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■ Europe: LNBs for Satellite Broadcast

◆ Features

(1) Wide band type receiving all broadcasting channels (analog & digital) in Europe. [Universal LNB]
(2) Originally developed feed-horn waveguide makes the wide-band, low-noise characteristics possible.
(3) One of the industry's most compact and lightweight package
(4) Low dissipation current design for energy saving [80 mA (TYP.): BS1K0EL150A]

◆ Specifications

Destination		Europe, Astra/Eutelsat Satellite etc.			
Receiving polarization		Horizontal/Vertical polarization			
Model No. <Type>		BS1R8EL500A <4 output>	BS1R8EL400A <4 output>	BS1K0EL250A <2 output>	BS1K0EL150A <1 output>
Input frequency (GHz)		10.7 to 11.7 [Low band], 11.7 to 12.75 [High band]			
Output frequency (MHz)		950 to 1 950 [Low band], 1 100 to 2 150 [High band]			
Local oscillation frequency (GHz)		9.75 [Low band], 10.6 [High band]			
NF (dB)		0.7 (TYP.)		0.4 (TYP.)	
Conversion gain (dB)		56 (TYP.)			58 (TYP.)
Phase noise		–55 dBc/Hz at 1 kHz (TYP.)			
Cross-polar discrimination (dB)		25 (TYP.)			
Supply voltage (V DC) (Polarization switching)	Vertical polarization	11.5 to 14.0 (0/22 kHz)			
	Horizontal polarization	16.0 to 19.0 (0/22 kHz)			
Dissipation current (mA)		210 (TYP.)/250 (MAX.)	310 (TYP.)/350 (MAX.)	190 (TYP.)/250 (MAX.)	80 (TYP.)/120 (MAX.)
Waveguide		Feed-horn (F/D = 0.6)			
Output impedance (Ω)		75			
Output connector (F-type)		4-output (H/H, H/L, V/H, V/L)	4-output (H/V, High and low switching)	2-output (H/V, High and low switching)	1-output (H/V, High and low switching)
Outline dimensions (W) × (D) × (H) (mm)		133.0 × 103.6 × 60.0	133.0 × 103.6 × 60.0	135.0 × 90.0 × 58.0	103.0 × 60.0 × 60.0
Weight (g)		Approx. 255	Approx. 256	Approx. 245	Approx. 90


BS1R8EL500A


BS1R8EL400A


BS1K0EL250A


BS1K0EL150A

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■ Japan/Asia/Australia: LNBs for CS Digital Satellite Broadcast

◆ Specifications

Destination		Japan, Asia, Australia, CS Satellite
Receiving polarization		Horizontal/Vertical polarization
Model No. <Type>		BS1R8AR100A
Input frequency (GHz)		11.70 to 12.75
Output frequency (MHz)		1 000 to 2 050
Local oscillation frequency (GHz)		10.7
NF (dB)		0.7 (TYP.) / 0.9 (MAX.)
Conversion gain (dB)		55 to 64
Phase noise		–75 dBc/Hz at 1 kHz (TYP.)
Cross-polar discrimination (dB)		25 (TYP.)
Supply voltage (V DC) (Polarization switching)	Vertical polarization	11.5 to 14.0
	Horizontal polarization	16.0 to 19.0
Dissipation current (mA)		80 (TYP.)/120 (MAX.)
Waveguide		Feed-horn (F/D = 0.6)
Output impedance (Ω)		75
Output connector (F-type)		1-output (H/V switching)
Outline dimensions (mm)		107.3 (W) × 60 (D) × 60 (H)
Weight (g)		Approx. 110

BS1R8AR100A

■ Japan: LNBs for BS/CS 110° Satellite Broadcast

◆ Features

(1) Can receive 2 satellite broadcasts of 110° BS/CS digital
[Employs wide-band (1 GHz) circular' linear polarization conversion technology (septum waveguide structure)]

(2) Outstanding noise figure (NF) characteristics enabling compact design of antenna diameter. [NF: 0.45 dB (TYP.)/BS1F6JU300A]

(3) Low dissipation current design for improved energy saving. [80 mA (TYP.)]

◆ Standard Specifications

Destination		Japan BS/CS 110° Satellite		
Receiving polarization		Right circular polarization		Right/Left circular polarization
Model No.		BS1F6JU300A	BS1F6JP300A	BS1F6JP100A
Input frequency (GHz)		11.71023 to 12.751		
Output frequency (MHz)		1 032.23 to 2 073		
Local oscillation frequency (GHz)		10.678		
NF (dB)		0.45 (TYP.) / 0.6 (MAX.)	0.7 (TYP.) / 1.1 (MAX.)	
Conversion gain (dB)		48 to 60		
Phase noise		–65 dBc/Hz at 1 kHz (TYP.)		
Cross-polar discrimination (dB)		25 (TYP.)/20 (MIN.)		
Supply voltage (V DC) (Polarization switching)	Right circular polarization	9.5 to 18.0		13.5 to 16.5
	Left circular polarization	—		9.5 to 12.0
Dissipation current (mA)		80 (TYP.)/110 (MAX.)		
Waveguide		Feed-horn (F/D = 0.5)		
Output impedance (Ω)		75		
Output connector (F-type)		1-output		1-output (R/L switching)
Outline dimensions (mm)		96 (W) × 53.07 (D) × 71 (H)		
Weight (g)		Approx. 130 (not including outer cabinet)		

BS1F6JP300A

* Outer cabinet is made upon request.

RF Components

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■ Digital DBS Front-End Units

◆ Features

(1) Equipped with a direct conversion IC developed by Sharp. Reliability is improved by reducing power consumption and component counts.

(2) Wide-band reception design also covering CS broadcast band. [Reception frequency: 950 to 2 150 MHz]

(3) Wide product line-up of LINK integrated types for contributing to set development time reduction. [Compatible with DVB-S/DVB-S2/ISDB-S/ABS-S demodulation]

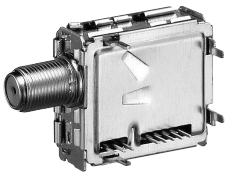
(4) User support tools can be provided. [Sample/evaluation boards and software are available.]

◆ Standard Specifications <IQ output type>

Destination	Global (DVB-S)	Global (ISDB-S/DVB-S2/ABS-S)	
Input type	1-input/1-loop through output		1-input
Model No.	BS2S7HZ0502	BS2S7HZ7306A	BS2S7HZ6701
Input frequency (MHz)	950 to 2 150		
Input signal level (dBm)	–65 to –25		
The 1st intermediate frequency (MHz)	Zero-IF (Direct conversion)		
Base band frequency bandwidth (MHz)	10 to 30, 2.0 MHz step (BB LPF)		
RF input local leak (dBm)	–70 and below		
Output type	I/Q		
Channel selection system	PLL (I²C-bus)*1		
Noise figure (dB)	7 (TYP.)		
Tuning voltage (V DC)	Shared with a 3.3 V power source		
Supply voltage (V DC)	3.3		
LNB power supply	DC 25 V, 400 mA (MAX.)		
Input impedance (Ω)	75		
Outline dimensions (mm)	29.6 (W) × 29.4 (D) × 13.0 (H)		30.6 (W) × 25.0 (D) × 13.0 (H)

※ Contact SHARP for custom design product.
*1 I²C-bus is a trademark of Philips Corporation.

BS2S7HZ0502/
BS2S7HZ7306A

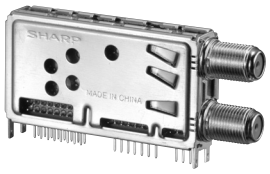


BS2S7HZ6701

■ Digital DBS Front-End Unit

◆ Standard Specifications <NIM type>

Destination	Global (DVB-S)
Input type	1-input, 1-loop through output
Model No.	BS2F7VZ7395
Input frequency (MHz)	950 to 2 150
Input signal level (dB m)	–65 to –25
The 1st intermediate frequency (MHz)	Zero-IF (Direct conversion)
Base band frequency bandwidth (MHz)	10 to 30, 2.0 MHz step (BB LPF)
RF input local leak (dB m)	–70 and below
Output type	Transport stream (parallel/serial)
Symbol rate (M baud)	45 (MAX.)
Channel selection system	PLL (I²C-bus)*1
Noise figure (dB)	7 (TYP.)
Tuning voltage (V DC)	Shared with a 3.3 V power source
Supply voltage (V DC)	3.3, 2.5
LNB power supply	25 V DC, 400 mA (MAX.)
Input impedance (Ω)	75
Outline dimensions (mm)	57.5 (W) × 29.6 (D) × 13.2 (H)

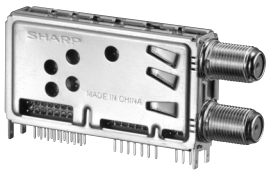


BS2F7VZ7395

※ Contact SHARP for custom design product.
*1 I²C-bus is a trademark of Philips Corporation.

◆ Standard Specifications <NIM type>

Destination	Europe (DVB-S2)	
Input type	1-input, 1-loop through output	1-input
Model No.	BS2F7VZ7702	BS2F7HZ1263
Input frequency (MHz)	950 to 2 150	
Input signal level (dB m)	–65 to –25	
The 1st intermediate frequency (MHz)	Zero-IF (Direct conversion)	
Base band frequency bandwidth (MHz)	10 to 30, 2.0 MHz step (BB LPF)	10 to 30
RF input local leak (dB m)	–70 and below	
Output type	Transport stream (parallel/serial)	
Symbol rate (M baud)	45 (MAX.)	10 to 30
Channel selection system	PLL (I²C-bus)*1	
Noise figure (dB)	7 (TYP.)	
Tuning voltage (V DC)	Shared with a 3.3 V power source	
Supply voltage (V DC)	3.3, 1.2	3.3, 1.0
LNB power supply	25 V DC, 400 mA (MAX.)	
Input impedance (Ω)	75	
Outline dimensions (mm)	57.5 (W) × 29.6 (D) × 13.2 (H)	56.0 (W) × 34.9 (D) × 10.0 (H)



BS2F7VZ7702

BS2F7HZ1263

※ Contact SHARP for custom design product.
*1 I²C-bus is a trademark of Philips Corporation.

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■ Combination Front-End Units for Digital Terrestrial, Analog Terrestrial and Digital Satellite Broadcasting

◆ Features

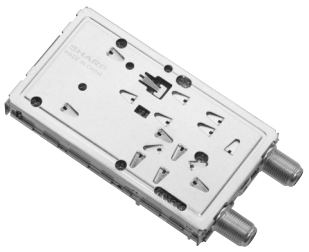
(1) Enables simultaneous reception of digital terrestrial and digital satellite broadcasting.

(2) Contributes to making LCD TVs and other devices thinner.

◆ Standard Specifications

Destination	Japan (ISDB-T/S/NTSC)		
Model No.	VA1R5JF8012		
	Digital terrestrial	Analog terrestrial	Digital DBS
Input frequency (MHz)	VHF, UHF, CATV (pass-through) VHF Low: 93 to 167 VHF High: 173 to 399 UHF: 405 to 767		950 to 2 150
Input signal level*1 (dBm)	–75 to –20	–	–65 to –25
Output type	Transport stream (Serial)	CVBS/SIF	Transport stream (Serial)
IF bandwidth (MHz)	6		–
Base band frequency bandwidth (MHz)	–		10 to 30, 2.0 MHz step (BB LPF)
Noise figure (dB)	6 (TYP.)		6 (TYP.)
Phase noise (dBc/Hz)	–90 (TYP.) at 10 kHz offset		–80 (TYP.) at 10 kHz offset
Image rejection (dB)	–65 (TYP.)		–
Channel selection system	PLL (I^2C-bus)*2		
Supply voltage (V DC)	1.2, 2.5, 3.3, 5.0		
Outline dimensions (mm)	85.5 (W) × 45.2 (D) × 12.7 (H)		

*1 It conforms to the ARIB standard.
*2 I^2C-bus is a trademark of Philips Corporation.



VA1R5JF8012

■ Front-End Units for ISDB-T/DVB-T/CTTB/CATV

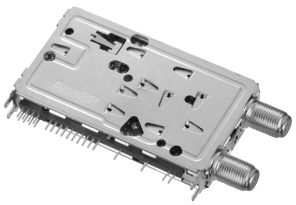
◆ Features

(1) Low phase noise characteristics, high elimination of adjacent channel interference.
(2) Transport stream output front-end units with built-in OFDM demodulation IC.
(3) Compact, low power consumption.
(4) Other types are available with various forms of chassis (vertical or horizontal type) and input connectors (F or DIN type), etc.

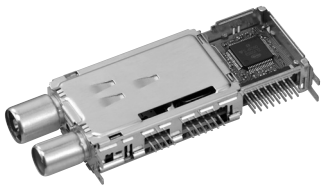
◆ Standard Specifications

Destination	Japan (ISDB-T/S)		Europe (DVB-T)/Asia (DVB-T)	
Model No.	VA1J5JF7011*1		VA1T1ED5065	VA1K5ED5459
	Digital terrestrial	Digital satellite		
Input frequency (MHz)	VHF, UHF, CATV (pass-through) VHF Low: 93 to 167 VHF High: 173 to 399 UHF: 405 to 767	950 to 2 150	VHF: 143.5 to 430 UHF: 430 to 862	VHF: 146 to 430 UHF: 430 to 862
Output type	Transport stream (Serial)		Direct IF	Transport stream (Parallel/serial)
IF bandwidth (MHz)	6	—	7, 8, selectable	8
Noise figure (dB)	6 (TYP.)	8 (TYP.)	6 (TYP.)	
Phase noise (dBc/Hz)	–90 (TYP.) at 10 kHz offset	–80 (TYP.) at 10 kHz offset	–90 (TYP.) at 10 kHz offset	
Image rejection (dB)	–65 (TYP.)	—	–55 (TYP.)	—
Channel selection system	PLL (I^2C-bus)*2			
Power consumption (W)	2.0*3		0.75	1.3
Supply voltage (V DC)	1.2, 2.5, 3.3, 5		5 (DC-DC converter)	5, 3.3, 1.2 (DC-DC converter)
Outline dimensions (mm)	70.0 (W) x 40.0 (D) x 12.7 (H)		52.0 (W) x 35.9 (D) x 13.4 (H)	70.0 (W) x 29.6 (D) x 13.2 (H)

*1 Enables simultaneous reception of digital terrestrial and digital satellite broadcasting.
*2 I^2C-bus is a trademark of Philips Corporation.
*3 During simultaneous OFDM/8PSK demodulation operation.



VA1J5JF7011



VA1K5ED5459

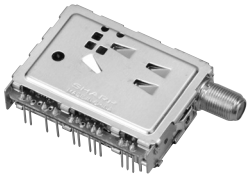
FRONT-END UNITS FOR ISDB-T/DVB-T/CTTB/CATV

◆ Standard Specifications

Destination	Brazil (ISDB-TB)	China (CTTB)	Europe/China/India (DVB-C)
Model No.	VA1J5BF6009	VA1T1EF2096	VA1K5CD5405
	Digital terrestrial	Digital terrestrial	CATV
Input frequency (MHz)	54 to 864	47 to 862	
Output type	Transport stream (Serial)	Direct IF	Transport stream (Parallel/serial)
IF frequency/IF bandwidth (MHz)	44/6	36/8	
Noise figure (dB)	6 (TYP.)		
Phase noise (dBc/Hz)	–90 (TYP.) at 10 kHz offset	–87 (TYP.) at 10 kHz offset	
Image rejection (dB)	–65 (TYP.)	–55 (TYP.)	
Channel selection system	PLL (I^2C-bus)*1		
Power consumption (W)	2.0	0.75	1.3
Supply voltage (V DC)	1.2, 2.5, 3.3, 5	5	2.5, 3.3, 5
Outline dimensions (mm)	70.0 (W) x 37.0 (D) x 12.5 (H)	68.2 (W) x 35.9 (D) x 14.1 (H)	70.0 (W) x 29.4 (D) x 13.0 (H)

*1 I^2C-bus is a trademark of Philips Corporation.

VA1J5BF6009



VA1T1EF2096

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■ Front-End Units for Digital Terrestrial and Analog Terrestrial Broadcasting

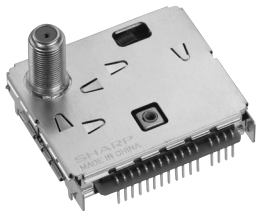
◆ Features

Contributing to the development of thinner LCD TVs and similar products by combining compatibility with digital and analog terrestrial broadcasts into a single unit.

◆ Standard Specifications

Destination		North America	Europe	Brazil*2	China
Model No.		VA1Y2UF2446	VA1E2ED2001	VA1G5BF8015	VA1G2CD8001
Input frequency (MHz)		Low: 54 to 160.9 Mid: 161 to 425.9 High: 426 to 864	VHF: 47 to 430 UHF: 430 to 862	VHF Low: 54 to 160.9 VHF High: 161 to 425.9 UHF: 426 to 864	47 to 870
Analog intermediate frequency (MHz)	Video	45.75	B/G, I, D/K, L: 38.9 L': 33.9	45.75	38.0
	Audio	41.25	D/K, L: 32.4 I: 32.9 B/G: 33.4 L': 40.4	41.25	D/K: 31.5, I: 32.0, B/G: 32.5, M/N: 33.5
Digital intermediate frequency (MHz)		44	36.167	44	36
Digital IF bandwidth (MHz)		6	7/8 (switchable)	6	8
Phase noise (dBc/Hz)		–85 (TYP.) at 20 kHz offset	–85 (TYP.) at 10 kHz offset	–90 (TYP.) at 10 kHz offset	–85 (TYP.) at 10 kHz offset
Supply voltage (V DC)		5.0	5.0	1.2, 2.5, 3.3, 5	5.0
Noise figure (dB)		TYP. 6 (54 to 806 MHz), TYP. 7 (806 to 861 MHz)	TYP. 6		
Channel selection system		PLL (I^2C-bus)*1			
Image rejection (dB)		Low: –65.0, Mid: –65.0, High: –60.0	TYP. –65		
Outline dimensions (W) × (D) × (H) (mm)		52.6 × 38.1 × 10.0	53.9 × 28.9 × 9.5	70.0 × 37.0 × 10.0	70.0 × 37.0 × 10.0

*1 I^2C-bus is a trademark of Philips Corporation.
*2 Transport stream output front-end units with built-in OFDM demodulation IC


VA1Y2UF2446


VA1E2ED2001


VA1G5BF8015

RF Components

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■ MPEG Module

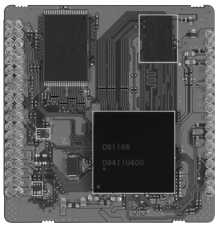
◆ Features

(1) An OFDM demodulator, MPEG decoder and video encoder circuit are combined into a single package for reception of ISDB-T.

(2) Comes with built-in standard reception software, with a simple EPG included, based on the ARIB standard.
Compatible with Ministry of Internal Affairs and Communications specifications for a "simple tuner."
Compatible also with full HD output.

(3) The tuner (RF) section is separate, making it possible to select between digital/analog and digital tuners.

Recommended tuner { Digital terrestrial: VA1T1JF2031
Analog terrestrial/Digital terrestrial: VA1W2JF2008



DU6N4JZ00xx

◆ Standard Specifications

Model No.	DU6N4JZ00xx
Circuit configuration	[RF (separate body) +] OFDM + MPEG
Receiving channel (ch)	[VHF] 1 to 13, [UHF] 14 to 62, [CATV] C13 to C63*1
Video output	Component (Full HD)*2
Audio output	Analog stereo (L/R)
B-CAS	Built-in control software
EPG	Built-in simple EPG
ES (Engineering service)	○
Firm ware upgrades	○
Supply voltage (V)	3.3/1.8/1.0
Power consumption (W)	Approx. 1.1
Outline dimensions (mm)	58 (W) × 60 (D) × 7 (H)

*1 CATV (pass-through)
*2 Composite video/YC (SD) output is also supported.

■ One-Seg Tuner Module

◆ Features

(1) High sensitivity: -98 dBm (13 seg, QPSK CR: 2/3)
(2) Compact and thin design: 5.9 × 5.9 × 1.0 mm
(3) Low power consumption: 70 mW (with software power control)
(4) Output interface: TS serial output

VA3A5JZ947

◆ Standard Specifications

Destination	Japan
Model No.	VA3A5JZ947
Input frequency (MHz)	470 to 770 (UHF: 13 to 62)
Input signal level (dBm)	–98 (13 seg, QPSK CR: 2/3)
Outline dimensions (mm)	5.9 (W) × 5.9 (D) × 1.0 (H)
Supply voltage (V DC)	1.8 (RF) 2.8 (RF OSC) 1.2 (OFDM Core) 1.7 to 2.8 (I/O)
Power consumption (mW)	70 (with software power control)
Operating temperature (degree C)	–20 to 85
Control I/F	I²C-bus*1

*1 I²C-bus is a trademark of Philips Corporation.

ONE-SEG TUNER MODULE FOR SIMULTANEOUS 2-PROGRAM RECEPTION / EMBEDDED WIRELESS LAN-BLUETOOTH COMBO MODULE

■ One-Seg Tuner Module for Simultaneous 2-program Reception

◆ Features

(1) Capable of receiving two one-seg programs simultaneously

(2) Compatible with diversity reception for stable, high-sensitivity reception (with single-program reception)

(3) Compact package size (9.0 × 9.0 × 1.25 mm)

VA3A5JZ923

◆ Standard Specifications

Destination	Japan
Model No.	VA3A5JZ923
Output type	Transport stream
Reception frequency range (MHz)	470 to 770 (UHF: 13 to 62 ch)
OFDM demodulation	Built in
Input sensitivity (dBm)	–112 (using diversity reception)
Control interface	I²C-bus*1
Supply voltage (V)	1.2 (OFDM), 1.8 (RF), 1.8 to 3.1 (I/O)
Power consumption (mW)	82 (with single-tuner reception) 160 (with 2-tuner reception) 155 (with 2-tuner diversity reception)
Outline dimensions (mm)	9.0 (W) × 9.0 (D) × 1.25 (H)

*1 I²C-bus is a trademark of Philips Corporation.

■ Embedded Wireless LAN-Bluetooth Combo Module

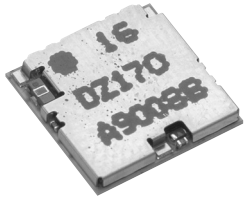
◆ Features

(1) A two-in-one module compliant with the latest Bluetooth standard (v2.1)
Wireless LAN: 11b/g, Bluetooth: v2.1+EDR* (3 Mbps)

(2) Compatible with IEEE802.15.2 standard compliant wireless LAN and Bluetooth coexistence functions.

(3) Thin, compact configuration—the smallest class in the industry.
9.0 x 9.0 x 1.22 mm

*EDR: Enhanced Data Rate



DC2K1DZ170

◆ Standard Specifications

Model No.	DC2K1DZ170	
Wireless communication standard	WLAN (IEEE802.11b/g)	Bluetooth v2.1+EDR
Outline dimensions (mm)	9.0 (W) × 9.0 (D) × 1.22 (H) (LTCC)	
Frequency (MHz)	2 400 to 2 483.5	2 402 to 2 480
Data rate (Mbps)	1/2/5.5/11 & 6/9/12/18/24/36/48/54	1/2/3
Number of channels	13	79
Transmission output (dBm)	11g: +14/11b: +18	Class 2
Receiving sensitivity (dBm)	TYP.: –84 (11 Mbps, PER 8%) TYP.: –71 (54 Mbps, PER 10%)	TYP.: –70 (1 Mbps, BER 0.1%) TYP.: –70 (2 Mbps, BER 0.01%) TYP.: –70 (3 Mbps, BER 0.01%)
Security	WEP TKIP AES	by driver software
Interface	SPI/SDIO	PCM (64 kbps), SPI/UART

Consult separately regarding driver software.

RoHS Pb FREE

■ Advanced Flex Printed Circuit Boards

The advanced flex printed circuit board is a multilayered composite wiring board comprised of flexible printed circuits (FPC) laminated into a multilayer configuration. The PWBs and FPCs are connected to each other via copper-plated through holes. It is ideal for compact, lightweight equipment design.

◆ Features

(1) For selecting optimal specifications to suit specific applications, special specifications such as for mobile phones are also available.
- Minimum thickness in multi-layer part: 0.26 mm (4-layer), 0.33 mm (6-layer)
- Minimum pattern width/pitch: 0.06/0.07 mm
- Flexibility of single/double sided FPC part (dedicated for hinge): More than 200 000 times 180-degree bending of radius 3 mm

(2) Capable of board-to-board connection without connectors, which enables space-saving and 3-dimensional equipment assembly.

(3) Through hole plating connection of multi-layer (3 to 8) part to flexible part significantly improves reliability.

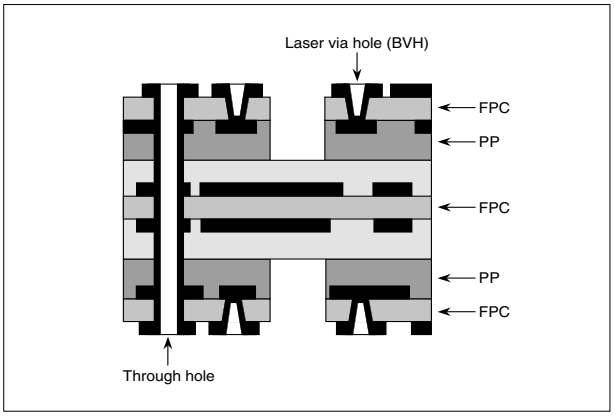
(4) Blind Via Hole (BVH) forming with laser via drilling of small diameter.

(5) Sheet design provides excellent mountability, equivalent to that of PWB.

◆ Outline Specifications

Type		Folding type/Flying tail type
Min. base thickness (mm)		0.26 (4-layer), 0.33 (6-layer), 0.40 (8-layer)
Min. line width/spacing (mm)		0.06/0.07
Min. through hole diameter (mm)		ø0.25
Min. via hole land diameter	Through hole (mm)	Outer layer: ø0.5, Inner layer: ø0.5
	Blind via hole (mm)	ø0.09
	Inner via hole (mm)	ø0.30
Solder resist		Multi layer: Liquid photo solder resist, FPC: Film cover ray
Surface finish		Heat-resistant preflux, Ni-Au plating (Ni-Au plating for flying tail)
Safety standard		UL (94V-0)

■ Construction of Advanced Flex Board (example of 6-layer BVH)



Printed Circuit Boards

Notice
In the absence of confirmation by device specification sheets, SHARP takes no responsibility for any defects that may occur in equipment using any SHARP devices shown in catalogs, data books, etc. Contact SHARP in order to obtain the latest device specification sheets before using any SHARP device.

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■ Flexible Build-Up Multilayer PCBs

<Flex-rigid specifications>

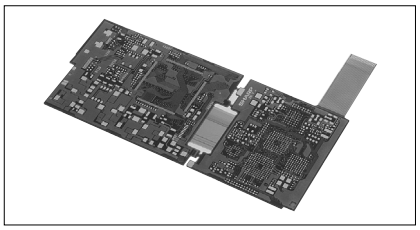
Advanced flex specifications are used for the inner layer core material of this build-up multilayer PCB, so the board can handle finer mounting patterns and achieve connectorless between-board connections using an inner layer flexible printed circuit (FPC). This facilitates greater equipment design flexibility and ultra-compact designs.

◆ Features

(1) Multiple build-up layers are connected internally with an FPC, thereby improving connection reliability between multilayer boards and reducing both connection space and connector weight.

(2) Enables narrow pitch (0.4 mm) CSP and bare chip mounting, and thus greater equipment compactness through ultra-high density mounting.

(3) Enables via-on-IVH (inner-via-hole) configurations, and makes it possible to achieve ultra-high density wiring designs.
(Facilitates a diverse range of designs for greater compactness and thinness.)

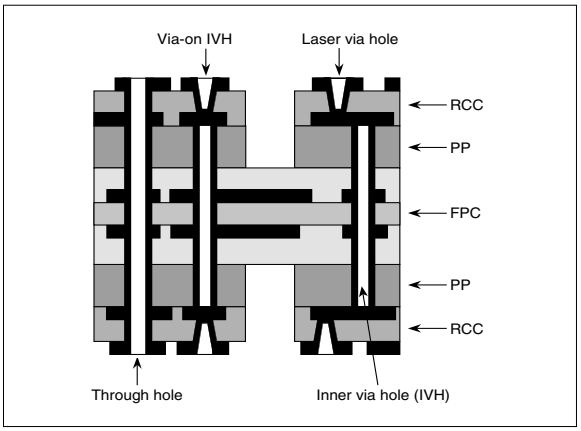


◆ Outline Specifications

Type		F1 (6- to 8-layer)
No. of build-up layers		1 for each side of core layer
Core layer configuration		3 to 6 layers (Polyimide, FR-4)
Min. board thickness*1 (mm)		0.57 (6-layer), 0.77 (8-layer)
Via hole diameter Land hole diameter	Conformal via hole (mm)	ø0.09/ø0.30
	Stacked via hole	–
Via-on IVH		Available
Inner via hole diameter (mm)		ø0.2
Min. line width/spacing*2 (mm)		0.09/0.09
CSP mountable pitch (mm)		0.4
Safety standard		UL (94V-0)

*1 Consult with SHARP if a thinner type is required for special designs.
*2 Values are measured at build-up portion.

■ Construction of Flexible Build-Up Multilayer PCBs (example of 6-layer IVH)



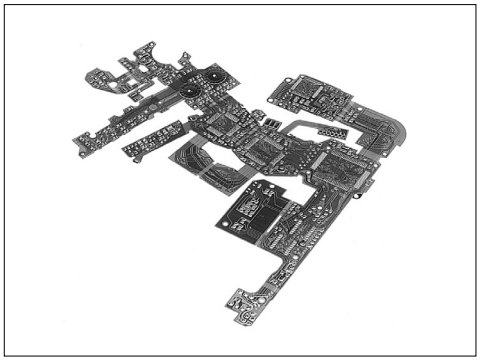
■ Flexible Printed Circuit Boards

The flexible printed circuit board is designed for high space efficiency and product design flexibility, which are now aiming at more compact and higher density mounting. It also contributes to the reduction of assembly process and to the enhancement of the reliability.

◆ Features

(1) High density mounting circuit, SMT and other most suitable flexible PCB are available.

(2) High precision type for COF with flip chip mounting and wire bonding capabilities and other connector mounting type are also available.



◆ Standard specifications

Layers	Single side	Both-side through-hole
Substrate materials	Polyimido film, non-adhesive polyimido	
Design pattern width (mm)	0.02 (MIN.)	0.05 (MIN.)
Design pattern spacing (mm)	0.04 (MIN.)	0.05 (MIN.)
Through-hole / land diameter (mm)	–	ø0.1/ø0.3 (MIN.)
Cover lay	Polyimido film, heat resistant ink, liquid soldering resist	
Safety standard	UL (94V-0)	

◆ Line-up

Multi-layer flexible PCB	Both-side flexible PCB
Single-layer flexible PCB	Flex-rigid PCB
Single-side high precision flexible PCB	Both-side high precision flexible PCB

Other line-up

Bonding Ni-Au plating
Highly flexible (bending capacity)
High density SMT