

# 脉冲激光功率测量系统

## 以精确和可重现的方法测试VCSEL和激光

### 专为光束功率测量而设计

蓝菲光学脉冲激光功率测量系统系列确保了以精确和可重现的方法测定被校准或发散的激光或激光二极管。积分球专门设计用于激光，是测量光辐射束总功率的理想选择。由于积分球独特的几何结构，激光束功率测量不受激光束偏振及校准的影响

伴随积分球总处理能力产生的衰减也缓和了探测器的饱和。该系统可与开口一起使用或用一系列的可选的光纤适配器开孔，用于激光二极管组件或开口缩减接头。

### 灵活设计

每套系统由激光功率积分球、灯杆和灯杆支架及基础组件、探测器组件及多波段校准系统组成。第二个探测器开口方便用户灵活地安装一个额外的探测器组件或光谱仪，以分析较宽灵敏度的激光或分析光谱特性。

辐射光束从入射口投射到积分球内，与积分球入口呈45°角处有一个探测器，可以限制探测器视场角，在不影响测试精度的情况下可以收集高度分散的光源。



该系统可以测试波长范围从350~1700nm、功率从几nW到几百瓦范围的激光，测试结果可溯源至NIST。

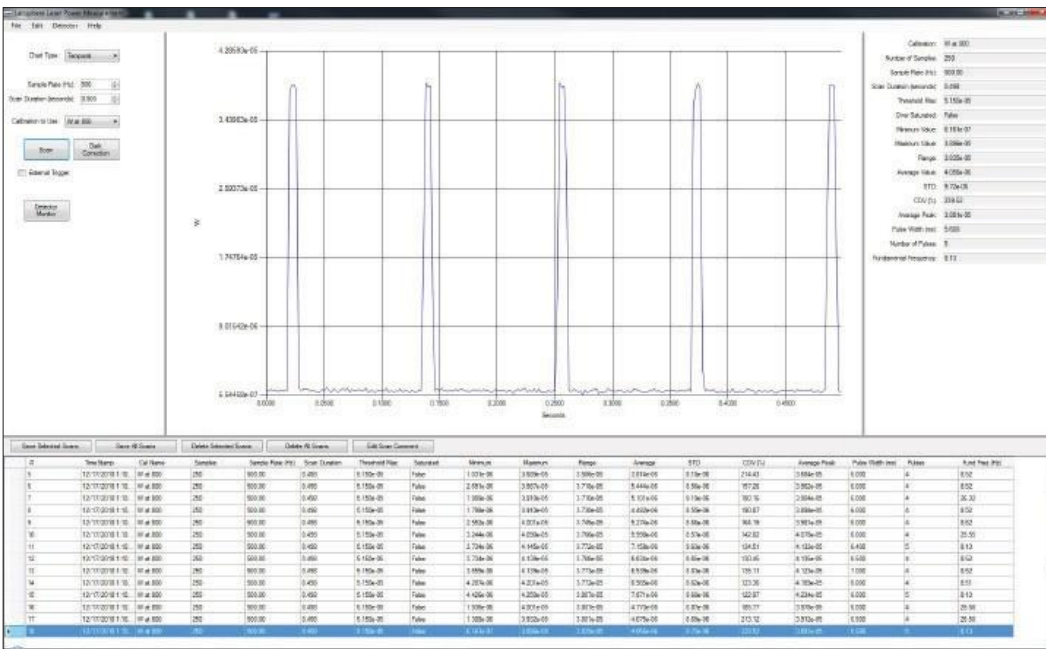
直径为2、4、6英寸的积分球的涂层使用了蓝菲光学的Spectrafect®或Infragold®, 或由我公司的高度漫反射材料Spectralon®制成。这些漫反射内层既经久耐用又能长期保持高稳定性，所以确保了精确的光积分。

### 特点:

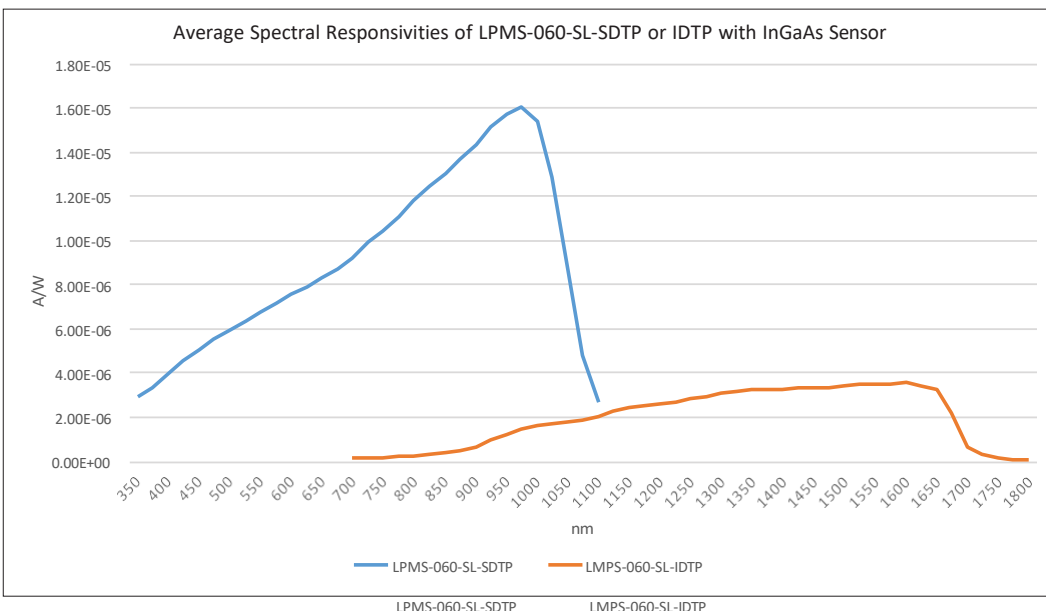
- 积分球内部使用Spectrafect®, Infragold® 或 Spectralon® 涂料, 可以降低激光方向对测试带来的影响
- 坚固的光纤安装端口
- 3种积分球尺寸可选: 2,4,6英寸可选
- 2种探测器可选: Silicon (Si), InGaAs (IN)
- 可为光纤或者光谱仪预留出安装端口
- 校准结果可溯源至NIST

### 测量:

- VCSEL
- 激光
- 激光二极管
- 激光二极管组件
- 发散的单色光源
- 脉冲激光功率



- 设定波长的平均辐射功率 (CW)
- 设定波长的平均峰值辐射功率 (脉冲)
- COV (CW)
- 探测器采样率 (Hz)
- 探测器扫描间隔 (秒)
- 激光功率密度: 单位面积的瞬时激光束功率。 W / cm<sup>2</sup> (选择 以cm<sup>2</sup>为单位的光束面积) 需要输入光束面积
- 最大功率 (CW)
- 最小功率 (CW)
- 超量程警告
- 峰值辐射功率 (脉冲)
- 脉冲宽度或脉冲持续时间间隔
- 辐射功率范围 (CW)
- 辐射功率 (W)
- 重复率/频率 (脉冲)
- 标准差 (CW)
- 给定LPMS探测器灵敏度范围的最大阈值和系统响应率
- 给定LPMS探测器灵敏度范围的最小阈值和系统响应率
- 总测量时间: 不一定与测量过程中的激光发射时间相同。秒
- 脉冲数
- 波长 (客户根据待测激光和校准数据表选择)



## 针对VIS NIR 低功率激光器

|                | <b>LPMS-020-SF-SDTP</b>                 | <b>LPMS-040-SF-SDTP</b>                 | <b>LPMS-060-SF-SDTP</b>                 |
|----------------|---|---|---|
| 型号:            | <b>AA-01548-100</b>                     | <b>AA-01551-100</b>                     | <b>AA-01554-100</b>                     |
| 料号:            | Spectrafect                             | Spectralect                             | Spectralect                             |
| 积分球内部涂层:       | 2 inch                                  | 4 inch                                  | 6 inch                                  |
| 积分球尺寸:         | 0.5 inch                                | 1.0 inch                                | 1.0 inch                                |
| 积分球入口直径: (带边框) | 2, 0.5 inch port frames                 | 2, 0.5 inch port frames                 | 2, 0.5 inch port frames                 |
| 积分球传感器开口: (标准) | Silicon                                 | Silicon                                 | Silicon                                 |
| 传感器:           | 350 – 1100                              | 350 – 1100                              | 350 – 1100                              |
| 光谱范围: (nm)     | 975                                     | 975                                     | 975                                     |
| 光谱峰值: (nm)     | 5.69E-04 @ 975 nm                       | 1.42E-04 @ 975 nm                       | 6.33E-05 @ 975 nm                       |
| 光谱响应: (A/W)    | 1.8 nW                                  | 7.0 nW                                  | 1.6 nW                                  |
| 975 nm最小功率:    | 1.8 W                                   | 7 W                                     | 16 W                                    |
| 975 nm最大功率*:   | Low 10Hz, High: 5000Hz                  | Low 10Hz, High: 5000Hz                  | Low 10Hz, High: 5000Hz                  |
| 采样率:           | 5kHz with internal sample rate of 20kHz | 5kHz with internal sample rate of 20kHz | 5kHz with internal sample rate of 20kHz |
| 数据记录率:         | 0.1 to 0.0002 sec                       | 0.1 to 0.0002 sec                       | 0.1 to 0.0002 sec                       |
| 记录时间间隔:        | 5V TTL female BNC                       | 5V TTL female BNC                       | 5V TTL female BNC                       |
| 触发:            | USB-A                                   | USB-A                                   | USB-A                                   |
| 计算机接口:         | USB-A, 5V                               | USB-A, 5V                               | USB-A, 5V                               |
| 功率要求:          | 20° – 40° C                             | 20° – 40° C                             | 20° – 40° C                             |
| 操作温度:          |   |   |   |

## 针对 VIS NIR中等功率激光器, 更稳健可靠

|                | <b>LPMS-020-SL-SDTP</b>                 | <b>LPMS-040-SL-SDTP</b>                 | <b>LPMS-060-SL-SDTP</b>                 |
|----------------|---|---|---|
| 型号:            | <b>AA-01549-100</b>                     | <b>AA-01552-100</b>                     | <b>AA-01555-100</b>                     |
| 料号:            | Spectralon                              | Spectralon                              | Spectralon                              |
| 积分球内部涂层:       | 2 inch                                  | 4 inch (I.D.)                           | 6 inch (I.D.)                           |
| 积分球尺寸:         | 0.5 inch                                | 1.0 inch                                | 1.0 inch                                |
| 积分球入口直径: (带边框) | 2, 0.5 inch port frames                 | 2, 0.5 inch port frames                 | 2, 0.5 inch port frames                 |
| 积分球传感器开口: (标准) | Silicon                                 | Silicon                                 | Silicon                                 |
| 传感器:           | 350 – 1100                              | 350 – 1100                              | 350 – 1100                              |
| 光谱范围: (nm)     | 975                                     | 975                                     | 975                                     |
| 光谱峰值: (nm)     | 9.66E-05 @ 975 nm                       | 3.55E-05 @ 975 nm                       | 5.05E-06 @ 975 nm                       |
| 光谱响应: (A/W)    | 10 nW                                   | 28 nW                                   | 20 nW                                   |
| 975 nm最小功率:    | 10 W                                    | 28 W                                    | 20 W                                    |
| 975 nm最大功率*:   | Low 10Hz, High: 5000Hz                  | Low 10Hz, High: 5000Hz                  | Low 10Hz, High: 5000Hz                  |
| 采样率:           | 5kHz with internal sample rate of 20kHz | 5kHz with internal sample rate of 20kHz | 5kHz with internal sample rate of 20kHz |
| 数据记录率:         | 0.1 to 0.0002 sec                       | 0.1 to 0.0002 sec                       | 0.1 to 0.0002 sec                       |
| 记录时间间隔:        | 5V TTL female BNC                       | 5V TTL female BNC                       | 5V TTL female BNC                       |
| 触发:            | USB-A                                   | USB-A                                   | USB-A                                   |
| 计算机接口:         | USB-A, 5V                               | USB-A, 5V                               | USB-A, 5V                               |
| 功率要求:          | 20° – 40° C                             | 20° – 40° C                             | 20° – 40° C                             |
| 操作温度:          |   |   |   |

\* Actual maximum power based on thermal limits of sphere coating and/or material. Contact our sales engineers for further information.

## 针对NIR低功率激光器

|                | <b>LPMS-020-SF-IDTP</b>                 | <b>LPMS-040-SF-IDTP</b>                 | <b>LPMS-060-SF-IDTP</b>                 |
|----------------|---|---|---|
| 型号:            |   |   |   |
| 料号:            | <b>AA-01548-400</b>                     | <b>AA-01551-400</b>                     | <b>AA-01554-400</b>                     |
| 积分球内部涂层:       | Spectrafect                             | Spectralect                             | Spectralect                             |
| 积分球尺寸:         | 2 inch                                  | 4 inch                                  | 6 inch                                  |
| 积分球入口直径: (带边框) | 0.5 inch                                | 1.0 inch                                | 1.0 inch                                |
| 积分球传感器开口: (标准) | 2, 0.5 inch port frames                 | 2, 0.5 inch port frames                 | 2, 0.5 inch port frames                 |
| 传感器:           | InGaAs                                  | InGaAs                                  | InGaAs                                  |
| 光谱范围: (nm)     | 800 - 1700                              | 800 - 1700                              | 800 - 1700                              |
| 光谱峰值: (nm)     | 1300                                    | 1300                                    | 1300                                    |
| 光谱响应: (A/W)    | 9.43E-05 @ 1300 nm                      | 1.87E-05 @ 1300 nm                      | 1.05E-05 @ 1300 nm                      |
| 1300 nm最小功率:   | 10 nW                                   | 50 nW                                   | 100 nW                                  |
| 1300 nm最大功率*:  | 10 W                                    | 50 W                                    | 100 W                                   |
| 采样率:           | Low 10Hz, High: 5000Hz                  | Low 10Hz, High: 5000Hz                  | Low 10Hz, High: 5000Hz                  |
| 数据记录率:         | 5kHz with internal sample rate of 20kHz | 5kHz with internal sample rate of 20kHz | 5kHz with internal sample rate of 20kHz |
| 记录时间间隔:        | 0.1 to 0.0002 sec                       | 0.1 to 0.0002 sec                       | 0.1 to 0.0002 sec                       |
| 触发:            | 5V TTL female BNC                       | 5V TTL female BNC                       | 5V TTL female BNC                       |
| 计算机接口:         | USB-A                                   | USB-A                                   | USB-A                                   |
| 功率要求:          | USB-A, 5V                               | USB-A, 5V                               | USB-A, 5V                               |
| 操作温度:          | 20° – 40° C                             | 20° – 40° C                             | 20° – 40° C                             |

## 针对 NIR中等功率激光器, 更稳健可靠

|                | <b>LPMS-020-SL-IDTP</b>                 | <b>LPMS-040-SL-IDTP</b>                 | <b>LPMS-060-SL-IDTP</b>                 |
|----------------|---|---|---|
| 型号:            |   |   |   |
| 料号:            | <b>AA-01549-400</b>                     | <b>AA-01552-400</b>                     | <b>AA-01555-400</b>                     |
| 积分球内部涂层:       | Spectralon                              | Spectralon                              | Spectralon                              |
| 积分球尺寸:         | 2 inch                                  | 4 inch (I.D.)                           | 6 inch (I.D.)                           |
| 积分球入口直径: (带边框) | 0.5 inch                                | 1.0 inch                                | 1.0 inch                                |
| 积分球传感器开口: (标准) | 2, 0.5 inch port frames                 | 2, 0.5 inch port frames                 | 2, 0.5 inch port frames                 |
| 传感器:           | InGaAs                                  | InGaAs                                  | InGaAs                                  |
| 光谱范围: (nm)     | 800 - 1700                              | 800 - 1700                              | 800 - 1700                              |
| 光谱峰值: (nm)     | 1600                                    | 1600                                    | 1600                                    |
| 光谱响应: (A/W)    | 2.49E-05 @ 1600 nm                      | 9.16E-06 @ 1600 nm                      | 3.55E-06 @ 1600 nm                      |
| 1600 nm最小功率:   | 40 nW                                   | 109 nW                                  | 50 nW                                   |
| 1600 nm最大功率*:  | 40 W                                    | 109 W                                   | 50 W                                    |
| 采样率:           | Low 10Hz, High: 5000Hz                  | Low 10Hz, High: 5000Hz                  | Low 10Hz, High: 5000Hz                  |
| 数据记录率:         | 5kHz with internal sample rate of 20kHz | 5kHz with internal sample rate of 20kHz | 5kHz with internal sample rate of 20kHz |
| 记录时间间隔:        | 0.1 to 0.0002 sec                       | 0.1 to 0.0002 sec                       | 0.1 to 0.0002 sec                       |
| 触发:            | 5V TTL female BNC                       | 5V TTL female BNC                       | 5V TTL female BNC                       |
| 计算机接口:         | USB-A                                   | USB-A                                   | USB-A                                   |
| 功率要求:          | USB-A, 5V                               | USB-A, 5V                               | USB-A, 5V                               |
| 操作温度:          | 20° – 40° C                             | 20° – 40° C                             | 20° – 40° C                             |

\* Actual maximum power based on thermal limits of sphere coating and/or material. Contact our sales engineers for further information.

## 针对 NIR大功率激光器，具有较高的热阈值

|                | <b>LPMS-040-IG-IDTP</b>                 | <b>LPMS-060-IG-IDTP</b>                 |
|----------------|---|---|
| 型号:            | <b>AA-01550-400</b>                     | <b>AA-01553-400</b>                     |
| 料号:            | Infragold                               | Infragold                               |
| 积分球内部涂层:       | 4 inch                                  | 6 inch                                  |
| 积分球尺寸:         | 1.0 inch                                | 1.0 inch                                |
| 积分球入口直径: (带边框) | 2, 0.5 inch port frames                 | 2, 0.5 inch port frames                 |
| 积分球传感器开口: (标准) | InGaAs                                  | InGaAs                                  |
| 传感器:           | 800 - 1800                              | 800 - 1800                              |
| 光谱范围: (nm)     | 1600                                    | 1600                                    |
| 光谱峰值: (nm)     | 3.41E-06 @ 1600 nm                      | 1.52E-06 @ 1600 nm                      |
| 光谱响应: (A/W)    | 290 nW                                  | 659 nW                                  |
| 1600 nm最小功率:   | 290 W                                   | 659 W                                   |
| 1600 nm最大功率*:  | Low 10Hz, High: 5000Hz                  | Low 10Hz, High: 5000Hz                  |
| 采样率:           | 5kHz with internal sample rate of 20kHz | 5kHz with internal sample rate of 20kHz |
| 数据记录率:         | 0.1 to 0.0002 sec                       | 0.1 to 0.0002 sec                       |
| 记录时间间隔:        | USB-A                                   | USB-A                                   |
| 计算机接口:         | USB-A, 5V                               | USB-A, 5V                               |
| 功率要求:          | 20° – 40° C                             | 20° – 40° C                             |
| 操作温度:          |   |   |

\* Actual maximum power based on thermal limits of sphere coating and/or material. Contact our sales engineers for further information.

## Ordering Information

| 型号                | Description   | 料号           |
|-------------------|---|--------------|
| LPMS-020-SF-IDTP  | Spectrafect 2 inch, 3 port CW and pulsed laser power measurement system with high speed   | AA-01548-400 |
| LPMS-020-SF-SDTP  | Spectrafect 2 inch, 3 port CW and pulsed laser power measurement system with high speed Silicon detector and control software and UI 350 nm to 1100 nm every 10 nm. Watts at X nm | AA-01548-100 |
| LPMS-020-SL-IDTP  | Spectralon 2 inch, 3 port CW and pulsed laser power measurement system with high speed  | AA-01549-400 |
| LPMS-020-SL-SDTP  | Spectralon 2 inch, 3 port CW and pulsed laser power measurement system with high speed Silicon detector and control software and UI 350 nm to 1100 nm every 10 nm. Watts at X nm  | AA-01549-100 |
| LPMS-040-IG-IDTP  | Infragold 4 inch, 3 port CW and pulsed laser power measurement system with high speed   | AA-01550-400 |
| LPMS-040-SF-IDTP  | Spectrafect 4 inch, 3 port CW and pulsed laser power measurement system with high speed InGaAs detector and control software and UI 800 nm to 1700 nm every 10 nm. Watts at X nm  | AA-01551-400 |
| LPMS-040-SF-SDTP  | Spectrafect 4 inch, 3 port CW and pulsed laser power measurement system with high speed   | AA-01551-100 |
| LPMS-040-SL-IDTP  | Spectralon 4 inch, 3 port CW and pulsed laser power measurement system with high speed InGaAs detector and control software and UI 800 nm to 1700 nm every 10 nm. Watts at X nm   | AA-01552-400 |
| LPMS-040-SL-SDTP  | Spectralon 4 inch, 3 port CW and pulsed laser power measurement system with high speed  | AA-01552-100 |
| LPMS-060-IG -IDTP | Infragold 6 inch, 3 port CW and pulsed laser power measurement system with high speed InGaAs detector and control software and UI 800 nm to 1700 nm every 10 nm. Watts at X nm    | AA-01553-400 |
| LPMS-060-SF-IDTP  | Spectrafect 6 inch, 3 port CW and pulsed laser power measurement system with high speed   | AA-01554-400 |
| LPMS-060-SF-SDTP  | Spectrafect 6 inch, 3 port CW and pulsed laser power measurement system with high speed Silicon detector and control software and UI 350 nm to 1100 nm every 10 nm. Watts at X nm | AA-01554-100 |
| LPMS-060-SL-IDTP  | Spectralon 6 inch, 3 port CW and pulsed laser power measurement system with high speed  | AA-01555-400 |
| LPMS-060-SL-SDTP  | Spectralon 6 inch, 3 port CW and pulsed laser power measurement system with high speed Silicon detector and control software and UI 350 nm to 1100 nm every 10 nm. Watts at X nm  | AA-01555-100 |
| SDA-050-HS1       | Silicon detector assembly - high speed. Mounts on PF-050 0.5 inch port frame  | AS-81067-000 |
| IDA-050-HS1       | InGaAs detector assembly - high speed. Mounts on PF-050 0.5 inch port frame   | AS-81067-001 |

## Optional Accessories

|               |                                |              |
|---------------|--------------------------------|--------------|
| SMA-050-SF/SL | Adaptor, SMA, 0.5", SF/SL      | AS-02428-004 |
| SMA-100-SF/SL | Adaptor, SMA, 1.0", SF/SL      | AS-02428-008 |
| SMA-050-IG    | Adaptor, SMA, 0.5", Infragold  | AS-02432-004 |
| SMA-100-IG    | Adaptor, SMA, 1.0", Infragold  | AS-02432-008 |
| SMA-050-FB    | Adaptor, SMA, 0.5", Flat Black | AS-02436-004 |
| SMA-100-FB    | Adaptor, SMA, 1.0", Flat Black | AS-02436-008 |