

**Pb-free
HEAT**



MU03 Series

Single Color / Light Bar Module

Features

Light emitting surface (Outer size)	6 x 9 mm (7 x 10 mm) (L x W)
Product features	<ul style="list-style-type: none"> • Single Color (Green, Yellow Green, Orange or Red) • Lead-free soldering compatible • RoHS compliant
Peak wavelength	Green : 555 nm (5201,5205) : 560 nm (5202) Yellow Green : 570 nm (4201,4205) Orange : 605 nm (3201,3205) Red : 660 nm (2201,2205)
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

Color and Luminous Intensity

Part No.	Material	Emitted Color	Resin Color	Intensity ^{※1} I _v (mcd)			Number of Chips
				MIN.	TYP.	I _F	
MU03-5201	GaP	Green	Green	3	7	20	2
MU03-5205	GaP		Milky White	5	10	20	2
MU03-5202	GaP		Green	8	16	20	2
MU03-4201	GaP	Yellow Green	Yellow	10	20	20	2
MU03-4205	GaP		Milky White	10	20	20	2
MU03-3201	GaAsP	Orange	Orange	5	10	20	2
MU03-3205	GaAsP		Milky White	5	10	20	2
MU03-2201	GaAlAs	Red	Red	10	20	20	2
MU03-2205	GaAlAs		Milky White	10	20	20	2

※1 Luminous Intensity : 2 chips

Absolute Maximum Ratings

(T_a=25 °C)

Item	Symbol	Absolute Maximum Ratings										Unit
		5201	5205	5202	4201	4205	3201	3205	2201	2205		
Power Dissipation ^{※2}	P _d	125	125	150	150	150	125	125	120	120	mW	
Forward Current	I _F	25	25	30	30	30	25	25	30	30	mA	
Pulse Forward Current ^{※3}	I _{FRM}	60	60	60	60	60	60	60	60	60	mA	
Derating (T _a =25°C or higher)	ΔI _F	0.33	0.33	0.40	0.40	0.40	0.33	0.33	0.40	0.40	mA/°C	
	ΔI _{FRM}	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	mA/°C	
Reverse Voltage	V _R	4	4	4	4	4	4	4	4	4	V	
Operating Temperature	T _{opr}	-40~+85										°C
Storage Temperature	T _{stg}	-40~+85										°C

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

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

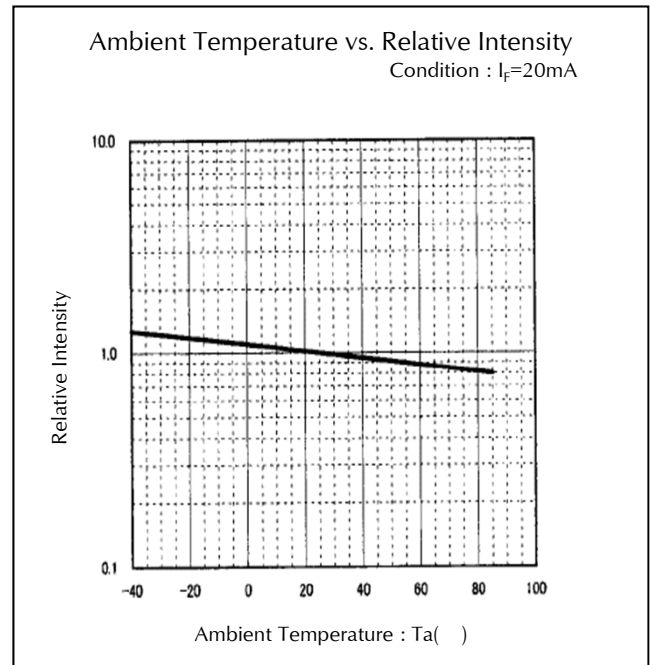
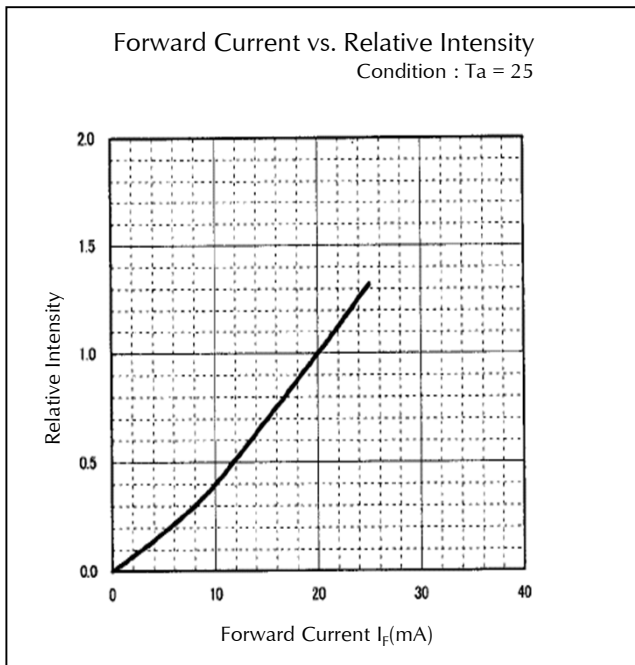
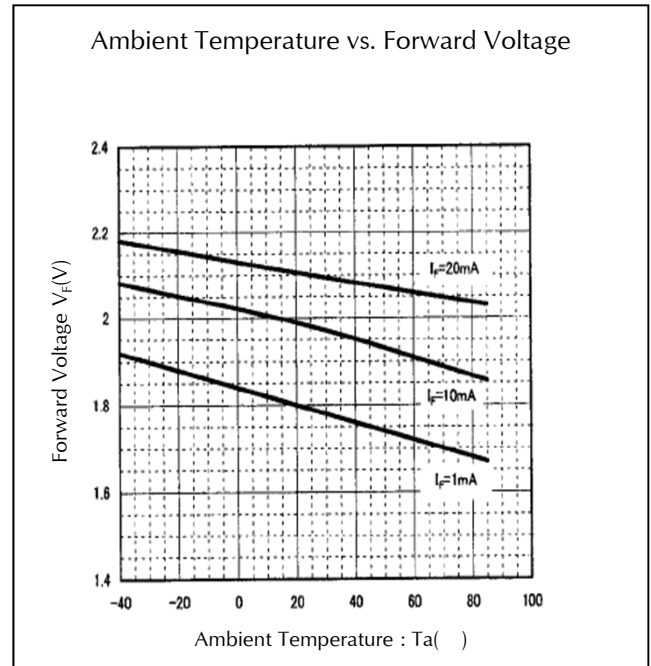
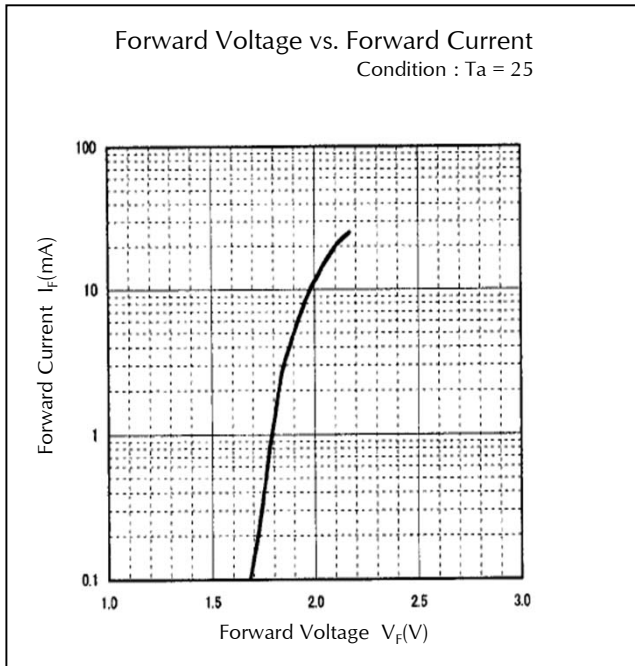
Electro-Optical Characteristics

(T_a=25 °C)

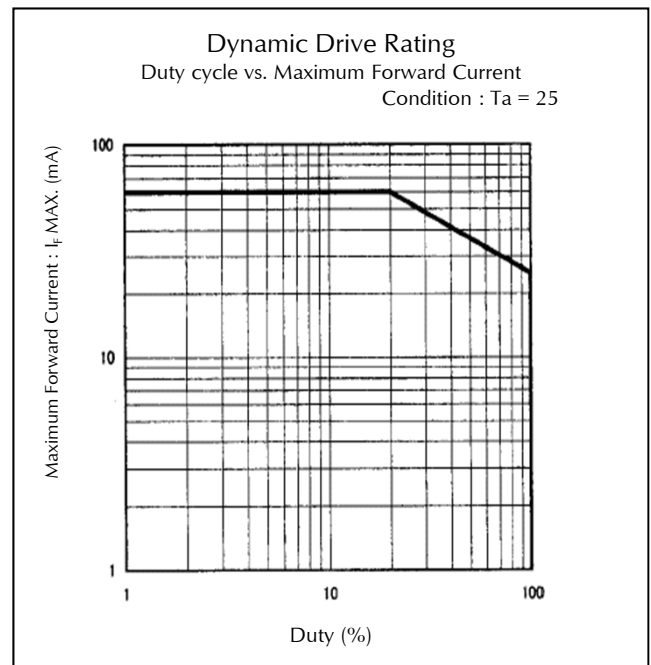
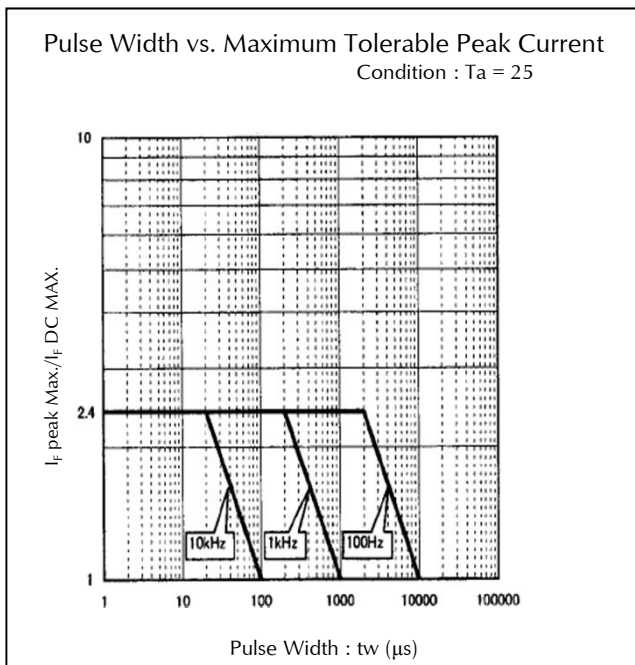
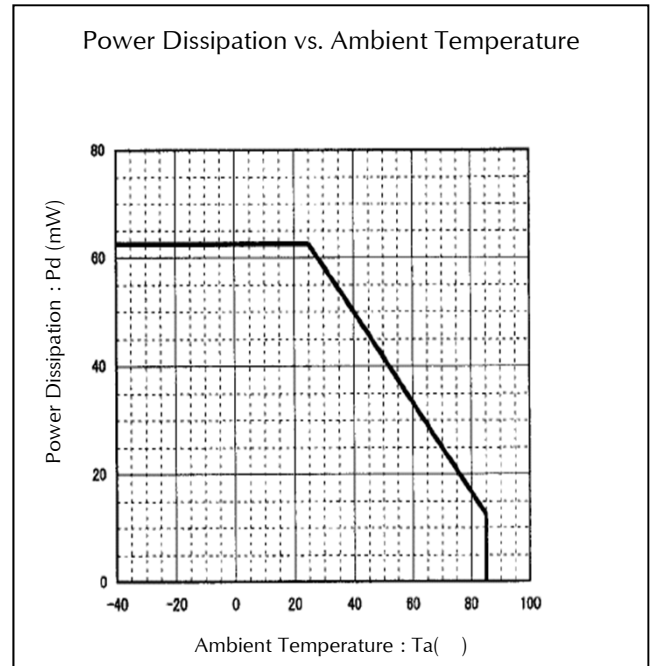
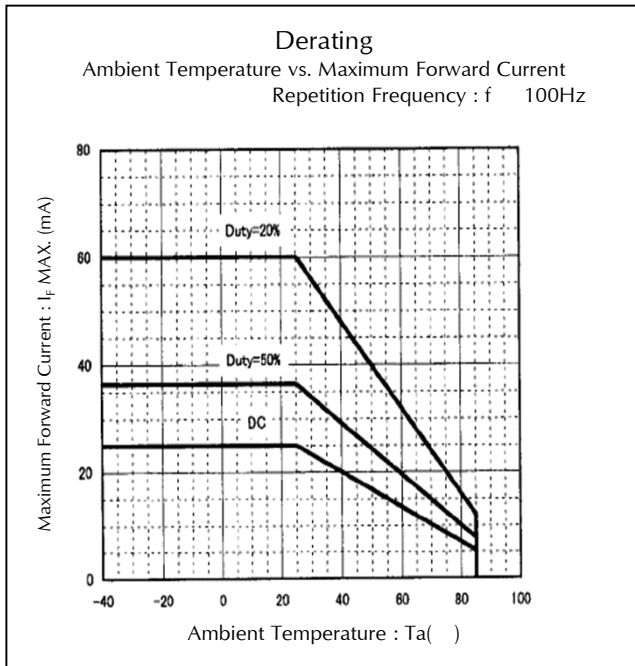
Item	Conditions	Symbol		Characteristics										Unit
				5201	5205	5202	4201	4205	3201	3205	2201	2205		
Forward Voltage	I _F =20mA	V _F	TYP.	2.2	2.2	2.1	2.1	2.1	2.2	2.2	1.7	1.7	V	
			MAX.	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.0		2.0
Reverse Current	V _R =4V	I _R	MAX.	100	100	100	100	100	100	100	100	100	μA	
Peak Wavelength	I _F =20mA	λ _p	TYP.	555	555	560	570	570	605	605	660	660	nm	
Spectral Line Half Width	I _F =20mA	Δλ	TYP.	30	30	30	30	30	30	30	30	30	nm	

※ The above Items : 1 chip

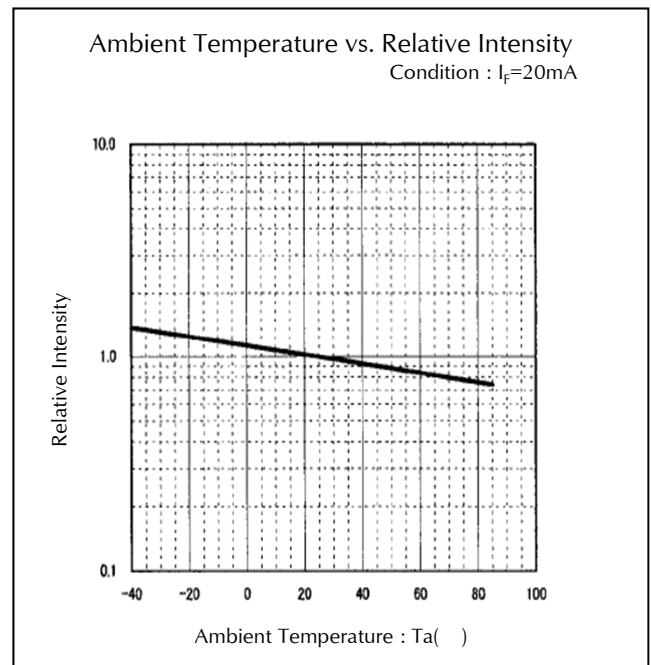
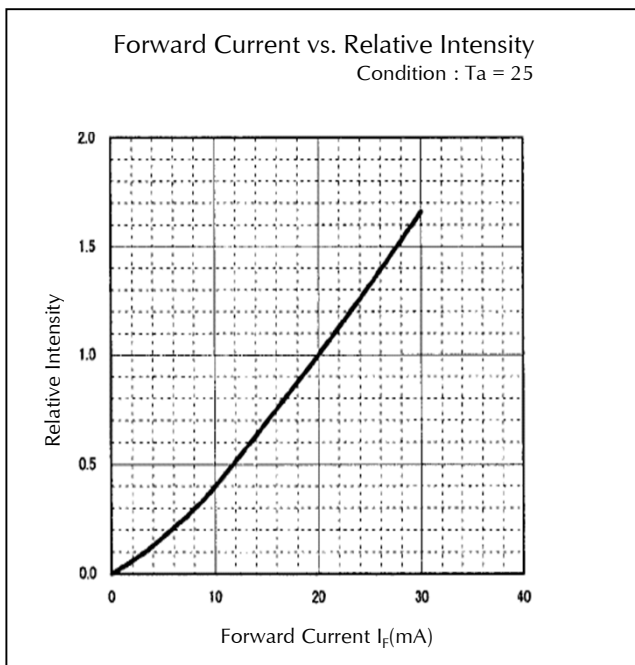
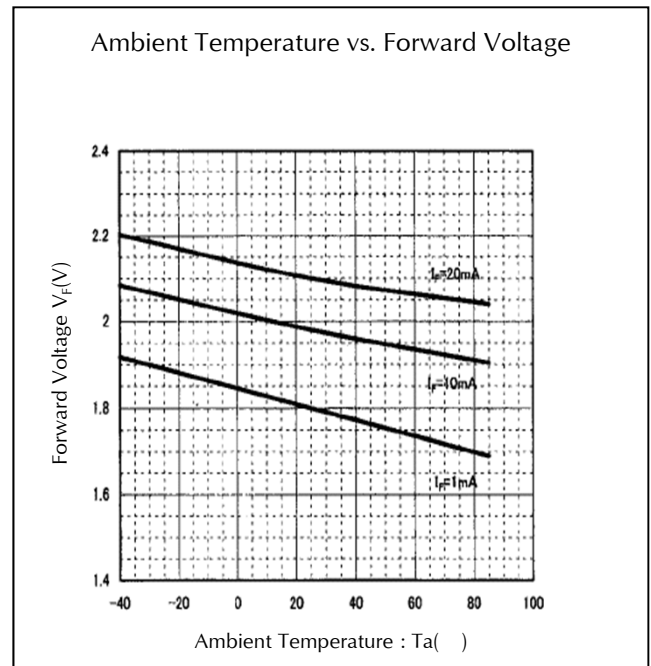
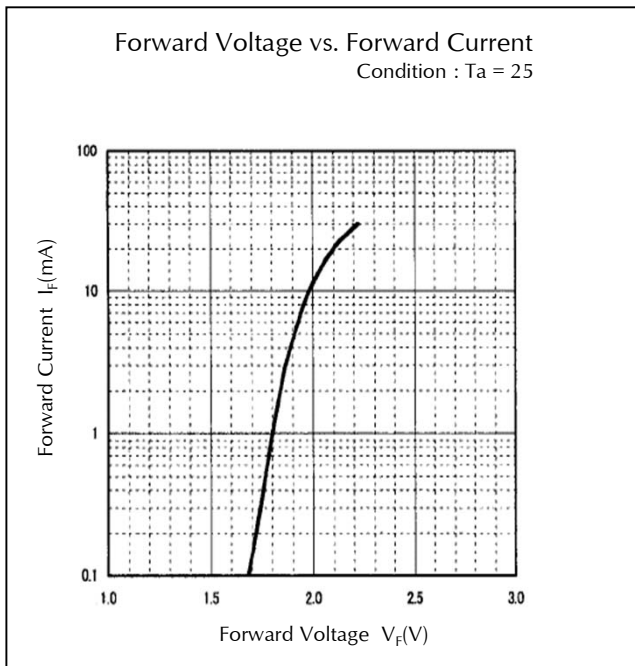
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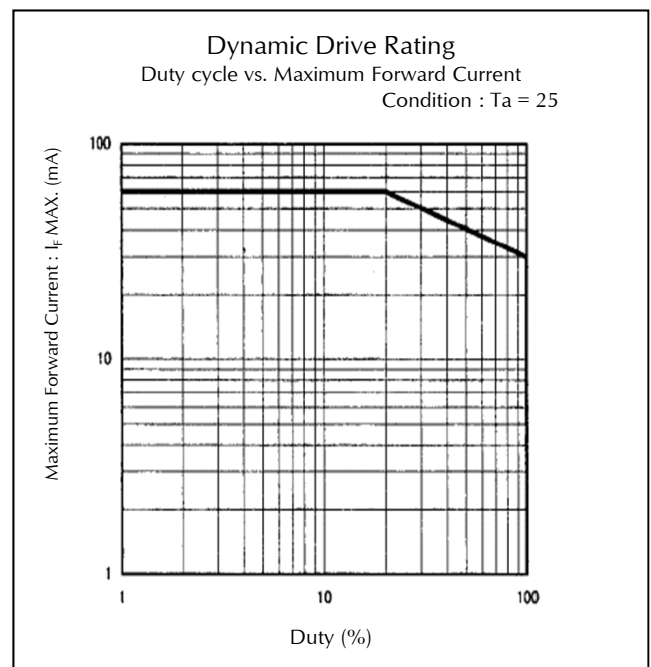
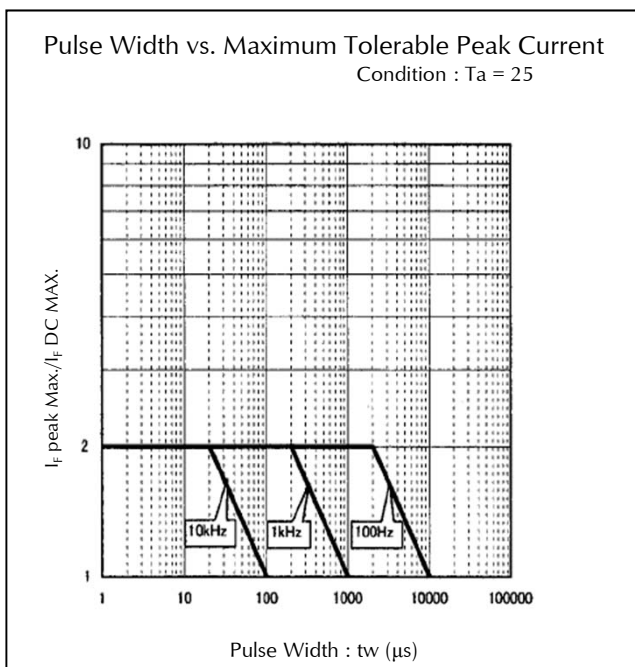
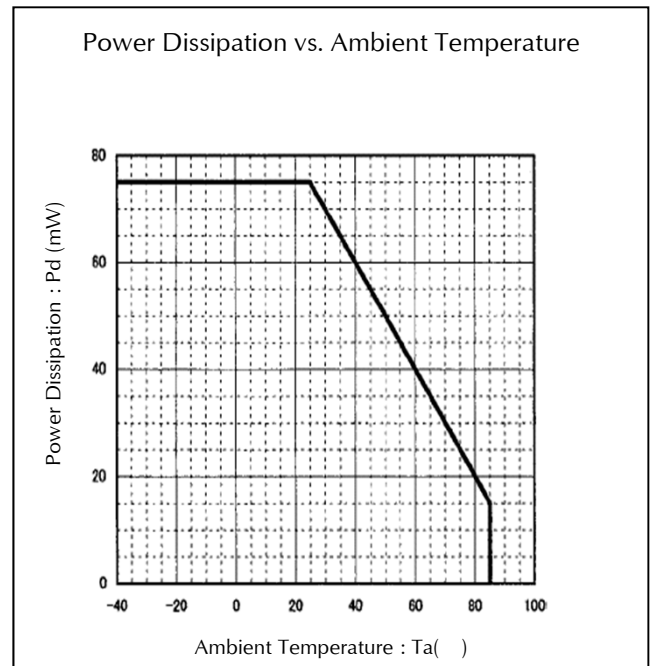
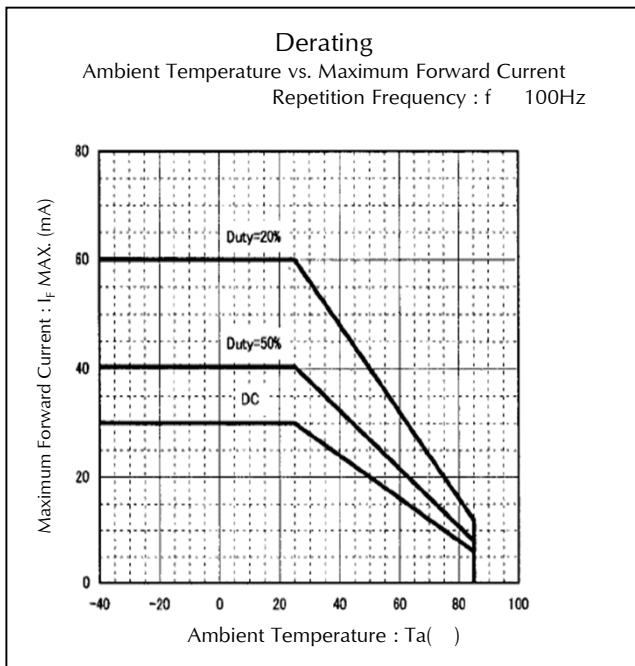
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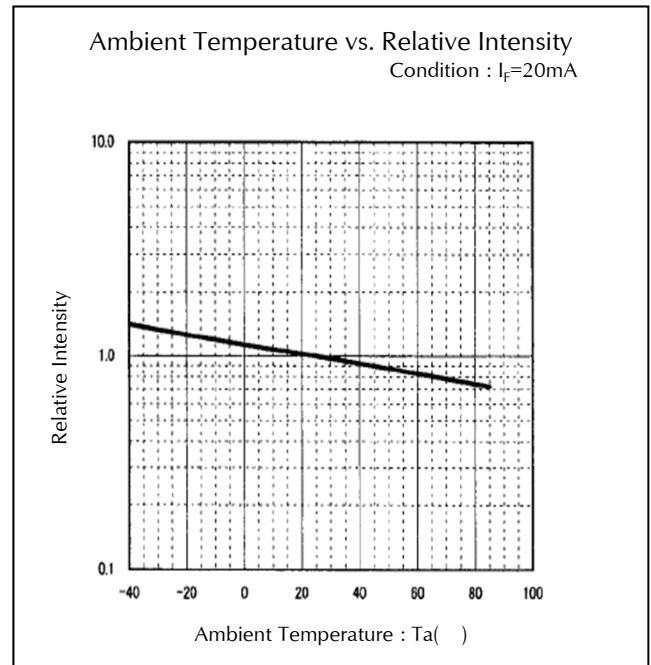
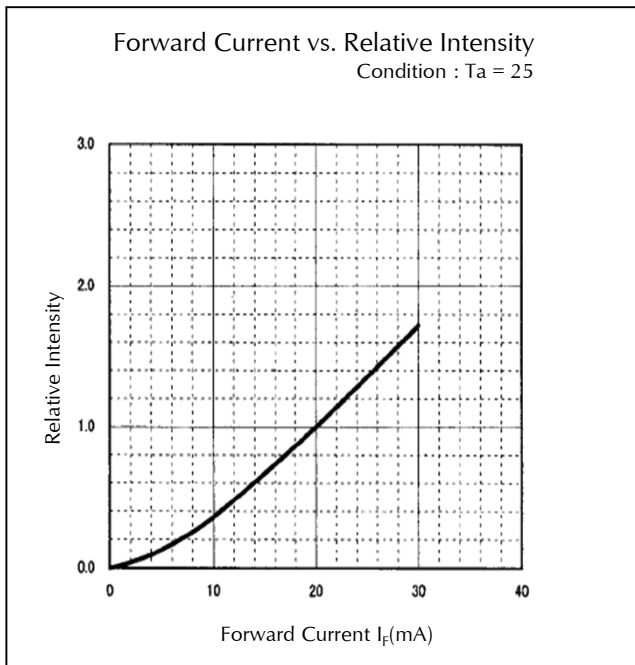
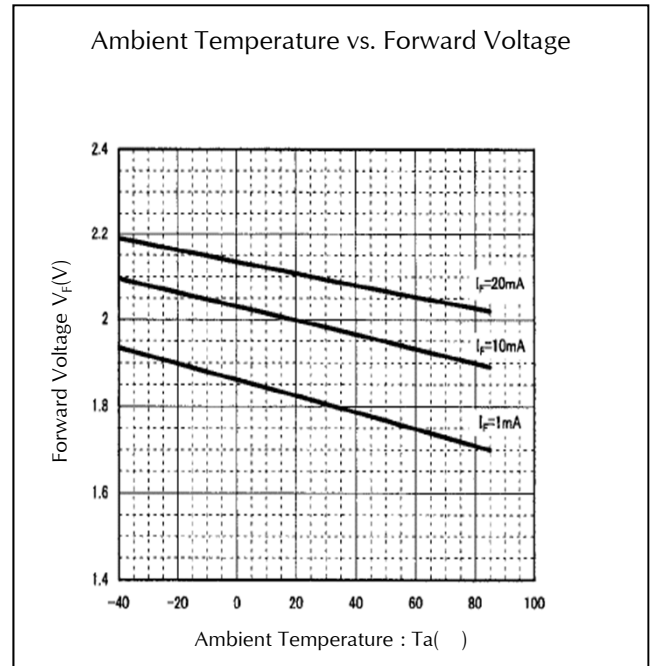
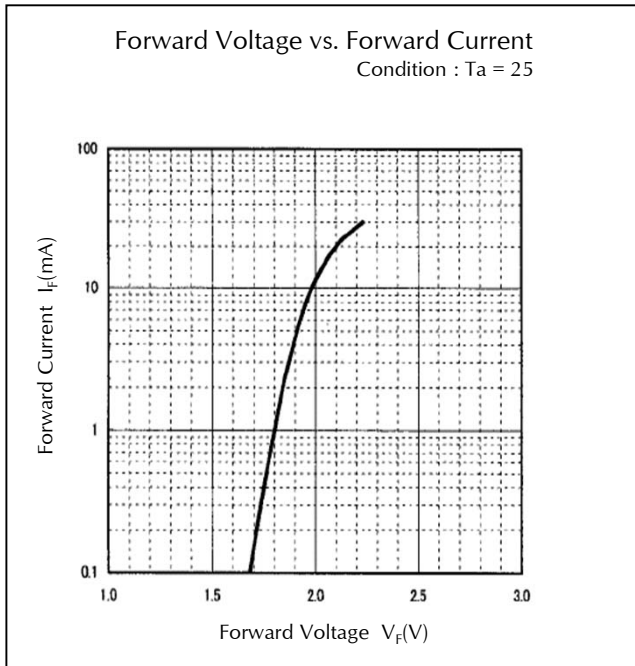
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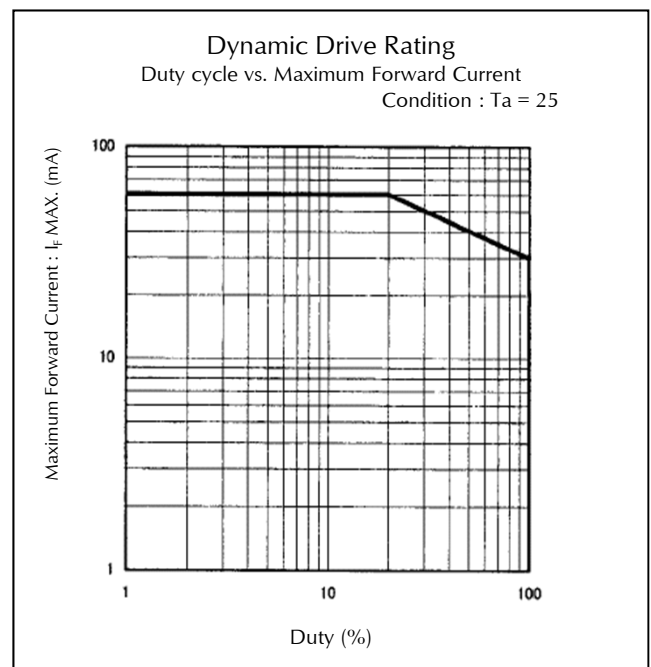
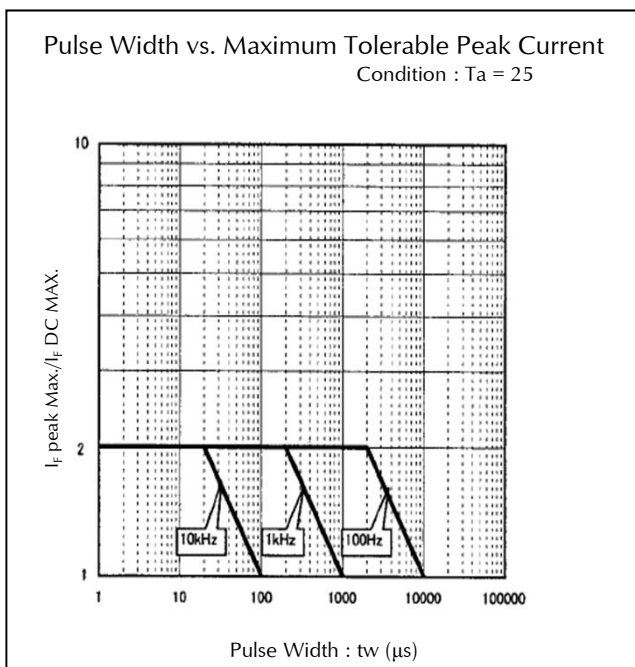
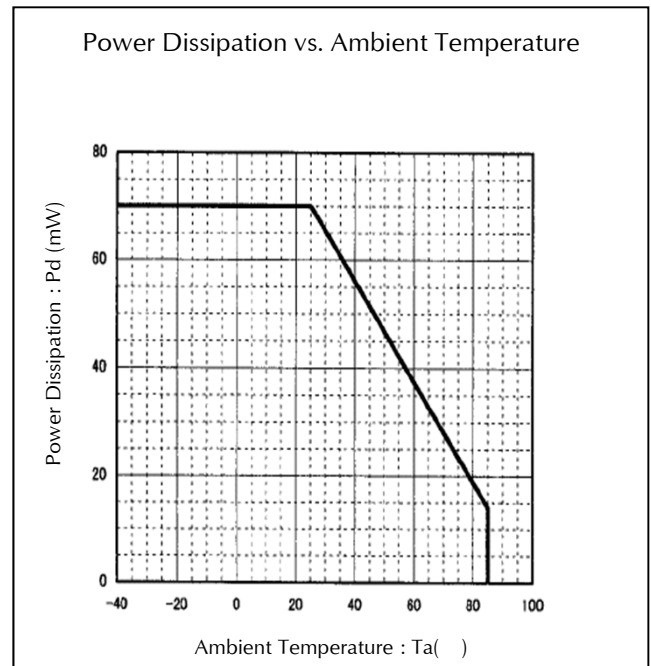
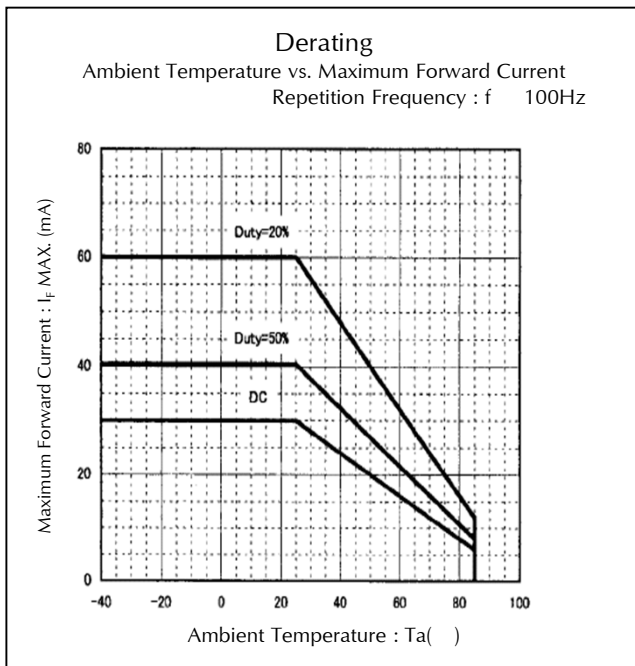
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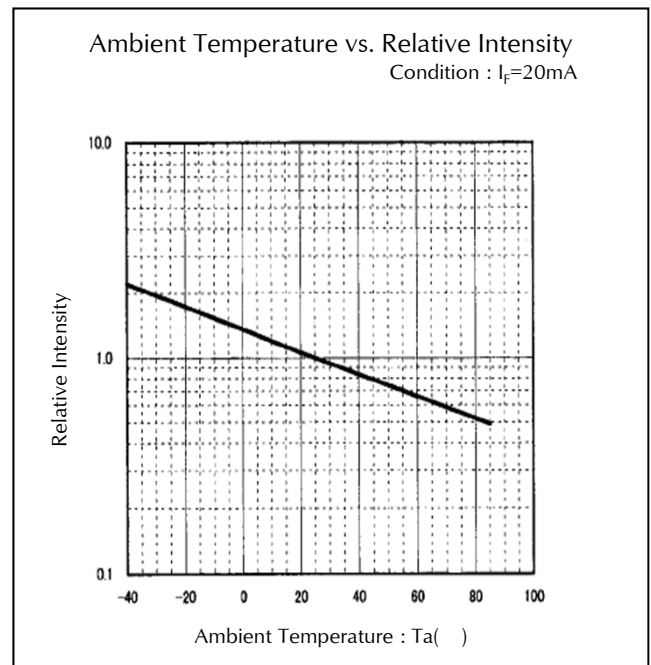
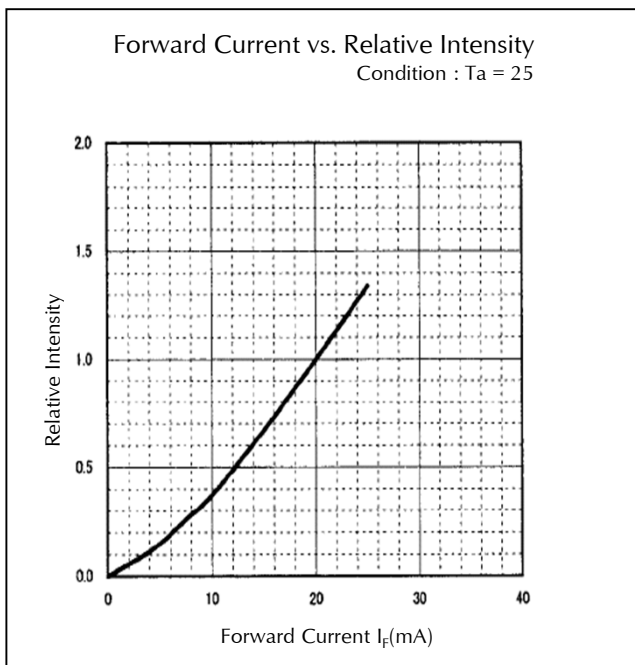
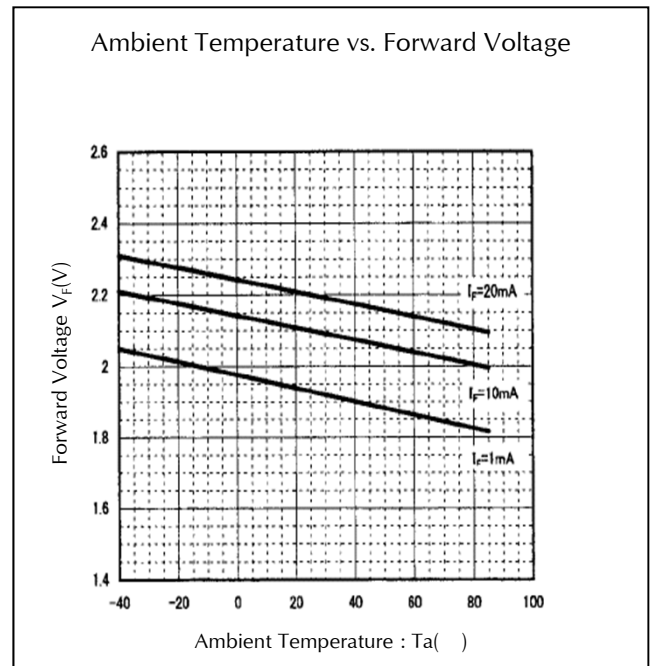
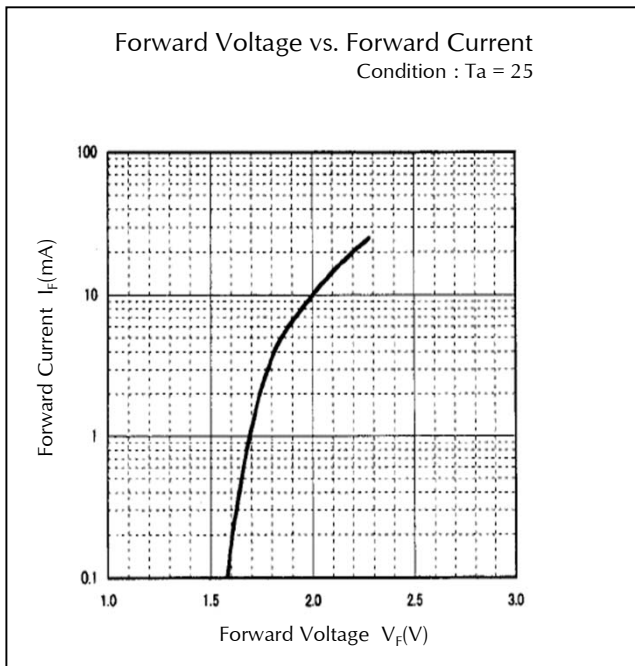
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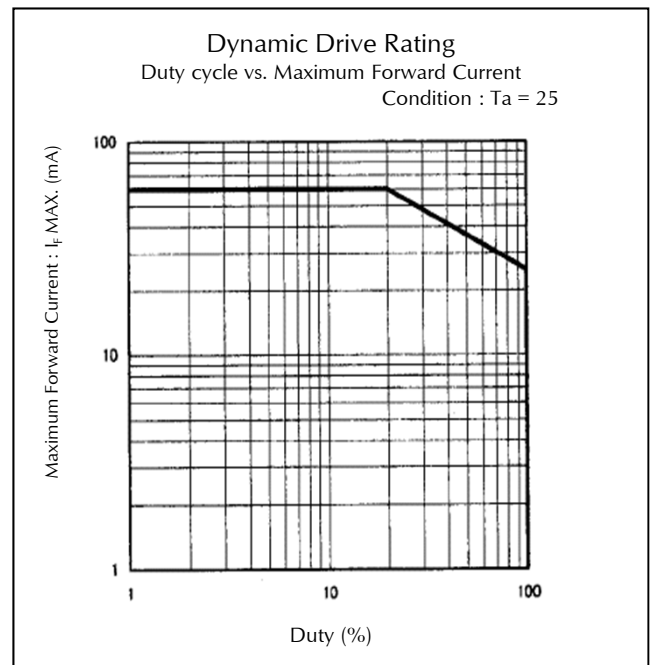
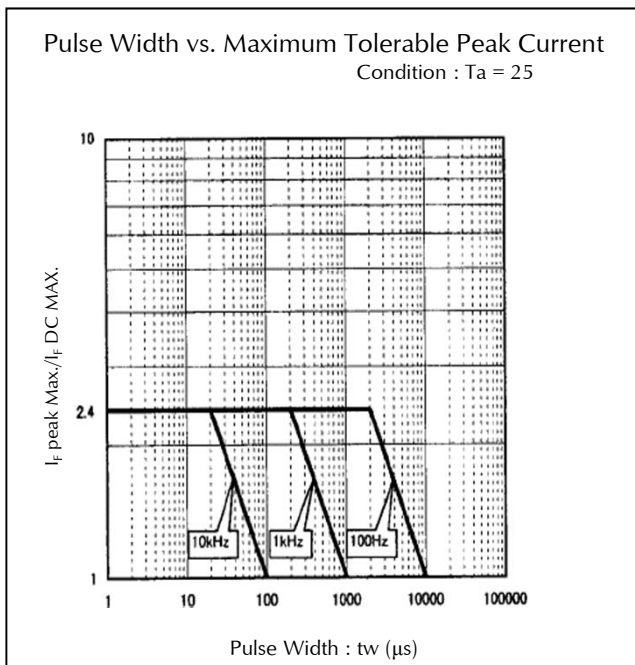
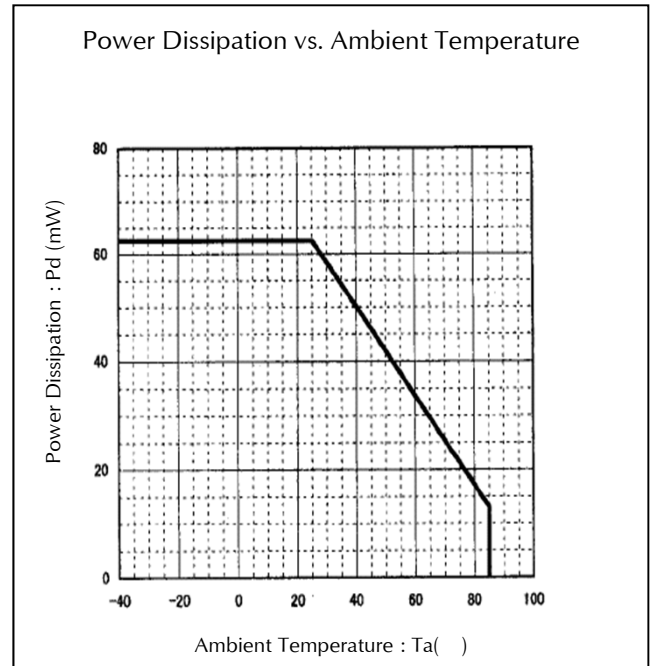
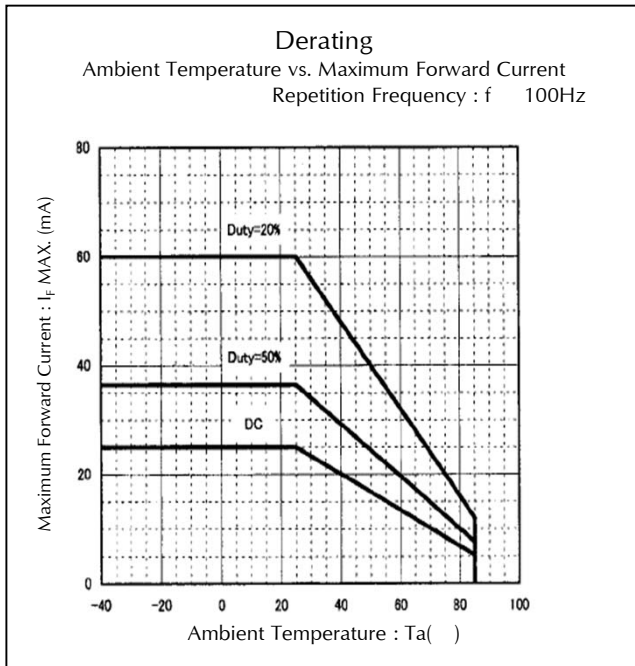
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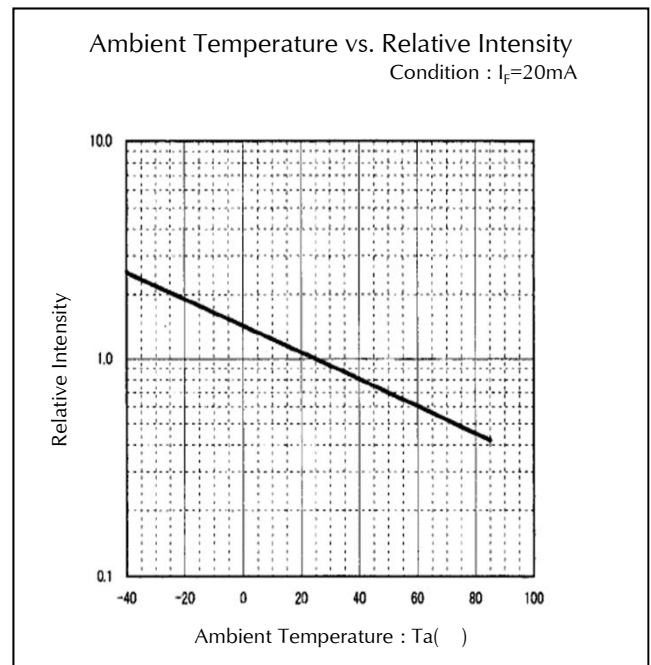
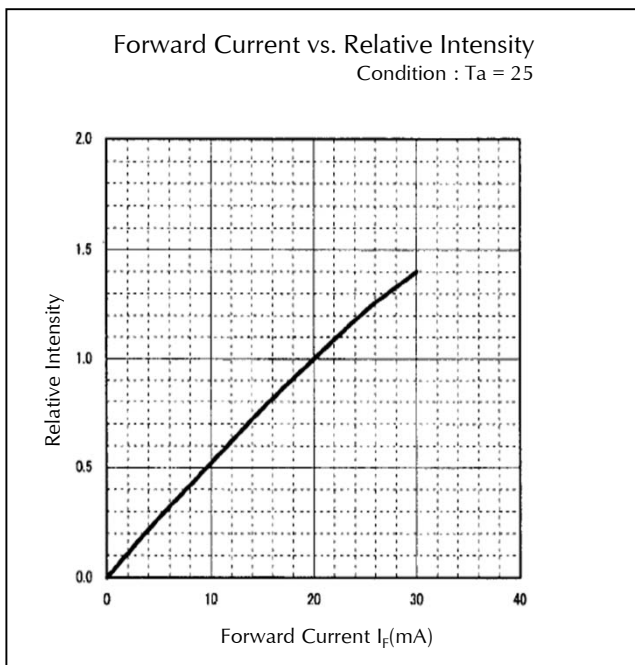
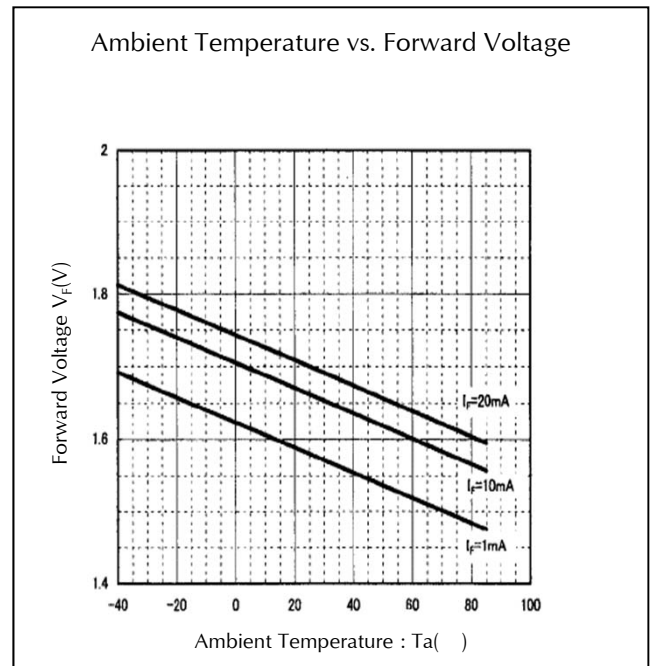
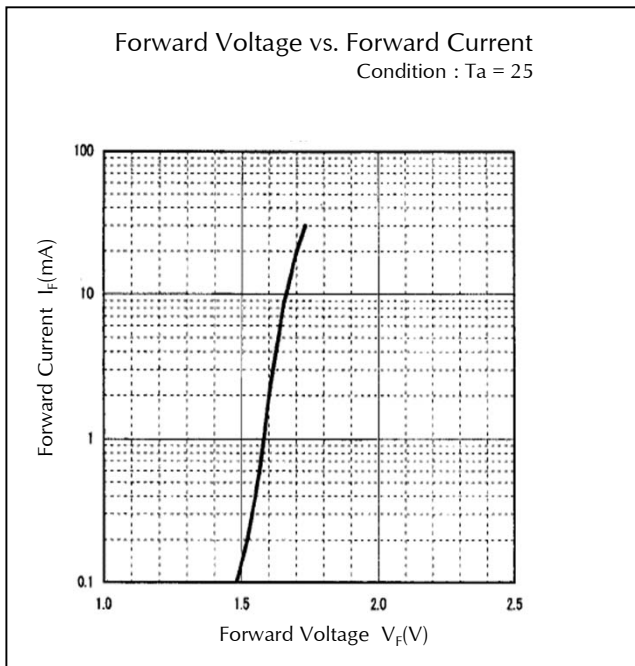
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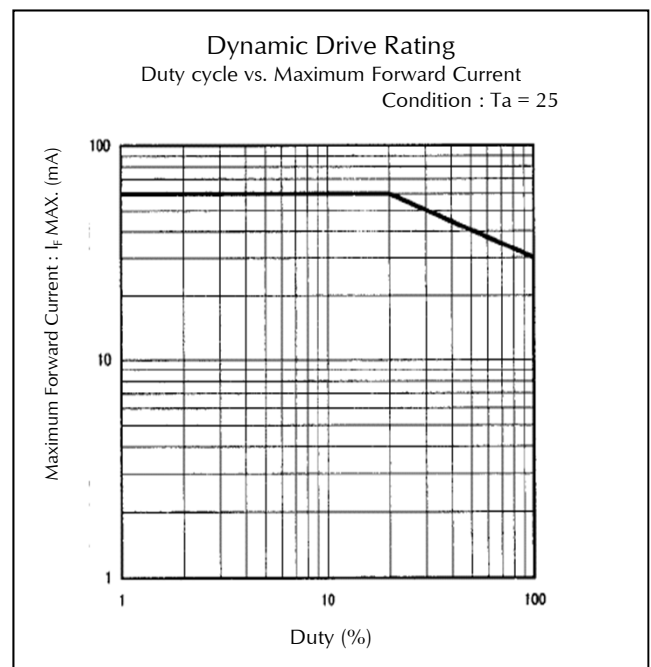
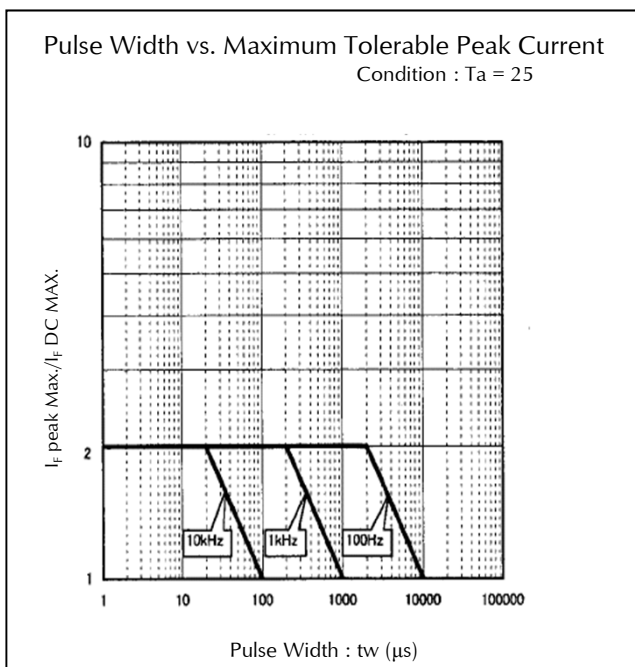
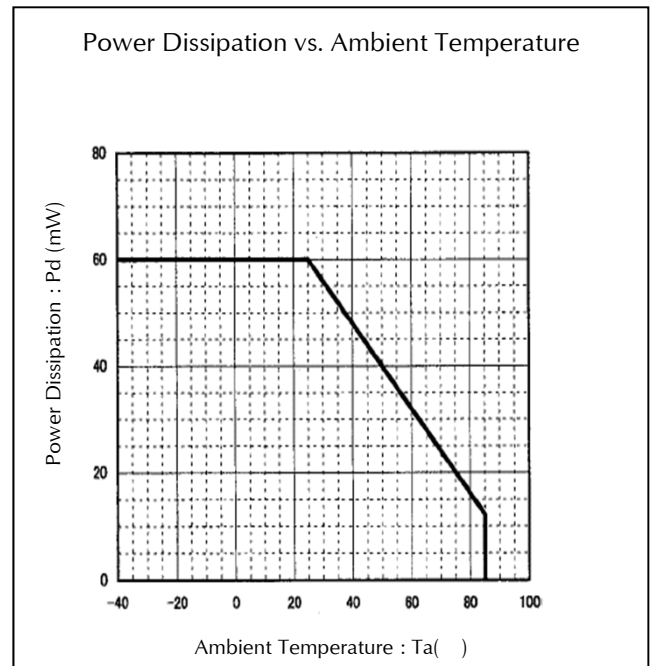
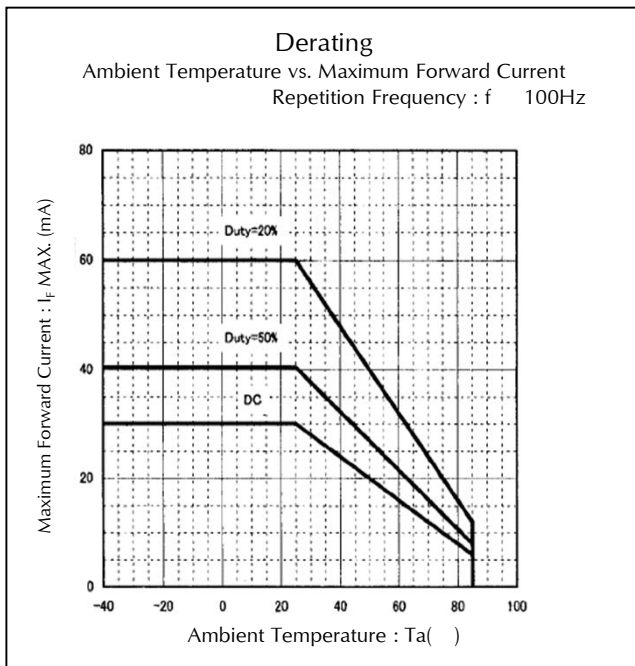
Technical Data(3201/3205)



Technical Data(2201/2205)



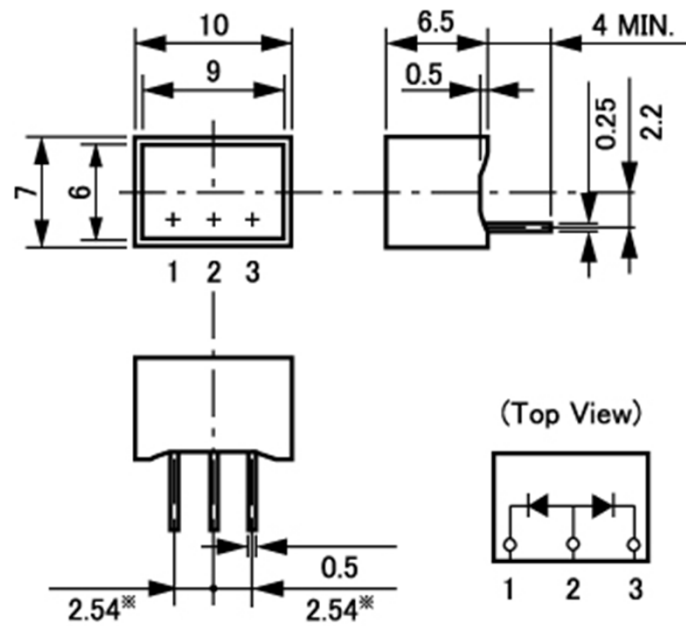
Technical Data(2201/2205)



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 2.0 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.
Soldering time and frequency	3 s 2 times	(MAX.) (MAX.)
Position	At least 2.0 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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