

MarkTech Optoelectronics

Photo Reflectors

Winter 2023 Catalog

Product	Peak Wavelength	Package	Device Type	Fall Time	Current	Dark Current	Forward Voltage	Rise Time
MTRS0012C	1220	5.1x3.3mm SMD (4 pin)	InGaAs Photo Diode		180		1.03	
MTRS0013C	1300	5.1x3.3mm SMD (4 pin)	InGaAs Photo Diode		180		1.00	
MTRS1070	700	4mm Plastic Flat Lens (4 pin)	Photo Transistor	30	500	100	1.8 - 2.2	20
MTRS4010C	1040	5.1x3.3mm SMD (4 pin)	InGaAs Photo Diode		180		1.25	
MTRS4720D	468	4mm Plastic Flat Lens (4 pin)	Photodiode	1	0.35	100	3.5 - 4.0	1
MTRS5116C	1625	5.1x3.3mm SMD (4 pin)	InGaAs Photo Diode		180		0.87	
MTRS5250D	520	4mm Plastic Flat Lens (4 pin)	Photo Diode	1	0.3	100	3.5 - 4.0	1
MTRS5750	574	4mm Plastic Flat Lens (4 pin)	Photo Transistor	1	0.18	100	2.4 - 2.8	1
MTRS5750D	574	4mm Plastic Flat Lens (4 pin)	Photodiode	30	150	100	2.4 - 2.8	20
MTRS5900D	590	4mm Plastic Flat Lens (4 pin)	Photodiode	1	0.3	100	2.0 - 2.5	1
MTRS6014C	1430	5.1x3.3mm SMD (4 pin)	InGaAs Photo Diode		180		0.95	
MTRS6140D	610	4mm Plastic Flat Lens (4 pin)	Photo Diode	1	0.55	100	2.0 - 2.5	1
MTRS6660	660	4mm Plastic Flat Lens (4 pin)	Photo Transistor	30	1200	100	1.8 - 2.2	30
MTRS6660D	660	4mm Plastic Flat Lens (4 pin)	Photodiode	1	1.5	10	1.8 - 2.2	1
MTRS6660DSM	660	5.1x3.3mm SMD (4 pin)	Photo Diode		1.5		1.80	
MTRS7010C	1070	5.1x3.3mm SMD (4 pin)	InGaAs Photo Diode		180		1.25	
MTRS8760C	870	4mm Plastic Flat Lens (4 pin)	Photo Diode	2.0	0.9	10	1.34	2.0
MTRS8800RWSC4	880	TO-46 Metal Can Flat Lens (3 pin)	Photo Diode	NA	0.01	10	1.45	NA
MTRS9520	950	4mm Plastic Flat Lens (4 pin)	Photo Transistor	30	100	100	1.1 - 1.4	20
MTRS9520D	950	4mm Plastic Flat Lens (4 pin)	Photo Diode	2.0	0.9	10	1.2 - 1.5	2.0
MTRS9520DSM	950	5.1x3.3mm SMD (4 pin)	Photo Diode		1.5		1.20	

Peak Emission Wavelength: 1220nm

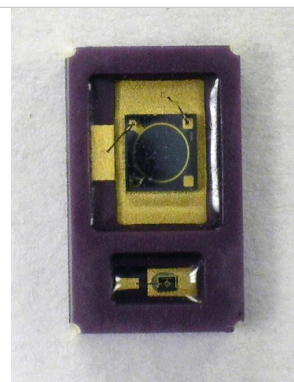
The MTRS0012C reflective sensor consists of a 1220nm infrared emitter and high sensitivity InGaAs photodiode in the same package. The black molded housing reduces the effect of external ambient light. Custom emitter/detectors are available.

FEATURES

- > 1.00mm Active Area
- > 5.1 x 3.3mm Surface Mount Package
- > Short Detection Distance Optimum 0.5-1.5mm

APPLICATIONS

- > Card Reader
- > Bar-code Reader
- > Edge Sensing / Money-bill Reader



Absolute Maximum Ratings (Ta=25°C)

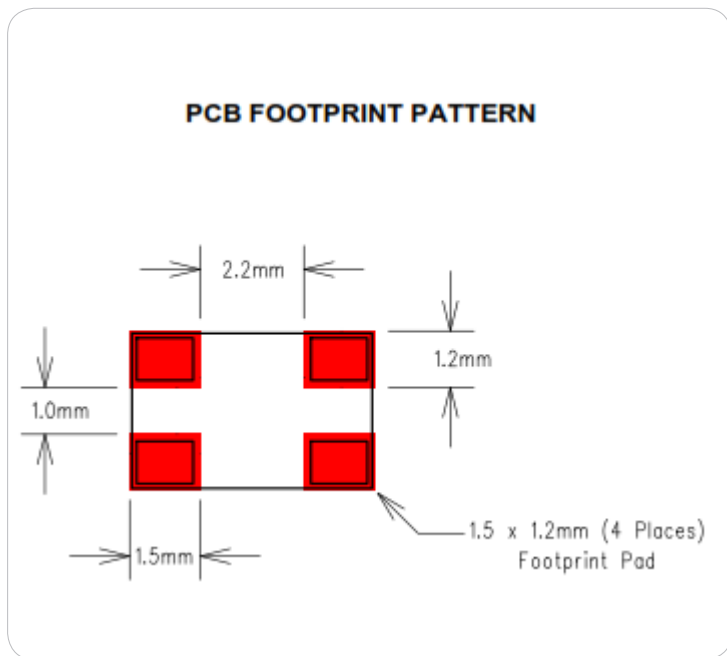
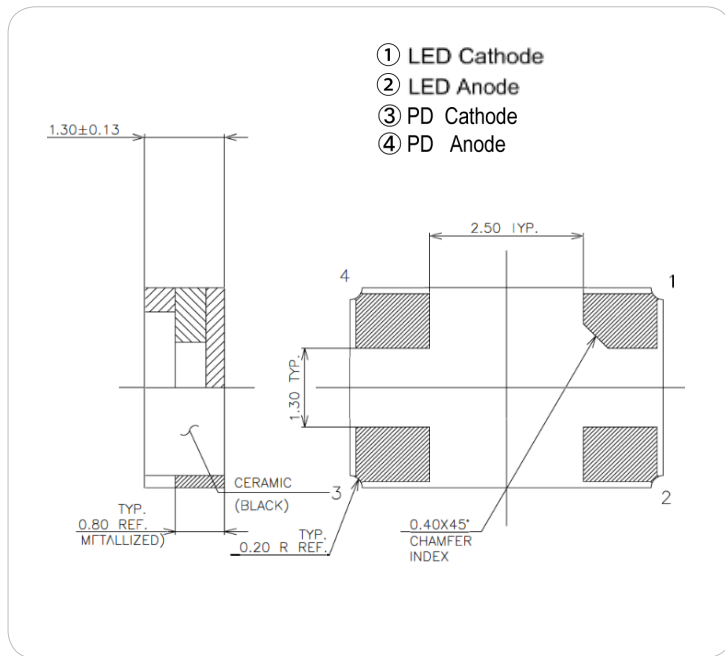
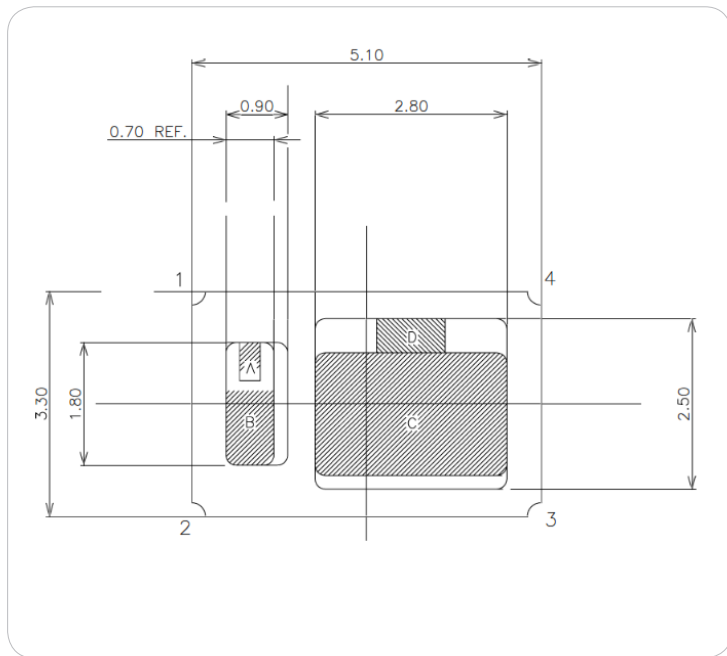


ITEMS	SYMBOL	RATINGS	UNIT
Forward Current (LED)	IF	40	mA
Pulse Forward Current (LED)*1	IFP	0.5	A
Reverse Voltage (LED)	VR	5	V
Power Dissipation (LED)	PD	100	mW
Reverse Voltage (PD)	VR (IR=10uA)	3	V
Reverse Current (LED)	IR (VR=5V)	10	uA
Operating Temperature Range	Topr	-20 to +80	°C
Storage Temperature Range	Tstg	-30 to +100	°C

*1: Tw=10µsec, T=10msec.

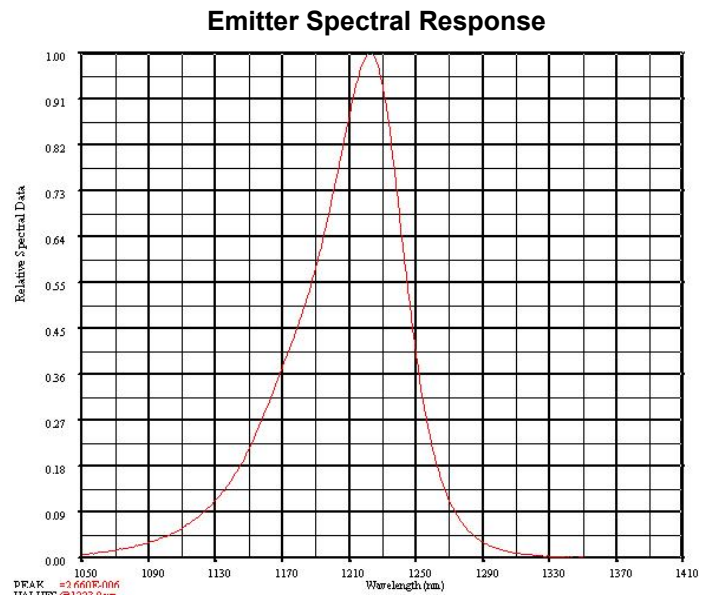
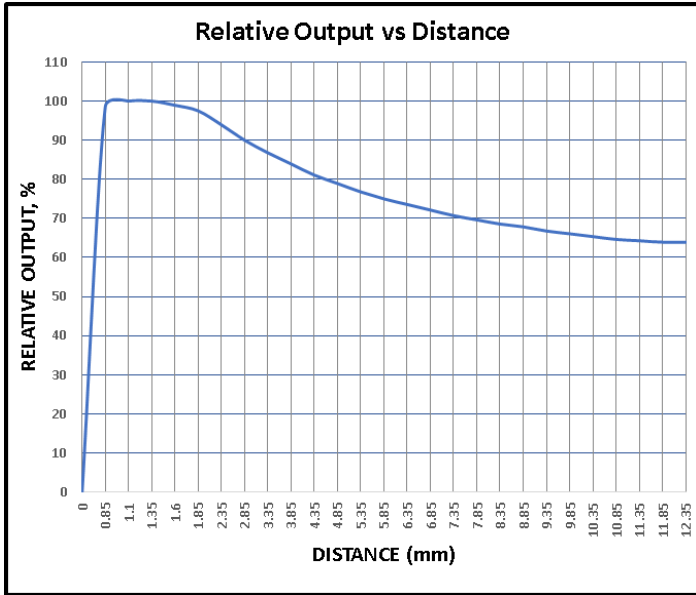
Electrical & Optical Characteristics (Ta = 25°C)

ITEMS	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNIT
Forward Voltage (LED)	VF	IF=20mA	--	1.03	--	V
Peak Emissions Wavelength (LED)	λ_p	IF=20mA	--	1220	--	nm
Spectral Line Half Width (LED)	$\Delta\lambda$	IF=20mA	--	60	--	nm
Power Output (LED)	PO	IF=20mA	--	2.2	--	mW
Reverse Dark Current (Iceo)	ID	VR=1V	--	2.0	--	uA
Light Current @1300nm	IL	$\lambda=1300\text{nm}$; VR=2V	--	180	--	uA
Shunt Resistance	RSH	VR=10mV	--	2	--	MΩ
Sensitivity Range	V	VR=0V	600	--	1750	nm
Responsivity	R	$\lambda=1550\text{nm}$	--	0.70	--	A/W
Quantum Efficiency	QE	$\lambda=1660\text{nm}$	--	55	--	%
Total Capacitance	CT	VR=0V	--	60	--	pF
Rise/Fall Time (10 to 90%)	Tr, Tf	VR=10V, IF=20mA, RL=1KΩ	--	--	--	uS



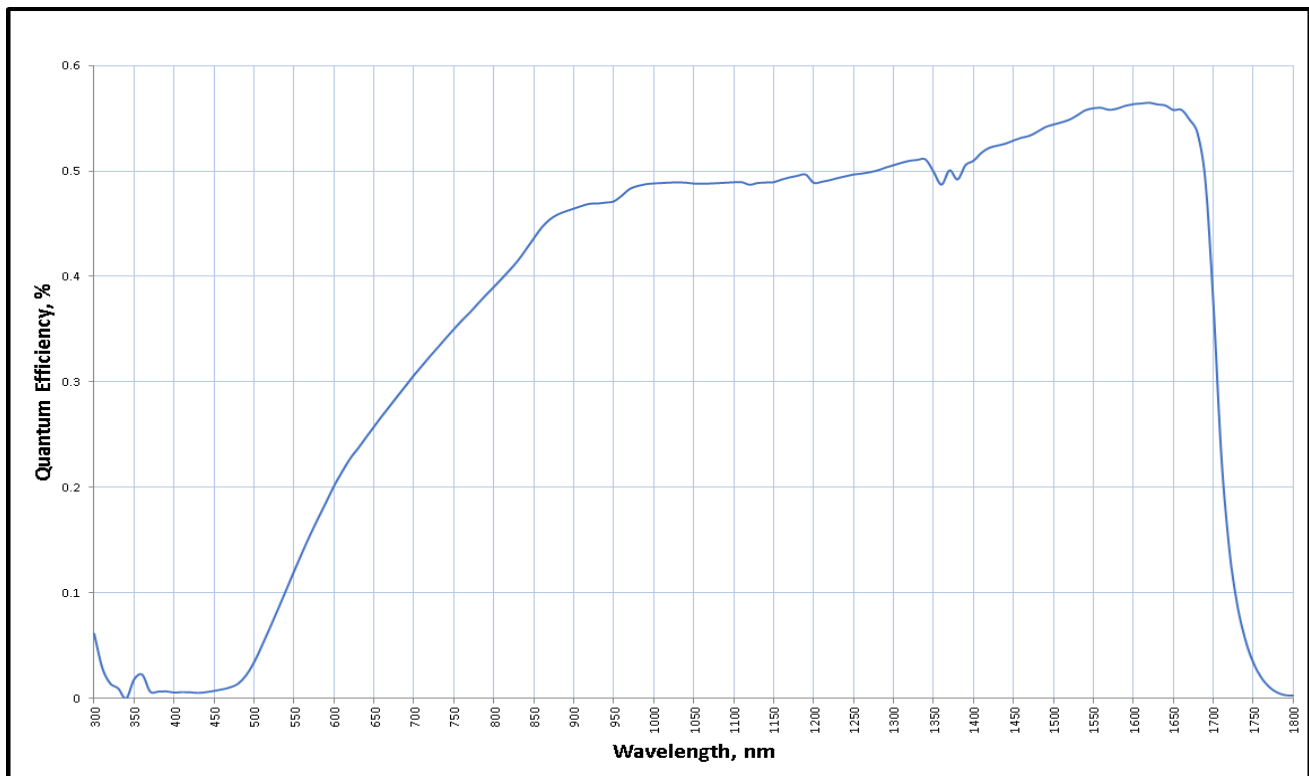
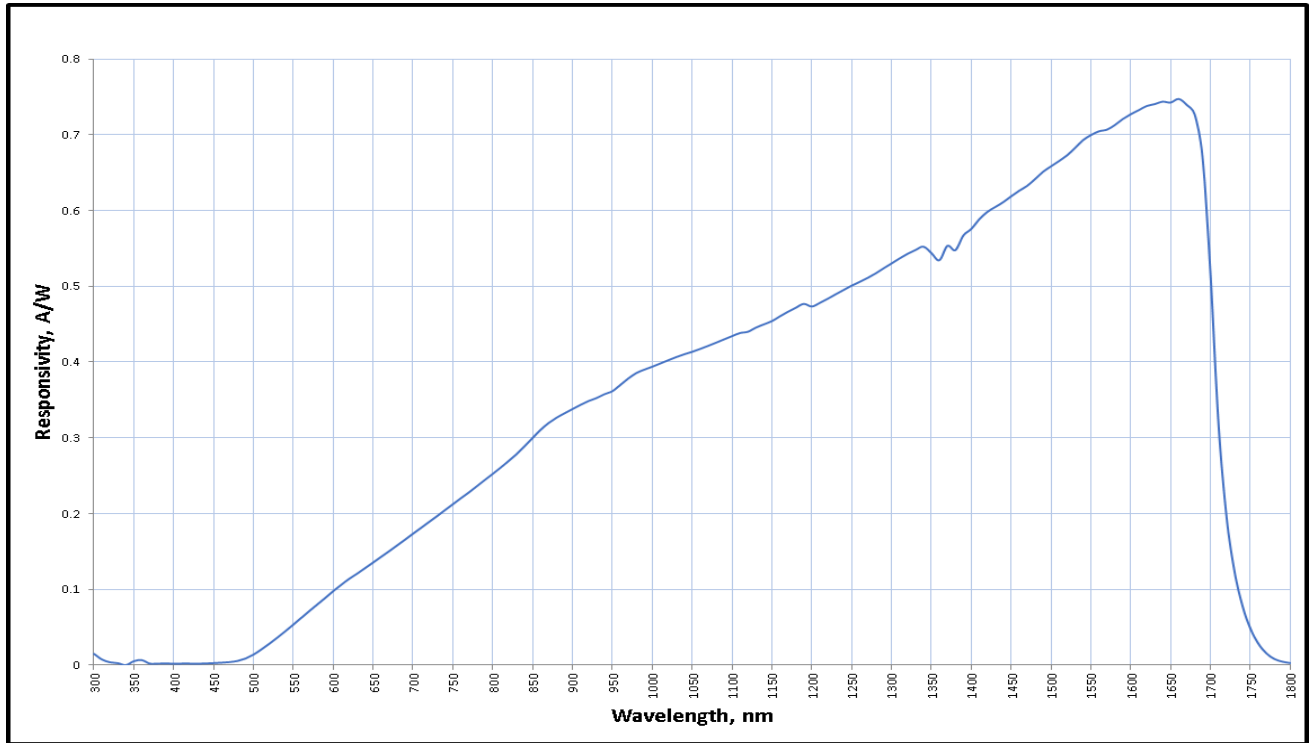
Unit: mm, Tolerance: ±0.2

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Unit: mm, Tolerance: ±0.2

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Peak Emission Wavelength: 1300nm

The MTRS0013C reflective sensor consists of a 1300nm infrared emitter and high sensitivity InGaAs photodiode in the same package. The black molded housing reduces the effect of external ambient light. Custom emitter/detectors are available.

FEATURES

- > 1.00mm Active Area
- > 5.1 x 3.3mm Surface Mount Package
- > Short Detection Distance Optimum 0.5-1.5mm

APPLICATIONS

- > Card Reader
- > Bar-code Reader
- > Edge Sensing / Money-bill Reader



Absolute Maximum Ratings (Ta=25°C)

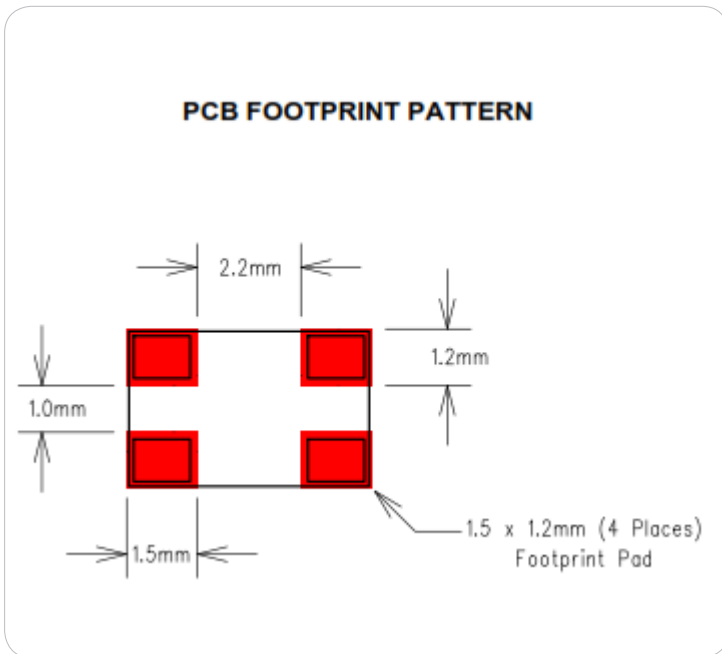
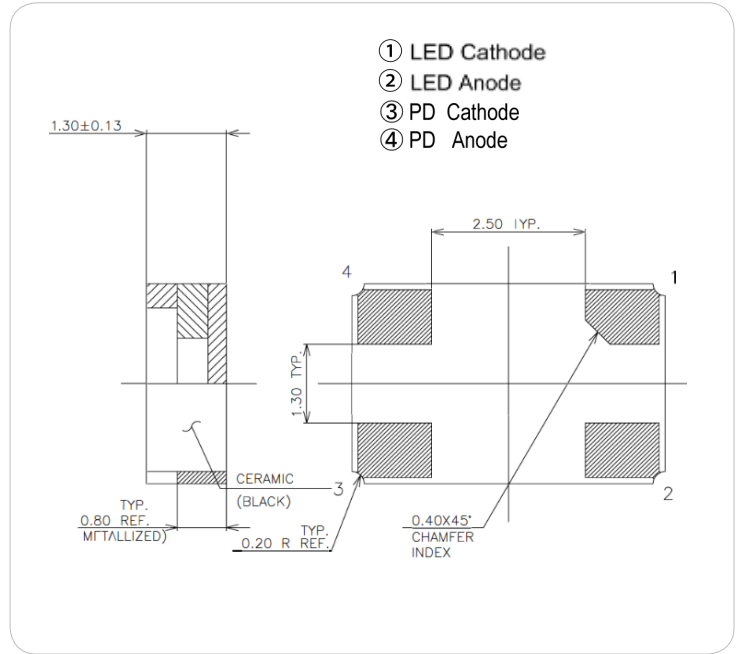
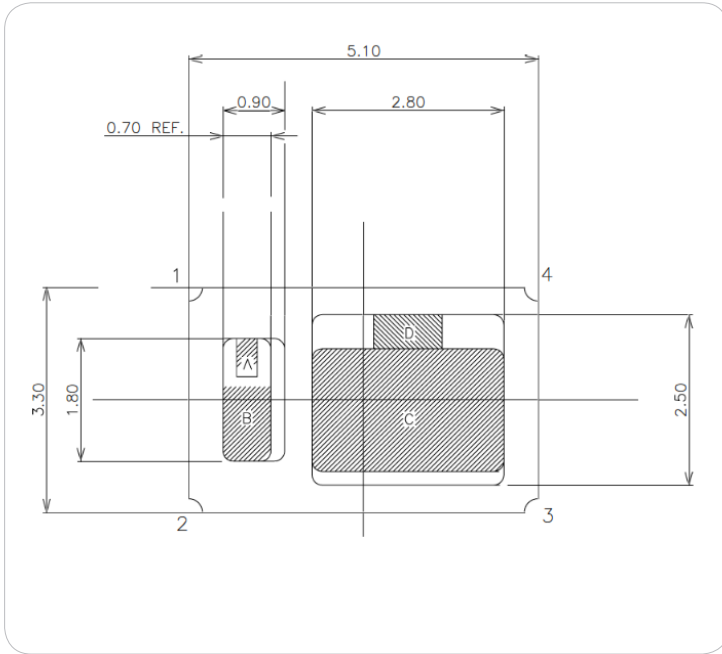


ITEMS	SYMBOL	RATINGS	UNIT
Forward Current (LED)	IF	40	mA
Pulse Forward Current (LED)*1	IFP	0.5	A
Reverse Voltage (LED)	VR	5	V
Power Dissipation (LED)	PD	100	mW
Reverse Voltage (PD)	VR (IR=10uA)	3	V
Reverse Current (LED)	IR (VR=5V)	10	uA
Operating Temperature Range	Topr	-20 to +80	°C
Storage Temperature Range	Tstg	-30 to +100	°C

*1: Tw=10µsec, T=10msec.

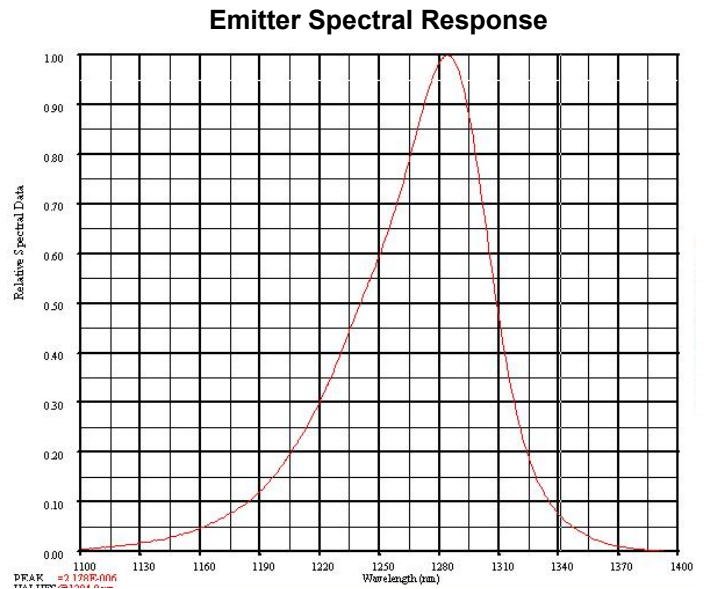
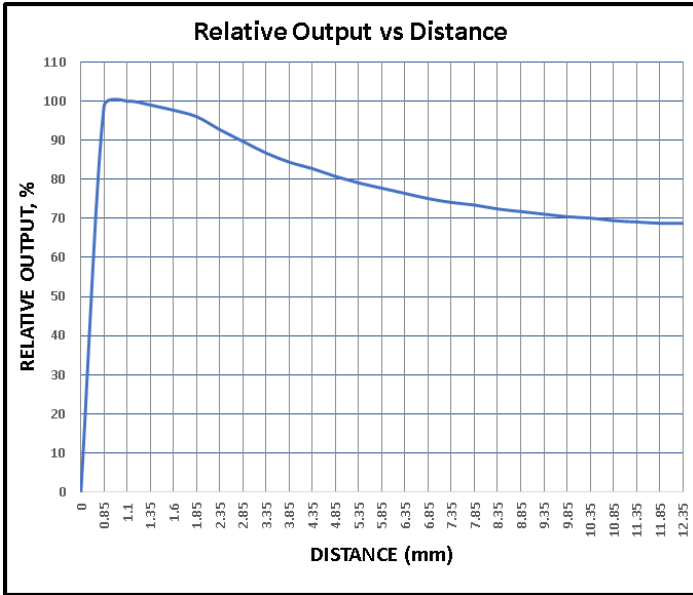
Electrical & Optical Characteristics (Ta = 25°C)

ITEMS	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNIT
Forward Voltage (LED)	VF	IF=20mA	--	1.0	--	V
Peak Emissions Wavelength (LED)	λ_p	IF=20mA	--	1300	--	nm
Spectral Line Half Width (LED)	$\Delta\lambda$	IF=20mA	--	70	--	nm
Power Output (LED)	PO	IF=20mA	--	1.4	--	mW
Reverse Dark Current (Iceo)	ID	VR=1V	--	2.0	--	uA
Light Current @1300nm	IL	$\lambda=1300\text{nm}$; VR=2V	--	180	--	uA
Shunt Resistance	RSH	VR=10mV	--	2	--	MΩ
Sensitivity Range	V	VR=0V	600	--	1750	nm
Responsivity	R	$\lambda=1550\text{nm}$	--	0.70	--	A/W
Quantum Efficiency	QE	$\lambda=1660\text{nm}$	--	55	--	%
Total Capacitance	CT	VR=0V	--	60	--	pF
Rise/Fall Time (10 to 90%)	Tr, Tf	VR=10V, IF=20mA, RL=1KΩ	--	--	--	uS



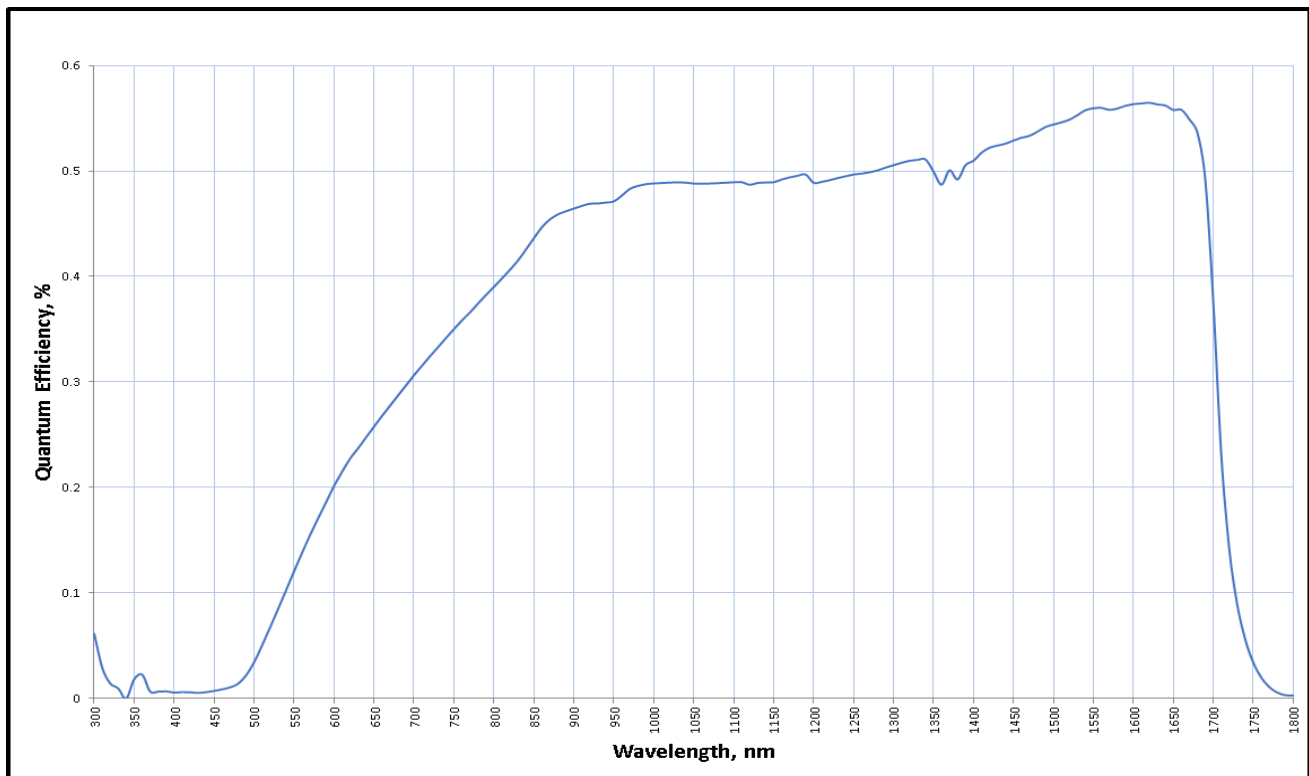
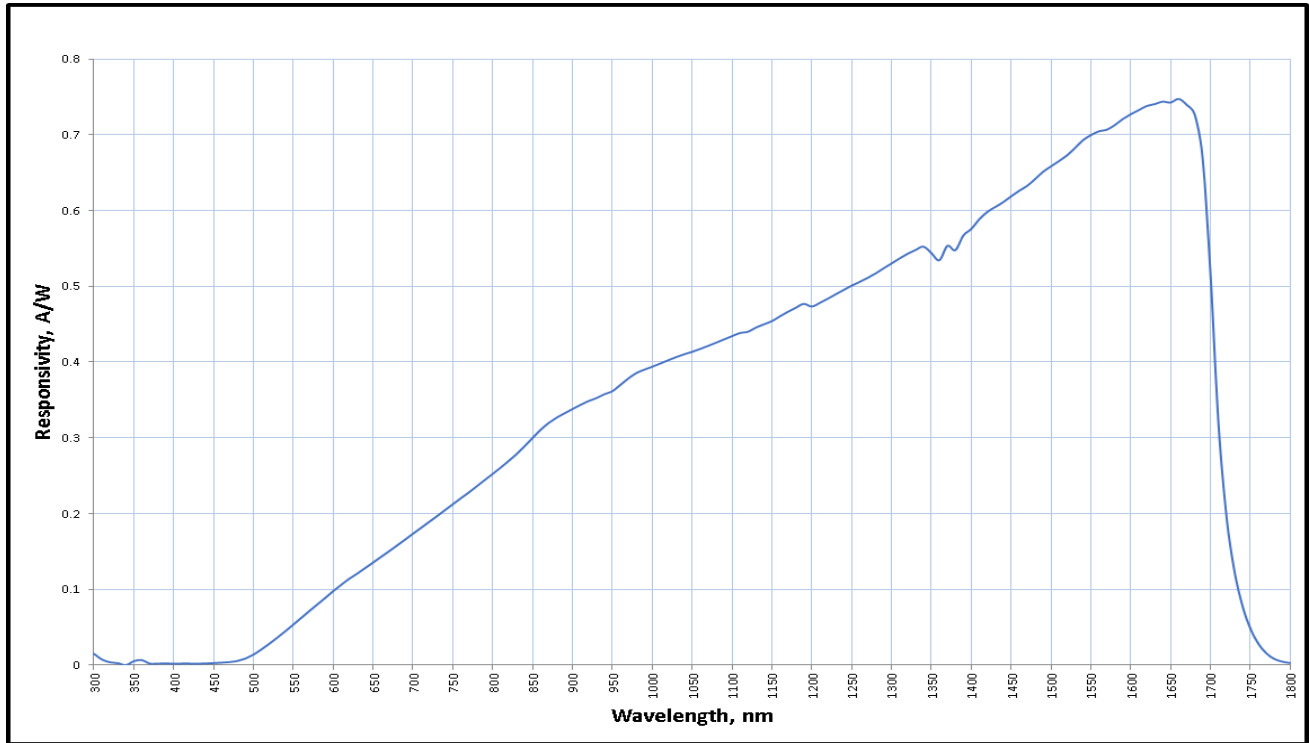
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Unit: mm, Tolerance: ±0.2

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Peak Emission Wavelength: 700nm

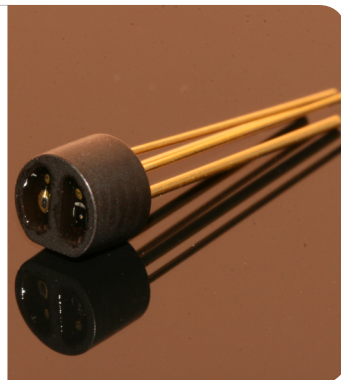
The 700nm reflective sensor consists of a 700nm visible emitter and high sensitivity photo transistor in the same package. The black molded housing reduces the effect of external ambient light. Custom emitter/detectors are available.

FEATURES

- > High Reliability
- > Compact (Φ4.0)
- > Short Detection Distance Optimum 0.5-1.5mm

APPLICATIONS

- > Card Reader
- > Bar-code Reader
- > Edge Sensing / Money-bill Reader



Absolute Maximum Ratings (Ta=25°C)



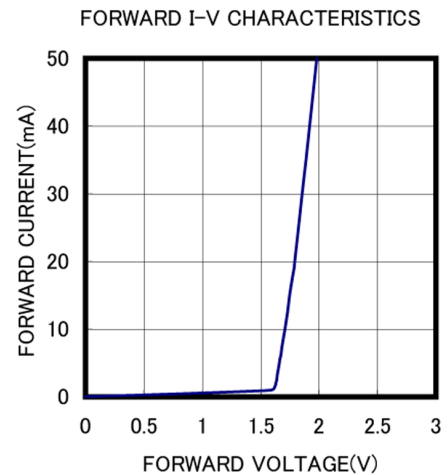
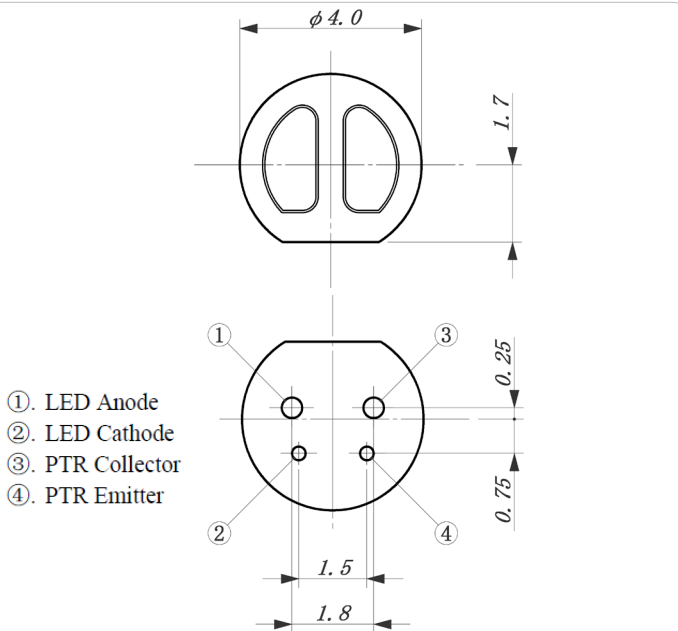
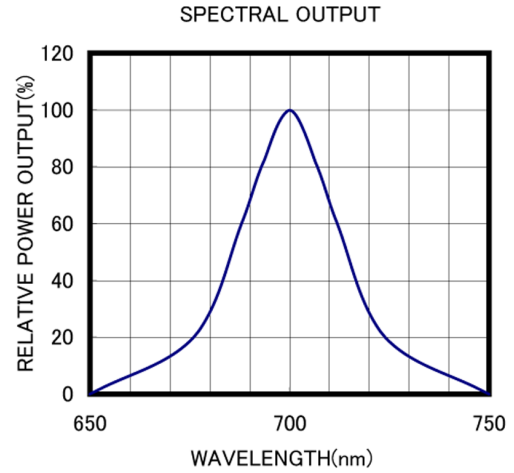
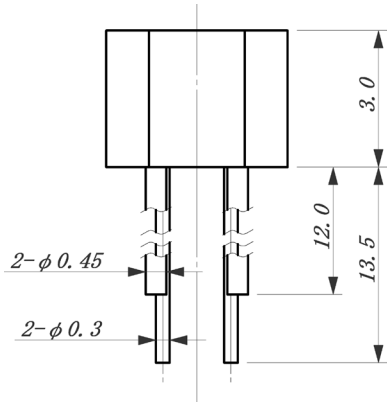
ITEMS	SYMBOL	RATINGS	UNIT
Forward Current (LED)	IF	50	mA
Pulse Forward Current (LED)*1	IFP	0.5	A
Reverse Voltage (LED)	VR	4	V
Power Dissipation (LED)	PD	100	mW
Collector-Emitter Voltage (PT)	Vce	20	V
Emitter-Collector Voltage (PT)	Vec	5	V
Collector Current (PT)	Ic	50	mA
Collector Power Dissipation (PT)	PC	75	mW
Total Power Dissipation	Ptot	100	mW
Operating Temperature Range	Topr	-20 ~ +80	°C

*1: Tw=10μsec, T=10msec.

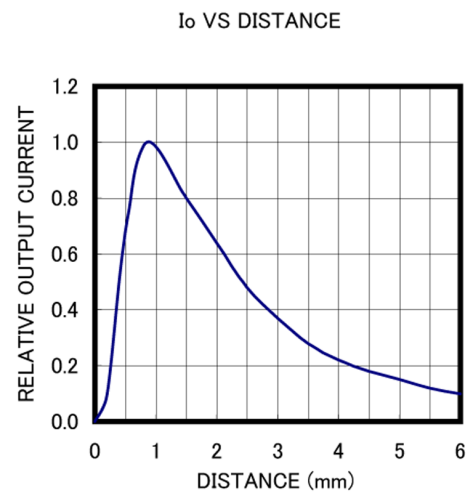
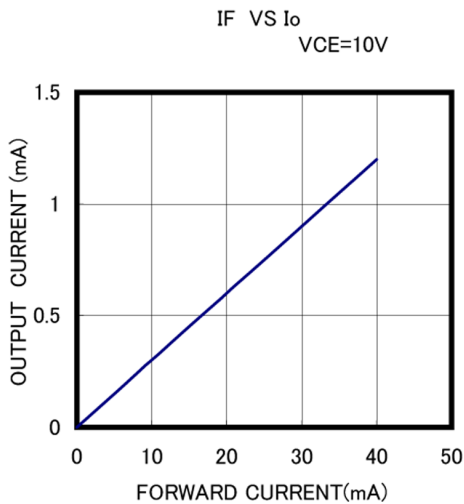
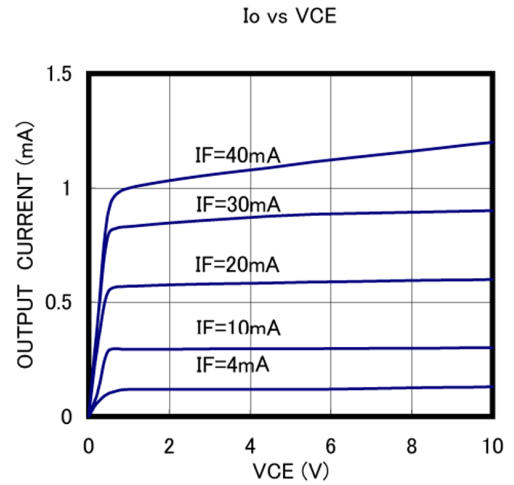
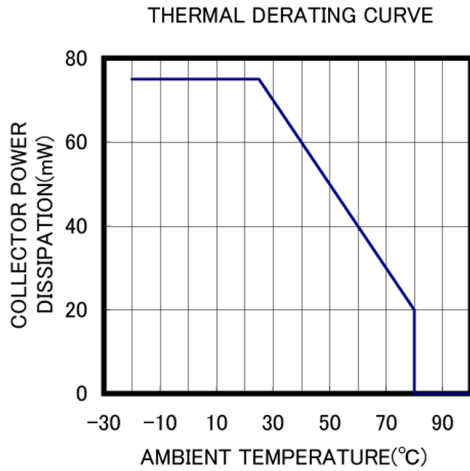
Electrical & Optical Characteristics (Ta = 25°C)

ITEMS	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNIT
Forward Voltage	VF	IF=20mA	--	1.8	2.3	V
Reverse Current	IR	VR=4V	--	--	10	μA
Peak Emission Wavelength	λp	IF=20mA	--	700	--	nm
Spectral Line Half Width	Δλ	IF=20mA	--	25	--	nm
Dark Current (Iceo)	ID	Vce=10V	--	--	100	nA
Output Current	Io	IF=20mA, Vce=2V, d=1mm *	180	500	--	μA
Cross-talk Current	Ix	IF=20mA, Vce=2V	--	--	200	nA
Rise Time (10 to 90%)	Tr	Vcc=5V, Io=0.1mA, RL=1KΩ	--	20	--	μS
Fall Time (10 to 90%)	Tf	Vcc=5V, Io=0.1mA, RL=1KΩ	--	30	--	μS
Lead Soldering Temperature*2	Tls	--	--	--	260	°C

*1: Measured by reflecting with Aluminum evaporated mirror (d=1.00mm). *2: Time 5 Sec max, Position: Up to 3mm from the body.



Unit: mm, Tolerance: ± 0.2



Peak Emission Wavelength: 1040nm

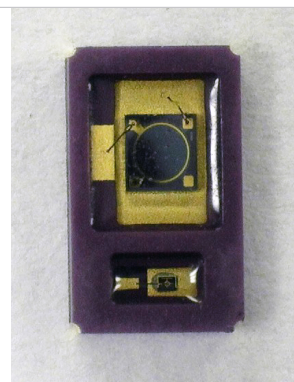
The MTRS4010C reflective sensor consists of a 1040nm infrared emitter and high sensitivity InGaAs photodiode in the same package. The black molded housing reduces the effect of external ambient light. Custom emitter/detectors are available.

FEATURES

- > 1.00mm Active Area
- > 5.1 x 3.3mm Surface Mount Package
- > Short Detection Distance Optimum 0.5-1.5mm

APPLICATIONS

- > Card Reader
- > Bar-code Reader
- > Edge Sensing / Money-bill Reader



Absolute Maximum Ratings (Ta=25°C)

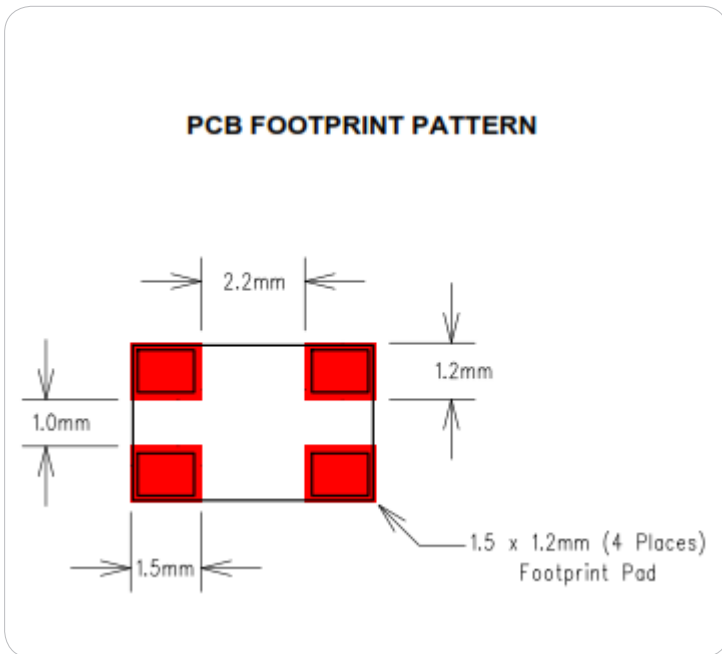
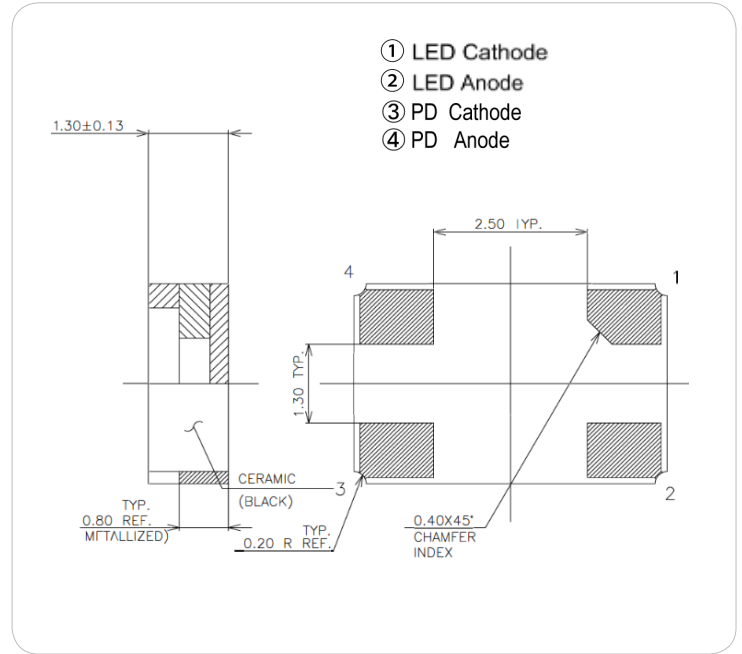
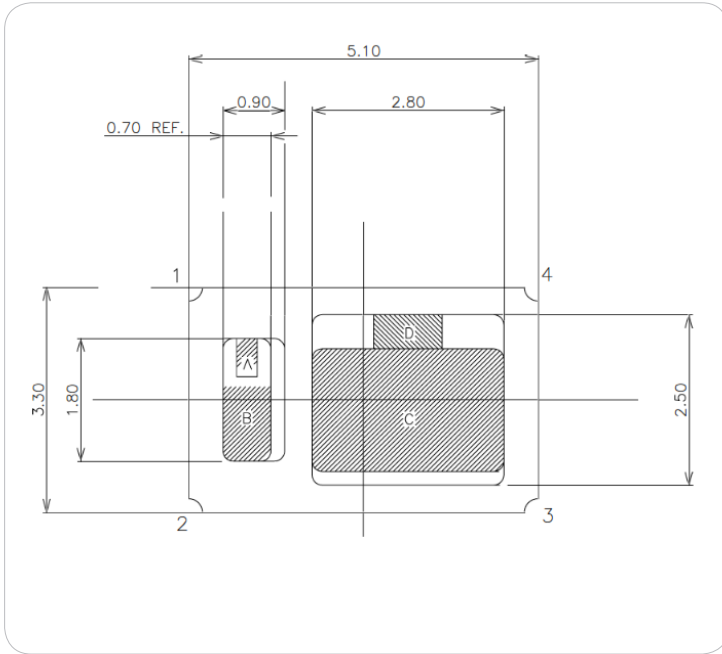


ITEMS	SYMBOL	RATINGS	UNIT
Forward Current (LED)	IF	40	mA
Pulse Forward Current (LED)*1	IFP	0.5	A
Reverse Voltage (LED)	VR	5	V
Power Dissipation (LED)	PD	100	mW
Reverse Voltage (PD)	VR (IR=10uA)	3	V
Reverse Current (LED)	IR (VR=5V)	10	uA
Operating Temperature Range	Topr	-20 to +80	°C
Storage Temperature Range	Tstg	-30 to +100	°C

*1: Tw=10µsec, T=10msec.

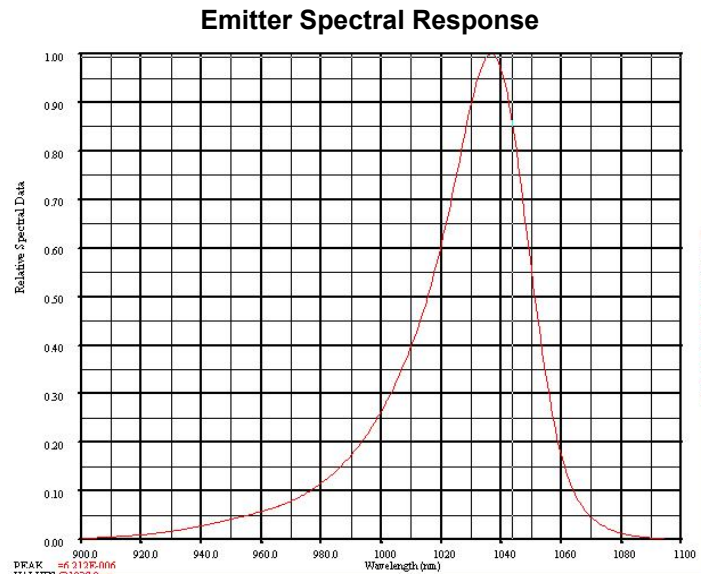
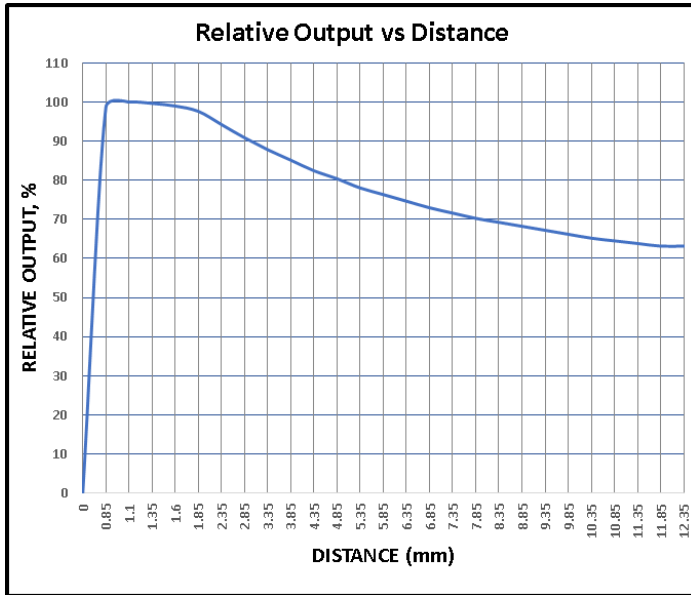
Electrical & Optical Characteristics (Ta = 25°C)

ITEMS	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNIT
Forward Voltage (LED)	VF	IF=20mA	--	1.25	--	V
Peak Emissions Wavelength (LED)	λ_p	IF=20mA	--	1040	--	nm
Spectral Line Half Width (LED)	$\Delta\lambda$	IF=20mA	--	35	--	nm
Power Output (LED)	PO	IF=20mA	--	2.3	--	mW
Reverse Dark Current (Iceo)	ID	VR=1V	--	2.0	--	uA
Light Current @1300nm	IL	$\lambda=1300\text{nm}$; VR=2V	--	180	--	uA
Shunt Resistance	RSH	VR=10mV	--	2	--	MΩ
Sensitivity Range	V	VR=0V	600	--	1750	nm
Responsivity	R	$\lambda=1550\text{nm}$	--	0.70	--	A/W
Quantum Efficiency	QE	$\lambda=1660\text{nm}$	--	55	--	%
Total Capacitance	CT	VR=0V	--	60	--	pF
Rise/Fall Time (10 to 90%)	Tr, Tf	VR=10V, IF=20mA, RL=1KΩ	--	--	--	uS



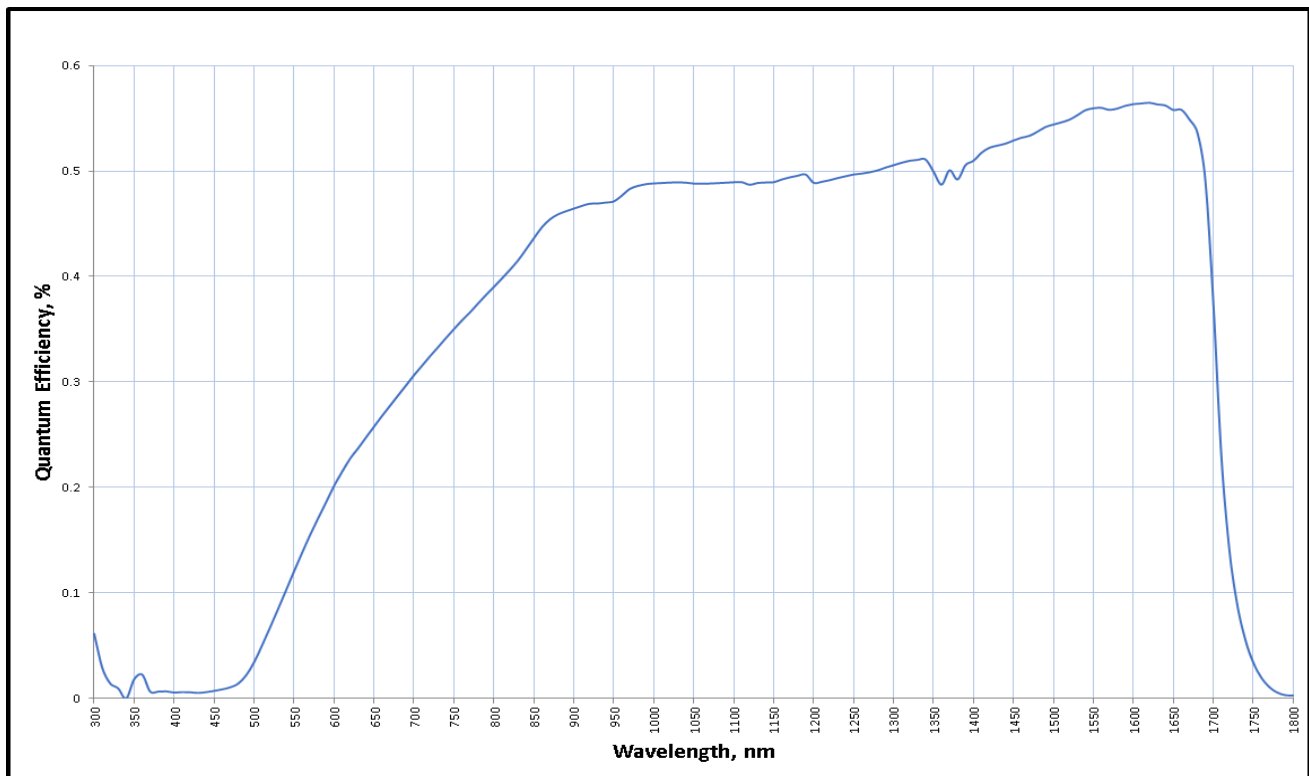
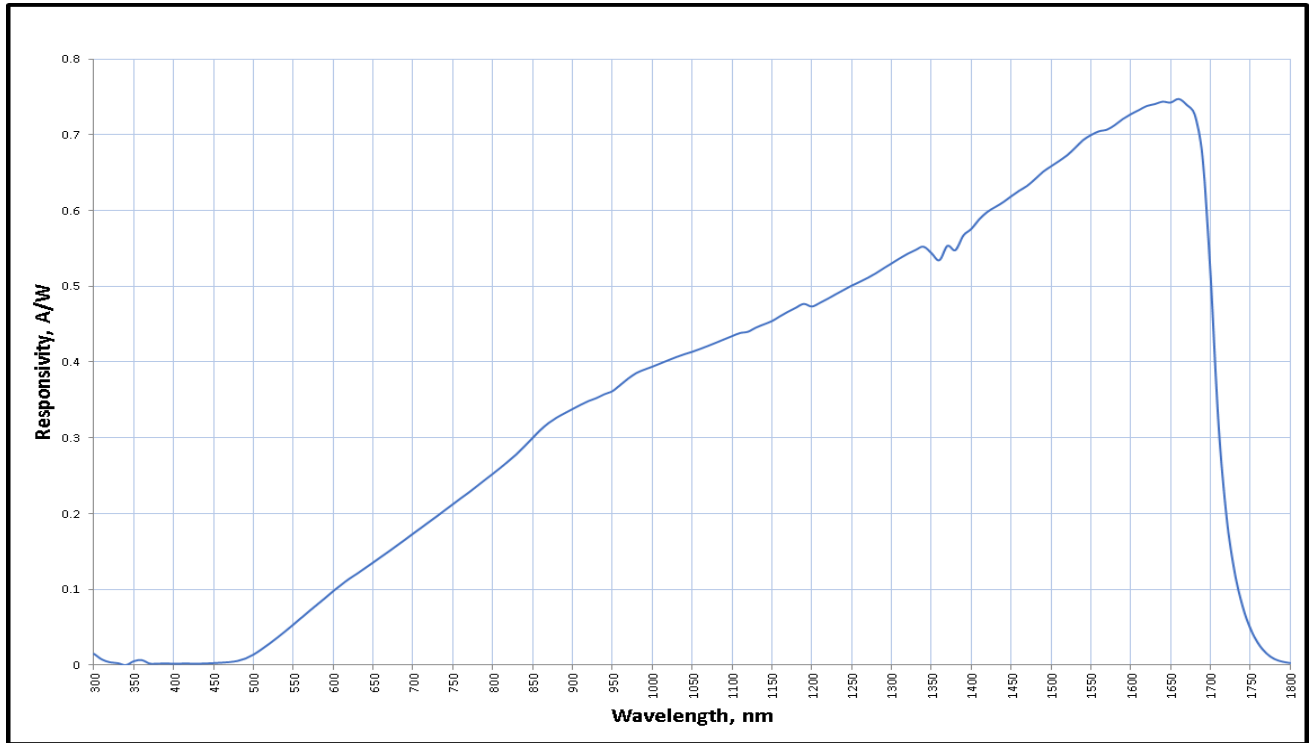
Unit: mm, Tolerance: ±0.2

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Unit: mm, Tolerance: ±0.2

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Peak Emission Wavelength: 468nm

The 468nm reflective sensor consists of a 468nm visible emitter and high sensitivity photo diode in the same package. The black molded housing reduces the effect of external ambient light. Custom emitter/detectors are available.

FEATURES

- > High Reliability
- > Compact (Φ4.0)
- > Short Detection Distance Optimum 0.5-1.5mm

APPLICATIONS

- > Card Reader
- > Bar-code Reader
- > Edge Sensing / Money-bill Reader



Absolute Maximum Ratings (Ta=25°C)



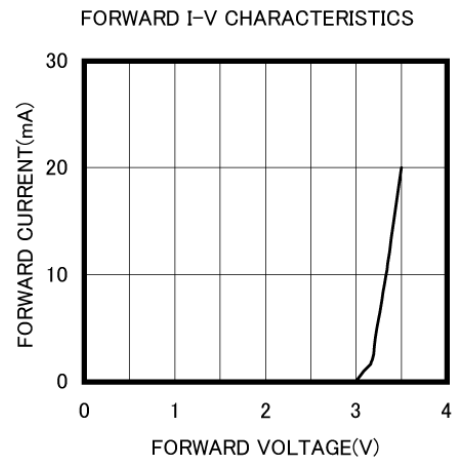
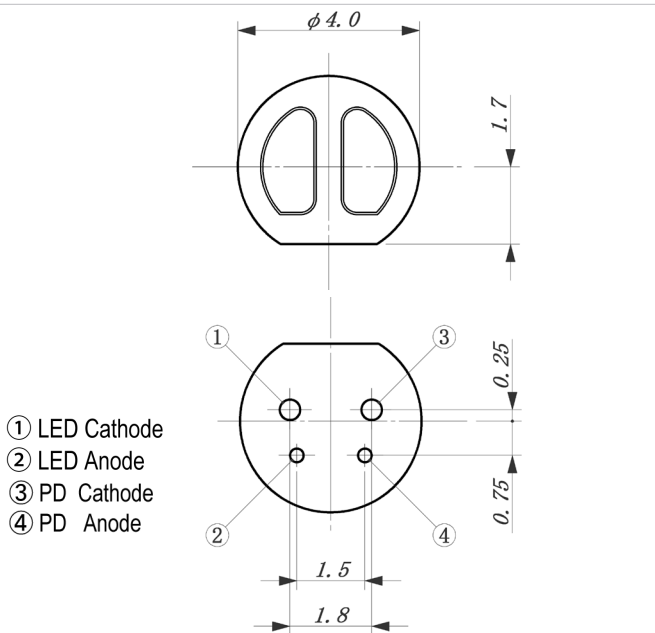
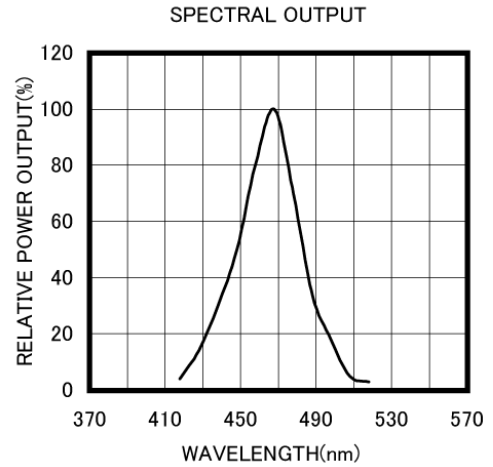
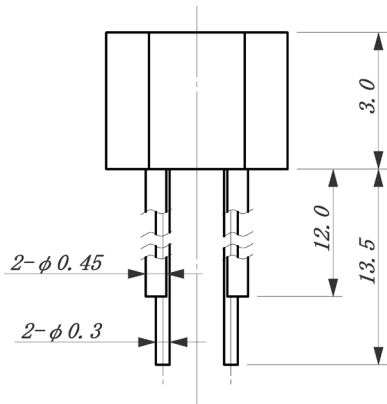
ITEMS	SYMBOL	RATINGS	UNIT
Forward Current (LED)	IF	20	mA
Pulse Forward Current (LED)*1	IFP	50	mA
Reverse Voltage (LED)	VR	5	V
Power Dissipation (LED)	PD	100	mW
Reverse Voltage (PD)	VR	30	V
Power Dissipation (PD)	PD	75	mW
Total Power Dissipation	Ptot	100	mW
Operating Temperature Range	Topr	-20 ~ +80	°C
Storage Temperature Range	Tstg	-30 ~ +100	°C

*1: Tw=10μsec, T=10msec.

Electrical & Optical Characteristics (Ta = 25°C)

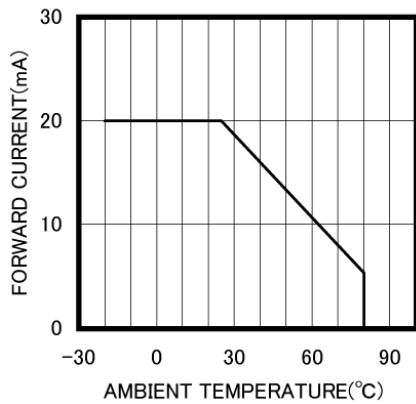
ITEMS	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNIT
Forward Voltage	VF	IF=20mA	--	3.5	4.0	V
Reverse Current	IR	VR=4V	--	--	10	μA
Peak Emission Wavelength	λp	IF=20mA	--	468	--	nm
Spectral Line Half Width	Δλ	IF=20mA	--	35	--	nm
Dark Current (I _{ceo})	ID	VR=10V	--	--	100	nA
Output Current	I _o	IF=10mA, VR=10V, d=1mm *	--	0.35	--	μA
Cross-talk Current	I _x	IF=10mA, VR=10V	--	--	10.0	nA
Rise Time (10 to 90%)	Tr	VR=10V, IF=10mA, RL=1KΩ	--	1.0	--	μS
Fall Time (10 to 90%)	Tf	VR=10V, IF=10mA, RL=1KΩ	--	1.0	--	μS
Lead Soldering Temperature*2	T _{ls}	--	--	--	260	°C

*1: Measured by reflecting with Aluminum evaporated mirror (d=1.00mm). *2: Time 5 Sec max, Position: Up to 3mm from the body.

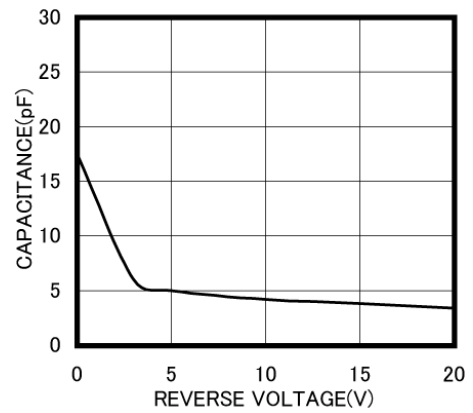


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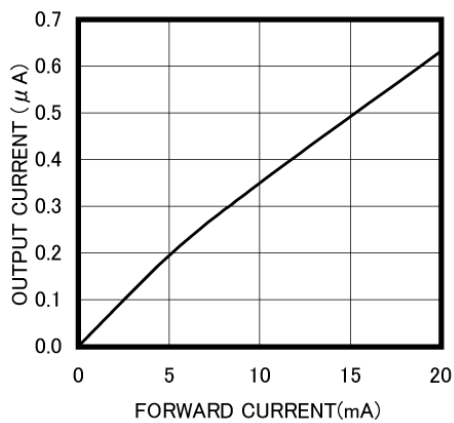
THERMAL DERATING CURVE



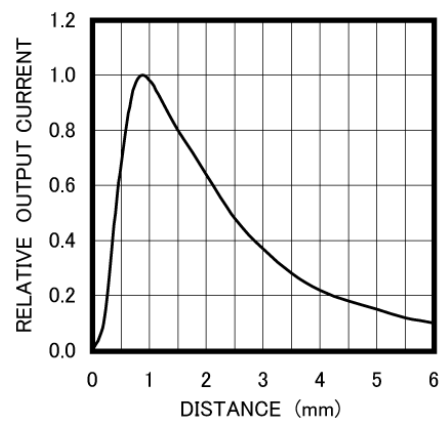
CAPACITANCE vs REVERSE VOLTAGE



IF VS Io @VR=10V



Io VS DISTANCE



The information contained herein is subject to change without notice.

2011-08-11

Peak Emission Wavelength: 1625nm

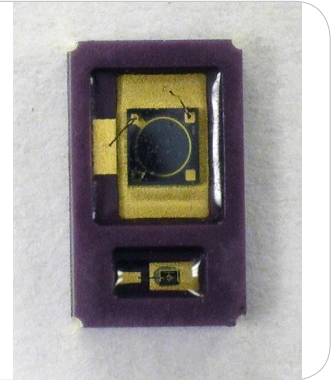
The MTRS5116C reflective sensor consists of a 1625nm infrared emitter and high sensitivity InGaAs photodiode in the same package. The black molded housing reduces the effect of external ambient light. Custom emitter/detectors are available.

FEATURES

- > 1.00mm Active Area
- > 5.1 x 3.3mm Surface Mount Package
- > Short Detection Distance Optimum 0.5-1.5mm

APPLICATIONS

- > Card Reader
- > Bar-code Reader
- > Edge Sensing / Money-bill Reader



Absolute Maximum Ratings (Ta=25°C)

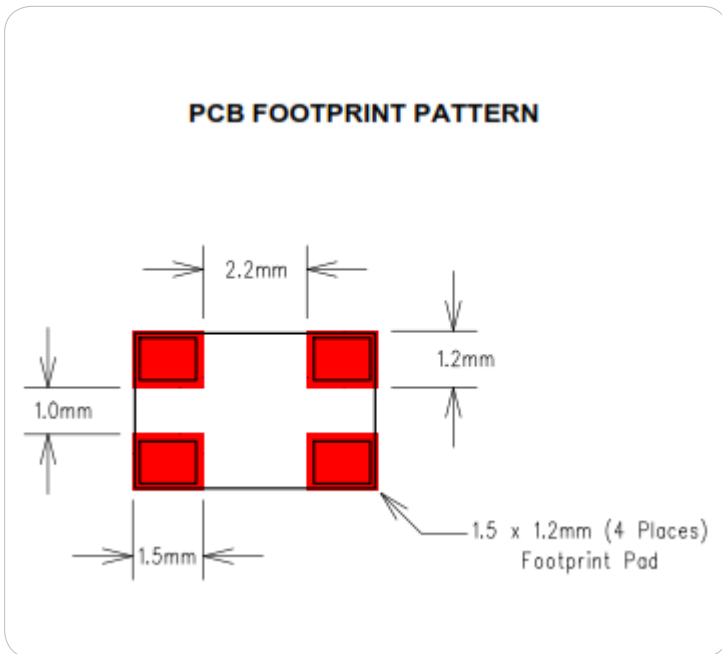
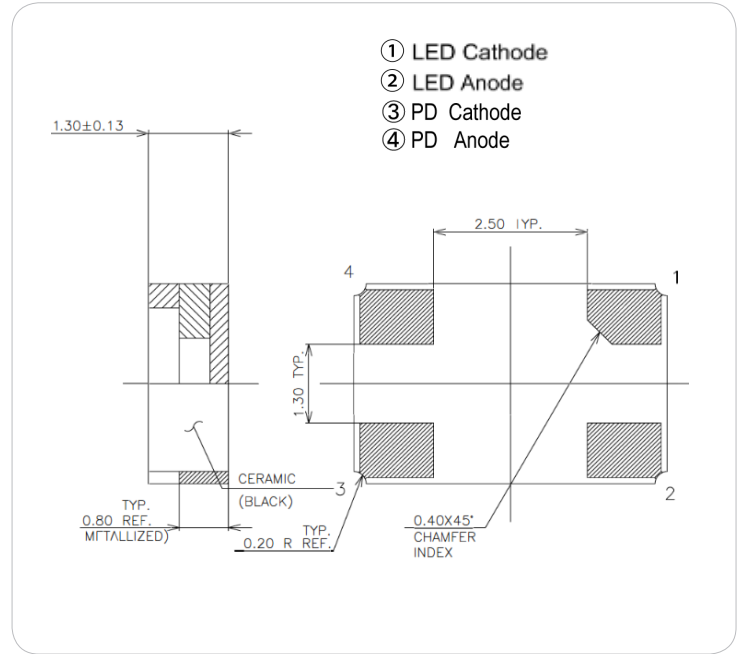
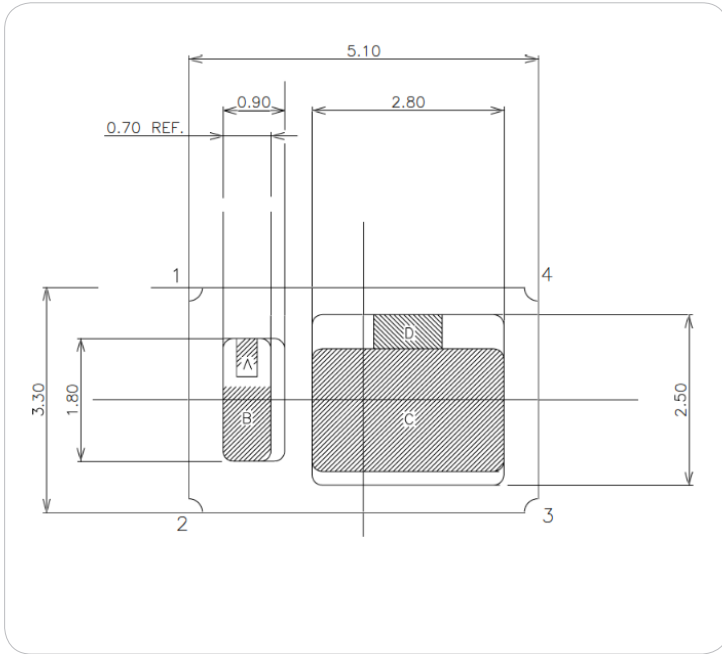


ITEMS	SYMBOL	RATINGS	UNIT
Forward Current (LED)	IF	40	mA
Pulse Forward Current (LED)*1	IFP	0.5	A
Reverse Voltage (LED)	VR	5	V
Power Dissipation (LED)	PD	100	mW
Reverse Voltage (PD)	VR (IR=10uA)	3	V
Reverse Current (LED)	IR (VR=5V)	10	uA
Operating Temperature Range	Topr	-20 to +80	°C
Storage Temperature Range	Tstg	-30 to +100	°C

*1: Tw=10µsec, T=10msec.

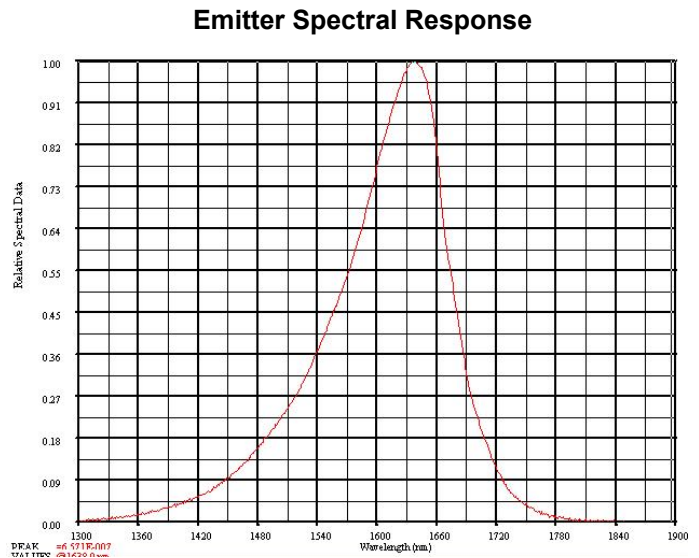
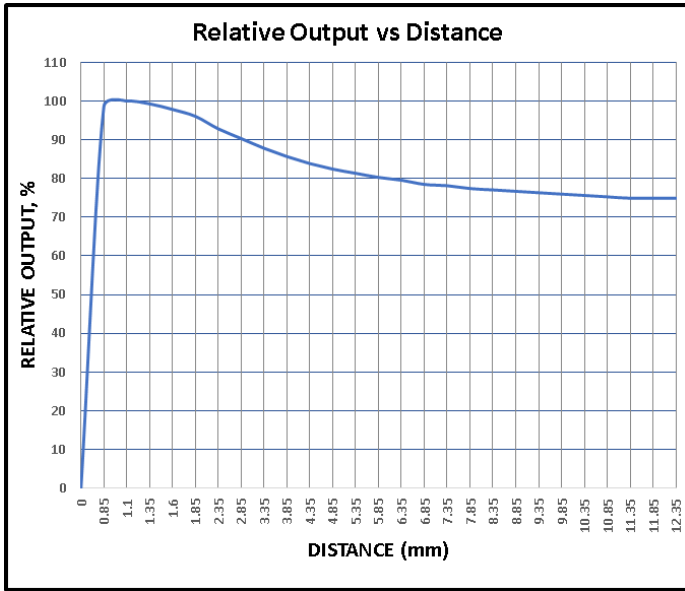
Electrical & Optical Characteristics (Ta = 25°C)

ITEMS	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNIT
Forward Voltage (LED)	VF	IF=20mA	--	0.87	--	V
Peak Emissions Wavelength (LED)	λ_p	IF=20mA	--	1625	--	nm
Spectral Line Half Width (LED)	$\Delta\lambda$	IF=20mA	--	120	--	nm
Power Output (LED)	PO	IF=20mA	--	0.71	--	mW
Reverse Dark Current (Iceo)	ID	VR=1V	--	2.0	--	uA
Light Current @1300nm	IL	$\lambda=1300\text{nm}$; VR=2V	--	180	--	uA
Shunt Resistance	RSH	VR=10mV	--	2	--	MΩ
Sensitivity Range	V	VR=0V	600	--	1750	nm
Responsivity	R	$\lambda=1550\text{nm}$	--	0.70	--	A/W
Quantum Efficiency	QE	$\lambda=1660\text{nm}$	--	55	--	%
Total Capacitance	CT	VR=0V	--	60	--	pF
Rise/Fall Time (10 to 90%)	Tr, Tf	VR=10V, IF=20mA, RL=1KΩ	--	--	--	uS



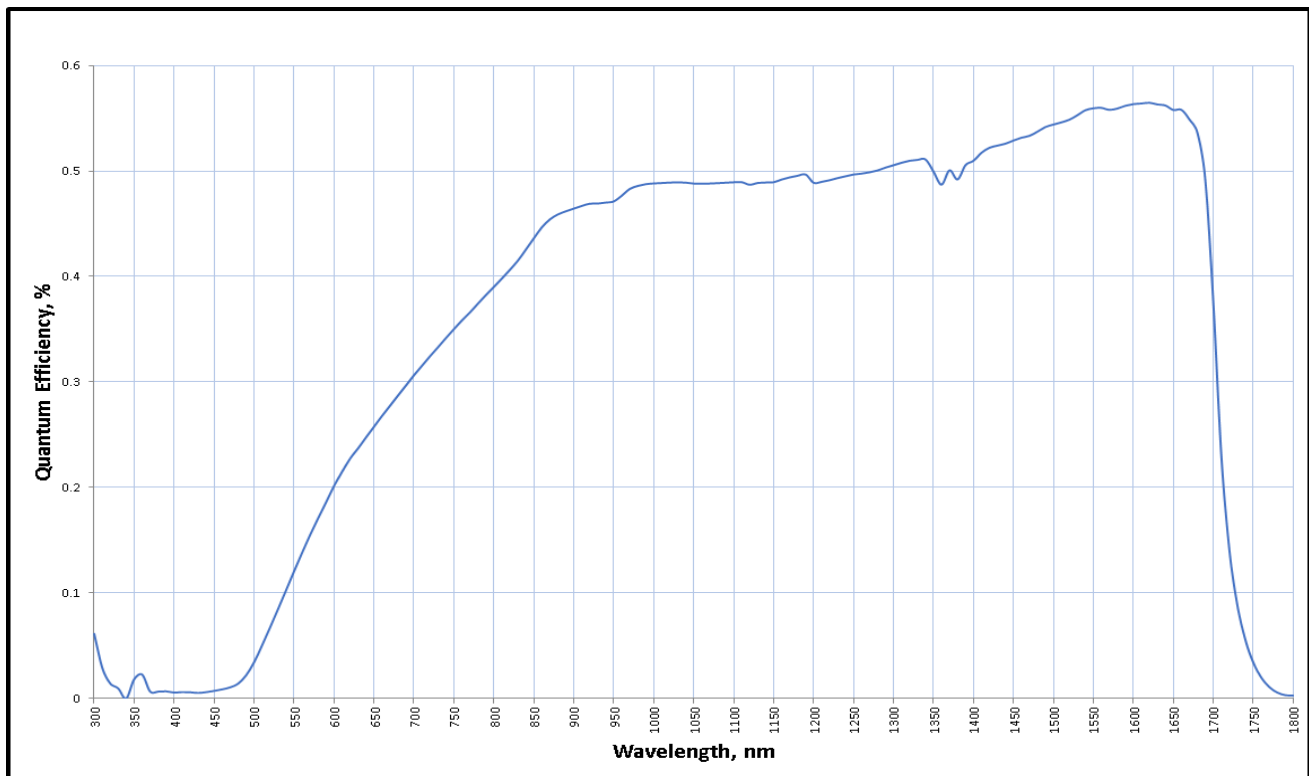
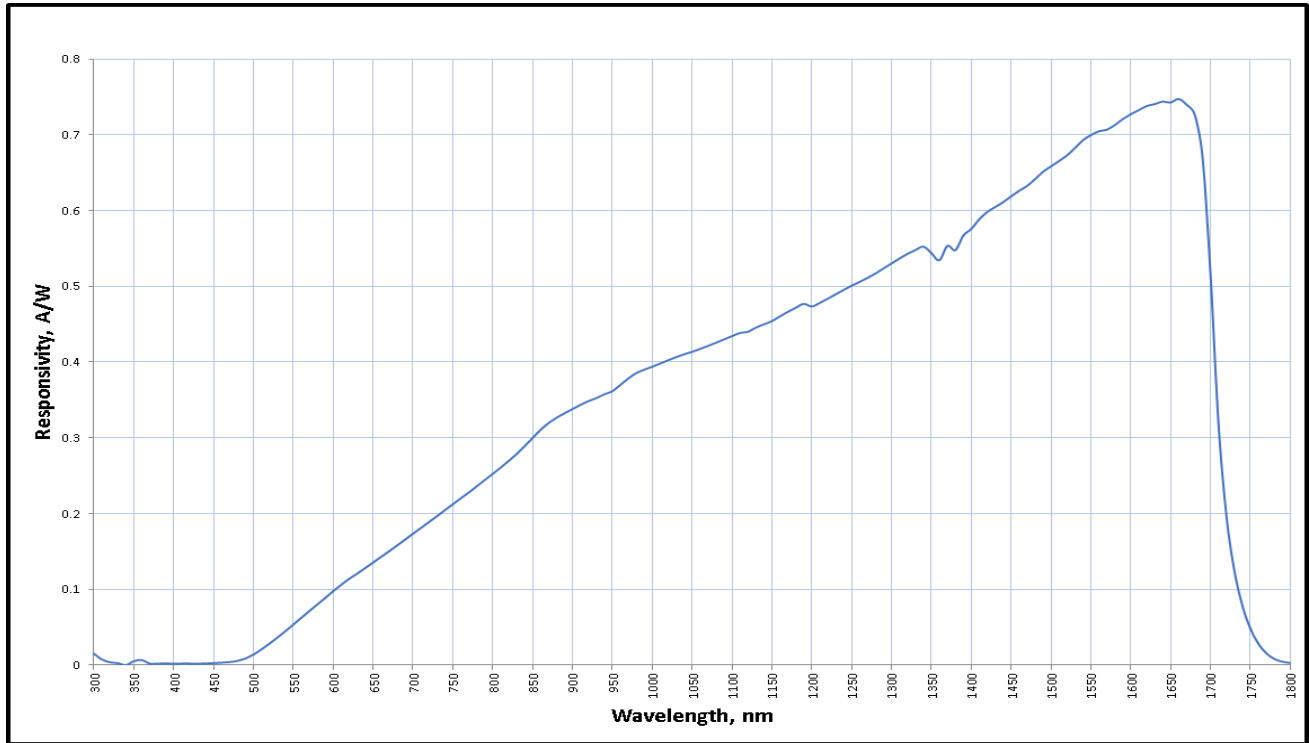
Unit: mm, Tolerance: ±0.2

2021-05-27



Unit: mm, Tolerance: ±0.2

2021-05-27



2021-05-27

Peak Emission Wavelength: 520nm

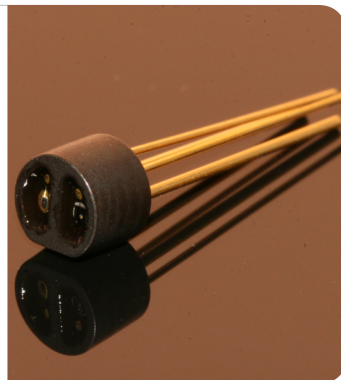
The 520nm reflective sensor consists of a 520nm visible emitter and high sensitivity photo diode in the same package. The black molded housing reduces the effect of external ambient light. Custom emitter/detectors are available.

FEATURES

- > High Reliability
- > Compact (Φ4.0)
- > Short Detection Distance Optimum 0.5-1.5mm

APPLICATIONS

- > Card Reader
- > Bar-code Reader
- > Edge Sensing / Money-bill Reader



Absolute Maximum Ratings (Ta=25°C)



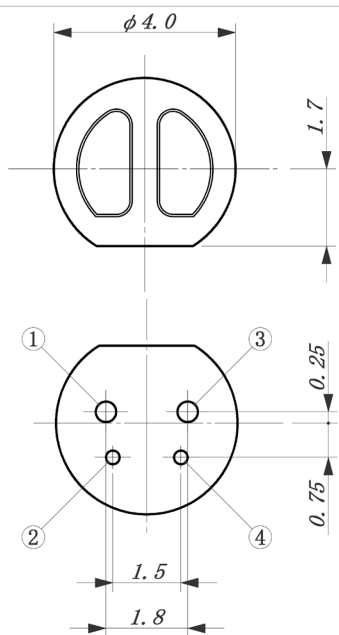
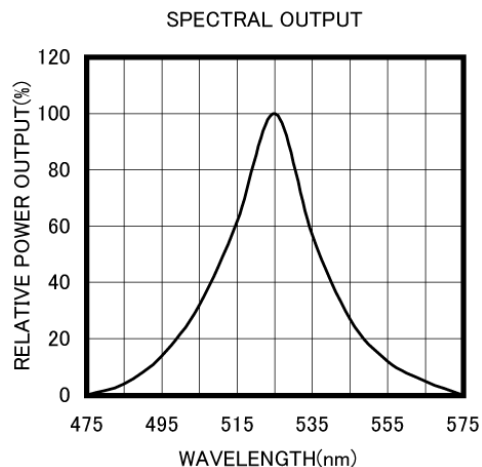
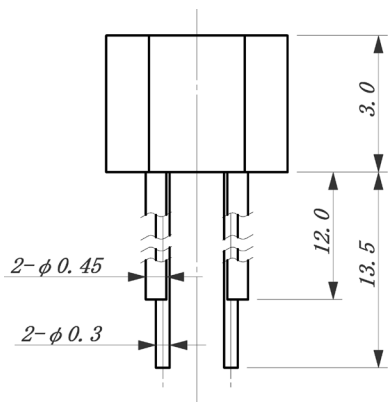
ITEMS	SYMBOL	RATINGS	UNIT
Forward Current (LED)	IF	20	mA
Pulse Forward Current (LED)*1	IFP	50	mA
Reverse Voltage (LED)	VR	5	V
Power Dissipation (LED)	PD	100	mW
Reverse Voltage (PD)	VR	30	V
Power Dissipation (PD)	PD	75	mW
Total Power Dissipation	Ptot	100	mW
Operating Temperature Range	Topr	-20 ~ +80	°C
Storage Temperature Range	Tstg	-30 ~ +100	°C

*1: Tw=10μsec, T=10msec.

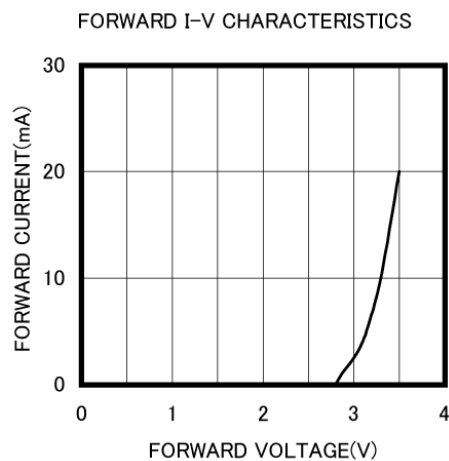
Electrical & Optical Characteristics (Ta = 25°C)

ITEMS	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNIT
Forward Voltage	VF	IF=20mA	--	3.5	4.0	V
Reverse Current	IR	VR=4V	--	--	10	μA
Peak Emission Wavelength	λp	IF=20mA	--	520	--	nm
Spectral Line Half Width	Δλ	IF=20mA	--	45	--	nm
Dark Current (I _{ceo})	ID	VR=10V	--	--	100	nA
Output Current	I _o	IF=10mA, VR=10V, d=1mm *	--	0.3	--	μA
Cross-talk Current	I _x	IF=10mA, VR=10V	--	--	10.0	nA
Rise Time (10 to 90%)	Tr	VR=10V, IF=10mA, RL=1KΩ	--	1.0	--	μS
Fall Time (10 to 90%)	Tf	VR=10V, IF=10mA, RL=1KΩ	--	1.0	--	μS
Lead Soldering Temperature*2	T _{ls}	--	--	--	--	°C

*1: Measured by reflecting with Aluminum evaporated mirror (d=1.00mm). *2: Time 5 Sec max, Position: Up to 3mm from the body.

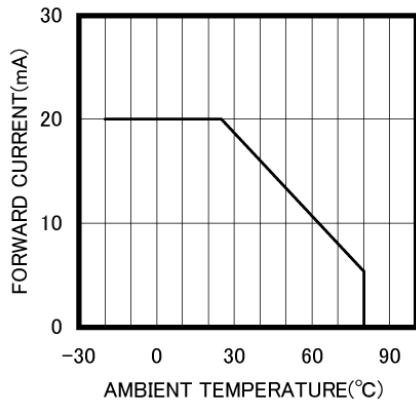


- ① LED Cathode
- ② LED Anode
- ③ PD Cathode
- ④ PD Anode

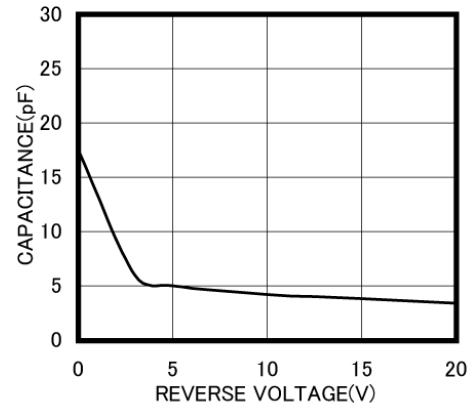


Unit: mm, Tolerance: ±0.2

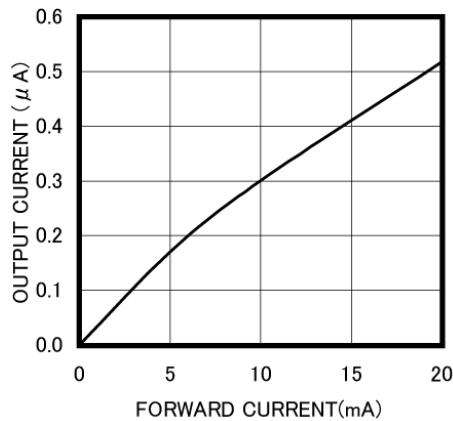
THERMAL DERATING CURVE



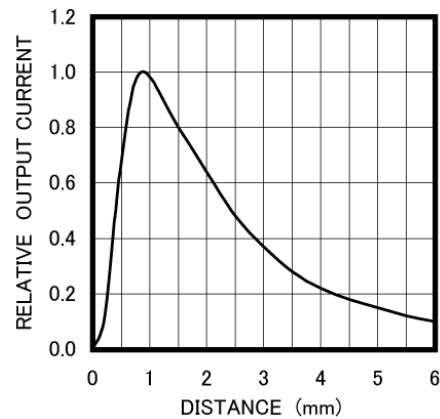
CAPACITANCE vs REVERSE VOLTAGE



IF VS Io @VR=10V



Io VS DISTANCE



The information contained herein is subject to change without notice.

2011-08-11

Peak Emission Wavelength: 574nm

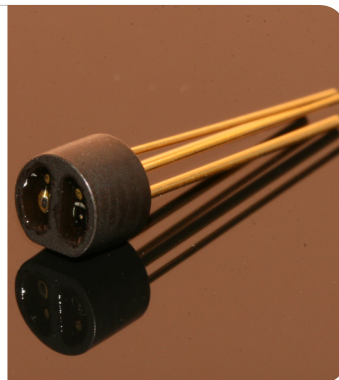
The 574nm reflective sensor consists of a 574nm visible emitter and high sensitivity photo transistor in the same package. The black molded housing reduces the effect of external ambient light. Custom emitter/detectors are available.

FEATURES

- > High Reliability
- > Compact (Φ4.0)
- > Short Detection Distance Optimum 0.5-1.5mm

APPLICATIONS

- > Card Reader
- > Bar-code Reader
- > Edge Sensing / Money-bill Reader



Absolute Maximum Ratings (Ta=25°C)



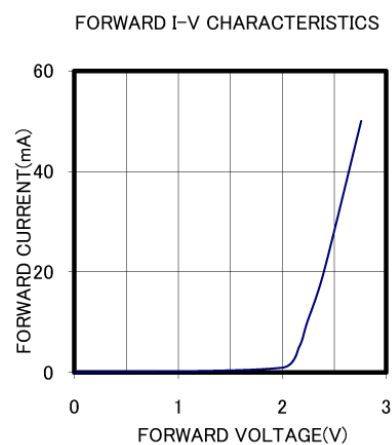
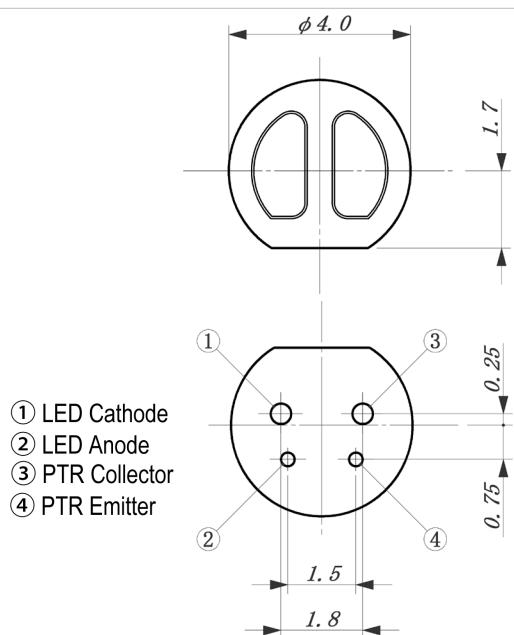
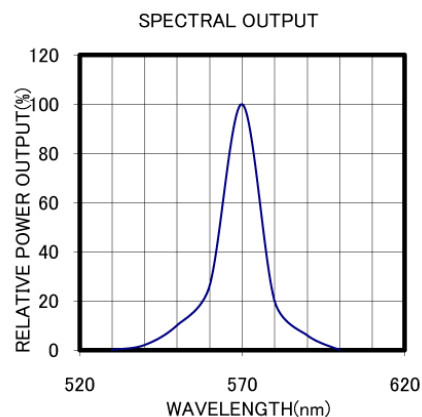
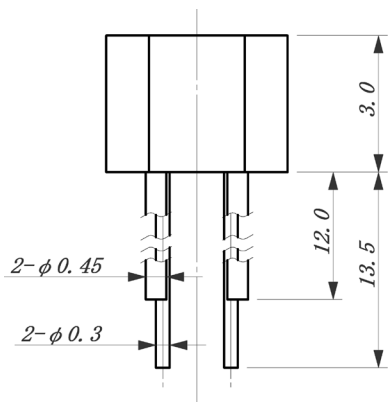
ITEMS	SYMBOL	RATINGS	UNIT
Forward Current (LED)	IF	30	mA
Pulse Forward Current (LED)*1	IFP	0.1	A
Reverse Voltage (LED)	VR	5	V
Power Dissipation (LED)	PD	80	mW
Collector-Emitter Voltage (PT)	Vce	20	V
Emitter-Collector Voltage (PT)	Vec	5	V
Collector Current (PT)	Ic	50	mA
Collector Power Dissipation (PT)	PC	75	mW
Total Power Dissipation	Ptot	100	mW
Operating Temperature Range	Topr	-20 ~ +80	°C

*1: Tw=10μsec, T=10msec.

Electrical & Optical Characteristics (Ta = 25°C)

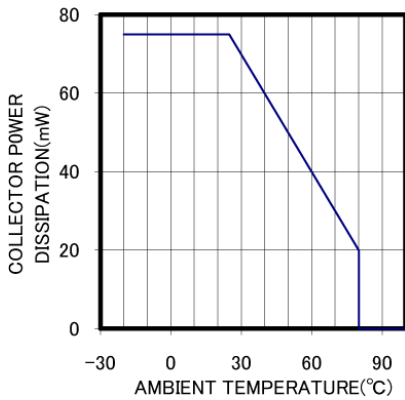
ITEMS	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNIT
Forward Voltage	VF	IF=20mA	--	2.4	2.8	V
Reverse Current	IR	VR=5V	--	--	10	μA
Peak Emission Wavelength	λp	IF=20mA	--	574	--	nm
Spectral Line Half Width	Δλ	IF=20mA	--	11	--	nm
Dark Current (Iceo)	ID	Vce=10V	--	--	100	nA
Output Current	Io	IF=20mA, Vce=10V, d=1mm *	50	150	--	μA
Cross-talk Current	Ix	IF=20mA, Vce=10V	--	--	1.0	nA
Rise Time (10 to 90%)	Tr	Vcc=5V, Io=0.1mA, RL=1KΩ	--	20	--	μS
Fall Time (10 to 90%)	Tf	Vcc=5V, Io=0.1mA, RL=1KΩ	--	30	--	μS
Lead Soldering Temperature*2	TIs	--	--	--	260	°C

*1: Measured by reflecting with Aluminum evaporated mirror (d=1.00mm). *2: Time 5 Sec max, Position: Up to 3mm from the body.

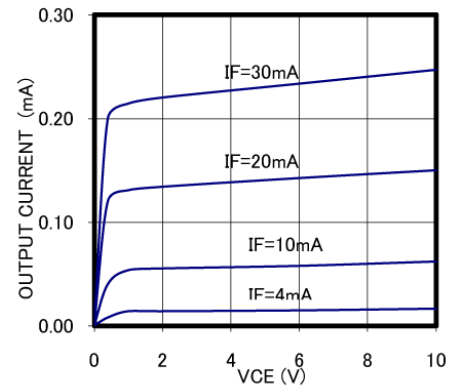


Unit: mm, Tolerance: ±0.2

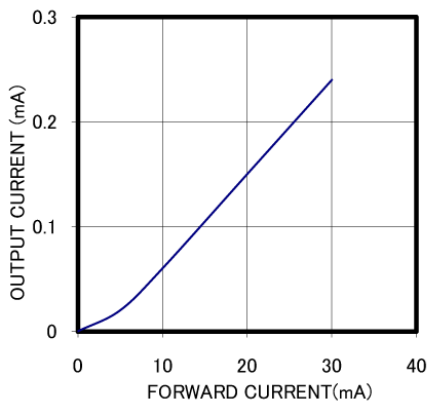
THERMAL DERATING CURVE



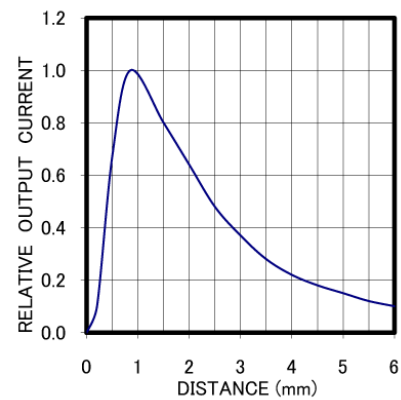
I_o vs VCE



I_F VS I_o
VCE=10V



I_o VS DISTANCE



The information contained herein is subject to change without notice.

2011-08-11

Peak Emission Wavelength: 574nm

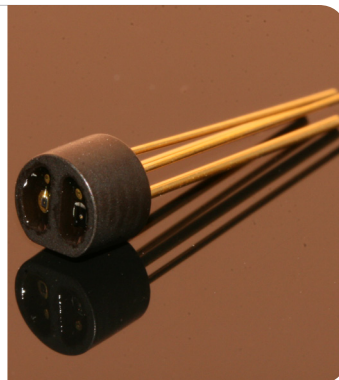
The 574nm reflective sensor consists of a 574nm visible emitter and high sensitivity photo diode in the same package. The black molded housing reduces the effect of external ambient light. Custom emitter/detectors are available.

FEATURES

- > High Reliability
- > Compact (Φ4.0)
- > Short Detection Distance Optimum 0.5-1.5mm

APPLICATIONS

- > Card Reader
- > Bar-code Reader
- > Edge Sensing / Money-bill Reader



Absolute Maximum Ratings (Ta=25°C)



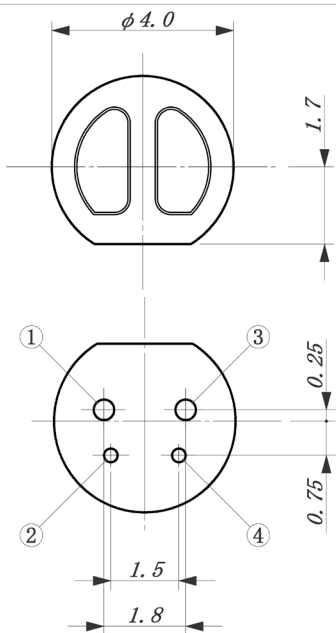
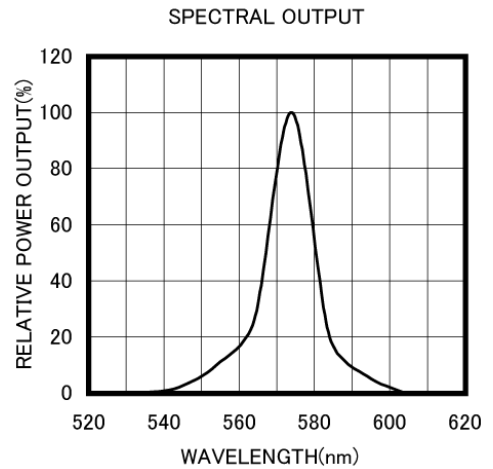
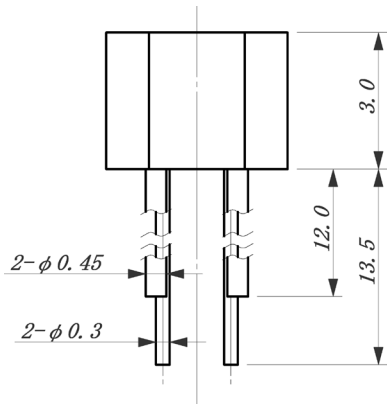
ITEMS	SYMBOL	RATINGS	UNIT
Forward Current (LED)	IF	30	mA
Pulse Forward Current (LED)*1	IFP	50	mA
Reverse Voltage (LED)	VR	5	V
Power Dissipation (LED)	PD	100	mW
Reverse Voltage (PD)	VR	30	V
Power Dissipation (PD)	PD	75	mW
Total Power Dissipation	Ptot	100	mW
Operating Temperature Range	Topr	-20 ~ +80	°C
Storage Temperature Range	Tstg	-30 ~ +100	°C

*1: Tw=10μsec, T=10msec.

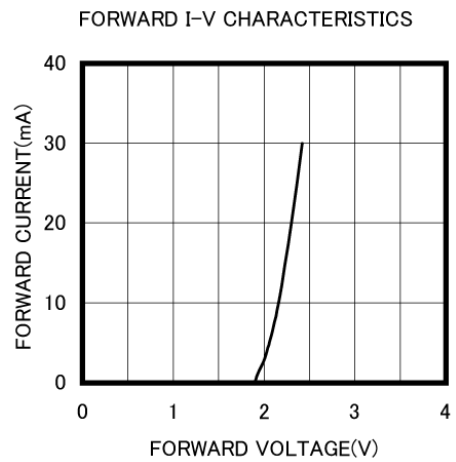
Electrical & Optical Characteristics (Ta = 25°C)

ITEMS	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNIT
Forward Voltage	VF	IF=20mA	--	2.4	2.8	V
Reverse Current	IR	VR=4V	--	--	10	μA
Peak Emission Wavelength	λp	IF=20mA	--	574	--	nm
Spectral Line Half Width	Δλ	IF=20mA	--	11	--	nm
Dark Current (I _{ceo})	ID	VR=10V	--	--	100	nA
Output Current	I _o	IF=20mA, VR=10V, d=1mm *	--	0.18	--	μA
Cross-talk Current	I _x	IF=20mA, VR=10V	--	--	10.0	nA
Rise Time (10 to 90%)	Tr	VR=10V, IF=20mA, RL=1KΩ	--	1.0	--	μS
Fall Time (10 to 90%)	Tf	VR=10V, IF=20mA, RL=1KΩ	--	1.0	--	μS
Lead Soldering Temperature*2	T _{ls}	--	--	--	260	°C

*1: Measured by reflecting with Aluminum evaporated mirror (d=1.00mm). *2: Time 5 Sec max, Position: Up to 3mm from the body.

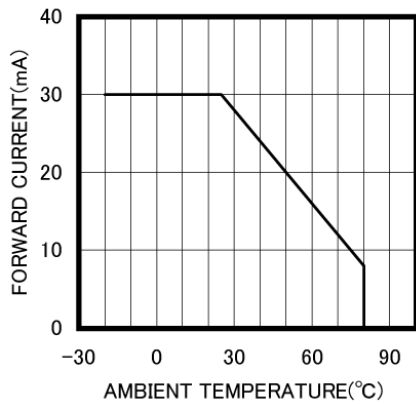


- ① LED Cathode
- ② LED Anode
- ③ PD Cathode
- ④ PD Anode

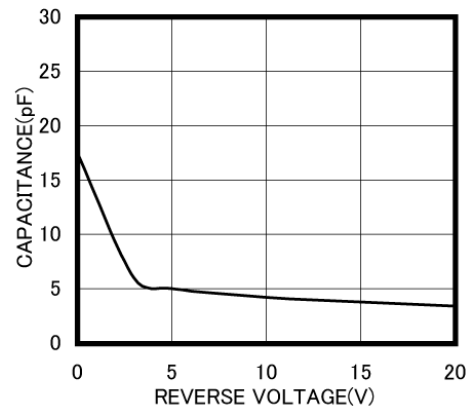


Unit: mm, Tolerance: ±0.2

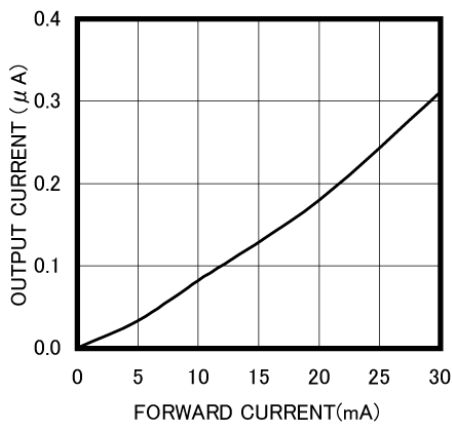
THERMAL DERATING CURVE



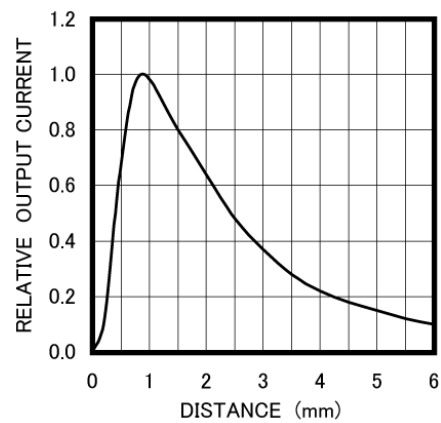
CAPACITANCE vs REVERSE VOLTAGE



IF VS I_o @VR=10V



I_o VS DISTANCE



Peak Emission Wavelength: 590nm

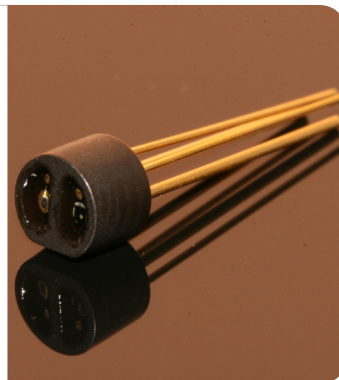
The 590nm reflective sensor consists of a 590nm visible emitter and high sensitivity photo diode in the same package. The black molded housing reduces the effect of external ambient light. Custom emitter/detectors are available.

FEATURES

- > High Reliability
- > Compact (Φ4.0)
- > Short Detection Distance Optimum 0.5-1.5mm

APPLICATIONS

- > Card Reader
- > Bar-code Reader
- > Edge Sensing / Money-bill Reader



Absolute Maximum Ratings (Ta=25°C)



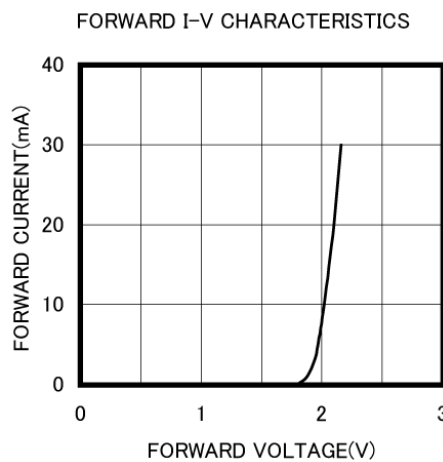
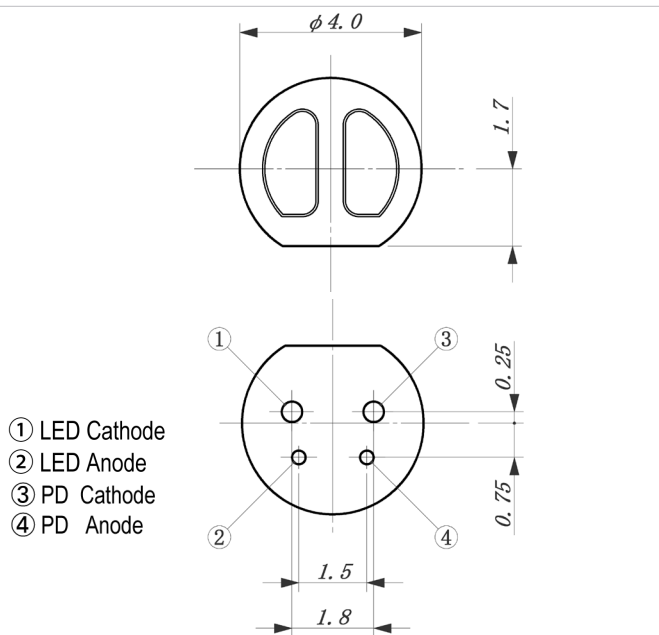
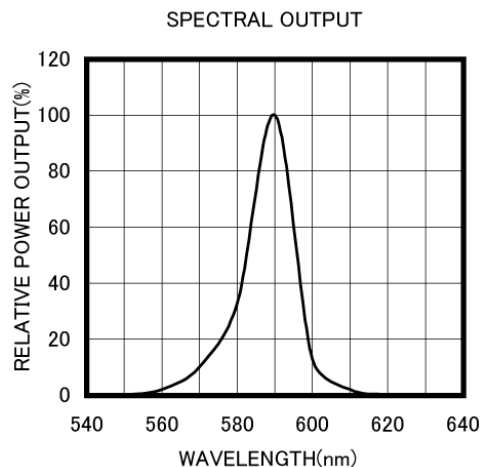
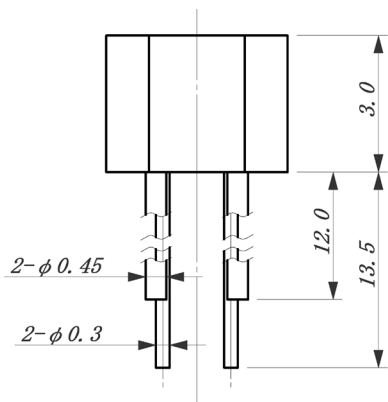
ITEMS	SYMBOL	RATINGS	UNIT
Forward Current (LED)	IF	30	mA
Pulse Forward Current (LED)*1	IFP	50	mA
Reverse Voltage (LED)	VR	5	V
Power Dissipation (LED)	PD	100	mW
Reverse Voltage (PD)	VR	30	V
Power Dissipation (PD)	PD	75	mW
Total Power Dissipation	Ptot	100	mW
Operating Temperature Range	Topr	-20 ~ +80	°C
Storage Temperature Range	Tstg	-30 ~ +100	°C

*1: Tw=10μsec, T=10msec.

Electrical & Optical Characteristics (Ta = 25°C)

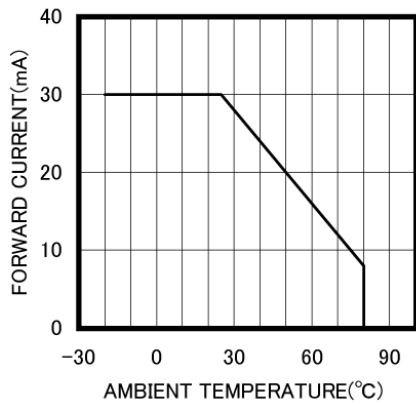
ITEMS	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNIT
Forward Voltage	VF	IF=20mA	--	2.0	2.5	V
Reverse Current	IR	VR=4V	--	--	10	μA
Peak Emission Wavelength	λp	IF=20mA	--	590	--	nm
Spectral Line Half Width	Δλ	IF=20mA	--	13	--	nm
Dark Current (I _{ceo})	ID	VR=10V	--	--	100	nA
Output Current	I _o	IF=20mA, VR=10V, d=1mm *	--	0.3	--	μA
Cross-talk Current	I _x	IF=20mA, VR=10V	--	--	10.0	nA
Rise Time (10 to 90%)	Tr	VR=10V, IF=20mA, RL=1KΩ	--	1.0	--	μS
Fall Time (10 to 90%)	Tf	VR=10V, IF=20mA, RL=1KΩ	--	1.0	--	μS
Lead Soldering Temperature*2	T _{ls}	--	--	--	260	°C

*1: Measured by reflecting with Aluminum evaporated mirror (d=1.00mm). *2: Time 5 Sec max, Position: Up to 3mm from the body.

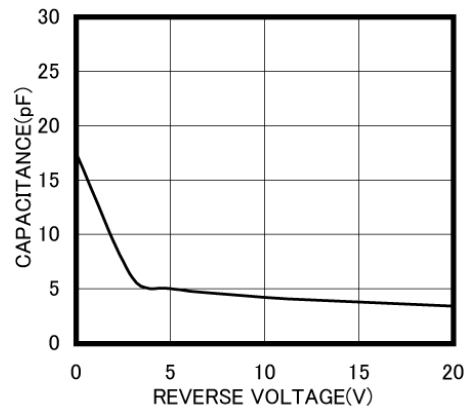


Unit: mm, Tolerance: ± 0.2

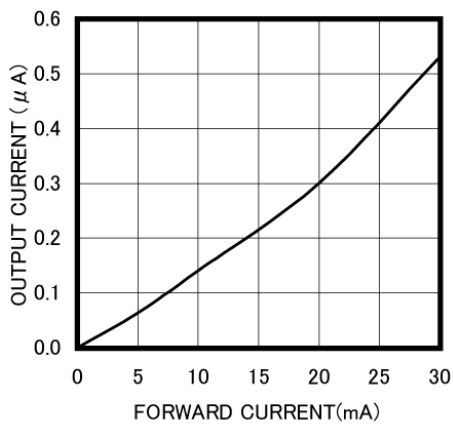
THERMAL DERATING CURVE



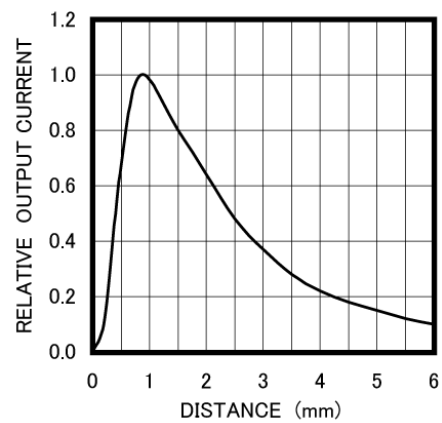
CAPACITANCE vs REVERSE VOLTAGE



IF VS I_o @VR=10V



I_o VS DISTANCE



The information contained herein is subject to change without notice.

2011-08-11

Peak Emission Wavelength: 1430nm

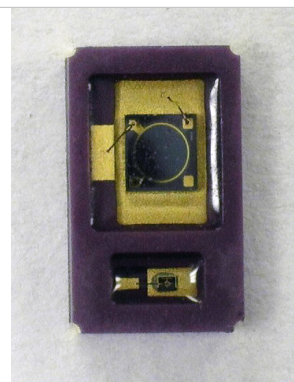
The MTRS6014C reflective sensor consists of a 1430nm infrared emitter and high sensitivity InGaAs photodiode in the same package. The black molded housing reduces the effect of external ambient light. Custom emitter/detectors are available.

FEATURES

- > 1.00 mm Active Area
- > 5.1 x 3.3mm Surface Mount Package
- > Short Detection Distance Optimum 0.5-1.5mm

APPLICATIONS

- > Card Reader
- > Bar-code Reader
- > Edge Sensing / Money-bill Reader



Absolute Maximum Ratings (Ta=25°C)

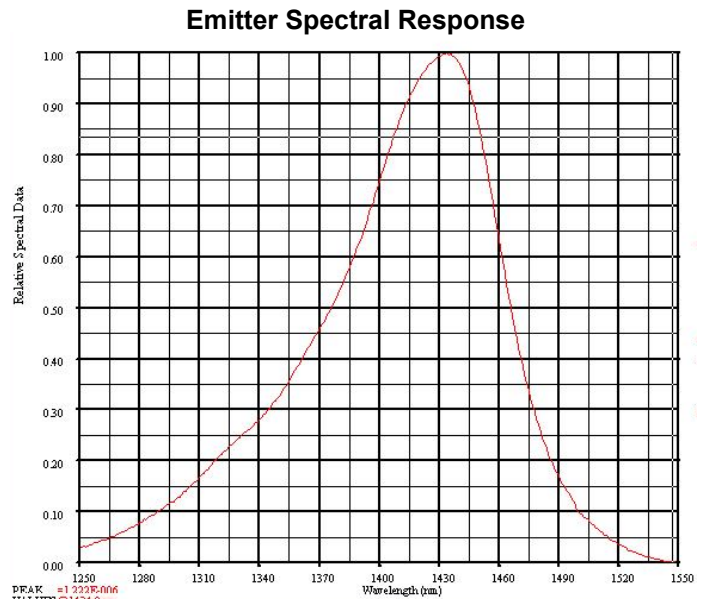
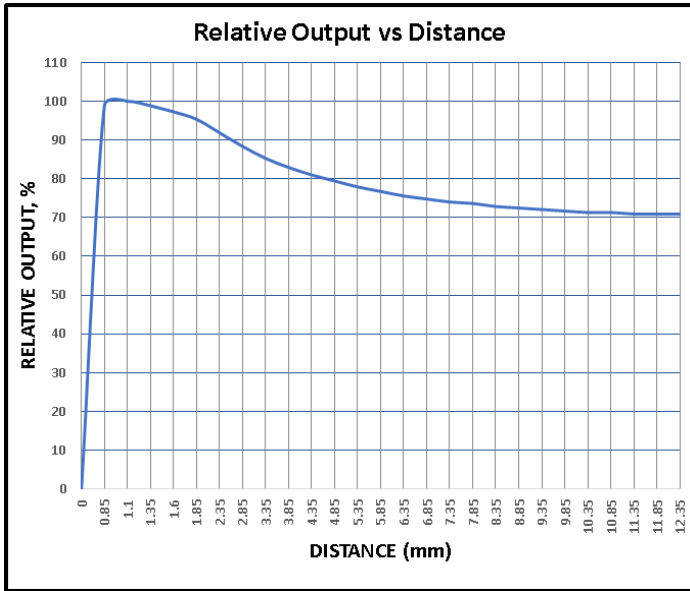


ITEMS	SYMBOL	RATINGS	UNIT
Forward Current (LED)	IF	40	mA
Pulse Forward Current (LED)*1	IFP	0.5	A
Reverse Voltage (LED)	VR	5	V
Power Dissipation (LED)	PD	100	mW
Reverse Voltage (PD)	VR (IR=10uA)	3	V
Reverse Current (LED)	IR (VR=5V)	10	uA
Operating Temperature Range	Topr	-20 to +80	°C
Storage Temperature Range	Tstg	-30 to +100	°C

*1: Tw=10µsec, T=10msec.

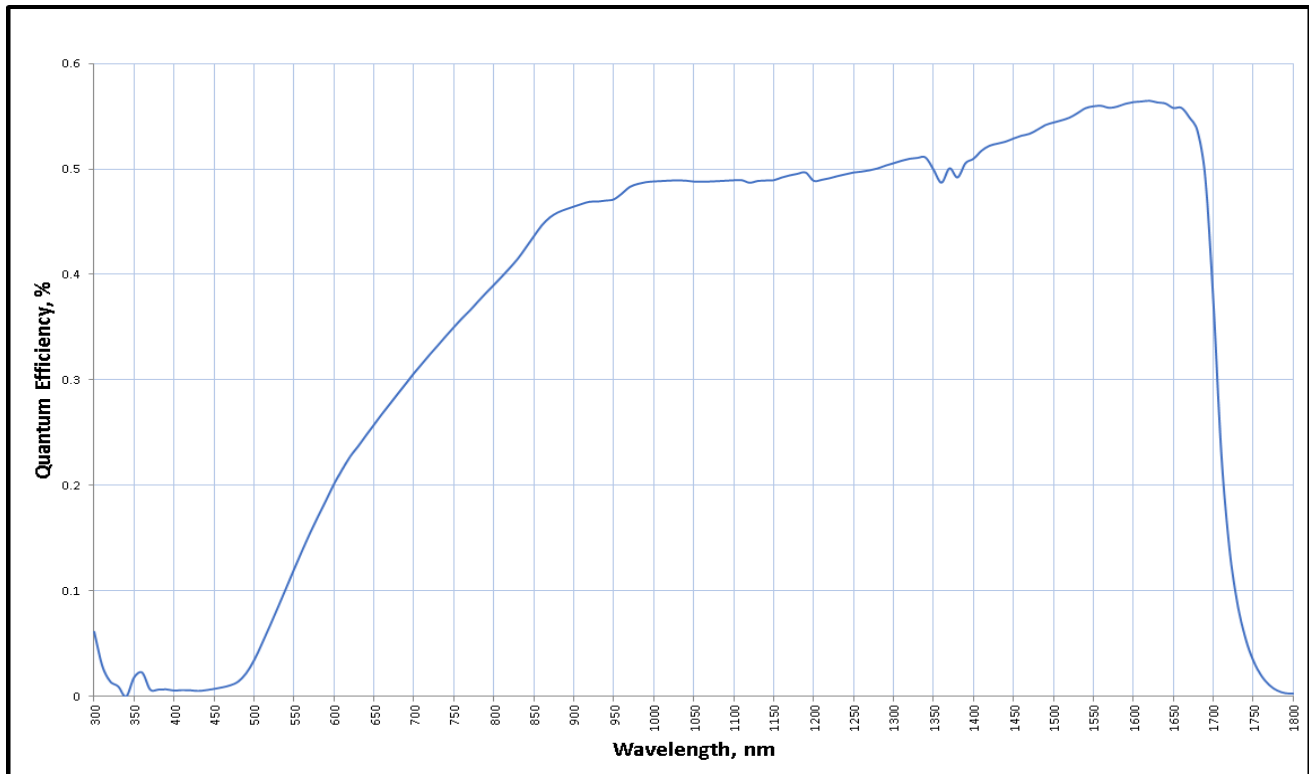
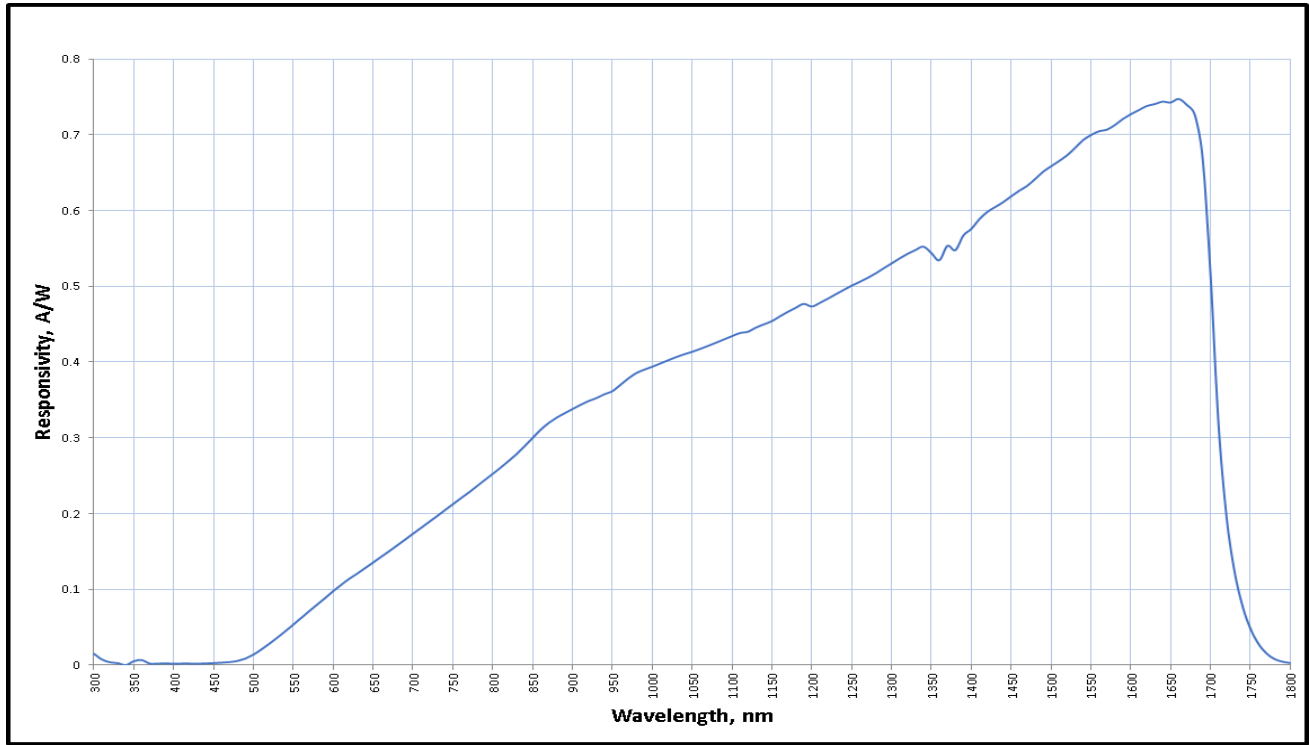
Electrical & Optical Characteristics (Ta = 25°C)

ITEMS	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNIT
Forward Voltage (LED)	VF	IF=20mA	--	0.95	--	V
Peak Emissions Wavelength (LED)	λ_p	IF=20mA	--	1430	--	nm
Spectral Line Half Width (LED)	$\Delta\lambda$	IF=20mA	--	90	--	nm
Power Output (LED)	PO	IF=20mA	--	1.4	--	mW
Reverse Dark Current (Iceo)	ID	VR=1V	--	2.0	--	uA
Light Current @1300nm	IL	$\lambda=1300\text{nm}$; VR=2V	--	180	--	uA
Shunt Resistance	RSH	VR=10mV	--	2	--	MΩ
Sensitivity Range	V	VR=0V	600	--	1750	nm
Responsivity	R	$\lambda=1550\text{nm}$	--	0.70	--	A/W
Quantum Efficiency	QE	$\lambda=1660\text{nm}$	--	55	--	%
Total Capacitance	CT	VR=0V	--	60	--	pF
Rise/Fall Time (10 to 90%)	Tr, Tf	VR=10V, IF=20mA, RL=1KΩ	--	--	--	uS



Unit: mm, Tolerance: ±0.2

2021-05-27



2021-05-27

Peak Emission Wavelength: 610nm

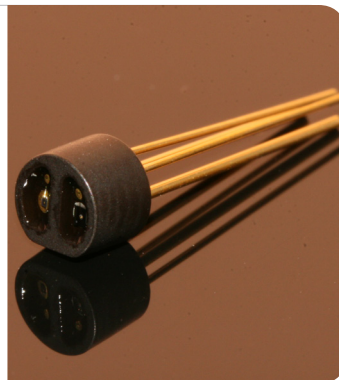
The 610nm reflective sensor consists of a 610nm visible emitter and high sensitivity photo diode in the same package. The black molded housing reduces the effect of external ambient light. Custom emitter/detectors are available.

FEATURES

- > High Reliability
- > Compact (Φ4.0)
- > Short Detection Distance Optimum 0.5-1.5mm

APPLICATIONS

- > Card Reader
- > Bar-code Reader
- > Edge Sensing / Money-bill Reader



Absolute Maximum Ratings (Ta=25°C)



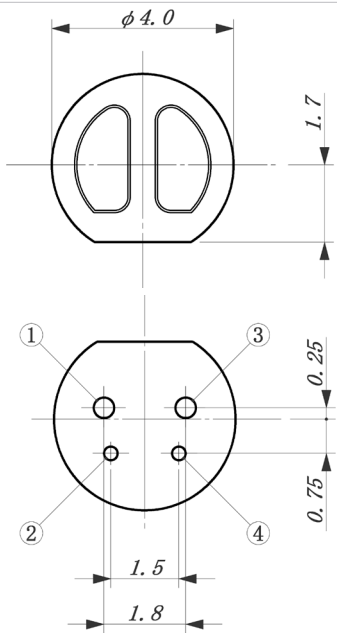
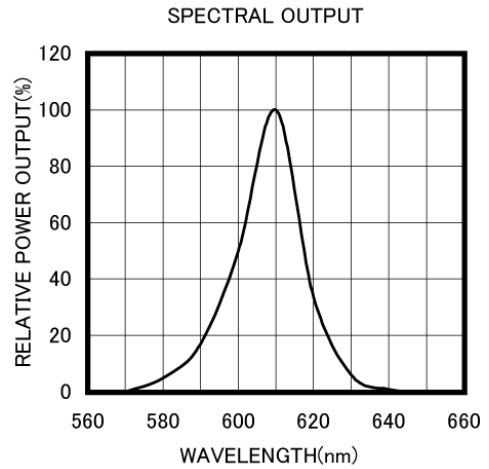
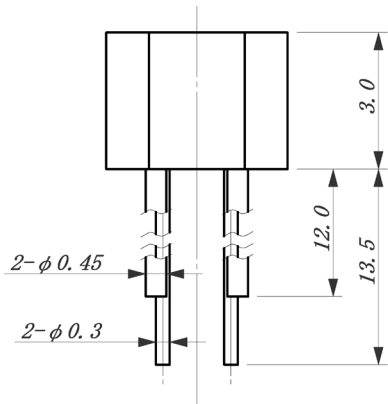
ITEMS	SYMBOL	RATINGS	UNIT
Forward Current (LED)	IF	30	mA
Pulse Forward Current (LED)*1	IFP	50	mA
Reverse Voltage (LED)	VR	5	V
Power Dissipation (LED)	PD	100	mW
Reverse Voltage (PD)	VR	30	V
Power Dissipation (PD)	PD	75	mW
Total Power Dissipation	Ptot	100	mW
Operating Temperature Range	Topr	-20 ~ +80	°C
Storage Temperature Range	Tstg	-30 ~ +100	°C

*1: Tw=10μsec, T=10msec.

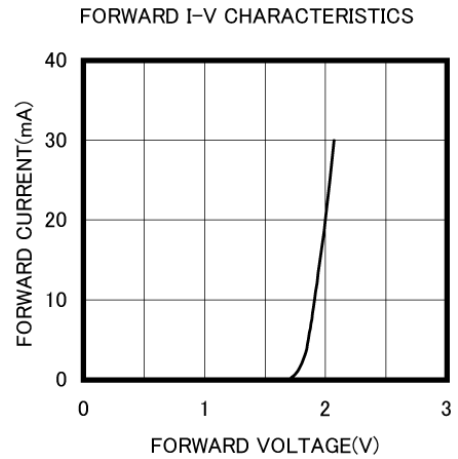
Electrical & Optical Characteristics (Ta = 25°C)

ITEMS	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNIT
Forward Voltage	VF	IF=20mA	--	2.0	2.5	V
Reverse Current	IR	VR=4V	--	--	10	μA
Peak Emission Wavelength	λp	IF=20mA	--	610	--	nm
Spectral Line Half Width	Δλ	IF=20mA	--	17	--	nm
Dark Current (I _{ceo})	ID	VR=10V	--	--	100	nA
Output Current	I _o	IF=20mA, VR=10V, d=1mm *	--	0.55	--	μA
Cross-talk Current	I _x	IF=20mA, VR=10V	--	--	10.0	nA
Rise Time (10 to 90%)	Tr	VR=10V, IF=20mA, RL=1KΩ	--	1.0	--	μS
Fall Time (10 to 90%)	Tf	VR=10V, IF=20mA, RL=1KΩ	--	1.0	--	μS
Lead Soldering Temperature*2	T _{ls}	--	--	--	260	°C

*1: Measured by reflecting with Aluminum evaporated mirror (d=1.00mm). *2: Time 5 Sec max, Position: Up to 3mm from the body.

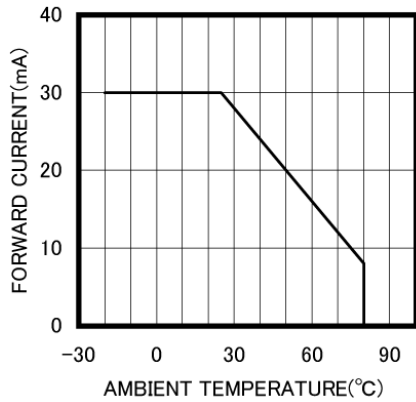


- ① LED Cathode
- ② LED Anode
- ③ PD Cathode
- ④ PD Anode

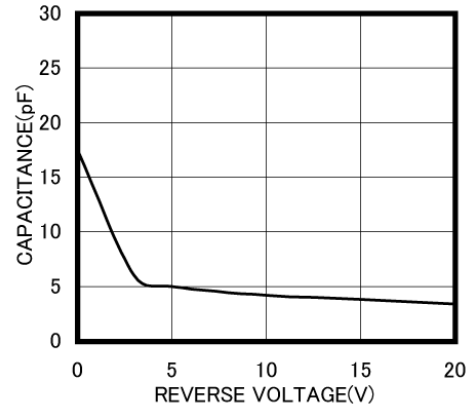


Unit: mm, Tolerance: ±0.2

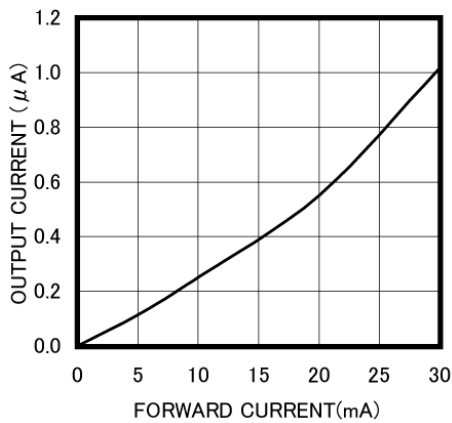
THERMAL DERATING CURVE



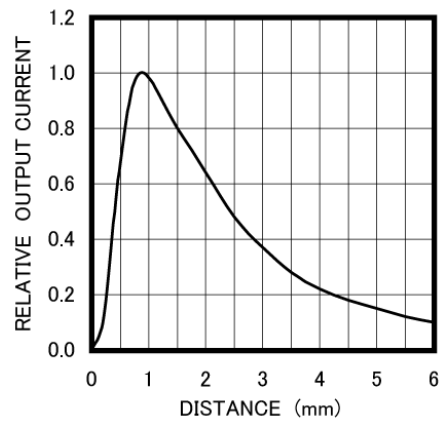
CAPACITANCE vs REVERSE VOLTAGE



IF VS I_o @VR=10V



I_o VS DISTANCE



Peak Emission Wavelength: 660nm

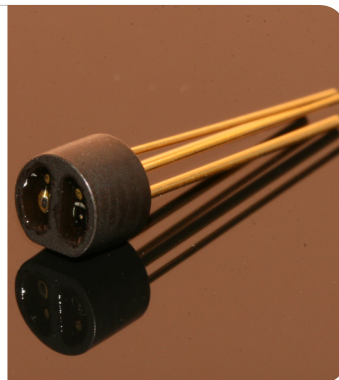
The 660nm reflective sensor consists of a 660nm visible emitter and high sensitivity photo transistor in the same package. The black molded housing reduces the effect of external ambient light. Custom emitter/detectors are available.

FEATURES

- > High Reliability
- > Compact (Φ4.0)
- > Short Detection Distance Optimum 0.5-1.5mm

APPLICATIONS

- > Card Reader
- > Bar-code Reader
- > Edge Sensing / Money-bill Reader



Absolute Maximum Ratings (Ta=25°C)



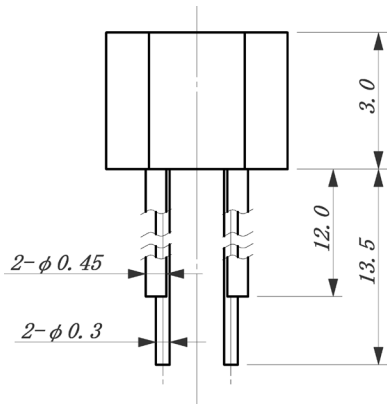
ITEMS	SYMBOL	RATINGS	UNIT
Forward Current (LED)	IF	40	mA
Pulse Forward Current (LED)*1	IFP	0.5	A
Reverse Voltage (LED)	VR	4	V
Power Dissipation (LED)	PD	100	mW
Collector-Emitter Voltage (PT)	Vce	20	V
Emitter-Collector Voltage (PT)	Vec	5	V
Collector Current (PT)	Ic	50	mA
Collector Power Dissipation (PT)	PC	75	mW
Total Power Dissipation	Ptot	100	mW
Operating Temperature Range	Topr	-20 ~ +80	°C

*1: Tw=10μsec, T=10msec.

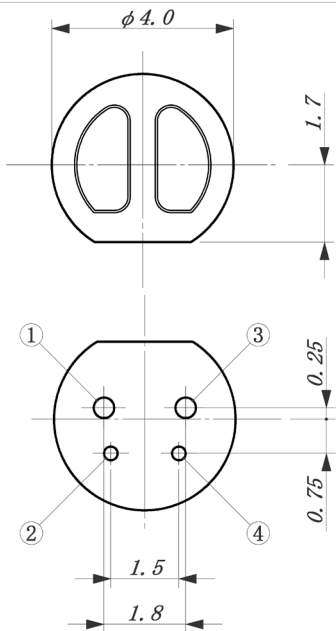
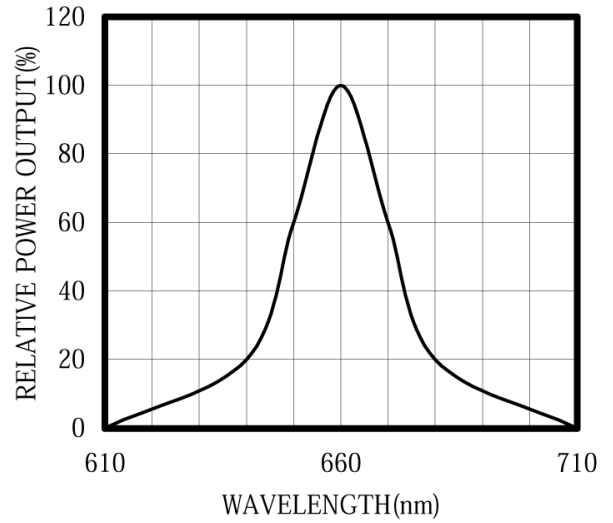
Electrical & Optical Characteristics (Ta = 25°C)

ITEMS	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNIT
Forward Voltage	VF	IF=20mA	--	1.8	2.2	V
Reverse Current	IR	VR=4V	--	--	10	μA
Peak Emission Wavelength	λp	IF=20mA	--	660	--	nm
Spectral Line Half Width	Δλ	IF=20mA	--	25	--	nm
Dark Current (Iceo)	ID	Vce=10V	--	--	100	nA
Output Current	Io	IF=20mA, Vce=10V, d=1mm *	800	1200	--	μA
Cross-talk Current	Ix	IF=20mA, Vce=10V	--	--	1.0	nA
Rise Time (10 to 90%)	Tr	Vcc=5V, Io=0.1mA, RL=1KΩ	--	30	--	μS
Fall Time (10 to 90%)	Tf	Vcc=5V, Io=0.1mA, RL=1KΩ	--	30	--	μS
Lead Soldering Temperature*2	TIs	--	--	--	260	°C

*1: Measured by reflecting with Aluminum evaporated mirror (d=1.00mm). *2: Time 5 Sec max, Position: Up to 3mm from the body.

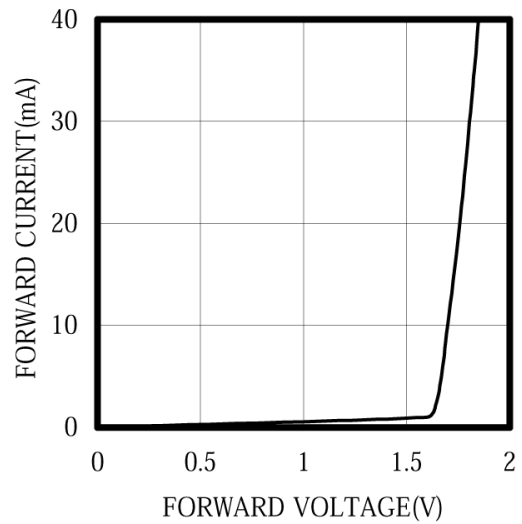


SPECTRAL OUTPUT



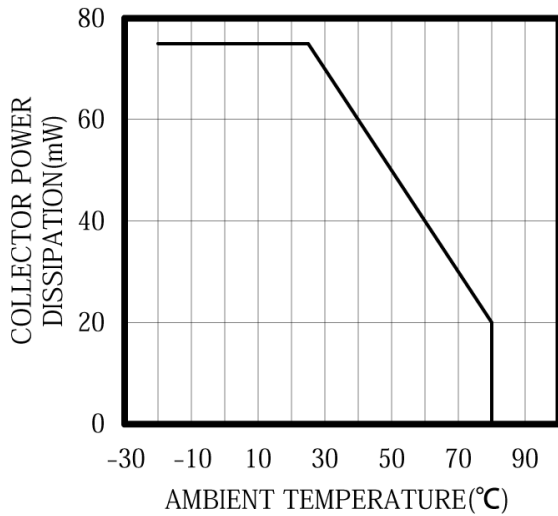
- ① LED Anode
- ② LED Cathode
- ③ PTR Collector
- ④ PTR Emitter

FORWARD I-V CHARACTERISTICS

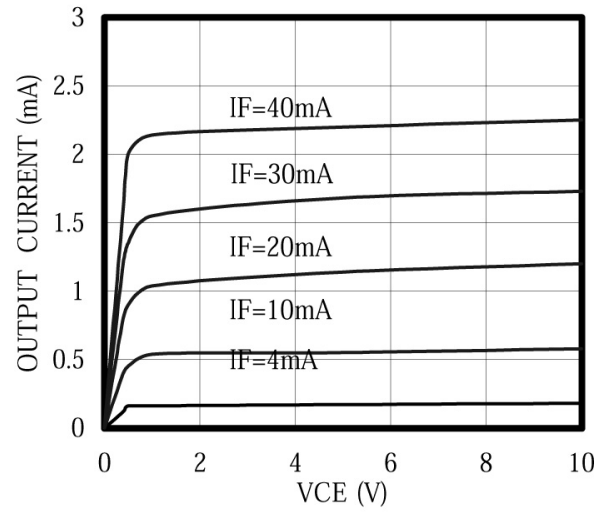


Unit: mm, Tolerance: ±0.2

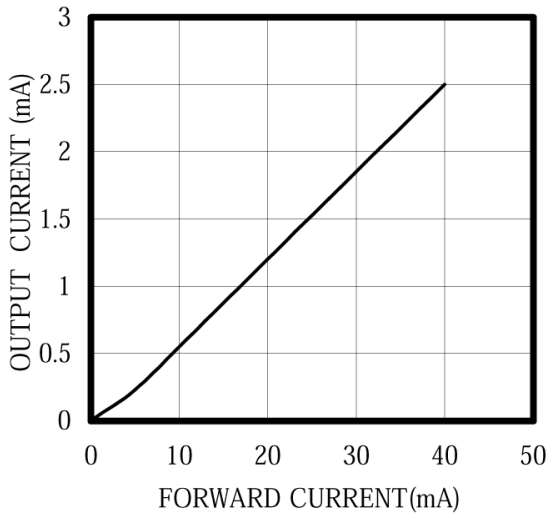
THERMAL DERATING CURVE



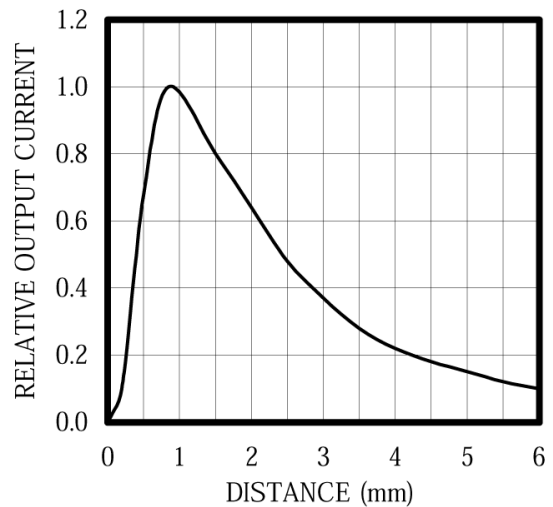
I_o vs VCE



I_F VS I_o
VCE=10V



I_o VS DISTANCE



Peak Emission Wavelength: 660nm

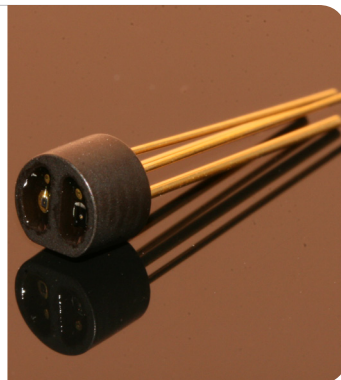
The 660nm reflective sensor consists of a 660nm visible emitter and high sensitivity photo diode in the same package. The black molded housing reduces the effect of external ambient light. Custom emitter/detectors are available.

FEATURES

- > High Reliability
- > Compact (Φ4.0)
- > Short Detection Distance Optimum 0.5-1.5mm

APPLICATIONS

- > Card Reader
- > Bar-code Reader
- > Edge Sensing / Money-bill Reader



Absolute Maximum Ratings (Ta=25°C)



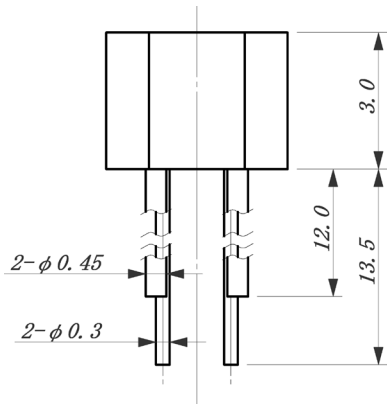
ITEMS	SYMBOL	RATINGS	UNIT
Forward Current (LED)	IF	40	mA
Pulse Forward Current (LED)*1	IFP	0.5	A
Reverse Voltage (LED)	VR	4	V
Power Dissipation (LED)	PD	100	mW
Reverse Voltage (PD)	VR	30	V
Power Dissipation (PD)	PD	100	mW
Total Power Dissipation	Ptot	100	mW
Operating Temperature Range	Topr	-20 ~ +80	°C
Storage Temperature Range	Tstg	-30 ~ +100	°C

*1: Tw=10μsec, T=10msec.

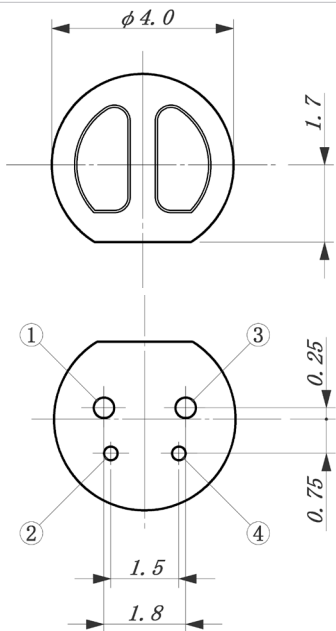
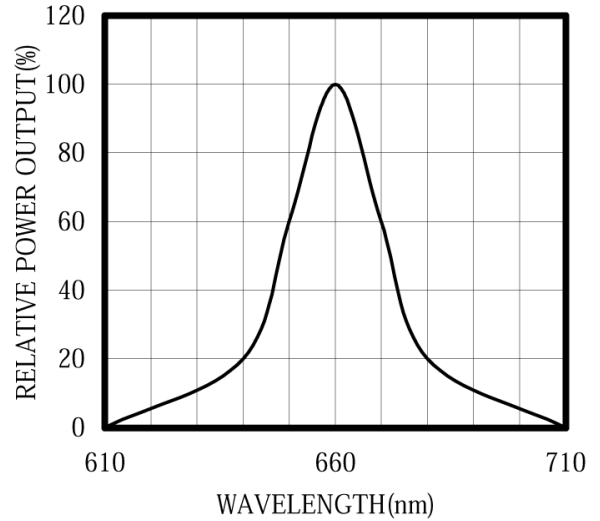
Electrical & Optical Characteristics (Ta = 25°C)

ITEMS	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNIT
Forward Voltage	VF	IF=20mA	--	1.8	2.2	V
Reverse Current	IR	VR=4V	--	--	10	μA
Peak Emission Wavelength	λp	IF=20mA	--	660	--	nm
Spectral Line Half Width	Δλ	IF=20mA	--	25	--	nm
Dark Current (I _{ceo})	ID	VR=10V	--	--	10	nA
Output Current	I _o	IF=20mA, VR=10V, d=1mm *	0.7	1.5	--	μA
Cross-talk Current	I _x	IF=20mA, VR=10V	--	--	1.0	nA
Rise Time (10 to 90%)	Tr	VR=10V, IF=20mA, RL=1KΩ	--	1.0	--	μS
Fall Time (10 to 90%)	Tf	VR=10V, IF=20mA, RL=1KΩ	--	1.0	--	μS
Lead Soldering Temperature*2	T _{ls}	--	--	--	260	°C

*1: Measured by reflecting with Aluminum evaporated mirror (d=1.00mm). *2: Time 5 Sec max, Position: Up to 3mm from the body.

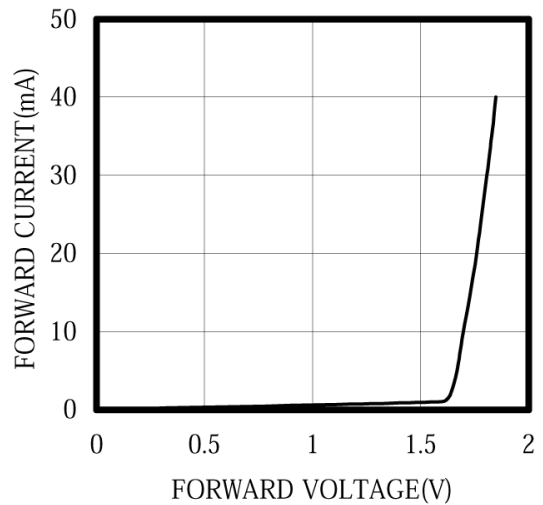


SPECTRAL OUTPUT



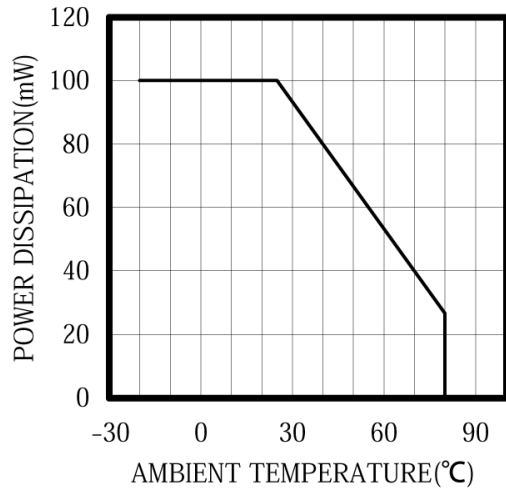
- ① LED Anode
- ② LED Cathode
- ③ PD Cathode
- ④ PD Anode

FORWARD I-V CHARACTERISTICS

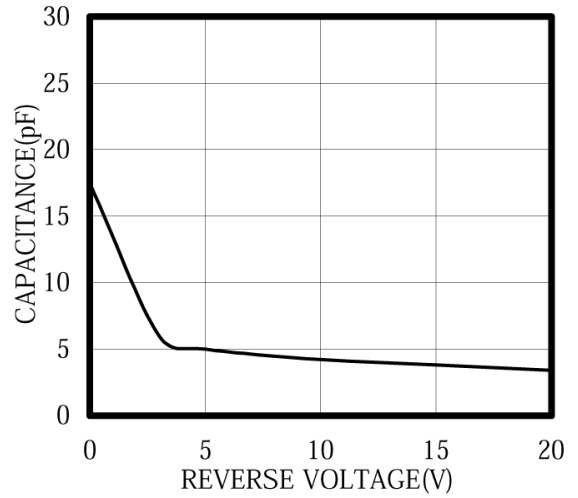


Unit: mm, Tolerance: ±0.2

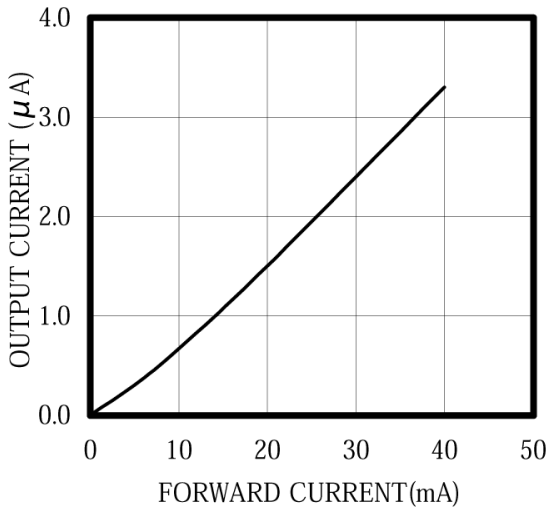
THERMAL DERATING CURVE



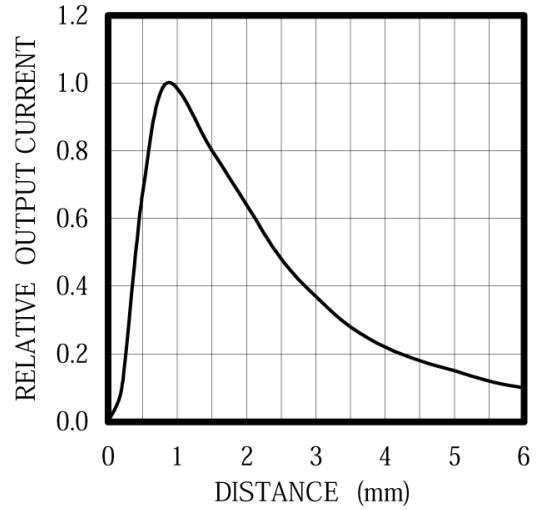
CAPACITANCE vs REVERSE VOLTAGE



IF VS Io @VR=10V



Io VS DISTANCE



The information contained herein is subject to change without notice.

2011-08-11

Peak Emission Wavelength: 660nm

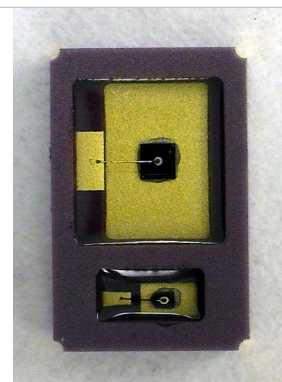
The 660nm reflective sensor consists of a 660nm visible emitter and high sensitivity photo diode in the same package. The black molded housing reduces the effect of external ambient light. Custom emitter/detectors are available.

FEATURES

- > High Reliability
- > 5.1 x 3.3mm Surface Mount Package
- > Short Detection Distance Optimum 0.5-1.5mm

APPLICATIONS

- > Card Reader
- > Bar-code Reader
- > Edge Sensing / Money-bill Reader



Absolute Maximum Ratings (Ta=25°C)

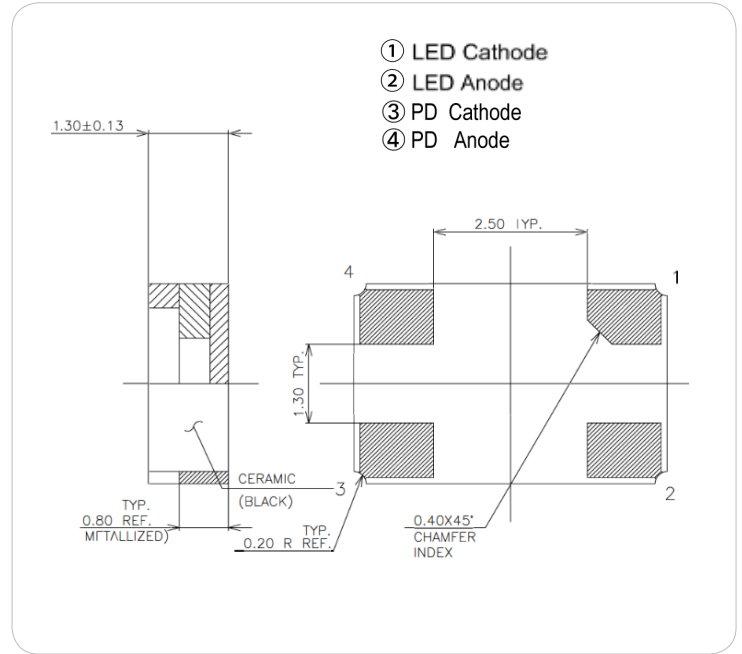
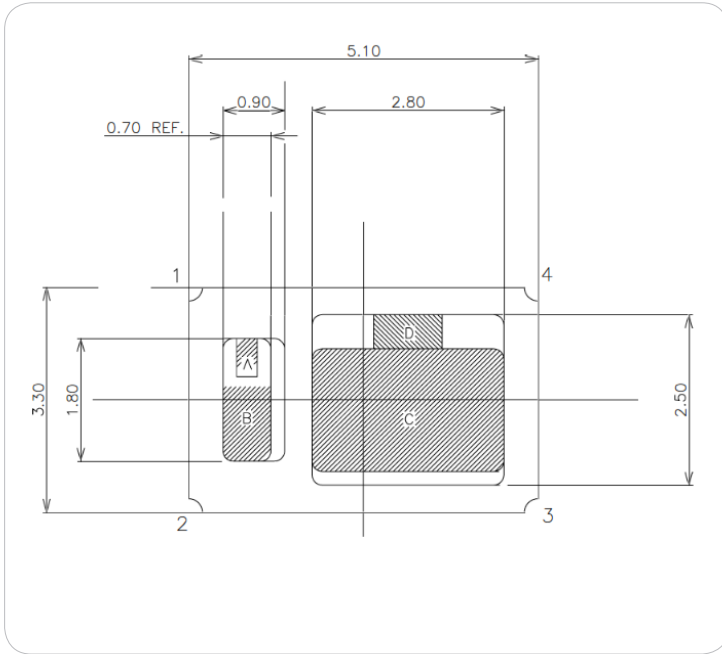


ITEMS	SYMBOL	RATINGS	UNIT
Forward Current (LED)	IF	40	mA
Pulse Forward Current (LED)*1	IFP	0.5	A
Reverse Voltage (LED)	VR	5	V
Power Dissipation (LED)	PD	100	mW
Operating Temperature Range	Topr	-20 to +80	°C
Storage Temperature Range	Tstg	-30 to +100	°C

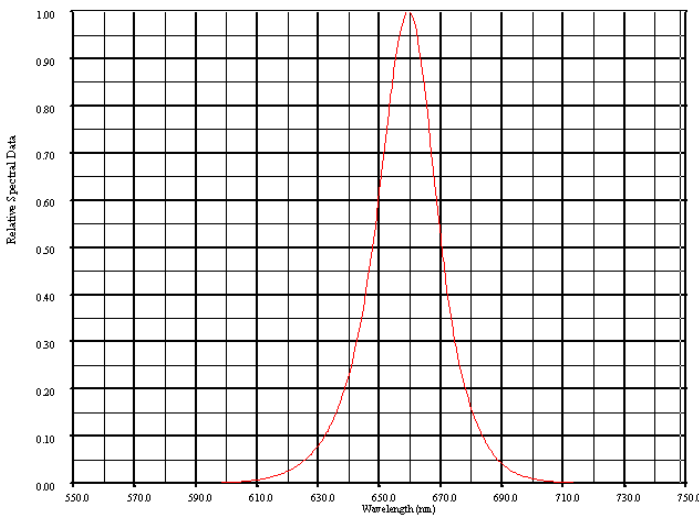
*1: Tw=10µsec, T=10msec.

Electrical & Optical Characteristics (Ta = 25°C)

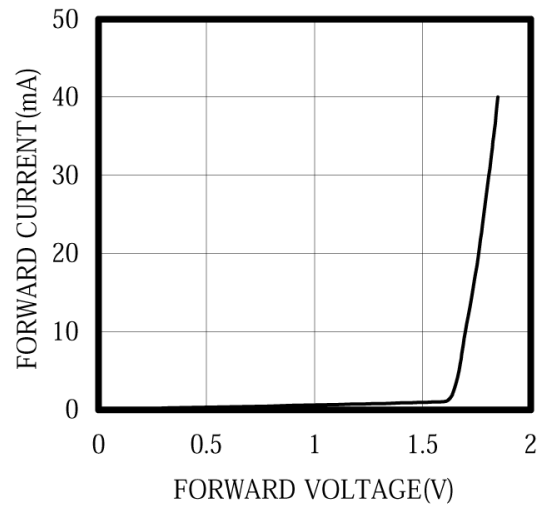
ITEMS	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNIT
Forward Voltage (LED)	VF	IF=20mA	--	1.8	--	V
Forward Voltage (PD)	VF	IF=20mA	--	--	1.3	V
Peak Emissions Wavelength	λ_p	IF=20mA	640	660	670	nm
Spectral Line Half Width	$\Delta\lambda$	IF=20mA	--	25	--	nm
Power Output	PO	IF=20mA	--	0.8	--	mW
Reverse Dark Current (Iceo)	ID	VR=10V H=0mw/cm2	--	--	10	nA
Reverse Light Current	IL	VR=5V CT=2870°K H=5mw/cm2	1.8	2.0	2.2	uA
Reverse Breakdown Voltage	V(BR)R	IR=100uA H=0mw/cm2	33	--	--	V
Open Circuit Voltage	VOC	CT=2870°K H=5mw/cm2	--	420	--	mV
Short Circuit Current	SC	CT=2870°K H=5mw/cm2	--	1.5	--	µA
Total Capacitance	CT	VR=5V H=0mw/cm2 f=1MHz	--	5	--	pF



EMITTER SPECTRAL RESPONSE



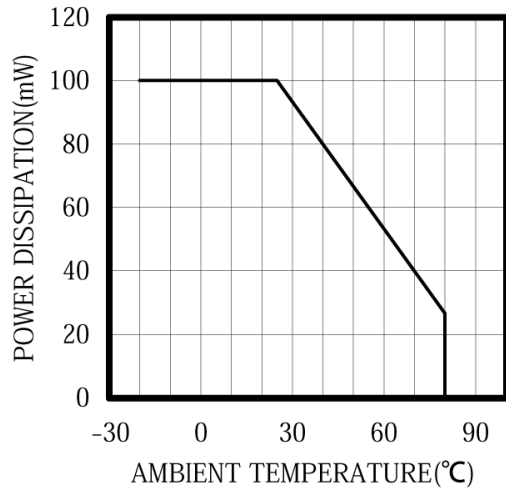
FORWARD I-V CHARACTERISTICS



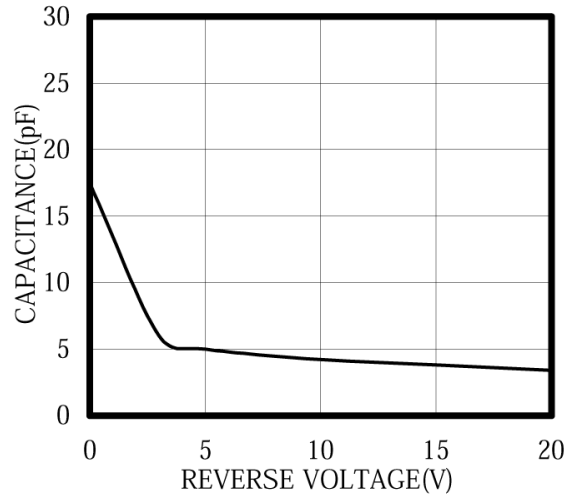
Unit: mm, Tolerance: ±0.2

2021-05-27

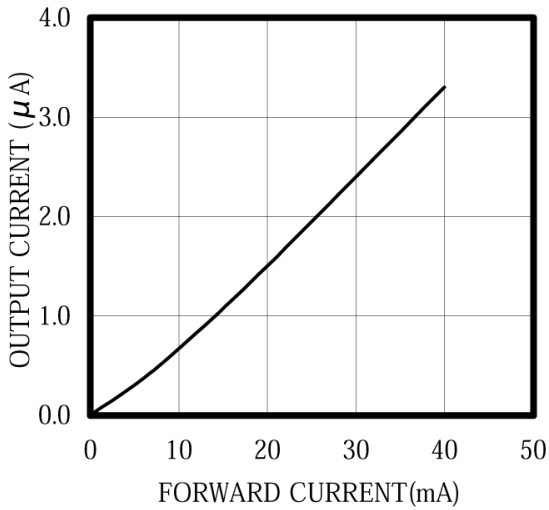
THERMAL DERATING CURVE



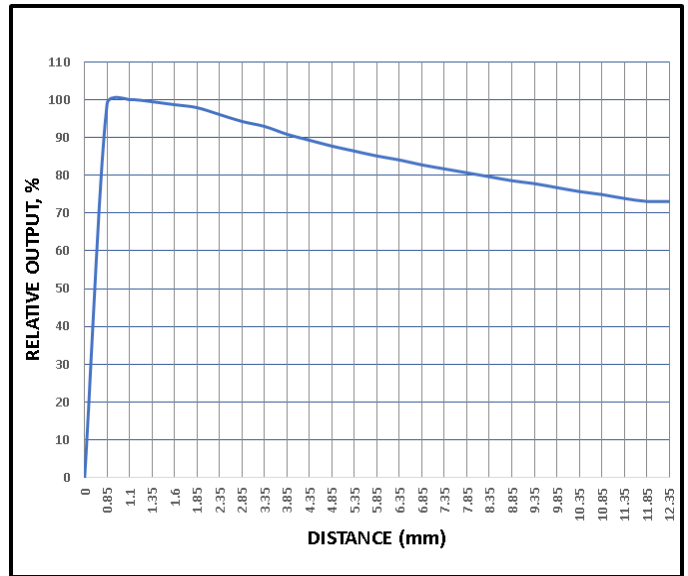
CAPACITANCE vs REVERSE VOLTAGE



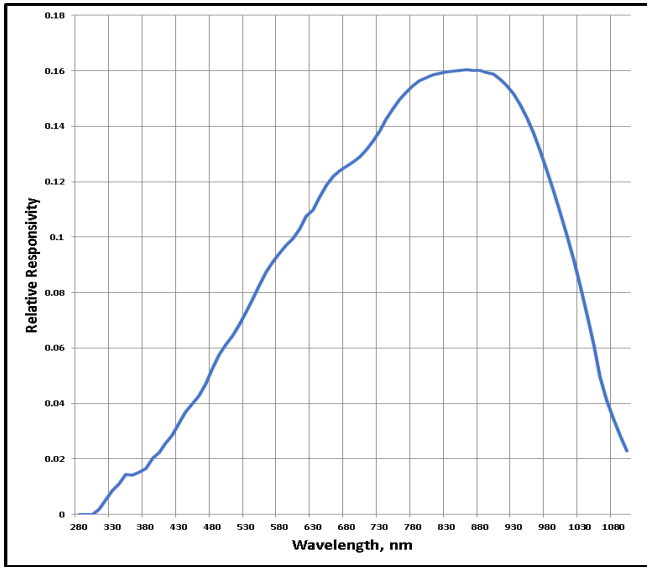
IF VS I_o @VR=10V



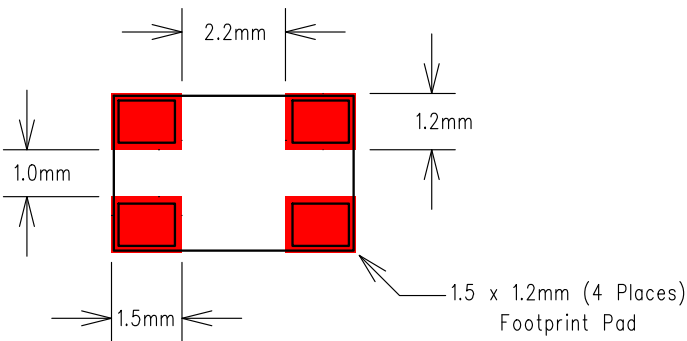
RELATIVE OUTPUT vs DISTANCE



RESPONSIVITY



PCB FOOTPRINT PATTERN



The information contained herein is subject to change without notice.

2021-05-27

Peak Emission Wavelength: 1070nm

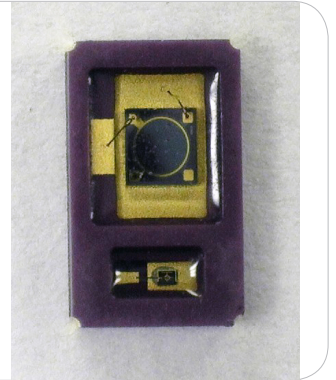
The MTRS7010C reflective sensor consists of a 1070nm infrared emitter and high sensitivity InGaAs photodiode in the same package. The black molded housing reduces the effect of external ambient light. Custom emitter/detectors are available.

FEATURES

- > 1.00mm Active Area
- > 5.1 x 3.3mm Surface Mount Package
- > Short Detection Distance Optimum 0.5-1.5mm

APPLICATIONS

- > Card Reader
- > Bar-code Reader
- > Edge Sensing / Money-bill Reader



Absolute Maximum Ratings (Ta=25°C)

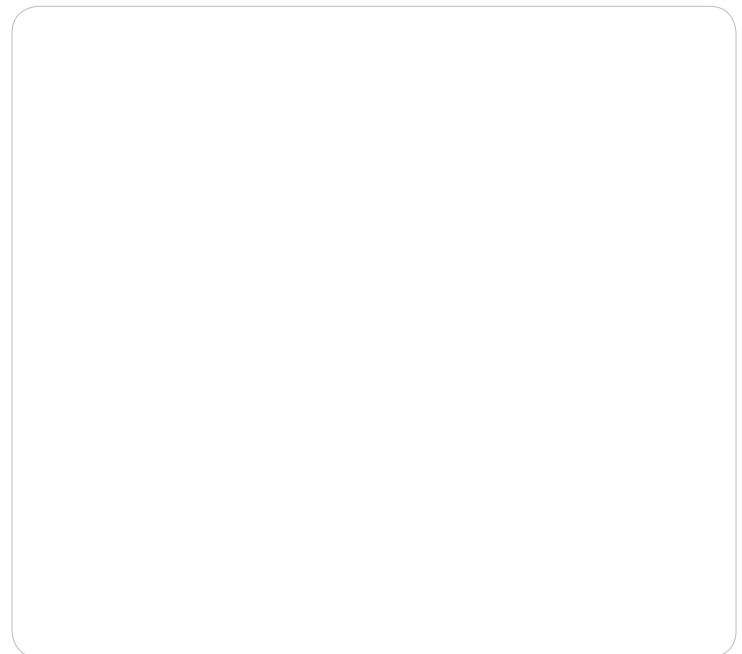
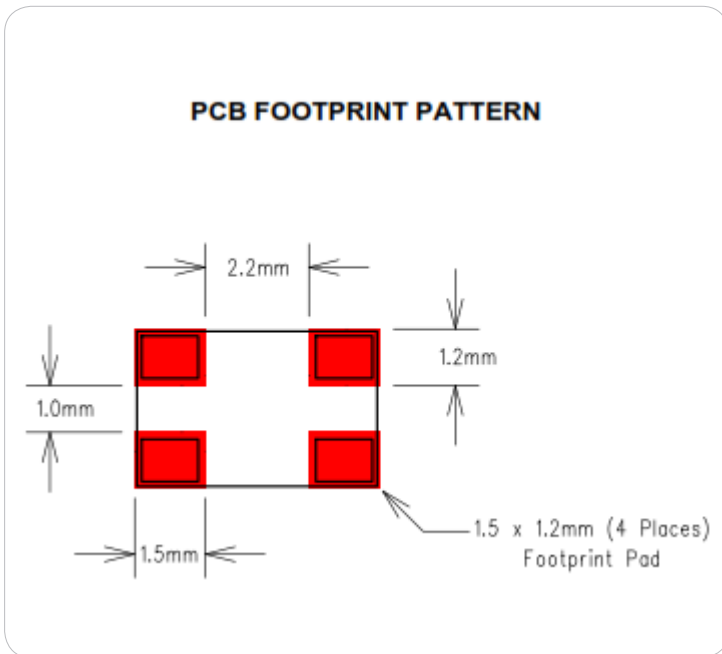
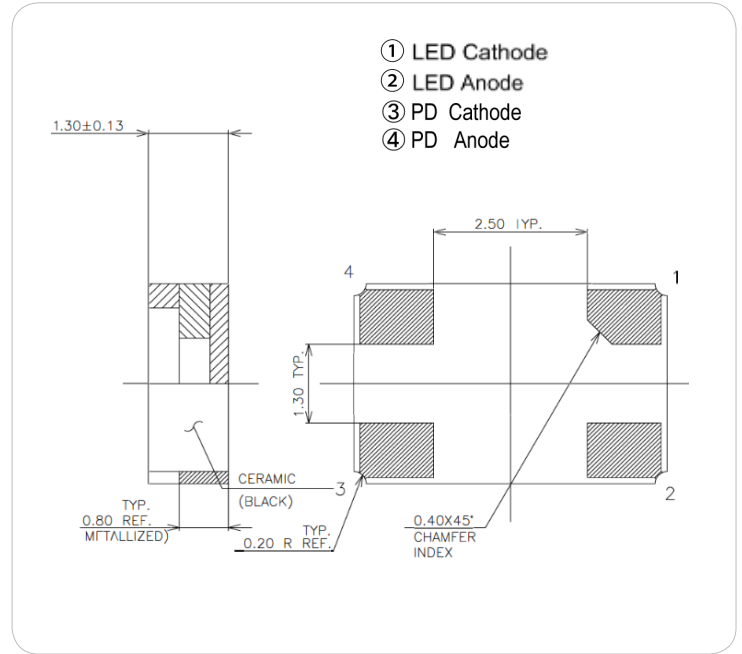
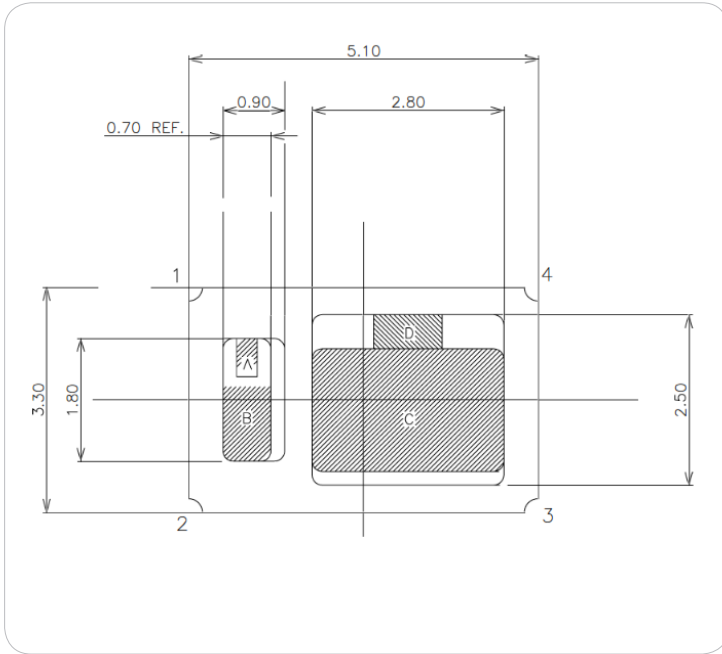


ITEMS	SYMBOL	RATINGS	UNIT
Forward Current (LED)	IF	40	mA
Pulse Forward Current (LED)*1	IFP	0.5	A
Reverse Voltage (LED)	VR	5	V
Power Dissipation (LED)	PD	100	mW
Reverse Voltage (PD)	VR (IR=10uA)	3	V
Reverse Current (LED)	IR (VR=5V)	10	uA
Operating Temperature Range	Topr	-20 to +80	°C
Storage Temperature Range	Tstg	-30 to +100	°C

*1: Tw=10µsec, T=10msec.

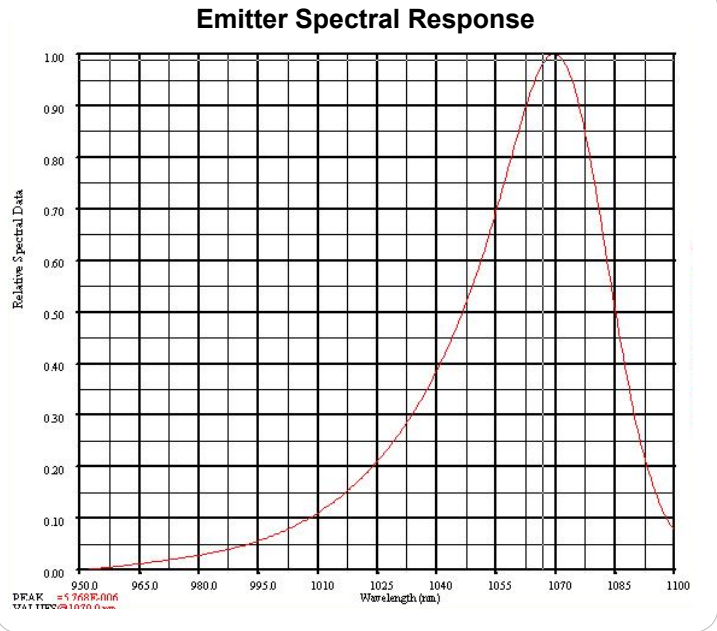
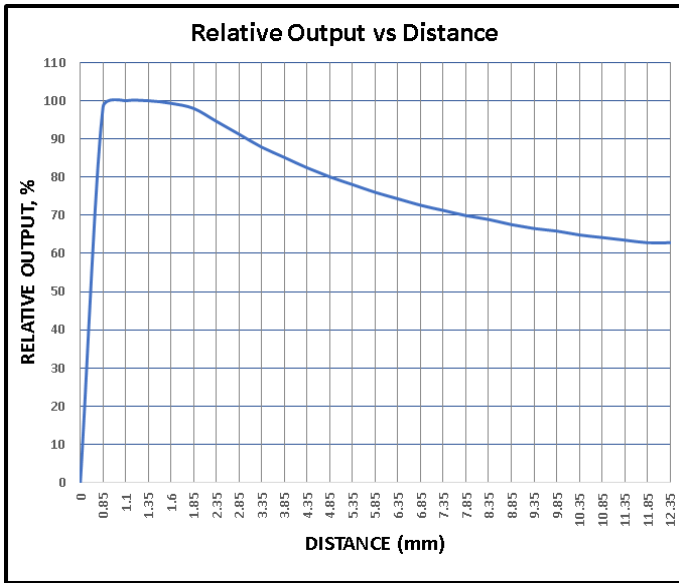
Electrical & Optical Characteristics (Ta = 25°C)

ITEMS	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNIT
Forward Voltage (LED)	VF	IF=20mA	--	1.25	--	V
Peak Emissions Wavelength (LED)	λ_p	IF=20mA	--	1070	--	nm
Spectral Line Half Width (LED)	$\Delta\lambda$	IF=20mA	--	40	--	nm
Power Output (LED)	PO	IF=20mA	--	2.2	--	mW
Reverse Dark Current (Iceo)	ID	VR=1V	--	2.0	--	uA
Light Current @1300nm	IL	$\lambda=1300\text{nm}$; VR=2V	--	180	--	uA
Shunt Resistance	RSH	VR=10mV	--	2	--	MΩ
Sensitivity Range	V	VR=0V	600	--	1750	nm
Responsivity	R	$\lambda=1550\text{nm}$	--	0.70	--	A/W
Quantum Efficiency	QE	$\lambda=1660\text{nm}$	--	55	--	%
Total Capacitance	CT	VR=0V	--	60	--	pF
Rise/Fall Time (10 to 90%)	Tr, Tf	VR=10V, IF=20mA, RL=1KΩ	--	--	--	uS



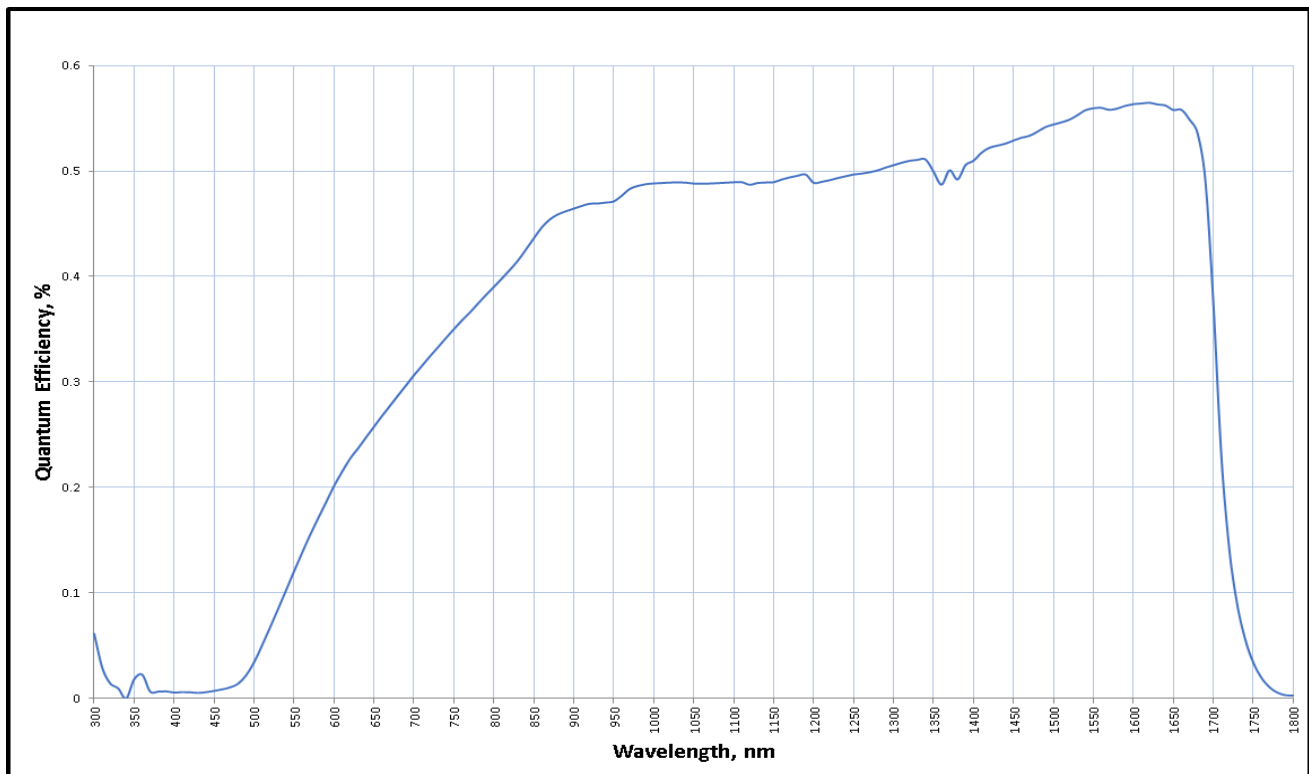
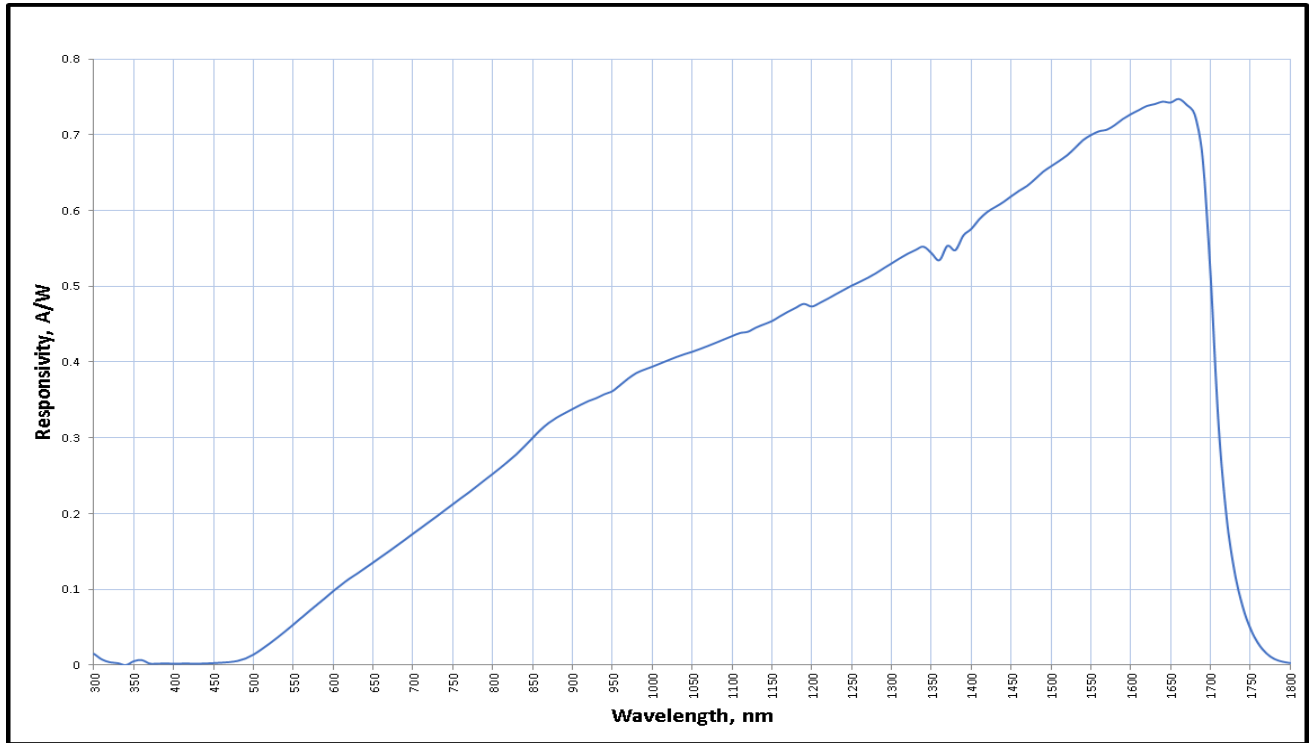
Unit: mm, Tolerance: ±0.2

2021-05-27



Unit: mm, Tolerance: ± 0.2

2021-05-27



Peak Emission Wavelength: 870nm

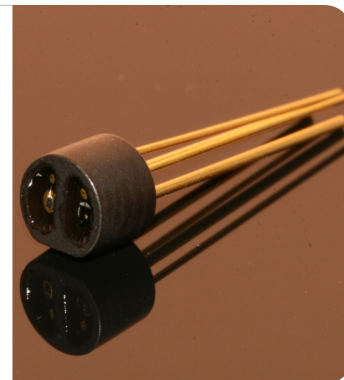
The 870nm reflective sensor consists of a 870nm infrared emitter and high sensitivity photo diode in the same package. The black molded housing reduces the effect of external ambient light. Custom emitter/ detectors are available.

FEATURES

- > High Reliability
- > Compact (Φ4.0)
- > Short Detection Distance Optimum 0.5-1.5mm

APPLICATIONS

- > Card Reader
- > Bar-code Reader
- > Edge Sensing / Money-bill Reader



Absolute Maximum Ratings (Ta=25°C)



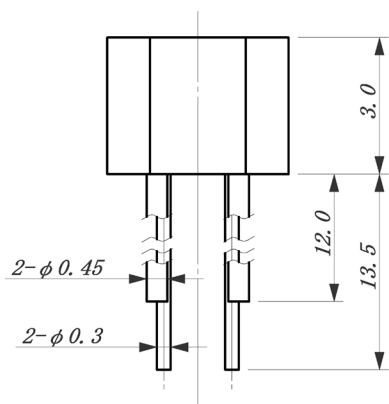
ITEMS	SYMBOL	RATINGS	UNIT
Forward Current (LED)	IF	60	mA
Pulse Forward Current (LED)*1	IFP	1	A
Reverse Voltage (LED)	VR	5	V
Power Dissipation (LED)	PD	100	mW
Reverse Voltage (PD)	VR	30	V
Power Dissipation (PD)	PD	100	mW
Total Power Dissipation	Ptot	100	mW
Operating Temperature Range	Topr	-20 ~ +80	°C
Storage Temperature Range	Tstg	-30 ~ +100	°C

*1: Tw=10μsec, T=10msec.

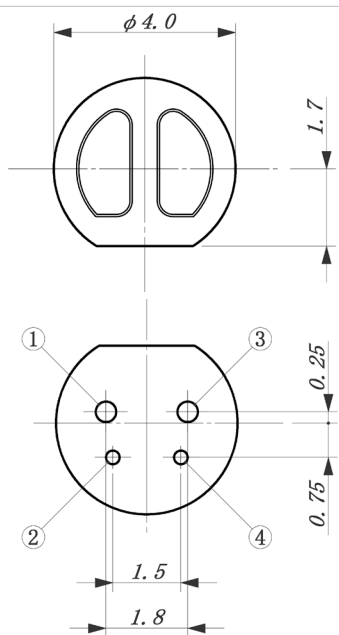
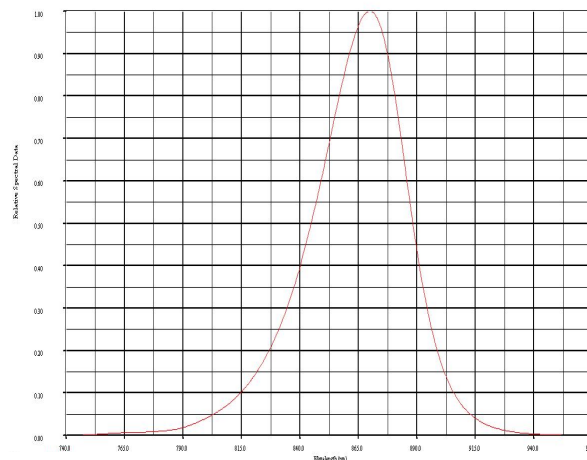
Electrical & Optical Characteristics (Ta = 25°C)

ITEMS	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNIT
Forward Voltage	VF	IF=20mA	--	1.34	--	V
Reverse Current	IR	VR=5V	--	--	10	μA
Peak Emission Wavelength	λp	IF=20mA	--	870	--	nm
Spectral Line Half Width	Δλ	IF=20mA	--	50	--	nm
Power Output	Po	IF=20mA	--	1.25	--	mW
Dark Current (Iceo)	ID	VR=10V	--	--	10	nA
Output Current	Io	IF=20mA, VR=10V, d=1mm *	0.5	0.9	--	μA
Cross-talk Current	Ix	IF=20mA, VR=10V	--	--	1.0	nA
Rise Time (10 to 90%)	Tr	VR=10V, IF=20mA, RL=1KΩ	--	2.0	--	μS
Fall Time (10 to 90%)	Tf	VR=10V, IF=20mA, RL=1KΩ	--	2.0	--	μS
Lead Soldering Temperature*2	Tls	--	--	--	260	°C

*1: Measured by reflecting with Aluminum evaporated mirror (d=1.00mm). *2: Time 5 Sec max, Position: Up to 3mm from the body.

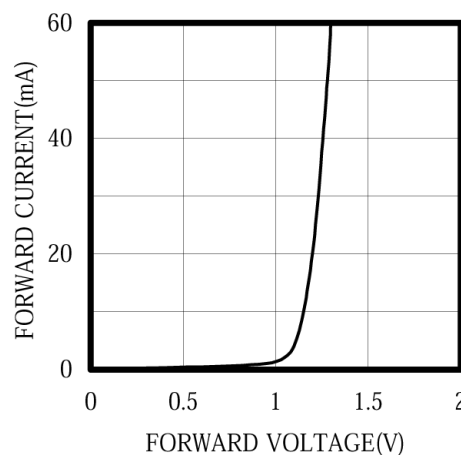


SPECTRAL OUTPUT



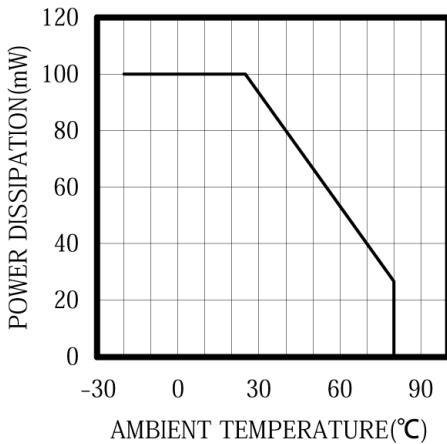
- ① LED Cathode
- ② LED Anode
- ③ PD Cathode
- ④ PD Anode

FORWARD I-V CHARACTERISTICS

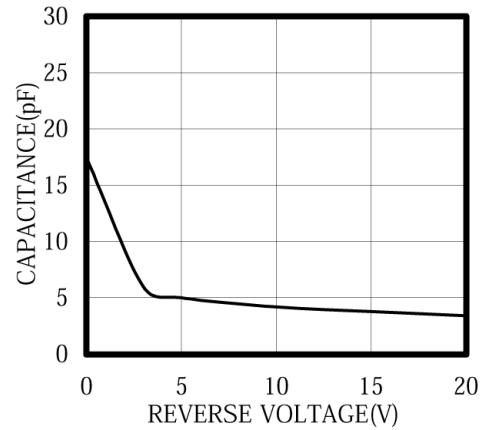


Unit: mm, Tolerance: ±0.2

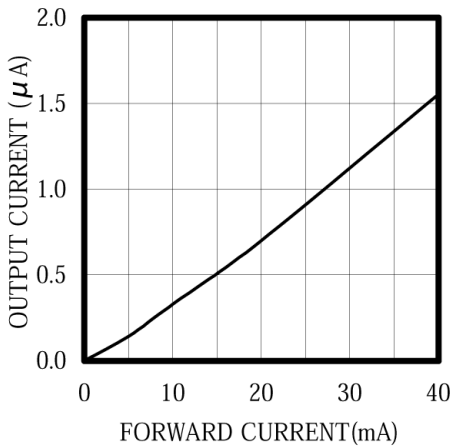
THERMAL DERATING CURVE



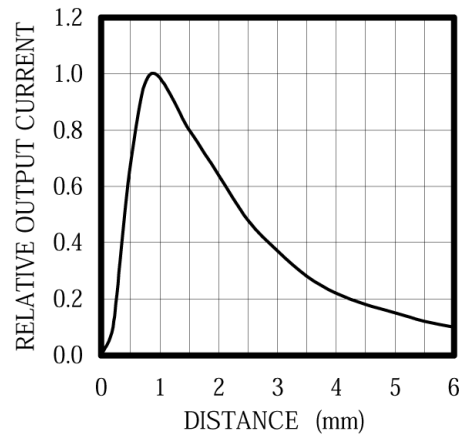
CAPACITANCE vs REVERSE VOLTAGE



IF VS I_o @VR=10V



I_o VS DISTANCE



Peak Emission Wavelength: 880nm

The 880nm IR emitter/detector series is designed for applications requiring high output and precise optical / mechanical axis alignment. Custom package solutions and sorting are available.

FEATURES

- > Flat Lens
- > High Output Power
- > Less Reflection
- > High Reliability

APPLICATIONS

- > Optical Switches / Security Systems
- > Linear & Rotary Encoder
- > Card Readers / Medical Electronics



Absolute Maximum Ratings (Ta=25°C)

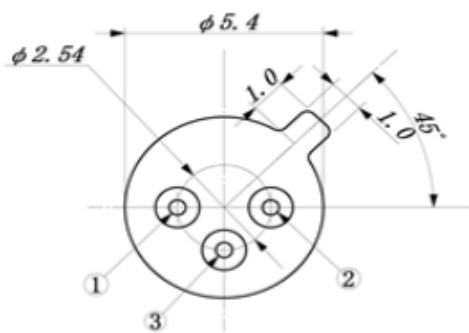
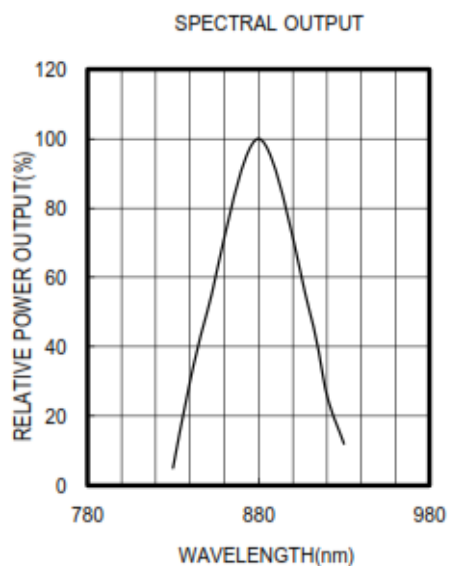
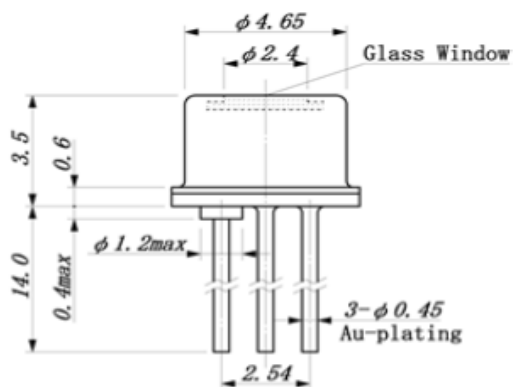


ITEMS	SYMBOL	RATINGS	UNIT
Forward Current (DC)	IF	100	mA
Forward Current (Pulse)*1	IFP	1	A
LED Reverse Voltage	VR	5	V
PD Reverse Voltage	VR	20	V
Power Dissipation	PD	180	mW
Operating Temperature Range	Topr	-20 ~ +85	°C
Storage Temperature Range	Tstg	-30 ~ +100	°C
Lead Soldering Temperature*2	TIs	260	°C

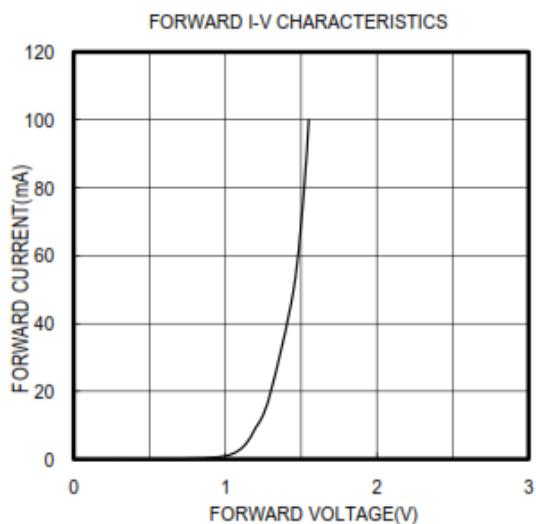
*1: Tw=10μsec, T=10msec. *2: Time 5Sec max, Position: Up to 3mm from the body.

Electrical & Optical Characteristics (Ta = 25°C)

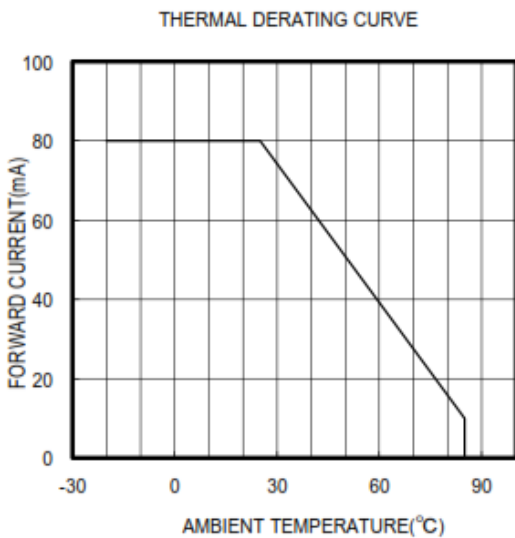
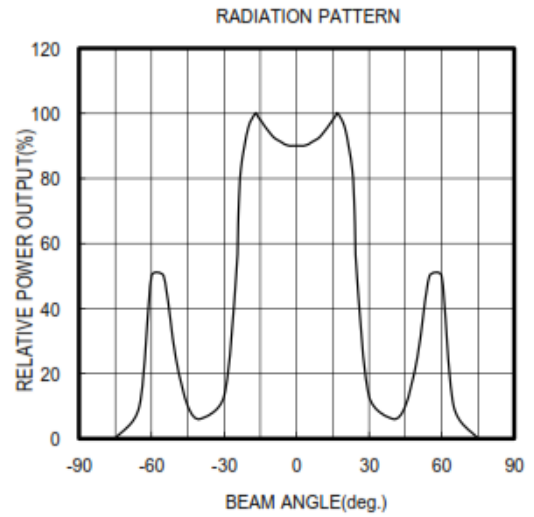
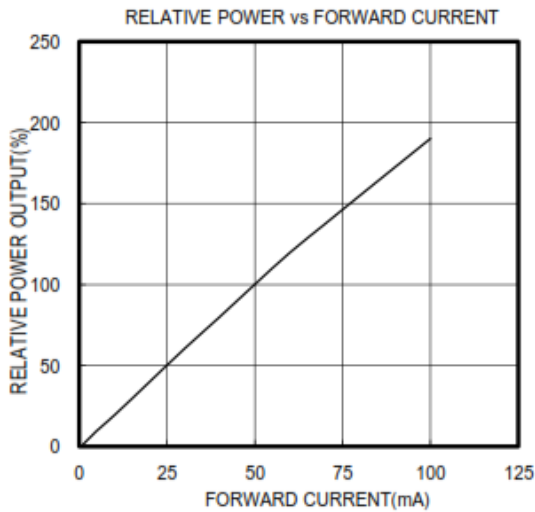
ITEMS	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNIT
Power Output	PO	IF=50mA	--	2.0	--	mW
Forward Voltage	VF	IF=50mA	--	1.45	1.8	V
Reverse Current	IR	VR=5V	--	--	10	μA
PD Light Current	IL	IF=20mA, VRd=10V	--	10	--	μA
PD Dark Current	ID	VRd=10V	--	--	10	nA
Peak Emission Wavelength	λp	IF=50mA	865	880	895	nm
Spectral Line Half Width	Δλ	IF=50mA	--	60	--	nm
Half Intensity Beam Angle	Θ	IF=50mA	--	±25	--	deg



- ① LED-Anode • PD-Cathode (CASE)
② LED-Cathode ③ PD-Anode
Dimensions (Unit:mm)



Unit: mm, Tolerance: ± 0.2



Peak Emission Wavelength: 950nm

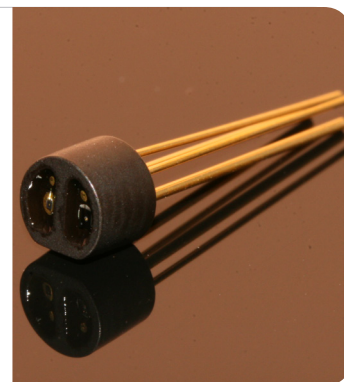
The 950nm reflective sensor consists of a 950nm infrared emitter and high sensitivity photo transistor in the same package. The black molded housing reduces the effect of external ambient light. Custom emitter/detectors are available.

FEATURES

- > High Reliability
- > Compact (Φ4.0)
- > Short Detection Distance Optimum 0.5-1.5mm

APPLICATIONS

- > Card Reader
- > Bar-code Reader
- > Edge Sensing / Money-bill Reader



Absolute Maximum Ratings (Ta=25°C)



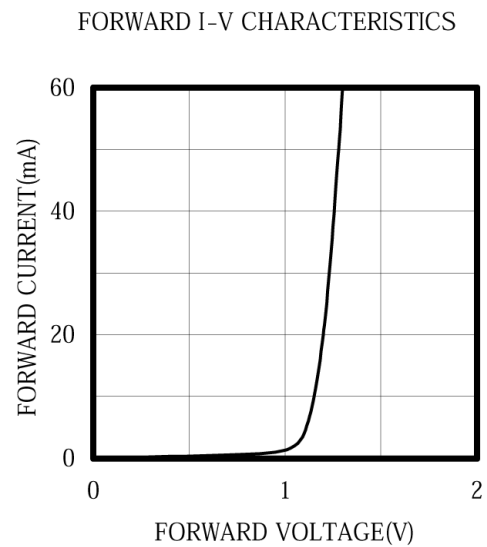
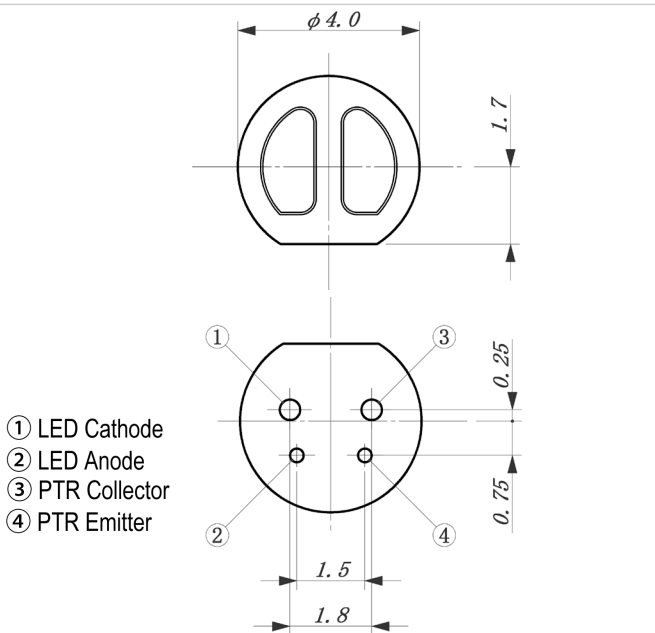
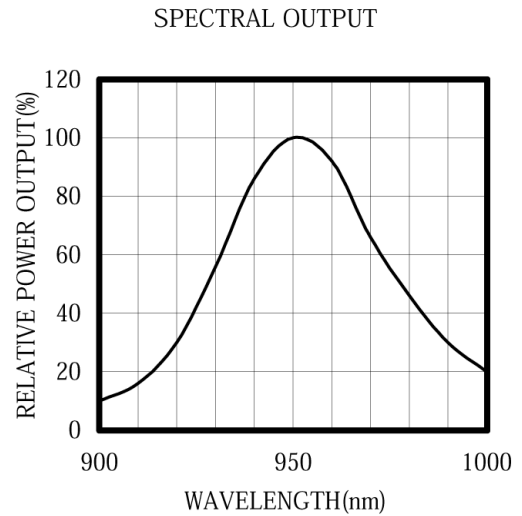
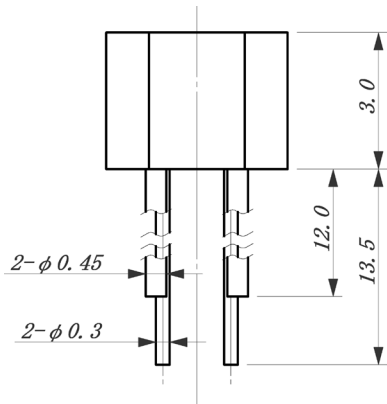
ITEMS	SYMBOL	RATINGS	UNIT
Forward Current (LED)	IF	60	mA
Pulse Forward Current (LED)*1	IFP	1	A
Reverse Voltage (LED)	VR	5	V
Power Dissipation (LED)	PD	100	mW
Collector-Emitter Voltage (PT)	Vce	20	V
Emitter-Collector Voltage (PT)	Vec	5	V
Collector Current (PT)	Ic	50	mA
Collector Power Dissipation (PT)	PC	75	mW
Total Power Dissipation	Ptot	100	mW
Operating Temperature Range	Topr	-20 ~ +80	°C

*1: Tw=10μsec, T=10msec.

Electrical & Optical Characteristics (Ta = 25°C)

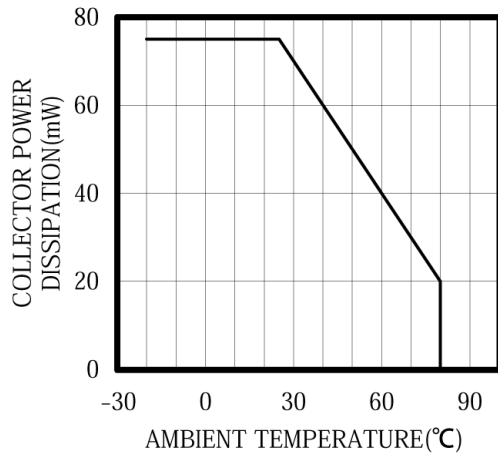
ITEMS	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNIT
Forward Voltage	VF	IF=4mA	--	1.1	1.4	V
Reverse Current	IR	VR=5V	--	--	10	μA
Peak Emission Wavelength	λp	IF=4mA	--	950	--	nm
Spectral Line Half Width	Δλ	IF=4mA	--	50	--	nm
Dark Current (I _{ceo})	ID	Vce=10V	--	--	100	nA
Output Current	I _o	IF=4mA, Vce=10V, d=1mm *	30	100	--	μA
Cross-talk Current	I _x	IF=4mA, Vce=10V	--	--	1.0	%
Rise Time (10 to 90%)	Tr	Vcc=5V, I _o =0.1mA, RL=1KΩ	--	20	--	μS
Fall Time (10 to 90%)	Tf	Vcc=5V, I _o =0.1mA, RL=1KΩ	--	30	--	μS
Lead Soldering Temperature*2	T _{ls}	--	--	--	260	°C

*1: Measured by reflecting with Aluminum evaporated mirror (d=1.00mm). *2: Time 5 Sec max, Position: Up to 3mm from the body.

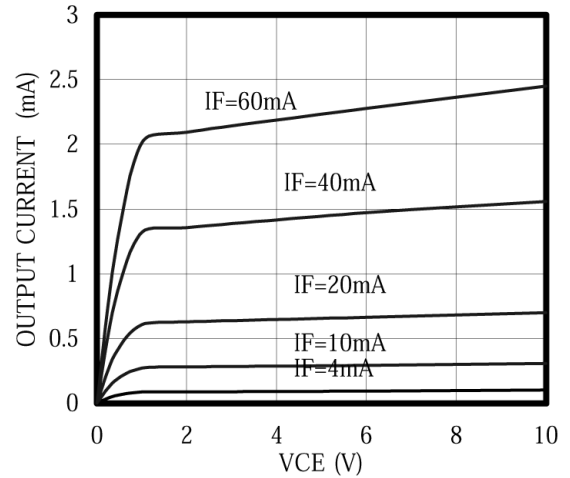


Unit: mm, Tolerance: ± 0.2

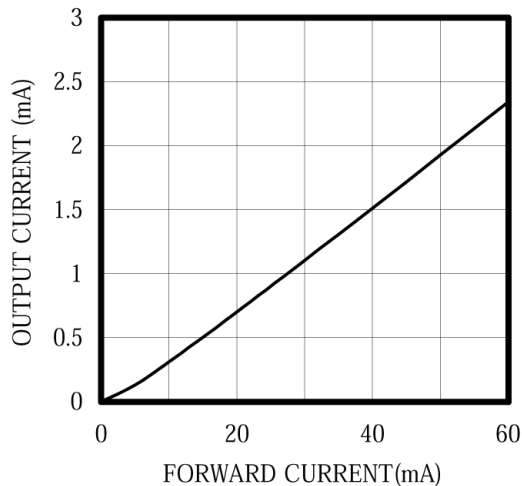
THERMAL DERATING CURVE



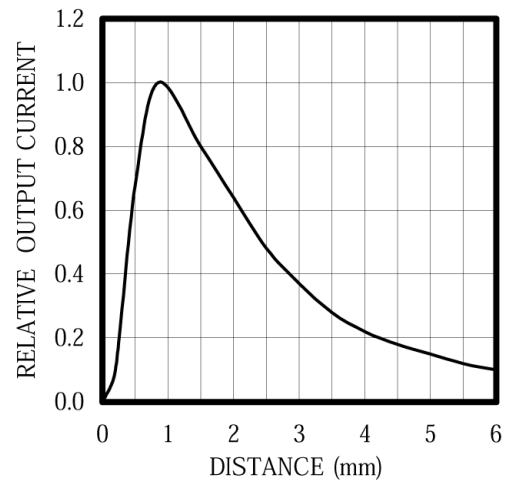
I_o vs VCE



I_F VS I_o
VCE=10V



I_o VS DISTANCE



The information contained herein is subject to change without notice.

2011-08-11

Peak Emission Wavelength: 950nm

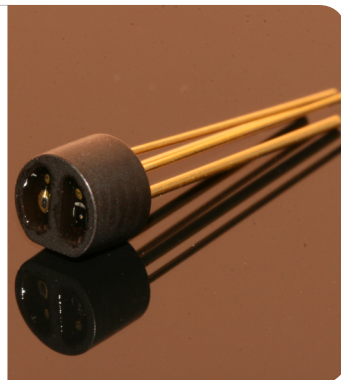
The 950nm reflective sensor consists of a 950nm infrared emitter and high sensitivity photo diode in the same package. The black molded housing reduces the effect of external ambient light. Custom emitter/detectors are available.

FEATURES

- > High Reliability
- > Compact (Φ4.0)
- > Short Detection Distance Optimum 0.5-1.5mm

APPLICATIONS

- > Card Reader
- > Bar-code Reader
- > Edge Sensing / Money-bill Reader



Absolute Maximum Ratings (Ta=25°C)



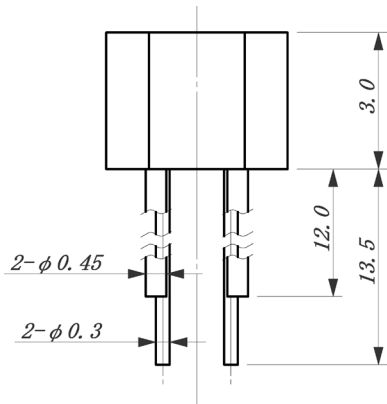
ITEMS	SYMBOL	RATINGS	UNIT
Forward Current (LED)	IF	60	mA
Pulse Forward Current (LED)*1	IFP	1	A
Reverse Voltage (LED)	VR	5	V
Power Dissipation (LED)	PD	100	mW
Reverse Voltage (PD)	VR	30	V
Power Dissipation (PD)	PD	100	mW
Total Power Dissipation	Ptot	100	mW
Operating Temperature Range	Topr	-20 ~ +80	°C
Storage Temperature Range	Tstg	-30 ~ +100	°C

*1: Tw=10μsec, T=10msec.

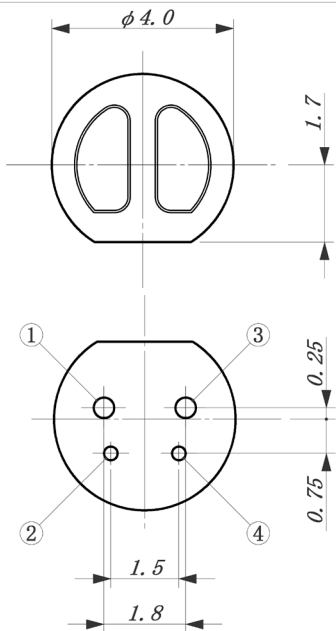
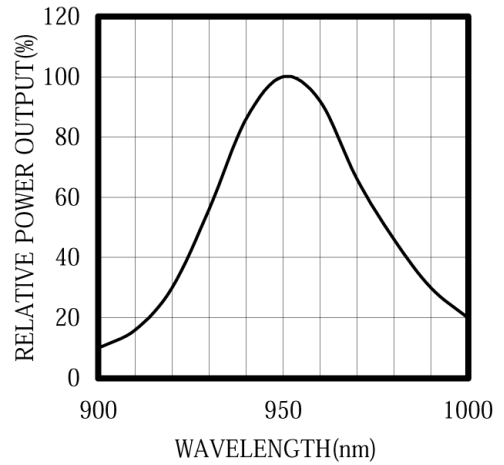
Electrical & Optical Characteristics (Ta = 25°C)

ITEMS	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNIT
Forward Voltage	VF	IF=20mA	--	1.2	1.5	V
Reverse Current	IR	VR=5V	--	--	10	μA
Peak Emission Wavelength	λp	IF=20mA	--	950	--	nm
Spectral Line Half Width	Δλ	IF=20mA	--	50	--	nm
Dark Current (I _{ceo})	ID	VR=10V	--	--	10	nA
Output Current	I _o	IF=20mA, VR=10V, d=1mm *	0.5	0.9	--	μA
Cross-talk Current	I _x	IF=20mA, VR=10V	--	--	1.0	nA
Rise Time (10 to 90%)	Tr	VR=10V, IF=20mA, RL=1KΩ	--	2.0	--	μS
Fall Time (10 to 90%)	Tf	VR=10V, IF=20mA, RL=1KΩ	--	2.0	--	μS
Lead Soldering Temperature*2	T _{ls}	--	--	--	260	°C

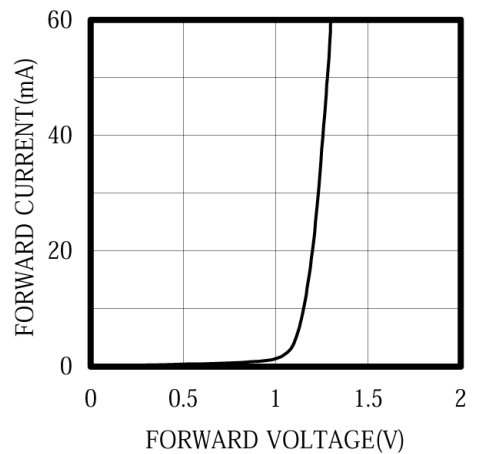
*1: Measured by reflecting with Aluminum evaporated mirror (d=1.00mm). *2: Time 5 Sec max, Position: Up to 3mm from the body.



SPECTRAL OUTPUT

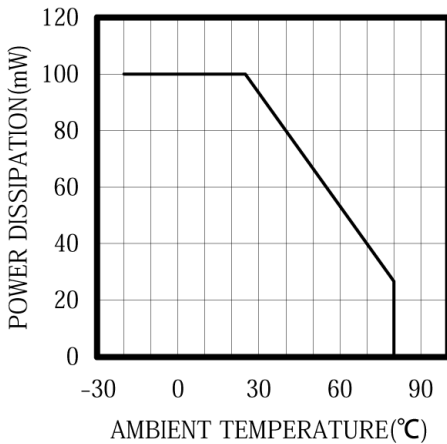


FORWARD I-V CHARACTERISTICS

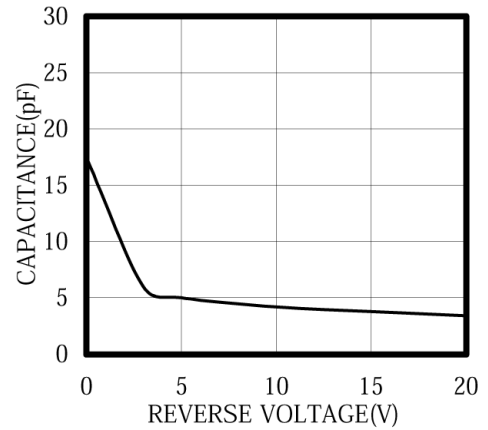


Unit: mm, Tolerance: ±0.2

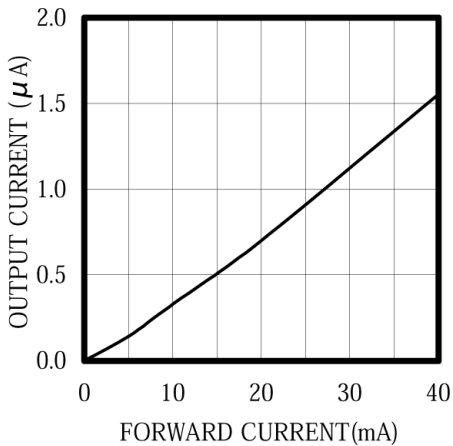
THERMAL DERATING CURVE



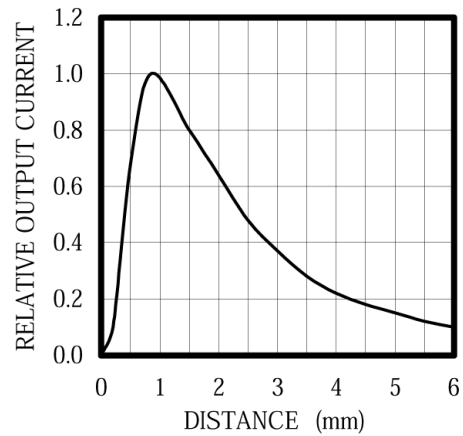
CAPACITANCE vs REVERSE VOLTAGE



IF VS I_o @VR=10V



I_o VS DISTANCE



The information contained herein is subject to change without notice.

2016-09-23

Peak Emission Wavelength: 950nm

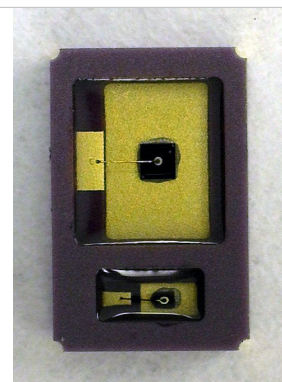
The 950nm reflective sensor consists of a 950nm infrared emitter and high sensitivity photo diode in the same package. The black molded housing reduces the effect of external ambient light. Custom emitter/detectors are available.

FEATURES

- > High Reliability
- > 5.1 x 3.3mm Surface Mount Package
- > Short Detection Distance Optimum 0.5-1.5mm

APPLICATIONS

- > Card Reader
- > Bar-code Reader
- > Edge Sensing / Money-bill Reader



Absolute Maximum Ratings (Ta=25°C)

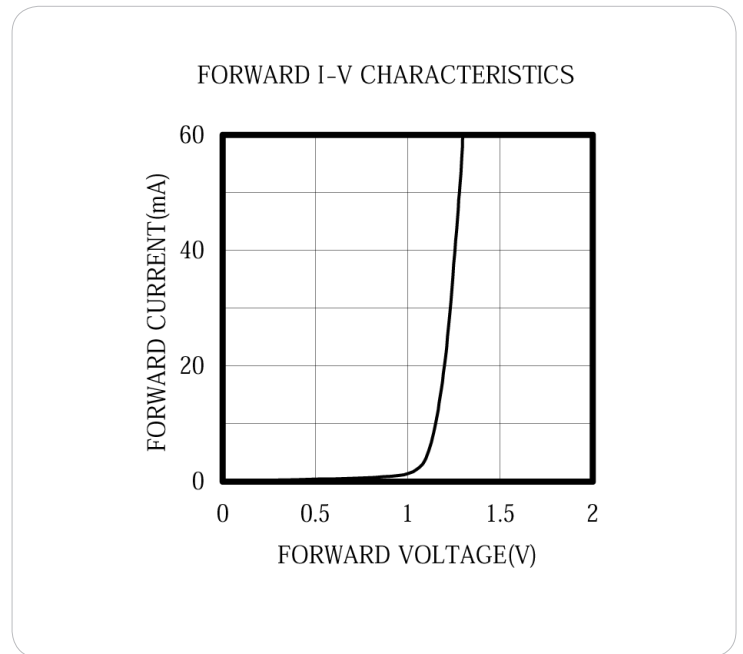
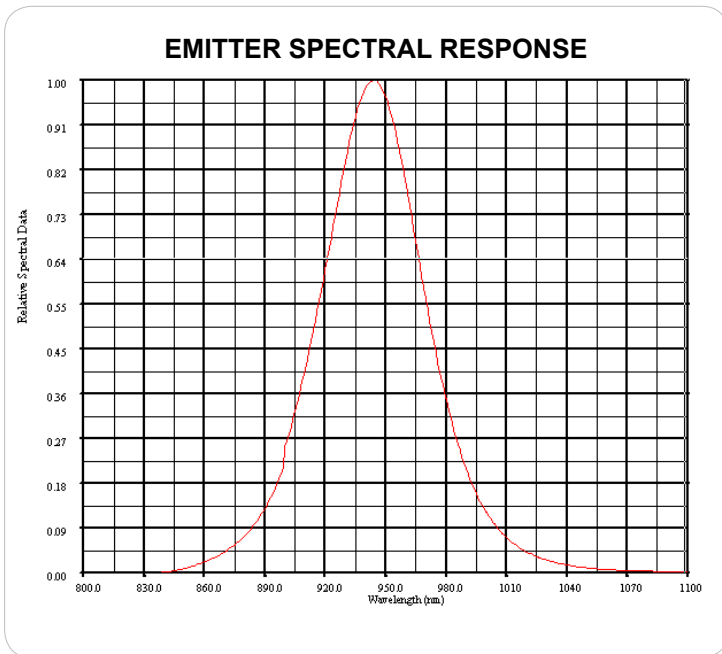
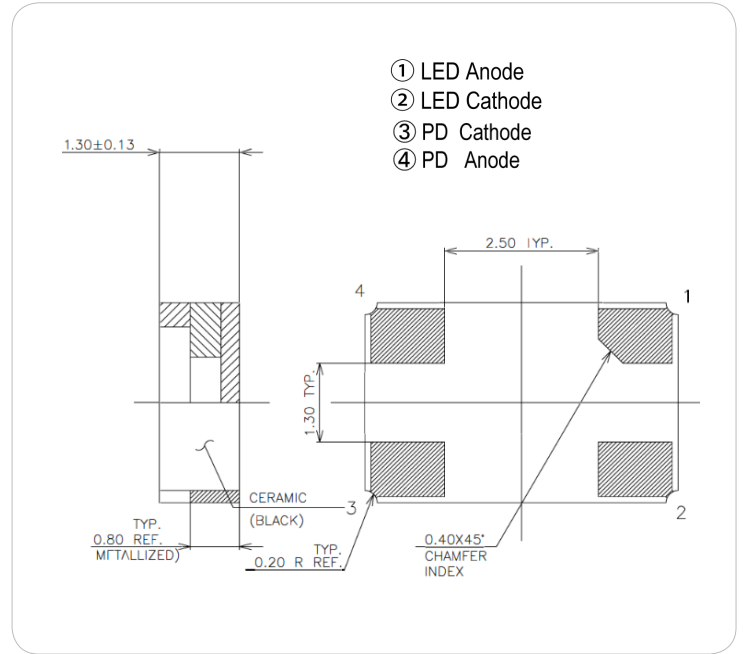
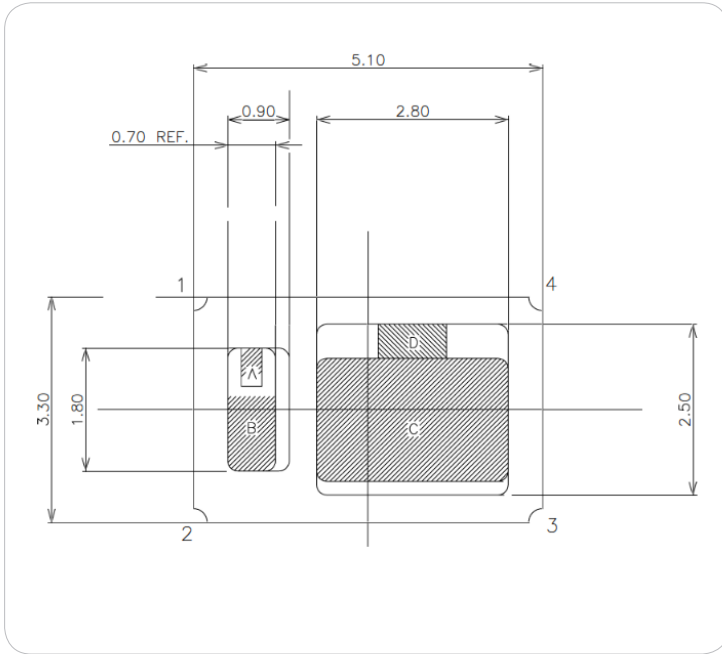


ITEMS	SYMBOL	RATINGS	UNIT
Forward Current (LED)	IF	100	mA
Pulse Forward Current (LED)*1	IFP	1	A
Reverse Voltage (LED)	VR	5	V
Power Dissipation (LED)	PD	100	mW
Reverse Current	IR (VR=5V)	10	uA
Operating Temperature Range	Topr	-20 to +80	°C
Storage Temperature Range	Tstg	-30 to +100	°C

*1: Tw=10µsec, T=10msec.

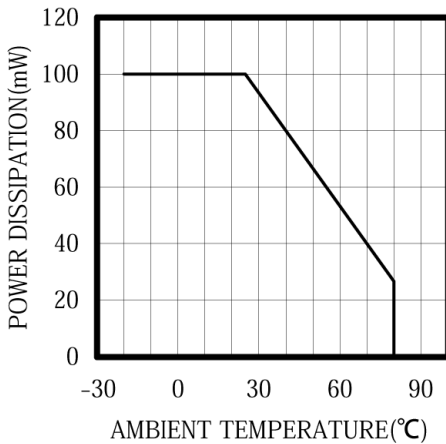
Electrical & Optical Characteristics (Ta = 25°C)

ITEMS	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNIT
Forward Voltage (LED)	VF	IF=50mA	--	1.2	--	V
Forward Voltage (PD)	VF	IF=20mA	--	--	1.3	V
Peak Emissions Wavelength	λ_p	IF=50mA	--	950	--	nm
Spectral Line Half Width	$\Delta\lambda$	IF=50mA	--	55	--	nm
Power Output	PO	IF=50mA	--	2.1	--	mW
Reverse Dark Current (Iceo)	ID	VR=10V H=0mw/cm2	--	--	10	nA
Reverse Light Current	IL	VR=5V CT=2870°K H=5mw/cm2	1.8	2.0	2.2	uA
Reverse Breakdown Voltage	V(BR)R	IR=100uA H=0mw/cm2	33	--	--	V
Open Circuit Voltage	VOC	CT=2870°K H=5mw/cm2	--	420	--	mV
Short Circuit Current	SC	CT=2870°K H=5mw/cm2	--	1.5	--	µA
Total Capacitance	CT	VR=5V H=0mw/cm2 f=1MHz	--	5	--	pF

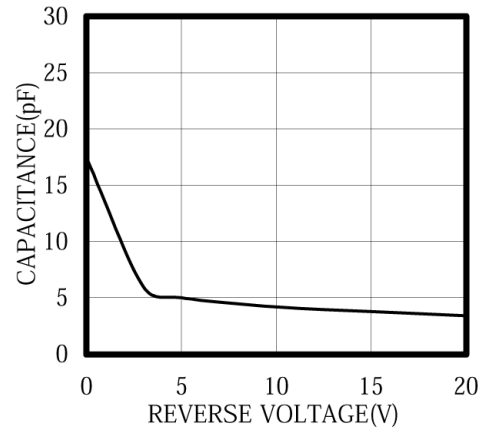


Unit: mm, Tolerance: ±0.2

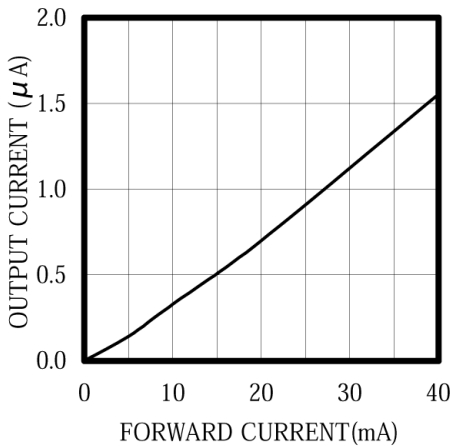
THERMAL DERATING CURVE



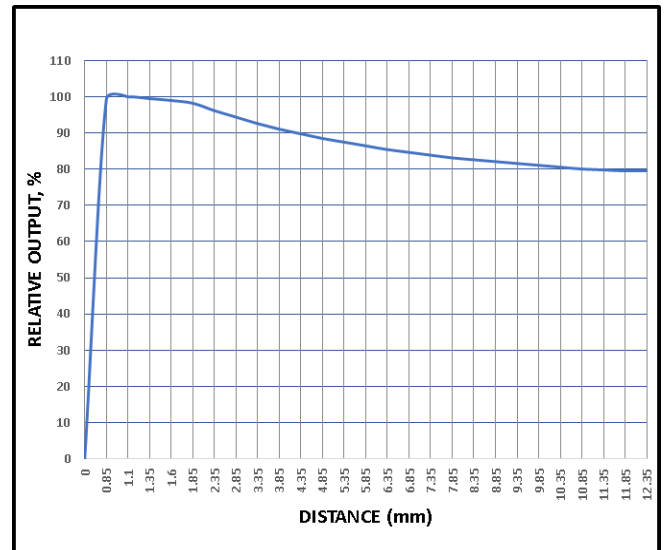
CAPACITANCE vs REVERSE VOLTAGE



IF VS I_o @VR=10V



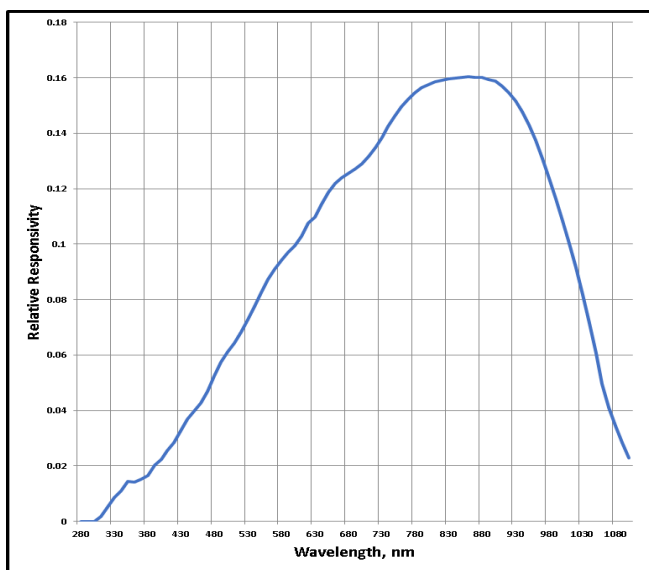
RELATIVE OUTPUT vs DISTANCE



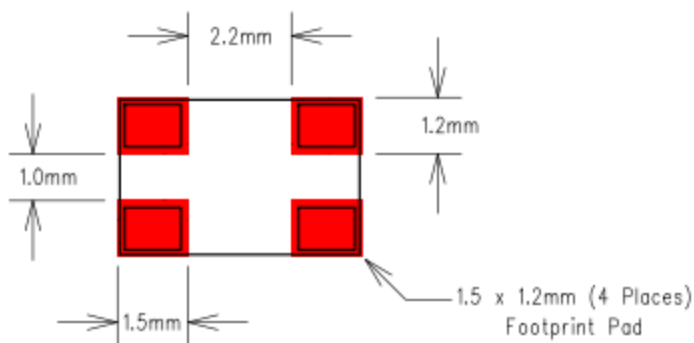
The information contained herein is subject to change without notice.

2021-05-27

RESPONSIVITY



PCB FOOTPRINT PATTERN



The information contained herein is subject to change without notice.

2021-05-27