

Harvatek Surface Mount CHIP LEDs Data Sheet
F3NC3GRB-20C-001342

Official Product	HT Part No.F3NC3GRB-20C-001342			
Tentative Product	*****	*****		
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DISCLAIMER	3
LIFE SUPPORT POLICY	3
PRODUCT SPECIFICATIONS	4
ATTENTION: ELECTROSTATIC DISCHARGE (ESD) PROTECTION	4
LABEL SPECIFICATIONS	5
SPECIFICATIONS RANGE	6
PRODUCT FEATURES	8
ELECTRO-OPTICAL CHARACTERISTICS	8
PACKAGE OUTLINE DIMENSION AND RECOMMENDED SOLDERING PATTERN FOR REFLOW	
SOLDERING	9
ABSOLUTE MAXIMUM RATINGS	10
CHARACTERISTICS OF F3NC3GRB	11
PRECAUTION FOR USE	12
PACKAGING	13
TAPE DIMENSION	13
REEL DIMENSION	14
PACKING	14
DRY PACK	15
BAKING	15
PRECAUTIONS	15
HANDLING OF SILICONE RESIN LEDS	16
REFLOW SOLDERING	17
REWORKING	17
CLEANING	17
CAUTIONS OF PICK AND PLACE	18
REVISE HISTORY	18

Official Product	HT Part No.F3NC3GRB-20C-001342			
Tentative Product	*****	*****		
Specifications are subject to changes for improvement without advance notice. Proprietary data, drawings, company confidential all rights reserved.		01/12/2018	Version 1.1	Page 2/18

DISCLAIMER

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1. Life support devices or systems are devices or systems which, (a) are intended for surgical implant into the body, or (b) support or sustain life, and (c) whose failure to perform when properly used in accordance with instructions for use provided in the labeling, can be reasonably expected to result in a significant injury of the user.
2. A critical component in any component of a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or system, or to affect its safety or effectiveness.

Official Product	HT Part No.F3NC3GRB-20C-001342			
Tentative Product	*****	*****		
Specifications are subject to changes for improvement without advance notice. Proprietary data, drawings, company confidential all rights reserved.		01/12/2018	Version 1.1	Page 3/18

Product Specifications

Item	Specification	Material	Quantity
Luminous Intensity(Iv)	R:360.0-715.0 mcd G:900.0-1800.0 mcd B:180.0-450.0 mcd @20mA/ T _s = 25°C;Tolerance: ± 10%		
Dominant Wavelength	R:615.0-630.0 nm G:515.0-530.0 nm B:460.0-476.0 nm @20mA/ T _s = 25°C;Tolerance: ± 1.0nm		
Vf	R:1.6-2.6 V G:2.7-3.7 V B:2.7-3.7 V @20mA/ T _s = 25°C ;Tolerance: ± 0.1V		
Ir	<10 μA @ V _R = 5 V		
Resin	Clear	Silicone	
Carrier tape	EIA 481-1A specs	Conductive black tape	
Reel	EIA 481-1A specs	Conductive black	
Label	HT standard	Paper	
Packing bag	220x240mm	Aluminum laminated bag/ no-zipper	One reel per bag
Carton	HT standard	Paper	Non-specified

Others:

Each immediate box consists of 5 reels. The 5 reels may not necessarily have the same lot number or the same bin combinations of Iv, λ_D and Vf. Each reel has a label identifying its specification; the immediate box consists of a product label as well.

Note :This is shipped test conditions

※Remarks: This product should be operated in forward bias. If a reverse voltage is continuously applied to the product, such operation can cause migration resulting in LED damage.

ATTENTION: Electrostatic Discharge (ESD) protection



The symbol to the left denotes that ESD precaution is needed. ESD protection for GaP and AlGaAs based chips is necessary even though they are relatively safe in the presence of low static-electric discharge. Parts built with AlInGaP, GaN, or/and InGaN based chips are **STATIC SENSITIVE devices**. ESD precaution must be taken during design and assembly.

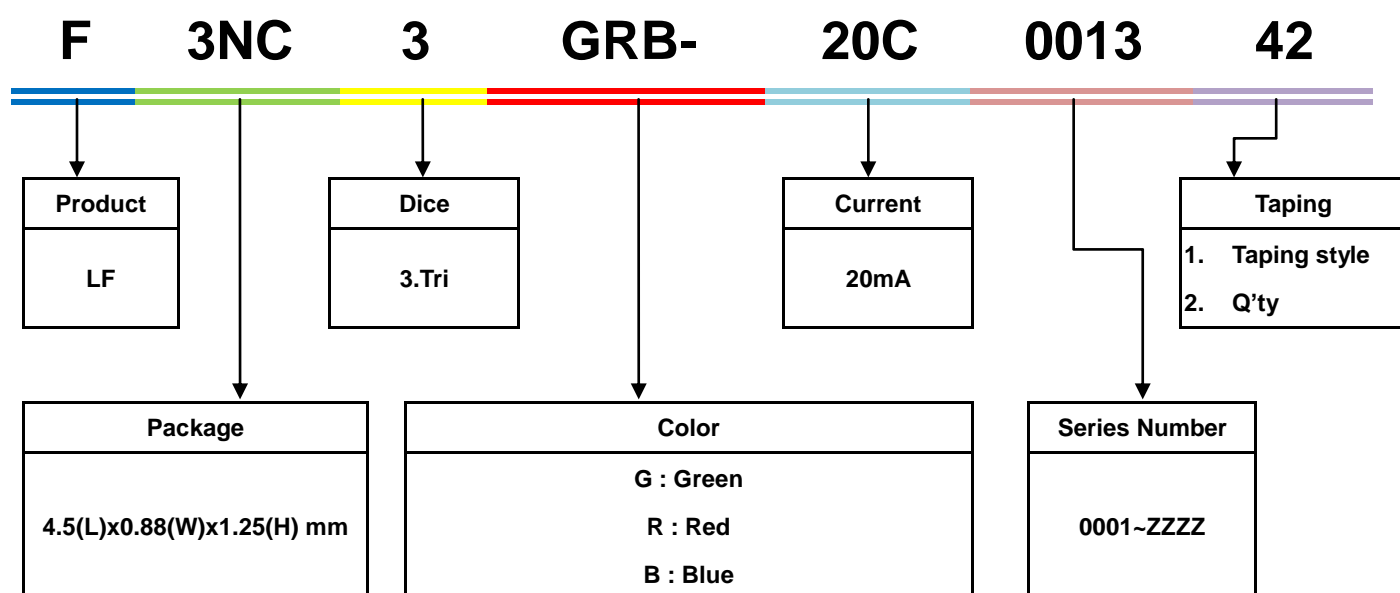
If manual work or processing is needed, please ensure the device is adequately protected from ESD during the process.

Official Product	HT Part No.F3NC3GRB-20C-001342		
Tentative Product	*****	*****	
Specifications are subject to changes for improvement without advance notice. Proprietary data, drawings, company confidential all rights reserved.		01/12/2018	Version 1.1 Page 4/18

Label Specifications



Harvatek P/N:



Lot No.:

1	2	3	4	5	6	7	8	9	10
E	1	A	1	A	2	2	L	1	2
Code 1 2		Code 3	Code 4	Code 5	Code 6	Code 7	Code 8	Code 9	Code 10
		Mfg. Year	Mfg. Month	Mfg. Date	Consecutive number		Special code		
Internal Tracing Code		2010-A	1:Jan.	1:A	01~ZZ		000~ZZZ		
		2011-B	2:Feb.	2:B					
		2012-C	3:C					
		2013-D	A:Oct.	26:Z					
		.	B:Nov.	27:7					
		.	C:Dec.	28:8					
				29:9					
				30:3					
				31:4					

Official Product	HT Part No.F3NC3GRB-20C-001342			
Tentative Product	*****		*****	
Specifications are subject to changes for improvement without advance notice. Proprietary data, drawings, company confidential all rights reserved.			01/12/2018	Version 1.1
			Page 5/18	

Specifications Range

■ Luminous Intensity (Iv) Bin:

Color	Bin Code	Spec. Range
R	U	360.0-450.0 mcd
	V	450.0-560.0 mcd
	W	560.0-715.0 mcd
G	Y	900.0-1125.0 mcd
	Z	1125.0-1440.0 mcd
	AA	1440.0-1800.0 mcd
B	S	180.0-285.0 mcd
	T	285.0-360.0 mcd
	U	360.0-450.0 mcd

Note: It maintains a tolerance of $\pm 10\%$ on Luminous Intensity

■ Dominant Wavelength (Wd) Bin:

Color	Bin Code	Spec. Range
R	A	615.0-620.0 nm
	B	620.0-625.0 nm
	C	625.0-630.0 nm
G	A	515.0-520.0 nm
	B	520.0-525.0 nm
	C	525.0-530.0 nm
B	A	460.0-464.0 nm
	B	464.0-468.0 nm
	C	468.0-472.0 nm
	D	472.0-476.0 nm

Note: It maintains a tolerance of Wd $\pm 1.0\text{nm}$

Official Product	HT Part No.F3NC3GRB-20C-001342			
Tentative Product	*****	*****		
Specifications are subject to changes for improvement without advance notice. Proprietary data, drawings, company confidential all rights reserved.		01/12/2018	Version 1.1	Page 6/18

■ Forward Voltage (Vf) Bin:

Color	Bin Code	Spec. Range
R	E1A	1.6-2.6 V
G&B	G8	2.7-2.9 V
	H7	2.9-3.1 V
	H8	3.1-3.3 V
	J7	3.3-3.5 V
	J8	3.5-3.7 V

Note: It maintains a tolerance of $\pm 0.1V$ on forward voltage measurements

Official Product	HT Part No.F3NC3GRB-20C-001342		
Tentative Product	*****	*****	
Specifications are subject to changes for improvement without advance notice. Proprietary data, drawings, company confidential all rights reserved.		01/12/2018	Version 1.1 Page 7/18

Product Features

Electro-Optical Characteristics

(T_{Soldering} , 25 °C)

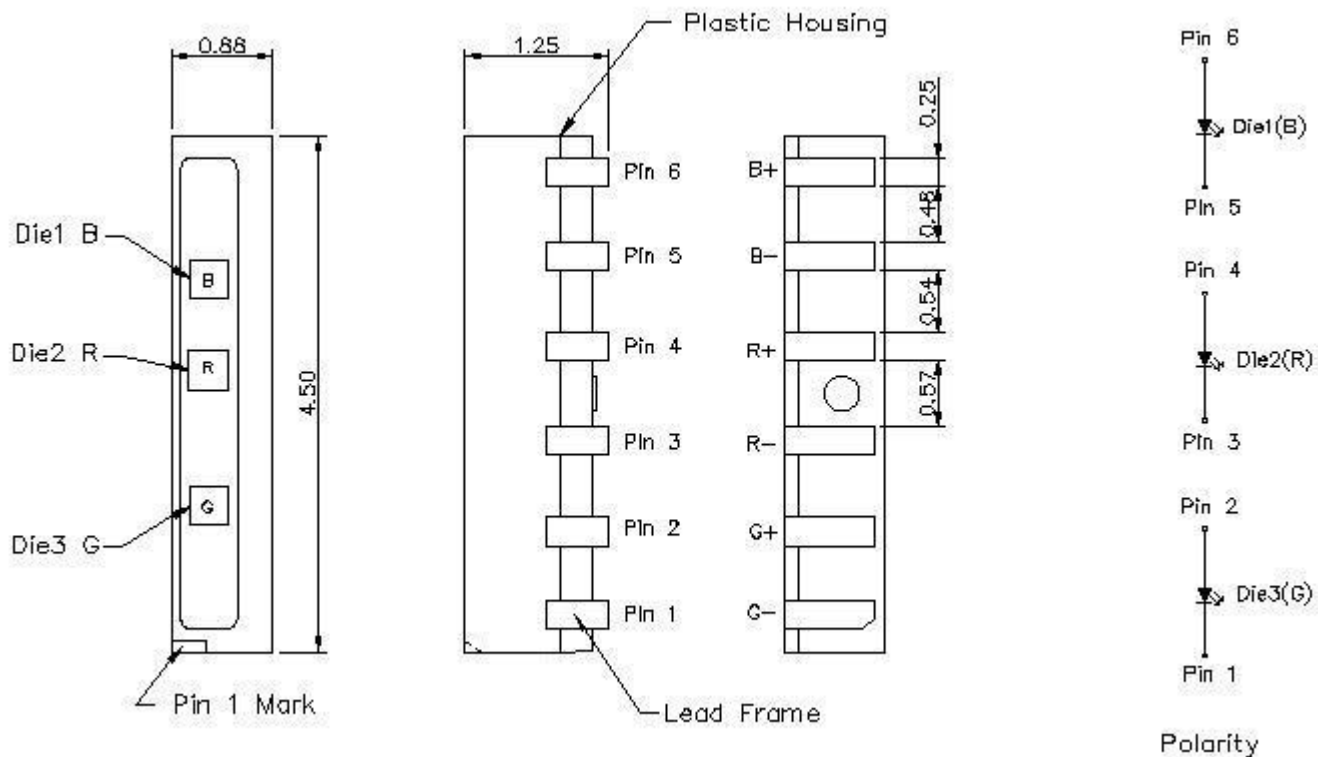
Series	Emitting Color	Material	V _F (V)		Wavelength λ(nm)			I _V (mcd)	Viewing
			Typ	Max	λ _D	λ _P	Δ λ	Typical	Angle $2\theta \frac{1}{2}$
F3NC3GRB	R	AlGaInP	2.0	2.4	624	631	20	500	120
	G	InGaN	3.3	3.7	525	520	30	1300	120
	B	InGaN	3.3	3.7	470	468	30	250	120

Official Product	HT Part No.F3NC3GRB-20C-001342			
Tentative Product	*****	*****		
Specifications are subject to changes for improvement without advance notice. Proprietary data, drawings, company confidential all rights reserved.		01/12/2018	Version 1.1	Page 8/18

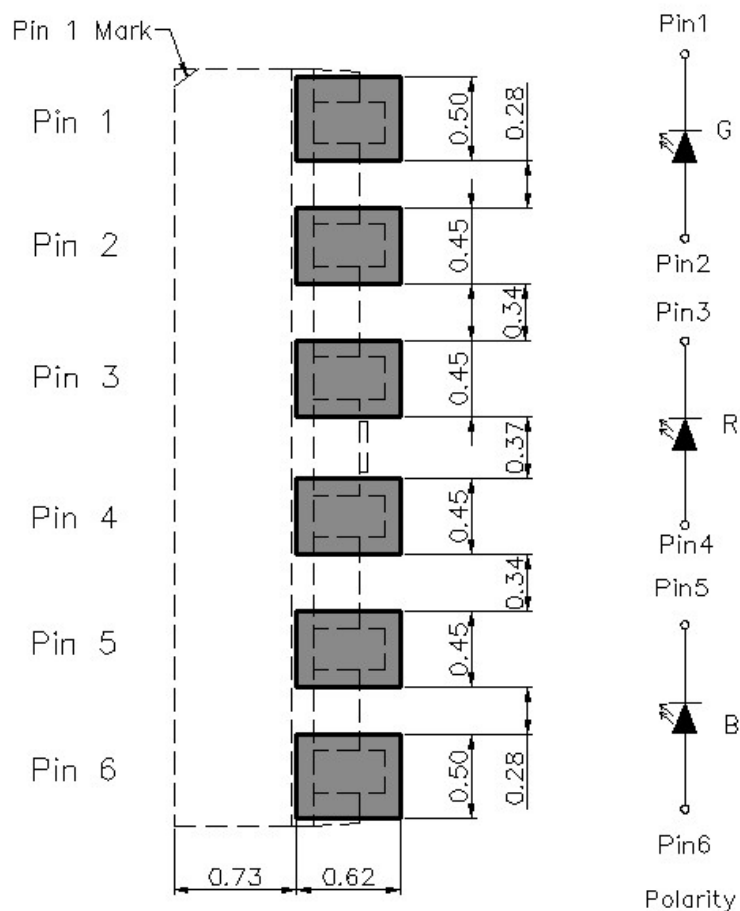
Package Outline Dimension and Recommended Soldering Pattern for Reflow Soldering

(Unit:mm Tolerance: +/-0.1)

Outline Dim.



Official Product	HT Part No.F3NC3GRB-20C-001342		
Tentative Product	*****	*****	*****
Specifications are subject to changes for improvement without advance notice. Proprietary data, drawings, company confidential all rights reserved.		01/12/2018	Version 1.1 Page 9/18



Soldering terminals may shift in the Wd direction.

Absolute Maximum Ratings

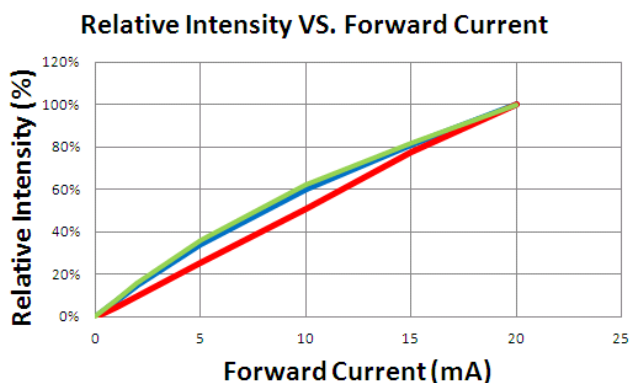
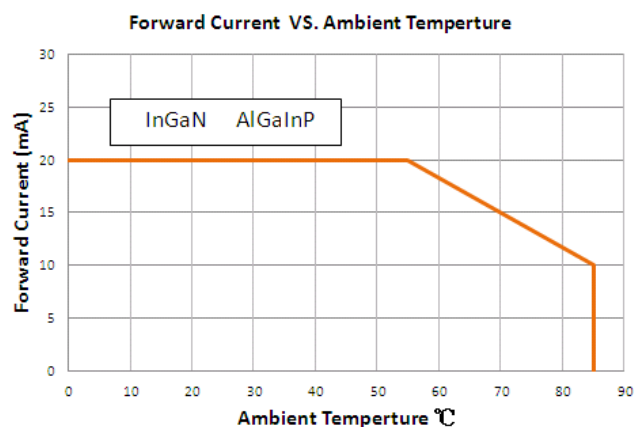
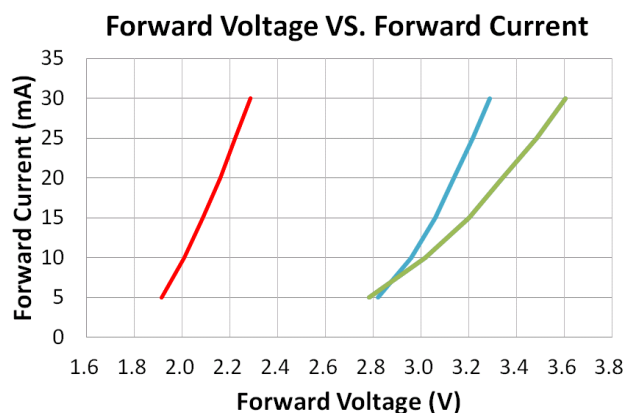
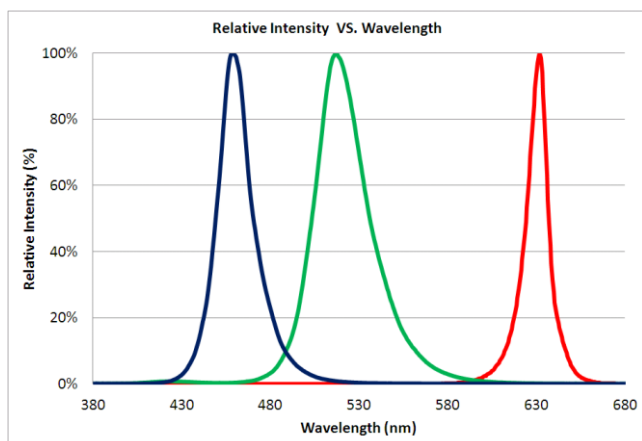
($T_{\text{Soldering}} 25^{\circ}\text{C}$)

Series	P_D (mW)	I_F (mA)	I_{FP} (mA)*	T_{OP} ($^{\circ}\text{C}$)	T_{ST} ($^{\circ}\text{C}$)
Color	Power Dissipation	Forward Current	Pulse Forward Current	Operating Temperature	Storage Temperature
R	52	20	30	-40~+85	-40~+100
G	74	20	30	-40~+85	-40~+100
B	74	20	30	-40~+85	-40~+100

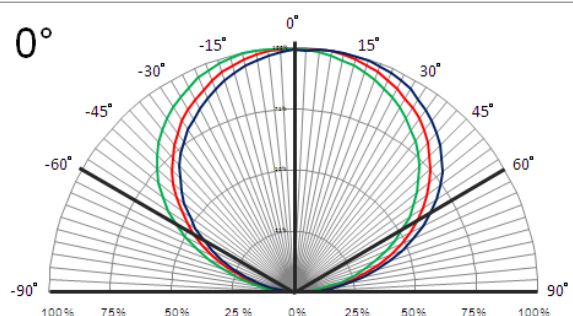
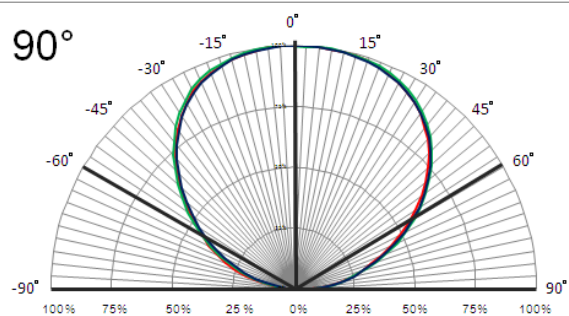
* Condition for I_{FP} is pulse of 1/10 duty and 0.1msec width

Official Product	HT Part No.F3NC3GRB-20C-001342			
Tentative Product	*****	*****		
Specifications are subject to changes for improvement without advance notice. Proprietary data, drawings, company confidential all rights reserved.		01/12/2018	Version 1.1	Page 10/18

Characteristics of F3NC3GRB



Directive Characteristics



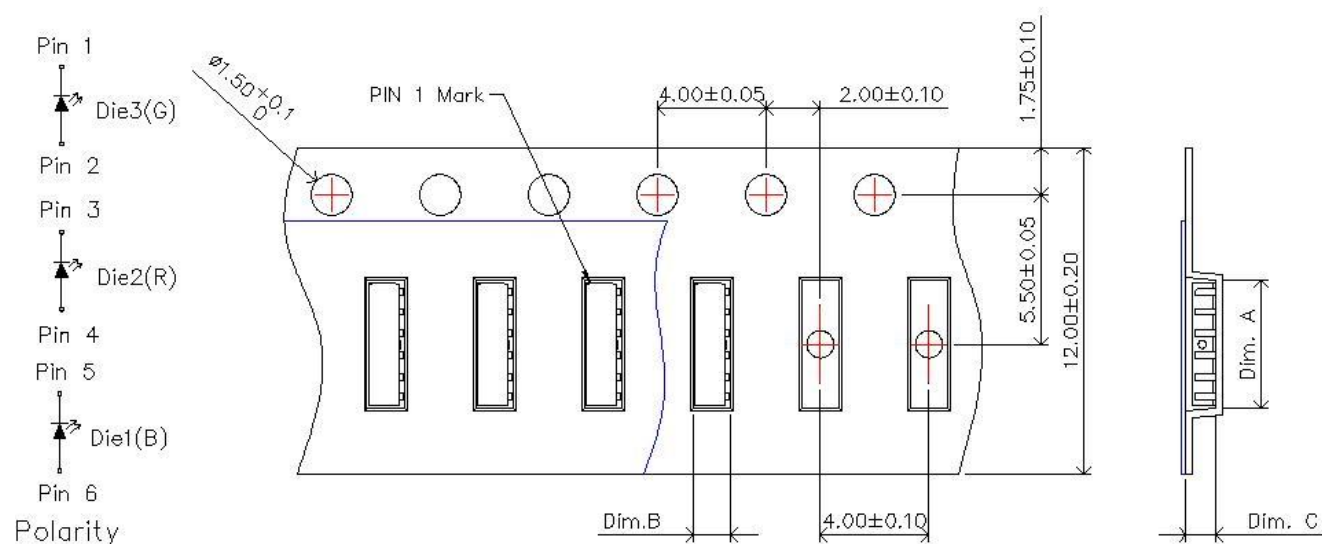
Official Product	HT Part No.F3NC3GRB-20C-001342		
Tentative Product	*****	*****	
Specifications are subject to changes for improvement without advance notice. Proprietary data, drawings, company confidential all rights reserved.		01/12/2018	Version 1.1 Page 11/18

Precaution for Use

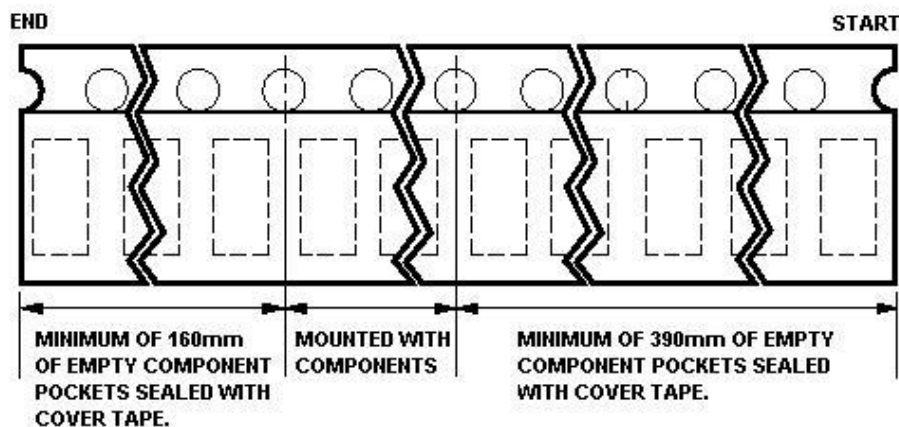
1. The chips should not be used directly in any type of fluid such as water, oil, organic solvent, etc.
2. When the LEDs are illuminating, the maximum ambient temperature should be first considered before operation.
3. LEDs must be stored in a clean environment. A sealed container with a nitrogen atmosphere is necessary if the storage period is over 3 months after shipping.
4. The LEDs must be used within 72 hrs after unpacked. Unused products must be repacked in an anti-electrostatic package, folded to close any opening and then stored in a dry and cool space.
5. The appearance and specifications of the products may be modified for improvement without further notice.
6. The LEDs are sensitive to the static electricity and surge. It is strongly recommended to use a grounded wrist band and anti-electrostatic glove when handling the LEDs. If a voltage over the absolute maximum rating is applied to LEDs, it will damage LEDs. Damaged LEDs will show some abnormal characteristics such as remarkable increase of leak current, lower turn-on voltage and getting unlit at low current.

Official Product	HT Part No.F3NC3GRB-20C-001342			
Tentative Product	*****	*****		
Specifications are subject to changes for improvement without advance notice. Proprietary data, drawings, company confidential all rights reserved.		01/12/2018	Version 1.1	Page 12/18

Packaging Tape Dimension

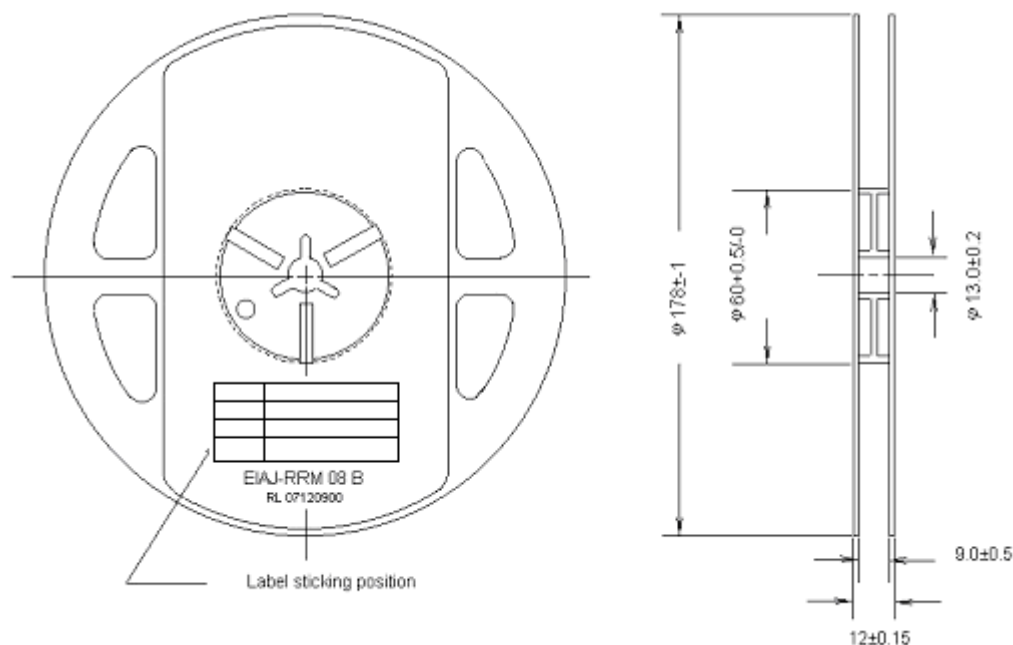


Dim. A	Dim. B	Dim. C	Q'ty/Reel
4.7 ± 0.10	1.4 ± 0.10	1.1 ± 0.10	2K

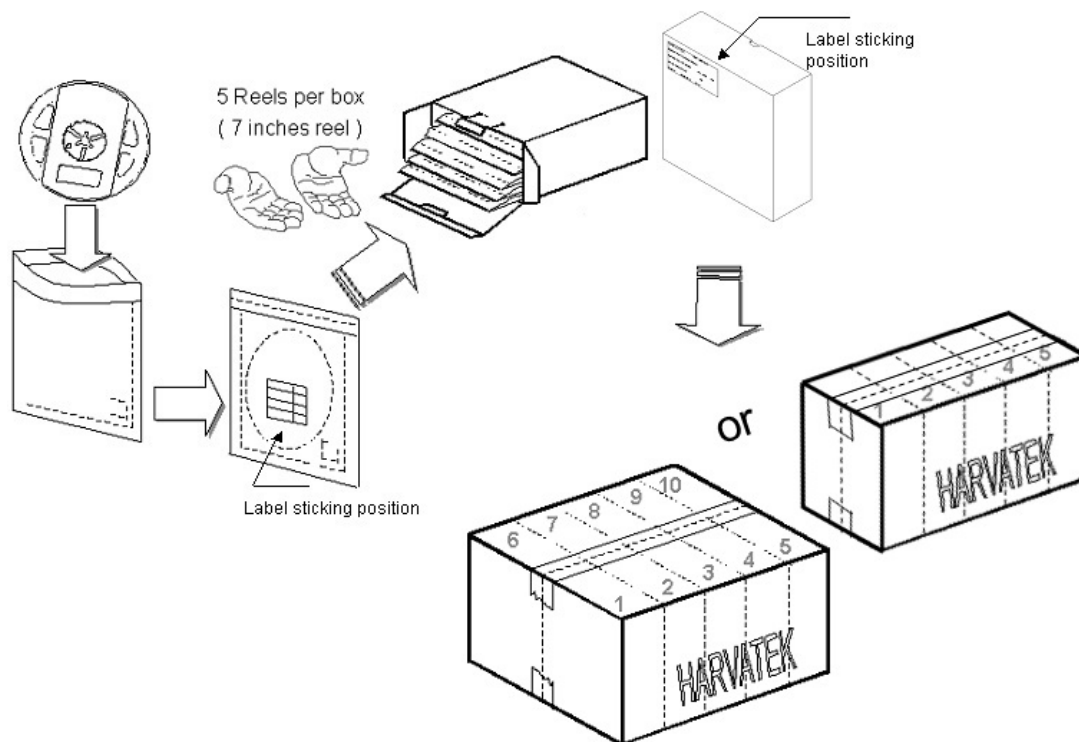


Official Product	HT Part No.F3NC3GRB-20C-001342		
Tentative Product	*****	*****	*****
Specifications are subject to changes for improvement without advance notice. Proprietary data, drawings, company confidential all rights reserved.		01/12/2018	Version 1.1 Page 13/18

Reel Dimension



Packing



5 or 10 boxes per carton is available depending on shipment quantity.

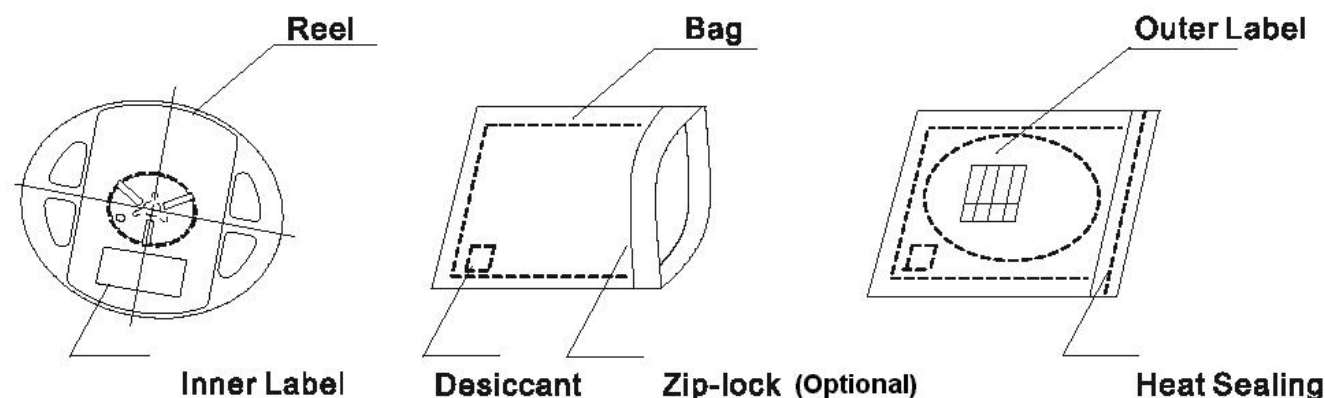
Official Product	HT Part No.F3NC3GRB-20C-001342		
Tentative Product	*****	*****	
Specifications are subject to changes for improvement without advance notice. Proprietary data, drawings, company confidential all rights reserved.		01/12/2018	Version 1.1 Page 14/18

Dry Pack

All SMD optical devices are **MOISTURE SENSITIVE**. Avoid exposure to moisture at all times during transportation or storage. Every reel is packaged in a moisture protected anti-static bag. Each bag is properly sealed prior to shipment.

Upon request, a humidity indicator will be included in the moisture protected anti-static bag prior to shipment.

The packaging sequence is as follows:



Baking

Baking before soldering is recommended when the package has been unsealed for 72 hrs.

The conditions are as followings:

1. $60\pm3^{\circ}\text{C} \times (12\sim 24\text{hrs})$ and $<5\%\text{RH}$, taped reel type.
2. $100\pm3^{\circ}\text{C} \times (45\text{min}\sim 1\text{hr})$, bulk type.
3. $130\pm3^{\circ}\text{C} \times (15\text{min}\sim 30\text{min})$, bulk type.

Precautions

1. Avoid exposure to moisture at all times during transportation or storage.
2. Anti-Static precaution must be taken when handling GaN, InGaN, and AlInGaP products.
3. It is suggested to connect the unit with a current limiting resistor of the proper size. Avoid applying a reverse voltage beyond the specified limit.
4. Avoid operation beyond the limits as specified by the absolute maximum ratings.
5. Avoid direct contact with the surface through which the LED emits light.
6. If possible, assemble the unit in a clean room or dust-free environment.

Official Product	HT Part No.F3NC3GRB-20C-001342		
Tentative Product	*****	*****	
Specifications are subject to changes for improvement without advance notice. Proprietary data, drawings, company confidential all rights reserved.		01/12/2018	Version 1.1 Page 15/18

Handling of Silicone Resin LEDs

Handling Indications

During processing, mechanical stress on the surface should be minimized as much as possible.

Sharp objects of all types should not be used to pierce the sealing compound.



Figure 1

In general, LEDs should only be handled from the side. By the way, this also applies to LEDs without a silicone sealant, since the surface can also become scratched.

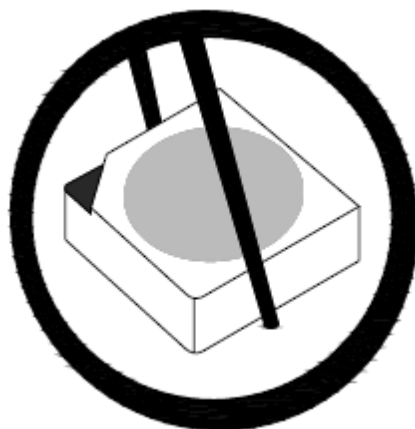


Figure 2

When populating boards in SMT production, there are basically no restrictions regarding the form of the pick and place nozzle, except that mechanical pressure on the surface of the resin must be prevented.

This is assured by choosing a pick and place nozzle which is large than LEDs reflector area.

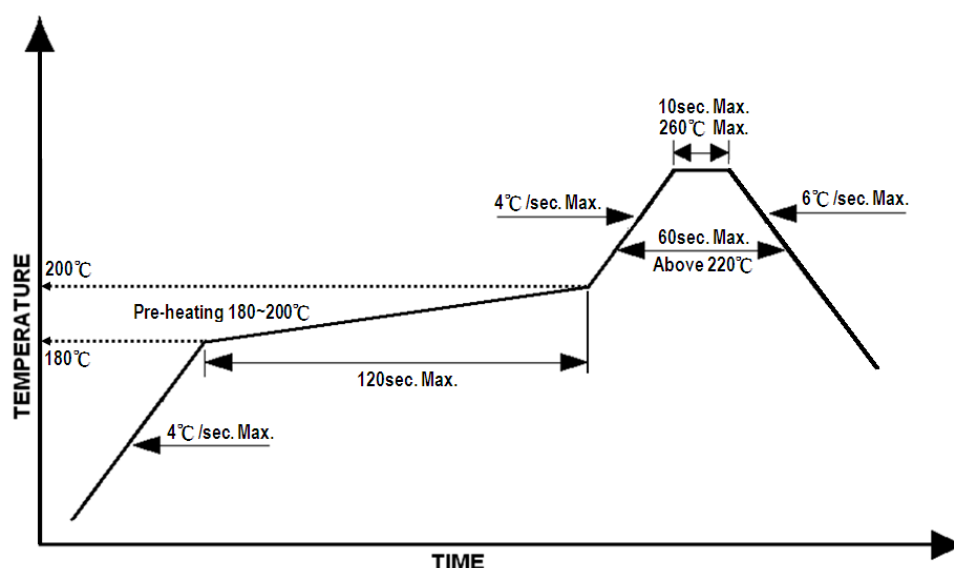
Official Product	HT Part No.F3NC3GRB-20C-001342			
Tentative Product	*****	*****		
Specifications are subject to changes for improvement without advance notice. Proprietary data, drawings, company confidential all rights reserved.		01/12/2018	Version 1.1	Page 16/18

Reflow Soldering

Recommend soldering paste specifications:

1. Operating temp.: Above 220 °C ,60 sec.
2. Peak temp.:260 °CMax.,10sec Max.
3. Reflow soldering should not be done more than two times.
4. Never attempt next process until the component is cooled down to room temperature after reflow.
5. The recommended reflow soldering profile (measured on the surface of the LED terminal) is as following:

Lead-free Solder Profile



Reworking

- Rework should be completed within 5 seconds under 260 °C.
- The iron tip must not come in contact with the copper foil.
- Twin-head type is preferred.

Cleaning

Following are cleaning procedures after soldering:

- An alcohol-based solvent such as isopropyl alcohol (IPA) is recommended.
- Temperature x Time should be 50°C x 30sec. or <30°C x 3min
- Ultrasonic cleaning: < 15W/ bath; bath volume ≤ 1liter
- Curing: 100 °C max, <3min

Official Product	HT Part No.F3NC3GRB-20C-001342		
Tentative Product	*****	*****	
Specifications are subject to changes for improvement without advance notice. Proprietary data, drawings, company confidential all rights reserved.		01/12/2018	Version 1.1 Page 17/18

Cautions of Pick and Place

- Avoid stress on the resin at elevated temperature.
- Avoid rubbing or scraping the resin by any object.
- Electric-static may cause damage to the component. Please ensure that the equipment is properly grounded. Use of an ionizer fan is recommended.

Revise History

Rev.	Descriptions	Date	Page
1.0		10/31/2017	
1.1	Modify The Recommended Soldering Pattern for Reflow Soldering.	01/22/2018	P10

Official Product	HT Part No.F3NC3GRB-20C-001342		
Tentative Product	*****	*****	
Specifications are subject to changes for improvement without advance notice. Proprietary data, drawings, company confidential all rights reserved.		01/12/2018	Version 1.1 Page 18/18