High Power Infrared Emitter (850 nm)
Version 1.5

IRL 81 A

Features:

- High Power Infrared LED
- Pink plastic package with lateral emission
- Short switching times
- Matches phototransistor LPT 80 A

Applications

- For a variety of manufacturing and monitoring applications, which require beam interruption
- Photointerrupters

Notes

Depending on the mode of operation, these devices emit highly concentrated non visible infrared light which can be hazardous to the human eye. Products which incorporate these devices have to follow the safety precautions given in IEC 60825-1 and IEC 62471.

Ordering Information

Type:	**Radiant Intensity** I_e [mW/sr] **I_F = 20 mA, t_p = 20 ms**	**Ordering Code**
IRL 81A	25 (≥ 6.3)	Q68000A8000
IRL 81A-RS	10 ... 32	Q65112A2269

Note: Measured at a solid angle of Ω = 0.01 sr

Maximum Ratings (T_A = 25 °C)

Parameter	Symbol	Values	Unit
Operation and storage temperature range	T_{op}; T_{stg}	-40 ... 100	°C
Reverse voltage	V_R	5	V
Forward current	I_F	100	mA
Surge current (t_p = 200 µs, D = 0)	I_{FSM}	1	A
Power consumption	P_{tot}	180	mW
Thermal resistance junction - ambient (ambient mounted on PC-board (FR4), padsize 16 mm^2 each)	R_{thJA}	375	K / W
ESD withstand voltage (acc. to ANSI/ ESDA/ JEDEC JS-001 - HBM)	V_{ESD}	2	kV

Characteristics (T_A = 25 °C)

Parameter		Symbol	Values	Unit
Peak wavelength (I_F = 100 mA, t_p = 20 ms)	(typ)	λ_{peak}	860	nm
Centroid wavelength (I_F = 100 mA, t_p = 20 ms)	(typ)	$\lambda_{centroid}$	850	nm
Spectral bandwidth at 50% of I_{max} (I_F = 100 mA, t_p = 20 ms)	(typ)	$\Delta\lambda$	30	nm
Half angle	(typ)	φ	± 12	°
Dimensions of active chip area	(typ)	L x W	0.3 x 0.3	mm x mm
Rise and fall time of I_e (10% and 90% of $I_{e\,max}$) (I_F = 100 mA, R_L = 50 Ω, 10% ... 90%)	(typ)	t_r, t_f	12	ns
Forward voltage (I_F = 20 mA, t_p = 20 ms)	(typ (max))	V_F	1.3 (≤ 1.6)	V
Forward voltage (I_F = 1 A, t_p = 100 µs)	(typ (max))	V_F	2.4 (≤ 3)	V
Reverse current (V_R = 5 V)		I_R	not designed for reverse operation	µA
Total radiant flux (I_F=20 mA, t_p=20 ms)	(typ)	Φ_e	12	mW

Parameter		Symbol	Values	Unit
Temperature coefficient of I_e or Φ_e (I_F = 100 mA, t_p = 20 ms)	(typ)	TC_I	-0.5	% / K
Temperature coefficient of V_F (I_F = 100 mA, t_p = 20 ms)	(typ)	TC_V	-0.7	mV / K
Temperature coefficient of wavelength (I_F = 100 mA, t_p = 20 ms)	(typ)	TC_λ	0.3	nm / K

Grouping (T_A = 25 °C)

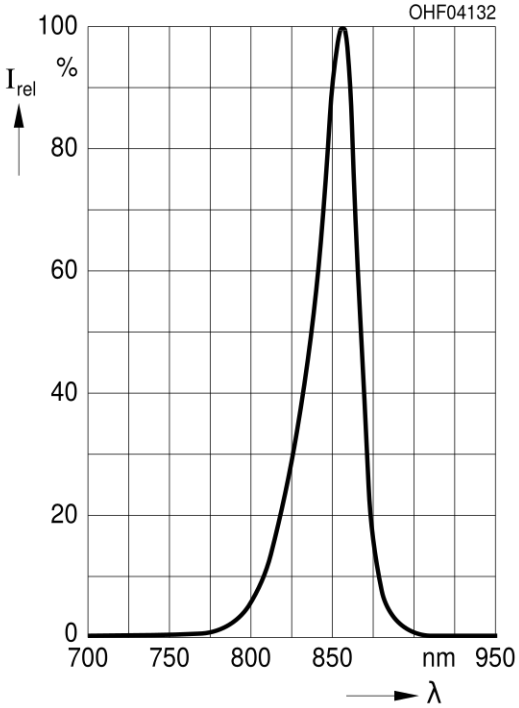
Group	Min Radiant Intensity I_F = 20 mA, t_p = 20 ms $I_{e, min}$ [mW / sr]	Max Radiant Intensity I_F = 20 mA, t_p = 20 ms $I_{e, max}$ [mW / sr]
IRL 81 A - Q	6.3	12.5
IRL 81 A - R	10	20
IRL 81 A - S	16	32
IRL 81 A - T	25	50

Note: measured at a solid angle of Ω = 0.01 sr

Only one group in one packing unit (variation lower 1.6:1).

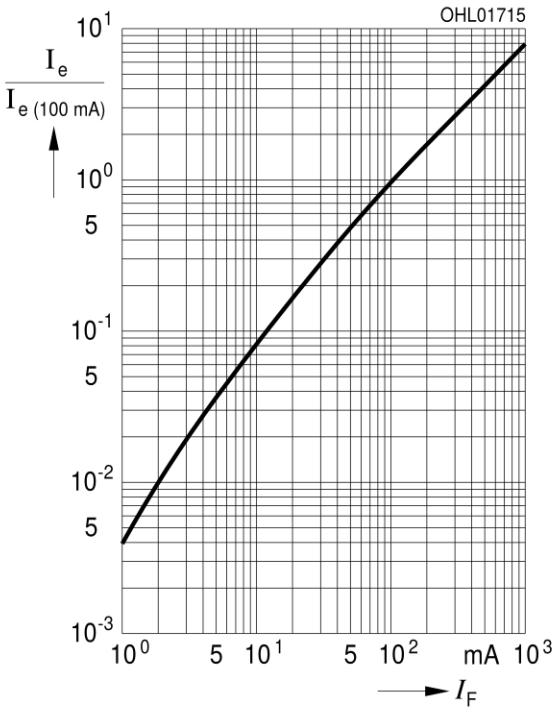
Relative Spectral Emission [1] *page 8*

$I_{rel} = f(\lambda)$, $T_A = 25°C$



Radiant Intensity [1] *page 8*

$I_e / I_e(100\ mA) = f(I_F)$, single pulse, $t_p = 25\ \mu s$, $T_A = 25°C$

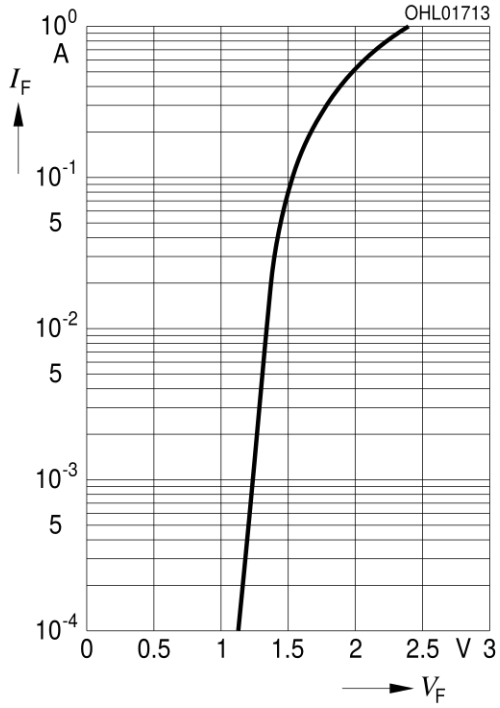


Max. Permissible Forward Current

$I_{F,\ max} = f(T_A)$, RthJA = 375 K/W

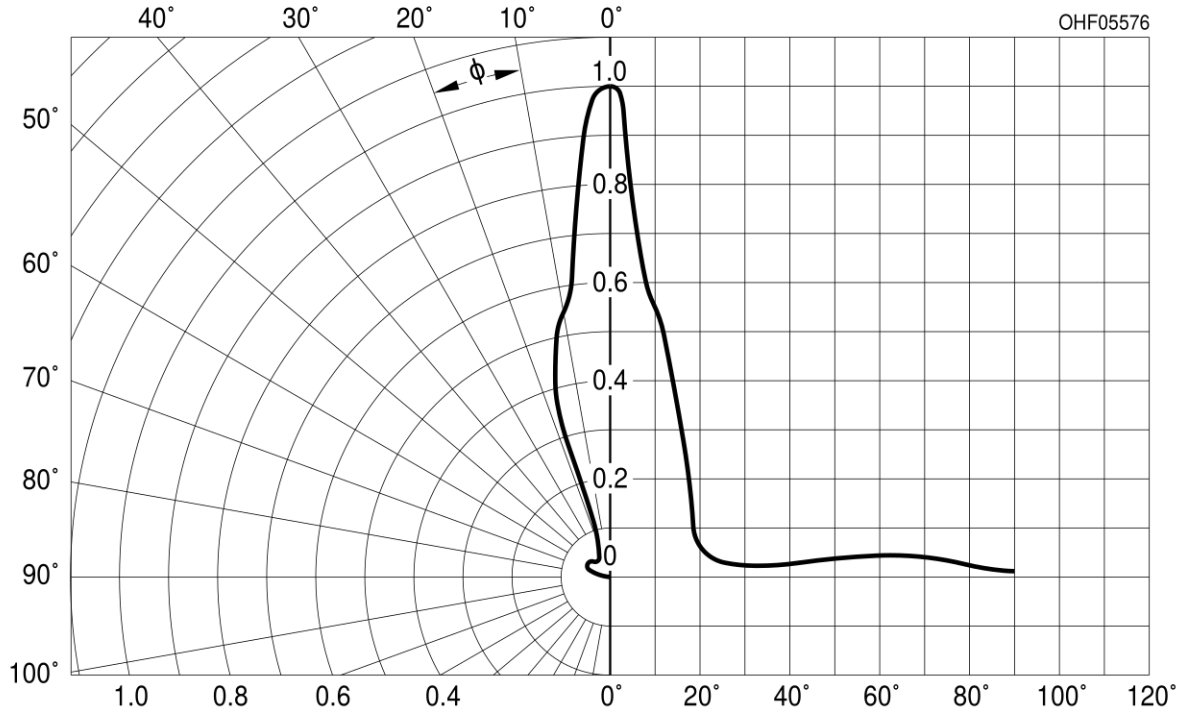
Forward Current [1] *page 8*

$I_F = f(V_F)$, single pulse, $t_p = 100\ \mu s$, $T_A = 25°C$

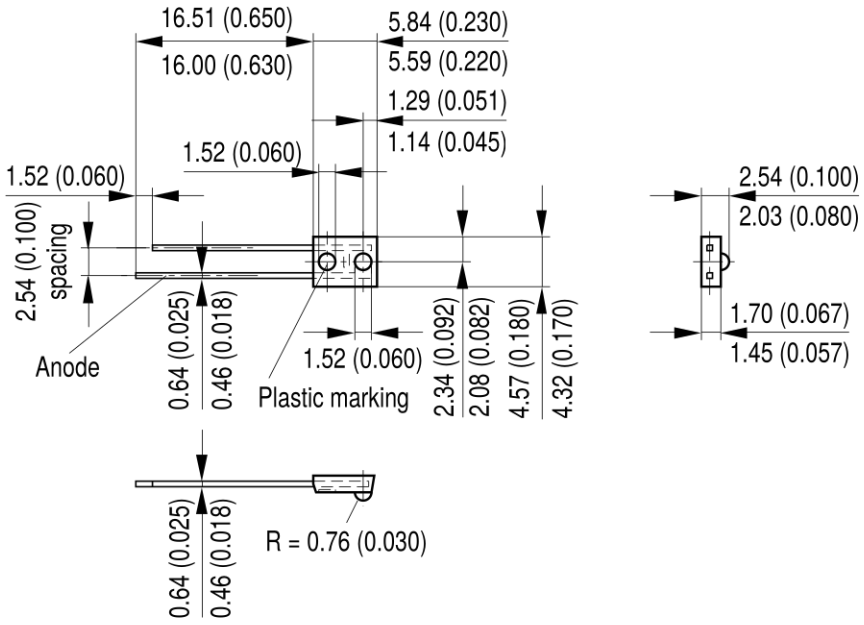


Radiation Characteristics [1] *page 8*

$I_{rel} = f(\phi)$, $T_A = 25°C$



Package Outline



Approx. weight 0.2 g GEOY6461

Dimensions in mm (inch).

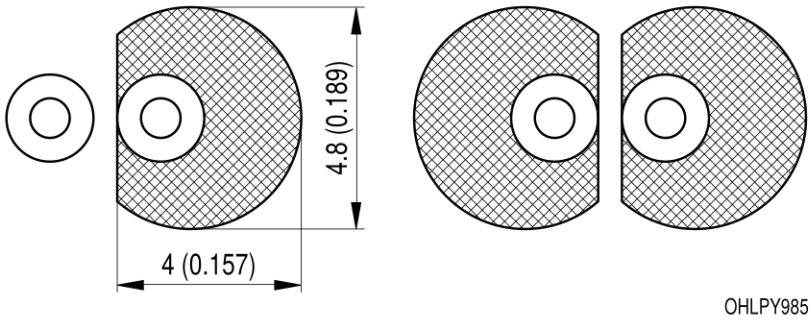
Package

Sidelooker, Epoxy

Approximate Weight:
0.2 g

Note:
Light-red colored plastic package, sidelooker, solder tabes 2.54 mm (1/10”)

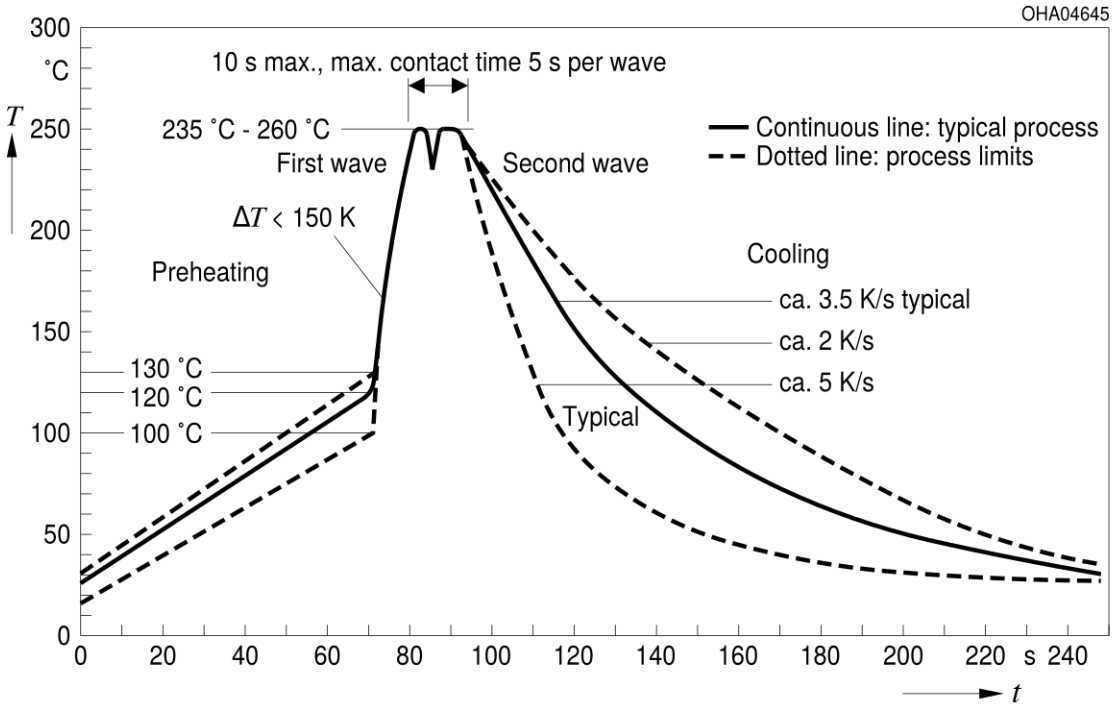
Recommended Solder Pad
TTW Soldering



Dimensions in mm (inch).

TTW Soldering

IEC-61760-1 TTW



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Language english will prevail in case of any discrepancies or deviations between the two language wordings.

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Glossary

[1] **Typical Values:** Due to the special conditions of the manufacturing processes of LED, the typical data or calculated correlations of technical parameters can only reflect statistical figures. These do not necessarily correspond to the actual parameters of each single product, which could differ from the typical data and calculated correlations or the typical characteristic line. If requested, e.g. because of technical improvements, these typ. data will be changed without any further notice.

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