HWFR-P5B1 HWFR-P5B2 HWFR-P5B3
HWFR-P5C1 HWFR-P5C2
HWFR-P5G1 HWFR-P5G2

P5 Series InGaN LED Chips

Technical Data DS39

Lumileds revolutionary chip design produces extraordinarily bright blue, traffic green, and green chips, and enables LED package designers to make products with outstanding flux performance.

Benefits

- Superior Efficiency
- Lowers Lighting System Cost
- Fewer LEDs Required

Features

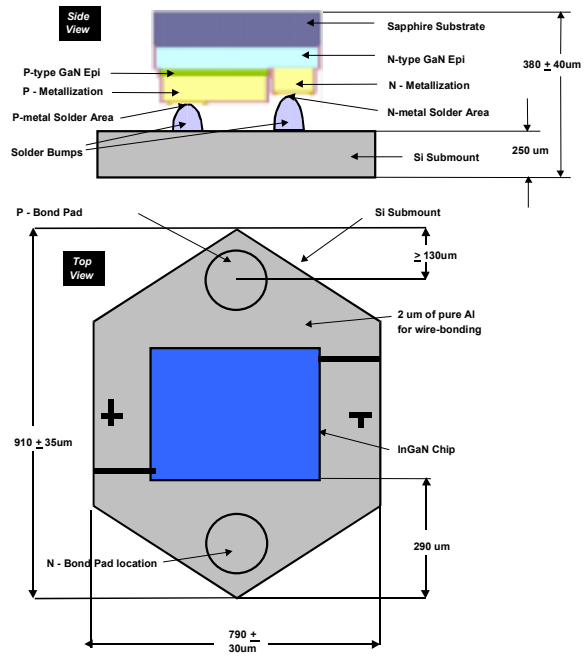
- High Luminous Flux
- Lowest Vf Available
- High Forward Current Operation Capability
- Excellent ESD Performance
- 5 nm Color Bins
- InGaN Chip Soldered On Silicon Submount

Typical Applications

- Outdoor Video Displays and Signs
- Traffic Signals
- Backlighting
- Automotive Lighting
- Specialty Lighting

LUMILEDS™
LIGHT FROM SILICON VALLEY

Outline Drawings



Not Drawn To Scale

Selection Guide [Notes 1 and 2]

Part Number	LED Color	Total flux Φ_V (mlm) @ 50mA Typ.	Total flux Φ_V (mlm) @ 20mA Typ.
HWFR-P5B3	460 nm InGaN Blue	1000	500
HWFR-P5B1	465 nm InGaN Blue	1200	600
HWFR-P5B2	475 nm InGaN Blue	1600	800
HWFR-P5C1	500 nm InGaN Traffic Green	4000	2000
HWFR-P5C2	505 nm InGaN Traffic Green	4000	2000
HWFR-P5G1	525 nm InGaN Green	4400	2200
HWFR-P5G2	530 nm InGaN Green	4400	2200

Notes:

1. Typical values given are the average values expected by Seller in large quantities and are for information only.
2. Measurements were made using the Lumileds SuperFlux package with epoxy encapsulation and are for information only.
3. Maximum ratings are package dependent. Ratings were determined using a Lumileds SuperFlux package. Results will vary.
4. The reverse breakdown voltage (Vr) is dependant on the type of die attach used and on the electrical configuration of the package. If non-conductive die attach epoxy is used and the submount is isolated from the cathode, then the Vr is < -5V at Ir = -10uA. See Figures 1, 2, and 3.
5. Electrical and Optical measurements, except Flux, are pulsed measurements.
6. The forward voltage at IF = 20 mA is chip measured data while the the forward voltage at IF = 50 mA is Lumileds SuperFlux package measured data.

Absolute Maximum Ratings at T_A = 25 °C [Note 3]

Parameter		Units
DC Forward Current	50	mA
Reverse Voltage (I_R = 10 μ_A)	< -0.5 [See Note 4]	V
Operating Temperature Range	-40 to + 100	C
LED Junction Temperature	125	C
ESD Rating MM	Class II (2KV)	-
ESD Rating HBM	16000	V
Manufacturing Process Temperature	170	C

Optical Characteristics at T_A = 25 deg C, [Notes 1,2, and 5]

Part Number	Total flux Φ(mlm) Typ. @IF= 50mA	Typ. @IF= 20mA	Peak Wave Length λPeak (nm) Typ. @IF= 20mA	Dominant WaveLength λDom(nm) [2] @IF=20mA Min.	Typ.	Max	Intensity Iv (mcd) @IF=20mA Min.	Typ.	Spectral Width FWHM (nm) Typ. @IF= 20mA
HWFR-P5B3	1000	500	456	455	460	465	130	210	20
HWFR-P5B1	1200	600	461	460	465	470	150	240	20
HWFR-P5B2	1600	800	471	470	475	480	170	270	22
HWFR-P5C1	4000	2000	495	490	500	510	400	800	26
HWFR-P5C2	4000	2000	500	495	505	515	400	800	26
HWFR-P5G1	4400	2200	518	515	525	535	450	900	30
HWFR-P5G2	4400	2200	523	520	530	540	450	900	30

Electrical Characteristics at T_A = 25 °C [Notes 4, 5, and 6]

Part Number	Forward Voltage V_F (Volts) @ I_F = 50 mA [6] Typ.	Max	Forward Voltage V_F (Volts) @ I_F = 20 mA [6] Typ	Max	Reverse Breakdown V_R (Volts) @ I_R = 100 µA Min	Typ
HWFR-P5B3	4.1	4.5	3.5	3.8	-0.5	-0.6
HWFR-P5B1	4.0	4.5	3.4	3.8	-0.5	-0.6
HWFR-P5B2	4.0	4.5	3.4	3.8	-0.5	-0.6
HWFR-P5C1	3.9	4.5	3.3	3.8	-0.5	-0.6
HWFR-P5C2	3.9	4.5	3.3	3.8	-0.5	-0.6
HWFR-P5G1	3.8	4.5	3.2	3.8	-0.5	-0.6
HWFR-P5G2	3.8	4.5	3.2	3.8	-0.5	-0.6

Visual Inspection, Testing, & Sorting

Visual Inspection	100%
Iv, Vf, & Color Testing	100%
Sorting – 5nm Color Bins, Iv Bins TBD	100%

Mechanical Dimensions

Parameter		Units
Chip Size	338 x 358	um
SubMount Size	910 x 790	um
Height	380	um

Figures

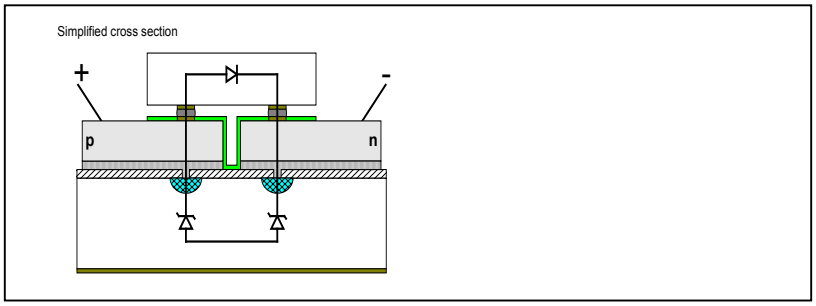


Figure 1 - This is a simplified cross section of a P5 InGaN Series Chip.

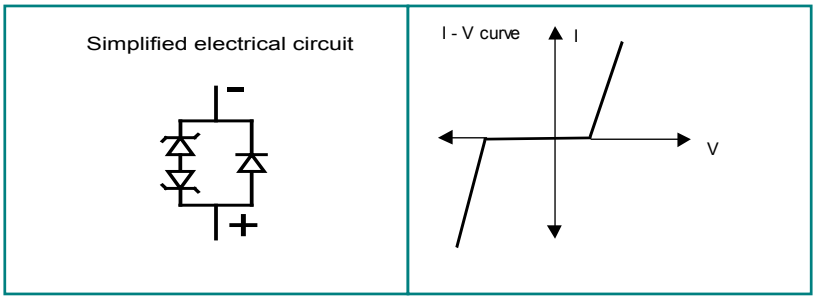


Figure 2 - Die is attached on package with non-conductive epoxy. The n and p wirebond pads are isolated from the back metallization. Package level Vr @ -100 uA is < -5.0 V.

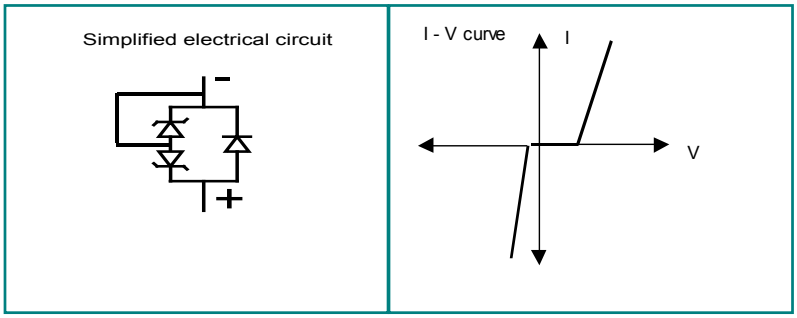


Figure 3 - Die is attached on package with conductive epoxy. The n terminals of Zener diodes are common with the n wirebond pad, essentially shorting the second Zener diode. Package level Vr @ -100uA <-0.5V.

Company Information

Lumileds is a world-class supplier of Light Emitting Diodes (LEDs) producing billions of LEDs annually. Lumileds is a fully integrated supplier, producing core LED material in all three base colors (Red, Green, Blue) and White. Lumileds has R&D development centers in San Jose, California, Best, The Netherlands, and Malaysia. Lumileds has production capabilities in San Jose, California and Malaysia.

Lumileds is pioneering high-flux LED technology and bridging the gap between solid-state LED technology and the lighting world. Lumileds is absolutely dedicated to bringing the best and brightest LED technology to enable new applications and markets in the lighting world.

Lumileds may make process or materials changes affecting the performance or other characteristics of our products. These products supplied after such changes will continue to meet published specifications, but may not be identical to products supplied as samples or under prior orders.

LUMILEDS

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