

650 nm RCLED

Land Mark

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EPIWAFERS FOR PHOTODETECTOR (PD)

EPIWAFERS FOR VISIBLE-LIGHT LASER DIODE (LD) and RCLED

EPIWAFERS FOR LASER DIODE

Descriptions

Two- or three-inch epiwafers grown by MOVPE are available for 650 nm Resonant cavity light emitting diode (RCLED) fabrication. The active region comprises multiple quantum wells of InGaP/InAlGaP sandwiched by InAlGaP layers to form a resonant cavity between P- and N-DBR mirrors. Since N-DBR has higher reflection, the light is emitted from the P-DBR mirror. 650nm RCLED can be used as light source in plastic optical fiber (POF) communication application.

P-GaAs
Al_xGa_{1-x}As/
AlAs
P-DBR(8 pairs)
P-InAlGaP
MQW
Active Region
N-InAlGaP
AlAs/
Al_xGa_{1-x}As
N-DBR (32 pairs)
N-GaAs Buffer
N-GaAs Substrate

FIG. 1

Wafer Characterization

Figure 2 shows the PL test result of 650nm RCLED epiwafer. Due to the high reflection of N-DBR beneath the active region, the FWHM is as narrow as 7.5 nm.

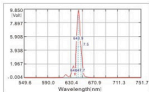


FIG. 2

Figure 3 shows the reflectivity spectrum of five distinct points. Both Alion dip and stop-band center have good uniformity.

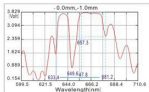


FIG. 3

650 nm RCLED

(LD) AND LIGHT-EMITTING DIODE (LED) EPIMAFERS FOR VERTICAL CAVITY SURFACE EMITTING LASER DIODE (VCSEL) SOLAR CELL EPIMAFERS

Wafer Characterization

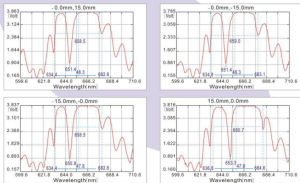


FIG. 3

Typical Epitaxial Capability

Parameters	Values
PL wavelength	± 5 nm of specified value
Eton dip	± 10 nm of specified value
SB center	± 10 nm of specified value
Thickness uniformity	Better than $\pm 2.5\%$
Doping control	$\sim \pm 30\%$
P-AlGaAs doping (cm^{-3})	C doped; $5\text{E}17$ to $1\text{E}20$
N-AlGaAs doping (cm^{-3})	Si doped; $1\text{E}17$ to $5\text{E}18$
P ⁺⁺ -GaAs doping (cm^{-3})	C doped; $>1\text{E}19$
Defect density control (Diameter)	$<100 \text{ cm}^{-2}$ ($D>10\mu\text{m}$)

Typical Epitaxy Parameters

Parameter	Symbol	Typical
Forward Voltage @20mA	V_f	$\sim 2.0 \text{ V}$
Output Power @20mA	P_o	$\sim 0.5 \text{ mW}$
Beam Divergence @20mA	2θ	$\sim 100 \text{ degree}$
Rise / Fall Time @ 20mA	T_r / T_f	$5\text{ns} / 5\text{ns}$
Aperture diameter	ϕ	$80 \mu\text{m}$