



Ph-free
HEAT



DNK318U

Through-hole IRED/
φ 5 High Speed, High Total Output Power Type

Features

Package	φ 5 type, Water clear epoxy
Product features	<ul style="list-style-type: none">• High Power Output : 20mW TYP. ($I_F=50\text{mA}$)• High Speed : Cut-off Frequency 55 TYP. MHz ($I_F=50\text{mA}$)• No lead package• Lead-free soldering compatible
Peak Wavelength	870nm
Half Intensity Angle	20 deg.
Die materials	GaAIAs
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	170	mW
Forward Current	I _F	100	mA
Pulse Forward Current ¹	I _{FRM}	1000	mA
Derating (Ta=25 or higher)	I _F	1.33	mA/
	I _{FRM}	13.3	mA/
Reverse Voltage	V _R	5	V
Operating Temperature	T _{opr}	0~+85	
Storage Temperature	T _{stg}	-30~+100	

1 IFRM Measurement condition : Pulse Width 100 μ s, Duty 1/100

Electro-Optical Characteristics

(Ta=25°C)

Item	Conditions	Symbol	Characteristics		Unit
Forward Voltage	I _F =50mA	V _F	TYP.	1.5	V
			MAX.	1.7	
Reverse Current	V _R =5V	I _R	MAX.	100	μ A
Radiant Intensity	I _F =50mA	I _E	MIN.	40	mW/sr
			TYP.	80	
Total Output Power	I _F =50mA	Po	TYP.	20	mW
Peak Wavelength	I _F =50mA	λ _p	TYP.	870	nm
Spectral Half-width	I _F =50mA		TYP.	45	nm
Half Intensity Angle	I _F =50mA	2θ _{1/2}	TYP.	22	deg.
Cut-off Frequency	I _F =50mA _{DC} ±5mA, -3db from 0.1MHz	fc	MIN.	(40)	MHz
			TYP.	55	
Response Time	I _F =50mA	tr/tf	TYP.	7	ns
Pulse Forward Voltage	I _{FRM} =500mA	V _{FM}	Max.	3.4	V

() : Reference Value

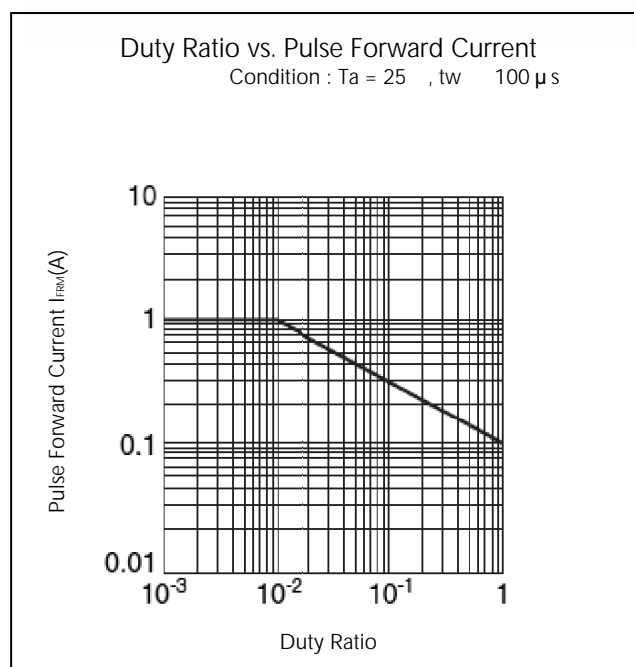
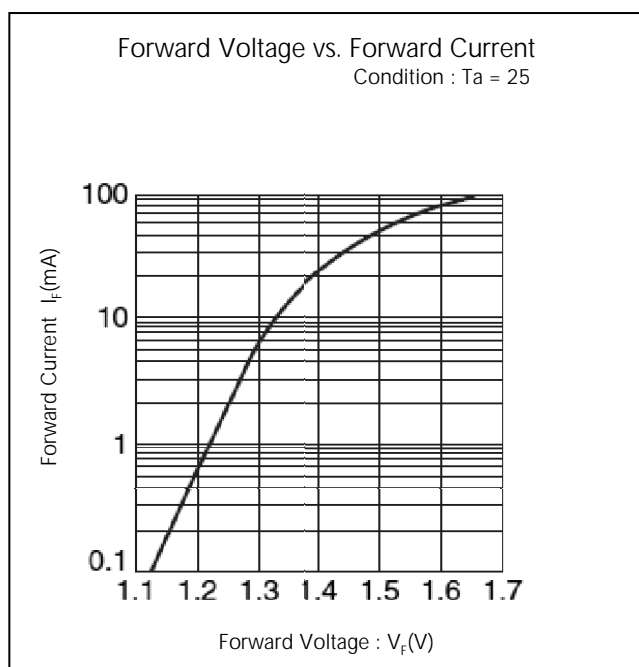
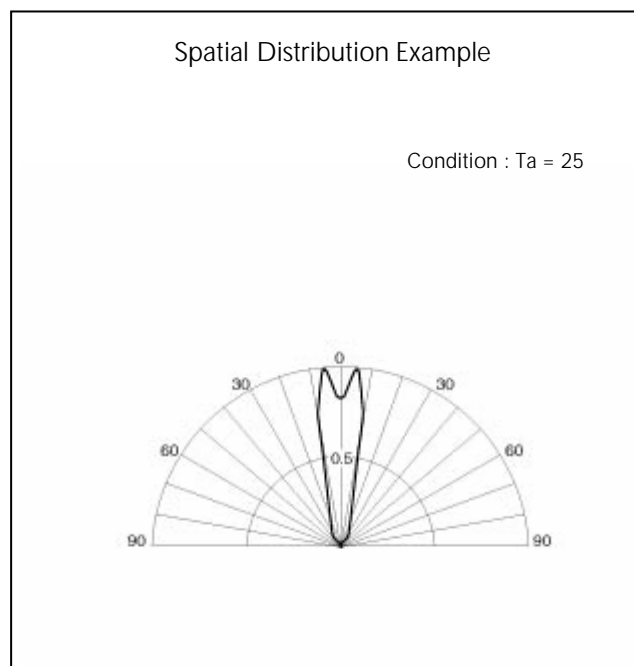
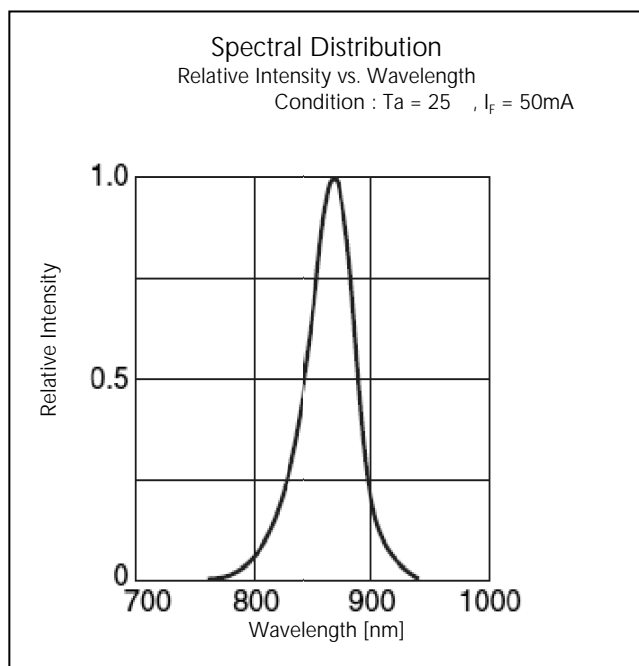
Radiant Intensity Rank

(Ta=25°C)

Rank	I _E (mW/sr)		Condition
	MIN.	MAX.	
A	40	80	I _F = 50mA
B	56	112	
C	80	160	
D	112	224	
E	160	320	

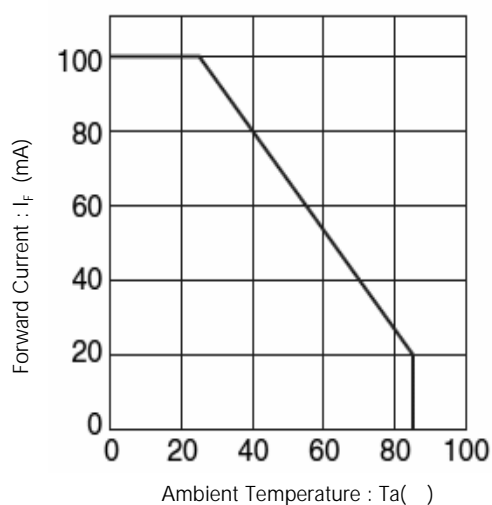
Please contact our sales staff concerning rank designation.

Technical Data



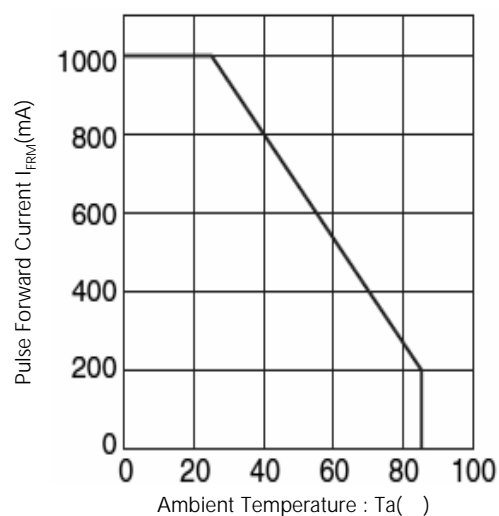
Technical Data

Ambient Temperature vs. Forward Current



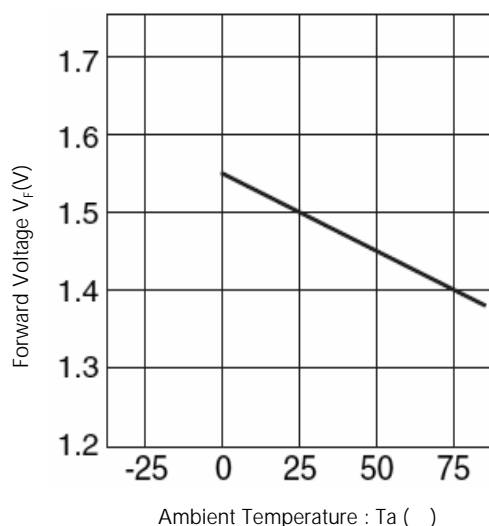
Ambient Temperature vs. Pulse Forward Current

Condition : t_w 100 μ s, Duty 1/100



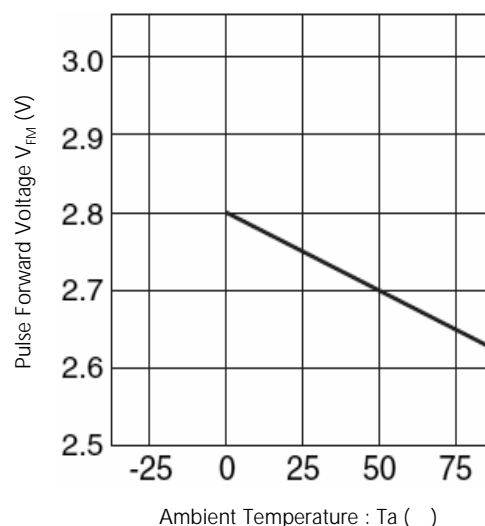
Ambient Temperature vs. Forward Voltage

Condition : I_F = 50mA



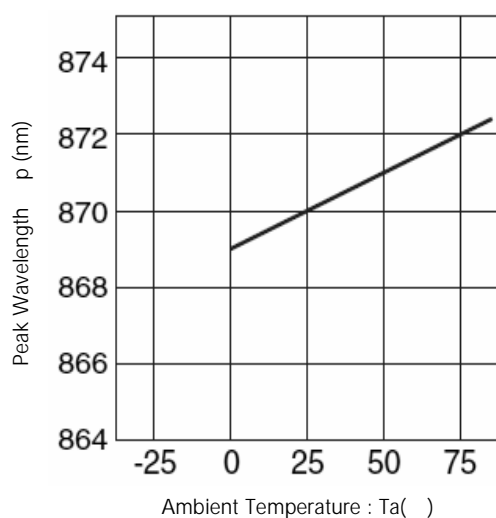
Ambient Temperature vs. Pulse Forward Voltage

Condition : I_{FRM} = 500mA, t_w 100 μ s, Duty 1/100

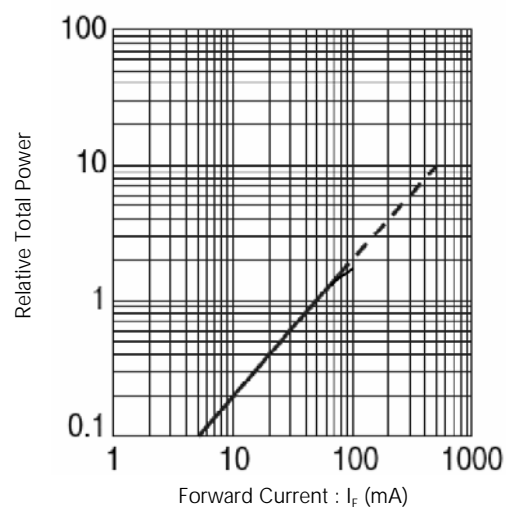


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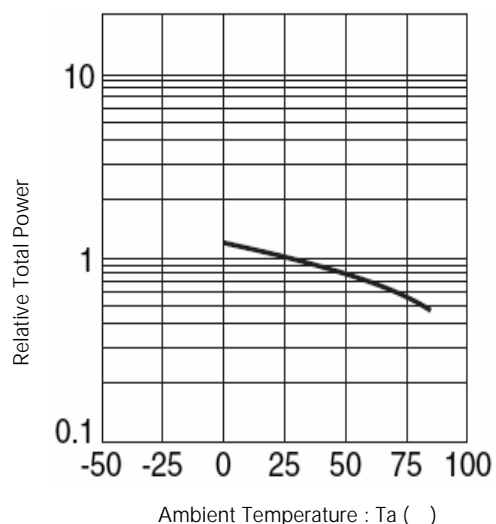
Ambient Temperature vs. Peak Wavelength
Condition : $I_F = 50\text{mA}$



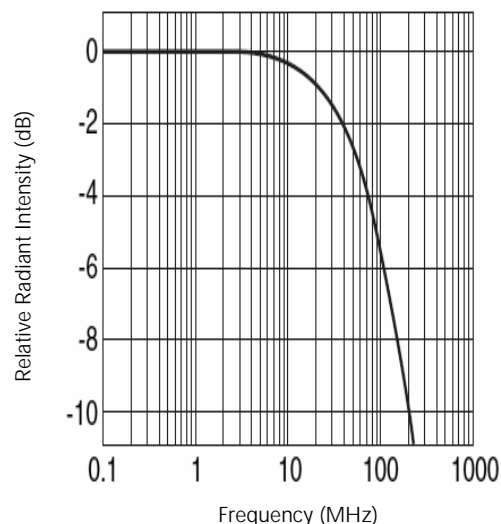
Forward Current vs. Relative Total Power
Condition : - - Pulse, $t_w = 100\mu\text{s}$,
Duty $1/100$, $T_a = 25$
----DC



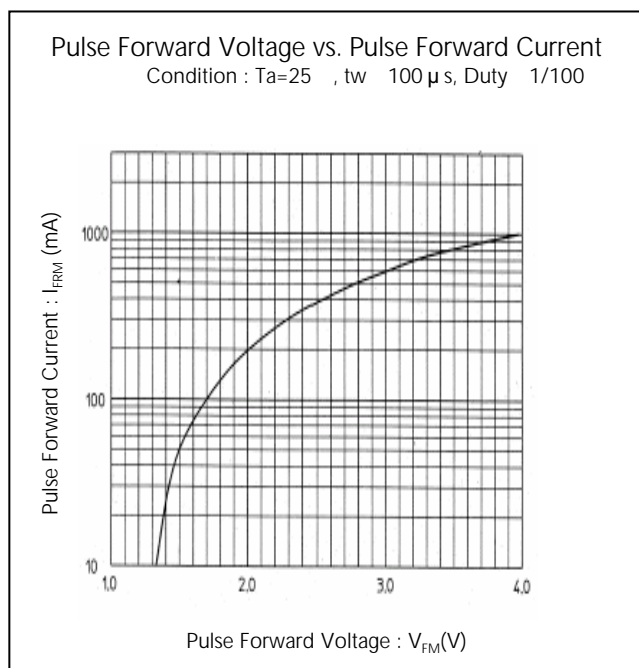
Ambient Temperature vs. Relative Total Power
Condition : $I_F = 50\text{mA}$



Frequency
Condition : $T_a = 25$, $I_F = 50\text{mA}_{\text{DC}} \pm 5\text{mA}$

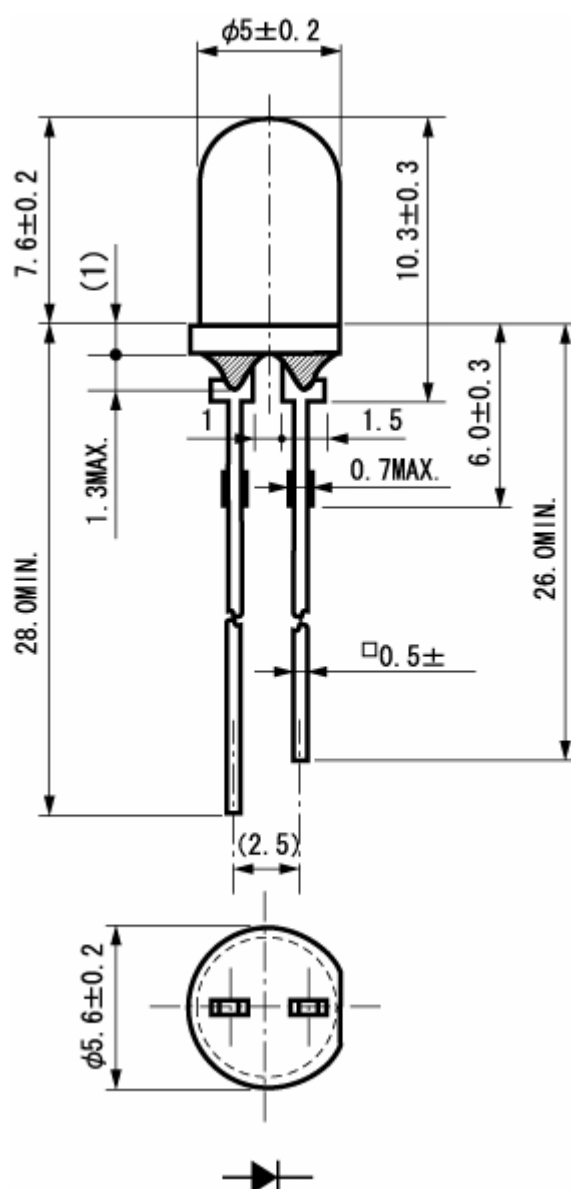


Technical Data



Package Dimensions

(Unit: mm)



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 3.0 mm away from resin body	

- 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.) (30 W Max.)
Soldering time and frequency	3 s 1 time	(MAX.) (MAX.)
Position	At least 3.0 mm away from resin body	

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	10sec	0/25
		265±5°C, 3mm from package base	10sec	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)	10sec	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	-	-	No notable, decoloration, deformation and cracking

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