

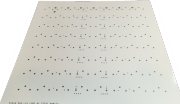



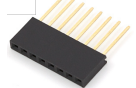




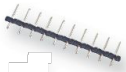








Steve Manley – 8x8x8 3D RGB LED Cube – Parts List

Item	Description	Quantity / Cube	Cost	Where Purchased	Additional Information																																																				
<div>RGB LED</div> <div></div>	5mm Diffused Common Anode RGB LED	512	£34.46 / 1000 LEDs	eBay: http://www.ebay.co.uk/itm/1000pcs-5mm-Round-top-Diffused-Multicolor-4-pins-Common-Anode-RGB-LED-light-/151281086209?ssPageName=ADME:X:AAQ:GB:1123	<table><tr><th></th><th colspan="2">Forward Voltage(V) If=20mA</th><th colspan="2">Dominant wavelength(nm)K If=20mA</th><th colspan="2">LuMen(LM) If=20mA</th><th>Reverse current(uA) Vr=5V</th><th>Power Angle (deg)</th></tr><tr><th></th><th>Min</th><th>Typ</th><th>Min</th><th>Typ</th><th>Min</th><th>Typ</th><th>Max</th><th></th></tr><tr><td>Red</td><td>2.1</td><td>2.4</td><td>620</td><td>630</td><td>3000</td><td>4000</td><td>10</td><td>20-25</td></tr><tr><td>Green</td><td>3.0</td><td>3.4</td><td>520</td><td>530</td><td>6000</td><td>8000</td><td>10</td><td>20-25</td></tr><tr><td>Blue</td><td>3.0</td><td>3.4</td><td>460</td><td>465</td><td>4000</td><td>5000</td><td>10</td><td>20-25</td></tr></table>		Forward Voltage(V) If=20mA		Dominant wavelength(nm)K If=20mA		LuMen(LM) If=20mA		Reverse current(uA) Vr=5V	Power Angle (deg)		Min	Typ	Min	Typ	Min	Typ	Max		Red	2.1	2.4	620	630	3000	4000	10	20-25	Green	3.0	3.4	520	530	6000	8000	10	20-25	Blue	3.0	3.4	460	465	4000	5000	10	20-25							
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<div>Tinned Copper Wire</div> <div></div>	20 SWG (or 20 AWG) 500g Real	1	£13.55 / Real	eBay: http://www.ebay.co.uk/itm/20-SWG-Tinned-Copper-Wire-500g-CB903-/160533739486?ssPageName=ADME:L:OU:GB:3160	<table><tr><th>Parameter</th><th>Value</th></tr><tr><td>Conductor Area CSA</td><td>0.66mm²</td></tr><tr><td>External Diameter</td><td>0.914mm</td></tr><tr><td>Conductor Make-up</td><td>1/0.914mm</td></tr><tr><td>Current Rating</td><td>33A</td></tr><tr><td>SWG Number</td><td>20</td></tr><tr><td>Length</td><td>86m</td></tr></table>	Parameter	Value	Conductor Area CSA	0.66mm²	External Diameter	0.914mm	Conductor Make-up	1/0.914mm	Current Rating	33A	SWG Number	20	Length	86m																																						
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<div>Base PCB</div> <div></div>	Interface for the Cube and Control Circuits Custom sized board with white solder mask.	1	£276 / 5 Boards	Proto-Pic: http://proto-pic.co.uk/large-pcb-prototype-manufacturing-service-250mm-x-250mm/	Board Dimension are: 100mm x 100mm (max) for standard PCB (quantity 10) 250mm x 250mm (max) for larger PCB (quantity 5) <table><tr><th>Parameter</th><th>Value</th></tr><tr><td>Material</td><td>FR-4</td></tr><tr><td>Board Dimension (min)</td><td>10mm X10mm</td></tr><tr><td>Outline Dimension Accuracy</td><td>± 0.2mm</td></tr><tr><td>Board Thickness</td><td>1.6mm</td></tr><tr><td>Board Thickness Tolerance</td><td>± 10%</td></tr><tr><td>Dielectric Separation thickness</td><td>0.075mm-5.00mm</td></tr><tr><td>Conductor Width (min)</td><td>0.15mm(Recommend>8mil)</td></tr><tr><td>Conductor Space (min)</td><td>0.15mm(Recommend>8mil)</td></tr><tr><td>Outer Conductor thickness</td><td>35um (1 Oz Copper)</td></tr><tr><td>Inner Conductor thickness</td><td>17um-100um</td></tr><tr><td>Copper to Edge</td><td>0.25mm 0.5mm</td></tr><tr><td>Plated Component Plated via Diameter(Mechanical)</td><td>0.3mm-6.30mm</td></tr><tr><td>Plated Hole Diameter Tolerance(Mechanical)</td><td>0.08mm</td></tr><tr><td>Unplated Hole Diameter Tolerance</td><td>0.05mm</td></tr><tr><td>Hole Space(min)</td><td>0.25mm</td></tr><tr><td>Hole to Edge</td><td>0.4mm</td></tr><tr><td>Annular Ring(min)</td><td>0.15mm</td></tr><tr><td>Aspect Ratio</td><td>8:01</td></tr><tr><td>Solder Resist Type</td><td>Photosensitive ink</td></tr><tr><td>Solder Resist Color</td><td>Black ,Green, White, Blue ,Yellow, Red</td></tr><tr><td>Solder Resist Clearance</td><td>0.1mm</td></tr><tr><td>Solder Resist Coverage</td><td>0.1mm</td></tr><tr><td>Plug Hole Diameter</td><td>0.3mm-0.65mm</td></tr><tr><td>Selective Finish</td><td>HASL, ENIG</td></tr><tr><td>Silkscreen line width (min)</td><td>6mil</td></tr></table>	Parameter	Value	Material	FR-4	Board Dimension (min)	10mm X10mm	Outline Dimension Accuracy	± 0.2mm	Board Thickness	1.6mm	Board Thickness Tolerance	± 10%	Dielectric Separation thickness	0.075mm-5.00mm	Conductor Width (min)	0.15mm(Recommend>8mil)	Conductor Space (min)	0.15mm(Recommend>8mil)	Outer Conductor thickness	35um (1 Oz Copper)	Inner Conductor thickness	17um-100um	Copper to Edge	0.25mm 0.5mm	Plated Component Plated via Diameter(Mechanical)	0.3mm-6.30mm	Plated Hole Diameter Tolerance(Mechanical)	0.08mm	Unplated Hole Diameter Tolerance	0.05mm	Hole Space(min)	0.25mm	Hole to Edge	0.4mm	Annular Ring(min)	0.15mm	Aspect Ratio	8:01	Solder Resist Type	Photosensitive ink	Solder Resist Color	Black ,Green, White, Blue ,Yellow, Red	Solder Resist Clearance	0.1mm	Solder Resist Coverage	0.1mm	Plug Hole Diameter	0.3mm-0.65mm	Selective Finish	HASL, ENIG	Silkscreen line width (min)	6mil
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<div>Shift Register Board</div> <div></div>	Drives the LED Cathodes Standard sized board	4	£78 / 10 Boards	Proto-Pic: https://proto-pic.co.uk/pcb-prototype-manufacturing-service-10-boards/																																																					
<div>Anode Driver Board</div> <div></div>	Multiplexes the Anodes Custom sized board	1	£100 / 5 Boards	Proto-Pic: http://proto-pic.co.uk/large-pcb-prototype-manufacturing-service-250mm-x-250mm/																																																					
<div>8 Pin Male SM Header</div> <div></div>	8 Pin Mail surface Mount Header (mounts onto Base PCB)	24	£0.29 each	Proto-Pic: http://proto-pic.co.uk/header-8-pin-male-smd-0-1/	Pin spacing is 0.1 inch See Datasheet on vendor website																																																				
<div>8 Pin Female Header</div> <div></div>	8 Pin Female Stackable Header (mounts onto Shift Register Boards)	24	£0.35 each	Proto-Pic: http://proto-pic.co.uk/8-pin-stackable-header-for-arduino/	Pin spacing is 0.1 inch See Datasheet on vendor website																																																				
<div>4 Way Molex Housing</div> <div></div>	Molex 22-01-2045 Crimp Housing, 2.54MM, 4 way	17	£2.10 / pack 10	Farnell: http://uk.farnell.com/molex/22-01-2045/crimp-housing-2-54mm-4way/dp/143128?CMP=i-bf9f-00001000	Pin spacing is 0.1 inch See Datasheet on vendor website																																																				
<div>4 Pin Molex Header</div> <div></div>	Molex 22-05-7048 Connector, Header, THT, RA, 2.54MM, 4 way	17	£2.84 / pack 5	Farnell: http://uk.farnell.com/molex/22-05-7048/connector-header-tht-ra-2-54mm/dp/9731628?ost=9731628	Pin spacing is 0.1 inch See Datasheet on vendor website																																																				

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 Molex Contact Pin	Molex 08-50-0032 Contact, Socket, 30-22AWG, Crimp	60	£7.38 / pack 100	Farnell: http://uk.farnell.com/molex/08-50-0032/contact-socket-30-22awg-crimp/dp/2424111?MER=baynote-2424111-pr	See Datasheet on vendor website
 Pluggable Terminal Block 3 Way 5MM	Imo Precision Controls 20.130M/3 Terminal Block, Pluggable, 3POS, 5MM, 14AWG	5	£1.42 / pack 2	Farnell: http://uk.farnell.com/imo-precision-controls/20-130m-3/terminal-block-pluggable-3pos/dp/9632590	See Datasheet on vendor website
 Header Through Hole 5MM	Imo Precision Controls 20.130M/PS Connector, Header, THT, 5MM, 24WAY	15	£1.09 / strip 24	Farnell: http://uk.farnell.com/imo-precision-controls/20-130m-ps/connector-header-tht-5mm-24way/dp/9632620?MER=en-mer-0713-pd-r2-acce	See Datasheet on vendor website
 Shift Register TLC5916IN	Texas Instruments TLC5916IN Constant Current, LED Driver, 8Bit, PDIP16	24	£1.53 each	Farnell: http://uk.farnell.com/texas-instruments/tlc5916in/ic-led-driver-8ch-pdip16/dp/1647814?CMP=i-bf9f-00001000	See Full Datasheet on vendor website
 Shift Register SN74HC595N	Texas Instruments SN74HC595N Shift Register, 8BIT, DIP16	1	£0.54 each	Farnell: http://uk.farnell.com/texas-instruments/sn74hc595n/shift-register-8bit-74hc595-dip16/dp/9591664	See Full Datasheet on vendor website
 Hex Buffer	Texas Instruments CD74HC4050E Logic, Non-inverting, Hex, 1 Input, 16DIP	1	£0.48 each	Farnell: http://uk.farnell.com/texas-instruments/cd74hc4050e/logic-non-inv-hex-1input-16dip/dp/1739945?ost=1739945	See Full Datasheet on vendor website
 P-Channel Power MOSFET 19A	International Semiconductors AU1RF9Z34N MOSFET, P CH, 55V, 19A, TO-220AB	8	£0.94 each	Farnell: http://uk.farnell.com/international-rectifier/au1rf9z34n/mosfet-p-ch-55v-19a-to-220ab/dp/2062068?ost=2062068	See Full Datasheet on vendor website
 Rectifier Diode 1A	Vishay General Semiconductor 1N4004 E3/54 Rectifier, Standard, 1A, 400V, DO-204AL	1	£0.95 each	Farnell: http://uk.farnell.com/vishay-general-semiconductor/1n4004-e3-54/rectifier-standard-1a-400v-do/dp/2335181?ost=2335181	See Datasheet on vendor website
 Capacitor 100nF 50V	Kemet C320C104K5R5TA CAP, MLCC, X7R, 100NF, 50V, RAD	34	£1.02 / pack 10	Farnell: http://uk.farnell.com/kemet/c320c104k5r5ta/ca-p-mlcc-x7r-100nf-50v-rad/dp/1457655?ost=1457655	See Datasheet on vendor website

Item	Description	Quantity / Cube	Cost	Where Purchased	Additional Information
Capacitor 100uF 25V Electrolytic 	Rubycon 25YXF100MEFC6.3X11 CAP, ALU ELEC, 100UF, 25V, RAD	6	£0.79 / pack 5	Farnell: http://uk.farnell.com/rubycon/25yxf100mefc6-3x11/cap-alu-elec-100uf-25v-rad/dp/1144620?ost=1144620	See Datasheet on vendor website
Resistor 100R 0.25W 	Multicomp MF25 100R Resistor, 0.25W, 1%	8	£1.35 / pack 50	Farnell: http://uk.farnell.com/multicomp/mf25-100r/resistor-100r-0-25w-1/dp/9341099?ost=9341099	See Datasheet on vendor website
Resistor 100R 0.25W 	Multicomp MF12 1K Resistor, 0.125W, 1%	32	£0.29 / pack 10	Farnell: http://uk.farnell.com/multicomp/mf12-1k/resistor-1k-0-125w-1/dp/9342400	See Datasheet on vendor website
6V 3.3A Power Supply 	Ideal Power Supply 6V 5206-20S06-V-3A PSU, 6V, 3.3A, Earthed Output	1	£15.78 each	Farnell: http://uk.farnell.com/ideal-power/5206-20s06-v-3a/psu-6v-3-3a-earthed-output/dp/2112015?ost=2112015	See Datasheet on vendor website