Color chart and Luminous Intensity

(Ta=25℃)

Part No.	Die Name	Material	Emitted Color	Lens Color	Dominant Wavelength λ d (nm)		Luminous Intensity Iv (mcd)		
					TYP.	IF	MIN.	TYP.	IF
FRYPY1211C	FR	AlGaInP	Red	Milky White	626	20	40.0	80.0	20
	YPY		Yellow Green		572	20	25.0	50.0	20
BRBG1211C	BR	GaAlAs	Red		647	20	7.0	11.7	20
	BG	GaP	Green		558	20	1.7	2.4	20
BRPG1211C	BR	GaAlAs	Red		647	20	7.0	11.7	20
	PG	GaP	Green		567	20	4.5	6.4	20
BRPY1211C	BR	GaAlAs	Red		647	20	7.0	11.7	20
	PY	GaP	Yellow Green		572	20	7.0	11.7	20

Low current type

Part No.	Die Name	Material	Emitted Color	Lens Color	Dominant Wavelength λ d (nm)		Luminous Intensity Iv (mcd)		
					TYP.	IF	MIN.	TYP.	IF
FRYPY1211C-0005	FR	AlGaInP	Red	Milky White	626	5	14.0	30.0	5
	YPY		Yellow Green		570	5	6.3	12.0	5

Absolute Maximum Ratings

(Ta=25℃)

Item	Symbol	Absolute Maximum Ratings						Unit
		BG	PG	PY	YPY	FR	BR	
Power Dissipation	P_d	70	70	70	78	81	70	mW
Continuous forward current	I_F	25	25	25	30	30	25	mA
Repetitive peak forward current※1	I_{FRM}	60	60	60	100	100	60	mA
Derating linearly (Ta=25℃ or higher)	ΔI_F	0.36	0.36	0.36	0.43	0.43	0.36	mA/℃
	ΔI_{FRM}	0.86	0.86	0.86	1.43	1.43	0.86	mA/℃
Reverse Voltage	V_R	4	4	4	5	5	4	V
Operating Temperature	T_{opr}	-30～+85			-40～+85		-30～+85	℃
Storage Temperature	T_{stg}	-40～+100						℃

Low current type

Item	Symbol	Absolute Maximum Ratings		Unit
		YPY	FR	
Power Dissipation	P_d	36	36	mW
Continuous forward current	I_F	15	15	mA
Repetitive peak forward current※1	I_{FRM}	48	48	mA
Derating linearly (Ta=25℃ or higher)	ΔI_F	0.21	0.21	mA/℃
	ΔI_{FRM}	0.69	0.69	mA/℃
Reverse Voltage	V_R	5	5	V
Operating Temperature	T_{opr}	-40～+85		℃
Storage Temperature	T_{stg}	-40～+100		℃

※1 I_{FRM}Measurement condition : Pulse Width≦1ms., Duty≦1/20.

※ The ratings specified above are under the condition that only one diode is lit.
50% Max. of each rating shall be applied when two diodes are lit simultaneously.

Electro-Optical Characteristics

(Ta=25℃)

Item	Conditions	Symbol		Characteristics						Unit
				BG	PG	PY	YPY	FR	BR	
Forward Voltage	I_F=20mA	V_F	TYP.	2.1	2.1	2.1	2.1	1.9	1.7	V
			MAX.	2.8	2.8	2.8	2.6	2.4	2.3	
Reverse Current	V_R=5V	I_R	MAX.	–	–	–	100	100	–	μA
	V_R=4V			100	100	100	–	–	100	
Peak Wavelength	I_F=20mA	λ_p	TYP.	555	560	570	575	635	660	nm
Dominant Wavelength	I_F=20mA	λ_d	TYP.	558	567	572	572	626	647	nm
Spectral Line Half Width	I_F=20mA	$\Delta\lambda$	TYP.	30	30	30	15	15	30	nm
Half Intensity Angle	I_F=20mA	2θ 1/2	TYP. (θ x)	168	168	168	115	115	150	deg.
			TYP. (θ y)	139	139	139	140	140	140	

Low current type

Item	Conditions	Symbol	Characteristics			Unit
				YPY	FR	
Forward Voltage	I_F=5mA	V_F	TYP.	1.95	1.85	V
			MAX.	2.4	2.4	
Reverse Current	V_R=5V	I_R	MAX.	100	100	μA
Peak Wavelength	I_F=5mA	λ_p	TYP.	572	635	nm
Dominant Wavelength	I_F=5mA	λ_d	TYP.	570	626	nm
Spectral Line Half Width	I_F=5mA	$\Delta\lambda$	TYP.	15	15	nm
Half Intensity Angle	I_F=5mA	2θ 1/2	TYP. (θ x)	115	115	deg.
			TYP. (θ y)	140	140	

Luminous Intensity Rank

(Ta=25℃)

Rank	I_V (mcd)															
	FRYPY1211C				BRBG1211C				BRPG1211C				BRPY1211C			
	IF = 20mA				IF = 20mA				IF = 20mA				IF = 20mA			
	YPY		FR		BG		BR		PG		BR		PY		BR	
	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.
AA	25	40	40	64	1.7	3.4	7.0	14.0	4.5	9.0	7.0	14.0	7.0	14.0	7.0	14.0
AB	40	64	40	64	2.4	4.8	7.0	14.0	6.4	12.8	7.0	14.0	9.9	19.8	7.0	14.0
AC	64	100	40	64	3.4	6.8	7.0	14.0	9.0	18.0	7.0	14.0	14.0	28.0	7.0	14.0
BA	25	40	64	100	1.7	3.4	9.9	19.8	4.5	9.0	9.9	19.8	7.0	14.0	9.9	19.8
BB	40	64	64	100	2.4	4.8	9.9	19.8	6.4	12.8	9.9	19.8	9.9	19.8	9.9	19.8
BC	64	100	64	100	3.4	6.8	9.9	19.8	9.0	18.0	9.9	19.8	14.0	28.0	9.9	19.8
CA	25	40	100	160												
CB	40	64	100	160												
CC	64	100	100	160												

※ Please contact our sales staff concerning rank designation.

Low current type

Rank	I_V (mcd)			
	FRYPY1211C-0005			
	IF = 5mA			
	YPY		FR	
	MIN.	MAX.	MIN.	MAX.
AA	6.3	10.0	14.0	22.0
AB	10.0	16.0	14.0	22.0
AC	16.0	25.0	14.0	22.0
BA	6.3	10.0	22.0	36.0
BB	10.0	16.0	22.0	36.0
BC	16.0	25.0	22.0	36.0
CA	6.3	10.0	36.0	57.0
CB	10.0	16.0	36.0	57.0
CC	16.0	25.0	36.0	57.0

※ Please contact our sales staff concerning rank designation.

Color Tone Groups (λd)

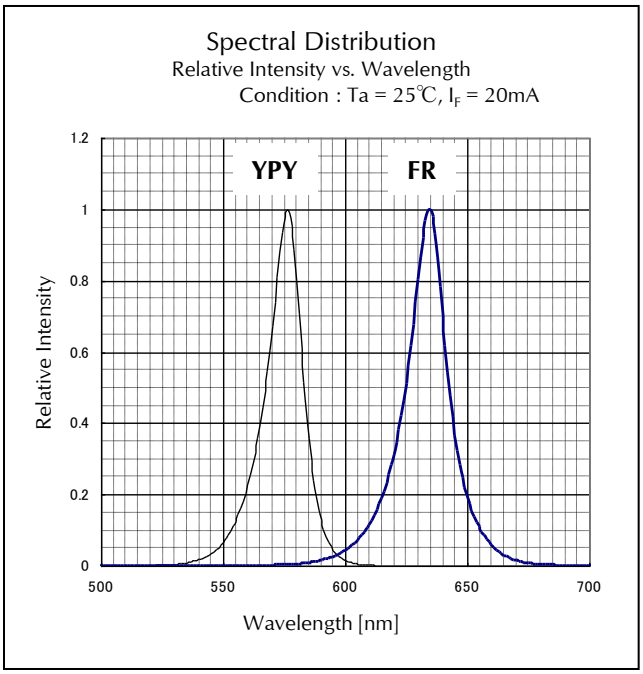
(Ta=25℃)

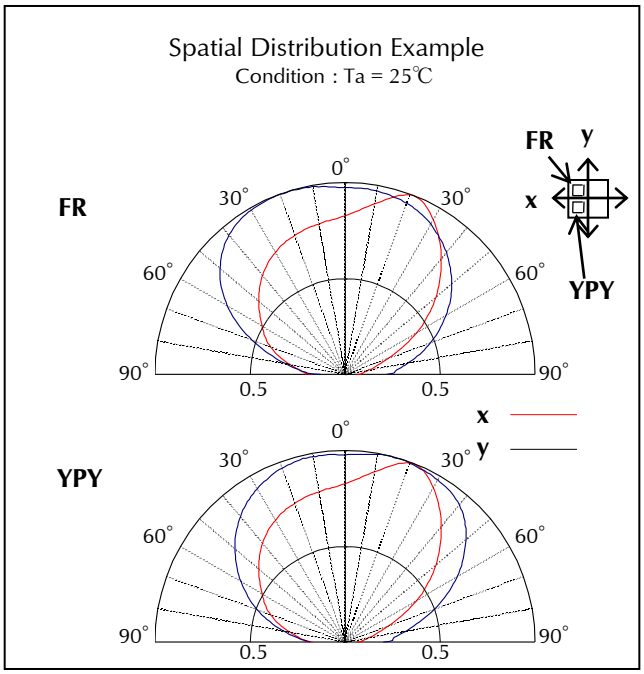
Rank	Dominant Wavelength λ d(nm)	
	FRYPY1211C	
	YPY	
	I_F=20mA	
	MIN.	MAX.
A	568	572
B	572	576

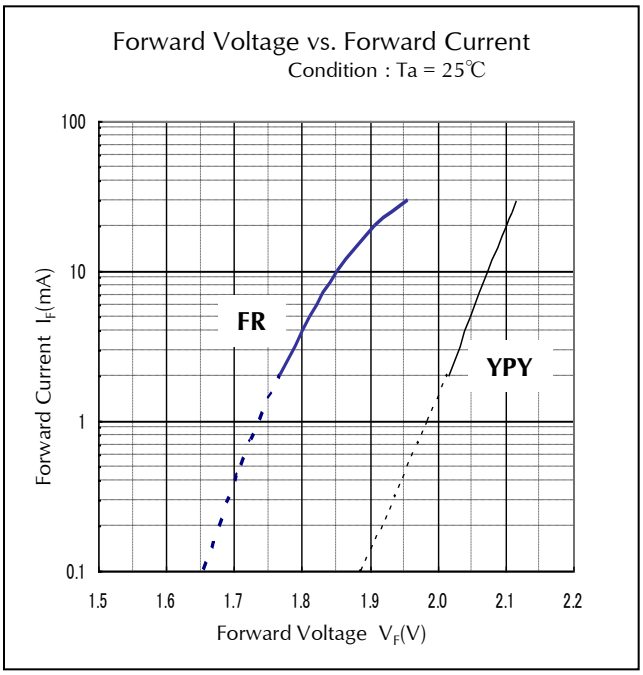
Low current type

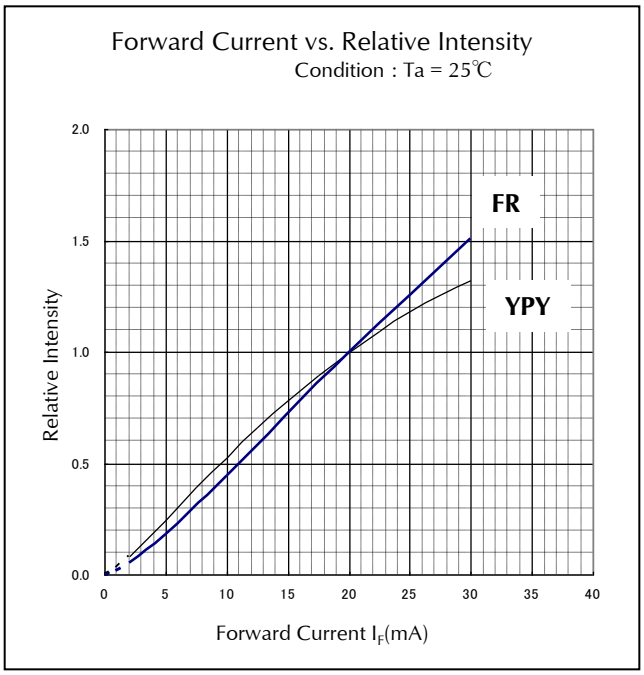
Rank	Dominant Wavelength λ d(nm)	
	FRYPY1211C-0005	
	YPY	
	I_F=5mA	
	MIN.	MAX.
A	566.5	570.5
B	570.5	574.5

Technical Data(**FR,YPY**)





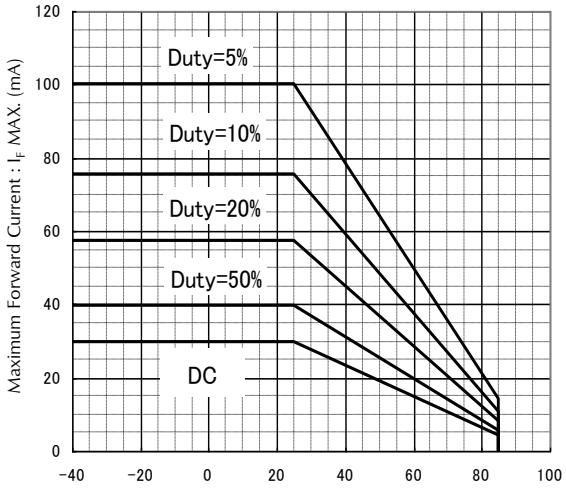




Technical Data(**FR,YPY**)

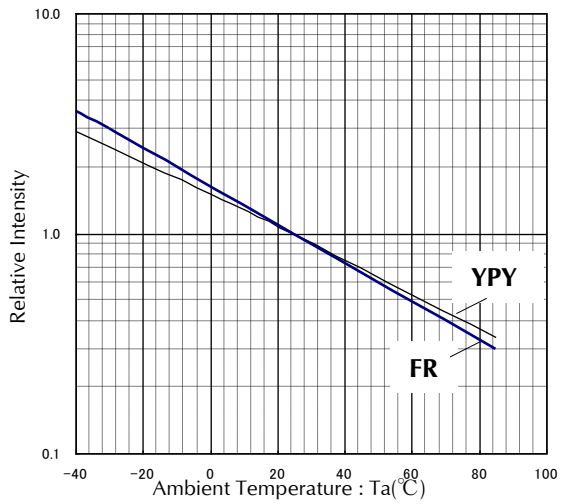
Derating

Ambient Temperature vs. Maximum Forward Current
Repetition Frequency : f ≧ 50Hz

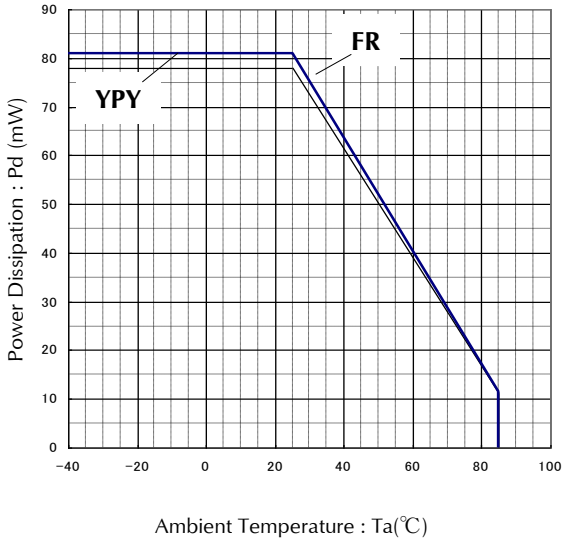


Ambient Temperature vs. Relative Intensity

Condition : I_F=20mA

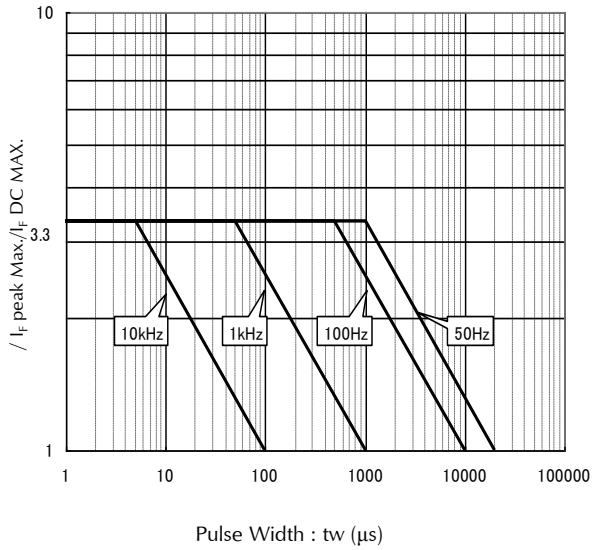


Power Dissipation vs. Ambient Temperature



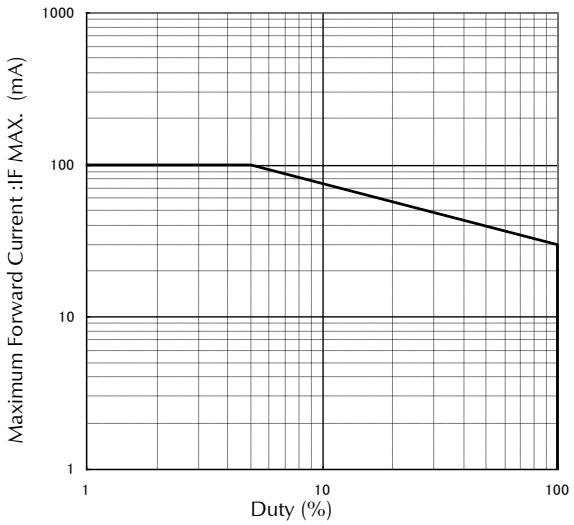
Pulse Width vs. Maximum Tolerable Peak Current

Condition : Ta = 25℃

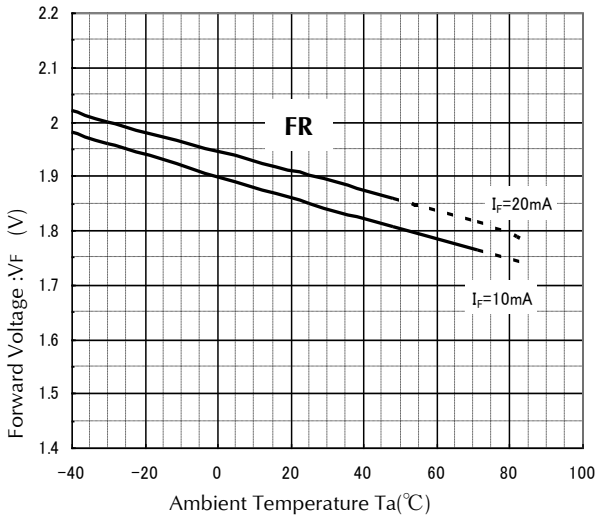


Technical Data(**FR,YPY**)

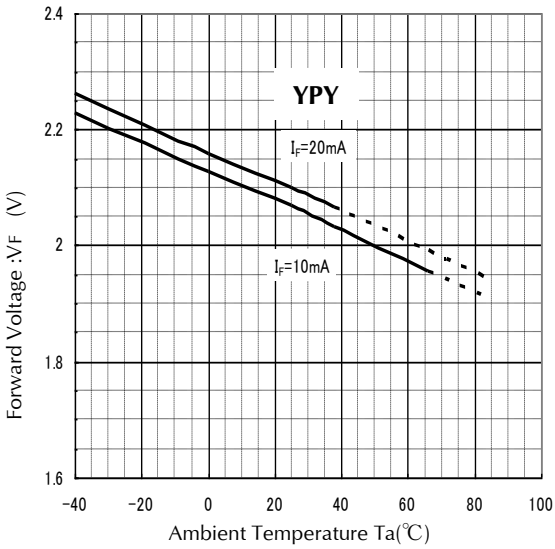
Duty cycle vs. Maximum Forward Current



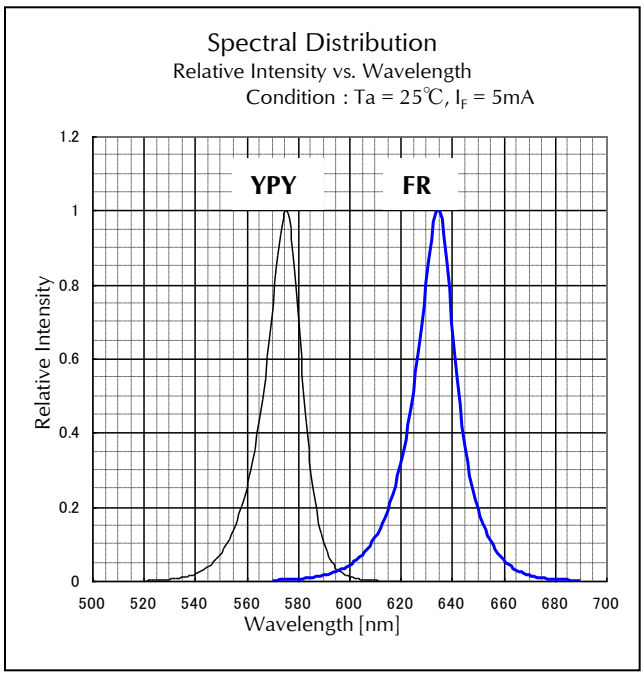
Ambient Temperature vs. Forward Voltage

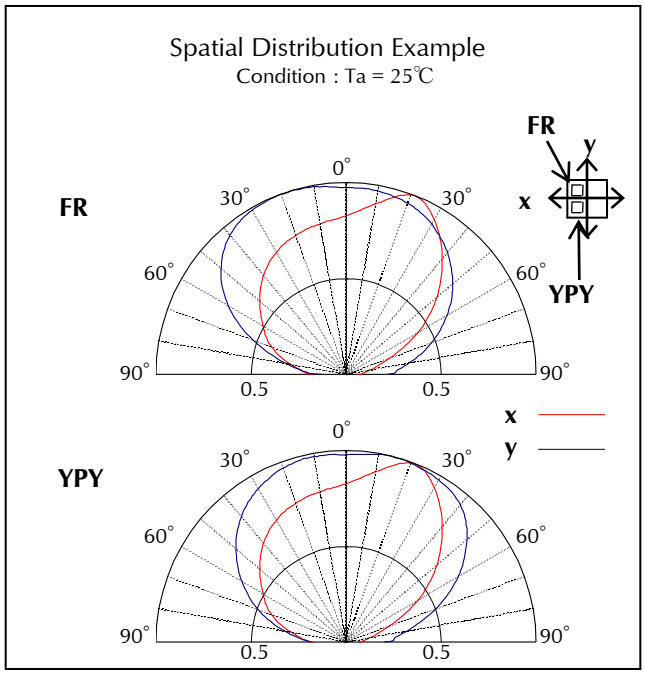


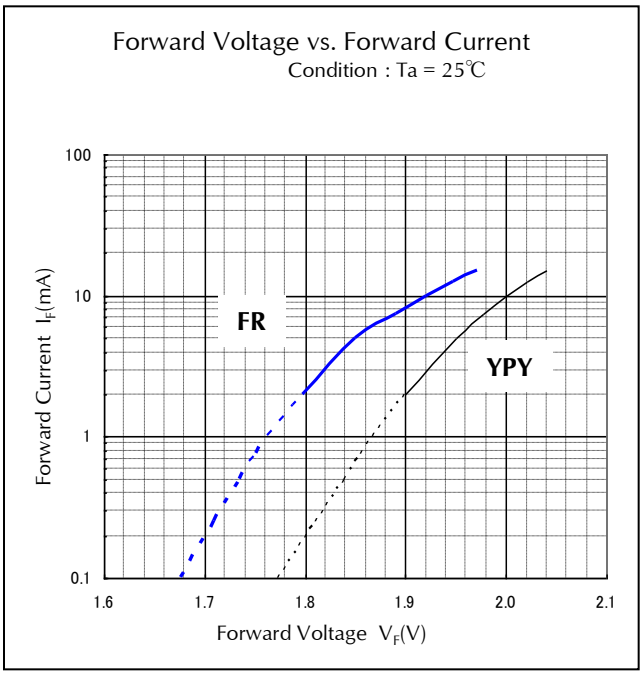
Ambient Temperature vs. Forward Voltage

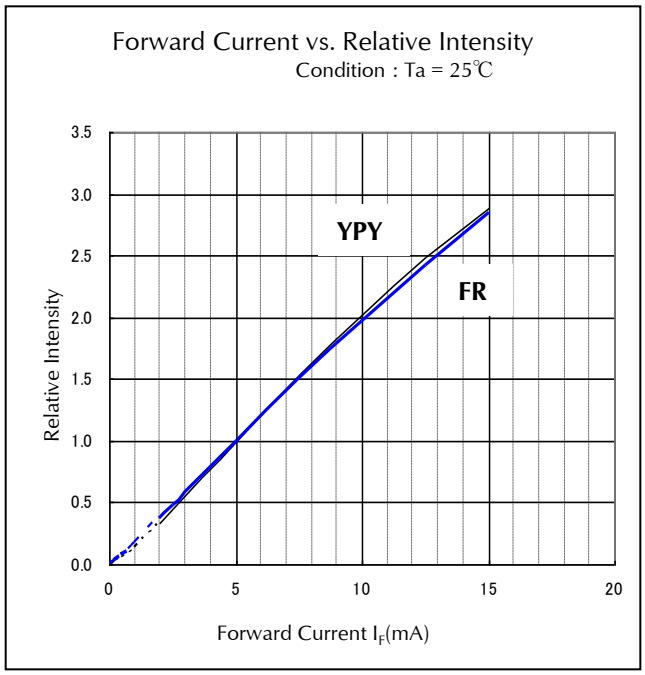


Technical Data(**FR,YPY**) Low current type(IF=5mA)





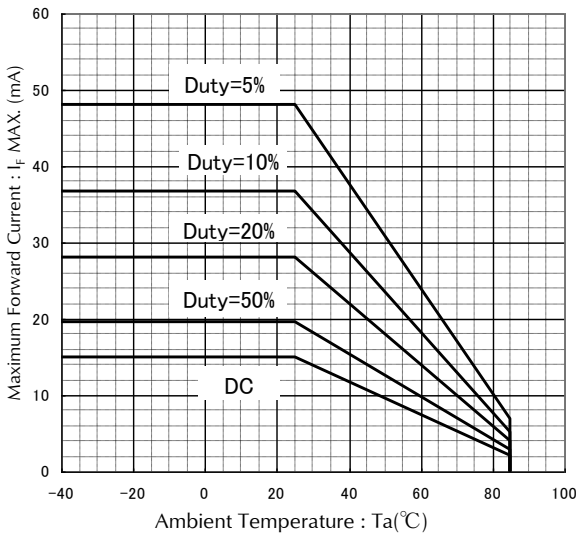




Technical Data(**FR,YPY**) Low current type(IF=5mA)

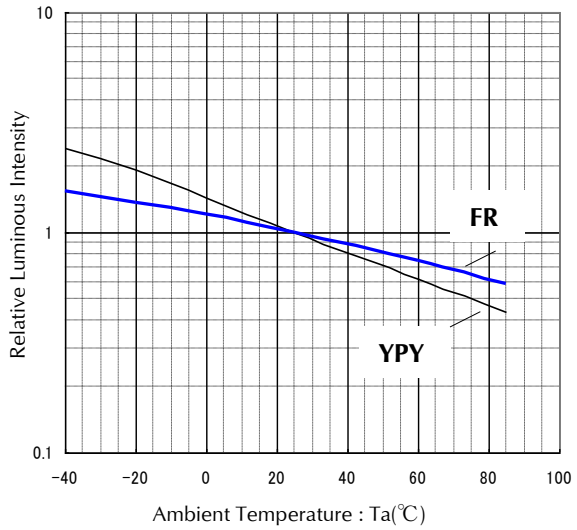
Derating

Ambient Temperature vs. Maximum Forward Current
Repetition Frequency : f ≧ 50Hz

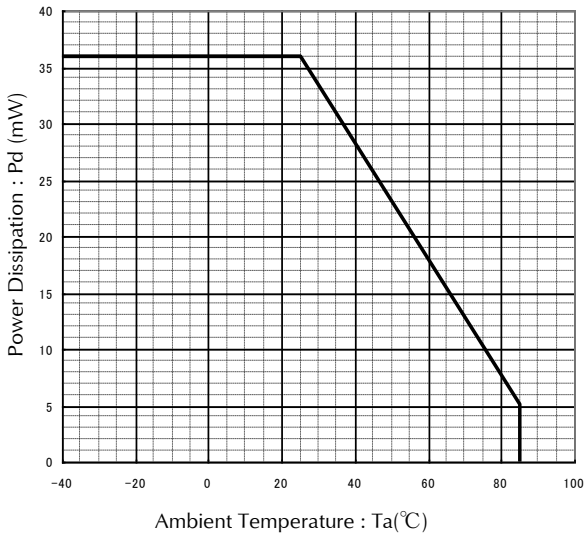


Ambient Temperature vs. Relative Intensity

Condition : I_F=5mA

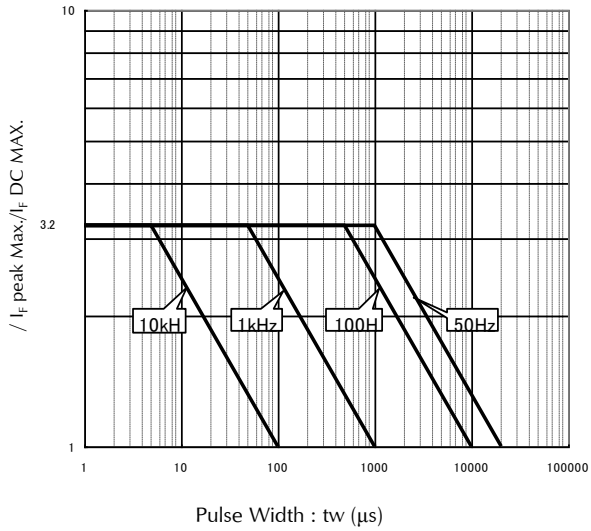


Power Dissipation vs. Ambient Temperature



Pulse Width vs. Maximum Tolerable Peak Current

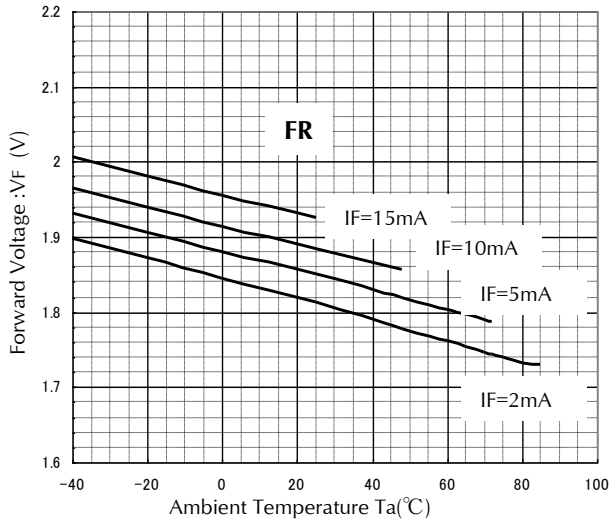
Condition : Ta = 25℃



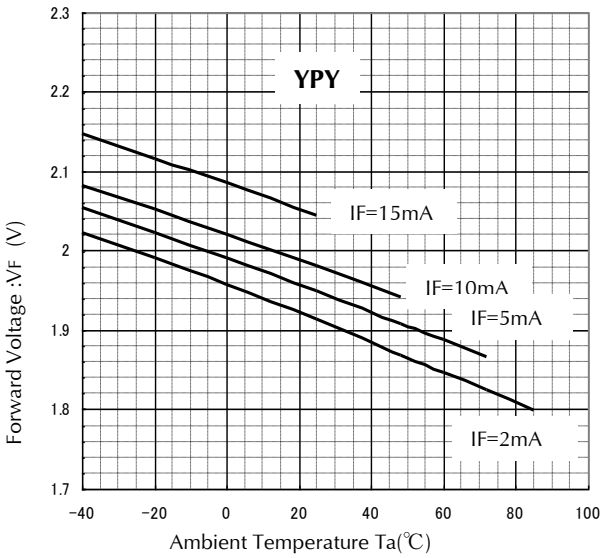
Technical Data(**FR,YPY**) Low current type(IF=5mA)

Duty cycle vs. Maximum Forward Current

Ambient Temperature vs. Forward Voltage



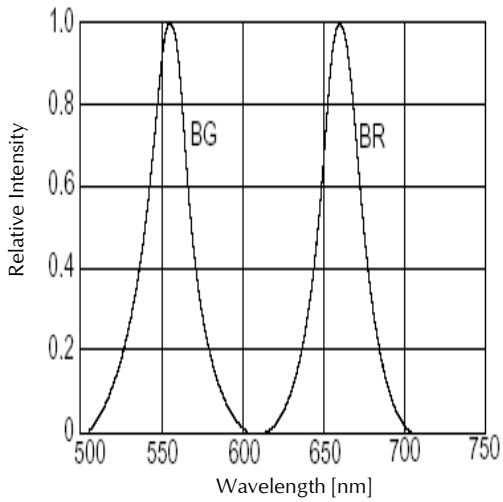
Ambient Temperature vs. Forward Voltage



Technical Data(**BR,BG**)

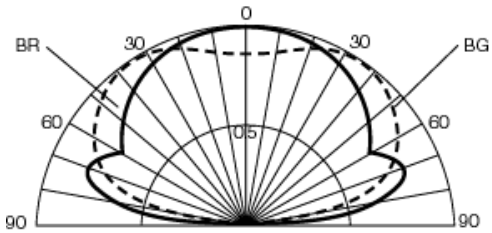
Spectral Distribution

Relative Intensity vs. Wavelength
Condition : Ta = 25℃, I_F = 20mA



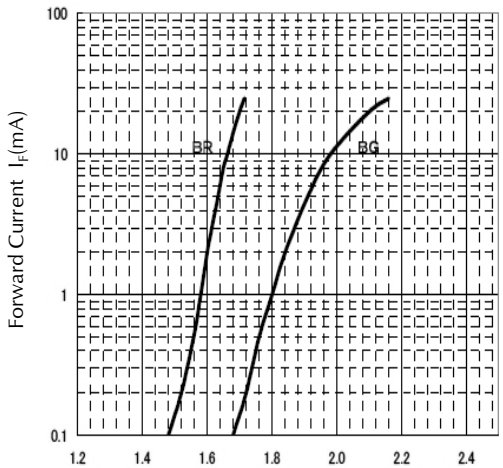
Spatial Distribution Example

Condition : Ta = 25℃



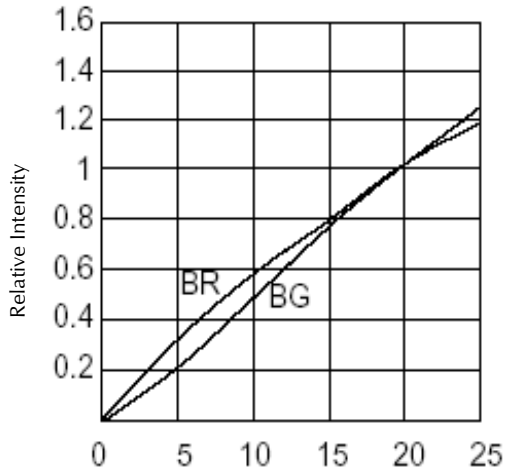
Forward Voltage vs. Forward Current

Condition : Ta = 25℃



Forward Current vs. Relative Intensity

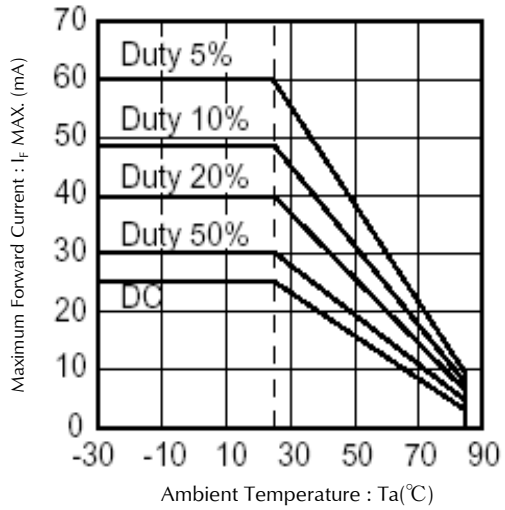
Condition : Ta = 25℃



Technical Data(**BR,BG**)

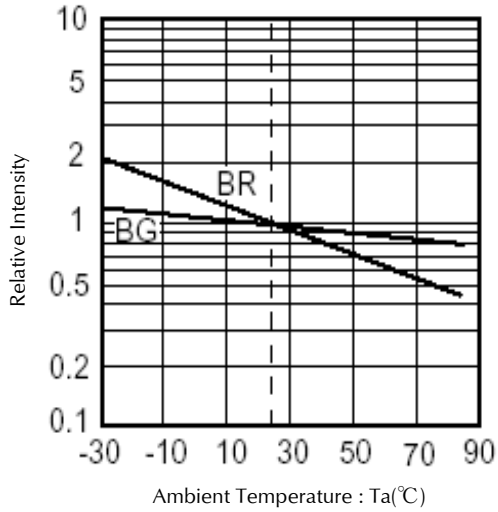
Derating

Ambient Temperature vs. Maximum Forward Current
Repetition Frequency : f ≧ 50Hz

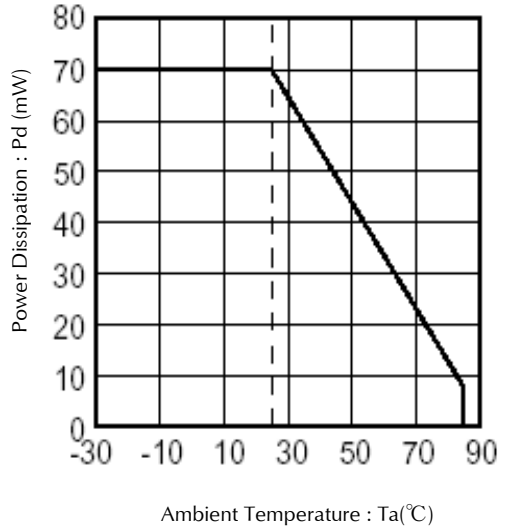


Ambient Temperature vs. Relative Intensity

Condition : I_F=20mA

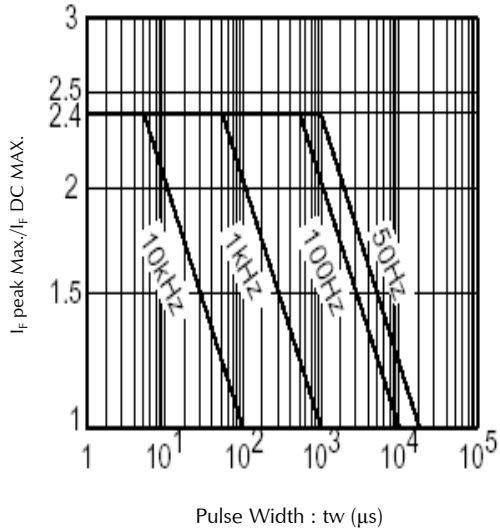


Power Dissipation vs. Ambient Temperature



Pulse Width vs. Maximum Tolerable Peak Current

Condition : Ta = 25℃

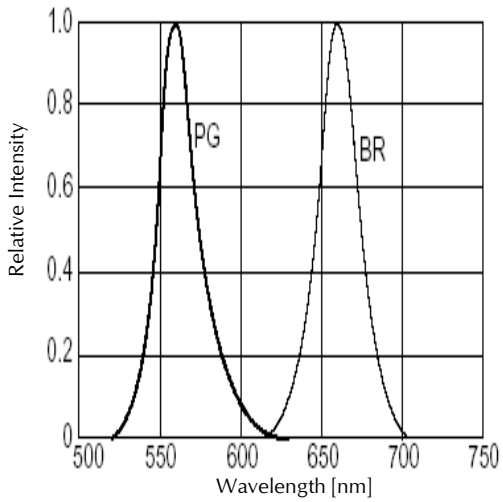


Technical Data(**BR,PG**)

Spectral Distribution

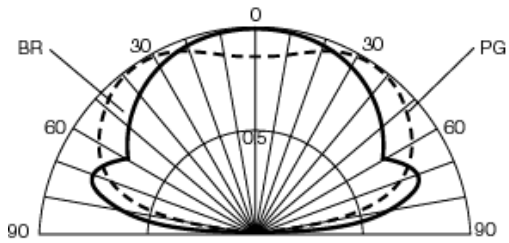
Relative Intensity vs. Wavelength

Condition : Ta = 25℃, I_F = 20mA



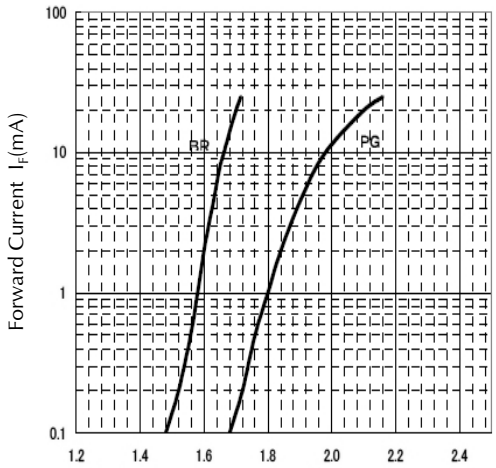
Spatial Distribution Example

Condition : Ta = 25℃



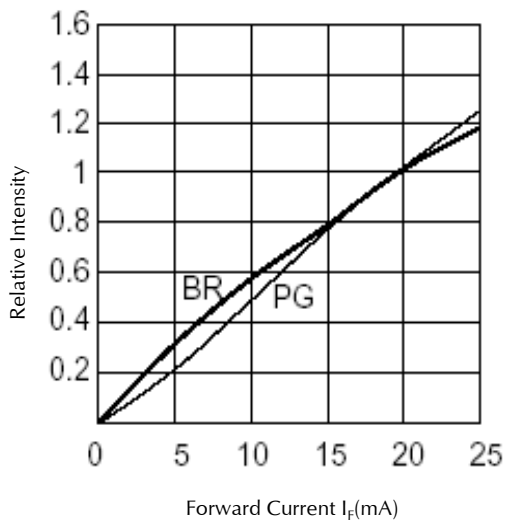
Forward Voltage vs. Forward Current

Condition : Ta = 25℃



Forward Current vs. Relative Intensity

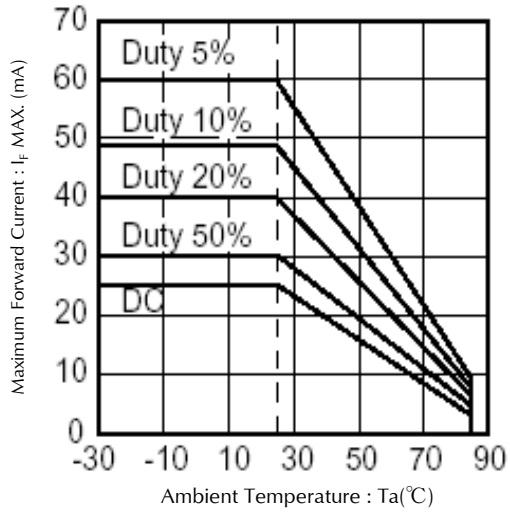
Condition : Ta = 25℃



Technical Data(**BR,PG**)

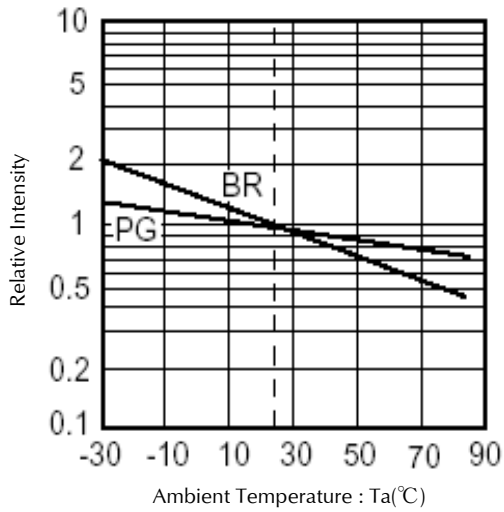
Derating

Ambient Temperature vs. Maximum Forward Current
Repetition Frequency : f ≧ 50Hz

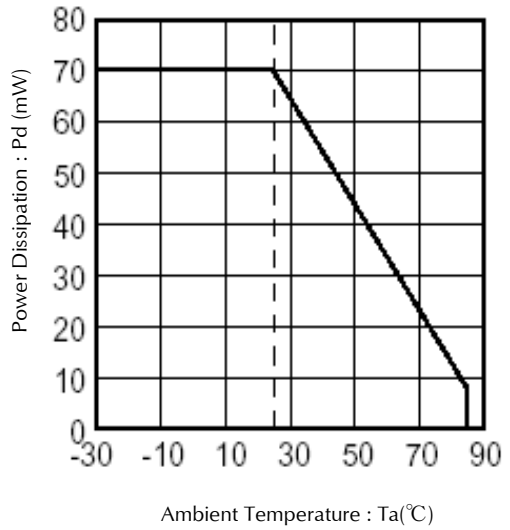


Ambient Temperature vs. Relative Intensity

Condition : I_F=20mA

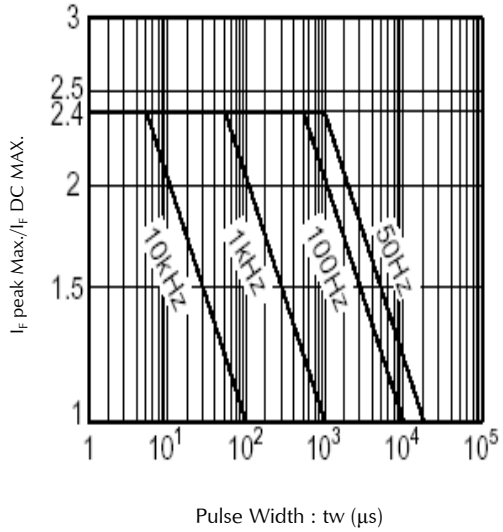


Power Dissipation vs. Ambient Temperature



Pulse Width vs. Maximum Tolerable Peak Current

Condition : Ta = 25℃

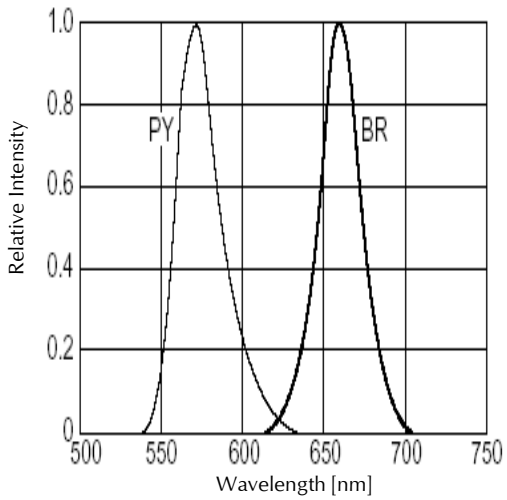


Technical Data(**BR,PY**)

Spectral Distribution

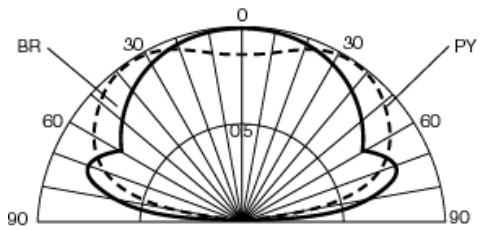
Relative Intensity vs. Wavelength

Condition : Ta = 25℃, I_F = 20mA



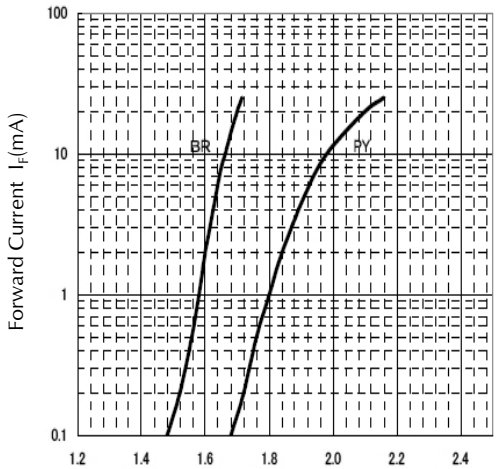
Spatial Distribution Example

Condition : Ta = 25℃



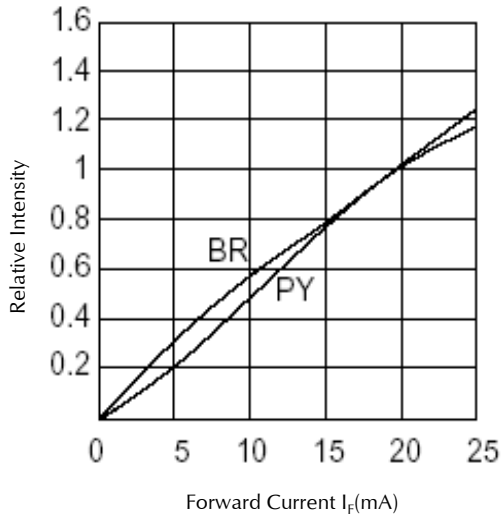
Forward Voltage vs. Forward Current

Condition : Ta = 25℃



Forward Current vs. Relative Intensity

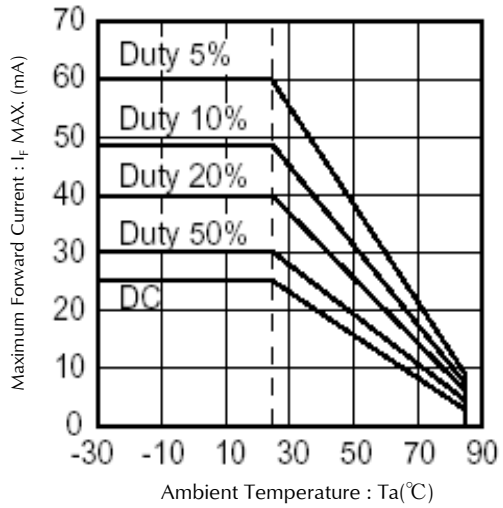
Condition : Ta = 25℃



Technical Data(**BR,PY**)

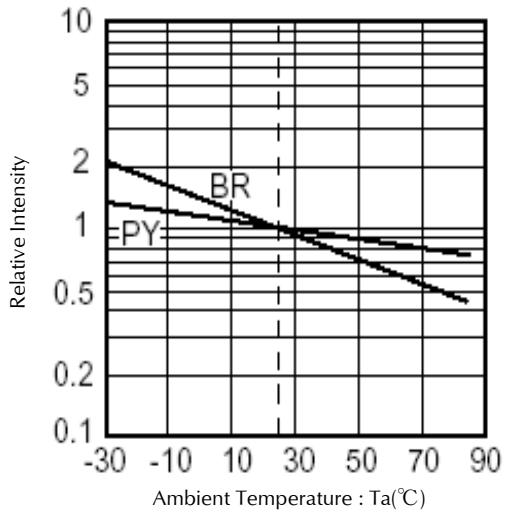
Derating

Ambient Temperature vs. Maximum Forward Current
Repetition Frequency : f ≧ 50Hz

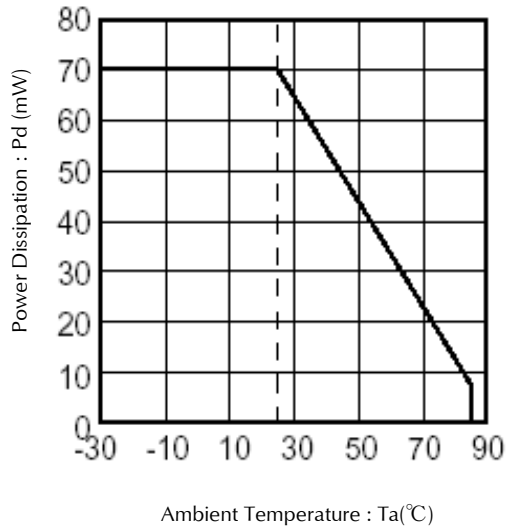


Ambient Temperature vs. Relative Intensity

Condition : I_F=20mA

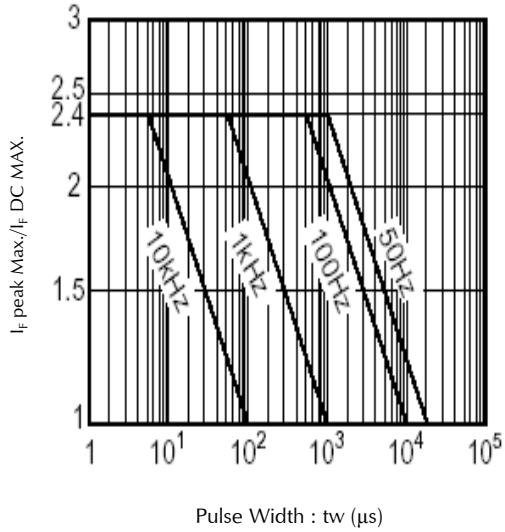


Power Dissipation vs. Ambient Temperature



Pulse Width vs. Maximum Tolerable Peak Current

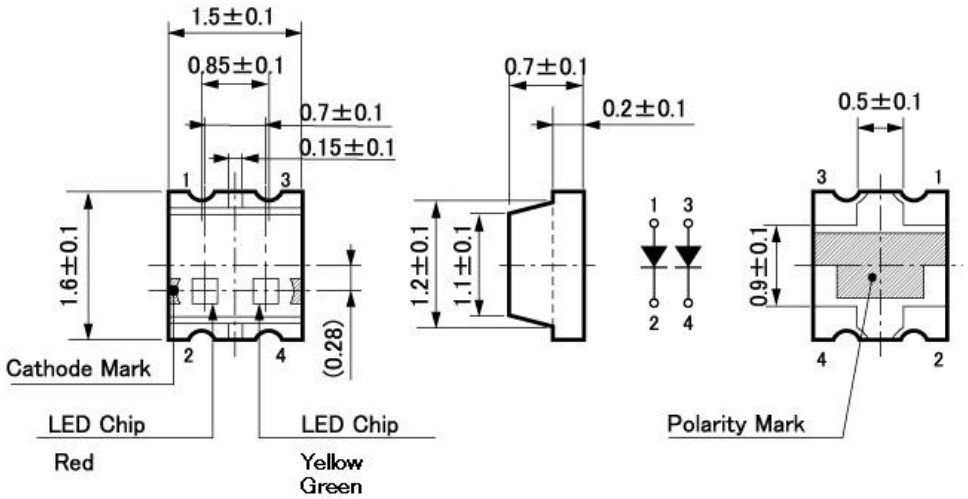
Condition : Ta = 25℃



Package Dimensions(FRYPY)

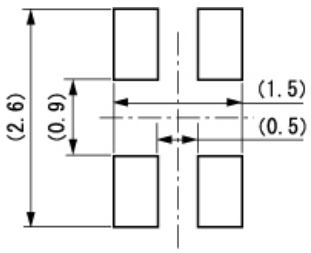
(Unit: mm)

Weight: (3.0)mg



Recommended Soldering Pattern

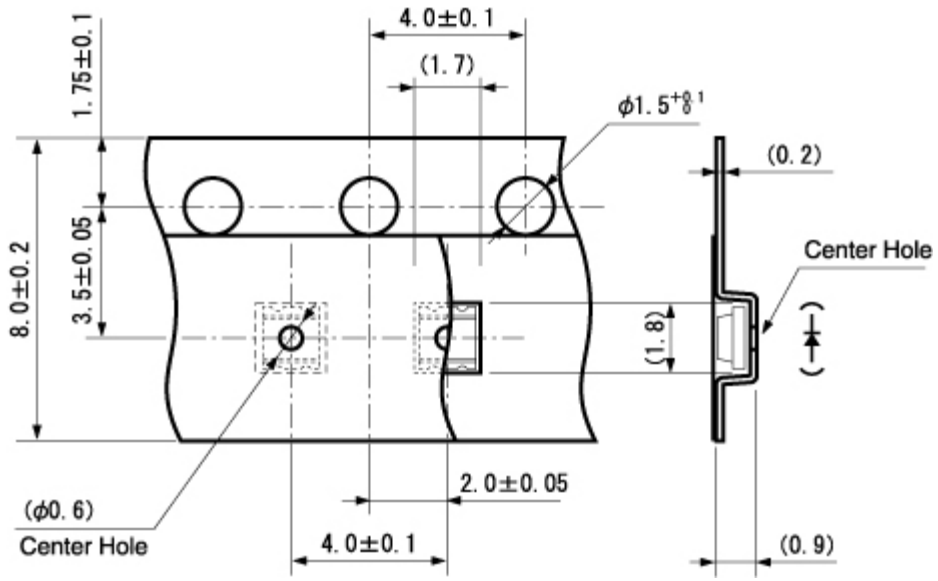
(Unit: mm)



Taping Specification

(Unit: mm)

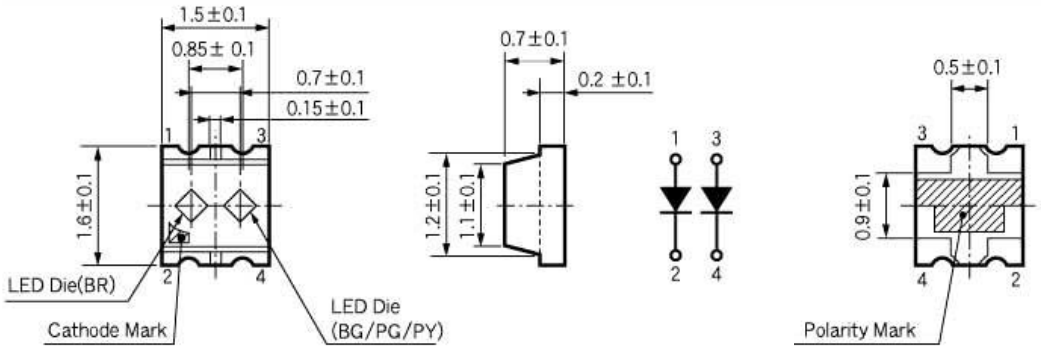
Quantity : 4,000pcs/ reel (standard)



Package Dimensions(BRBG, BRPG, BRPY)

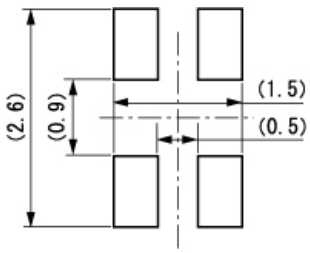
(Unit: mm)

Weight: (3.0)mg



Recommended Soldering Pattern

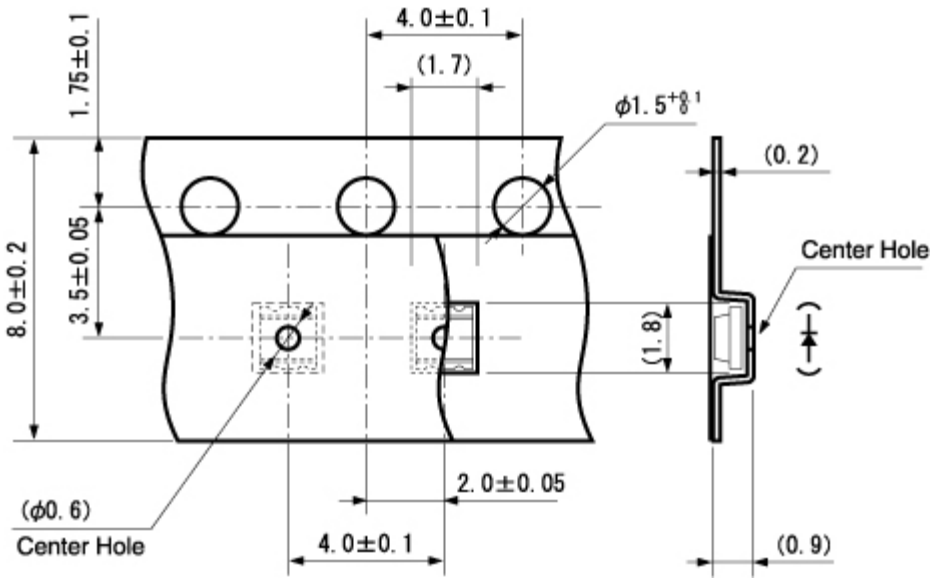
(Unit: mm)



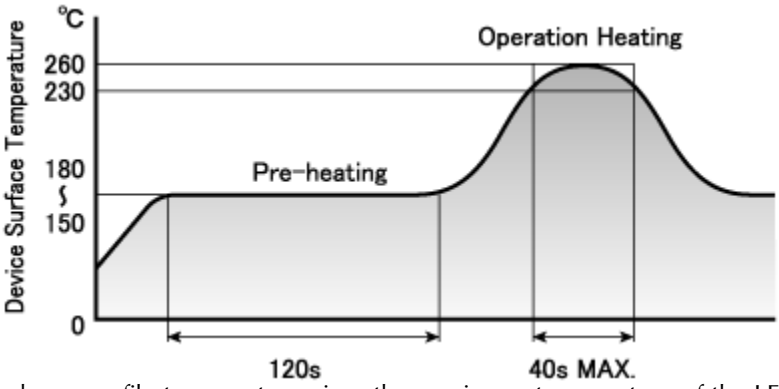
Taping Specification

(Unit: mm)

Quantity : 4,000pcs/ 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 normal temperature after the first reflow) in order to prevent the LED from absorbing moisture.

3) Temperature fluctuation to the LED during the pre-heating process shall be minimized.

Manual Soldering Conditions

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

Reliability Testing Result

Reliability Testing Result	Applicable Standard	Testing Conditions	Duration	Failure
Room Temp. Operating Life	EIAJ ED-4701/100(101)	Ta = 25℃, I_F = Maxium Rated Current	1,000 h	0/25
Resistance to Soldering Heat	EIAJ ED-4701/300(301)	Pre-heating : 150～180℃ 120s Max. Operation Heating : 230℃ 40s Max. Peak Temperature : 260℃	Twice	0/25
Temperature Cycling	EIAJ ED-4701/100(105)	Minimum Rated Storage Temperature(30min) ～Normal Temperature(15min) ～Maximum Rated Storage Temperature(30min) ～Normal Temperature(15min)	5 cycles	0/25
Wet High Temp. Storage Life	EIAJ ED-4701/100(103)	Ta = 60±2℃, RH = 90±5%	1,000 h	0/25
High Temp. Storage Life	EIAJ ED-4701/200(201)	Ta = Maximum Rated Storage Temperature	1,000 h	0/25
Low Temp. Storage Life	EIAJ ED-4701/200(202)	Ta = Minimum Rated Storage Temperature	1,000 h	0/25
Vibration, Variable Frequency	EIAJ ED-4701/400(403)	98.1m/s^2 (10G), 100 ～ 2KHz sweep for 20min., XYZ each direction	2 h	0/10

Failure Criteria

Items	Symbols	Conditions	Failure criteria
Luminous Intensity	I_V	I_F Value of each product Luminous Intensity	Testing Min. Value < Spec. Min. Value x 0.5
Forward Voltage	V_F	I_F Value of each product Forward Voltage	Testing Max. Value ≧ Spec. Max. Value x 1.2
Reverse Current	I_R	V_R = Maximum Rated Reverse Voltage V	Testing Max. Value ≧ Spec. Max. Value x 2.5
Cosmetic Appearance	-	-	Occurrence of notable decoloration, deformation and cracking

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