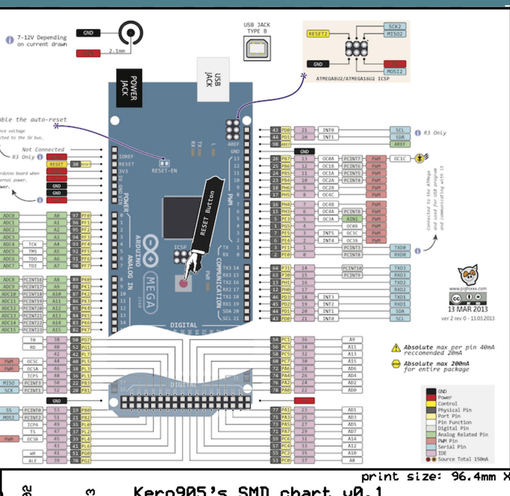
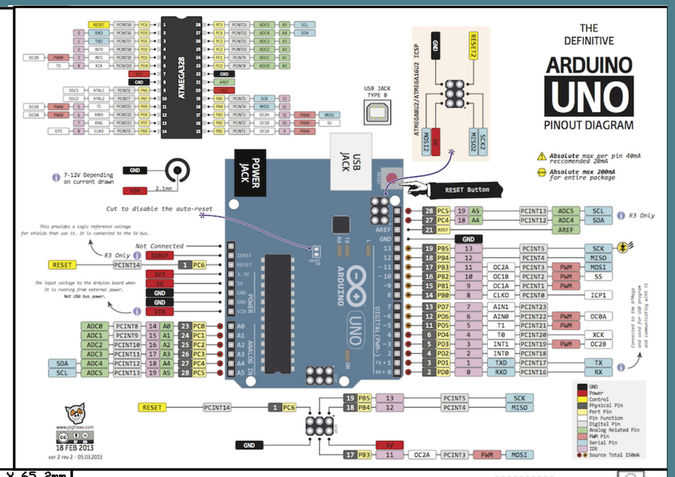
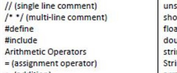
Color	Band 1	Band 2	Band 3	Multiplier	Tolerance
Black	0	0	0	10e0	
Brown	1	1	1	10e1	1.00%
Red	2	2	2	10e2	2.00%
Orange	3	3	3	10e3	3.00%
Yellow	4	4	4	10e4	4.00%
Green	5	5	5	10e5	0.50%
Blue	6	6	6	10e6	0.25%
Violet	7	7	7	10e7	0.10%
Grey	8	8	8	10e8	0.05%
White	9	9	9	10e9	
Gold				10e-1	5.00%
Silver				10e-2	10.00%
No band					20.00%





- 3-Terminal Regulators
- Output Current up to 1.5 A
- Internal Thermal-Overload Protection
- High Power-Dissipation Capability
- Internal Short-Circuit Current Limiting
- Output Transistor Safe-Area Compensation

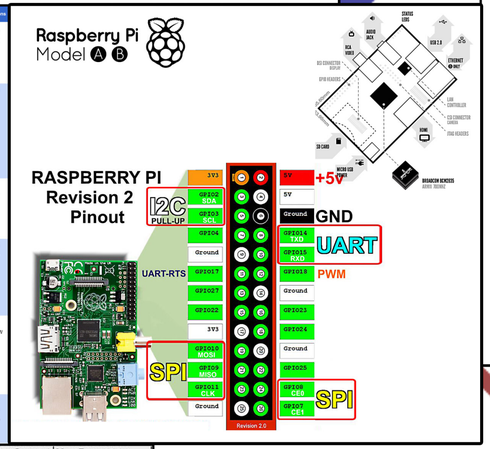
KC (TO-220) PACKAGE (TOP VIEW)

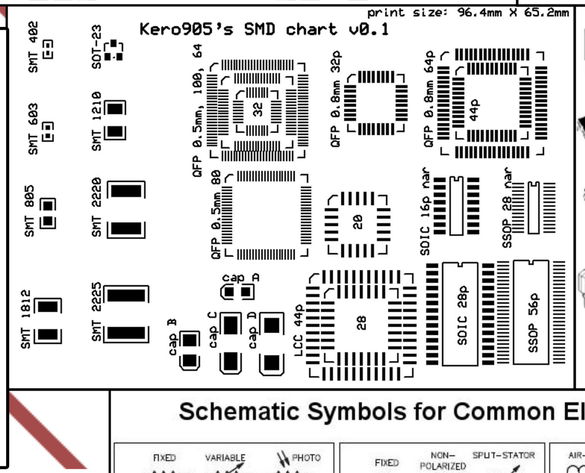


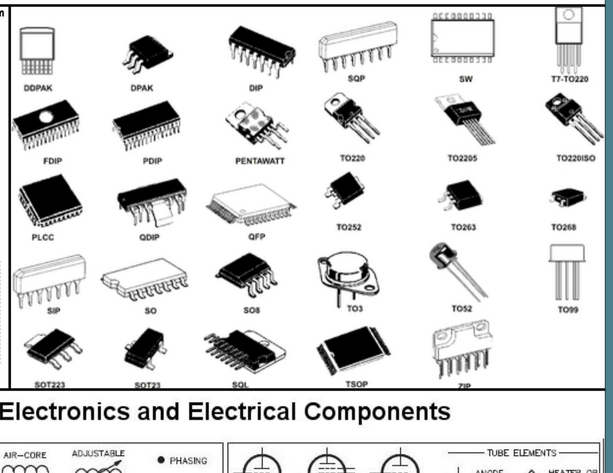
KCS (TO-220) PACKAGE (TOP VIEW)

KTE PACKAGE (TOP VIEW)

PARAMETER	TEST CONDITIONS		T_J†	μA7805C MIN	TYP	MAX	UNIT
Output voltage	I_O = 5 mA to 1 A, P_O ≤ 15 W	V_I = 7 V to 20 V,	25°C	4.8	5	5.2	V
			0°C to 125°C	4.75		5.25	
Input voltage regulation	V_I = 7 V to 25 V		25°C		3	100	mV
	V_I = 8 V to 12 V				1	50	
Ripple rejection	V_I = 8 V to 18 V,	f = 120 Hz	0°C to 125°C	62	78		dB
Output voltage regulation	I_O = 5 mA to 1.5 A		25°C		15	100	mV
	I_O = 250 mA to 750 mA				5	50	
Output resistance	f = 1 kHz		0°C to 125°C		0.017		Ω
Temperature coefficient of output voltage	I_O = 5 mA		0°C to 125°C		–1.1		mV/°C
Output noise voltage	f = 10 Hz to 100 kHz		25°C		40		μV
Dropout voltage	I_O = 1 A		25°C		2		V
Bias current			25°C		4.2	8	mA
Bias current change	V_I = 7 V to 25 V		0°C to 125°C			1.3	mA
	I_O = 5 mA to 1 A					0.5	
Short-circuit output current			25°C		750		mA
Peak output current			25°C		2.2		A







Most Common Name	Other Common Names	IEC Name	ANSI/NEDA Name	Typical Capacity (mAh)	Nominal Voltage (V)	Shape	Terminal Layout	Dimensions
AAA	Micro Microlight MN2400 MX2400	LR03 (alkaline) R03 (carbon-zinc) FR03 (Li-FeS2)	24A (alkaline) 24D (carbon-zinc) 24LF (Li-FeS2)	1200 (alkaline) 540 (carbon-zinc) 800-1000 (Ni-MH)	1.5 1.2 (NiMH and NiCd)	Cylinder	• Nub cylinder end • Flat opposite end	L 44.5 mm D 10.5 mm
AA	Pencil-sized Penlight Mignon MN1500 MX1500 Type 316 (Soviet Union/Russia) KR15/51 (NiCd)	LR6 (alkaline) R6 (carbon-zinc) FR6 (Lithium-FeS2) HR6 (NiMH) ZR6 (Ni-Mn)	15A (alkaline) 15D (carbon-zinc) 15LF (Lithium-FeS2) 1.2vAD (NiMH) 1001S (NiCd)	2700 (alkaline) 1100 (carbon-zinc) 3000 (Lithium-FeS2) 1700-2900 (NiMH) 600-1000 (NiCd)	1.5 1.2 (NiMH and NiCd)	Cylinder	• Nub cylinder end • Flat opposite end	L 50.5 mm D 13.5 – 14.5 mm
C	MN1400 MX1400 Baby Type 343 (Soviet Union/Russia) KR27/50 (NiCd)	LR14 (alkaline) R14 (carbon-zinc) KR27/50 (NiCd)	14A (alkaline) 14D (carbon-zinc)	8000 (alkaline) 3800 (carbon-zinc) 4500-6000 (NiMH)	1.5 1.2 (NiMH)	Cylinder	• Nub cylinder end • Flat opposite end	L 50 mm D 26.2 mm
D	LR20 (in Britain until the 1970s) Flashlight Battery MN1300 MX1300 Mono Type 373 (Soviet Union/Russia)	LR20 (alkaline) R20 (carbon-zinc)	13A (alkaline) 13D (carbon-zinc)	12000 (alkaline) 8000 (carbon-zinc) 9000–11500 (NiMH)	1.5 1.2 (NiMH)	Cylinder	• Nub cylinder end • Flat opposite end	L 61.5 mm D 34.2 mm
9-Volt	PP3 Radio battery MN1604 Square(ish) battery Krona (Soviet Union/Russia)	6LR61 (alkaline) 6F22 (carbon-zinc) 6KR61 (NiCd)	1604A (alkaline) 1604D (carbon-zinc) 1604LC (Lithium) 7.2vK (NiMH) 1160A (NiCd)	565 (alkaline) 400 (carbon-zinc) 1200 (lithium) 175 (NiMH) 120 (NiCd) 500 (Lithium polymer rechrg)	9 7.2 (NiMH and NiCd) 8.4 (some NiMH and NiCd)	Rectangular	both small end • male clasp - female clasp	H 48.5 mm L 26.5 mmW 17.5 mm
Lantern (Spring)	Lantern 6 Volt Spring Top M908 (UK) 996 or P2996	4R25Y (alkaline) 4R25 (carbon-zinc)	908A (alkaline) 908D (carbon-zinc)	26000 (alkaline) 10500 (carbon-zinc)	6	Square	Springs Top • Corner - Center	H 115 mm L 68.2 mm W 68.2 mm

Structure	Variables	Functions
setup()	Constants	Digital I/O
loop()	HIGH | LOW	pinMode()
Control Structures	INPUT | OUTPUT| INPUT_PULLUP	digitalWrite()
if	true | false	digitalRead()
if...else	integer constants	Analog I/O
for	floating point constants	analogReference()
switch case	Data Types	analogRead()
while	void	analogWrite() - PWM
do... while	boolean	Due only
break	char	analogReadResolution()
continue	unsigned char	analogWriteResolution()
return	byte	Advanced I/O
goto	int	tone()
Further Syntax	unsigned int	noTone()
; (semicolon)	word	shiftOut()
{} (curly braces)	long	shiftIn()
// (single line comment)	unsigned long	pulseIn()
/* */ (multi-line comment)	short	Time
#define	float	millis()
#include	double	micros()
Arithmetic Operators	string - char array	delay()
= (assignment operator)	String - object	delayMicroseconds()
+ (addition)	array	Math
- (subtraction)	Conversion	min()
* (multiplication)	char()	max()
/ (division)	byte()	abs()
% (modulo)	int()	constrain()
Comparison Operators	word()	map()
== (equal to)	long()	pow()
!= (not equal to)	float()	sqrt()
< (less than)	Variable Scope & Qualifiers	Trigonometry
> (greater than)	variable scope	sin()
<= (less than or equal to)	static	cos()
>= (greater than or equal to)	volatile	tan()
Boolean Operators	const	Random Numbers
&& (and)	Utilities	randomSeed()
|| (or)	sizeof()	random()
! (not)		Bits and Bytes
Pointer Access Operators		lowByte()
* dereference operator		highByte()
& reference operator		bitRead()
Bitwise Operators		bitWrite()
& (bitwise and)		bitSet()
| (bitwise or)		bitClear()
^ (bitwise xor)		bit()
~ (bitwise not)		External Interrupts
<< (bitshift left)		attachInterrupt()
>> (bitshift right)		detachInterrupt()
Compound Operators		Interrupts
++ (increment)		interrupts()
-- (decrement)		noInterrupts()
+= (compound addition)		Communication
-= (compound subtraction)		Serial
*= (compound multiplication)		Stream
/= (compound division)		USB (Leonardo and Due only)
&= (compound bitwise and)		Keyboard
|= (compound bitwise or)		Mouse

AWG	Diameter [inches]	Diameter [mm]	Area [mm²]	Resistance [Ohms / 1000 ft]	Resistance [Ohms / km]	Max Current [Amperes]	Max Frequency for 100% skin depth
0000 (4/0)	0.46	11.684	107	0.049	0.16072	302	125 Hz
000 (3/0)	0.4096	10.40384	85	0.0618	0.202704	239	160 Hz
00 (2/0)	0.3648	9.26592	67.4	0.0779	0.255512	190	200 Hz
0 (1/0)	0.3249	8.25246	53.5	0.0983	0.322424	150	250 Hz
1	0.2893	7.34822	42.4	0.1239	0.406392	119	325 Hz
2	0.2576	6.54304	33.6	0.1563	0.512664	94	410 Hz
3	0.2294	5.82676	26.7	0.197	0.64616	75	500 Hz
4	0.2043	5.18922	21.2	0.2485	0.81508	60	650 Hz
5	0.1819	4.62026	16.8	0.3133	1.027624	47	810 Hz
6	0.162	4.1148	13.3	0.3951	1.295928	37	1100 Hz
7	0.1443	3.66522	10.5	0.4982	1.634096	30	1300 Hz
8	0.1285	3.2639	8.37	0.6282	2.060496	24	1650 Hz
9	0.1144	2.90576	6.63	0.7921	2.598088	19	2050 Hz
10	0.1019	2.58826	5.26	0.9989	3.276392	15	2600 Hz
11	0.0907	2.30378	4.17	1.26	4.1328	12	3200 Hz
12	0.0808	2.05232	3.31	1.588	5.20864	9.3	4150 Hz
13	0.072	1.8288	2.62	2.003	6.56984	7.4	5300 Hz
14	0.0641	1.62814	2.08	2.525	8.282	5.9	6700 Hz
15	0.0571	1.45034	1.65	3.184	10.44352	4.7	8250 Hz
16	0.0508	1.29032	1.31	4.016	13.17248	3.7	11 k Hz
17	0.0453	1.15062	1.04	5.064	16.60992	2.9	13 k Hz
18	0.0403	1.02362	0.823	6.385	20.9428	2.3	17 kHz
19	0.0359	0.91186	0.653	8.051	26.40728	1.8	21 kHz
20	0.032	0.8128	0.518	10.15	33.292	1.5	27 kHz
21	0.0285	0.7239	0.41	12.8	41.984	1.2	33 kHz
22	0.0254	0.64516	0.326	16.14	52.9392	0.92	42 kHz
23	0.0226	0.57404	0.258	20.36	66.7808	0.729	53 kHz
24	0.0201	0.51054	0.205	25.67	84.1976	0.577	68 kHz
25	0.0179	0.45466	0.162	32.37	106.1736	0.457	85 kHz
26	0.0159	0.40386	0.129	40.81	133.8568	0.361	107 kHz
27	0.0142	0.36068	0.102	51.47	168.8216	0.288	130 kHz
28	0.0126	0.32004	0.081	64.9	212.872	0.226	170 kHz
29	0.0113	0.28702	0.0642	81.83	268.4024	0.182	210 kHz
30	0.01	0.254	0.0509	103.2	338.496	0.142	270 kHz
31	0.0089	0.22606	0.0404	130.1	426.728	0.113	340 kHz
32	0.008	0.2032	0.032	164.1	538.248	0.091	430 kHz
33	0.0071	0.18034	0.0254	206.9	678.632	0.072	540 kHz
34	0.0063	0.16002	0.0201	260.9	855.752	0.056	690 kHz
35	0.0056	0.14224	0.016	329	1079.12	0.044	870 kHz
36	0.005	0.127	0.0127	414.8	1360	0.035	1100 kHz
37	0.0045	0.1143	0.01	523.1	1715	0.0289	1350 kHz
38	0.004	0.1016	0.00797	659.6	2163	0.0228	1750 kHz
39	0.0035	0.0889	0.00632	831.8	2728	0.0175	2250 kHz
40	0.0031	0.07874	0.00501	1049	3440	0.0137	2900 kHz

PCB Trace Width		Temperature Rise = 10 deg C	
Thickness = 1 oz/ft^2		Trace Length = 1 inch	
	Internal Layer		
Current	Trace Width(mil)	Resistance	Vdrop
0.01	0.0536	9.41	0.0941
0.1	1.28	0.393	0.0393
0.25	4.55	0.111	0.0278
0.5	11.8	0.0427	0.0213
0.75	20.7	0.0244	0.0183
1	30.8	0.0164	0.0164
1.5	53.8	0.00938	0.0141
2	80	0.00631	0.0126
5	283	0.00178	0.00891
	External Layer		
Current	Trace Width(mil)	Resistance	Vdrop
0.01	0.0206	24.5	0.245
0.1	0.494	1.02	0.102
0.25	1.75	0.289	0.0722
0.5	4.55	0.111	0.0555
0.75	7.95	0.0635	0.0476
1	11.8	0.0427	0.0427
1.5	20.7	0.0244	0.0366
2	30.8	0.0164	0.0328
5	109	0.00464	0.0232