



**Pb-free
HEAT**



1105W Series

Single Color Dome Lens Type
(High Reliability type, V-Series)

Product features

Package	3216 fixed lens type, Water clear epoxy		
Product features	• Outer Dimension 3.2 x 1.6 x 1.85mm (L x W x H) • Wide operation temperature range. Storage Temperature : InGaP : -40 °C~110 °C : AlInGaP : -40 °C~120 °C Operating Temperature : -40 °C~100 °C Operation Guarantee • Ramification of luminosity group sorting. It is possible to have a uniform transmission with little irregularities even when several are lined up. • Systematization of luminosity groups and color tone groups. Unified to a simple standard. • Corresponding to a use requiring high reliability in cars etc... • Surface Mount Type and Reverse Mount Type are possible. • Shape resin into a lens to make high luminosity possible. • Lead free compatibility.		
Dominant wavelength	Blue	: 470nm (VUB)	
	Green	: 525nm (VUG) , 558nm(VYBG)	
	Yellow-Green	: 572nm (VYPY)	
	Yellow	: 590nm (VFX)	
	Orange	: 605nm (VFA)	
	Red	: 626nm (VFR)	
Spatial distribution	VUB,VUG : 20deg. VYBG,VYPY,VFX,VFA,VFR : 40 deg.		
Die materials	VUB,VUG : InGaP VYBG, VYPY, VFX, VFA, VFR :AlGaInP		
Optical efficiency	VUB	: 10.9 lm/W	VFX : 11.8 lm/W
	VUG	: 23.6 lm/W	VFA : 11.8 lm/W
	VYBG	: 1.3 lm/W	VFR : 11.8 lm/W
	VYPY	: 4.8 lm/W	
Rank grouping parameter	Sorted by luminous intensity and wavelength and taped according to rank.		
Assembly methods (customer)	Corresponding to surface mounter.		
Soldering methods	Corresponding to reflow soldering, dip soldering, and manual soldering.		
Taping dimensions	2,000pcs(standard) per reel in a 8mm width tape. Reel diameter: ϕ 180mm		
ESD	AlInGaP:2kV (HBM) InGaP:1kV (HBM)		

Recommended Applications

SW lighting for car indicators, meter panel, car audio and heater control, etc...

Color Variations and Luminous Intensity

 (T_a=25°C)

Part No.	Material	Emitted Color	Lens Color	Dominant Wavelength		Luminous Intensity			Luminous Flux	
				λ_d (nm)		I_v (mcd)			Φ_v (lm)	
				TYP.	I _F	MIN.	MAX.	I _F	TYP.	I _F
VUB1105W	InGaN	Blue	Water Clear	470	10	150	680	10	350	10
VUG1105W	InGaN	Green		525	10	470	2,200	10	780	10
VYBG1105W	AlGaInP			558	20	27	120	20	55	20
VYPY1105W	AlGaInP	Yellow-Green		572	20	120	560	20	200	20
VFY1105W	AlGaInP	Yellow		590	20	270	1,200	20	450	20
VFA1105W	AlGaInP	Orange		605	20	270	1,200	20	450	20
VFR1105W	AlGaInP	Red		626	20	270	1,200	20	450	20

※ Note : The luminous intensity(I_v) and dominant wavelength(λ_d) above are the setup values of the sorting machine.
 (Tolerance : I_v ... +10%, λ_d ... ± 1 nm)

Absolute Maximum Ratings

($T_a=25^{\circ}\text{C}$)

Item	Symbol	Absolute Maximum Ratings							Unit
		VUB	VUG	VYBG	VYPY	VFY	VFA	VFR	
Power Dissipation	P_d	84	84	81	81	78	78	78	mW
Forward Current	I_F	20	20	30	30	30	30	30	mA
Pulse Forward Current ^{※1}	I_{FRM}	48	48	100	100	100	100	100	mA
Derating ($T_a=75^{\circ}\text{C}$ or higher)	ΔI_F	$0.40^{\text{※2}}$	$0.40^{\text{※2}}$	1.0	1.0	1.0	1.0	1.0	mA/ $^{\circ}\text{C}$
	ΔI_{FRM}	$0.96^{\text{※2}}$	$0.96^{\text{※2}}$	3.33	3.33	3.33	3.33	3.33	mA/ $^{\circ}\text{C}$
Reverse Voltage	V_R	5	5	5	5	5	5	5	V
Operating Temperature	T_{opr}	-40 ~ +100							$^{\circ}\text{C}$
Storage Temperature	T_{stg}	-40 ~ +110		-40 ~ +120					$^{\circ}\text{C}$

※1 I_{FRM} Measurement condition : Pulse Width $\leq 1\text{ms}$., Duty $\leq 1/20$.

※2 Temperature Condition: $T_a=60^{\circ}\text{C}$ or higher.

Thermal Characteristics

Item	Symbol	Ratings							Unit
		VUB	VUG	VYBG	VYPY	VFY	VFA	VFR	
Junction Temperature (MAX.)	T_j	110	110	120	120	120	120	120	$^{\circ}\text{C}$
Thermal Resistance (TYP.) (Junction/ Solder Point)	$R_{(th J-S)}$	600	600	700	650	650	650	650	$^{\circ}\text{C}/\text{W}$

※ $R_{(th J-S)}$ Measurement Condition / Substrate: FR4($t=1.6\text{mm}$) Pattern Size: 16mm^2 .

Electro-Optical Characteristics (VUB,VUG)

(T_a=25°C)

Item	Conditions	Symbol	Characteristic Ratings		Unit
			VUB	VUG	
Forward Voltage	I _F =10mA	V _F	TYP.	3.3	V
			MAX.	3.8	
Reverse Current	V _R =5V	I _R	MAX.	100	μA
Peak Wavelength	I _F =10mA	λ _p	TYP.	465	nm
Dominant Wavelength	I _F =10mA	λ _d	TYP.	470	nm
Spectral Line Half Width	I _F =10mA	Δλ	TYP.	26	nm
Half Intensity Angle	I _F =10mA	2θ _{1/2}	TYP.	20	deg.

※Note: The dominant wave length (λ_d) above is the setup value of the sorting machine.
(Tolerance: λ_d ...± 1nm)

Electro-Optical Characteristics (VYBG, VYPY, VFY, VFA, VFR)

(T_a=25°C)

Item	Conditions	Symbol	Characteristic Rating					Unit
			VYBG	VYPY	VFY	VFA	VFR	
Forward Voltage	I _F =20mA	V _F	TYP.	2.1	2.1	1.9	1.9	V
			MAX.	2.5	2.5	2.4	2.4	
Reverse Current	V _R =5V	I _R	MAX.	100	100	100	100	μA
Peak Wavelength	I _F =20mA	λ _p	TYP.	565	575	592	609	nm
Dominant Wavelength	I _F =20mA	λ _d	TYP.	558	572	590	605	nm
Spectral Line Half Width	I _F =20mA	Δλ	TYP.	15	15	15	15	nm
Half Intensity Angle	I _F =20mA	2θ _{1/2}	TYP.	40	40	40	40	deg.

※Note: The dominant wave length (λ_d) above is the setup value of the sorting machine.
(Tolerance: λ_d ...± 1nm)

Luminous Intensity Rank

 (T_a=25°C)

Standard Chart (Unit: mcd)

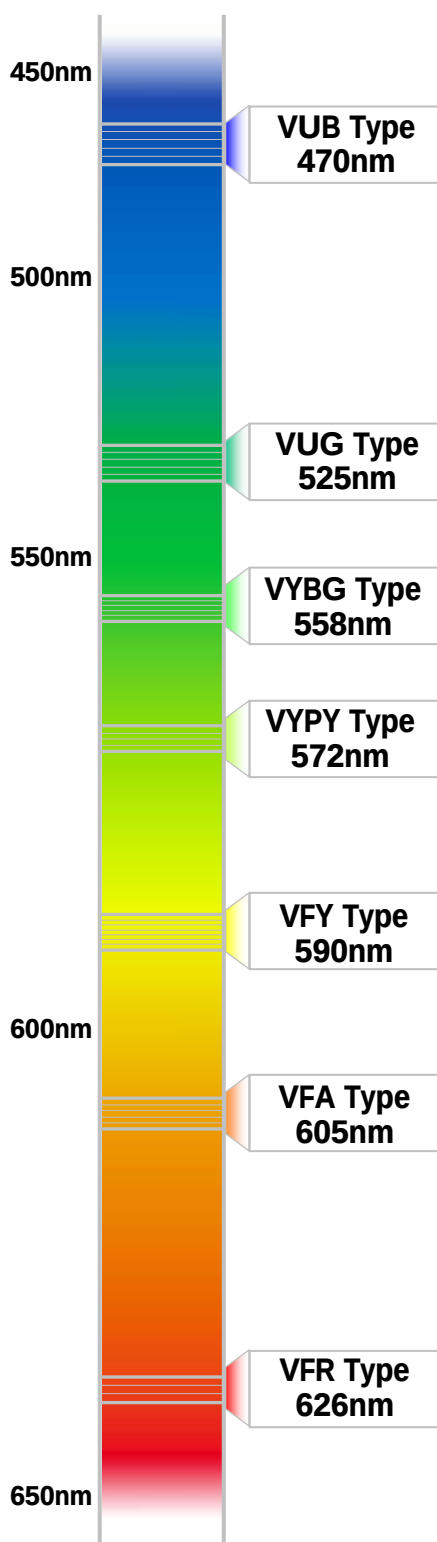
Rank	I _v (mcd)		VUB	VUG	VYBG	VYPY	VFY	VFA	VFR
	MIN.	MAX.	I _F =10mA		I _F =20mA				
B5	22	27							
B6	27	33			B6				
B7	33	39							
B8	39	47							
B9	47	56							
BX	56	68							
BY	68	82							
BZ	82	100							
C1	100	120			C1				
C2	120	150				C2			
C3	150	180	C3						
C4	180	220							
C5	220	270							
C6	270	330					C6	C6	C6
C7	330	390		C9					
C8	390	470							
C9	470	560			C9				
CX	560	680	CX						
CY	680	820							
CZ	820	1,000							
D1	1,000	1,200							
D2	1,200	1,500					D2	D2	D2
D3	1,500	1,800							
D4	1,800	2,200		D4					
D5	2,200	2,700							
D6	2,700	3,300							
D7	3,300	3,900							
D8	3,900	4,700							
D9	4,700	5,600							

※ Limited width of luminous intensity rank is from Min.4 rank width.

Color Tone Groups (λ_d)

 $\{T_a=25^{\circ}\text{C}\}$

(unit: nm)

 Tolerance: $\pm 1\text{nm}$


VUB Type ($I_F=10\text{mA}$)

	A	B	C	D	E
MIN.	460.0	464.0	468.0	472.0	476.0
MAX.	464.0	468.0	472.0	476.0	480.0

VUG Type ($I_F=10\text{mA}$)

	A	B	C	D	E
MIN.	515.0	520.0	525.0	530.0	535.0
MAX.	520.0	525.0	530.0	535.0	540.0

VYBG Type ($I_F=20\text{mA}$)

	A	B	C	D	E
MIN.	552.0	555.0	558.0	561.0	564.0
MAX.	555.0	558.0	561.0	564.0	567.0

VYPY Type ($I_F=20\text{mA}$)

	A	B	C	D
MIN.	567.0	570.0	573.0	576.0
MAX.	570.0	573.0	576.0	579.0

VFY Type ($I_F=20\text{mA}$)

	A	B	C	D	E	F	G
MIN.	577.0	580.0	583.0	586.0	589.0	592.0	595.0
MAX.	580.0	583.0	586.0	589.0	592.0	595.0	598.0

VFA Type ($I_F=20\text{mA}$)

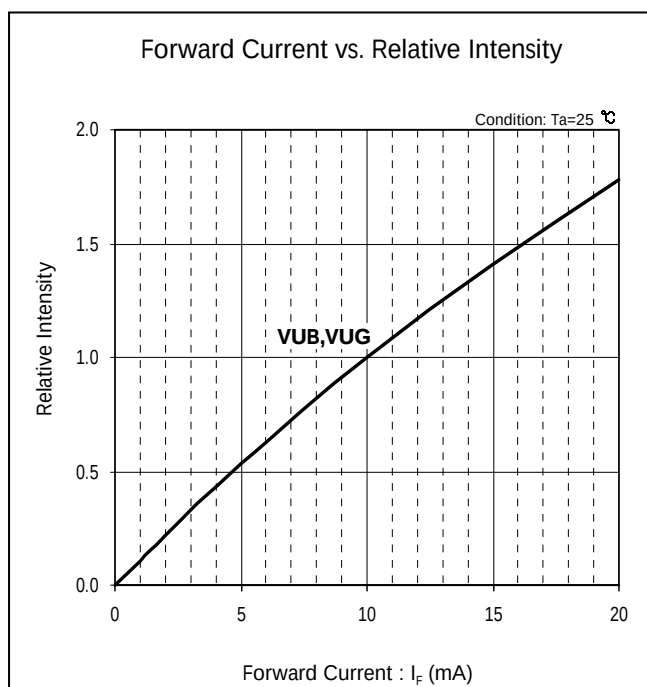
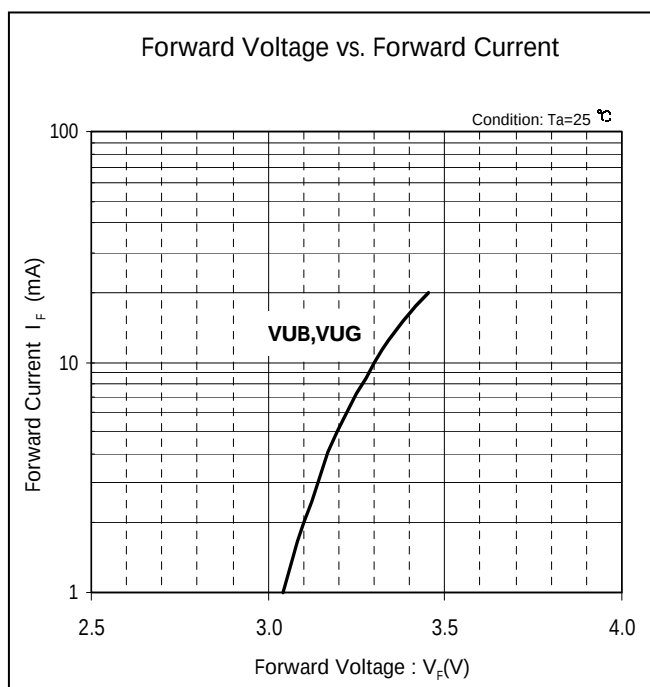
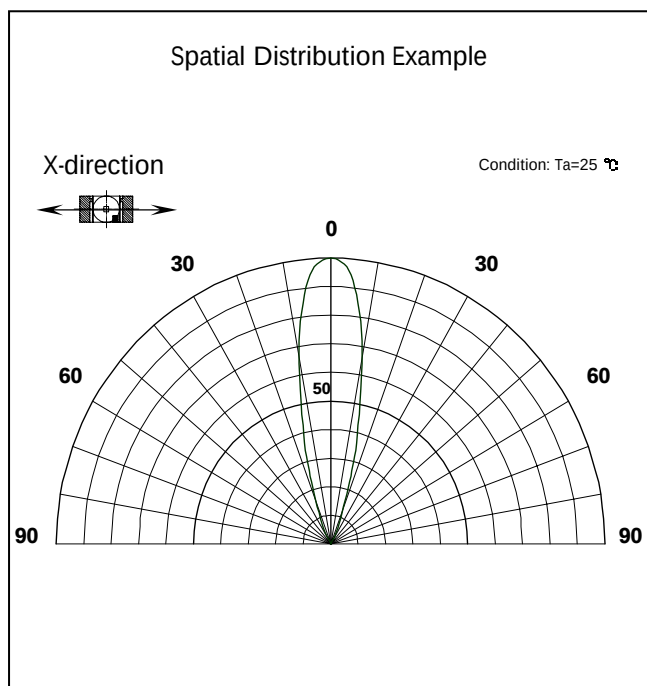
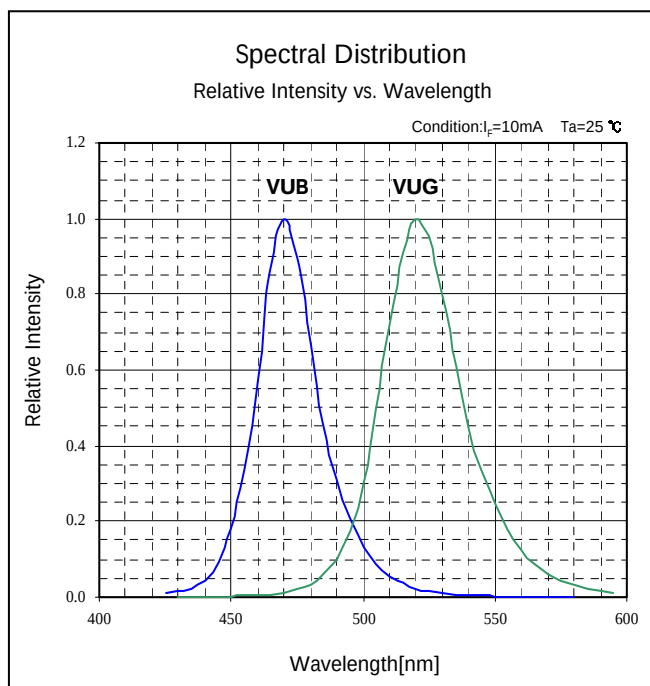
	A	B	C	D	E
MIN.	597.0	600.0	603.0	606.0	609.0
MAX.	600.0	603.0	606.0	609.0	612.0

VFR Type ($I_F=20\text{mA}$)

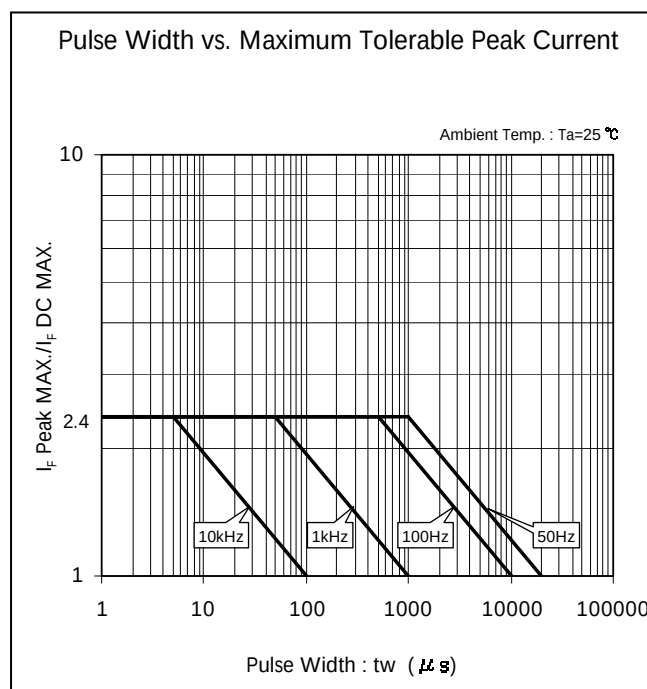
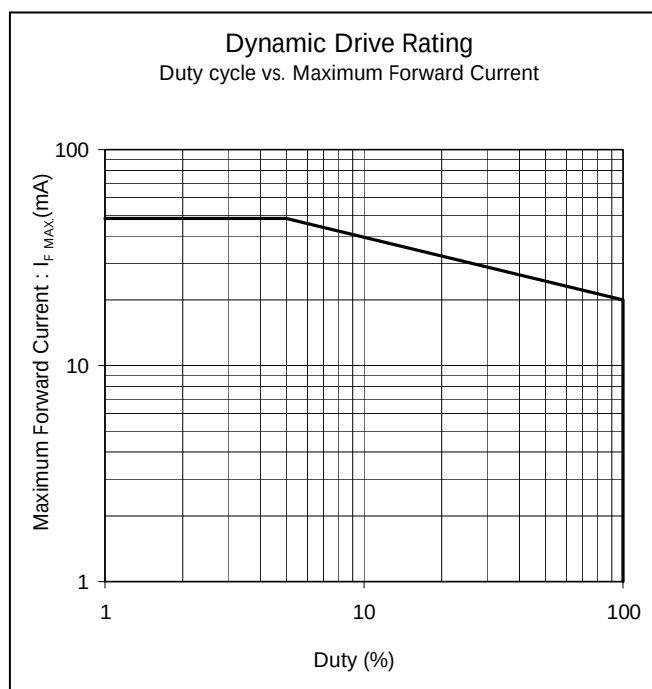
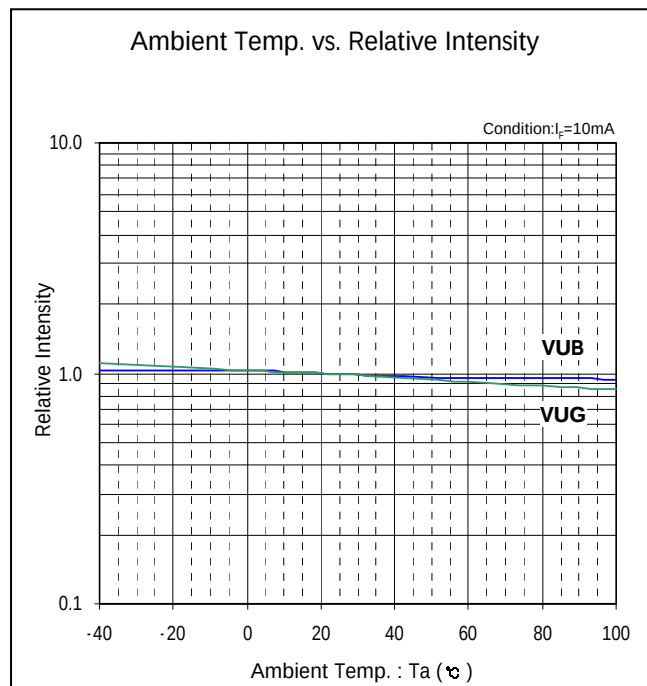
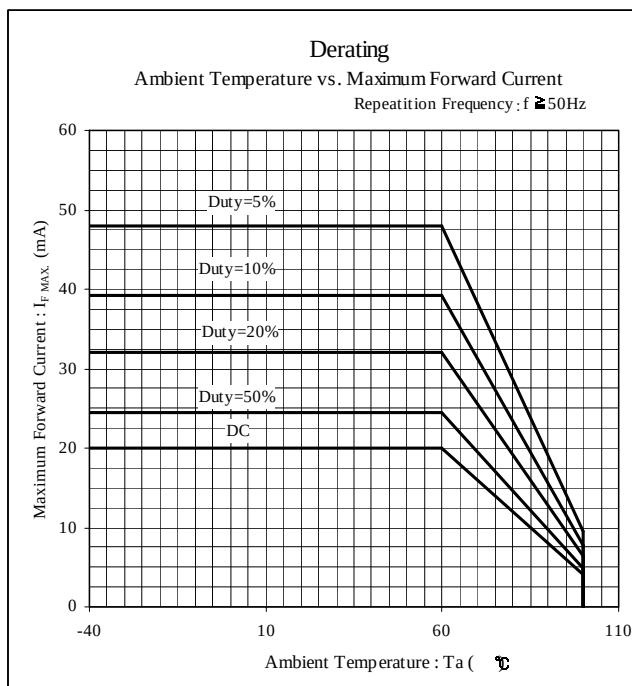
	A	B	C
MIN.	620.0	626.0	632.0
MAX.	626.0	632.0	638.0

※ Limited width of luminous intensity rank is from Min.5 to Min.6 rank width.
(It changes with product.)

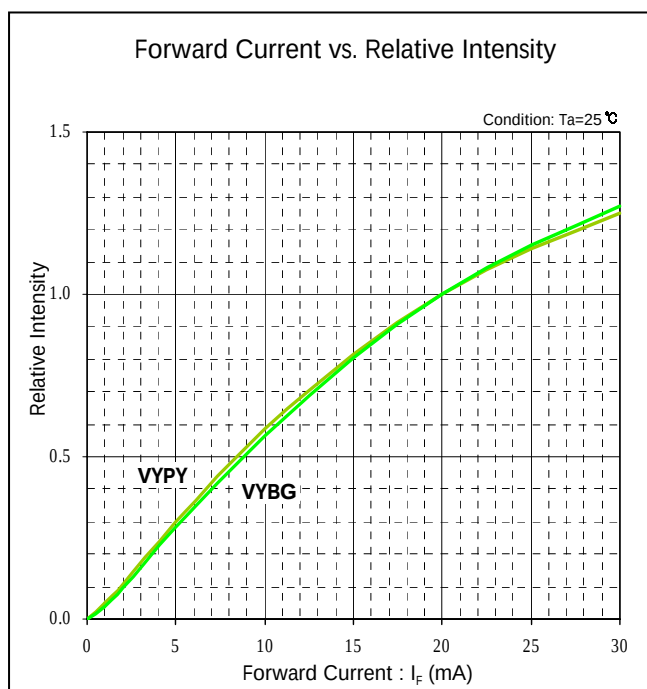
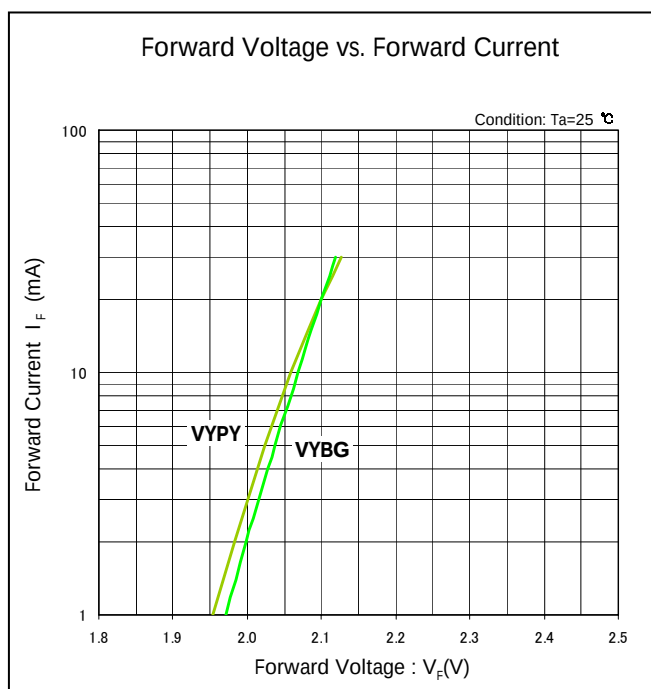
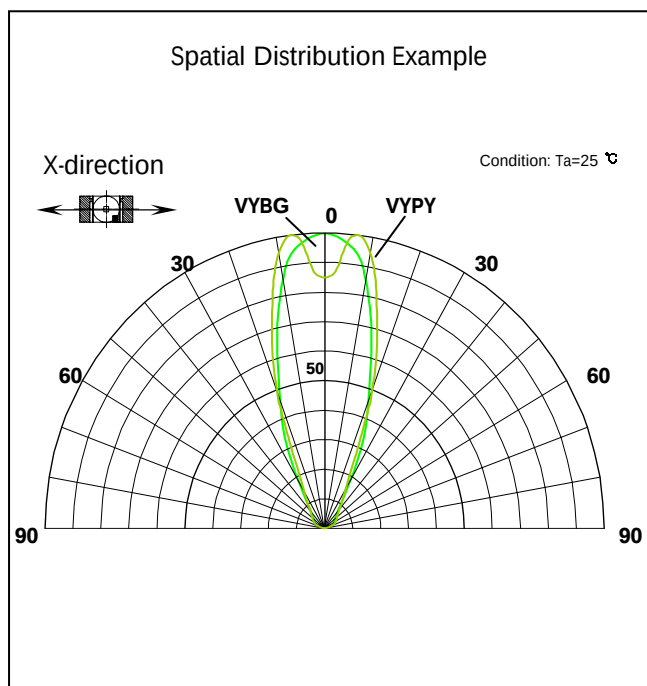
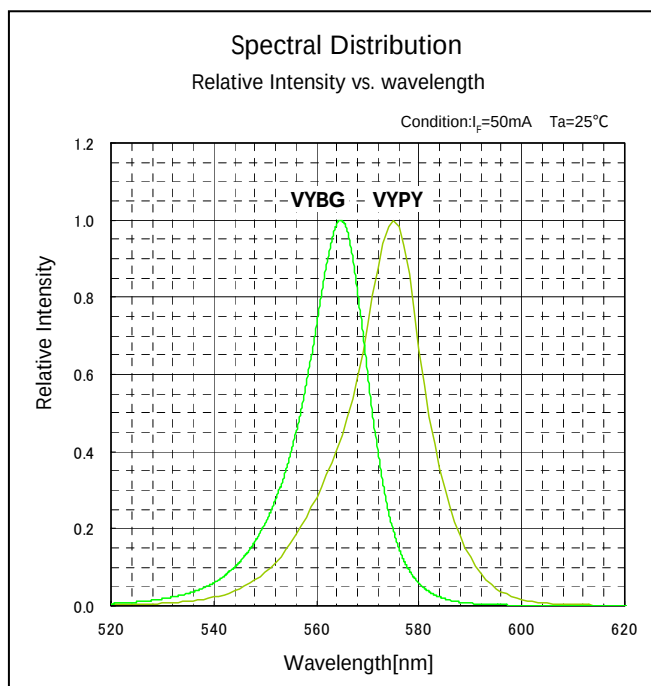
Characteristics Chart (VUB,VUG)



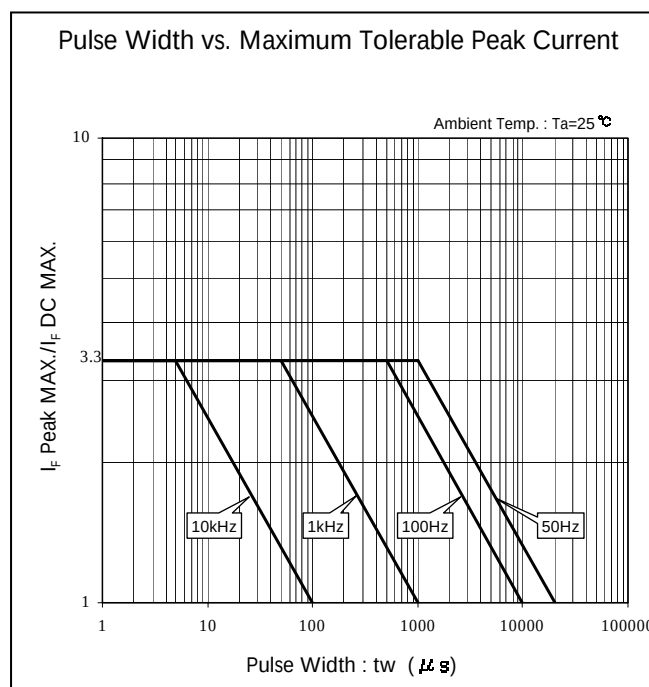
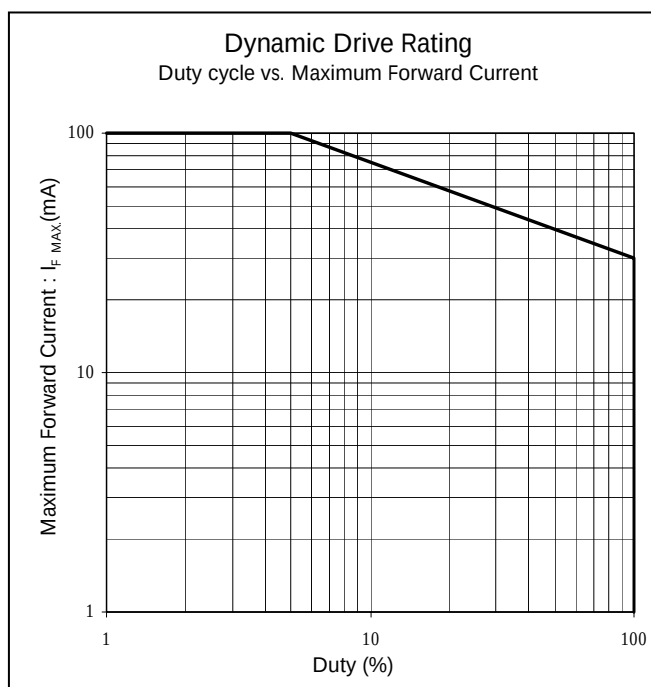
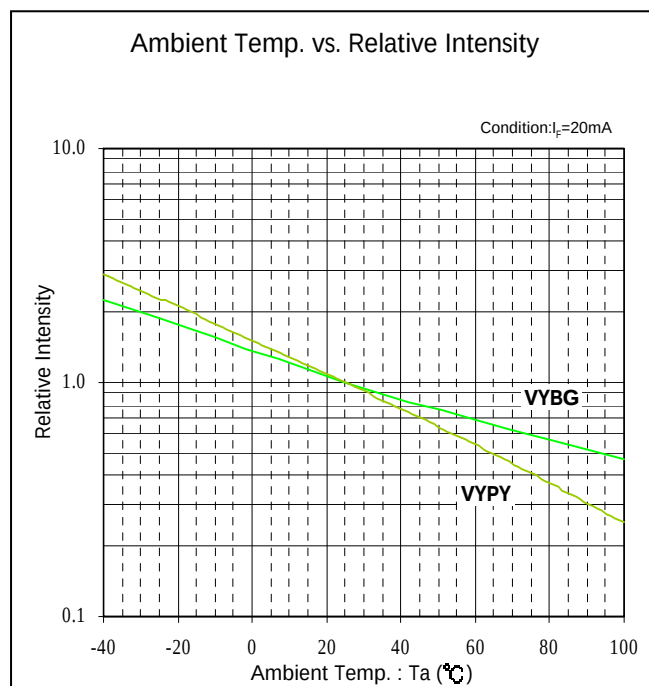
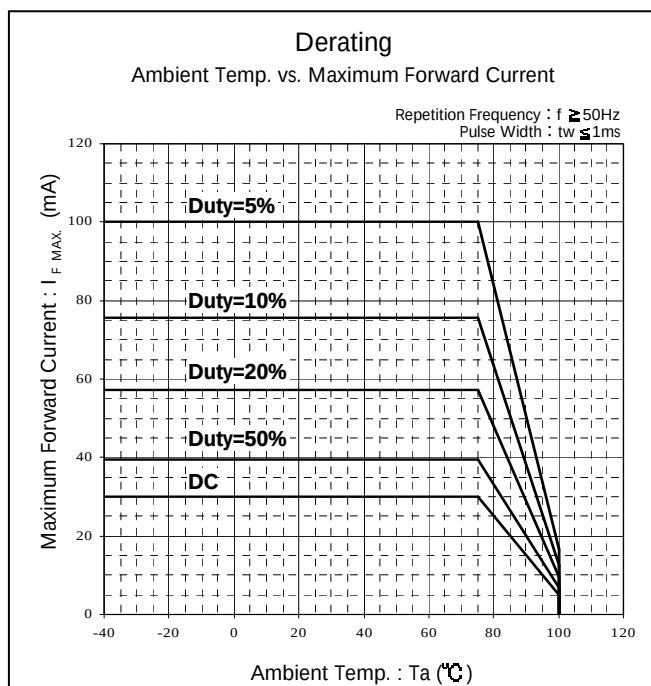
Characteristics Chart (VUB,VUG)



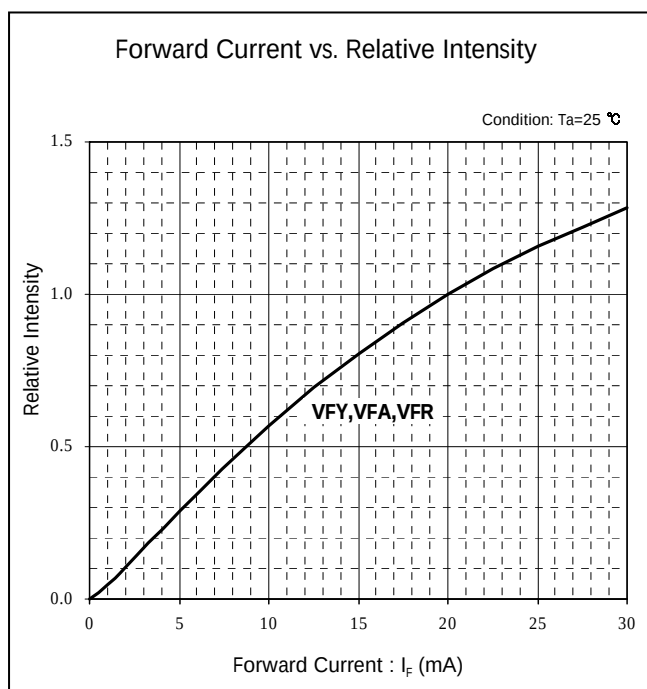
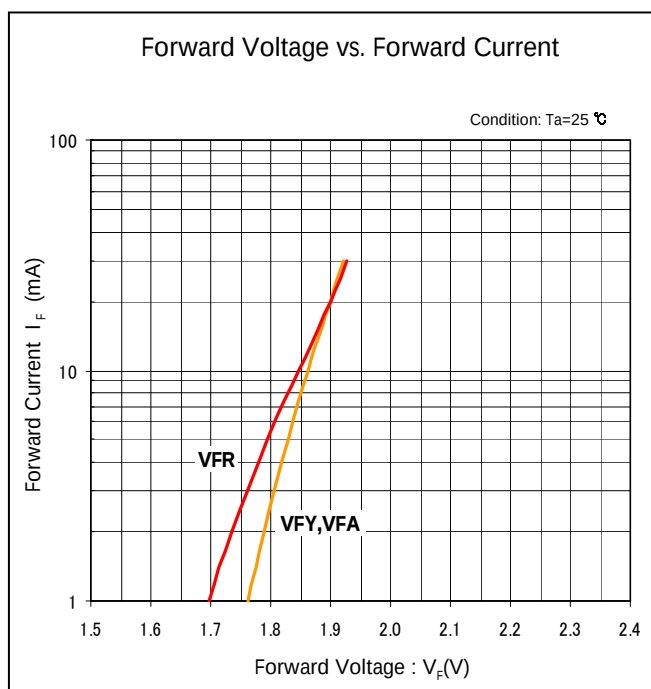
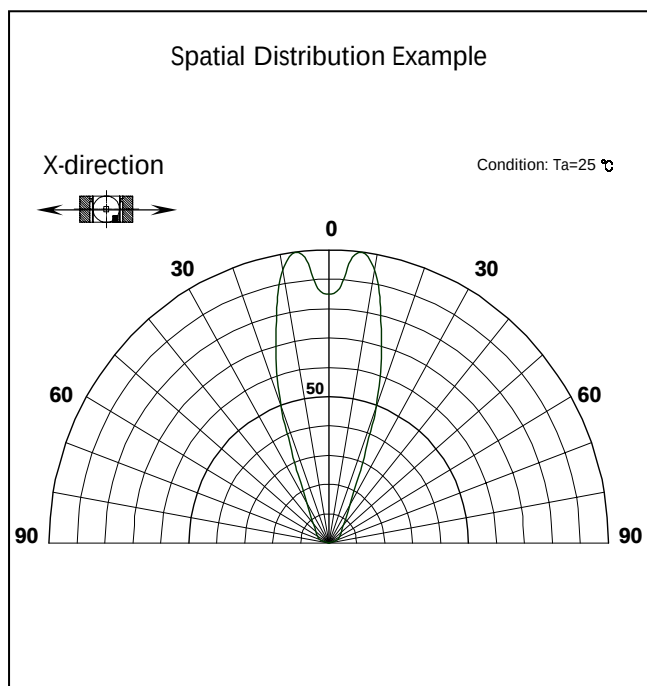
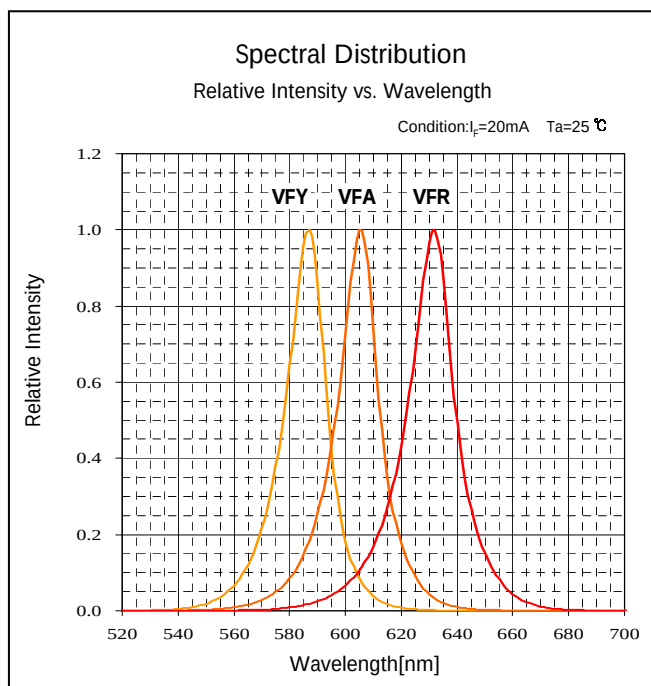
Characteristics Chart (VYBG, VYPY)



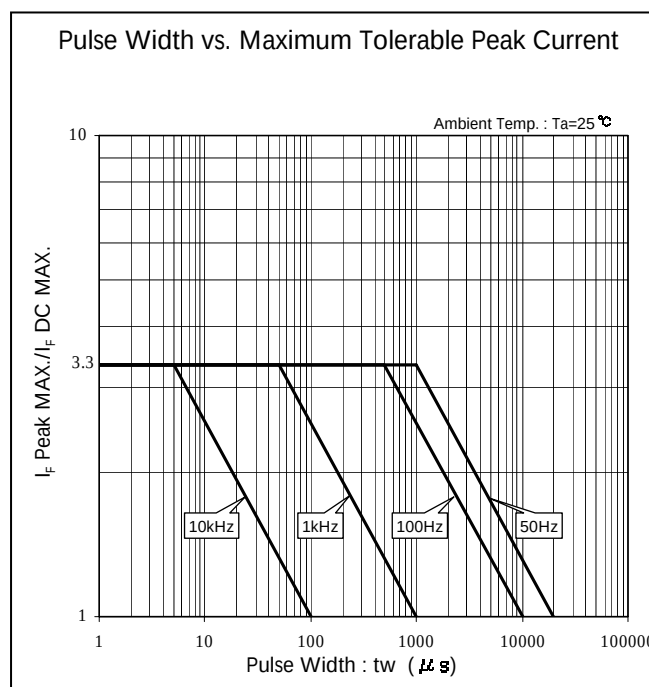
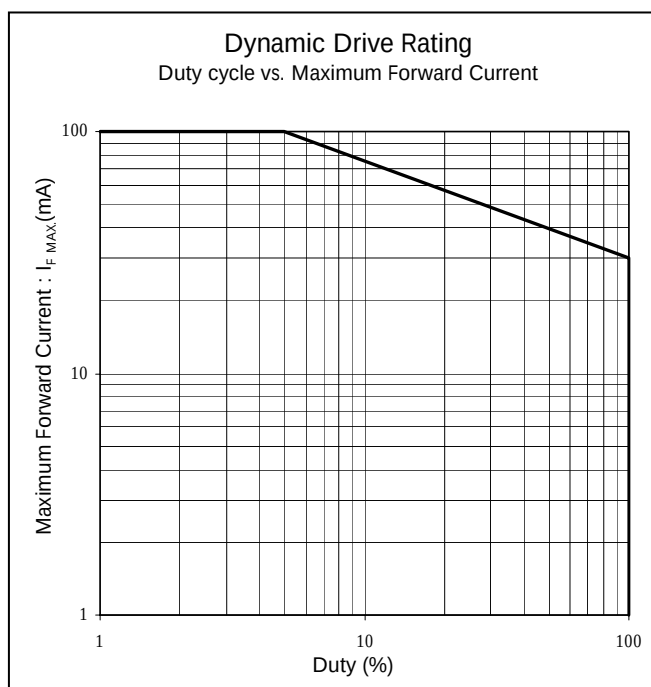
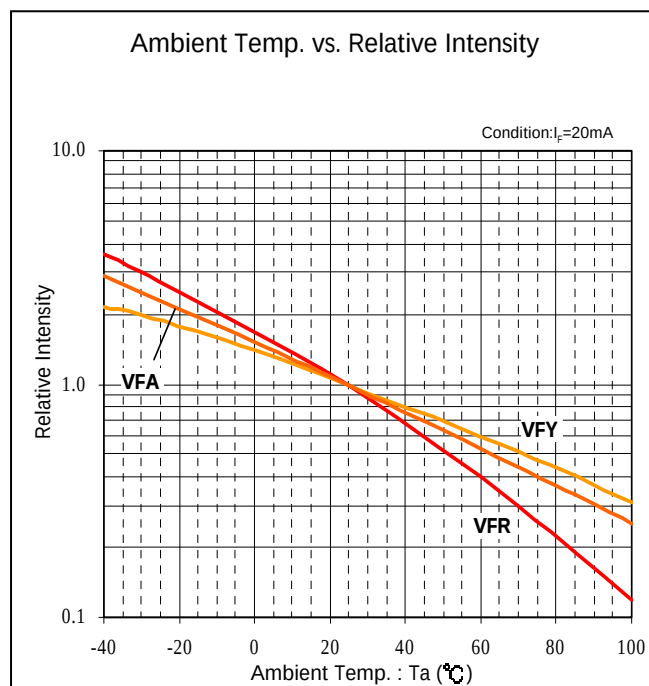
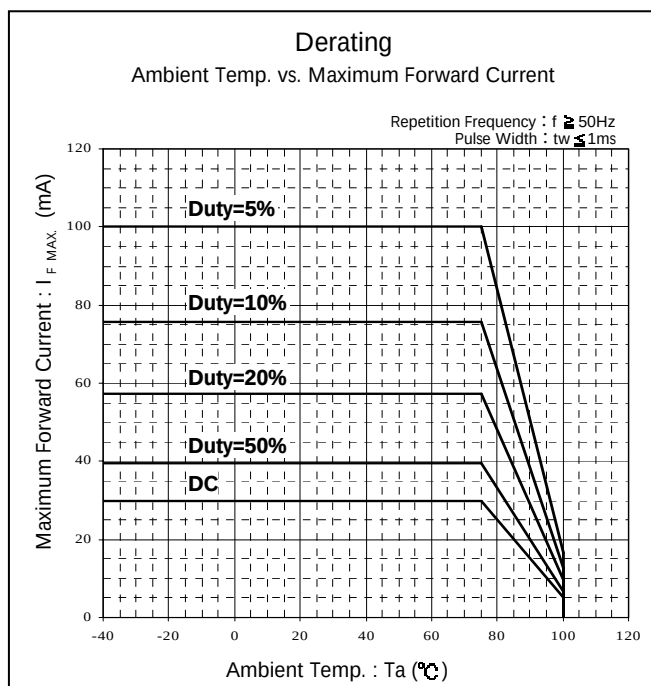
Characteristics Chart (VYBG, VYPY)



Characteristics Chart (VFY,VFA,VFR)



Characteristics Chart (VFY,VFA,VFR)

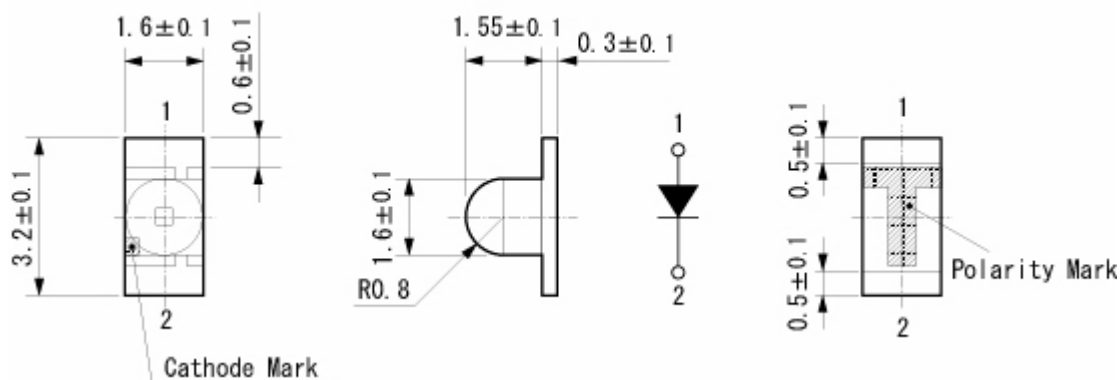


Package Dimensions

(Unit: mm)

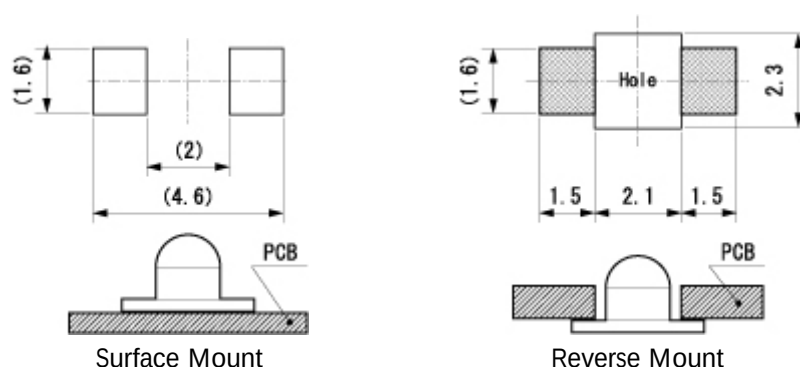
Weight: (7.81)mg

Tolerance: ± 0.1



Recommended Soldering Pattern

(Unit: mm)

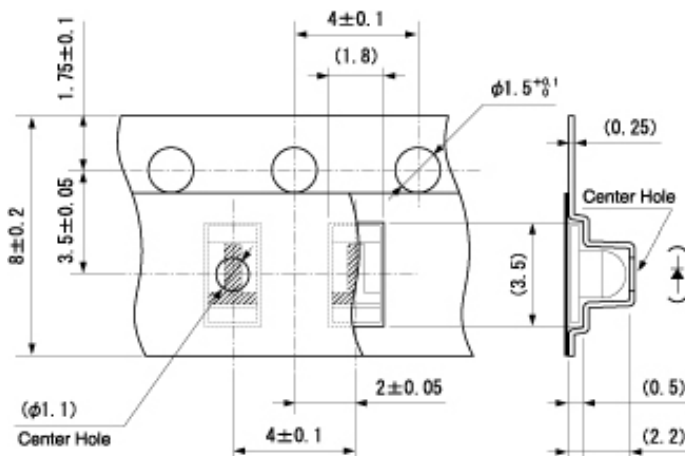
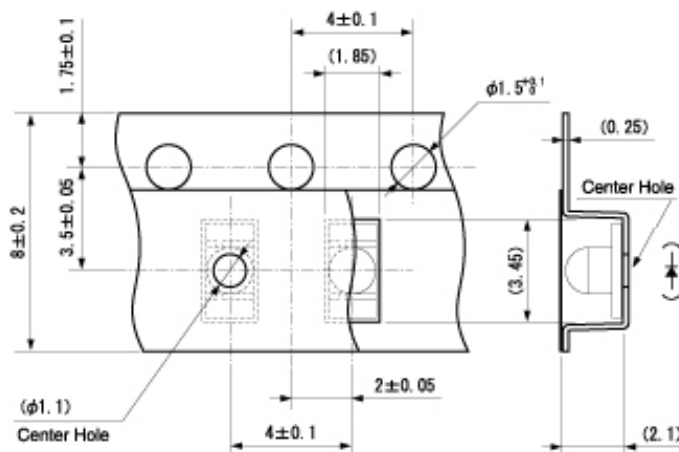


Taping Specification

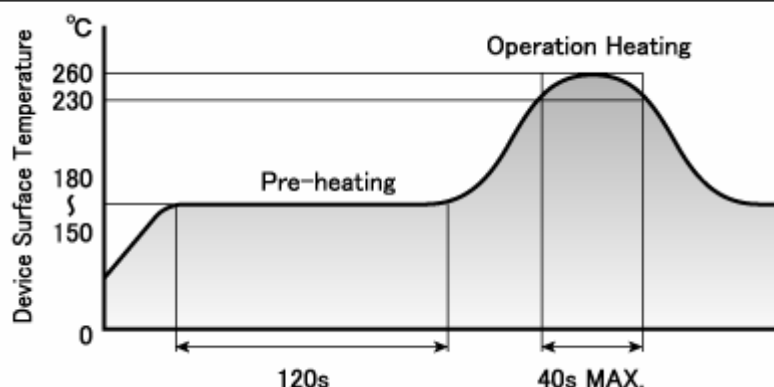
(Unit: mm)

Part No. : V□□1105W -TR (Surface Mount)
Quantity: 2,000pcs/ reel(standard)

Part No. : V□□1105W -RR (Reverse Mount)
Quantity: 2,000pcs/ reel(standard)



Reflow Soldering Conditions



- 1) The above profile temperature gives the maximum temperature of the LED resin surface. Please set the temperature so as to avoid exceeding this range.
- 2) Total times of reflow soldering process shall be no more than 2 times. When the second reflow soldering process is performed, intervals between the first and second reflow should be short as possible (while allowing some time for the component to return to room temperature after the first reflow) in order to prevent the LED resin from absorbing moisture.
- 3) Temperature fluctuation to the LED during the pre-heating process shall be minimized. (6 °C maximum)

Dip Soldering Conditions

Pre-heating	120 °C 60 s	(MAX.) (MAX.)
Solder Bath Temp.	265 °C	(MAX.)
Dipping Time	5 s	(MAX.)

- 1) The dip soldering process shall be 2 times maximum.
- 2) The product shall be cooled to room temp. before the second dipping process.

Manual Soldering Conditions

Iron tip temp.	350 °C	(MAX.)
Soldering time and frequency	3 s 1 time	(MAX.) (MAX.)

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