# Integrated Circuit



## Introduction

An Integrated Circuit is a formal name for a component commonly termed chip or IC, that is a small electronic device made out of a semiconductor material.

The first integrated circuit was developed in the 1950s by Jack Kilby of Texas Instruments and Robert Noyce of Fairchild Semiconductor, now a part of Schlumberger.

Integrated circuits are used for a variety of devices, including microprocessors (CPUs), audio and video equipment, and automobiles. Integrated circuits are often classified by the number of transistors and other electronic components they contain:

- **SSI** (small-scale integration): Up to 100 electronic components per chip
- **MSI** (medium-scale integration): From 100 to 3,000 electronic components per chip
- **LSI** (large-scale integration): From 3,000 to 100,000 electronic components per chip
- **VLSI** (very large-scale integration): From 100,000 to 1,000,000 electronic components per chip
- **ULSI** (ultra large-scale integration): More than 1 million electronic components per chip

IC are usually packaged in a plastic or ceramic case with external connector pins.Some ICs used in midibox designs:

| Description | Type | Mouser Ref | Reichelt ref | Digikey ref |
|---|---|---|---|---|
| 74HC165 | Serial Register | 595-CD74HC165EE4 | | |
| 74HC595 | Serial Register | 595-CD74HC595E | | |
| 74HCT541 | Line Driver | 595-D74HCT541E | | |
| 74HC00 | Logic Gate | 595-CD74HC00EE4 | | |
| 6N138 | OptoCoupler | 512-6N138M | | |
| MOS4051 | Multiplexer switch | 595-CD74HC4051M96 | | |
| TL072 | Operational Amplifier | 595-TL072ACP | | |
| TL074 | Operational Amplifier | 512-LM324N | | |
| MCP6004 | Operational Amplifier | 579-MCP6004-E/P | | |
| MCP3208 | Analog>Digital converter | 579-MCP3208CIP | | |
| MCP3428 | Analog>Digital converter | 579-MCP3428E/SL | | |

| Description | Type | Mouser Ref | Reichelt ref | Digikey ref |
|---|---|---|---|---|
| MAX525 | Digital>Analog converter | 700-MAX525BCPP | | |
| CD22M3494EZ | Crosspoint switch | 968-CD22M3494EZ | | |
| PIC16F88 | Microcontroller | 579-PIC16F88-I/P | | |

## Datasheets

Mouser Referenced Datasheets are given for example.

- 74HC165
- 74HC595
- 74HCT541
- 74HC00
- 6N138
- MOS4051
- TL072
- TL074 / LM324
- MCP600X
- MCP3208
- MCP3428
- MAX525
- CD22M3494
- PIC16F88

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