

1984

HITACHI QUICK REFERENCE GUIDE TO INTEGRATED CIRCUITS AND DISCRETE SEMICONDUCTOR DEVICES

PREFERRED EUROPEAN TYPE-SELECTION

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NOTICE

The example of an applied circuit or combination with other equipment shown herein indicates characteristics and performance of a semiconductor-applied product. The Company shall assume no responsibility for a problem involving a patent caused when applying the descriptions in the example.

LINEAR IC

Spec.	Device No.	Function	Structure	Package code	Material for details	Page
A	HA1124	TV Sound IF		DP-14	DB	43
A	HA1125					
A	HA1127	5 Transistor Arrays		DG-14	DB	
A	HA1137W	FM IF (Hi-Fi)		DP-16	DB	44
A	HA1156W	FM MPX (Hi-Fi)		DP-14		45
A	HA1196					
A	HA1197	AM Tuner (Hi-Fi)		DP-16		
A	HA1199	AM Tuner (Car)				44
A	HA11211	FM/AM Tuner (Hi-Fi)		DP-18		
A	HA11223W	FM MPX with Pilot Cancel		DP-16		45
A	HA11225	FM IF (Hi-Fi)		DP-16		44
A	HA11226	Dolby-B N.R. System		DP-18		45
A	HA11226MP					
A	HA11423	Color TV Deflection Signal Processor		DP-16-2	43	
A	HA11423MP			MP-18		
A	HA11431			DP-28		
A	HA11431NT			DP-30S		
A	HA11436A	Color TV Lumi-chroma with Auto. Flesh		DP-28	42	
A	HA11440A	Color TV Picture IF		DP-16		
A	HA11441	TV Synchronous Processor		DP-16-2	43	
A	HA11441MP			MP-18		
A	HA11442A	Color TV Picture IF		DP-16		
A	HA11445A	TV Signal Processor		DP-28		
A	HA11458	Color TV/VTR Picture IF & Sound IF		DP-28	42	
A	HA11461NT	Color TV Picture IF, Sound IF & H/V		DP-42S		
A	HA11464	Color TV Chroma Processor		DP-16-2		
A	HA11465A	TV Video Amp.		DP-28	DB	
A	HA11480	Color TV Lumi-chroma with Auto. Flesh	Bipolar	DP-30S		42
A	HA11485NT	VTR Picture IF & Sound IF		DP-16-2		
A	HA11720	Video Camera Encoder		MP-18		
A	HA11720MP			MP-28		
A	HA11731MP	Video Camera 3-ch Processing Amp.		DP-22		
A	HA11734	VTR Slow Motion Controller		DP-28		
A	HA11741	VTR Color Signal Processor		MP-28		
A	HA11743AMP	Video Camera Integrator		DP-28		
A	HA11744	VTR Write & Read Amp.				
A	HA11745	VTR Video Amp.				
A	HA11747A	VTR Servo Controller		DP-18	43	
A	HA11749	VTR Speed Controller		DP-16		
A	HA11750	VTR f_H Correction		DP-42S		
A	HA11751NT	VTR Phase Servo Controller		DP-16		
A	HA11752	VTR Playback Preamp.		DP-42S		
A	HA11753NT	VTR Servo Controller		DP-28		
A	HA11755	VTR Video Reproducing Video Signal Processor				
A	HA11756	VTR Chroma Signal Processor		FP-36		
A	HA11759PB	Video Camera Index Signal Processor		MP-44		
A	HA11760PB	Video Camera M-signal Processor		DP-16		
A	HA11767AMP	Video Camera 4-ch Process				
A	HA11768	VTR 2/4/6 Automatic Mode Change				
A	HA11772	VTR Preamp.		MP-28		
A	HA11773MP	Video Camera AGC				
A	HA11774MP	Video Camera Det.				
A	HA11776AMP	Video Camera Encoder				

Spec.	Device No.	Function	Structure	Package code	Material for details	Page
A	HA11777MP	Video Camera Auto White Balance		MP-28		A
A	HA11781NT	VTR Chroma Signal Processor				A
A	HA11784NT	VTR Video & Playback		DP-30S		43
A	HA11789MP	Sound FM Mod. and Demod. for Hi-Fi VTR		MP-28		A
A	HA11789NT			DP-30S		A
A	HA12002	Protector of Speaker & Power Amp.		SP-8		46
A	HA12005	Audio Low Noise Amp.		DP-16		A
A	HA12006	Electronic Controller for Cassette Tape Deck		DP-16-2		A
A	HA12010	Fluorescent Tube Bar Graph Display				A
A	HA12016	FM MPX (Hi-Fi)		DP-16		45
A	HA12017	Audio Low Noise Amp.		SP-7		B
A	HA12020	Audio Auto. Equalizer		DP-28		B
A	HA12022	Voltage Gain Controller				46
A	HA12024	Audio Tape Program Selector		DP-16-2		45
A	HA12026	FM MPX with VCO Stop (Car, Portable)		DP-16		45
A	HA12028	Cassette Tape Deck REC/PLY System		DP-22		45
A	HA12031	FM MPX with Birdie Noise Cancel		DP-28		45
A	HA12032	Quartz-lock Player Motor Controller		DP-18		A
A	HA12033	Microcomputer Output Extender for Tape Deck		DP-16-2		46
A	HA12034	Audio Tape Program Selector		DP-16		A
A	HA12035	Audio 2-ch Auto. Equalizer		DP-28		A
A	HA12037NT	Cassette Tape Deck REC/PLY System		DP-30S		A
A	HA12038			DP-28		45
A	HA12038NT	Dolby-B/C Noise Reduction		DP-30S		A
A	HA12038MP			M-28		A
A	HA12039	Auto. Volume Control (Car)		DP-16-2		A
A	HA12043					46
A	HA12044	CX Noise Reduction		DP-18		A
A	HA12045					A
A	HA12045MP			MP-18		A
A	HA12046			DP-18		A
A	HA12046MP	Dolby-B Noise Reduction	Bipolar	MP-18	DB	45
A	HA12047			DP-18		A
A	HA12047MP			MP-18		B
A	HA12048FP			FP-18		B
A	HA12048MP			MP-18		B
A	HA12049A	DAD Preamp.		DP-28		46
A	HA12051NT	Cassette Tape Deck REC/PLY System		DP-30S		45
A	HA12052C			DP-18		A
A	HA12052CFP	Pre + Power Amp. (Headphone Stereo)		FP-18		45
A	HA12052CMS			MP-18		A
A	HA12053	DAD Sample & Hold		DP-16		46
A	HA12055V	Noise Cancel + FM MPX (Car)		SP-21		45
A	HA12058			DP-28		A
A	HA12058MP	Dolby-B/C Noise Reduction		MP-28		45
A	HA12058NT			DP-30S		A
A	HA12063	FM MPX		DP-16		45
B	HA12066MP	Noise Reduction for VHS Hi-Fi and 8 mm Video		MP-18		-
A	HA12067NT	Fluorecent Tube Bar Graph Display		DP-30S		45
A	HA12411	FM IF System (Car)				A
A	HA12412	FM IF System (Hi-Fi)		DP-16		A
A	HA12413	FM/AM IF System (Modular, Portable)				44
A	HA12417	AM Tuner (Car)		SP-16		A

Spec.	Device No.	Function	Structure	Package code	Material for details	Page
A	HA12418	FM IF System (Car)		SP-16		A
A	HA12427AV	AM Tuner (Car)		SP-16		A
A	HA12428	AM Tuner with Station Det. (Car)		DP-16-2		44
A	HA12428V	AM Tuner with Station Det. (Car)		SP-21		A
A	HA12429	AM Radio Noise Canceller		DP-18		A
A	HA12429MP			MP-18		46
A	HA12430	FM/AM IF System (Modular, Portable)		DP-20		A
A	HA12432	AM Tuner with Station Det. (Hi-Fi)				A
A	HA12435V	FM IF System (Car)		SP-21		A
A	HA12436	FM IF System (Portable)		DP-16		44
B	HA12438	FM Front-End for Car Radio		FP-16		A
B	HA12439V			SP-16		A
A	HA1364	TV Sound IF + Audio Out		QP-12T		43
A	HA1374	Dual 2 ~ 3W Audio Power Amp. (8Ω)		SP-10TA	DB	A
A	HA1374A	Dual 3 ~ 4W Audio Power Amp. (8Ω)				
A	HA1377	Dual 5.8W Audio Power Amp. (4Ω)				A
A	HA1384	20W BTL Audio Power Amp. (4Ω)				A
A	HA1388	18W BTL Audio Power Amp. (4Ω)				A
A	HA1392	Dual 4 ~ 7W Audio Power Amp. (4Ω)				46
A	HA1393	19W BTL Audio Power Amp. (4Ω)		SP-12T		A
A	HA1394	Dual 6 ~ 8W Audio Power Amp. (8Ω)				A
A	HA1396	20W BTL Audio Power Amp. (4Ω)				A
A	HA1397	20W Audio Power Amp. (8Ω)				A
A	HA13001	Dual 5.5W (8Ω)/17.5W BTL (4Ω)				A
A	HA13003	PWM Amp. Modulator		DP-14T		46
A	HA13007	Stepping Motor Driver		DP-16		—
A	HA13102	Dual 5.5W Audio Power Amp. (4Ω)		SP-12T		46
A	HA13108	Dual 5.7W Audio Power Amp. (4Ω)		SP-12T	D.S	—
A	HA13405	Motor Driver (3-phase)	Bipolar	SP-23T		A
A	HA13406W					
A	HA13408	9-ch Printer Driver				A
A	HA13412	Motor Driver (3-phase)				—
A	HA13421A	Stepping Motor Driver		DP-16		—
B	HA13425	Fan Motor Driver		DP-16		A
B	HA13425MP			MP-18		A
B	HA13426	Winchester Spindle Motor Driver		SP-23T		—
A	HA13429	8-channel Power Driver		DP-20		A
A	HA13431	Spindle Motor Driver for 5.5 inches FDD		SP-23T		A
A	HA13432	Spindle Motor Driver for 3 to 3.5 inches FDD		DP-24TS		A
A	HA13432MP			MP-28		A
A	HA16603P	Contactless Switch		DP-16		A
A	HA16605W	Burner Controller		DP-20		—
A	HA16613A	8-bit Double Integral A/D Converter		DP-28		A
A	HA16617P	8-ch Fluorescent Display Driver				A
A	HA16617PJ			DP-18		—
A	HA16619P					A
A	HA16619PJ					—
B	HA16628P	DC Motor Control (5-bit D/A Converter)		DP-16		—
B	HA16629P	DC Motor Control (F/V Converter)				
A	HA16631P	FDD Read Amp.		DP-18		A
A	HA16631MP			MP-18		A
A	HA16632AP	FDD VFO		DP-28		—
A	HA16633P	16-bit D/A Converter		DP-42		46

Spec.	Device No.	Function	Structure	Package code	Material for details	Page
A	HA16636P	Ground Fault Interrupter		SP-8		A
B	HA16640NT	FDD Write + Mechanizm Control	Bipolar	DP-42S	DB	A
B	HA16642MP	FDD Read/Write Circuit	Bi-CMOS	MP-44		A
B	HA16642NT			DP-42S	A	
A	HC16701	Thermal Head Driver		Chip		A
A	HA17008RP	8-bit D/A Converter		DP-16		A
A	HA17008RG		DG-16	A		
A	HA17012RP	12-bit D/A Converter		DP-16		A
A	HA17012RG		DG-16	A		
A	HA17080PA	JFET-top Operational Amp.		DP-8		A
A	HA17080PS					A
A	HA17080GA			DG-8		A
A	HA17080GS					A
A	HA17082PA	Dual JFET-top Operational Amp.		DP-8		A
A	HA17082PS					A
A	HA17082GA			DG-8		A
A	HA17082GS					A
A	HA17083P			DP-14		A
A	HA17083PA					A
A	HA17083G			DG-14		A
A	HA17083GA					A
A	HA17084P	Quad. JFET-top Operational Amp.		DP-14		A
A	HA17084PA					A
A	HA17301P	Quad. Operational Amp.	Bipolar	DG-14		A
A	HA17301G					A
A	HA17324			DP-14		A
A	HA17324P			DG-14	DB	A
A	HA17324G			DP-14		A
A	HA17339	Quad. Voltage Comparator		DP-14		A
A	HA17358	Dual Operation Amp.		DP-8		A
A	HA17393	Dual Voltage Comparator		DP-16		A
A	HA17408P	8-bit D/A Converter		DG-16		A
A	HA17408G					A
A	HA17458	Dual Operational Amp.		DP-8		A
A	HA17458PS					A
A	HA17458GS			DG-8		A
A	HA17524P	Switching Regulator Controller		DP-16		A
A	HA17524G				DG-16	
A	HA17555	Precision Timer		DP-8		A
A	HA17555PS					A
A	HA17555GS			DG-8		A
A	HA17558	Dual Operational Amp.		DP-8		A
A	HA17558PS					A
A	HA17558GS			DG-8		A
A	HA17715G	High Speed Operational Amp.		DG-14		A
A	HA17723	Voltage Regulator		DP-14		A
A	HA17723G				DG-14	
A	HA17733	Differential Video Amp.		DP-14		A
A	HA17733P					A
A	HA17733G			DG-14		A
A	HA17741	General Purpose Operational Amp.		DP-8		A
A	HA17741PS					A
A	HA17741G			DG-14		A

Spec.	Device No.	Function	Structure	Package code	Material for details	Page		
A	HA17741GS	General Purpose Operational Amp.		DG-8				
A	HA17747			DP-14				
A	HA17747P	Dual Operational Amp.		DG-14				
A	HA17747G							
A	HA17805	1A		5V				
A	HA17805P			6V				
A	HA17806							
A	HA17806P							
A	HA17807			7V				
A	HA17807P							
A	HA17808			8V				
A	HA17808P							
A	HA17812			12V				
A	HA17812P							
A	HA17815			15V				
A	HA17815P							
A	HA17818			18V				
A	HA17818P							
A	HA17824			24V				
A	HA17824P							
A	HA178M05	Fixed Voltage Regulator		5V	T-220AB			
A	HA178M05P			6V				
A	HA178M06							
A	HA178M06P			7V				
A	HA178M07							
A	HA178M07P							
A	HA178M08			8V				
A	HA178M08P							
A	HA178M12			12V			Bipolar	DB
A	HA178M12P							
A	HA178M15	15V						
A	HA178M15P							
A	HA178M18	18V						
A	HA178M18P							
A	HA178M20	20V						
A	HA178M20P							
A	HA178M24	24V						
A	HA178M24P							
A	HA17901P	Quad. Voltage Comparator		DP-14				
A	HA17901G			DG-14				
A	HA17902	Quad. Operational Amp.		DP-14				
A	HA17902P			DG-14				
A	HA17902G	Dual Voltage Comparator		DP-8				
A	HA17903PS			DG-8				
A	HA17903GS	Dual Operational Amp.		DP-8				
A	HA17904PS			DG-8				
A	HA17904GS	Dual Voltage Comparator		DG-14				
A	HA1807			DP-8				
A	HA1812PS	Universal Voltage Comparator		DG-8				
A	HA1812GS			DP-8				
A	HA1813PS	Voltage Comparator		DP-8				
A	HA1835P	5V Regulator Controller		DP-14				
A	HA19202	4-bit High Speed A/D Converter		DP-22				
A	HA19203MP			MP-18				
C	HA19208G	8-bit High Speed A/D Converter		DG-28A				
A	TBA800	5W Audio Power Amp. (16Ω)		QP-12TA		46		
A	TBA810AS	7W Audio Power Amp. (4Ω)		QP-12T				
A	TBA810SH							

DIGITAL IC

Spec.	Device No.	Function	Structure	Package code	Material for details	Page
■ HD10K Series						
A	HD10101	Quad. OR/NOR	Bipolar ECL	DG-16	DB	39
A	HD10102	Quad. 2-NOR				
A	HD10104	Quad. 2-AND				
A	HD10105	Triple 2-3-2-OR/NOR				
A	HD10106	Triple 4-3-3-NOR				
A	HD10107	Triple 2-Ex.-OR-NOR				
A	HD10109	Dual 4-5-OR/NOR				
A	HD10110	Dual 3-in, 3-out OR				
A	HD10111	Dual 3-in, 3-out NOR				
A	HD10116	Triple Line Receiver				
A	HD10117	Dual 2-wide, 2-3-OR-AND/OR-NAND				
A	HD10118	Dual 2-wide, 3-OR-AND				
A	HD10119	4-wide, 4-3-3-OR/AND				
A	HD10121	4-wide, OR-AND/OR-NAND				
A	HD10124	Quad. TTL-ECL Translator				
A	HD10125	Quad. ECL-TTL Translator				
A	HD10130	Dual Latch				
A	HD10131	Dual D Master-Slave F.F.				
A	HD10132	Dual Multiplexer				
A	HD10133	Quad. Latch				
A	HD10134	Multiplexer with Latch				
A	HD10136	Universal Hexadecimal Counter				
A	HD10145	64-bit Register File (RAM)				
A	HD10147	128-bit RAM				
A	HD10148	64-bit RAM				
A	HD10160	12-bit Parity Gen./Check				
A	HD10161	Binary-to-1-8 Decoder (Low)				
A	HD10162	Binary-to-1-8 Decoder (High)				
A	HD10164	8-line Multiplexer				
A	HD10174	Dual 4-to-1 Multiplexer				
A	HD10175	Quint Latch				
A	HD10179	Look-ahead Carry Block				
A	HD10180	Dual Adder/Subtractor				
A	HD10181	4-bit ALU/Function Gen.				
A	HD10209	Dual High Speed 4-5-OR/NOR	DG-24			
A	HD10210	Dual High Speed 3-in, 3-out OR	DG-16			
A	HD10211	Dual High Speed 3-in, 3-out NOR				
A	HD10230	Dual High Speed Latch				
A	HD10231	Dual High Speed D Master-Slave F.F.				
■ HD100K Series						
A	HD100101	Triple 5-OR/NOR	Bipolar ECL	DG-24A	DB	39
A	HD100101F			FG-24		
A	HD100102			DG-24A		
A	HD100102F	Quint 2-OR/NOR		FG-24		
A	HD100107	Quint Exclusive-OR/NOR		DG-24A		
A	HD100107F			FG-24		
A	HD100112			DG-24A		
A	HD100112F	Quad. Driver		FG-24		
A	HD100114	Quint Diff. Line Receiver		DG-24A		
A	HD100114F			FG-24		
A	HD100117			DG-24A		
A	HD100117F	Triple 2-wide OR-AND/OR-NAND		FG-24		
A	HD100118	5-wide OR-AND/OR-NAND		DG-24A		
A	HD100118F			FG-24		

Spec.	Device No.	Function	Structure	Package code	Material for details	Page
A	HD100122	9-bit Buffer		DG-24A		
A	HD100122F			FG-24		
A	HD100123	Hex Bus Driver		DG-24A		
A	HD100123F			FG-24		
A	HD100124	TTL to ECL Translator		DG-24A		
A	HD100124F			FG-24		
A	HD100125	ECL to TTL Translator		DG-24A		
A	HD100125F			FG-24		
A	HD100126	9-bit Back Plane Driver		DG-24A		
A	HD100126F			FG-24		
A	HD100130	Triple D-Latch		DG-24A		
A	HD100130F			FG-24		
A	HD100131	Triple D-F.F.		DG-24A		
A	HD100131F			FG-24		
A	HD100136	4-stage Counter/S.R.		DG-24A		
A	HD100136F			FG-24		
A	HD100141	8-bit S.R.		DG-24A		
A	HD100141F			FG-24		
A	HD100142	4x4 Content Addressable Memory		DG-24A		
A	HD100142F			FG-24		
A	HD100145	16x4 R/W Register		DG-24A		
A	HD100145F			FG-24		
A	HD100150	Hex D-Latch		DG-24A		
A	HD100150F			FG-24		
A	HD100151	Hex D-F.F.		DG-24A		
A	HD100151F			FG-24		
A	HD100155	Quad. Multiplexer/Latch	Bipolar	DG-24A	DB	39
A	HD100155F			ECL		
A	HD100156	Mask-Merge		DG-24A		
A	HD100156F			FG-24		
A	HD100158	8-bit Shift Matrix		DG-24A		
A	HD100158F			FG-24		
A	HD100160	Dual Parity Gen./Checker		DG-24A		
A	HD100160F			FG-24		
A	HD100163	Dual 8-input Multiplexer		DG-24A		
A	HD100163F			FG-24		
A	HD100164	16-input Multiplexer		DG-24A		
A	HD100164F			FG-24		
A	HD100165	Universal Priority Encoder		DG-24A		
A	HD100165F			FG-24		
A	HD100166	9-bit Comparator		DG-24A		
A	HD100166F			FG-24		
A	HD100170	Universal De-MPX/Decoder		DG-24A		
A	HD100170F			FG-24		
A	HD100171	Triple 4-input MPX with Enable		DG-24A		
A	HD100171F			FG-24		
A	HD100179	Carry Look-ahead		DG-24A		
A	HD100179F			FG-24		
A	HD100180	Fast 6-bit Adder		DG-24A		
A	HD100180F			FG-24		
A	HD100181	4-bit Binary/BCD ALU		DG-24A		
A	HD100181F			FG-24		
A	HD100182	9-bit Wallace Tree Adder		DG-24A		
A	HD100182F			FG-24		
A	HD100183	2 x 8-bit Recode Multiplier		DG-24A		
A	HD100183F			FG-24		

Spec.	Device No.	Function	Structure	Package code	Material for details	Page
■ Bipolar/Bi-CMOS Gate Array HD25/HD27 Series						
A	HD25L	400 Gate Array	Bip. LSTTL	PGA-72	D.S	38
A	HD27K	200 Gate Array	Bip.-CMOS	DP-16, DP-20, DP-28, DP-42	D.S	39
A	HD27L	550 Gate Array				
A	HD27P	1000 Gate Array				
A	HD27Q	1600 Gate Array				
A	HD27Q	1600 Gate Array		DP-28, DP-42, DP-64S, FP-60, FP-80		

Spec.	Device No.	Function	Structure	Package code	Material for details	Page	
■ CMOS LSI HD43000 Series							
A	HD430196B	TV Remote Control Transmit	CMOS	DP-18	DB	43	
A	HD43160AH	LCD Controller		FP-54	DB	40	
A	HD43360	4-bit Processor	CMOS	FP-60A	D.S	40	
A	HD43365						
A	HD43380						
A	HD43381						
A	HD43550						
A	HD44007A	Video Camera Sync. Gen.	CMOS	DP-28	DB	43	
A	HD440072A						
A	HD440361	Playback for PCM Digital Audio	CMOS	FP-60	DB	46	
A	HD440362						
A	HD44037	Error Correct. for PCM Digital Audio	CMOS	DP-8	DB	43	
A	HD440381	Recorder for PCM Digital Audio					
A	HD440382	Preamp. for TV Remote Control Receiv.	CMOS	FP-60	DB	40	
A	HD44100H						LCD Driver (with Bidirectional S.R.)
A	HD44101H	LCD Controller/Driver	CMOS	FP-80	DB	41	
A	HD44102CH	LCD Segment Driver					
A	HD44103CH	LCD Common Driver	CMOS	FP-44	DB	41	
B	HD44105H						
A	HD44211A	1-chip CODEC/Filter	CMOS	DG-16	DB	41	
A	HD44212A						A-law
A	HD44222						μ -law
A	HD44231B						A-law
C	HD44231C						μ -law
A	HD44232B						A-law
C	HD44232C						μ -law
A	HD44233B						A-law
C	HD44233C						μ -law
A	HD44234B						A-law
C	HD44234C	μ -law					
A	HD44235	A-law	CMOS	DG-16	DB	41	
C	HD44235C						

Spec.	Device No.	Function	Structure	Package code	Material for details	Page	
A	HD44236	1-chip CODEC/Filter	CMOS	DG-16	DB	41	
C	HD44236C						μ -law
A	HD44237						A-law
C	HD44237C						μ -law
A	HD44238						A-law
C	HD44238C						μ -law
C	HD44240C	LCD Controller/Driver (LCD-II)	CMOS	FP-80	U.M	40	
A	HD44780						
A	HD44797E	LCD-IV Evaluation Chip	CMOS	FP-100	U.M	42	
A	HD44850E	4-bit μ -com Evaluation Chip					
A	HD44857E	128k Mask ROM (for Speech Synthesis)	CMOS	DP-28	U.M	42	
A	HD44881						
A	HD44883	EPROM Interface (for Speech Synthesis)	CMOS	DP-40	U.M	42	

■ CMOS Gate Array HD61 Series

A	HD61J Series	500 Gates, I/O 50	CMOS	DP-28, DP-42, FP-54, DC-28, DC-40	D.S	38
A	HD61K Series	1000 Gates, I/O 68		DP-28, DP-42, DP-64S, FP-80, DC-28, DC-40		
A	HD61L Series	1600 Gates, I/O 68		DP-28, DP-42, DP-64S, FP-80, DC-28, DC-40, PGA-72A		
B	HD61MM Series	2500 Gates, I/O 104 (RAM on chip available)		DP-64S, FP-100, DC-28, DC-40, PGA-120		

■ CMOS LSI HD6100 Series

A	HD61100	LCD Driver (Duty: Static ~ 1/64)	CMOS	FP-100	D.S	40	
B	HD61102	LCD Segment Driver					
A	HD61103	LCD Common Driver		FP-80	DB		
A	HD61602	LCD Segment Driver (Static ~ 1/4)					
A	HD61603	LCD Segment Driver (Static)		DC-40	U.M		40
A	HD61810B	High Performance Signal Processor					
A	HD61830	LCD Controller		FP-60	DB	40	
A	HD61885	1-chip Speech Synthesizer		DP-28	U.M.	42	
A	HD61887						
A	HD61901H	DAD Signal Processor		FP-54	DB	46	
A	HD61902H						
A	HD61927	Video Camera Sync. Signal Gen.		DP-22			

MICROCOMPUTER

■ 4-bit HMCS40 Series

Spec.	Device No.	Function	Structure	Package code	Material for details	Page
A	HMCS44C (HD44800)	4-bit 1-chip Microcomputer	CMOS	DP-42, DP-42S	U.M	34
A	HMCS44CL (HD44808)					
A	HMCS45C (HD44820)		CMOS	DP-64S, FP-54		
A	HMCS45CL (HD44828)					
A	HMCS46C (HD44840)		CMOS	DP-42, DP-42S		
A	HMCS46CL (HD44848)					
A	HMCS47C (HD44860)		CMOS	DP-64S, FP-54		
A	HMCS47CL (HD44868)					
B	HMCS402C (HD614020)		4-bit 1-chip Micom. with LCD Driver	CMOS	DP-64S, FP-54	FP-80
C	HMCS402CL					
C	HMCS402AC					
B	HMCS404C (HD414040)					
C	HMCS404CL					
A	LCD-III (HD44790/795)					
B	LCD-IV (HD613900)					

■ 8-bit CMOS 1-chip MCU & Peripheral HD6300 Series

A	HD6301V1P	8-bit 1-chip MCU	ROM 4KB, RAM 128B, I/O 29	1MHz	CMOS	DP-40	DB	34
A	HD6301V1F			1.5MHz		FP-54		
A	HD6301V1CG					CG-40		
A	HD63A01V1P			2MHz	DP-40			
A	HD63A01V1F				FP-54			
A	HD63A01V1CG			CG-40				
A	HD63B01V1P			2MHz	DP-40			
A	HD63B01V1F				FP-54			
A	HD63B01V1CG				CG-40			

Spec.	Device No.	Function	Structure	Package code	Material for details	Page
A	HD6301X0P	ROM 4KB, RAM 192B, I/O 53	CMOS	1MHz	DP-64S	B
A	HD6301X0F			1MHz	FP-80	B
A	HD63A01X0P			1.5MHz	DP-64S	A
A	HD63A01X0F			1.5MHz	FP-80	B
A	HD63B01X0P			2MHz	DP-64S	C
A	HD63B01X0F			2MHz	FP-80	C
B	HD6301Y0P			1MHz	DP-64S	C
B	HD6301Y0F			1MHz	FP-64	C
B	HD63A01Y0P			1.5MHz	DP-64S	C
B	HD63A01Y0F			1.5MHz	FP-64	C
B	HD63B01Y0P			2MHz	DP-64S	C
B	HD63B01Y0F			2MHz	FP-64	C
A	HD63P01M1	EPROM on package	CMOS	1MHz	DC-40P	A
B	HD63PA01M1			1.5MHz		A
B	HD63PB01M1			2MHz		A
A	HD6303RP	ROM-less RAM 128B, I/O 13	CMOS	1MHz	DP-40	A
A	HD6303RF			1MHz	FP-54	A
A	HD6303RCG			1.5MHz	GG-40	A
A	HD63A03RP			1.5MHz	DP-40	B
A	HD63A03RF			1.5MHz	FP-54	B
A	HD63A03RCG			2MHz	CG-40	B
A	HD63B03RP			2MHz	DP-40	B
A	HD63B03RF			2MHz	FP-54	B
A	HD63B03RCG			1MHz	CG-40	B
A	HD6303XP			1MHz	DP-64S	B
A	HD6303XF			1.5MHz	FP-80	B
A	HD63A03XP			1.5MHz	DP-64S	B
A	HD63A03XF	2MHz	FP-80	A		
A	HD63B03XP	2MHz	DP-64S	A		
A	HD63B03XF	1MHz	FP-80	A		
B	HD6303Y0P	1MHz	DP-64S	A		
B	HD6303Y0F	1.5MHz	FP-64	A		
B	HD63A03Y0P	1.5MHz	DP-64S	A		
B	HD63A03Y0F	2MHz	FP-64	A		
B	HD63B03Y0P	2MHz	DP-64S	A		
B	HD63B03Y0F	1MHz	FP-64	A		
B	HD6305U0P	1MHz	DP-40	A		
B	HD63A05U0P	1.5MHz		A		
B	HD63B05U0P	2MHz		A		
C	HD6305V0P	1MHz	DP-40	B		
C	HD63A05V0P	1.5MHz		A		
C	HD63B05V0P	2MHz		B		
A	HD6305X0P	1MHz	DP-64S	A		
A	HD6305X0F	1.5MHz	FP-64	A		
A	HD63A05X0P	1.5MHz	DP-64S	A		
A	HD63A05X0F	2MHz	FP-64	A		
A	HD63B05X0P	2MHz	DP-64S	A		
A	HD63B05X0F	1MHz	FP-64	A		
B	HD6305X1P	1MHz	DP-64S	A		
B	HD6305X1F	1.5MHz	FP-64	A		
B	HD63A05X1P	1.5MHz	DP-64S	C		
B	HD63A05X1F	2MHz	FP-64	A		
B	HD63B05X1P	2MHz	DP-64S	C		
B	HD63B05X1F	1MHz	FP-64	C		
B	HD6305X2P	1MHz	DP-64S	C		
B	HD6305X2F	1.5MHz	FP-64	A		
B	HD63A05X2P	1.5MHz	DP-64S	A		
B	HD63A05X2F	1.5MHz	FP-64	B		

Spec.	Device No.	Function	Structure	Package code	Material for details	Page
B	HD63B05X2P	8-bit 1-chip MCU	ROM-less, RAM 128B, I/O 31	2MHz	DP-64S	A
B	HD63B05X2F					
A	HD63L05F1	8-bit High-end MPU (external clock)	ROM 4KB, RAM 96B, I/O 20 8-bit A/D, LCD Driver	2MHz	FP-64	34
B	HD63L05F2					
C	HD63B09P	8-bit High-end MPU (external clock)	ROM 4KB, RAM 96B, I/O 20 8-bit A/D, LCD Driver	2MHz	DP-40	A
C	HD63C09P			2.5MHz		A
C	HD63D09P			3MHz		B
C	HD63B09EP			2MHz		B
C	HD63C09EP			2.5MHz		B
C	HD63D09EP			3MHz		B
C	HD6318P			1MHz		B
C	HD63A18P			1.5MHz		B
A	HD6321P	Real Time Clock + RAM	ROM 4KB, RAM 96B, I/O 20 8-bit A/D, LCD Driver	1MHz	DP-24	A
A	HD63A21P			1.5MHz		B
A	HD6321FP	Peripheral Interface Adapter	ROM 4KB, RAM 96B, I/O 20 8-bit A/D, LCD Driver	1MHz	DB	B
A	HD63A21FP			1.5MHz		A
A	HD63B21P			2MHz		A
A	HD63B21FP			2MHz		A
B	HD6340P			1MHz		A
B	HD63A40P			1.5MHz		A
B	HD63B40P	Program. Timer Module	ROM 4KB, RAM 96B, I/O 20 8-bit A/D, LCD Driver	2MHz	DP-28	A
B	HD6350P			1MHz		A
B	HD6350FP	Async. Communication Interface Adapter	ROM 4KB, RAM 96B, I/O 20 8-bit A/D, LCD Driver	1MHz	DB	A
B	HD63A50P			1.5MHz		A
B	HD63A50FP			1.5MHz		A
B	HD63B50P			2MHz		A
B	HD63B50FP			2MHz		A
B	HD6350FP			2MHz		A
A	HD146818P	Real Time Clock + RAM	ROM 4KB, RAM 96B, I/O 20 8-bit A/D, LCD Driver	1MHz	DP-24	A
A	HD146818FP			1.5MHz		A

■ 8-bit MPU/MCU & Peripheral HD6800 Series

A	HD6800P	8-bit MPU	ROM 2KB, RAM 128B, I/O 29	1MHz	DP-40	B
A	HD68A00P			1.5MHz		
A	HD68B00P			2MHz		
A	HD6801S0P	8-bit 1-chip MCU	ROM 4KB, RAM 128B, I/O 29	EPROM on Package	DC-40P	B
A	HD6801S5P					
A	HD6801V0P					
A	HD6801V5P					
A	HD68P01V07					
B	HD68P01V07-1					
A	HD68P01M0	8-bit MPU	ROM 2KB, RAM 128B, I/O 29	Clock + RAM 128B	DP-40	35
B	HD68P01M0-1					
A	HD6802P	8-bit 1-chip MCU	ROM 4KB, RAM 128B, I/O 29	EPROM on Package	DB	B
A	HD6802WP					
A	HD6803P					
A	HD6803P-1					
A	HD6805S1P					
A	HD6805S6P					
A	HD6805U1P					
A	HD6805V1P					
C	HD6805T2P					
A	HD6805W1P					
C	HD6805X0P					
C	HD6805X1P					
C	HD6805X2P					
A	HD68P05M0	EPROM on Package	ROM 4KB, RAM 128B, I/O 29	EPROM on Package	DP-64S	B
A	HD68P05V07					
B	HD68P05W0	EPROM on Package	ROM 4KB, RAM 128B, I/O 29	EPROM on Package	DC-40P	B
B	HD68P05W0					

Spec.	Device No.	Function	Structure	Package code	Material for details	Page			
A	HD6809P	8-bit High-end MPU				1MHz			
A	HD68A09P					1.5MHz			
A	HD68B09P					2MHz			
A	HD6809EP	8-bit High-end MPU (external Clock)				1MHz			
A	HD68A09EP					1.5MHz			
A	HD68B09EP					2MHz			
A	HD6821P	Peripheral Interface Adapter				1MHz			
A	HD68A21P					1.5MHz			
A	HD68B21P					2MHz			
A	HD6840P	Programmable Timer Module				1MHz			
A	HD68A40P					1.5MHz			
A	HD68B40P					2MHz			
A	HD6843P	Floppy Disk Controller				1MHz			
A	HD68A43P					1.5MHz			
A	HD68B43P					2MHz			
A	HD6844P	DMA Controller	NMOS	DP-40	DB	1MHz			
A	HD68A44P					1.5MHz			
A	HD68B44P					2MHz			
A	HD6845P	3MHz CRT Controller				1MHz			
A	HD68A45P					1.5MHz			
A	HD68B45P					2MHz			
A	HD6845SP	3.7MHz CRT Controller				1MHz			
A	HD68A45SP					1.5MHz			
A	HD68B45SP					2MHz			
A	HD6846P	Combi. ROM-I/O-Timer				1MHz			
A	HD6850P	Async. Communication Interface Adapter				1MHz			
A	HD68A50P	Sync. Serial Data Adapter				1.5MHz			
A	HD6852P					1MHz			
A	HD68A52P					1.5MHz			
■ 8-bit Peripheral									
A	HD46508P	Analog Data Acquisition Unit	NMOS	DP-40	DB	1MHz			
A	HD46508P-1					1.5MHz			
A	HD46508AP					1MHz			
A	HD46508AP-1					1.5MHz			
■ 16-bit MPU & Peripheral HD68000 Series									
A	HD68000-4	16-bit Microprocessor	NMOS	DC-64	DB	4MHz			
A	HD68000-6					6MHz			
A	HD68000-8					8MHz			
A	HD68000-10					10MHz			
A	HD68000-12					12MHz			
A	HD68000Y4					4MHz			
A	HD68000Y6			6MHz					
A	HD68000Y8			8MHz					
A	HD68000Y10			10MHz					
A	HD68000Y12			12MHz					
A	HD68000Z4			4MHz					
A	HD68000Z6			6MHz					
A	HD68000Z8	8MHz							
A	HD68000Z10	10MHz							
A	HD68000Z12	12MHz							
A	HD68450-4	DMA Controller	NMOS	DC-64	DB	4MHz			
A	HD68450-6					6MHz			
A	HD68450-8					8MHz			
B	HD68450-10					10MHz			
C	HD68450-12					12MHz			
A	HD68450Y4					4MHz			
A	HD68450Y6			6MHz					
A	HD68450Y8			8MHz					
B	HD68450Y10			10MHz					
C	HD68450Y12			12MHz					
							PGA-68		

■ 4-bit Evaluation

A	H40EVKIT	Evaluation Kit	HMCS42 ~ 45C				
A	H40EVKIT2		HMCS40 Series				
B	H40EVKIT4		LCD-III/IV				
A	H40MIX1	Emulator Set	HMCS40 Series				
A	H40MIX2		LCD-III				
A	H40MIX4		LCD-III/IV				
B	H400CMIX1		HMCS400 Series				
A	H40LCEV00	Evaluation Board	LCD-III				
B	H40LCEV04		LCD-III/IV				
A	H43EV00		HMCS42/43				
A	H45CEV00		HMCS42 ~ 45C				
A	H47CEV00		HMCS40 Series				
B	H400CEV01		HMCS400 Series				

■ 8-bit Evaluation

A	H31EV00	Evaluation Board	HD6301V				
B	H31EV01		HD6301X				
A	H31EVT1	Evaluation Kit	HD6301V, 6303R				
A	H31MIX1	Emulator Set	HD6301V				
A	H31MIX2		HD6301X				
C	H31MIX3		HD6301Y				
A	H35EV00	Evaluation Board	HD6305X				
A	H35EVT1	Evaluation Kit	HD6305X				
A	H35MIX1	Emulator Set	HD6305X				
A	H3L5EV00	Evaluation Board	HD63L05				
A	H3L5EVT1	Evaluation Kit	HD63L05				
A	H3L5MIX1	Emulator Set	HD63L05				
A	H61EV01	Evaluation Board	HD6801S/V				
A	H61EVT2	Evaluation Kit	HD6801S/V, 6803				
A	H61MIX1	Emulator Set	HD6801S/V				
A	H64EMB01	Extendible Memory Board	HD6801S/V, 6803, 6301V				
C	H65EV04	Evaluation Board	HD6805X				
A	H65MIX1	Emulator Set	HD6805S/U/V				
A	H65MIX2		HD6805W				
C	H65MIX4		HD6805X				
A	H65EVT2	Evaluation Kit	HD6805S/U/V				
A	H65EVT3		HD6805W				
C	H65EVT4		HD6805X				

■ Development System

A	H68SD5	4-bit and 8-bit Single-chip Microcom. Use					U.M	35
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IC MEMORY

■ Bipolar RAM

Spec.	Device No.	Function	Access Time (ns)max	Structure	Package code	Material for details	Page
A	HM10414	256 × 1 RAM (ECL 10K)	10	Bipolar	DG-16	DB	37
A	HM10414-1		8				
A	HM2110	1024 × 1 RAM (ECL 10K)	35				
A	HM2110-1		25				
A	HM2112		10				
A	HM2112-1		8				
A	HM10422	256 × 4 RAM (ECL 10K)	10				
A	HM10422-7		7				
A	HM10470	4096 × 1 RAM (ECL 10K)	25				
A	HM10470-1		15				
A	HM10470-20		20				
A	HM2142		10				
A	HM10474	1024 × 4 RAM (ECL 10K)	25				
B	HM10474-8		8				
B	HM10474-10		10				
A	HM10474-15	16384 × 1 RAM (ECL 10K)	15				
A	HM10480		25				
A	HM10480F	4096 × 4 RAM (ECL 10K)	25				
B	HM10484-15		15				
B	HM10484-20	20					
A	HM100415	1024 × 1 RAM (ECL 100K)	10				
A	HM100415CC						
A	HM100422	256 × 4 RAM (ECL 100K)	10				
A	HM100422F						
A	HM100422CC						
A	HM100470						
A	HM100470-15	4096 × 1 RAM (ECL 100K)	25				
A	HM100470-15		15				
A	HM100474	1024 × 4 RAM (ECL 100K)	25				
A	HM100474-15		15				
A	HM100474F		25				

Spec.	Device No.	Function	Access Time (ns)max	Structure	Package code	Material for details	Page					
A	HM100474F-15	1024 × 4 RAM (ECL 100K)	15		FG-24							
A	HM100480		25									
B	HM100480-15	16384 × 1 RAM (ECL 100K)	15	Bipolar	DG-20	DB	37					
B	HM100480-20		20									
A	HM100480F		25		FG-20							
B	HM100480F-15		15									
B	HM100480F-20		20									
C	HM100484-15		15									
C	HM100484-20	20	DG-28A									
A	HM2510	1024 × 1 RAM (TTL)	70		DG-16A							
A	HM2510-1		45									
A	HM2510-2		35									
A	HM2511		70									
A	HM2511-1		45									
A	HM25289		35					DS				
			16 × 4 RAM (TTL)									

■ MOS RAM

A	HM48416AP-12	16384 × 4 Dynamic RAM	120		DP-18						
A	HM48416AP-15		150								
A	HM48416AP-20		200								
A	HM4864-2	65536 × 1 Dynamic RAM	150	NMOS	DG-16A	DB	36				
A	HM4864-3		200								
A	HM4864P-2		150		DP-16						
A	HM4864P-3		200								
A	HM4864A-12		120		DG-16A						
A	HM4864A-15		150								
A	HM4864A-20		200		DP-16						
A	HM4864AP-12		120								
A	HM4864AP-15		150		CG-18						
A	HM4864ACG-12		120								
A	HM4864ACG-15		150		DG-16A						
A	HM4864ACG-20		200								
A	HM50256-12	262144 × 1 Dynamic RAM (Page Mode)	120		DG-16A						
A	HM50256-15		150								
A	HM50256-20		200		DP-16A						
A	HM50256P-12		120								
A	HM50256P-15		150		DG-16A						
A	HM50256P-20		200								
A	HM50257-12		262144 × 1 Dynamic RAM (Nibble Mode)		120			CMOS	DP-16A		
A	HM50257-15				150						
A	HM50257-20				200				DG-16A		
A	HM50257P-12				120						
A	HM50257P-15				150				DP-16A		
A	HM50257P-20				200						
A	HM6116-2	2048 × 8 Static RAM	120		DG-24						
A	HM6116-3		150								
A	HM6116-4		200		DP-24						
A	HM6116P-2		120								
A	HM6116P-3		150		FP-24						
A	HM6116P-4		200								
A	HM6116FP-2		120		CG-32						
A	HM6116FP-3		150								
A	HM6116FP-4		200		DG-24						
A	HM6116CG-2		120								
A	HM6116CG-3		150								
A	HM6116CG-4		200								
A	HM6116L-2		120								

Spec.	Device No.	Function	Access Time (ns)max	Structure	Package code	Material for details	Page
A	HM6116L-3	2048 x 8 Static RAM	150	CMOS	DG-24	DB	36
A	HM6116L-4		200				
A	HM6116LP-2		120				
A	HM6116LP-3		150				
A	HM6116LP-4		200				
A	HM6116LFP-2		120				
A	HM6116LFP-3		150				
A	HM6116LFP-4		200				
A	HM6116AP-12		120				
A	HM6116AP-15		150				
A	HM6116AP-20		200				
A	HM6116ASP-12		120				
A	HM6116ASP-15		150				
A	HM6116ASP-20		200				
A	HM6116ALP-12		120				
A	HM6116ALP-15		150				
A	HM6116ALP-20		200				
A	HM6116ALSP-12		120				
A	HM6116ALSP-15		150				
A	HM6116ALSP-20		200				
A	HM6117P-3		150				
A	HM6117P-4		200				
A	HM6117FP-3		150				
A	HM6117FP-4		200				
A	HM6117LP-3		150				
A	HM6117LP-4		200				
A	HM6117LFP-3		150				
A	HM6117LFP-4		200				
A	HM6147H-35	4096 x 1 Static RAM	35	CMOS	DG-18	DB	36
A	HM6147H-45		45				
A	HM6147H-55		55				
A	HM6147HP-35		35				
A	HM6147HP-45		45				
A	HM6147HP-55		55				
A	HM6147HLP-35		35				
A	HM6147HLP-45		45				
A	HM6147HLP-55		55				
A	HM6148H-35		35				
A	HM6148H-45		45				
A	HM6148H-55		55				
A	HM6148HP-35	35					
A	HM6148HP-45	45					
A	HM6148HP-55	55					
A	HM6148HLP-35	35					
A	HM6148HLP-45	45					
A	HM6148HLP-55	55					
A	HM6167	16384 x 1 Static RAM	70	CMOS	DG-20	DB	36
A	HM6167-6		85				
A	HM6167-8		100				
A	HM6167P		70				
A	HM6167P-6		85				
A	HM6167P-8		100				
A	HM6167LP		70				
A	HM6167LP-6		85				
A	HM6167LP-8		100				
A	HM6167H-45		45				
A	HM6167H-55		55				
A	HM6167HP-45		45				
					DP-20		

Spec.	Device No.	Function	Access Time (ns)max	Structure	Package code	Material for details	Page			
A	HM6167HP-55	16384 x 1 Static RAM	55	CMOS	DP-20	DB	36			
A	HM6167HCG-45		45		CG-20					
A	HM6167HCG-55		55		DP-20					
A	HM6167HLP-45		45							
A	HM6167HLP-55		55							
A	HM6168H-45	4096 x 4 Static RAM	45		CMOS			DG-20	DB	36
A	HM6168H-55		55							
A	HM6168H-70		70							
A	HM6168HP-45		45							
A	HM6168HP-55		55							
A	HM6168HP-70		70					DP-20		
A	HM6168HLP-45		45							
A	HM6168HLP-55		55							
A	HM6168HLP-70		70							
A	HM6264P-10		8192 x 8 Static RAM							
A	HM6264P-12	120			DP-28					
A	HM6264P-15	150								
A	HM6264FP-12	120								
A	HM6264FP-15	150			FP-28					
A	HM6264LP-10	100								
A	HM6264LP-12	120		DP-28						
A	HM6264LP-15	150								
A	HM6264LFP-12	120								
A	HM6264LFP-15	150		FP-28						
B	HM6267P-35	16384 x 1 Static RAM	35		CMOS	DB	36			
B	HM6267P-45		45							
A	HM6810P	128 x 8 Static RAM	450	NMOS				DP-24		
A	HM68A10P		360							

■ MOS ROM

B	HN27256-20	32768 x 8 EPROM	200	NMOS	DG-28		
A	HN27256-25		250				
A	HN27256-30		300				
A	HN27C64-15	8192 x 8 EPROM	150	CMOS	DG-28		
A	HN27C64-20		200				
A	HN27C64-25		250				
A	HN27C64-30		300				
A	HN482732AG-20	4096 x 8 EPROM	200	NMOS	DG-24B		
A	HN482732AG-25		250				
A	HN482732AG-30		300				
A	HN482764G	8192 x 8 EPROM	250	NMOS	DG-28	DB	36
A	HN482764G-2		200				
A	HN482764G-3		300				
A	HN482764G-4		450				
A	HN482764P-3	8192 x 8 One Time PROM	300	NMOS	DP-28		
A	HN4827128G-25	250					
A	HN4827128G-30	300	DG-28				
A	HN4827128G-45	450					
B	HN4827128P-30	16384 x 8 One Time PROM					
B	HN58064P-25	250					
B	HN58064P-30	8192 x 8 EEPROM	300	NMOS	DP-28		
B	HN58064P-45		450				
A	HN61256P	32768 x 8 or 65536 x 4 Mask ROM	3500	CMOS	DP-28		
A	HN61256FP						
A	HN61364P	8192 x 8 Mask ROM	250	CMOS	DP-28		
A	HN61364FP						

Spec.	Device No.	Function	Access Time (ns)max	Structure	Package code	Material for details	Page
A	HN61365P	8192 x 8 Mask ROM	250	CMOS	DP-28	DB	36
A	HN61366P						
A	HN613128P	16384 x 8 Mask ROM	250		DP-28	DB	36
A	HN613128FP						
A	HN613256P	32768 x 8 Mask ROM	250		FP-54	DB	36
A	HN613256FP						
B	HN62301P	131072 x 8 Mask ROM	350		DP-28		

HYBRID IC

Spec.	Device No.	Function	Access Time (ns)max	Structure	Package code	Material for details	Page
A	User Custom	Passive elements and Hitachi designs active elements		Thick Film	DIP, SIP	U.M	-
	DB	HPAK	7	Large Signal Amp.			
		T-350AB	2				
		T-3	100				
		T-3P	100				
		T-3	200				
		T-3	400				
		T-350AB	400				
		T-3P	140				
		T-3P	160				
		DPAK	40				
		T-350AB	60				
		T-3	10m				
		T-3	10m				
		T-3	10m				
		T-3	10m				
		T-3	150	Small Signal Amp.			
		T-3	140				
		T-3	160				
		T-3	160	Large Signal Amp.			
		T-3	140				
		T-3	160				

TRANSISTOR

■ FET / POWER FET

Spec.	Device No.	Function	V _{DSX} (V _{GSS}) (V)	I _D (A)	Structure	Package code	Material for details	Page
A	2SJ48	Large Signal Amp.	120	7	Silicon P-channel MOS	T-3		47
A	2SJ49		140	7				
A	2SJ50		160	7				
A	2SJ55		180	8				
A	2SJ56		200	8				
A	2SJ56 ⊕		200	8				47
A	2SJ68	Low Noise Amp.	40	30m	Silicon P-channel Junction	T-92		—
A	2SJ69		40	30m		T-92M		
A	2SJ70		40	0.2				
A	2SJ76		140	0.5				
A	2SJ77		160	0.5		T-220AB		47
A	2SJ77 ⊗		160	0.5				47
A	2SJ78		180	0.5				
A	2SJ79		200	0.5			47	
A	2SJ79 ⊗		200	0.5				
A	2SJ81	Large Signal Amp.	120	7	Silicon P-channel MOS	HPAK	DB	47
A	2SJ82		140	7				
A	2SJ83		160	7				
A	2SJ96		60	8				
A	2SJ99		140	8				
A	2SJ100		160	8		T-220AB		—
A	2SJ101		40	5				
A	2SJ102		60	5				
A	2SJ112		100	10				
A	2SJ113		100	10				
A	2SJ114		200	8		T-3P		47
A	2SJ116		400	8		T-3		—
A	2SJ117		400	2		T-220AB		47
A	2SJ118		140	8		T-3P		—
A	2SJ119		160	8		T-3P		47
A	2SJ120	40	2	DPAK		49		
A	2SJ122	60	10	T-220AB		—		
A	2SK16 ⊕		(20)	10m	Silicon N-channel Junction	T-72		—
A	2SK40		(50)	10m				
A	2SK54		(1)	10m				
A	2SK55		(1)	10m				
A	2SK133		120	7				
A	2SK134	Large Signal Amp.	140	7	Silicon N-channel MOS	T-3		47
A	2SK135		160	7				

Spec.	Device No.	Function	V _{DSX} (V _{GSS}) (V)	I _D (A)	Structure	Package code	Material for details	Page	
A	2SK168	Small Signal Amp.	(1)	20m	Si.N-ch.J	T-92		—	
A	2SK175	Large Signal Amp.	180	8	Silicon N-channel MOS	T-3		47	
A	2SK176		200	8				47	
A	2SK176 ⊕	Low Noise Amp.	(40)	30m	Silicon N-channel MOS	T-92		47	
A	2SK186		(40)	30m				—	
A	2SK187		(40)	0.2		T-92M		47	
A	2SK190		(15)	0.5				—	
A	2SK191	Large Signal Amp.	160	0.5	Si.N-ch.J	T-39		—	
A	2SK196 ⊕		(1)	20m		MPAK		48	
A	2SK197	Large Signal Amp.	140	0.5	Silicon N-channel MOS	T-220AB		47	
A	2SK213		160	0.5					47
A	2SK214		160	0.5					47
A	2SK214 ⊗		180	0.5					47
A	2SK215		200	0.5					47
A	2SK216	Small Signal Amp.	200	0.5	Si.N-ch.J	MPAK		48	
A	2SK216 ⊗		(1)	20m					47
A	2SK217	Large Signal Amp.	160	8	Silicon N-channel MOS	HPAK		47	
A	2SK220 ⊕		120	7					47
A	2SK221 ⊕		140	7					47
A	2SK225		160	7					47
A	2SK227	High Voltage Large Signal Amp.	250	8	Si.N-ch.J	T-3		47	
A	2SK258 ⊕		350	5					47
A	2SK259 ⊕		400	5					47
A	2SK260 ⊕	Large Signal Amp.	60	8	Si.N-ch.J	HPAK		47	
A	2SK286		15	50m					47
A	2SK291	High Voltage Large Signal Amp.	80	5	Si.N-ch.J	T-92		—	
A	2SK294		100	5					47
A	2SK295	Large Signal Amp.	300	1	Silicon N-channel MOS	T-220AB	DB	47	
A	2SK296		400	8					47
A	2SK298		450	8					47
A	2SK299		120	10					47
A	2SK308	High Voltage Large Signal Amp.	400	3	Si.N-ch.J	T-3		47	
A	2SK310		450	3					47
A	2SK311	Large Signal Amp.	400	12	Silicon N-channel MOS	T-220AB		47	
A	2SK312		450	12					47
A	2SK313		180	8					47
A	2SK317	High Voltage Large Signal Amp.	180	4	Si.N-ch.J	RF-PAK		47	
A	2SK318		400	5					47
A	2SK319	Large Signal Amp.	400	5	Si.N-ch.J	T-220AB		47	
A	2SK320		450	5					47
A	2SK322	Small Signal Amp.	(10)	50m	Si.N-ch Junction	MPAK		48	
A	2SK323		(40)	30m					48
A	2SK343	Large Signal Amp.	140	8	Silicon N-channel MOS	HPAK		47	
A	2SK344		160	8					47
A	2SK345		40	5					47
A	2SK346		60	5					47
A	2SK347	H.V. Large Signal Amp.	400	1	Si.N-ch Junction	DPAK		47, 49	
A	2SK347 ⊙		400	1					47, 49
A	2SK349	High Voltage Large Signal Amp.	400	10	Si.N-ch Junction	T-3P		47	
A	2SK350		450	10					47
A	2SK351		800	5					47
A	2SK359	Small Signal Amp.	20	30m	Si.N-ch Junction	T-92		—	
A	2SK360		20	30m					48
A	2SK375	High Voltage Large Signal Amp.	300	1	Silicon N-channel MOS	DPAK		47, 49	
A	2SK375 ⊙		300	1					47, 49
A	2SK382	Signal Amp.	500	2	Si.N-ch Junction	T-220AB		47	

Spec.	Device No.	Function	I_D (A)	V_{DSX} (V_{GSS}) (V)	I_D (A)	Structure	Package code	Material for details	Page		
A	2SK383	Large Signal Amp.	10	100	10		T-220AB		47		
A	2SK384	H.V. Large Signal Amp.	8	500	0.3		DKPAK		47, 49		
A	2SK384 ①		8	500	0.3		DKPAK-L				
A	2SK398	Large Signal Amp.	8	100	10		T-3		47		
A	2SK399		30m	100	10		T-3P				
A	2SK400		30m	200	8		T-3				
A	2SK401		0.2	250	10		T-3P				
A	2SK402		0.2	400	8		T-3P				
A	2SK403	0.2	450	8							
A	2SK408	High Voltage Large Signal Amp.	50m	180	2	Silicon	T-220AB		47		
A	2SK409	Large Signal Amp.	0.2	180	8	N-channel	RF-PAK				
A	2SK410	High Voltage Large Signal Amp.	0.2	250	10	MOS	T-3P				
A	2SK412		0.2	140	8						
A	2SK413	Large Signal Amp.	0.2	160	8		T-3P		47		
A	2SK414	H.V. Large Signal Amp.	0.2	800	3						
A	2SK415		0.2	40	2		DKPAK		47		
A	2SK416	30m	40	2		DKPAK-L		47, 49			
A	2SK416 ①	8	60	10		T-220AB		47			
A	2SK428	Large Signal Amp.	8	100	3		DKPAK				
A	2SK429		7	100	3		DKPAK-L		47, 49		
A	2SK429 ①		7	150	3		DKPAK				
A	2SK430		7	150	3		DKPAK-L				
A	2SK430 ①		8	40	30m	Si.N-ch.J	MPAK		48		
A	2SK431		Low Noise Amp.	2	22	0.1		T-92			
A	2SK435	Small Signal Amp.	2	20	0.1	Silicon	SPAK	DB	49		
A	2SK439		8	200	6	N-channel	T-3				
A	2SK440	Large Signal Amp.	30m	500	0.3	MOS	T-126		47		
A	2SK441	H.V. Large Signal Amp.	30	6	0.1	GaAs Schottky	FPAK				
B	2SK457	Low Noise Amp.	2	22	0.1	Si.N-ch.J	SPAK		49		
A	2SK494	Small Signal Amp.	1	500	12		T-3				
A	2SK512	Large Signal Amp.	8	800	3	Silicon	T-220		47		
A	2SK513		8	800	5		N-channel				
A	2SK534		10	400	1.5		MOS			DKPAK	
A	2SK535		3				DKPAK-L				47, 49
A	2SK535 ①		3								
A	3SK20 ④	Small Signal Amp.	12	20	10m	Silicon N-channel Dual Gate MOS	FPAK				
A	3SK21 ④		12	20	10m						
A	3SK45		8	22	35m						
A	3SK51		4	20	35m						
A	3SK53		2	15	33m						
A	3SK60		2	15	33m						
A	3SK70		30m	20	50m						
A	3SK80		30m	20	50m						
A	3SK81		30m	20	50m						
A	3SK82		8	15	33m						
A	3SK83		2	15	33m						
A	3SK85		2	22	35m						
A	3SK95		1	15	35m						
A	3SK96		1	15	35m						
A	3SK103		10	15	35m						
A	3SK104		10	15	35m						
A	3SK104V		3	15	35m						
A	3SK113		30m	12	80m						
A	3SK136		30m	20	50m						
A	3SK137	1	15	35m							
A	3SK138	1	15	35m							

DIODE

■ Laser Diode

Spec.	Device No.	Function	P _O (mW)	λ _p (nm)	Structure	Package code	Material for details	Page		
B	HL1221A		5	1200	InGaAsP	Type A	DB	50		
B	HL1221B		1.2*							
B	HL1221C		5							
B	HL1321P		1.2	1300						
B	HL1321SP		1.0	1300		Type P				
A	HL7801E		5	780		Type E				
A	HL7801G					Type G				
B	HL7802E		2	780		Type E				
B	HL7802G					Type G				
A	HL8311E		2	830		Type E				
A	HL8311G			Type G						
A	HL8312E	20	830	GaAlAs	Type E	DB	50			
A	HL8312G				Type G					
B	HL8314E				Type E					
A	HLP1400	15	830		Type A					
A	HLP1500	6*			Type B					
A	HLP1600	15			Type C					
A	HLP5400	5	1300		InGaAsP			Type A	DB	50
A	HLP5500	1.2*						Type B		
A	HLP5600	5						Type C		

■ Infra-red Emitting Diode

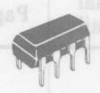
Spec.	Device No.	Function	P _O (W)	λ _p (nm)	Structure	Package code	Material for details	Page
A	HE8402F		60μ	840	GaAlAs	Type F	DB	50
A	HE8403R		80μ*	840		Type R		
A	HE8801		6m	850		Type SG		
A	HE8811		20m	840		Type R		
A	HLP20R		15m	760		Type R		
A	HLP20RG		7m					
A	HLP30R		25m	820		Type R		
A	HLP30RG		12m					
A	HLP40R		35m	820		Type R		
A	HLP40RG		17m					
A	HLP50R	45m	840	Type R				
A	HLP50RG	22m						
A	HLP60R	55m	840	Type R				
A	HLP60RG	17m						
C	HS9807		25μ(min)	1300	InGaAsP	-		

*Expected output power from a 50μm dia. GI fiber.

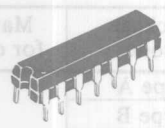
PACKAGE OUTLINE

● Plastic DIP

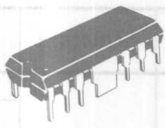
DP-8



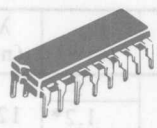
DP-14



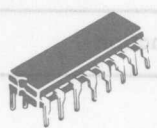
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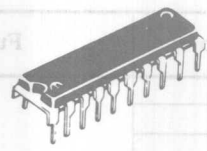
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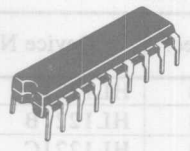
DP-16A



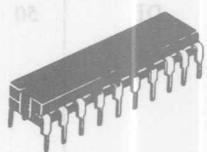
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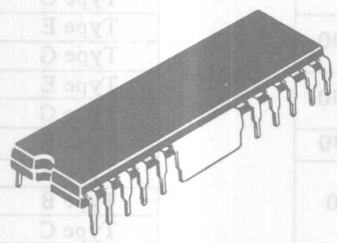
DP-18



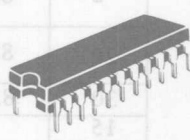
DP-20



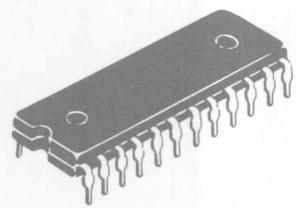
DP-20T



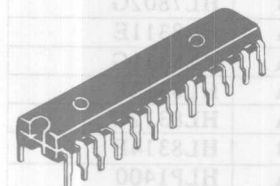
DP-22



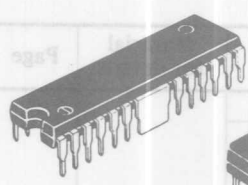
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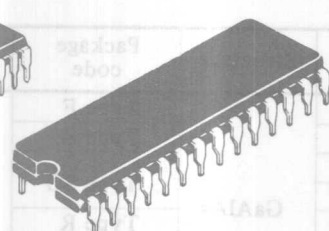
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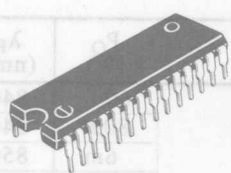
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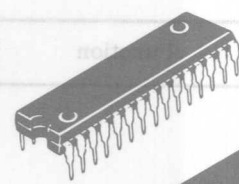
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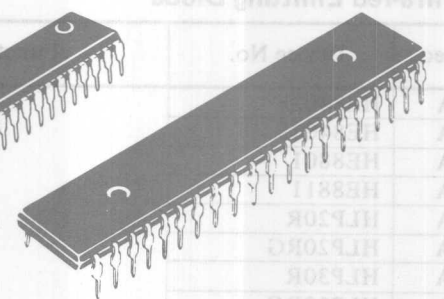
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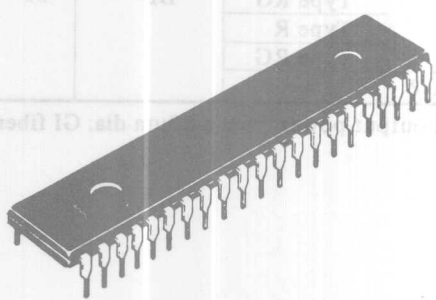
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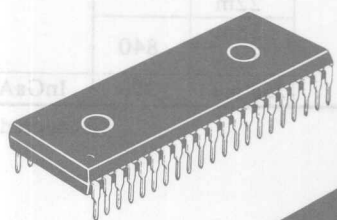
DP-40



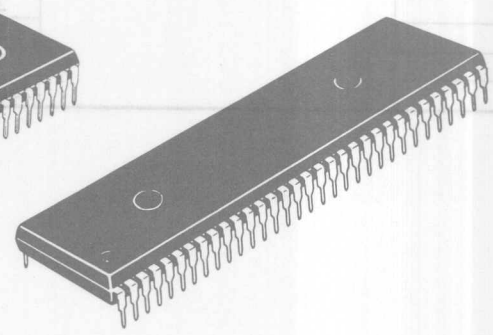
DP-42



DP-42S



DP-64S

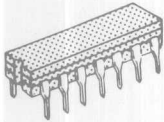


● Cerdip

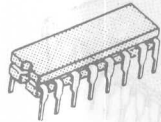
DG-8



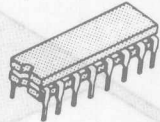
DG-14



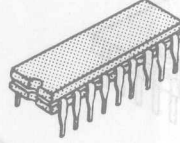
DG-16



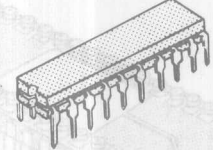
DG-16A



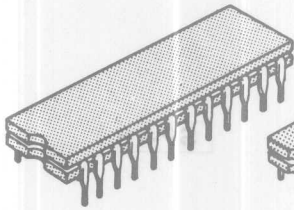
DG-18



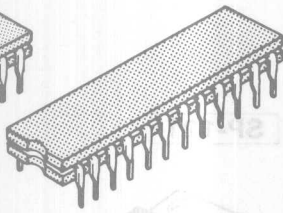
DG-20



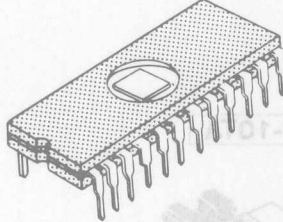
DG-24



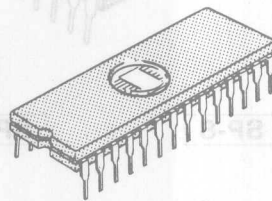
DG-24A



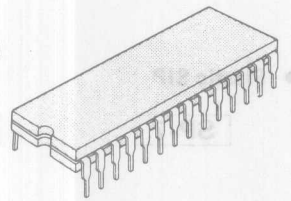
DG-24B



DG-28

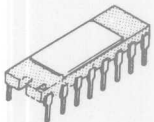


DG-28A

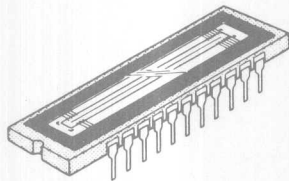


● Ceramic DIP

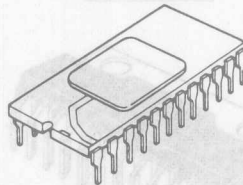
DC-16



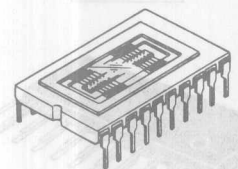
DC-22



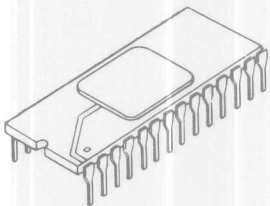
DC-24



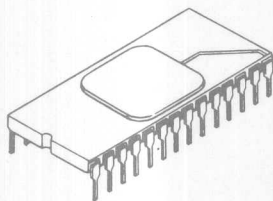
DC-24D



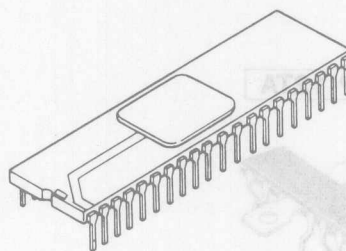
DC-28



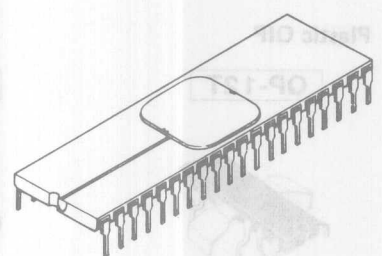
DC-28A



DC-40

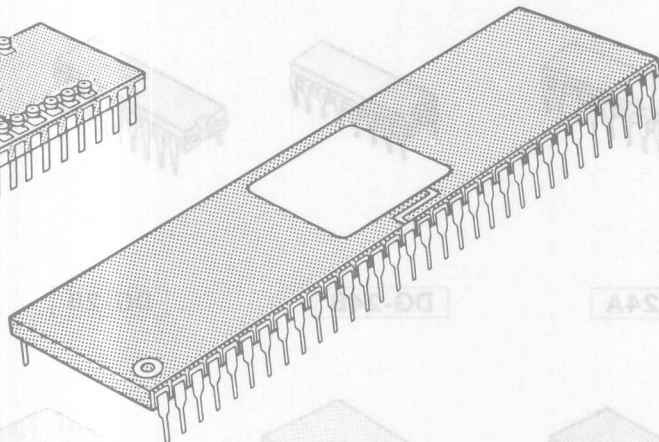
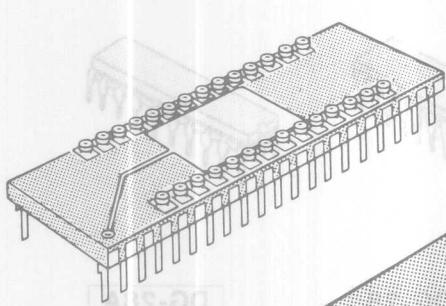


DC-40A



DC-40P

DC-64



• Plastic SIP

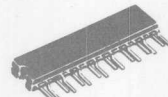
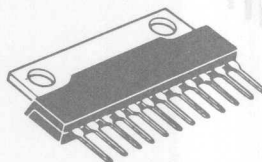
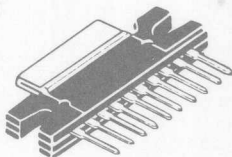
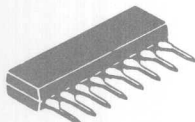
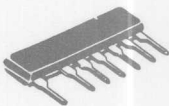
SP-7

SP-8

SP-10TA

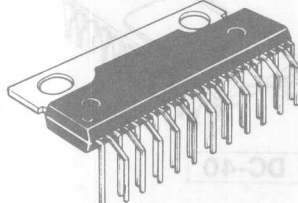
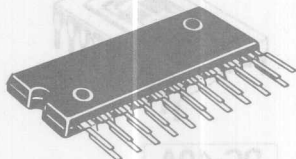
SP-12T

SP-16



SP-21

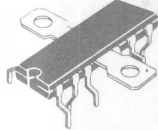
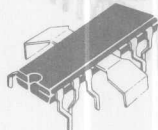
SP-23T



• Plastic QIP

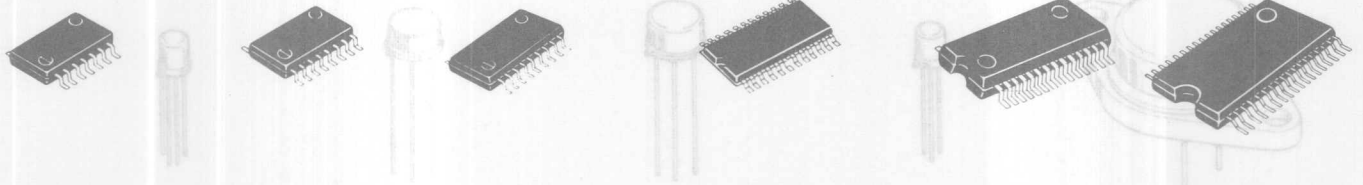
QP-12T

QP-12TA

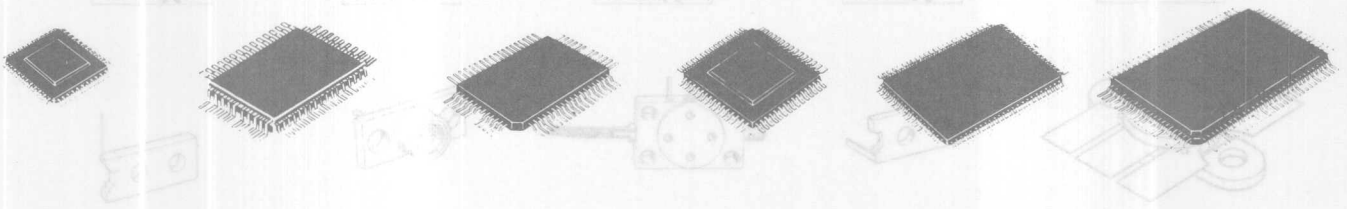


● Plastic Flat

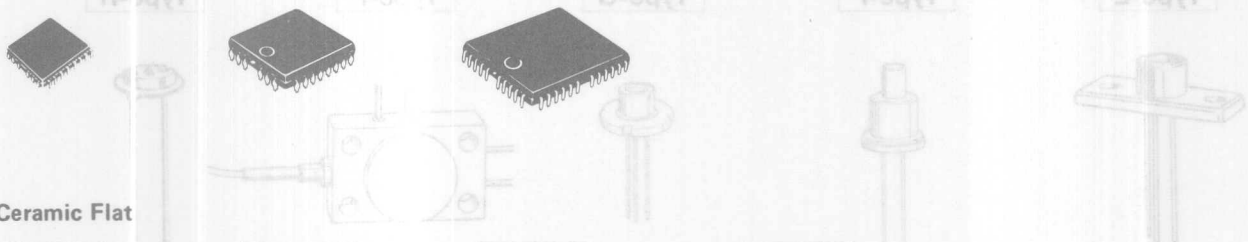
FP-14 FP-16 FP-18 FP-24 FP-28 FP-36



FP-44 FP-54 FP-60 FP-60A FP-80 FP-100

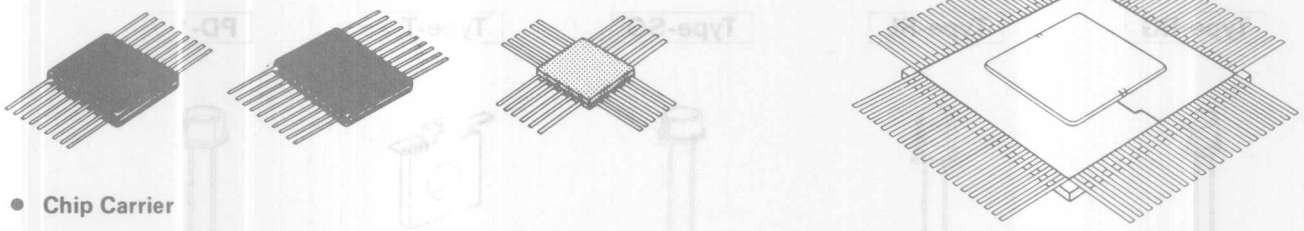


MP-18 MP-28 MP-44



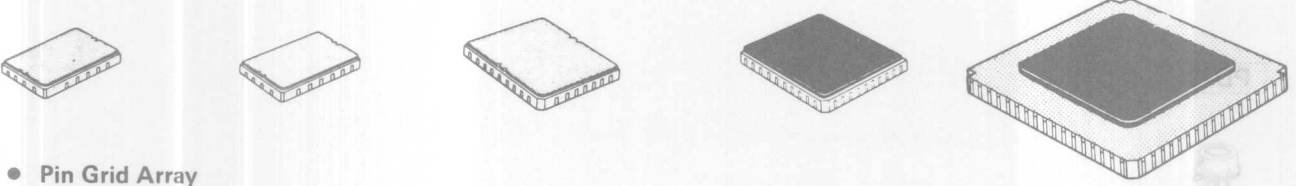
● Ceramic Flat

FG-18 FG-20 FG-24 FC-80



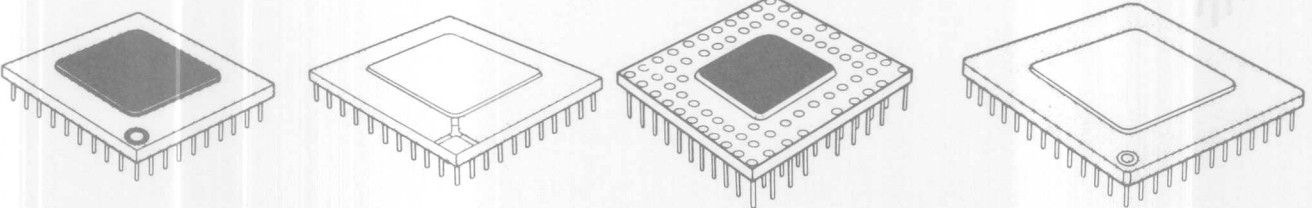
● Chip Carrier

CG-18 CG-20 CG-32 CG-40 CG-68



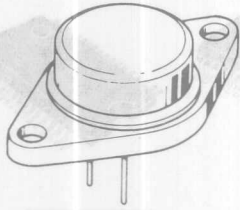
● Pin Grid Array

PGA-68 PGA-72 PGA-72A PGA-120



● Hermetic Seal

T-3



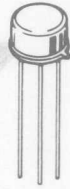
RF-PAK

T-18



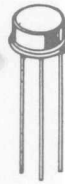
Type-A

T-39



Type-B

T-39A

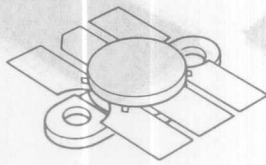


Type-C

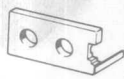
T-72



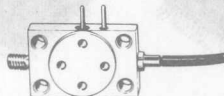
Type-D



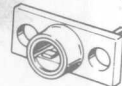
Type-E



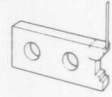
Type-F



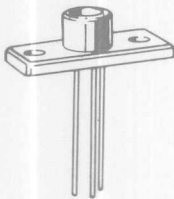
Type-G



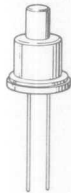
Type-P



Type-R



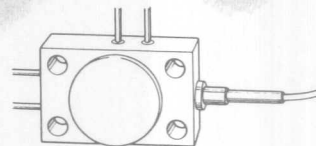
Type-RG



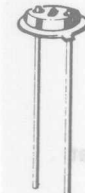
Type-RL



Type-SG



Type-T



PD-1



PD-2



CG-60



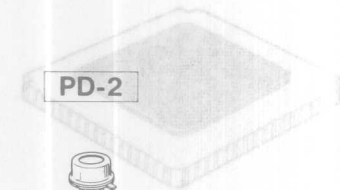
CG-35



CG-20



CG-18



PGA-150



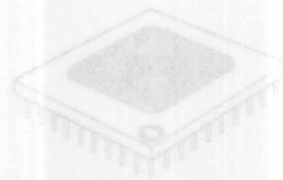
PGA-75A



PGA-75



PGA-68

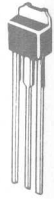


• Plastic Mold

DPAK



DPAK-L



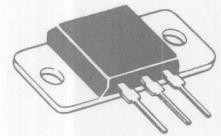
EPAK



FPAK



HPAK



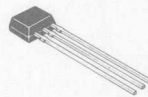
MPAK



MPAK4



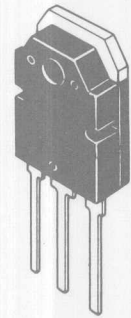
SPAK



UPAK



T-3P



T-92



T-92A



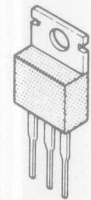
T-126



T-202

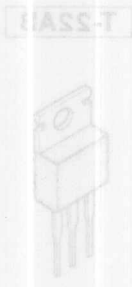
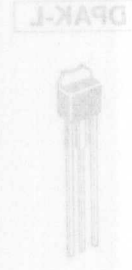


T-22AB



NOTES

● Plastic Mold



MICROCOMPUTER

4-bit System HMCS40/HMCS400 Series

Device	Series Name	PMOS HMCS40 Series					CMOS HMCS40C/400C Series								LCD Series	
		42	43	44A	45A	47A	42C/CL	43C/CL	44C/CL	45C/CL	46C/CL	47C/CL	402C/CL/AC	404C/CL	LCD-III	LCD-IV
Eva- luation	ROM(KB)	0.5	1	2	4	4	0.5	1	2	4	4	4	2	4	2	4
	RAM(Byte)	32	80	160	160	256	32	80	160	160	256	256	160	256	160	256
	I/O Port	22	32	32	44	44	22	32	32	44	32	44	58	58	32	32
Emulator Set for H68SD5	H40MIX1															
	H40MIX2															
	H40MIX4															
	H400CMIX1															
Evaluation Kit	H40EVKIT															
	H40EVKIT2															
	H40EVKIT4															
Evaluation Board	H40LCEV00															
	H40LCEV04															
	H43EV00															
	H45CEV00															
	H47CEV00															
Evaluation Chip	H400CEV01															
	HD38750E															
	HD44850E															
	HD44857E															
	HD44797E															

NOT FOR NEW DEVELOPMENTS

Built-in
 →
 LCD
 Driver

8-bit System HMCS6800 Series

• Single-chip CMOS HD6300 Series

Device	Series Name	HD6301V		HD6301X		HD6301Y		HD6305		HD6305X			HD6305Y			HD63L05 [†]
		6301V	6303R	6301X	6303X	6301Y	6303Y	6305U	6305V	6305X0	6305X1	6305X2	6305Y0	6305Y1	6305Y2	
Eva- luation	ROM(KB)	4	-	4	-	16	-	2	4	4	4	-	8	8	-	4
	RAM(Byte)	128	128	192	192	256	256	128	192	128	128	128	256	256	256	96
	I/O Port	29	13	53	24	53	24	31	31	55	31	31	55	31	31	20
EPROM on Package MCU	32K															
	64K															
Emulator Set for H68SD5	H31MIX1															
	H31MIX2															
	H31MIX3															
	H35MIX1															
	H3L5MIX1															
Evaluation Kit	H31EVT1															
	H35EVT1															
	H3L5EVT1															
Evaluation Board	H31EV00															
	H31EV01															
	H35EV00															
	H3L5EV00															

Built-in
 →
 LCD
 Driver

† Built-in A/D Converter

● Single-chip NMOS HD6800 Series

Device	Series Name	HD6801				HD6805					HD6805X		
		6801S	6801V	6803	6805S1	6805S6	6805U	6805V	6805T	6805W†	6805X0	6805X1	6805X2
Evaluation	ROM(KB)	2	4	—	1.1	1.8	2	4	2.5	4	4	4	—
	RAM(Byte)	128	128	128	64	64	96	96	64	96	96	96	96
	I/O Port	29	29	13	20	20	32	32	19	29	55	31	31
EPROM on Package MCU	32K												
	64K												
Emulator Set for H68SD5	H61MIX1												
	H65MIX1												
	H65MIX2												
	H65MIX4												
Evaluation Kit	H61EVT2												
	H65EVT2												
	H65EVT3												
	H65EVT4												
Evaluation Board	H61EV01												
	H65EV04												

† Built-in A/D Converter

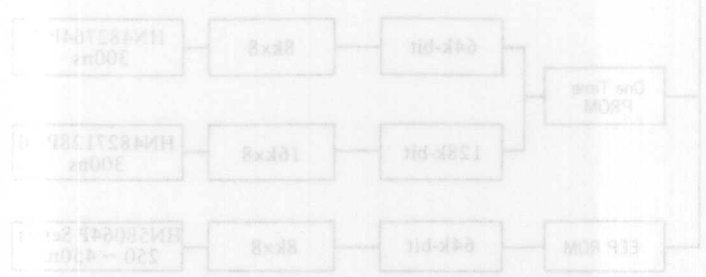
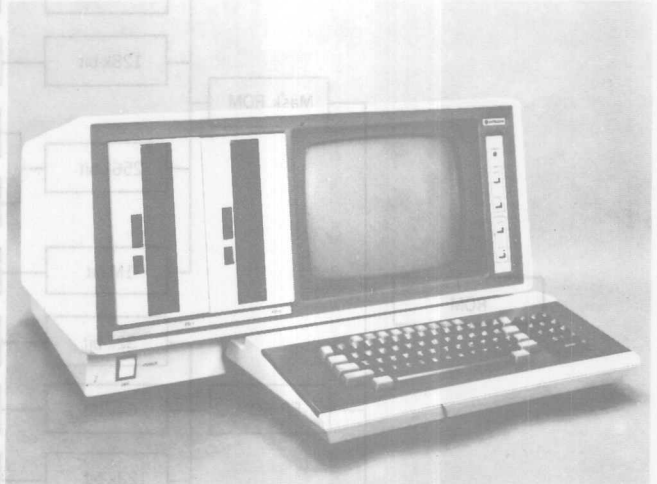
Development Tool

■ H68SD5 (for 4-bit and 8-bit Single-chip Microcomputer)

H68SD5 is an all-in-one type compact HD6800 based CRT/Key board microcomputer terminal with one Floppy disk driver and has standard interface for the TTY (RS-232C or TTL level) and printer (centronics parallel interface). The EPROM Programmer and the second Floppy disk driver are optionally available.

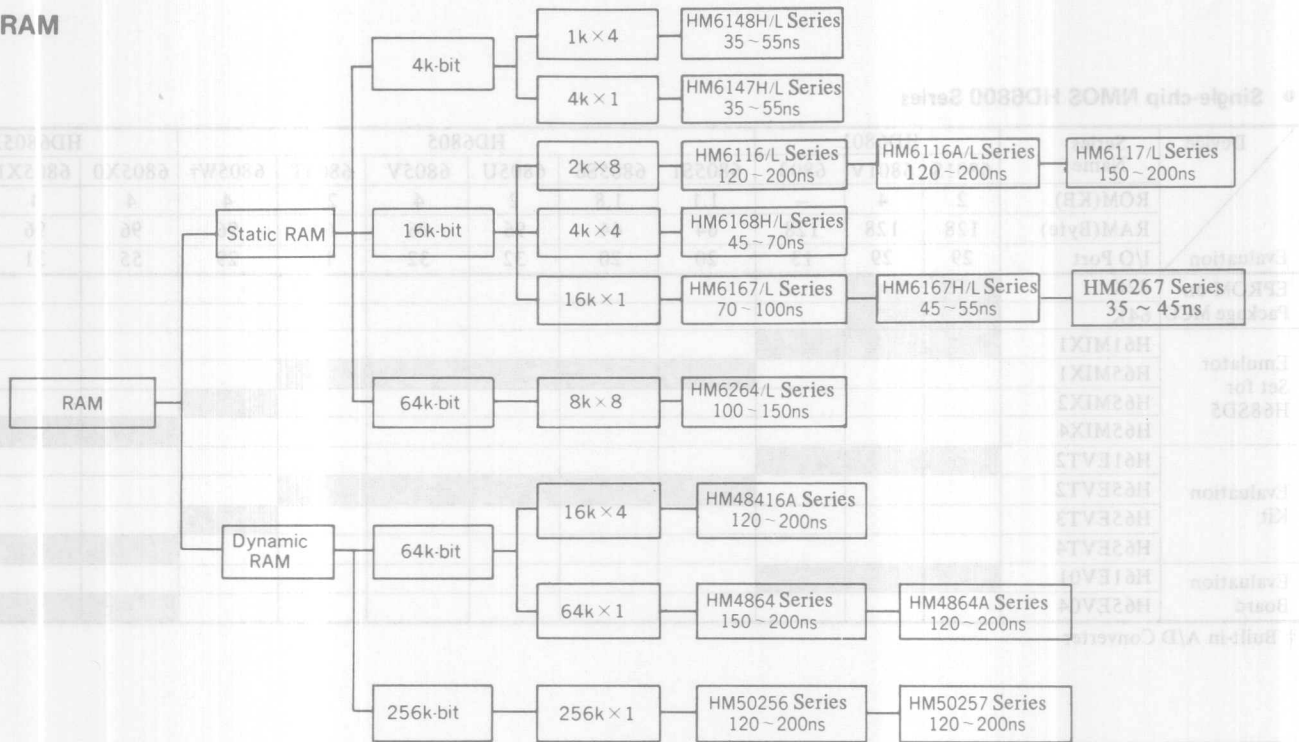
■ FEATURES

- ★ Supports the system development for 8-Bit and 4-Bit single-chip microcomputers
- ★ Disk based low cost system
- ★ Provides the CRT Editor, Assembler, Emulator and EPROM Programmer controlled by FDOS-III
- ★ 56k-byte RAMs
- ★ Allows linking between the H68SD5 and the I/O devices (TTY and Printer)
- ★ Easy to debug user's prototype system using the Emulator Module

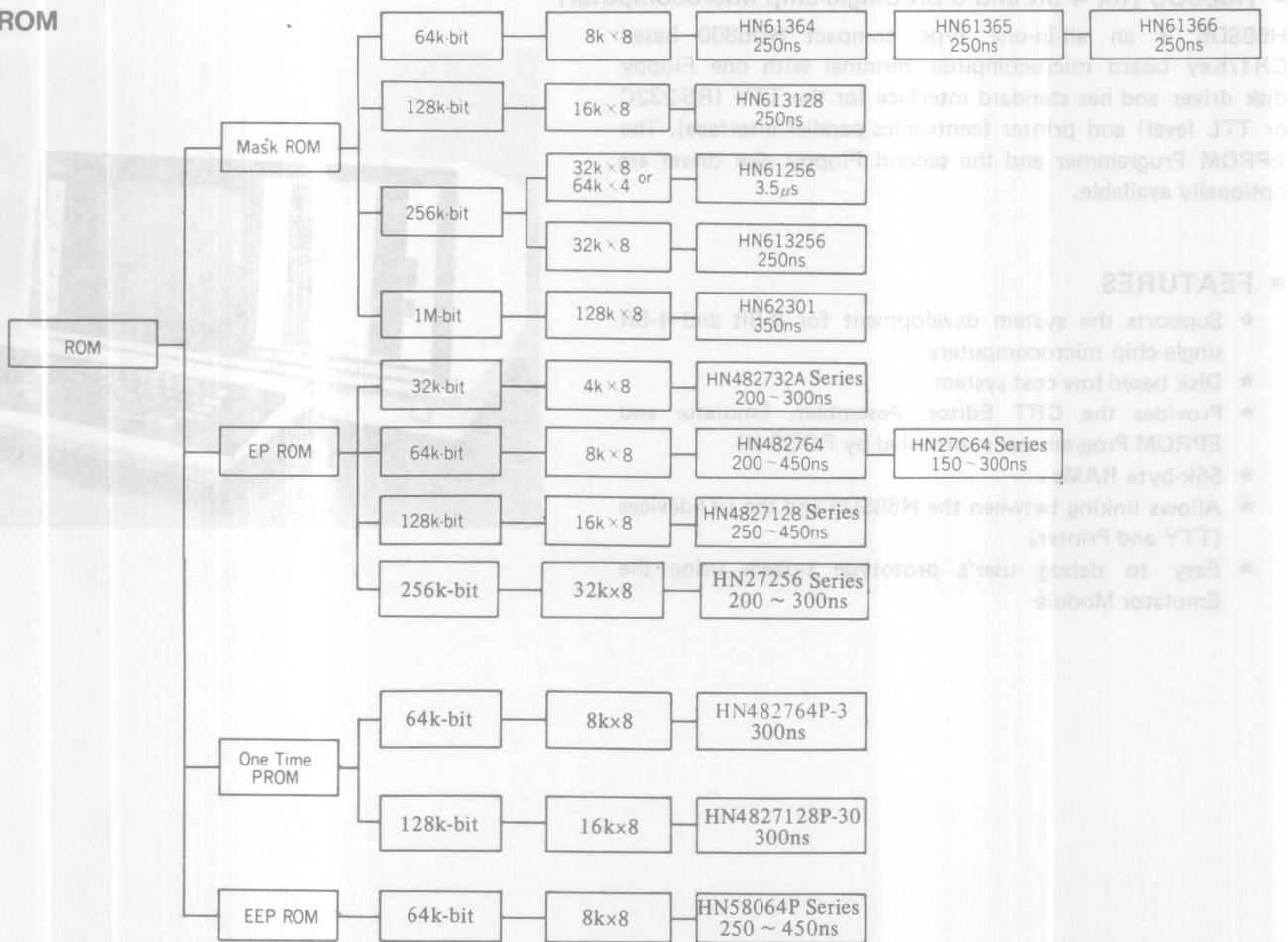


IC MEMORY

MOS RAM



MOS ROM



GATE ARRAY

CMOS Gate Array HD61J/HD61K/HD61L/HD61MM Series

FEATURES

- **Fast operation**
 Internal gate (2-input NAND, FO=3, AL=3mm) . . . 3.5ns typ
 Input buffer (FO=3, AL=3mm) 9ns typ
 Output buffer (C_L=50pF) 20ns typ
 Memory access time (HD61MM) 60ns typ
- **Low Power dissipation**
 At 10MHz operation (Internal gate) 130μW/gate typ
- **Abundant input and output configuration**
 Allocation of all pins except power supply pins to input/output/input-output
 Output can be CMOS/open drain/3-state
- **Memory on-chip (HD61MM)**
 Flexibility of memory capacity and word organization
 Selection of single port/dual port memory
- **Wide operation temperature range**
 -20 to +75°C
- **Wide package selection**
 Especially plastic packages with high pin count
 DILP64/FPP100
- **Powerful design support**
 User-Defined-Macro
 Test pattern evaluation with fault simulator
 Design support at local Design Center
- **Quick turn around time and reasonable development cost**

LINE UP

		HD61J	HD61K	HD61L	HD61MM
Gate count		504	1080	1584	2496
I/O pin count		50	68	68	104
RAM on chip		-	-	-	available
Package	DP28	○	○	○	-
	DP42	○	○	○	-
	DP64	-	○	○	○
	DP54	○	-	-	-
	FP80	-	○	○	-
	FP100	-	-	-	○*
	DC28	○	○	○	○
	DC40	○	○	○	○
	PGA72	-	-	○	-
	PGA120	-	-	-	○*
Power supply pin			4		4 *8

Bi-CMOS Gate Array HD27K/HD27L/HD27P/HD27Q Series

■ **FEATURES**

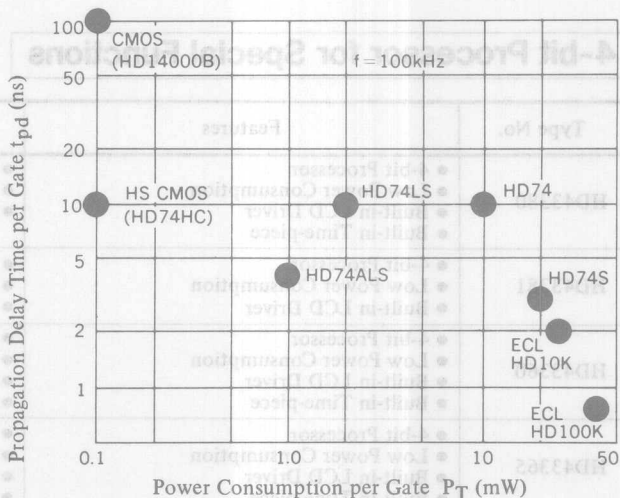
- High speed with super low power dissipation
 - Internal gate: 4.0ns (Fan out=3) @0.05mW
 - Input buffer: 5.0ns (Fan out=3) @2.6mW
 - Output buffer: 8.0ns (C_L=15pF) @2.6mW
- LS TTL compatible input/output
 - Selectable totem-pole/3-state/open collector output
 - I_{OL}=8mA: Capable of driving 20 LS TTL's
- Output buffer can construct logic functions.
 - Saves gate stages.
- A variety of macrocell library
 - Internal gate: 44
 - Output buffer: 9
- A variety of reliable package
 - Plastic DIP 16 to 64 pins
 - Plastic FP 60 to 100 pins (under development)
- A variety of DA system support
 - Only logic diagrams and test patterns needed as an interface with the user.
- Short development time

■ **LINE UP**

	Number of gates			Number of V _{CC} and GND pins	Package	
	Internal gate (2-input NAND)	Input buffer	Output buffer		DIP (Plastic)	FP* (Plastic)
HD27K	200	18	18	2	16, 20, 28, 42 pins	-
HD27L	528	30	30	4	28, 42, 64 pins	60, 80 pins
HD27P	966	40	40	4	28, 42, 64 pins	60, 80, 100 pins
HD27Q	1530	50	50	4	28, 42, 64 pins	60, 80, 100 pins

LOGIC FAMILIES

Hitachi logic IC's include general TTL to ultrahigh-speed and easy-to-handle ECL 100K, and low power and wide voltage range CMOS logic. High-speed CMOS logic devices are equivalent to the standard 74HC devices, and the development of the new devices is continuously being promoted.



	ECL		TTL				CMOS	
	HD10K	HD100K	HD74	HD74S	HD74LS	HD74ALS	HD14000B	HD74HC
Operating Supply Voltage Range (V)	-5.2±10%	-4.2~-5.7	+5±5%	+5±5%	+5±5%	+5±10%	+3~+18	+2~+6
Propagation Delay Time (ns/Gate)	2	0.75	10	3	10	4	105	10
Power Consumption (mW/Gate)	25	40	10	20	2	1	0.1	0.1
Operating Temperature Range (°C)	-30~+85	0~+85	-20~+75	-20~+75	-20~+75	-20~+75	-40~+85	-40~+85
Package	Cerdip	Cerdip Cera.Flat	Plastic DIP Cerdip	Plastic DIP Cerdip	Plastic DIP Cerdip	Plastic DIP Cerdip	Plastic DIP Cerdip SOP	Plastic DIP SOP
Number of Device	39	35	101	38	126	16	110	99

LSI FOR SPECIAL FUNCTIONS

LCD Controller/Drivers

Type		General		Segment Display		
LSI Characteristics	Type Number	HD44100H	HD61100	HD61602	HD61603	
	Process	CMOS	CMOS	CMOS	CMOS	
	Supply Voltage (V)	5*1	5*1	3 ~ 5*1	3 ~ 5*1	
	Operating Temperature (°C)	-20 ~ +75*2	-20 ~ +75	-20 ~ +75	-20 ~ +75	
	Package	FP-60	FP-100	FP-80	FP-80	
	Power Dissipation (mW)	5.0	5.0	0.5 (5V)	0.5 (5V)	
Function	Memory	ROM (bits)	-	-	-	
		RAM (bits)	-	-	51 x 4	64 x 1
	I/O	Interface (CPU)	8	4	14	10
		Interface (Driver IC)	2	2	-	-
		Interface (External ROM, RAM)	-	-	-	-
	Number of Instruction		-	-	4	4
	LCD Driver	Common	-	-	4	1
		Segment	40	80	51	64
		Duty	Free (N)	Free (N)	Static, 1/2, 1/3, 1/4	Static
		Bias	1/2, 1/3, 1/4, 1/5	1/2, 1/3, 1/4, 1/5	1/2, 1/3	-
Display Capability		N x 40 Matrix (1/N Duty)	N x 80 Matrix (1/N Duty)	204 Segment (1/4 Duty)	64 Segment	
Comment		SR type	SR type			

*1: Except Power Supply for LCD.

*2: -40 ~ +85°C (Special Request). Please contact Hitachi Agents.

*3: CG; Character Generator.

4-bit Processor for Special Functions

Type No.	Features	Functions	Supply Voltage	Cycle Time	Power Consumption
HD43380	<ul style="list-style-type: none"> 4-bit Processor Low Power Consumption Built-in LCD Driver Built-in Time-piece 	<ul style="list-style-type: none"> ROM 480 x 26 bit RAM 48 x 6 bit LCD Driver Segment 3 x 27 	3V	183μs	30μW
HD43381	<ul style="list-style-type: none"> 4-bit Processor Low Power Consumption Built-in LCD Driver 	<ul style="list-style-type: none"> ROM 480 x 26 bit RAM 48 x 6 bit LCD Drive Segment 3 x 27 	3V	183μs	30μW
HD43360	<ul style="list-style-type: none"> 4-bit Processor Low Power Consumption Built-in LCD Driver Built-in Time-piece 	<ul style="list-style-type: none"> ROM 480 x 26 bit RAM 48 x 6 bit LCD Drive Segment 3 x 27 4-bit Data Output 	3V	183μs	30μW
HD43365	<ul style="list-style-type: none"> 4-bit Processor Low Power Consumption Built-in LCD Driver Built-in Time-piece 	<ul style="list-style-type: none"> ROM 960 x 27 bit RAM 64 x 8 bit LCD Drive Segment 4 x 26 8-bit Data I/O 	3V	183μs	30μW
HD43550	<ul style="list-style-type: none"> 4-bit Processor Wide I/O Port (51 bit) Compatible Instruction with HMCS40 	<ul style="list-style-type: none"> ROM 3008 x 10 bit RAM 64 x 10 bit 	5V	20μs	1mW
HD61810B (HSP)	<ul style="list-style-type: none"> Digital Signal Processor Floating Point Operation High Speed Operation 	<ul style="list-style-type: none"> Instruction ROM 512 x 22 bit Data ROM 128 x 16 bit RAM 200 x 16 bit 16-bit Floating Point Operation 	5V	250μs	250mW

Character Display			Graphic Display				
HD44780 (LCD-II)	HD44101H	HD43160AH	HD44102CH	HD44103CH	HD61830	HD61102	HD61103
CMOS	CMOS	CMOS	CMOS	CMOS	CMOS	CMOS	CMOS
5*1	5*1	5*1	5*1	5*1	5*1	5*1	5*1
-20 ~ +75*2	-20 ~ +75	-20 ~ +75	-20 ~ +75	-20 ~ +75	-20 ~ +75	-20 ~ +75	-20 ~ +75
FP-80	FP-80	FP-54	FP-80	FP-60	FP-60	FP-100	FP-100
1.75	1.75	10.0	2.5	4.0	30.0	2.5	5.0
7200 (CG)*3	6720 (CG)*3	6240 (CG)*3	-	-	7360 (CG)*3	-	-
80x8/64x8 (CG)*3	32x8	80x8	200x8	-	(External 65536x8)	512x8	-
11	12	21	21	6	13	21	2
4	4	5	-	5	9	-	2
-	-	18	-	-	33	-	-
11	8	6	6	-	12	8	-
16	15	-	-	20	-	-	64
40	40	-	50	-	-	64	-
1/8, 1/11, 1/16	1/7, 1/14	1/8, 1/12, 1/16	1/8, 1/12, 1/16 1/24, 1/32	1/8, 1/12, 1/16 1/24, 1/32	1/1 ~ 1/128	~ 1/64	1/48, 1/64 1/96, 1/128
1/4, 1/5	1/4, 1/5	-	1/5	1/5	-	1/5	-
16 Digits (5x7 Dots 1/16 Duty)	16 Digits (5x7 Dots 1/14 Duty)	-	32x50 Dots (1/32 Duty)	-	-	Nx64 Matrix (1/64 duty)	Nx64 Matrix (1/64 duty)
Expandable to 80 Digits using HD44100H	Expandable to 32 Digits using HD44100H	Display to 80 Digits using HD44100H			Display to 524288 Dots using HD44100H		

CODEC/Filter Combo-LSI

Series	Type No.	Comp. Law	Power Dissipation (mW)	CR Filter	Voltage Reference	Clock			Signaling
						Internal Clock	Sync/Async	PCM Bit Clock Required	
HD44210	HD44211A	A	150	-	-	External 128kHz req.	Both	64 ~ 2048kHz	
	HD44212A	μ							
HD44220	HD44222	μ	40	-	External	PLL	Both	64 ~ 2048kHz	Decoder Shift
	HD44231B	A							
HD44230	HD44232B	μ	60	○	○	Divider	Sync	1536/1544/2048kHz	
	HD44233B	A							
	HD44234B	μ							
	HD44235	A	50	○	○	PLL	Sync	64 ~ 2048kHz	Decoder Shift
	HD44236	μ							
	HD44237	A							
	HD44238	μ							
HD44230C	HD44231C	A	60	○	○	Divider	Sync	1536/1544/2048kHz	
	HD44232C	μ							
	HD44233C	A							
	HD44234C	μ	60	○	○	PLL	Sync	64 ~ 2048kHz	Decoder Shift
	HD44235C	A							
	HD44236C	μ							
HD44240	HD44237C	A	60	○	○	PLL	Both	64 ~ 2048kHz	Decoder Shift
	HD44238C	μ							
	HD44240C	μ		○	○	PLL	Both	64 ~ 2048kHz	A/B Data I/O

*A-law: Europe and International Telephone.

*μ-law: U.S.A., Canada and Japan.

Speech Synthesis LSI

Type	PMOS 3-chip System	CMOS 1-chip System
Device	HD38880B (Speech Synthesizer) HD38881 (128k-bit ROM) HD38882 (EPROM Interface) HMCS40 Series (Controller)	HD61885/7 (Speech Synthesizer) HD44881 (128k-bit Expanding ROM)
System	PARCOR	PARCOR
Voice channel model	<ul style="list-style-type: none"> 8 steps/10 steps digital filter; selectable Voice canal loss effect (existencel non-existence); selectable 	10 steps digital filter
Voice source model	<ul style="list-style-type: none"> Voice sound Rectangular wave/triangle wave; selectable Voiceless sound; White noise 	
Sampling frequency	8kHz	10kHz
Bit rate (b/s)	2400 4800 9600	1250 ~ 9900
Frame period (ms)	20 20 10	10/20
Variable speaking speed	Variation of frame period is possible from -30% to 60% by 10% steps.	-25%, 0, +25%
Speaking time	50 ~ 100 sec/ROM (2400 b/s)	10 ~ 20 sec (internal ROM)

IC FOR CONSUMER APPLICATIONS

TV Applications

■ AFT and PIF

Type No.	Outline	Electrical Performance						Recommended Application		Remarks
		AFT	PIF Amp.	RF AGC	Video Det.	Supply Voltage (V)	Other	Color	B/W	
HA11440A	DP-28	•	•	Reverse	•	12	with Video Amp.	•	-	Direct coupled SAW filter
HA11442A	DP-16	•	•	Forward	•	12	with Video Amp.	•	-	Direct coupled SAW filter
HA11458	DP-28	•	•	Reverse	•	12	with SIF	•	-	Correspond to composite SAW filter, PIF + SIF
HA11461NT	DP-42S	•	•	Reverse	•	12	with SIF, Audio-DC-ATT and H/V	•	-	Direct coupled SAW filter
HA11485NT	DP-30S	•	•	Reverse	•	12	with SIF	•	-	

■ Color and Video Signal Processing

Type No.	Outline	Electrical Performance					Recommended Application		Remarks
		Color Amp.	Color Sync.	Color Demod.	Video Amp.	Supply Voltage (V)	Color	B/W	
HA11431	DP-28	•	•	•	Brightness Control	12	•	-	Tint DC Control Blinking
HA11436A	DP-28	•	•	•	Brightness Control	12	•	-	With Automatic Flesh Control
HA11464	DP-16-2	•	•	•	-	12	•	-	Tint DC Control, Color Saturation
HA11465A	DP-16-2	-	-	-	Brightness Control	12	•	-	Sync. Sept. Pedestal Clamp Blanking

■ B/W TV 1-chip

Type No.	Outline	Function	Function	Features
HA11445A	DP-28	PIF, Synchronous Signal Processing, SIF	Reverse RF AGC	A set comprises the tuner and the sound, picture, horizontal and vertical output circuits.

■ Synchronous Signal Processing and Deflection

Type No.	Outline	Electrical Performance							Recommended Application		Remarks
		Sync. Sept.	Horiz. Osc.	Horiz. Drive	Vert. Osc.	Vert. Drive	Vert. Out.	Supply Voltage (V)	Color	B/W	
HA11423	DP-16-2 MP-18	•	•	-	•	-	-	12	•	-	with X-ray protection and Blanking
HA11441	DP-16-2	•	•	•	•	•	-	5	•	•	Low Voltage Operation, with Blanking

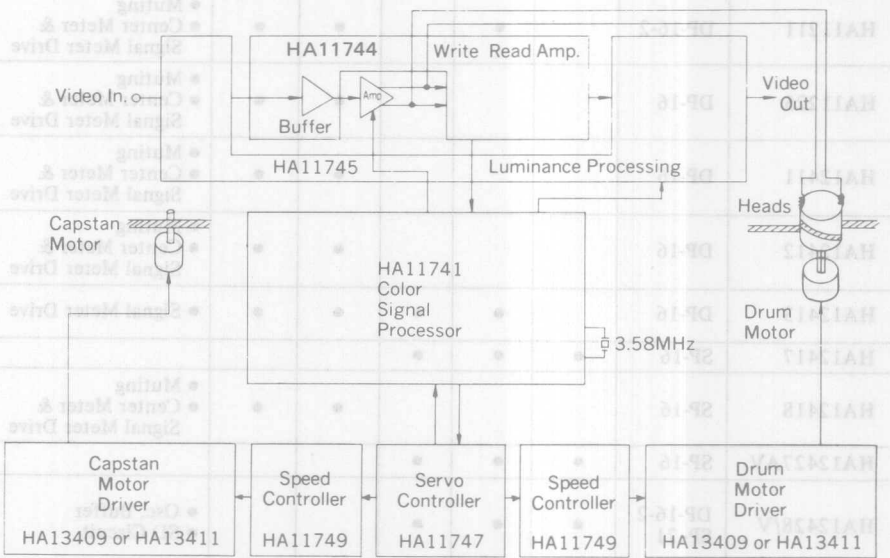
■ Sound Signal Processing

Type No.	Outline	Electrical Performance					Recommended Application		Remarks
		SIF Amp.	Discrim.	AF Amp.	Power Amp.	Supply Voltage (V)	Color	B/W	
HA1124 HA1125	DP-14	•	Differential Peak Det.	•	-	9	•	•	HA1125 is included zener diode for regulated supply
HA1364	QP-12T	•	Differential Peak Det.	•	•	24	•	-	-

■ Other Functions

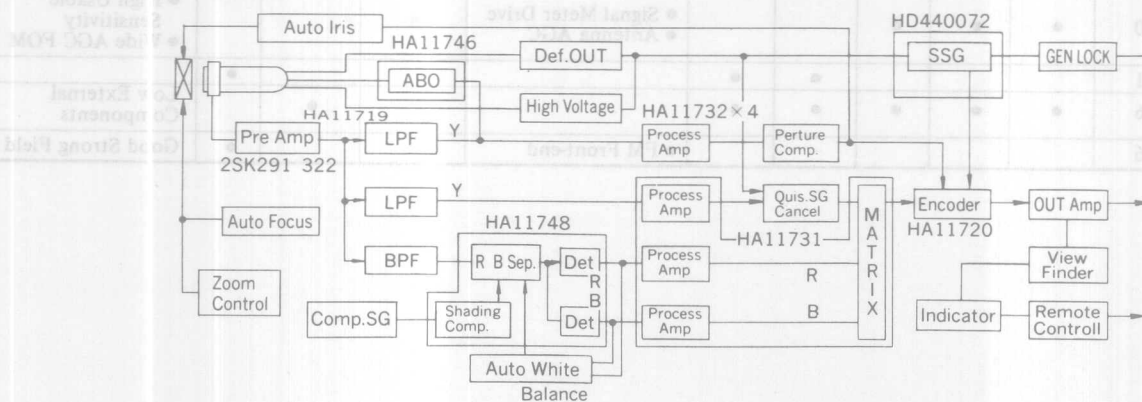
Type No.	Outline	Functions	Recommended Applications
HD38986/E	DP-42	PLL Channel Selection of Voltage-controlled System	
HD430196B	DP-18	with PPM code, address 3-bit + data 6-bit transmission, prevention of double pushing and 455kHz ceramic filter used are possible.	Transmitter of Remote Control
HD44042	DP-8	Preamplifier for Infra-red Remote Control System	Receiver for Infra-red Remote Control System

VTR Applications

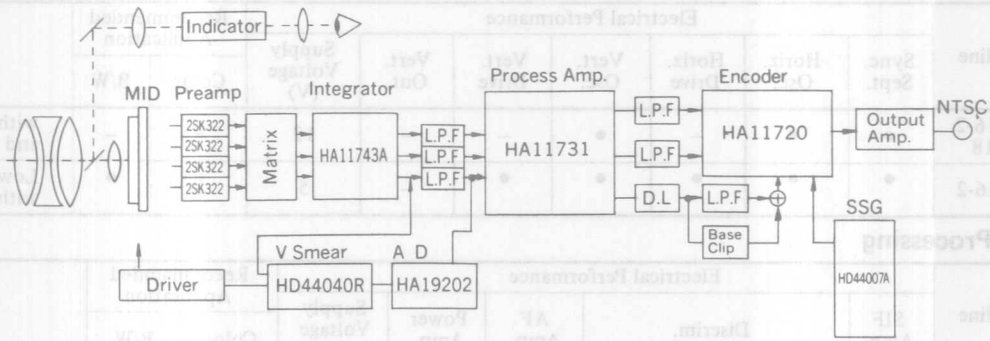


Video Camera Applications

● One Carrier Frequency System Camera



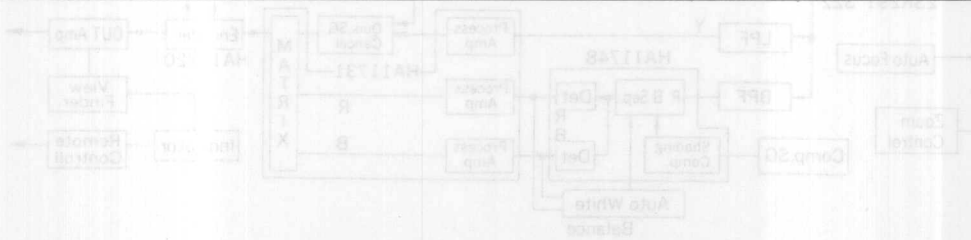
● Solid State (MID) Camera



Audio Applications

■ FM/AM Receivers

Type No.	Outline	Electrical Performance						Recommended Application			Remarks
		AM-RF Conv.	AM-IF Amp.	AM Det.	FM-IF Amp.	FM Demod.	Other Function	Tuner Receiver	Radio, Cassette with Radio	Car Use	
HA1137W	DP-16				●	●	● Muting ● Center Meter & Signal Meter Drive	●		○	S/N: 72dB typ
HA1197	DP-16	●	●	●			● Signal Meter Drive	●			
HA1199	DP-16	●	●	●						●	Good Strong Field
HA11211	DP-16-2		●		●	●	● Muting ● Center Meter & Signal Meter Drive	●			S/N: 79dB typ
HA11225	DP-16				●	●	● Muting ● Center Meter & Signal Meter Drive	●			● Variable Muting Level ● S/N: 84dB typ
HA12411	DP-16				●	●	● Muting ● Center Meter & Signal Meter Drive	○		●	
HA12412	DP-16				●	●	● Muting ● Center Meter & Signal Meter Drive	●			Tuning Meter short-circuit for AM band.
HA12413	DP-16		●	●	●	●	● Signal Meter Drive	○	●		$V_{CC} = 3 \sim 16V$ $I_Q = 15mA$ typ
HA12417	SP-16	●	●	●						●	Good Strong Field
HA12418	SP-16				●	●	● Muting ● Center Meter & Signal Meter Drive	○		●	
HA12427AV	SP-16	●	●	●						●	Coupled Ceramic Filter
HA12428/V	DP-16-2 SP-21	●	●	●			● Osc. Buffer ● SD Circuit			●	● Good 2-Signal Interruption Characteristic ● Good Strong Field at High Sensitivity
HA12430	DP-20	●	●	●	●	●	● Signal Meter Drive	○	●		
HA12432	DP-20	●	●	●			● Signal Meter Drive ● Antenna AGC	●			● High Usable Sensitivity ● Wide AGC FOM
HA12435V	SP-21				●	●				●	
HA12436	DP-16	●	●	●	●	●			●		Low External Components
HA12439V	SP-16						● FM Front-end			●	Good Strong Field



■ FM Stereo Demodulators

Type No.	Outline	Electrical Performance				Recommended Applications			Remarks
		Demodulation System	Pilot Canceller	Post Amp.	Lamp Driver	Tuner Receiver	Radio, Cassette with Radio	Car Use	
HA1156W	DP-14	PLL			•	•		○	$G_V = -6\text{dB}$
HA1196	DP-16	PLL		•	•	•			$G_V = 15\text{dB}$
HA11223W	DP-16	PLL	•		•	•			$G_V = -2\text{dB}$ $S/N = 86\text{dB typ}$
HA12016	DP-16	PLL		•	•	•			$G_V = 12\text{dB}$ $S/N = 88\text{dB typ}$
HA12026	DP-16	PLL			•		•	•	with VCO stop
HA12031	DP-28	PLL	•	•	•	•			with Mute, VCO stop and Beat Canceller
HA12055V	SP-21	PLL			•			•	with FM Noise suppressor
HA12063	DP-16	PLL			•		•		Non-adjust

■ Cassette Tape Deck Applications

Type No.	Outline	Electrical Performance					Remarks
		PLY/REC Amp.	Headphone Amp.	Mechanism Control	Electronic Switch	Other	
HA11226/MP	DP-16-2 MP-18					Dolby-B Type 2-channel	
HA12005	DP-16	•			•		PLY/REC Switch
HA12006	DP-16-2		•		•		includes Head Switch and Mute Switch
HA12010	DP-16					12 point linear-scale bargraph display (0.25V step)	
HA12020	DP-28					Automatic Equalizer	with 5-bit DA and EQ
HA12024	DP-16-2					Automatic Program Selection	
HA12028	DP-22	•	•		•		with REC Switch and Mute Switch
HA12035	DP-28					2-channel Automatic Equalizer	with 4-bit DA and EQ
HA12037NT	DP-30S				•	For Cassette Tape Deck with Radio	All electronics of function switch
HA12038/MP/NT	DP-28 DP-30S MP-28					Dolby-C Type	
HA12045/MP	DP-18 MP-18					Dolby-B Type 2-channel	Low external parts count
HA12046/MP							
HA12047/MP							
HA12048/FP/MP	DP-18 FP-18 MP-18						
HA12051NT	DP-30S	•	•			Signal Circuit of Dolby-C Type Deck	1-chip IC for PLY/REC Signal with Mute Switch
HA12052C	DP-18 FP-18 MP-18		•			• 2-channel Headphone Stereo • with Automatic Stop Detect	• Low External Components • with Mute Switch
HA12058	DP-28 DP-30S MP-28					Dolby-B/C Type	
HA12067NT	DP-30S					12 point log-scale bargraph display (2dB step)	• Low External Components • Wide Operating Voltage (11 ~ 24V)

■ Preamplifiers

Type No.	Outline	Max. Ratings		Electrical Characteristics				Recommended Application				Remarks
		P_T (mW)	V_{CC} (V)	Noise	THD (%)	$G_{V(OL)}$ (dB)	V_{out} (V)	HiFi Amp.	Car Use	Cassette Tape Recorder	Home Stereo	
HA12017	SP-7	500	± 26.5	$V_{n(out)}$ 1.15mV	0.002	105	14.7	•			○	2 supplies system

■ Power ICs

Type No.	Outline	Max. Ratings		Electrical Characteristics			Recommended Application				Remarks
		P_T (W)	V_{CC} (V)	P_{out} (W)	R_L (Ω)	V_{CC} (V)	Hi-Fi Amp.	Car Use	Cassette Tape Recorder	Home Stereo	
HA1377	SP-12T	15	18	5.8x2	4	13.2		●	○		2-channel built-in
HA1384	SP-12T	15	26	20	4	13.2		●		○	BTL
HA1388	SP-12T	15	18	18	4	13.2		●		○	BTL
HA1392	SP-12T	15	20	6.8	4	15		●	●		2-channel built-in, with Mute Terminal
				4.3	4	12					
HA1393	SP-12T	15	26	20	4	13.2		●		○	BTL
HA1394	SP-12T	15	35	8.2x2	8	25			○	●	2-channel built-in
HA1396	SP-12T	15	26	20	4	13.2		●		○	BTL with Mute
HA1397	SP-12T	30	±30	20	8	±22	●			○	2 supplies system
HA13001	SP-12T	15	26	5.5x2	4	13.2		●			2 channel built-in
				17.5							
HA13102	SP-12T	15	18	5.5x2	4	13.2		●	○		2 channel built-in
TBA800	QP-12TA	5	30	5.0	16	24			○	●	Cassette Tape Deck Applications
				3.4	8	16					
TBA810AS	QP-12TA	5	20	7	4	16			○	●	Type No.
TBA810SH	QP-12T										

■ PCM and DAD Applications

Use	Type	Function	Contents	Outline	Use	Type	Function	Contents	Outline
P C M	HD440361	Playback	<ul style="list-style-type: none"> ● Conversion of sample data from in-series to in-alternating ● Detection of error data ● Detection and protection of control block ● RAM control and data processing ● Mute function 	FP-60	D A D	HA12049A	Interface	<ul style="list-style-type: none"> ● Input Signal Processing 	DP-28
			<ul style="list-style-type: none"> ● Detection and protection of synchronizing signal ● RAM address control ● Deinterleave 			HA12053	Interface	<ul style="list-style-type: none"> ● Sample & Hold 	DP-16
	HD440362	Error correction	<ul style="list-style-type: none"> ● RAM I/O ● Error correction ● Check and latch of control block ● D/A output latch and buffer 			HA16633	D/A Converter	<ul style="list-style-type: none"> ● 16-bit D/A Converter ● High-speed settling (1.5μs) 	DP-42
	HD44037		<ul style="list-style-type: none"> ● Parity word generation (P, Q) ● RAM address control 			HD61901H	Error Correction	<ul style="list-style-type: none"> ● EFM Signal Demod. ● Error Correction 	FP-60
	HD440381		Recording			<ul style="list-style-type: none"> ● Conversion of output data from in-alternating to in-series ● Synchronizing signal generation ● CRCC generation ● RAM address control ● Interleave 	HD61902H	Output Control	<ul style="list-style-type: none"> ● External RAM Address Control ● Output Control ● Digital Servo
HD440382									

■ Other Applications

Type No.	Outline	Functions	Remarks
HA12002	SP-8	Protection of Speaker and Power Amp.	with Relay Driver
HA12022	DP-16-2	Voltage Controlled Amp.	
HA12032	DP-18	Motor Controller for Quartz-lock Player	except Motor Driver
HA12039	DP-16-2	Automatic Volume Control (AVC)	Adjustment of the volume by detecting the indoor noise of a car
HA12043	DP-18	CX NR System for MCA System	NR Effects 14dB
HA12044	DP-18	CX NR System	NR Effects 20dB
HA12429/MP	DP-18 MP-18	AM Noise Canceller	
HA13003	DP-14T	Modulator for PWM Amplifier	Small Channel Crosstalk

TRANSISTOR

MPAK Series

Power MOS FET Line Up

V _{DS} (V)	I _D (A)												
	0.3	0.5	1	1.5	2	3	4	5	6	7	8	10	12
35				*HS8709(1.8)				*HS8711(0.6)					
40					2SK416(0.5) 2SJ120(1.2)			2SK345(0.3) 2SJ101(0.3)					
60								2SK346(0.3) 2SJ102(0.3)			2SK286(0.5) 2SJ96(0.5)	2SK428(0.1) 2SJ122(0.15)	
80								2SK294(0.4)					
100					2SK429(0.5)			2SK295(0.4)				2SK383(0.15) 2SK398(0.2) 2SJ112(0.25) 2SK399(0.2) 2SJ113(0.25)	
120										2SK133(1.0) 2SJ48(1.0) 2SK225(1.0) 2SJ81(1.0)		2SK308(0.2)	
140		2SK213(8) 2SJ76(10)								2SK134(1.0) 2SJ49(1.0) 2SK226(1.0) 2SJ82(1.0)	2SK343(0.4) 2SJ99(0.4) 2SK413(0.4) 2SJ118(0.4)		
150					2SK430(0.8)								
160		2SK214(8) 2SK214(8) 2SJ77(10) 2SJ77(10) 2SK196(8)								2SK135(1.0) 2SJ50(1.0) 2SK227(1.0) 2SJ83(1.0)	2SK344(0.4) 2SJ100(0.4) 2SK414(0.4) 2SJ119(0.4) 2SK220(1.0)		
180		2SK215(8) 2SJ78(10)			2SK408(7.0) 2SK409(7.0)		2SK318(1.9)				2SK175(1.0) 2SJ55(1.0) 2SK317(0.95) 2SK410(1.2) *HS8707(1.3)		
200		2SK216(8) 2SK216(8) 2SJ79(10) 2SJ79(10)								*2SK440(0.4)	2SK176(1.0) 2SJ56(1.0) 2SK221(1.0) 2SK400(0.5) 2SJ114(0.6)		
250		2SK511(30)									2SK258(0.8)	2SK401(0.3) 2SK412(0.3)	
300				2SK296(2.5) 2SK375(2.5)									
350								2SK259(2.5)					
400				2SK347(9)	2SK535(4)	2SJ117(5)	2SK310(2.5)	2SK260(2.5)			2SK298(1.1) 2SK402(1.1) 2SJ116(1.75)	2SK349(0.67)	2SK312(0.67)
450							2SK311(2.5)	2SK320(1.1)			2SK299(1.1) 2SK403(1.1)	2SK350(0.67)	2SK313(0.67)
500		2SK384(25) 2SK441(25)				2SK382(2.5)							2SK512(0.5)
800						2SK415(5) 2SK515(5)		2SK351(1.7) 2SK534(3)					

Power MOS FET for Audio Applications

Output (W)		Input Stage		Driver Stage				Output Stage					
Single Push-pull	Parallel Push-pull	FET	Bipolar		FET (V _{DSX})		Bipolar (V _{CEO})		FET (V _{DSX})				
			NPN	PNP	N-ch	P-ch	NPN	PNP	Can Type		Resin Type		
									N-ch	P-ch	N-ch	P-ch	
50~60	-				2SK213 (140V)	2SJ76 (-140V)	2SD756 (120V)	2SB716 (-120V)	2SK133 (120V)	2SJ48 (-120V)	2SK225 (120V)	2SJ81 (-120V)	
50~80	100~120	2SK186 2SK190			2SK214 (160V)	2SJ77 (-160V)	2SD756A (140V)	2SB716A (-140V)	2SK134 (140V)	2SJ49 (-140V)	2SK226 (140V) 2SK343 (140V) 2SK413 (140V)	2SJ82 (-140V) 2SJ99 (-140V) 2SJ118 (-140V)	
-	120~140		2SC1775 2SC2855	2SA872 2SA1190							2SK227 (160V) 2SK344 (160V) 2SK414 (200V)	2SJ83 (-160V) 2SJ100 (-160V) 2SJ119 (-160V)	
80~100	-				2SK215 (180V)	2SJ78 (-180V)	2SD668A (160V)	2SB648A (-160V)	2SK135 (160V)	2SJ50 (-160V)			
-	140~200		2SC1775A 2SC2856	2SA872A 2SA1191		2SK216 (200V)	2SJ79 (-200V)	2SD758 (200V)	2SB718 (-200V)	2SK175 (180V) 2SK176 (200V)	2SJ55 (-180V) 2SJ56 (-200V)	2SK400 (200V)	2SJ114 (-200V)

Note) 1. Under line is D series (Drain Case)

- : D Series
- : Under Development
- () : R_{DS(on)} [Ω]

MPAK Series

TRANSISTOR

Transistor Type	Type Number		Maximum Ratings			Reference Type Number		
	NPN (N-ch)	PNP (P-ch)	V _{CEO} V _{D SX} (V)	I _C I _D (mA)	P _C (mW)	Type Number		Outline
						NPN (N-ch)	PNP (P-ch)	
Bipolar Transistor For Low Frequency	—	2SA1052	30	100	150	—	2SA1029	TO-92
	2SC2618	2SA1121	35	500	150	2SC1213	2SA673	TO-92
	—	2SA1122	55	100	150	—	2SA844	TO-92
	—	2SA1171	90	50	150	—	2SA893	TO-92
	2SD1101	2SB831	20	700	150	2SD467	2SB561	TO-92
	—	2SB973	10	700	150	—	—	—
	2SC2462	—	40	100	150	2SC458	—	TO-92
	2SC2463	—	50	100	150	2SC1345	—	TO-92
	2SC2821	—	10	50	150	—	—	—
	2SD1306	—	15	700	150	2SD655	—	TO-92
Bipolar Transistor For High Frequency	2SC2619	—	30	100	150	2SC461	—	TO-92
	2SC2620	—	20	20	100	2SC535	—	TO-92
	2SC2732	—	25	20	150	2SC2464	—	FPAK
	2SC2733	—	20	50	150	2SC2512	—	TO-92
	2SC2735	—	20	50	150	2SC1906	—	TO-92
	2SC2736	—	20	50	150	2SC2471	—	TO-92
	2SC2776	—	20	30	150	2SC1342	—	TO-92
	2SC3015	—	10	50	150	2SC2729	—	FPAK
	2SC3016	—	10	50	150	2SC2730	—	FPAK
	2SC3127	—	12	50	150	2SC3128	—	TO-92
2SC3493	—	12	20	150	2SC2727	—	FPAK	
Single Gate MOS FET	2SK197	—	18	20	150	2SK55	—	TO-92
	2SK217	—	30	20	150	2SK168	—	TO-92
	2SK322	—	15	50	150	2SK291	—	TO-92
	2SK323	—	40	30	150	2SK186	—	TO-92
	2SK360	—	20	30	150	2SK359	—	TO-92
	2SK431	—	40	30	150	2SK187	—	TO-92
Dual Gate MOS FET	3SK136	—	20	35	150	3SK81	—	FPAK
	3SK137	—	15	35	150	3SK104	—	FPAK
	3SK138	—	15	35	150	3SK103	—	FPAK

UPAK Series

Type Number		Maximum Rating			Reference Type Number		
NPN	PNP	V _{CEO} (V)	I _C (A)	P _C (W)	Type Number		Outline
					NPN	PNP	
2SD1366	2SB1000	20	1	1	2SD468	2SB562	TO-92M
2SD1366A	2SB1000A	25	1	1	2SD468A	2SB562A	TO-92M
2SD1367	2SB1001	16	2	1	2SD787	2SB738	TO-92M
2SD1368	2SB1002	50	1	1	2SD789	2SB740	TO-92M
2SD1418	2SB1025	80	1	1	2SD667	2SB647	TO-92M
2SD1419	2SB1026	100	1	1	2SD667A	2SB647A	TO-92M
2SD1463	2SB1045	100	50m	1	2SD666A	2SB646A	TO-92M
2SD1464	2SB1046	160	50m	1	2SD668A	2SB648A	TO-126

EPAK Series

Transistor Type	Type Number		Absolute Maximum Ratings			Reference Type Number		
	NPN	PNP	V _{CEO} (V)	I _C (A)	P _C (W)	Type Number		Outline
						NPN	PNP	
Bipolar Transistor	—	2SA1340	50	0.1	0.4	—	2SA1031	TO-92
	—	2SA1351	30	0.1	0.4	—	2SA1031	TO-92
	2SC3394	—	50	0.1	0.4	2SC458 (L)	—	TO-92
	2SC3414	—	30	0.1	0.4	2SC458 (L)	—	TO-92

DKPAK Series

Transistor Type	Type Number		Absolute Maximum Ratings			Reference Type Number			
	NPN	PNP	V _{CEO} V _{DSS} (V)	I _C I _D (A)	P _C (T _C =25°C) (W)	Type Number		Outline	
						NPN	PNP		
Bipolar Transistor	2SC2870	—	300	0.1	10	2SC1514	—	TO-202	
	2SC3129	—	400	0.5	10	2SC2899	—	TO-126	
	2SC3132	—	30	3	10	2SC3004	—	TO-126	
	2SD1077	2SB837	35	2.5	20	2SC1162	2SA715	TO-126	
	2SD1078	2SB838	50	2.0	20	2SC1212	2SA743	TO-126	
	2SD1079	2SB839	80	2.0	20	2SC1212A	2SA743A	TO-126	
	2SD1080	2SB840	120	1.5	20	2SD669	2SB649	TO-126	
	2SD1081	2SB841	160	1.5	20	2SD669A	2SB649A	TO-126	
	2SD1083	—	60	2	20	2SD975	—	TO-126	
	2SD1281	2SB957	60	2	20	2SD1177	2SB874	TO-126	
	2SC2871	2SA1197	60	1	20	2SC2324 (K)	2SA1194 (K)	TO-126	
	2SD1465	2SB1047	120	1.5	20	—	—	—	
	—	2SA1233	360	100m	10	—	2SA1024 (H)	TO-18	
	2SC3362	—	400	1.5	10	—	—	—	
	2SC3363	—	450	1.0	10	—	—	—	
	2SD1520	2SB1072	80	4	20	—	—	—	
	—	2SA1379	600	0.8	10	—	—	—	
	2SC3386	—	50	3	10	—	—	—	
	Power MOS FET	2SK416	2SJ120	40	2	10	—	—	—
		2SK429	—	100	3	20	—	—	—
2SK430		—	150	3	20	—	—	—	
2SK375		—	300	1	10	2SK296	—	TO-220	
2SK347		—	400	1	10	—	—	—	
(HS7281)		—	400	1.5	10	—	—	—	
2SK384		—	500	0.3	10	2SK441	—	TO-39	
2SK535		—	400	1.5	20	—	—	—	

() Under Development

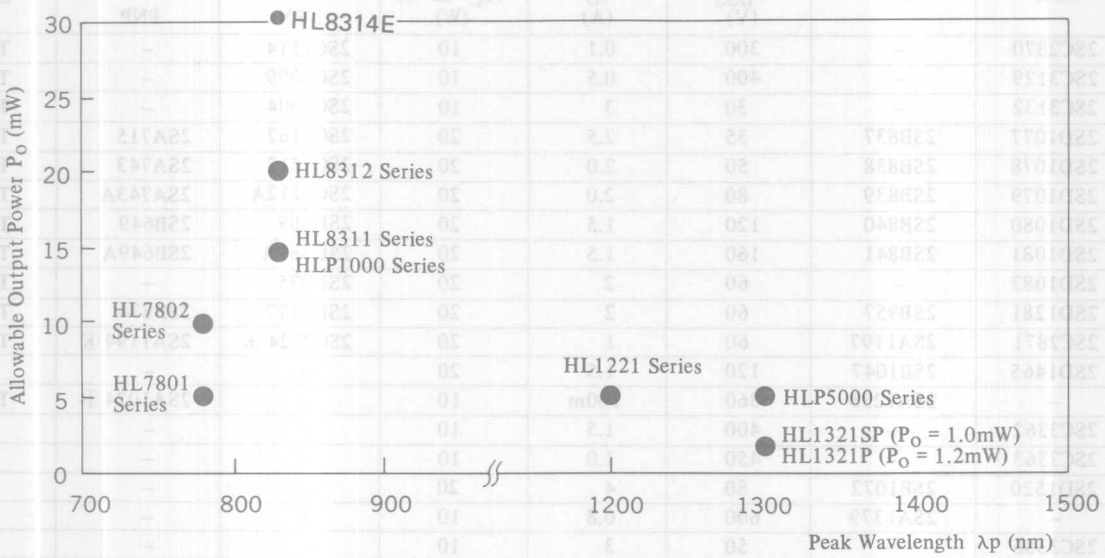
SPAK Series

Transistor Type	Type Number		Absolute Maximum Ratings			Reference Type Number		
	NPN (N-ch)	PNP (P-ch)	V _{CEO} V _{DSS} (V)	I _C I _D (A)	P _C (W)	Type Number		Outline
						NPN (N-ch)	PNP (P-ch)	
Bipolar Transistor	—	2SA1337	50	0.1	0.3	—	2SA1031	TO-92
	—	2SA1350	30	0.1	0.3	—	2SA1031	TO-92
	—	2SA1374	55	0.1	0.3	—	2SA836	TO-92
	—	2SA1390	35	0.5	0.3	—	2SA673	TO-92
	2SC3390	—	50	0.1	0.3	2SC458 (LG)	—	TO-92
	2SC3391	—	20	20m	0.2	2SC535	—	TO-92
	2SC3413	—	30	0.1	0.3	2SC458 (LG)	—	TO-92
	2SC3470	—	50	0.1	0.3	2SC1345	—	TO-92
	2SC3494	—	30	0.1	0.3	2SC460	—	TO-92
	2SC3553	—	35	0.5	0.3	2SC1213	—	TO-92
	2SD1504	—	15	0.5	0.3	—	—	—
MOS FET	2SK439	—	20	30m	0.3	2SK359	—	TO-92
	2SK494	—	22	0.1	0.3	2SK435	—	TO-92

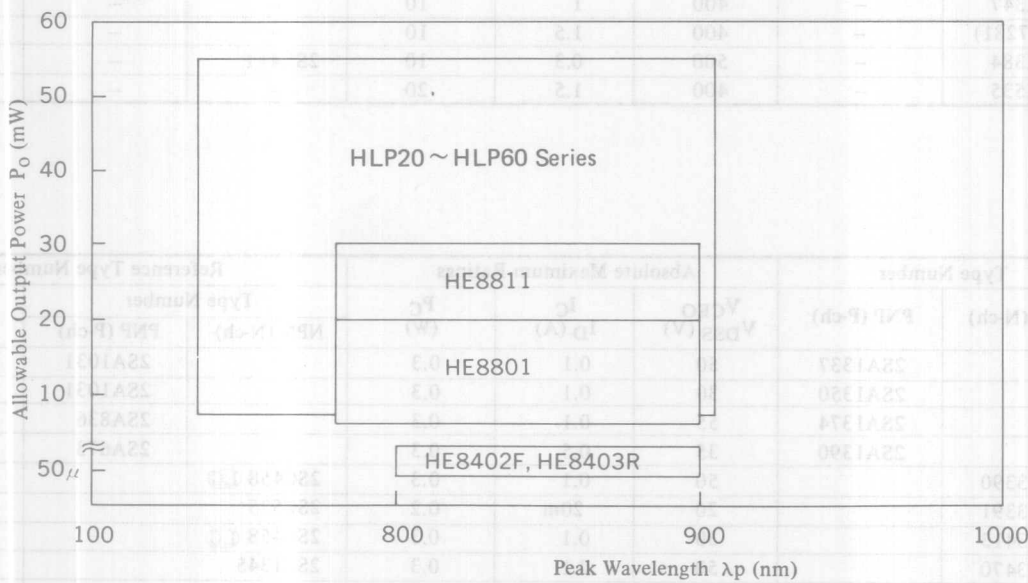
OPTOELECTRONIC DEVICES

SPAK Series

■ Laser Diodes



■ Infra-red Emitting Diodes



■ Photo Detectors

