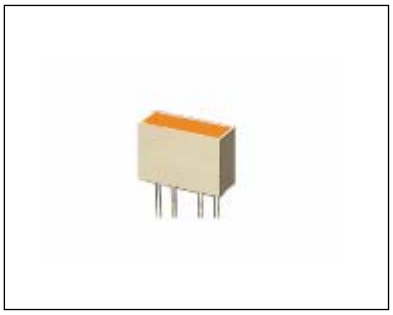


Pb-free HEAT

MU16 Series

Single Color / Light Bar Module

Features

Light emitting surface (Outer size)	4x 12 mm (5 x 13 mm) (L x W)
Product features	・Single Color (Green, Yellow Green, Orange or Red) ・Lead–free soldering compatible ・RoHS compliant
Peak wavelength	Green : 555 nm Yellow Green : 570 nm Orange : 605 nm Red : 660 nm
Die materials	Green, Yellow Green : GaP Orange : GaAsP Red : GaAlAs
Soldering methods	TTW (Through The Wave) soldering and manual soldering
Soldering methods	More than 2kV(HBM)
Packing	Plastic bag

Recommended Applications

Electric Household Appliances, OA/FA, Other General Applications

Pb-free HEAT

MU16 Series

Single Color / Light Bar Module

Color and Luminous Intensity

Part No.	Material	Emitted Color	Resin Color	Intensity※1 Iv (mcd)			Number of Chips
				MIN.	TYP.	I_F	
MU16-5101	GaP	Green	Green	4	8	20	2
MU16-5105	GaP		Milky White	4	8	20	2
MU16-4101	GaP	Yellow Green	Yellow	8	16	20	2
MU16-4105	GaP		Milky White	8	16	20	2
MU16-3101	GaAsP	Orange	Orange	6	12	20	2
MU16-3105	GaAsP		Milky White	6	12	20	2
MU16-2101	GaAlAs	Red	Red	8	16	20	2
MU16-2105	GaAlAs		Milky White	8	16	20	2

※1 Luminous Intensity : 2 chips

Absolute Maximum Ratings

(Ta=25℃)

Item	Symbol	Absolute Maximum Ratings								Unit
		5101	5105	4101	4105	3101	3105	2101	2105	
Power Dissipation※2	P_d	125		150		125		120		mW
Forward Current	I_F	25		30		25		30		mA
Pulse Forward Current ※3	I_{FRM}	60		60		60		60		mA
Derating (Ta=25℃ or higher)	ΔI_F	0.33		0.40		0.33		0.40		mA/℃
	ΔI_{FRM}	0.80		0.80		0.80		0.80		mA/℃
Reverse Voltage	V_R	4		4		4		4		V
Operating Temperature	T_{opr}	-40～+85								℃
Storage Temperature	T_{stg}	-40～+85								℃

※2 Power Dissipation : 2 chips, The other Items : 1 chip

※3 I_{FRM} Measurement condition : Pulse Width ≦ 2ms, Duty ≦ 1/5

Electro-Optical Characteristics

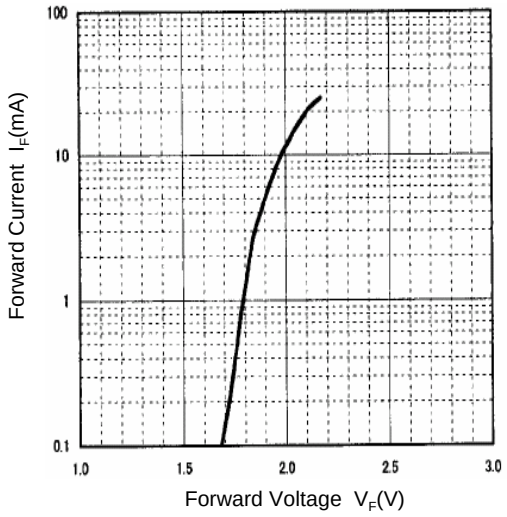
(Ta=25℃)

Item	Conditions	Symbol	Characteristics								Unit
				5101	5105	4101	4105	3101	3105	2101	2105	
Forward Voltage	I_F=20mA	V_F	TYP.	2.2		2.1		2.2		1.7		V
			MAX.	2.5		2.5		2.5		2.0		
Reverse Current	V_R=4V	I_R	MAX.	100		100		100		100		μA
Peak Wavelength	I_F=20mA	λ_p	TYP.	555		570		605		660		nm
Spectral Line Half Width	I_F=20mA	$\Delta\lambda$	TYP.	30		30		30		30		nm

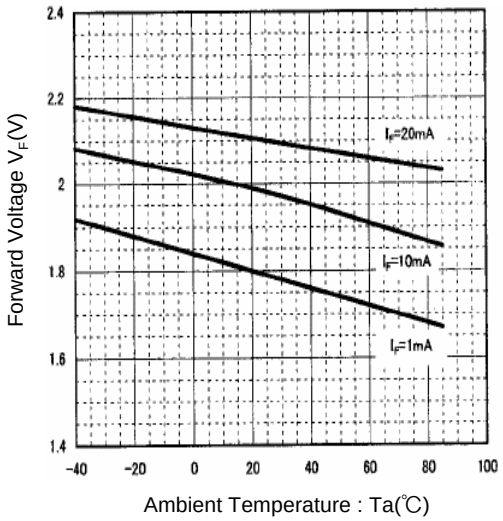
※ The above Items : 1 chip

Technical Data**(5101/5105)**

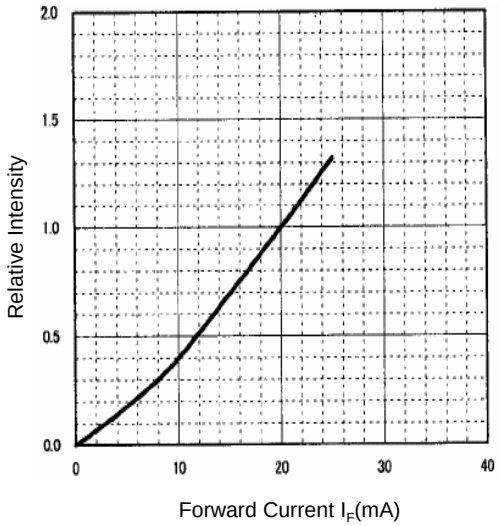
Forward Voltage vs. Forward Current
Condition : Ta = 25℃



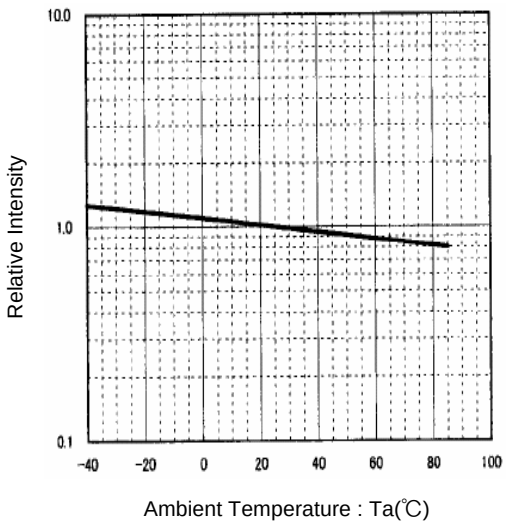
Ambient Temperature vs. Forward Voltage



Forward Current vs. Relative Intensity
Condition : Ta = 25℃



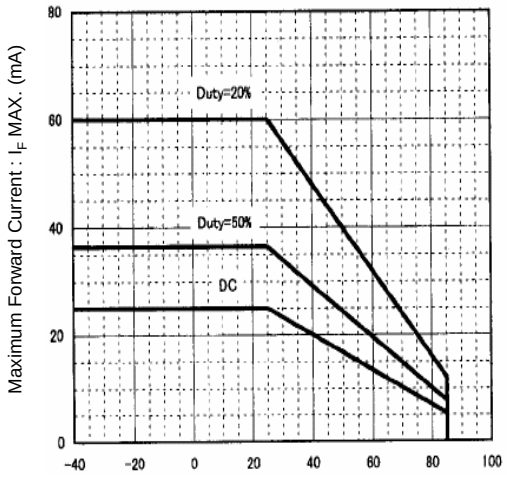
Ambient Temperature vs. Relative Intensity
Condition : I_F=20mA



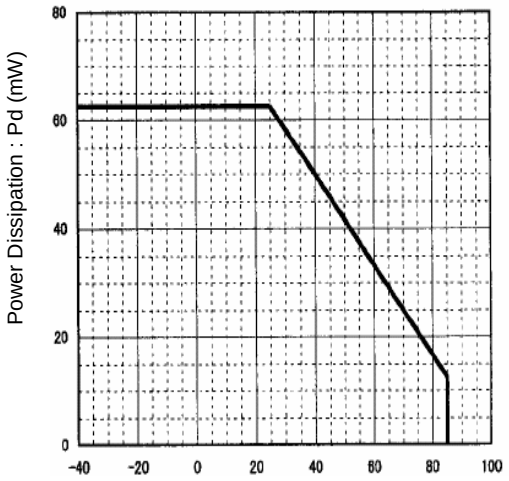
Technical Data**(5101/5105)**

Derating

Ambient Temperature vs. Maximum Forward Current
Repetition Frequency : f ≧ 100Hz

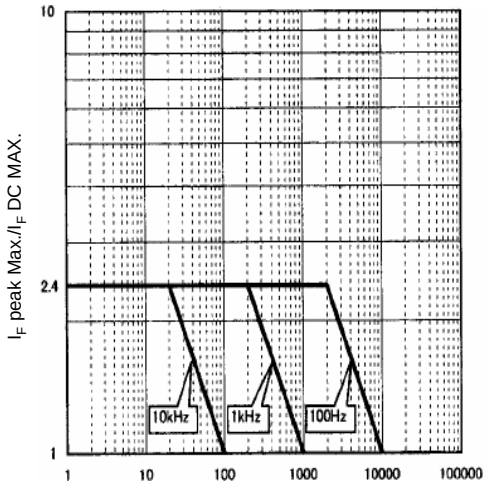


Power Dissipation vs. Ambient Temperature



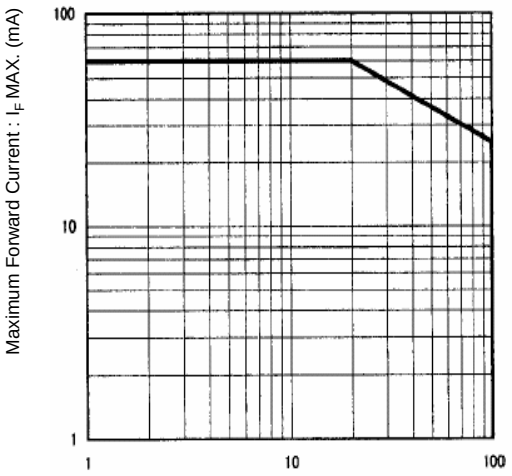
Pulse Width vs. Maximum Tolerable Peak Current

Condition : Ta = 25℃



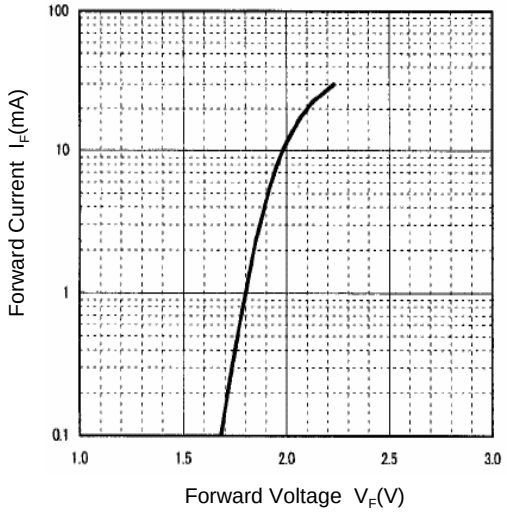
Dynamic Drive Rating

Duty cycle vs. Maximum Forward Current
Condition : Ta = 25℃

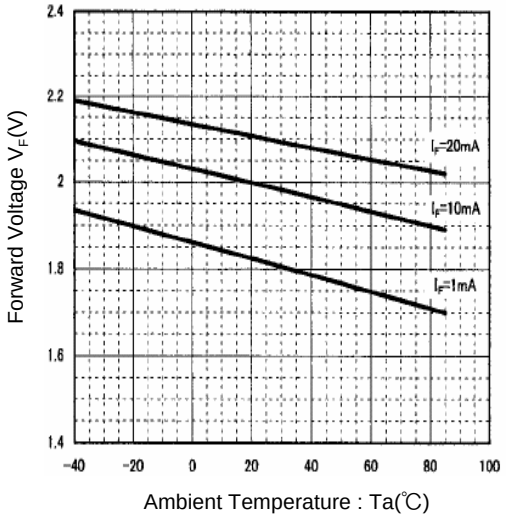


Technical Data**(4101/4105)**

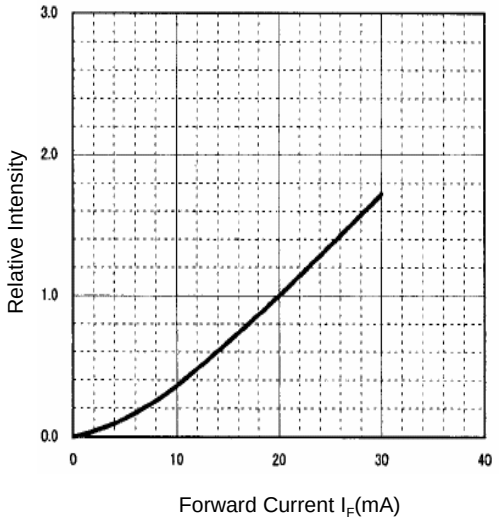
Forward Voltage vs. Forward Current
Condition : Ta = 25℃



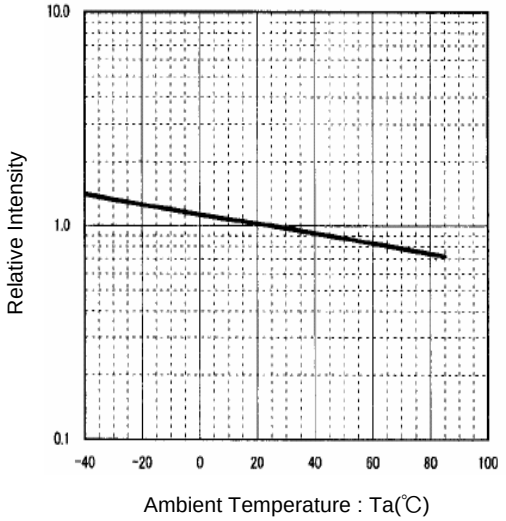
Ambient Temperature vs. Forward Voltage



Forward Current vs. Relative Intensity
Condition : Ta = 25℃



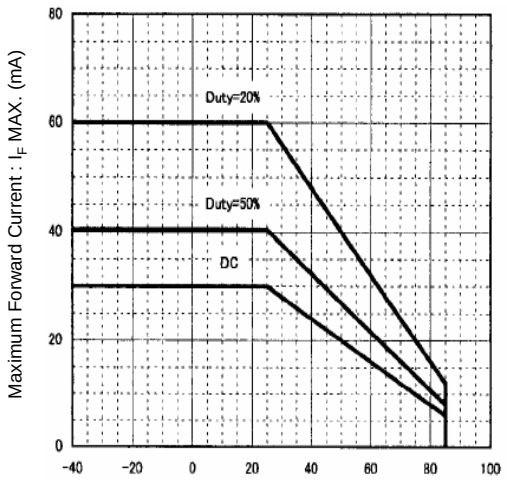
Ambient Temperature vs. Relative Intensity
Condition : I_F=20mA



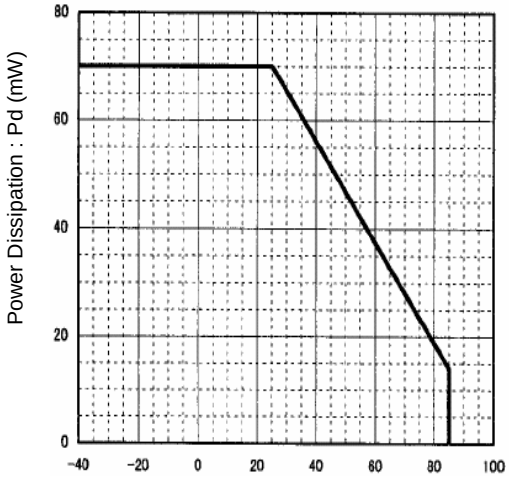
Technical Data**(4101/4105)**

Derating

Ambient Temperature vs. Maximum Forward Current
Repetition Frequency : f ≧ 100Hz

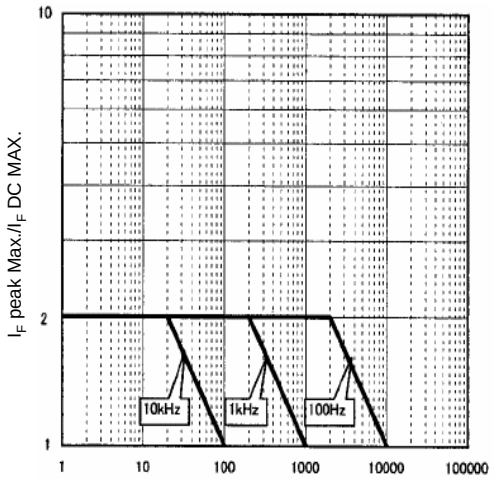


Power Dissipation vs. Ambient Temperature



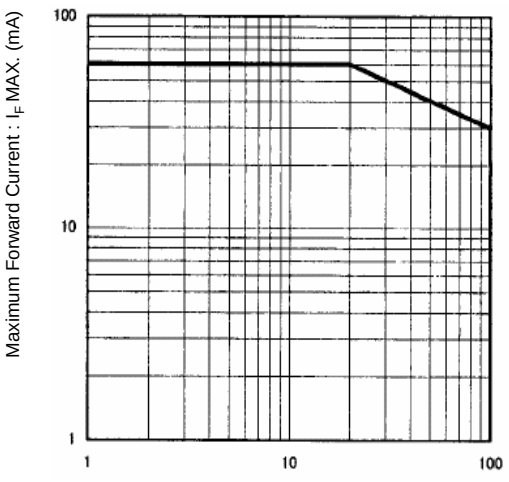
Pulse Width vs. Maximum Tolerable Peak Current

Condition : Ta = 25℃



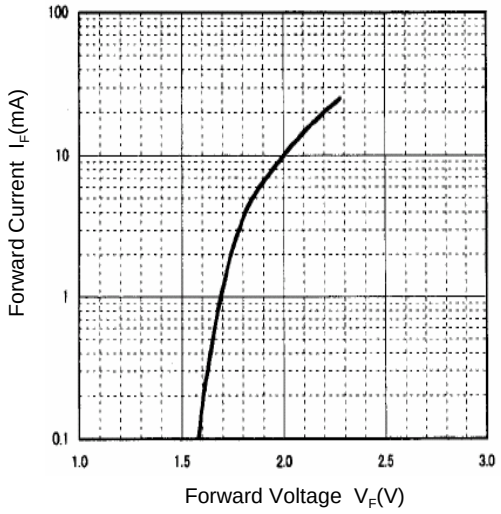
Dynamic Drive Rating

Duty cycle vs. Maximum Forward Current
Condition : Ta = 25℃

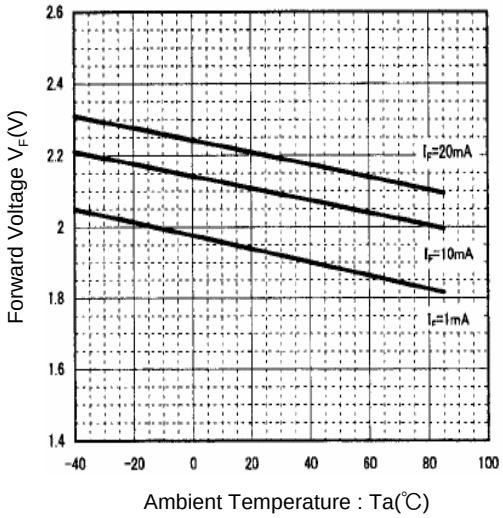


Technical Data**(3101/3105)**

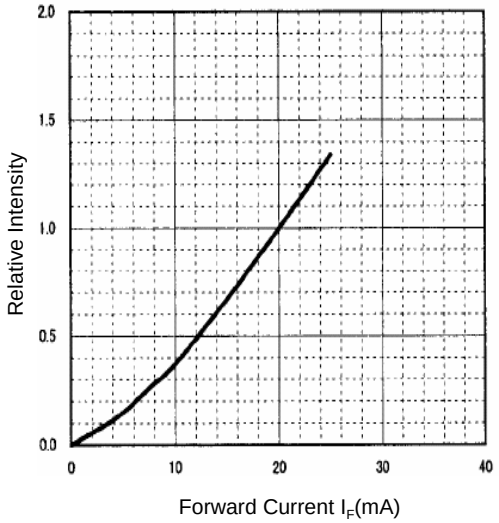
Forward Voltage vs. Forward Current
Condition : Ta = 25℃



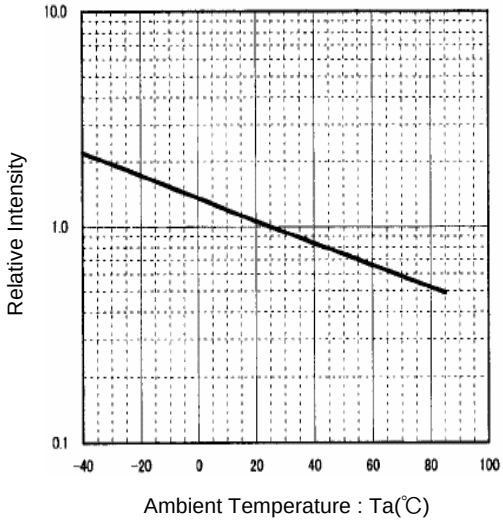
Ambient Temperature vs. Forward Voltage



Forward Current vs. Relative Intensity
Condition : Ta = 25℃



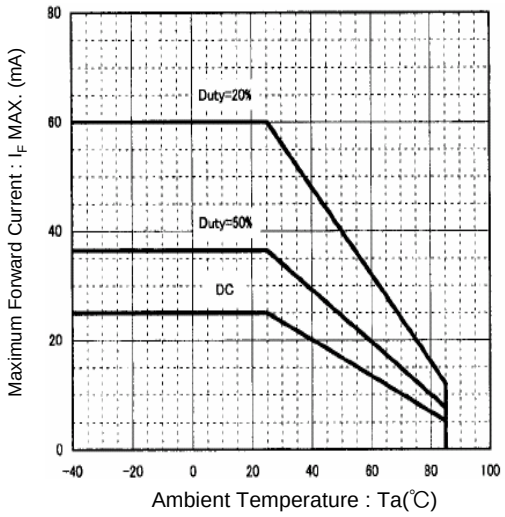
Ambient Temperature vs. Relative Intensity
Condition : I_F=20mA



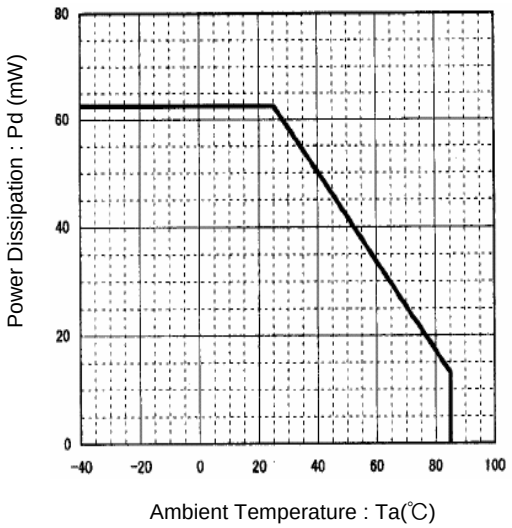
Technical Data**(3101/3105)**

Derating

Ambient Temperature vs. Maximum Forward Current
Repetition Frequency : f ≧ 100Hz

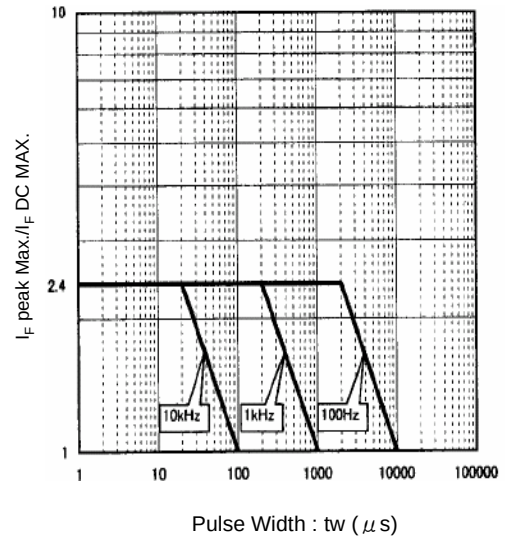


Power Dissipation vs. Ambient Temperature



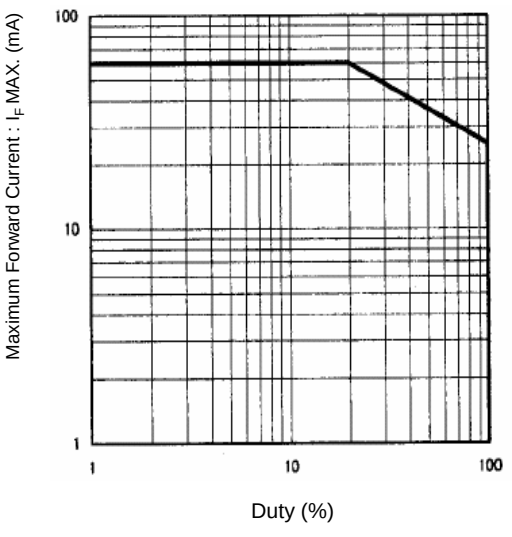
Pulse Width vs. Maximum Tolerable Peak Current

Condition : Ta = 25℃



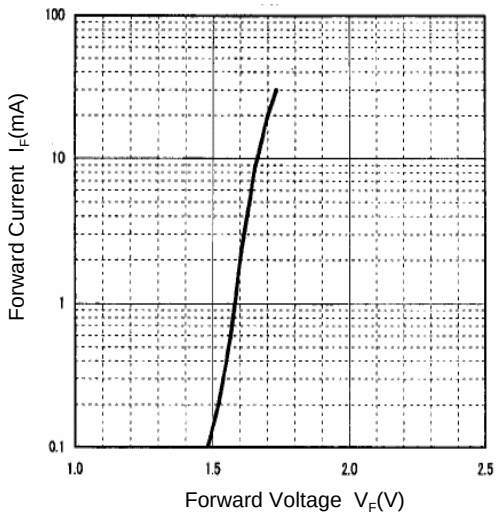
Dynamic Drive Rating

Duty cycle vs. Maximum Forward Current
Condition : Ta = 25℃

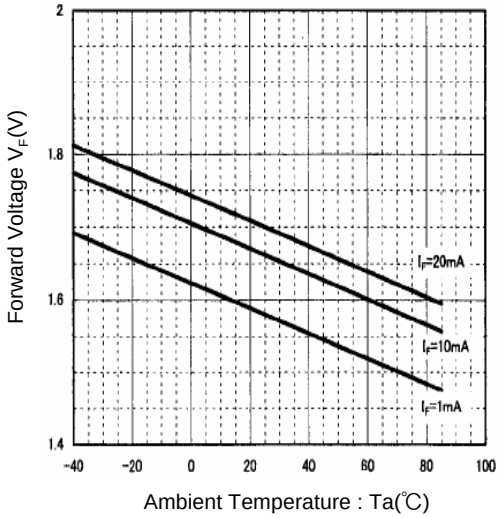


Technical Data**(2101/2105)**

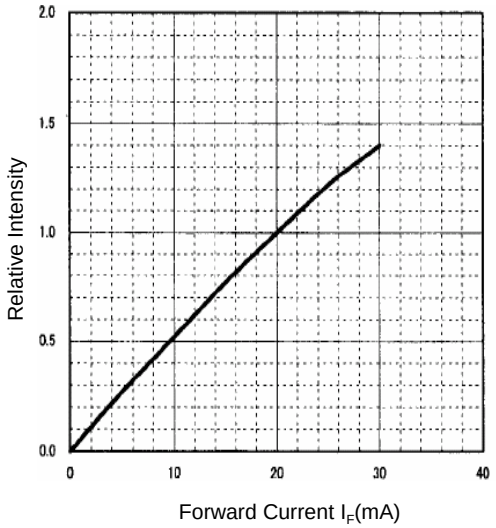
Forward Voltage vs. Forward Current
Condition : Ta = 25℃



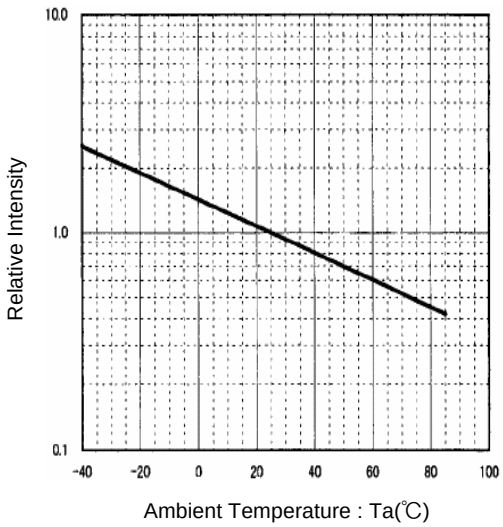
Ambient Temperature vs. Forward Voltage



Forward Current vs. Relative Intensity
Condition : Ta = 25℃



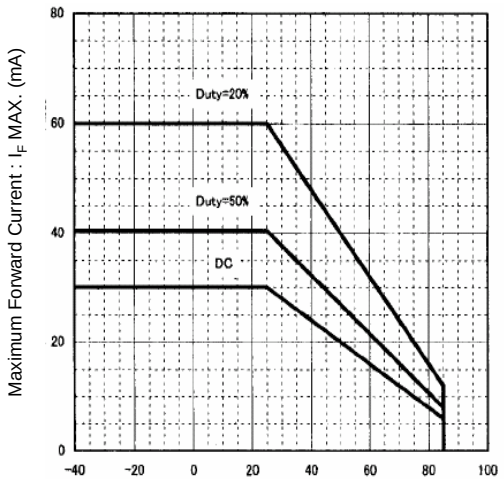
Ambient Temperature vs. Relative Intensity
Condition : I_F=20mA



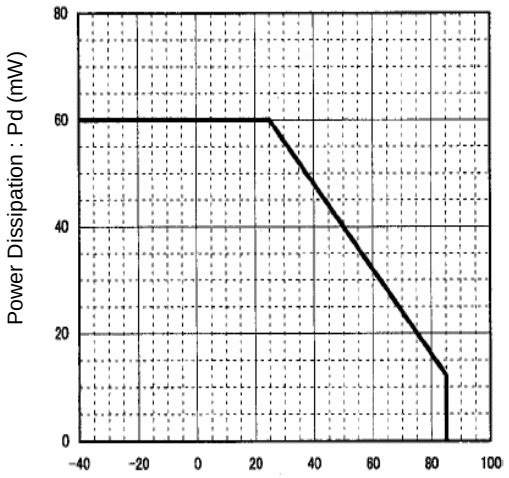
Technical Data**(2101/2105)**

Derating

Ambient Temperature vs. Maximum Forward Current
Repetition Frequency : f ≧ 100Hz

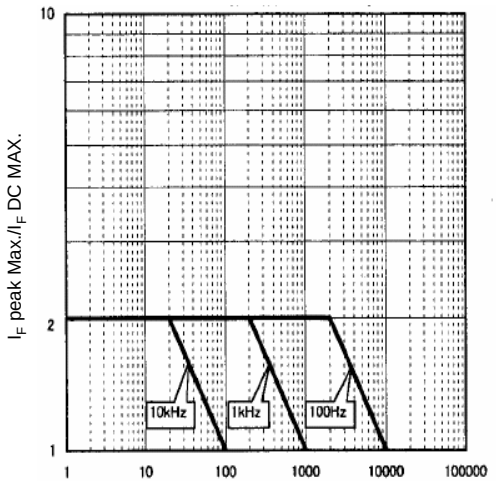


Power Dissipation vs. Ambient Temperature



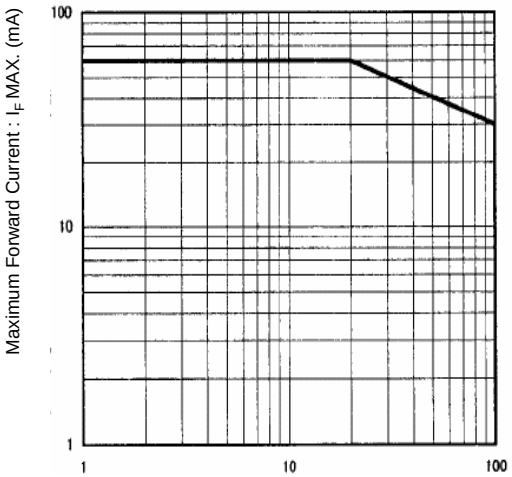
Pulse Width vs. Maximum Tolerable Peak Current

Condition : Ta = 25℃



Dynamic Drive Rating

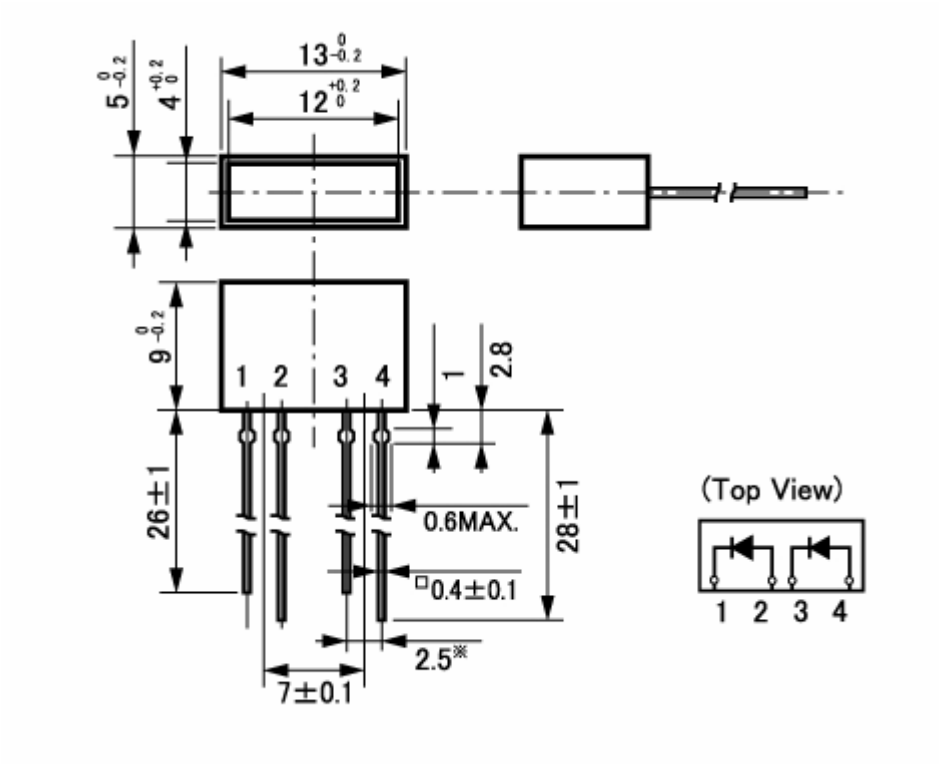
Duty cycle vs. Maximum Forward Current
Condition : Ta = 25℃



Package Dimensions

(Unit: mm)

(Tolerance：±0.25 mm)



● ※ mark : The measure of lead root

TTW (Through The Wave) soldering Conditions

Pre-heating	100 ℃ 60 s	(MAX.) Resin surface temperature (MAX.)
Solder Bath Temp.	265 ℃	(MAX.)
Dipping Time	5 s	(MAX.)
Position	At least 3.0 mm away from the root of lead	

1) The dip soldering process shall be 2 times maximum.
2) The product shall be cooled to normal temperature before the second dipping process.

Manual Soldering Conditions

Iron tip temp.	400 ℃	(MAX.) (30 W Max.)
Soldering time and frequency	3 s 2 times	(MAX.) (MAX.)
Position	At least 3.0 mm away from the root of lead	

Reliability Testing Result

Reliability Testing Result	Applicable Standard	Testing Conditions	Duration	Failure
Room Temp. Operating Life	EIAJED-4701/100(101)	Ta = 25℃, I_F = Maxium Rated Current	1,000 h	0/10
Resistance to Soldering Heat	EIAJED-4701/300(302)	260±5℃, 3mm from package base	10s	0/10
Temperature Cycling	EIAJED-4701/100(105)	Minimum Rated Storage Temperature(30min) ～Normal Temperature(15min) ～Maximum Rated Storage Temperature(30min) ～Normal Temperature(15min)	5 cycles	0/10
Wet High Temp. Storage Life	EIAJED-4701/100(103)	Ta = 60±2℃, RH = 90±5%	1,000 h	0/10
High Temp. Storage Life	EIAJED-4701/200(201)	Ta = Maximum Rated Storage Temperature	1,000 h	0/10
Low Temp. Storage Life	EIAJED-4701/200(202)	Ta = Minimum Rated Storage Temperature	1,000 h	0/10
Lead Tension	EIAJED-4701/400(401)	5N,1time	10s	0/10
Vibration, Variable Frequency	EIAJED-4701/400(403)	98.1m/s^2(10G), 100 ～ 2KHz sweep for 20min., XYZ each direction	2 h	0/10
Lead Bend	EIAJED-4701/400(401)	2.5N, 0°←→ 90°	Twice	0/10
Shock	JISC 7201 A-8	It falls on wood engraving from height of 75cm.	3 times	0/10

Failure Criteria

Items	Symbols	Conditions	Failure criteria
Luminous Intensity	Iv	I_F=20mA	Testing Min. Value ＜ Spec. Min. Value x 0.5
Forward Voltage	V_F	I_F=20mA	Testing Max. Value ≧ Spec. Max. Value x 1.2
Reverse Current	I_R	V_R=4V	Testing Max. Value ≧ Spec. Max. Value x 2.5
Cosmetic Appearance	-	-	Occurrence of notable decoloration, deformation and cracking

Special Notice to Customers Using the Products and Technical Information Shown in This Data Sheet

1) The technical information shown in the data sheets are limited to the typical characteristics and circuit examples of the referenced products. It does not constitute the warranting of industrial property nor the granting of any license.

2) For the purpose of product improvement, the specifications, characteristics and technical data described in the data sheets are subject to change without prior notice. Therefore it is recommended that the most updated specifications be used in your design.

3) When using the products described in the data sheets, please adhere to the maximum ratings for operating voltage, heat dissipation characteristics, and other precautions for use. We are not responsible for any damage which may occur if these specifications are exceeded.

4) The products that have been described to this catalog are manufactured so that they will be used for the electrical instrument of the benchmark (OA equipment, telecommunications equipment, AV machine, home appliance and measuring instrument).
The application of aircrafts, space borne application, transportation equipment, medical equipment and nuclear power control equipment, etc. needs a high reliability and safety, and the breakdown and the wrong operation might influence the life or the human body. Please consult us beforehand if you plan to use our product for the usages of aircrafts, space borne application, transportation equipment, medical equipment and nuclear power control equipment, etc. except OA equipment, telecommunications equipment, AV machine, home appliance and measuring instrument.

5) In order to export the products or technologies described in this data sheet which are under the "Foreign Exchange and Foreign Trade Control Law," it is necessary to first obtain an export permit from the Japanese government.

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7) The most updated edition of this data sheet can be obtained from the address below:
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