

Specifications of Electronic components

SI No:1. BNO055-9DOF Absolute Orientation IMU breakout PCB

Feature	Specification
Sensor	
Accelerometer	±2g, ±4g, ±8g, ±16g measurement range
	14-bit resolution
Gyroscope	±2000°/s, ±1000°/s, ±500°/s, ±250°/s measurement range
	14-bit resolution
Magnetometer	±132 μT, ±16 μT, ±8 μT measurement range
	14-bit resolution
Processor	
CPU	ARM Cortex-M0
SRAM	32 KB
ROM	16 KB
Output Data	
Absolute Orientation	Euler angles or quaternions
Linear Acceleration	m/s ²
Angular Velocity	rad/s
Magnetic Field Strength	μT
Temperature	°C
Interface	I2C
Power Supply	2.8V to 3.3V DC
Physical Dimensions	20mm x 27mm x 4mm
Additional Features	
Low power consumption	
High accuracy and precision	
Easy-to-use I2C interface	
Breakout Board Features	
3.3V regulator	
Logic level shifting for I2C and reset pins	
External 32.768 kHz crystal for accurate timekeeping	

SI No:2. Shuttle board 3.0 BNO055

feature	Specification
Sensor	
Accelerometer measurement range	±2g, ±4g, ±8g, ±16g
	14-bit resolution

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Gyroscope	$\pm 2000^\circ/\text{s}$, $\pm 1000^\circ/\text{s}$, $\pm 500^\circ/\text{s}$, $\pm 250^\circ/\text{s}$ measurement range
	14-bit resolution
Magnetometer	$\pm 132 \mu\text{T}$, $\pm 16 \mu\text{T}$, $\pm 8 \mu\text{T}$ measurement range
	14-bit resolution
Processor	
CPU	ARM Cortex-M0
SRAM	32 KB
ROM	16 KB
Output Data	
	Absolute Orientation Linear Acceleration Angular Velocity Magnetic Field Strength Temperature
Interface	I2C
Power Supply	2.8V to 3.3V DC
Physical Dimensions	20mm x 27mm x 4mm
Additional Features	
	Low power consumption
	High accuracy and precision
	Easy-to-use I2C interface

Sl.No:3. ESP32 microcontroller

Feature	Specification
Processor	
CPU	Dual-core Xtensa LX6
Clock Speed	Up to 240 MHz
SRAM	520 KB
ROM	448 KB
Wireless Connectivity	
Wi-Fi	802.11b/g/n, 2.4GHz, 150 Mbps
Bluetooth	Bluetooth v4.2, Bluetooth LE
Peripherals	
GPIO	36
ADC	12-bit
DAC	2-channel
SPI	2
I2C	2
UART	2
SD Card	Yes
Capacitive Touch	Yes
IR	Yes
Hall Sensor	Yes
Power Supply	
Operating Voltage	3.0V to 3.6V
Power Consumption	Deep Sleep: $< 5 \mu\text{A}$
Other Features	
Flash Memory	4/8/16 MB SPI Flash

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Temperature Range	-40°C to 85°C
Security	Secure Boot, Secure OTA

Sl. No 4. Bosch Sensortech Sensor evaluation Board

Feature	Specification
Microcontroller	Nordic nRF52840
Processor	ARM Cortex-M4F
RAM	256 KB
Flash Memory	1 MB
Power Supply	5V DC USB or 3.7V Li-ion battery
Wireless Connectivity	Bluetooth Low Energy (BLE) 5.0
Interface	USB

Sl.No:5 Raspberry-pi

Feature	Specification
Processor	Broadcom BCM2711, quad-core Cortex-A72 (ARM v8) 64-bit SoC @ 1.5GHz
Memory	2GB, 4GB, or 8GB LPDDR4 RAM
Wireless Connectivity	2.4 GHz and 5.0 GHz IEEE 802.11b/g/n/ac wireless
Ethernet	Gigabit Ethernet
USB Ports	2 x USB 3.0, 2 x USB 2.0
Video Output	2 x micro-HDMI ports (up to 4Kp60 supported)
Storage	Micro SD card slot
Power Supply	5V DC via USB-C connector (minimum 3A)
Operating Temperature	0°C to 50°C
Dimensions	85mm x 56.5mm

Sl.No:6 Arduino Mega

Feature	Specification
Microcontroller	ATmega2560
Operating Voltage	5V
Input Voltage	7V-12V
Digital I/O Pins	54
Analog Input Pins	16
DC Current per I/O Pin	40 mA
DC Current for 3.3V Pin	50 mA
Flash Memory	256 KB
SRAM	8 KB
EEPROM	4 KB
Clock Speed	16 MHz
USB Connection	USB Type-B
Power Jack	DC power jack
ICSP Header	For in-system programming

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Reset Button

For resetting the microcontroller

Sl.No:7 Rechargeable li-ion battery

Items	Parameter
Rated Capacity	250mAh
	240mAh (min)
Energy	0.925Wh
Nominal Voltage	3.7V
Open Voltage	3.7~4.2V
Load Voltage	$\geq 3.7V$ & $\leq 4.2V$
Internal Impedance	$\leq 250m\Omega$
Charge voltage	4.2V
Standard charge current	125mA
Max charge current	250mA
Standard discharge current	50mA
Maximum continuous discharge current	250mA
Discharge cut-off voltage	2.75V
Operating Temperature	0°C~+45°C

Sl.No:8 I2C TCA9548A Expander

Feature	Specification
Channels	8
Interface	I2C
I2C Addresses	0x70 to 0x77
Supply Voltage	1.65V to 5.5V
Logic Levels	5V tolerant inputs
Switching Speed	Fast switching times
Low Quiescent Current	Low power consumption
Package	TSSOP-16
Operating Temperature	-40°C to +85°C

Sl.No:9. 14. 8 V 2200mah LIPO battery

- Capacity – 2200mah
- Nominal voltage – 14.8 v

Sl. No: 10. 11.1v LIPO battery

- Capacity – 2200mah
- Nominal voltage 11.1v

Sl.No:11. 12v battery regulator

Regulator Module

Output Current (mA): 1200

Model No: LM7812

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Input Voltage (V): 5-24
 Output Voltage (V): 12
 Shipping Weight: 0.03 kg
 Shipping Dimensions: 6 × 4 × 1 cm

Sl.No:12. 5v battery regulator

Model Type Power Module
 Input Voltage (V): 5V~12V
 Output Voltage (V): 12 volts 8 watts
 Input Current (A): 2A
 Dimensions (L x W x H) mm: 16 x 33 mm
 Shipping Weight: 0.001 kg
 Shipping Dimensions: 4 × 2 × 1 cm

Sl.No:13. 10v battery regulator

Feature	Specification
Output Voltage	10V
Input Voltage Range	16V to 35V
Output Current	500mA
Package	TO-252
Thermal Shutdown	Yes
Short Circuit Protection	Yes
Overload Protection	Yes

Sl.No:14. HC-05 Bluetooth Module Specifications

Feature	Specification
Bluetooth Version	2.0 + EDR
Frequency	2.4 GHz ISM band
Modulation	GFSK (Gaussian Frequency Shift Keying)
Transmit Power	Class 2 (up to 4 dBm)
Sensitivity	-80 dBm (typical)
Range	Approximately 10 meters
Interface	UART
Operating Voltage	3.3V to 5V DC
Operating Current	Less than 50 mA
Standby Current	Less than 2.5 mA
Sleep Current	Less than 1 mA
Baud Rate	9600, 19200, 38400, 57600, 115200, 230400, 460800
Profiles	SPP , HID , and others
Modes	Master, Slave, or Master/Slave

Sl.No:15. MCP4725 12-bit DAC Breakout Board Specifications

Feature	Specification
Resolution	12-bit

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Output Voltage Range	0V to Vref
Reference Voltage	Typically 5V
Output Impedance	100 ohms
Supply Voltage	2.7V to 5.5V
Interface	I2C
I2C Address	Default: 0x60
Operating Temperature	-40°C to +85°C
Package	SOIC-8 or TSSOP-8

Sl. No: 16 TIP41C

- NPN power transistors

Collector-base voltage ($I_E = 0$)	100 V
Collector-emitter voltage ($I_B = 0$)	100 V
Emitte-base voltage ($I_C = 0$)	5 V
Collector current	6 A
Collector peak current ($t_P < 5ms$)	10 A
Base current	3 A
Total dissipation at $T_{case} = 25^\circ C$	65 W
Storage temperature	-65 to 150 °C
Max. operating junction temperature	150 °C

Sl.No:17. LM358 Dual Operational Amplifier

Feature	Specification
Supply Voltage Range	3V to 32V
Input Offset Voltage	3mV max
Input Offset Current	15nA max
Input Bias Current	50nA max
Input Voltage Range	0V to $V_{cc}-1.5V$
Common-Mode Input Voltage Range	0V to $V_{cc}-1.5V$
Output Voltage Swing	0V to $V_{cc}-1.5V$
Output Short-Circuit Protection	Yes
Quiescent Current per Amplifier	300 μ A
Unity-Gain Bandwidth	1.2MHz
Slew Rate	0.5V/ μ s
Package	DIP-8, SOIC-8

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Sl.no: 18 SOIC-8 Breakout Board

Feature	Specification
Package Type	SOIC-8
Pin Pitch	0.65mm (0.025 inches)
Board Material	FR-4 or similar PCB material
Pin Layout SOIC-8 IC	Matches the pinout of the target
Power Supply used	Depends on the specific IC being used
I/O Connections	Provides access to the IC's input and output pins
Additional Components May include voltage regulators, level shifters, or other components, depending on the specific application	

Sl.no:19 KY040 rotary encoder

Feature	Specification
Operating Voltage	5V DC
Mechanical Angle	360°
Output	2-bit Gray Code
Positions per Revolution	30
Output Pins	5
Dimensions	30mm x 18mm x 30mm

Sl.No:20.BF350 Strain Gauge

Feature	Specification
Nominal Resistance	350 ohms
Gauge Factor	2.00 - 2.20
Strain Limit	2.0%
Fatigue Life	≥ 1 million cycles
Temperature Range	-30°C to +85°C
Creep Compensation	Yes
Mounting	Adhesive bonding

Sl. No:21. HX711 AMPLIFIER

Common mode input	AGND+1.2 V AVDD-1.3 V
Internal Oscillator, RATE = 0	10 Hz
Crystal or external clock,	$f_{clk}/1,105,920$
Crystal or external clock, RATE = DVDD	$f_{clk}/138,240$
Output data coding (HEX)	2's complement 800000 ---7FFFFFF
Output settling time	400 ms
Input offset drift	0.2 mV
Input noise	50 nV(rms)
Input offset (Gain = 128)	±6 nV/°C

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Gain (Gain = 128)	±5 ppm/°C
Input common mode rejection	Gain = 128, RATE = 0
Power supply rejection	Gain = 128, RATE = 0 ,100dB
Reference bypass (VBG)	1.25 V
Crystal or external clock frequency	1-20 MHz
Power supply voltage	2.6 -5.5 V
Analog supply current	1400 µA
Digital supply current	100 µA

Sl.No:22. Teensy 4.0 Development Board

Feature	Specification
Processor	ARM Cortex-M7
Clock Speed	600 MHz
RAM	1024 KB
Flash Memory	2048 KB
USB Ports	2 x USB (480 Mbit/s each)
Digital I/O Pins	40
Analog Input Pins	14
PWM Output Pins	31
Serial Ports	7
SPI Ports	3
I2C Ports	3
CAN Bus	3 (1 with CAN FD)
I2S/TDM	2
S/PDIF	1
SDIO	1
DMA Channels	32
Cryptographic Acceleration	Yes
Random Number Generator	Yes
RTC	Yes
Programmable FlexIO	Yes
Pixel Processing Pipeline	Yes
Peripheral Cross Triggering	Yes
Power On/Off Management	Yes

SlNo:23 DAC TLC 5615

Parameter	Value
DAC Type	8-bit DAC
Resolution	8 bits
Number of Channels	1 (Single Channel)
Input Interface	Serial (SPI compatible)

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Voltage Reference	2.5 V to V _{DD}
Output Voltage Range	0 to V _{ref}
Output Impedance	2 k Ω
Output Drive Capability	1 mA
Output Settling Time	20 μ s
Power Supply Voltage	2.7 V to 5.5 V
Power Supply Current	500 μ A
Interface Speed (SPI Clock)	20 MHz (max)
Power Consumption	Low-power operation
Package Type	PDIP-8, SOIC-8, TSSOP-8
Operating Temperature Range	-40°C to +85°C
Digital Input Voltage Levels	0 V to V _{DD}
Accuracy (INL/DNL)	\pm 1 LSB

Sl.No:24.7805 Voltage Regulator Specifications

Feature	Specification
Output Voltage	5V
Input Voltage Range	7V to 25V
Output Current	1A
Quiescent Current	5mA
Dropout Voltage	Typically 2V
Package	TO-220 or TO-220P
Thermal Shutdown	Yes
Short Circuit Protection	Yes
Overload Protection	Yes

Sl. No: 25 Voltage Regulator Specifications

Feature	Specification
Output Voltage	12V
Input Voltage Range	14V to 35V
Output Current	1A
Quiescent Current	5mA
Dropout Voltage	Typically 2V
Package	TO-220
Thermal Shutdown	Yes
Short Circuit Protection	Yes
Overload Protection	Yes

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