

AKKON USB Controller Board

USB microcontroller board with the ARM7 LPC2148™*
Design files



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 Attachments: no attachments

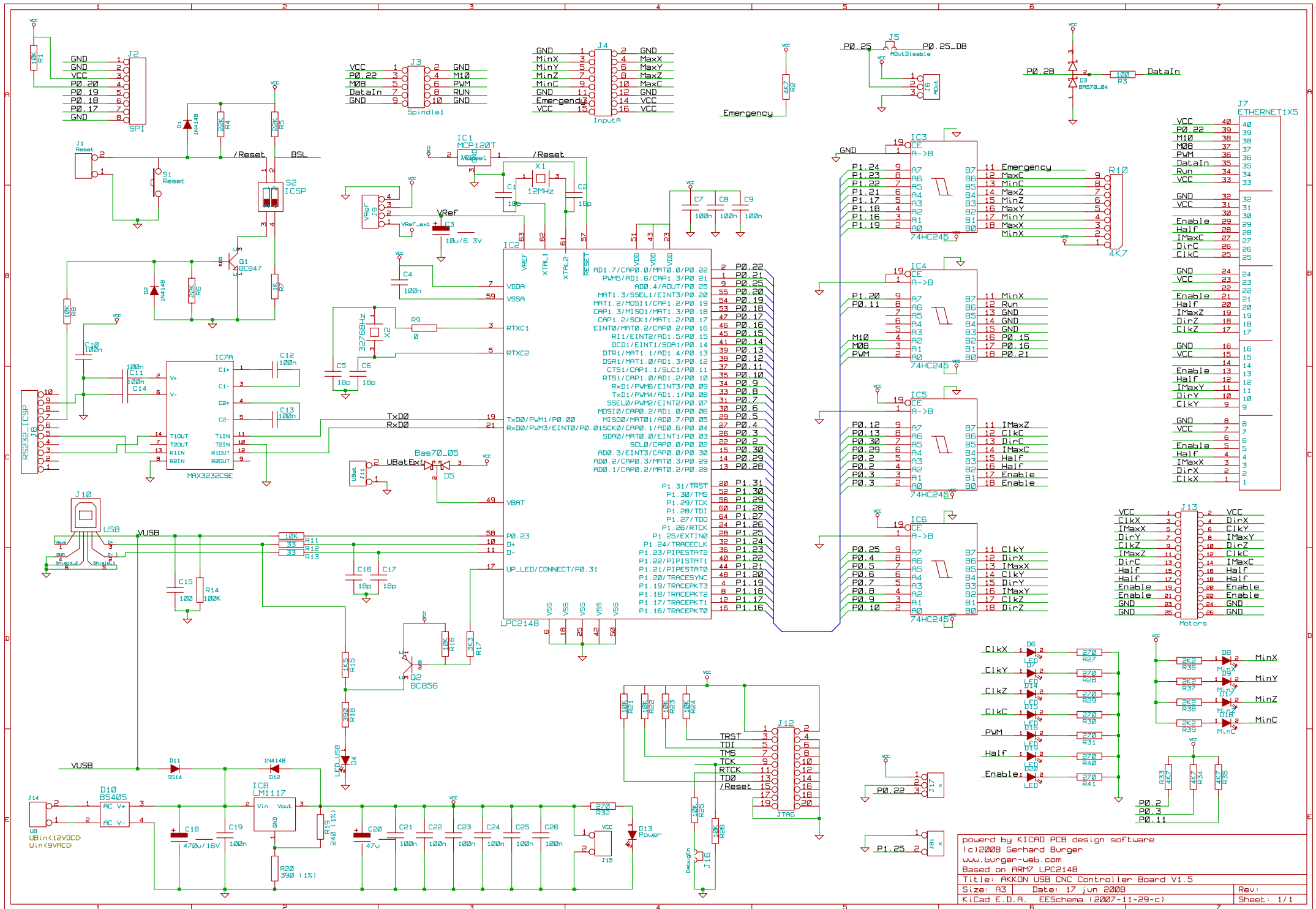
Table of versions

Version	Date	Remarks
1.0	28.05.2008	first version
1.1	17.06.2008	improvement
1.2	21.06.2008	Improvement, extending document with description about identification of SMD-parts
1.3	22.06.2008	improvement

Introduction

The AKKON USB Controller Board is a prototyping or development board based on the LPC2148 ARM7 micro controller, with USB support, power supply and IO drivers. The board is designed as development kit for starting up working with ARM7 microcontrollers and for fast development of new devices.

This document includes the schematics, mounting plan, part list and general information for realizing the project.



Pin List (Left):

VCC	1	GND	2
P0_22	3	M10	4
M08	5	PWM	6
DataIn	7	RUN	8
GND	9	GND	10
GND	11	VCC	12
GND	13	VCC	14
GND	15	VCC	16

Pin List (Right):

GND	17	GND	18
MinX	19	MaxX	20
MinY	21	MaxY	22
MinZ	23	MaxZ	24
GND	25	GND	26
Emergenc	27	VCC	28
VCC	29	VCC	30

Pin List (Top Right):

VCC	40	VCC	40
P0_22	39	M10	38
M08	37	PWM	36
DataIn	35	Run	34
VCC	33	VCC	33
GND	32	GND	32
VCC	31	VCC	31
Enable	29	Half	28
DirC	27	IMaxC	26
DirX	25	DirZ	24
DirY	23	DirX	22
DirZ	21	DirY	20
DirX	19	DirZ	18
DirY	17	DirX	16
DirZ	15	DirY	14
DirX	13	DirZ	12
DirY	11	DirX	10
DirZ	9	DirY	8
DirX	7	DirZ	6
DirY	5	DirX	4
DirZ	3	DirY	2
DirX	2	DirZ	1

Pin List (Bottom Right):

VCC	1	VCC	2
DirX	3	DirY	4
IMaxX	5	DirZ	6
DirY	7	IMaxY	8
DirZ	9	DirX	10
IMaxZ	11	DirY	12
DirX	13	IMaxX	14
DirY	15	DirZ	16
DirZ	17	DirX	18
Enable	19	Enable	20
Enable	21	Enable	22
GND	23	GND	24
GND	25	GND	26

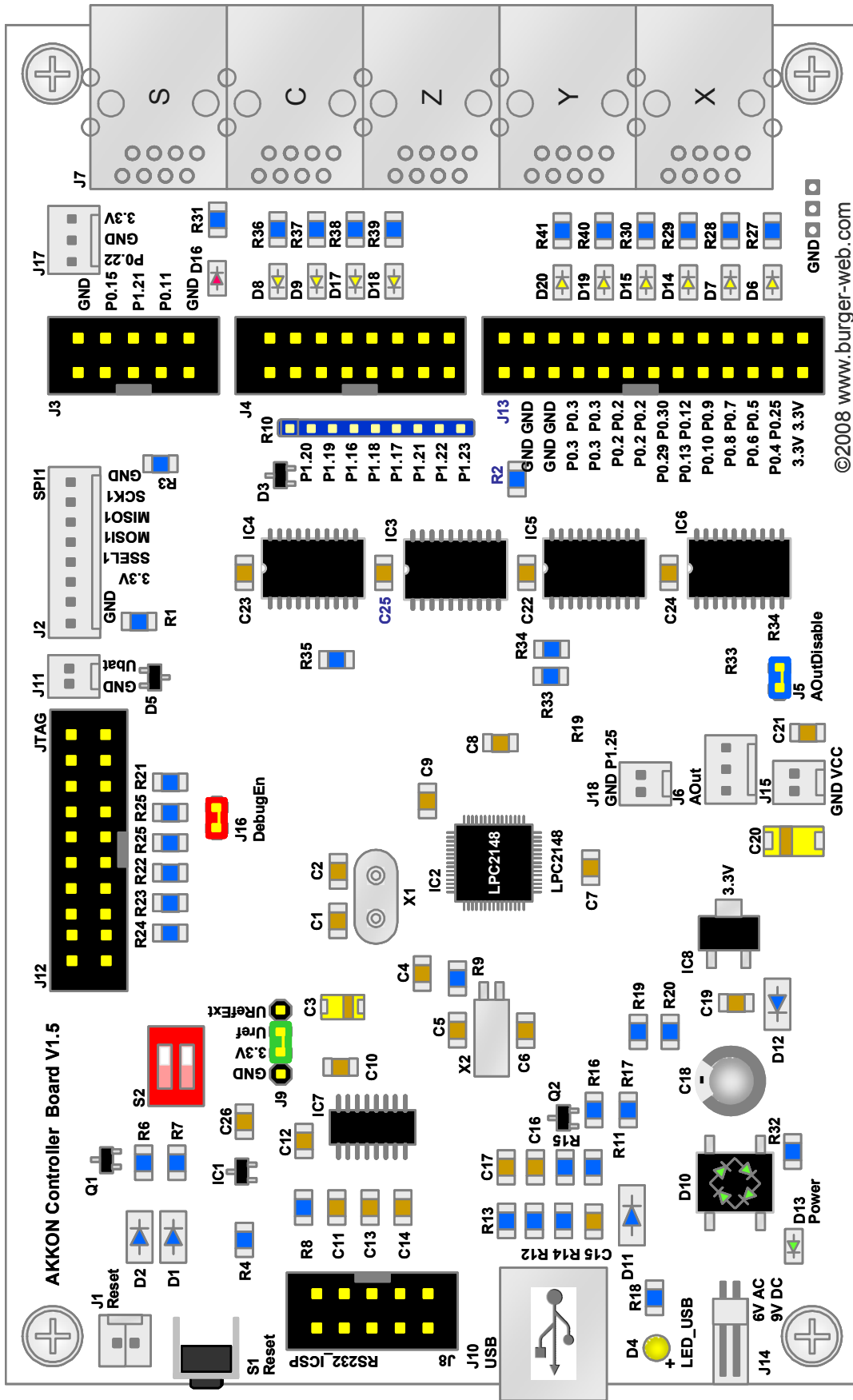
power by KICAD PCB design software
 (c)2008 Gerhard Burger
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 Based on ARM7 LPC2148
 Title: AKKON USB CNC Controller Board V1.5
 Size: A3 Date: 17 jun 2008 Rev:
 KiCad E.D.A. EESchema (2007-11-29-c) Sheet: 1/1

Part list
AKKON USB Controller Board V1.5

No.	Count	Value	Case	Description	Designator
1	5	RJ45	RJ45	ETHERNET1X5	J7
2	1	USB Type B	USB Type B	connector	J10
3	2	IDC10	IDC10	Connector 10	J3, J8
4	1	IDC16	IDC16	Connector 16	J4
5	1	IDC20	IDC20	connector	J12
6	1	IDC26	IDC26	connector	J13
7	4	PSS2G	PSS2G	connector	J1, J11, J15, J18
8	1	PSS2W	PSS2W	connector	J14
9	1	PSS2W-Cable		cable for power suply	J14
10	2	PSS3G	PSS3G	connector	J6, J17
11	1	PSS8G	PSS8G	Connector 8	J2
12	1	Switch 3055	SWITCH 3055	switch	S1
13	1	Dip Switch 2*2	DIPSWITCH2	dip switch	S2
14	4	M3*8		screw	optional
15	4	distance part M3*10mm			optional
16	2	SIP2	SIP2	AOutDisable	J5, J16
17	1	SIP4	SIP4	connector	J9
18	3	Jumper		Jumper	J5, J9, J16
19	1	12MHz	HC49	quarz	X1
20	1	32768Hz	OSZILLATOR3	quarz	X2
21	1	LPC2148	SOT314-2	Micro controller	IC2
22	4	74LV245 or 74HC245	SOL-20	Line driver	IC3-IC6
23	1	MAX3232CSE	SO-16	RS232 line driver	IC7
24	1	LM1117	SOT223	voltage regulator	IC8
25	1	MCP120T-315	SOT-23	Reset circuit (code SLUS)	IC1
26	1	BC847	SOT-23	transistor	Q1
27	1	BC856	SOT-23	transistor	Q2
28	1	BAS70 04	SOT-23	Schottkey diode (code 74)	D3
29	1	BAS70 05	SOT-23	Schottkey diode (code 75)	D5
30	1	BS40S	SO DIL	Diode bridge	D10
31	3	1N4148	D1206 or MELF	Diode	D1, D2, D12
32	1	SS14	DO-214	Schottkey diode	D11
33	1	Led yellow	Led	Led low currenct	LED
34	4	Led red	0805	Led red	D8, D9, D17, D18
35	8	Led green	0805	Led green	D4, D6-D7, D13-D6, D19-D20
36	1	470u/16V	radial s=3.5mm, D=8mm	Capacitor electrolytic	C18
37	6	18p	0805	Capacitor ceramic	C1, C2, C5, C6, C16, C17
38	17	100n	0805	Capacitor ceramic	C4, C7-C15, C19, C21-C26
39	1	10u/6.3V	3216 resp Case A	Capacitor tantalum	C3
40	1	47u	3528 rep. Case B	Capacitor tantalum	C20
41	10	10K	0805	resistor	R1, R8, R11, R16, R21-R26
42	4	4K7	0805	resistor	R2, R33-R35
43	1	100	0805	resistor	R3
44	3	22K	0805	resistor	R4, R5, R6
45	1	1K	0805	resistor	R7
46	1	0	0805	resistor	R9
47	1	4K7	SIP9	resistor	R10
48	2	33	0805	resistor	R12, R13
49	1	100K	0805	resistor	R14
50	1	1K5	0805	resistor	R15
51	1	3K3	0805	resistor	R17
52	1	390	0805	resistor	R18, R20
53	1	240	0805	resistor	R19
54	12	2K2 resp. 270ohm (10mA Led)	0805	resistor	R27-R32, R36-R41
55	1	Printed circuit board	Akkon Controller board		

No	Version	Date	Release notes
1	Version 1.0	29th of May 2008	first release

Date:

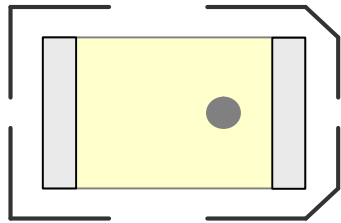


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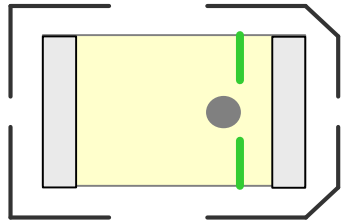
last update: 20th of June 2008

Identification of diodes

Anode  Kathode



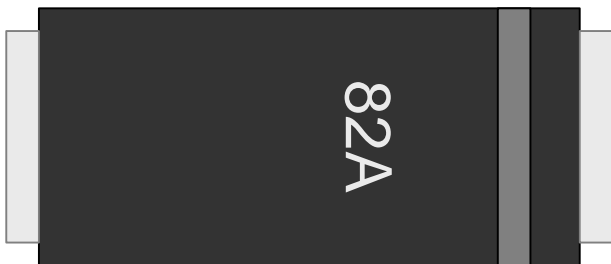
D20 etc.



D8 etc.



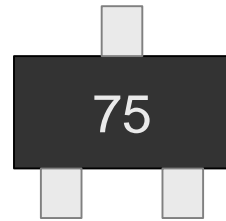
D1, D2,
D12



D11

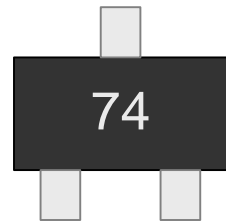


Identification of transistors, diodes and ICs



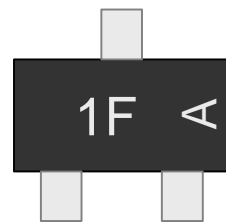
D5

BAS70-05



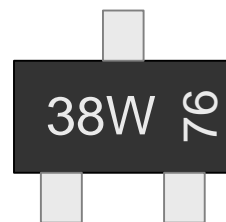
D3

BAS70-04



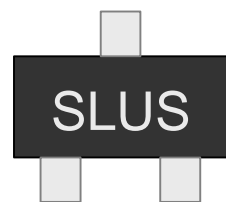
Q1

BC847



Q2

BC856



IC1

MCP120T-315



Identification of resistors

Case A: Resistors with three characters indicate a resistor with 5% tolerancy. First two characters outline the resistor value, the third one outlines the number of following zeros of the resistor value.
Example:

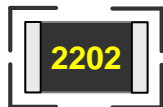


Case B: Resistors with four characters indicate a resistor with 1% tolerancy. First three numbers outline the resistor value. The fourth number outlines the number of following zeros of the resistor value.

Case C: Exception, resistors with character R: R indicates the decimal point



resistor, 5% tolerance, $47 * 10 \exp(0) = 470\text{ohm}$ (Case A)



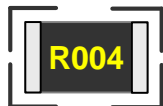
resistor, 1% tolerance, $220 * 10 \exp(2) = 22\text{Kohm}$ (Case B)



resistor, 33,0ohm (Case C)



resistor, 0,47ohm (Case C)



resistor 0,004ohm (Case C)



resistor 4,7ohm (Case C)

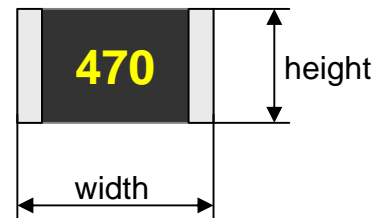
Size of resistors:

first two values indicate width in mil, last two values height in mil (1mil = 0.254mm = [1Inch/1000])

Examples:

Size 1206 Width: 12mil, Height: 06mil = 3.2mm * 1.52mm

Size 0805 Width: 08mil, Height: 05mil = 2.0mm * 1.27mm



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