

# SMT870-23

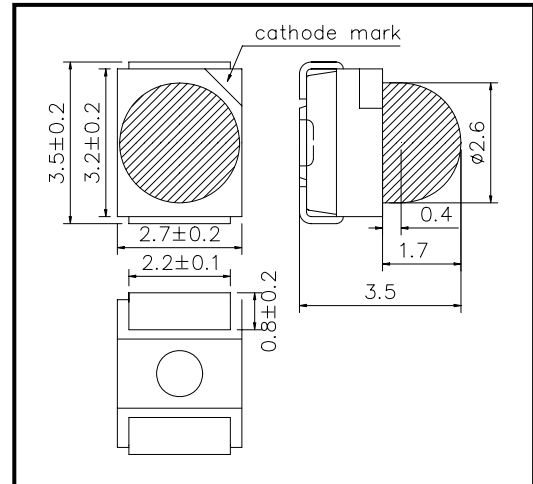
High Performance Infrared TOP LED with Lens

SMT870-23 consists of an AlGaAs LED mounted on the lead frame as TOP LED package with plastic ball lens and is 44mW typical of output power and 80mW/sr of radiant Intensity. It emits a spectral band of radiation at 870nm.

### ◆ Specifications

1) Product Name	TOP IR LED
2) Type No.	SMT870-23
3) Chip	
(1) Chip Material	AlGaAs
(2) Chip Dimension	400um*400nm
(3) Peak Wavelength	870nm typ.
4) Package	
(1) Lead Frame Die	Silver Plated
(2) Package Resin	PPA Resin
(3) Lens	Epoxy Resin
(4) Diameter	Φ2.6mm

### ◆ Outer dimension (Unit:mm)



### ◆ Absolute Maximum Rating

Item	Symbol	Maximum Rated Value	Unit	Ambient Temperature
Power Dissipation	P <sub>D</sub>	160	mW	T <sub>a</sub> =25°C
Forward Current	I <sub>F</sub>	100	mA	T <sub>a</sub> =25°C
Pulse Forward Current	I <sub>FP</sub>	1,000	mA	T <sub>a</sub> =25°C
Reverse Voltage	V <sub>R</sub>	5	V	T <sub>a</sub> =25°C
Junction Temperature	T <sub>J</sub>	100	°C	
Thermal Resistance	R <sub>thja</sub>	190	K/W	
Operating Temperature	T <sub>OPR</sub>	-20 ~ +80	°C	
Storage Temperature	T <sub>STG</sub>	-30 ~ +80	°C	
Soldering Temperature	T <sub>SOL</sub>	255	°C	

‡Pulse Forward Current condition: Duty=1% and Pulse Width=10us.

‡Soldering condition: Soldering condition must be completed within 10 seconds at 255°C

### ◆ Electro-Optical Characteristics [T<sub>a</sub>=25°C]

Item	Symbol	Condition	Minimum	Typical	Maximum	Unit
Forward Voltage	V <sub>F</sub>	I <sub>F</sub> =50mA DC		1.45	1.60	V
		I <sub>F</sub> =100mA, t <sub>p</sub> =20ms		1.50	1.8	
Reverse Current	I <sub>R</sub>	V <sub>R</sub> =5V			10	uA
Total Radiated Power	P <sub>O</sub>	I <sub>F</sub> =50mA DC	16.0	22.0		mW
		I <sub>F</sub> =100mA, t <sub>p</sub> =20ms		44.0		
Radiant Intensity	I <sub>E</sub>	I <sub>F</sub> =50mA DC		40		mW/sr
		I <sub>F</sub> =100mA, t <sub>p</sub> =20ms		80		
Peak Wavelength	λ <sub>P</sub>	I <sub>F</sub> =50mA DC	855	870	885	nm
Half Width	Δλ	I <sub>F</sub> =50mA DC		40		nm
Viewing Half Angle	θ <sub>1/2</sub>	I <sub>F</sub> =50mA DC		±15		deg.
Rise Time	t <sub>r</sub>	I <sub>F</sub> =50mA DC		15		ns
Fall Time	t <sub>f</sub>	I <sub>F</sub> =50mA DC		10		ns

‡Total Radiated Power is measured by Photodyne #500

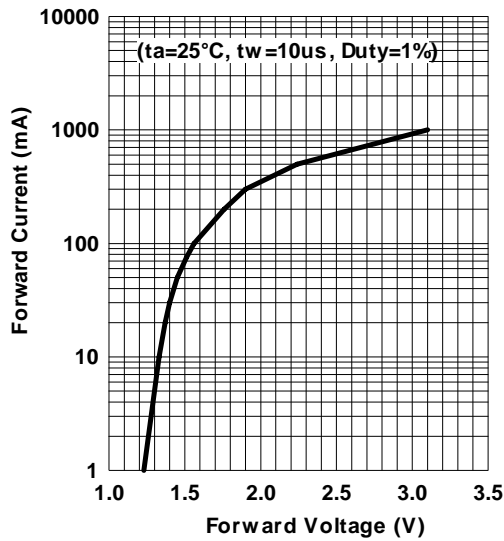
‡Radiant Intensity is measured by Tektronix J-6512.

USHIO EUROPE B.V. ([www.ushio.eu](http://www.ushio.eu))

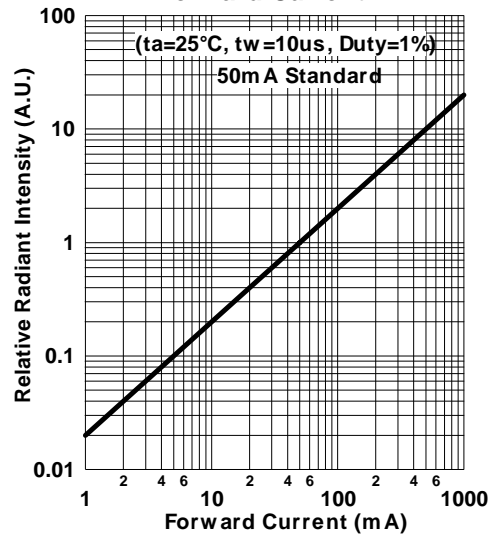
Sky Park, Breguetlaan 16-18, 1438 BC, Oude Meer, The Netherlands

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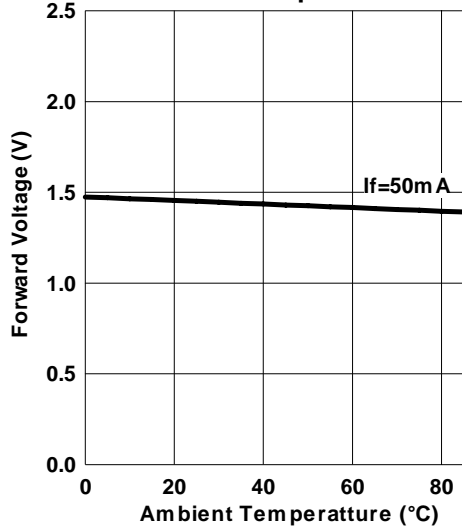
Forward Current - Forward Voltage



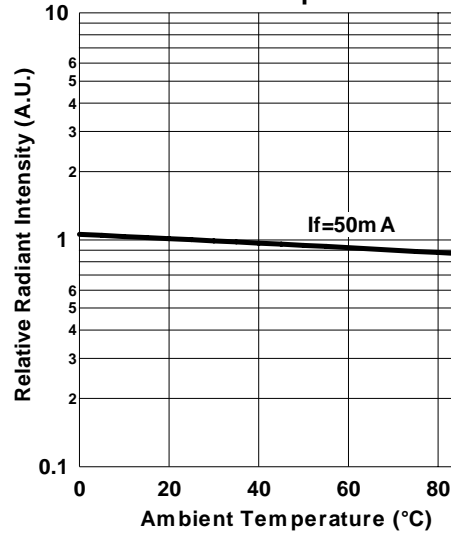
Relative Radiant Intensity - Forward Current



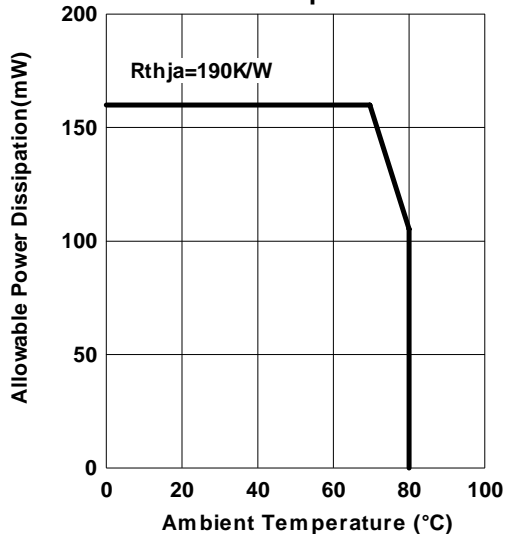
Forward Voltage - Ambient Temperature



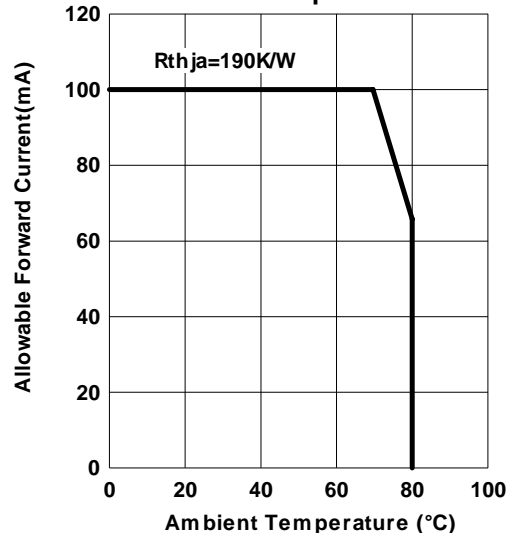
Relative Radiant Intensity - Ambient Temperature



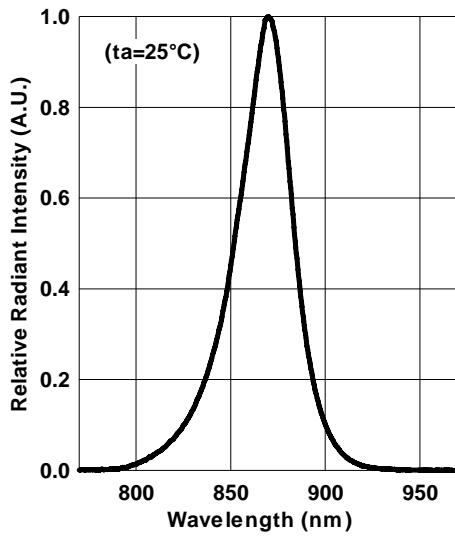
Allowable Power Dissipation - Ambient Temperature



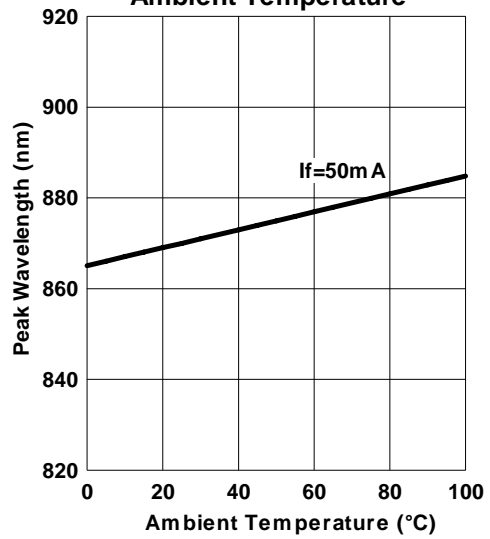
Allowable Forward Current - Ambient Temperature



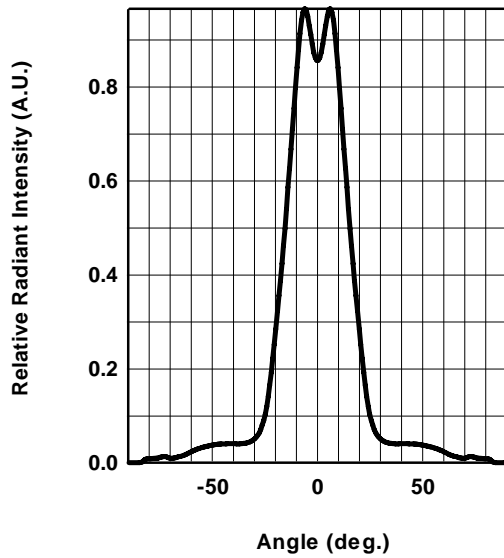
**Relative Spectral Emission**



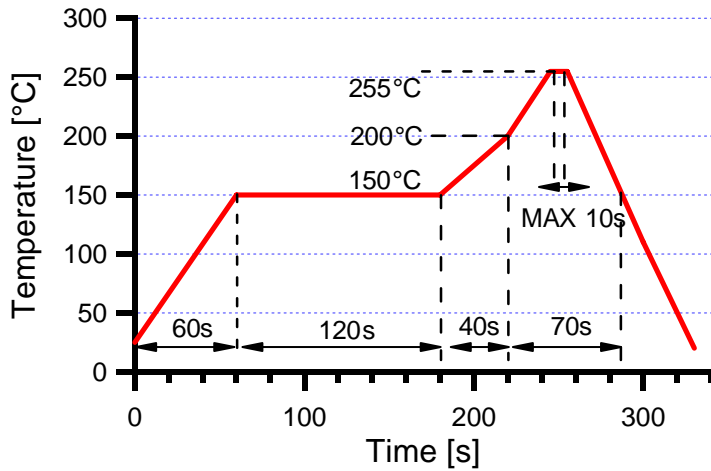
**Peak Wavelength - Ambient Temperature**



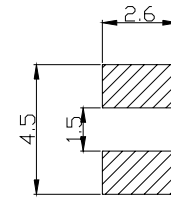
**Radiation Characteristics**



◆ SMD Application  
IR-Reflow Soldering Profile for lead free soldering

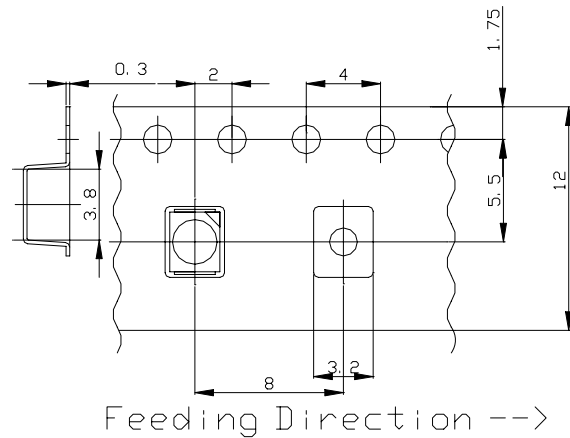
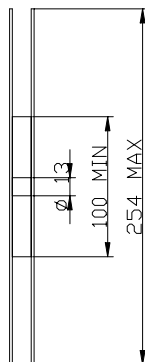
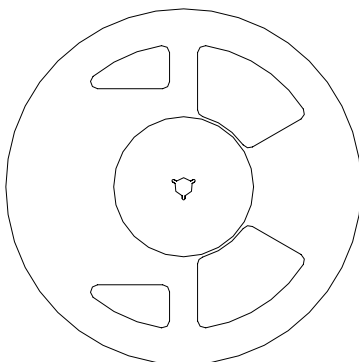


Recommended Land Layout (Unit: mm)



Don't put stress on SMD and a circuit board after soldering.

◆ SMD Packing  
Tape and Reel Dimensions (Unit: mm)



◆ Wrapping

Moisture barrier bag aluminum laminated film with a desiccant to keep out the moisture absorption during the transportation and storage.