

# **AMERICAN BRIGHT** **OPTOELECTRONICS CORP.**

Specification for AB-3838EJ Series

## **AB-3838EJ-F1E**

*3838 EMC 1.0W 850nm 3V IR LED*



### **Features:**

- Top view infrared LED
- High power infrared LED
- Low thermal resistance
- Pb-free reflow soldering application
- RoHS and REACH compliant

### **Applications:**

- Surveillance systems
- Machine Vision
- License Plate Scanning
- Automotive Sensing
- Night Vision

## Absolute Maximum Ratings ( $T_j=25^{\circ}\text{C}$ )

Item	Symbol	Absolute Max. Rating	Unit
Forward Current	$I_F$	1000	mA
Pulse Forward Current	$I_{FP}$	3000	mA
Power Dissipation	PD	3.6	W
Reverse Voltage	$V_R$	5	V
Operating Temperature	$T_{opr}$	-40~ +105	$^{\circ}\text{C}$
Storage Temperature	$T_{stg}$	-40~ +105	$^{\circ}\text{C}$
Junction Temperature	$T_j$	115	$^{\circ}\text{C}$
Soldering Temperature	$T_{sld}$	Reflow soldering: 230 $^{\circ}\text{C}$ or 260 $^{\circ}\text{C}$ for 10 sec	

\* IFP condition with Pulse: Width $\leq$ 100 $\mu\text{s}$ , Duty cycle $\leq$ 1/10

\* LED's properties might be different from suggested values like above and below tables if operation condition will be exceeded our parameter range. Care is to be taken that power dissipation does not exceed the absolute maximum rating of the product

\* All measurements were made under the standardized environment of American Bright LED

## Electrical/Optical Characteristics ( $T_j=25^{\circ}\text{C}$ )

Item	Symbol	Min.	Typ.	Max.	Unit	Condition
Forward Voltage	$V_F$	2.6	3.0	3.4	V	$I_f = 350\text{mA}$
Reverse Current	$I_R$	-	-	10	$\mu\text{A}$	$V_R = 5\text{V}$
Radiant Flux	$\Phi_e$	-	510	-	mW	$I_f = 350\text{mA}$
Viewing Angle	$2\theta_{1/2}$	-	90	-	$^{\circ}$	$I_f = 350\text{mA}$
Thermal Resistance	$R_{th\ j-sp}$	-	4.5	-	$^{\circ}\text{C}/\text{W}$	$I_f = 350\text{mA}$
Electrostatic Discharge	ESD	6000	-	-	V	HBM

\* Tolerance of measurements of the Forward Voltage is  $\pm 0.1\text{V}$

\* Tolerance of measurements of the Radiant Flux is  $\pm 7\%$

\*  $2\theta_{1/2}$  is the off-axis where the luminous intensity is 1/2 of the peak intensity

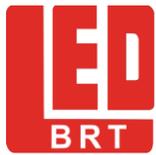
\* Tolerance of measurements of Peak Wavelength is  $\pm 2.0\text{nm}$

\*  $R_{th\ j-sp}$  is the thermal resistance from LED junction to solder point on MCPCB with electrical power

## Naming System:

**AB-3838EJ-F1E-yyy**

yyy: bin code



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## BIN Structure

### Radiant Flux BINs ( $I_F = 350\text{mA}$ , $T_j = 25^\circ\text{C}$ )

Radiant Flux			
BIN code	Min.	Max.	Unit
JP1	390	440	mW
JP2	440	490	mW
JQ1	490	550	mW
JQ2	550	610	mW
JR1	610	690	mW

\* Tolerance of measurements of the Radiant Flux is  $\pm 7\%$

### Peak Wavelength Bins ( $I_F = 350\text{mA}$ , $T_j = 25^\circ\text{C}$ )

BIN code	Min.	Max.	Unit
XE0	840	860	nm
XF0	860	880	nm

\* Tolerance of measurements of the peak wavelength is  $\pm 2.0\text{nm}$

### Forward Voltage Ranks ( $I_F = 350\text{mA}$ , $T_j = 25^\circ\text{C}$ )

BIN Code	Min.	Max.	Unit
AB6	2.6	2.8	V
AC3	2.8	3.0	V
AC4	3.0	3.2	V
AC5	3.2	3.4	V

\* Tolerance of measurements of the Forward Voltage is  $\pm 0.1\text{V}$

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Typical Characteristics Curves

Fig 1. Typical Spectrum,  $T_j = 25^\circ\text{C}$

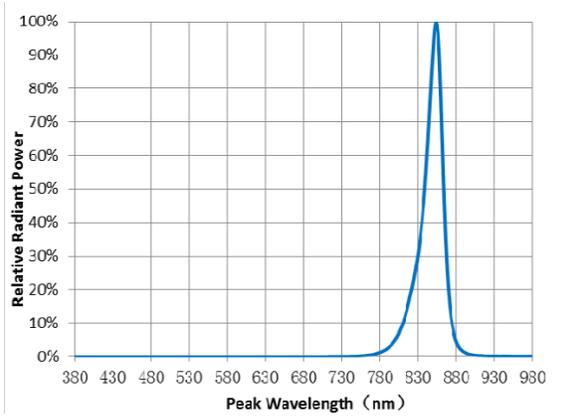


Fig 2. Forward Current vs. Relative Intensity,  $T_j = 25^\circ\text{C}$

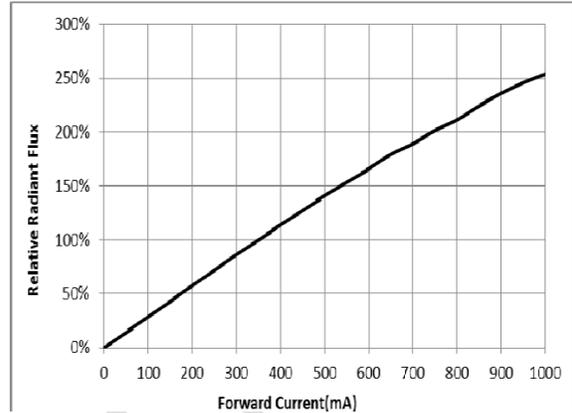


Fig 3. Forward Current vs. Relative Voltage,  $T_j = 25^\circ\text{C}$

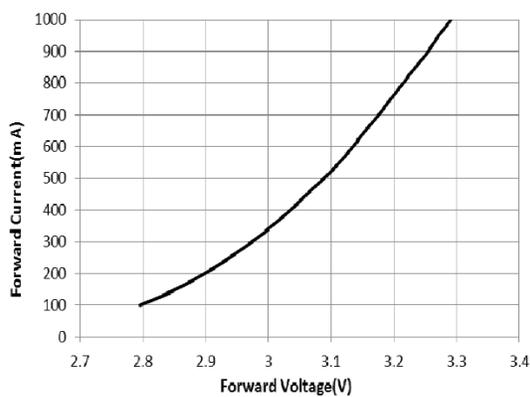


Fig 4. Soldering Temperature vs. Relative Output Flux

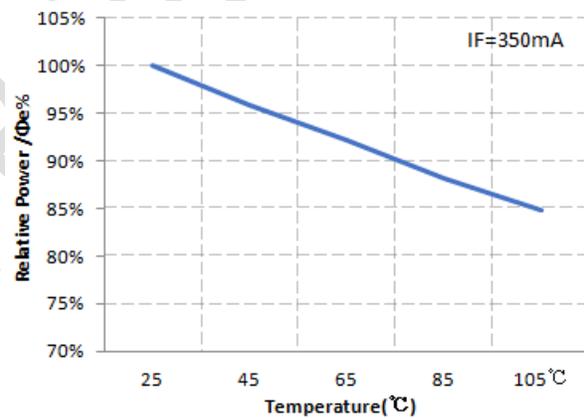


Fig 5. Typical Viewing Angle =  $90^\circ$ ,  $T_j = 25^\circ\text{C}$

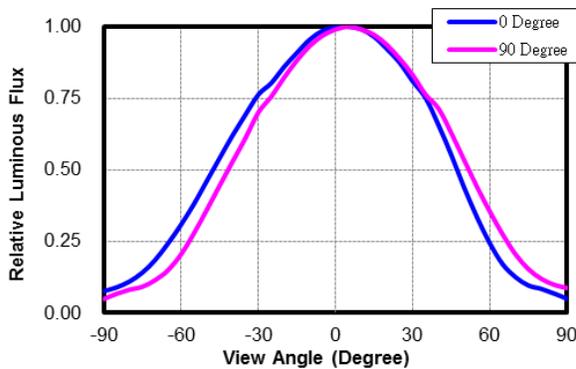
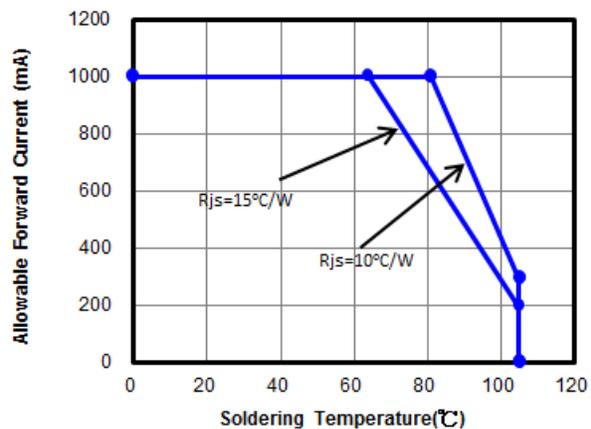
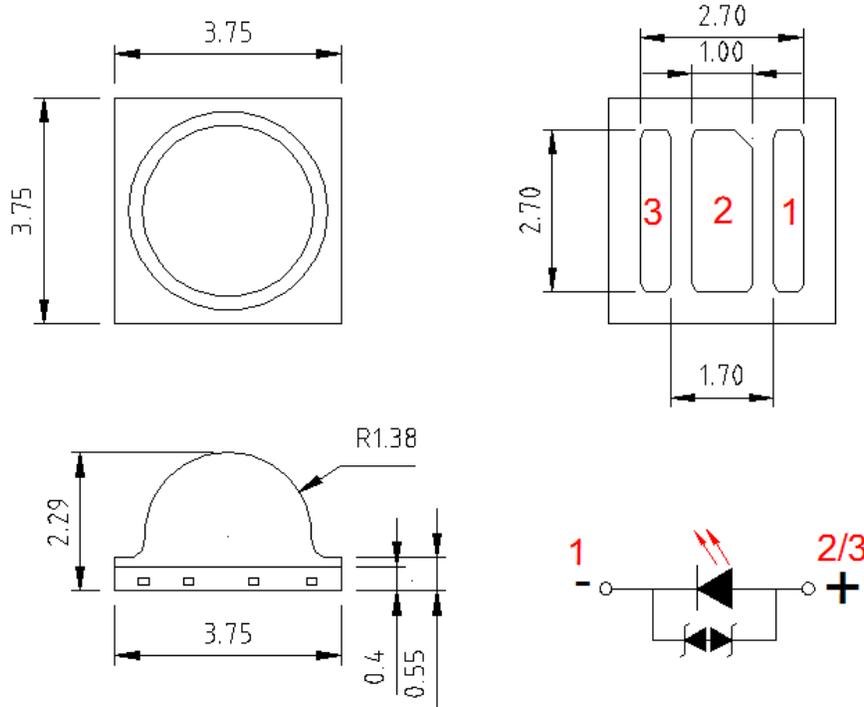


Fig 6. Soldering Temperature vs. Maximum Forward Current

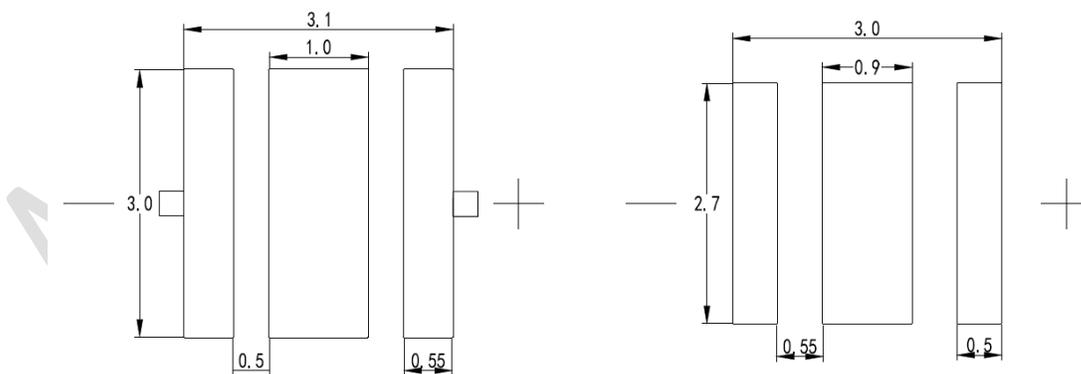


## Package Dimensions



\* The tolerance unless mentioned is  $\pm 0.2\text{mm}$ , unit = mm

## Recommended Solder Pad



Recommended PCB Solder Pad

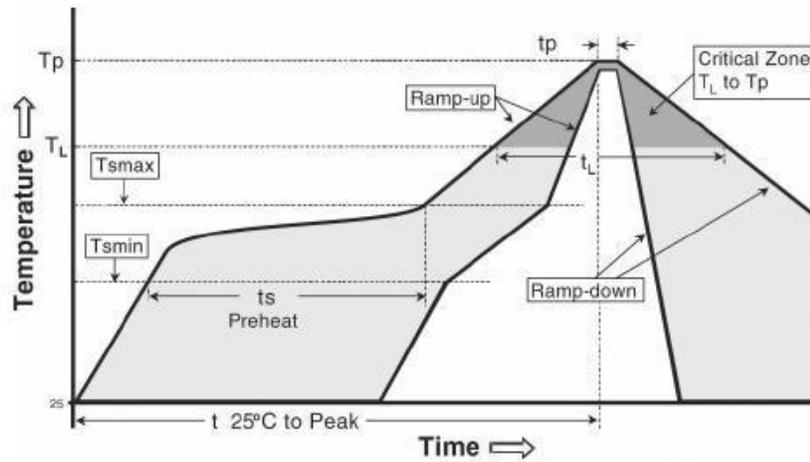
Recommended Stencil Pattern

\* The tolerance unless mentioned is  $\pm 0.1\text{mm}$ , unit = mm



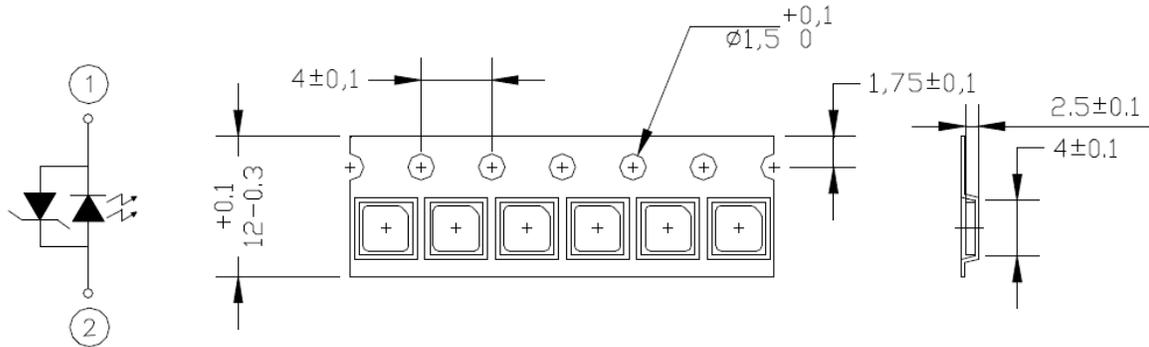
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## Reflow Soldering Characteristics



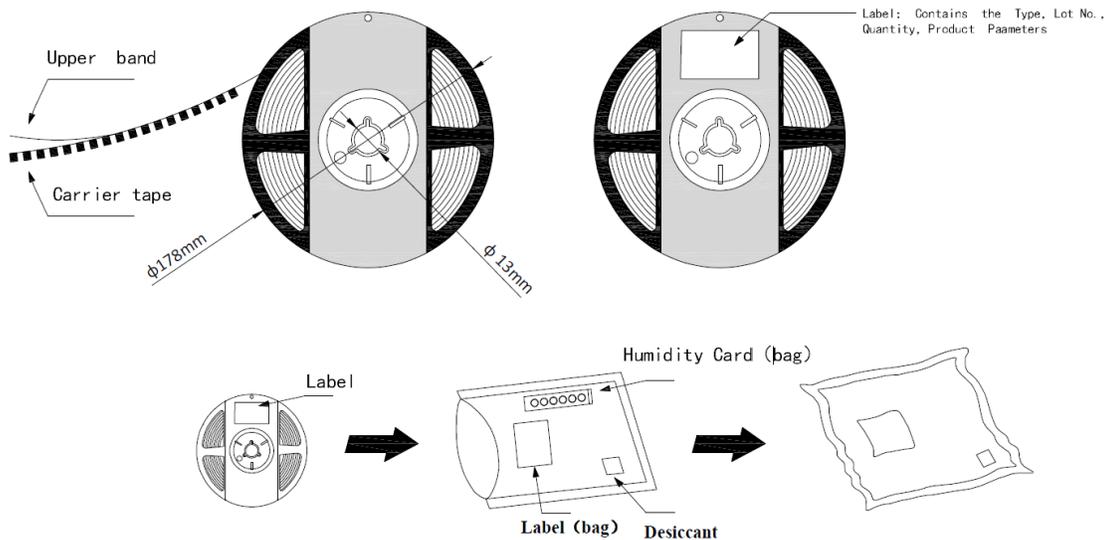
Reflow Soldering	
Temperature min ( $T_{s, \min}$ )	150°C
Temperature Max ( $T_{s, \max}$ )	200°C
Time ( $t_s$ ) from ( $T_{s, \min}$ to $T_{s, \max}$ )	60-120 s
Ramp-up rate ( $T_L$ to $T_p$ )	3°C/s Max
Liquidous temperature ( $T_L$ )	217°C
Time ( $T_L$ ) maintained above $T_L$	60-150 s
Peak package body temperature	260°C Max
Time ( $T_p$ ) within 5°C of the specified classification temperature ( $T_c$ )	30 s Max
Ramp-down rate ( $T_p$ to $T_L$ )	6°C/s Max
Time 25°C to peak temperature	8 min. Max

## Package Dimensions of Tape



- \* Quantity: Max 1000pcs/Reel
- \* Cumulative Tolerance: Cumulative Tolerance/10 pitches to be  $\pm 0.25$ mm
- \* Package: P/N, Manufacturing data Code No. and Quantity to be indicated on a waterproof Package.
- \* unit = mm

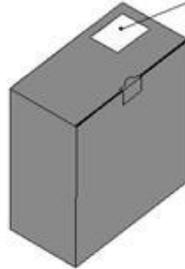
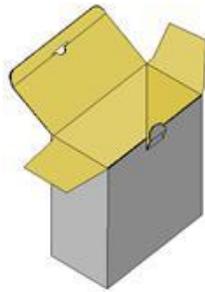
## Package Dimensions of Reel





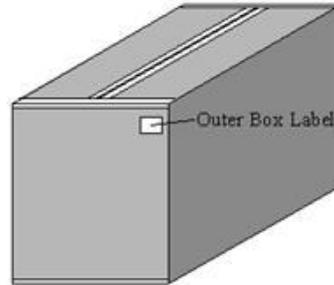
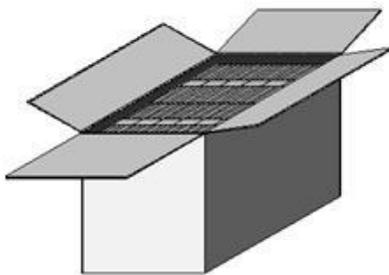
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## Packaging



Label Contains Type,  
Lot NO, Quantity, Product  
Parameters.

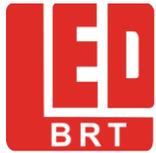
\* Capacity 4 or 8 reels per box.



Outer Box Label

\* Capacity 48 or 64 reels per box.

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## Caution

1. Reflow soldering is recommended not to be done more than two times. In the case of more than 24 hours passed soldering after first, LEDs will be damaged.
2. Repairs should not be done after the LEDs have been soldered. When repair is unavoidable, suitable tools must be used.
3. Die slug is to be soldered.
4. When soldering, do not put stress on the LEDs during heating.
5. After soldering, do not warp the circuit board.

## Notes on American Bright EMC Series soldering:

1. Recommend to use reflow machine.
2. Recommend to use heating plate soldering.
3. Manual soldering is not recommended.

## Notes on reflow process:

1. To confirm whether the actual temperature curve in the reflow soldering conditions comply with recommended conditions. LEDs are guaranteed for one time reflow.
2. During reflow process do not apply force on LED active area.
3. After reflow process, PCB board should be cooled down before packing or storage.

## Precaution for use

### *Storage*

1. Before opening the package: The LED should be kept at 5-30°C and 60%RH or less.
2. After opening the package: The LED's lifetime is 168Hrs @30°C or less and 60%RH or less. If unused LED remain, it should be stored in moisture proof packages JEDEC (**MSL 3**).
3. If the moisture absorbent material (silica gel) has faded away or the LEDs have exceeded the storage time, baking treatment should be performed using the following conditions: baking treatment: 60±5°C for 24 hours.