

# MCL1210FRGB1T DATASHEET

Multi Color LED, 1210, Flat Lens, RGB

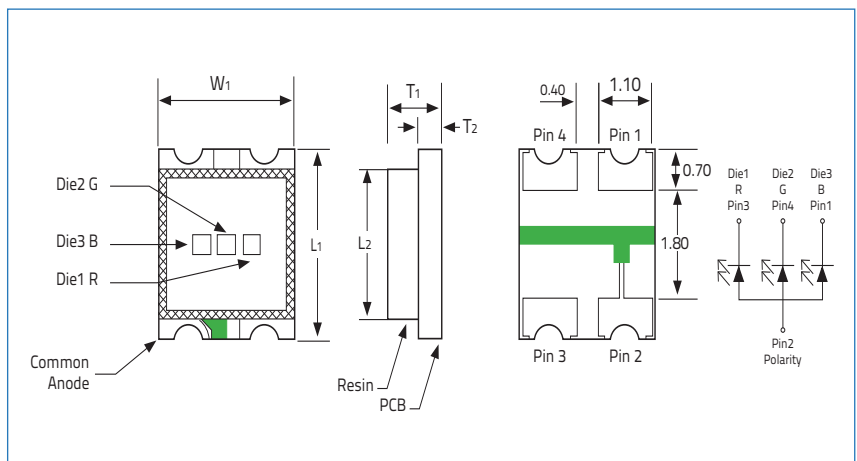


VENKEL LTD.

| Part Number   | Size | Emitting Color         | Emitting Material | Lens-Color | Luminous Intensity mcd  | Wavelength nm $\lambda_P$                                | Viewing Angle ( $2\theta$ 1/2) |
|---------------|------|------------------------|-------------------|------------|---|--|--------------------------------|
| MCL1210FRGB1T | 1210 | Red, Green, Blue (RGB) | AlInGaP, InGaN    | Diffused   | Red: 112.50 mcd typ<br>Green: 285 mcd typ<br>Blue: 112.50 mcd typ | Red: 632 nm typ<br>Green: 520 nm typ<br>Blue: 468 nm typ | 120°                           |

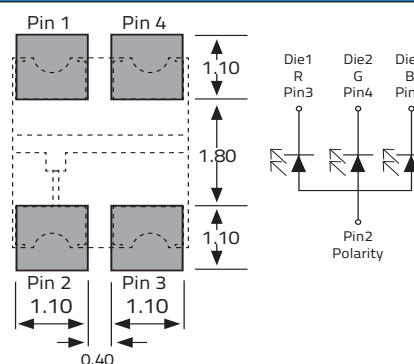
| Electrical & Optical Specifications ( $T_A=25^\circ\text{C}$ ) |                 | Red @20mA | Green @20mA | Blue @20mA | Unit          |
|--|-----------------|-----------|-------------|------------|---------------|
| Forward Voltage Typ.   | $V_F$           | 2.0       | 3.3         | 3.3        | V             |
| Forward Voltage Max.   | $V_F$           | 2.4       | 3.9         | 3.9        | V             |
| Reverse Current (Max) ( $V_R=5V$ )                             | $I_R$           | <100      | <100        | <100       | $\mu\text{A}$ |
| Peak Wavelength Typ.   | $\lambda_P$     | 632       | 520         | 468        | nm            |
| Dominant Wavelength Typ.                                       | $\lambda_D$     | 624       | 525         | 470        | nm            |
| Spectral Line Half Width Typ.                                  | $\Delta\lambda$ | 20        | 30          | 40         | nm            |

| Absolute Maximum Ratings ( $T_A=25^\circ\text{C}$ ) |           | Red        | Green/Blue | Unit |
|---|-----------|------------|------------|------|
| Reverse Voltage                                     | $V_R$     | 5          | 5          | V    |
| DC Forward Current                                  | $I_F$     | 20         | 20         | mA   |
| Peak Forward Current 1/10 Duty Cycle @ 10KHz        | $I_{FP}$  | 40         | 60         | mA   |
| Power Dissipation                                   | $P_D$     | 48         | 78         | mW   |
| Operating Temperature                               | $T_A$     | -40 ~ +85  |            | °C   |
| Storage Temperature                                 | $T_{stg}$ | -40 ~ +100 |            |      |



| Dimensions               |                          | Units: Inches (mm)        |                            |
|--------------------------|--------------------------|---------------------------|----------------------------|
| $L_1$                    | $L_2$                    | $T_1$                     | $T_2$                      |
| 0.126±0.004<br>(3.2±0.1) | 0.10±0.004<br>(2.55±0.1) | 0.0433±0.004<br>(1.1±0.1) | 0.0188±0.004<br>(0.48±0.1) |
| W                        |                          |                           |                            |
| 0.106±0.004<br>(2.7±0.1) |                          |                           |                            |

## Soldering Pad Layout



Tolerances are all ±0.1mm

# MCL1210FRGB1T DATASHEET

Multi Color LED, 1210, Flat Lens, RGB



VENKEL LTD.

## Graphs

Fig. 1 Forward Voltage vs Forward Current

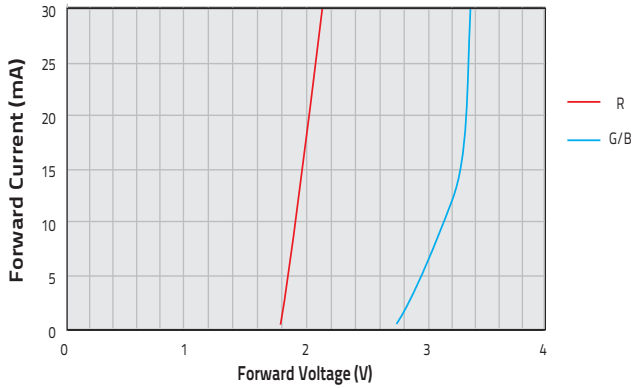


Fig. 4 Relative Intensity vs Wavelength

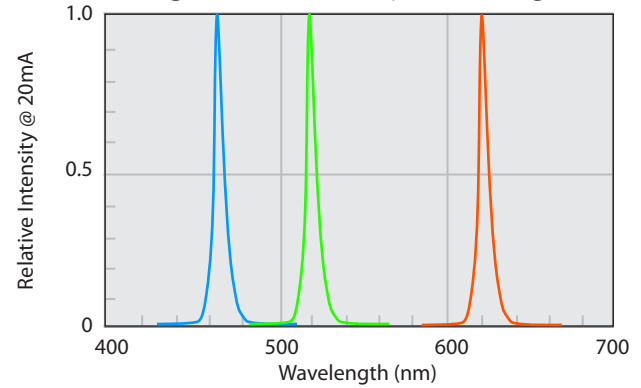


Fig. 2 Relative Intensity vs Forward Current

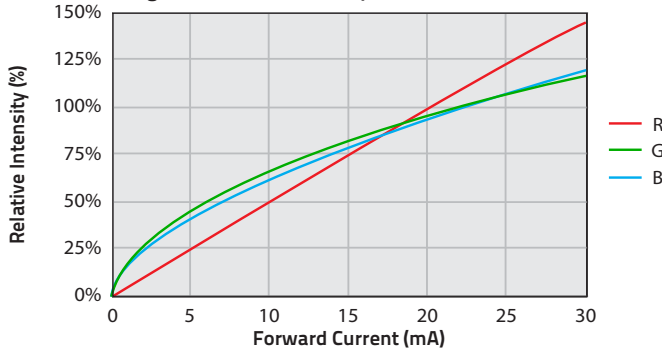


Fig. 6 Directive Radiation

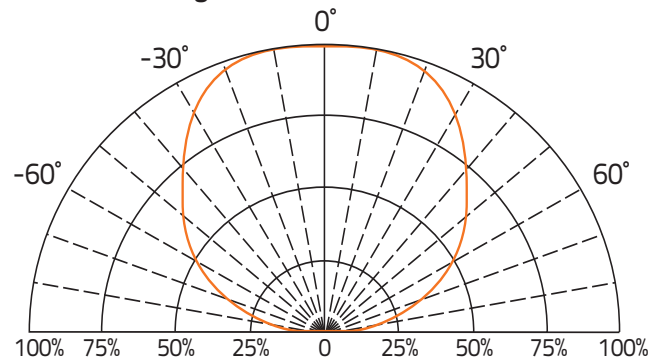
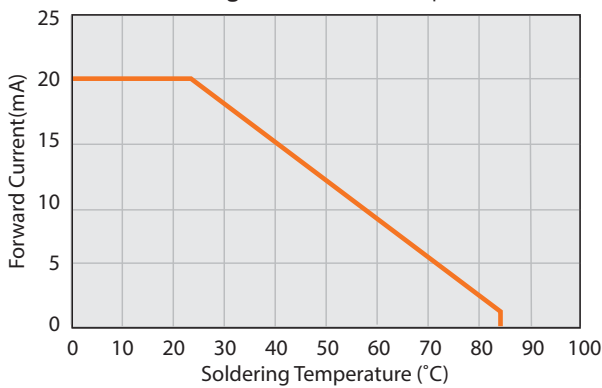


Fig. 3 Current vs Temp



## Environmental information

|                                  |                       |
|----------------------------------|-----------------------|
| RoHS Status                      | 6 of 6 Compliant      |
| REACH Status                     | Compliant             |
| Halogen Status                   | Halogen Free          |
| Conflict Mineral Status          | Conflict Mineral Free |
| Moisture Sensitivity Level (MSL) | 3                     |

## Reflow profile

|                                |            |
|--------------------------------|------------|
| Max Reflow Temperature         | 260°C      |
| Number of Reflow Cycles        | 2          |
| Time at Max Reflow Temperature | 10 seconds |

# MCL1210FRGB1T DATASHEET

Multi Color LED, 1210, Flat Lens, RGB



VENKEL LTD.

## Label Example

Item: MCL1210FRGB1T  
 Chip Type LED,1210,Flat Lens,RGB  
 Qty: 500 D/C: 1616  
 Lot: GS11470168 VF: 1.6-2.4  
 VF: 2.7-3.9  
 BIN/HUE: Q/AC-S/A-Q/AB VF: 2.7-3.9

**VENKEL LTD**  
 YOUR SINGLE SOURCE FOR SURFACE MOUNT PASSIVES

## Codes:

VF: Forward Voltage | BIN: Luminous Intensity | HUE: Dominant Wavelength

## Luminous Intensity Classification (BIN Code)

| RED BIN Code | lv(mcd) at 20mA |       |
|--------------|-----------------|-------|
|              | Min.            | Max.  |
| P            | 45              | 71.5  |
| Q            | 71.5            | 112.5 |
| R            | 112.5           | 180   |
| S            | 180             | 285   |

| Green BIN Code | lv(mcd) at 20mA |      |
|----------------|-----------------|------|
|                | Min.            | Max. |
| R              | 112.5           | 180  |
| S              | 180             | 285  |
| T              | 285             | 360  |
| U              | 360             | 450  |

| Blue BIN Code | lv(mcd) at 20mA |       |
|---------------|-----------------|-------|
|               | Min.            | Max.  |
| P             | 45              | 71.5  |
| Q             | 71.5            | 112.5 |
| R             | 112.5           | 180   |
| S             | 180             | 285   |

## Dominant Wavelength Classification (HUE Code)

| $\lambda_D$ (nm) |      |      |          |      |      |          |      |      |
|------------------|------|------|----------|------|------|----------|------|------|
| Red              |      |      | Green    |      |      | Blue     |      |      |
| Hue Code         | Min. | Max. | Hue Code | Min. | Max. | Hue Code | Min. | Max. |
| AC               | 615  | 630  | A        | 515  | 520  | AA       | 460  | 465  |
|                  |      |      | B        | 520  | 525  | AB       | 465  | 470  |
|                  |      |      | C        | 525  | 530  | AC       | 470  | 475  |
|                  |      |      | D        | 530  | 535  | AD       | 475  | 480  |

# MCL1210FRGB1T DATASHEET

Multi Color LED, 1210, Flat Lens, RGB



VENKEL LTD.

| Reel Specifications |          | Units: mm |          |          |
|---------------------|----------|-----------|----------|----------|
|                     |          |           |          |          |
| <b>M</b>            | <b>C</b> | <b>F</b>  | <b>E</b> | <b>G</b> |
| 178±1.5             | 13.0±0.2 | 12.0±0.1  | 60.0±1.0 | 9.0±0.5  |

| Packaging Specifications |     |
|--------------------------|-----|
| Reel Size:               | 7"  |
| Quantity per Reel :      | 500 |

| Storage Specifications  |
|---|
| 1. Storage temperature and RH: 5°C~35°C, RH60%  |
| 2. Once the package is opened, the LEDs should be used within a week. Otherwise, they should be kept in a moisture proof bag with desiccant. We suggest that you use this product within one year from date code. |
| 3. If opened for more than one week in an atmosphere of 5°C~35°C, RH60%. The parts should be heat treated at 60°C±5°C for 15 hours.   |

| Tape Specifications |          | Units: mm |           |          |
|---------------------|----------|-----------|-----------|----------|
|                     |          |           |           |          |
| <b>T</b>            | <b>W</b> | <b>A</b>  | <b>B</b>  | <b>F</b> |
| 1.4±0.10            | 8.0±0.30 | 3.02±0.10 | 3.52±0.05 | 3.5±0.05 |
| <b>E</b>            | <b>H</b> | <b>J</b>  | <b>D</b>  | <b>G</b> |
| 1.75±0.10           | 4.0±0.10 | 2.0±0.05  | 1.5±0.1   | 4.0±0.2  |

# MCL1210FRGB1T DATASHEET

Multi Color LED, 1210, Flat Lens, RGB



VENKEL LTD.

| Environmental Test Criteria |   |  |             |
|-----------------------------|---|--|-------------|
| Classification              | Test Item                               | Test Condition   | Sample Size |
| Endurance Test              | Operating Life                          | 1. Ta=25°C<br>2. If=20mA<br>3. t=1000hrs (-24hrs, +72hrs)                          | 22          |
|                             | High Temperature Storage                | 1. Ta=105°C±5°C<br>2. t=1000hrs (-24hrs, +72hrs)                                   | 22          |
|                             | Low Temperature Storage                 | 1. Ta=-40°C±5°C<br>2. t=1000hrs (-24hrs, +72hrs)                                   | 22          |
|                             | High Temperature, High Humidity Storage | 1. Ta=85°C<br>2. RH=85%<br>3. t=1000hrs(-24hrs, +72hrs)                            | 22          |
| Environmental Test          | Thermal Shock                           | 1. Ta=100°C±5°C & -40°C±5°C<br>20min / 10sec / 20min<br>3. Total: 100 cycles total | 22          |
|                             | Temperature Cycling                     | 1. 100°C±5°C & -40°C±5°C<br>30mins / 5mins / 30mins<br>2. 100 Cycles               | 22          |
|                             | IR Reflow                               | 1. T=260°C Max. 10 seconds Max<br>2. 6 Min   | 22          |

## Drive Method

LED is a current operated drive, and therefore it requires some kind of current limiting incorporated into the driver circuit. This current limiting typically takes the form of a current limiting resistor placed in series with the LED. Consider worst case voltage variations that can occur across the current limiting resistor placed in series with the LED. The forward current should not be allowed to change by more than 40% of its desired value.

