Product Type : P10 RGB Module

Product Code : P10RGB-OSAB1S-3216

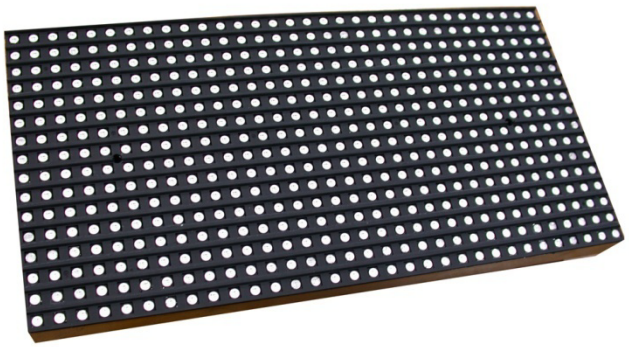
Content

Introduction

SDM-P10RGB-OSAB1Q-3216 is a 32×16 full color SMD LED unit design for wide range of applications such as video screens, graphic, alphabet, numeric, symbol and VMS without color distribution.

Applications

- Full Color Video Screen
- Outdoor Concert & Performance Screen
- Stadium Display
- Advertising Display
- Sport Parameter Screen



Features

Module Type	Outdoor LED Display Module
LED Type	3-in-1 SMD
Display Color	Red, Green, Blue
Module dimension	320mm x 160mm
Module Pixel	512 pixel / module
Pixel Pitch	10mm
Resolution	10000dot / m2
Brightness (Typ.)	8000nit
Gray Scale	4096 Level for each color
Weight (Typ.)	1000g / Module

Product Characterize

Recommended Rating (Ta = 25℃)

Item	Symbol	Value	Unit
Control Circuit Voltage	VCC	5.0 ± 0.2	DC V
LED Voltage	VLED1	2.0 ± 0.2	DC V
	VLED2	3.2 ± 0.2	DC V
Activity Temperature	Topr	0 ~ 45	℃

Absolute Rating (Ta = 25℃)

Item	Symbol	Value	Unit
Supply Voltage	VIN	-0.3 ~ VCC+0.3	DC V
Control Circuit Voltage	VCC	- 0.3 ~ 5.2	DC V
LED Voltage	VLED1	- 0.3 ~ 2.4	DC V
	VLED2	- 0.3 ~ 3.6	DC V
Activity Temperature	Topr	- 10 ~ 60	℃
Storage Temperature	Tstg	- 20 ~ 85	℃

Electrical / Luminance Characterize

Luminance (Typ.)	Red	2400	mcd
	Green	4800	mcd
	Blue	800	mcd
	White	8000	mcd
Wavelength	Red	625 ± 5	nm
	Green	525 ± 5	nm
	Blue	470 ± 5	nm
Gray Scale	4096 Gray Scale for Each color		
Current Usage (Typ.)	Icc	12	A (DC 5V)
Viewing Angle (Typ.)	Horizontal Axis	120	Degree
	Vertical Axis	120	Degree

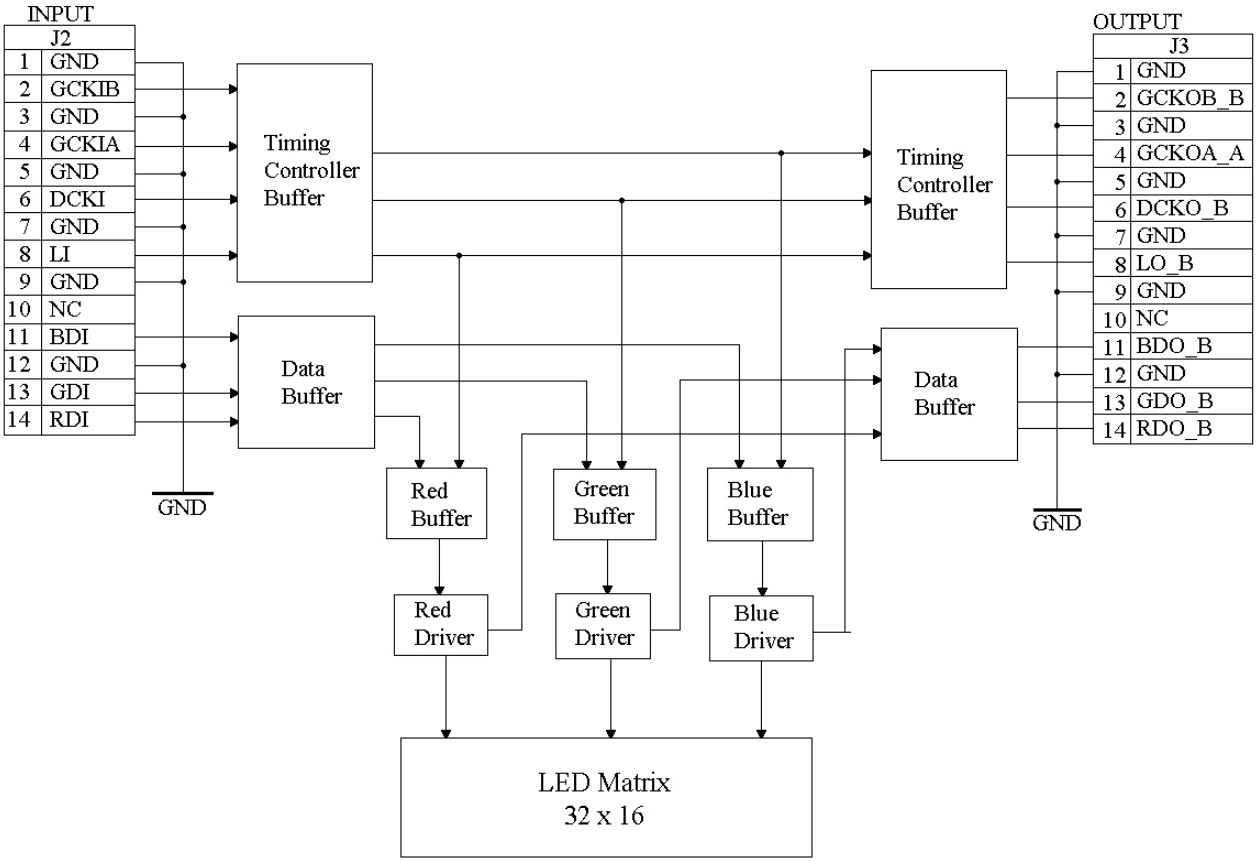
*Luminance Tolerance : 15% for each color

Product Characterize

Reliability Test (with recommend rating)

Test		Test condition	Note	Amount	Error
Activity Test	Room Temperature	25℃	1000 hr	2	0
	Low Temperature	-10℃	1000 hr	2	0
	High Humidity Heat	60℃ / RH=90%	1000 hr	2	0
	Thermal cycle	-10℃ ~ 60℃	250 cycle	2	0
Storage Test	Room Temperature	25℃	1000 hr	1	0
	Low Temperature	-10℃	1000 hr	1	0
	High Humidity Heat	60℃ / RH=90%	1000 hr	1	0
Strength Test	Vibration	Acceleration	5G	1	0
		10-150Hz Scan Cycle	20 cycle		
		Scan Speed (XYZ Axis)	1 oct/min		

Block Diagram



Interface Connection

Power I/F：3047-12FN ALEX Connector Co., Ltd.

J1			
No.	**Signal name**	**No.**	**Signal name**
1	GND	7	VCC
2	GND	8	VCC
3	GND	9	VCC
4	GND	10	VCC
5	GND	11	VCC
6	GND	12	VCC

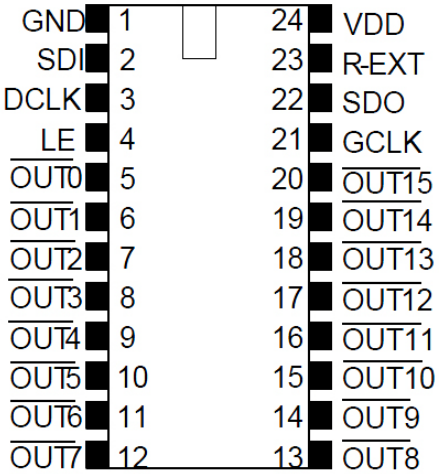
Input, Output I/F：C06S-14ASB1-G Don Connex Electronics Co., Ltd.

J2				J3			
No.	**Signal name**	**No.**	**Signal name**	**No.**	**Signal name**	**No.**	**Signal name**
1	GND	2	GCKIB	1	GND	2	GCKOB_B
3	GND	4	GCKIA	3	GND	4	GCKOA_B
5	GND	6	DCKI	5	GND	6	DCKO_B
7	GND	8	LI	7	GND	8	LO_B
9	GND	10	NC	9	GND	10	NC
11	BDI	12	GND	11	BDO_B	12	GND
13	GDI	14	RDI	13	GDO_B	14	RDO_B

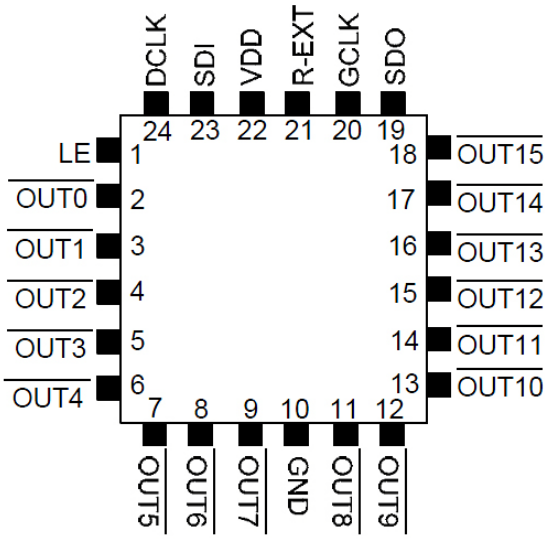
Pin Function Description

Signal Name	**Description**	**Signal Name**	**Description**
VCC	Power Input for module	GND	Ground Connection
NC	Not Use		
LI	Data Latch(LE) Input	LO_B	Data Latch(LE) Output
DCKI	Data Clock value Input	DCKO	Data Clock value Output
GCKIA	Gray Scale Clock Input Red & Green	GCKOA_B	Gray Scale Clock Output Red & Green
GCKIB	Gray Scale Clock Input Blue	GCKOB_B	Gray Scale Clock Output Blue
RDI	Red Data Input	RDO_B	Red Data Input
GDI	Green Data Input	RDO_B	Green Data Input
BDI	Blue Data Input	RDO_B	Blue Data Input

Driver IC Terminal Configuration



MBI5030GF/GTS



MBI5030GFN

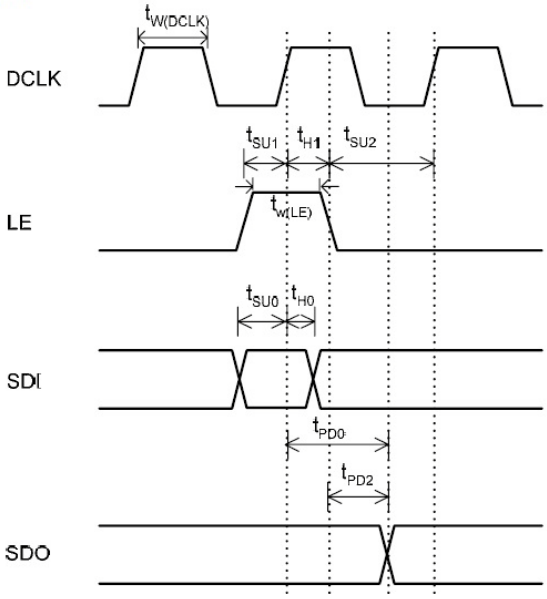
Pin Name	Function	Module Pin
GND	Ground terminal for control logic and current sink	
SDI	Serial-data input to the shift register	RDI GDI BDI ERDI
DCLK	Clock input terminal used to shift data on rising edge and carries command information when LE is asserted.	DCLKI
LE	Data strobe terminal and controlling command with DCLK	LI
Out0 – Out15	Constant current output terminals	
GCLK	Gray scale terminal Clock input for gray scale. The gray scale display is counted by gray scale clock comparing with input data.	GCLKIA GCLKIB
SDO	Serial-data output to the receiver-end SDI of next driver IC	RDO_B GDO_B BDI_B ERDO_B
R-EXT	Input terminal used to connect an external resistor for setting up output current for all output channels	
VDD	3.3V / 5V supply voltage terminal	VCC

Switch Characteristics

Characteristics		Min	Typ.	Max	Unit
Setup Time	SDI - DCLK(H)	1			ns
	LE(H) - DCLK(H)	1			ns
	LE(L) - DCLK(H)	5			ns
Hold Time	DCLK(H) - SDI	3			ns
	DCLK(H) - LE(L)	7			ns
Pulse Width	LE	5			ns
	DCLK	15			ns
	GCLK	15			ns
Output Rise Time of Output Ports		15	25		ns
Output Fall Time of Output Ports		10	15		ns
Data Clock Frequency				30	MHz
Gray Scale Clock Frequency				33	MHz

Timing Waveform

(1)



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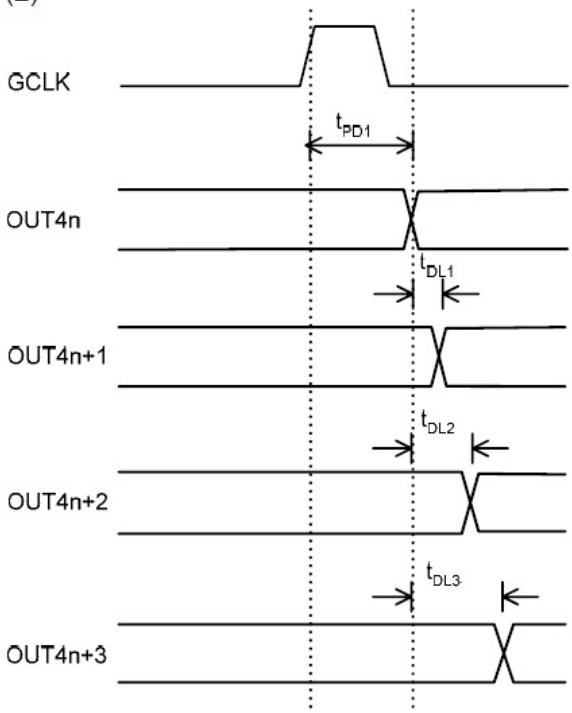
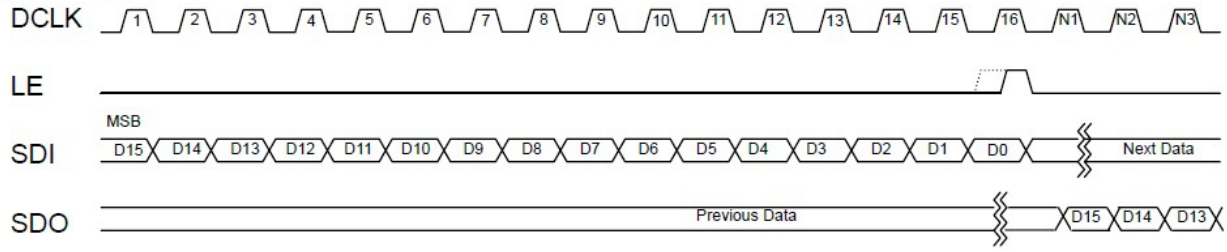
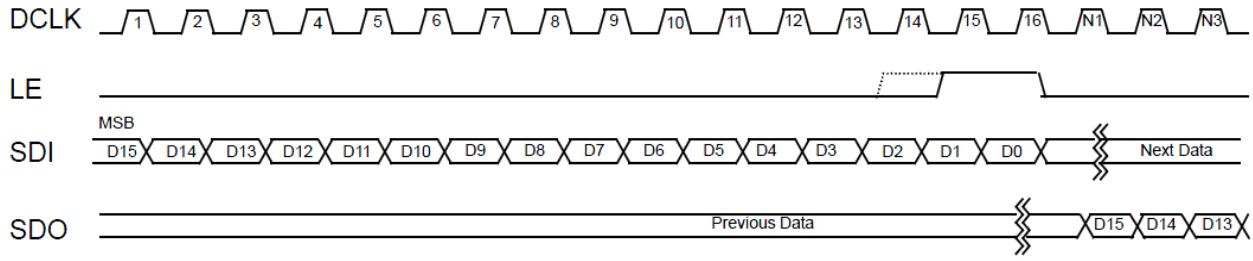


Timing Chat

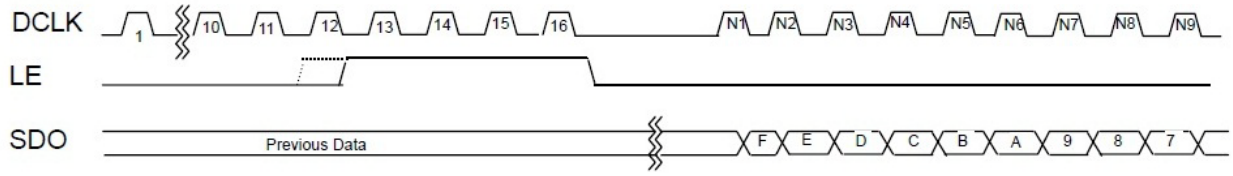
Data Latch



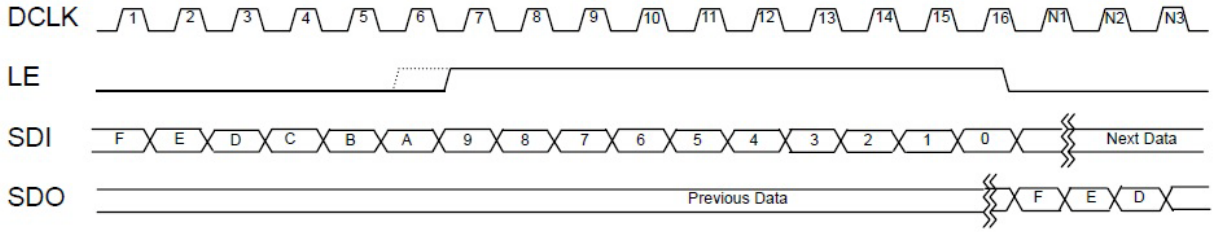
Global Latch



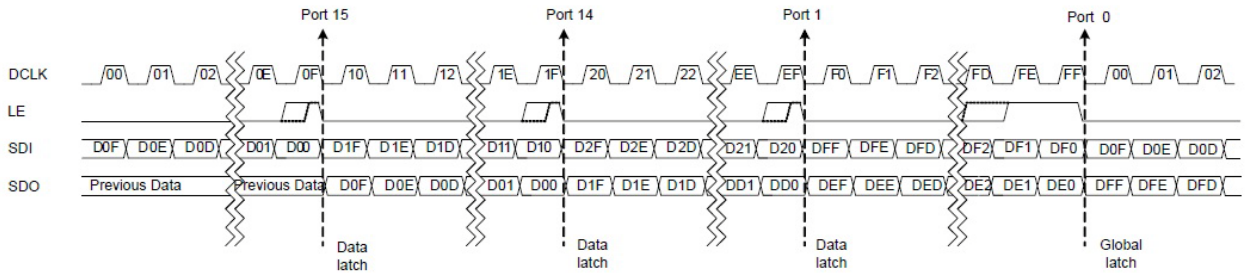
Read Configuration



Write Configuration



Full Timing for Data Loading



LED Mapping

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7	8	15	16	23	24	31	32	39	40	47	48	55	56	63	64	263	264	271	272	279	280	287	288	295	296	303	304	311	312	319	320
65	66	73	74	81	82	89	90	97	98	105	106	113	114	121	122	321	322	329	330	337	338	345	346	353	354	361	362	369	370	377	378
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96	200	207	208	215	216	223	224	231	232	239	240	247	248	255	256	455	456	463	464	471	472	479	480	487	488	495	496	503	504	511	512

Shift Register Mapping

LED															
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48
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65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96
97	98	99	100	101	102	103	104	105	106	107	108	109	110	111	112
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161	162	163	164	165	166	167	168	169	170	171	172	173	174	175	176
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193	194	195	196	197	198	199	200	201	202	203	204	205	206	207	208
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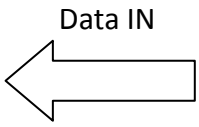
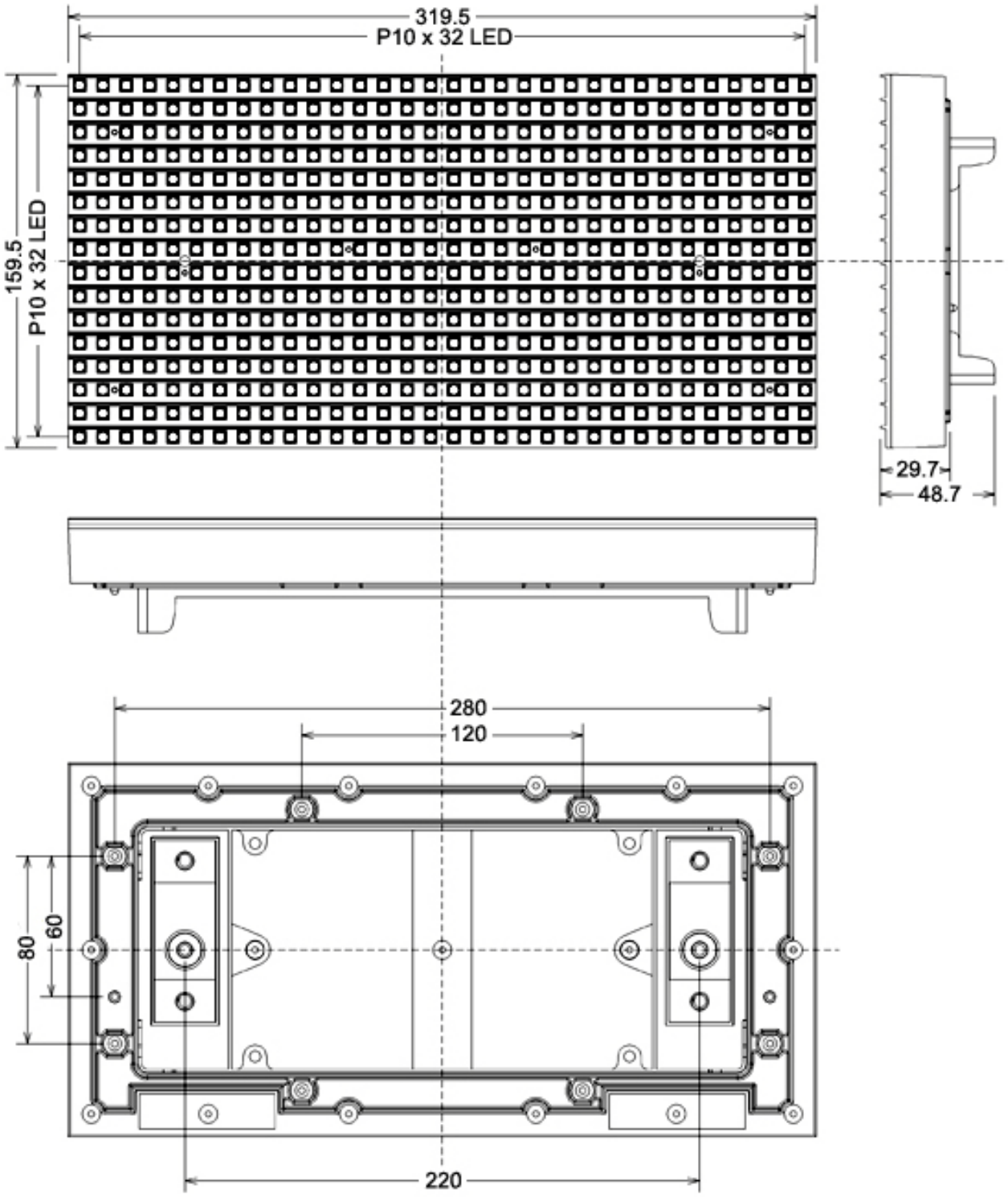


Module dimension



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Safety Precautions

1. The products are designed and produced for application of ordinary electronic equipment (AV, office, telecommunication, home appliances, amusement, etc)
   If the product to be used in devices requiring extremely high reliability such as medical, transport, aircraft/spacecraft, nuclear power controllers, fuel controllers, car equipment including car accessories, safety devices, etc., the malfunction of this product may result in any serious damages (against human life, human body, etc..), please consider of fail-safe design absolutely and secure safety as below
   a) Installation of protection circuits or other protective devices to improve system-safety.
   b) Installation of redundant circuits in order to avoid risks by single-circuit failure
2. The product are designed for use of ordinary electronic equipment such as displaying letters and video images, and not designed for uses in the following special environments.
   a) Use in various types of liquid, including water, oils, chemicals, and organic solvents.
   b) Use in place where the products are exposed to sea winds or corrosive gases
   c) Use in places where the products are exposed to static electricity or electromagnetic waves.
   d) Use in proximity to heat-producing components, plastic cords, or other flammable items.
   e) Use of the products in dew condensation.
3. The products are not resistant to radiation.
4. SANDER does not responsible for any problems resulting from the uses of the products against this specification
5. SANDER should be notified of any product-safety issues. Moreover, product safety issues should be periodically monitored by the customer.
6. The features of this product are high brightness and multicolored emission; however, this product may have a bad effect on human eyes. In case of looking at this products at close range for a long time, we highly recommend using an eye protection for UV cut and light reduction.

Important Notice

7. There are some high-temperature parts inside the products. Please do not touch the parts directly. Moreover, please do not put any flammable substances close to the parts due to ignition.
8. Please do not put over-voltage against the absolute voltage asait may cause failure of products.

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1. These Specifications contain information related to SANDER's industrial property. Any uses besides the usage of these products are not permitted. Duplication of these specifications and its disclosure to the third party without permission from SANDER are prohibited.
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Precautions on Use of Products.

1. LEDs and parts, are very weak against external impact. LEDs and Parts may be damaged due to contact of tools or your casing of the products to the products. When handling the products, please pay special attention.
2. The products are not designed to tolerate against solvent. Please pay special attention not to attach any organic solvent such as thinner, to the products.
3. The products apply high density LSIs that are very weak to static electricity. while handling the products, please wearing an earth band to make human body electrification lower than 100V. Especially, cloths made by chemical fiber are likely to be electrified several thousand voltages of static electricity and it may destroy the circuits.
4. Please war clean gloves when handling the products as sweat or sebum attached with hands may corrode the products and it may be cause the breakdown.
5. When detaching connecters, please make sure SANDER products are firmly attached with your products, supply voltage is switched off and no remaining voltage. Also please do not detach connectors when power-supply is on as it may damage the products. Please be careful not to miss-insert connecters.
6. Once products are exposed to UV rays for long time, the colors of LED and PCB/Housing may change the color.
7. Please do not to touch the edges with module or metals as a part of circuit patterns may be exposed around the PCBs.
8. In case looking the products through sunglasses or finder of camera, the color would be different as you sense by looking by eyes, and an accurate evaluation may be difficult to be made.

Important Notice

When using power supply not applies or approved by SANDER

1. Surge voltage / current flow will damage the product, user should measured and make sure the power supply will not supply power over absolute specification.
2. In case of using switching power supply for constant voltage power supply, linking-noise may occur and in the image displayed on the products, noise could be mixed or inhomogeneity of brightness and color tone could occur.
3. The products require VCC power supply for control and LED for lighting. The system GND potential-point should be a part of power supply connecters to prevent multiple-point earth of duplicate connection as each GND is connected near the connecters of the products.
4. The installation of the products, in case falling screws and they hit the parts of circuits, the products could be damaged.

When Casing the product by use items not provide by SANDER

1. Please make sure of designing the casing with sufficient margin of safety by taking into consideration ofr the heat generation and the thermal expansion, especially when using various units interconnected each other.
2. Please use as short signal lines as possible. (MHz units's frequency signal had transmission distance limit)
3. Please take special care for heat dissipation using fan etc. As internal heat may cause luminous intensity down or extra ordinal operation. Please also pay attention to inhomogeneity due to heat dissipation.
4. These products include digital circuits and induce high-frequency noise. it is a possibility to give some disturbance to other surrounding equipments depending on the way to wire or the way of assemble chassis.
   When connecting with other units, signal lines will be wired around and noise will be radiated, please design the chassis by fully considering of signal frequency and EMI ability if necessary.

Activity Condition

1. The shapes of dots covering over LED dies are different from each other somehow, therefore, while condition of non-lighting may see some pattern
2. The aging characteristics of LED may given luminous intensity differ between frequent and infrequent lighting areas. Difference will be more obvious at fixed emitting area.
3. The brightness of LED become dimming once unit's temperature increases. Please note that the brightness may vary depending on the lighting rate and lighting time per product.

Important Notice

Guarantee

1. Sander Electronics will not be held liable for any damages or claims resulting from the use of its products in medical and military applications.
2. The guaranteed period of luminous intensity and product performance is within one year from shipment by SANDER, with recommended storage conditions and product are not opened.
   (SANDER Recommended Storage Condition : 25℃ ±10℃; RH = 50% ± 10%)
3. Even during guarantee period, request of repair base on following situation require charge of fee
   a) Accident due to careless handling and unexpected usage.
   b) Accident due to repairs or improvements without permission of SANDER
   c) Accident due to uncontrollable situation (Fire, flood, disaster, war, etc.)

Revision History

Datasheet Version	Modification Data	Modifier
V2.11	2012 / 3 / 15	Jay
V3.0	2012 / 3 / 16	Jay

Lighting up the world one diode at a time.
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