Pb-free HEAT

DNK3804X

Through-hole IRED/
ϕ3 High Speed, High Total Output Power Type

Features

Package	ϕ3 type, Water clear epoxy
Product features	・High Speed : Cut-off Frequency 55 MHz TYP. (I_F=50mA) ・High Power Output : 27mW TYP. (I_F=50mA) ・Wide Distribution ・Flush Mount Type ・Lead-free soldering compatible ・RoHS compliant
Peak Wavelength	870nm
Half Intensity Angle	55 deg.
Die materials	GaAlAs
Rank grouping parameter	Sorted by radiant intensity per rank taping
Soldering methods	TTW (Through The Wave) soldering and manual soldering ※Please refer to Soldering Conditions about soldering.
ESD	2kV (HBM)
Packing	Bulk : 200pcs(MIN.)

Recommended Applications

Electric Household Appliances, OA/FA, PC/Peripheral Equipment, Other General Applications

Absolute Maximum Ratings

(Ta=25℃)

Item	Symbol	Absolute Maximum Ratings	Unit
Power Dissipation	Pd	170	mW
Forward Current	I_F	100	mA
Pulse Forward Current ※1	I_{FRM}	1,000	mA
Derating (Ta=25℃ or higher)	ΔI_F	1.33	mA/℃
	ΔI_{FRM}	13.3	mA/℃
Reverse Voltage	V_R	5	V
Operating Temperature	T_{opr}	-30~+85	℃
Storage Temperature	T_{stg}	-30~+100	℃

※1 I_{FRM} Measurement condition : Pulse Width≦0.1ms, Duty≦1/100

Electro-Optical Characteristics

(Ta=25℃)

Item	Conditions	Symbol	Characteristics		Unit
Forward Voltage	I_F=50mA	V_F	MIN.	1.3	V
			TYP.	1.5	
			MAX.	1.7	
Reverse Current	V_R=5V	I_R	MAX.	100	μA
Radiant Intensity	I_F=50mA	I_E	MIN.	8.4	mW/sr
			TYP.	22.0	
Total Output Power	I_F=50mA	Po	TYP.	27	mW
Peak Wavelength	I_F=50mA	λ_p	TYP.	870	nm
Spectral Half-width	I_F=50mA	$\Delta\lambda$	TYP.	45	nm
Half Intensity Angle	I_F=50mA	2θ 1/2	TYP.	55	deg.
Cut-off Frequency	I_F=50mA$_{DC}$±5mA, -3db from 1MHz	fc	MIN.	(40)	MHz
			TYP.	55	
Response Time	I_F=50mA	tr/tf	TYP.	7/7	ns
Pulse Forward Voltage	I_{FRM}=500mA	V_{FM}	Max.	3.4	V

( ) : Reference Value

Radiant Intensity Rank

(Ta=25℃)

Rank	I_E (mW/sr)		Condition
	MIN.	MAX.	
A	8.4	16.8	I_F = 50mA
B	12.0	24.0	
C	16.8	33.6	
D	24.0	48.0	
E	33.6	67.2	

※Please contact our sales staff concerning rank designation.

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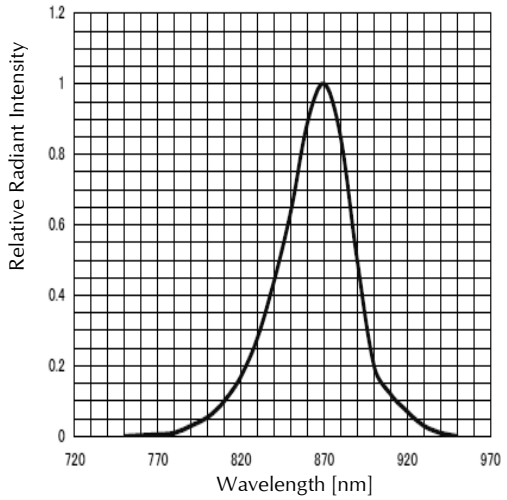
Technical Data

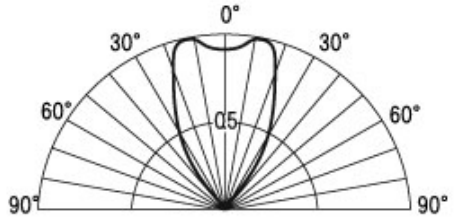
Spectral Distribution

Wavelength vs. Relative Radiant Intensity
Condition : Ta = 25℃, I_F = 50mA



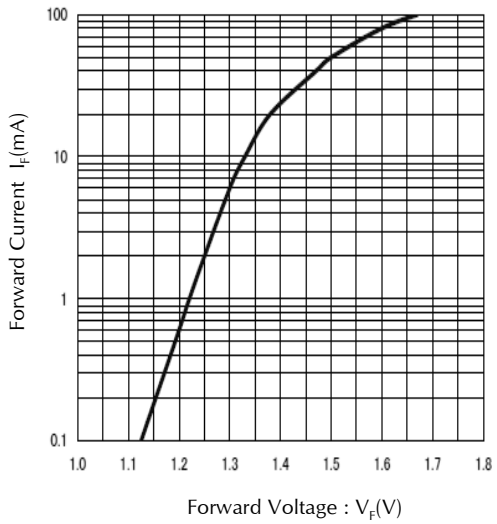
Spatial Distribution Example

Condition : Ta = 25℃



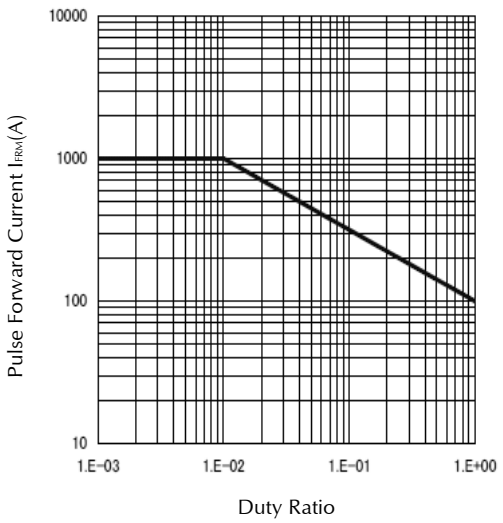
Forward Voltage vs. Forward Current

Condition : Ta = 25℃



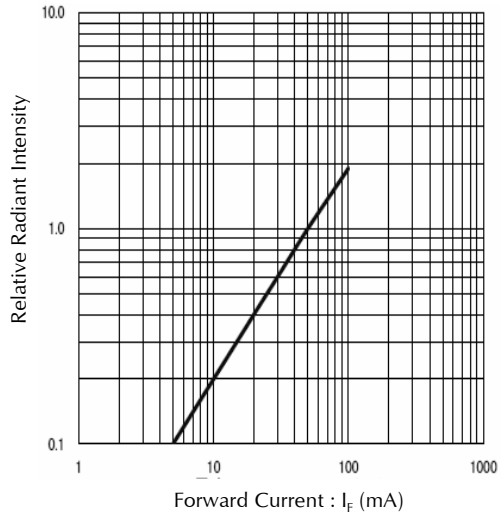
Duty Ratio vs. Pulse Forward Current

Condition : Ta = 25℃, tw ≦ 100 μs

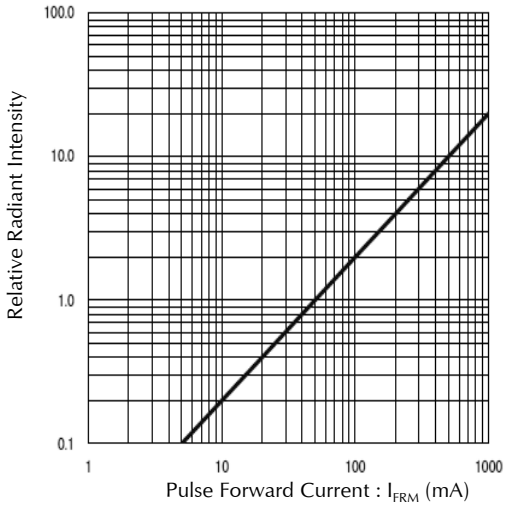


Technical Data

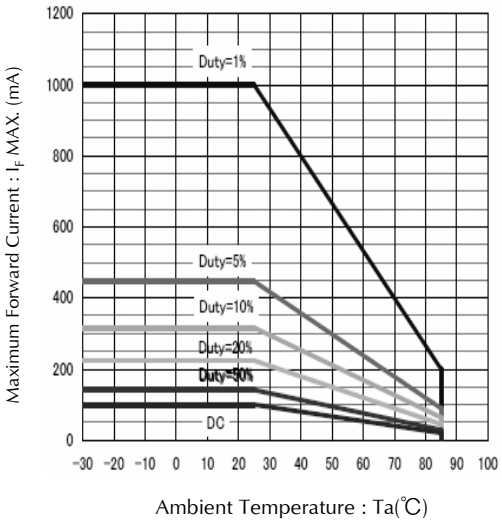
Forward Current vs. Relative Radiant Intensity
Condition : Ta = 25℃



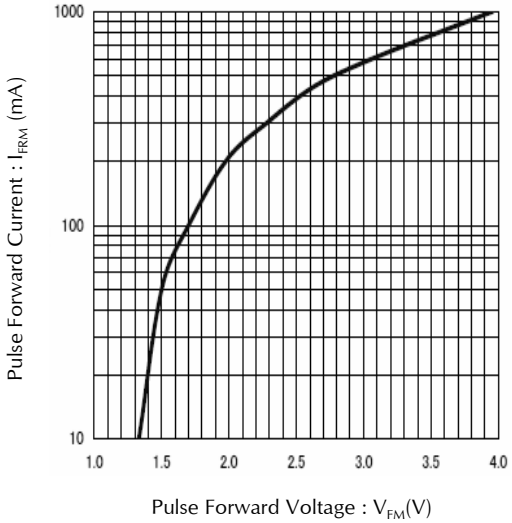
Pulse Forward Current vs. Relative Radiant Intensity
Condition : Ta = 25℃, tw≦100μs, Duty≦1/100



Derating
Ambient Temperature vs. Maximum Forward Current
Condition : tw≦100μs

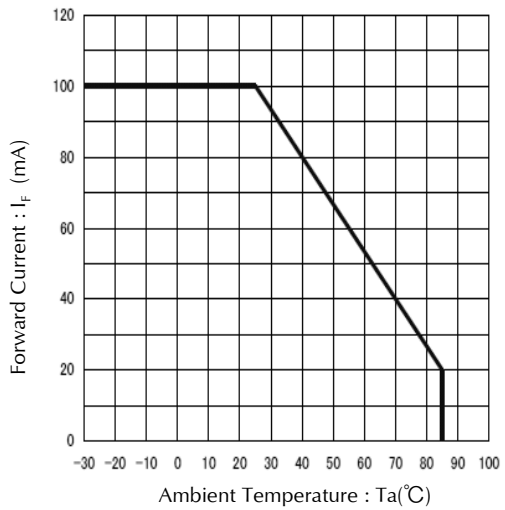


Pulse Forward Voltage vs. Pulse Forward Current
Condition : Ta=25℃, tw≦100μs, Duty≦1/100



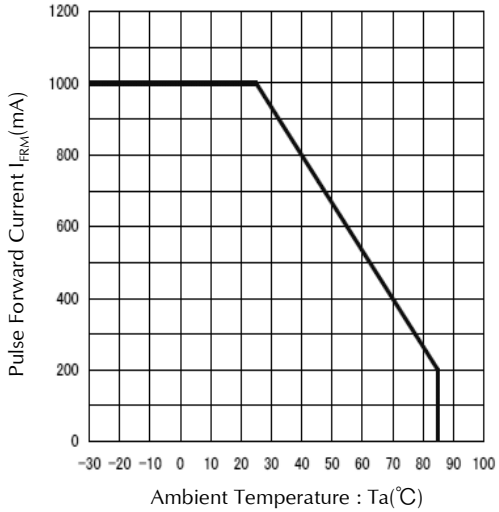
Technical Data

Ambient Temperature vs. Forward Current



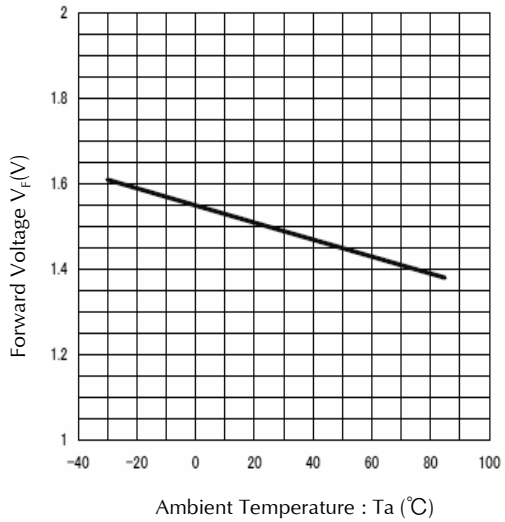
Pulse Forward Current vs. Ambient Temperature

Condition : tw≦100 μs, Duty≦1/100



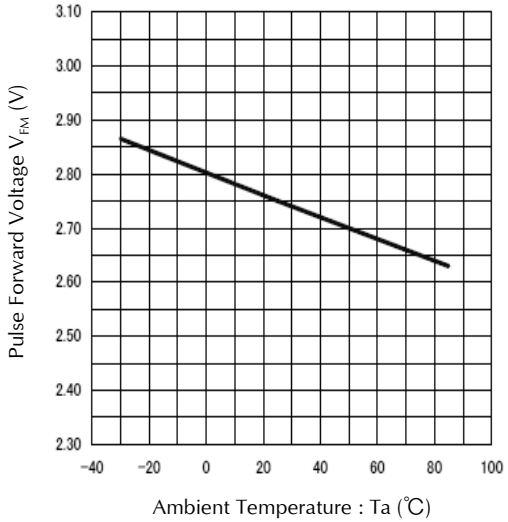
Ambient Temperature vs. Forward Voltage

Condition : I_F = 50mA



Ambient Temperature vs. Pulse Forward Voltage

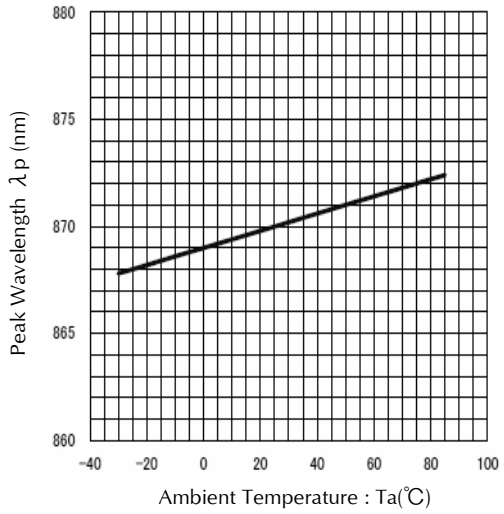
Condition : I_{FRM}=500mA, tw≦100 μs, Duty≦1/100



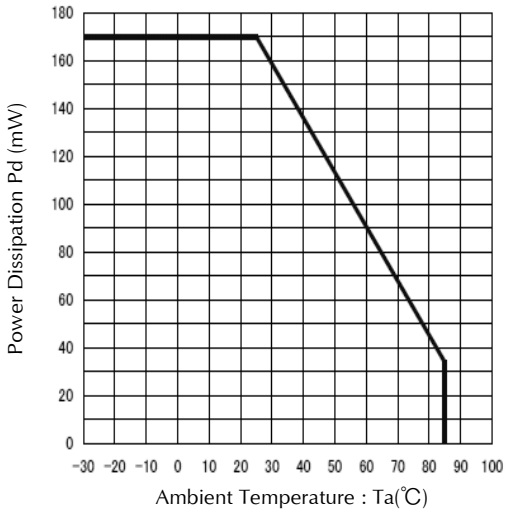
Technical Data

Ambient Temperature vs. Peak Wavelength

Condition : I_F = 50mA

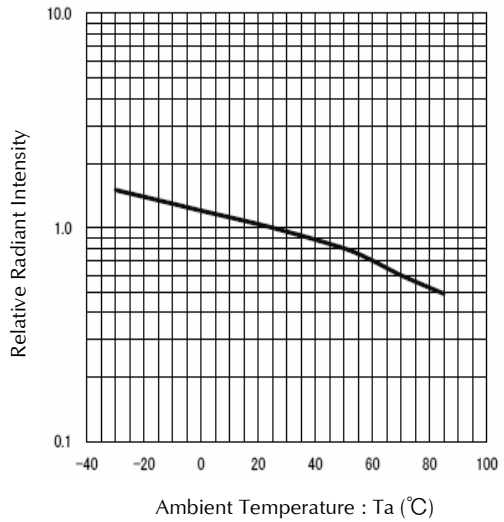


Ambient Temperature vs. Power Dissipation



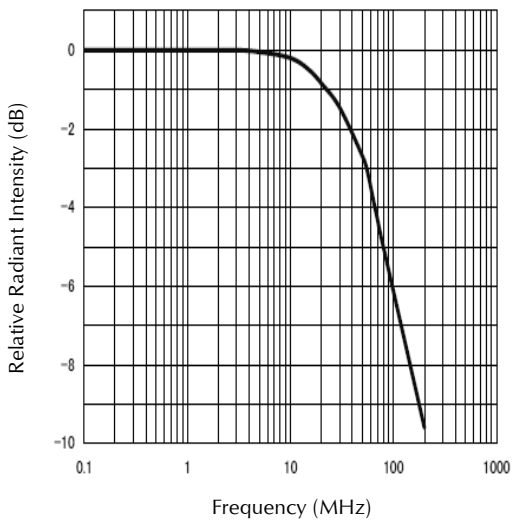
Ambient Temperature vs. Relative Radiant Intensity

Condition : I_F = 50mA



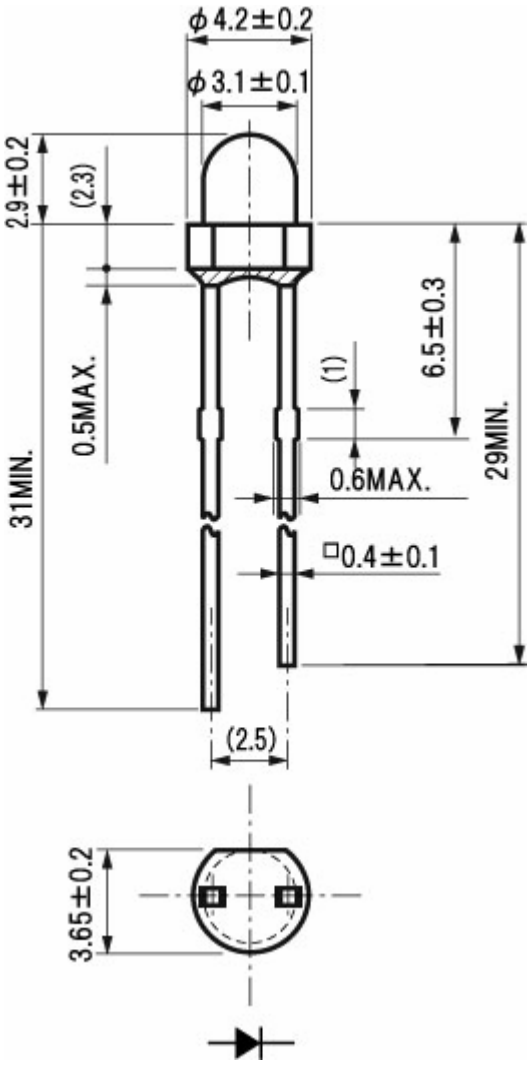
Frequency vs. Relative Radiant Intensity

Condition : Ta = 25℃, I_F = 50mA$_{DC}$±5mA



Package Dimensions

(Unit: mm)



TTW (Through The Wave) soldering Conditions

Pre-heating	100 ℃	(MAX.) Resin surface temperature
Solder Bath Temp.	265 ℃	(MAX.)
Dipping Time	5 s	(MAX.)
Position	At least 1.6 mm away from the root of lead	

1) The dip soldering process shall be twice maximum.
2) The product shall be cooled to normal temperature 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.	400 ℃	(MAX.) (30 W Max.)
Soldering time and frequency	3 s 1 time	(MAX.) (MAX.)
Position	At least 1.6 mm away from the root of lead	

※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℃, I_F = Maxium Rated Current	1,000 h	0/25
Resistance to Soldering Heat	EIAJ ED-4701/300(302)	265±5℃, 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℃, 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	I_V	I_F Value of each product Luminous Intensity	Testing Min. Value < Spec. Min. Value x 0.5
Forward Voltage	V_F	I_F 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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