

Description

The VPSL-0635-005-x-5-A/B/E is a 0.63 μm band, AlGaInP index guided, laser diode with a multi-quantum well (MQW) structure. It is suitable as a light source for laser levelers, scanners, and optical equipment for measurement. Combined with an integrated, internal, beam correcting optic and encased in a hermetic sealed package, this is a high-performance, highly reliable, and long life laser diode.

Features

- Built-in monitor photodiode
- Circular, diverging beam, NA approximately 0.11
- Diffraction limited wavefront, aberration equal or better than λ/4 peak to valley
- 5mW CW optical power
- Standard 5.6 mm form factor

Absolute Maximum Ratings (T_C=case temperature=25°C)

| Item | Symbol | Min | Max | Unit |
|-----------------------|---------------------|-----|-----|------|
| Optical output power | P _O | - | 6 | mW |
| LD reverse voltage | V _R (LD) | - | 2 | V |
| PD reverse voltage | V _R (PD) | - | 30 | V |
| Operating temperature | T _{opr} | -10 | +50 | °C |
| Storage temperature | T _{stg} | -40 | +85 | °C |

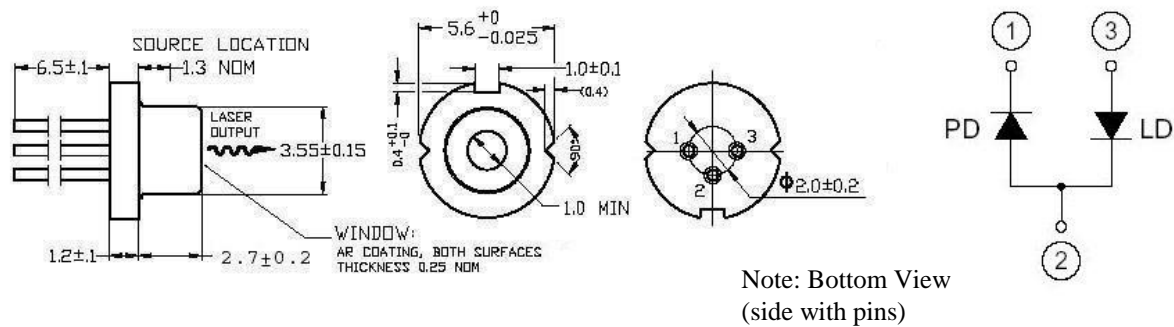
Optical and Electrical Characteristics (T_C=case temperature=25°C)

| Item | Symbol | Min | Typ | Max | Unit | Test Conditions |
|----------------------|-----------------|-----|------|----------|-------|---|
| Optical output power | P _O | - | 5 | - | mW | Kink free |
| Threshold current | I _{th} | - | 30 | 40 | mA | |
| Operating current | I _{op} | - | 34 | 50 | mA | P _O =5mW |
| Operating voltage | V _{op} | - | 2.2 | 2.7 | V | P _O =5mW |
| Slope efficiency | η _s | 0.3 | 0.5 | 0.8 | mW/mA | 3(mW)/(I _(4mW) -I _(1mW)) |
| Lasing wavelength | λ _p | 630 | 635 | 640 | nm | P _O =5mW |
| Circularity | φ | | - | 0.8:1.25 | ratio | P _O =5mW |
| Beam divergence II | θ | 6 | 8 | 12 | deg | P _O =5mW, FWHM |
| Off axis angle | Δθ | - | - | ±3 | deg | |
| Monitor current | I _s | 0.1 | 0.15 | 0.5 | mA | P _O =5mW, V _r (pd)=5V |

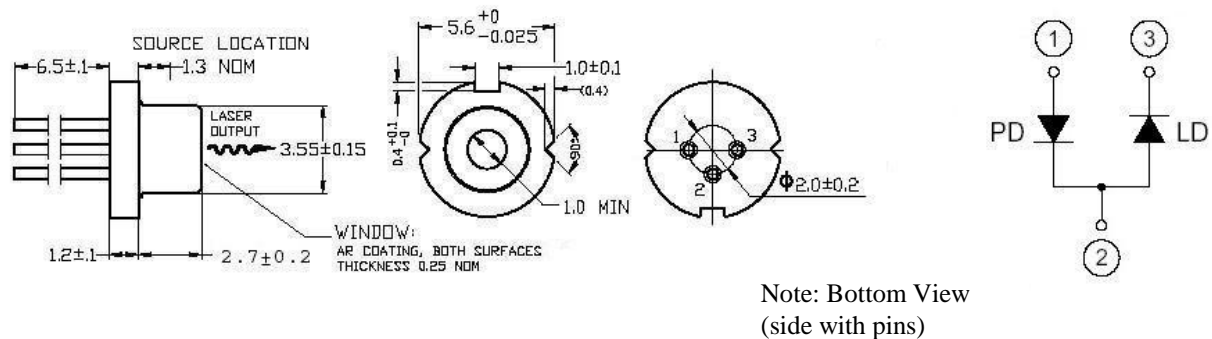
Specifications are subject to change without notice. Each purchased VPSL is provided with test data. Please refer to this data before using the VPSL.

Package Detail, Mechanical & Electrical – VPSL-0635-005-x-5-A/B/E

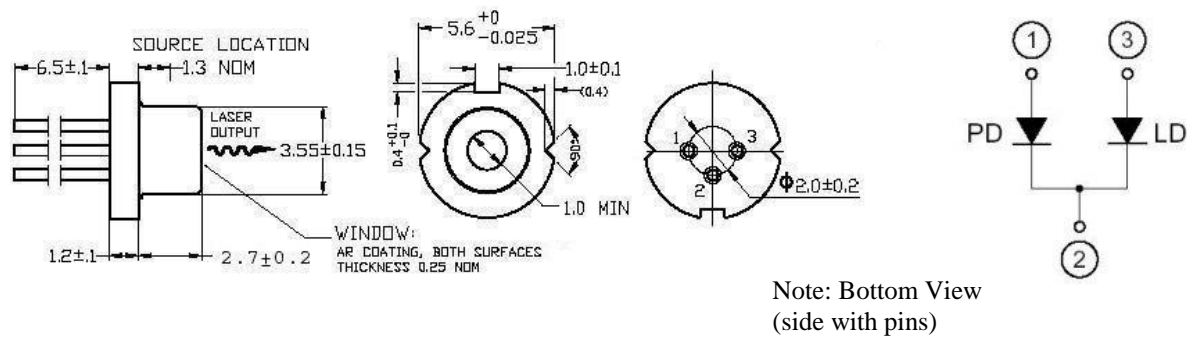
A PINOUT PACKAGE



B PINOUT PACKAGE



E PINOUT PACKAGE



Handling Care and Precautions for Use of VPSL Diodes

1. Absolute Maximum Ratings

Do not exceed, *even momentarily*, the maximum ratings (see page 1, table). When a VPSL diode is driven in excess of its maximum ratings, it can cause at minimum a considerable reduction in reliability, and potentially instantaneous failure.

- a. VPSL diodes may be damaged by surge currents generated at power on-off operation. Check on the transient characteristics of the power supply to make sure that such surges do not exceed the maximum ratings.
- b. The maximum ratings are specified for a case temperature of 25°C. Designs should be made to work well within this temperature range. As the case temperature goes up, power dissipation as well as maximum light output power is reduced.

2. Soldering Conditions

Maximum solder-tip temperature is 260°C and soldering time must be within 3.0 seconds. A minimum solder clearance of 1.6mm should be maintained from the root of the lead.

3. Prevention of Breakdown due to Static Electricity

VPSL diodes may be adversely affected by static electricity and surge currents and, consequently, cause breakdown of the diode and reduction of reliability unless the following precautions are taken:

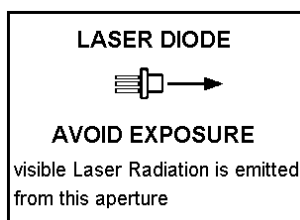
- a. Power supplies, installation and measuring equipment should be grounded. A noise filter or noise-cut transformer should be provided on any power supply inputs.
- b. Anyone working with a VPSL diode should be grounded through high resistance (500 K Ohm - 1M Ohm) by means of a ground strap and wrist band (for example).
- c. Soldering irons should be grounded to protect laser diodes from voltage leaks.
- d. During operation of the VPSL diode, working clothes, hats, and shoes should be static-protected. Cotton-based clothing is preferred.
- e. Any container for carriage and storage should be static-protected.
- f. Avoid using laser diodes in an environment where high frequency surge currents may be generated by an inductive electric field (such as a fluorescent lamp). These fields can also cause breakdown or deterioration of the laser diode.

4. Package Handling

- a. The laser diode package should not be cut off, reworked, or deformed. Do not hold the cap of the VPSL diode tightly, otherwise it may induce cracks or damage to the window glass.
- b. Do not touch the surface of the window glass. Any scratch or contamination may result in reduction of optical characteristics.
- c. Remove small contaminates on the surface softly using a cotton tip stick with a small amount of methyl alcohol.

5. Safety

The output light from laser diodes is harmful to a human body even if it is invisible. Avoid looking at the output light of a VPSL diode directly, or even indirectly through a lens during operation. Observance of operation should be through an infrared TV camera or related equipment. Refer to IEC 825-1 and 21 CFR 1040.10-1040.11 as a radiation safety standard for laser products.



Description

The VPSL-0635-005-x-9-B Laser Device is a 0.63 μm band, AlGaInP, index-guided, multi-quantum well (MQW) laser diode with an integrated, internal, beam correcting optic. It is suitable as a light source for bar code readers, laser levelers and various other types of optical equipment. Hermetic sealing of the package assures high reliability.

Features

- Visible light output
- 5mW CW optical power
- Built-in monitor photodiode.
- Circular, diverging beam, NA approximately 0.11
- Diffraction limited wavefront, aberration equal or better than $\lambda/4$ peak to valley
- Standard 9mm form factor

Absolute Maximum Ratings (T_C =case temperature=25°C) *

| Item | Symbol | Min | Max | Unit |
|-----------------------|------------|-----|-----|------|
| Optical output power | P_O | - | 5 | mW |
| LD reverse voltage | V_R (LD) | - | 2 | V |
| PD reverse voltage | V_R (PD) | - | 30 | V |
| Operating temperature | T_{opr} | -10 | +50 | °C |
| Storage temperature | T_{stg} | -40 | +85 | °C |

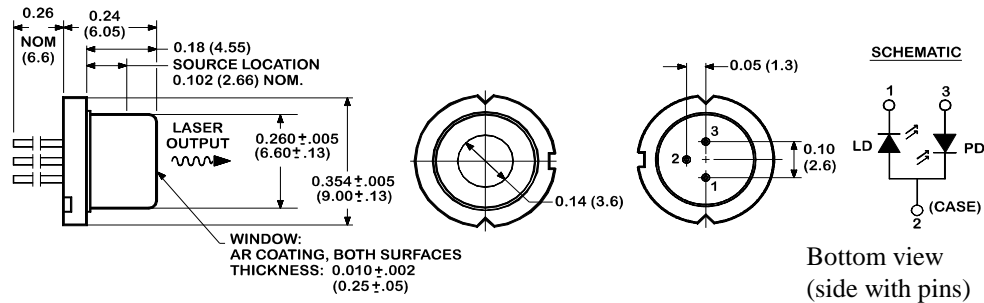
Optical and Electrical Characteristics (T_C =case temperature=25°C) *

| Item | Symbol | Min | Typ | Max | Unit | Test Conditions |
|----------------------|----------------|-----|-----|----------|-------|---|
| Optical output power | P_O | - | - | 5 | mW | Kink free |
| Threshold current | I_{th} | 20 | 45 | 70 | mA | |
| Operating current | I_{op} | - | 55 | 85 | mA | $P_O=5\text{mW}$ |
| Operating voltage | V_{op} | - | - | 2.7 | V | $P_O=5\text{mW}$ |
| Lasing wavelength | λ_p | 625 | 638 | 640 | nm | $P_O=5\text{mW}$ |
| Circularity | ϕ | | - | 0.8:1.25 | ratio | $P_O=5\text{mW}$ |
| Beam divergence | θ | 5 | 8 | 11 | deg | $P_O=5\text{mW}$, FWHM |
| Off axis angle | $\Delta\theta$ | - | - | ± 3 | deg | |
| Monitor current | I_s | 0.2 | 0.4 | 0.8 | mA | $P_o=5\text{mW}$, $V_r(\text{pd})=5\text{V}$ |

Specifications are subject to change without notice. Each purchased VPSL is provided with test data. Please refer to this data before using the VPSL.

Package Detail, Mechanical & Electrical – VPSL-0635-005-x-9-B

B PINOUT PACKAGE



Handling Care and Precautions for Use of VPSL Diodes

1. Absolute Maximum Ratings

Do not exceed, *even momentarily*, the maximum ratings (see page 1, table). When a VPSL diode is driven in excess of its maximum ratings, it can cause at minimum a considerable reduction in reliability, and potentially instantaneous failure.

- VPSL diodes may be damaged by surge currents generated at power on-off operation. Check on the transient characteristics of the power supply to make sure that such surges do not exceed the maximum ratings.
- The maximum ratings are specified for a case temperature of 25°C. Designs should be made to work well within this temperature range. As the case temperature goes up, power dissipation as well as maximum light output power is reduced.

2. Soldering Conditions

Maximum solder-tip temperature is 260°C and soldering time must be within 3.0 seconds. A minimum solder clearance of 1.6mm should be maintained from the root of the lead.

3. Prevention of Breakdown due to Static Electricity

VPSL diodes may be adversely affected by static electricity and surge currents and, consequently, cause breakdown of the diode and reduction of reliability unless the following precautions are taken:

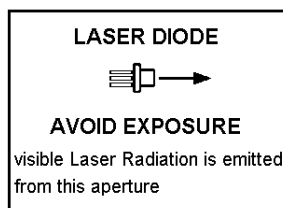
- Power supplies, installation and measuring equipment should be grounded. A noise filter or noise-cut transformer should be provided on any power supply inputs.
- Anyone working with a VPSL diode should be grounded through high resistance (500 K Ohm - 1M Ohm) by means of a ground strap and wrist band (for example).
- Soldering irons should be grounded to protect laser diodes from voltage leaks.
- During operation of the VPSL diode, working clothes, hats, and shoes should be static-protected. Cotton-based clothing is preferred.
- Any container for carriage and storage should be static-protected.
- Avoid using laser diodes in an environment where high frequency surge currents may be generated by an inductive electric field (such as a fluorescent lamp). These fields can also cause breakdown or deterioration of the laser diode.

4. Package Handling

- The laser diode package should not be cut off, reworked, or deformed. Do not hold the cap of the VPSL diode tightly, otherwise it may induce cracks or damage to the window glass.
- Do not touch the surface of the window glass. Any scratch or contamination may result in reduction of optical characteristics.
- Remove small contaminants on the surface softly using a cotton tip stick with a small amount of methyl alcohol.

5. Safety

The output light from laser diodes is harmful to a human body even if it is invisible. Avoid looking at the output light of a VPSL diode directly, or even indirectly through a lens during operation. Observance of operation should be through an infrared TV camera or related equipment. Refer to IEC 825-1 and 21 CFR 1040.10-1040.11 as a radiation safety standard for laser products.



Description

The VPSL-0635-010-x-5-A/B is a 0.63 μm band, AlGaInP index guided, laser diode with a multi-quantum well (MQW) structure. It is suitable as a light source for laser pointers and optical equipment for alignment. Combined with an integrated, internal, beam correcting optic and encased in a hermetic sealed package, this is a high-performance, highly reliable, and long life laser diode.

Features

- Built-in monitor photodiode
- Circular, diverging beam, NA approximately 0.11
- Diffraction limited wavefront
- 10mW CW optical power
- Standard 5.6 mm form factor

Absolute Maximum Ratings (T_C =case temperature=25°C)

| Item | Symbol | Min | Max | Unit |
|-----------------------|------------|-----|-----|------|
| Optical output power | P_O | - | 12 | mW |
| LD reverse voltage | V_R (LD) | - | 2 | V |
| PD reverse voltage | V_R (PD) | - | 30 | V |
| Operating temperature | T_{opr} | -10 | +50 | °C |
| Storage temperature | T_{stg} | -40 | +85 | °C |

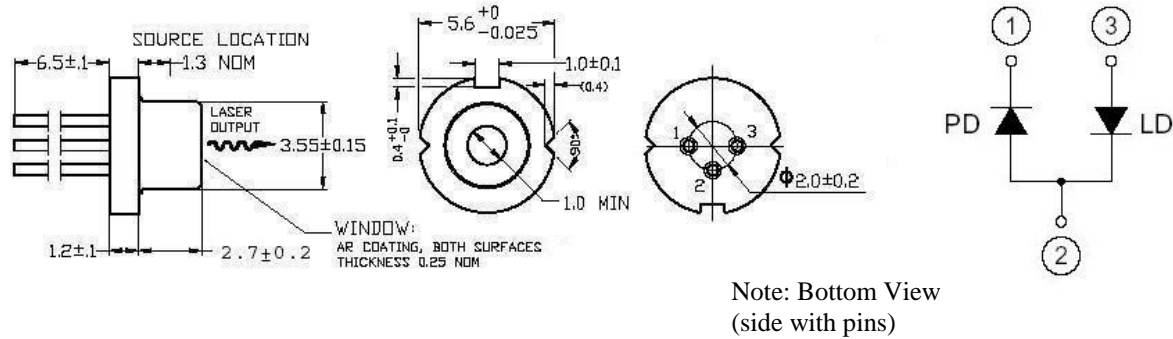
Optical and Electrical Characteristics (T_C =case temperature=25°C)

| Item | Symbol | Min | Typ | Max | Unit | Test Conditions |
|----------------------|----------------|------|------|----------|-------|---|
| Optical output power | P_O | - | 10 | 12 | mW | Kink free |
| Threshold current | I_{th} | - | 35 | 47 | mA | |
| Operating current | I_{op} | - | 45 | 55 | mA | $P_O=10\text{mW}$ |
| Operating voltage | V_{op} | - | 2.2 | 2.5 | V | $P_O=10\text{mW}$ |
| Slope efficiency | η_s | - | 0.95 | - | mW/mA | |
| Lasing wavelength | λ_p | - | 637 | 645 | nm | $P_O=10\text{mW}$ |
| Circularity | ϕ | | - | 0.8:1.25 | ratio | $P_O=10\text{mW}$ |
| Beam divergence | θ | 6 | 8 | 12 | deg | $P_O=10\text{mW}$, FWHM |
| Off axis angle | $\Delta\theta$ | - | - | ± 3 | deg | |
| Monitor current | I_s | 0.05 | 0.15 | 0.3 | mA | $P_O=10\text{mW}$, $V_r(pd)=5\text{V}$ |

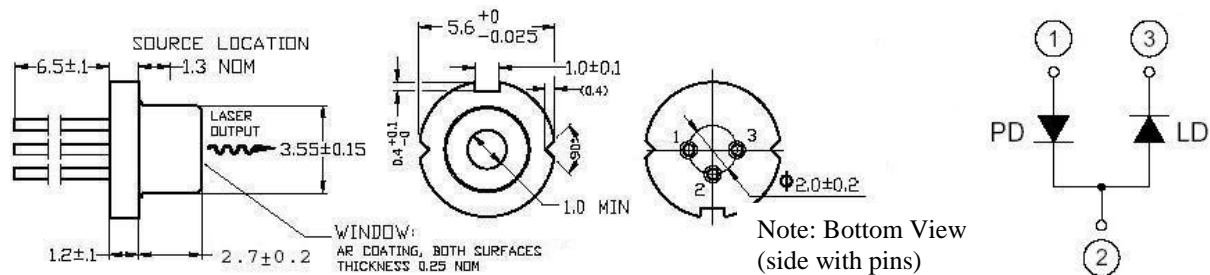
Specifications are subject to change without notice. Each purchased VPSL is provided with test data. Please refer to this data before using the VPSL.

Package Detail, Mechanical & Electrical – VPSL-635-010-x-5-A/B

A PINOUT PACKAGE



B PINOUT PACKAGE



Handling Care and Precautions for Use of VPSL Diodes

1. Absolute Maximum Ratings

Do not exceed, *even momentarily*, the maximum ratings (see page 1, table). When a VPSL diode is driven in excess of its maximum ratings, it can cause at minimum a considerable reduction in reliability, and potentially instantaneous failure.

- VPSL diodes may be damaged by surge currents generated at power on-off operation. Check on the transient characteristics of the power supply to make sure that such surges do not exceed the maximum ratings.
- The maximum ratings are specified for a case temperature of 25°C. Designs should be made to work well within this temperature range. As the case temperature goes up, power dissipation as well as maximum light output power is reduced.

2. Soldering Conditions

Maximum solder-tip temperature is 260°C and soldering time must be within 3.0 seconds. A minimum solder clearance of 1.6mm should be maintained from the root of the lead.

3. Prevention of Breakdown due to Static Electricity

VPSL diodes may be adversely affected by static electricity and surge currents and, consequently, cause breakdown of the diode and reduction of reliability unless the following precautions are taken:

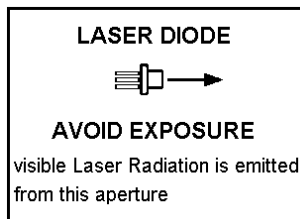
- a. Power supplies, installation and measuring equipment should be grounded. A noise filter or noise-cut transformer should be provided on any power supply inputs.
- b. Anyone working with a VPSL diode should be grounded through high resistance (500 K Ohm - 1M Ohm) by means of a ground strap and wrist band (for example).
- c. Soldering irons should be grounded to protect laser diodes from voltage leaks.
- d. During operation of the VPSL diode, working clothes, hats, and shoes should be static-protected. Cotton-based clothing is preferred.
- e. Any container for carriage and storage should be static-protected.
- f. Avoid using laser diodes in an environment where high frequency surge currents may be generated by an inductive electric field (such as a fluorescent lamp). These fields can also cause breakdown or deterioration of the laser diode.

4. Package Handling

- a. The laser diode package should not be cut off, reworked, or deformed. Do not hold the cap of the VPSL diode tightly, otherwise it may induce cracks or damage to the window glass.
- b. Do not touch the surface of the window glass. Any scratch or contamination may result in reduction of optical characteristics.
- c. Remove small contaminates on the surface softly using a cotton tip stick with a small amount of methyl alcohol.

5. Safety

The output light from laser diodes is harmful to a human body even if it is invisible. Avoid looking at the output light of a VPSL diode directly, or even indirectly through a lens during operation. Observance of operation should be through an infrared TV camera or related equipment. Refer to IEC 825-1 and 21 CFR 1040.10-1040.11 as a radiation safety standard for laser products.



Description

The VPSL-0635-010-x-9-B is a 0.63 μ m band, AlGaInP index-guided, multi-quantum well (MQW) laser diode with an integrated, internal, beam correcting optic. It is suitable as a light source for bar code readers, laser levelers and various other types of optical equipment. Hermetic sealing of the package assures high reliability.

Features

- Visible light output
- Built-in monitor photodiode
- Circular, diverging beam, NA approximately 0.11
- Diffraction limited wavefront
- Standard 9mm form factor

Absolute Maximum Ratings (T_C =case temperature=25°C) *

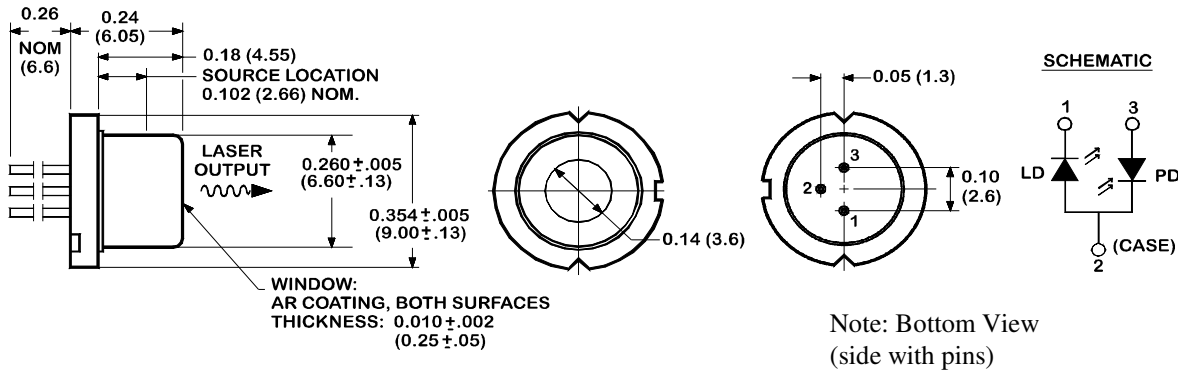
| Item | Symbol | Min | Max | Unit |
|-----------------------|------------|-----|-----|------|
| Optical output power | P_O | - | 10 | mW |
| LD reverse voltage | V_R (LD) | - | 2 | V |
| PD reverse voltage | V_R (PD) | - | 30 | V |
| Operating temperature | T_{opr} | -10 | +50 | °C |
| Storage temperature | T_{stg} | -40 | +85 | °C |

Optical and Electrical Characteristics (T_C =case temperature=25°C) *

| Item | Symbol | Min | Typ | Max | Unit | Test Conditions |
|----------------------|----------------|-----|-----|----------|-------|---------------------------|
| Optical output power | P_O | - | - | 10 | mW | Kink free |
| Threshold current | I_{th} | 20 | 50 | 75 | mA | |
| Operating current | I_{op} | - | 70 | 95 | mA | $P_O=10mW$ |
| Operating voltage | V_{op} | - | - | 2.7 | V | $P_O=10mW$ |
| Slope efficiency | η | 0.3 | 0.5 | 0.7 | mW/mA | |
| Lasing wavelength | λ_p | 625 | 638 | 640 | nm | $P_O=10mW$ |
| Circularity | ϕ | | - | 0.8:1.25 | ratio | $P_O=10mW$ |
| Beam divergence | θ | 5 | 8 | 11 | deg | $P_O=10mW$, FWHM |
| Off axis angle | $\Delta\theta$ | - | - | ± 3 | deg | |
| Monitor current | I_S | 0.2 | 0.4 | 0.8 | mA | $P_O=10mW$, $V_r(pd)=5V$ |

Specifications are subject to change without notice. Each purchased VPSL is provided with test data. Please refer to this data before using the VPSL.

Package Detail, Mechanical & Electrical – VPSL-0635-010-x-9-B



Handling Care and Precautions for Use of VPSL Diodes

1. Absolute Maximum Ratings

Do not exceed, *even momentarily*, the maximum ratings (see page 1, table). When a VPSL diode is driven in excess of its maximum ratings, it can cause at minimum a considerable reduction in reliability, and potentially instantaneous failure.

- a. VPSL diodes may be damaged by surge currents generated at power on-off operation. Check on the transient characteristics of the power supply to make sure that such surges do not exceed the maximum ratings.
- b. The maximum ratings are specified for a case temperature of 25°C. Designs should be made to work well within this temperature range. As the case temperature goes up, power dissipation as well as maximum light output power is reduced.

2. Soldering Conditions

Maximum solder-tip temperature is 260°C and soldering time must be within 3.0 seconds. A minimum solder clearance of 1.6mm should be maintained from the root of the lead.

3. Prevention of Breakdown due to Static Electricity

VPSL diodes may be adversely affected by static electricity and surge currents and, consequently, cause breakdown of the diode and reduction of reliability unless the following precautions are taken:

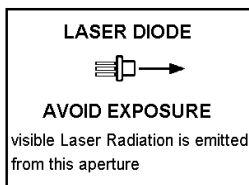
- a. Power supplies, installation and measuring equipment should be grounded. A noise filter or noise-cut transformer should be provided on any power supply inputs.
- b. Anyone working with a VPSL diode should be grounded through high resistance (500 K Ohm - 1M Ohm) by means of a ground strap and wrist band (for example).
- c. Soldering irons should be grounded to protect laser diodes from voltage leaks.
- d. During operation of the VPSL diode, working clothes, hats, and shoes should be static-protected. Cotton-based clothing is preferred.
- e. Any container for carriage and storage should be static-protected.
- f. Avoid using laser diodes in an environment where high frequency surge currents may be generated by an inductive electric field (such as a fluorescent lamp). These fields can also cause breakdown or deterioration of the laser diode.

4. Package Handling

- a. The laser diode package should not be cut off, reworked, or deformed. Do not hold the cap of the VPSL diode tightly, otherwise it may induce cracks or damage to the window glass.
- b. Do not touch the surface of the window glass. Any scratch or contamination may result in reduction of optical characteristics.
- c. Remove small contaminates on the surface softly using a cotton tip stick with a small amount of methyl alcohol.

5. Safety

The output light from laser diodes is harmful to a human body even if it is invisible. Avoid looking at the output light of a VPSL diode directly, or even indirectly through a lens during operation. Observance of operation should be through an infrared TV camera or related equipment. Refer to IEC 825-1 and 21 CFR 1040.10-1040.11 as a radiation safety standard for laser products.



Description

The VPSL-0635-015-x-9-B is a 0.63 μm band, AlGaInP index-guided, multi-quantum well (MQW) laser diode with an integrated, internal, beam correcting optic. It is suitable as a light source for laser levelers and optical equipment for measurement. Hermetic sealing of the package assures high reliability.

Features

- Visible light output
- 15mW CW optical power
- Built-in monitor photodiode
- Circular, diverging beam, NA approximately 0.11
- Diffraction limited wavefront
- Standard 9mm form factor

Absolute Maximum Ratings (T_C =case temperature=25°C)

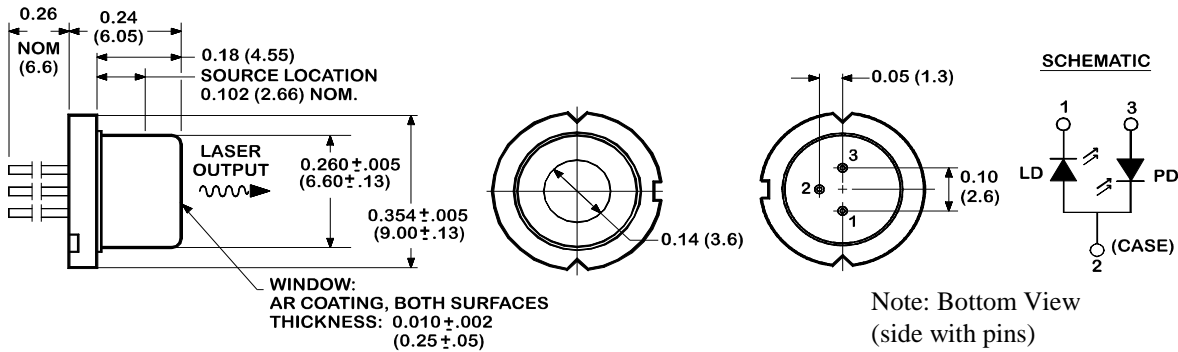
| Item | Symbol | Min | Max | Unit |
|-----------------------|------------|-----|-----|------|
| Optical output power | P_O | - | 15 | mW |
| LD reverse voltage | V_R (LD) | - | 2 | V |
| PD reverse voltage | V_R (PD) | - | 30 | V |
| Operating temperature | T_{opr} | -10 | +50 | °C |
| Storage temperature | T_{stg} | -40 | +85 | °C |

Optical and Electrical Characteristics (T_C =case temperature=25°C)

| Item | Symbol | Min | Typ | Max | Unit | Test Conditions |
|----------------------|----------------|-----|------|----------|-------|--|
| Optical output power | P_O | - | - | 15 | mW | Kink free |
| Threshold current | I_{th} | 20 | 55 | 75 | mA | |
| Operating current | I_{op} | - | 85 | 100 | mA | $P_O=15\text{mW}$ |
| Operating voltage | V_{op} | - | - | 2.7 | V | $P_O=15\text{mW}$ |
| Slope efficiency | η | 0.3 | - | 0.7 | mW/mA | $P_O=15\text{mW}$ |
| Lasing wavelength | λ_p | 630 | 638 | 640 | nm | $P_O=15\text{mW}$ |
| Circularity | ϕ | | - | 0.8:1.25 | Ratio | $P_O=15\text{mW}$ |
| Beam divergence | θ | 5 | 8 | 11 | Deg | $P_O=15\text{mW}$, FWHM |
| Off axis angle | $\Delta\theta$ | - | - | ± 3 | Deg | |
| Monitor current | I_S | 0.1 | 0.20 | 0.4 | mA | $P_O=15\text{mW}$, $V_r(\text{pd})=5\text{V}$ |

Specifications are subject to change without notice. Each purchased VPSL is provided with test data. Please refer to this data before using the VPSL.

Package Detail, Mechanical & Electrical – VPSL-0635-015-x-9-B



Handling Care and Precautions for Use of VPSL Diodes

1. Absolute Maximum Ratings

Do not exceed, *even momentarily*, the maximum ratings (see page 1, table). When a VPSL diode is driven in excess of its maximum ratings, it can cause at minimum a considerable reduction in reliability, and potentially instantaneous failure.

- a. VPSL diodes may be damaged by surge currents generated at power on-off operation. Check on the transient characteristics of the power supply to make sure that such surges do not exceed the maximum ratings.
- b. The maximum ratings are specified for a case temperature of 25°C. Designs should be made to work well within this temperature range. As the case temperature goes up, power dissipation as well as maximum light output power is reduced.

2. Soldering Conditions

Maximum solder-tip temperature is 260°C and soldering time must be within 3.0 seconds. A minimum solder clearance of 1.6mm should be maintained from the root of the lead.

3. Prevention of Breakdown due to Static Electricity

VPSL diodes may be adversely affected by static electricity and surge currents and, consequently, cause breakdown of the diode and reduction of reliability unless the following precautions are taken:

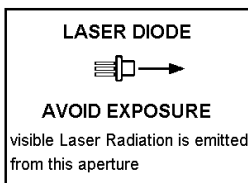
- a. Power supplies, installation and measuring equipment should be grounded. A noise filter or noise-cut transformer should be provided on any power supply inputs.
- b. Anyone working with a VPSL diode should be grounded through high resistance (500 K Ohm - 1M Ohm) by means of a ground strap and wrist band (for example).
- c. Soldering irons should be grounded to protect laser diodes from voltage leaks.
- d. During operation of the VPSL diode, working clothes, hats, and shoes should be static-protected. Cotton-based clothing is preferred.
- e. Any container for carriage and storage should be static-protected.
- f. Avoid using laser diodes in an environment where high frequency surge currents may be generated by an inductive electric field (such as a fluorescent lamp). These fields can also cause breakdown or deterioration of the laser diode.

4. Package Handling

- a. The laser diode package should not be cut off, reworked, or deformed. Do not hold the cap of the VPSL diode tightly, otherwise it may induce cracks or damage to the window glass.
- b. Do not touch the surface of the window glass. Any scratch or contamination may result in reduction of optical characteristics.
- c. Remove small contaminants on the surface softly using a cotton tip stick with a small amount of methyl alcohol.

5. Safety

The output light from laser diodes is harmful to a human body even if it is invisible. Avoid looking at the output light of a VPSL diode directly, or even indirectly through a lens during operation. Observance of operation should be through an infrared TV camera or related equipment. Refer to IEC 825-1 and 21 CFR 1040.10-1040.11 as a radiation safety standard for laser products.



Description

The VPSL-0639-035-x-5-B is a 0.63 μm band, AlGaInP index guided, laser diode with a multi-quantum well (MQW) structure. It is suitable as a light source for laser pointers and optical equipment for alignment. Combined with an integrated, internal, beam correcting optic and encased in a hermetic sealed package, this is a high-performance, highly reliable, and long life laser diode.

Features

- Built-in monitor photodiode
- Circular, diverging beam, NA approximately 0.11
- Diffraction limited wavefront
- 35mW CW optical power
- Standard 5.6 mm form factor

Absolute Maximum Ratings (T_C =case temperature=25°C)

| Item | Symbol | Min | Max | Unit |
|-----------------------|------------|-----|-----|------|
| Optical output power | P_O | - | 35 | mW |
| LD reverse voltage | V_R (LD) | - | 2 | V |
| PD reverse voltage | V_R (PD) | - | 30 | V |
| Operating temperature | T_{opr} | -10 | +50 | °C |
| Storage temperature | T_{stg} | -40 | +85 | °C |

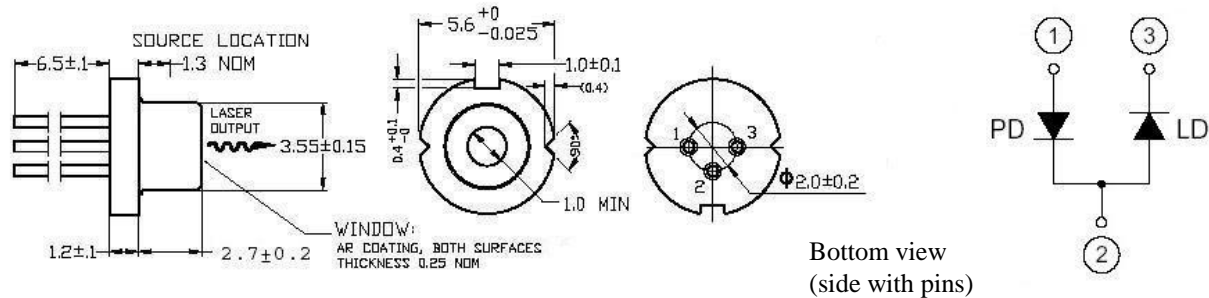
Optical and Electrical Characteristics (T_C =case temperature=25°C)

| Item | Symbol | Min | Typ | Max | Unit | Test Conditions |
|----------------------|----------------|------|------|----------|-------|--|
| Optical output power | P_O | - | - | 35 | mW | Kink free |
| Threshold current | I_{th} | 30 | 45 | 65 | mA | |
| Operating current | I_{op} | - | 95 | 130 | mA | $P_O=30\text{mW}$ |
| Operating voltage | V_{op} | - | 2.3 | 2.8 | V | $P_O=30\text{mW}$ |
| Slope efficiency | η_s | 0.4 | 0.6 | 0.9 | mW/mA | $18(\text{mW})/(I_{(24\text{mW})}-I_{(6\text{mW})})$ |
| Lasing wavelength | λ_p | 635 | 639 | 642 | nm | $P_O=30\text{mW}$ |
| Circularity | ϕ | | - | 0.8:1.25 | ratio | $P_O=30\text{mW}$ |
| Beam divergence | θ | 7 | 8.5 | 11 | deg | $P_O=30\text{mW}$, FWHM |
| Off axis angle | $\Delta\theta$ | - | - | ± 3 | deg | |
| Monitor current | I_s | 0.05 | 0.15 | 0.25 | mA | $P_O=30\text{mW}$, $V_{R(PD)}=5\text{V}$ |

Specifications are subject to change without notice. Each purchased VPSL is provided with test data. Please refer to this data before using the VPSL.

Package Detail, Mechanical & Electrical – VPSL-0639-035-x-5-B

B PINOUT PACKAGE



Handling Care and Precautions for Use of VPSL Diodes

1. Absolute Maximum Ratings

Do not exceed, *even momentarily*, the maximum ratings (see page 1, table). When a CircuLaser diode is driven in excess of its maximum ratings, it can cause at minimum a considerable reduction in reliability, and potentially instantaneous failure.

- CircuLaser diodes may be damaged by surge currents generated at power on-off operation. Check on the transient characteristics of the power supply to make sure that such surges do not exceed the maximum ratings.
- The maximum ratings are specified for a case temperature of 25°C. Designs should be made to work well within this temperature range. As the case temperature goes up, power dissipation as well as maximum light output power is reduced.

2. Soldering Conditions

Maximum solder-tip temperature is 260°C and soldering time must be within 3.0 seconds. A minimum solder clearance of 1.6mm should be maintained from the root of the lead.

3. Prevention of Breakdown due to Static Electricity

CircuLaser diodes may be adversely affected by static electricity and surge currents and, consequently, cause breakdown of the diode and reduction of reliability unless the following precautions are taken:

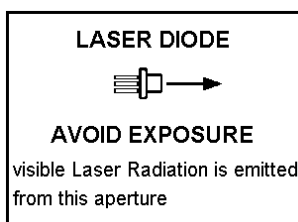
- Power supplies, installation and measuring equipment should be grounded. A noise filter or noise-cut transformer should be provided on any power supply inputs.
- Anyone working with a CircuLaser diode should be grounded through high resistance (500 K Ohm - 1M Ohm) by means of a ground strap and wrist band (for example).
- Soldering irons should be grounded to protect laser diodes from voltage leaks.
- During operation of the CircuLaser diode, working clothes, hats, and shoes should be static-protected. Cotton-based clothing is preferred.
- Any container for carriage and storage should be static-protected.
- Avoid using laser diodes in an environment where high frequency surge currents may be generated by an inductive electric field (such as a fluorescent lamp). These fields can also cause breakdown or deterioration of the laser diode.

4. Package Handling

- The laser diode package should not be cut off, reworked, or deformed. Do not hold the cap of the CircuLaser diode tightly, otherwise it may induce cracks or damage to the window glass.
- Do not touch the surface of the window glass. Any scratch or contamination may result in reduction of optical characteristics.
- Remove small contaminates on the surface softly using a cotton tip stick with a small amount of methyl alcohol.

5. Safety

The output light from laser diodes is harmful to a human body even if it is invisible. Avoid looking at the output light of a CircuLaser diode directly, or even indirectly through a lens during operation. Observance of operation should be through an infrared TV camera or related equipment. Refer to IEC 825-1 and 21 CFR 1040.10-1040.11 as a radiation safety standard for laser products.



Description

The VPSL-640-040-x-5-A/B is an 640nm laser diode, it is suitable as a visible light source for laser levelers, scanners, displays, and optical equipment for measurement. A diffraction- limited and circular wavefront is accomplished through the integration of our beam correcting optic that creates a Virtual Point Source. Hermetic sealing of the package assures high reliability.

Features

- Built-in monitor photodiode.
- Single Transverse mode
- 40mW optical power
- Standard 5.6mm form factor

Absolute Maximum Ratings (T_C =case temperature=25°C) *

| Item | Symbol | Rated Value | Unit |
|-----------------------|------------|-------------|------|
| Optical output power | P_O | 45 | mW |
| LD reverse voltage | V_R (LD) | 2 | V |
| PD reverse voltage | V_R (PD) | 30 | V |
| Operating Temperature | T_{opr} | -10 ~ +50 | °C |
| Storage Temperature | T_{stg} | -40 ~ +85 | °C |

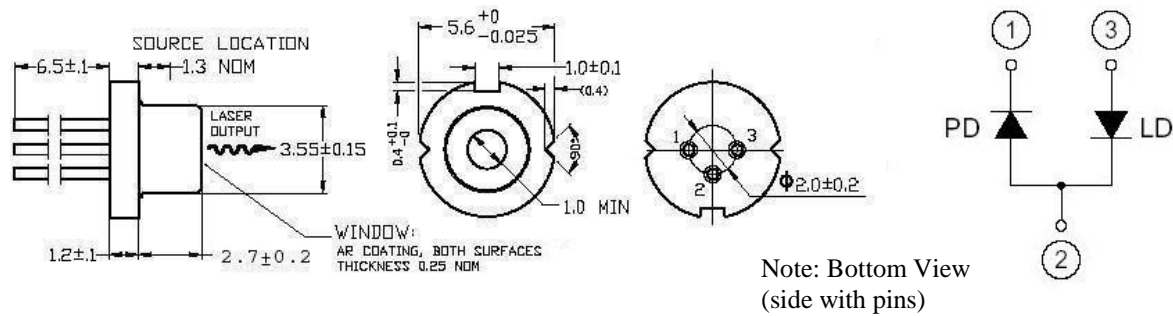
Optical and Electrical Characteristics (T_C =case temperature=25°C) *

| Item | Symbol | Min | Typ | Max | Unit | Test Conditions |
|----------------------|----------------|------|-----|----------|-------|------------------------------|
| Optical output power | P_O | - | 40 | 45 | mW | |
| Threshold current | I_{th} | - | 45 | 60 | mA | |
| Operating current | I_{op} | - | 90 | 110 | mA | $P_O=40mW$ |
| Operating voltage | V_{op} | - | 2.4 | 2.6 | V | $P_O=40mW$ |
| Lasing wavelength | λ_p | - | 640 | 643 | nm | $P_O=40mW$ |
| Circularity | ϕ | | - | 0.8:1.25 | ratio | $P_O=40mW @e^{-2}$ |
| Beam divergence | θ | 7 | 10 | 13 | deg | $P_O=40mW$, FWHM |
| Off axis angle | $\Delta\theta$ | - | - | ± 3 | deg | |
| Monitor current | I_S | 0.15 | 0.3 | 0.6 | mA | $P_O=40mW$, V_R (PD) = 5V |

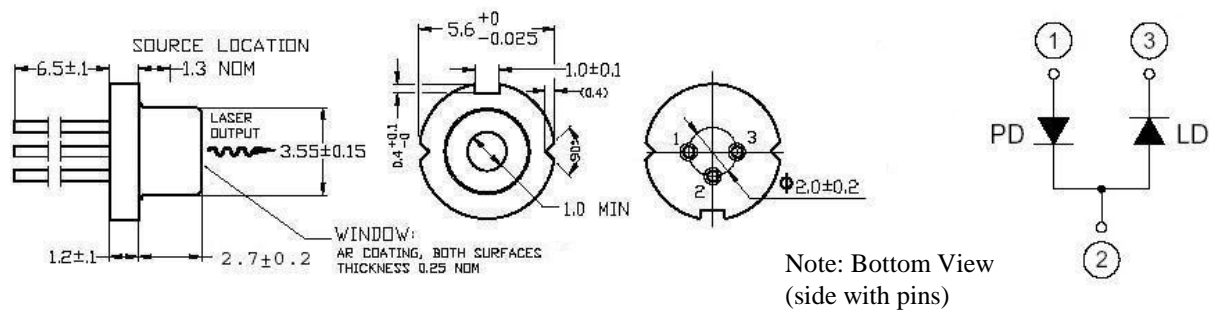
Specifications are subject to change without notice. Each purchased VPSL is provided with test data.

Package Detail, Mechanical & Electrical – VPSL-640-040-x-5-A/B

A PINOUT PACKAGE



B PINOUT PACKAGE



Handling Care and Precautions for Use of VPSL Diodes

1. Absolute Maximum Ratings

Do not exceed, *even momentarily*, the maximum ratings (see page 1, table). When a CircuLaser diode is driven in excess of its maximum ratings, it can cause at minimum a considerable reduction in reliability, and potentially instantaneous failure.

- a. CircuLaser diodes may be damaged by surge currents generated at power on-off operation. Check on the transient characteristics of the power supply to make sure that such surges do not exceed the maximum ratings.
- b. The maximum ratings are specified for a case temperature of 25°C. Designs should be made to work well within this temperature range. As the case temperature goes up, power dissipation as well as maximum light output power is reduced.

2. Soldering Conditions

Maximum solder-tip temperature is 260°C and soldering time must be within 3.0 seconds. A minimum solder clearance of 1.6mm should be maintained from the root of the lead.

3. Prevention of Breakdown due to Static Electricity

CircuLaser diodes may be adversely affected by static electricity and surge currents and, consequently, cause breakdown of the diode and reduction of reliability unless the following precautions are taken:

- a. Power supplies, installation and measuring equipment should be grounded. A noise filter or noise-cut transformer should be provided on any power supply inputs.
- b. Anyone working with a CircuLaser diode should be grounded through high resistance (500 K Ohm - 1M Ohm) by means of a ground strap

VPSL Laser Device

VPSL-640-040-x-5-A/B

and wrist band (for example).

c. Soldering irons should be grounded to protect laser diodes from voltage leaks.

d. During operation of the CircuLaser diode, working clothes, hats, and shoes should be static-protected. Cotton-based clothing is preferred.

e. Any container for carriage and storage should be static-protected.

f. Avoid using laser diodes in an environment where high frequency surge currents may be generated by an inductive electric field (such as a fluorescent lamp). These fields can also cause breakdown or deterioration of the laser diode.

4. Package Handling

a. The laser diode package should not be cut off, reworked, or deformed. Do not hold the cap of the CircuLaser diode tightly, otherwise it may induce cracks or damage to the window glass.

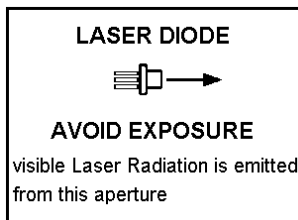
b. Do not touch the surface of the window glass. Any scratch or contamination may result in reduction of optical characteristics.

c. Remove small contaminates on the surface softly using a cotton tip stick with a small amount of methyl alcohol.

5. Safety

The output light from laser diodes is harmful to a human body even if it is invisible. Avoid looking at the output light of a CircuLaser diode directly, or even indirectly through a lens during operation. Observance of operation should be through an infrared TV camera or related equipment. Refer to IEC 825-1 and 21 CFR 1040.10-1040.11 as a radiation safety standard for laser products.

Blue Sky Research is an ISO 9001:2008 certified company



Description

The VPSL-642-080-x-5-A/B is an 642nm laser diode, it is suitable as a visible light source for laser levelers, scanners, displays, and optical equipment for measurement. A diffraction- limited and circular wavefront is accomplished through the integration of our beam correcting optic that creates a Virtual Point Source. Hermetic sealing of the package assures high reliability.

Features

- Built-in monitor photodiode.
- Single longitudinal mode
- 80mW optical power
- Standard 5.6mm form factor

Absolute Maximum Ratings (T_C =case temperature=25°C) *

| Item | Symbol | Rated Value | Unit |
|-----------------------|------------|-------------|------|
| Optical output power | P_O | 90 | mW |
| LD reverse voltage | V_R (LD) | 2 | V |
| PD reverse voltage | V_R (PD) | 30 | V |
| Operating Temperature | T_{opr} | -10 ~ +40 | °C |
| Storage Temperature | T_{stg} | -40 ~ +85 | °C |

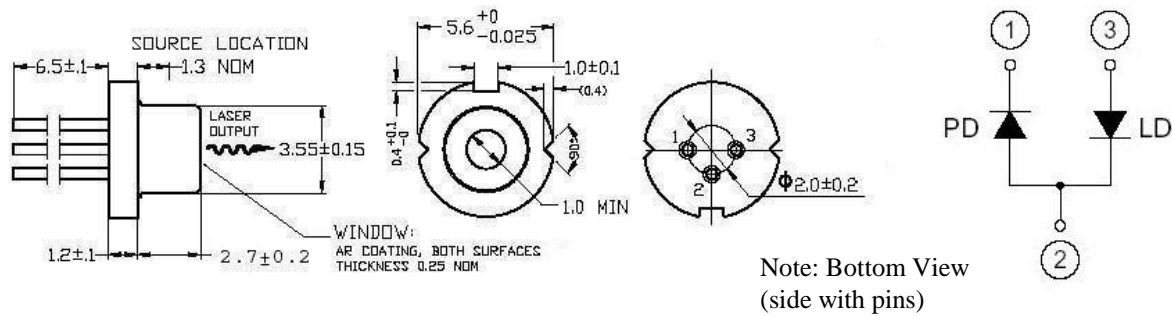
Optical and Electrical Characteristics (T_C =case temperature=25°C) *

| Item | Symbol | Min | Typ | Max | Unit | Test Conditions |
|----------------------|----------------|-----|-----|----------|-------|--------------------|
| Optical output power | P_O | - | 80 | 90 | mW | |
| Threshold current | I_{th} | - | 80 | 95 | mA | |
| Operating current | I_{op} | - | 175 | 200 | mA | $P_O=80mW$ |
| Operating voltage | V_{op} | - | 2.7 | - | V | $P_O=80mW$ |
| Lasing wavelength | λ_p | - | 643 | 645 | nm | $P_O=80mW$ |
| Circularity | ϕ | | - | 0.8:1.25 | ratio | $P_O=80mW @e^{-2}$ |
| Beam divergence | θ | 7 | 10 | 13 | deg | |
| Off axis angle | $\Delta\theta$ | - | - | ± 3 | deg | |
| Monitor current | I_s | - | 0.5 | - | mA | $P_O=80mW$ |

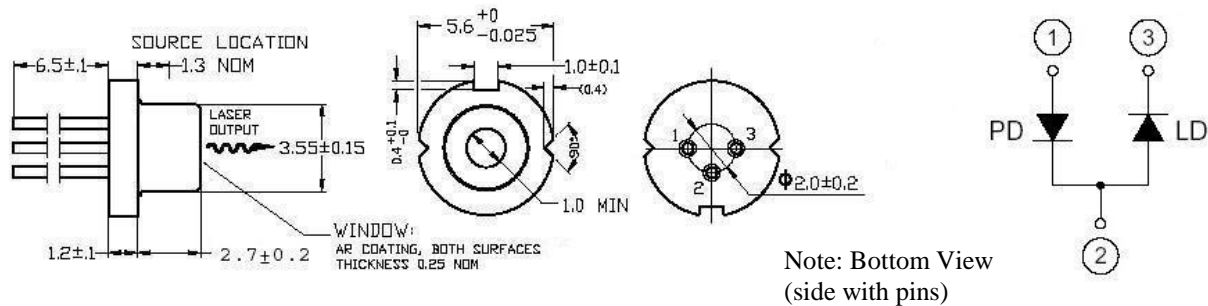
Specifications are subject to change without notice. Each purchased VPSL is provided with test data.

Package Detail, Mechanical & Electrical – VPSL-642-080-x-5-A/B

A PINOUT PACKAGE



B PINOUT PACKAGE



Handling Care and Precautions for Use of CircuLaser Diodes

1. Absolute Maximum Ratings

Do not exceed, *even momentarily*, the maximum ratings (see page 1, table). When a CircuLaser diode is driven in excess of its maximum ratings, it can cause at minimum a considerable reduction in reliability, and potentially instantaneous failure.

- CircuLaser diodes may be damaged by surge currents generated at power on-off operation. Check on the transient characteristics of the power supply to make sure that such surges do not exceed the maximum ratings.
- The maximum ratings are specified for a case temperature of 25°C. Designs should be made to work well within this temperature range. As the case temperature goes up, power dissipation as well as maximum light output power is reduced.

2. Soldering Conditions

Maximum solder-tip temperature is 260°C and soldering time must be within 3.0 seconds. A minimum solder clearance of 1.6mm should be maintained from the root of the lead.

3. Prevention of Breakdown due to Static Electricity

CircuLaser diodes may be adversely affected by static electricity and surge currents and, consequently, cause breakdown of the diode and reduction of reliability unless the following precautions are taken:

- Power supplies, installation and measuring equipment should be grounded. A noise filter or noise-cut transformer should be provided on any power supply inputs.
- Anyone working with a CircuLaser diode should be grounded through high resistance (500 K Ohm - 1M Ohm) by means of a ground strap and wrist band (for example).
- Soldering irons should be grounded to protect laser diodes from voltage leaks.
- During operation of the CircuLaser diode, working clothes, hats, and shoes should be static-protected. Cotton-based clothing is preferred.

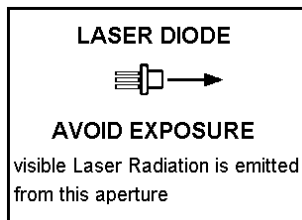
- e. Any container for carriage and storage should be static-protected.
- f. Avoid using laser diodes in an environment where high frequency surge currents may be generated by an inductive electric field (such as a fluorescent lamp). These fields can also cause breakdown or deterioration of the laser diode.

4. Package Handling

- a. The laser diode package should not be cut off, reworked, or deformed. Do not hold the cap of the CircuLaser diode tightly, otherwise it may induce cracks or damage to the window glass.
- b. Do not touch the surface of the window glass. Any scratch or contamination may result in reduction of optical characteristics.
- c. Remove small contaminates on the surface softly using a cotton tip stick with a small amount of methyl alcohol.

5. Safety

The output light from laser diodes is harmful to a human body even if it is invisible. Avoid looking at the output light of a CircuLaser diode directly, or even indirectly through a lens during operation. Observance of operation should be through an infrared TV camera or related equipment. Refer to IEC 825-1 and 21 CFR 1040.10-1040.11 as a radiation safety standard for laser products.



Description

The VPSL-0650-007-X-5-B is a 0.60 μm band, AlGaInP index guided, visible laser diode. Applications include; laser pointers, bar code readers, and DVD players. Combined with an integrated, internal, beam correcting optic and encased in a hermetic sealed package, this is a high-performance, highly reliable, and long life laser diode. It is available with one pin-out configuration.

Features

- Integrated monitor photodiode
- 650nm visible light @ 7mW w/Diffraction limited wavefront
- 7mW CW optical power
- Extended operating temperature range, -10 to +70 °C
- Standard 5.6 mm form factor

Absolute Maximum Ratings (T_C =case temperature=25°C) *

| Item | Symbol | Min | Max | Unit |
|---------------------------|---------------|-----|-----|------|
| Optical output power (CW) | P_O | - | 10 | mW |
| LD reverse voltage | V_R (LD) | - | 2 | V |
| PD reverse voltage | V_{RD} (PD) | | 30 | V |
| Forward Current (PD) | I_{FD} | | 10 | mA |
| Operating temperature | T_{opr} | -10 | +70 | °C |
| Storage temperature | T_{stg} | -40 | +85 | °C |

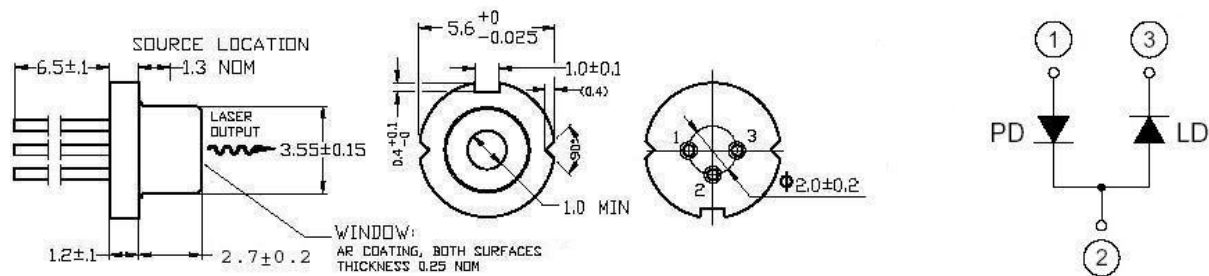
Optical and Electrical Characteristics (T_C =case temperature=25°C)

| Item | Symbol | Min | Typ | Max | Unit | Test Conditions |
|----------------------|-------------|-----|------|----------|-------|---|
| Optical output power | P_O | - | 7 | 10 | mW | Kink free |
| Threshold current | I_{th} | - | 20 | 25 | mA | |
| Operating current | I_{op} | - | 27 | 35 | mA | $P_O=7\text{mW}$ |
| Operating voltage | V_{op} | - | 2.2 | 2.5 | V | $P_O=7\text{mW}$ |
| Lasing wavelength | λ_p | 645 | 650 | 660 | nm | $P_O=7\text{mW}$ |
| Monitor Current. | I_m | 0.1 | 0.15 | 0.3 | mA | $P_O=7\text{mW}$, $V_{RD} = 5\text{V}$ |
| Circularity | ϕ | | - | 0.8:1.25 | ratio | $P_O=7\text{mW}$ |
| Beam divergence | θ | 6 | 9 | 12 | deg | $P_O=7\text{mW}$, FWHM |

* Specifications are subject to change without notice. Each purchased VPSL is provided with test data. Please refer to this data before using the VPSL.

Package Detail, Mechanical & Electrical – VPSL-0650-007-X-5-B

B PINOUT PACKAGE



Note: Bottom View
(side with pins)

Handling Care and Precautions for Use of VPSL Diodes

1. Absolute Maximum Ratings

Do not exceed, *even momentarily*, the maximum ratings (see page 1, table). When a VPSL diode is driven in excess of its maximum ratings, it can cause at minimum a considerable reduction in reliability, and potentially instantaneous failure.

- VPSL diodes may be damaged by surge currents generated at power on-off operation. Check on the transient characteristics of the power supply to make sure that such surges do not exceed the maximum ratings.
- The maximum ratings are specified for a case temperature of 25°C. Designs should be made to work well within this temperature range. As the case temperature goes up, power dissipation as well as maximum light output power is reduced.

2. Soldering Conditions

Maximum solder-tip temperature is 260°C and soldering time must be within 3.0 seconds. A minimum solder clearance of 1.6mm should be maintained from the root of the lead.

3. Prevention of Breakdown due to Static Electricity

VPSL diodes may be adversely affected by static electricity and surge currents and, consequently, cause breakdown of the diode and reduction of reliability unless the following precautions are taken:

- Power supplies, installation and measuring equipment should be grounded. A noise filter or noise-cut transformer should be provided on any power supply inputs.
- Anyone working with a VPSL diode should be grounded through high resistance (500 K Ohm - 1M Ohm) by means of a ground strap and wrist band (for example).
- Soldering irons should be grounded to protect laser diodes from voltage leaks.
- During operation of the VPSL diode, working clothes, hats, and shoes should be static-protected. Cotton-based clothing is preferred.
- Any container for carriage and storage should be static-protected.
- Avoid using laser diodes in an environment where high frequency surge currents may be generated by an inductive electric field (such as a fluorescent lamp). These fields can also cause breakdown or deterioration of the laser diode.

4. Package Handling

- The laser diode package should not be cut off, reworked, or deformed. Do not hold the cap of the VPSL diode tightly, otherwise it may induce cracks or damage to the window glass.
- Do not touch the surface of the window glass. Any scratch or contamination may result in reduction of optical characteristics.
- Remove small contaminants on the surface softly using a cotton tip stick with a small amount of methyl alcohol.

5. Safety

The output light from laser diodes is harmful to a human body even if it is invisible. Avoid looking at the output light of a VPSL diode directly, or even indirectly through a lens during operation. Observance of operation should be through an infrared TV camera or related equipment. Refer to IEC 60825-1, IEC 60601-2-22:2007 and 21 CFR 1040.10-1040.11 as a radiation safety standard for laser products.

Description

The VPSL-0658-035-x-5-A is a 0.65 μm band, AlGaInP index guided, laser diode with a multi-quantum well (MQW) structure. It is suitable as a light source for large capacity optical disc memories, such as DVD-RAM, and various other types of optical equipment. Combined with an integrated, internal, beam correcting optic and encased in a hermetic sealed package, this is a high-performance, highly reliable, and long life laser diode.

Features

- Built-in monitor photodiode
- Circular, diverging beam, NA approximately 0.11 at $1/e^2$ point
- Diffraction limited wavefront
- 35mW CW optical power, 50mW pulsed (50% duty, pulse < 1 μs)
- Standard 5.6 mm form factor

Absolute Maximum Ratings (T_C =case temperature=25°C) *

| Item | Symbol | Min | Max | Unit |
|-----------------------|------------|-----|-----|------|
| Optical output power | P_O | - | 35 | mW |
| LD reverse voltage | V_R (LD) | - | 2 | V |
| PD reverse voltage | V_R (PD) | - | 30 | V |
| Operating temperature | T_{opr} | -10 | +60 | °C |
| Storage temperature | T_{stg} | -40 | +85 | °C |

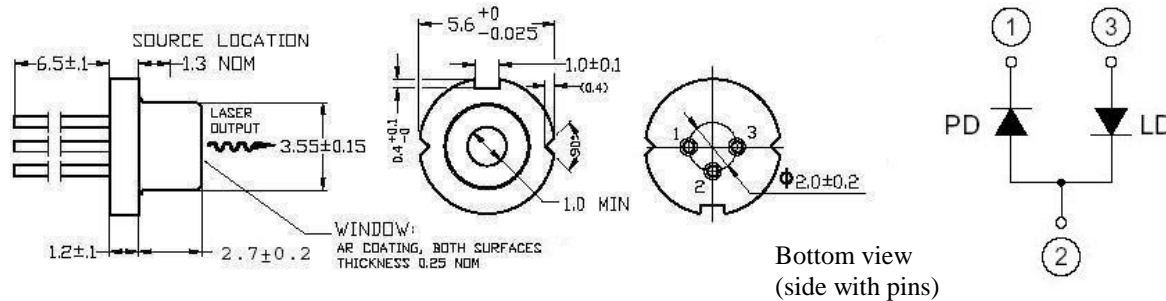
Optical and Electrical Characteristics (T_C =case temperature=25°C) *

| Item | Symbol | Min | Typ | Max | Unit | Test Conditions |
|----------------------|----------------|------|------|----------|-------|--|
| Threshold current | I_{th} | 30 | 45 | 70 | mA | |
| Operating current | I_{op} | - | 80 | 120 | mA | $P_O=30\text{mW}$ |
| Operating voltage | V_{op} | 2.1 | 2.6 | 3.0 | V | $P_O=30\text{mW}$ |
| Optical output power | P_O | - | 30 | 35 | mW | Kink free |
| Slope efficiency | DP_O/dI_{op} | 0.5 | 0.75 | 1.0 | mW/mA | $P_O=30\text{mW}$ |
| Lasing wavelength | λ_p | 645 | 658 | 665 | nm | $P_O=30\text{mW}$ |
| Circularity | ϕ | | - | 0.8:1.25 | ratio | $P_O=30\text{mW}$ |
| Beam divergence | θ | 7 | 8.5 | 10.5 | deg | $P_O=30\text{mW}$, FWHM |
| Off axis angle | $\Delta\theta$ | - | - | ± 3 | deg | |
| Monitor current | I_S | 0.05 | 0.3 | 1.5 | mA | $P_O=30\text{mW}$, $V_r(\text{pd})=5\text{V}$ |

Specifications are subject to change without notice. Each purchased VPSL is provided with test data.

Package Detail, Mechanical & Electrical – VPSL-0658-035-x-5-A

A PINOUT PACKAGE



Handling Care and Precautions for Use of VPSL Diodes

1. Absolute Maximum Ratings

Do not exceed, *even momentarily*, the maximum ratings (see page 1, table). When a CircuLaser diode is driven in excess of its maximum ratings, it can cause at minimum a considerable reduction in reliability, and potentially instantaneous failure.

- CircuLaser diodes may be damaged by surge currents generated at power on-off operation. Check on the transient characteristics of the power supply to make sure that such surges do not exceed the maximum ratings.
- The maximum ratings are specified for a case temperature of 25°C. Designs should be made to work well within this temperature range. As the case temperature goes up, power dissipation as well as maximum light output power is reduced.

2. Soldering Conditions

Maximum solder-tip temperature is 260°C and soldering time must be within 3.0 seconds. A minimum solder clearance of 1.6mm should be maintained from the root of the lead.

3. Prevention of Breakdown due to Static Electricity

CircuLaser diodes may be adversely affected by static electricity and surge currents and, consequently, cause breakdown of the diode and reduction of reliability unless the following precautions are taken:

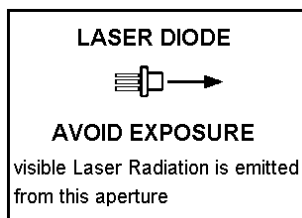
- Power supplies, installation and measuring equipment should be grounded. A noise filter or noise-cut transformer should be provided on any power supply inputs.
- Anyone working with a CircuLaser diode should be grounded through high resistance (500 K Ohm - 1M Ohm) by means of a ground strap and wrist band (for example).
- Soldering irons should be grounded to protect laser diodes from voltage leaks.
- During operation of the CircuLaser diode, working clothes, hats, and shoes should be static-protected. Cotton-based clothing is preferred.
- Any container for carriage and storage should be static-protected.
- Avoid using laser diodes in an environment where high frequency surge currents may be generated by an inductive electric field (such as a fluorescent lamp). These fields can also cause breakdown or deterioration of the laser diode.

4. Package Handling

- The laser diode package should not be cut off, reworked, or deformed. Do not hold the cap of the CircuLaser diode tightly, otherwise it may induce cracks or damage to the window glass.
- Do not touch the surface of the window glass. Any scratch or contamination may result in reduction of optical characteristics.
- Remove small contaminates on the surface softly using a cotton tip stick with a small amount of methyl alcohol.

5. Safety

The output light from laser diodes is harmful to a human body even if it is invisible. Avoid looking at the output light of a CircuLaser diode directly, or even indirectly through a lens during operation. Observance of operation should be through an infrared TV camera or related equipment. Refer to IEC 60825-1 and 21 CFR 1040.10-1040.11 as a radiation safety standard for laser products.



Description

The VPSL-0658-050-x-5-G is a 0.65 μm band, AlGaAlP laser diode with a quantum well structure. It is suitable as a light source for large capacity optical disc memories, such as DVD-RAM, and various other types of optical equipment. Combined with an integrated, internal, beam correcting optic and encased in a hermetic sealed package, this is a high-performance, highly reliable, and long life laser diode.

Features

- Diffraction limited wavefront
- 50mW CW optical power, 50mW pulsed (50% duty, pulse < 1 μs)
- Standard 5.6 mm (TO-18) form factor

Absolute Maximum Ratings (T_C =case temperature=25°C)

| Item | Symbol | Min | Max | Unit |
|-----------------------|------------|-----|-----|------|
| Optical output power | P_O | - | 60 | mW |
| LD reverse voltage | V_R (LD) | - | 2 | V |
| PD reverse voltage | V_R (PD) | - | 30 | V |
| Operating temperature | T_{opr} | -10 | +75 | °C |
| Storage temperature | T_{stg} | -40 | +85 | °C |

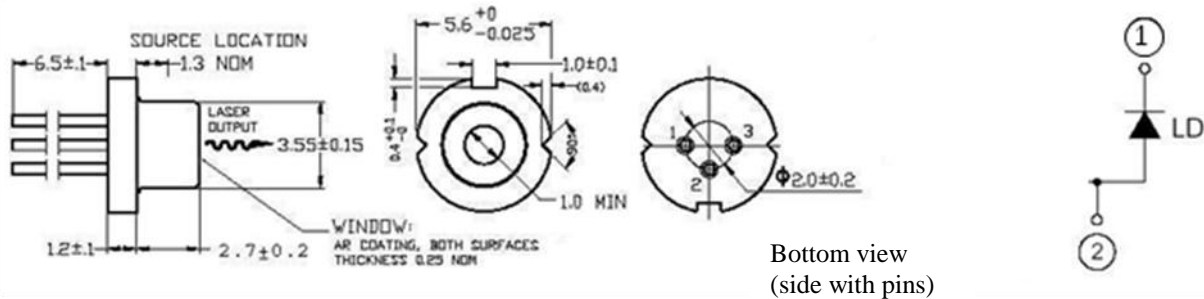
Optical and Electrical Characteristics (T_C =case temperature=25°C)

| Item | Symbol | Min | Typ | Max | Unit | Test Conditions |
|----------------------|----------------|-----|-----|----------|-------|--------------------------|
| Threshold current | I_{th} | 30 | 45 | 60 | mA | |
| Operating current | I_{op} | - | 90 | 120 | mA | $P_O=30\text{mW}$ |
| Operating voltage | V_{op} | - | 2.6 | 3.0 | V | $P_O=30\text{mW}$ |
| Optical output power | P_O | - | 50 | 60 | mW | Kink free |
| Slope efficiency | DP_O/dI_{op} | - | 1.0 | - | mW/mA | $P_O=30\text{mW}$ |
| Lasing wavelength | λ_p | 653 | 660 | 667 | nm | $P_O=30\text{mW}$ |
| Circularity | ϕ | | - | 0.8:1.25 | ratio | $P_O=30\text{mW}$ |
| Beam divergence | θ | 6 | 9 | 12 | deg | $P_O=30\text{mW}$, FWHM |
| Off axis angle | $\Delta\theta$ | - | - | ± 3 | deg | |

Specifications are subject to change without notice. Each purchased VPSL is provided with test data.

Package Detail, Mechanical & Electrical – VPSL-0658-050-x-5-G

G PINOUT PACKAGE



Handling Care and Precautions for Use of VPSL Diodes

1. Absolute Maximum Ratings

Do not exceed, *even momentarily*, the maximum ratings (see page 1, table). When a CircuLaser diode is driven in excess of its maximum ratings, it can cause at minimum a considerable reduction in reliability, and potentially instantaneous failure.

- CircuLaser diodes may be damaged by surge currents generated at power on-off operation. Check on the transient characteristics of the power supply to make sure that such surges do not exceed the maximum ratings.
- The maximum ratings are specified for a case temperature of 25°C. Designs should be made to work well within this temperature range. As the case temperature goes up, power dissipation as well as maximum light output power is reduced.

2. Soldering Conditions

Maximum solder-tip temperature is 260°C and soldering time must be within 3.0 seconds. A minimum solder clearance of 1.6mm should be maintained from the root of the lead.

3. Prevention of Breakdown due to Static Electricity

CircuLaser diodes may be adversely affected by static electricity and surge currents and, consequently, cause breakdown of the diode and reduction of reliability unless the following precautions are taken:

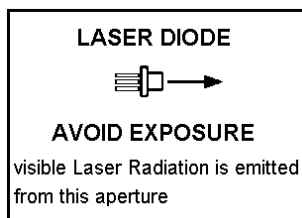
- Power supplies, installation and measuring equipment should be grounded. A noise filter or noise-cut transformer should be provided on any power supply inputs.
- Anyone working with a CircuLaser diode should be grounded through high resistance (500 K Ohm - 1M Ohm) by means of a ground strap and wrist band (for example).
- Soldering irons should be grounded to protect laser diodes from voltage leaks.
- During operation of the CircuLaser diode, working clothes, hats, and shoes should be static-protected. Cotton-based clothing is preferred.
- Any container for carriage and storage should be static-protected.
- Avoid using laser diodes in an environment where high frequency surge currents may be generated by an inductive electric field (such as a fluorescent lamp). These fields can also cause breakdown or deterioration of the laser diode.

4. Package Handling

- The laser diode package should not be cut off, reworked, or deformed. Do not hold the cap of the CircuLaser diode tightly, otherwise it may induce cracks or damage to the window glass.
- Do not touch the surface of the window glass. Any scratch or contamination may result in reduction of optical characteristics.
- Remove small contaminates on the surface softly using a cotton tip stick with a small amount of methyl alcohol.

5. Safety

The output light from laser diodes is harmful to a human body even if it is invisible. Avoid looking at the output light of a CircuLaser diode directly, or even indirectly through a lens during operation. Observance of operation should be through an infrared TV camera or related equipment. Refer to IEC 60825-1 and 21 CFR 1040.10-1040.11 as a radiation safety standard for laser products.



Description

The VPSL-0658-120-x-5-A is a 0.66 μm band, AlGaInP index guided, laser diode. It is suitable as a light source for large capacity optical disc memories, such as DVD-RAM, LIDAR, and various other types of optical equipment. Combined with an integrated, internal, beam correcting optic and encased in a hermetic sealed package, this is a high-performance, highly reliable, and long life laser diode.

Features

- Single Transverse Mode laser
- Circular, diverging beam, NA approximately 0.11
- Diffraction limited wavefront
- 120mW CW optical power
- Standard 5.6 mm form factor

Absolute Maximum Ratings (T_C =case temperature= 25°C)

| Item | Symbol | Min | Max | Unit |
|-----------------------|------------|-----|-----|------------------|
| Optical output power | P_O | - | 130 | mW CW |
| LD reverse voltage | V_R (LD) | - | 2 | V |
| PD reverse voltage | V_R (PD) | - | 30 | V |
| Operating temperature | T_{opr} | -10 | +60 | $^\circ\text{C}$ |
| Storage temperature | T_{stg} | -40 | +85 | $^\circ\text{C}$ |

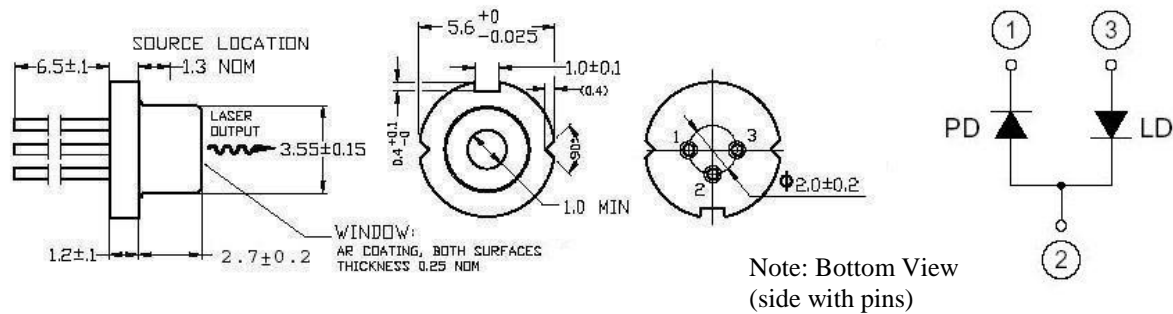
Optical and Electrical Characteristics (T_C =case temperature= 25°C)

| Item | Symbol | Min | Typ | Max | Unit | Test Conditions |
|----------------------|-------------|-----|-----|----------|-------|---------------------------|
| Optical output power | P_O | - | 120 | 130 | mW | Kink free |
| Threshold current | I_{th} | - | 60 | 75 | mA | |
| Operating current | I_{op} | - | 175 | 210 | mA | $P_O=120\text{mW}$ |
| Operating voltage | V_{op} | - | 2.5 | 3.3 | V | $P_O=120\text{mW}$ |
| Lasing wavelength | λ_p | 652 | 660 | 665 | nm | $P_O=120\text{mW}$ |
| Circularity | ϕ | | - | 0.8:1.25 | ratio | $P_O=120\text{mW}$ |
| Beam divergence | θ | 7 | 10 | 13 | deg | $P_O=120\text{mW}$, FWHM |

Specifications are subject to change without notice. Each purchased VPSL is provided with test data. Please refer to this data before using the VPSL.

VPSL - Package Detail, Mechanical & Electrical – VPSL-0658-120-x-5-A

A Pinout



Handling Care and Precautions for Use of VPSL Diodes

1. Absolute Maximum Ratings

Do not exceed, *even momentarily*, the maximum ratings (see page 1, table). When a VPSL diode is driven in excess of its maximum ratings, it can cause at minimum a considerable reduction in reliability, and potentially instantaneous failure.

- VPSL diodes may be damaged by surge currents generated at power on-off operation. Check on the transient characteristics of the power supply to make sure that such surges do not exceed the maximum ratings.
- The maximum ratings are specified for a case temperature of 25°C. Designs should be made to work well within this temperature range. As the case temperature goes up, power dissipation as well as maximum light output power is reduced.

2. Soldering Conditions

Maximum solder-tip temperature is 260°C and soldering time must be within 3.0 seconds. A minimum solder clearance of 1.6mm should be maintained from the root of the lead.

3. Prevention of Breakdown due to Static Electricity

VPSL diodes may be adversely affected by static electricity and surge currents and, consequently, cause breakdown of the diode and reduction of reliability unless the following precautions are taken:

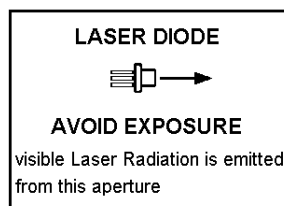
- Power supplies, installation and measuring equipment should be grounded. A noise filter or noise-cut transformer should be provided on any power supply inputs.
- Anyone working with a VPSL diode should be grounded through high resistance (500 K Ohm - 1M Ohm) by means of a ground strap and wrist band (for example).
- Soldering irons should be grounded to protect laser diodes from voltage leaks.
- During operation of the VPSL diode, working clothes, hats, and shoes should be static-protected. Cotton-based clothing is preferred.
- Any container for carriage and storage should be static-protected.
- Avoid using laser diodes in an environment where high frequency surge currents may be generated by an inductive electric field (such as a fluorescent lamp). These fields can also cause breakdown or deterioration of the laser diode.

4. Package Handling

- The laser diode package should not be cut off, reworked, or deformed. Do not hold the cap of the VPSL diode tightly, otherwise it may induce cracks or damage to the window glass.
- Do not touch the surface of the window glass. Any scratch or contamination may result in reduction of optical characteristics.
- Remove small contaminates on the surface softly using a cotton tip stick with a small amount of methyl alcohol.

5. Safety

The output light from laser diodes is harmful to a human body even if it is invisible. Avoid looking at the output light of a VPSL diode directly, or even indirectly through a lens during operation. Observance of operation should be through an infrared TV camera or related equipment. Refer to IEC 825-1 and 21 CFR 1040.10-1040.11 as a radiation safety standard for laser products.



Description

The VPSL-0670-005-x-5-B is a 670nm InGaAlP Index-guided laser diode with an integrated beam correcting optic inside the standard package. It is suitable as light sources for barcode readers, levelers, laser printers, and various other types of optical equipment. Hermetic sealing of the package assures high reliability.

Features

- Visible light output.
- Built-in monitor photodiode.
- Circular, diverging beam, NA approximately 0.12
- Diffraction limited wavefront, aberration equal or better than $\lambda/4$ peak to valley
- 5mW CW optical power
- Standard 5.6mm form factor

Absolute Maximum Ratings (T_C =case temperature=25°C) *

| Item | Symbol | Min | Max | Unit |
|-----------------------|------------|-----|-----|------|
| Optical output power | P_O | - | 7 | mW |
| LD reverse voltage | V_R (LD) | - | 2 | V |
| PD reverse voltage | V_R (PD) | - | 30 | V |
| Operating temperature | T_{opr} | -10 | +70 | °C |
| Storage temperature | T_{stg} | -40 | +85 | °C |

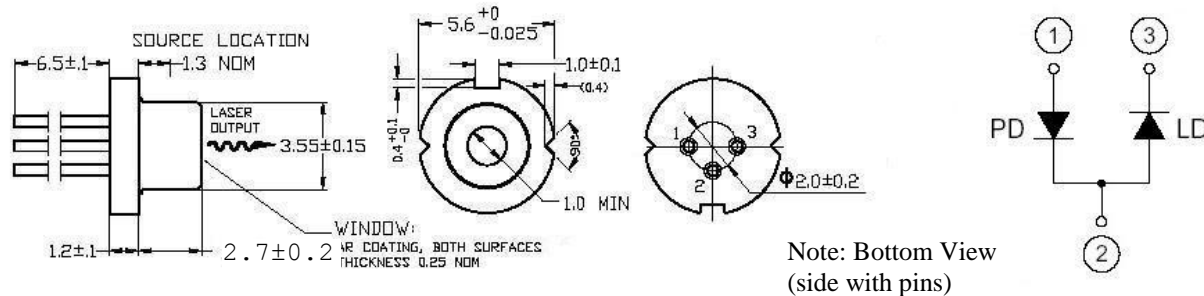
Optical and Electrical Characteristics (T_C =case temperature=25°C) *

| Item | Symbol | Min | Typ | Max | Unit | Test Conditions |
|----------------------|----------------|-----|-----|----------|-------|------------------|
| Optical output power | P_O | - | 5 | 7 | mW | Kink free |
| Threshold current | I_{th} | - | 20 | 40 | mA | |
| Operating current | I_{op} | - | 30 | 45 | mA | $P_O=5mW$ |
| Operating voltage | V_{op} | - | 2.3 | 2.6 | V | $P_O=5mW$ |
| Lasing wavelength | λ_p | 660 | 670 | 680 | nm | $P_O=5mW$ |
| Circularity | ϕ | | - | 0.8:1.25 | Ratio | $P_O=5mW$ |
| Beam divergence | θ | 7 | 9 | 11 | Deg | $P_O=5mW$, FWHM |
| Off axis angle | $\Delta\theta$ | - | - | ± 3 | Deg | |
| Monitor current | I_S | 0.1 | 0.2 | 0.5 | mA | $P_O=5mW$ |

Specifications are subject to change without notice. Each purchased VPSL is provided with test data. Please refer to this data before using the VPSL. The LD is to be operated in APC mode

Package Detail, Mechanical & Electrical – VPSL-670-005-x-5-B

B PINOUT PACKAGE



Handling Care and Precautions for Use of VPSL Diodes

1. Absolute Maximum Ratings

Do not exceed, *even momentarily*, the maximum ratings (see page 1, table). When a VPSL diode is driven in excess of its maximum ratings, it can cause at minimum a considerable reduction in reliability, and potentially instantaneous failure.

- VPSL diodes may be damaged by surge currents generated at power on-off operation. Check on the transient characteristics of the power supply to make sure that such surges do not exceed the maximum ratings.
- The maximum ratings are specified for a case temperature of 25°C. Designs should be made to work well within this temperature range. As the case temperature goes up, power dissipation as well as maximum light output power is reduced.

2. Soldering Conditions

Maximum solder-tip temperature is 260°C and soldering time must be within 3.0 seconds. A minimum solder clearance of 1.6mm should be maintained from the root of the lead.

3. Prevention of Breakdown due to Static Electricity

VPSL diodes may be adversely affected by static electricity and surge currents and, consequently, cause breakdown of the diode and reduction of reliability unless the following precautions are taken:

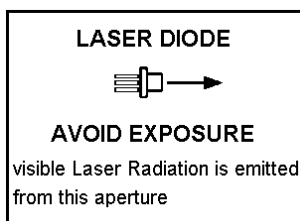
- Power supplies, installation and measuring equipment should be grounded. A noise filter or noise-cut transformer should be provided on any power supply inputs.
- Anyone working with a VPSL diode should be grounded through high resistance (500 K Ohm - 1M Ohm) by means of a ground strap and wrist band (for example).
- Soldering irons should be grounded to protect laser diodes from voltage leaks.
- During operation of the VPSL diode, working clothes, hats, and shoes should be static-protected. Cotton-based clothing is preferred.
- Any container for carriage and storage should be static-protected.
- Avoid using laser diodes in an environment where high frequency surge currents may be generated by an inductive electric field (such as a fluorescent lamp). These fields can also cause breakdown or deterioration of the laser diode.

4. Package Handling

- The laser diode package should not be cut off, reworked, or deformed. Do not hold the cap of the VPSL diode tightly, otherwise it may induce cracks or damage to the window glass.
- Do not touch the surface of the window glass. Any scratch or contamination may result in reduction of optical characteristics.
- Remove small contaminates on the surface softly using a cotton tip stick with a small amount of methyl alcohol.

5. Safety

The output light from laser diodes is harmful to a human body even if it is invisible. Avoid looking at the output light of a VPSL diode directly, or even indirectly through a lens during operation. Observance of operation should be through an infrared TV camera or related equipment. Refer to IEC 825-1 and 21 CFR 1040.10-1040.11 as a radiation safety standard for laser products.



Description

The VPSL-0670-010-X-5-A/B/E is a 0.67 μm band, InGaAlP, circularized, laser diode with a multi-quantum well (MQW) structure. It is suitable as a light source for imaging, projection, large capacity optical disc memories, such as DVD-RAM, and various other types of optical equipment. Combined with an integrated, internal, beam correcting optic and encased in a hermetic sealed package, this is a high-performance, highly reliable, and long life laser diode available in 3 different pinouts (A, B or E).

Features

- Circular, diverging beam, NA approximately 0.11
- Diffraction limited wavefront
- 10mW CW optical power
- Standard 5.6 mm form factor

Absolute Maximum Ratings (T_C =case temperature=25°C)

| Item | Symbol | Min | Max | Unit |
|---------------------------|------------|-----|-----|------|
| Optical output power (CW) | P_O | - | 12 | mW |
| LD reverse voltage | V_R (LD) | - | 2 | V |
| PD Reverse Voltage | V_R (PD) | | 30 | V |
| Operating temperature | T_{opr} | -10 | +70 | °C |
| Storage temperature | T_{stg} | -40 | +85 | °C |

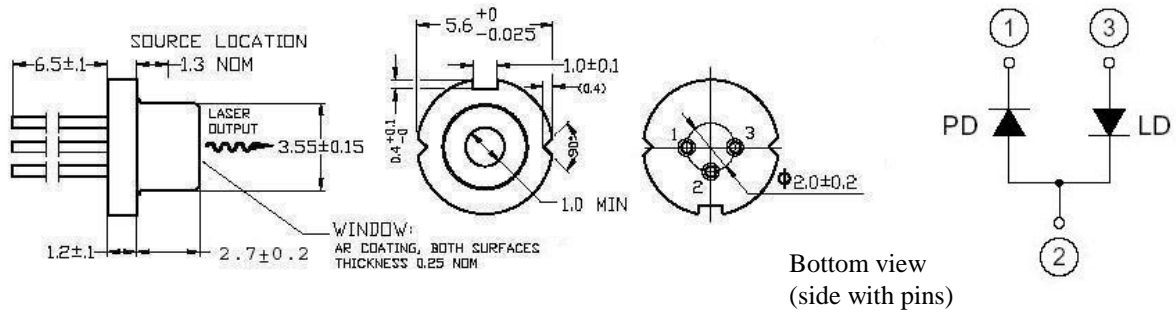
Optical and Electrical Characteristics (T_C =case temperature=25°C)

| Item | Symbol | Min | Typ | Max | Unit | Test Conditions |
|----------------------|-------------|-----|-----|----------|-------|-------------------|
| Optical output power | P_O | - | 10 | - | mW | Kink free |
| Threshold current | I_{th} | | 20 | 40 | mA | |
| Operating current | I_{op} | - | 40 | 80 | mA | $P_O=10mW$ |
| Operating voltage | V_{op} | - | 2.3 | 2.6 | V | $P_O=10mW$ |
| Lasing wavelength | λ_p | 660 | 670 | 680 | nm | $P_O=10mW$ |
| Monitor Current | I_m | 0.1 | 0.2 | 0.5 | mA | $P_O=10mW$ |
| Circularity | ϕ | | - | 0.8:1.25 | ratio | $P_O=10mW$ |
| Beam divergence | θ | 7 | 9 | 11 | deg | $P_O=10mW$, FWHM |

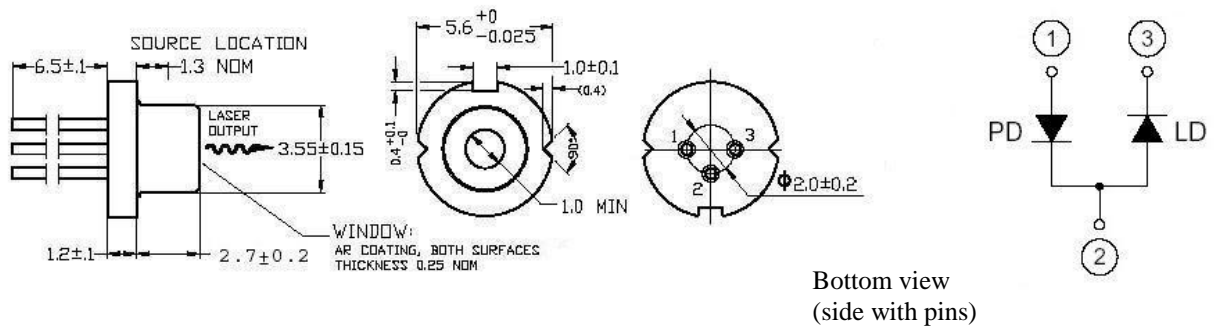
Specifications are subject to change without notice. VPSL-0670-010-X-5-A/B/E to be operated in APC mode.

Package Detail, Mechanical & Electrical – VPSL-0670-010-x-5-A/B/E

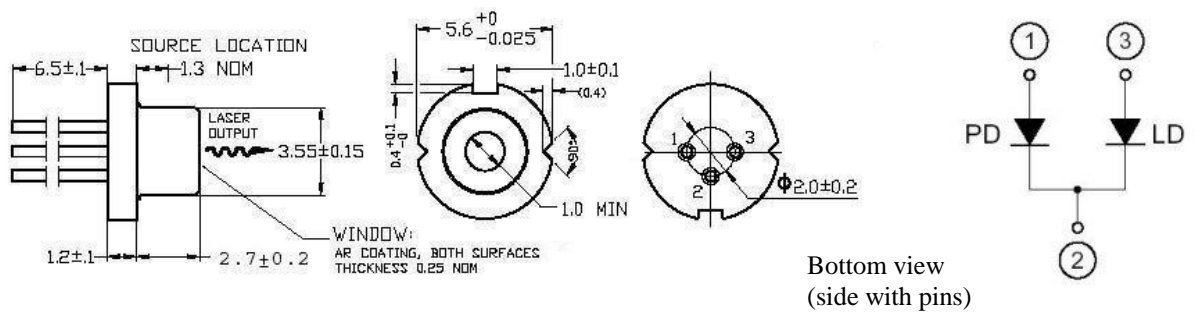
A PINOUT PACKAGE



B PINOUT PACKAGE



E PINOUT PACKAGE



Handling Care and Precautions for Use of VPSL Diodes

1. Absolute Maximum Ratings

Do not exceed, *even momentarily*, the maximum ratings (see page 1, table). When a VPSL diode is driven in excess of its maximum ratings, it can cause at minimum a considerable reduction in reliability, and potentially instantaneous failure.

- VPSL diodes may be damaged by surge currents generated at power on-off operation. Check on the transient characteristics of the power supply to make sure that such surges do not exceed the maximum ratings.
- The maximum ratings are specified for a case temperature of 25°C. Designs should be made to work well within this temperature range. As the case temperature goes up, power dissipation as well as maximum light output power is reduced.

2. Soldering Conditions

Maximum solder-tip temperature is 260°C and soldering time must be within 3.0 seconds. A minimum solder clearance of 1.6mm should be maintained from the root of the lead.

3. Prevention of Breakdown due to Static Electricity

VPSL diodes may be adversely affected by static electricity and surge currents and, consequently, cause breakdown of the diode and reduction of reliability unless the following precautions are taken:

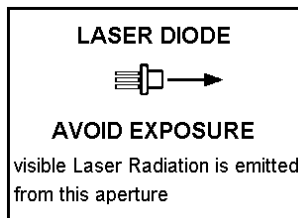
- Power supplies, installation and measuring equipment should be grounded. A noise filter or noise-cut transformer should be provided on any power supply inputs.
- Anyone working with a VPSL diode should be grounded through high resistance (500 K Ohm - 1M Ohm) by means of a ground strap and wrist band (for example).
- Soldering irons should be grounded to protect laser diodes from voltage leaks.
- During operation of the VPSL diode, working clothes, hats, and shoes should be static-protected. Cotton-based clothing is preferred.
- Any container for carriage and storage should be static-protected.
- Avoid using laser diodes in an environment where high frequency surge currents may be generated by an inductive electric field (such as a fluorescent lamp). These fields can also cause breakdown or deterioration of the laser diode.

4. Package Handling

- The laser diode package should not be cut off, reworked, or deformed. Do not hold the cap of the VPSL diode tightly, otherwise it may induce cracks or damage to the window glass.
- Do not touch the surface of the window glass. Any scratch or contamination may result in reduction of optical characteristics.
- Remove small contaminates on the surface softly using a cotton tip stick with a small amount of methyl alcohol.

5. Safety

The output light from laser diodes is harmful to a human body even if it is invisible. Avoid looking at the output light of a VPSL diode directly, or even indirectly through a lens during operation. Observance of operation should be through an infrared TV camera or related equipment. Refer to IEC 825-1 and 21 CFR 1040.10-1040.11 as a radiation safety standard for laser products.



Description

The VPSL-0670-010-X-9-B is a 0.67 μm band, InGaAlP, circularized, laser diode with a multi-quantum well (MQW) structure. It is suitable as a light source for imaging, projection, large capacity optical disc memories, such as DVD-RAM, and various other types of optical equipment. Combined with an integrated, internal, beam correcting optic and encased in a hermetic sealed package, this is a high-performance, highly reliable, and long life laser diode available in 3 different pinouts (A, B or E).

Features

- Circular, diverging beam, NA approximately 0.11
- Diffraction limited wavefront
- 10mW CW optical power
- Standard 9 mm form factor
- Integrated monitor photodiode

Absolute Maximum Ratings (T_C =case temperature=25°C)

| Item | Symbol | Min | Max | Unit |
|---------------------------|------------|-----|-----|------|
| Optical output power (CW) | P_O | - | 10 | mW |
| LD reverse voltage | V_R (LD) | - | 2 | V |
| PD Reverse Voltage | V_R (PD) | | 30 | V |
| Operating temperature | T_{opr} | -10 | +50 | °C |
| Storage temperature | T_{stg} | -40 | +85 | °C |

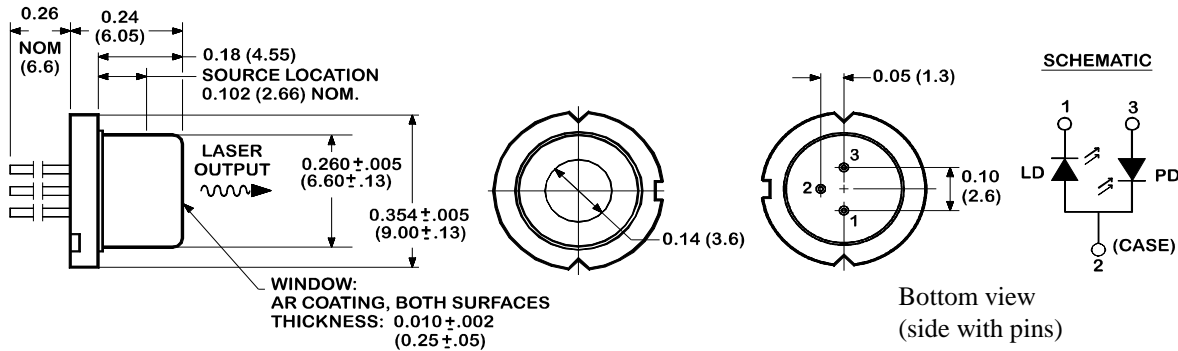
Optical and Electrical Characteristics (T_C =case temperature=25°C)

| Item | Symbol | Min | Typ | Max | Unit | Test Conditions |
|----------------------|-------------|-----|-----|----------|-------|-------------------|
| Optical output power | P_O | - | 10 | - | mW | Kink free |
| Threshold current | I_{th} | 30 | 35 | 40 | mA | |
| Operating current | I_{op} | - | 40 | 80 | mA | $P_O=10mW$ |
| Operating voltage | V_{op} | - | - | 2.7 | V | $P_O=10mW$ |
| Lasing wavelength | λ_p | 660 | 670 | 680 | nm | $P_O=10mW$ |
| Monitor Current | I_m | 0.3 | 0.5 | 0.8 | mA | $P_O=10mW$ |
| Circularity | ϕ | | - | 0.8:1.25 | ratio | $P_O=10mW$ |
| Beam divergence | θ | 5 | 8 | 11 | deg | $P_O=10mW$, FWHM |

Specifications are subject to change without notice. Each purchased VPSL is provided with test data. Please refer to this data before using the VPSL.

Package Detail, Mechanical & Electrical – VPSL-0670-010-x-9-B

B PINOUT PACKAGE



Handling Care and Precautions for Use of VPSL Diodes

1. Absolute Maximum Ratings

Do not exceed, *even momentarily*, the maximum ratings (see page 1, table). When a VPSL diode is driven in excess of its maximum ratings, it can cause at minimum a considerable reduction in reliability, and potentially instantaneous failure.

- VPSL diodes may be damaged by surge currents generated at power on-off operation. Check on the transient characteristics of the power supply to make sure that such surges do not exceed the maximum ratings.
- The maximum ratings are specified for a case temperature of 25°C. Designs should be made to work well within this temperature range. As the case temperature goes up, power dissipation as well as maximum light output power is reduced.

2. Soldering Conditions

Maximum solder-tip temperature is 260°C and soldering time must be within 3.0 seconds. A minimum solder clearance of 1.6mm should be maintained from the root of the lead.

3. Prevention of Breakdown due to Static Electricity

VPSL diodes may be adversely affected by static electricity and surge currents and, consequently, cause breakdown of the diode and reduction of reliability unless the following precautions are taken:

- Power supplies, installation and measuring equipment should be grounded. A noise filter or noise-cut transformer should be provided on any power supply inputs.
- Anyone working with a VPSL diode should be grounded through high resistance (500 K Ohm - 1M Ohm) by means of a ground strap and wrist band (for example).
- Soldering irons should be grounded to protect laser diodes from voltage leaks.
- During operation of the VPSL diode, working clothes, hats, and shoes should be static-protected. Cotton-based clothing is preferred.
- Any container for carriage and storage should be static-protected.
- Avoid using laser diodes in an environment where high frequency surge currents may be generated by an inductive electric field (such as a fluorescent lamp). These fields can also cause breakdown or deterioration of the laser diode.

4. Package Handling

- The laser diode package should not be cut off, reworked, or deformed. Do not hold the cap of the VPSL diode tightly, otherwise it may induce cracks or damage to the window glass.
- Do not touch the surface of the window glass. Any scratch or contamination may result in reduction of optical characteristics.
- Remove small contaminates on the surface softly using a cotton tip stick with a small amount of methyl alcohol.

5. Safety

The output light from laser diodes is harmful to a human body even if it is invisible. Avoid looking at the output light of a VPSL diode directly, or even indirectly through a lens during operation. Observance of operation should be through an infrared TV camera or related equipment. Refer to IEC 825-1 and 21 CFR 1040.10-1040.11 as a radiation safety standard for laser products.

