



**Pb-free
HEAT**



MU09 Series

Bi-Color / Light Bar Module

Features

Light emitting surface (Outer size)	φ 6.4 mm (φ 7 mm)
Product features	<ul style="list-style-type: none"> • Bi-Color • 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

Color and Luminous Intensity

Part No.	Material	Emitted Color	Resin Color	Intensity ^{※1} I _v (mcd)			Number of Chips
				MIN.	TYP.	I _F	
MU09-9101	GaP	Green	Milky White	4	8	20	2
	GaAlAs	Red		4	8	20	1
MU09-9102	GaP	Yellow Green	Milky White	6	12	20	2
	GaAlAs	Red		4	8	20	1
MU09-9103	GaAsP	Orange	Milky White	4	6	20	2
	GaAlAs	Red		4	8	20	1

※1 Luminous Intensity : 2 chips (Green·Yellow Green·Orange), 1 chip (Red)

Absolute Maximum Ratings

(Ta=25°C)

Item	Symbol	Absolute Maximum Ratings				Unit
		Green	Yellow Green	Orange	Red	
Power Dissipation ^{※2}	P _d	125	150	125	60	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)	ΔI _F	0.33	0.40	0.33	0.40	mA/°C
	ΔI _{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 (Green·Yellow Green·Orange), 1 chip (Red)

The other Items : 1 chip

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

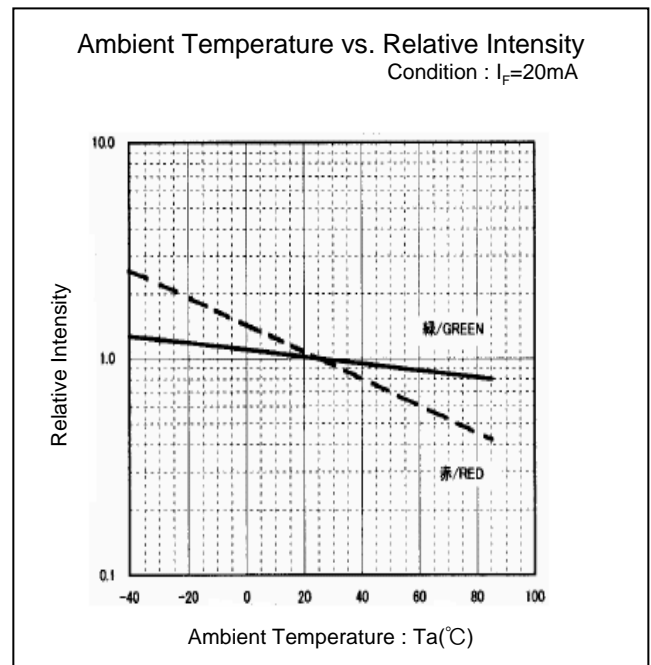
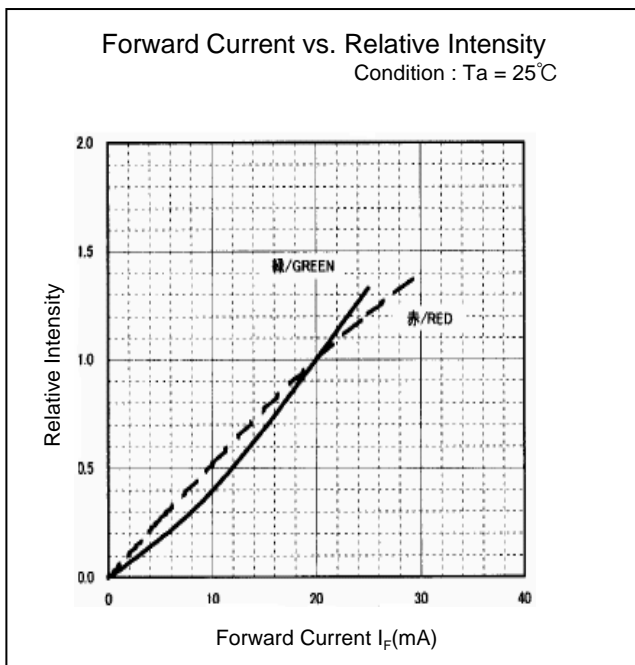
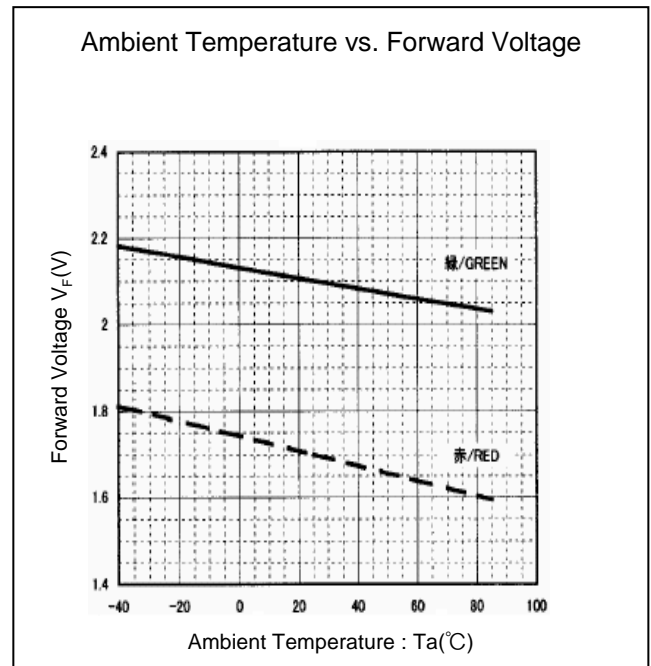
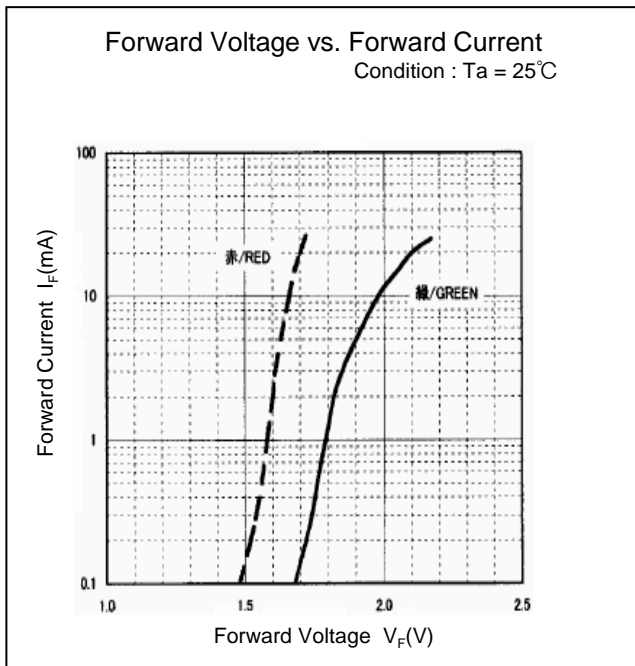
Electro-Optical Characteristics

(Ta=25°C)

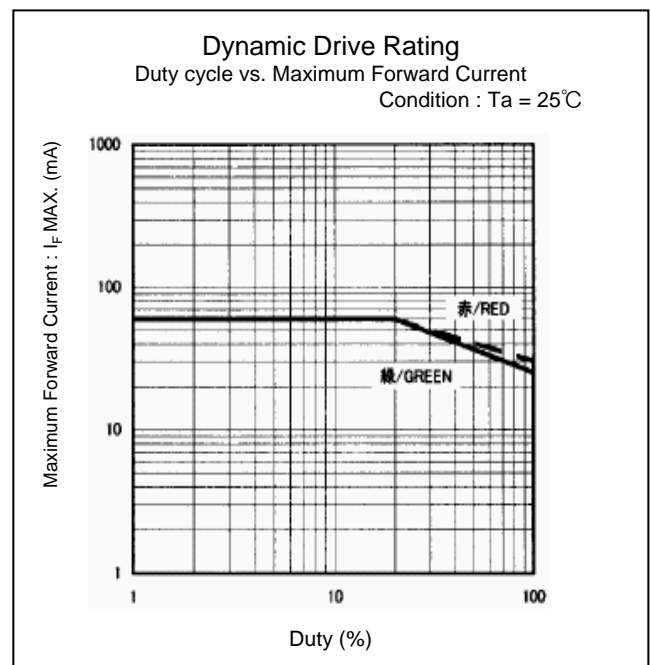
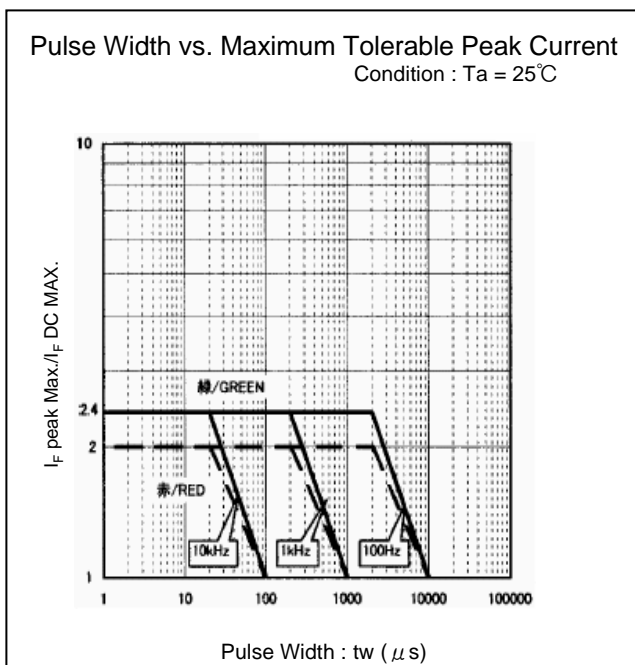
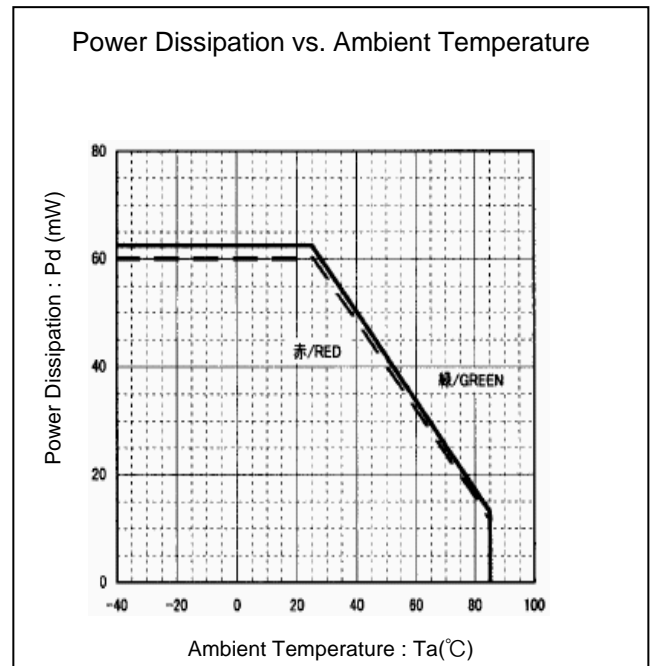
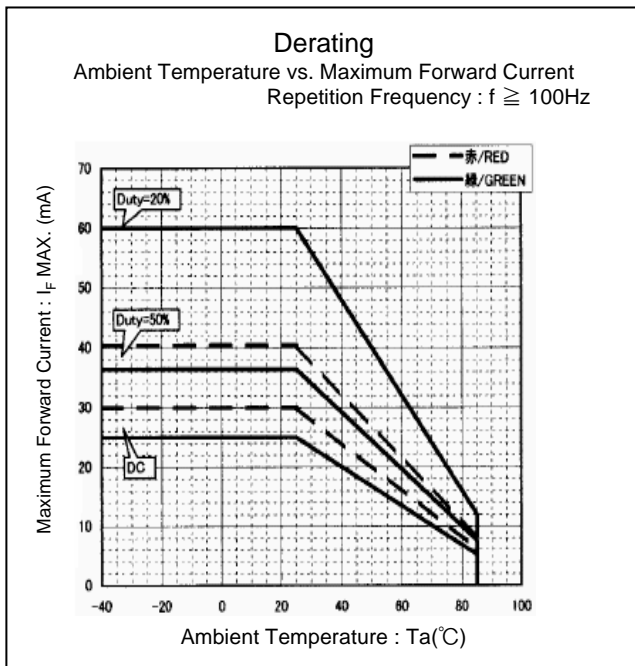
Item	Conditions	Symbol		Characteristics				Unit
				Green	Yellow Green	Orange	Red	
Forward Voltage	I _F =20mA	V _F	TYP.	2.2	2.1	2.2	1.7	V
			MAX.	2.5	2.5	2.5	2.0	
Reverse Current	V _R =4V	I _R	MAX.	100	100	100	100	μA
Peak Wavelength	I _F =20mA	λ _p	TYP.	555	570	605	660	nm
Spectral Line Half Width	I _F =20mA	Δλ	TYP.	30	30	30	30	nm

※ The above Items : 1 chip

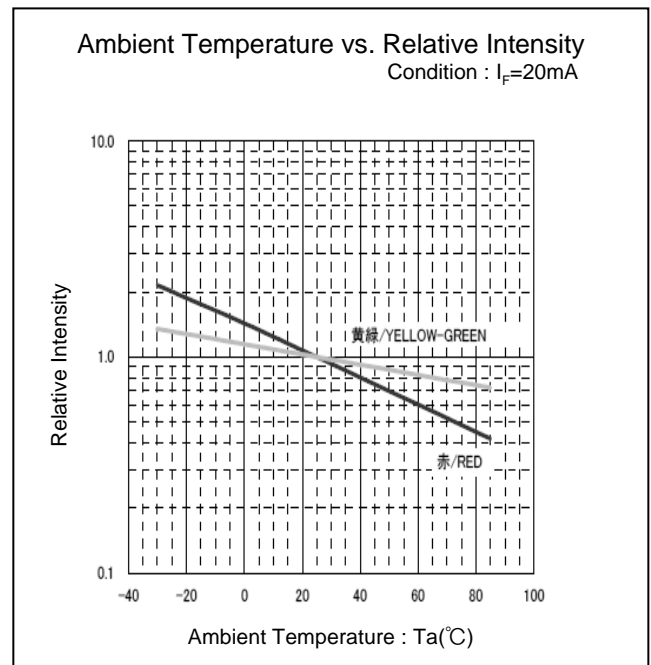
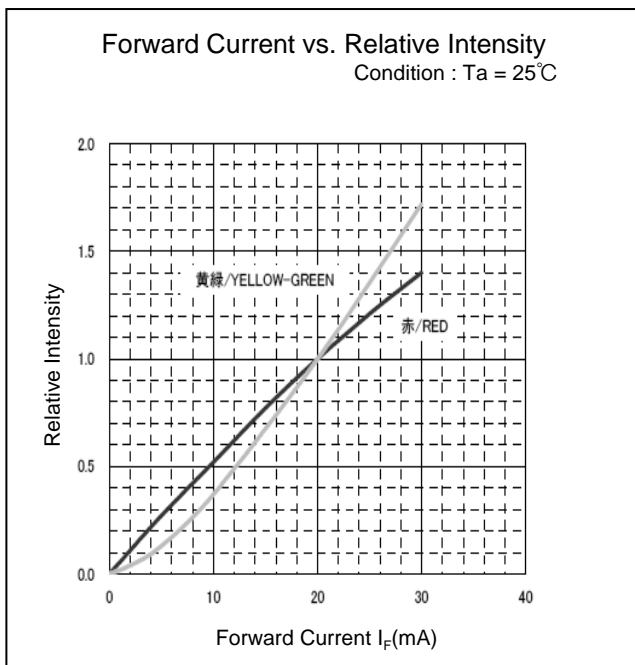
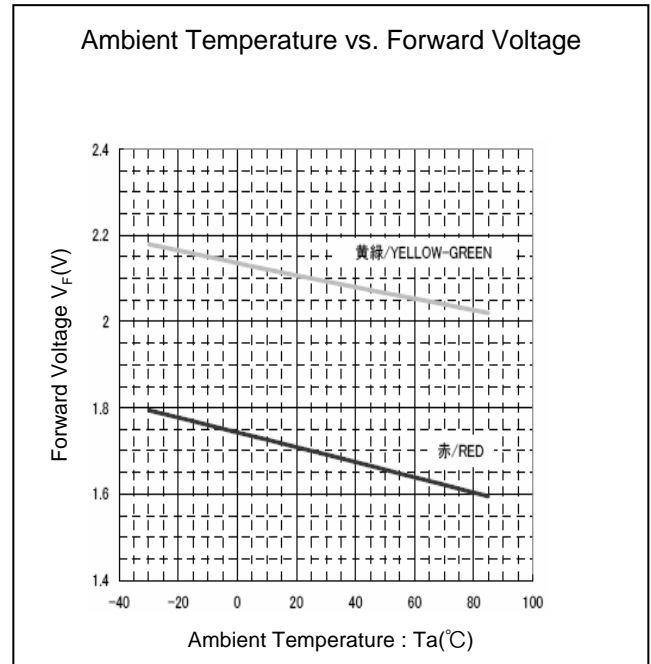
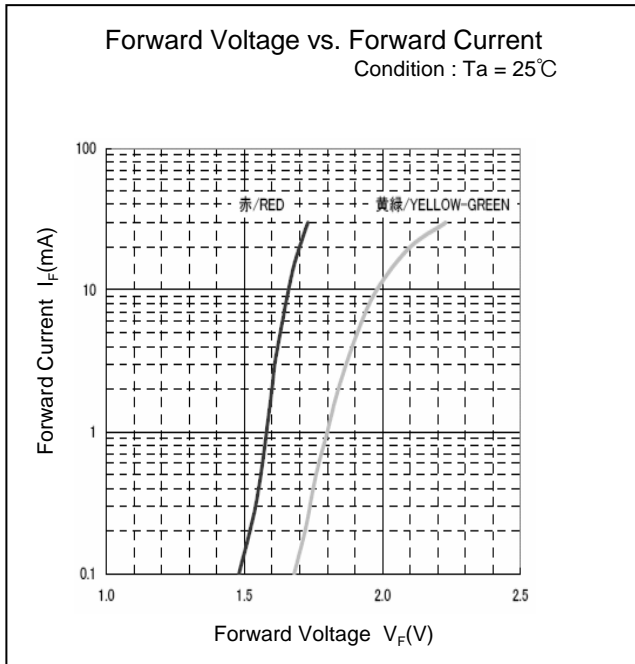
Technical Data(9101)



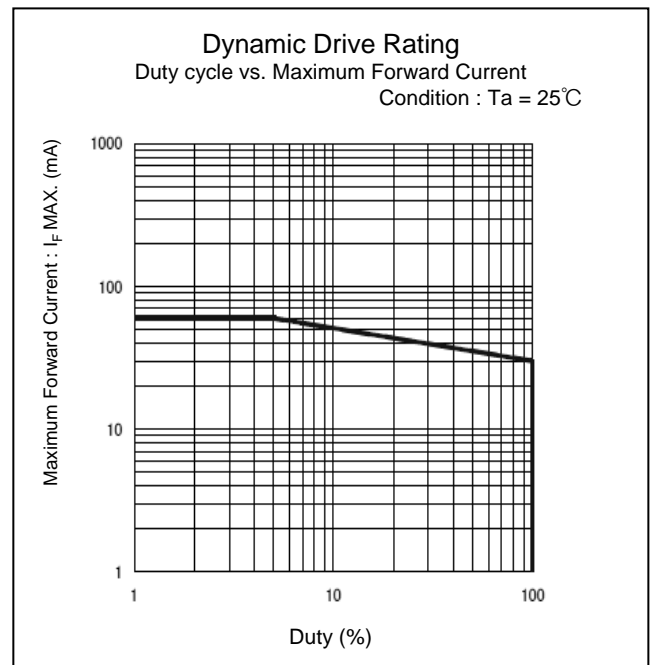
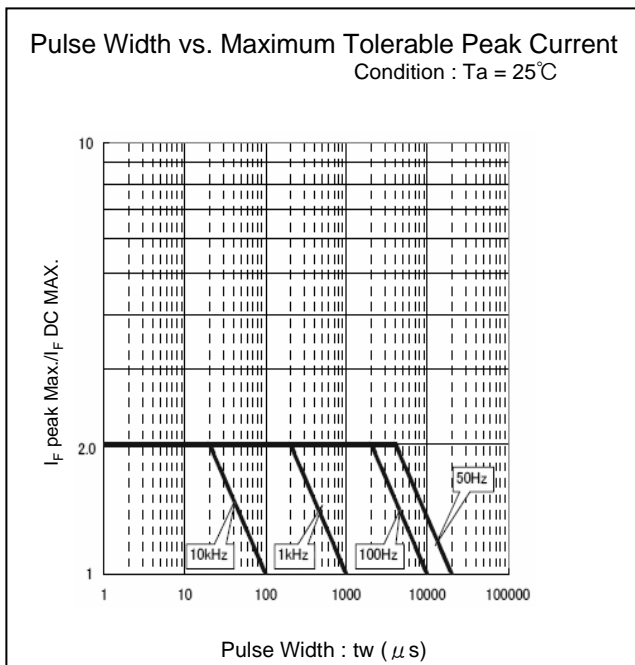
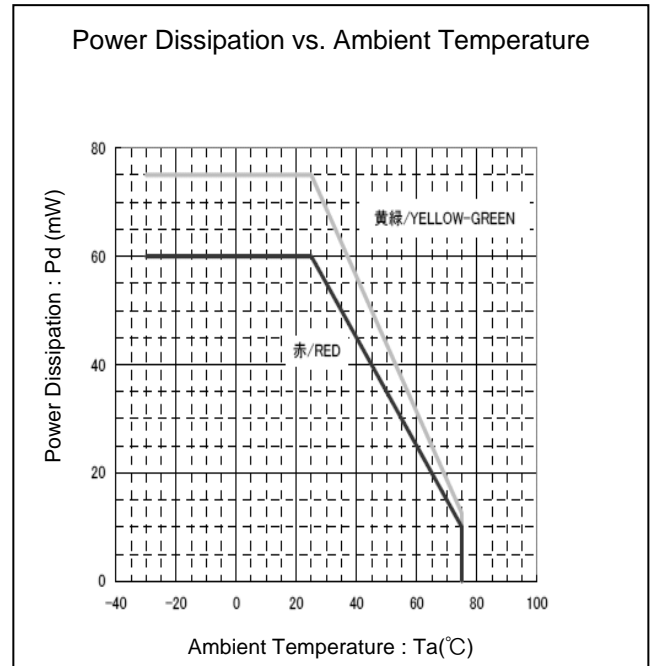
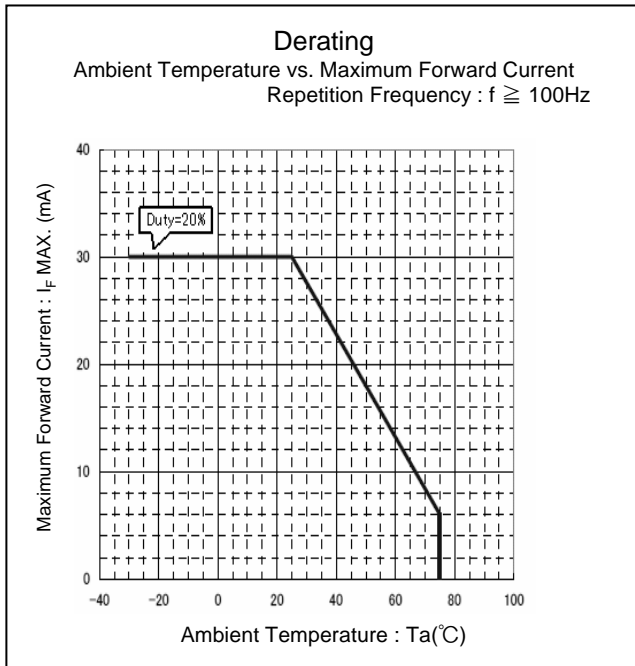
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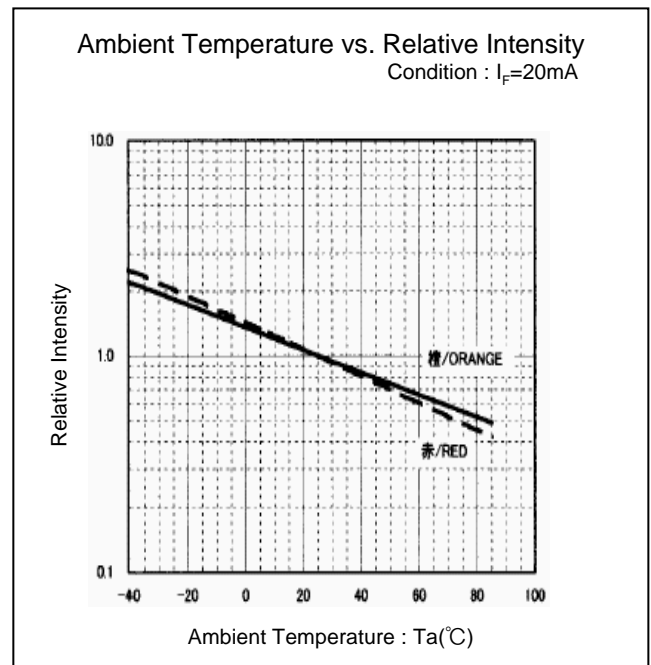
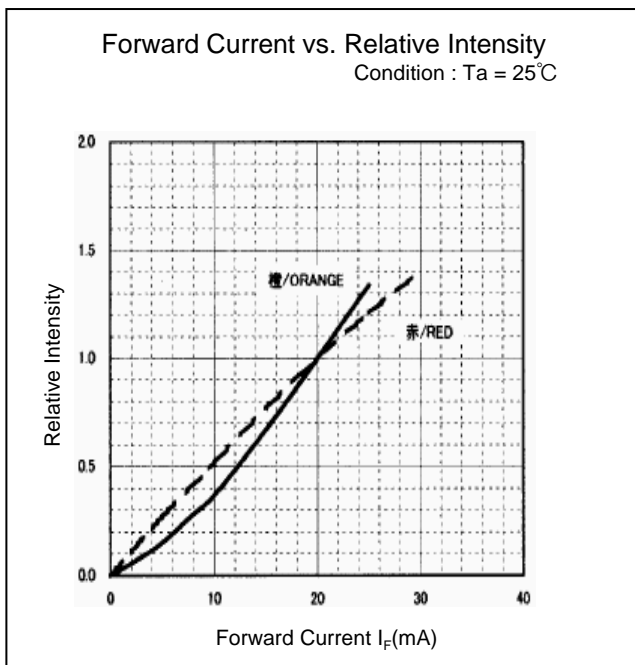
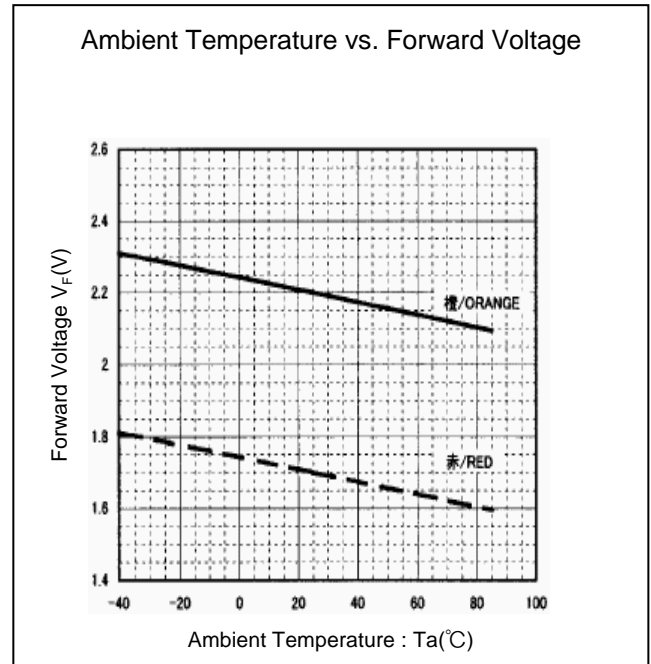
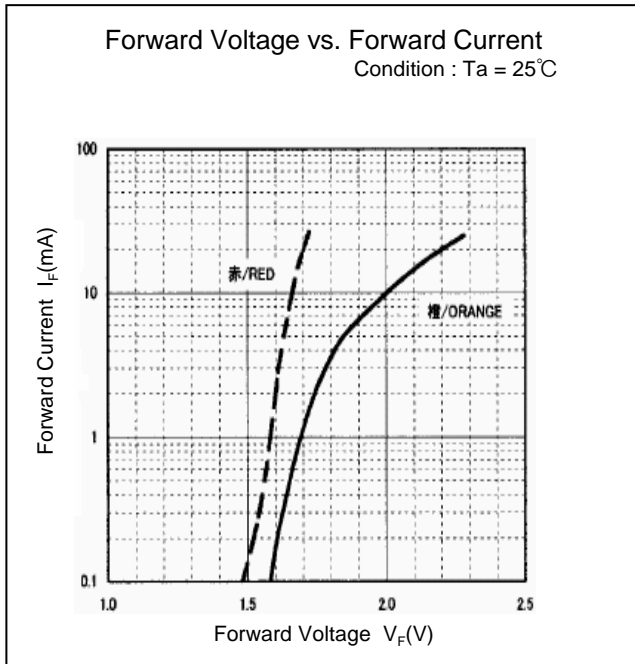
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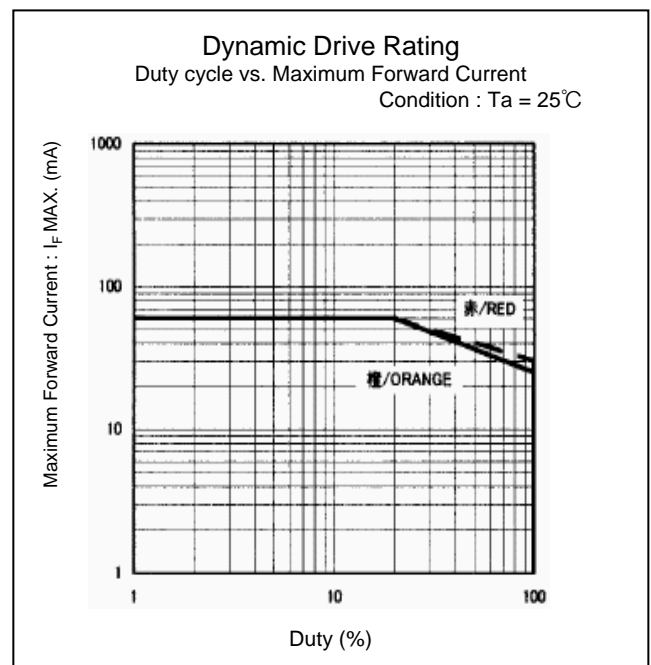
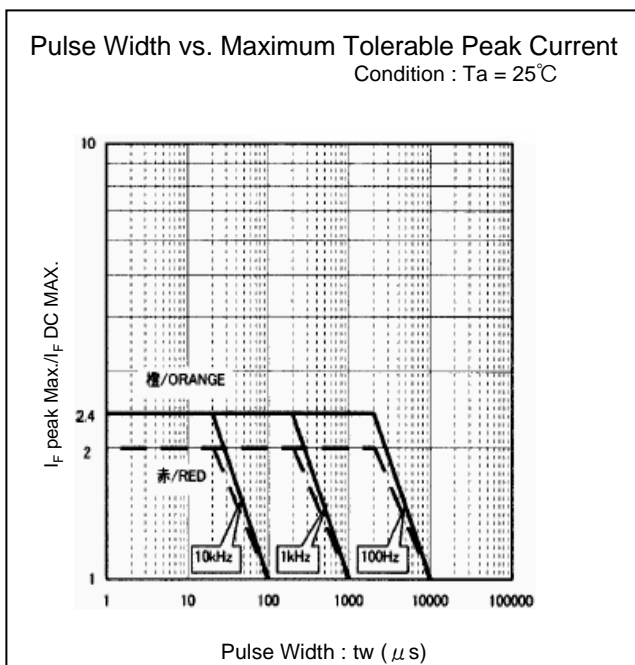
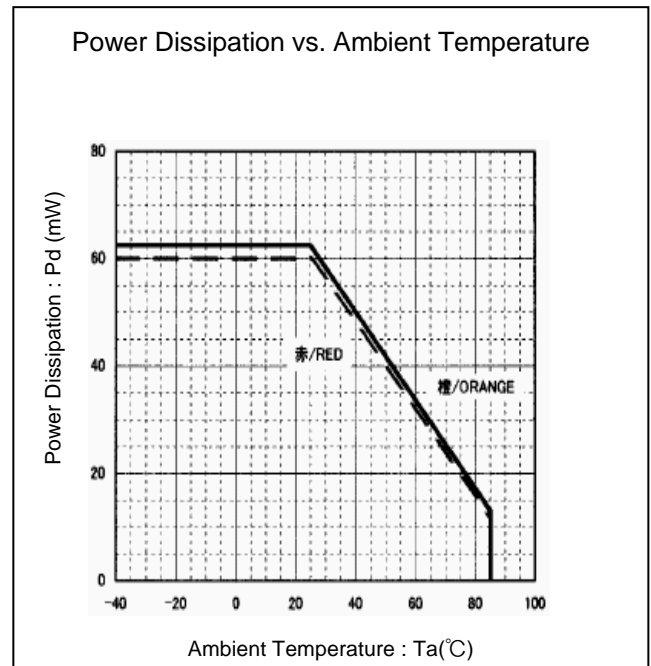
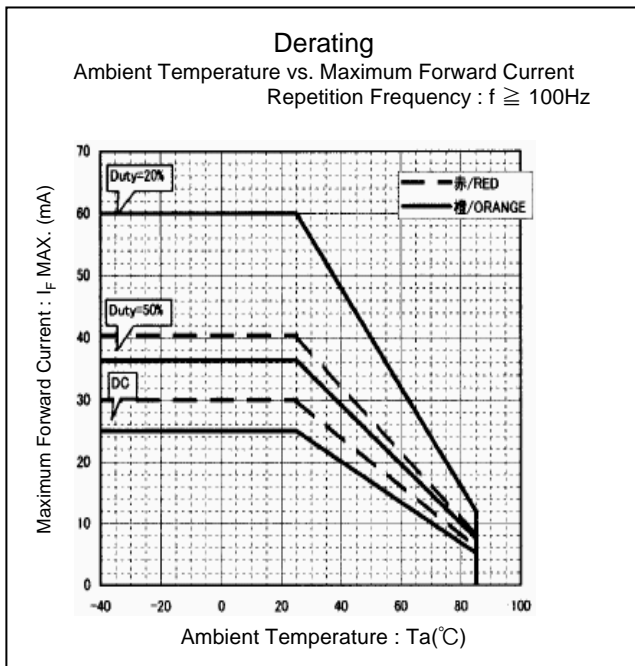
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Technical Data(9103)



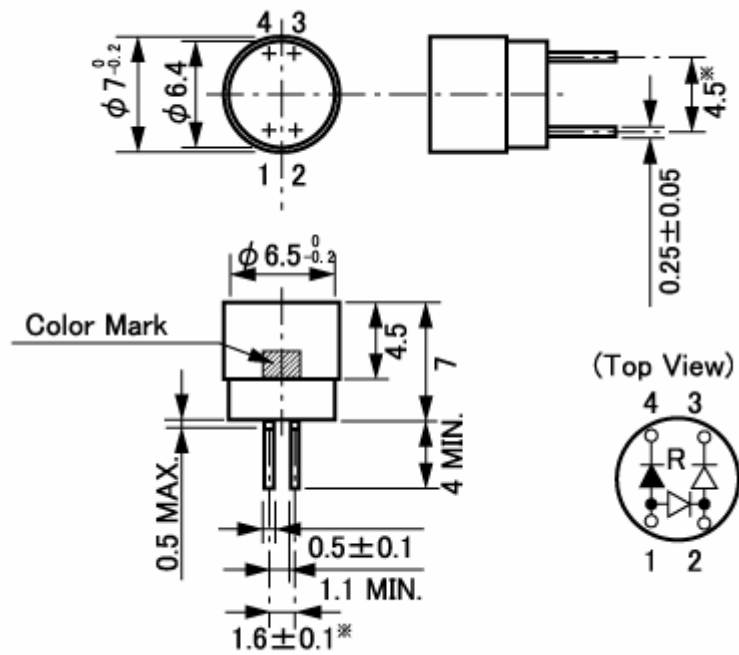
Technical Data(9103)



Package Dimensions

(Unit: mm)

(Tolerance : ± 0.25 mm)



● ※ 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 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 °C	(MAX.) (30 W 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	EAJED-4701/100(101)	Ta = 25°C, If = Maximum Rated Current	1,000 h	0/10
Resistance to Soldering Heat	EAJED-4701/300(302)	260±5°C, 3mm from package base	10s	0/10
Temperature Cycling	EAJED-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	EAJED-4701/100(103)	Ta = 60±2°C, RH = 90±5%	1,000 h	0/10
High Temp. Storage Life	EAJED-4701/200(201)	Ta = Maximum Rated Storage Temperature	1,000 h	0/10
Low Temp. Storage Life	EAJED-4701/200(202)	Ta = Minimum Rated Storage Temperature	1,000 h	0/10
Lead Tension	EAJED-4701/400(401)	5N, 1time	10s	0/10
Vibration, Variable Frequency	EAJED-4701/400(403)	98.1m/s ² (10G), 100 ~ 2KHz sweep for 20min., XYZ each direction	2 h	0/10
Lead Bend	EAJED-4701/400(401)	2.5N, 0°←→ 90°	Twice	0/10
Shock	JSC 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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