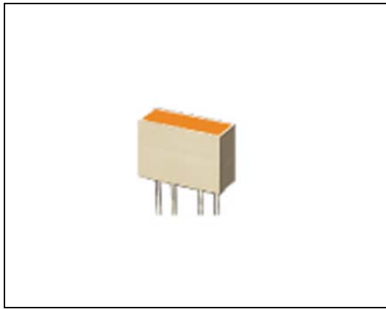




MU16 Series

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	<table><tr><td>Green</td><td>: 555 nm</td></tr><tr><td>Yellow Green</td><td>: 570 nm</td></tr><tr><td>Orange</td><td>: 605 nm</td></tr><tr><td>Red</td><td>: 660 nm</td></tr></table>	Green	: 555 nm	Yellow Green	: 570 nm	Orange	: 605 nm	Red	: 660 nm
Green	: 555 nm								
Yellow Green	: 570 nm								
Orange	: 605 nm								
Red	: 660 nm								
Die materials	<table><tr><td>Green, Yellow Green</td><td>: GaP</td></tr><tr><td>Orange</td><td>: GaAsP</td></tr><tr><td>Red</td><td>: GaAlAs</td></tr></table>	Green, Yellow Green	: GaP	Orange	: GaAsP	Red	: GaAlAs		
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

Color and Luminous Intensity

Part No.	Material	Emitted Color	Resin Color	Intensity ^{※1} I _v (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°C)

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°C or higher)	Δ I _F	0.33		0.40		0.33		0.40		mA/°C
	Δ I _{FRM}	0.80		0.80		0.80		0.80		mA/°C
Reverse Voltage	V _R	4		4		4		4		V
Operating Temperature	T _{opr}	-40~+85								°C
Storage Temperature	T _{stg}	-40~+85								°C

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

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

Electro-Optical Characteristics

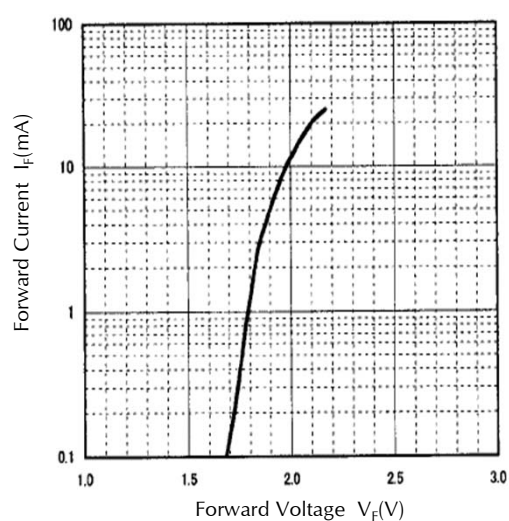
(Ta=25°C)

Item	Conditions	Symbol		Characteristics						Unit
				5101	5105	4101	4105	3101	3105	
Forward Voltage	I _F =20mA	V _F	TYP.	2.2		2.1		2.2		V
			MAX.	2.5		2.5		2.5		
Reverse Current	V _R =4V	I _R	MAX.	100		100		100		μA
Peak Wavelength	I _F =20mA	λ _p	TYP.	555		570		605		nm
Spectral Line Half Width	I _F =20mA	Δ λ	TYP.	30		30		30		nm

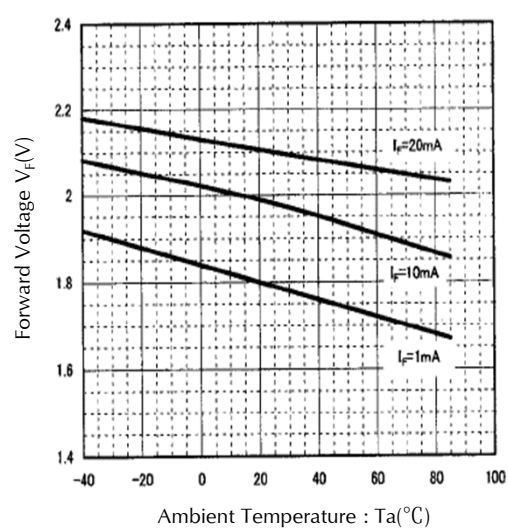
※ The above Items : 1 chip

Technical Data(5101/5105)

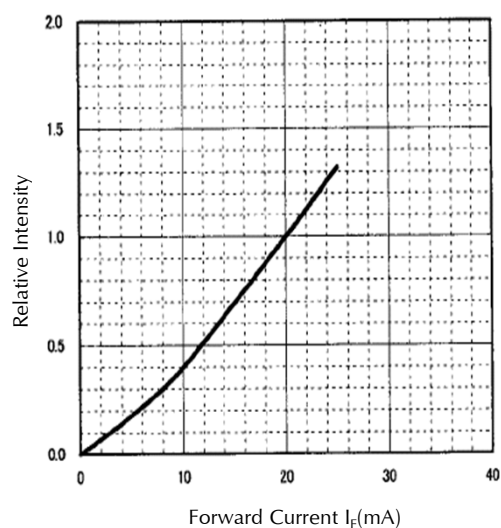
Forward Voltage vs. Forward Current
Condition : $T_a = 25^\circ\text{C}$



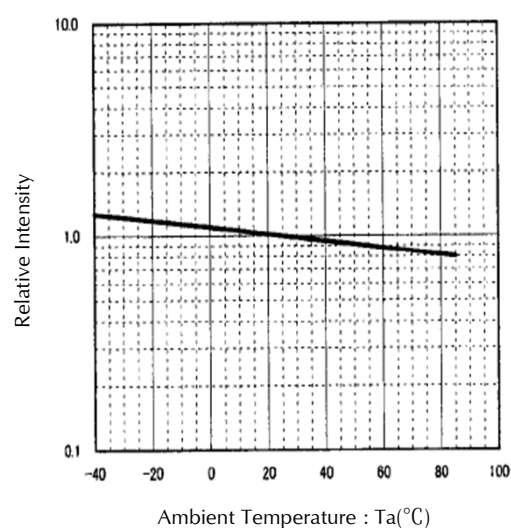
Ambient Temperature vs. Forward Voltage



Forward Current vs. Relative Intensity
Condition : $T_a = 25^\circ\text{C}$



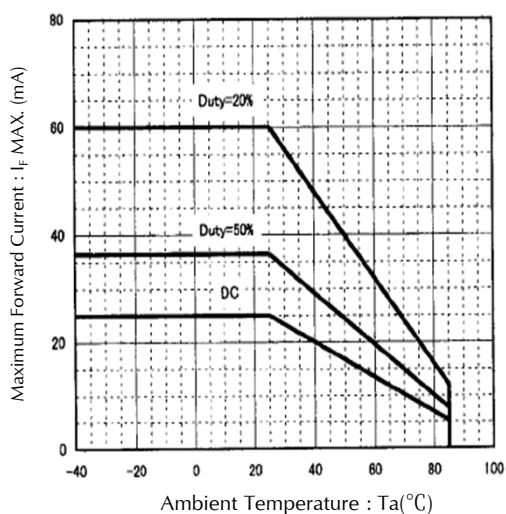
Ambient Temperature vs. Relative Intensity
Condition : $I_F = 20\text{mA}$



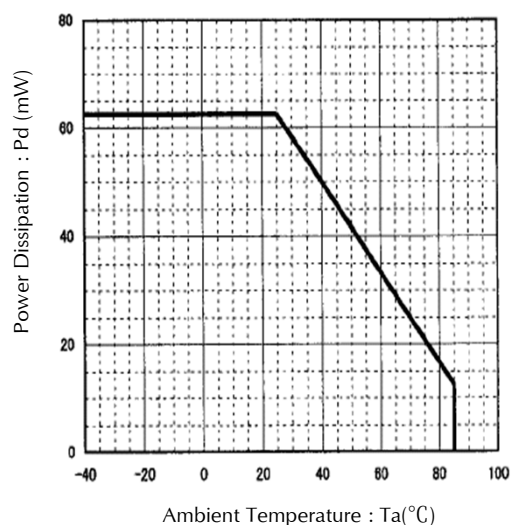
Technical Data(5101/5105)

Derating

Ambient Temperature vs. Maximum Forward Current
Repetition Frequency : $f \geq 100\text{Hz}$

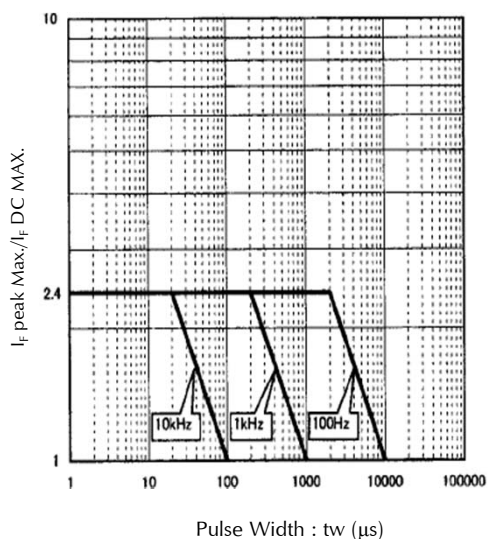


Power Dissipation vs. Ambient Temperature



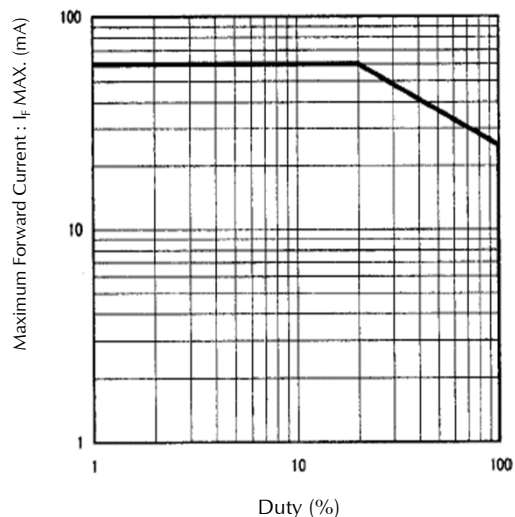
Pulse Width vs. Maximum Tolerable Peak Current

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



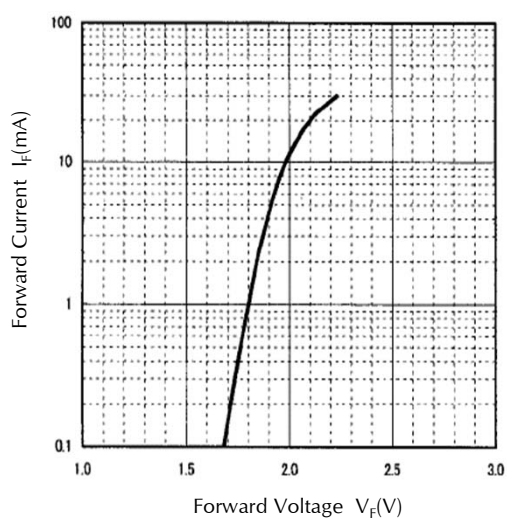
Dynamic Drive Rating

Duty cycle vs. Maximum Forward Current
Condition : $T_a = 25^\circ\text{C}$

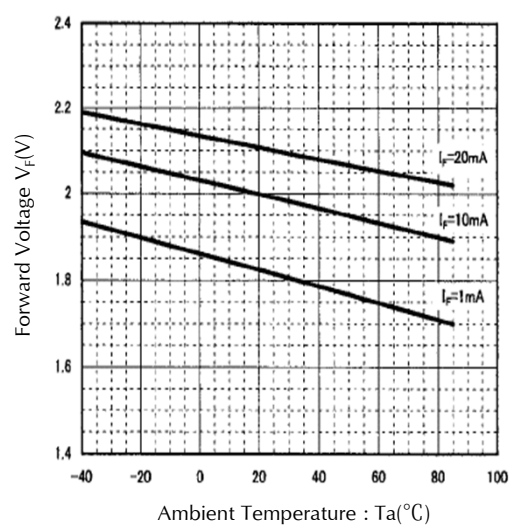


Technical Data(4101/4105)

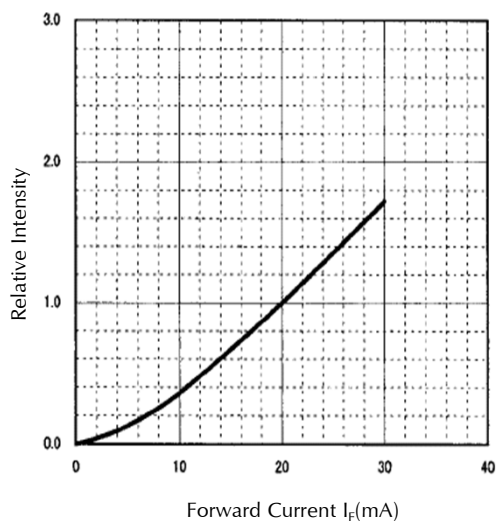
Forward Voltage vs. Forward Current
Condition : $T_a = 25^\circ\text{C}$



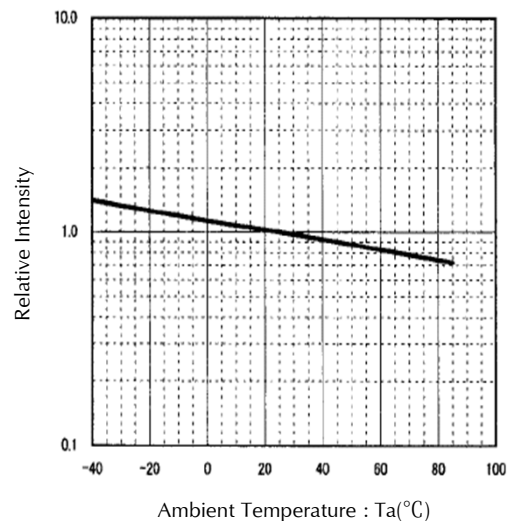
Ambient Temperature vs. Forward Voltage



Forward Current vs. Relative Intensity
Condition : $T_a = 25^\circ\text{C}$



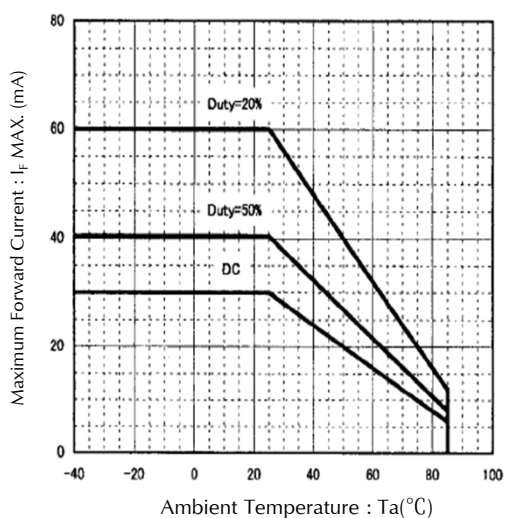
Ambient Temperature vs. Relative Intensity
Condition : $I_F = 20\text{mA}$



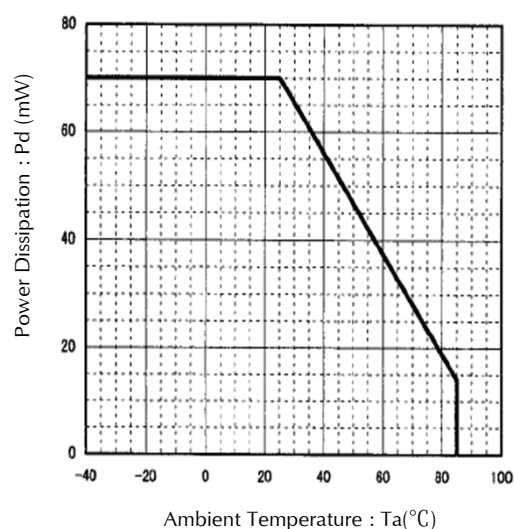
Technical Data(4101/4105)

Derating

Ambient Temperature vs. Maximum Forward Current
Repetition Frequency : $f \geq 100\text{Hz}$

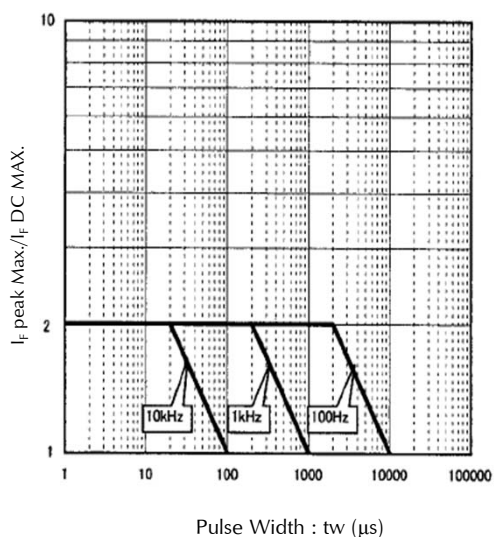


Power Dissipation vs. Ambient Temperature



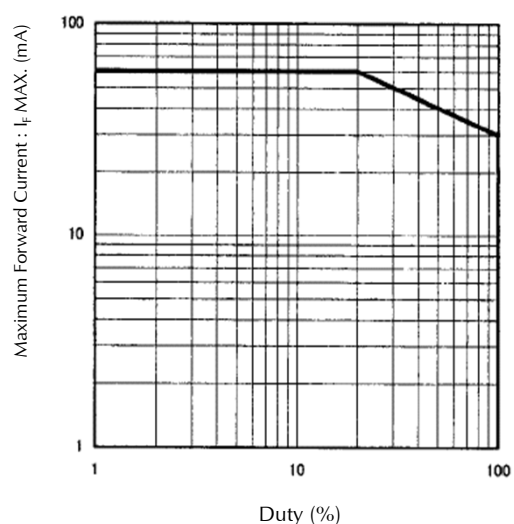
Pulse Width vs. Maximum Tolerable Peak Current

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



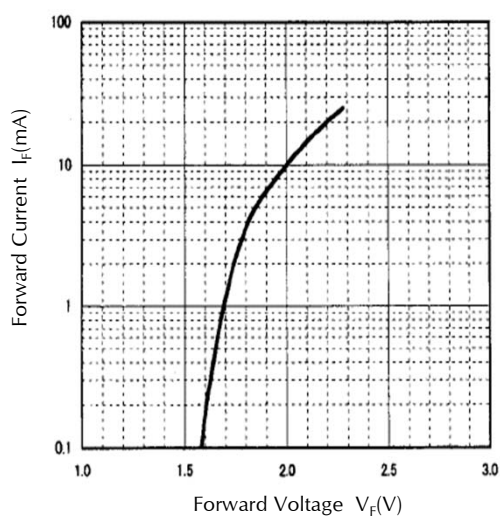
Dynamic Drive Rating

Duty cycle vs. Maximum Forward Current
Condition : $T_a = 25^\circ\text{C}$

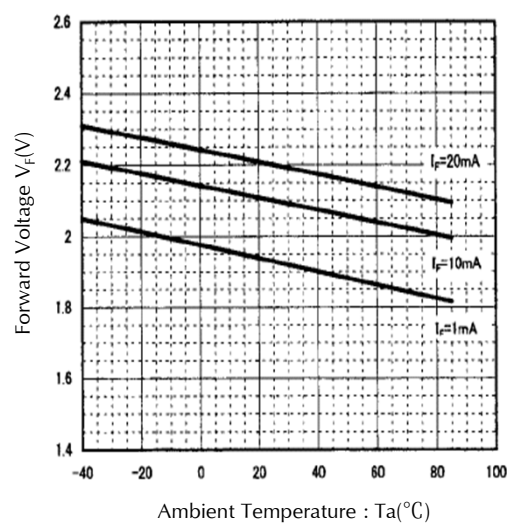


Technical Data(3101/3105)

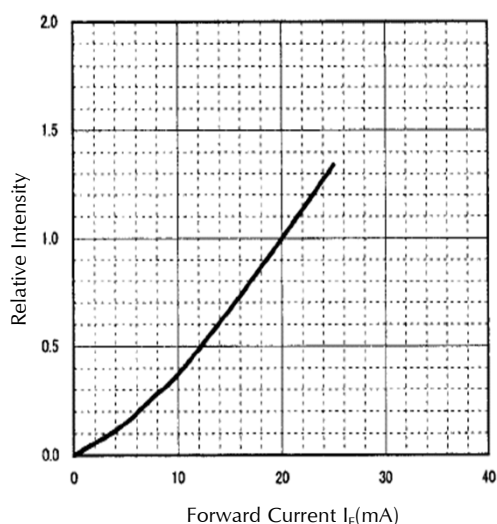
Forward Voltage vs. Forward Current
Condition : $T_a = 25^\circ\text{C}$



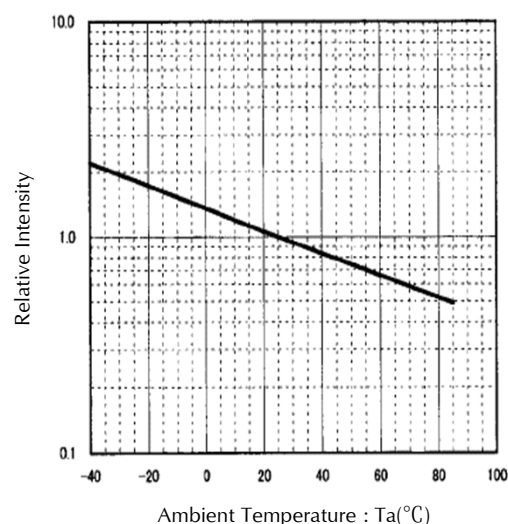
Ambient Temperature vs. Forward Voltage



Forward Current vs. Relative Intensity
Condition : $T_a = 25^\circ\text{C}$



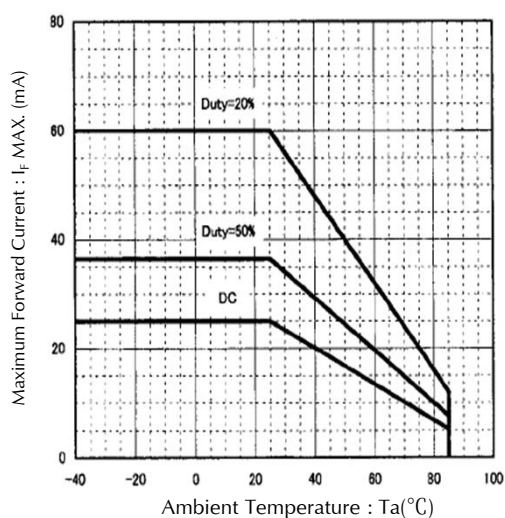
Ambient Temperature vs. Relative Intensity
Condition : $I_F = 20\text{mA}$



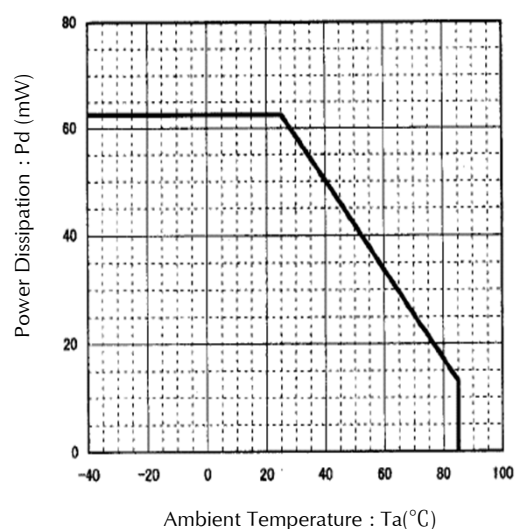
Technical Data(3101/3105)

Derating

Ambient Temperature vs. Maximum Forward Current
Repetition Frequency : $f \geq 100\text{Hz}$

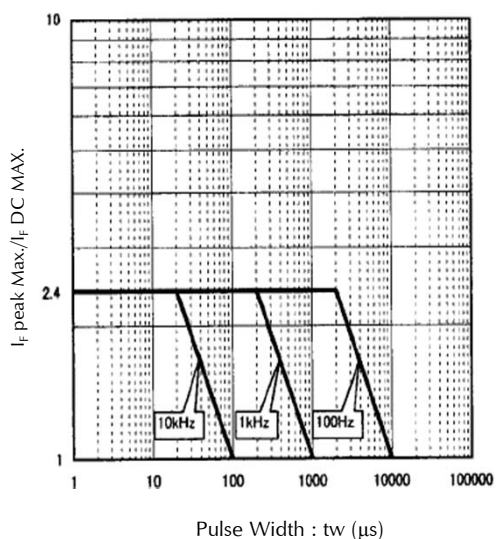


Power Dissipation vs. Ambient Temperature



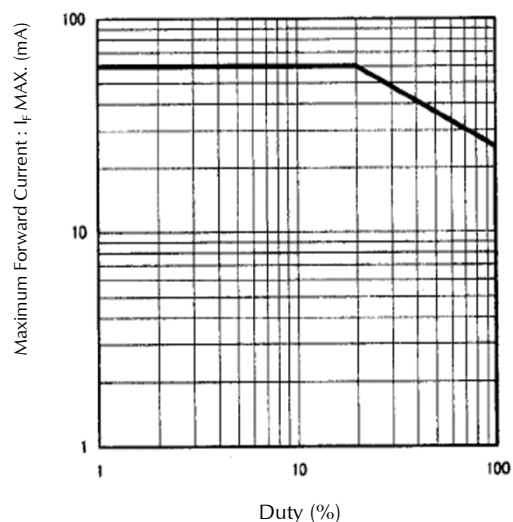
Pulse Width vs. Maximum Tolerable Peak Current

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



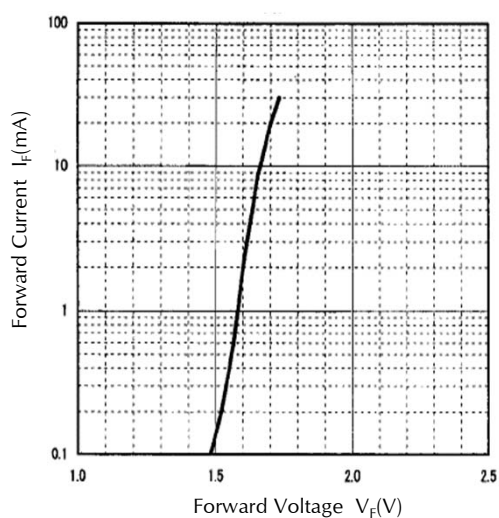
Dynamic Drive Rating

Duty cycle vs. Maximum Forward Current
Condition : $T_a = 25^\circ\text{C}$

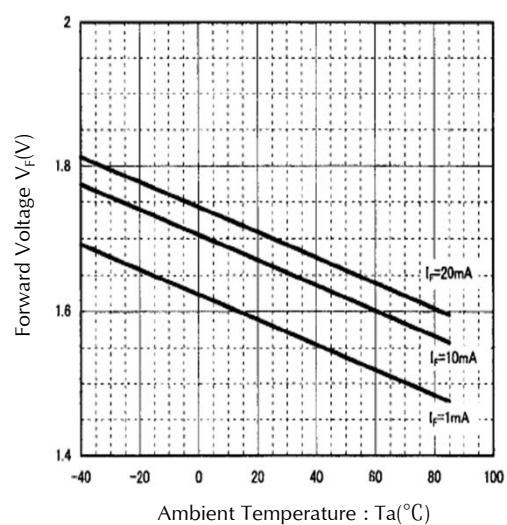


Technical Data(2101/2105)

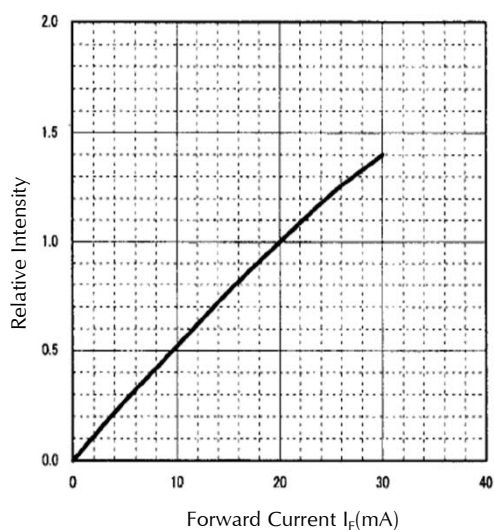
Forward Voltage vs. Forward Current
Condition : $T_a = 25^\circ\text{C}$



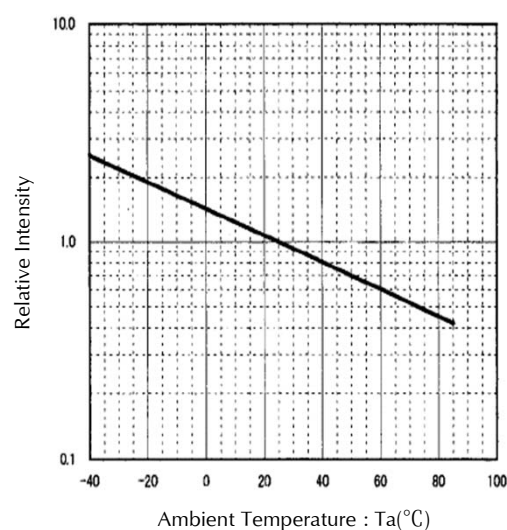
Ambient Temperature vs. Forward Voltage



Forward Current vs. Relative Intensity
Condition : $T_a = 25^\circ\text{C}$



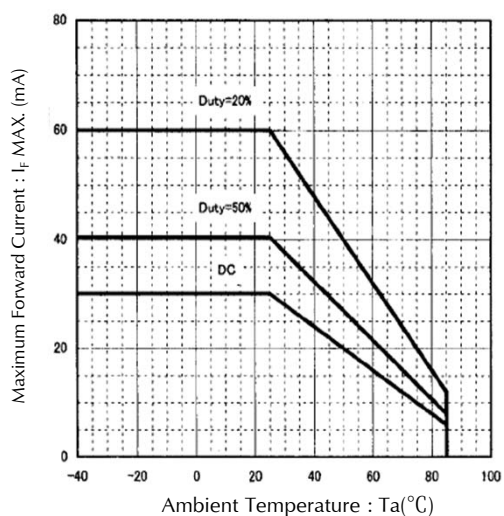
Ambient Temperature vs. Relative Intensity
Condition : $I_F = 20\text{mA}$



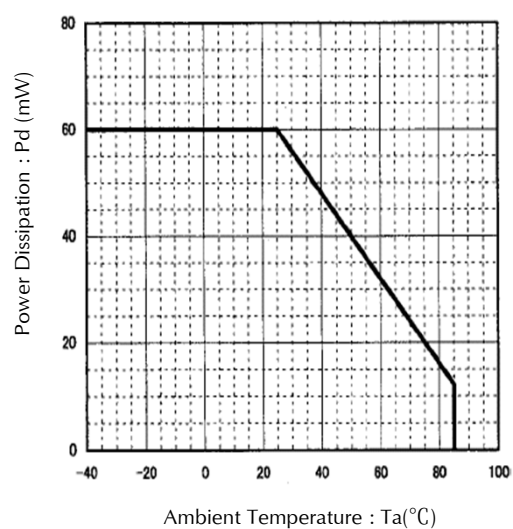
Technical Data(2101/2105)

Derating

Ambient Temperature vs. Maximum Forward Current
Repetition Frequency : $f \geq 100\text{Hz}$

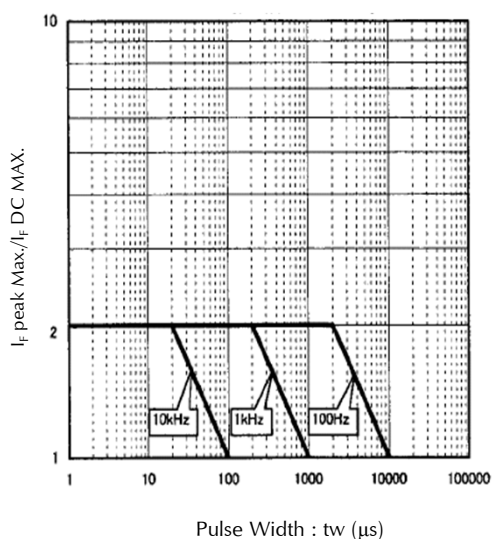


Power Dissipation vs. Ambient Temperature



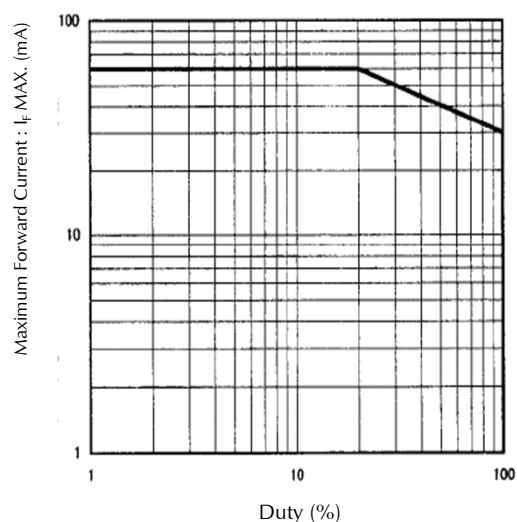
Pulse Width vs. Maximum Tolerable Peak Current

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



Dynamic Drive Rating

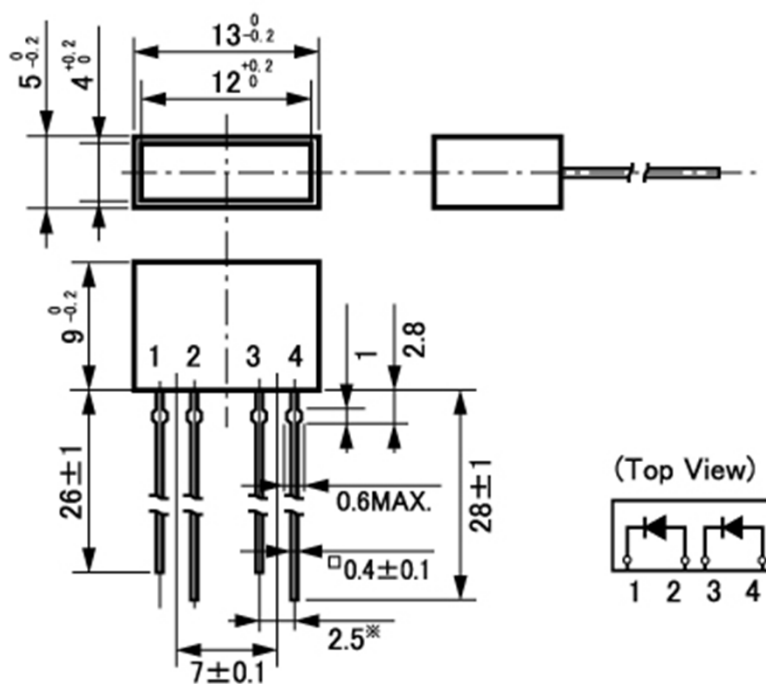
Duty cycle vs. Maximum Forward Current
Condition : $T_a = 25^\circ\text{C}$



Package Dimensions

(Unit: mm)

(Tolerance : ± 0.25 mm)



● $\ast$ mark : The measure of lead root

TTW (Through The Wave) soldering Conditions

Pre-heating	100 °C 60 s	(MAX.) Resin surface temperature (MAX.)
Solder Bath Temp.	265 °C	(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.	360 °C	(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	EIAJ ED-4701/100(101)	Ta = 25°C, If = Maximum Rated Current	1,000 h	0/10
Resistance to Soldering Heat	EIAJ ED-4701/300(302)	260±5°C, 3mm from package base	10s	0/10
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	0/10
Wet High Temp. Storage Life	EIAJ ED-4701/100(103)	Ta = 60±2°C, RH = 90±5%	1,000 h	0/10
High Temp. Storage Life	EIAJ ED-4701/200(201)	Ta = Maximum Rated Storage Temperature	1,000 h	0/10
Low Temp. Storage Life	EIAJ ED-4701/200(202)	Ta = Minimum Rated Storage Temperature	1,000 h	0/10
Lead Tension	EIAJ ED-4701/400(401)	5N, 1time	10s	0/10
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
Lead Bend	EIAJ ED-4701/400(401)	2.5N, 0°↔90°	Twice	0/10
Shock	JIS C 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	If=20mA	Testing Min. Value < Spec. Min. Value x 0.5
Forward Voltage	V _F	If=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

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