOTES:

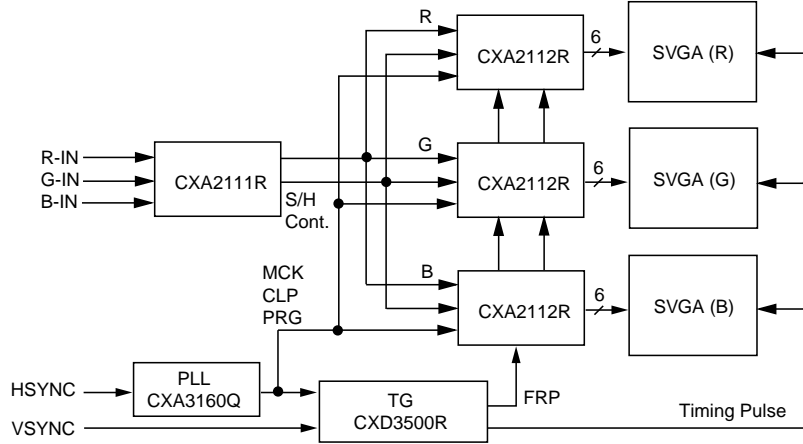
1. Contact Sony for wavelength selection.
2. Under development.

LCD (Data Projector)

SVGA Data Projector LCD

Model	Display Size	Effec. Dots in Number	Optical Transmittance	Contrast Ratio
LCX031ALT	1.3"	486K dots (804H x 604V)	24% (Aperture Ratio: 67%)	350 : 1

Block Diagram

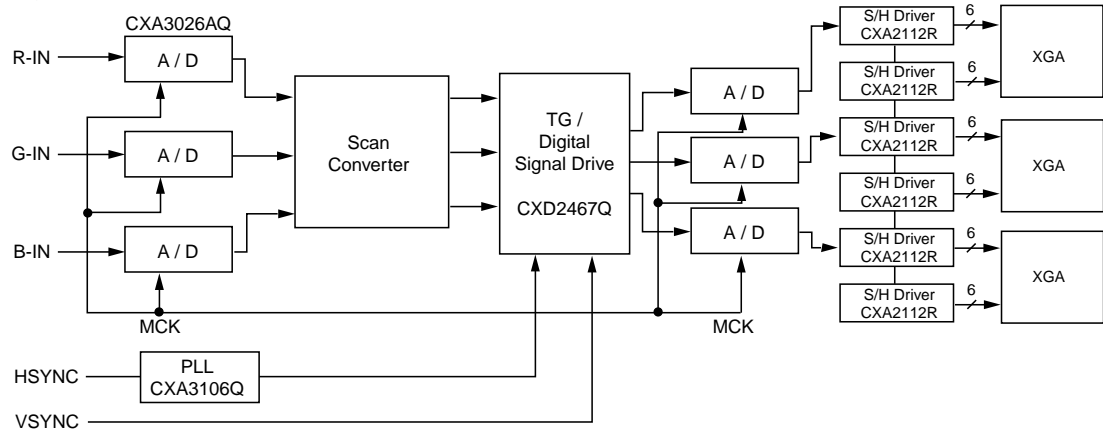


XGA Data Projector LCD

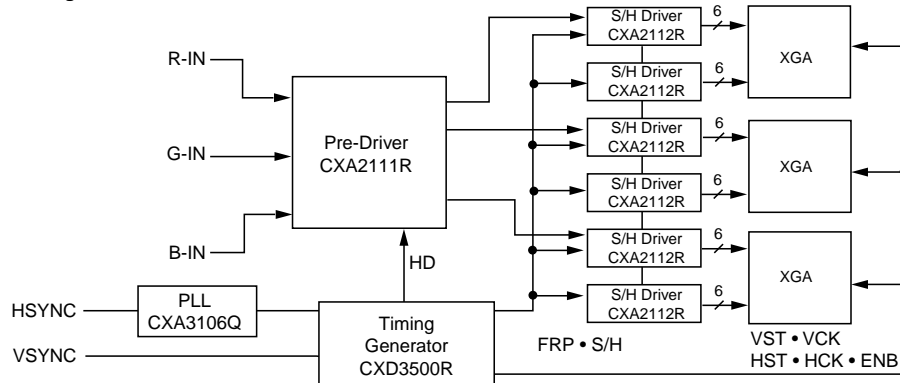
Model	Display Size	Effec. Dots in Number	Optical Transmittance	Aperture Ratio
LCX017CLT	1.8"	786K dots (1,024 x 768)	23%	69%
LCX023CMT	1.3"	768K dots (1,024 x 768)	30%	84% (Effective)
LCX029AMT	0.9"	786K dots (1,024 x 768)	21%	50% (Effective)

Block Diagram

Digital



Analog



Mixed Signal Systems

Analog LCD I/F Chipset

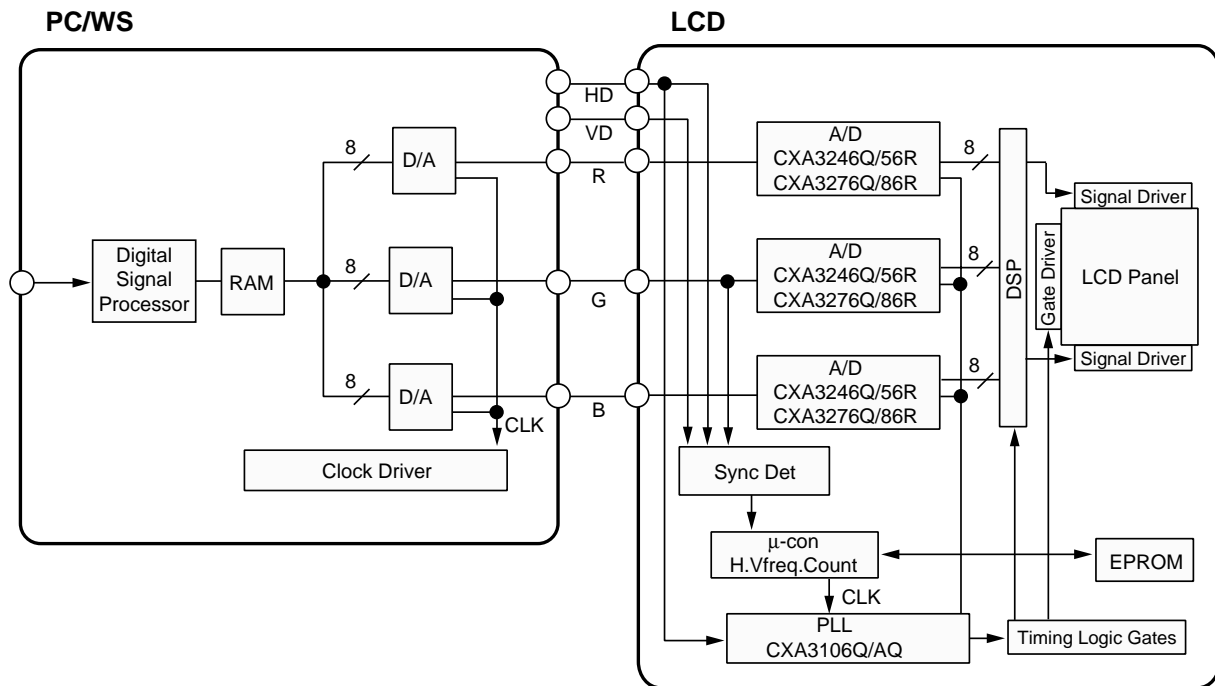
A/D converters and PLLs are provided for LCD monitors and projectors according to the resolution.

In XGA resolution, the A/D converters CXA3246Q (QFP) and CXA3256R (LQFP), and the PLL CXA3106Q are available.

In SXGA resolution, the A/D converters CXA3276Q (QFP) and CXA3286R (LQFP), and the PLL CXA3106AQ are available.

The use of Sony's A/D converters and PLLs enables simple designing of XGA and SXGA with the same concept and gives excellent picture quality. Moreover, the D/A converter CXA3197R, which is capable of TLL interface, is provided for LCD projectors.

LCD Monitor System Block Diagram



Function/Resolution	XGA	SXGA
A/D	CXA3246Q (8-bit 120M QFP)	CXA3276Q (8-bit 160M QFP)
	CXA3256R (8-bit 120M LQFP)	CXA3286R (8-bit 160M LQFP)
PLL	CXA3106Q	CXA3106AQ

Mixed Signal Systems (continued)

- A/D Converter Lineup (Chipset only)

Product Name	Bits	Rate (MSPS)	Pd (mW)	Features	Supply Voltage (V)	Package	Pins
CXA3246Q	8	120	500	1 : 2 De-Multiplex TTL Output	4.75 to 5.25 or ±4.75 to ±5.25	QFP	48
CXA3256R	8	120	500	1 : 2 De-Multiplex TTL Output	4.75 to 5.25 or ±4.75 to ±5.25	LQFP	48
CXA3276Q	8	160	550	1 : 2 De-Multiplex TTL Output	4.75 to 5.25 or ±4.75 to ±5.25	QFP	48
CXA3286R	8	160	550	1 : 2 De-Multiplex TTL Output	4.75 to 5.25 or ±4.75 to ±5.25	LQFP	48

- D/A Converter Lineup (Chipset only)

Product Name	Bits	Rate (MSPS)	Pd (mW)	Features	Supply Voltage (V)	Package	Pins
CXA3197R	10	125	480	2 : 1 Multiplex TTL Input	4.75 to 5.25 or ±4.75 to ±5.25	LQFP	48

- PLL Lineup

Product Name	SyncInput (kHz)	Clock Output (MHz)	Pd (mW)	Resolution	Supply Voltage (V)	Package	Pins
CXA3106Q	10 to 100	10 to 120	335	XGA or below	4.75 to 5.25	QFP	48
CXA3106AQ	10 to 100	10 to 160	350	SXGA or below			

Memory

Synchronous SRAM⁽¹⁾

Capacity	Part Number	Configuration	Features	Cycle Time (ns)	VCC (V)	Pins	Package
1Mb	CXK77910ATM/AYM	128K x 9 bits	Standard Write, LVCMOS/LVTTL I/O, Mirror Image Pinout (TM <-> YM)	10, 12	5.0	44	TSOP (II)
	CXK77V1810GB	64K x 18 bits	Standard Write, LVCMOS/LVTTL I/O	10	3.3	119	BGA
	CXK77B3610AGB	32K x 36 bits	Late Write, LVCMOS/LVTTL I/O, 4-Mode Operation ⁽²⁾	5, 5R, 6	3.3	119	BGA
	CXK77B1811AGB	64K x 18 bits	Late Write, LVCMOS/LVTTL I/O, 4-Mode Operation ⁽²⁾	5, 5R, 6	3.3	119	BGA
	CXK77B3611AGB	32K x 36 bits	Late Write, HSTL I/O, 4-Mode Operation ⁽²⁾	5, 5A, 6	3.3	119	BGA
	CXK77B1810AGB	64K x 18 bits	Late Write, HSTL I/O, 4-Mode Operation ⁽²⁾	5, 5A, 6	3.3	119	BGA
2Mb	CXK77920YM	256K x 9 bits	Standard Write, LVCMOS/LVTTL I/O, Mirror Image Pinout (TM <-> YM)	11	5.0	44	TSOP (II)
4Mb	CXK77V1840GB	256K x 18 bits	Standard Write, LVCMOS/LVTTL I/O	8, 10, 12	3.3	119	BGA
	CXK77B3640GB ⁽⁴⁾	128K x 36 bits	Late Write, HSTL I/O, 4-Mode Operation ⁽²⁾	4, 45A	3.3	119	BGA
	CXK77B1840GB ⁽⁴⁾	256K x 18 bits	Late Write, HSTL I/O, 4-Mode Operation ⁽³⁾	45A	3.3	119	BGA
	CXK77B1840AGB ⁽⁴⁾	256K x 18 bits	Late Write, HSTL I/O, 4-Mode Operation ⁽²⁾	38, 4, 45	3.3	119	BGA
	CXK77B3640AGB ⁽⁴⁾	128K x 36 bits	Late Write, HSTL I/O, 4-Mode Operation ⁽²⁾	38, 4, 45	3.3	119	BGA
	CXK77B3641GB ⁽⁴⁾	128K x 36 bits	Late Write, LVCMOS/LVTTL I/O, 3-Mode Operation ⁽³⁾	45, 6	3.3	119	BGA
	CXK77B1841GB ⁽⁴⁾	256K x 18 bits	Late Write, LVCMOS/LVTTL I/O, 3-Mode Operation ⁽³⁾	45, 6	3.3	119	BGA
	CXK77B1841AGB ⁽⁴⁾	256K x 18 bits	Late Write, LVCMOS/LVTTL I/O, 3-Mode Operation ⁽³⁾	33, 37, 5, 6	3.3	119	BGA
	CXK77B3641AGB ⁽⁴⁾	128K x 36 bits	Late Write, LVCMOS/LVTTL I/O, 3-Mode Operation ⁽³⁾	33, 37, 5, 6	3.3	119	BGA

NOTES:

1. Delivery 16 weeks ARO. Check with marketing for available inventory.
2. Register-Register Mode, Register-Latch Mode, Register-FlowThru Mode, Dual Clock Mode.
3. Register-Register Mode, Register-Latch Mode, Register-Flow Thru Mode.
4. Contact marketing for production plan and schedule.

Serial/Optical Communications

• Transmitter ICs

Part Number	Function	Data Rate (typ.)	Power Consumption (mW) (typ.)	Supply Voltage (V)	Package ⁽²⁾	Pins
CXB1549Q	Laser Diode Driver (with built-in Op Amp)	1.25Gbps (min.)	195	3.3	QFP	40
CXB1818Q ⁽¹⁾	Laser Diode Driver with D-FF	622MHz	195	3.3	QFP	40

• Receiver ICs

Part Number	Function	Data Rate (typ.)	Power Consumption (mW) (typ.)	Supply Voltage (V)	Package ⁽²⁾	Pins
CXB1573R	Post Amp (2R IC)	531/622/ 1,062Mbps/ 1.25Gbps	165	3.3	LQFP	32
CXB1575AQ	Post Amp + CDR, built-in PLL (3R IC)	155Mbps	320	3.3	QFP	40
CXB1577Q	Post Amp (2R IC)	531/622/ 1,062Mbps/ 1.25Gbps	165, 250	3.3, 5.0	QFP	40
CXB1577R	Post Amp (2R IC)	551/622/ 1,062Mbps/ 1.25Gbps	250	5.0	LQFP	32
CXB1805Q ⁽¹⁾	Post Amp + CDR (3R IC)	155/622Mbps	231	3.3	QFP	46

• ATM/Gigabit Ethernet ICs/Fiber Channel ICs

Part Number	Function	Data Rate (typ.)	Power Consumption (mW) (typ.)	Supply Voltage (V)	Package ⁽²⁾	Pins
CXB1585N	Clock and Data Recovery (F.C. Repeater)	1,062Mbps	400	3.3	SSOP	24
CXB1590Q	ATM Transceiver w/PLL	622Mbps	825	3.3	QFP	80
CXB1595AN	Clock and Data Recovery (F.C. Repeater)	1,062Mbps	380	3.3	SSOP	30
CXB1596AR ⁽¹⁾	F.C. Transceiver with PLL (10mm x 10mm) Lower Power	1,062Mbps	650	3.3	LQFP	64

NOTES:

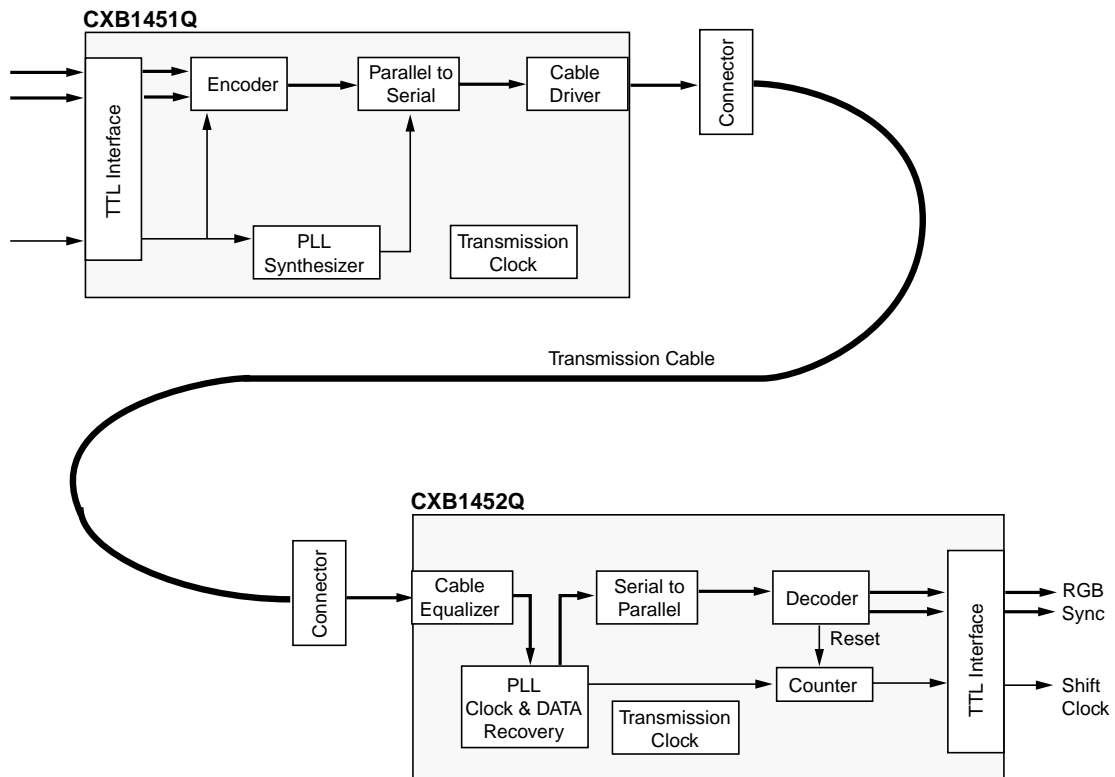
- Under development.
- QFP = Quad Plastic Flat Package
MQFP = Metal Quad Flat Package
CQFP = Ceramic Quad Flat Package
LQFP = Low Profile Quad Flat Package
SOP = Small Outline Package

Serial/Optical Communications (continued)

- GVIF — Gigabit Video Interface

Part Number	Function	Including BLK	Resolution	Color Depth	Power Supply	Pd (typ.)	Package (Body Size)
CXB1451Q	GVIF Transmitter	ENCODER P/S Converter PLL Synthesizer Cable Driver	VGA, SVGA & XGA	18-bit	+3.3V	0.8W	PQFP80 (14mm x 14mm)
CXB1452Q	GVIF Receiver	DECODER S/P Converter PLL Clock Recovery Cable Equalizer	VGA, SVGA & XGA	18-bit	+3.3V	1.0W	PQFP80 (14mm x 14mm)
CXB1454R	GVIF Receiver	TTL I/F DECODER Cable Equalizer PLL Synthesizer P/S Converter Common Mode Voltage Driver	VGA, SVGA, XGA	24-bit	+3.3V	1.1W	LQFP64 (14mm x 14mm)
CXB1455R	GVIF Transmitter	TTL /IF ENCODER P/S Converter PLL Synthesizer Cable Driver Common Mode Voltage Level Detector	VGA, SVGA, XGA	24-bit	+3.3V	0.25W	LQFP48 (7mm X 7mm)
CXB1456R	GVIF Receiver	TTL I/F DECODER Cable Equalizer PLL Synthesizer P/S Converter Common Mode Voltage Driver	VGA, SVGA, XGA	24-bit	+3.3V	0.25W	LQFP64 (10mm x 10mm)

GVIF Chip Set

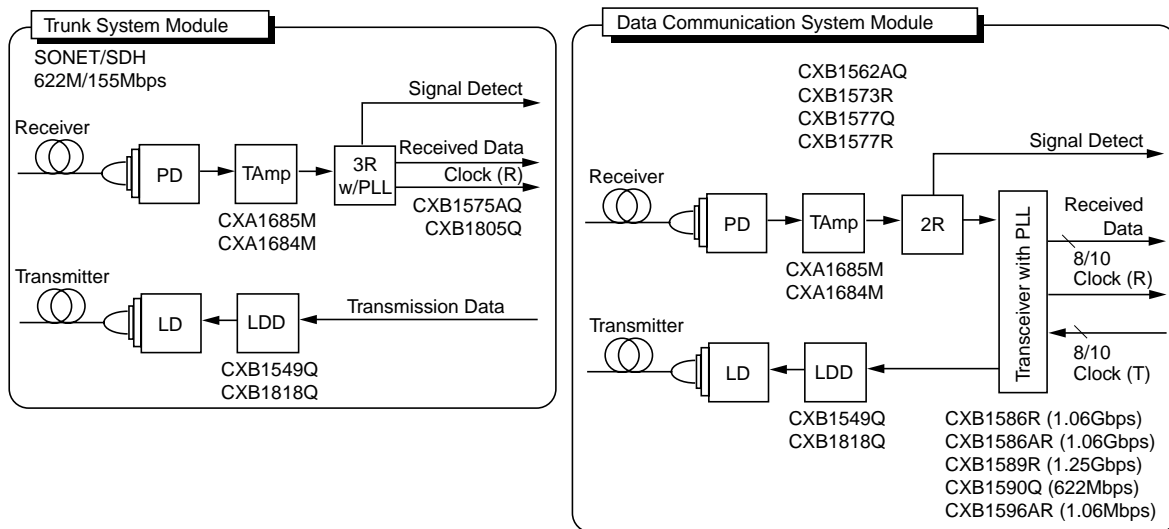


Serial/Optical Communications (continued)

• Applications

Application	Data Rate	Transmitter	LDD	T Amp.	2R IC	3R IC	Receiver	Repeater
SDH (SONET)	155Mbps	—	—	CXA1685M	CXB1562AQ CXB1572Q	CXB1575AQ CXB1805Q	—	—
	622Mbps			CXA1684M	CXB1563Q CXB1577Q	CXB1805Q		
FDDI	125Mbps			CXA1685M	CXB1562AQ CXB1572Q	—		
Fibre Channel	133Mbps			—	CXB1548QY	CXB1685M		
	266Mbps	CXB1583Q	CXB1558QY	—	CXB1572Q	—	CXB1583Q	
	531Mbps	CXB1581Q	CXB1549Q	CXA1684M	CXB1573R	—	CXB1582Q	—
Gigabit Ethernet	1.25Gbps	CXB1589R	CXB1818Q	—	CXB1577R	—	CXB1582Q	CXB1585N
				—	CXB1563Q CXB1577Q	—	CXB1586R/AR CXB1596AR	
ATM	622Mbps	CXB1590Q	—	CXA1684M	—	—	CXB1590Q	—
Gigabit Ethernet	1.25Gbps	CXB1589R	—	—	—	—	CXB1589R	—

• Transmission System



NOTES:

- PD: Photo Diode
- T Amp: Transimpedance Amplifier
- 2R: Reshaping & Regenerating
- 3R: Reshaping, Regenerating & Retiming
- LD: Laser Diode/LED
- LDD: Laser Diode Driver/LED Driver
- PLL: Phase-Locked Loop

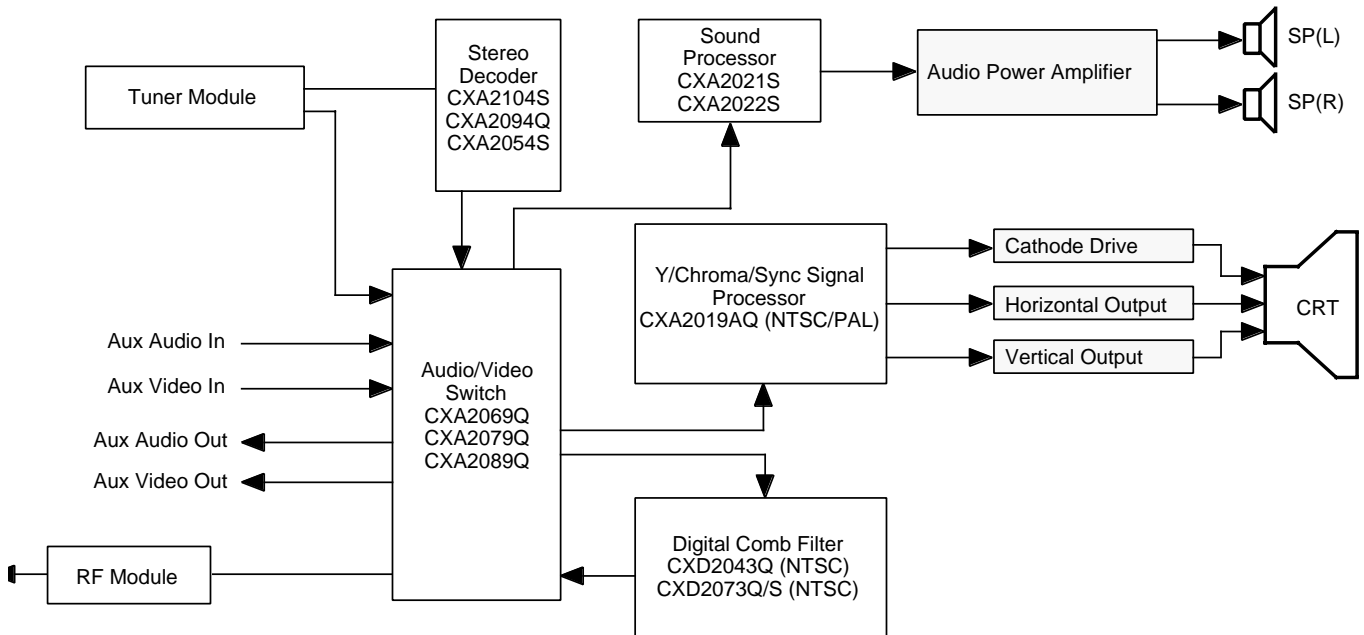
TV

Part Number	Package	Function	Voltage
CXA2104S	SDIP	US TV Stereo & SAP Decoder, dbx-TV Noise Reduction Decoder, I ² C Bus	9
CXA2094Q	QFP		
CXA2054S	SDIP	US TV Stereo & SAP Decoder, dbx-TV Noise Reduction Decoder, I ² C Bus, Sound Processor, AGC	9
CXA2021S	SDIP	Sound Processor, I ² C Bus, Volume, Bass, Treble, Surround, AGC	12
CXA2022S		Sound Processor, I ² C Bus, Volume, Bass, Treble, 3-mode Surround, AGC	
CXD2043Q	QFP	NTSC, High Precision of Y/C Field Separation, Built-in 4fsc PLL	5
CXD2073Q		NTSC, 2 Line Comb, Built-in 4fsc PLL	
CXA2019AQ		Y/C Signal Processor	

— I²C Bus Controlled Audio/Video Switch

Part Number	Number of Inputs	Number of Outputs	Frequency Charac.	Features	Supply Voltage	Package	Pins
CXA2069Q	7	3	20MHz, -3dB	S2 Compatible, Audio/Video Switch	9	QFP	64
CXA2079Q	6	2					64
CXA2089Q	5	2					48

TV System Block Diagram



Wireless Communications

GaAs MMIC (Microwave Monolithic IC)

— Switch IC

Part Number	Functions	Insertion Loss (dB)	Isolation (dB)	@ Frequency (GHz)	Control Voltage (V)	V _{DD} (V)	Package	C D M A	T D M A	G S M
CXG1077TN -T2, 1K/reel	SPDT	0.35 0.5	22 17	0.9 1.8	3 3	N/A	TSSOP-10	X	X	
CXG1028ATN -T2, 1K/reel	SPDT	0.3 0.5	22 17	0.9 1.9	3-5 ⁽¹⁾ 3-5 ⁽¹⁾	N/A	TSSOP-10	X	X	X
CXG1045N -T4, 1K/reel	DPDT	0.4 0.6	22 17	0.9 1.9	3-5 ⁽¹⁾ 3-5 ⁽¹⁾	N/A	SSOP-8	X	X	X
CXG1009TN -T2, 1K/reel	SPDT	0.7 0.8	56 44	1.0 2.0	3 3	N/A	TSSOP-10	X	X	X
CXG1022TM -T4, 1K/reel	SPDT	0.3	31	1.0	3	N/A	TSSOP-10	X	X	X
CXG1039TN -T2, 1K/reel	SPDT w/Logic	0.8	50	2.0	3	3	TSSOP-10	X	X	X
CXG1040TN -T2, 1K/reel	DPDT w/Logic	0.5	25	2.0	3	3	TSSOP-10	X		
CXG1068N -T4, 1K/reel	SP4T	0.5 0.6	24 20	0.9 1.8	5 5	5 5	SSOP-20		X	X
CXG1025R -T4, 1K/reel	SP4T	1.0	45	2.4	3	3	LQFP-32	X	X	X
CXG1091TN ⁽²⁾ -T2, 1K/reel	SP4T w/Logic	0.5 0.7	24 20	0.9 1.8	3 3	5 5	TSSOP-16		X	X
CXG1092N ⁽²⁾ -T4, 1K/reel	SP5T w/Logic	0.5 0.7	24 20	0.9 1.8	3 3	5 5	SSOP-20		X	X

NOTES:

1. (Pin=35dBm, Vct1=5V) or (Pin=10dBm, Vct1=3V)
2. Samples Available: Now; MP Available: 11/99

— Driver Amplifier

Part Number	Gain (dB)	P _{OUT} (dBm)	Distortion	Frequency (GHz)	Number of Stages	V _{DD} (V)	Package
CXG1027TM	29.5	10	ACPR=-65dBc	0.94	2	3.4	TSSOP-10

— Power Amplifier

Part Number	Gain (dB)	P _{OUT} (dBm)	Distortion	Frequency (GHz)	Number of Stages	V _{DD} (V)	Package
CXG1047FN ⁽¹⁾ -T2, 1K/reel	28	34	Harm (2f) <-42dBc (3f) <-37dBc	1.88	3	3.6	HSOF-16

NOTE:

1. Samples Available: Now; MP Available: 11/99

— Low Noise Amp/Mixer

Part Number	Functions	NF (dB)	Gain (dB)	Frequency (GHz)	V _{DD} (V)	Package
CXG1013N -T4, 1K/reel	LNA Mixer	1.8 7.2	14.5 9	1.9 (flo=1.66) 1.9 (flo=1.66)	3.0 3.0	SSOP-16
CXG1034TN -T2, 1K/reel	Mixer	8.5	8	1.9 (flo=1.66)	3.0	TSSOP-10

Wireless Communications (continued)

CDMA Cellular/CDMA PCS IC — Gain Control Amplifier (AGC Amp)

	Part Number	Package	Input Port	fopr (MHz)	Vcc (V)	Gain Range (dB)	IIP3 (dBm)	NF (dB)
RF IF	CXA3001N -T4, 1K/reel	SSOP-24	Dual	10 to 100	3.1 to 3.8	-45 to +45	-38@G=40dB f=85.38MHz	6.5@G=40dB f=85.38MHz
	CXA3201AN -T4, 1K/reel	SSOP-16	Dual	50 to 300	2.7 to 3.8	-45 to +45	-38@G=40dB f=210.38MHz	5@G=40dB f=210.38MHz
	CXA3221AN -T4, 1K/reel	SSOP-8	Single	50 to 300	2.7 to 3.8	-45 to +45	-38@G=40dB f=210.38MHz	5@G=40dB f=210.38MHz
TX IF	CXA3002N -T4, 1K/reel	SSOP-24	Single	10 to 200	3.1 to 3.8	-40 to 40	-26@G=3.5dB f=130.38MHz	10@G=35dB f=130.38MHz
	CXA3202AN -T4, 1K/reel	SSOP-16	Single	50 to 300	2.7 to 3.8	-60 to 20	-5@G=15dB f=130.38MHz	25@G=15dB f=130.38MHz
	CXA3222AN -T4, 1K/reel	SSOP-8	Single	50 to 300	2.7 to 3.8	-60 to 20	-5@G=15dB f=130.38MHz	25@G=15dB f=130.38MHz

— Baseband Analog ASIC (BBASIC)

Part Number	Functions, Features	Supply Voltage (V)	Package	Pins
CXA3003BR ⁽¹⁾ -T6, 500/reel	Analog Baseband ASIC for CDMA, FM with I/Q DEM, I/Q MOD, PLL, A/D, D/A	3.3	LQFP	80
CXA3303R ⁽¹⁾ -T6, 500/reel		3.0	LQFP	80

NOTE:

1. Samples and data sheet to be distributed only to CDMA licensees.

Analog Cellular IC

— IF Amplifier IC

Part Number	Functions, Features	Supply Voltage (V)	Package	Pins
CXA1741Q -T4, 1K/reel	FM IF amplifier with filter for TACS, NTACS	2.7 to 3.6	QFP	40
CXA1742Q -T4, 1K/reel	FM IF amplifier with filter for AMPS	2.7 to 3.6	QFP	40

— PLL IC

Part Number	Functions, Features	Supply Voltage (V)	Package	Pins
CXA1786N -T4, 1K/reel	1GHz-band single chip PLL for radio communication, power save mode	2.7 to 5.5	SSOP	20

Wireless Communications (continued)

GPS IC

Part Number	Functions, Features	Supply Voltage (V)	Package	Pins
CXA1951AQ -T4, 1K/reel	Receive down converter, LNA, mixer, IF amplifier, PLL, oscillator	2.7 to 5.5	QFP	40
CXD2930BR -TL, 500/reel	16-channel GPS signal processing IC, built-in 32-bit RISC CPU, 32Kbyte SRAM	3.0 to 3.6	LQFP	144
CXD2931R ⁽¹⁾ -TL, 500/reel	16-channel GPS signal processing IC, built-in 32-bit RISC CPU, 36Kbyte SRAM and 2Mbit MASK ROM	3.0 to 3.6	LQFP	144

NOTE:

1. Samples Available: 10/99; MP Available: 12/99

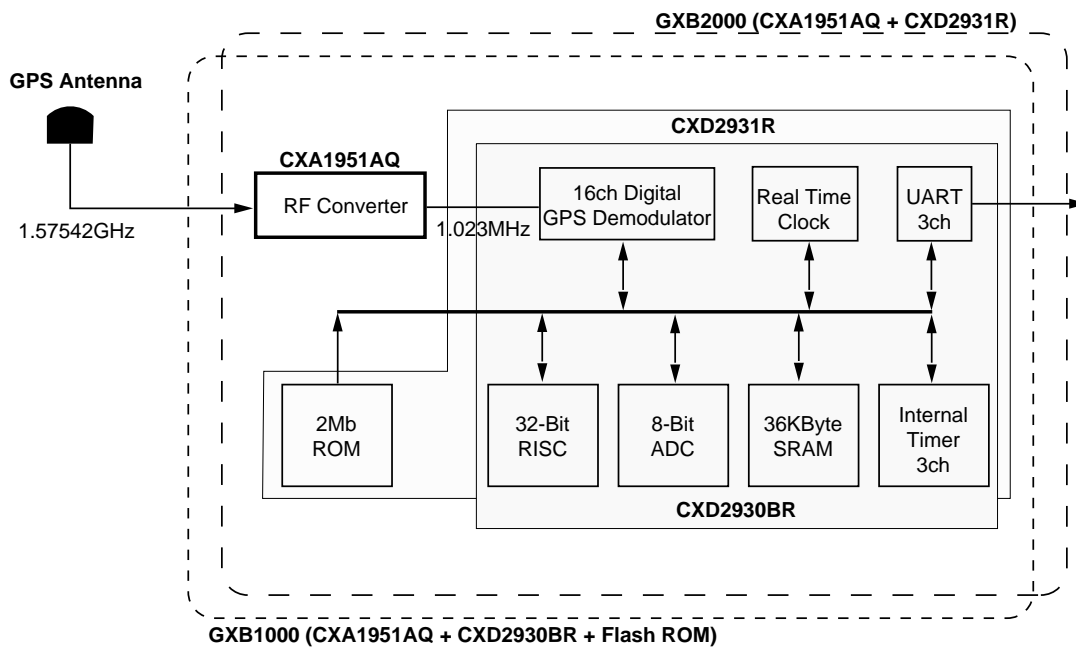
GPS Receiver Module

Part Number	Functions	Supply Voltage (V)	Module Size	Weight
GXB1000 ⁽¹⁾	CXD2930BR + CXA1951AQ Module	3.0 to 3.6	47.3mm x 24.6mm	6.7g
GXB2000 ⁽²⁾	CXD2931R + CXA1951AQ Module	3.0 to 3.6	36.5mm x 25.0mm	5.7g

NOTES:

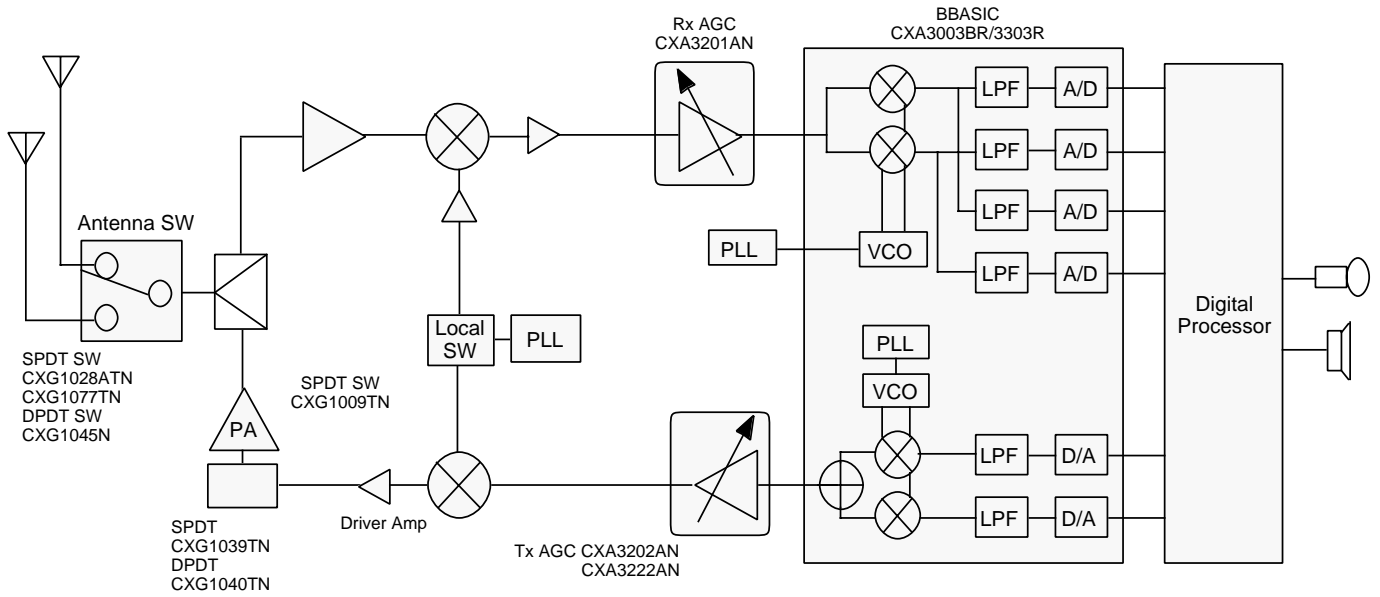
1. Samples Available: Now; MP Available: 10/99
2. Samples Available: 11/99, MP Available: 1/00

Sony GPS System

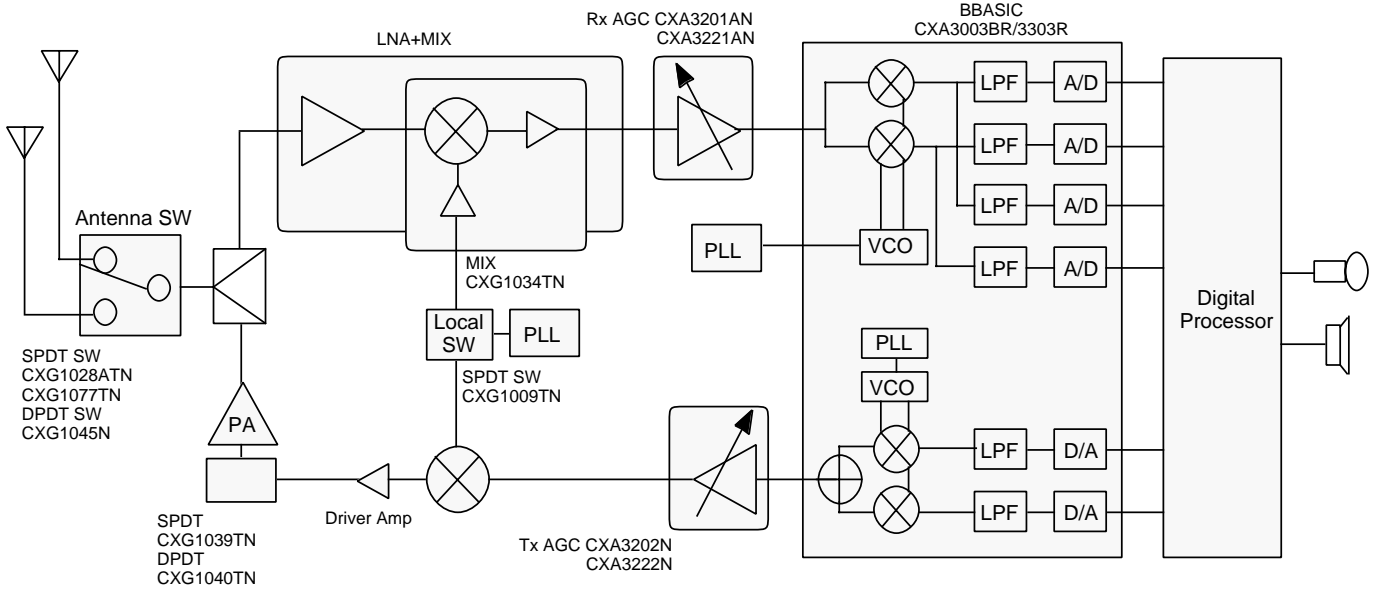


Wireless Communications (continued)

CDMA800/AMPS800 (Dual Mode)

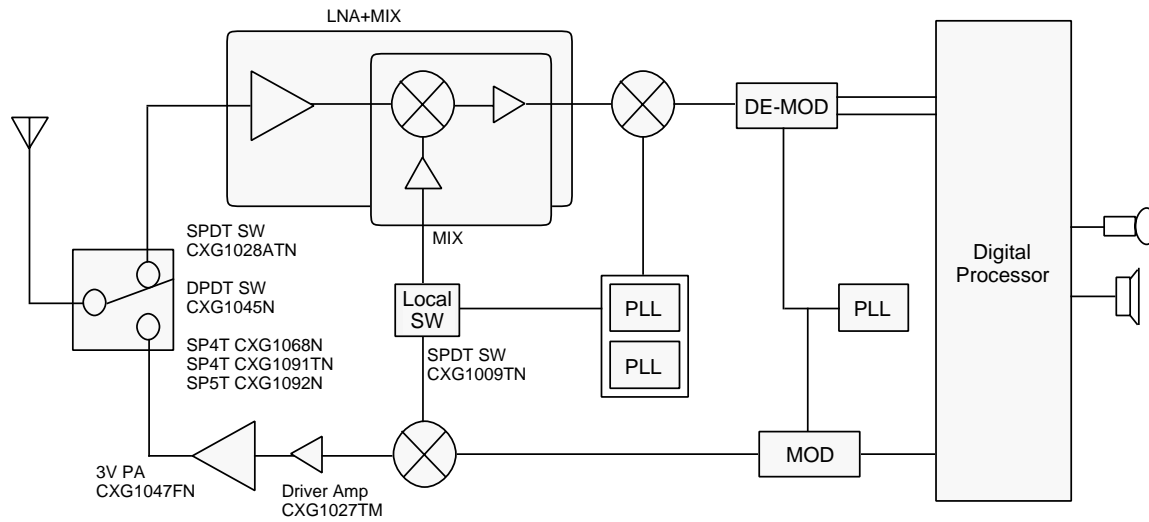


CDMA1900 (PCS)

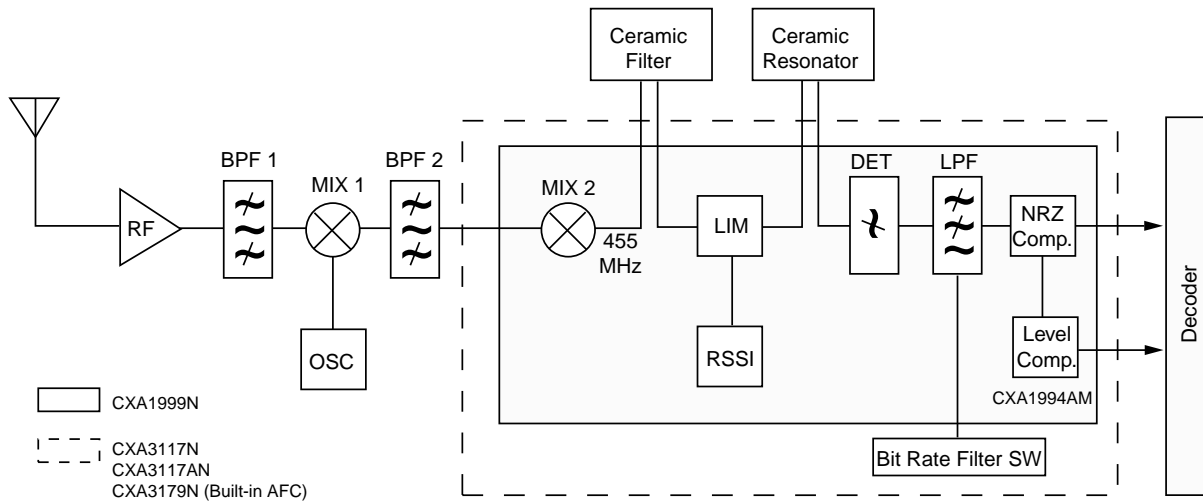


Wireless Communications (continued)

DCS1800/PCS1900 (GSM)



Pager System (Double Conversion)



Wireless Communications (continued)

Pager IC

— FM IF Amplifier

Part Number	Structure	Functions, Features	Supply Voltage (V)	Package	Pins
CXA1999N -T4, 1K/reel	Double conversion	Low power FM IF amplifier with 4-level FSK comparator	1.1 to 4.0	SSOP	20
CXA3117N -T4, 1K/reel	Double conversion	Low power FM IF amplifier with 4-level FSK comparator, bit rate filter selection switch	1.1 to 4.0	SSOP	24
CXA3117AN -T4, 1K/reel	Double conversion	Low power FM IF amplifier with 4-level FSK comparator, bit rate filter selection switch. Quick charge by the detector output sense method	1.1 to 4.0	SSOP	24
CXA3176N -T4, 1K/reel	Double conversion	Super low power FM IF amplifier (w/second mixer), PACT compatible	1.1 to 4.0	SSOP	24
CXA3179N -T4, 1K/reel	Double conversion	Low power FM IF amplifier with 4-level FSK comparator, bit rate filter selection switch	1.1 to 4.0	SSOP	24

— Comparator

CXA1994AM -T4, 500/reel	—	4-level FSK comparator	1.0 to 4.0	SOP	8
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GaAs MES FET for RF Receiver

Part Number	Applications	Features	Supply Voltage VDS (V)	ID (mA)	Package	Pins
SGM2014AM -T7, 3K/reel	UHF RF amplifier, mixer, oscillator	Low cross modulation, built-in gate protection diode, low noise NF = 1.5dB (typ.) @f = 900MHz	5.0	10	Mini Mold	4
SGM2014AN -T7, 3K/reel	UHF RF amplifier, mixer, oscillator	Low cross modulation, built-in gate protection diode, low noise NF = 1.5dB (typ.) @f = 900MHz	5.0	10	Super Mini Mold	4
SGM2016AM/AP -T7, 3K/reel	UHF RF amplifier, mixer, oscillator	Built-in gate protection diode, low noise NF = 1.2dB (typ.) @f = 900MHz	5.0	10	Mini Mold	4
SGM2016AN -T7, 3K/reel	UHF RF amplifier, mixer, oscillator	Built-in gate protection diode, low noise NF = 1.2dB (typ.) @f = 900MHz	5.0	10	Super Mini Mold	4
3SK165A -0-T7, -1-T7, 3K/reel	UHF RF amplifier, mixer	Low noise, low input capacitance 0.5pF (typ.)	5.0	10	Mini Mold	4
3SK166A -2-T7, 3K/reel	UHF RF amplifier, oscillator	Low noise, high gm 40ms (typ.)	5.0	10	Mini Mold	4

Index of Device Numbers

Product	Page	Product	Page	Product	Page	Product	Page	Product	Page
3SK165A	23	CXB1573R	14	CXG1091TN	18	ICX204AL	4	ILX724K	7
3SK166A	23	CXB1575AQ	14	CXG1092N	18	ICX205AK	4	ILX734LA	7
CXA1310AQ	3	CXB1577Q	14	CXK77910ATM	13	ICX205AL	4	LCX017CLT	10
CXA1390AR	2	CXB1577R	14	CXK77910AYM	13	ICX206AK	2	LCX023CMT	10
CXA1391R	2	CXB1585N	14	CXK77920YM	13	ICX206AL	3	LCX029AMT	10
CXA1592R	2	CXB1590Q	14	CXK77B1810AGB	13	ICX206AKB	2	LCX031ALT	10
CXA1690Q	4	CXB1595AN	14	CXK77B1811AGB	13	ICX207AK	2	MCB100	4
CXA1741Q	19	CXB1596AR	14	CXK77B1840AGB	13	ICX207AL	3	MCB101	4
CXA1742Q	19	CXB1805Q	14	CXK77B1840GB	13	ICX207AKB	2	MCB120	4
CXA1786N	19	CXB1818Q	14	CXK77B1841AGB	13	ICX208AK	2	MCB121	4
CXA1951AQ	20	CXD1217M	2	CXK77B1841GB	13	ICX208AKB	2	SGM2014AM	23
CXA1994AM	23	CXD1250M	4	CXK77B3610AGB	13	ICX208AL	3	SGM2014AN	23
CXA1999N	23	CXD1261AR	3	CXK77B3611AGB	13	ICX209AK	2	SGM2016AM	23
CXA2006Q	4	CXD1265R	2	CXK77B3640AGB	13	ICX209AL	3	SGM2016AN	23
CXA2019AQ	17	CXD1267AN	2,3,4	CXK77B3640GB	13	ICX209AKB	2	SGM2016AP	23
CXA2021S	17	CXD1268M	3,4	CXK77B3641AGB	13	ICX248AK	2	SLD1131VS	9
CXA2022S	17	CXD1915R	8	CXK77B3641GB	13	ICX248AL	3	SLD1132VS	9
CXA2054S	17	CXD1922Q	8	CXK77V1810GB	13	ICX249AK	2	SLD1133VL	9
CXA2069Q	17	CXD1930Q	8	CXK77V1840GB	13	ICX249AL	3	SLD1135VS	9
CXA2079Q	17	CXD2043Q	17	CXL1517M	2	ICX254AK	2	SLD1137VS	9
CXA2089Q	17	CXD2073Q	17	CXL1518M	2	ICX254AL	3	SLD234VL	9
CXA2094Q	17	CXD2311AR	4	CXL5504M	2	ICX255AK	2	SLD301	9
CXA2104S	17	CXD2401R	2	GXB1000	20	ICX255AL	3	SLD304	9
CXA3001N	19	CXD2408AR	4	CXB2000	20	ICX258AK	2	SLD322	9
CXA3002N	19	CXD2409R	3	ICX038DLA	3	ICX258AL	3	SLD323	9
CXA3003BR	19	CXD2424R	4	ICX038DNA	2	ICX259AK	2	SLD324	9
CXA3106AQ	11,12	CXD2434ATQ	4	ICX038DNB	2	ICX259AL	3	SLD326	9
CXA3117AN	23	CXD2437TQ	4	ICX039DLA	3	ILX503A	7	SLD327	9
CXA3117N	23	CXD2450R	4	ICX039DNA	2	ILX505A	7		
CXA3176N	23	CXD2460R	4	ICX039DNB	2	ILX506	7		
CXA3179N	23	CXD2463R	3	ICX054BK	2	ILX508A	7		
CXA3197R	11,12	CXD2457R	4	ICX054BL	3	ILX511	7		
CXA3201AN	19	CXD2930BR	20	ICX055BK	2	ILX514	7		
CXA3202AN	19	CXD2931R	20	ICX055BL	3	ILX516K	7		
CXA3221AN	19	CXG1009TN	18	ICX058CK	2	ILX518K	7		
CXA3222AN	19	CXG1013N	18	ICX058CL	3	ILX520K	7		
CXA3246Q	11,12	CXG1022TM	18	ICX059CK	2	ILX521A	7		
CXA3256R	11,12	CXG1025R	18	ICX059CL	3	ILX523A	7		
CXA3276Q	11,12	CXG1027TM	18	ICX076AK	2	ILX524K	7		
CXA3286R	11,12	CXG1028ATN	18	ICX076AL	3	ILX526A	7		
CXA3303R	19	CXG1034TN	18	ICX077AK	2	ILX531A	7		
CXB1451Q	15	CXG1039TN	18	ICX077AL	3	ILX532A	7		
CXB1452Q	15	CXG1040TN	18	ICX082AL	3	ILX533K	7		
CXB1454R	15	CXG1045N	18	ICX083AL	3	ILX535K	7		
CXB1455R	15	CXG1047FN	18	ICX096AKE	2	ILX703A	7		
CXB1456R	15	CXG1068N	18	ICX097AKE	2	ILX716K	7		
CXB1549Q	14	CXG1077TN	18	ICX204AK	4	ILX718K	7		

Sony Electronics Inc.
Semiconductor Business Division
Authorized Sales Representatives

Alabama: Rep, Inc. — 256/881-9270

Alaska: Sony — 408/955-4004

Arkansas: Component Technology — 972/783-8831

Arizona: Reptronix — 602/230-2630

California:

(North) Phase II Technical Sales — 408/980-0414 or
916/663-3558

(South) DynaRep, Inc. — 805/777-1185 or 714/573-1223
(San Diego) Addem — 858/794-1999

Colorado: Wescom Marketing — 303/432-6809

Connecticut: S-J Associates — 203/723-4707

Delaware: S-J Associates — 609/866-1234

District of Columbia: S-J Associates — 703/533-2233

Florida: Conley & Assoc. — 407/365-3283 or 727/572-8895

Georgia: Rep, Inc. — 770/938-4358

Hawaii: Sony — 408/955-4004

Idaho:

(North) Phase II Technical Sales — 503/292-7922
(South) Wescom Marketing — 208/377-5585

Illinois:

(North) Janus, Inc. — 630/250-9650
(South) Lorenz Sales — 913/469-1312

Indiana: Skyline Sales & Assoc. — 219/489-4992

Iowa: Lorenz Sales — 319/294-1000

Kansas: Lorenz Sales — 913/469-1312

Kentucky: Skyline Sales & Assoc. — 317/587-1320

Louisiana: Component Technology — 972/783-8831

Maine: S-J Associates — 978/670-8899

Maryland: S-J Associates — 703/533-2233

Massachusetts: S-J Associates — 978/670-8899

Michigan: Skyline Sales & Assoc. — 734/416-1493

Minnesota: Vector Design Technology — 651/631-1334

Mississippi: Rep, Inc. — 256/881-9270

Missouri: Lorenz Sales — 314/997-4558

Montana: Phase II Technical Sales — 425/821-8313

Nebraska: Lorenz Sales — 402/932-3314

Nevada:

(North) Phase II Technical Sales — 916/663-3558
(Clark County) Reptronix — 602/230-2630

New Hampshire: S-J Associates — 978/670-8899

New Jersey:

(North) S-J Associates — 516/536-4242
(South) S-J Mid-Atlantic — 609/866-1234

New Mexico: Reptronix — 505/292-1718

New York:

(Metropolitan) S-J Associates — 516/536-4242
(Upstate) L-MAR — 607/785-1185 or 716/425-9100

North Carolina: Rep, Inc. — 919/469-9997 or 704/334-9289

North Dakota: Vector Design Technology — 612/631-1334

Ohio: Skyline Sales & Assoc. — 440/846-0019

Oklahoma: Component Technology — 972/783-8831

Oregon: Phase II Technical Sales — 503/292-7922

Pennsylvania:

(West) Sony — 972/383-1377
(East) S-J Associates — 609/866-1234

Rhode Island: S-J Associates — 978/670-8899

South Carolina: Rep, Inc. — 919/469-9997 or 704/334-9289

South Dakota: Vector Design Technology — 651/631-1334

Texas:

(Austin) Component Technology — 512/246-8512
(Dallas) Component Technology — 972/783-8831
(El Paso County) Reptronix — 505/292-1718
(Houston) Component Technology — 281/599-8573 or
281/655-0550

Tennessee: Rep, Inc. — 770/938-4358

Utah: Wescom Marketing — 801/269-0419

Vermont: S-J Associates — 978/670-8899

Virginia: S-J Associates — 703/533-2233

Washington: Phase II Technical Sales — 425/821-8313

West Virginia: S-J Associates — 703/533-2233

Wisconsin:

(West) Vector Design Technology — 651/631-1334
(East) Janus, Inc. — 414/646-5420

Wyoming: Wescom Marketing — 208/377-5585

Canada:

Alberta: Davetek Marketing Inc. — 403/283-3577

British Columbia: Davetek Marketing Inc. — 604/430-3680

Montreal: Kaltron — 905/264-3968

Ontario: Kaltron — 613/256-5278

Quebec: Kaltron — 514/630-7238

Puerto Rico:

Rio Peidras: Economic Marketing Services — 787/287-2665

Sony Electronics Inc.
Semiconductor Business Division
Authorized Distributors

Alabama:	Marshall — 256/881-9235	Ohio:	
Arizona:	Bell Microproducts — 602/297-9551	Dayton	Marshall — 937/898-4480
	Marshall — 602/496-0290	Solon	Marshall — 440/248-1788
California:		Oregon:	Bell Microproducts — 503/524-0787
Agoura Hills	Bell Microproducts — 818/865-0266		Marshall — 503/644-5050
El Monte	Marshall — 626/307-6000	Pennsylvania:	Marshall — 609/234-9100
Irvine	Bell Microproducts — 949/470-2900		
	Marshall — 949/458-5301	Texas:	
Milpitas	Marshall — 408/942-4600	Austin	Bell Microproducts — 512/258-0725
Rancho Cordova	Marshall — 916/635-9700		Marshall — 512/837-1991
San Diego	Bell Microproducts — 619/597-3010	Houston	Marshall — 713/467-1666
	Marshall — 619/627-4140	Richardson	Bell Microproducts — 972/783-4191
San Jose	Bell Microproducts — 408/451-9400		Marshall — 972/705-0600
Thousand Oaks	Marshall — 805/370-5100	Utah:	Bell Microproducts — 801/295-3900
Colorado:	Bell Microproducts — 303/846-3065		Marshall — 801/973-2288
	Marshall — 303/460-0477	Washington:	Marshall — 425/486-5747
Connecticut:	Marshall — 203/265-3822	Wisconsin:	Marshall — 414/797-8400
Florida:		Canada:	
Altamonte Springs	Bell Microproducts — 407/682-1199	Montreal	Marshall — 514/694-8142
	Marshall — 407/767-8585	Quebec	Marshall — 418/656-1162
Deerfield Beach	Marshall — 954/422-8600	Toronto	Marshall — 905/612-1771
St. Petersburg	Marshall — 727/573-1399	Vancouver	Marshall — 604/294-6506
Georgia:	Marshall — 770/814-9393		
Illinois:	Bell Microproducts — 847/413-8530		
	Marshall — 847/490-0155		
Indiana:	Marshall — 937/898-4480		
Kansas:	Marshall — 913/492-3121		
Maryland:	Bell Microproducts — 410/720-5100		
	Marshall — 410/880-3030		
Massachusetts:			
Woburn	Bell Microproducts — 781/933-9010		
Wilmington	Marshall — 978/658-0810		
Michigan:	Marshall — 734/254-0943		
Minnesota:			
Eden Prairie	Bell Microproducts — 612/943-1122		
Plymouth	Marshall — 612/559-2211		
New Jersey:			
Fairfield	Marshall — 201/882-0320		
Pine Brook	Bell Microproducts — 973/244-9668		
New York:			
Endicott	Marshall — 607/785-2345		
Rochester	Marshall — 716/235-7620		
Ronkonkoma	Marshall — 516/737-9300		
Smithtown	Bell Microproducts — 516/543-2000		
North Carolina:	Marshall — 919/878-9882		