



**Pb-free
HEAT**



3338S Series

Single Color ϕ 3 Round Shape Type

Features

| | |
|-------------------------|--|
| Package | ϕ 3 Round shape type, EMBG/MBG,EMPG/MPG : Green Diffused epoxy EMPY/MPY,EMAY/MAY : Yellow Diffused epoxy EMAA/MAA : Orange Diffused epoxy EMVR/MVR,EBR/BR,MPR : Red Diffused epoxy |
| Product features | <ul style="list-style-type: none"> • Outer Dimension ϕ3 Round shape type • Operation temperature range. Storage Temperature : -30 ~ 100 Operating Temperature : -30 ~ 85 • Lead-free soldering compatible • RoHS compliant |
| Dominant wavelength | Green : 558nm (EMBG/MBG), 567nm(EMPG/MPG) Yellow Green : 572nm (EMPY/MPY) Yellow : 590nm (EMAY/MAY) Orange : 606nm (EMAA/MAA) Red : 624nm (EMVR/MVR) 647nm (EBR/BR) 630nm (MPR) |
| Half Intensity Angle | EMBG/MBG,EMPG/MPG : 30 deg. EMPY/MPY,EMAY/MAY,EMAA/MAA : 28 deg. EMVR/MVR,EBR/BR : 25 deg. MPR : 29 deg. |
| Die materials | EMBG/MBG,EMPG/MPG, EMPY/MPY,MPR : GaP EMAY/MAY,EMAA/MAA,EMVR/MVR : GaAsP EBR/BR : GaAlAs |
| Rank grouping parameter | Sorted by luminous intensity per rank taping |
| Soldering methods | TTW (Through The Wave) soldering and manual soldering |
| ESD | More than 2kV(HBM) |
| Packing | Bulk : 200pcs(MIN.) |

Recommended Applications

Amusement Equipment, Electric Household Appliances, OA/FA, Other General Applications

Color and Luminous Intensity

(Ta=25)

| Part No. | Material | Emitted Color | Lens Color | | Dominant Wavelength | | Luminous Intensity | | |
|---------------|----------|---------------|------------|----------|---------------------|----------------|--------------------|-------|----------------|
| | | | | | λ d (nm) | | Iv (mcd) | | |
| | | | | | TYP. | I _F | MIN. | TYP. | I _F |
| EMBG/MBG3338S | GaP | Green | Green | Diffused | 558 | 20 | 8/4 | 12/8 | 20 |
| EMPG/MPG3338S | GaP | | | | 567 | 20 | 20/10 | 30/20 | 20 |
| EMPY/MPY3338S | GaP | Yellow Green | Yellow | | 572 | 20 | 30/15 | 45/30 | 20 |
| EMAY/MAY3338S | GaAsP | Yellow | | | 590 | 20 | 20/10 | 30/20 | 20 |
| EMAA/MAA3338S | GaAsP | Orange | Orange | | 606 | 20 | 20/10 | 30/20 | 20 |
| EMVR/MVR3338S | GaAsP | Red | Red | | 624 | 20 | 20/10 | 30/20 | 20 |
| EBR/BR3338S | GaAlAs | | | | 647 | 20 | 30/15 | 45/30 | 20 |
| MPR3338S | GaP | | | | 630 | 10 | 1.5 | 3 | 10 |

Absolute Maximum Ratings

(Ta=25)

| Item | Symbol | Absolute Maximum Ratings | | | | | | | | Unit |
|---------------------------------|--------------|--------------------------|--------------|--------------|--------------|--------------|--------------|------------|------|-------|
| | | EMBG/ MBG | EMPG/ MPG | EMPY/ MPY | EMAY/ MAY | EMAA/ MAA | EMVR/ MVR | EBR/ BR | MPR | |
| Power Dissipation | P_d | 70 | 70 | 85 | 85 | 70 | 75 | 100 | 75 | mW |
| Forward Current | I_F | 25 | 25 | 30 | 30 | 25 | 30 | 50 | 30 | mA |
| Pulse Forward Current *1 | I_{FRM} | 60 | 60 | 75 | 75 | 60 | 75 | 300 | 75 | mA |
| Derating (Ta=25°C or higher) | ΔI_F | 0.33 | 0.33 | 0.40 | 0.40 | 0.33 | 0.40 | 0.67 | 0.40 | mA/°C |
| Reverse Voltage | V_R | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | V |
| Operating Temperature | T_{opr} | -30~+85 | | | | | | | | °C |
| Storage Temperature | T_{stg} | -30~+100 | | | | | | | | °C |

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

Electro-Optical Characteristics (EMBG/MBG,EMPG/MPG,EMPY/MPY,EMAY/MAY,EMAA/MAA,EMVR/MVR,EBR/BR) (Ta=25)

| Item | Conditions | Symbol | Characteristics | | | | | | | | Unit |
|--------------------------|----------------------|------------------|-----------------|----------|----------|----------|----------|----------|--------|-----|---------|
| | | | EMBG/MBG | EMPG/MPG | EMPY/MPY | EMAY/MAY | EMAA/MAA | EMVR/MVR | EBR/BR | | |
| Forward Voltage | I _F =20mA | V _F | TYP. | 2.1 | 2.1 | 2.1 | 2.2 | 2.2 | 2.0 | 1.7 | V |
| | | | MAX. | 2.8 | 2.8 | 2.8 | 2.8 | 2.8 | 2.8 | 2.0 | |
| Reverse Current | V _R =4V | I _R | MAX. | 20 | 20 | 20 | 20 | 20 | 20 | 100 | μ A |
| Peak Wavelength | I _F =20mA | λ_p | TYP. | 555 | 560 | 570 | 580 | 605 | 630 | 660 | nm |
| Dominant Wavelength | I _F =20mA | λ_d | TYP. | 558 | 567 | 572 | 590 | 606 | 624 | 647 | nm |
| Spectral Line Half Width | I _F =20mA | $\Delta \lambda$ | TYP. | 30 | 30 | 30 | 30 | 30 | 30 | 30 | nm |
| Half Intensity Angle | I _F =20mA | 2 θ 1/2 | TYP. | 30 | 30 | 28 | 28 | 28 | 25 | 25 | deg. |

Electro-Optical Characteristics(MPR)

(Ta=25)

| Item | Conditions | Symbol | Characteristics | | Unit |
|--------------------------|----------------------|------------------|-----------------|-----|---------|
| | | | | MPR | |
| Forward Voltage | I _F =10mA | V _F | TYP. | 2.1 | V |
| | | | MAX. | 2.8 | |
| Reverse Current | V _R =4V | I _R | MAX. | 20 | μ A |
| Peak Wavelength | I _F =10mA | λ_p | TYP. | 700 | nm |
| Dominant Wavelength | I _F =10mA | λ_d | TYP. | 630 | nm |
| Spectral Line Half Width | I _F =10mA | $\Delta \lambda$ | TYP. | 100 | nm |
| Half Intensity Angle | I _F =10mA | 2 θ 1/2 | TYP. | 29 | deg. |

Luminous Intensity Rank

(Ta=25)

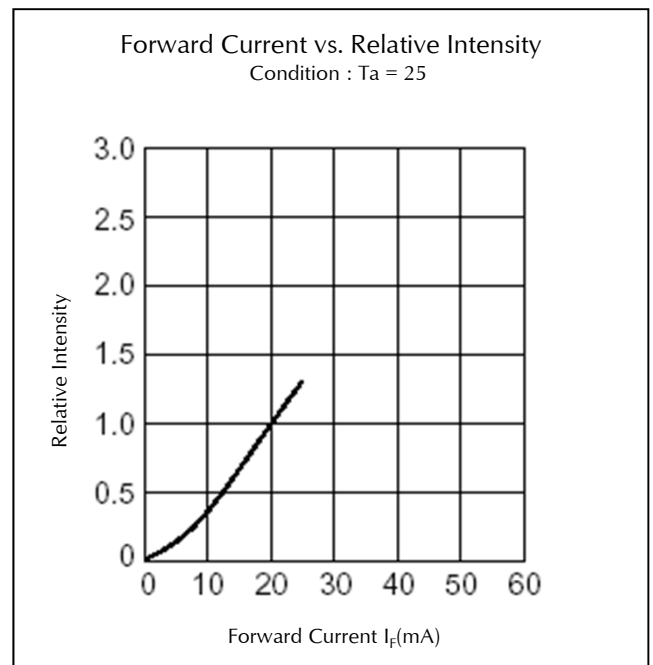
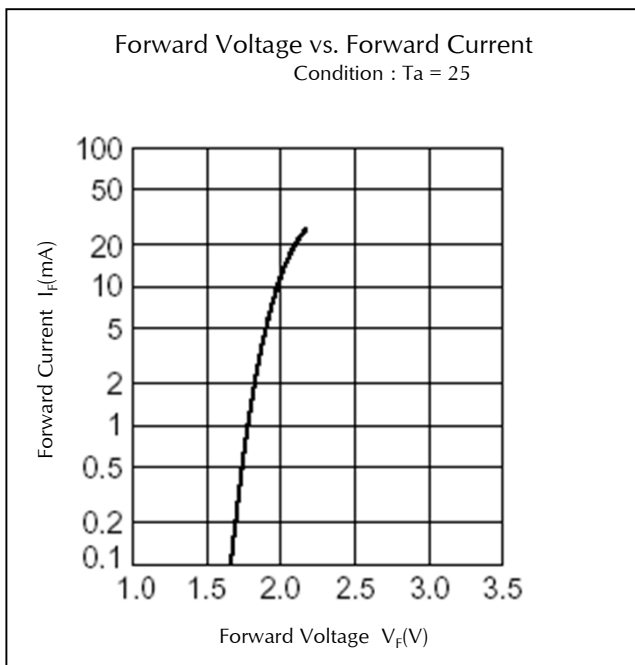
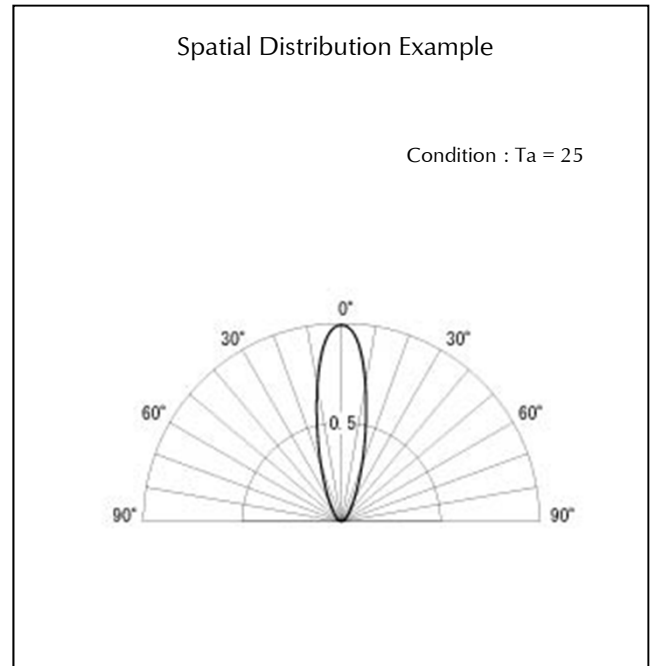
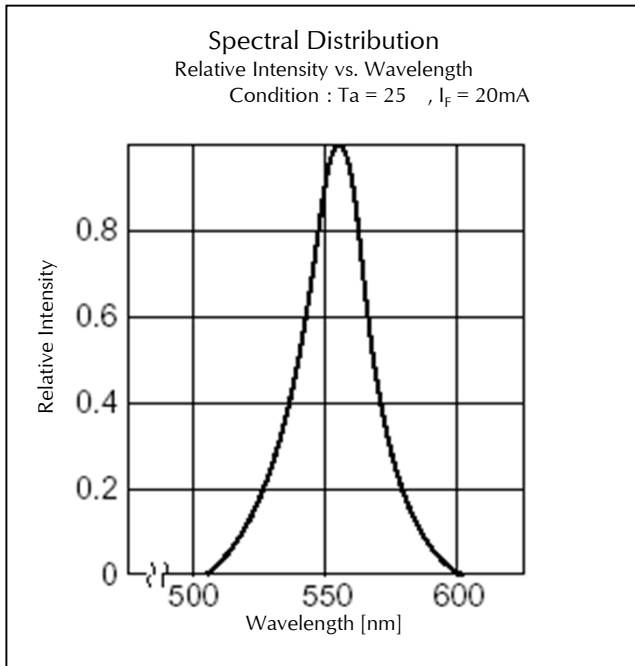
| Rank | I _v (mcd) | | | | | | | | | | | | | | | |
|------|----------------------|------|----------------------|------|----------------------|------|----------------------|------|----------------------|------|----------------------|------|----------------------|------|----------------------|------|
| | MBG | | MPG | | MPY | | MAY | | MAA | | MVR | | BR | | MPR | |
| | I _f =20mA | | I _f =20mA | | I _f =20mA | | I _f =20mA | | I _f =20mA | | I _f =20mA | | I _f =20mA | | I _f =10mA | |
| | MIN. | MAX. | MIN. | MAX. | MIN. | MAX. | MIN. | MAX. | MIN. | MAX. | MIN. | MAX. | MIN. | MAX. | MIN. | MAX. |
| A | 4.0 | 8.0 | 10.0 | 20.0 | 15.0 | 30.0 | 10.0 | 20.0 | 10.0 | 20.0 | 10.0 | 20.0 | 15.0 | 30.0 | 1.5 | 3.0 |
| B | 5.6 | 11.2 | 14.0 | 28.0 | 21.0 | 42.0 | 14.0 | 28.0 | 14.0 | 28.0 | 14.0 | 28.0 | 21.0 | 42.0 | 2.1 | 4.2 |
| C | 8.0 | 16.0 | 20.0 | 40.0 | 30.0 | 60.0 | 20.0 | 40.0 | 20.0 | 40.0 | 20.0 | 40.0 | 30.0 | 60.0 | 3.0 | 6.0 |
| D | 11.2 | 22.4 | 28.0 | 56.0 | 42.0 | 84.0 | 28.0 | 56.0 | 28.0 | 56.0 | 28.0 | 56.0 | 42.0 | 84.0 | 4.2 | 8.4 |
| E | 16.0 | - | 40.0 | - | 60.0 | - | 40.0 | - | 40.0 | - | 40.0 | - | 60.0 | - | 6.0 | - |

Please contact our sales staff concerning rank designation.

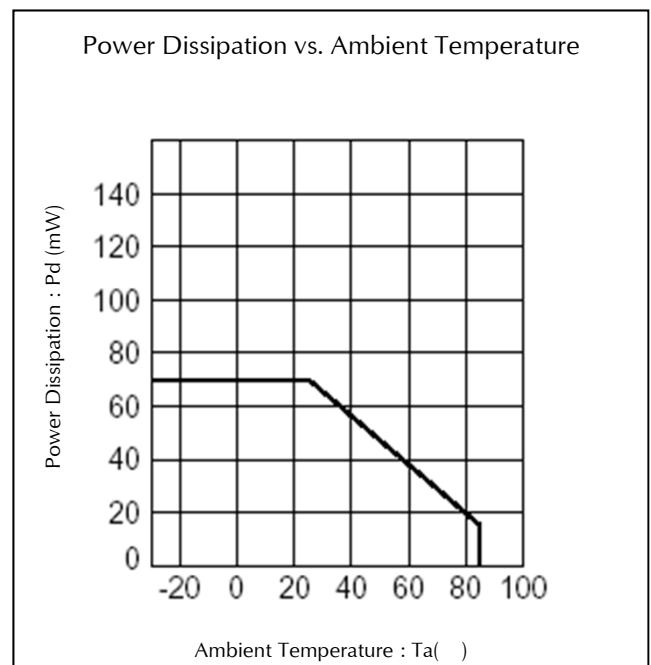
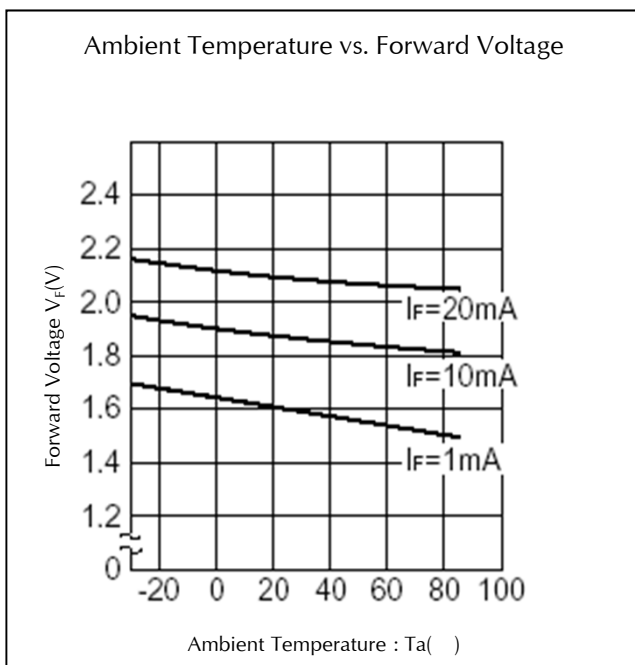
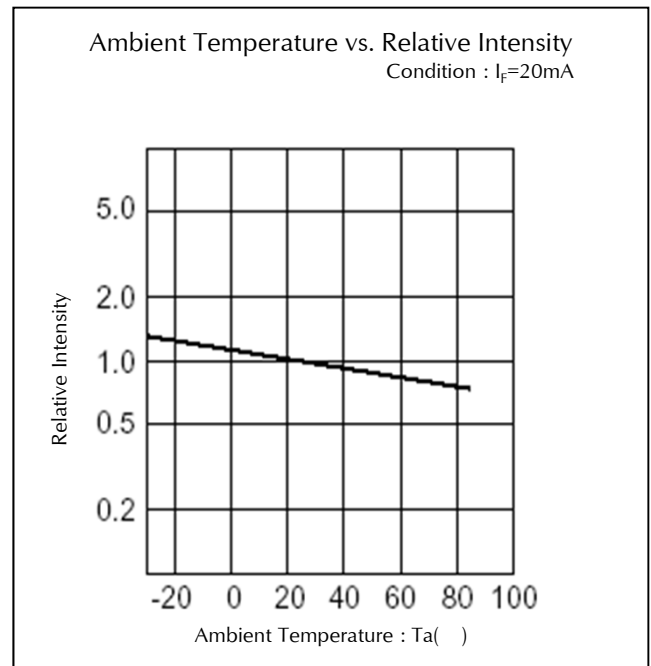
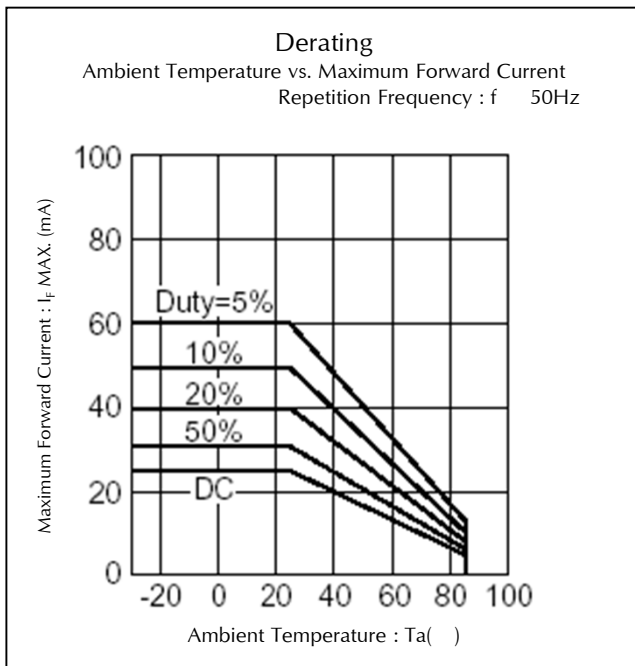
| Rank | I _v (mcd) | | | | | | | | | | | | | |
|------|----------------------|------|----------------------|------|----------------------|------|----------------------|------|----------------------|------|----------------------|------|----------------------|------|
| | EMBG | | EMPG | | EMPY | | EMAY | | EMAA | | EMVR | | EBR | |
| | I _f =20mA | | I _f =20mA | | I _f =20mA | | I _f =20mA | | I _f =20mA | | I _f =20mA | | I _f =20mA | |
| | MIN. | MAX. | MIN. | MAX. | MIN. | MAX. | MIN. | MAX. | MIN. | MAX. | MIN. | MAX. | MIN. | MAX. |
| C | 8.0 | 16.0 | 20.0 | 40.0 | 30.0 | 60.0 | 20.0 | 40.0 | 20.0 | 40.0 | 20.0 | 40.0 | 30.0 | 60.0 |
| D | 11.2 | 22.4 | 28.0 | 56.0 | 42.0 | 84.0 | 28.0 | 56.0 | 28.0 | 56.0 | 28.0 | 56.0 | 42.0 | 84.0 |
| E | 16.0 | - | 40.0 | - | 60.0 | - | 40.0 | - | 40.0 | - | 40.0 | - | 60.0 | - |

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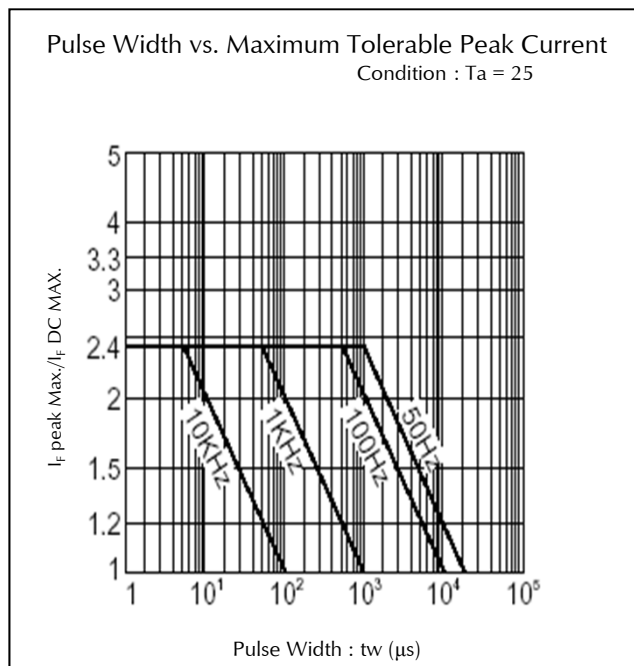
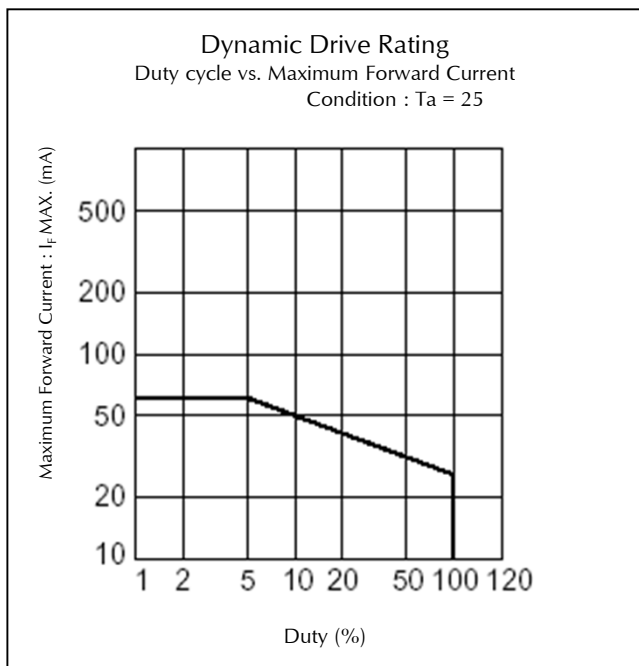
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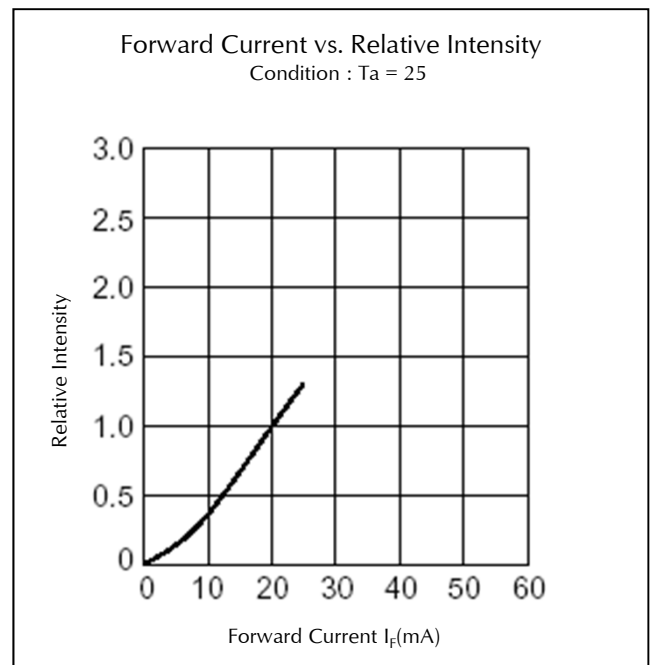
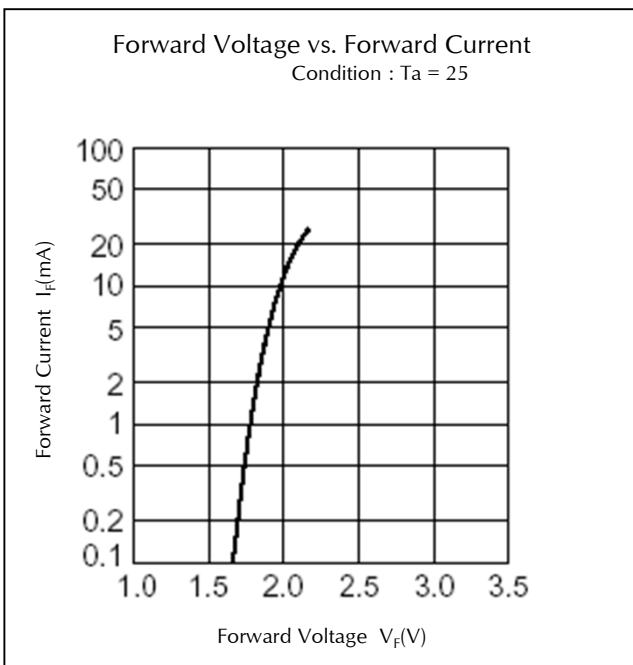
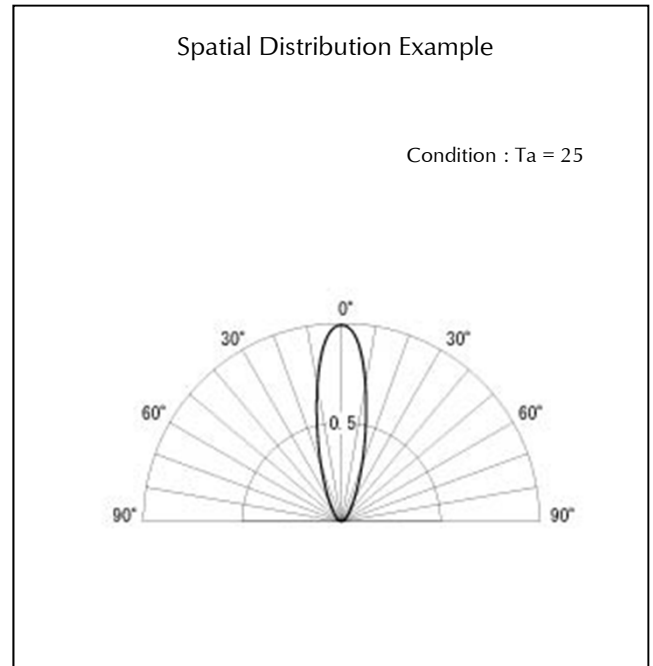
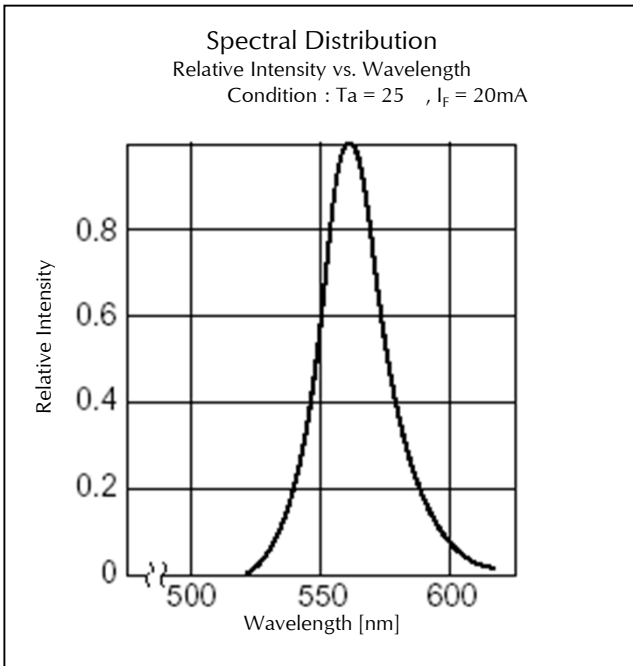
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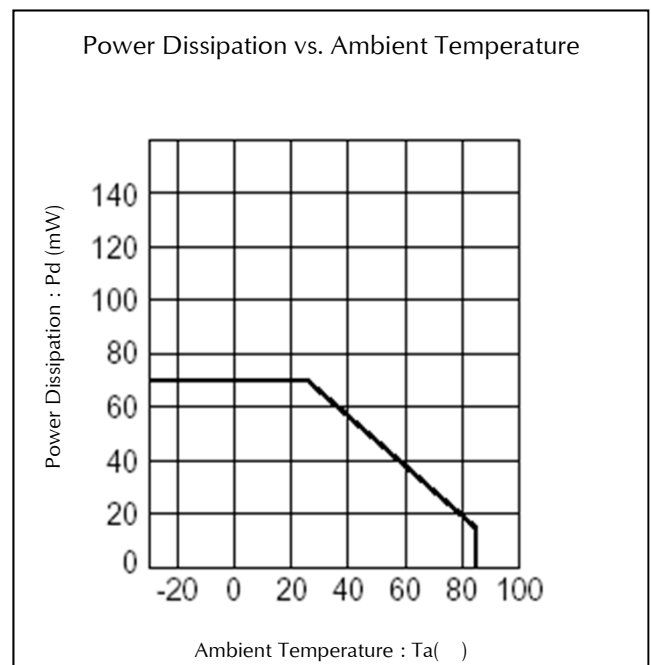
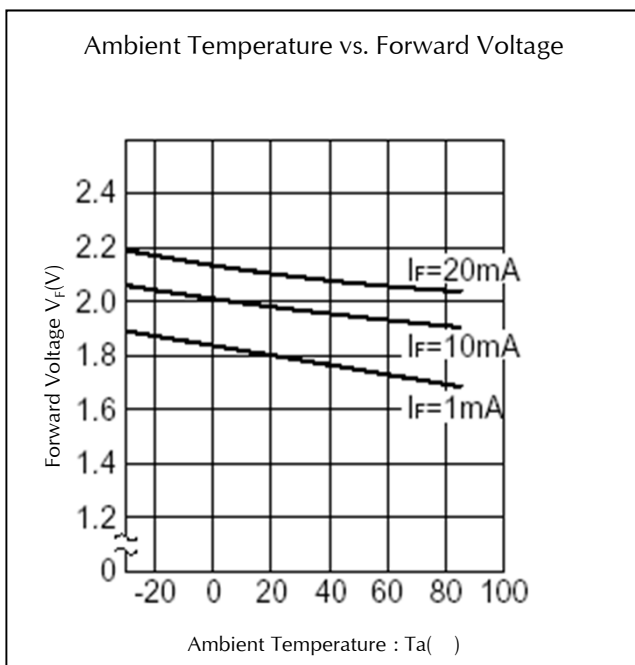
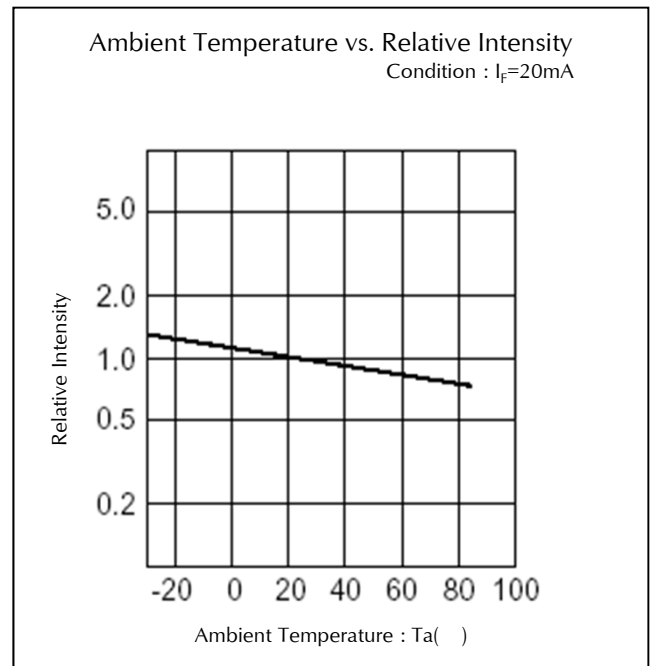
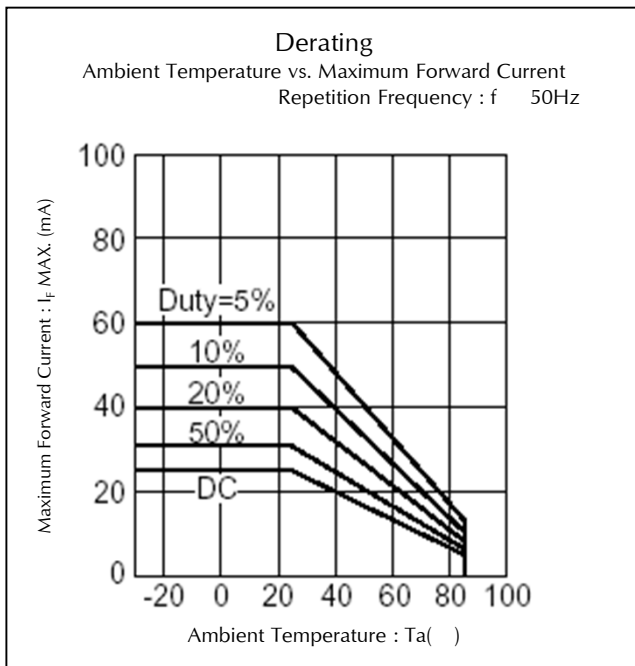
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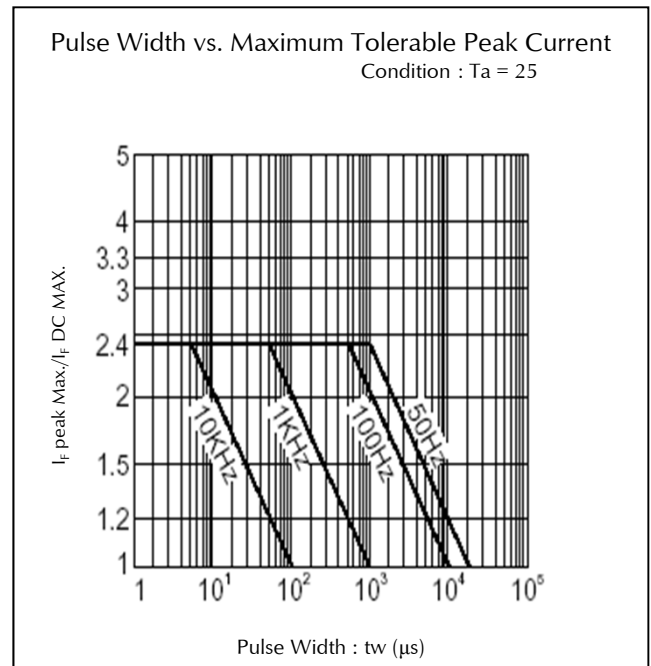
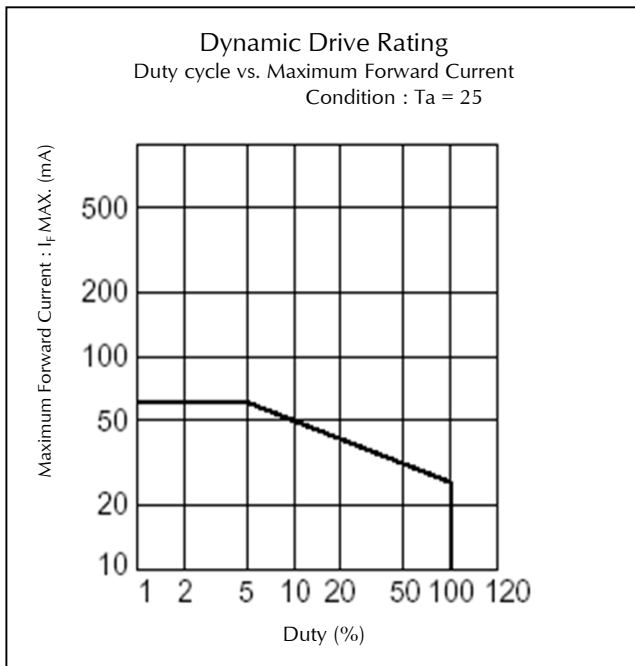
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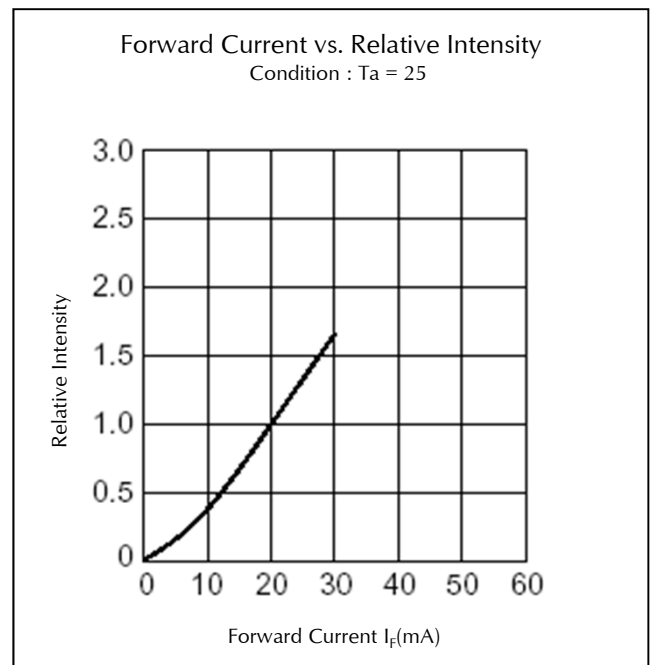
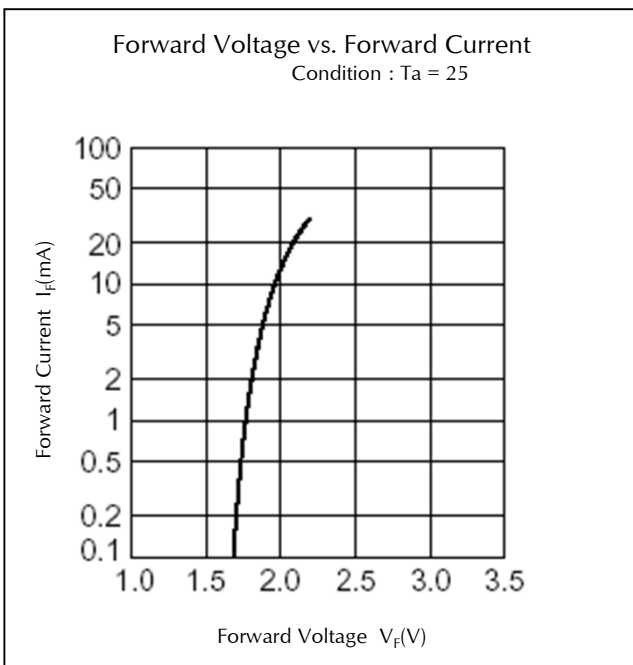
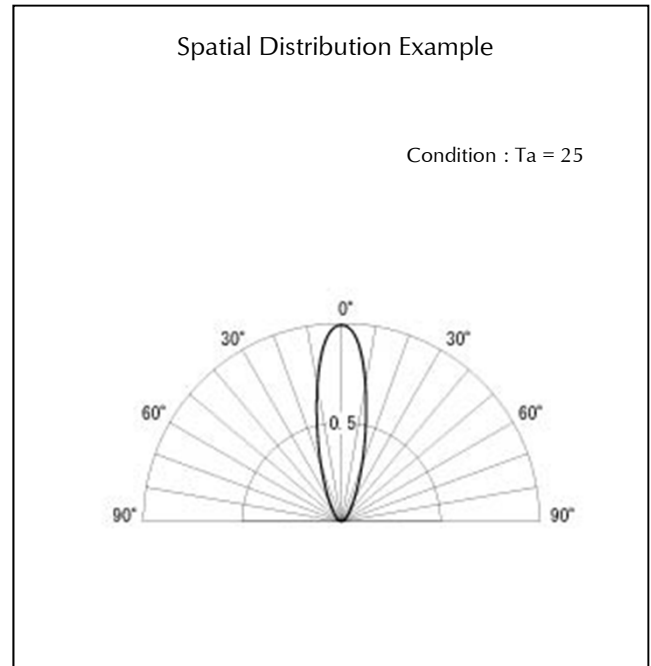
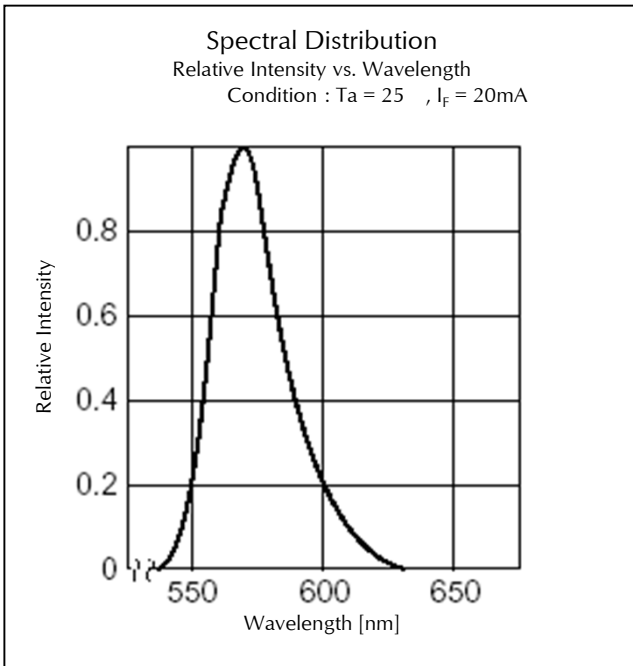
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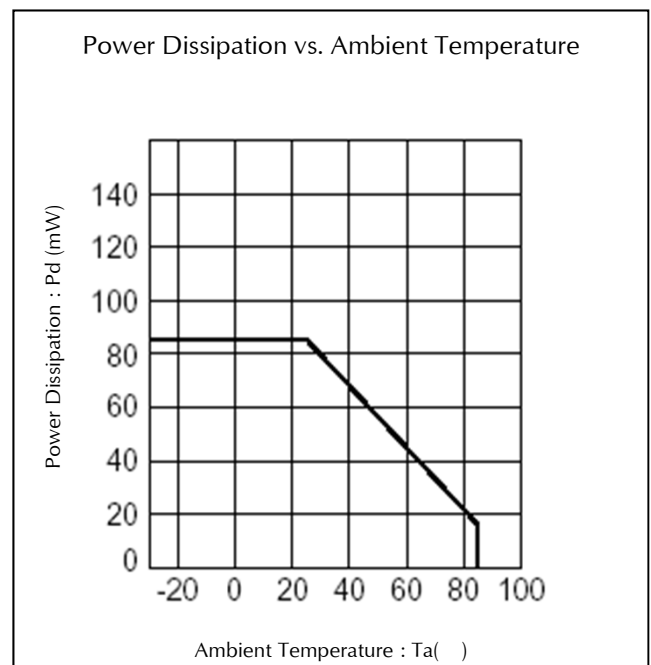
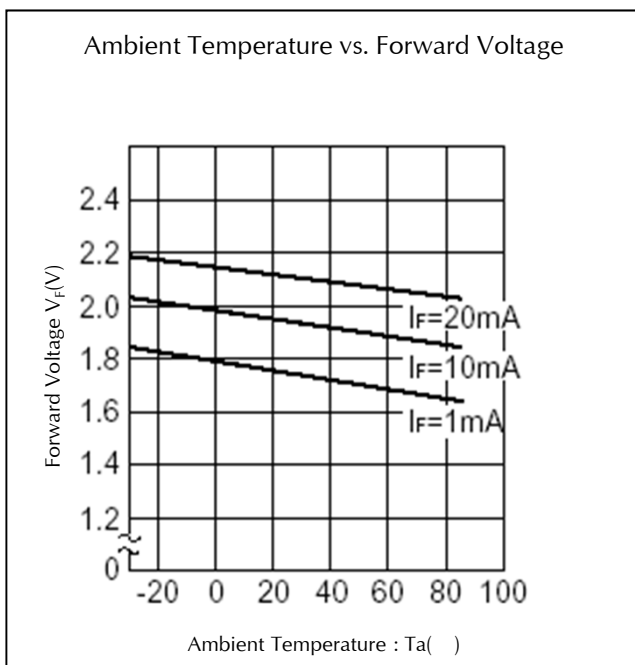
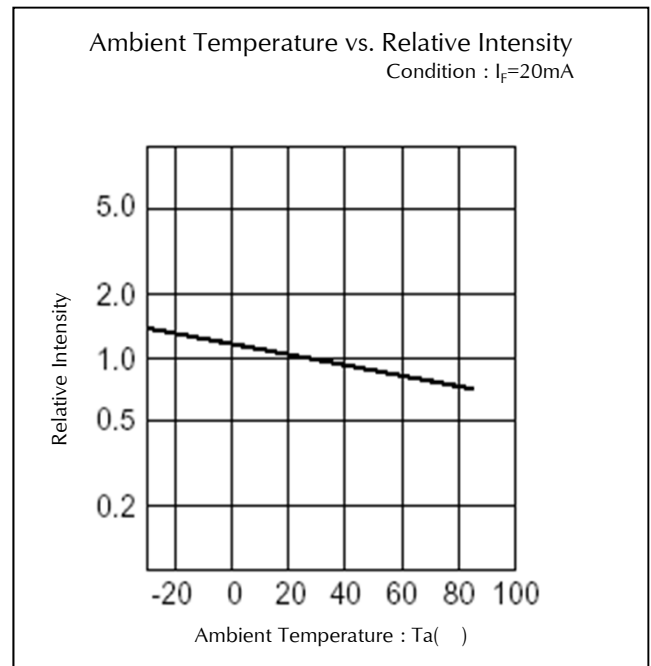
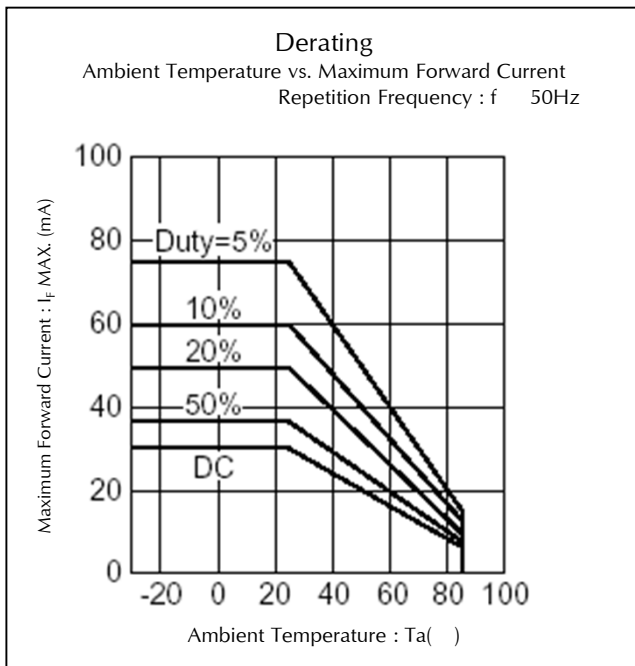
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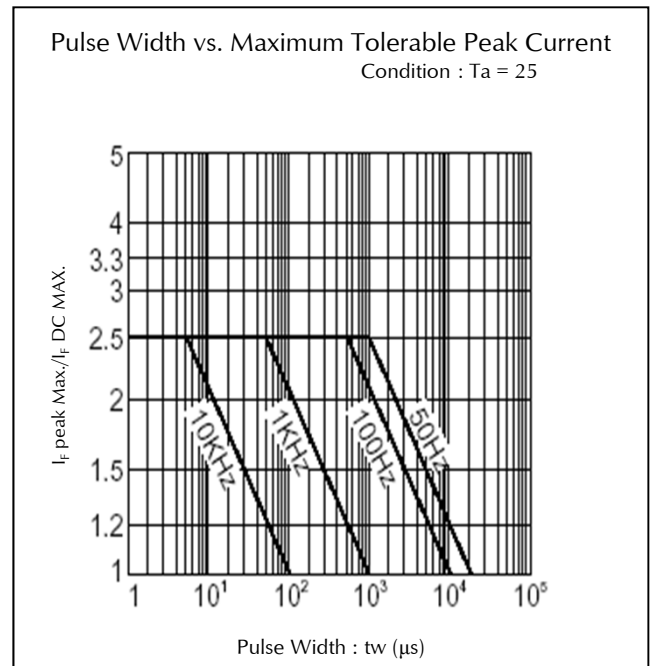
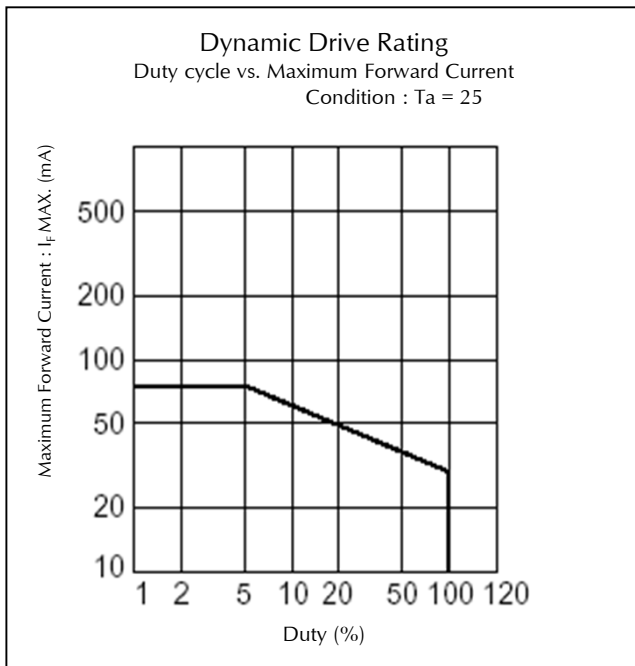
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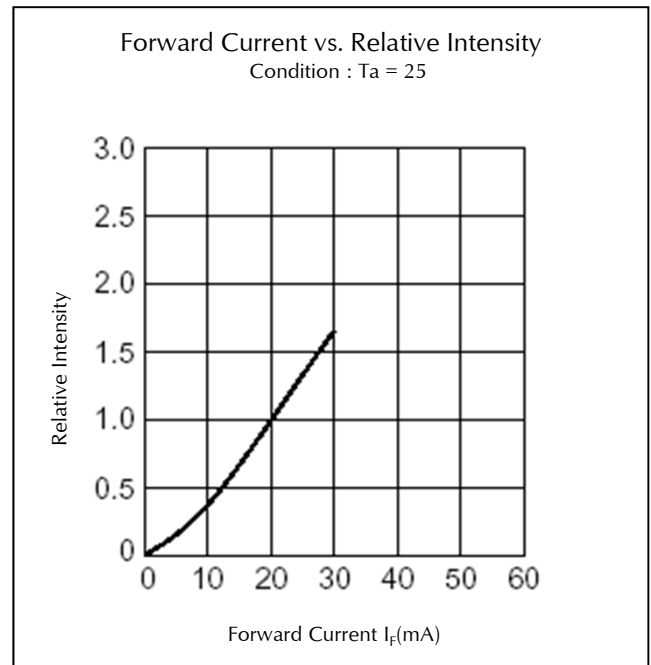
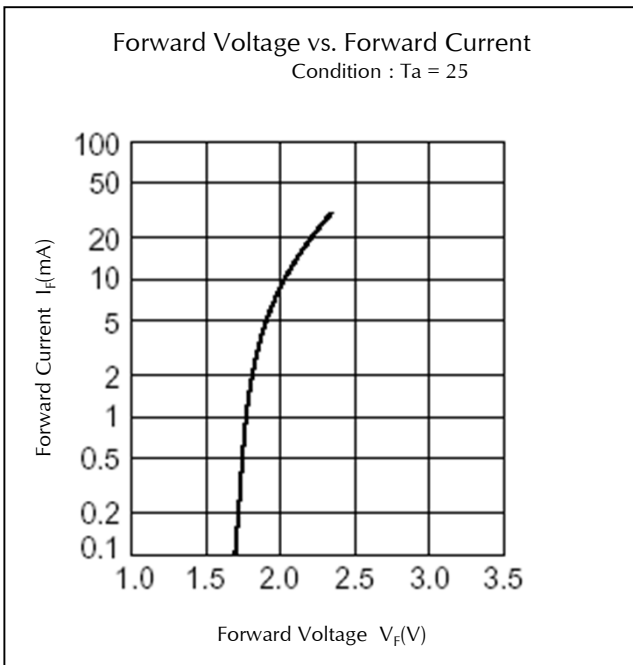
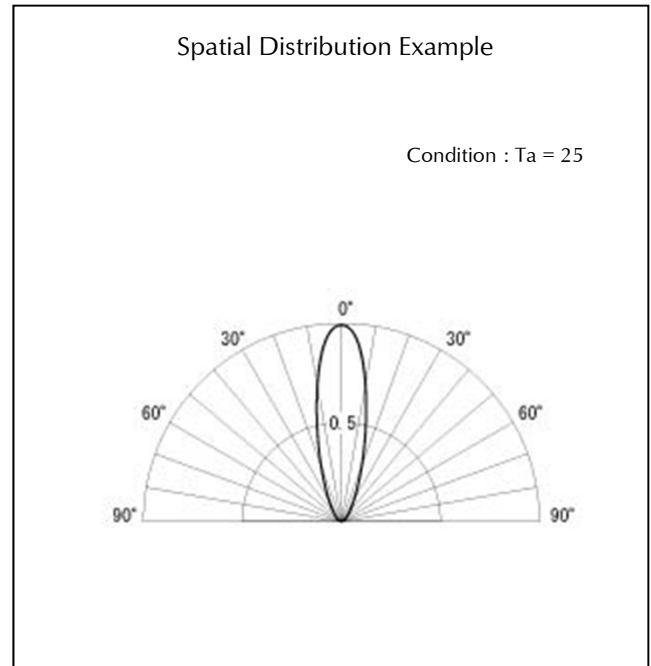
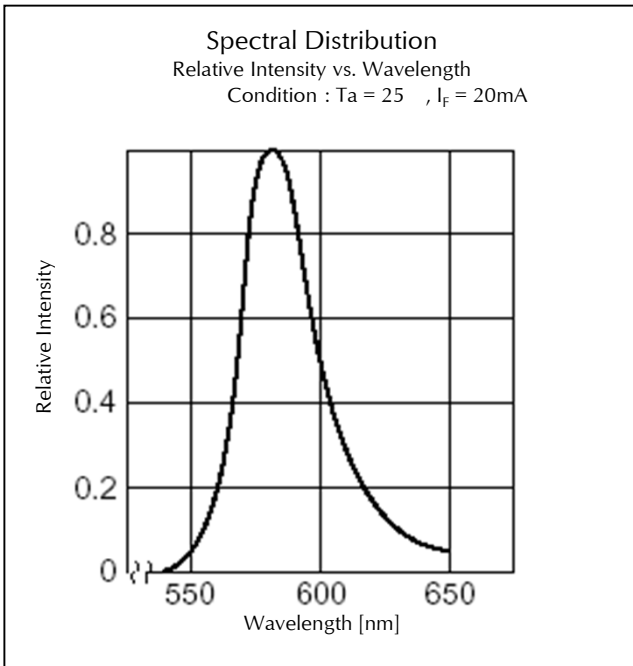
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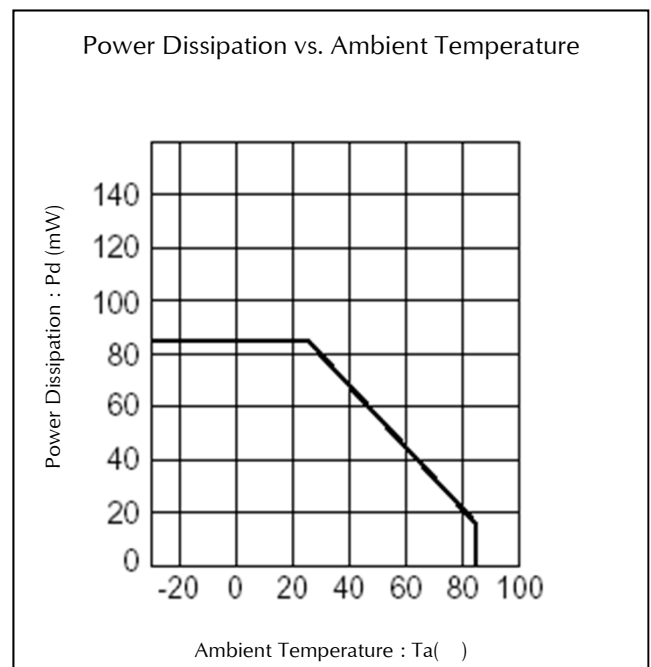
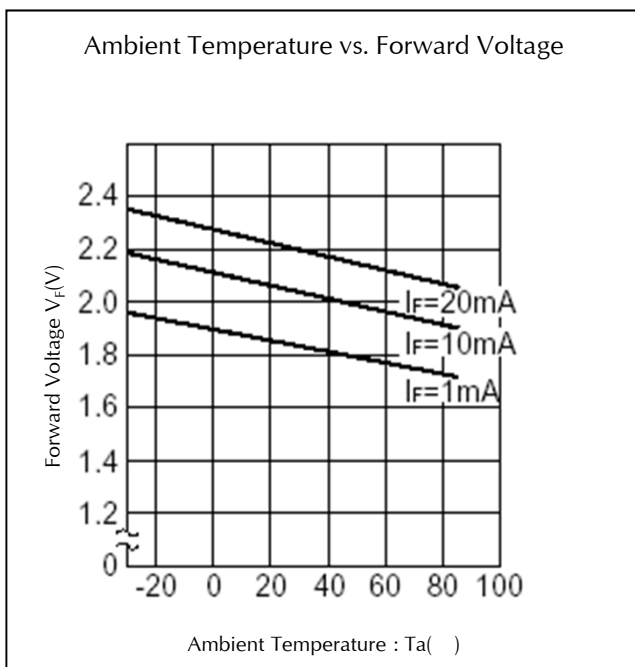
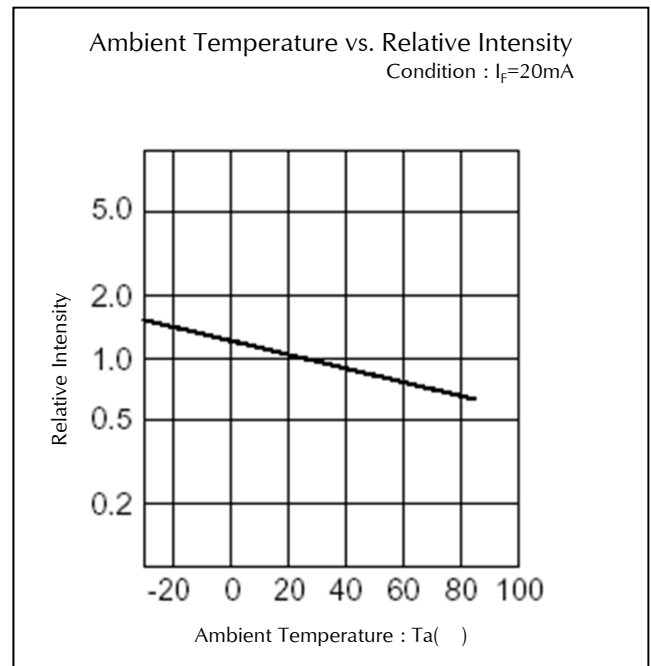
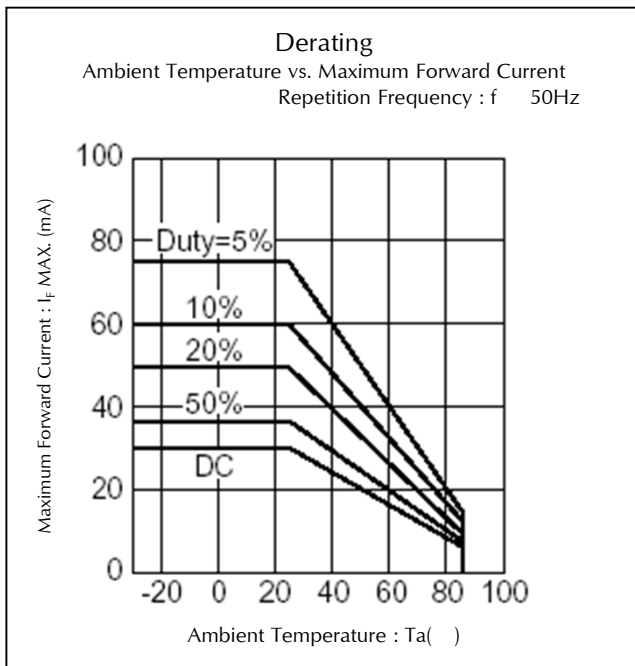
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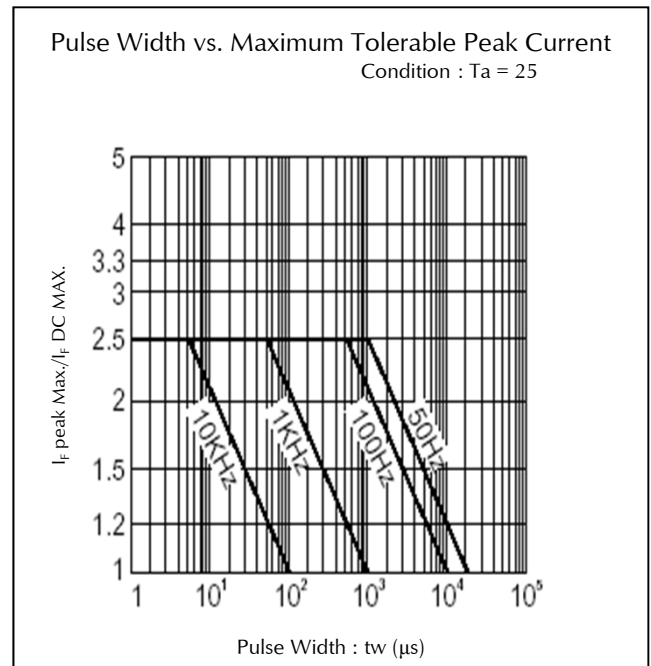
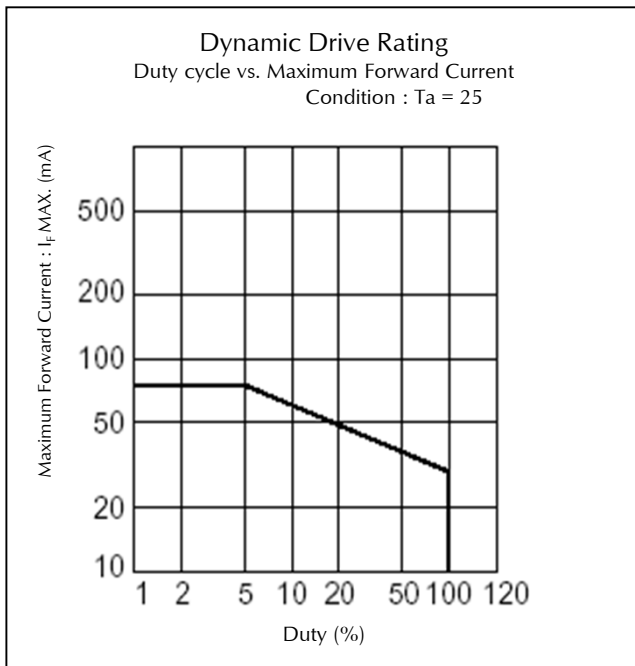
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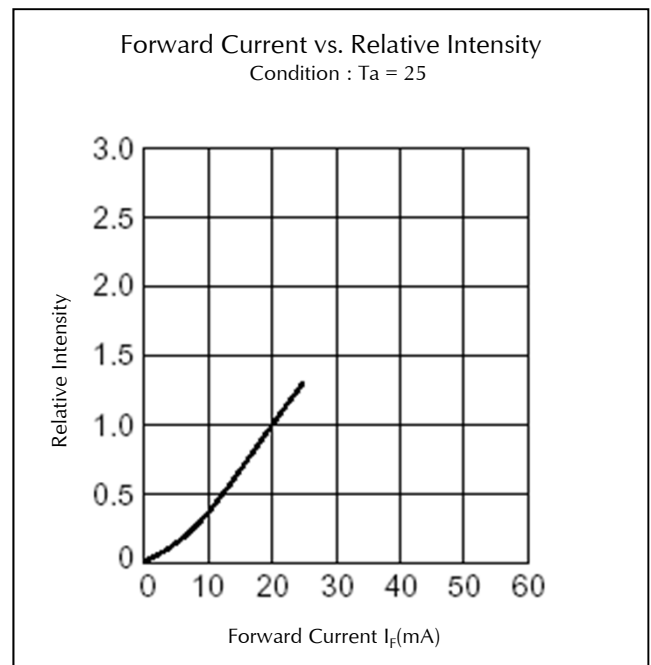
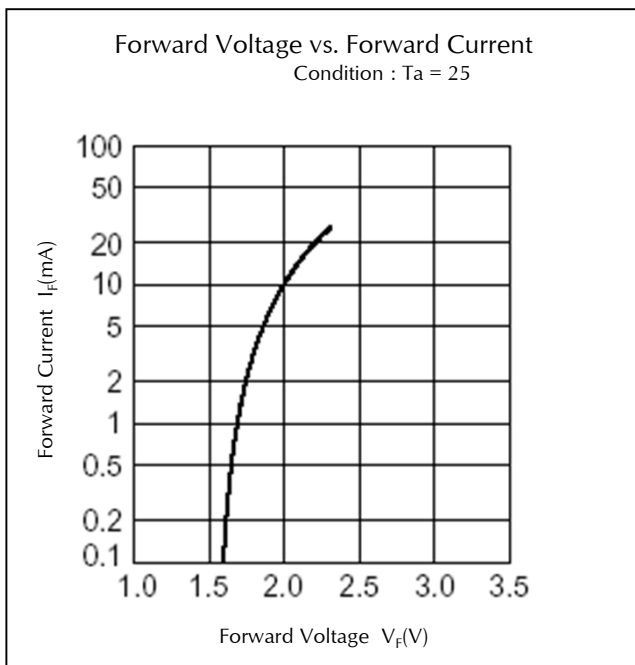
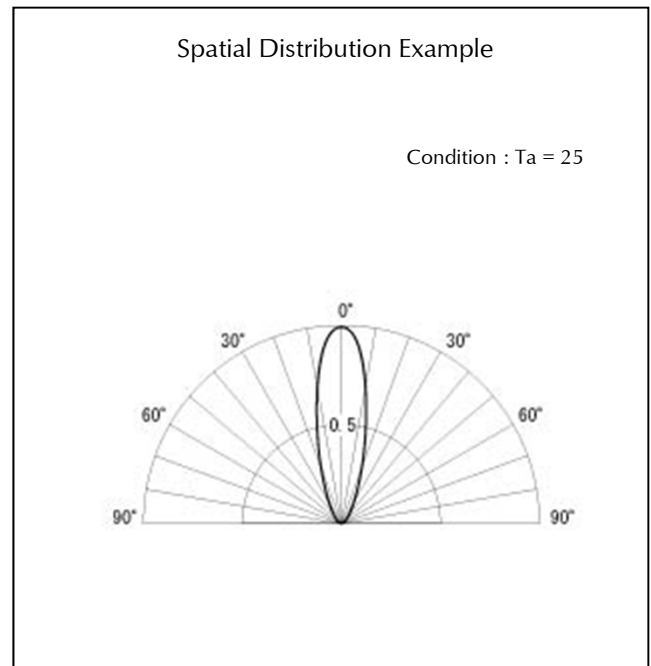
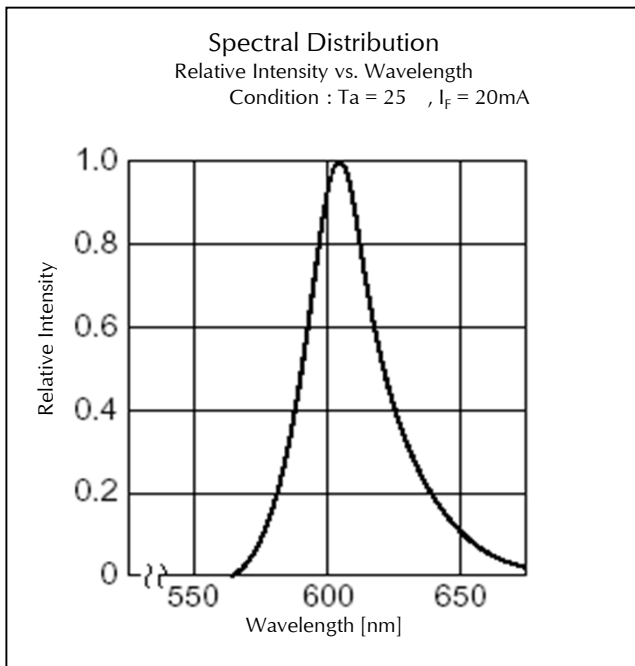
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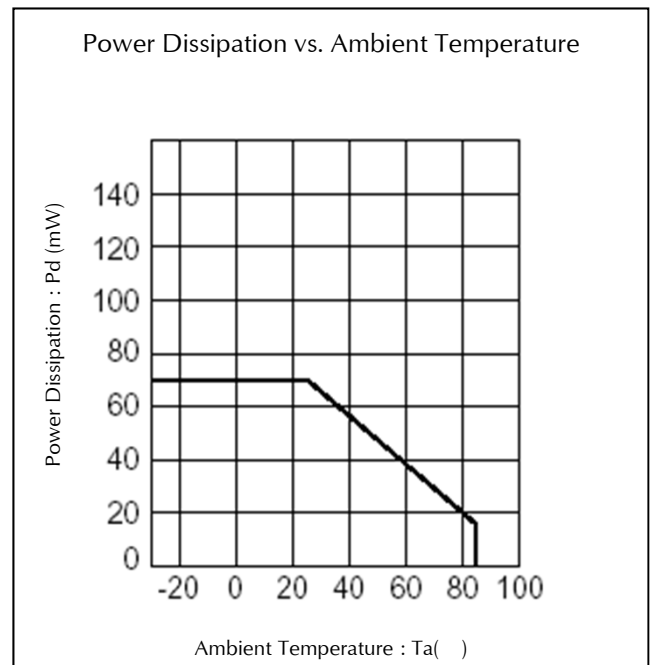
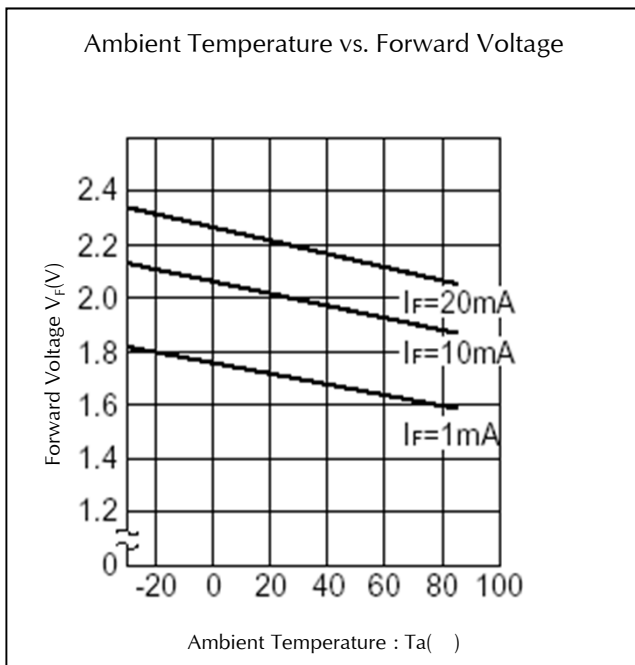
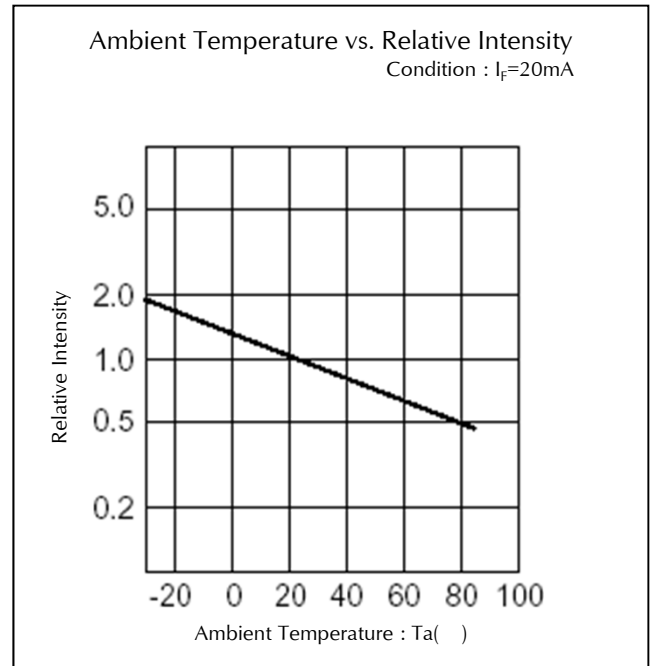
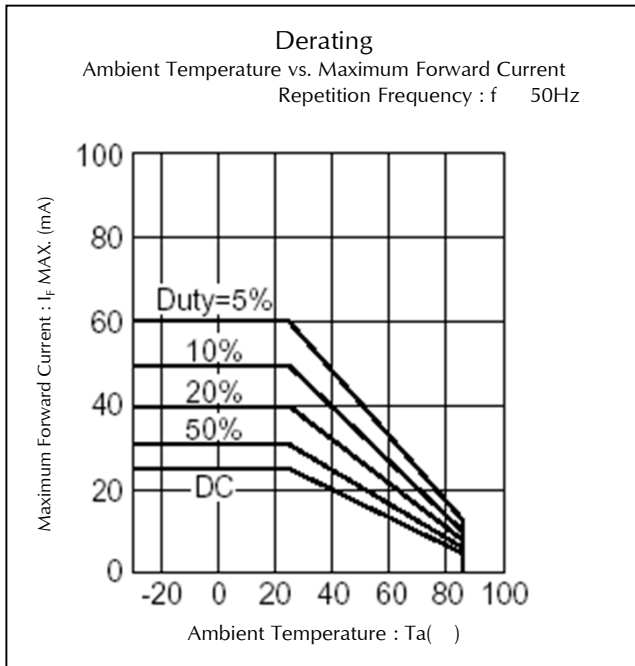
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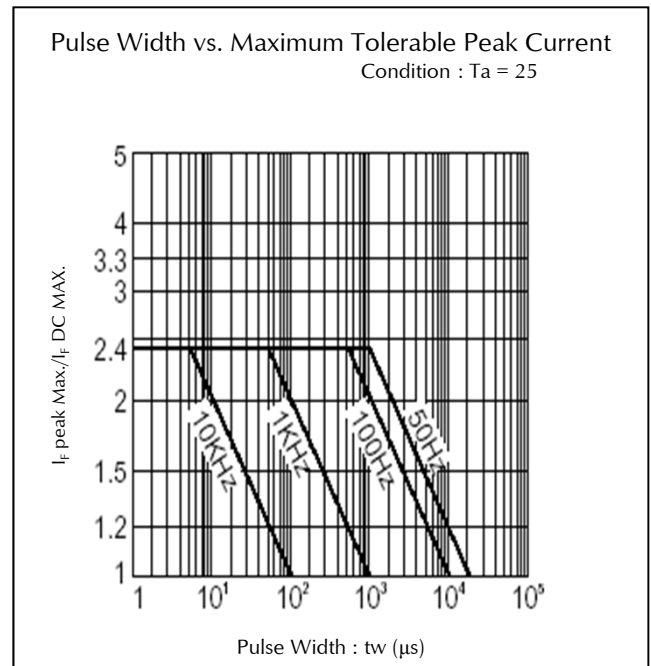
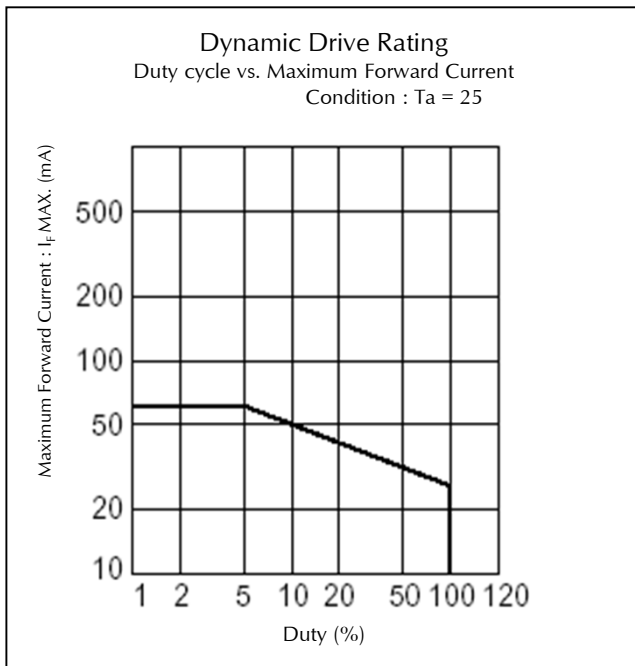
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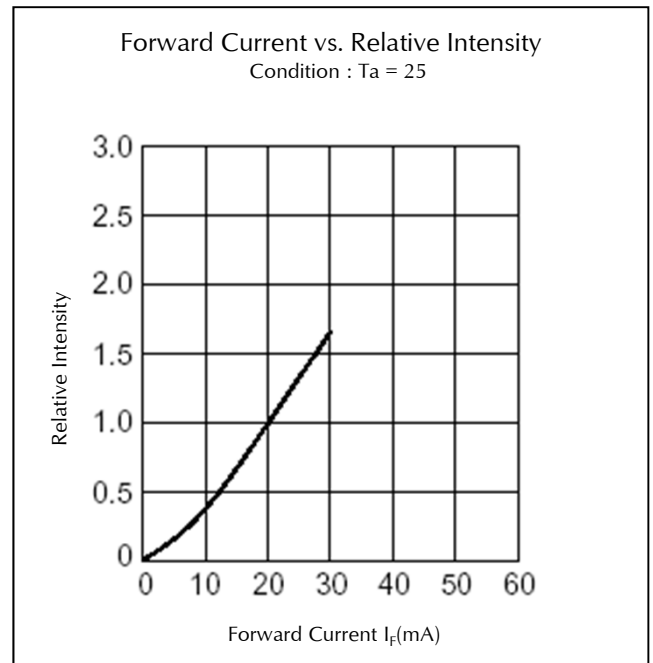
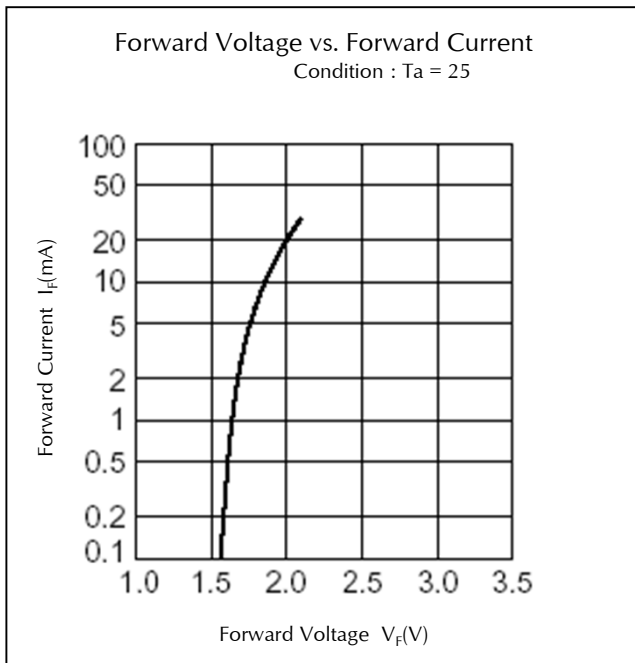
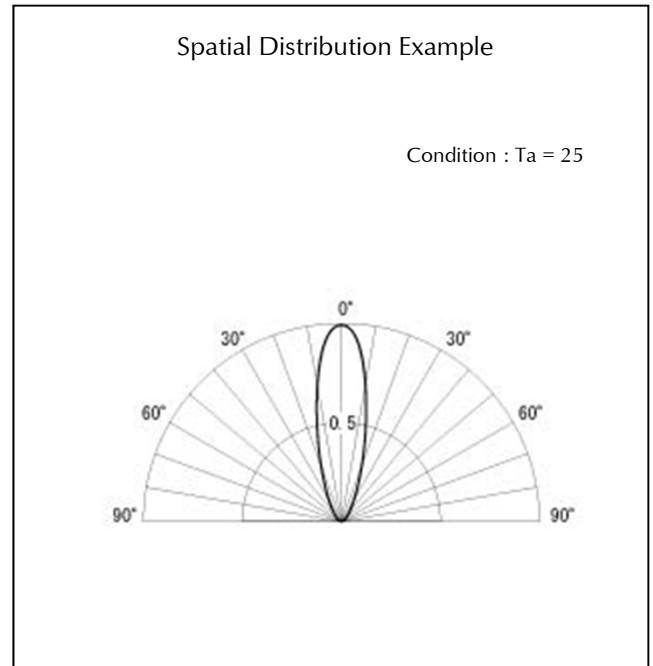
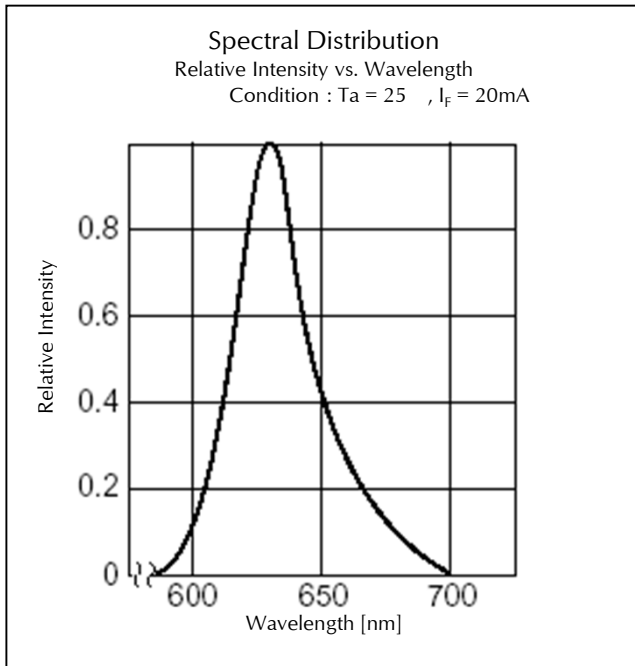
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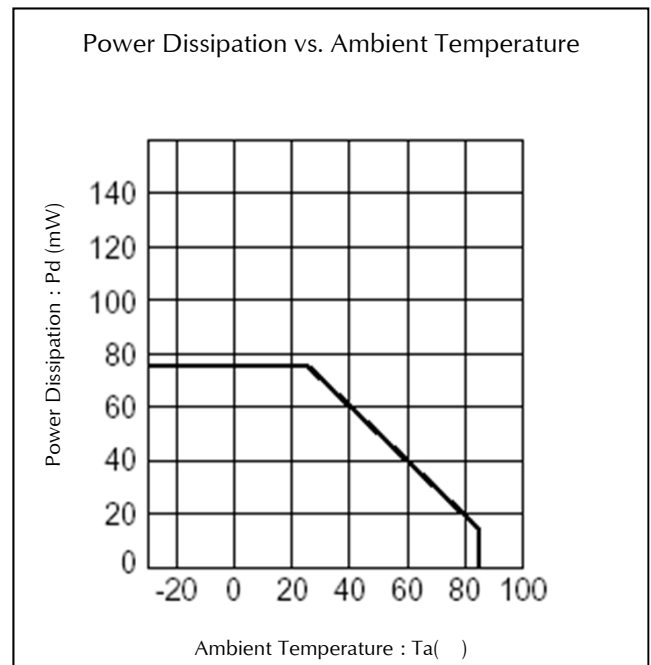
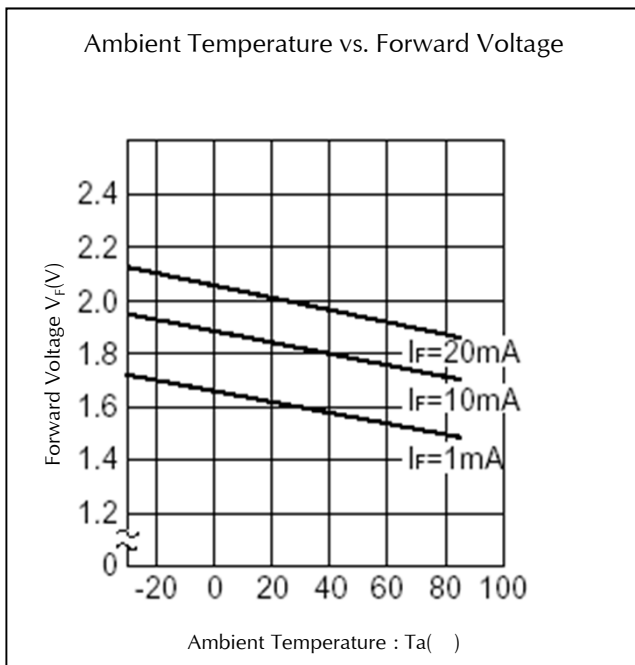
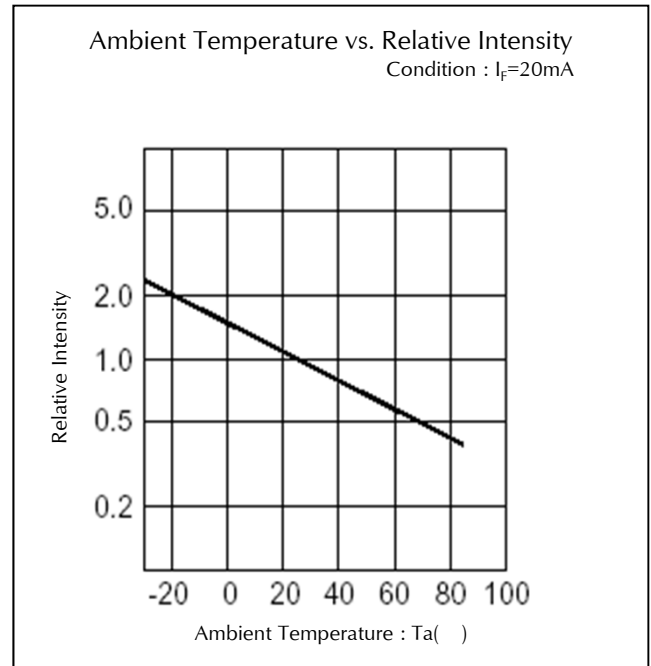
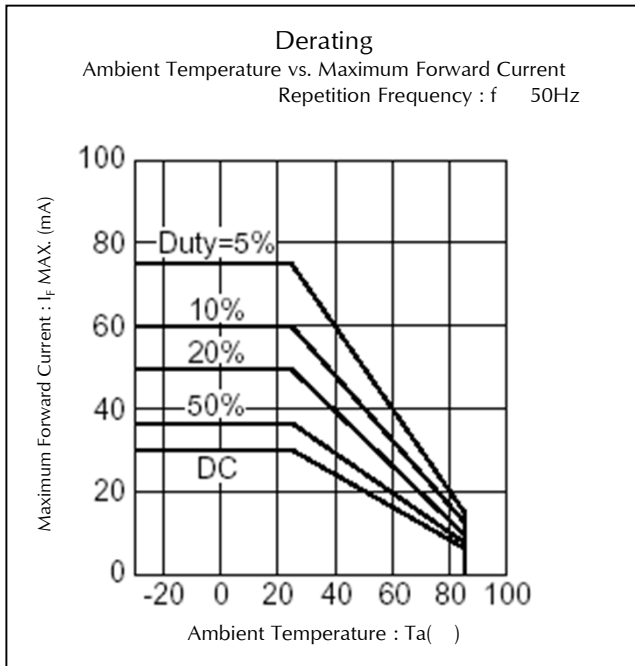
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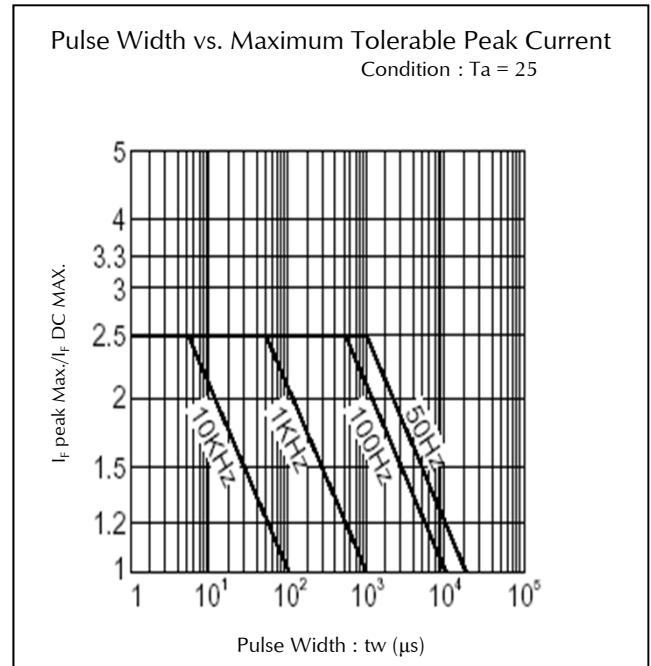
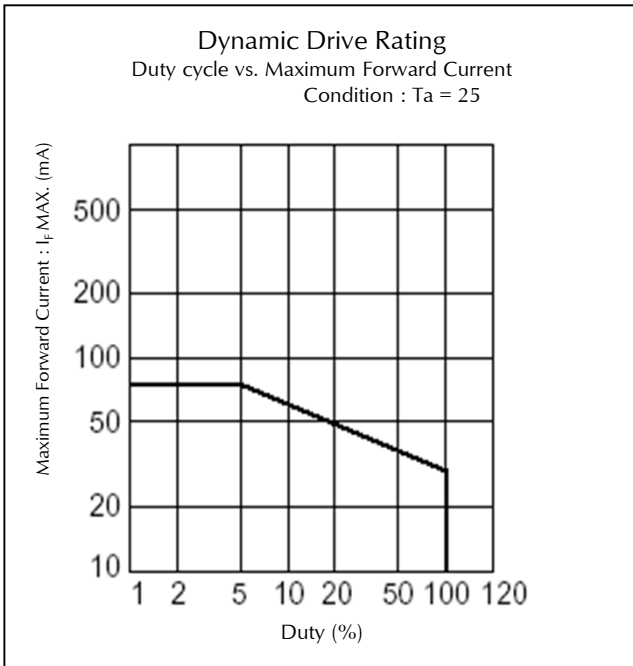
Technical Data(EMVR/MVR)



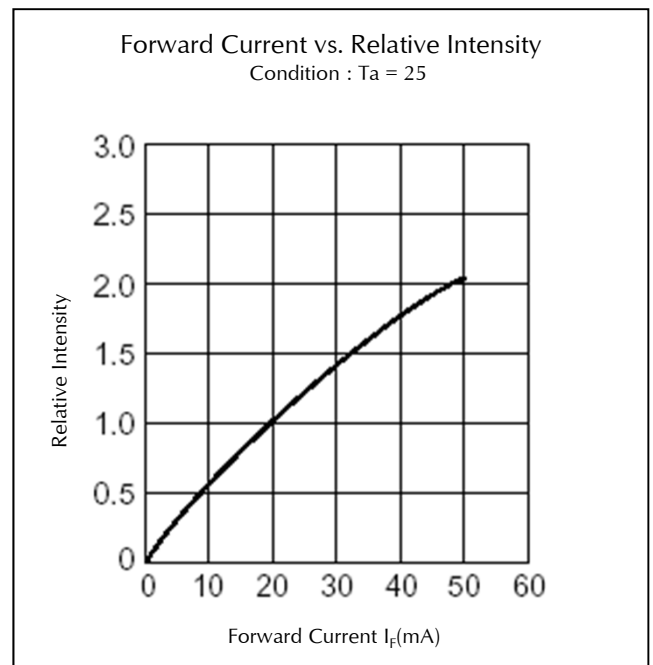
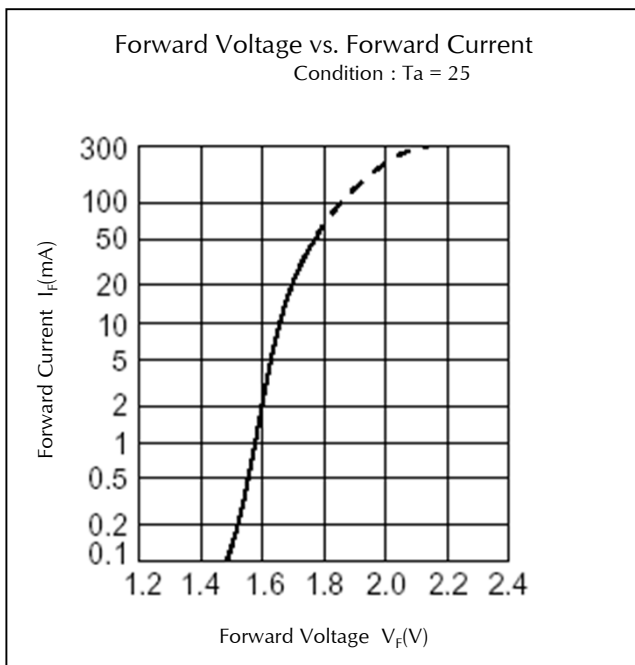
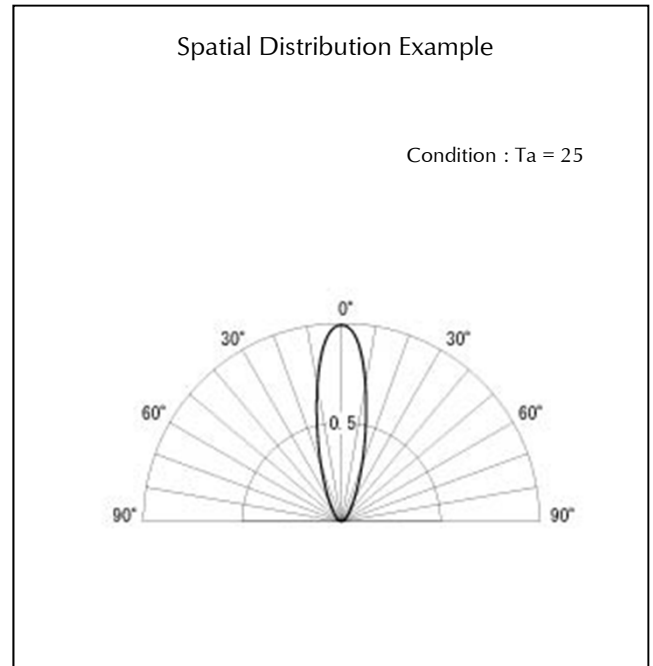
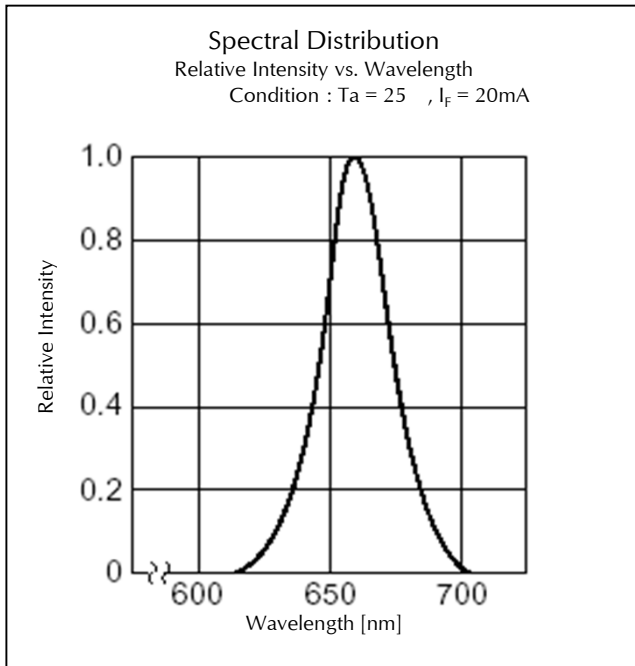
Technical Data(EMVR/MVR)



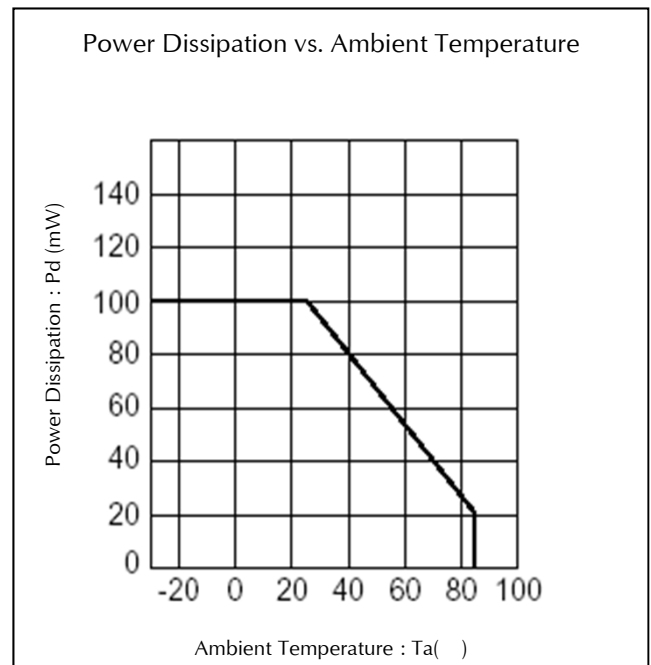
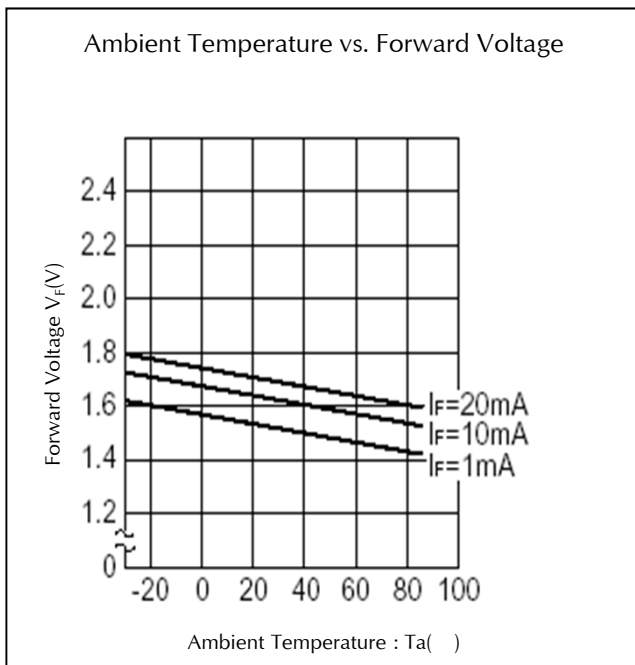
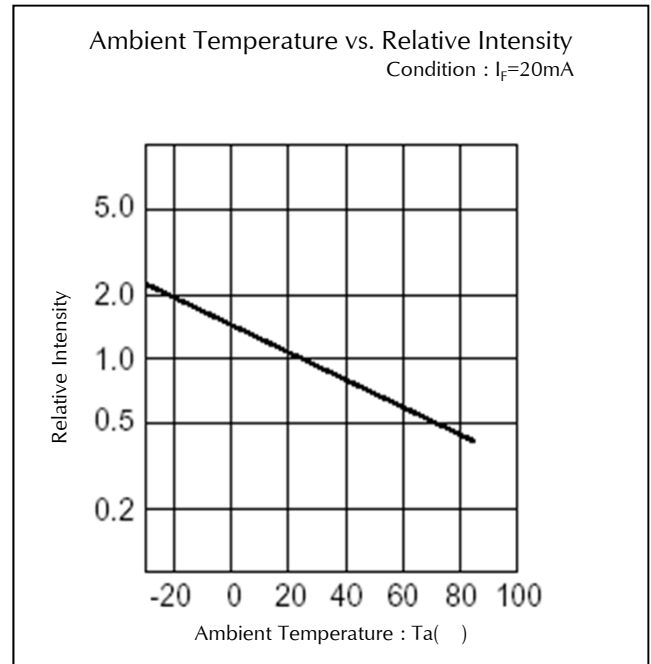
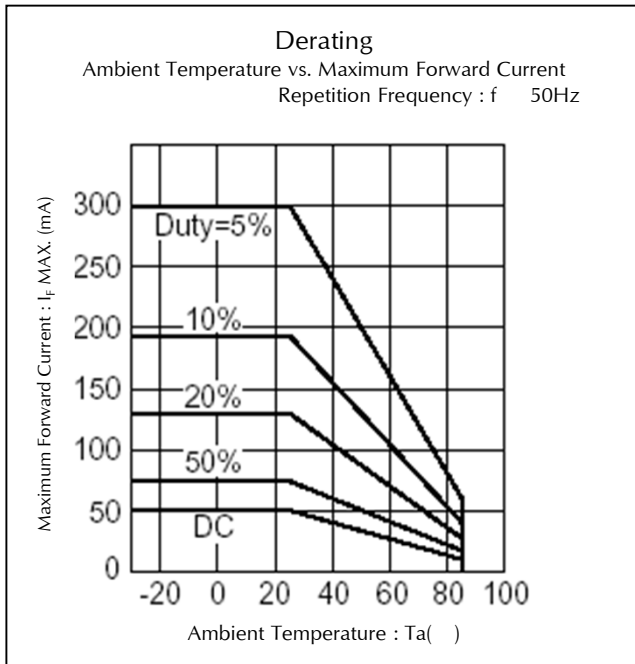
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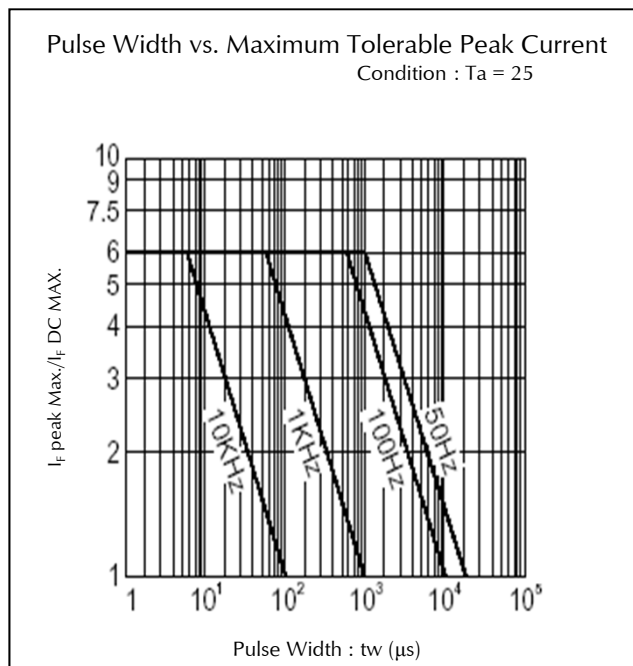
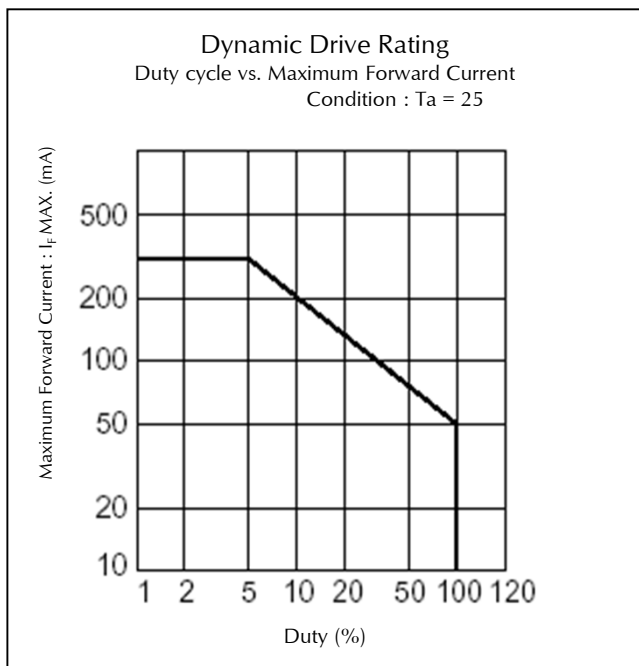
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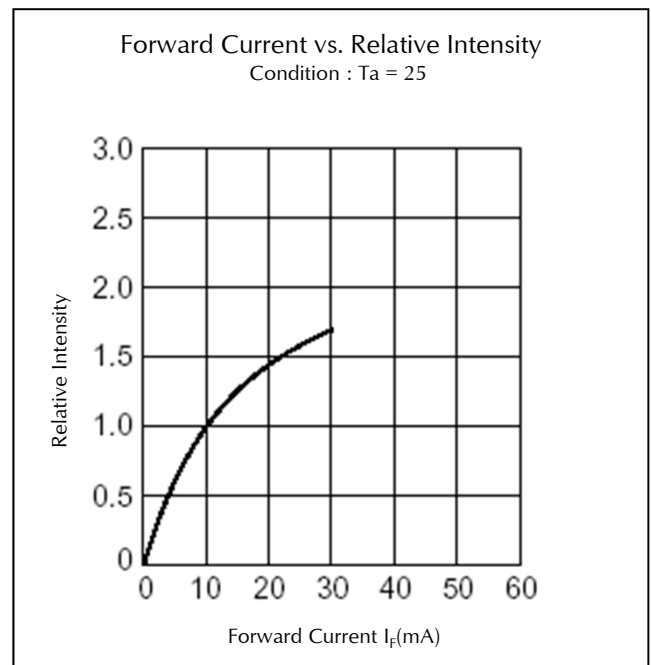
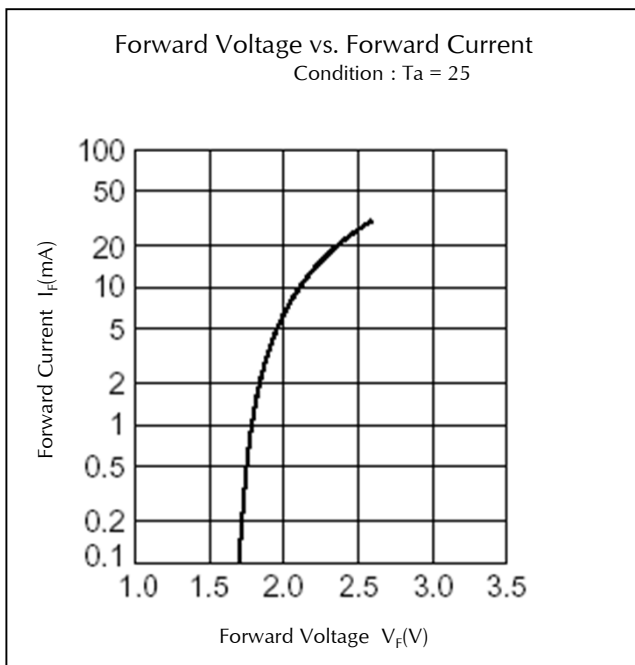
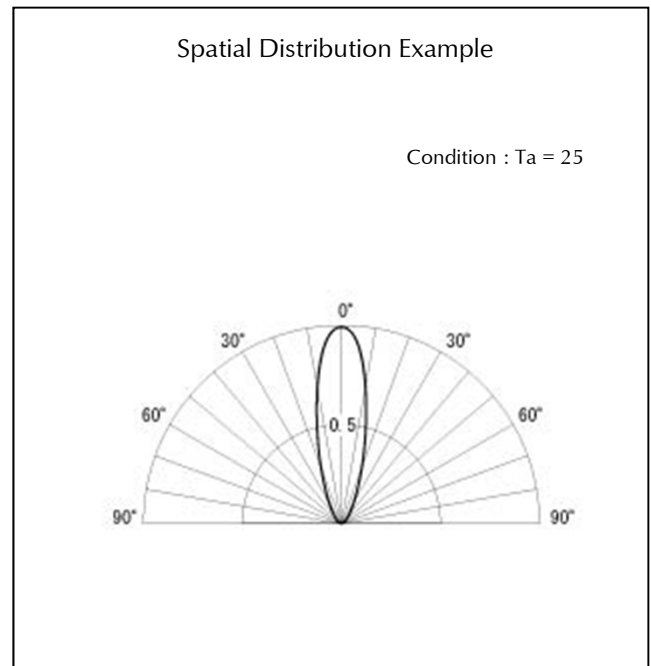
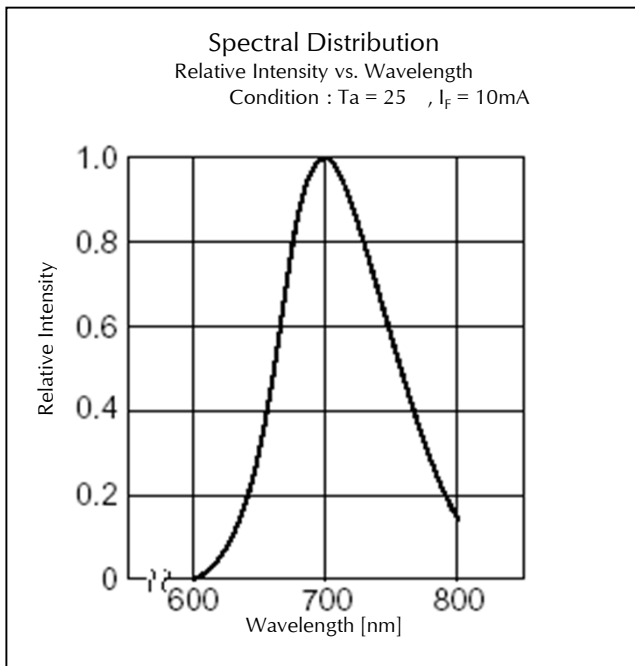
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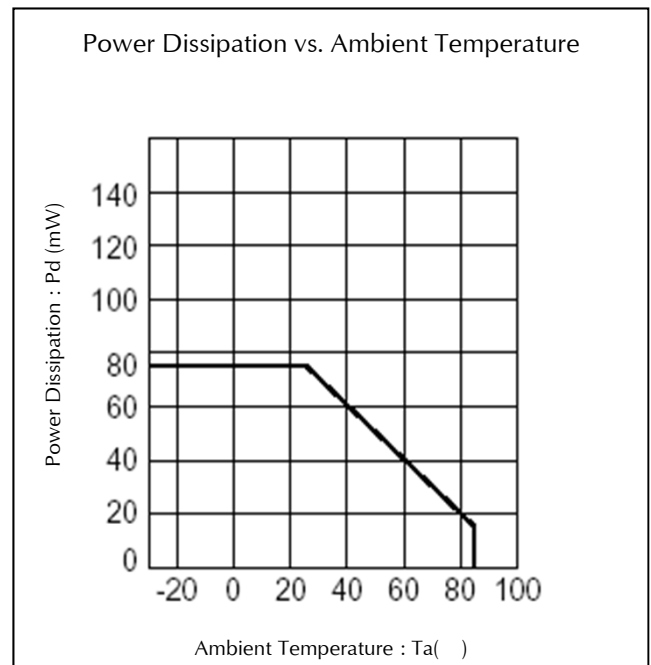
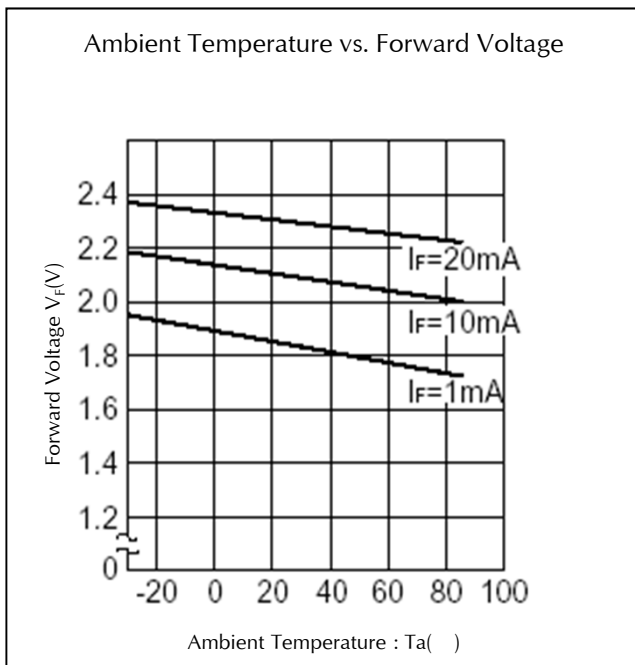
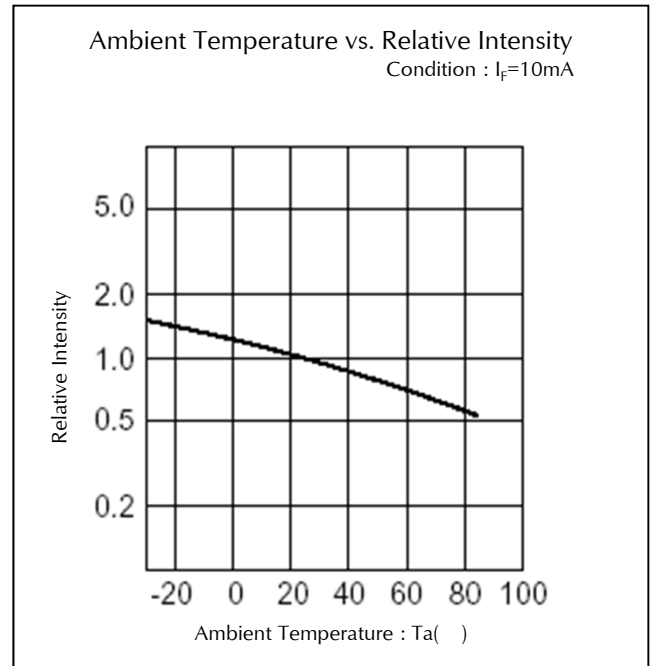
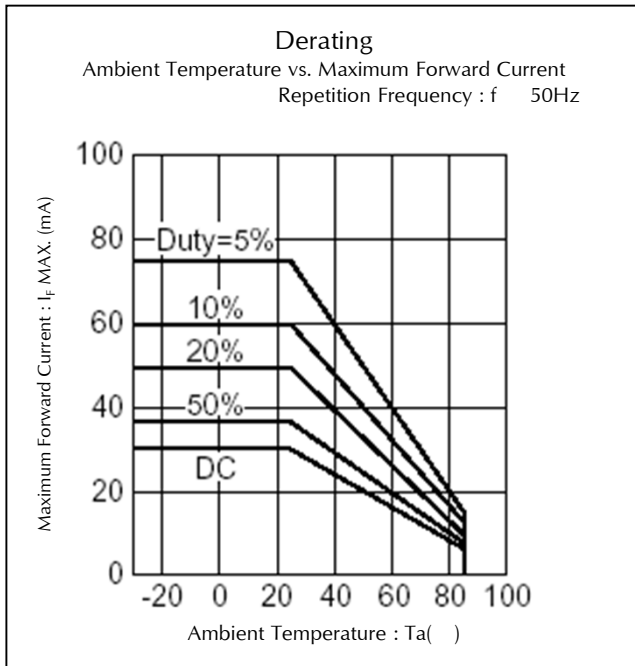
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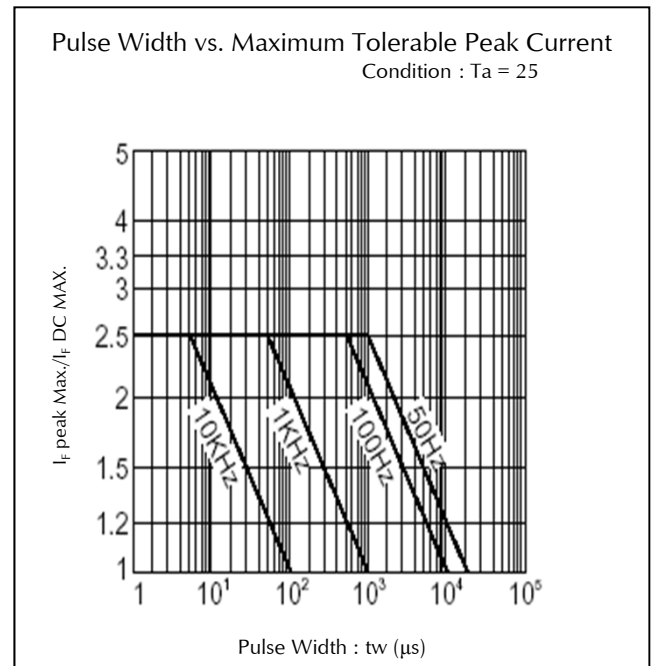
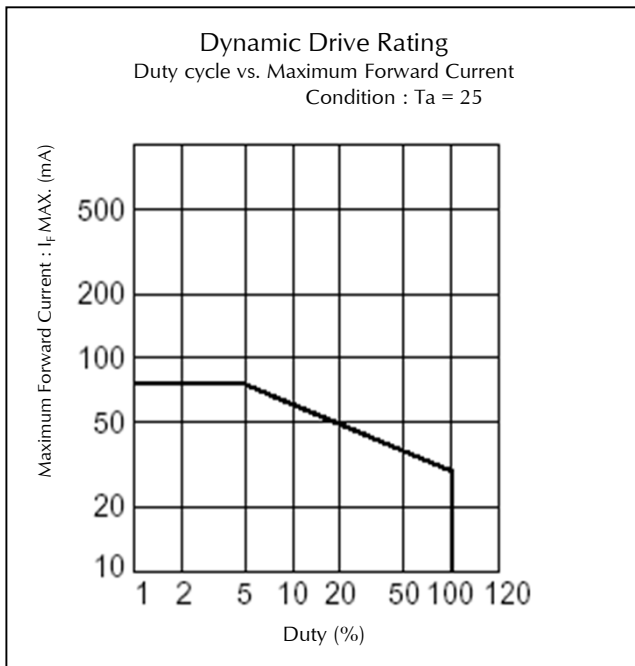
Technical Data(MPR)



Technical Data(MPR)



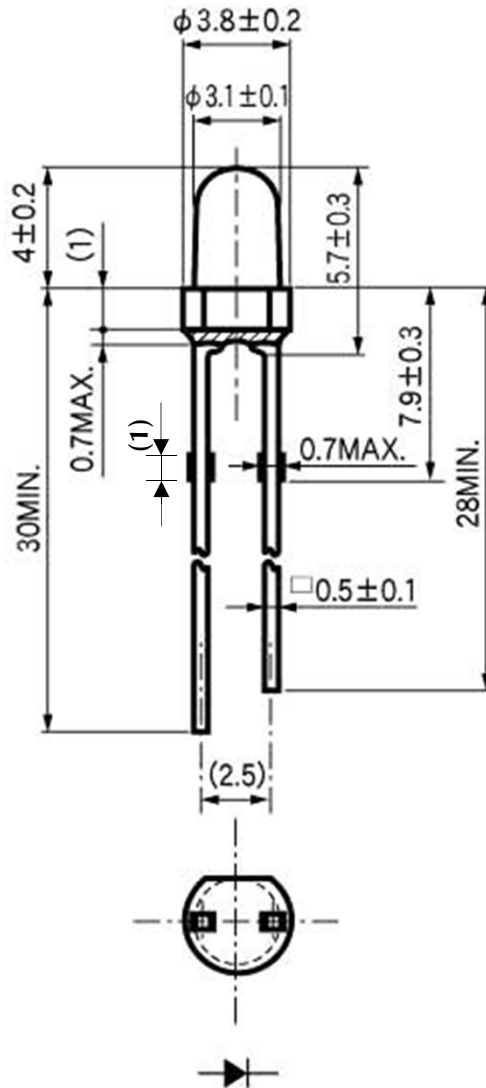
Technical Data(MPR)



Package Dimensions

(Unit: mm)

Mass : (0.16)g



TTW (Through The Wave) soldering Conditions

| | | |
|-------------------|-----|--------|
| Pre-heating | 100 | (MAX.) |
| Solder Bath Temp. | 265 | (MAX.) |
| Dipping Time | 5 s | (MAX.) |

- 1) The dip soldering process shall be 2 times maximum.
- 2) The product shall be cooled to room temp. before the second dipping process.

The detail is described to LED and Photodetector handling precautions of home page:
 "Mounting through-hole Type Devices" and "Soldering", and use it after the confirmation, please.

Manual Soldering Conditions

| | | |
|------------------------------|---------|--------|
| Iron tip temp. | 360 | (MAX.) |
| Soldering time and frequency | 3 s | (MAX.) |
| | 2 times | (MAX.) |

The detail is described to LED and Photodetector handling precautions of home page:
 "Mounting through-hole Type Devices" and "Soldering", and use it after the confirmation, please.

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 | 0/25 |
| Resistance to Soldering Heat | EIAJ ED-4701/300(302) | 260±5°C, 3mm from package base | 10s | 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°C, 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 |
| Lead Tension | EIAJ ED-4701/400(401) | 10N, 1time (□0.4 and Flat Package : 5N) | 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 |

Failure Criteria

| Items | Symbols | Conditions | Failure criteria |
|---------------------|----------------|---|---|
| Luminous Intensity | Iv | If Value of each product Luminous Intensity | Testing Min. Value < Spec. Min. Value x 0.5 |
| Forward Voltage | V _F | If 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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