

# Device Modeling Report

COMPONENTS: Laser Diode  
PART NUMBER: DL-4038-021  
MANUFACTURER: SANYO

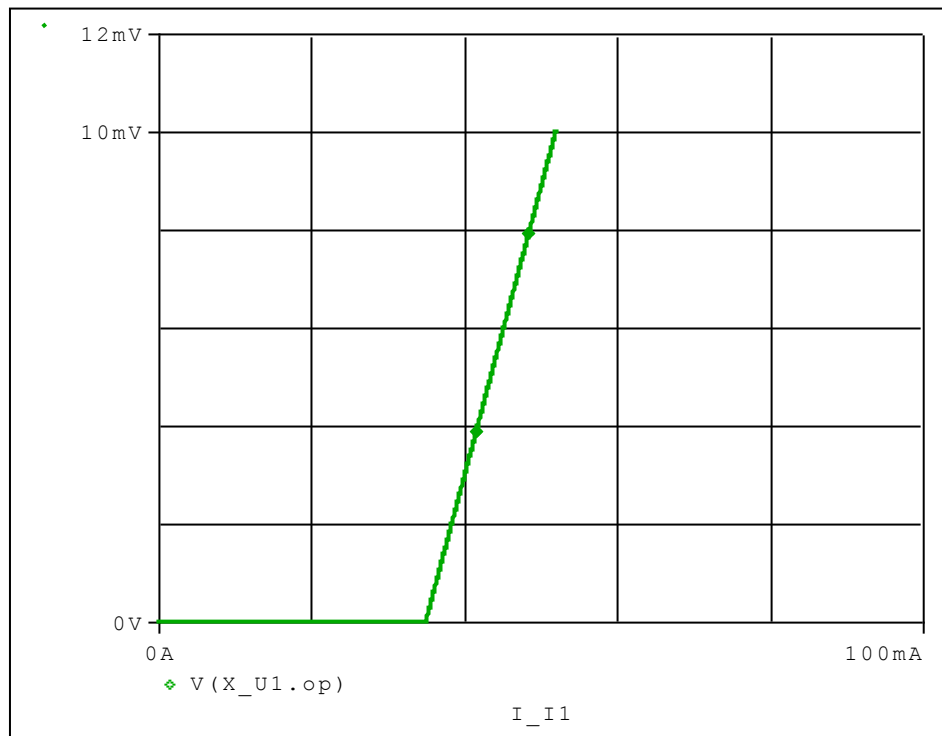


**Bee Technologies Inc.**

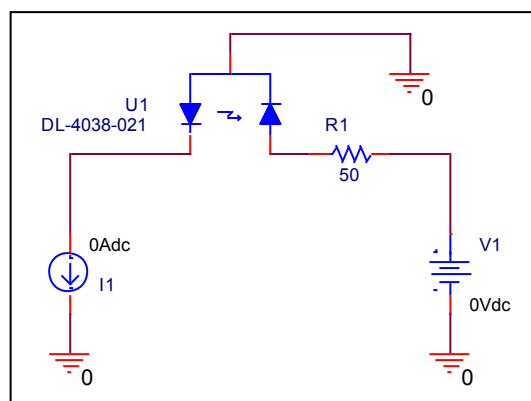
| PSpice model parameter | Model description                           |
|------------------------|---------------------------------------------|
| IS                     | Saturation Current                          |
| N                      | Emission Coefficient                        |
| RS                     | Series Resistance                           |
| IKF                    | High-injection Knee Current                 |
| CJO                    | Zero-bias Junction Capacitance              |
| M                      | Junction Grading Coefficient                |
| VJ                     | Junction Potential                          |
| ISR                    | Recombination Current Saturation Value      |
| BV                     | Reverse Breakdown Voltage(a positive value) |
| IBV                    | Reverse Breakdown Current(a positive value) |
| TT                     | Transit Time                                |

## Optical Output Power vs. Forward current characteristics

### Circuit simulation result

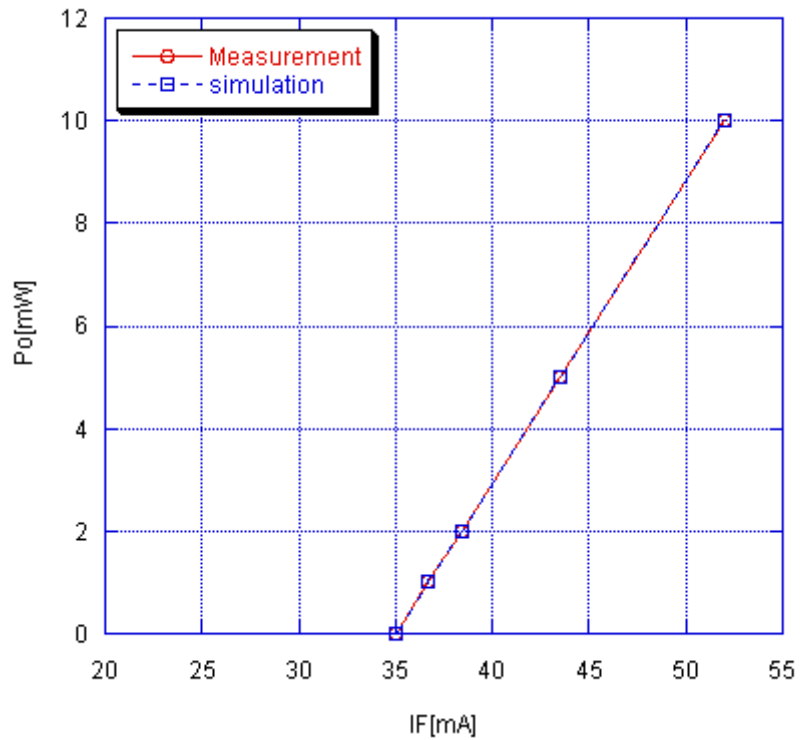


### Evaluation circuit



## Comparison graph

### Circuit simulation result

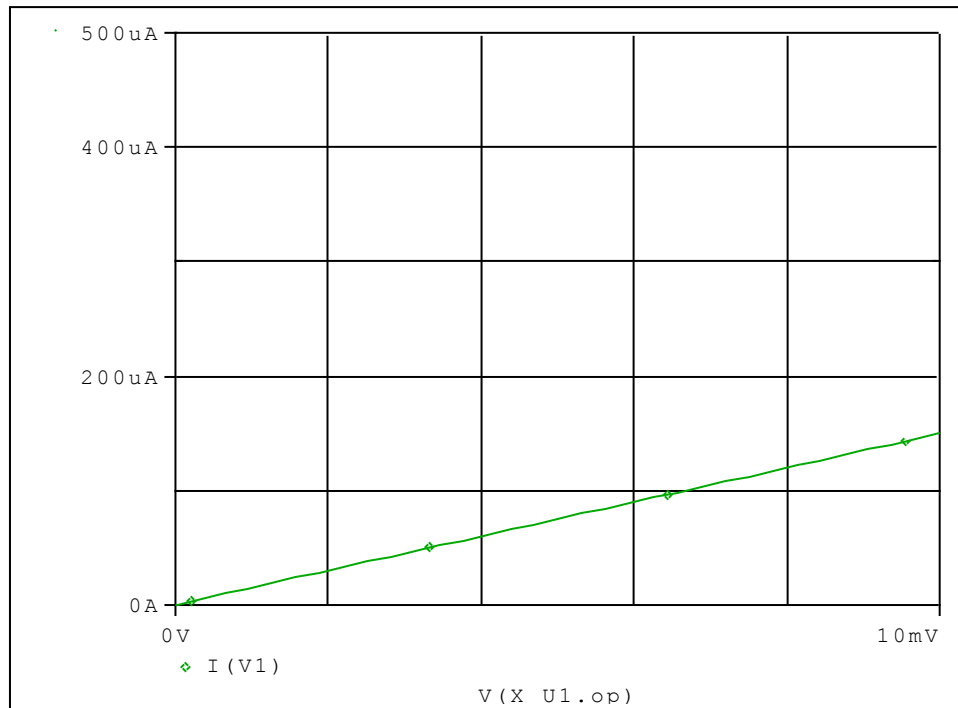


### Simulation Result

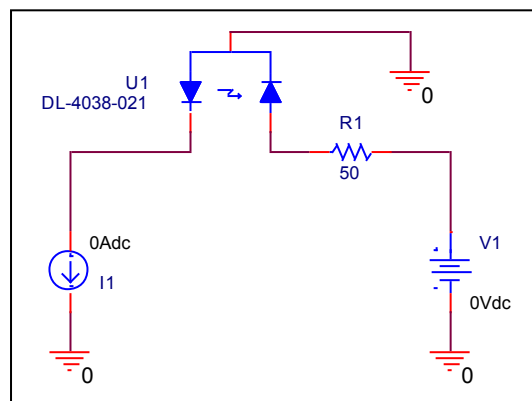
| Po[mW] | IF[mA]      |            | Error (%) |
|--------|-------------|------------|-----------|
|        | Measurement | Simulation |           |
| 0.010  | 35.000      | 34.980     | 0.057     |
| 1.000  | 36.650      | 36.660     | 0.027     |
| 2.000  | 38.450      | 38.440     | 0.026     |
| 5.000  | 43.500      | 43.470     | 0.069     |
| 10.000 | 52.000      | 51.980     | 0.038     |

## Monitor Current vs. Optical Output Power characteristics

### Circuit simulation result

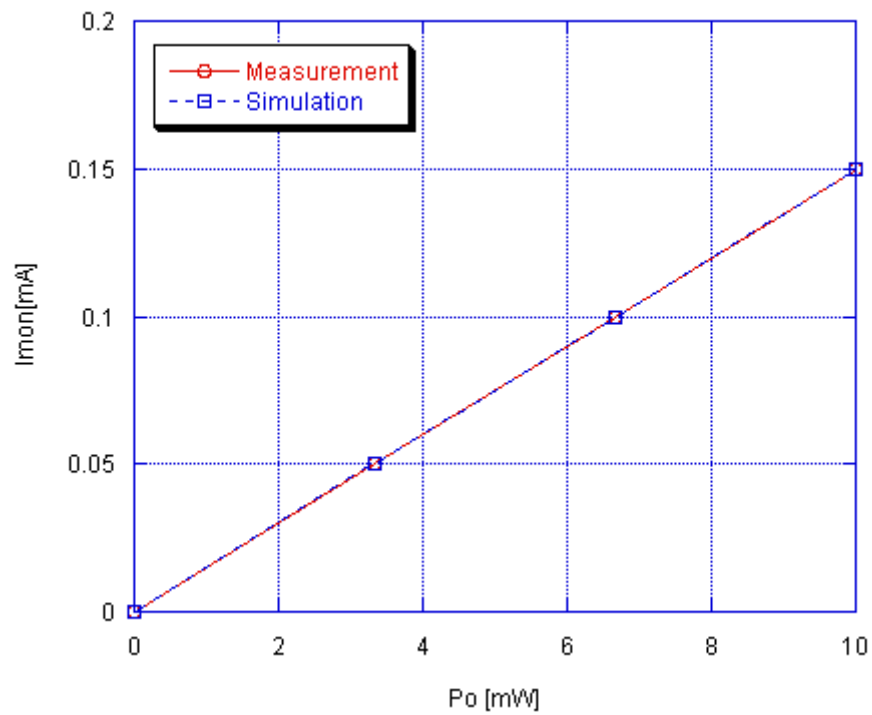


### Evaluation circuit



## Comparison graph

### Circuit simulation result



### Simulation Result

| I <sub>mon</sub> [mA] | P <sub>o</sub> [mW] |            | Error (%) |
|-----------------------|---------------------|------------|-----------|
|                       | Measurement         | Simulation |           |
| 0.050                 | 3.333               | 3.333      | 0.000     |
| 0.100                 | 6.666               | 6.666      | 0.000     |
| 0.150                 | 10.000              | 10.000     | 0.000     |