HELIOWORKS

"Out Shines All Others"

STEADY STATE **IR** SOURCE

Model EK-8520

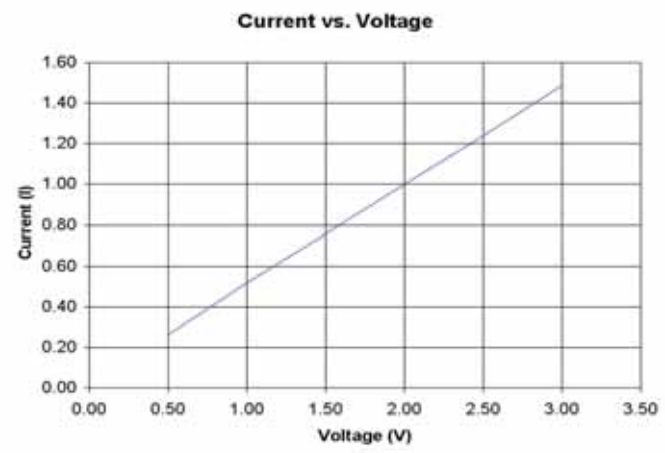
Helioworks, Inc. offers a unique steady state black body infrared emitter in an industry standard TO-8 package that operates at up to 950˚ Centigrade. It has no window and therefore emits the full un-attenuated blackbody spectrum.

Key features include:

- Kanthal filament with emissivity, ε = 0.7
- No window
- Internal gold plated parabolic reflector
- Standard TO-8 package

Electrical Specifications:

Peak Voltage = 3.0 Volts DC MAXIMUM
Peak Current = 1.48 Amps
Peak Power = 4.4 Watts

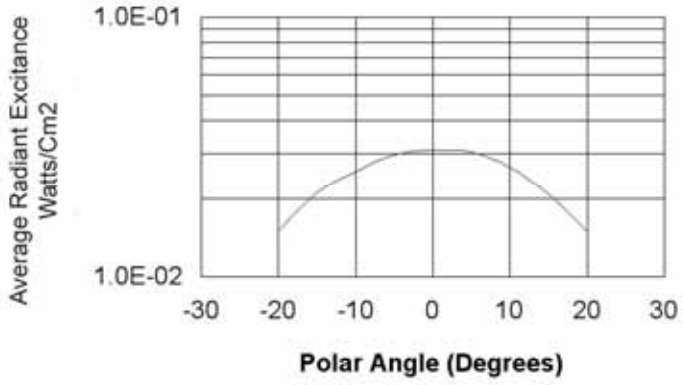


V	I	W=VI	R=V/I
0.50	0.26	0.13	1.90
1.00	0.52	0.52	1.92
1.50	0.76	1.14	1.97
2.00	1.00	2.00	2.00
2.50	1.24	3.10	2.02
2.80	1.39	3.89	2.01
3.00	1.49	4.47	2.01

Approximate 950° C

Average Radiant Excitance (Watts/Cm2):

Volts = 3.0, Distance = 3.0 inches from source



Polar Angle	Average Radiant Excitance (Watts/Cm2)
-20	2.00E-02
-15	2.45E-02
-10	2.75E-02
-5	2.98E-02
0	3.10E-02
5	3.10E-02
10	2.98E-02
15	2.70E-02
20	2.25E-02

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HELIOWORKS

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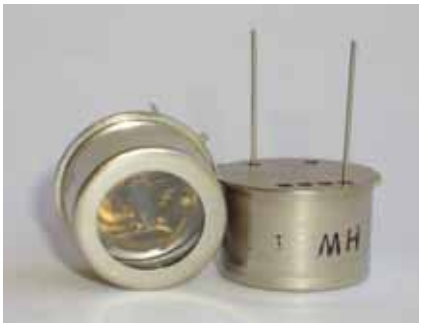
STEADY STATE **IR** SOURCE

Model EK-8521

Helioworks, Inc. offers a unique steady state black body infrared emitter in an industry standard TO-8 package that operates at up to 950˚ Centigrade. A Sapphire window provides spectral transmission to over 5 microns.

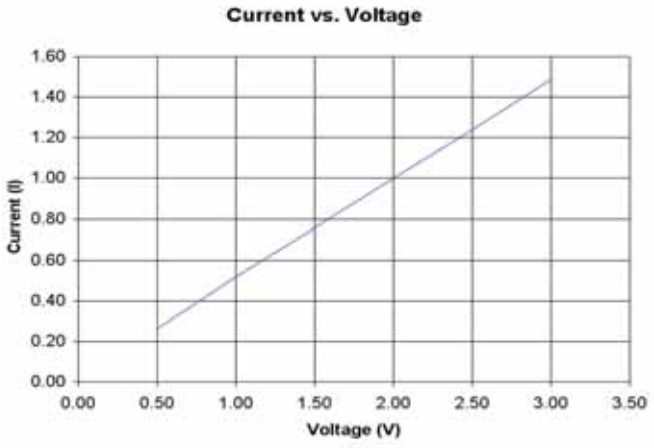


Key Features include:

- Kanthal filament with emissivity, ε = 0.7
- Sapphire window
- Internal gold plated parabolic reflector
- Standard TO-8 package
- Inert gas backfill

Electrical Specifications:

Peak Voltage = 3.0 Volts DC MAXIMUM
Peak Current 1.48 Amps
Peak Power = 4.4 Watts

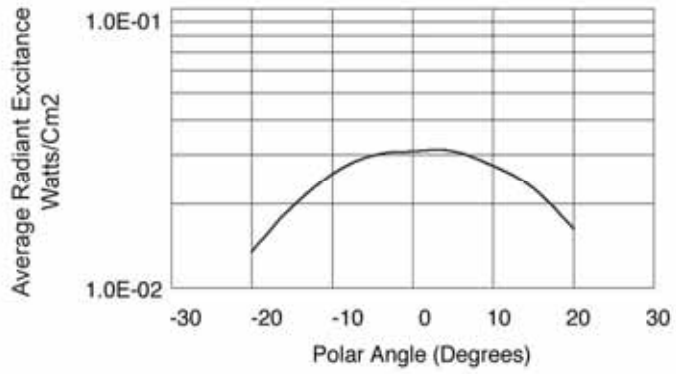


V	I	W=VI	R=V/I
0.50	0.26	0.13	1.90
1.00	0.52	0.52	1.92
1.50	0.76	1.14	1.97
2.00	1.00	2.00	2.00
2.50	1.24	3.10	2.02
2.80	1.39	3.89	2.01
3.00	1.49	4.47	2.01

Approximate 950° C

Average Radiant Excitance (Watts/Cm2):

Volts = 3.0, Distance = 3.0 inches from source



Polar Angle	Average Radiant Excitance (Watts/Cm2)
-20	1.35E-02
-15	1.95E-02
-10	2.58E-02
-5	2.98E-02
0	3.10E-02
5	3.09E-02
10	2.75E-02
15	2.28E-02
20	1.63E-02

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HELIOWORKS

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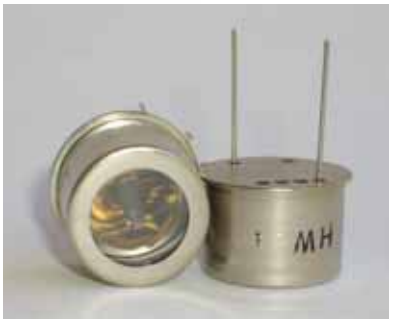
STEADY STATE **IR** SOURCE

Model EK-8522

Helioworks offers a unique steady state black body infrared emitter that operates at up to 950˚ Centigrade in an industry standard TO-8 package. The window is Calcium Fluoride (CaF2) which transmits IR radiation to over 9 µm.

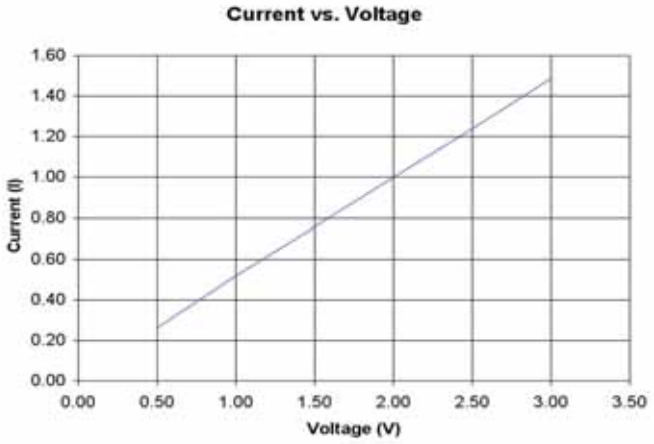


Key features include:

- Kanthal filament with emissivity, ε = 0.7
- Calcium Flouride window
- Internal gold plated parabolic reflector
- Standard TO-8 package
- Inert gas backfill

Electrical Specifications:

Peak Voltage = 3.0 Volts DC MAXIMUM
Peak Current 1.48 Amps
Peak Power = 4.4 Watts

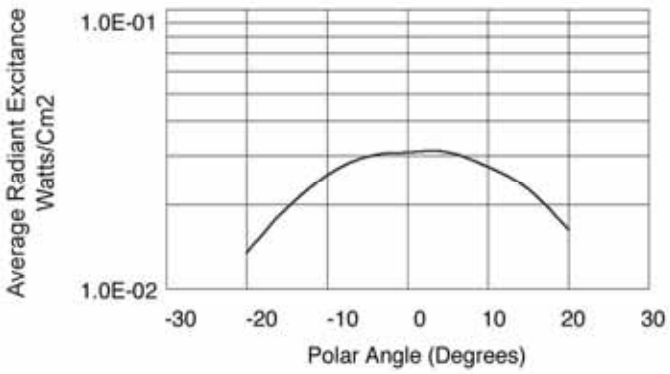


V	I	W=VI	R=V/I
0.50	0.26	0.13	1.90
1.00	0.52	0.52	1.92
1.50	0.76	1.14	1.97
2.00	1.00	2.00	2.00
2.50	1.24	3.10	2.02
2.80	1.39	3.89	2.01
3.00	1.49	4.47	2.01

Approximate 950° C

Average Radiant Excitance (Watts/CM2):

Volts = 3.0, Distance = 3.0 inches from source



Polar Angle	Average Radiant Excitance (Watts/Cm2)
-20	1.35E-02
-15	1.95E-02
-10	2.58E-02
-5	2.98E-02
0	3.10E-02
5	3.09E-02
10	2.75E-02
15	2.28E-02
20	1.63E-02

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HELIOWORKS

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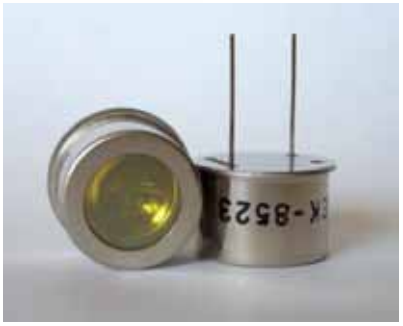
STEADY STATE **IR** SOURCE

Model EK-8523

Helioworks offers a unique steady state black body infrared emitter that operates at up to 950˚ Centigrade in an industry standard TO-8 package. The window is Zinc Selenide (ZnSe) which transmits IR radiation from visual to over 12 µm.

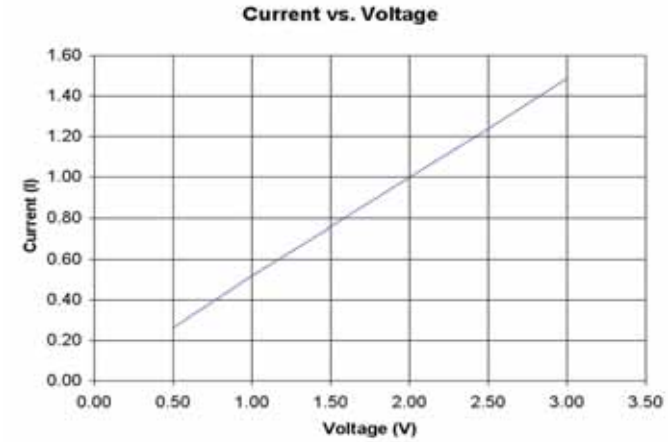


Key features include:

- Kanthal filament with emissivity, ε =0.7
- Zinc Selenide (ZnSe) window
- Internal gold plated parabolic reflector
- Standard TO-8 package
- Inert gas backfill

Electrical Specifications:

Peak Voltage = 3.0 Volts DC MAXIMUM
Peak Current = 1.48 Amps
Peak Power = 4.4 Watts

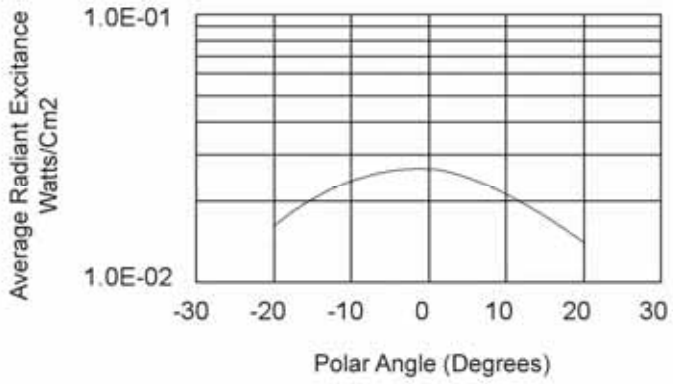


V	I	W=VI	R=V/I
0.50	0.26	0.13	1.90
1.00	0.52	0.52	1.92
1.50	0.76	1.14	1.97
2.00	1.00	2.00	2.00
2.50	1.24	3.10	2.02
2.80	1.39	3.89	2.01
3.00	1.49	4.47	2.01

Approximate 950° C

Average Radiant Excitance (Watts/CM2):

Volts = 3.0, Distance = 3.0 inches from source



Polar Angle	Average Radiant Excitance (Watts/CM2)
-20	1.60E-02
-15	2.00E-02
-10	2.37E-02
-5	2.60E-02
0	2.65E-02
5	2.45E-02
10	2.10E-02
15	1.75E-02
20	1.40E-02

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HELIOWORKS

"Out Shines All Others"

PULSABLE **IR** SOURCE

Model EP-3872*

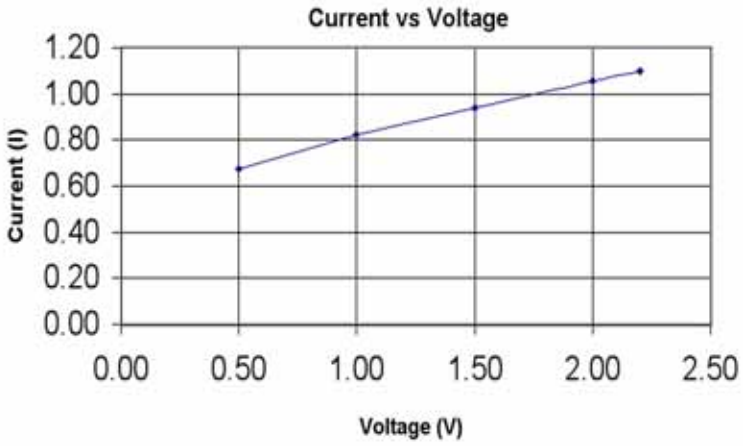
Helioworks offers a unique steady state infrared emitter with a tungsten filament. It can operate in pulsed or steady state mode at temperatures in excess of 1900º K in an industry standard TO-8 package. The window is Sapphire which transmits IR radiation to over 5 µm.

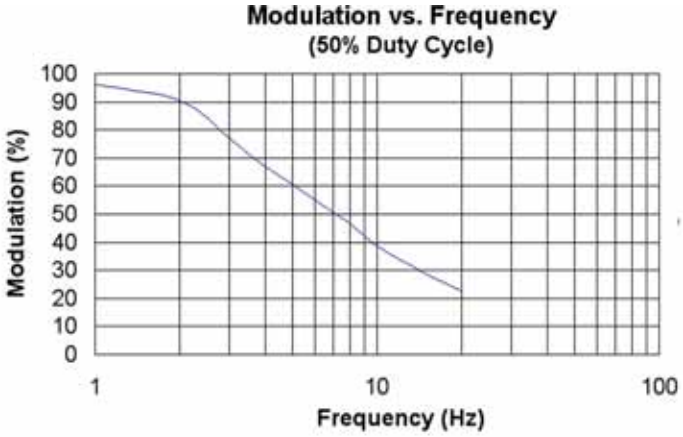
Key features include:

- Tungsten filament
- Can be operated in pulsed or steady state mode
- Internal gold plated parabolic reflector
- Sapphire window
- Standard TO-8 package

Electrical Specifications:

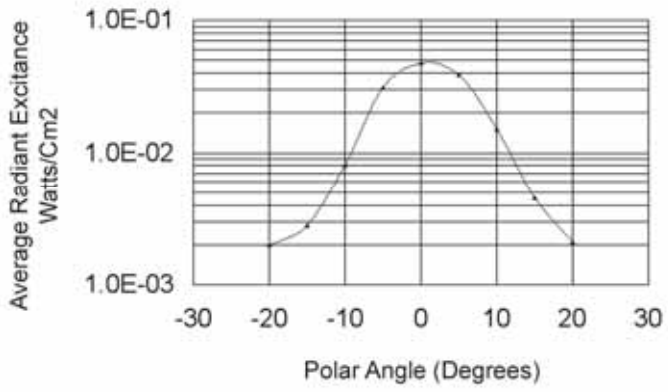
Peak Voltage = 2.2 Volts
Peak Current = 1.1 Amps
Peak Power = 2.4 Watts





Average Radiant Excitance (Watts/CM2):

Volts = 3.0, Distance = 3.0 inches from source



Polar Angle	Average Radiant Excitance (Watts/CM2)
-20	2.00E-03
-15	2.80E-03
-10	8.00E-03
-5	3.10E-02
0	4.75E-02
5	3.90E-02
10	1.50E-02
15	4.50E-03
20	2.10E-03

*Patented

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HELIOWORKS

"Out Shines All Others"

PULSABLE **IR** SOURCE

Model EP-3962*

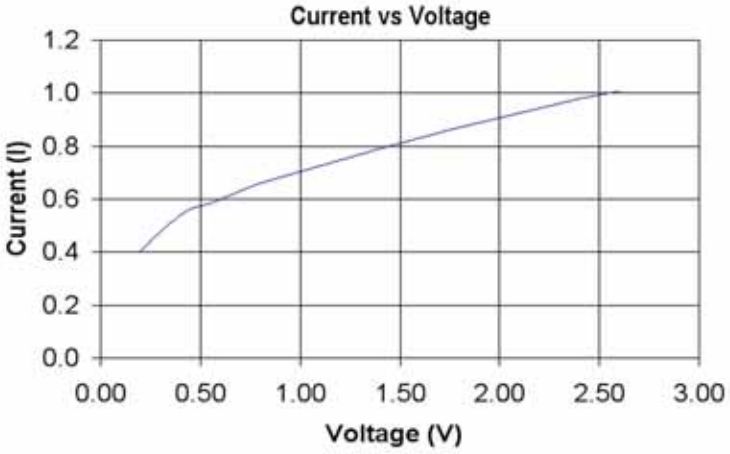
Helioworks offers a unique steady state infrared emitter with a tungsten filament. It operates in pulsed or steady state mode at temperatures in excess of 1900º K in an industry standard TO-8 package. The window is Sapphire which transmits IR radiation to over 5 µm.

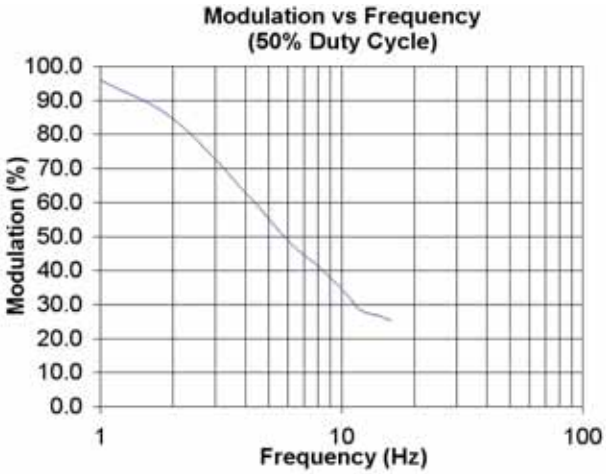
Key features include:

- Tungsten filament
- Can be operated in pulsed or steady state mode
- Internal gold plated parabolic reflector
- Sapphire window
- Standard TO-8 package

Electrical Specifications:

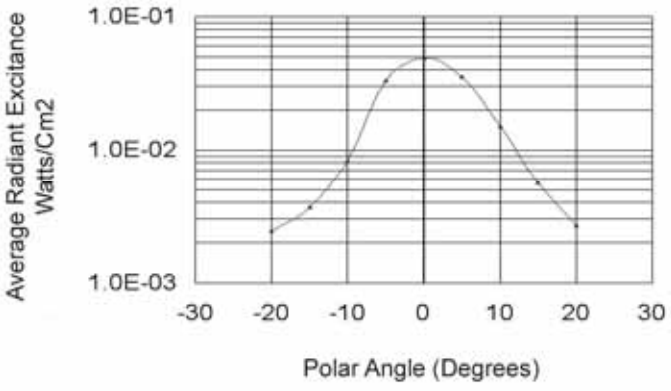
Peak Voltage = 2.6 Volts
Peak Current = 1.05 Amps
Peak Power = 2.7 Watts





Average Radiant Excitance (Watts/CM2):

Volts = 2.6, Distance = 3.0 inches from source



Polar Angle	Average Radiant Excitance (Watts/CM2)
-20	2.50E-03
-15	3.80E-03
-10	8.00E-03
-5	3.30E-02
0	4.95E-02
5	3.60E-02
10	1.50E-02
15	5.60E-03
20	2.70E-03

*Patented

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HELIOWORKS

"Out Shines All Others"

PULSABLE **IR** SOURCE

Model EP-3963*

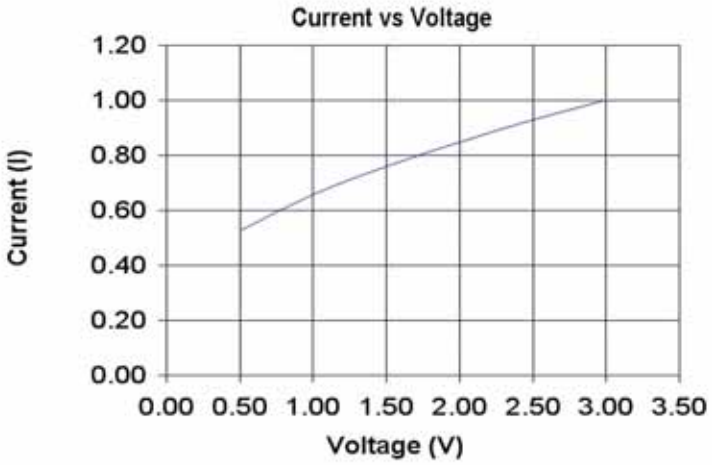
Helioworks offers a unique steady state infrared emitter with a tungsten filament and sapphire window. It can operate in pulsed or steady state mode at temperatures in excess of 1900º K in an industry standard TO-8 package.

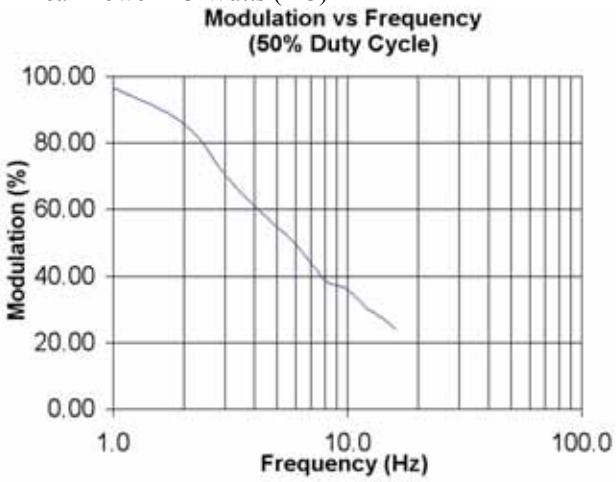
Key features include:

- Tungsten filament
- Can be operated in pulsed or steady state mode
- Internal gold plated parabolic reflector
- Sapphire window
- Standard TO-8 package

Electrical Specifications:

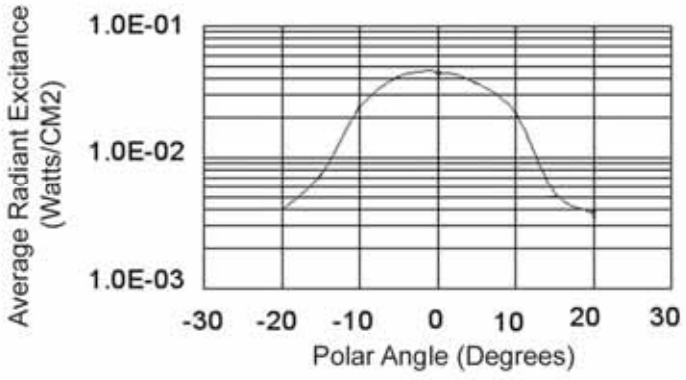
Peak Voltage = 3.0 Volts maximum
Peak Current = 1.0 Amp
Peak Power = 3 Watts (DC)





Average Radiant Excitance (Watts/CM2):

Volts = 2.6, Distance = 3.0 inches from source



Polar Angle	Average Radiant Excitance (Watts/Cm2)
-20	4.00E-03
-15	7.40E-03
-10	2.40E-02
-5	4.15E-02
0	4.55E-02
5	3.75E-02
10	2.15E-02
15	5.40E-03
20	3.70E-03

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HELIOWORKS

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PULSABLE **IR** SOURCE

Model EP-3964*

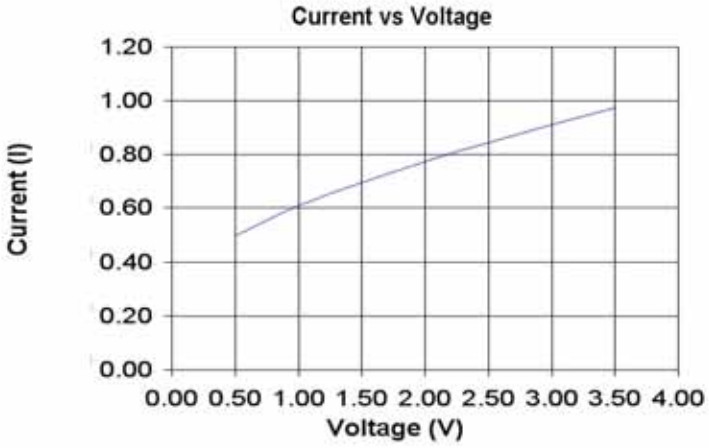
Helioworks, Inc. offers a unique Pulsable infrared emitter with a tungsten filament that provides mid IR radiation to over 5 microns. It can operate in pulsed or steady state mode at temperatures in excess of 1900º K in an industry standard TO-8 package.

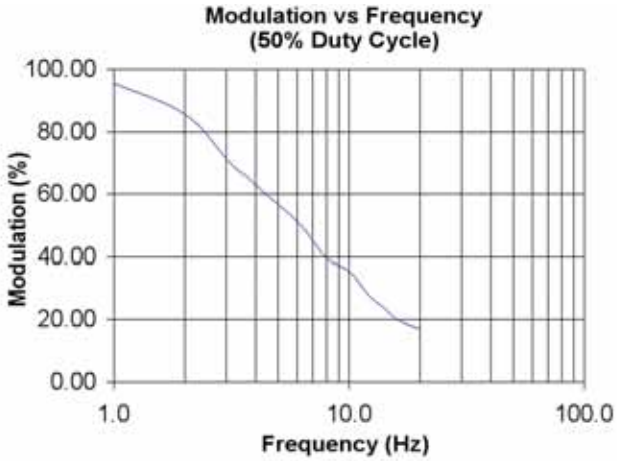
Key features include:

- Tungsten filament
- Can be operated in pulsed or steady state mode
- Internal gold plated parabolic reflector
- Sapphire window
- Standard TO-8 package

Electrical Specifications:

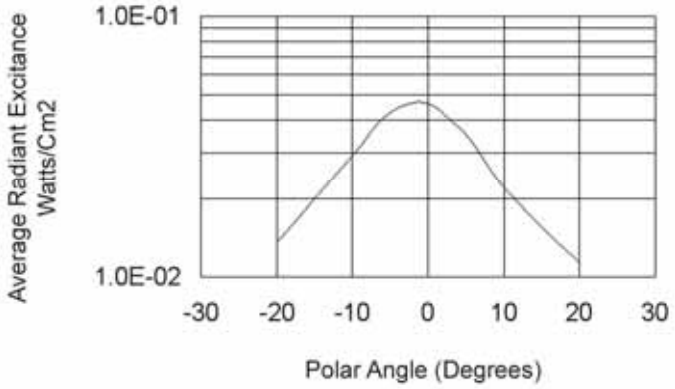
Peak Voltage = 3.5 Volts DC MAXIMUM
Peak Current = 1.0 Amp
Peak Power = 3.5 Watts





Average Radiant Excitance (Watts/Cm2):

Volts = 3.5, Distance = 3.0 inches from source



Polar Angle	Average Radiant Excitance (Watts/Cm2)
-20	1.35E-02
-15	2.00E-02
-10	2.90E-02
-5	4.30E-02
0	4.65E-02
5	3.50E-02
10	2.20E-02
15	1.55E-02
20	1.15E-02

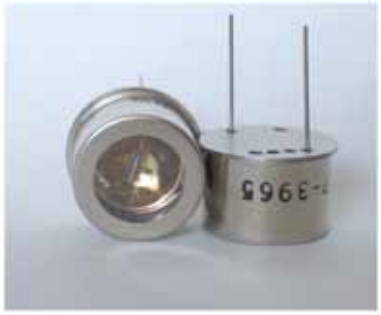
*Patented

HELIOWORKS

"Out Shines All Others"

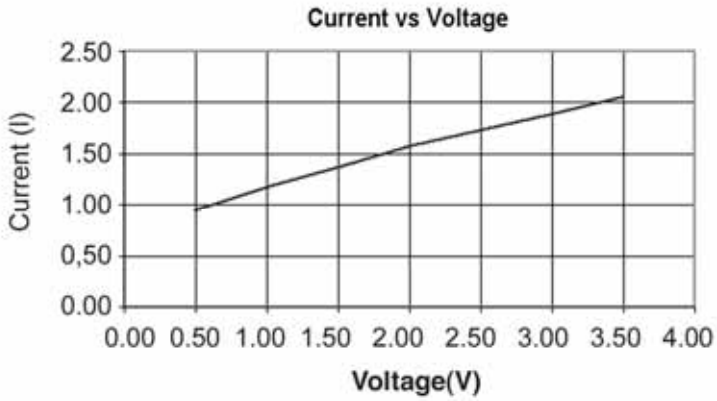
PULSABLE **IR** SOURCE
Model EP-3965*

Helioworks, Inc. offers a unique Pulsable infrared emitter with a tungsten filament that provides mid IR radiation to over 5 microns. It can operate in pulsed or steady state mode at temperatures of up to 2000º K in an industry standard TO-8 package.



Key features include:
- Tungsten filament
- Can be operated in pulsed or steady state mode
- Internal gold plated parabolic reflector
- Sapphire window
- Standard TO-8 package

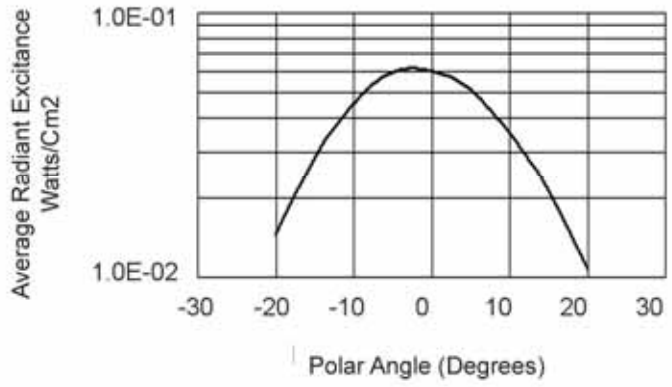
Electrical Specifications:
Peak Voltage = 3.5 Volts DC MAXIMUM
Peak Current = 2.0 Amp
Peak Power = 7.2 Watts



V	I	W=V1	R=V/1
0.50	0.94	0.47	0.53
1.00	1.17	1.17	0.85
1.50	1.37	2.06	1.09
2.00	1.57	3.14	1.27
2.50	1.73	4.33	1.45
3.00	1.89	5.67	1.59
3.50	2.05	7.18	1.71

Average Radiant Excitance (Watts/Cm2):

Volts = 3.5, Distance = 3.0 inches from source



Polar Angle	Average Radiant Excitance (Watts/Cm2)
-20	1.44E-02
-15	2.79E-02
-10	4.52E-02
-5	5.95E-02
0	6.02E-02
5	5.12E-02
10	3.54E-02
15	2.11E-02
20	1.06E-02

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HELIOWORKS

"Out Shines All Others"

PULSABLE **IR** SOURCE

Model EF-8531

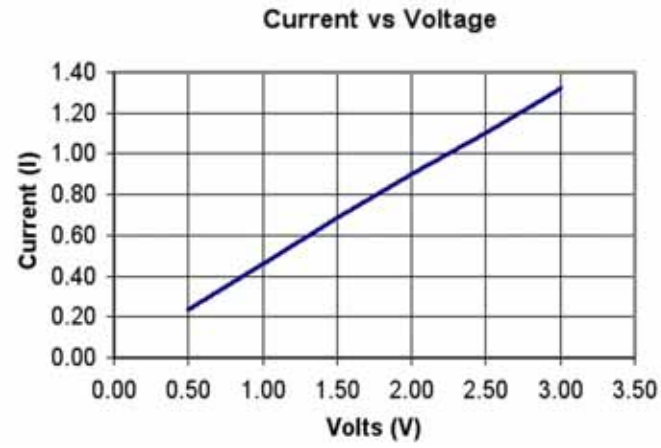
HelioWorks, Inc. offers a unique pulsable infrared emitter with three (3) radiating elements that can be addressed individually (4 lead package), or in total (2 lead package). It can operate in pulsed or steady state mode at a peak temperature of 700°C (973°K) in an industry standard TO-8 package with a Sapphire window. Specify either 2 lead or 4 lead package. Photo shows 4 lead package.

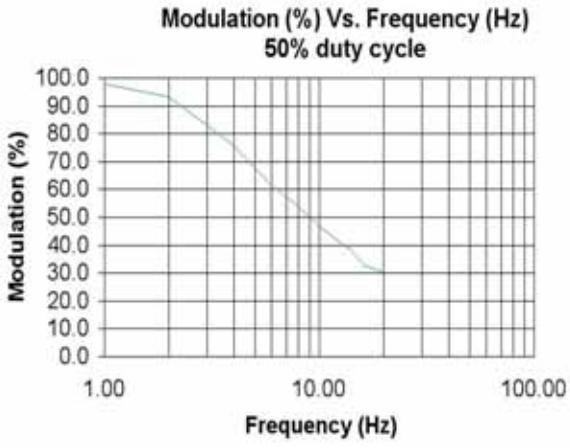
Key features include:

- Filament has uniform emitting area
- Emissivity is 0.88
- Sapphire window
- Operates in pulsed or steady state mode
- Industry standard TO-8 package
- Operates at peak temperature of 700°C (973°K)
- Large temperature change ΔT, during pulsing

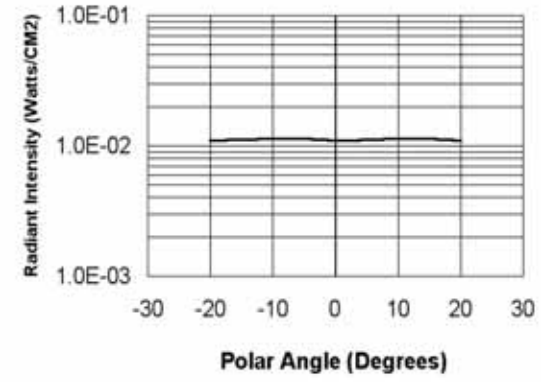
Electrical Specifications (2 lead package):

Peak Voltage = 3.00 Volts DC MAXIMUM
Peak Current = 1.34 Amps
Peak Power = 4.0 Watts

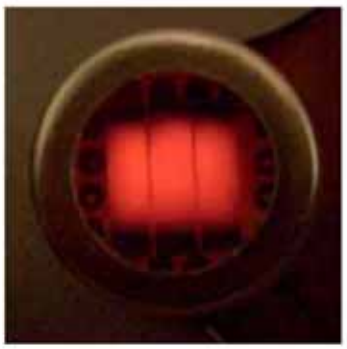




Polar Intensity
(V = 3.0, Distance = 2 inches from face)



Polar Angle	Average (Watts/Cm)
-20	1.10E-02
-15	1.12E-02
-10	1.14E-02
-5	1.13E-02
0	1.10E-02
5	1.11E-02
10	1.13E-02
15	1.13E-02
20	1.10E-02



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HELIOWORKS

"Out Shines All Others"

PULSABLE **IR** SOURCE

Model EF-8532

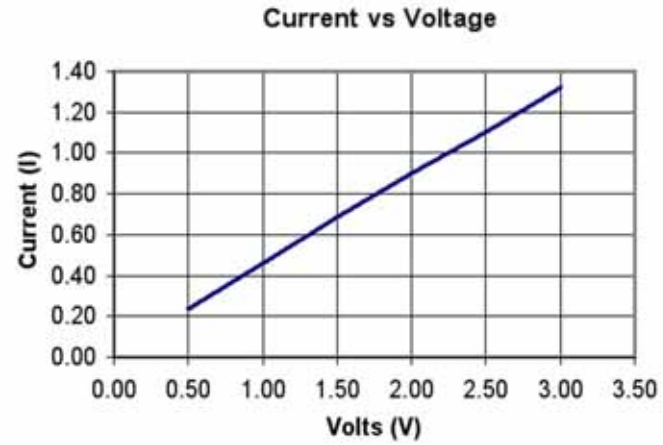
HelioWorks, Inc. offers a unique pulsable infrared emitter with three (3) radiating elements that can be addressed individually (4 lead package), or in total (2 lead package). It can operate in pulsed or steady state mode at a peak temperature of 700°C (973°K) in an industry standard TO-8 package with a Calcium Flouride window. Specify either 2 lead or 4 lead package. Photo shows 4 leads.

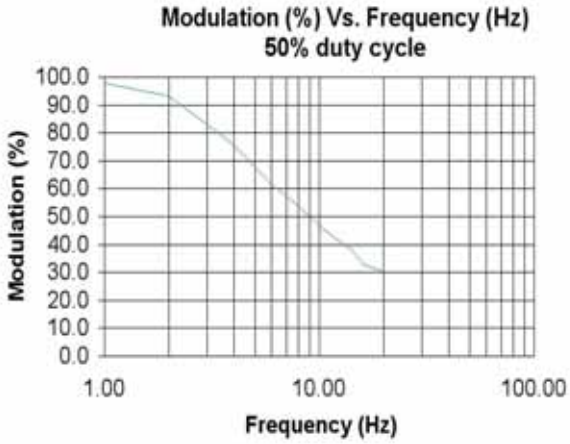
Key features include:

- Filament has uniform emitting area
- Emissivity is 0.88
- Calcium Fluoride window
- Operates in pulsed or steady state mode
- Industry standard TO-8 package
- Operates at peak temperature of 700°C (973°K)
- Large temperature change, ΔT, during pulsing

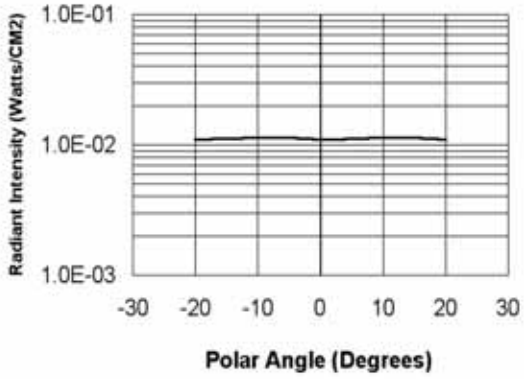
Electrical Specifications (2 lead package):

Peak Voltage = 3.00 Volts DC MAXIMUM
Peak Current = 1.34 Amps
Peak Power = 4.0 Watts





Polar Intensity
(V = 3.0, Distance = 2 inches from face)



Polar Angle	Average (Watts/Cm)
-20	1.10E-02
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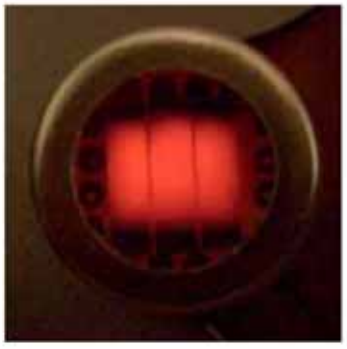
15	1.13E-02
20	1.10E-02



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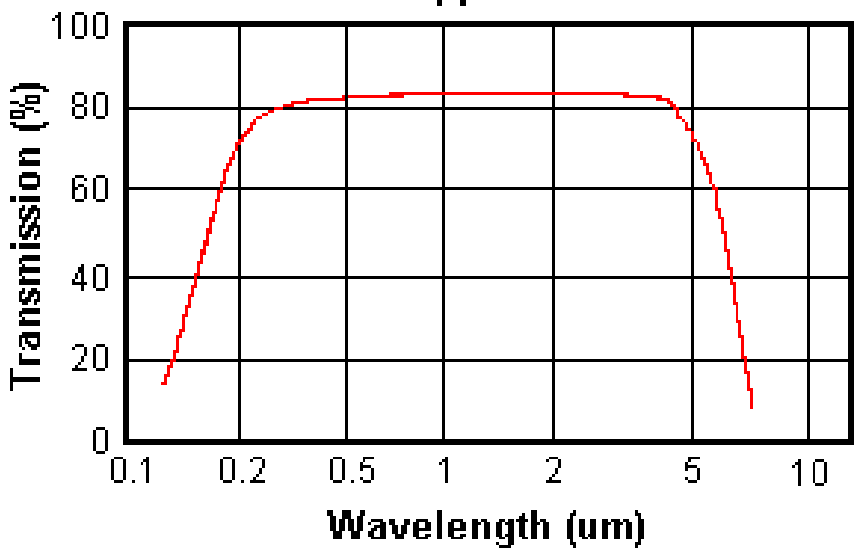
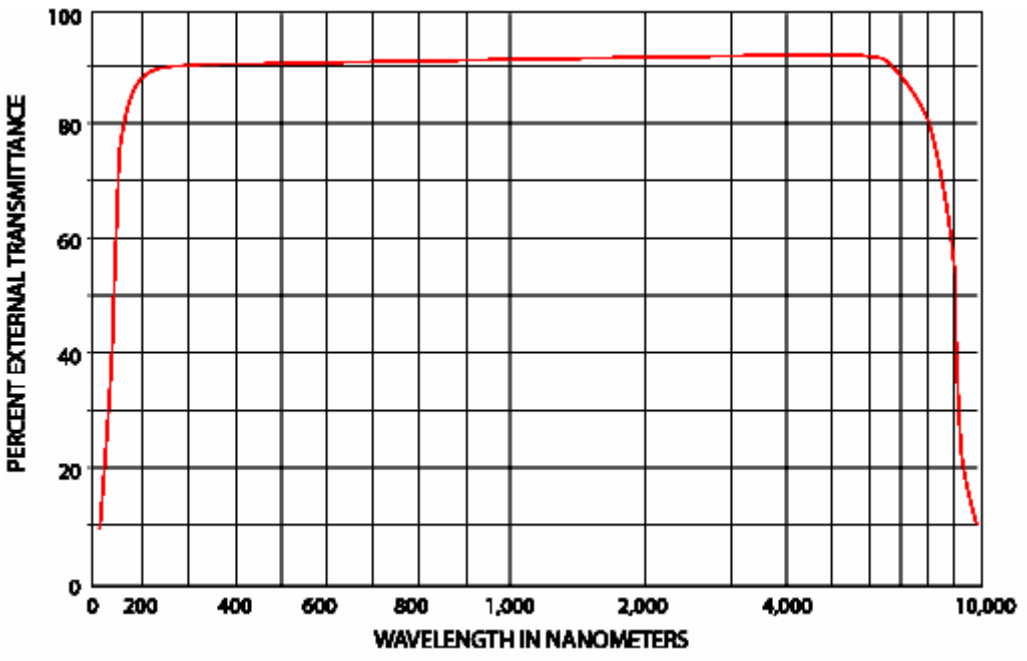
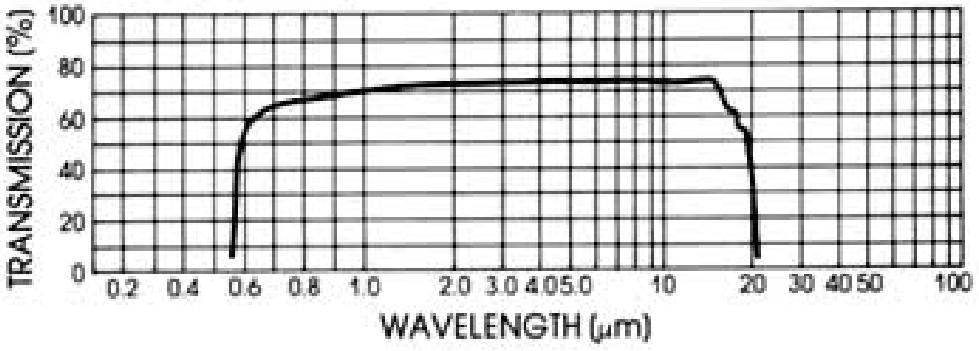
Sapphire





Zinc Selenide (ZnSe)



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