

SEMICONDUCTOR PRODUCTS

SHORT FORM CATALOG



2024

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INTRODUCTION

JSC «INTEGRAL» develops, manufactures and exports microelectronic components and electronic products. «INTEGRAL» company provides a full cycle of design and manufacture: from silicon substrates up to integrated circuits and semiconductor devices, from microelectronic components up to electronic devices.

Total number of employees is more than 5 thousand persons.

The main line of activity of JSC «INTEGRAL» is design and manufacture of microelectronic components (integrated circuit, transistors, diodes) – about 90 % of the total production volume. JSC «INTEGRAL» exports more than 95 % of the volume of manufactured goods.

«INTEGRAL» company is open for long term cooperation with customers both in design, production and deliveries of products.

• BASIC TYPES OF INTEGRATED CIRCUITS MANUFACTURED:

- Microcontrollers, drivers, peripheral ICs,
- TV and audio ICs,
- Telecommunications ICs,
- Power electronics, standard analog ICs,
- Standard digital logic ICs,
- Special-purpose electronic component base,
- Clock/watch, calculator ICs,
- Melody synthesizer and electronic thermometer ICs,
- etc.

• BASIC TYPES OF SEMICONDUCTOR DEVICES MANUFACTURED:

- Bipolar transistors,
- Power bipolar Darlington transistors,
- Insulated gate bipolar transistors,
- Bipolar transistors with damping diode and resistor in the emitter-base circuit,
- Unijunction bipolar transistors,
- Low-power n- and p-channel MOSFETs,
- Power n- and p-channel MOSFETs,
- Microwave mixing diodes, rectifier diodes, Schottky diodes,
- Power high-speed diodes and diode matrices,
- Pulse diode matrices,
- Power rectifier and limiter diodes.

INTEGRATED CIRCUITS

INTEGRATED CIRCUITS

Drivers, Peripherals, Real Time Clock ICs

• Display Driver ICs

Part	Pin to Pin Compatibility	Supply Voltage, Ucc,V	LCD Voltage, V	Duty	RAM	Column Lines	Common Lines	Frequency, kHz	Pins (Pads)	Notes
LCD Controllers and Drivers										
IZ6570AA	NJU6570AA SED1520DAA	2.4...5.5	2.4...13	1/16 1/32	80x32	61	16	2	(100)	Chip
IZ6570OA	NJU6570OA SED1520DOA	2.4...5.5	2.4...13	1/16 1/32	80x32	61	16	18	(100)	Chip
IZ6450	NJU6450A	2.4...5.5	3.5...10	1/16 1/32	80x32	61	16	18	(100)	Chip
IZ6451	NJU6451A	2.4...5.5	3.5...10	1/16 1/32	80x32	72	8	18	(100)	Chip
IZ7065	KS0065	2.7...5.5	3...13	1/8 1/16		40		max400	(59)	Chip
IZ7066	KS0066	4.5...5.5	3...13	1/8 1/11 1/16	80x8	40	16	350	(80)	Chip
IZ602	FL602 HT1621	2.4...5.5	2.4...Ucc	1/2 1/3 1/4	32x4	32	4	256	(48)	Chip

• LED Driver Circuits

Part	Pin to Pin Compatibility	Function	Package
IL9910N IL9910D IL9910DH IZ9910	HV9910	Universal High Brightness LED Driver, 1A	DIP-8 SO-8 SO-16 Chip
IZ9921	HV9921	20mA/50mA/30mA Switch-Mode LED Driver IC	Chip
IZ9922	HV9922		
IZ9922A	-		
IZ9923	HV9923		
IZ7150 IZ7150A	AMC7150	Power LED Driver, 1,5 A Power LED Driver, 0,8 A	Chip
IL3361AD	HV9961	High-stable LED-driver IC; 8 V÷450 V supply voltage	SO-8
IL3361BD			SO-16
IZ3361			Chip
IL3367D	HV9967	High-voltage LED-driver IC with built-in MOSFET key, 8 V÷60 V input voltage	SO-8
IZ3367			Chip
IZ33120		120mA LED Driver IC with built-in MOSFET, 8 V÷450 V input voltage	Chip
IZ3302		Universal High Brightness LED Driver, 1A	Chip
IZR402U	BCR402	Constant current LED-driver; 42 V supply voltage; 18.6 V output voltage; LED-driver current: 22 mA up to 65 mA with external resistor	Chip
IZR402R		Constant current LED-driver; 60 V supply voltage; 38.6 V output voltage; LED-driver current: 22 mA up to 65 mA with external resistor	Chip

• **Interface Integrated Circuits** (Reference Date)

Parameter	IL75232N IL75232DW	ILX202N ILX202D	ILX207N ILX207DW	ILX208N ILX208D	ILX232N ILX232D	ILX485N ILX485D	ILX3221N	ILX3226N	ILX3232N ILX3232D	ILX3483N	ILX3485N	ILX3486N
ESD Voltage (kV)	0.5	2	2	2	2	4	4	4	4	4	4	4
Power Supply Voltage (V)	±9...±15 for TX 5 for RX	4.5...5.5	4.75...5.25	4.5...5.5	4.5...5.5	4.75...5.25	3...5.5	3...5.5	3...5.5	3...3.6	3...3.6	3...3.6
No. of TX/RX	3/5	2/2	5/3	4/4	2/2	1/1	1/1	1/1	2/2	1/1	1/1	1/1
No. of TX/RX on Bus						32						
Supply Current (mA)	30	10	20	20	10	0.9	0.001	0.001	1	0.001	0.001	0.001
Standard	RS-232	•	•	•	•	•	•	•	•	•	•	•
	RS-485/RS-422											
Auto Shutdown Plus, Auto Shutdown							•	•				
Date Rate (bps)		64K	120K	120K	120K	2.5M	250K	250K	120K	250K	12M	2.5M
External Caps (µF)		4x0.1	4x0.1	4x0.1	4x1.0		4x0.1	4x0.1	4x0.1	-	-	-
Operating Temperature Range (°C)	0 ÷ +75	-40 ÷ +85										

• **Real Time Clock**

Part	Pin to Pin Compatibility	Function	Package
Digital timers			
IN1307N IN1307D	DS1307N/ZN	64 x 8 Serial Real Time Clock	DIP-8 SO-8
IN1356D	M41T56	512bit (64bit x 8) Serial Access Timekeeper SRAM	SO-8
IN1363D	PCF8563	Real Time Clock / Calendar	SO-8

• **ICs for Audio Systems**

Part	Pin to Pin Compatibility	Function	Features	Package
IL34119N IL34119D	MC34119	0.25 W Low Power Mono Audio Amplifier	<ul style="list-style-type: none"> □ Vcc=2...16 V □ Low Quiescent Supply Current for Battery Powered Applications □ Chip Disable Input to Power Down the IC □ Drives a Wide Range of Speaker Loads (8-100 Ω) □ Output Power Exceed 250 mW with 32 Ω Speaker □ Gain Adjustable from 0 dB to 46 dB for Voice Band □ Requires Few External Components 	DIP-8 SO-8
IL386N IL386D	LM386	1 W Low Power Mono Audio Amplifier	<ul style="list-style-type: none"> □ Vcc=4...12 V □ Battery Operation □ Low Quiescent Current Drain: 4 mA □ Voltage Gains from 20 to 200 dB □ Ground Referenced Input □ Self-Centering Output Quiescent Voltage □ Low Distortion 	DIP-8 SO-8
ILA7056B	TDA7056B	5 W Mono BTL Audio Amplifier with DC Volume Control	<ul style="list-style-type: none"> □ Vcc=4.5...18 V □ DC volume control □ Few external components □ Mute mode □ Thermal protection □ Short-circuit proof □ No switch-on and of clicks □ Low HF radiation □ Low power consumption 	SIL-9MPF

• **Switches and DTMF Receivers**

Part	Pin to Pin Compatibility	Function	Features	Package
IL9170N IL9170DW	HM9170	DTMF Receiver	<ul style="list-style-type: none"> □ Vcc =2.5...5.5 V □ Icc max=9.0 mA □ Power consumption 15 mW □ Quartz generator 3.58 MHz □ Decoding of 16 DTMF tones-pairs □ 4-bit parallel output □ PWDN 	DIP-18 SO-18
IL567N IL567D	LM567	Tone Decoder	<ul style="list-style-type: none"> □ 20 to 1 frequency range with an external resistor □ Logic compatible output with 100 mA current sinking capability □ Bandwidth adjustable from 0 to 14% □ High rejection of out of band signals and noise □ Immunity to false signals □ Highly stable center frequency □ Center frequency adjustable from 0.01 Hz to 500 kHz 	DIP-8 SO-8
IL9200N IL9200D	HM9200	DTMF generators	<ul style="list-style-type: none"> □ Vcc =2.5...5.5 V □ Low standby current □ Low total distortion 3.58 MHz crystal or ceramic resonator 	DIP-8 SO-8

• **Pulse and Tone/Pulse Dialers**

Part	Pin to Pin Compatibility	Function	Features	Package
IL91531N	UM91531	Parallel Input Tone/Pulse Dialer	<ul style="list-style-type: none"> □ Vcc=2.5...5.5 V □ Quartz generator 3.58 MHz □ Output signal: pulse 10 Hz or DTMF □ 4-bit parallel data input from microcomputer □ Selectable Make/Break ratio □ Inter digital pause 800 ms 	DIP-16
IL91214AN IL91214AD	UMS91214A	Tone/Pulse Dialer with Handsfree Control and Flash Function	<ul style="list-style-type: none"> □ Vcc=2.0...5.5 V □ Quartz generator 3.58 MHz □ 32-digit redial memory □ Tone/Pulse switchable □ Output signal: pulse 10 Hz(20Hz) or DTMF □ Flash Function □ 4x4 keyboard □ 09 - mode output pin (IL91214BN/BDW) □ 10 – key in tone output (IL91214BN/BDW) 	DIP-16 SO-16

INTEGRATED CIRCUITS

Telecommunications ICs

• Single Chip Telephone IC

Part	Pin to Pin Compatibility	Function	Features	Package
IL2533N IL2533DW	AS2533	Multi-Standard CMOS Single Chip Telephone IC with Dual Soft Clipping	<ul style="list-style-type: none"> □ Line/speech circuit, LD/MF repertory dialer and tone ringer on one 28 pin CMOS chip □ Operating range from 13 to 100 mA (down to 5mA with reduced performance) □ Soft clipping to avoid harsh distortion □ Volume control of receive signal □ Line loss compensation selectable by pin option □ Low noise (max. - 72 dBmp) □ Real or complex impedance □ NET 4 compatible. □ LD/MF switchable dialing □ Pacifier tone during programming □ 31 digits last number redial □ Sliding cursor protocol with comparison □ Pause key for access pause or wait function □ 3 flash keys, 100 ms, 280 ms and 375/600 ms □ On chip MF filter (CEPT CS 203 compatible) □ Ring frequency discrimination □ 3-tone melody generator □ Oscillator Frequency (Resonator: Murata CSA 3.58MG312AM)-3.58 MHz □ 4x4...4x8 Keyboard 	DIP-28 SO-28

• Speaker ICs

Part	Pin to Pin Compatibility	Function	Features	Package
IL34118N IL34118DW	MC34118	Voice Switched Speakerphone Circuit	<ul style="list-style-type: none"> □ $V_{cc} = 3.0 \dots 6.5$ V □ $I_{cc} = 5.0$ mA □ Improved Attenuator Gain Range: 52 dB Between Transmit and Receive □ Low Voltage Operation for Line-Powered Applications (3.0-6.5 V) □ 4-Point Signal Sensing for Improved Sensitivity □ Background Noise Monitors for Both Transmit and Receive Paths □ Microphone Amplifier Gain Set by External Resistors – Mute Function Included □ Chip Disable for Active/Standby Operation □ On Board Filter Pinned-Out for User Defined Function □ Dial Tone Detector to Inhibit Receive Idle Mode During Dial Tone Presence □ Standard 28-Pin Plastic Dip Package and SOIC Package Available □ Compatible with IL34119 Speaker Amplifier 	DIP-28 SO-28
IL34119N IL34119D	MC34119	Telephone Audio Amplifier	<ul style="list-style-type: none"> □ $V_{cc} = 2.0 \dots 16.0$ V □ $I_{cc} = 2.7$ mA □ Drives a wide range of speaker loads (8...100 Ω) □ Output power exceeds 250 mW with 32 Ω Speaker □ Low total harmonic distortion □ Gain adjustable 0...46 dB for voice band □ Requires few external components 	DIP-8 SO-8

• **Speaker ICs** (continued)

Part	Pin to Pin Compatibility	Function	Features	Package
IL3726/18N IL3726/18DW	PBL3726/18	Speaker Integrated Circuit	<ul style="list-style-type: none"> □ $V_{LN}=3.3...4.1$ V ($I_L=15$ mA) □ $V_{LN}=11.0... 15.0$ V ($I_L=100$mA) □ 7 Capacitors & Resistors □ Low Voltage Operating □ DTMF signal input with confidence tone □ Mute input for DTMF dialing □ Line loss compensation (line current dependent) for microphone and earpiece amplifiers □ Gain control curve adaptable to exchange supply □ DC line voltage adjustment facility 	DIP-18 SO-20
ILA1062AN ILA1062AD ILA1062N ILA1062D	TEA1062A TEA1062	Low Voltage Transmission Circuit with Dialer Interface	<ul style="list-style-type: none"> □ Low DC line voltage; operates down to 1.6 V □ Line operation current range 10...140 mA □ $I_{cc} \leq 1.35$ mA □ Voltage gain range: <ul style="list-style-type: none"> microphone amplifier 11...52 dB telephone amplifier 20...31 dB □ Voltage regulator with adjustable static resistance □ Provides supply for external circuits □ Symmetrical high-impedance inputs <ul style="list-style-type: none"> (64 kΩ) for dynamic, magnetic or piezoelectric microphones □ Asymmetrical high-impedance inputs <ul style="list-style-type: none"> (32 kΩ) for electret microphones □ DTMF signal input with confidence tone □ Mute input for pulse or DTMF dialing □ Receiving amplifier for dynamic, magnetic or piezoelectric earpieces □ Large gain setting range on microphone and earpiece amplifiers 	DIP-16 SO-16 DIP-16 SO-16

• **Tone Telephone Ringers**

Part	Pin to Pin Compatibility	Function	Features	Package
IL2418N IL2418D	KA2418	Two-Tone Telephone Ringer with Diode Bridge	<ul style="list-style-type: none"> □ $V_{cc}=26$ V □ I_{cc} max=1.8 mA □ Activation voltage 12.2...13 V □ Sustaining voltage 8.0...8.8 V □ Internal Zener diodes to protect against over voltages □ High noise immunity due to built-in voltage-current hysteresis □ Ringer impedance adjustable with external components □ Output $F_1=2100...2550$ Hz $F_2=1500...1850$ Hz 	DIP-8 SO-8

INTEGRATED CIRCUITS

Telecommunications ICs

• IC for Smart Cards

Part	Pin to Pin Compatibility	Function	Features	Pads
IZ2815A-03	SLE4436E	IC for Prepaid Cards	<ul style="list-style-type: none"> □ Vcc=4.5...5.5 V □ Icc=5 mA □ 221-bit EEPROM and 16 bit mask-programmable ROM □ 104 bit user memory fully compatible with IZ4406: <ul style="list-style-type: none"> - 64 bit identification area - 40 bit counter area including 1 bit for personalization □ 133 bit additional memory for advanced features <ul style="list-style-type: none"> - 4 bit counter backup (anti-tearing flags) - 1 bit initiation flag for authentication key 2 - 16 bit data area 1 for free user access - 48 bit authentication key 1 - either 64 bit data area 1 for user defined data or 48 bit authentication key 2 □ EEPROM programming time 5 ms □ Endurance minimum of 100000 write/erase cycles per bit □ Data retention for minimum of 10 years □ Contact configuration and serial interface in accordance to ISO standard 7816-3 	5

• ICs for identification systems

Part	Pin to pin compatibility	Function	Features	Pads
IZ2803-5		Read / write transponder IC	<ul style="list-style-type: none"> □ For non-contact plastic card □ Operating frequency range: 100 ... 150 kHz □ ROM information capacity: 64 bit □ External inductor AC voltage value: 3min and 15 max □ Data retention with the power off: 5 years min 	4
IZ1990	DS1990A	1-Wire interface electronic key IC	<ul style="list-style-type: none"> □ Power supply: 2.8 – 6.0 V □ Unique 64 bite code 	2
IZ1991	DS1991	1-Wire interface and increased security level electronic key IC	<ul style="list-style-type: none"> □ Power supply: 2.8 – 6.0 V □ Unique 64 bite code □ 3 memory blocks, 384 bit each □ Scratch-pad memory: 512 bit 	2

• **ICs for Control and Power Electronics**

Part	Pin to Pin Compatibility	Function	Package
IL33035N IL33035DW	MC33035	Brushless DC Motor Controller	DIP-24 SO-24
IL33153PN	MC33153P	Single IGBT Gate Driver	DIP-8
IL33262N IL33262D	MC33262	Power Factor Controller ($T_A = -40 \dots +105^\circ\text{C}$)	DIP-8 SO-8
IL34262N IL34262D	MC34262	Power Factor Controller	DIP-8 SO-8
IL6562D	L6562		SO-8
IL6562N	L6562	Power Factor Controller	DIP-8
IL7101N/AN/BN IL7101D/AD/BD	GL7101	Earth Leakage Current Detector ($U_T = 4 \dots 9 \text{ mV}$ for AN) ($U_T = 9 \dots 18 \text{ mV}$ for N/D)	DIP-8 DIP-8 SO-8
IL4145AN	RV4145A	Low Power Ground Fault Interrupter	DIP-8
ILN2003BN	ULN2003B	High-Voltage High-Current Darlington Transistor Arrays	DIP-16 SO-16
ILN2004BN ILN2004BD	ULN2004B	High-Voltage High-Current Darlington Transistor Arrays	DIP-16 SO-16
ILN62083N ILN62083D	TD62083AFN	8CH Darlington Sink Driver	DIP-18 SO-18
ILN62084N ILN62084D	TD62084AFN		DIP-18 SO-18
ILN62783N ILN62783D	TD62783AFN		DIP-18 SO-18
ILN62784N ILN62784D	TD62784AFN		DIP-18 SO-18

• **High-Voltage Drivers ICs** (Reference Data)

Part	Topr (°C)	I _{OUT} (max) (mA)	V _{CE} (max) (V)	I _{IN} (max) (mA)	V _{IN} (max) (V)	V _F / V _R (max) (V/V)	Designation	Package
7CH High-Voltage Drivers								
ILN2003BN	- 20 ÷ +85	500	50	1.35	30	2/50	TTL, 5V CMOS	DIP-16 SO-16
ILN2004BN ILN2004BD	- 20 ÷ +85	500	50	1.35	30	2/50	6 ~ 15V PMOS, CMOS	DIP-16 SO-16
8CH High-Voltage Drivers								
ILN62083N ILN62083D	- 40 ÷ +85	500	50	1.35	30	2/50	TTL, 5V CMOS	DIP-18 SO-18
ILN62084N ILN62084D	- 40 ÷ +85	500	50	0.50	30	2/50	6 ~ 15V PMOS, CMOS	DIP-18 SO-18
ILN62783N ILN62783D	- 40 ÷ +85	-500	50	0.26	30	2/50	TTL, 5V CMOS	DIP-18 SO-18
ILN62784N ILN62784D	- 40 ÷ +85	-500	50	0.13	30	2/50	6 ~ 15V PMOS, CMOS	DIP-18 SO-18

INTEGRATED CIRCUITS

Power Electronics, Standard Analog IC

• Automotive ICs

Part	Pin to Pin Compatibility	Function	Package
IL33193N IL33193D	MC33193	Automotive Direction Indicator $R_S=20\text{ m}\Omega$, $F_n=2.2$, Duty Cycle (Normal Operation) 45÷55%, Duty Cycle (One 21 W Lamp Defect) 35÷45%, Defect Lamp Detector Threshold 42.5÷56 mV, $R_{SS}=220\ \Omega$	DIP-8 SO-8
IL33193N-03 IL33193D-03	UEA1041B	Automotive Direction Indicator $R_S=30\text{ m}\Omega$, $F_n=2.5$, Duty Cycle (Normal Operation) 45÷55%, Duty Cycle (One 21 W Lamp Defect) 35÷45%, Defect Lamp Detector Threshold 75÷95 mV, $R_{SS}=220\ \Omega$, Short Circuit Detector Threshold	DIP-8 SO-8
IL33197AN IL33197AD	MC33197A	Automotive Wash Wiper Timer Output Clamp Voltage ($I_{out}=20\text{ mA}$) 19.5÷22 V, Internally incorporated Zener diode 20 V	DIP-8 SO-8
IL6083N IL6083N-01	U6083B	Power Control With Interference Suppression (for N-01: Duty cycle 10... 100%, $V_{S1}=24.5...28.0\text{ V}$, $V_{S2}=18.5...22.0\text{ V}$, $V_{Batt1}=16.7...21.0\text{ V}$ (switched on), $V_{Batt1}=18.3...22.5\text{ V}$ (switched off), $V_{TS}=10.1...10.7\text{ V}$, $I_S=5...17\text{ mA}$)	DIP-8
IN9014N		For light control relay IC	DIP-8
IL8190N IL8190DW	CS8190ENF16 CS8190EDWF20	Precision Air-Core Tach/Speedo Driver with Return to Zero	DIP-16 SO-20
IL33290AD	MC33290	ISO K Line Serial Link Interface	SO-8
ILA82C251D	PCA82C251T	CAN transceiver for 24 V systems	SO-8
IN2515/AN/ADW/BN/BDW	MCP2515	CAN Controller	SO-18
IL33091AN IL33091AD	MC33091A	High-Side MOS Driver	DIP-8 SO-8
ILE4250GS	TLE4250G	Low-Drop Voltage Tracker (2÷36 V); 50 mA; Reverse Polarity Protection	P-TO-263-5-1 TO-220AB/5
ILE4260 ILE4260-2	TLE4260	Low-Drop Voltage Regulator 5 V; 500 mA; Reverse Polarity Protection	P-TO-220-5-12
ILE4264G IZE4264-2	TLE4264G TLE4264-2G	Low-Drop Voltage Regulator 5 V; 100 mA; Reverse Polarity Protection	P-SOT223-4-1 Chip
ILE4266G IZE4266-2	TLE4266G TLE4266-2G	Low-Drop Voltage Regulator 5 V; 100 mA; Reverse Polarity Protection	P-SOT223-4-2 Chip
ILE4267G ILE4267S	TLE4267G TLE4267S	Low-Drop Voltage Regulator 5 V; 400 mA; Reverse Polarity Protection	P-TO-220-7-180 P-TO-220-7-230
ILE4268GDW	TLE4268G	Low-Drop Voltage Regulator 5 V; 150 mA; Reverse Polarity Protection	P-DSO-20-6
ILE4270G ILE4270S ILE4270Q	TLE4270G TLE4270S	Low-Drop Voltage Regulator 5 V; 550 mA; Reverse Polarity Protection	P-TO-263-5-1 P-TO-220-5-12 P-TO-220-5-11
ILE4271G ILE4271S	TLE4271G TLE4271S	Low-Drop Voltage Regulator 5 V; 550 mA; Reverse Polarity Protection	P-TO-220-7-180 P-TO-220-7-230
ILE4274V50/V85/V10	TLE4274	Low-Drop Voltage Regulator 5 V/8.5 V/10 V; 400 mA; Reverse Polarity Protection	TO-220AB/3
ILE4275G/S	TLE4275G	Low-Drop Voltage regulator 5 V; 400 mA; Reverse Polarity Protection	P-TO-263-5-1 TO-220AB/5
ILE4276VG/VS/V50G/V50S/V85G/V85S/V10S	TLE4276	Low-Drop Voltage Regulator 5 V/8.5 V/10 V; 400 mA; Reverse Polarity Protection	P-TO-263-5-1 TO-220AB/5
IZE4278	TLE4278	Low-Drop Voltage Regulator 5 V; 150 mA; Reverse Polarity Protection	Chip
IZ4206	TLE4206G	1 A DC Motor Driver for Servo Driver Applications	Chip
IZE4263	TLE4263	LDO Regulator 5 V; 150 mA	Chip
IZE4279	TLE4279	LDO Regulator 5 V; 150 mA	Chip

• Timers

Part	Pin to Pin Compatibility	Function	Package
Digital timers			
IN555N IN555D	NE555	Timer	DIP-8 SO-8
ILC555N ILC555D	GLC555	Timer	DIP-8 SO-8
IN556N IN556D	NE556	Dual Timer	DIP-14 SO-14
ILC556N	GLC556	Dual Timer	DIP-14
IN558N	NE558	Quad Timer	DIP-16
ILC558N	GLC558	Quad Timer	DIP-16

• Comparators

Part	Pin to Pin Compatibility	Function	Package
IL311AN IL311AD IL311ANM	LM311, LM211	Highly Flexible Voltage Comparators ($T_A = -45...+85^{\circ}\text{C}$)	DIP-8 SO-8 DIP-14
IL339N IL339D	LM339	Quad Comparator	DIP-14 SO-14
IL293N IL293D	LM293	Dual Comparator ($T_A = -40...+85^{\circ}\text{C}$)	DIP-8 SO-8
IL393N IL393D	LM393	Dual Comparator	DIP-8 SO-8

• μP Supervisory Circuits

Part	Pin to Pin Compatibility	Function	Package
IN1232N IN1232D	DS1232	Micro Monitor	DIP-8 SO-8
IN1705N IN1705D IN1705RN IN1705RD	DS1705	Micro Monitor (RN, RD – Push-Pull Reset Output)	DIP-8 SO-8 DIP-8 SO-8
IN1706N IN1706D IN1706SRN IN1706SRD	DS1706S	Micro Monitor (SRN, SRD - Push-Pull Reset Output)	DIP-8 SO-8 DIP-8 SO-8
IN1708N IN1708D	DS1708	Micro Monitor	DIP-8 SO-8
IL809/810LW IL809/810MW IL809/810TW IL809/810SW IL809/810RW	STM809/810LW STM809/810MW STM809/810TW STM809/810SW STM809/810RW	Reset Circuit	SOT-23-3

INTEGRATED CIRCUITS

Power Electronics, Standard Analog IC

• Operational Amplifiers

Part	Pin to Pin Compatibility	Function	Package
IL258N IL258D	LM258	Dual Operational Amplifier ($T_A = -40 \div +85^\circ\text{C}$)	DIP-8 SO-8
IL358N IL358D	LM358	Dual Operational Amplifier	DIP-8 SO-8
IL224N IL224D	LM224	Quad Operational Amplifier ($T_A = -40 \div +85^\circ\text{C}$)	DIP-14 SO-14
IL324N IL324D	LM324	Quad Operational Amplifier	DIP-14 SO-14
IL1776CN, CAN IL1776CD, CAD	MC1776C	Micropower Programmable Operational Amplifier (CAN, CAD $T_A = -40 \div +85^\circ\text{C}$)	DIP-8 SO-8
IL4558N IL4558D	GL4558	Dual Operational Amplifier	DIP-8 SO-8
IZ4560	NJM4560	Dual Operational Amplifier ($T_A = -25 \div +75^\circ\text{C}$)	Chip
IZ4580	NJM4580	Dual Operational Amplifier ($T_A = -40 \div +85^\circ\text{C}$)	Chip
IL8541D	AD8541	Micropower CMOS operational amplifier	Chip SO-8
IL8515D	AD8515	Low power operational amplifier	Chip SO-8
IL8615D	AD8615	Rail to Rail wide bandwidth operational amplifier	Chip SO-8

INTEGRATED CIRCUITS

Power Electronics, Standard Analog IC

• Voltage Regulators

Part	Pin to Pin Compatibility	Output Voltage, V	Output Current, A	Output Voltage Tolerance, %	Tested Operating Junction Temp. Range, °C	Package
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Positive Voltage Regulators

IL78XXAC IL78XXC IL78XXB	78XXAC 78XXC 78XXB	5; 6; 8; 9; 10; 12; 15; 18; 20; 24	1.0	2 4 4	T _j = -10...+125 T _j = -10...+125 T _j = -45...+125	TO-220
IL78FXX	78FXX	5; 6; 8; 9;10;12;15;18; 24	1.0	4	T _j = -10...+125	TO-126
IL78MXX	78MXX	5; 6; 8; 9; 12; 15; 18; 24	0,5	2 4	T _j = -10...+125	TO-126
IL78LXXAC IL78LXXC	78LXXAC 78LXXC	3.3; 5; 6; 8; 9; 12; 15; 18; 24	0.1	5 10	T _j = -10...+125	TO-92

Negative Regulators

IL79XXAC IL79XXC IL79XXB	79XXAC 79XXC 79XXB	5; 6; 8; 9; 12; 15; 18; 20; 24	1.0	2 4 4	T _j = -10...+125 T _j = -10...+125 T _j = -45...+125	TO-220
IL79LXXAC IL79LXXC	79LXXAC 79LXXC	5; 6; 8; 9; 12; 15; 18; 24	0.1	5 10	T _j = -10...+125	TO-92

Low Dropout Voltage Regulators

ILE4250G	TLE4250G	2 ÷ 36	0.05	0.5	T _j = -40...+150	P-TO-263-5-1 TO-220AB/5
ILE4260 ILE4260-2	TLE4260S	5	0.5	5 2	T _j = -40...+125	P-TO-220-5-12
ILE4264G	TLE4264G	5	0.10	2	T _j = -40...+125	P-SOT223-4-1
IZE4264-2	TLE4264-2G	5	0.10	3	T _j = -40...+125	Chip
ILE4266G	TLE4266G	5	0.10	2	T _j = -40...+125	P-SOT223-4-2
IZE4266-2	TLE4266-2G	5	0.10	3	T _j = -40...+125	Chip
ILE4267G ILE4267S	TLE4267G TLE4267S	5	0.4	2	T _j = -40...+125	P-TO-220-7-180 P-TO-220-7-230
ILE4268GDW	TLE4268G	5	0.15	2	T _j = -40...+125	SO-20
ILE4270G ILE4270S ILE4270Q	TLE4270G TLE4270S	5	0.55	2	T _j = -40...+125	P-TO-263-5-1 P-TO-220-5-12 P-TO-220-5-11
ILE4270 (without "RESET")		5	0.55	2	T _j = -40...+125	TO-220AB/3
ILE4271G ILE4271S	TLE4271G TLE4271S	5	0.55	2	T _j = -40...+125	P-TO-220-7-180 P-TO-220-7-230
ILE4274	TLE4274	5; 8.5; 10	0.4	4	T _j = -40...+150	TO-220AB/3
ILE4275G/S	TLE4275G	5	0.4	2	T _j = -40...+150	P-TO-263-5-1
ILE4276V	TLE4276	5; 8.5; 10	0.4	4	T _j = -40...+150	TO-220AB/5
IZE4278	TLE4278	5	0.15	2	T _j = -40...+150	Chip
IZ1734-33	SSAIC1734-33	3.3	0.3	2	T _j = -40...+125	Chip
IZ1734-50	SSAIC1734-50	5	0.3	2		
IZ1735-33	SSAIC1735-33	3.3	0.5	2		
IZ1735-50	SSAIC1735-50	5	0.5	2		

INTEGRATED CIRCUITS

Power Electronics, Standard Analog IC

• Voltage Regulators (continued)

Low Dropout Voltage Regulators

Part	Pin to Pin Compatibility	Output Voltage, V	Output Current, A	Output Voltage Tolerance, %	Tested Operating Junction Temp. Range, °C	Package
IL1117A	AMS1117A	1.2; 1.25; Adj; 1.5; 1.8; 2.5; 2.85; 3.3; 5	1.0	1.5	T _j = -40...+125	TO-220 TO-126
IL3480	LM3480	3.3; 5.0	0.1	4	T _j = -10...+125	TO-92
IL1084	LT1084	1.25; 1.5; 1.8; 2.5; 2.85; 3.3; 3.6; 5.0	5.0	1.5	T _j = -10...+125	TO-220
IL1085	LT1085	1.25; 1.5; 1.8; 2.5; 2.85; 3.3; 3.6; 5.0	3.0	1.5	T _j = -10...+125	TO-220

Adjustable Voltage Regulators

Part	Pin to Pin Compatibility	Function	Package
IL317	LM317T	Adjustable Output Positive Voltage Regulator 1.5 A; (1.2...37 V) T _j =-40...+125°C	TO-220AB/3
IL317L	LM317L	Adjustable Output Positive Voltage Regulator 0.1 A; (1.2...37 V) T _j =-40...+125°C	TO-92
IL2931CD	LM2931C	Adjustable Dropout Voltage Regulator 0.1 A; (3...24 V) T _j = -40...+125°C	SO-8

Switching Regulators

Part	Pin to Pin Compatibility	Function	Package
IL2576 – 3.3 IL2576 – 5 IL2576 – 12 IL2576 – 15 IL2576 – ADJ	LM2576 – 3.3 LM2576 – 5 LM2576 – 12 LM2576 – 15 LM2576 – ADJ	3A, 40V, 50 kHz Step-Down Switching Regulator	TO-220 AB/5
IL2576HV – 3.3 IL2576HV – 5 IL2576HV – 12 IL2576HV – 15 IL2576HV – ADJ	LM2576HV – 3.3 LM2576HV – 5 LM2576HV – 12 LM2576HV – 15 LM2576HV – ADJ	3A, 60V, 50 kHz Step-Down Switching Regulator	TO-220 AB/5
IL5256 – 3.3 IL5256 – 5 IL5256 – 12 IL5256 – ADJ	LM2596 – 3.3 LM2596 – 5 LM2596 – 12 LM2596 – ADJ	3A, 40V, 150 kHz Step-Down Voltage Regulator	TO-220 AB/5
IL34063AN IL34063AD	MC34063A	Step-Up /Down/inverting Switching Regulator (I _{sw} ≤1.5A)	Dip-8 SO-8

INTEGRATED CIRCUITS

Power Electronics, Standard Analog IC

• Precision Low Voltage Reference

Part	Pin to Pin Compatibility	Function	Features	Package
IL431	TL431	Programmable precision references. This monolithic IC voltage references operate as a low temperature coefficient Zener. The characteristics of these references make them excellent replacements for zener diodes in many applications such as digital voltmeters, power supplies, and operation amplifier circuits.	□ Vref = 2.5...37 V □ I _k max=100 mA □ Shunt Reference Dynamic Impedance $Z \leq 0.5 \Omega$ □ Tolerance 0.5%; 1%; 2%	TO-92 SOT-23 SO-8
IL432	TL432		□ Vref= 1.24...16V □ I _k max = 100 mA □ Shunt Reference Dynamic Impedance $Z \leq 0.5 \Omega$ □ Tolerance 0.5%; 1%	TO-92

• PWM Controllers

Part	Pin to Pin Compatibility	Function	Package
IL494N	TL494IN	Pulse-Width-Modulation Control Circuit	DIP-16
IL6083N IL6083N-01	U6083B	Power Control With Interference Suppression (for IL6083N N-01: Duty cycle 10... 100%, V _{S1} =24.5...28.0 V, V _{S2} =18.5...22.0 V, V _{Batt1} =16.7...21.0 V (switched on), V _{batt1} =18.3...22.5 V (switched off), V _{TS} =10.1...10.7 V, I _s =5...17 mA)	DIP-8

• Voltage Detectors

Part	Pin to Pin Compatibility	Function	Package
IL70XX	KIA70XX	Voltage Detector U _{cc} max= 15 V; I _{oL} max<16 mA; U _s = 2.1/2.3/2.5/2.9/ 3.3/ 3.6/3.7/ 3.9/ 4.2/ 4.5 V	TO-92

• Power Supply ICs

Part	Pin to Pin Compatibility	Function	Package
IL1051	TSM1051	Constant Voltage and Constant Current Controller For Adaptors and Battery Chargers	DIP-8 Chip
IL7660	ICL7660	CMOS Voltage Converter	DIP-8, SO – 8, Chip

INTEGRATED CIRCUITS

Standard Digital Logic ICs

• IN74AC/ACTXXXN, D Series

Part	Pin to Pin Compatibility	Function	Package
IN74AC/ACT00N,D	MC74AC/ACT00N,D	Quad 2-Input NAND Gate	DIP-14, SO-14
IN74AC/ACT02N,D	MC74AC/ACT02N,D	Quad 2-Input NOR Gate	DIP-14, SO-14
IN74AC/ACT04N,D	MC74AC/ACT04N,D	Hex Inverter	DIP-14, SO-14
IN74AC/ACT05N,D	CD74AC/ACT05N,D	Hex Inverter, OC	DIP-14, SO-14
IN74AC/ACT08N,D	MC74AC/ACT08N,D	Quad 2-Input AND Gate	DIP-14, SO-14
IN74AC/ACT10N,D	MC74AC/ACT10N,D	Triple 3-Input Positive-NAND Gate	DIP-14, SO-14
IN74AC/ACT11N,D	MC74AC/ACT11N,D	Triple 3-Input AND Gate	DIP-14, SO-14
IN74AC/ACT14N,D	MC74AC/ACT14N,D	Hex Schmitt-Trigger Inverter	DIP-14, SO-14
IN74AC/ACT20N,D	CD74AC/ACT20N,D	Dual 4-Input NAND Gate	DIP-14, SO-14
IN74AC/ACT21N,D	Own	Dual 4-Input AND Gate	DIP-14, SO-14
IN74AC/ACT27N,D	Own	Triple 3-Input NOR Gate	DIP-14, SO-14
IN74AC/ACT32N,D	MC74A/ACTC32N,D	Quad 2-Input OR Gate	DIP-14, SO-14
IN74AC/ACT34N,D	own	Hex Non-Inverter	DIP-14, SO-14
IN74AC/ACT74N,D	MC74AC/ACT74N,D	Dual D-Type Flip-Flop	DIP-14, SO-14
IN74AC/ACT86N,D	MC74AC/ACT86N,D	Quad 2-Input Exclusive-OR Gate	DIP-14, SO-14
IN74AC/ACT109N,D	MC74AC/ACT109N,D	Dual J-K Positive-Edge-Triggered Flip-Flop	DIP-16, SO-16
IN74AC/ACT112N,D	CD74AC/ACT112N,D	Dual J-K Negative-Edge-Triggered Flip-Flop	DIP-16, SO-16
IN74AC/ACT125N,D	T74AC/ACT125N,D	Quad 3-State Buffer	DIP-14, SO-14
IN74AC/ACT132N,D	MC74AC/ACT132N,D	Quad 2-Input NAND Schmitt-Trigger Inverter	DIP-14, SO-14
IN74AC/ACT138N,D	MC74AC/ACT138N,D	3-8 Decoder/Demultiplexer	DIP-16, SO-16
IN74AC/ACT139N,D	MC74AC/ACT139N,D	Dual 2-4 Decoder/Demultiplexer	DIP-16, SO-16
IN74AC/ACT151N,D	MC74AC/ACT151N,D	8-1 Data Selector/Multiplexer	DIP-16, SO-16
IN74AC/ACT153N,D	MC74AC/ACT153N,D	Dual 4-1 Data Selector/Multiplexer	DIP-16, SO-16
IN74AC/ACT157N,D	MC74AC/ACT157N,D	Quad 2-1 Data Selector/Multiplexer	DIP-16, SO-16
IN74AC/ACT158N,D	MC74AC/ACT158N,D	Quad 2-1 Data Selector/Multiplexer, INV	DIP-16, SO-16
IN74AC/ACT161N,D	MC74AC/ACT161N,D	4-Bit Synchronous Binary Counter, Asynchronous Reset	DIP-16, SO-16
IN74AC/ACT163N,D	MC74AC/ACT163N,D	4-Bit Synchronous Binary Counter, Synchronous Reset	DIP-16, SO-16
IN74AC/ACT164N,D	CD74AC/ACT164N,D	8-Bit Serial-In Parallel-Out Shift Register	DIP-14, SO-14
IN74AC/ACT174N,D	MC74AC/ACT174N,D	Hex D-Type Flip-Flop	DIP-16, SO-16
IN74AC/ACT175N,D	MC74AC/ACT175N,D	Quad D-Type Flip-Flop	DIP-16, SO-16
IN74AC/ACT192N,D	MC74AC/ACT192N,D	Synchronous Decade Up/Down Counter	DIP-16, SO-16
IN74AC/ACT193N,D	CD74AC/ACT193N,D	4-Bit Synchronous Binary Up/Down Counter	DIP-16, SO-16
IN74AC/ACT240N,D	MC74AC/ACT240N,D	Octal Buffer/Line Driver, INV (3-State)	DIP-20, SO-20
IN74AC/ACT241N,D	MC74AC/ACT241N,D	Octal Buffer/Line Driver, NINV (3-State)	DIP-20, SO-20
IN74AC/ACT244N,D	MC74AC/ACT244N,D	Octal Buffer/Line Driver NINV (3-State)	DIP-20, SO-20
IN74AC/ACT245N,D	MC74AC/ACT245N,D	Octal Bus Transceiver, NINV (3-State)	DIP-20, SO-20
IN74AC/ACT251N,D	MC74AC/ACT251N,D	8-1 Data Selector/Multiplexer (3-State)	DIP-16, SO-16
IN74AC/ACT253N,D	MC74AC/ACT253N,D	Dual 4-1 Data Selector/Multiplexer, NINV (3-State)	DIP-16, SO-16
IN74AC/ACT257N,D	MC74AC/ACT257N,D	Quad 2-1 Data Selector/Multiplexer, NINV (3-State)	DIP-16, SO-16
IN74AC/ACT258N,D	MC74AC/ACT258N,D	Quad 2-1 Data Selector/Multiplexer, INV (3-State)	DIP-16, SO-16
IN74AC/ACT273N,D	MC74AC/ACT273N,D	Octal D-Type Flip-Flop	DIP-20, SO-20
IN74AC/ACT299N,D	MC74AC/ACT299N,D	8-Bit Universal Shift/Storage Register (3-State)	DIP-20, SO-20
IN74AC/ACT323N,D	CD74AC/ACT323N,D	8-Bit Universal Shift/Storage Register (3-State)	DIP-20, SO-20
IN74AC/ACT373N,D	MC74AC/ACT373N,D	Octal D-Type Latch (3-State)	DIP-20, SO-20
IN74AC/ACT374N,D	MC74AC/ACT374N,D	Octal D-Type Flip-Flop (3-State)	DIP-20, SO-20
IN74AC/ACT533N,D	MC74AC/ACT533N,D	Octal D-Type Latch, INV (3-State)	DIP-20, SO-20
IN74AC/ACT534N,D	MC74AC/ACT534N,D	Octal D-Type Flip-Flop, NINV (3-State)	DIP-20, SO-20
IN74AC/ACT563N,D	MC74AC/ACT563N,D	Octal D-Type Transparent Latch	DIP-20, SO-20
IN74AC/ACT564N,D	MC74AC/ACT564N,D	Octal Edge-Triggered Flip-Flop	DIP-20, SO-20
IN74AC/ACT573N,D	MC74AC/ACT573N,D	Octal Transparent Latch (3-State)	DIP-20, SO-20
IN74AC/ACT574N,D	MC74AC/ACT574N,D	Octal D-Type Flip-Flop, NINV (3-State)	DIP-20, SO-20
IN74AC/ACT620N,D	MC74AC/ACT620N,D	Octal Bidirectional Bus Transceiver, INV	DIP-20, SO-20
IN74AC/ACT623N,D	MC74AC/ACT623N,D	Octal Bidirectional Bus Transceiver, NINV	DIP-20, SO-20
IN74AC/ACT640N,D	MC74AC/ACT640N,D	Octal Bus Transceiver (3-State)	DIP-20, SO-20

• IN74AC/ACTXXXN, D Series (continued)

Part	Pin to Pin Compatibility	Function	Package
IN74AC/ACT643N,D	MC74AC/ACT643N,D	Octal Bus Transceiver (3-State)	DIP-20, SO-20
IN74AC/ACT651N,D	CD74AC/ACT651N,D	Octal Bus Transceiver/Register, INV (3-State)	DIP-24, SO-24
IN74AC/ACT652N,D	Own	Octal Bus Transceiver/Register, NINV (3-State)	DIP-24, SO-24
IN74AC/ACT810N,D	MC74AC/ACT810N,D	Quad Exclusive-NOR Gate	DIP-14, SO-14
IN74AC/ACT4006N,D	own	18-Bit Static Shift Register	DIP-14, SO-14
IN74AC/ACT4015N,D	own	Dual 4-Bit Static Shift Register	DIP-16, SO-16
IN74AC/ACT4035N,D	own	4-Bit Parallel-In/Parallel-Out Shift Register	DIP-16, SO-16
IN74AC/ACT4520N,D	own	Dual 4-Bit Synchronous Binary Counter	DIP-16, SO-16

• IN74HC/HCTXXXAN, AD Series

Part	Pin to Pin Compatibility	Function	Package
IN74HC/HCT00AN,AD	MC74HC/HCT00AN,AD	Quad 2-Input NAND Gate	DIP-14, SO-14
IN74HC/HCT02AN,AD	MC74HC/HCT02AN,AD	Quad 2-Input NOR Gate	DIP-14, SO-14
IN74HC03AN,AD	MC74HC03AN,AD	Quad 2-Input NAND Gate, OC	DIP-14, SO-14
IN74HC/HCT04AN,AD	MC74HC/HCT04AN,AD	Hex Inverter	DIP-14, SO-14
IN74HC05AN,AD	SN74HC05AN,AD	Hex Inverter, OC	DIP-14, SO-14
IN74HC/HCT08AN,AD	MC74HC/HCT08AN,AD	Quad 2-Input AND Gate	DIP-14, SO-14
IN74HC/HCT10AN,AD	MC74HC/HCT10AN,AD	Triple 3-Input NAND Gate	DIP-14, SO-14
IN74HC11AN,AD	MC74HC11AN,AD	Triple 3-Input AND Gate	DIP-14, SO-14
IN74HC/HCT14AN,AD	MC74HC/HCT14AN,AD	Hex Schmitt-Trigger Inverter	DIP-14, SO-14
IN74HC/HCT20AN,AD	MC74HC/HCT20AN,AD	Dual 4-Input NAND Gate	DIP-14, SO-14
IN74HC21AN,AD	MC74HC21AN,AD	Dual 4-Input Positive-AND Gate	DIP-14, SO-14
IN74HC22AN,AD	MC74HC22AN,AD	Dual 4-Input Positive-NAND Gate, OC	DIP-14, SO-14
IN74HC/HCT27AN,AD	MC74HC/HCT27AN,AD	Triple 3-Input Positive-NOR Gate	DIP-14, SO-14
IN74HC/HCT30AN,AD	MC74HC/HCT30AN,AD	8-Input Positive-NAND Gate	DIP-14, SO-14
IN74HC/HCT32AN,AD	MC74HC/HCT32AN,AD	Quad 2-Input OR Gate	DIP-14, SO-14
IN74HC/HCT74AN,AD	MC74HC/HCT74AN,AD	Dual D-Type Flip-Flop	DIP-14, SO-14
IN74HC75AN,AD	MC74HC75AN,AD	Quad Bistable Latch	DIP-16, SO-16
IN74HC/HCT85AN,AD	MC74HC/HCT85AN,AD	4-Bit Magnitude Comparator	DIP-16, SO-16
IN74HC/HCT86AN,AD	MC74HC/HCT86AN,AD	Quad 2-Input Exclusive-OR Gate	DIP-14, SO-14
IN74HC109AN,AD	MC74HC109AN,AD	Dual J-K Positive-Edge-Triggered Flip-Flop	DIP-16, SO-16
IN74HC112AN,AD	MC74HC112AN,AD	Dual J-K Negative-Edge-Triggered Flip-Flop	DIP-16, SO-16
IN74HC123AN,AD	MC74HC123AN,AD	Dual Monostable Multivibrator with Reset	DIP-16, SO-16
IN74HC/HCT125AN,AD	MC74HC/HCT125AN,AD	Quad 3-State Buffer	DIP-14, SO-14
IN74HCT126AN,AD	MC74HCT126AN,AD	Quad 3-State Buffer	DIP-14, SO-14
IN74HC/HCT132AN,AD	MC74HC/HCT132AN,AD	Quad 2-Input NAND Schmitt-Trigger Inverter	DIP-14, SO-14
IN74HC/HCT138AN,AD	MC74HC/HCT138AN,AD	3-8 Decoder/Demultiplexer	DIP-16, SO-16
IN74HC/HCT139AN,AD	MC74HC/HCT139AN,AD	Dual 2-4 Decoder/Demultiplexer	DIP-16, SO-16
IN74HC/HCT151AN,AD	MC74HC/HCT151AN,AD	8-1 Data Selector/Multiplexer	DIP-16, SO-16
IN74HC/HCT153AN,AD	MC74HC/HCT153AN,AD	Dual 4-1 Data Selector/Multiplexer	DIP-16, SO-16
IN74HC154AN,AD	MC74HC154AN,AD	4-16 Decoder/Demultiplexer (3-State)	DIP-24, SO-24
IN74HC/HCT155AN,AD	MM74HC/HCT155AN,AD	Dual 2-4 Decoder/Demultiplexer	DIP-16, SO-16
IN74HC/HCT157AN,AD	MC74HC/HCT157AN,AD	Quad 2-1 Data Selector/Multiplexer	DIP-16, SO-16
IN74HC158AN,AD	MC74HC158AN,AD	Quad 2-1 Data Selector/Multiplexer, INV	DIP-16, SO-16
IN74HC161AN,AD	MC74HC161AN,AD	4-Bit Synchronous Binary Counter, Asynchronous Reset	DIP-16, SO-16
IN74HC/HCT163AN,AD	MC74HC/HCT163AN,AD	4-Bit Synchronous Binary Counter, Synchronous Reset	DIP-16, SO-16
IN74HC/HCT164AN,AD	MC74HC/HCT164AN,AD	8-Bit Serial-In Parallel-Out Shift Register	DIP-14, SO-14
IN74HC/HCT165AN,AD	MC74HC/HCT165AN,AD	8-Bit Parallel-in Serial-Out Shift Register	DIP-16, SO-16
IN74HC166AN,AD	CD74HC166AN,AD	8-Bit Parallel-in Serial-Out Shift Register	DIP-16, SO-16
IN74HC/HCT174AN,AD	MC74HC/HCT174AN,AD	Hex D-Type Flip-Flop	DIP-16, SO-16

INTEGRATED CIRCUITS

Standard Digital Logic ICs

IN74HC175AN,AD	MC74HC175AN,AD	Quad D-Type Flip-Flop	DIP-16, SO-16
IN74HC192AN,AD	CD74HC192AN,AD	Synchronous Decade Up/Down Counter	DIP-16, SO-16
IN74HC193AN,AD	CD74HC193AN,AD	4-Bit Synchronous Binary Up/Down Counter	DIP-16, SO-16
IN74HC221AN,AD	CD74HC221AN,AD	Dual Monostable Multivibrator with Reset	DIP-16, SO-16
IN74HC/HCT240AN,AD W	MC74HC/HCT240AN,AD W	Octal Buffer/Line Driver, INV (3-State)	DIP-20, SO-20
IN74HC/HCT241AN,AD W	MC74HC/HCT241AN,AD W	Octal Buffer/Line Driver, NINV (3-State)	DIP-20, SO-20
IN74HC/HCT244AN,AD W	MC74HC/HCT244AN,AD W	Octal Buffer/Line Driver NINV (3-State)	DIP-20, SO-20
IN74HC/HCT245AN,AD W	MC74HC/HCT245AN,AD W	Octal Bus Transceiver, NINV (3-State)	DIP-20, SO-20
IN74HC/HCT251AN,AD	MC74HC/HCT251AN,AD	8-I Data Selector/Multiplexer (3-State)	DIP-16, SO-16
IN74HC253AN,AD	MC74HC253AN,AD	Dual 4-1 Data Selector/Multiplexer, NINV (3-State)	DIP-16, SO-16
IN74HC257AN,AD	MC74HC257AN,AD	Quad 2-1 Data Selector/Multiplexer, NINV (3-State)	DIP-16, SO-16
IN74HC258AN,AD	CD74HC258AN,AD	Quad 2-1 Data Selector/Multiplexer, INV (3-State)	DIP-16, SO-16
IN74HC/HCT273AN,AD W	MC74HC/HCT273AN,AD W	Octal D-Type Flip-Flop	DIP-20, SO-20
IN74HC279AN,AD	MC74HC279AN,AD	Quad Set/Reset Latch	DIP-16, SO-16
IN74HC/HCT283AN,AD	CD74HC/HCT283AN,AD	4-Bit Full Adder	DIP-16, SO-16
IN74HC/HCT299AN,AD W	MC74HC/HCT299AN,AD W	8-Bit Universal Shift/Storage Register (3-State)	DIP-20, SO-20
IN74HC/HCT323AN,AD W	MC74HC/HCT323AN,AD W	8-Bit Universal Shift/Storage Register (3-State)	DIP-20, SO-20
IN74HC365AN,AD	MC74HC365AN,AD	Hex Buffer/Line Driver (3-State)	DIP-16, SO-16
IN74HC367AN,AD	MC74HC367AN,AD	Hex Buffer/Line Driver (3-State)	DIP-16, SO-16
IN74HC/HCT373AN,AD W	MC74HC/HCT373AN,AD W	Octal D-Type Latch (3-State)	DIP-20, SO-20
IN74HC/HCT374AN,AD W	MC74HC/HCT374AN,AD W	Octal D-Type Flip-Flop (3-State)	DIP-20, SO-20
IN74HC393AN,AD	MC74HC393AN,AD	Dual 4-Bit Binary Counter	DIP-14, SO-14
IN74HC533AN,ADW	MC74HC533AN,AD	Octal D-Type Latch, INV (3-State)	DIP-20, SO-20
IN74HC534AN,ADW	MC74HC534AN,AD	Octal D-Type Flip-Flop, NINV (3-State)	DIP-20, SO-20
IN74HC/HCT573AN,AD W	MC74HC/HCT573AN,AD W	Octal Transparent Latch (3-State)	DIP-20, SO-20
IN74HC/HCT574AN,AD W	MC74HC/HCT574AN,AD W	Octal D-Type Flip-Flop, NINV (3-State)	DIP-20, SO-20
IN74HC595AN,AD	MC74HC595AN,AD	8-Bit Shift Register with Output Latch	DIP-16, SO-16
IN74HC597AN,AD	MC74HC597AN,AD	8-Bit Shift Register with Input Latch	DIP-16, SO-16
IN74HC/HCT620AN,AD W	SN74HC/HCT620AN,AD W	Octal Bidirectional Bus Transceiver, INV	DIP-20, SO-20
IN74HC/HCT623AN,AD W	SN74HC/HCT623AN,AD W	Octal Bidirectional Bus Transceiver, NINV	DIP-20, SO-20
IN74HC/HCT640AN,AD W	MC74HC/HCT640AN,AD W	Octal Bus Transceiver (3-State)	DIP-20, SO-20
IN74HC651AN,ADW	CD74HC651AN,AD	Octal Bus Transceiver/Register (3-State)	DIP-24, SO-24
IN74HC652AN,ADW	CD74HC652AN,AD	Octal Bus Transceiver/Register, NINV (3-State)	DIP-24, SO-24
IN74HC/HCT874AN,AD W	own	Dual 4-Bit D-Type Flip Flop	DIP-24, SO-24
IN74HC4015AN,AD	MC74HC4015AN,AD	Dual 4-Bit Static Shift Register	DIP-16, SO-16
IN74HC4046AN,AD	MC74HC4046AN,AD	Phase-Locked Loop	DIP-16, SO-16
IN74HC4051AN,AD	MC74HC4051AN,AD	8-Channel Analog Multiplexer/Demultiplexer	DIP-16, SO-16
IN74HC4052AN,AD	MC74HC4052AN,AD	Dual 4-Channel Analog Multiplexer/Demultiplexer	DIP-16, SO-16
IN74HC4053AN,AD	MC74HC4053AN,AD	Triple 2-Channel Analog Multiplexer/Demultiplexer	DIP-16, SO-16
IN74HC4094AN,AD	CD74HC4094AN,AD	8-Bit Shift and Bus Register	DIP-16, SO-16

• IN74LVXXN, D Series

Part	Pin to Pin Compatibility	Function	Package
IN74LV00N,D	74LV00N,D	Quad 2-Input NAND Gate	DIP-14, SO-14
IN74LV02N,D	74LV02N,D	Quad 2-Input NOR Gate	DIP-14, SO-14
IN74LV04N,D	74LV04N,D	Hex Inverter	DIP-14, SO-14
IN74LVU04N,D	74LVU04N,D	Hex Inverter	DIP-14, SO-14
IN74LV08N,D	74LV08N,D	Quad 2-Input AND Gate	DIP-14, SO-14
IN74LV14N,D	74LV14N,D	Hex Schmitt-Trigger Inverter	DIP-14, SO-14
IN74LV32N,D	74LV32N,D	Quad 2-Input OR Gate	DIP-14, SO-14
IN74LV74N,D	74LV74N,D	Dual D-Type Flip-Flop	DIP-14, SO-14
IN74LV86N,D	74LV86N,D	Quad 2-Input Exclusive-OR Gate	DIP-14, SO-14
IN74LV138N,D	74LV138N,D	3-8 Decoder/Demultiplexer	DIP-16, SO-16
IN74LV139N,D	74LV139N,D	Dual 2-4 Decoder/Demultiplexer	DIP-16, SO-16
IN74LV164N,D	74LV164N,D	8-Bit Serial-In Parallel-Out Shift Register	DIP-14, SO-14
IN74LV174N,D	74LV174N,D	Hex D-Type Flip-Flop	DIP-16, SO-16
IN74LV240N,D	74LV240N,D	Octal Buffer/line Driver, INV (3-State)	DIP-20, SO-20
IN74LV241N,D	74LV241N,D	Octal Buffer/Line Driver, NINV (3-State)	DIP-20, SO-20
IN74LV244N,D	74LV244N,D	Octal Buffer/Line Driver, NINV (3-State)	DIP-20, SO-20
IN74LV245N,D	74LV245N,D	Octal Bus Transceiver, NINV (3-State)	DIP-20, SO-20
IN74LV273N,D	74LV273N,D	Octal D-Type Flip-Flop	DIP-20, SO-20
IN74LV373N,D	74LV373N,D	Octal D-Type Latch (3-State)	DIP-20, SO-20
IN74LV374N,D	74LV374N,D	Octal D-Type Flip-Flop (3-State)	DIP-20, SO-20
IN74LV573N,D	74LV573N,D	Octal Transparent Latch (3-State)	DIP-20, SO-20
IN74LV574N,D	74LV574N,D	Octal D-Type Flip-Flop, NINV (3-State)	DIP-20, SO-20
IN74LV620N,D	74LV620N,D	Octal Bidirectional Bus Transceiver, INV	DIP-20, SO-20
IN74LV623N,D	74LV623N,D	Octal Bidirectional Bus Transceiver, NINV	DIP-20, SO-20
IN74LV640N,D	74LV640N,D	Octal Bus Transceiver (3-State)	DIP-20, SO-20

• IN74XXN, D Series

Part	Pin to Pin Compatibility	Function	Package
IN7401N	SN7401N	Quad 2-Input NAND Gate, OC	DIP-14
IN7406N,D	SN7406N,D	Hex Inverter/Buffer with High-Voltage Output, OC	DIP-14, SO-14
IN7420N	SN7420N	Dual 4-Input NAND Gate	DIP-14
IN7450N	SN7450N	Dual 2-Wide 2-Input AND-OR-Invert Gate	DIP-14
IN7472N	SN7472N	J-K Flip-Flop	DIP-14
IN74141N	SN74141N	BCD-to-Decimal Decoder/Driver	DIP-16
IN74145N	SN74145N	BCD-to-Decimal Decoder, OC	DIP-16
IN74154N	SN74154N	4-16 Decoder/Demultiplexer	DIP-24
IN74175N	SN74175N	Quad D-Type Flip-Flop	DIP-16

INTEGRATED CIRCUITS

Standard Digital Logic ICs

• IN74LSXXXN, D Series

Part	Pin to Pin Compatibility	Function	Package
IN74LS04N,D	CD74LS04N,D	Hex Inverter	DIP-14, SO-14
IN74LS05N,D	CD74LS05N,D	Hex Inverter, OC	DIP-14, SO-14
IN74LS06N,D	CD74LS06N,D	Hex Inverter/Buffer with High-Voltage Output, OC	DIP-14, SO-14
IN74LS07N,D	CD74LS07N,D	Hex Buffer with High-Voltage Output, OC, 30 V	DIP-14, SO-14
IN74LS14N,D	CD74LS14N,D	Hex Schmitt-Trigger Inverter	DIP-14, SO-14
IN74LS86N,D	CD74LS86N,D	Quad 2-Input Exclusive-OR Gate	DIP-14, SO-14
IN74LS138N,D	CD74LS138N,D	3-8 Decoder/Demultiplexer	DIP-16, SO-16
IN74LS157N,D	CD74LS157N,D	Quad 2-1 Data Selector/Multiplexer	DIP-16, SO-16
IN74LS161AN,AD	CD74LS161AN,AD	4-Bit Binary Counter	DIP-16, SO-16
IN74LS164N,D	CD74LS164N,D	8-Bit Parallel-Out Shift Register	DIP-14, SO-14
IN74LS244N,D	CD74LS244N,DW	Octal Buffer/Line Driver, NINV (3-State)	DIP-20, SO-20
IN74LS245N,D	CD74LS245N,DW	Octal Bus Transceiver, NINV (3-State)	DIP-20, SO-20

• IN74ALSXXXXN, D Series

Part	Pin to Pin Compatibility	Function	Package
IN74ALS00AN,A	SN74ALS00AN,AD	Quad 2-Input Positive-NAND Gate	DIP-14, SO-14
IN74ALS01N,D	SN74ALS01N,D	Quad 2-Input Positive-NAND Gate, OC	DIP-14, SO-14
IN74ALS02N,D	SN74ALS02N,D	Quad 2-Input Positive-NOR Gate	DIP-14, SO-14
IN74ALS03AN,A	SN74ALS03AN,AD	Quad 2-Input Positive-NAND Gate, OC	DIP-14, SO-14
IN74ALS04AN,A	SN74ALS04AN,AD	Hex Inverter	DIP-14, SO-14
IN74ALS05AN,A	SN74ALS05AN,AD	Hex Inverter, OC	DIP-14, SO-14
IN74ALS08N,D	SN74ALS08N,D	Quad 2-Input Positive-AND Gate	DIP-14, SO-14
IN74ALS09N,D	SN74ALS09N,D	Quad 2-Input Positive-AND Gate, OC	DIP-14, SO-14
IN74ALS10AN,AD	SN74ALS10AN,AD	Triple 3-Input Positive-NAND Gate	DIP-14, SO-14
IN74ALS11AN,AD	SN74ALS11AN,AD	Triple 3-Input Positive-AND Gate	DIP-14, SO-14
IN74ALS12AN,AD	SN74ALS12AN,AD	Triple 3-Input Positive-NAND Gate, OC	DIP-14, SO-14
IN74ALS14N,D	SN74ALS14N,D	Hex Schmitt-Trigger Inverter	DIP-14, SO-14
IN74ALS15AN,AD	SN74ALS15AN,AD	Triple 3-Input Positive-AND Gate, OC	DIP-14, SO-14
IN74ALS20AN,AD	SN74ALS20AN,AD	Dual 4-Input Positive-NAND Gate	DIP-14, SO-14
IN74ALS21N,AD	SN74ALS21N,AD	Dual 4-Input Positive-AND Gate	DIP-14, SO-14
IN74ALS22BN,BD	SN74ALS22BN,BD	Dual 4-Input Positive-NAND Gate, OC	DIP-14, SO-14
IN74ALS27N,D	SN74ALS27N,D	Triple 3-Input Positive-NOR Gate	DIP-14, SO-14
IN74ALS30AN,AD	SN74ALS30AN,AD	8-Input Positive-NAND Gate	DIP-14, SO-14
IN74ALS32N,D	SN74ALS32N,D	Quad 2-Input Positive-OR Gate	DIP-14, SO-14
IN74ALS33AN,AD	SN74ALS33AN,AD	Quad 2-Input Positive-NOR Buffer, OC	DIP-14, SO-14

• IN74ALSXXXXN, D Series (continued)

Part	Pin to Pin Compatibility	Function	Package
IN74ALS51N,D	SN74ALS51N,D	AND-OR-Invert Gate	DIP-14, SO-14
IN74ALS54N,D	SN74ALS54N,D	4-Wide AND-OR-Invert Gate	DIP-14, SO-14
IN74ALS55N,D	SN74ALS55N,D	2-Wide 4-Input AND-OR-Invert Gate	DIP-14, SO-14
IN74ALS74AN,AD	SN74ALS74AN,AD	Dual D-Type Flip-Flop	DIP-14, SO-14
IN74ALS75N,D	SN74ALS75N,D	Quad Bistable Latch	DIP-16, SO-16
IN74ALS85N,D	SN74ALS85N,D	4-Bit Magnitude Comparator	DIP-16, SO-16
IN74ALS86N,D	SN74ALS86N,D	Quad 2-Input Exclusive-OR Gate	DIP-14, SO-14
IN74ALS90N,D	SN74ALS90N,D	4-Bit Decade Counter	DIP-14, SO-14
IN74ALS93N,D	SN74ALS93N,D	4-Bit Binary Counter	DIP-14, SO-14
IN74ALS107N,D	SN74ALS107N,D	Dual J-K Flip-Flop with Clear	DIP-14, SO-14
IN74ALS109N,D	SN74ALS109N,D	Dual J-K Positive-Edge-Triggered Flip-Flop	DIP-16, SO-16
IN74ALS112AN,AD	SN74ALS112AN,AD	Dual J-K Negative-Edge-Triggered Flip-Flop	DIP-16, SO-16
IN74ALS113AN,AD	SN74ALS113AN,AD	Dual J-K Negative-Edge-Triggered Flip-Flop	DIP-14, SO-14
IN74ALS114AN,AD	SN74ALS114AN,AD	Dual J-K Negative-Edge-Triggered Flip-Flop	DIP-14, SO-14
IN74ALS123N,D	SN74ALS123N,D	Dual Monostable Multivibrator with Reset	DIP-16, SO-16
IN74ALS125N,D	SN74ALS125N,D	Quad 3-State Buffer	DIP-14, SO-14
IN74ALS136N,D	SN74ALS136N,D	Quad 2-Input Exclusive-OR Gate, OC	DIP-14, SO-14
IN74ALS138N,D	SN74ALS138N,D	3-8 Decoder/Demultiplexer	DIP-16, SO-16
IN74ALS139N,D	SN74ALS139N,D	Dual 2-4 Decoder/Demultiplexer	DIP-16, SO-16
IN74ALS151N,D	SN74ALS151N,D	8-1 Data Selector/Multiplexer	DIP-16, SO-16
IN74ALS153N,D	SN74ALS153N,D	Dual 4-1 Data Selector/Multiplexer	DIP-16, SO-16
IN74ALS154N,DW	SN74ALS154N,D	4-16 Decoder/Demultiplexer (3-State)	DIP-24, SO-24
IN74ALS155N,D	SN74ALS155N,D	Dual 2-4 Decoder/Demultiplexer	DIP-16, SO-16
IN74ALS157N,D	SN74ALS157N,D	Quad 2-1 Data Selector/Multiplexer	DIP-16, SO-16
IN74ALS158N,D	SN74ALS158N,D	Quad 2-1 Data Selector/Multiplexer, INV	DIP-16, SO-16
IN74ALS160AN,AD	SN74ALS160AN,AD	Synchronous Decade Counter, Asynchronous Reset	DIP-16, SO-16
IN74ALS161AN,AD	SN74ALS161AN,AD	4-Bit Synchronous Binary Counter, Asynchronous Reset	DIP-16, SO-16
IN74ALS162AN,AD	SN74ALS162AN,AD	Synchronous Decade Counter, Synchronous Reset	DIP-16, SO-16
IN74ALS163AN,AD	SN74ALS163AN,AD	4-Bit Synchronous Binary Counter, Synchronous Reset	DIP-16, SO-16
IN74ALS164N,D	SN74ALS164N,D	8-Bit Serial-In Parallel-Out Shift Register	DIP-14, SO-14
IN74ALS165N,D	SN74ALS165N,D	8-Bit Parallel-in Serial-Out Shift Register	DIP-16, SO-16
IN74ALS166N,D	SN74ALS166N,D	8-Bit Parallel-in Serial-Out Shift Register	DIP-16, SO-16
IN74ALS170N,D	SN74ALS170N,D	4-by-4 Register File, OC	DIP-16, SO-16
IN74ALS173AN,AD	SN74ALS173AN,AD	4-Bit D-Type Register (3-State)	DIP-16, SO-16
IN74ALS174N,D	SN74ALS174N,D	Hex D-Type Flip-Flop	DIP-16, SO-16
IN74ALS175N,D	SN74ALS175N,D	Quad D-Type Flip-Flop	DIP-16, SO-16
IN74ALS181N,DW	SN74ALS181N,D	4-Bit Arithmetic Logic Unit	DIP-24, SO-24
IN74ALS182N,D	SN74ALS182N,D	Look-Ahead Carry Generator	DIP-16, SO-16
IN74ALS190N,D	SN74ALS190N,D	Synchronous Decade Up/Down Counter	DIP-16, SO-16
IN74ALS191N,D	SN74ALS191N,D	4-Bit Synchronous Binary Up/Down Counter	DIP-16, SO-16
IN74ALS192N,D	SN74ALS192N,D	Synchronous Decade Up/Down Counter	DIP-16, SO-16
IN74ALS193N,D	SN74ALS193N,D	4-Bit Synchronous Binary Up/Down Counter	DIP-16, SO-16
IN74ALS240AN,AD	SN74ALS240AN,AD	Octal Buffer/Line Driver, INV (3-State)	DIP-20, SO-20
IN74ALS241AN,AD	SN74ALS241AN,AD	Octal Buffer/Line Driver, NINV (3-State)	DIP-20, SO-20
IN74ALS242AN,AD	SN74ALS242AN,AD	Quad Bus Transceiver, INV (3-State)	DIP-14, SO-14
IN74ALS243AN,AD	SN74ALS243AN,AD	Quad Bus Transceiver, NINV (3-State)	DIP-14, SO-14
IN74ALS244AN,AD	SN74ALS244AN,AD	Octal Buffer/Line Driver, NINV (3-State)	DIP-20, SO-20
IN74ALS245AN,AD	SN74ALS245AN,AD	Octal Bus Transceiver, NINV (3-State)	DIP-20, SO-20
IN74ALS251N,D	SN74ALS251N,D	8-1 Data Selector/Multiplexer, INV (3-State)	DIP-16, SO-16
IN74ALS253N,D	SN74ALS253N,D	Dual 4-1 Data Selector/Multiplexer, NINV (3-State)	DIP-16, SO-16
IN74ALS257AN,AD	SN74ALS257AN,AD	Quad 2-1 Data Selector/Multiplexer, NINV (3-State)	DIP-16, SO-16
IN74ALS258AN,AD	SN74ALS258AN,AD	Quad 2-1 Data Selector/Multiplexer, INV (3-State)	DIP-16, SO-16
IN74ALS259N,D	SN74ALS259N,D	8-Bit Addressable Latch	DIP-16, SO-16
IN74ALS273N,DW	SN74ALS273N,D	Octal D-Type Flip-Flop	DIP-20, SO-20
IN74ALS279N,D	SN74ALS279N,D	Quad Set/Reset Latch	DIP-16, SO-16
IN74ALS280N,D	SN74ALS280N,D	9-Bit Odd/Even Parity Generator/Checker	DIP-14, SO-14

INTEGRATED CIRCUITS

Standard Digital Logic ICs

• IN74ALSXXXN, D Series (continued)

Part	Pin to Pin Compatibility	Function	Package
IN74ALS295BN,BD	SN74ALS295BN,BD	4-Bit Universal Shift Register	DIP-14, SO-14
IN74ALS298N,D	SN74ALS298N,D	Quad 2-1 Data Selector/Multiplexer	DIP-16, SO-16
IN74ALS299N,DW	SN74ALS299N,D	8-Bit Universal Shift/Storage Register (3-State)	DIP-20, SO-20
IN74ALS323N,DW	SN74ALS323N,D	8-Bit Universal Shift/Storage Register (3-State)	DIP-20, SO-20
IN74ALS352N,D	SN74ALS352N,D	Dual 4-1 Data Selector/Multiplexer	DIP-16, SO-16
IN74ALS353N,D	SN74ALS353N,D	Dual 4-1 Data Selector/Multiplexer (3-State)	DIP-16, SO-16
IN74ALS368N,D	SN74ALS368N,D	Hex Bus Driver (3-State)	DIP-16, SO-16
IN74ALS373N,DW	SN74ALS373N,D	Octal D-Type Latch (3-State)	DIP-20, SO-20
IN74ALS374AN,AD	SN74ALS374AN,AD	Octal D-Type Flip-Flop (3-State)	DIP-20, SO-20
IN74ALS377AN,AD	SN74ALS377AN,AD	Octal D-Type Flip-Flop with Enable	DIP-20, SO-20
IN74ALS393N,D	SN74ALS393N,D	Dual 4-Bit Binary Counter	DIP-14, SO-14
IN74ALS465AN,AD	SN74ALS465AN,AD	Octal Buffer, NINV (3-State)	DIP-20, SO-20
IN74ALS466AN,AD	SN74ALS466AN,AD	Octal Buffer, INV (3-State)	DIP-20, SO-20
IN74ALS573N,D	SN74ALS573N,D	Octal Transparent Latch (3-State)	DIP-20, SO-20
IN74ALS574N,D	SN74ALS574N,D	Octal D-Type Flip-Flop (3-State)	DIP-20, SO-20
IN74ALS640BN,BD	SN74ALS640BN,BD	Octal Bus Transceiver (3-State)	DIP-20, SO-20
IN74ALS643AN,AD	SN74ALS643AN,AD	Octal Bus Transceiver (3-State)	DIP-20, SO-20
IN74ALS670N,D	SN74ALS670N,D	4-by-4 Register File (3-State)	DIP-16, SO-16
IN74ALS873N,D	SN74ALS873N,D	Dual 4-Bit D-Type Latch (3-State)	DIP-24, SO-24
IN74ALS874N,D	SN74ALS874N,D	Dual 4-Bit D-Type Flip-Flop	DIP-24, SO-24
IN74ALS1000AN,AD	SN74ALS1000AN,AD	Quad 2-Input Positive-NAND Buffer	DIP-14, SO-14
IN74ALS1002AN,AD	SN74ALS1002AN,AD	Quad 2-Input Positive-NOR Buffer	DIP-14, SO-14
IN74ALS1003AN,AD	SN74ALS1003AN,AD	Quad 2-Input Positive-NAND Buffer, OC	DIP-14, SO-14
IN74ALS1004N,D	SN74ALS1004N,D	Hex Inverting Driver	DIP-14, SO-14
IN74ALS1005N,D	SN74ALS1005N,D	Hex Inverting Buffer, OC	DIP-14, SO-14
IN74ALS1008AN,AD	SN74ALS1008AN,AD	Quad 2-Input Positive-NAND Buffer	DIP-14, SO-14
IN74ALS1010AN,AD	SN74ALS1010AN,AD	Triple 3-Input Positive-NAND Buffer	DIP-14, SO-14
IN74ALS1011AN,AD	SN74ALS1011AN,AD	Triple 3-Input Positive-AND Buffer	DIP-14, SO-14
IN74ALS1020AN,AD	SN74ALS1020AN,AD	Dual 4-Input Positive-NAND Buffer	DIP-14, SO-14
IN74ALS1032AN,AD	SN74ALS1032AN,AD	Quad 2-Input Positive-OR Buffer/Driver	DIP-14, SO-14
IN74ALS1034N,D	SN74ALS1034N,D	Hex Driver	DIP-14, SO-14
IN74ALS1035N,D	SN74ALS1035N,D	Hex Noninverting Buffer, OC	DIP-14, SO-14

• IW4000BN, D Series

Part	Pin to Pin Compatibility	Function	Package
IW4001BN,BD	CD4001BN,BD	Quad 2-Input NOR Gate	DIP-14, SO-14
IW4002BN,BD	CD4002BN,BD	Dual 4-Input NOR Gate	DIP-14, SO-14
IW4006BN,BD	CD4006BN,BD	18-Bit Static Shift Register	DIP-14, SO-14
IW4008BN,BD	CD4008BN,BD	4-Bit Full Adder	DIP-16, SO-16
IW4011BN,BD	CD4011BN,BD	Quad 2-Input NAND Gate	DIP-14, SO-14
IW4012BN,BD	CD4012BN,BD	Dual 4-Input NAND Gate	DIP-14, SO-14
IW4013BN,BD	CD4013BN,BD	Dual D-Type Flip-Flop	DIP-14, SO-14
IW4015BN,BD	CD4015BN,BD	Dual 4-Bit Static Shift Register	DIP-16, SO-16
IW4016BN,BD	CD4016BN,BD	Quad Bilateral Switch	DIP-14, SO-14
IW4017BN,BD	CD4017BN,BD	Decade Counter/Driver	DIP-16, SO-16
IW4018BN,BD	CD4018BN,BD	Presetable Divide-by-N Counter	DIP-16, SO-16
IW4019BN,BD	CD4019BN,BD	Quad AND-OR Gate	DIP-16, SO-16
IW4020BN,BD	CD4020BN,BD	14-Bit Binary Divide Counter	DIP-16, SO-16

• IW4000BN, D Series (continued)

Part	Pin to Pin Compatibility	Function	Package
IW4021BN,BD	CD4021BN,BD	8-Bit Shift Register	DIP-16, SO-16
IW4022BN,BD	CD4022BN,BD	Divide-by-8 Counter/Divider	DIP-16, SO-16
IW4023BN,BD	CD4023BN,BD	Triple 3-Input NAND Gate	DIP-14, SO-14
IW4025BN,BD	CD4025BN,BD	Triple 3-Input NOR Gate	DIP-14, SO-14
IW4027BN,BD	CD4027BN,BD	Dual J-K Flip-Flop	DIP-16, SO-16
IW4028BN,BD	CD4028BN,BD	BCD-to-Decimal Decoder	DIP-16, SO-16
IW4029BN,BD	CD4029BN,BD	Binary or BCD-Decade Counter	DIP-16, SO-16
IW4030BN,BD	CD4030BN,BD	Quad Exclusive-OR Gate	DIP-14, SO-14
IW4034BN,BD	CD4034BN,BD	8-Bit Shift Register	DIP-24, SO-24
IW4035BN,BD	CD4035BN,BD	4-Bit Parallel-In/Parallel-Out Shift Register	DIP-16, SO-16
IW4040BN,BD	CD4040BN,BD	12-Bit Binary Counter	DIP-16, SO-16
IW4042BN,BD	CD4042BN,BD	Quad Clocked D-Latch	DIP-16, SO-16
IW4043BN,BD	CD4043BN,BD	Quad NOR R-S Latch (3-State)	DIP-16, SO-16
IW4049BN,BD	CD4049BN,BD	Hex Buffer/Converter	DIP-16, SO-16
IW4050BN,BD	CD4050BN,BD	Hex Buffer/Converter	DIP-16, SO-16
IW4051BN,BD	CD4051BN,BD	8-Channel Analog Multiplexer/Demultiplexer	DIP-16, SO-16
IW4052BN,BD	CD4052BN,BD	Dual 4-Channel Analog Multiplexer/Demultiplexer	DIP-16, SO-16
IW4053BN,BD	CD4053BN,BD	Triple 2-Channel Analog Multiplexer/Demultiplexer	DIP-16, SO-16
IW4059AN,AD	CD4059AN,AD	Programmable Counter	DIP-24, SO-24
IW4060BN,BD	CD4060BN,BD	14-Bit Binary Divide/ Counter	DIP-16, SO-16
IW4066BN,BD	CD4066BN,BD	Quad Bilateral Switch	DIP-14, SO-14
IW4068BN,BD	CD4068BN,BD	8-Input NAND Gate	DIP-14, SO-14
IW4069UBN,UBD	CD4069UBN,UBD	Hex Inverter	DIP-14, SO-14
IW4070BN,BD	CD4070BN,BD	Quad Exclusive-OR Gate	DIP-14, SO-14
IW4071BN,BD	CD4071BN,BD	Quad 2-Input OR Gate	DIP-14, SO-14
IW4072BN,BD	CD4072BN,BD	Dual 4-Input OR Gate	DIP-14, SO-14
IW4073BN,BD	CD4073BN,BD	Triple 3-Input AND Gate	DIP-14, SO-14
IW4075BN,BD	CD4075BN,BD	Triple 3-Input OR Gate	DIP-14, SO-14
IW4077BN,BD	CD4077BN,BD	Quad Exclusive-NOR Gate	DIP-14, SO-14
IW4081BN,BD	CD4081BN,BD	Quad 2-Input AND Gate	DIP-14, SO-14
IW4093BN,BD	CD4093BN,BD	Quad 2-Input NAND Schmitt Trigger	DIP-14, SO-14
IW4098BN,BD	CD4098BN,BD	Dual Monostable Multivibrator	DIP-16, SO-16
IW40107BN,BD	CD40107BN,BD	Dual 2-Input NAND Buffer/Driver	DIP-14, SO-14
IW4502BN,BD	CD4502BN,BD	Hex Inverter/Buffer	DIP-16, SO-16
IW4503BN,BD	CD4503BN,BD	Hex Buffer	DIP-16, SO-16
IW4511BN,BD	CD4511BN,BD	BCD-to-7-Segment Latch Decoder/Driver	DIP-16, SO-16
IW4516BN,BD	CD4516BN,BD	Presetable Binary Up/Down Counter	DIP-16, SO-16
IW4518BN,BD	CD4518BN,BD	Dual BCD Up Counter	DIP-16, SO-16
IW4519BN,BD	CD4519BN,BD	Quad AND/OR Select Gate	DIP-16, SO-16
IW4520BN,BD	CD4520BN,BD	Dual Binary Up Counter	DIP-16, SO-16
IW4528BN,BD	CD4528BN,BD	Dual Monostable Multivibrator	DIP-16, SO-16
IW4531BN,BD	NEF4531BN,BD	12-Bit Checker Tree	DIP-16, SO-16
IW4541BN,BD	CD4541BN,BD	Programmable Timer	DIP-14, SO-14
IW4543BN,BD	CD4543BN,BD	BCD-to-7-Segment Latch/Decoder/Driver for Liquid-Crystal Display	DIP-16, SO-16
IW4585BN,BD	CD4585BN,BD	4-Bit Comparator	DIP-16, SO-16

• FAMILY CHARACTERISTICS

DC Characteristics (Max)

	TTL			CMOS							Units
	74	74LS	74ALS	4000B	74AC	74ACT	74HC	74HCT	74LV		
	5±5%	5±5%	5±10%	3...18	2...6	5±10%	2...6	5±10%	1.0...5.5		
Supply Voltage Range, $V_{CC}(V_{DD})$	5±5%	5±5%	5±10%	3...18	2...6	5±10%	2...6	5±10%	1.0...5.5	V	
Operating Temperature, T_A	-10...+70	0...+70	-10...+70	-55...+125	-45...+85	-45...+85	-55...+125	-55...+125	-40...+125	°C	
High -Level Input Voltage, V_{IH} (min)	2	2	2	0.7xV _{DD}	0.7xV _{CC}	2	0.7xV _{CC}	2	0.7xV _{CC}	V	
Low -Level Input Voltage, V_{IL} (max)	0.8	0.8	0.8	0.3xV _{DD}	0.3xV _{CC}	0.8	0.3xV _{CC}	0.8	0.3xV _{CC}	V	
High-Level Output Voltage, V_{OH} (min)	2.4	V _{CC} -2	V _{CC} -2	V _{DD} -0.05	V _{CC} -0.1	V _{CC} -0.1	V _{CC} -0.1	V _{CC} -0.1	V _{CC} -0.2	V	
Low-Level Output Voltage, V_{OL} (max)	0.4	0.5	0.5	0.05	0.1	0.1	0.1	0.1	0.2	V	
High-Level Input Current, I_{IH}	40	20	20	+0.3	+1	+1	+1	+1	+1	µA	
Low-Level Input Current, I_{IL}	-1600	-400	-100	-0.3	-1	-1	-1	-1	-1	µA	
High-Level Output Current, I_{OH}	-0.4	-0.4	-0.4	-4.2 at V _O =2.5 V V _{DD} =5.0 V	-24 at V _O =V _{CC} -0.8	-24 at V _O =V _{CC} -0.8	-4 at V _O =V _{CC} -0.8	-4 at V _O =V _{CC} -0.8	-16	mA	
Low-Level Output Current, I_{OL}	16	8	8	0.88 at V _O =0.4 V V _{DD} =5.0 V	24 at V _O =0.4 V	24 at V _O =0.4 V	4 at V _O =0.4 V	4 at V _O =0.4 V	16	mA	
DC Noise Margin, DCM	0.4/0.4	0.3/0.7	0.3/0.7	1.5 at V _{DD} =5 V 3.0 at V _{DD} =10 V 4.0 at V _{DD} =15 V	1.25/1.25	0.7/2.4	1.25/1.25	0.7/2.4	0.8/0.8	V	

• FAMILY CHARACTERISTICS

DC Characteristics (Type)

Parameters	TTL			CMOS					Units
	74	74LS	74ALS	74AC	74ACT	74HC	74HCT	74LV	
Supply Current for Gate, I_G	3.4	0.4	0.2	0.0005	0.0005	0.0005	0.0005	0.0005	mA
Power Supply for Gate, P_G	10	2	1	0.0025	0.0025	0.001	0.001	0.001	mW
Propagation Delay Time, T_P	10	7	5	5	5	8	8	10	ns
Clock Frequency, F_{max}	35 $C_L=15$ pF	40	45	140	140	30	30	40	MHz
		$C_L=15$ pF	$C_L=50$ pF	$C_L=50$ pF	$C_L=50$ pF	$C_L=50$ pF	$C_L=50$ pF	$C_L=50$ pF	
Inputs V_{IL}/V_{IH}	TTL	TTL	TTL	CMOS	TTL, CMOS	CMOS	TTL, CMOS	CMOS	-
Outputs V_{OL}/V_{OH}	TTL	TTL	TTL	TTL, CMOS	TTL, CMOS	TTL, CMOS	TTL, CMOS	TTL, CMOS	-

● FAMILY CHARACTERISTICS

AC Characteristics

Parameters	Performance	TTL			CMOS					Units
		7400	74LS00	74ALS00	74AC00	74ACT00	74HC00	74HCT00	74LV00	
Propagation Delay, t_{PHL}/t_{PHL}	Type	10 $C_L=15$ pF	7 $C_L=15$ pF	5 $C_L=50$ pF	5 $C_L=50$ pF	5 $C_L=50$ pF	8 $C_L=50$ pF	8 $C_L=50$ pF	10 $C_L=50$ pF	ns
	Gate, NOR or NAND									
Propagation Delay, t_{PHL}/t_{PHL} (Clock to Q)	Max	22 $C_L=15$ pF	15 $C_L=15$ pF	11 $C_L=50$ pF	8.5 $C_L=50$ pF	9.5 $C_L=50$ pF	22 $C_L=50$ pF	28 $C_L=50$ pF	14 $C_L=50$ pF	ns
		74163	74LS163	74ALS163	74AC163	74ACT163	74HC163	74HCT163	74LV163	
Propagation Delay, t_{PHL}/t_{PHL} (Clock to Q)	Type	16 $C_L=15$ pF	18 $C_L=15$ pF	10 $C_L=50$ pF	5 $C_L=50$ pF	6 $C_L=50$ pF	20 $C_L=50$ pF	20 $C_L=50$ pF	18 $C_L=50$ pF	ns
	Counter									
Propagation Delay, t_{PHL}/t_{PHL} (Clock to Q)	Max	38 $C_L=15$ pF	27 $C_L=15$ pF	26 $C_L=50$ pF	9.5 $C_L=50$ pF	12 $C_L=50$ pF	28 $C_L=50$ pF	28 $C_L=50$ pF	23 $C_L=50$ pF	ns
		7474	74LS74	74ALS74	74AC74	74ACT74	74HC74	74HCT74	74LV74	
Propagation Delay, t_{PHL}/t_{PHL} (Clock to Q)	Type	25 $C_L=15$ pF	25 $C_L=15$ pF	13 $C_L=50$ pF	6 $C_L=50$ pF	6 $C_L=50$ pF	20 $C_L=50$ pF	24 $C_L=50$ pF	25 $C_L=50$ pF	ns
	Flip-Flop, D-Type									
Propagation Delay, t_{PHL}/t_{PHL} (Clock to Q)	Max	40 $C_L=15$ pF	40 $C_L=15$ pF	18 $C_L=50$ pF	10 $C_L=50$ pF	11.5 $C_L=50$ pF	30 $C_L=50$ pF	36 $C_L=50$ pF	35 $C_L=50$ pF	ns

• **CMOS ICs for LCD Wrist-Watches and Clocks**

Part (Pin to Pin Compatibility)	Display			Functions				Multi- plexing Ratio	Supply Current without Load max, μA	V _{DD} , V	Notes	
	Digits	Flags	Marks	Hour Minute Second Month Date	Alarm	Chrono- graph	12H/ 24H					
Digital watch												
IZ6099F (KS5199)	3.5		1	+			12	1/2	1.5	1.5		
Analog clock												
IZ33173	Output pulse duration 31.25 ms							2.0	1.5	Clock IC		
IZ33567								1.5	1.5	Clock with alarm, snooze, crescendo		

• **Electronic Thermometer IC**

Part	Pin to Pin Compatibility	Function	Features	Package
IZ8016		100° Digital thermometer °C/°F	<ul style="list-style-type: none"> □ Measurement temperature range: from -50°C to +50°C (from -58°F to +122°F) □ Resolution: 0.2°C (°F) □ Accuracy: ±1°C (°F) □ Supply voltage 1.5V □ Measurement cycle 1, 3, 5 & 10 seconds (on default– 10 seconds) □ Measuring RC-oscillator with external resistor & capacitor □ 32 kHz clock RC-oscillator with build-in capacity □ Serial interface □ Build-in circuit of non-linear digital correction □ 3.5 digit LCD with double multiplex 	Chip
IZ8005	HT7501	Medical thermometer	<ul style="list-style-type: none"> □ Supply voltage 1.5V □ Measurement temperature range: from +32.00°C to +43.00°C □ Accuracy: ±0.1°C □ Resolution: 0.01°C □ Selftesting □ Alarm signal □ Storage of measurements results (highest temperature) □ Automatic switch-off after 8 min 40 sec □ One button on/off switching 	Chip
IZ8071		Digital medical thermometer	<ul style="list-style-type: none"> □ Measurement temperature range: from 32 to 42°C (from 89.6 to 107.6°F) □ Measurement accuracy: ±0.05°C – for range from 35 to 38°C, ±0.1°C – for ranges from 32 to 35°C & from 38°C to 42°C □ Resolution: 0.0025°C □ RC-oscillator with own frequency 32.32kHz (external resistance) with adjustment function □ Build-in LCD driver circuit 3COM x 11SEG, 1/3 duty, 1/2 bias 	Chip
IN18B20 IN18B20D	DS18B21	Integrated circuit of digital sensor- measurer of temperature for industrial temperature range	<ul style="list-style-type: none"> □ Measurement temperature range: from -55°C to +125°C □ Temperature value is converted to 12-bit digital code □ Accuracy of temperature indication can be programmed by customer from 9 to 12 bit □ Alarm signal for case of temperature excess of threshold values determined (programmed) by customer □ Unique 64-bit serial number for each IC, not available for changes by customer □ Data read/write operation from memory of IC, 1-wire interface of data transfer 	TO-92 SO-8

INTEGRATED CIRCUITS

Clock IC, Electronic Thermometer IC

• Melody IC

Part	Maximum Number of Tunes (Notes)	Vcc V	Icc, μ A		Package
			Tune Play	Stop	
BT8028C-XX	16 (64)	1.3 – 3.3	60	0.5	TO-92
BT8031-XX	2 (127)	1.3 – 3.3	1.0	0.5	TO-92

XX – Melody code

• Voltage Controlled Oscillator (VCO) IC

Part	Pin to Pin Compatibility	Function	Features	Package
IZC6990	IZC6990	Voltage Controlled Oscillator	<ul style="list-style-type: none">□ Supply Voltage 2.25V-5.5V□ Frequency Range: 488Hz to 2MHz□ 72μA Supply Current at 100kHz□ Fixed-Frequency or Voltage-Controlled Operation<ul style="list-style-type: none">- Fixed: Single resistor programs frequency with <1.5% max error;- VCO: Two resistors set VCO center frequency and tuning range□ CMOS Logic Output Sources/Sinks 20mA	Chip

DISCRETE SEMICONDUCTORS

DISCRETE SEMICONDUCTORS

Transistors

• Power N-Channel MOSFETs

Part	Function	Package
IFP630	N-Channel MOSFET 200 V; 0.400 Ω– 9 A	Chip
IFF630		Chip
IFP640	N-Channel MOSFET 200 V; 0.180 Ω– 18 A	Chip
IFF640		Chip
IFP634	N-Channel MOSFET 250 V; 0.450 Ω– 8 A	Chip
IFF634		Chip
IFP730	N-Channel MOSFET 400 V; 0.950 Ω– 6 A	TO-220/3
IFF730		TO-220FP
IFP740	N-Channel MOSFET 400 V; 0.550 Ω– 10 A	TO-220/3
IFF740		TO-220FP
IFP830	N-Channel MOSFET 500 V; 1.400 Ω– 5 A	TO-220/3
IFF830		TO-220FP
IFP840	N-Channel MOSFET 500 V; 0.850 Ω– 8 A	TO-220/3
IFF840		TO-220FP
IFP1N60	N-Channel MOSFET 600 V; 12.000 Ω– 0,9 A	TO-220/3
IFU1N60		I-PAK
IFD1N60		D-PAK
IFU2N60	N-Channel MOSFET 600 V; 5.0 Ω– 1,8 A	I-PAK
IFD2N60		D-PAK
IFP2N60	N-Channel MOSFET 600 V; 5.0 Ω– 2 A	TO-220/3
IFF2N60		TO-220FP
IFP4N60	N-Channel MOSFET 600 V; 2.5 Ω– 4.0 A	TO-220/3
IFF4N60		TO-220FP
IFP7N60	N-Channel MOSFET 600 V; 1.2 Ω– 7 A	TO-220/3
IFF7N60		TO-220FP
IFP10N60	N-Channel MOSFET 600 V; 0.8 Ω– 10 A	Chip
IFF10N60		Chip
IFP12N60	N-Channel MOSFET 600 V; 0.7 Ω– 12 A	Chip
IFF12N60		Chip
IFU1N65	N-Channel MOSFET 650 V; 13.0 Ω– 1 A	Chip
IFD1N65		Chip
IFU2N65		Chip
IFD2N65	N-Channel MOSFET 650 V; 5.5 Ω– 2 A	Chip
IFP2N65		Chip
IFF2N65		Chip
IFP4N65	N-Channel MOSFET 650 V; 2.7 Ω– 4 A	Chip
IFF4N65		Chip
IFP7N65	N-Channel MOSFET 650 V; 1.3 Ω– 7 A	Chip
IFF7N65		Chip
IFP10N65	N-Channel MOSFET 650 V; 0.85 Ω– 10 A	Chip
IFF10N65		Chip
IFF12N65	N-Channel MOSFET 650 V; 0.8 Ω– 12 A	Chip
IFF12N65		Chip

• Unijunction Transistors

Part	Pin to Pin Compatibility	P max, W	Vb, b2 max, V	le pulse, A	le rev, μA	Veb sat, V	η	Package
2N2646	2N2646	0.3	35	2.0	12.0	0.7...3.5	0.56...0.75	Case 22A-01
2N2647	2N2647							
2N4870	2N4870	0.3	35	1.5	1.0	0.7...2.5	0.56...0.75	TO-92
2N4871	2N4871							

Foundry business

- Semiconductor IC and Discrete Devices Manufacturing under the Customer's Design (delivery on base of Probe Test)
- Semiconductor IC and Discrete Devices Manufacturing under the Customer's Design (delivery on the base of PCM)
- Wafer Fab Service – execution of separate Process Flow Steps or blocks (Metal sputtering, film deposition, EPI growing, back grinding, wafers testing and so on)
- Raw Si substrate and EPI manufacturing under the Customer's Spec

Production Capacity available for Foundry Business:

- 8" wafer production line (0.5-0.35 μ m design rule)
- 6" wafer production line (0.8-1.2 μ m design rule)
- 4" wafer production line (1.2-3.0 μ m design rule)

Basic Process available:

a) Integrated Circuits:

- DMOS
- CMOS
- BiCMOS
- CDMOS
- BiCDMOS
- Bipolar

b) Discrete devices:

- D-MOS (≤ 1000 V)
- Multi-Epi (≤ 700 V)
- Bipolar
- Process for high frequency devices (≤ 300 V)

Si substrates and EPI, manufacturing and delivery (according to the Customer's Spec):

- 4", 6", 8" wafers
- EPI parameter range: $d=0.5\dots 80$ μ m, $\rho=0.1\dots 50$ $\Omega \cdot \text{cm}$

Mask making:

- Mask Set manufacturing under the Customer's Spec (GDS II and DB):
 - a) for contact lithography
 - b) for Projection Reduction (Stepper lithography) (1:1/1:5/1:10)
- Pellicles manufacturing under the Customer's Spec
- Manufacture of photomasks with P/R coatings (glass and quartz substrates)

Contract management

Packaging:

- IC and Discrete Devices assembly (packaging) with Testing
- IC and Discrete Devices assembly (packaging) without Testing
- IC and Discrete Devices assembly (packaging) with Testing and Marking

Packages Types available:

a) Integrated Circuits:

- SOP (8-28 LD)
- DIP (8-40 LD)
- SHRINK DIP (30, 42, 52, 56 LD)
- QFP (48, 64, 100 LD)
- SIL (3, 8, 13, 17 LD)
- SIP (9LD)
- TO -220 (3, 5, 7 LD)
- SOT -23, SOT -143, SOT -223

b) Discrete devices:

- Case 22A-01
- DO-34, DO-35
- MELF, miniMELF
- SOT -23, SOT -143, SOT -223
- ISOWATT
- TO-18, TO-39, TO-72, TO-92, TO-126,
- TO-218, TO-220
- KD-17
- DPAK, D2PAK

Fabless service

IC and discrete devices design:

- IC Design according to the Customer's Data Sheet (Spec) and Process Development
- Discrete Devices Design according to the Customer's Data Sheet (Spec) and Process development
- GDS II and Tape out
- Engineering Consulting service
- Reengineering

Supplementary services

Design of electronic devices/ instruments and manufacture of samples as per Customer's requirements:

- Design and manufacture of PCB
- Design and manufacture of LCD:
 - TN-type ("twist") for electronic clock/watch, calculators, etc,
 - STN-type ("supertwist") for general purposes

Other services:

- Design and manufacture of quartz tooling and accessories, tools
- Design and manufacture of molds, punches, casting/transfer molds
- Marking blocks manufacturing
- High-precision stamping of lead frames for IC manufacturing