



**Pb-free  
HEAT**

**STANLEY**

# DNF324U-4

Through-hole IRED/ $\phi$  5 High Speed Type

## Features

Package	$\phi$ 5 type, Water clear epoxy
Product features	<ul style="list-style-type: none"> <li>• High Speed : Cut-off Frequency 30 TYP. MHz (<math>I_F=50\text{mA}</math>)</li> <li>• Wide Distribution</li> <li>• Lead-free soldering compatible</li> <li>• RoHS compliant</li> </ul>
Peak Wavelength	850nm
Half Intensity Angle	35 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°C)

Item	Symbol	Absolute Maximum Ratings	Unit
Power Dissipation	Pd	150	mW
Forward Current	I <sub>F</sub>	100	mA
Pulse Forward Current ※1	I <sub>FRM</sub>	1000	mA
Derating (Ta=25°C or higher)	$\Delta I_F$	1.33	mA/°C
	$\Delta I_{FRM}$	13.3	mA/°C
Reverse Voltage	V <sub>R</sub>	5	V
Operating Temperature	T <sub>opr</sub>	-30~+85	°C
Storage Temperature	T <sub>stg</sub>	-30~+100	°C

※1 IFRM Measurement condition : Pulse Width  $\leq 100 \mu s$ , Duty  $\leq 1/100$ 

## Electro-Optical Characteristics

(Ta=25°C)

Item	Conditions	Symbol	Characteristics		Unit
Forward Voltage	I <sub>F</sub> =50mA	V <sub>F</sub>	TYP.	1.6	V
			MAX.	2.0	
Reverse Current	V <sub>R</sub> =5V	I <sub>R</sub>	MAX.	100	$\mu A$
Radiant Intensity	I <sub>F</sub> =50mA	I <sub>E</sub>	MIN.	15	mW/sr
			TYP.	30	
Total Output Power	I <sub>F</sub> =50mA	Po	TYP.	13	mW
Peak Wavelength	I <sub>F</sub> =50mA	$\lambda_p$	TYP.	850	nm
Spectral Half-width	I <sub>F</sub> =50mA	$\Delta \lambda$	TYP.	45	nm
Half Intensity Angle	I <sub>F</sub> =50mA	2 $\theta$ 1/2	TYP.	35	deg.
Cut-off Frequency	I <sub>F</sub> =50mA <sub>DC</sub> ±5mA, -3db from 0.1MHz	fc	MIN.	20	MHz
			TYP.	30	
Response Time	I <sub>F</sub> =50mA	tr/tf	TYP.	10	ns
Pulse Forward Voltage	I <sub>FRM</sub> =500mA	V <sub>FM</sub>	Max.	3.4	V

# Radiant Intensity Rank

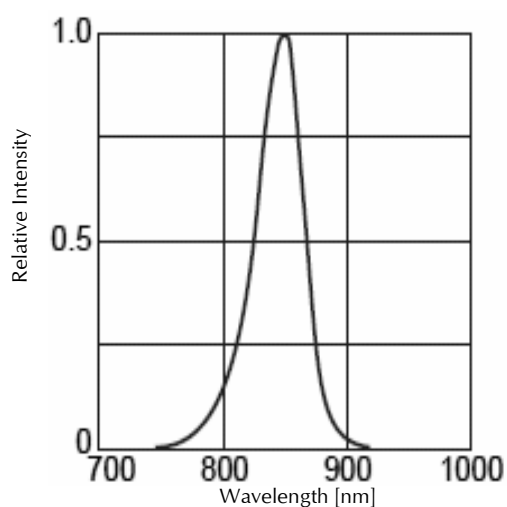
(Ta=25°C)

Rank	I <sub>E</sub> (mW/sr)		Condition
	MIN.	MAX.	
A	15	30	I <sub>F</sub> = 50mA
B	21	42	
C	30	60	
D	42	84	
E	60	120	

Please contact our sales staff concerning rank designation.

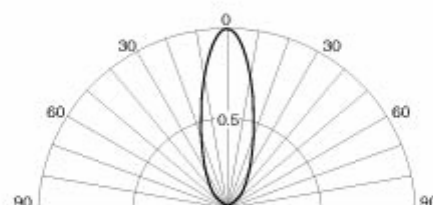
## Technical Data

**Spectral Distribution**  
Relative Intensity vs. Wavelength  
Condition :  $T_a = 25^\circ\text{C}$ ,  $I_f = 50\text{mA}$

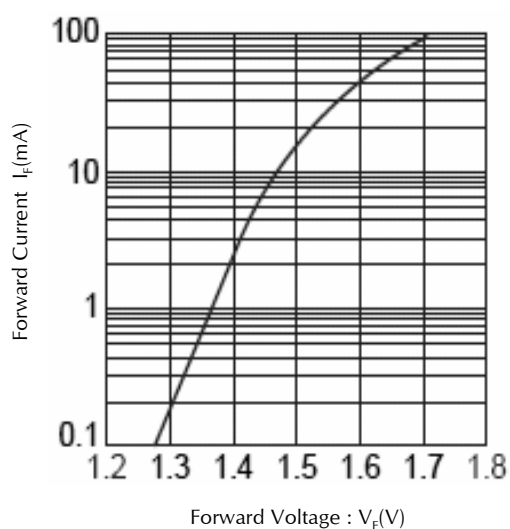


**Spatial Distribution Example**

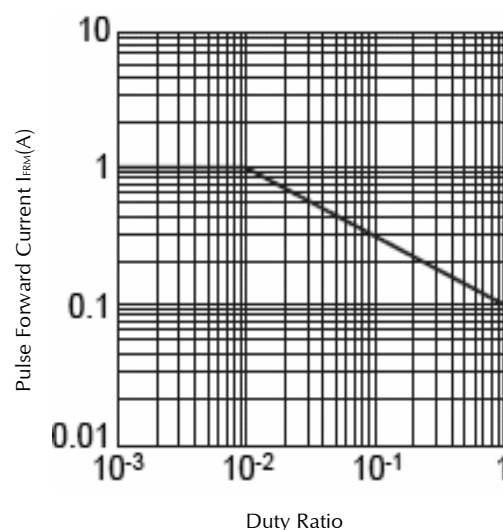
Condition :  $T_a = 25^\circ\text{C}$



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

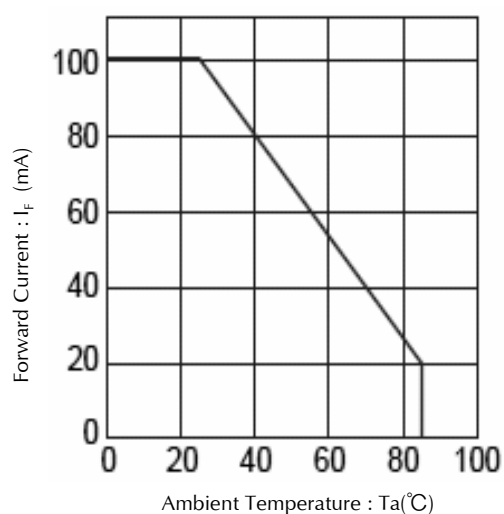


**Duty Ratio vs. Pulse Forward Current**  
Condition :  $T_a = 25^\circ\text{C}$ ,  $t_w \leq 100 \mu\text{s}$



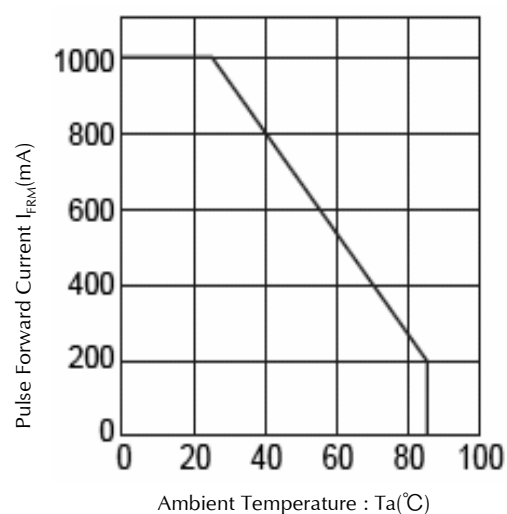
## Technical Data

Ambient Temperature vs. Forward Current



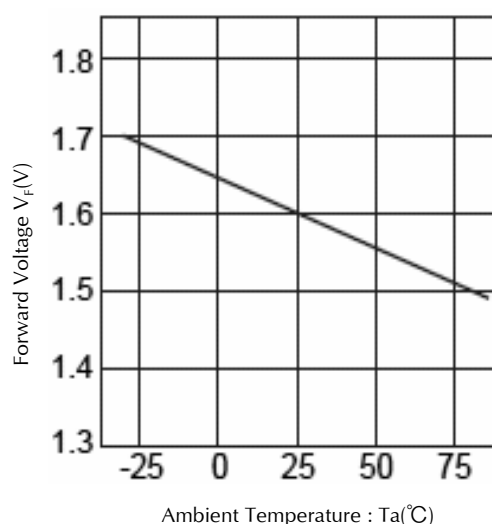
Ambient Temperature vs. Pulse Forward Current

Condition :  $t_w \leq 100 \mu s$ , Duty  $\leq 1/100$



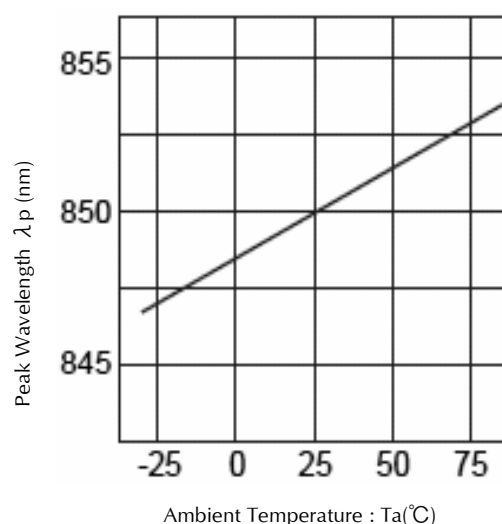
Ambient Temperature vs. Forward Voltage

Condition :  $I_F = 50 \text{ mA}$



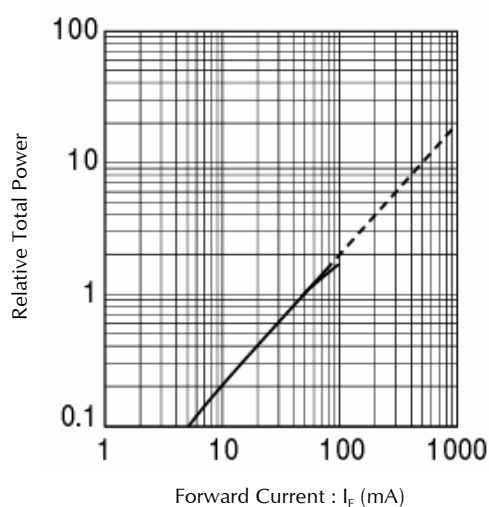
Ambient Temperature vs. Peak Wavelength

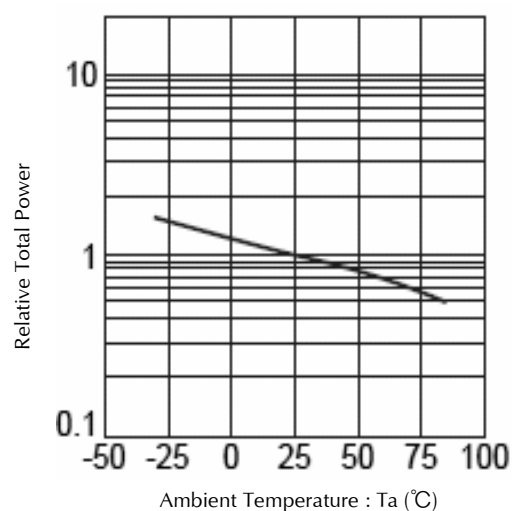
Condition :  $I_F = 50 \text{ mA}$

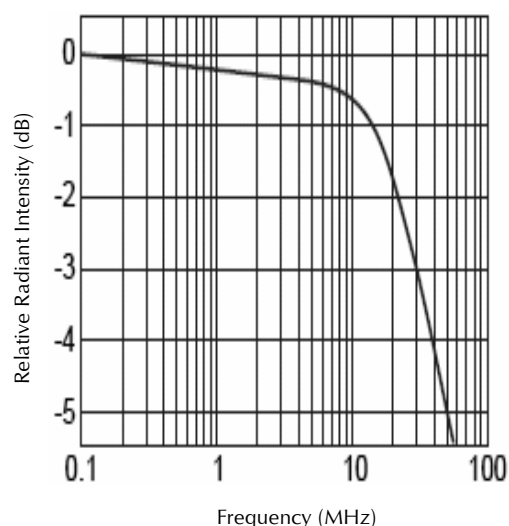


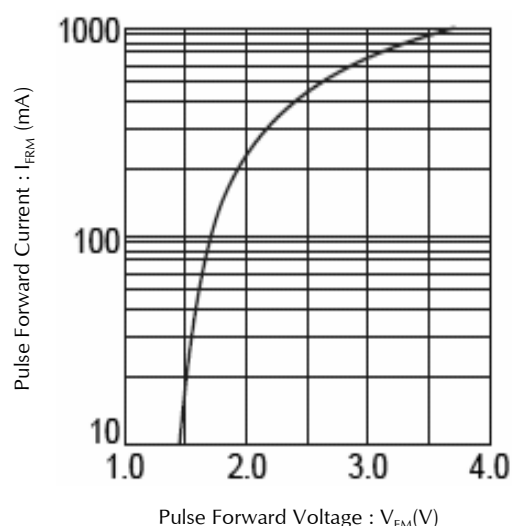
## Technical Data

**Forward Current vs. Relative Total Power**

Condition : - - Pulse,  $t_w \leq 100 \mu s$ ,  
Duty  $\leq 1/100$ ,  $T_a = 25^\circ C$ 

**Ambient Temperature vs. Relative Total Power**

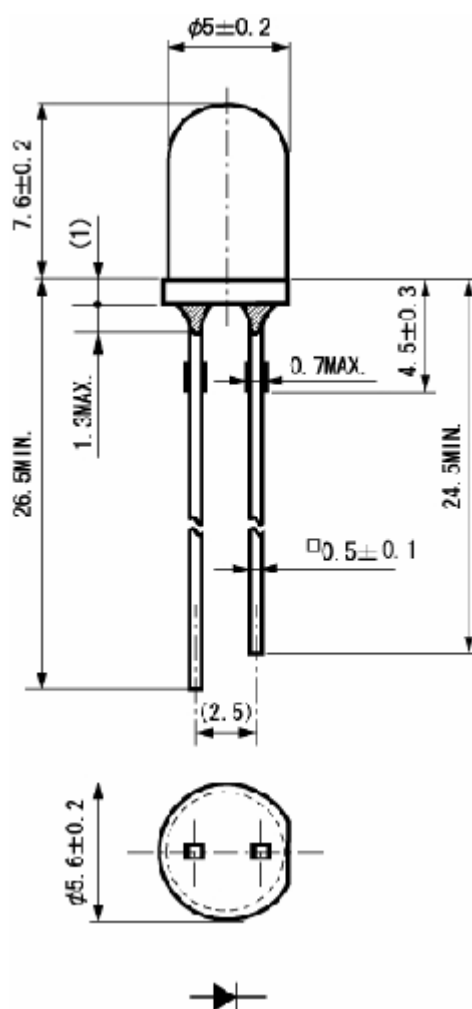
Condition :  $I_F = 50$  mA

**Frequency**

Condition :  $T_a = 25^\circ C$ ,  $I_F = 50$  mA<sub>DC</sub>  $\pm$  5 mA

**Pulse Forward Voltage vs. Pulse Forward Current**

Condition :  $T_a = 25^\circ C$ ,  $t_w \leq 100 \mu s$ , Duty  $\leq 1/100$ 


## Package Dimensions

(Unit: mm)



## TTW (Through The Wave) soldering Conditions

Pre-heating	100 °C	(MAX.) Resin surface temperature
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 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 °C	(MAX.) (30 W Max.)
Soldering time and frequency	3 s	(MAX.)
	1 time	(MAX.)
Position	At least 3.0 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°C, If = Maximum Rated Current	1,000 h	0/25
Resistance to Soldering Heat	EIAJ ED-4701/300(302)	265±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 <sup>2</sup> (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 <sub>F</sub>	If Value of each product Forward Voltage	Testing Max. Value ≥ Spec. Max. Value x 1.2
Reverse Current	I <sub>R</sub>	V <sub>R</sub> = 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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