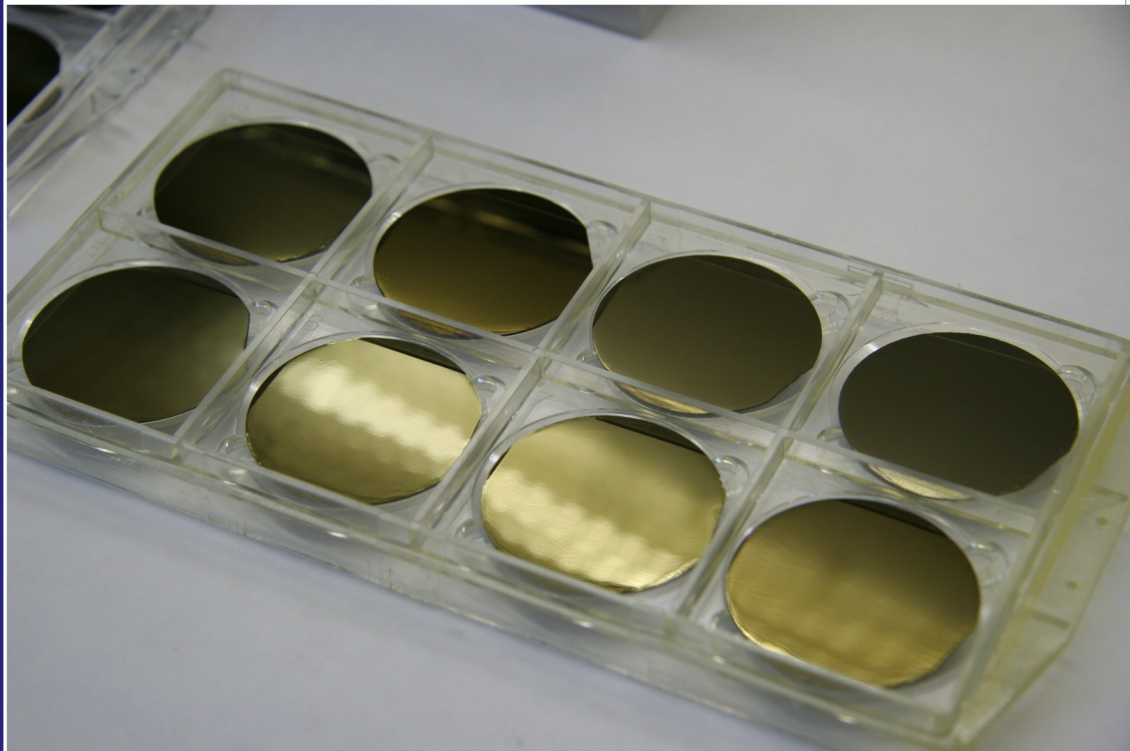


# **MeGa Epitech Co. Ltd**

**LPE WAFERS**  
**AlGaAs LED wafers**



**Made in Russia**

IR LED's Wafers 680-950 nm

| Type                          | Material structure/<br>substrate | Peak Wavelength, $\lambda_p$ ,<br>+/-10 (+/-5)*<br>[nm] | Power at 20mA<br>$P_0$ [mW] |     | Forward voltage at 20 mA<br>$U_f$ [V] |      | Reverse voltage at 10 $\mu$ A<br>$U_r$ [V] min | Response time [ns] |     |
|-------------------------------|----------------------------------|---------------------------------------------------------|-----------------------------|-----|---------------------------------------|------|------------------------------------------------|--------------------|-----|
|                               |                                  |                                                         | min                         | typ | min                                   | typ  |                                                | Tr                 | Tf  |
| HS 950P<br>p-side up          | GaAs/<br>n-GaAs                  | 950                                                     | 1.0                         | 1.2 | 1.1                                   | 1.2  | 8                                              | 500                | 500 |
| DH860N<br>type 1<br>n-side up | AlGaAs/<br>p-GaAs                | 860                                                     | 0.8                         | 1.2 | 1.30                                  | 1.40 | 8                                              | 30                 | 25  |
| DH860N<br>type 2<br>n-side up | AlGaAs/<br>p-GaAs                | 860                                                     | 1.4                         | 1.8 | 1.30                                  | 1.40 | 8                                              | 60                 | 50  |
| DDH 910P<br>p-side up         | AlGaAs/<br>n-AlGaAs              | 910                                                     | 3.0                         | 3.5 | 1.25                                  | 1.35 | 8                                              | 120                | 100 |
| DDH 870P<br>p-side up         | AlGaAs/<br>n-AlGaAs              | 870                                                     | 3.5                         | 4.0 | 1.25                                  | 1.35 | 8                                              | 30                 | 25  |
| DDH 870PS<br>p-side up        | AlGaAs/<br>n-AlGaAs              | 870                                                     | 2.8                         | 3.4 | 1.25                                  | 1.35 | 8                                              | 10                 | 10  |
| DDH 850P<br>p-side up         | AlGaAs/<br>n-AlGaAs              | 850                                                     | 3.5                         | 4.0 | 1.30                                  | 1.40 | 8                                              | 30                 | 25  |
| DDH 900N<br>n-side up         | AlGaAs/<br>p-AlGaAs              | 900                                                     | 3.0                         | 3.5 | 1.35                                  | 1.50 | 8                                              | 80                 | 60  |
| DDH 870N<br>n-side up         | AlGaAs/<br>p-AlGaAs              | 870                                                     | 3.5                         | 4.3 | 1.35                                  | 1.50 | 8                                              | 40                 | 30  |
| DDH 850N<br>n-side up         | AlGaAs/<br>p-AlGaAs              | 850                                                     | 3.5                         | 4.0 | 1.40                                  | 1.55 | 8                                              | 40                 | 30  |
| DDH 810N<br>n-side up         | AlGaAs/<br>p-AlGaAs              | 810                                                     | 3.8                         | 4.5 | 1.45                                  | 1.65 | 8                                              | 40                 | 30  |
| DDH 770N<br>n-side up         | AlGaAs/<br>p-AlGaAs              | 770                                                     | 3.5                         | 4.0 | 1.50                                  | 1.70 | 8                                              | 40                 | 30  |
| DDH 740N<br>n-side up         | AlGaAs/<br>p-AlGaAs              | 740                                                     | 3.5                         | 4.0 | 1.60                                  | 1.70 | 8                                              | 40                 | 30  |
| DDH 725N<br>n-side up         | AlGaAs/<br>p-AlGaAs              | 725                                                     | 3.2                         | 3.8 | 1.60                                  | 1.70 | 8                                              | 40                 | 30  |
| DDH 700N<br>n-side up         | AlGaAs/<br>p-AlGaAs              | 700                                                     | 3.5                         | 4.0 | 1.70                                  | 1.75 | 8                                              | 50                 | 35  |
| DDH 680N<br>n-side up         | AlGaAs/<br>p-AlGaAs              | 680                                                     | 3.5                         | 4.0 | 1.70                                  | 1.75 | 8                                              | 50                 | 35  |

\*On request by customer

RED LED's Wafers 650-660nm

| Type                 | Material structure/<br>substrate | Peak Wavelength,<br>$\lambda_p$ ,<br>+/-10 (+/-5)*<br>[nm] | Luminous Intensity at 20mA,<br>$I_v$ [mCd] |      | Forward voltage at 20 mA<br>$U_f$ [V] |      | Reverse voltage at 10 $\mu$ A<br>$U_r$ [V] min |
|----------------------|----------------------------------|------------------------------------------------------------|--------------------------------------------|------|---------------------------------------|------|------------------------------------------------|
|                      |                                  |                                                            | min                                        | typ  | min                                   | typ  |                                                |
| SH650N<br>n-side up  | AlGaAs/<br>p-GaAs                | 650                                                        | 5.0                                        | 7.0  | 1.70                                  | 1.85 | 8                                              |
| DH650N<br>n-side up  | AlGaAs/<br>p-GaAs                | 650                                                        | 8.0                                        | 10.8 | 1.75                                  | 1.90 | 8                                              |
| DDH660N<br>n-side up | AlGaAs/<br>p-AlGaAs              | 660                                                        | 20.0                                       | 30.0 | 1.80                                  | 1.90 | 8                                              |
| DDH660P<br>p-side up | AlGaAs/<br>n-AlGaAs              | 660                                                        | 18.0                                       | 20.0 | 1.90                                  | 1.95 | 8                                              |

\*On request by customer

# MeGa Epitech

## Epitaxial Technology

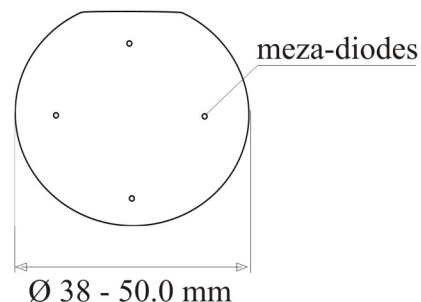
19, 3rd Academichesky proezd,  
248033, Kaluga, Russia  
Phone/fax 7-4842-79-23-70  
www.epitaxy.ru  
mega\_epitech@elikor.ru

## HS 950P GaAs IR LED's WAFERS

### Structure

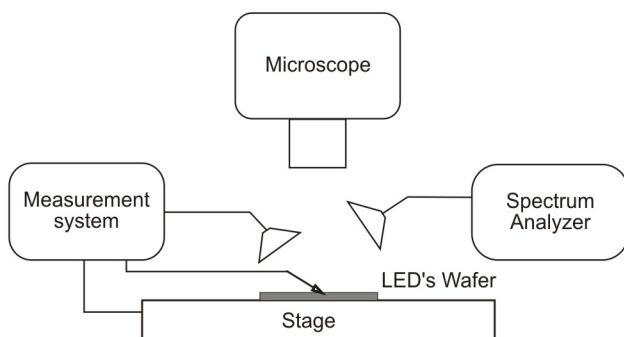
|                       |
|-----------------------|
| p-GaAs (Si)           |
| n-GaAs (Si)           |
| n-GaAs Substrate (Te) |

### Size



| Layer \ Item          | Thickness (μm) | Carrier concentration (cm <sup>-3</sup> ) |
|-----------------------|----------------|-------------------------------------------|
| p-GaAs (Si)           | 60 - 70        | (2-3)*10 <sup>18</sup>                    |
| n-GaAs (Si)           | 10 - 20        | (1-5)*10 <sup>17</sup>                    |
| n-GaAs substrate (Te) | -              | (0.7-2)*10 <sup>18</sup>                  |
| Total Thickness (μm)  | 230-270        |                                           |

### Measurement equipment



### Characteristics measured on four meza-diodes

| Item                    | Unit | Typical |
|-------------------------|------|---------|
| Emitted Power at 20 mA  | mW   | 1.2     |
| Peak wavelength at 5 mA | nm   | 950     |
| Forward volt. at 20 mA  | V    | <1.1    |
| Revers volt. at 10 μA   | V    | >8      |
| Response Time, Tr/Tf    | ns   | 500/500 |

### Type Names

HS 950P - 950 - Spectral Peak Wavelength , 950 ± 10 nm  
P - p - up side

# MeGa Epitech

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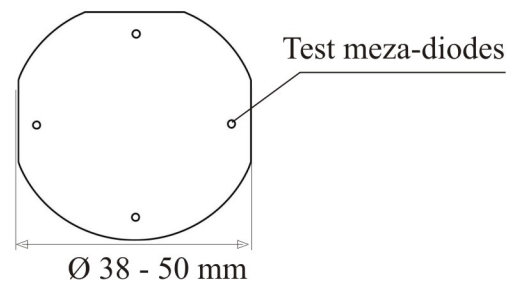
mega\_epitech@elikor.com

## DH 860N TYPE1 - GaAlAs IR LED's WAFERS

### Structure

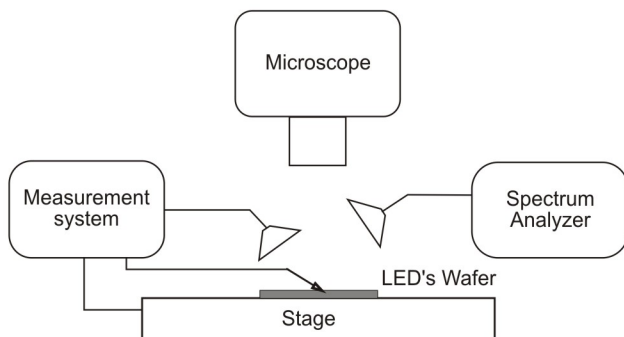
|                         |
|-------------------------|
| n-GaAlAs (Te)           |
| p-GaAlAs (Zn,Ge)        |
| p-GaAlAs (Zn)           |
| p-GaAs (Zn) - substrate |

### Size



| Layer \ Item            | Thickness (µm) | Carrier concentration ( cm <sup>-3</sup> ) | AlAs Mole-Fraction |
|-------------------------|----------------|--------------------------------------------|--------------------|
| n-GaAlAs ( Te )         | 15-20          | $>1 \cdot 10^{18}$                         | 0.10-0.30          |
| p-GaAlAs ( Zn, Ge )     | 1.0-2.5        | $5 \cdot 10^{17}$                          | 0.01 - 0.02        |
| p-GaAlAs ( Zn )         | 130 - 140      | $5 \cdot 10^{17}$                          | 0.10-0.15          |
| p-GaAlAs ( Zn ) substr. | 380 - 420      | $>8 \cdot 10^{18}$                         |                    |

### Measurement equipment



### Characteristics measured on four meza-diodes

| Item                    | Unit | Typical |
|-------------------------|------|---------|
| Emitted power at 20 mA  | mW   | 1.2     |
| Peak wavelength at 5 mA | nm   | 860     |
| Forward volt. at 20 mA  | V    | <1.30   |
| Revers volt. at 10 µA   | V    | >8      |
| Response Time, Tr/Tf    | ns   | 30/25   |

### Type Names

DH 860N - DH - Double Heterostructure

860 - Spectral Peak Wavelength ,  $860 \pm 5$  nm\*

N - n - up side

\*on request by customer ( $\pm 5$  nm min.)



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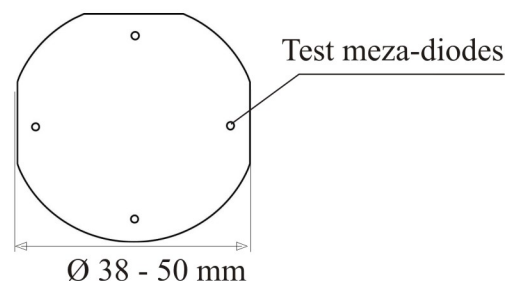
mega\_epitech@elikor.com

## DH 860N TYPE 2 - GaAlAs IR LED's WAFERS

### Structure

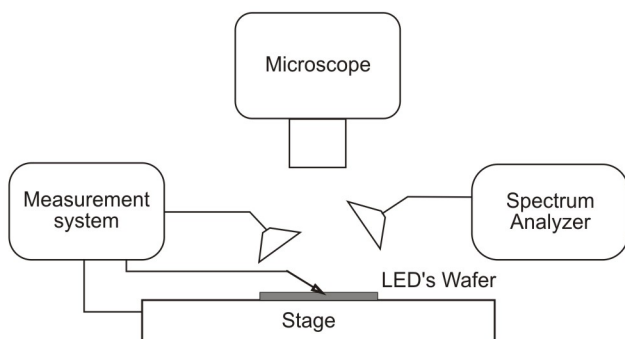
|                         |
|-------------------------|
| n-GaAlAs (Te)           |
| p-GaAlAs (Zn,Ge)        |
| p-GaAlAs (Zn)           |
| p-GaAs (Zn,Ge)          |
| p-GaAs (Zn) - substrate |

### Size



| Layer \ Item            | Thickness (μm) | Carrier concentration ( cm <sup>-3</sup> ) | AlAs Mole-Fraction |
|-------------------------|----------------|--------------------------------------------|--------------------|
| n-GaAlAs ( Te )         | 15-20          | $>1 \cdot 10^{18}$                         | 0.10-0.30          |
| p-GaAlAs ( Zn, Ge )     | 1.0-2.5        | $5 \cdot 10^{17}$                          | 0.01 - 0.02        |
| p-GaAlAs ( Zn )         | 130 - 140      | $5 \cdot 10^{17}$                          | 0.10-0.15          |
| p-GaAs ( Zn, Ge )       | 20 - 25        | $(6-8) \cdot 10^{17}$                      |                    |
| p-GaAlAs ( Zn ) substr. | 380 - 420      | $>8 \cdot 10^{18}$                         |                    |

### Measurement equipment



### Characteristics measured on four meza-diodes

| Item                    | Unit | Typical |
|-------------------------|------|---------|
| Emitted power at 20 mA  | mW   | 1.8     |
| Peak wavelength at 5 mA | nm   | 860     |
| Forward volt. at 20 mA  | V    | <1.30   |
| Revers volt. at 10 μA   | V    | >8      |
| Response Time, Tr/Tf    | ns   | 60/50   |

### Type Names

DH 860N - DH - Double Heterostructure

860 - Spectral Peak Wavelength ,  $860 \pm 5$  nm\*

N - n - up side

\*on request by customer ( $\pm 5$  nm min.)

# MeGa Epitech

## Epitaxial Technology

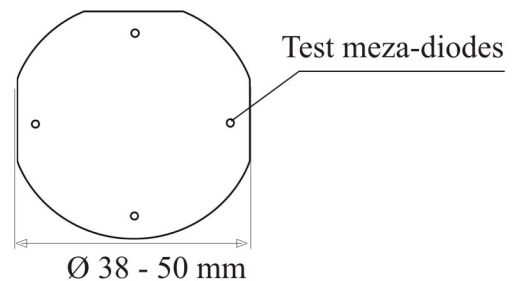
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## DDH 910P - GaAlAs IR LED's WAFERS

### Structure

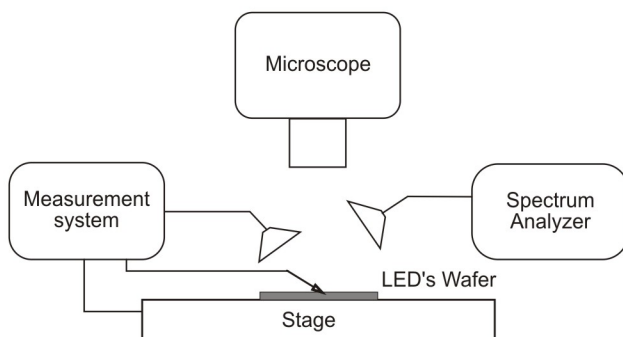
|                  |
|------------------|
| p-GaAlAs (Ge)    |
| p-GaAlAs (Ge,Si) |
| n-GaAlAs (Te)    |

### Size



| Layer \ Item    | Thickness (µm) | Carrier concentration ( cm <sup>-3</sup> ) | AlAs Mole-Fraction |
|-----------------|----------------|--------------------------------------------|--------------------|
| p-GaAlAs (Ge )  | 15-20          | $>1 \cdot 10^{18}$                         | 0.10-0.30          |
| p-GaAs (Ge, Si) | 2.0-4.0        | $5 \cdot 10^{17}$                          | 0                  |
| n-GaAlAs (Te)   | 130 - 140      | $> 2 \cdot 10^{17}$                        | 0.10-0.30          |

### Measurement equipment



### Characteristics measured on four meza-diodes

| Item                    | Unit | Typical |
|-------------------------|------|---------|
| Emitted power at 20 mA  | mW   | 3.5     |
| Peak wavelength at 5 mA | nm   | 910     |
| Forward volt. at 20 mA  | V    | <1.25   |
| Revers volt. at 10 µA   | V    | >8      |
| Response Time, Tr/Tf    | ns   | 120/100 |

### Type Names

DDH 910P - DDH - Double Double Heterostructure

910 - Spectral Peak Wavelength ,  $910 \pm 5$  nm\*

P - p - up side

\*on request by customer ( $\pm 5$  nm min.)

# MeGa Epitech

## Epitaxial Technology

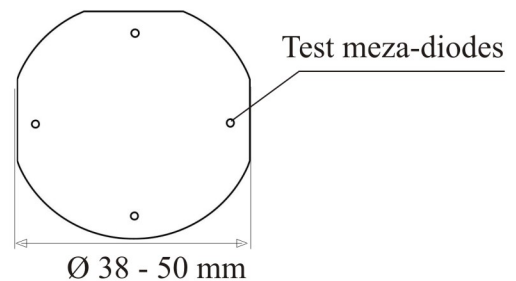
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## DDH 870P - GaAlAs IR LED's WAFERS

### Structure

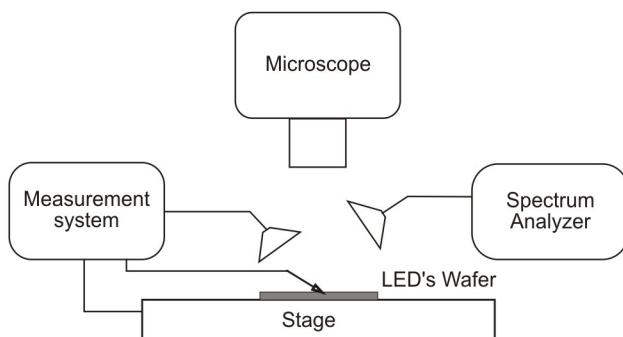
|               |
|---------------|
| p-GaAlAs (Ge) |
| p-GaAlAs (Ge) |
| n-GaAlAs (Te) |

### Size



| Layer \ Item   | Thickness (µm) | Carrier concentration ( cm <sup>-3</sup> ) | AlAs Mole-Fraction |
|----------------|----------------|--------------------------------------------|--------------------|
| p-GaAlAs (Ge ) | 15-20          | $>1 \cdot 10^{18}$                         | 0.10-0.30          |
| p-GaAlAs (Ge)  | 1.0-3.0        | $5 \cdot 10^{17}$                          | 0.01               |
| n-GaAlAs (Te)  | 130 - 140      | $> 2 \cdot 10^{17}$                        | 0.10-0.30          |

### Measurement equipment



### Characteristics measured on four meza-diodes

| Item                    | Unit | Typical |
|-------------------------|------|---------|
| Emitted power at 20 mA  | mW   | 4.0     |
| Peak wavelength at 5 mA | nm   | 870     |
| Forward volt. at 20 mA  | V    | <1.25   |
| Revers volt. at 10 µA   | V    | >8      |
| Response Time, Tr/Tf    | ns   | 30/25   |

### Type Names

DDH 870P - DDH - Double Double Heterostructure

870 - Spectral Peak Wavelength ,  $870 \pm 5$  nm\*

P - p - up side

\*on request by customer ( $\pm 5$  nm min.)

# MeGa Epitech

## Epitaxial Technology

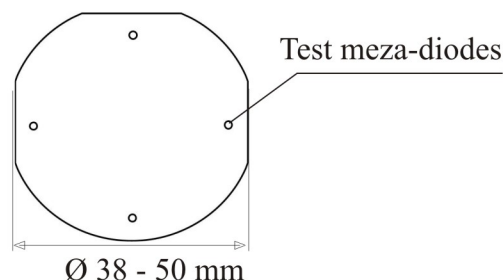
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## DDH 870PS - GaAlAs IR LED's WAFERS

### Structure

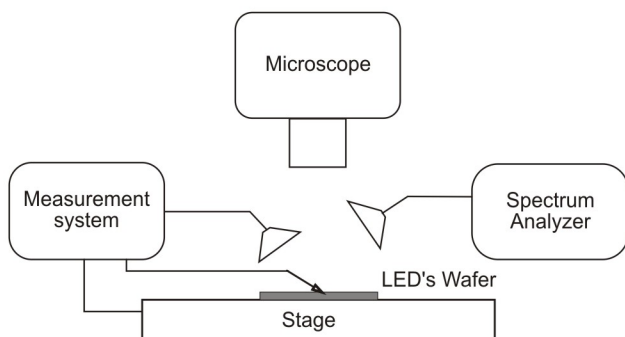
|               |
|---------------|
| p-GaAlAs (Ge) |
| p-GaAlAs (Ge) |
| n-GaAlAs (Te) |

### Size



| Layer \ Item   | Thickness (µm) | Carrier concentration ( cm <sup>-3</sup> ) | AlAs Mole-Fraction |
|----------------|----------------|--------------------------------------------|--------------------|
| p-GaAlAs (Ge ) | 15-20          | $>1 \cdot 10^{18}$                         | 0.10-0.30          |
| p-GaAlAs (Ge)  | 1.0-3.0        | $1 \cdot 10^{17}$                          | 0.01               |
| n-GaAlAs (Te)  | 130 - 140      | $> 2 \cdot 10^{17}$                        | 0.10-0.30          |

### Measurement equipment



### Characteristics measured on four meza-diodes

| Item                    | Unit | Typical |
|-------------------------|------|---------|
| Emitted power at 20 mA  | mW   | 3.4     |
| Peak wavelength at 5 mA | nm   | 870     |
| Forward volt. at 20 mA  | V    | <1.25   |
| Revers volt. at 10 µA   | V    | >8      |
| Response Time, Tr/Tf    | ns   | 10/10   |

### Type Names

DDH 870PS - DDH - Double Double Heterostructure

870 - Spectral Peak Wavelength ,  $870 \pm 5$  nm\*

P - p - up side

\*on request by customer ( $\pm 5$  nm min.)

# MeGa Epitech

## Epitaxial Technology

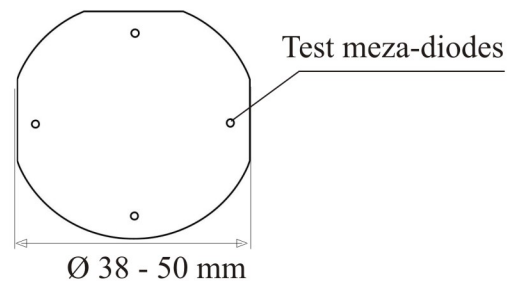
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## DDH 850P - GaAlAs IR LED's WAFERS

### Structure

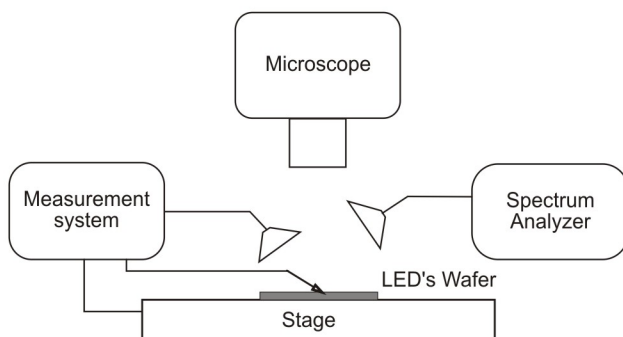
|               |
|---------------|
| p-GaAlAs (Ge) |
| p-GaAlAs (Ge) |
| n-GaAlAs (Te) |

### Size



| Layer \ Item   | Thickness (µm) | Carrier concentration ( cm <sup>-3</sup> ) | AlAs Mole-Fraction |
|----------------|----------------|--------------------------------------------|--------------------|
| p-GaAlAs (Ge ) | 15-20          | $>1 \cdot 10^{18}$                         | 0.10-0.30          |
| p-GaAlAs (Ge)  | 1.0-3.0        | $5 \cdot 10^{17}$                          | 0.03               |
| n-GaAlAs (Te)  | 130 - 140      | $> 2 \cdot 10^{17}$                        | 0.10-0.30          |

### Measurement equipment



### Characteristics measured on four meza-diodes

| Item                    | Unit | Typical |
|-------------------------|------|---------|
| Emitted power at 20 mA  | mW   | 4.0     |
| Peak wavelength at 5 mA | nm   | 850     |
| Forward volt. at 20 mA  | V    | <1.3    |
| Revers volt. at 10 µA   | V    | >8      |
| Response Time, Tr/Tf    | ns   | 30/25   |

### Type Names

DDH 850P - DDH - Double Double Heterostructure

850 - Spectral Peak Wavelength ,  $850 \pm 5$  nm\*

P - p - up side

\*on request by customer ( $\pm 5$  nm min.)



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## Epitaxial Technology

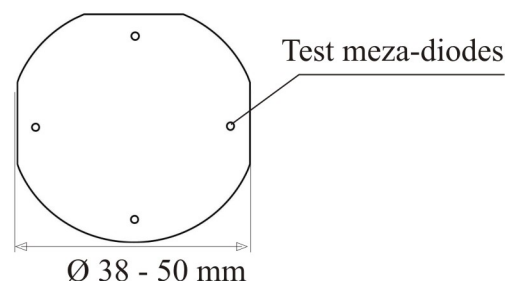
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Phone/fax 7-4842-500-593  
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## DDH 900N - GaAlAs IR LED's WAFERS

### Structure

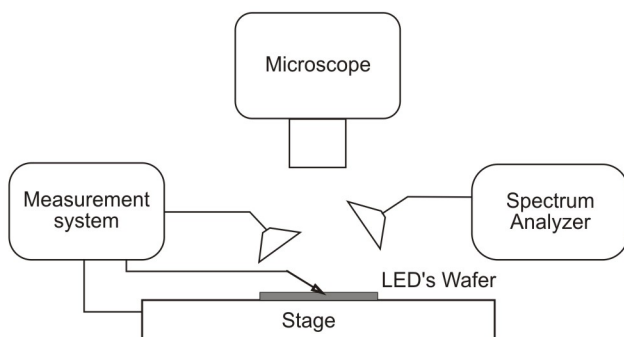
|                |
|----------------|
| n-GaAlAs (Te)  |
| p-GaAs (Si,Ge) |
| p-GaAlAs (Zn)  |

### Size



| Layer \ Item    | Thickness (µm) | Carrier concentration (cm <sup>-3</sup> ) | AlAs Mole-Fraction |
|-----------------|----------------|-------------------------------------------|--------------------|
| n-GaAlAs ( Te ) | 15-20          | $>1 \cdot 10^{18}$                        | 0.10-0.30          |
| p-GaAs (Si, Ge) | 2.0-3.0        | $5 \cdot 10^{17}$                         | 0                  |
| p-GaAlAs ( Zn ) | 130 - 140      | $> 5 \cdot 10^{17}$                       | 0.10-0.30          |

### Measurement equipment



### Characteristics measured on four meza-diodes

| Item                    | Unit | Typical |
|-------------------------|------|---------|
| Emitted power at 20 mA  | mW   | 3.5     |
| Peak wavelength at 5 mA | nm   | 900     |
| Forward volt. at 20 mA  | V    | <1.35   |
| Revers volt. at 10 µA   | V    | >8      |
| Response Time, Tr/Tf    | ns   | 80/60   |

### Type Names

DDH 900N - DDH - Double Double Heterostructure

900 - Spectral Peak Wavelength ,  $900 \pm 5$  nm\*

N - n - up side

\*on request by customer ( $\pm 5$  nm min.)

# MeGa Epitech

## Epitaxial Technology

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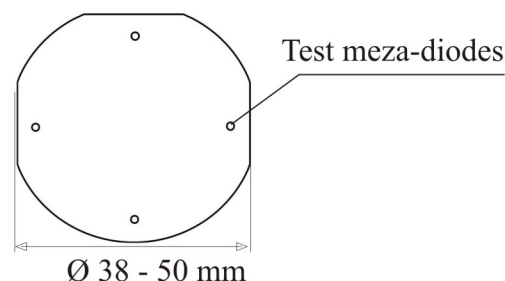
mega\_epitech@elikor.com

## DDH 870N - GaAlAs IR LED's WAFERS

### Structure

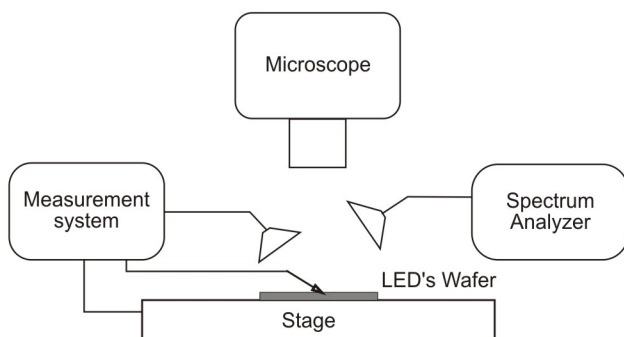
|                  |
|------------------|
| n-GaAlAs (Te)    |
| p-GaAlAs (Zn,Ge) |
| p-GaAlAs (Zn)    |

### Size



| Layer \ Item       | Thickness (µm) | Carrier concentration ( cm <sup>-3</sup> ) | AlAs Mole-Fraction |
|--------------------|----------------|--------------------------------------------|--------------------|
| n-GaAlAs ( Te )    | 15-20          | $>1 \cdot 10^{18}$                         | 0.10-0.30          |
| p-GaAlAs ( Zn, Ge) | 1.0-2.5        | $5 \cdot 10^{17}$                          | 0.01               |
| p-GaAlAs ( Zn)     | 130 - 140      | $> 5 \cdot 10^{17}$                        | 0.10-0.30          |

### Measurement equipment



### Characteristics measured on four meza-diodes

| Item                    | Unit | Typical |
|-------------------------|------|---------|
| Emitted power at 20 mA  | mW   | 4.3     |
| Peak wavelength at 5 mA | nm   | 870     |
| Forward volt. at 20 mA  | V    | <1.35   |
| Revers volt. at 10 µA   | V    | >8      |
| Response Time, Tr/Tf    | ns   | 40/30   |

### Type Names

DDH 870N - DDH - Double Double Heterostructure

870 - Spectral Peak Wavelength ,  $870 \pm 5$  nm\*

N - n - up side

\*on request by customer ( $\pm 5$  nm min.)

# MeGa Epitech

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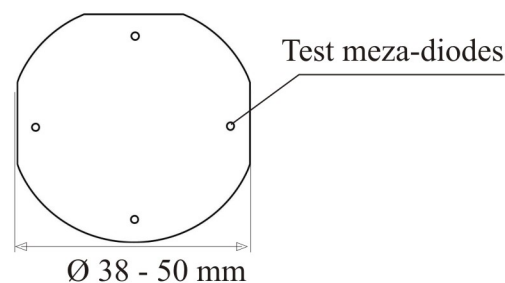
mega\_epitech@elikor.com

## DDH 850N - GaAlAs IR LED's WAFERS

### Structure

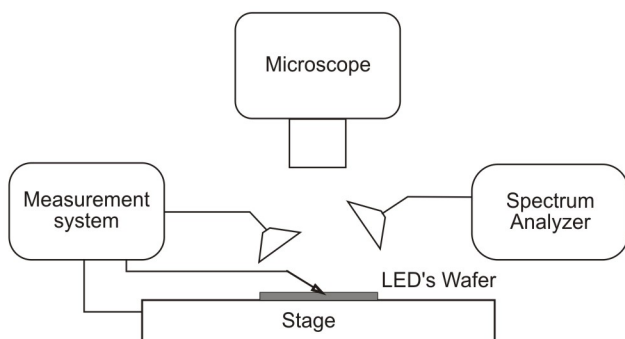
|                  |
|------------------|
| n-GaAlAs (Te)    |
| p-GaAlAs (Zn,Ge) |
| p-GaAlAs (Zn)    |

### Size



| Layer \ Item       | Thickness (µm) | Carrier concentration ( cm <sup>-3</sup> ) | AlAs Mole-Fraction |
|--------------------|----------------|--------------------------------------------|--------------------|
| n-GaAlAs ( Te )    | 15-20          | $>1 \cdot 10^{18}$                         | 0.10-0.30          |
| p-GaAlAs ( Zn, Ge) | 1.0-2.5        | $5 \cdot 10^{17}$                          | 0.03               |
| p-GaAlAs ( Zn)     | 130 - 140      | $> 5 \cdot 10^{17}$                        | 0.10-0.30          |

### Measurement equipment



### Characteristics measured on four meza-diodes

| Item                    | Unit | Typical |
|-------------------------|------|---------|
| Emitted power at 20 mA  | mW   | 4.0     |
| Peak wavelength at 5 mA | nm   | 850     |
| Forward volt. at 20 mA  | V    | <1.4    |
| Revers volt. at 10 µA   | V    | >8      |
| Response Time, Tr/Tf    | ns   | 40/30   |

### Type Names

DDH 850N - DDH - Double Double Heterostructure

850 - Spectral Peak Wavelength ,  $850 \pm 5$  nm\*

N - n - up side

\*on request by customer ( $\pm 5$  nm min.)

# MeGa Epitech

## Epitaxial Technology

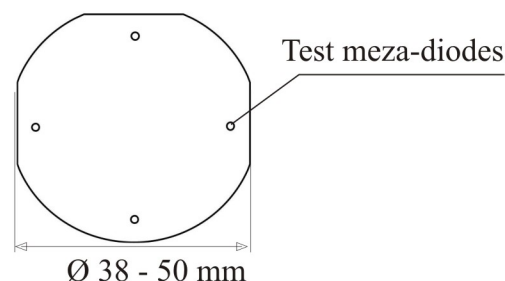
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Phone/fax 7-4842-500-593  
www.epitaxy.ru  
mega\_epitech@elikor.com

## DDH 810N - GaAlAs IR LED's WAFERS

### Structure

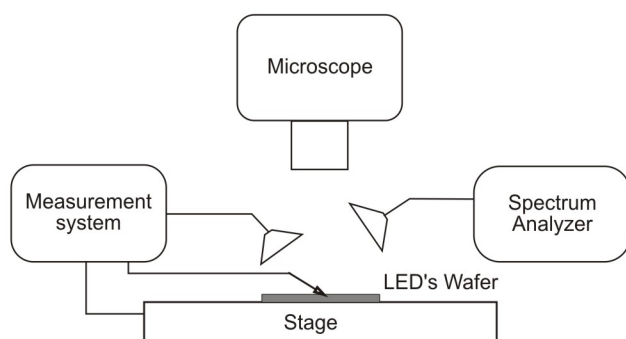
|                  |
|------------------|
| n-GaAlAs (Te)    |
| p-GaAlAs (Zn,Ge) |
| p-GaAlAs (Zn)    |

### Size



| Layer \ Item        | Thickness (μm) | Carrier concentration (cm <sup>-3</sup> ) | AlAs Mole-Fraction |
|---------------------|----------------|-------------------------------------------|--------------------|
| n-GaAlAs ( Te )     | 15-20          | $>1 \cdot 10^{18}$                        | 0.20-0.60          |
| p-GaAlAs ( Zn, Ge ) | 1.0-2.5        | $5 \cdot 10^{17}$                         | 0.08-0.16          |
| p-GaAlAs ( Zn )     | 130 - 140      | $> 5 \cdot 10^{17}$                       | 0.27-0.55          |

### Measurement equipment



### Characteristics measured on four meza-diodes

| Item                    | Unit | Typical |
|-------------------------|------|---------|
| Emitted power at 20 mA  | mW   | 4.5     |
| Peak wavelength at 5 mA | nm   | 810     |
| Forward volt. at 20 mA  | V    | <1.45   |
| Revers volt. at 10 μA   | V    | >8      |
| Response Time, Tr/Tf    | ns   | 40/30   |

### Type Names

DDH 810N - DDH - Double Double Heterostructure

810 - Spectral Peak Wavelength ,  $810 \pm 5$  nm\*

N - n - up side

\*on request by customer ( $\pm 5$  nm min.)

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## Epitaxial Technology

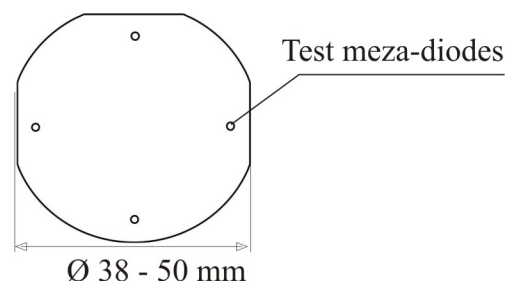
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## DDH 770N - GaAlAs IR LED's WAFERS

### Structure

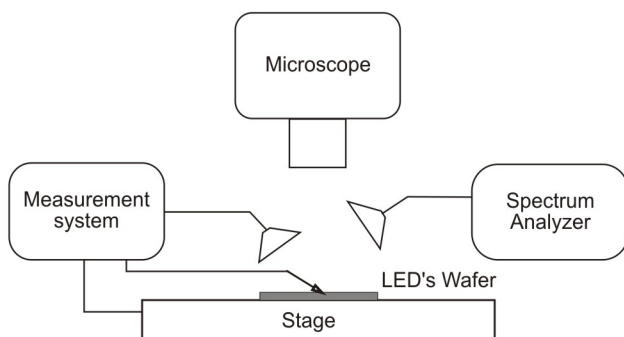
|                  |
|------------------|
| n-GaAlAs (Te)    |
| p-GaAlAs (Zn,Ge) |
| p-GaAlAs (Zn)    |

### Size



| Layer \ Item        | Thickness (µm) | Carrier concentration ( cm <sup>-3</sup> ) | AlAs Mole-Fraction |
|---------------------|----------------|--------------------------------------------|--------------------|
| n-GaAlAs ( Te )     | 15-20          | $>1 \cdot 10^{18}$                         | 0.55-0.60          |
| p-GaAlAs ( Zn, Ge ) | 1.0-2.5        | $5 \cdot 10^{17}$                          | 0.08-0.16          |
| p-GaAlAs ( Zn )     | 130 - 140      | $> 5 \cdot 10^{17}$                        | 0.27-0.55          |

### Measurement equipment



### Characteristics measured on four meza-diodes

| Item                    | Unit | Typical |
|-------------------------|------|---------|
| Emitted power at 20 mA  | mW   | 4.0     |
| Peak wavelength at 5 mA | nm   | 770     |
| Forward volt. at 20 mA  | V    | <1.5    |
| Revers volt. at 10 µA   | V    | >8      |
| Response Time, Tr/Tf    | ns   | 40/30   |

### Type Names

DDH 770N - DDH - Double Double Heterostructure

770 - Spectral Peak Wavelength ,  $770 \pm 5$  nm\*

N - n - up side

\*on request by customer ( $\pm 5$  nm min.)



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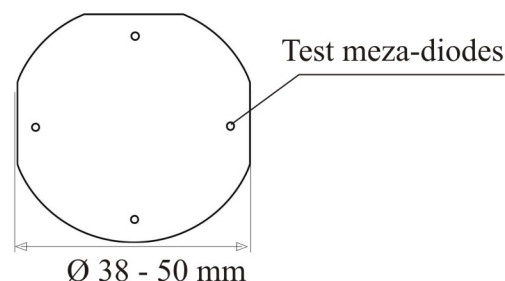
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## DDH 740N - GaAlAs IR LED's WAFERS

### Structure

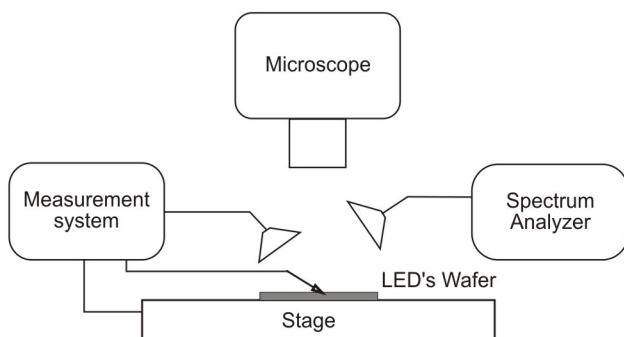
|               |
|---------------|
| n-GaAlAs (Te) |
| p-GaAlAs (Zn) |
| p-GaAlAs (Zn) |

### Size



| Layer \ Item  | Thickness (μm) | Carrier concentration (cm <sup>-3</sup> ) | AlAs Mole-Fraction |
|---------------|----------------|-------------------------------------------|--------------------|
| n-GaAlAs (Te) | 12-15          | $>2 \cdot 10^{18}$                        | 0.60               |
| p-GaAlAs (Zn) | 2-3            | $>5 \cdot 10^{17}$                        | 0.21-0.24          |
| p-GaAlAs (Zn) | 120 - 140      | $>5 \cdot 10^{17}$                        | 0.6                |

### Measurement equipment



### Characteristics measured on four meza-diodes

| Item                    | Unit | Typical |
|-------------------------|------|---------|
| Emitted power at 20 mA  | mW   | 4.0     |
| Peak wavelength at 5 mA | nm   | 740     |
| Forward volt. at 20 mA  | V    | <1.6    |
| Revers volt. at 10 μA   | V    | >8      |
| Response Time, Tr/Tf    | ns   | 40/30   |

### Type Names

DDH 740N - DDH - Double Double Heterostructure

740 - Spectral Peak Wavelength,  $740 \pm 5$  nm\*

N - n - up side

\*on request by customer ( $\pm 5$  nm min.)

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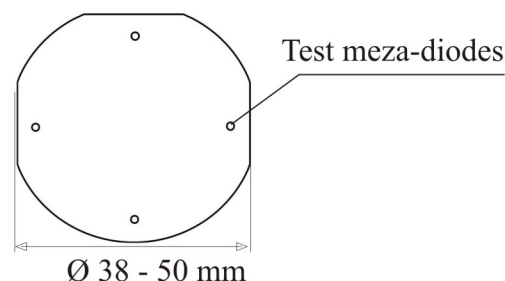
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## DDH 725N - GaAlAs IR LED's WAFERS

### Structure

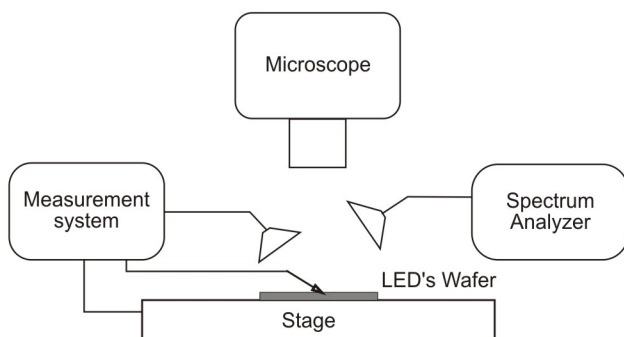
|               |
|---------------|
| n-GaAlAs (Te) |
| p-GaAlAs (Zn) |
| p-GaAlAs (Zn) |

### Size



| Layer \ Item    | Thickness (μm) | Carrier concentration (cm <sup>-3</sup> ) | AlAs Mole-Fraction |
|-----------------|----------------|-------------------------------------------|--------------------|
| n-GaAlAs ( Te ) | 12-15          | $>2 \cdot 10^{18}$                        | 0.60               |
| p-GaAlAs ( Zn ) | 2-3            | $>5 \cdot 10^{17}$                        | 0.21-0.24          |
| p-GaAlAs ( Zn ) | 120 - 140      | $>5 \cdot 10^{17}$                        | 0.6                |

### Measurement equipment



### Characteristics measured on four meza-diodes

| Item                    | Unit | Typical |
|-------------------------|------|---------|
| Emitted power at 20 mA  | mW   | 3.8     |
| Peak wavelength at 5 mA | nm   | 725     |
| Forward volt. at 20 mA  | V    | <1.6    |
| Revers volt. at 10 μA   | V    | >8      |
| Response Time, Tr/Tf    | ns   | 40/30   |

### Type Names

DDH 725N - DDH - Double Double Heterostructure

725 - Spectral Peak Wavelength ,  $725 \pm 5$  nm\*

N - n - up side

\*on request by customer ( $\pm 5$  nm min.)

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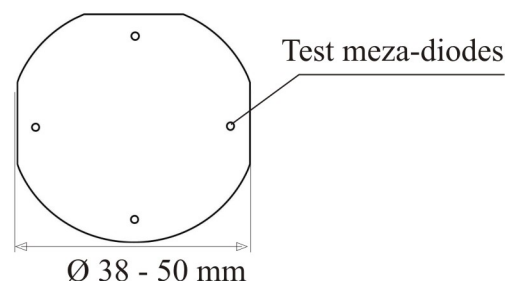
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## DDH 700N - GaAlAs IR LED's WAFERS

### Structure

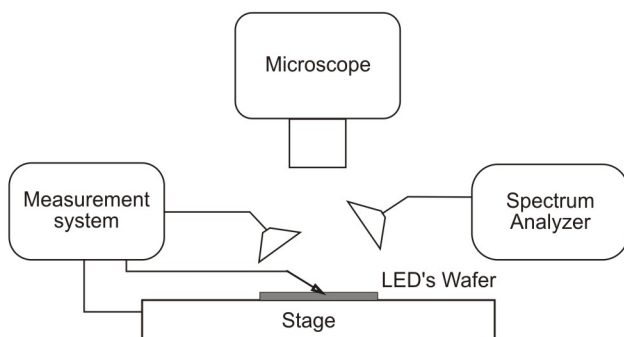
|               |
|---------------|
| n-GaAlAs (Te) |
| p-GaAlAs (Zn) |
| p-GaAlAs (Zn) |

### Size



| Layer \ Item  | Thickness (μm) | Carrier concentration (cm <sup>-3</sup> ) | AlAs Mole-Fraction |
|---------------|----------------|-------------------------------------------|--------------------|
| n-GaAlAs (Te) | 12-15          | $>2 \cdot 10^{18}$                        | 0.60               |
| p-GaAlAs (Zn) | 2-3            | $>5 \cdot 10^{17}$                        | 0.28-0.30          |
| p-GaAlAs (Zn) | 120 - 140      | $>5 \cdot 10^{17}$                        | 0.6                |

### Measurement equipment



### Characteristics measured on four meza-diodes

| Item                    | Unit | Typical |
|-------------------------|------|---------|
| Emitted power at 20 mA  | mW   | 3.5     |
| Peak wavelength at 5 mA | nm   | 700     |
| Forward volt. at 20 mA  | V    | <1.7    |
| Revers volt. at 10 μA   | V    | >8      |
| Response Time, Tr/Tf    | ns   | 50/35   |

### Type Names

DDH 700N - DDH - Double Double Heterostructure

700 - Spectral Peak Wavelength,  $700 \pm 5$  nm\*

N - n - up side

\*on request by customer ( $\pm 5$  nm min.)

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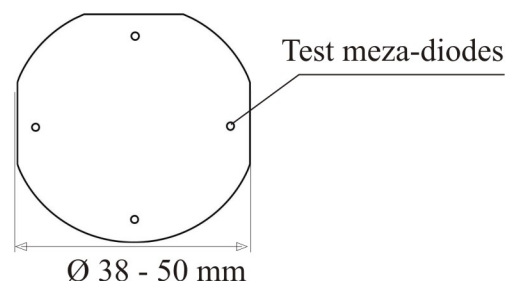
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## DDH 680N - GaAlAs IR LED's WAFERS

### Structure

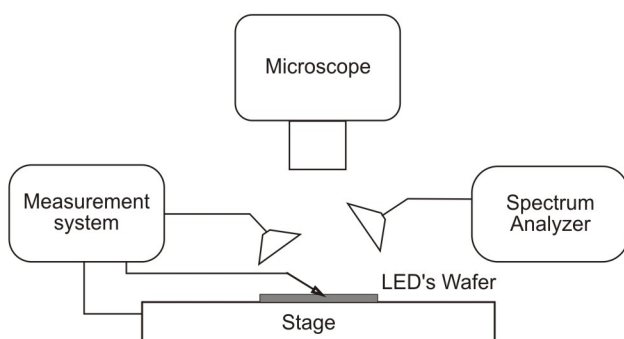
|               |
|---------------|
| n-GaAlAs (Te) |
| p-GaAlAs (Zn) |
| p-GaAlAs (Zn) |

### Size



| Layer \ Item  | Thickness (μm) | Carrier concentration (cm <sup>-3</sup> ) | AlAs Mole-Fraction |
|---------------|----------------|-------------------------------------------|--------------------|
| n-GaAlAs (Te) | 12-15          | $>2 \cdot 10^{18}$                        | 0.60               |
| p-GaAlAs (Zn) | 2-3            | $>5 \cdot 10^{17}$                        | 0.28-0.30          |
| p-GaAlAs (Zn) | 120 - 140      | $>5 \cdot 10^{17}$                        | 0.6                |

### Measurement equipment



### Characteristics measured on four meza-diodes

| Item                    | Unit | Typical |
|-------------------------|------|---------|
| Emitted power at 20 mA  | mW   | 3.5     |
| Peak wavelength at 5 mA | nm   | 680     |
| Forward volt. at 20 mA  | V    | <1.7    |
| Revers volt. at 10 μA   | V    | >8      |
| Response Time, Tr/Tf    | ns   | 50/35   |

### Type Names

DDH 680N - DDH - Double Double Heterostructure

680 - Spectral Peak Wavelength,  $680 \pm 5$  nm\*

N - n - up side

\*on request by customer ( $\pm 5$  nm min.)

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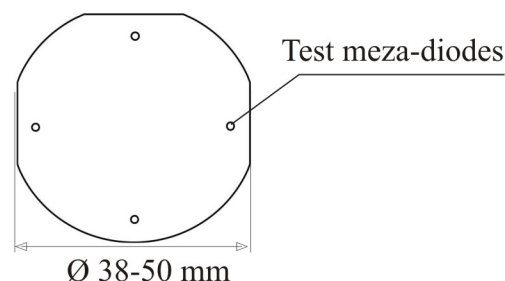
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## SH 650N - GaAlAs RED LED's WAFERS

### Structure

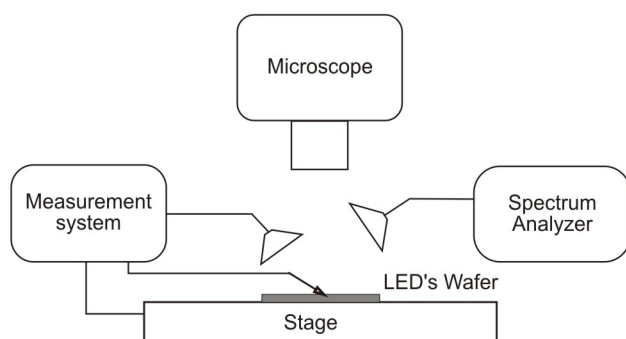
|                       |
|-----------------------|
| n-GaAlAs (Te)         |
| p-GaAlAs (Zn)         |
| p-GaAs (Zn) - substr. |

### Size



| Layer \ Item  | Thickness (µm) | Carrier concentration (cm <sup>-3</sup> ) | AlAs Mole-Fraction |
|---------------|----------------|-------------------------------------------|--------------------|
| n-GaAlAs (Te) | 10-15          | $>5 \cdot 10^{17}$                        | 0.60               |
| p-GaAlAs (Zn) | 10-15          | $>5 \cdot 10^{17}$                        | 0.35               |
| p-GaAs (Zn)   | 220 - 400      | $>8 \cdot 10^{18}$                        | 0.65               |

### Measurement equipment



### Characteristics measured on four meza-diodes

| Item                        | Unit | Typical |
|-----------------------------|------|---------|
| Luminous Intensity at 20 mA | mCd  | 7.0     |
| Peak wavelength at 5 mA     | nm   | 650     |
| Forward volt. at 20 mA      | V    | <1.7    |
| Revers volt. at 10 µA       | V    | >8      |
| Response Time, Tr/Tf        | ns   | 50/40   |

### Type Names

SH 650N

- SH - Single Heterostructure

650 - Spectral Peak Wavelength,  $650 \pm 5$  nm\*

N - n - up side

\*on request by customer ( $\pm 5$  nm min.)



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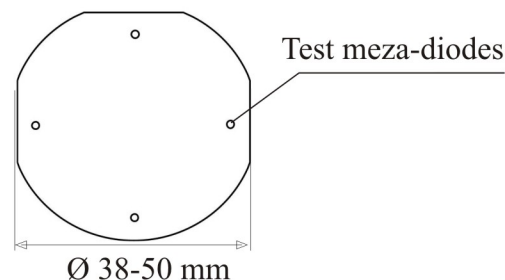
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## DH 650N - GaAlAs RED LED's WAFERS

### Structure

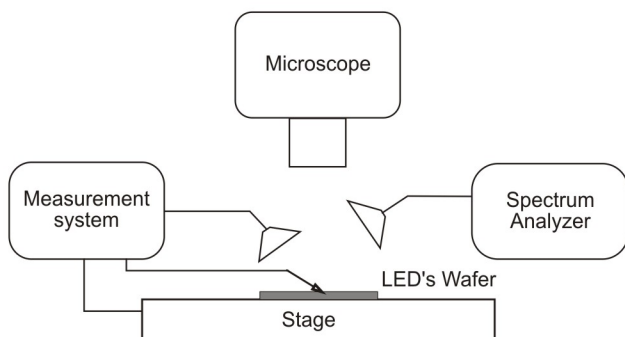
|                       |
|-----------------------|
| n-GaAlAs (Te)         |
| p-GaAlAs (Zn)         |
| p-GaAlAs (Zn)         |
| p-GaAs (Zn) - substr. |

### Size



| Layer \ Item            | Thickness (µm) | Carrier concentration ( cm <sup>-3</sup> ) | AlAs Mole-Fraction |
|-------------------------|----------------|--------------------------------------------|--------------------|
| n-GaAlAs ( Te )         | 10 - 15        | $>5 \cdot 10^{17}$                         | 0.8-0.6            |
| p-GaAlAs ( Zn )         | 1.5 - 2.0      | $> 5 \cdot 10^{17}$                        | 0.33-0.35          |
| p-GaAlAs ( Zn )         | 8 - 10         | $> 5 \cdot 10^{17}$                        | 0.6 - 0.8          |
| p-GaAs ( Zn ) - substr. | 220 - 400      | $> 8 \cdot 10^{18}$                        |                    |

### Measurement equipment



### Characteristics measured on four meza-diodes

| Item                        | Unit | Typical |
|-----------------------------|------|---------|
| Luminous Intensity at 20 mA | mCd  | 10.0    |
| Peak wavelength at 5 mA     | nm   | 650     |
| Forward volt. at 20 mA      | V    | <1.75   |
| Revers volt. at 10 µA       | V    | >8      |
| Response Time, Tr/Tf        | ns   | 50/40   |

### Type Names

DH 650N

- DH - Double Heterostructure

650 - Spectral Peak Wavelength ,  $650 \pm 5$  nm\*

N - n - up side

\*on request by customer ( $\pm 5$  nm min.)

# MeGa Epitech

## Epitaxial Technology

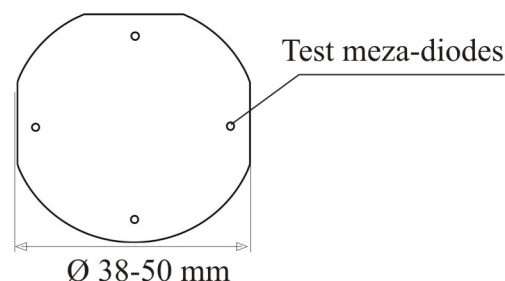
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## DDH 660N - GaAlAs RED LED's WAFERS

### Structure

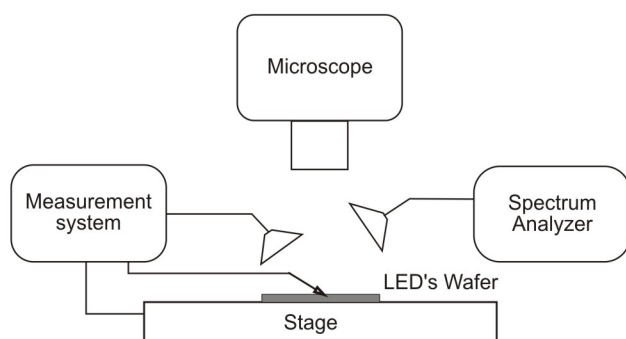
|               |
|---------------|
| n-GaAlAs (Te) |
| p-GaAlAs (Zn) |
| p-GaAlAs (Zn) |

### Size



| Layer \ Item  | Thickness (μm) | Carrier concentration (cm <sup>-3</sup> ) | AlAs Mole-Fraction |
|---------------|----------------|-------------------------------------------|--------------------|
| n-GaAlAs (Te) | 15-18          | $>2 \cdot 10^{18}$                        | 0.60               |
| p-GaAlAs (Zn) | 1.5-1.25       | $>5 \cdot 10^{17}$                        | 0.35               |
| p-GaAlAs (Zn) | 130 - 150      | $>5 \cdot 10^{17}$                        | 0.65               |

### Measurement equipment



### Characteristics measured on four meza-diodes

| Item                        | Unit | Typical |
|-----------------------------|------|---------|
| Luminous Intensity at 20 mA | mCd  | 30.0    |
| Peak wavelength at 5 mA     | nm   | 660     |
| Forward volt. at 20 mA      | V    | <1.8    |
| Revers volt. at 10 μA       | V    | >8      |
| Response Time, Tr/Tf        | ns   | 50/35   |

### Type Names

DDH 660N - DDH - Double Double Heterostructure

660 - Spectral Peak Wavelength,  $660 \pm 5$  nm\*

N - n - up side

\*on request by customer ( $\pm 5$  nm min.)

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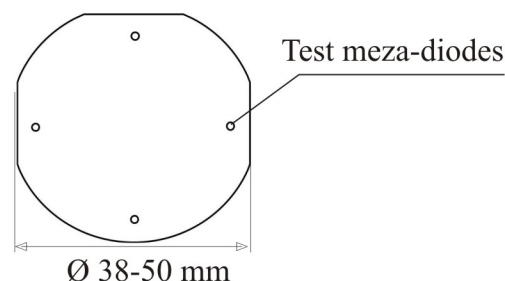
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mega\_epitech@elikor.com

## DDH 660P - GaAlAs RED LED's WAFERS

### Structure

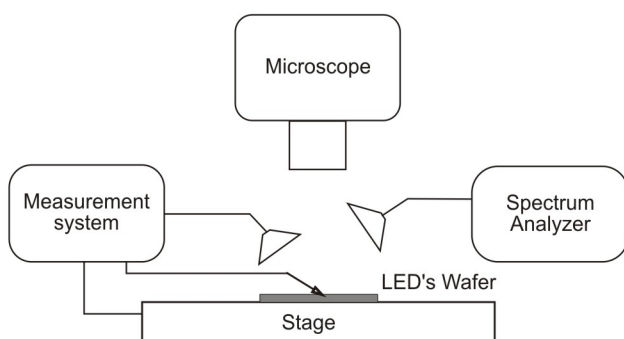
|               |
|---------------|
| p-GaAlAs (Zn) |
| p-GaAlAs (Zn) |
| n-GaAlAs (Te) |

### Size



| Layer \ Item    | Thickness (µm) | Carrier concentration ( cm <sup>-3</sup> ) | AlAs Mole-Fraction |
|-----------------|----------------|--------------------------------------------|--------------------|
| p-GaAlAs ( Zn ) | 10-15          | $> 5 \cdot 10^{17}$                        | 0.60-0.65          |
| p-GaAlAs ( Zn ) | 1.5- 2.5       | $> 5 \cdot 10^{17}$                        | 0.35               |
| n-GaAlAs ( Te ) | 120 - 130      | $> 2 \cdot 10^{18}$                        | 0.60-0.65          |

### Measurement equipment



### Characteristics measured on four meza-diodes

| Item                        | Unit | Typical |
|-----------------------------|------|---------|
| Luminous Intensity at 20 mA | mCd  | 20.0    |
| Peak wavelength at 5 mA     | nm   | 660     |
| Forward volt. at 20 mA      | V    | <1.9    |
| Revers volt. at 10 µA       | V    | >8      |
| Response Time, Tr/Tf        | ns   | 50/35   |

### Type Names

DDH 660P - DDH - Double Double Heterostructure

660 - Spectral Peak Wavelength ,  $660 \pm 5$  nm\*

P - p - up side

\*on request by customer ( $\pm 5$  nm min.)