

STANDARD CELLS

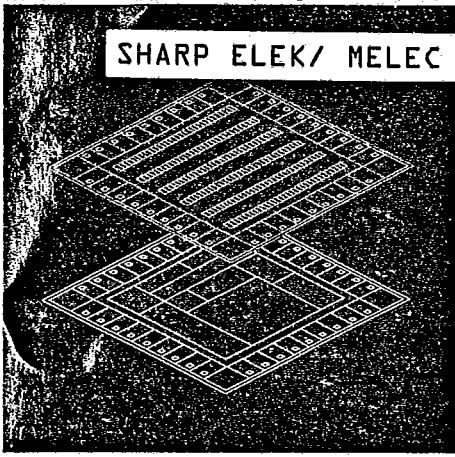
Standard Cells (CMOS1 — CMOS5A Series)

Features

- User-designed circuits or special I/O circuits can be designed in.
- Compatibility with the LZ92/LZ93/LZ95 Series means that standard cells can be developed in the same way as gate arrays.
- Chip size can be compressed even more than gate arrays for the same circuit density, permitting significant cost reductions.

Standard Cells

Model No.	CMOS1	CMOS4	CMOS4A	CMOS5A	
Internal gate count	1,500	10,000	13,000	30,000	
Delay time	Internal gate	350 ns	2.8 ns	1.7 ns	0.9 ns
	Input buffer	85 ns	4.0 ns	3.5 ns	3.5 ns
	Output buffer	60 ns	4.0 ns	3.5 ns	3.5 ns
Supply voltage	1.0 to 7.0V	2.0 to 5.5V			

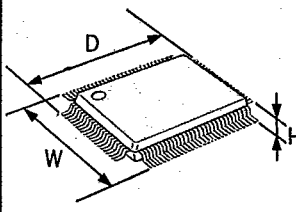
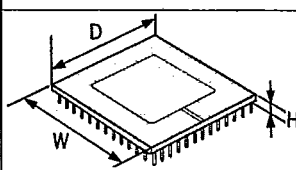
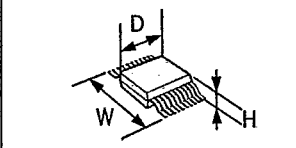
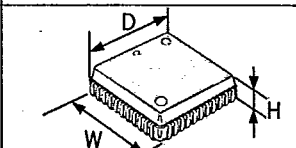


PACKAGES

Packaging Options

Sharp provides full support for a variety of gate array packaging options. Customers can select the packaging to match carrier and assembly methods, as well as optimum pin count, depending on the system. Packaging options for each series are indicated in the chart below.

Package name	Outline	Pin count	Pin pitch (mm)	W (mm)	D (mm)	H (mm) ^(*)
DIP (Dual-In-line Package)		16	2.54 (100mil)	7.6	19.3	4.2
		18			23.0	
		20			24.5	
		22		10.2	27.2	4.4
		24		15.2	31.0	5.1
		28			36.0	
		32			41.0	
		40			52.0	
		42			53.8	
		48			62.0	
SDIP (Shrink DIP)		24	1.778 (70mil)	7.6	22.0	4.2
		28		10.2	25.5	4.4
		30		15.2	27.2	5.1
		42			38.2	
		52			47.0	
		64		19.1	58.0	5.2
SOP (Small Outline Package)		24	1.27 (50mil)	12.0	15.4	2.3
		28			18.0	

Package name	Outline	Pin count	Pin pitch (mm)	W (mm)	D (mm)	H (mm) ^(*)
QFP (Quad Flat Package) (*2)		36	0.8	13.5	13.5	1.6
		44				
		48	0.75			
		52	0.65			
		56				
		60	0.8			
		64	1.0	18.8	24.8	2.9
		80 □	0.8			
		80 □	0.8	22.0	22.0	2.5
		96	0.7			
		100	0.65	18.8	24.8	2.9
		128	0.8	31.2	31.2	3.6
160	0.65					
PGA (Pin Grid Array)		180	2.54 (100mil)	40.0	40.0	4.7
MFP (Mini Flat Package)		18	0.8	9.3	7.5	1.6
		20	0.75			
QFJ (Quad Flat J-Leaded Package)		44	1.27 (50mil)	17.5	17.5	4.4

(*1) The height from the surface of PWB when mounted.

(*2) 80-pin QFP is available for two types of packages including rectangular "□" and square "□" outlines.

*Sharp also offers TAB and COB as well as a variety of package options described herein.