



# SA1615FV0CF00 Datasheet

Red (660 nm), and Infrared (880 nm) Emitter



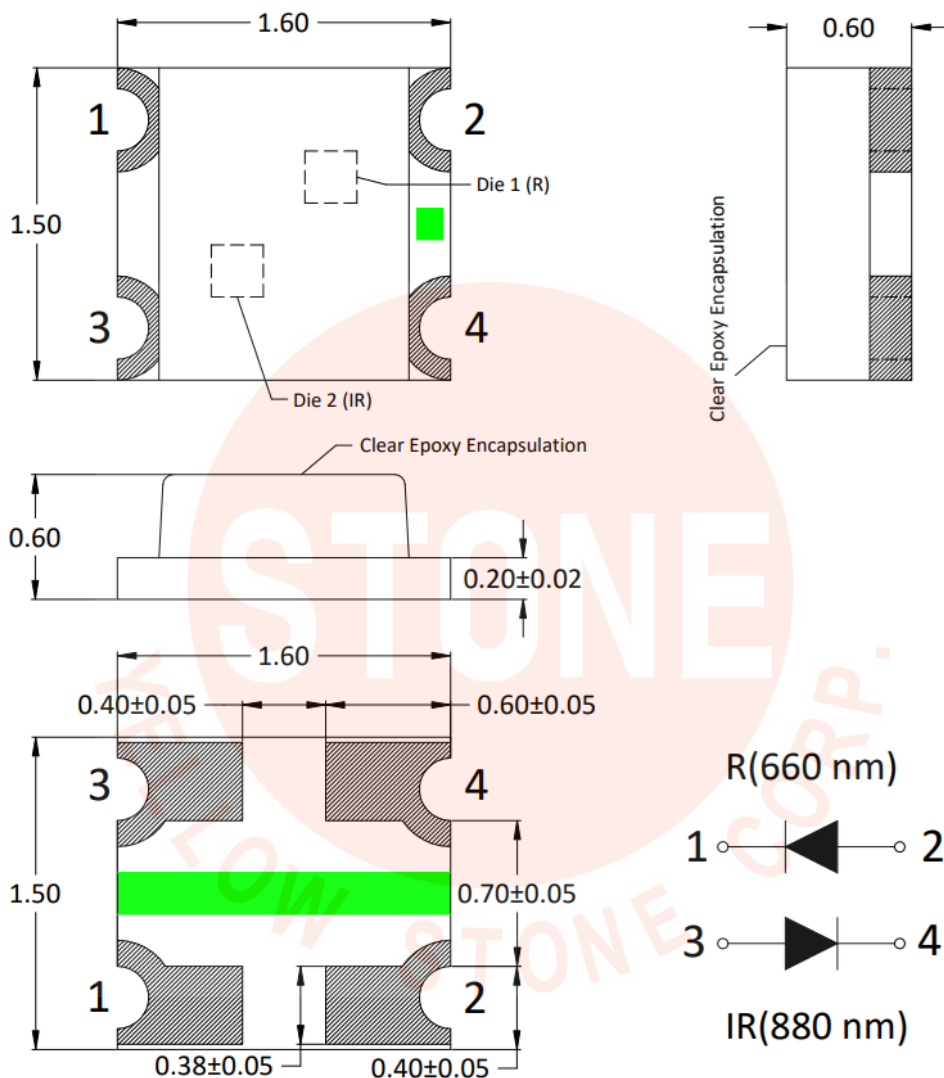
## Applications

- Health Monitoring (Heart Rate Monitoring, Pulse Oximetry)

## Features

- Package: clear epoxy
- ESD: 2 kV acc. to ANSI/ESDA/JEDEC JS-001 (HBM, Class 2)
- SMT package
- Suitable for SMT assembly
- Available on tape and reel
- Emitters can be controlled separately

## Dimensional Drawing



1. Dimensions are in millimeters.
2. General tolerance is  $\pm 0.1$  mm.

| Pin | Description                       |
|-----|-----------------------------------|
| 1   | Cathode red emitter (660nm)       |
| 2   | Anode red emitter (660 nm)        |
| 3   | Anode infrared emitter (880 nm)   |
| 4   | Cathode infrared emitter (880 nm) |

## Maximum Ratings

$T_A : 25\text{ }^{\circ}\text{C}$

| Parameter                                                              | Symbol    |      | Values                  |                        | Unit               |
|------------------------------------------------------------------------|-----------|------|-------------------------|------------------------|--------------------|
|                                                                        |           |      | ● Hyper red<br>(660 nm) | ● Infrared<br>(880 nm) |                    |
| Forward current                                                        | $I_F$     | max. | 50                      | 70                     | mA                 |
| Pulse forward current<br>( $t_p \leq 2.3\text{ ms}$ ; $D \leq 0.005$ ) | $I_{PF}$  | max. | 200                     | 300                    | mA                 |
| Power consumption                                                      | $P_{tot}$ | max. | 125                     | 150                    | mW                 |
| Reverse voltage                                                        | $V_R$     | max. | 5                       | 5                      | V                  |
| Operating temperature                                                  | $T_{op}$  | min. | -40                     | -40                    | $^{\circ}\text{C}$ |
|                                                                        |           | max. | 85                      | 85                     | $^{\circ}\text{C}$ |
| Storage temperature                                                    | $T_{stg}$ | min. | -40                     | -40                    | $^{\circ}\text{C}$ |
|                                                                        |           | max. | 85                      | 85                     | $^{\circ}\text{C}$ |
| ESD withstand voltage<br>acc. to ANSI/ESDA/JEDC JS-001(HBM, Class 2)   | $V_{ESD}$ | max. | 2                       | 2                      | kV                 |

The stated maximum ratings refer to one chip, unless otherwise specified.

## Characteristics

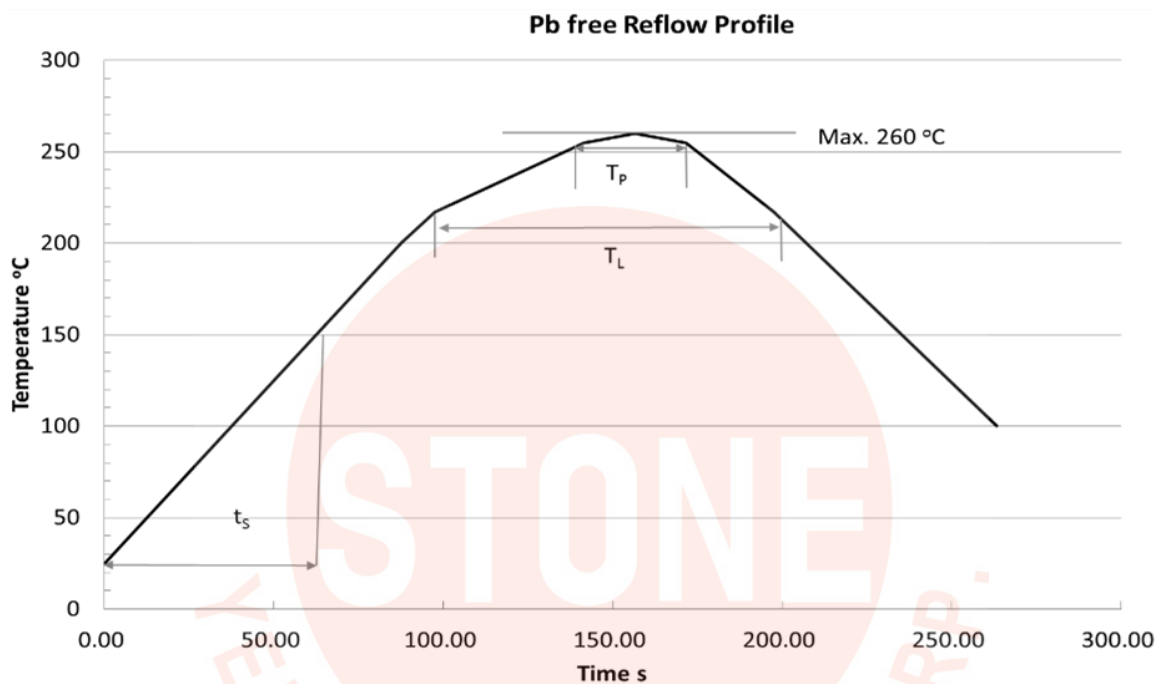
$I_F = 20 \text{ mA}$ ;  $t_p = 20 \text{ ms}$ ;  $T_A : 25 \text{ }^\circ\text{C}$

| Parameter                                                                        | Symbol                      |      | Values                  |                        | Unit          |
|----------------------------------------------------------------------------------|-----------------------------|------|-------------------------|------------------------|---------------|
|                                                                                  |                             |      | ● Hyper red<br>(660 nm) | ● Infrared<br>(880 nm) |               |
| Peak wavelength                                                                  | $\lambda_{\text{peak}}$     | typ. | 660                     | 880                    | nm            |
|                                                                                  |                             | min. | 650                     | 870                    |               |
| Centroid wavelength                                                              | $\lambda_{\text{centroid}}$ | typ. | 658                     | 880                    | nm            |
|                                                                                  |                             | max. | 665                     | 890                    |               |
| Spectral bandwidth<br>(50 % $I_{\text{rel,max}}$ (FWHM))                         | $\Delta\lambda$             | typ. | 20                      | 38                     | nm            |
| Half angle                                                                       | $\phi$                      | typ. | 60                      | 60                     | °             |
| Dimensions of chip size                                                          | L x W                       | typ. | 0.30 x 0.30             | 0.30 x 0.30            | mm            |
| Rise time (10% / 90%)<br>( $I_F = 100 \text{ mA}$ ; $R_L = 50 \text{ } \Omega$ ) | $T_r$                       | typ. | 35                      | 32                     | ns            |
| Fall time (10% / 90%)<br>( $I_F = 100 \text{ mA}$ ; $R_L = 50 \text{ } \Omega$ ) | $T_f$                       | typ. | 33                      | 31                     | ns            |
| Forward voltage                                                                  | $V_F$                       | typ. | 2                       | 1.5                    | V             |
| Reverse current<br>( $V_R = 5 \text{ V}$ )                                       | $I_R$                       | max. | 10                      | 10                     | $\mu\text{A}$ |
| Radiant intensity<br>( $I_F = 20 \text{ mA}$ ; $t_p = 20 \text{ ms}$ )           | $I_e$                       | typ. | 2.8                     | 1.5                    | mW/sr         |
| Total radiant flux                                                               | $\phi_e$                    | typ. | 11                      | 8.5                    | mW            |



## Reflow Soldering Profile

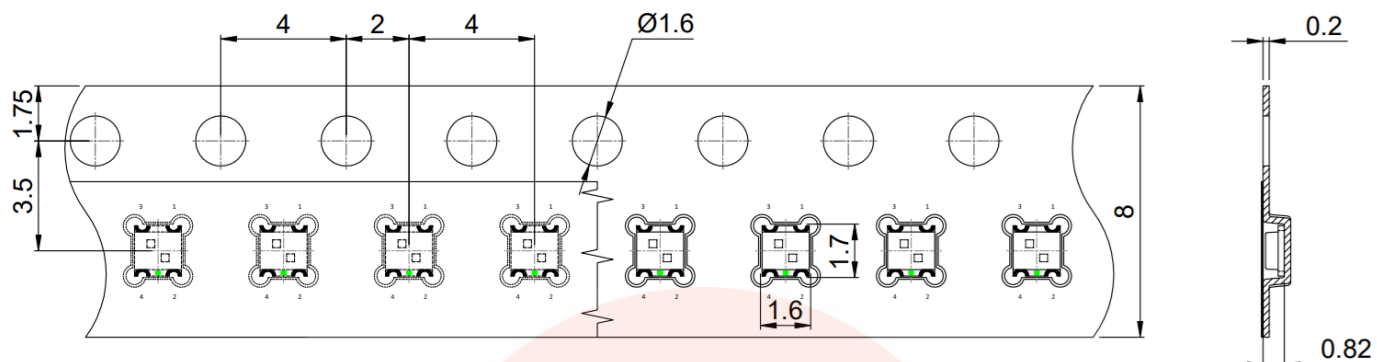
Product complies to MSL Level 3 acc. to JEDEC J-STD-020E



| Profile Feature                                                   | Symbol | Pb-Free (SnAgCu) Assembly |                |         | Unit |
|-------------------------------------------------------------------|--------|---------------------------|----------------|---------|------|
|                                                                   |        | Minimum                   | Recommendation | Maximum |      |
| Ramp-up rate to preheat<br>25 °C to 150 °C                        |        |                           | 2              | 3       | K/s  |
| Time $t_s$<br>$T_{Smin}$ to $T_{Smax}$                            | $t_s$  | 60                        | 100            | 120     | s    |
| Ramp-up rate to peak<br>$T_{Smax}$ to $T_P$                       |        |                           | 2              | 3       | K/s  |
| Liquidus temperature                                              | $T_L$  |                           | 217            |         | °C   |
| Time above liquidus temperature                                   | $t_L$  |                           | 80             | 100     | s    |
| Peak temperature                                                  | $T_P$  |                           | 245            | 260     | °C   |
| Time within 5 °C of the specified<br>peak temperature $T_P$ - 5 K | $T_P$  | 10                        | 20             | 30      | s    |
| Ramp-down Rate<br>$T_P$ to 100 °C                                 |        |                           | 3              | 4       | K/s  |
| Time<br>25 °C to $T_P$                                            |        |                           |                | 480     | s    |

1. Do not stress the silicone resin while it is exposed to high temperature.
2. The reflow process should not exceed 2 times.

## Dimensions of Tape



## Arrangement of Tape

| Leader |                   | Part Mounted<br>(4000 PCS) |  | Empty<br>(40 PCS) |     |
|--------|-------------------|----------------------------|--|-------------------|-----|
| Start  |                   |                            |  |                   | End |
|        | Empty<br>(10 PCS) |                            |  |                   |     |

User Progressive Direction