**GAMMA COOL BOX**

**BILL OF MATERIAL**

**June 2018, by Mej**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **TOTAL** |  | **236 €** |  |  |  |
|  | **Ref** | **Details** | **Unit cost** | **Quantity** | **Total cost** |
|  |  |  | **[€]** |  | **[€]** |
| **Modules** |  | **124 €** |  |  |  |
| **Fan+Radiator** | **GAMMAX\_200** | **12V, 200mA** | **12.0 €** | **5** | **60 €** |
|  |  | **4pin connector** |  |  |  |
|  |  | **95W** |  |  |  |
|  |  | **30dB** |  |  |  |

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| **Peltier** | **TEC1-07108HT** | **30x30x3.5mm** | **5.0 €** | **2** | **10 €** |
|  |  | **8.5V/8.5A** |  |  |  |

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| **Peltier** | **TES1-3105** | **15x15x5mm** | **3.0** | **€** | **2** | **6** | **€** |
|  |  | **3.5V/5A** |  |  |  |  |  |
| **Power supply** | **RS-150-12** | **Input: 88-264V / 47-63Hz** | **34.0** | **€** | **1** | **34** | **€** |
|  |  | **Output: 12V / 12.5A (150W)** |  |  |  |  |  |
|  |  | **199x98x38mm** |  |  |  |  |  |
|  |  | **! Without cable !** |  |  |  |  |  |
| **DC/DC buck** | **LM2596 module** | **Step-down. 3A max** | **2.0** | **€** | **1** | **2** | **€** |
|  |  | **Manual potentiometer** |  |  |  |  |  |
|  |  | **IC alone cost 3-4€ per 10 on elec** |  |  |  |  |  |
|  |  | **suppliers…** |  |  |  |  |  |
| **MCU** | **Arduino Leonardo** | **ATmega32U4** | **10.0** | **€** | **1** | **10** | **€** |
|  |  | **5V/16MHz** |  |  |  |  |  |
|  |  | **Native USB core** |  |  |  |  |  |
|  |  | **60kHz 8 bit PWM** |  |  |  |  |  |
| **RF** | **NRF24L01 module** | **RF module compatible MCU Arduino** | **2.0** | **€** | **1** | **2** | **€** |

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|  | **Ref** |  | **Details** | **Unit cost** |  | **Quantity** | **Total cost** |
|  |  |  |  | **[€]** |  |  | **[€]** |
| **Drivers** |  | **16 €** |  |  |  |  |  |
| **Dual Full-Bridge** | **DRV8432** |  | **GND to Vcc output (Vcc = 12V)** | **5.6** | **€** | **1** | **6 €** |
|  |  |  | **7A/channel, 12A peak** |  |  |  |  |
|  |  |  | **PWM ctrl** |  |  |  |  |
|  |  |  | **Custom SSOP (14x16mm\_Pitch0.65mm)** |  |  |  |  |
| **L** | **DENO-23-0001** |  | **2000uH - 16A max** | **1.0** | **€** | **2** | **2 €** |
|  |  |  | **NOT shielded** |  |  |  |  |
|  |  |  | **TH, Ø23mm** |  |  |  |  |
| **Dual Full-Bridge** | **DRV8412** |  | **GND to Vcc output (Vcc = 12V)** | **3.5** | **€** | **1** | **4 €** |
|  |  |  | **3A/channel, 6A peak** |  |  |  |  |
|  |  |  | **PWM ctrl** |  |  |  |  |
|  |  |  | **HTSSOP-44-EP (8x14mm\_Pitch0.635mm)** |  |  |  |  |
| **L** | **HCTI-330-5.2** |  | **330uH - 5.2A max** | **1.2** | **€** | **2** | **2 €** |
|  |  |  | **shielded** |  |  |  |  |
|  |  |  | **TH, Ø32mm** |  |  |  |  |
| **Single bridge** | **DRV8830** |  | **0.5V to 5V ouput (Vcc=6V)** | **1.0** | **€** | **2** | **2 €** |
|  |  |  | **1A max, 1.5A peak** |  |  |  |  |
|  |  |  | **I²C com** |  |  |  |  |
|  |  |  | **MSOP-10 (5x3mm\_Pitch0.5mm)** |  |  |  |  |
| **Other ICs** |  | **8 €** |  |  |  |  |  |
| **GPIO Expender** | **PCA9555** | **SOIC-24** | **16 GPIO expender, I²C com** | **0.9** | **€** | **1** | **1 €** |
|  |  |  | **7.5x15.4mm\_Pitch1.27mm** |  |  |  |  |
| **I²C Fan controler** | **MAX31790** | **QFN-28-1EP** | **6 channel "4 pin fan" controler** | **2.4** | **€** | **1** | **2 €** |
|  |  |  | **4x4mm\_Pitch0.4mm** |  |  |  |  |
| **I²C Temp sensor** | **MCP9904T-A** | **VDFN-10** | **1 internal + 3 outside junction sensor** | **0.7** | **€** | **5** | **4 €** |
|  |  |  | **3x3mm\_Pitch0.5mm** |  |  |  |  |
| **LDO 5V** | **MIC5219** | **SOT23-5** | **3.3V/500mA, Vin=10V max** | **0.6** | **€** | **1** | **1 €** |
| **LDO 3.3V** | **MIC5504** | **SOT23-5** | **3.3V/300mA, Vin=5.5V max** | **0.6** | **€** | **1** | **1 €** |
| **Passive electronic** |  | **6 €** |  |  |  |  |  |
| **Connector** | **2x4 SMD** |  |  | **0.20** | **€** | **12** | **2 €** |
|  | **1x4 SMD** |  |  | **0.10** | **€** | **6** | **1 €** |
|  | **Bornier SMD** |  | **9A** | **0.50** | **€** | **2** | **1 €** |
| **Q** |  |  | **for thermal sensing** | **0.05** | **€** | **15** | **1 €** |
| **LED** |  | **1206** |  | **0.05** | **€** | **14** | **1 €** |
| **R** |  | **1206, 0805** |  | **0.01** | **€** | **53** | **1 €** |
| **C** |  | **1206, 0805, 0603** |  | **0.01** | **€** | **40** | **0 €** |
| **Raw stock** |  | **68 €** |  |  |  |  |  |
| **Aluminium** |  | **10mm** |  |  |  |  | **50 €** |
| **Wood** |  | **18mm** |  |  |  |  | **10 €** |
| **Blue Foam** |  | **80mm** |  |  |  |  | **5 €** |
| **FR4 PCM** |  | **1.6mm, 35µm Cu** |  |  |  |  | **3 €** |
| **Miscellaneous** |  | **14 €** |  |  |  |  |  |
| **Wires** |  | **200mm, female, Pitch2.54mm** |  | **0.05** | **€** | **28** | **1 €** |
| **USB Cable** |  |  |  | **1** | **€** | **1** | **1 €** |
| **power cable** |  |  |  | **1** | **€** | **1** | **1 €** |
| **Screws** |  | **M3, 22mm** |  | **0.05** | **€** | **20** | **1 €** |
| **Thermal paste** |  | **15cc syringe** |  | **5** | **€** | **1** | **5 €** |
| **Soldering paste** | **Quickchip** | **15cc syringe, 220°C** |  | **5** | **€** | **1** | **5 €** |