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LAMPIRAN I

LEMBAR PLAGIAT

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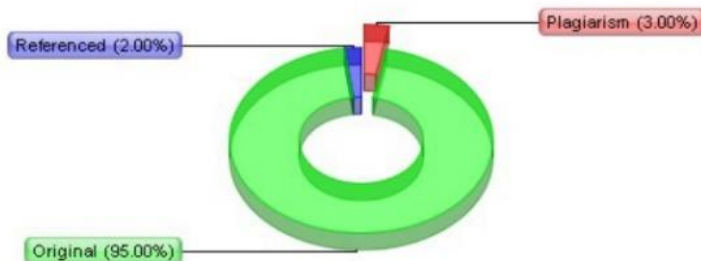
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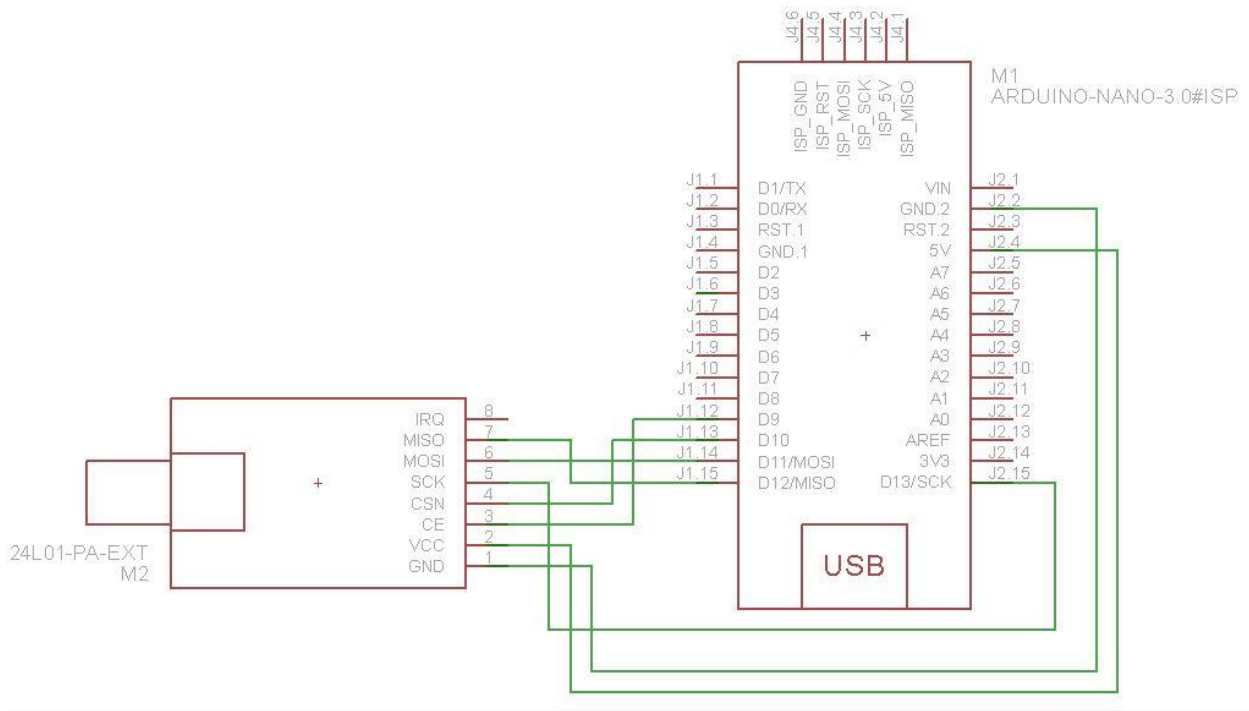
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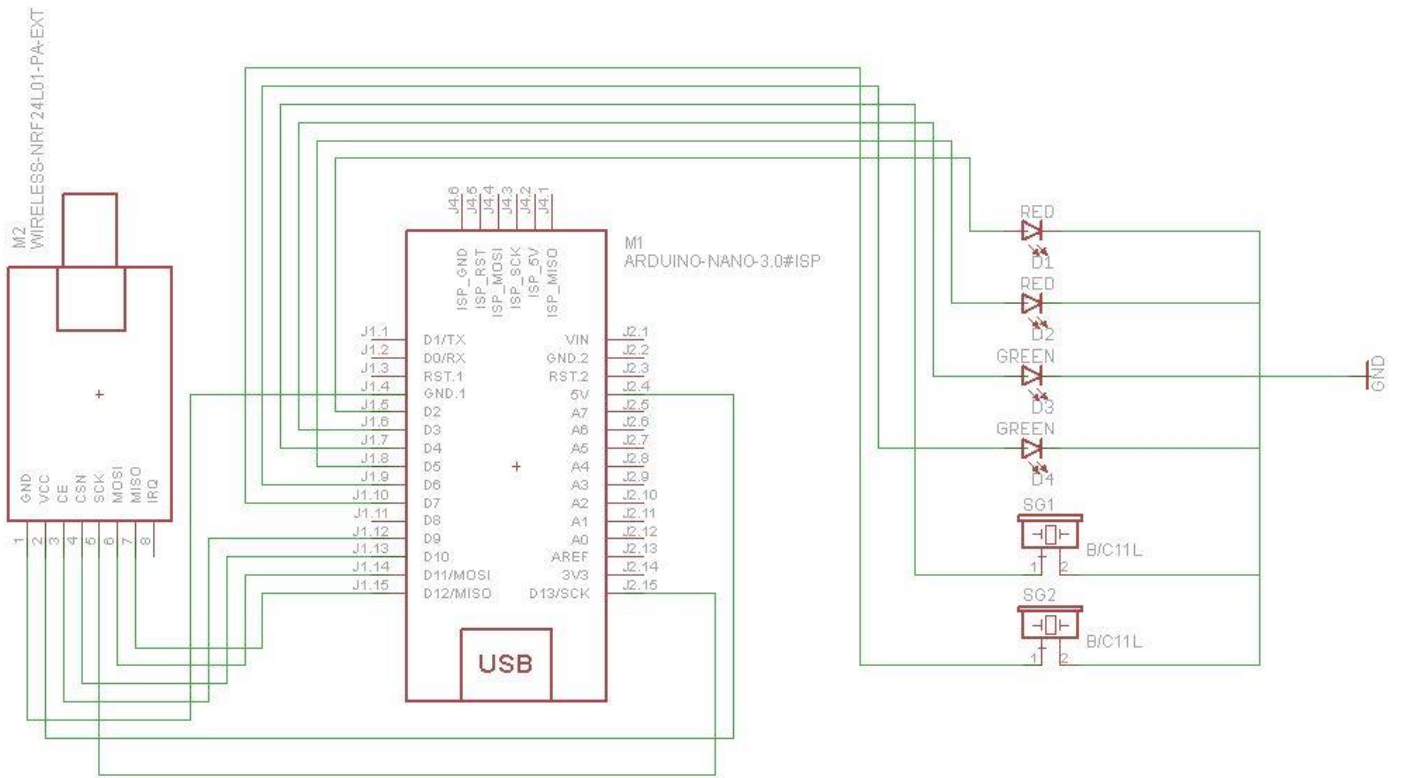
## RANGKAIAN KESELURUHAN

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# Rangkaian Pengirim



# Rangkaian Penerima



---

# LAMPIRAN III

*SOURCE CODE* PROGRAM

ARDUINO NANO

---

## Source Code Pengirim

```
#include <SPI.h>

#include <nRF24L01.h>

#include <RF24.h>

RF24 radio(9, 10); // CE, CSN

const byte address[6] = "00001";

void setup() {
  Serial.begin(9600);
  radio.begin();
  radio.setDataRate(RF24_1MBPS);
  radio.openWritingPipe(address);
  radio.setPALevel(RF24_PA_MIN);
  radio.setChannel(12);
  radio.stopListening();
}

void loop()
{
  const char text[] = "awas";
  radio.write(&text, sizeof(text));
  Serial.println(text);
  delay(500);
}
```

## Source Code Penerima

```
#include <SPI.h>
#include <nRF24L01.h>
#include <RF24.h>

RF24 radio(9, 10); // CE, CSN
const byte address[6] = "00001";
int ledred = 3;
int ledijo = 2;
int buzer = 4;
int buzer2 = 7;
int ledijo2 = 5;
int kuning = 6;

void setup() {
  pinMode(ledred, OUTPUT);
  pinMode(ledijo, OUTPUT);
  pinMode(buzer, OUTPUT);
  pinMode(buzer2, OUTPUT);
  pinMode(ledijo2, OUTPUT);
  pinMode(kuning, OUTPUT);
  Serial.begin(9600);
  radio.begin();
  radio.setDataRate(RF24_1MBPS);
  radio.openReadingPipe(1, pipes[1]);
  radio.setPALevel(RF24_PA_MIN);
  radio.setChannel(12);
  radio.startListening();
}

void loop()
```



```
{
if (radio.available())
{
digitalWrite(kuning, HIGH);
digitalWrite(ledred, HIGH);
digitalWrite(buzer, HIGH);
digitalWrite(buzer2, LOW);
delay(1000);
digitalWrite(kuning, LOW);
digitalWrite(ledred, LOW);
digitalWrite(buzer, LOW);
digitalWrite(buzer2, HIGH);
delay(1000);
digitalWrite(ledijo, LOW);
digitalWrite(ledijo2, LOW);
char text[32] = " ";
receive.read(&text, sizeof(text));
Serial.println(text);
}
else
{
digitalWrite(ledijo, HIGH);
digitalWrite(ledijo2, HIGH);
digitalWrite(ledred, LOW);
digitalWrite(buzer, LOW);
digitalWrite(buzer2, LOW);
delay(1000);
}
}
```

---

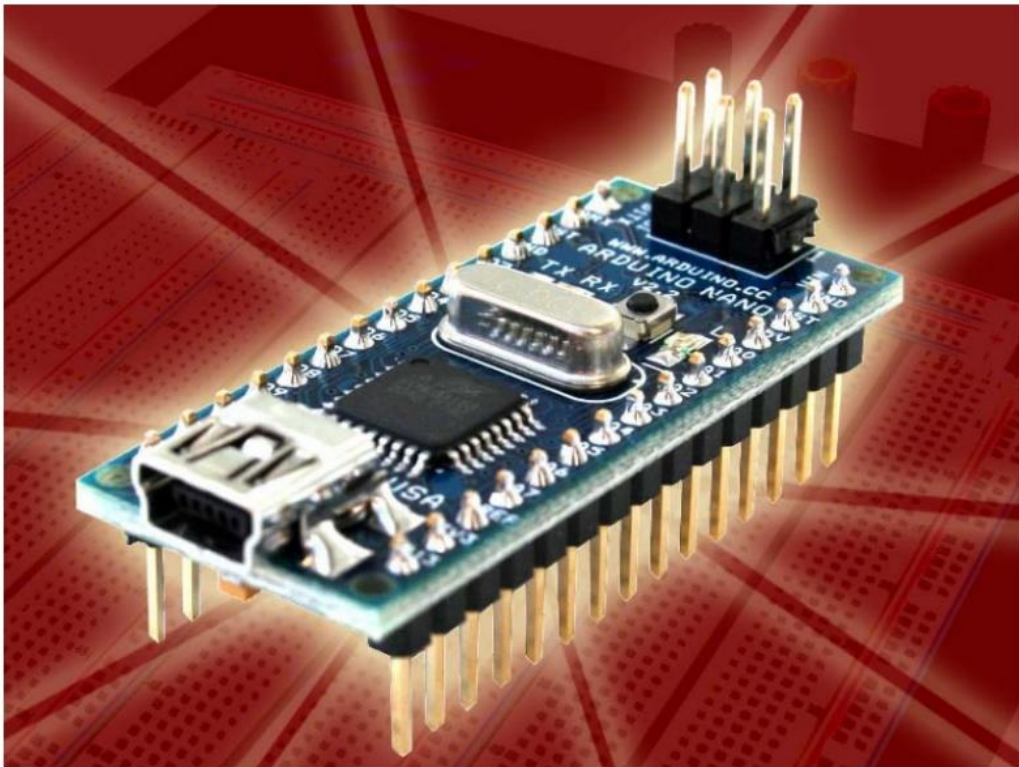
# LAMPIRAN IV

## *DATASHEET* ARDUINO NANO

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# *Arduino Nano (V2.3)*

## *User Manual*



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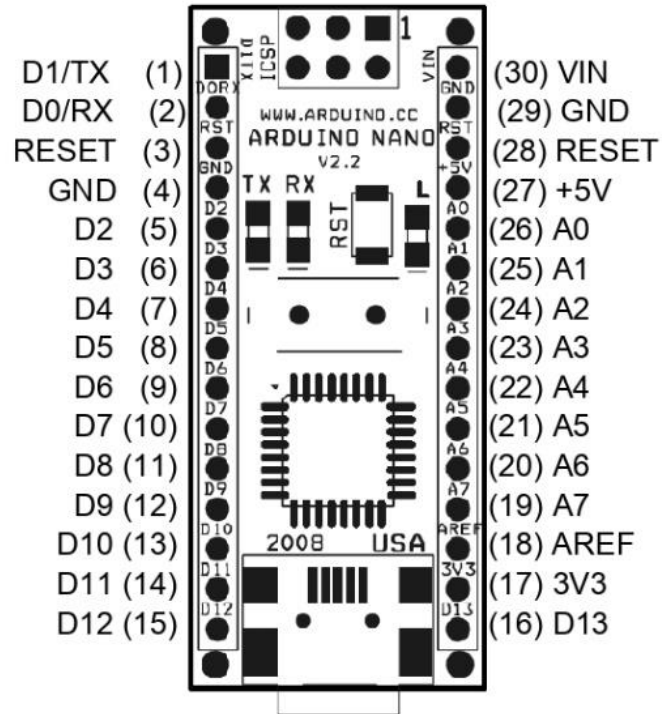
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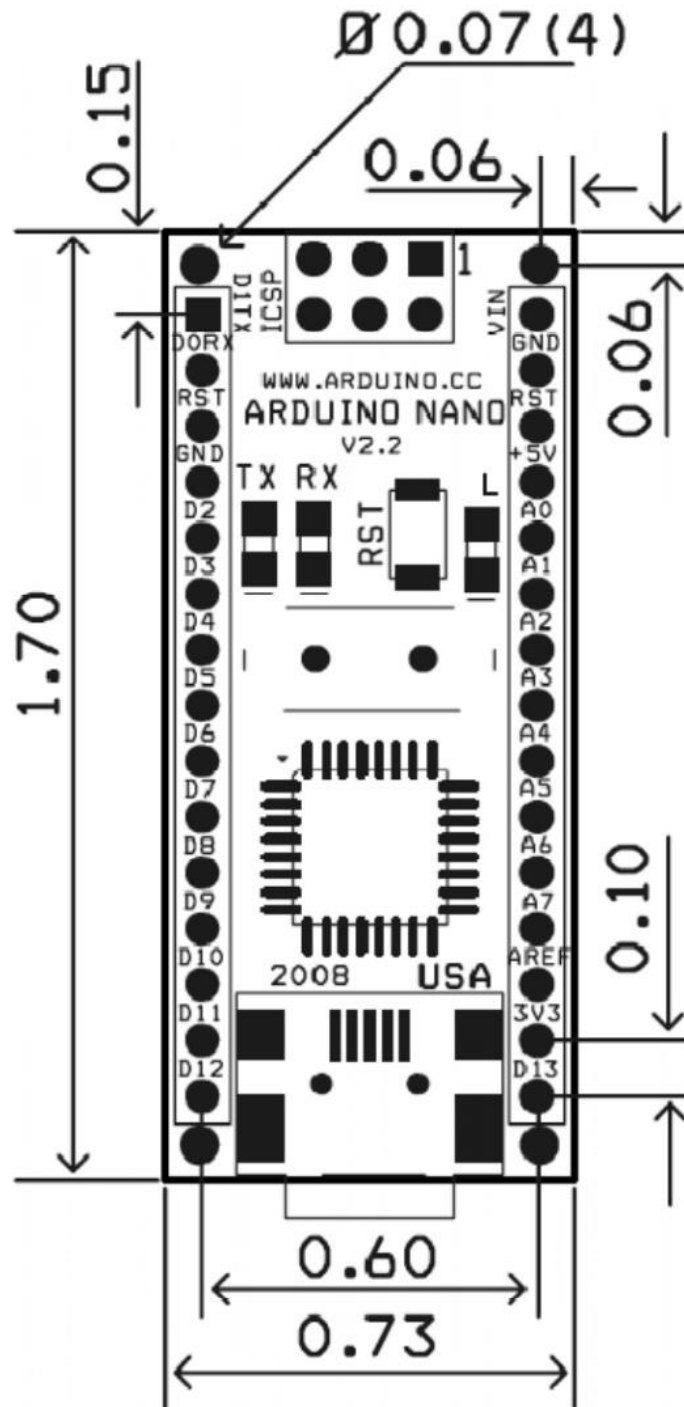
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## Arduino Nano Pin Layout



Pin No.	Name	Type	Description
1-2, 5-16	D0-D13	I/O	Digital input/output port 0 to 13
3, 28	RESET	Input	Reset (active low)
4, 29	GND	PWR	Supply ground
17	3V3	Output	+3.3V output (from FTDI)
18	AREF	Input	ADC reference
19-26	A7-A0	Input	Analog input channel 0 to 7
27	+5V	Output or Input	+5V output (from on-board regulator) or +5V (input from external power supply)
30	VIN	PWR	Supply voltage

Arduino Nano Mechanical Drawing



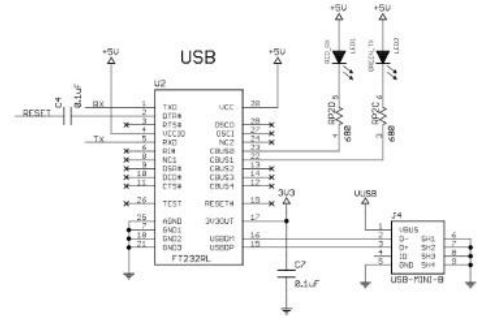
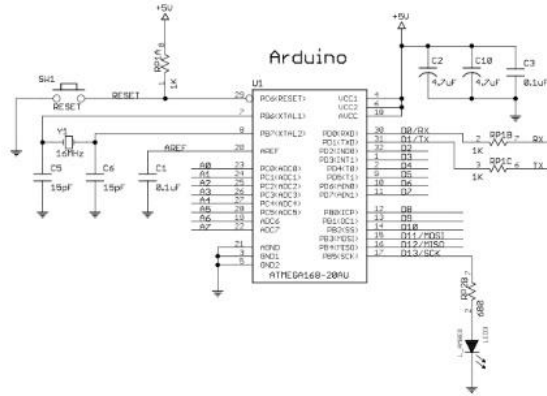
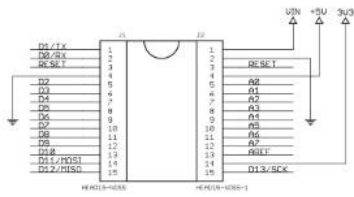
ALL DIMENSIONS ARE IN INCHES

**Arduino Nano Bill of Material**

Item Number	Qty.	Ref. Dest.	Description	Mfg. P/N	MFG	Vendor P/N	Vendor
1	5	C1,C3,C4,C7,C9	Capacitor, 0.1uF 50V 10% Ceramic X7R 0805	C0805C104K5RACTU	Kemet	80-C0805C104K5R	Mouser
2	3	C2,C8,C10	Capacitor, 4.7uF 10V 10% Tantalum Case A	T491A475K010AT	Kemet	80-T491A475K010	Mouser
3	2	C5,C6	Capacitor, 18pF 50V 5% Ceramic NOP/COG 0805	C0805C180J5GACTU	Kemet	80-C0805C180J5G	Mouser
4	1	D1	Diode, Schottky 0.5A 20V	MBR0520LT1G	ONsemi	863-MBR0520LT1G	Mouser
5	1	J1,J2	Headers, 36PS 1 Row	68000-136HLF	FCI	649-68000-136HLF	Mouser
6	1	J4	Connector, Mini-B Recept Rt. Angle	67503-1020	Molex	538-67503-1020	Mouser
7	1	J5	Headers, 72PS 2 Rows	67996-272HLF	FCI	649-67996-272HLF	Mouser
8	1	LD1	LED, Super Bright RED 100mcd 640nm 120degree 0805	APT2012SRCPRV	Kingbright	604-APT2012SRCPRV	Mouser
9	1	LD2	LED, Super Bright GREEN 50mcd 570nm 110degree 0805	APHCM2012CGCK-F01	Kingbright	604-APHCM2012CGCK	Mouser
10	1	LD3	LED, Super Bright ORANGE 160mcd 601nm 110degree 0805	APHCM2012SECK-F01	Kingbright	04-APHCM2012SECK	Mouser
11	1	LD4	LED, Super Bright BLUE 80mcd 470nm 110degree 0805	LTST-C170TBKT	Lite-On Inc	160-1579-1-ND	Digikey
12	1	R1	Resistor Pack, 1K +/-5% 62.5mW 4RES SMD	YC164-JR-071KL	Yageo	YC164J-1.0KCT-ND	Digikey
13	1	R2	Resistor Pack, 680 +/-5% 62.5mW 4RES SMD	YC164-JR-07680RL	Yageo	YC164J-680CT-ND	Digikey
14	1	SW1	Switch, Momentary Tact SPST 150gf 3.0x2.5mm	B3U-1000P	Omron	SW1020CT-ND	Digikey
15	1	U1	IC, Microcontroller RISC 16kB Flash, 0.5kB EEPROM, 23 I/O Pins	ATmega168-20AU	Atmel	556-ATMEGA168-20AU	Mouser
16	1	U2	IC, USB to SERIAL UART 28 Pins SSOP	FT232RL	FTDI	895-FT232RL	Mouser
17	1	U3	IC, Voltage regulator 5V, 500mA SOT-223	UA78M05CDCYRG3	TI	595-UA78M05CDCYRG3	Mouser
18	1	Y1	Cystal, 16MHz +/-20ppm HC-49/US Low Profile	ABL-16.000MHZ-B2	Abracon	815-ABL-16-B2	Mouser

# Arduino Nano Schematic

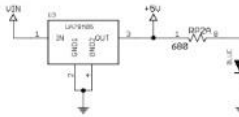
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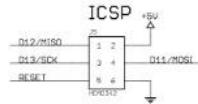
## +5V AREF OPTION



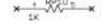
## +5V REG



## +5V AUTO SELECTOR



## NOT USED



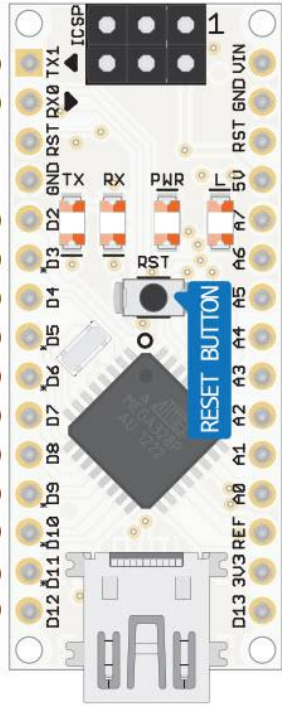
v2,3 - Modify FT232RL to use +5V	
TITLE: Arduino Nano	
Document Number:	REV: 2.3
Date: 6/26/2008 8:35:54 PM	Sheet: 1/1

1  
0

PCINT17 TXD PD1 31  
PCINT16 RXD PD0 30  
PCINT14 RESET PC6 29  
GND

2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12

PCINT18 INT0 PD2 32  
OC2B PCINT19 INT1 PD3 1  
XCK PCINT20 T0 PD4 2  
OC0B PCINT21 T1 PD5 9  
OC0A PCINT22 AIN0 PD6 10  
PCINT23 AIN1 PD7 11  
ICP1 PCINT0 CLK0 PB0 12  
PCINT1 OC1A PB1 13  
SS PCINT2 OC1B PB2 14  
MOSI PCINT3 OC2 PB3 15  
MISO PCINT4 PB4 16



VIN  
GND  
29 PC6 RESET PCINT14  
5V  
22 ADC7  
19 ADC6  
28 PC5 PCINT13 ADC5 SCL  
27 PC4 PCINT12 ADC4 SDA  
26 PC3 PCINT11 ADC3  
25 PC2 PCINT10 ADC2  
24 PC1 PCINT9 ADC1  
23 PC0 PCINT8 ADC0  
21 AREF  
3V3  
17 PB5 PCINT5 SCK

A7  
A6  
19 A5  
18 A4  
17 A3  
16 A2  
15 A1  
14 A0

13



---

# LAMPIRAN V

*DATASHEET MODULE*

*WIRELESS NRF24L01*

---

# Single chip 2.4 GHz Transceiver

# nRF24L01

## FEATURES

- True single chip GFSK transceiver
- Complete OSI Link Layer in hardware
- Enhanced ShockBurst™
- Auto ACK & retransmit
- Address and CRC computation
- On the air data rate 1 or 2Mbps
- Digital interface (SPI) speed 0-8 Mbps
- 125 RF channel operation
- Short switching time enable frequency hopping
- Fully RF compatible with nRF24XX
- 5V tolerant signal input pads
- 20-pin package (QFN20 4x4mm)
- Uses ultra low cost +/- 60 ppm crystal
- Uses low cost chip inductors and 2-layer PCB
- Power supply range: 1.9 to 3.6 V

## APPLICATIONS

- Wireless mouse, keyboard, joystick
- Keyless entry
- Wireless data communication
- Alarm and security systems
- Home automation
- Surveillance
- Automotive
- Telemetry
- Intelligent sports equipment
- Industrial sensors
- Toys

## GENERAL DESCRIPTION

nRF24L01 is a single chip radio transceiver for the world wide 2.4 - 2.5 GHz ISM band. The transceiver consists of a fully integrated frequency synthesizer, a power amplifier, a crystal oscillator, a demodulator, modulator and Enhanced ShockBurst™ protocol engine. Output power, frequency channels, and protocol setup are easily programmable through a SPI interface. Current consumption is very low, only 9.0mA at an output power of -6dBm and 12.3mA in RX mode. Built-in Power Down and Standby modes makes power saving easily realizable.

## QUICK REFERENCE DATA

Parameter	Value	Unit
Minimum supply voltage	1.9	V
Maximum output power	0	dBm
Maximum data rate	2000	kbps
Supply current in TX mode @ 0dBm output power	11.3	mA
Supply current in RX mode @ 2000 kbps	12.3	mA
Temperature range	-40 to +85	°C
Sensitivity @ 1000 kbps	-85	dBm
Supply current in Power Down mode	900	nA

Table 1 nRF24L01 quick reference data



**nRF24L01 Single Chip 2.4 GHz Radio Transceiver**

Type Number	Description	Version
nRF24L01	20 pin QFN 4x4, RoHS & SS-00259 compliant	D
nRF24L01 IC	Bare Dice	D
nRF24L01-EVKIT	Evaluation kit (2 test PCB, 2 configuration PCB, SW)	1.0

Table 2 nRF24L01 ordering information

**BLOCK DIAGRAM**

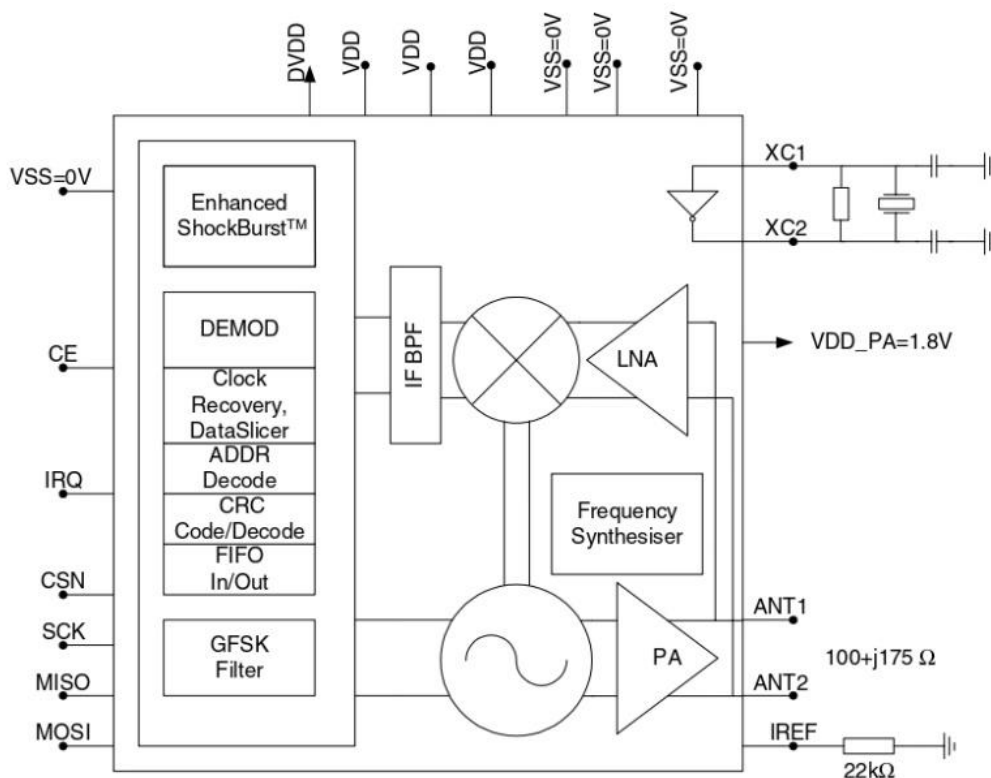


Figure 1 nRF24L01 with external components.



**PIN FUNCTIONS**

Pin	Name	Pin function	Description
1	CE	Digital Input	Chip Enable Activates RX or TX mode
2	CSN	Digital Input	SPI Chip Select
3	SCK	Digital Input	SPI Clock
4	MOSI	Digital Input	SPI Slave Data Input
5	MISO	Digital Output	SPI Slave Data Output, with tri-state option
6	IRQ	Digital Output	Maskable interrupt pin
7	VDD	Power	Power Supply (+3V DC)
8	VSS	Power	Ground (0V)
9	XC2	Analog Output	Crystal Pin 2
10	XC1	Analog Input	Crystal Pin 1
11	VDD_PA	Power Output	Power Supply (+1.8V) to Power Amplifier
12	ANT1	RF	Antenna interface 1
13	ANT2	RF	Antenna interface 2
14	VSS	Power	Ground (0V)
15	VDD	Power	Power Supply (+3V DC)
16	IREF	Analog Input	Reference current
17	VSS	Power	Ground (0V)
18	VDD	Power	Power Supply (+3V DC)
19	DVDD	Power Output	Positive Digital Supply output for de-coupling purposes
20	VSS	Power	Ground (0V)

Table 3 nRF24L01 pin function

**PIN ASSIGNMENT**

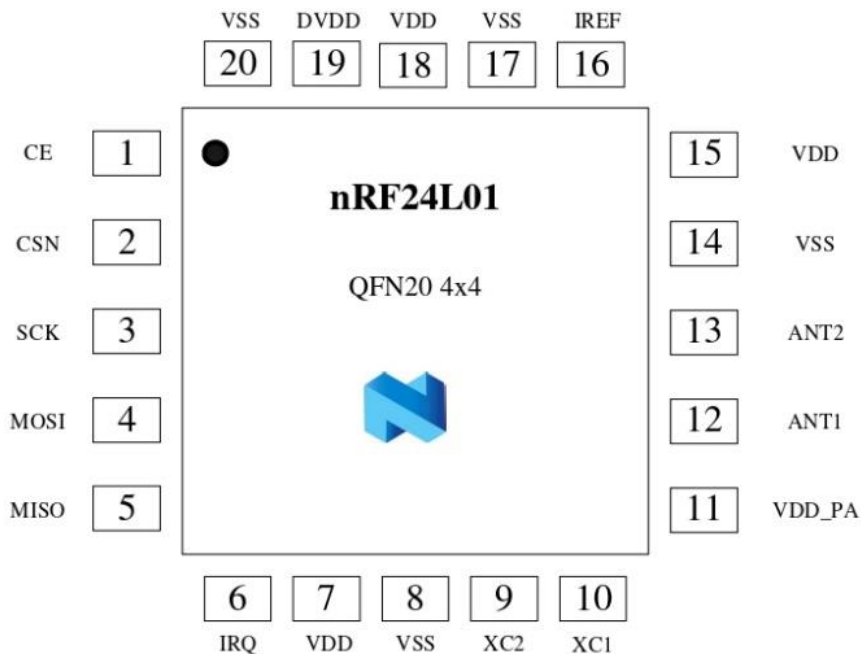


Figure 2 nRF24L01 pin assignment (top view) for a QFN20 4x4 package.



## ELECTRICAL SPECIFICATIONS

Conditions: VDD = +3V, VSS = 0V, T<sub>A</sub> = -40°C to +85°C

Symbol	Parameter (condition)	Notes	Min.	Typ.	Max.	Units
<b>Operating conditions</b>						
VDD	Supply voltage		1.9	3.0	3.6	V
TEMP	Operating Temperature		-40	+27	+85	°C
<b>Digital input pin</b>						
V <sub>IH</sub>	HIGH level input voltage	<sup>1</sup>	0.7VDD		5.25	V
V <sub>IL</sub>	LOW level input voltage		VSS		0.3VDD	V
<b>Digital output pin</b>						
V <sub>OH</sub>	HIGH level output voltage (I <sub>OH</sub> =-0.25mA)		VDD-0.3		VDD	V
V <sub>OL</sub>	LOW level output voltage (I <sub>OL</sub> =0.25mA)		VSS		0.3	V
<b>General RF conditions</b>						
f <sub>OP</sub>	Operating frequency	<sup>2</sup>	2400		2525	MHz
f <sub>XTAL</sub>	Crystal frequency			16		MHz
Δf <sub>1M</sub>	Frequency deviation @ 1000kbps			±160		kHz
Δf <sub>2M</sub>	Frequency deviation @ 2000kbps			±320		kHz
R <sub>GFSK</sub>	Data rate ShockBurst™		>0		2000	kbps
F <sub>CHANNEL</sub>	Channel spacing @ 1000kbps			1		MHz
F <sub>CHANNEL</sub>	Channel spacing @ 2000kbps			2		MHz
<b>Transmitter operation</b>						
P <sub>RF</sub>	Maximum Output Power	<sup>3</sup>		0	+4	dBm
P <sub>RFC</sub>	RF Power Control Range		16	18	20	dB
P <sub>RFCR</sub>	RF Power Accuracy				±4	dB
P <sub>BW</sub>	20dB Bandwidth for Modulated Carrier (2000kbps)			1800	2000	kHz
P <sub>RF1</sub>	1 <sup>st</sup> Adjacent Channel Transmit Power 2MHz				-20	dBm
P <sub>RF2</sub>	2 <sup>nd</sup> Adjacent Channel Transmit Power 4MHz				-50	dBm
I <sub>VDD</sub>	Supply current @ 0dBm output power	<sup>4</sup>		11.3		mA
I <sub>VDD</sub>	Supply current @ -18dBm output power			7.0		mA
I <sub>VDD</sub>	Average Supply current @ -6dBm output power, Enhanced ShockBurst™	<sup>5</sup>		0.05		mA
I <sub>VDD</sub>	Supply current in Standby-I mode	<sup>6</sup>		32		μA
I <sub>VDD</sub>	Supply current in power down			900		nA

<sup>1</sup> All digital inputs handle up to 5.25V signal inputs. Keep in mind that the VDD of the nRF24L01 must match the V<sub>IH</sub> of the driving device for output pins.

<sup>2</sup> Usable band is determined by local regulations

<sup>3</sup> Antenna load impedance = 15Ω+j88Ω

<sup>4</sup> Antenna load impedance = 15Ω+j88Ω. Effective data rate 1000kbps or 2000 kbps

<sup>5</sup> Antenna load impedance = 15Ω+j88Ω. Effective data rate 10kbps and full packets

<sup>6</sup> Given for a 12pF crystal. Current when using external clock is dependent on signal swing.





Receiver operation						
$I_{VDD}$	Supply current one channel 2000kbps			12.3		mA
$I_{VDD}$	Supply current one channel 1000kbps			11.8		mA
$RX_{SENS}$	Sensitivity at 0.1%BER (@2000kbps)			-82		dBm
$RX_{SENS}$	Sensitivity at 0.1%BER (@1000kbps)			-85		dBm
$C/I_{CO}$	C/I Co-channel (@2000kbps)	<sup>7</sup>		$7^8/11^9$		dB
$C/I_{1ST}$	1 <sup>st</sup> Adjacent Channel Selectivity C/I 2MHz			1/4		dB
$C/I_{2ND}$	2 <sup>nd</sup> Adjacent Channel Selectivity C/I 4MHz			-21/-20		dB
$C/I_{3RD}$	3 <sup>rd</sup> Adjacent Channel Selectivity C/I 6MHz			-27/-27		dB
$C/I_{CO}$	C/I Co-channel (@1000kbps)	<sup>10</sup>		$9^{11}/12^{12}$		dB
$C/I_{1ST}$	1 <sup>st</sup> Adjacent Channel Selectivity C/I 1MHz			8/8		dB
$C/I_{2ND}$	2 <sup>nd</sup> Adjacent Channel Selectivity C/I 2MHz			-22/-21		dB
$C/I_{3RD}$	3 <sup>rd</sup> Adjacent Channel Selectivity C/I 3MHz			-30/-30		dB

Table 4 nRF24L01 RF specifications

<sup>7</sup> Data rate is 2000kbps for the following C/I measurements

<sup>8</sup> According to ETSI EN 300 440-1 V1.3.1 (2001-09) page 27

<sup>9</sup> nRF24L01 equal modulation on interfering signal

<sup>10</sup> Data rate is 1000kbps for the following C/I measurements

<sup>11</sup> According to ETSI EN 300 440-1 V1.3.1 (2001-09) page 27

<sup>12</sup> nRF24L01 equal modulation on interfering signal

---

# LAMPIRAN VI

## TABEL ASCII

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# ASCII Code - The extended ASCII table

ASCII stands for American Standard Code for Information Interchange. It's a 7-bit character code where every single bit represents a unique character. On this webpage you will find 8 bits, 256 characters, ASCII table according to Windows-1252 (code page 1252) which is a superset of ISO 8859-1 in terms of printable characters. In the range 128 to 159 (hex 80 to 9F), ISO/IEC 8859-1 has invisible control characters, while Windows-1252 has writable characters. Windows-1252 is probably the most-used 8-bit character encoding in the world.

## ASCII control characters (character code 0-31)

The first 32 characters in the ASCII-table are unprintable control codes and are used to control peripherals such as printers.

DEC	OCT	HEX	BIN	Symbol	HTML Number	HTML Name	Description
0	000	00	00000000	NUL	&#000;		Null char
1	001	01	00000001	SOH	&#001;		Start of Heading
2	002	02	00000010	STX	&#002;		Start of Text
3	003	03	00000011	ETX	&#003;		End of Text
4	004	04	00000100	EOT	&#004;		End of Transmission
5	005	05	00000101	ENQ	&#005;		Enquiry
6	006	06	00000110	ACK	&#006;		Acknowledgment
7	007	07	00000111	BEL	&#007;		Bell
8	010	08	00001000	BS	&#008;		Back Space
9	011	09	00001001	HT	&#009;		Horizontal Tab
10	012	0A	00001010	LF	&#010;		Line Feed
11	013	0B	00001011	VT	&#011;		Vertical Tab
12	014	0C	00001100	FF	&#012;		Form Feed
13	015	0D	00001101	CR	&#013;		Carriage Return
14	016	0E	00001110	SO	&#014;		Shift Out / X-On
15	017	0F	00001111	SI	&#015;		Shift In / X-Off
16	020	10	00010000	DLE	&#016;		Data Line Escape
17	021	11	00010001	DC1	&#017;		Device Control 1 (oft. XON)
18	022	12	00010010	DC2	&#018;		Device Control 2
19	023	13	00010011	DC3	&#019;		Device Control 3 (oft. XOFF)
20	024	14	00010100	DC4	&#020;		Device Control 4
21	025	15	00010101	NAK	&#021;		Negative Acknowledgement
22	026	16	00010110	SYN	&#022;		Synchronous Idle
23	027	17	00010111	ETB	&#023;		End of Transmit Block
24	030	18	00011000	CAN	&#024;		Cancel
25	031	19	00011001	EM	&#025;		End of Medium
26	032	1A	00011010	SUB	&#026;		Substitute
27	033	1B	00011011	ESC	&#027;		Escape
28	034	1C	00011100	FS	&#028;		File Separator
29	035	1D	00011101	GS	&#029;		Group Separator
30	036	1E	00011110	RS	&#030;		Record Separator
31	037	1F	00011111	US	&#031;		Unit Separator



## ASCII printable characters (character code 32-127)

Codes 32-127 are common for all the different variations of the ASCII table, they are called printable characters, represent letters, digits, punctuation marks, and a few miscellaneous symbols. You will find almost every character on your keyboard. Character 127 represents the command DEL

DEC	OCT	HEX	BIN	Symbol	HTML Number	HTML Name	Description
32	040	20	00100000		&#32;		Space
33	041	21	00100001	!	&#33;		Exclamation mark
34	042	22	00100010	"	&#34;	&quot;	Double quotes (or speech marks)
35	043	23	00100011	#	&#35;		Number
36	044	24	00100100	\$	&#36;		Dollar
37	045	25	00100101	%	&#37;		Per cent sign
38	046	26	00100110	&	&#38;	&amp;	Ampersand
39	047	27	00100111	'	&#39;		Single quote
40	050	28	00101000	(	&#40;		Open parenthesis (or open bracket)
41	051	29	00101001	)	&#41;		Close parenthesis (or close bracket)
42	052	2A	00101010	*	&#42;		Asterisk
43	053	2B	00101011	+	&#43;		Plus
44	054	2C	00101100	,	&#44;		Comma
45	055	2D	00101101	-	&#45;		Hyphen
46	056	2E	00101110	.	&#46;		Period, dot or full stop
47	057	2F	00101111	/	&#47;		Slash or divide
48	060	30	00110000	0	&#48;		Zero
49	061	31	00110001	1	&#49;		One
50	062	32	00110010	2	&#50;		Two
51	063	33	00110011	3	&#51;		Three
52	064	34	00110100	4	&#52;		Four
53	065	35	00110101	5	&#53;		Five
54	066	36	00110110	6	&#54;		Six
55	067	37	00110111	7	&#55;		Seven
56	070	38	00111000	8	&#56;		Eight
57	071	39	00111001	9	&#57;		Nine
58	072	3A	00111010	:	&#58;		Colon
59	073	3B	00111011	;	&#59;		Semicolon
60	074	3C	00111100	<	&#60;	&lt;	Less than (or open angled bracket)
61	075	3D	00111101	=	&#61;		Equals
62	076	3E	00111110	>	&#62;	&gt;	Greater than (or close angled bracket)
63	077	3F	00111111	?	&#63;		Question mark
64	100	40	01000000	@	&#64;		At symbol
65	101	41	01000001	A	&#65;		Uppercase A
66	102	42	01000010	B	&#66;		Uppercase B
67	103	43	01000011	C	&#67;		Uppercase C
68	104	44	01000100	D	&#68;		Uppercase D
69	105	45	01000101	E	&#69;		Uppercase E
70	106	46	01000110	F	&#70;		Uppercase F
71	107	47	01000111	G	&#71;		Uppercase G
72	110	48	01001000	H	&#72;		Uppercase H
73	111	49	01001001	I	&#73;		Uppercase I
74	112	4A	01001010	J	&#74;		Uppercase J
75	113	4B	01001011	K	&#75;		Uppercase K
76	114	4C	01001100	L	&#76;		Uppercase L
77	115	4D	01001101	M	&#77;		Uppercase M
78	116	4E	01001110	N	&#78;		Uppercase N
79	117	4F	01001111	O	&#79;		Uppercase O
80	120	50	01010000	P	&#80;		Uppercase P
81	121	51	01010001	Q	&#81;		Uppercase Q
82	122	52	01010010	R	&#82;		Uppercase R
83	123	53	01010011	S	&#83;		Uppercase S
84	124	54	01010100	T	&#84;		Uppercase T
85	125	55	01010101	U	&#85;		Uppercase U
86	126	56	01010110	V	&#86;		Uppercase V
87	127	57	01010111	W	&#87;		Uppercase W
88	130	58	01011000	X	&#88;		Uppercase X
89	131	59	01011001	Y	&#89;		Uppercase Y
90	132	5A	01011010	Z	&#90;		Uppercase Z
91	133	5B	01011011	[	&#91;		Opening bracket
92	134	5C	01011100	\	&#92;		Backslash

DEC	OCT	HEX	BIN	Symbol	HTML Number	HTML Name	Description
93	135	5D	01011101	]	&#93;		Closing bracket
94	136	5E	01011110	^	&#94;		Caret - circumflex
95	137	5F	01011111	_	&#95;		Underscore
96	140	60	01100000	˘	&#96;		Grave accent
97	141	61	01100001	a	&#97;		Lowercase a
98	142	62	01100010	b	&#98;		Lowercase b
99	143	63	01100011	c	&#99;		Lowercase c
100	144	64	01100100	d	&#100;		Lowercase d
101	145	65	01100101	e	&#101;		Lowercase e
102	146	66	01100110	f	&#102;		Lowercase f
103	147	67	01100111	g	&#103;		Lowercase g
104	150	68	01101000	h	&#104;		Lowercase h
105	151	69	01101001	i	&#105;		Lowercase i
106	152	6A	01101010	j	&#106;		Lowercase j
107	153	6B	01101011	k	&#107;		Lowercase k
108	154	6C	01101100	l	&#108;		Lowercase l
109	155	6D	01101101	m	&#109;		Lowercase m
110	156	6E	01101110	n	&#110;		Lowercase n
111	157	6F	01101111	o	&#111;		Lowercase o
112	160	70	01110000	p	&#112;		Lowercase p
113	161	71	01110001	q	&#113;		Lowercase q
114	162	72	01110010	r	&#114;		Lowercase r
115	163	73	01110011	s	&#115;		Lowercase s
116	164	74	01110100	t	&#116;		Lowercase t
117	165	75	01110101	u	&#117;		Lowercase u
118	166	76	01110110	v	&#118;		Lowercase v
119	167	77	01110111	w	&#119;		Lowercase w
120	170	78	01111000	x	&#120;		Lowercase x
121	171	79	01111001	y	&#121;		Lowercase y
122	172	7A	01111010	z	&#122;		Lowercase z
123	173	7B	01111011	{	&#123;		Opening brace
124	174	7C	01111100		&#124;		Vertical bar
125	175	7D	01111101	}	&#125;		Closing brace
126	176	7E	01111110	~	&#126;		Equivalency sign - tilde
127	177	7F	01111111		&#127;		Delete

## The extended ASCII codes (character code 128-255)

There are several different variations of the 8-bit ASCII table. The table below is according to Windows-1252 (CP-1252) which is a superset of ISO 8859-1, also called ISO Latin-1, in terms of printable characters, but differs from the IANA's ISO-8859-1 by using displayable characters rather than control characters in the 128 to 159 range. Characters that differ from ISO-8859-1 is marked by light blue color.

DEC	OCT	HEX	BIN	Symbol	HTML Number	HTML Name	Description
128	200	80	10000000	€	&#128;	&euro;	Euro sign
129	201	81	10000001				
130	202	82	10000010	,	&#130;	&sbquo;	Single low-9 quotation mark
131	203	83	10000011	f	&#131;	&fnof;	Latin small letter f with hook
132	204	84	10000100	„	&#132;	&bdquo;	Double low-9 quotation mark
133	205	85	10000101	…	&#133;	&hellip;	Horizontal ellipsis
134	206	86	10000110	†	&#134;	&dagger;	Dagger
135	207	87	10000111	‡	&#135;	&Dagger;	Double dagger
136	210	88	10001000	ˆ	&#136;	&circ;	Modifier letter circumflex accent
137	211	89	10001001	‰	&#137;	&permil;	Per mille sign
138	212	8A	10001010	Š	&#138;	&Scaron;	Latin capital letter S with caron
139	213	8B	10001011	‹	&#139;	&lsaquo;	Single left-pointing angle quotation
140	214	8C	10001100	Œ	&#140;	&OElig;	Latin capital ligature OE
141	215	8D	10001101				
142	216	8E	10001110	Ž	&#142;		Latin capital letter Z with caron
143	217	8F	10001111				
144	220	90	10010000				
145	221	91	10010001	‘	&#145;	&lsquo;	Left single quotation mark
146	222	92	10010010	’	&#146;	&rsquo;	Right single quotation mark
147	223	93	10010011	“	&#147;	&ldquo;	Left double quotation mark
148	224	94	10010100	”	&#148;	&rdquo;	Right double quotation mark
149	225	95	10010101	•	&#149;	&bull;	Bullet
150	226	96	10010110	–	&#150;	&ndash;	En dash
151	227	97	10010111	—	&#151;	&mdash;	Em dash
152	230	98	10011000	˜	&#152;	&tilde;	Small tilde
153	231	99	10011001	™	&#153;	&trade;	Trade mark sign
154	232	9A	10011010	š	&#154;	&scaron;	Latin small letter S with caron
155	233	9B	10011011	›	&#155;	&rsaquo;	Single right-pointing angle quotation mark
156	234	9C	10011100	œ	&#156;	&oelig;	Latin small ligature oe
157	235	9D	10011101				
158	236	9E	10011110	ž	&#158;		Latin small letter z with caron
159	237	9F	10011111	ÿ	&#159;	&Yuml;	Latin capital letter Y with diaeresis
160	240	A0	10100000		&#160;	&nbsp;	Non-breaking space
161	241	A1	10100001	¡	&#161;	&iexcl;	Inverted exclamation mark
162	242	A2	10100010	¢	&#162;	&cent;	Cent sign
163	243	A3	10100011	£	&#163;	&pound;	Pound sign
164	244	A4	10100100	¤	&#164;	&curren;	Currency sign
165	245	A5	10100101	¥	&#165;	&yen;	Yen sign
166	246	A6	10100110	¦	&#166;	&brvbar;	Pipe, Broken vertical bar
167	247	A7	10100111	§	&#167;	&sect;	Section sign
168	250	A8	10101000	¨	&#168;	&uml;	Spacing diaeresis - umlaut
169	251	A9	10101001	©	&#169;	&copy;	Copyright sign
170	252	AA	10101010	ª	&#170;	&ordf;	Feminine ordinal indicator
171	253	AB	10101011	«	&#171;	&lquo;	Left double angle quotes
172	254	AC	10101100	¬	&#172;	&not;	Not sign
173	255	AD	10101101		&#173;	&shy;	Soft hyphen
174	256	AE	10101110	®	&#174;	&reg;	Registered trade mark sign
175	257	AF	10101111	ˉ	&#175;	&macr;	Spacing macron - overline
176	260	B0	10110000	°	&#176;	&deg;	Degree sign
177	261	B1	10110001	±	&#177;	&plusmn;	Plus-or-minus sign
178	262	B2	10110010	²	&#178;	&sup2;	Superscript two - squared
179	263	B3	10110011	³	&#179;	&sup3;	Superscript three - cubed
180	264	B4	10110100	´	&#180;	&acute;	Acute accent - spacing acute
181	265	B5	10110101	µ	&#181;	&micro;	Micro sign
182	266	B6	10110110	¶	&#182;	&para;	Pilcrow sign - paragraph sign
183	267	B7	10110111	·	&#183;	&middot;	Middle dot - Georgian comma
184	270	B8	10111000	¸	&#184;	&cedil;	Spacing cedilla
185	271	B9	10111001	¹	&#185;	&sup1;	Superscript one
186	272	BA	10111010	º	&#186;	&ordm;	Masculine ordinal indicator
187	273	BB	10111011	»	&#187;	&rquo;	Right double angle quotes

DEC	OCT	HEX	BIN	Symbol	HTML Number	HTML Name	Description
188	274	BC	10111100	¼	&#188;	&frac14;	Fraction one quarter
189	275	BD	10111101	½	&#189;	&frac12;	Fraction one half
190	276	BE	10111110	¾	&#190;	&frac34;	Fraction three quarters
191	277	BF	10111111	¿	&#191;	&iquest;	Inverted question mark
192	300	C0	11000000	À	&#192;	&Agrave;	Latin capital letter A with grave
193	301	C1	11000001	Á	&#193;	&Aacute;	Latin capital letter A with acute
194	302	C2	11000010	Â	&#194;	&Acirc;	Latin capital letter A with circumflex
195	303	C3	11000011	Ã	&#195;	&Atilde;	Latin capital letter A with tilde
196	304	C4	11000100	Ä	&#196;	&Auml;	Latin capital letter A with diaeresis
197	305	C5	11000101	Å	&#197;	&Aring;	Latin capital letter A with ring above
198	306	C6	11000110	Æ	&#198;	&AElig;	Latin capital letter AE
199	307	C7	11000111	Ç	&#199;	&Ccedil;	Latin capital letter C with cedilla
200	310	C8	11001000	È	&#200;	&Egrave;	Latin capital letter E with grave
201	311	C9	11001001	É	&#201;	&Eacute;	Latin capital letter E with acute
202	312	CA	11001010	Ê	&#202;	&Ecirc;	Latin capital letter E with circumflex
203	313	CB	11001011	Ë	&#203;	&Euml;	Latin capital letter E with diaeresis
204	314	CC	11001100	Ì	&#204;	&Igrave;	Latin capital letter I with grave
205	315	CD	11001101	Í	&#205;	&Iacute;	Latin capital letter I with acute
206	316	CE	11001110	Î	&#206;	&Icirc;	Latin capital letter I with circumflex
207	317	CF	11001111	Ï	&#207;	&Iuml;	Latin capital letter I with diaeresis
208	320	D0	11010000	Ð	&#208;	&ETH;	Latin capital letter ETH
209	321	D1	11010001	Ñ	&#209;	&Ntilde;	Latin capital letter N with tilde
210	322	D2	11010010	Ò	&#210;	&Ograve;	Latin capital letter O with grave
211	323	D3	11010011	Ó	&#211;	&Oacute;	Latin capital letter O with acute
212	324	D4	11010100	Ô	&#212;	&Ocirc;	Latin capital letter O with circumflex
213	325	D5	11010101	Õ	&#213;	&Otilde;	Latin capital letter O with tilde
214	326	D6	11010110	Ö	&#214;	&Ouml;	Latin capital letter O with diaeresis
215	327	D7	11010111	×	&#215;	&times;	Multiplication sign
216	330	D8	11011000	Ø	&#216;	&Oslash;	Latin capital letter O with slash
217	331	D9	11011001	Ù	&#217;	&Ugrave;	Latin capital letter U with grave
218	332	DA	11011010	Ú	&#218;	&Uacute;	Latin capital letter U with acute
219	333	DB	11011011	Û	&#219;	&Ucirc;	Latin capital letter U with circumflex
220	334	DC	11011100	Ü	&#220;	&Uuml;	Latin capital letter U with diaeresis
221	335	DD	11011101	Ý	&#221;	&Yacute;	Latin capital letter Y with acute
222	336	DE	11011110	Þ	&#222;	&THORN;	Latin capital letter THORN
223	337	DF	11011111	ß	&#223;	&szlig;	Latin small letter sharp s - ess-zed
224	340	E0	11100000	à	&#224;	&agrave;	Latin small letter a with grave
225	341	E1	11100001	á	&#225;	&aacute;	Latin small letter a with acute
226	342	E2	11100010	â	&#226;	&acirc;	Latin small letter a with circumflex
227	343	E3	11100011	ã	&#227;	&atilde;	Latin small letter a with tilde
228	344	E4	11100100	ä	&#228;	&auml;	Latin small letter a with diaeresis
229	345	E5	11100101	å	&#229;	&aring;	Latin small letter a with ring above
230	346	E6	11100110	æ	&#230;	&aelig;	Latin small letter ae
231	347	E7	11100111	ç	&#231;	&ccedil;	Latin small letter c with cedilla
232	350	E8	11101000	è	&#232;	&egrave;	Latin small letter e with grave
233	351	E9	11101001	é	&#233;	&eacute;	Latin small letter e with acute
234	352	EA	11101010	ê	&#234;	&ecirc;	Latin small letter e with circumflex
235	353	EB	11101011	ë	&#235;	&euml;	Latin small letter e with diaeresis
236	354	EC	11101100	ì	&#236;	&igrave;	Latin small letter i with grave
237	355	ED	11101101	í	&#237;	&iacute;	Latin small letter i with acute
238	356	EE	11101110	î	&#238;	&icirc;	Latin small letter i with circumflex
239	357	EF	11101111	ï	&#239;	&iuml;	Latin small letter i with diaeresis
240	360	F0	11110000	ð	&#240;	&eth;	Latin small letter eth
241	361	F1	11110001	ñ	&#241;	&ntilde;	Latin small letter n with tilde
242	362	F2	11110010	ò	&#242;	&ograve;	Latin small letter o with grave
243	363	F3	11110011	ó	&#243;	&oacute;	Latin small letter o with acute
244	364	F4	11110100	ô	&#244;	&ocirc;	Latin small letter o with circumflex
245	365	F5	11110101	õ	&#245;	&otilde;	Latin small letter o with tilde
246	366	F6	11110110	ö	&#246;	&ouml;	Latin small letter o with diaeresis
247	367	F7	11110111	÷	&#247;	&divide;	Division sign
248	370	F8	11111000	ø	&#248;	&oslash;	Latin small letter o with slash
249	371	F9	11111001	ù	&#249;	&ugrave;	Latin small letter u with grave
250	372	FA	11111010	ú	&#250;	&uacute;	Latin small letter u with acute
251	373	FB	11111011	û	&#251;	&ucirc;	Latin small letter u with circumflex

DEC	OCT	HEX	BIN	Symbol	HTML Number	HTML Name	Description
252	374	FC	11111100	ü	&#252;	&uuml;	Latin small letter u with diaeresis
253	375	FD	11111101	ý	&#253;	&yacute;	Latin small letter y with acute
254	376	FE	11111110	þ	&#254;	&thorn;	Latin small letter thorn
255	377	FF	11111111	ÿ	&#255;	&yuml;	Latin small letter y with diaeresis

