

# LT1 □ □ 53A Series

## Dichromatic Chip LED Devices

### ■ Model No.

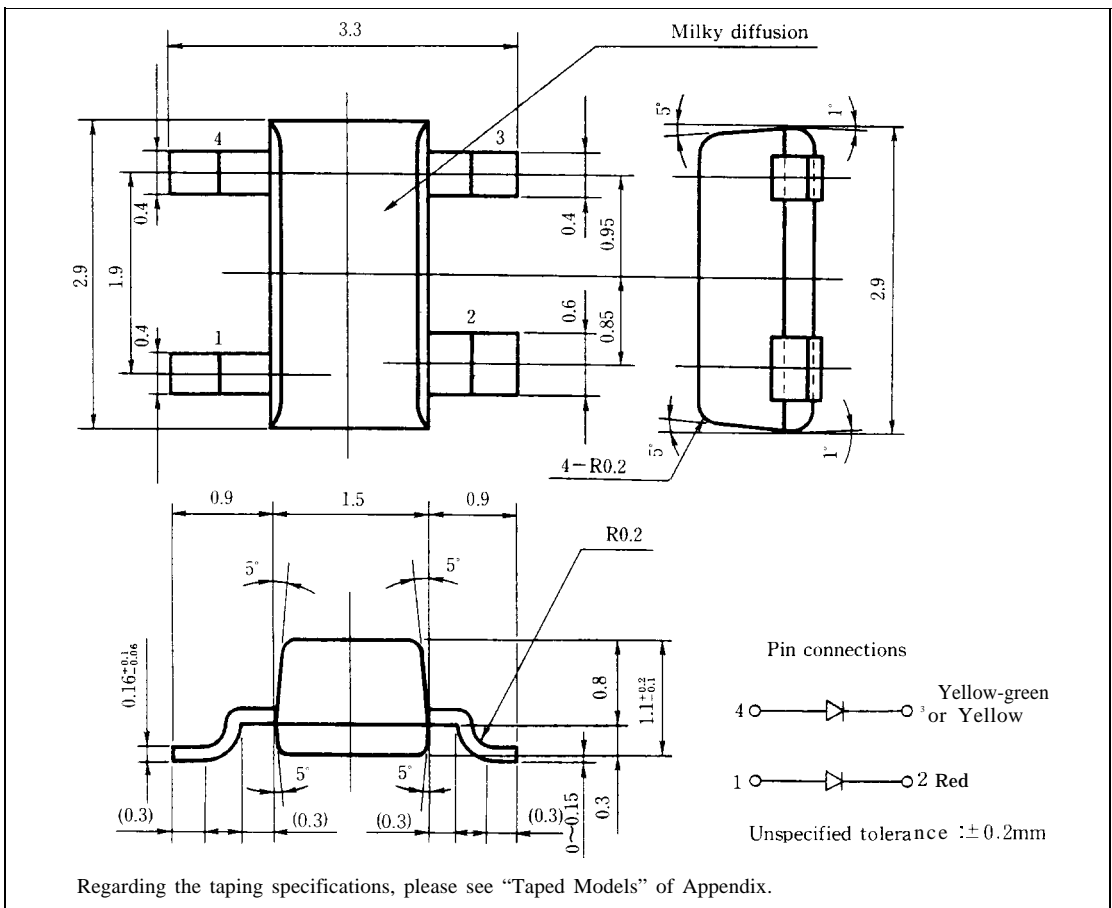
LT1ET53A	Yellow-green	GaP
	Red	GaAlAs/GaAs
LT1ED53A	Yellow-green	GaP
	Red	GaAsP/GaP
LT1HP53A	Yellow	GaAsP/GaP
	Red	GaP

### ■ Features

1. Radiation size  $1.5 \times 2.9$ mm
2. Milky diffusion lens type
3. Taped models : Tape width 8mm, 3,000 pcs/reel

### ■ Outline Dimensions

(Unit: mm)



**SHARP**

## LT1 □ □ 153A

## ■ Absolute Maximum Ratings

(Ta=25°C)

Parameter	Symbol	LT1ET53A		LT1ED53A		Unit	
		Yellow-green	Red	Yellow-green	Red		
※1 Power dissipation	P	50	66	50	84	mW	
Continuous forward current	I <sub>F</sub>	20	30	20	30	mA	
※2 Peak forward current	I <sub>FM</sub>	50	50	50	50	mA	
Derating factor	DC	—	0.27	0.29	0.27	0.40	mA/°C
	Pulse	—	0.67	0.67	0.67	0.67	mA/°C
Reverse voltage	V <sub>R</sub>	5		5		V	
Operating temperature	T <sub>opr</sub>	-25 to +85				°C	
Storage temperature	T <sub>stg</sub>	-25 to +100				°C	

(Ta =25°C )

Parameter	Symbol	LT1HP53A				Unit
		Yellow	Red			
※1 Power dissipation	P	50	23			mW
Continuous forward current	I <sub>F</sub>	20	10			mA
※2 Peak forward current	I <sub>FM</sub>	50	50			mA
Derating factor	DC	—	0.27	0.13		mA/°C
	Pulse	—	0.67	0.67		mA/°C
Reverse voltage	V <sub>R</sub>	5				V
Operating temperature	T <sub>opr</sub>	-25 to +85				°C
Storage temperature	T <sub>stg</sub>	-25 to +100				°C

※1 The value of power dissipation is specified under the condition that either yellow-green or red/yellow or red is lightened separately. When the both diodes of yellow-green and red/yellow or red are lightened simultaneously, the power dissipation of each diode should be less than the half of the value specified in this table.

※2 Duty ratio = 1/10, Pulse width = 0.1ms

LT1 ET53A (Yellow-green/Red)

■ **Electro-optical** Characteristics

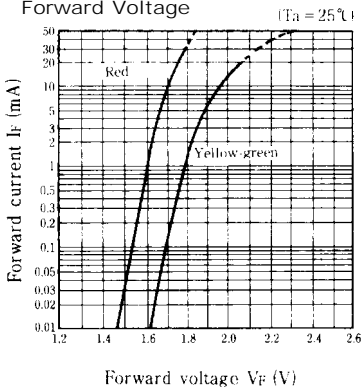
(Ta=25°C)

Parameter	Symbol	Radiation color	Conditions	MIN.	TYP.	MAX.	Unit
Forward voltage	V <sub>F</sub>	Yellow-green	I <sub>F</sub> = 10mA		1.95	2.5	V
		Red	I <sub>F</sub> = 20mA		1.75	2.2	
*3 Luminous intensity	I <sub>v</sub>	Yellow-green	I <sub>F</sub> = 10mA	1.4	3.6	-	'cd
		Red	I <sub>F</sub> = 20mA	2.5	6.5	-	
Peak emission wavelength	λ <sub>p</sub>	Yellow-green	I <sub>F</sub> = 10mA		565	-	'm
		Red	I <sub>F</sub> = 20mA		660	-	
Spectrum radiation bandwidth	Δλ	Yellow-green	I <sub>F</sub> = 10mA		30	-	'm
		Red	I <sub>F</sub> = 20mA		20	-	
Reverse current	I <sub>R</sub>	Yellow-green	V <sub>R</sub> = 4V			10	μA
		Red	V <sub>R</sub> = 4V			10	
Terminal capacitance	C <sub>t</sub>	Yellow-green	V=0V f=1 MHz		35	-	pF
		Red	V=0V f=1 MHz		30	-	
Response frequency	f <sub>c</sub>	Yellow-green	-		4	-	'Hz
		Red	-		8	-	

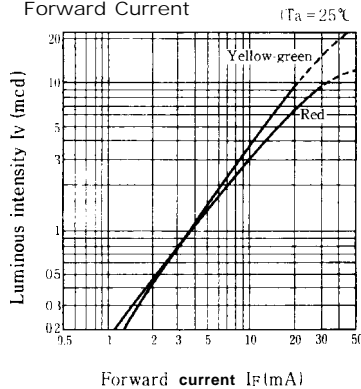
\*3 Tolerance: ±30%

■ **Characteristics Diagrams**

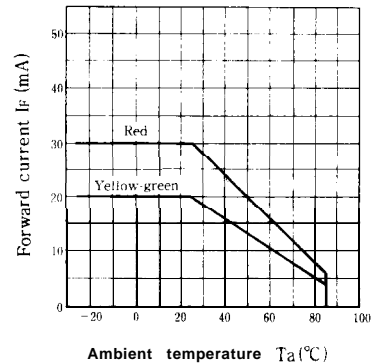
Forward Current vs. Forward Voltage



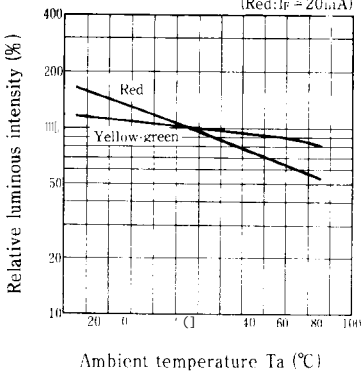
Luminous Intensity vs. Forward Current



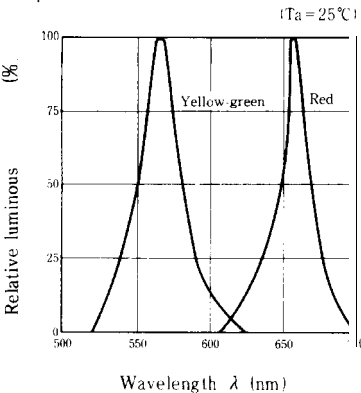
Forward Current Derating Curve



Relative Luminous Intensity vs. Ambient Temperature



Spectrum Distribution



### LT1ED53A (Yellow-green/Red)

#### ■ Electrical and/or Characteristic

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

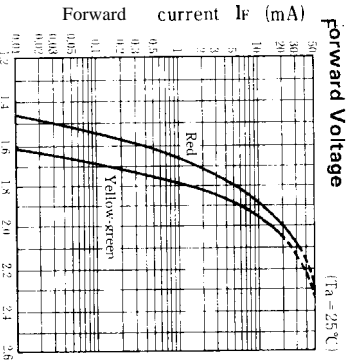
Parameter	Symbol	Radiation color	Conditions	Min. %	Typ. %	Max. %	Unit
Forward voltage	$V_f$	Yellow-green	$I_f = 10\text{mA}$	—	1.95	2.5	V
		Red	$I_f = 20\text{mA}$	—	2.0	2.8	
*3 Luminous intensity	$I_v$	Yellow-green	$I_f = 10\text{mA}$	1.1	—	—	mcd
		Red	$I_f = 20\text{mA}$	2.2	5.3	—	
Peak emission wavelength	$\lambda_p$	Yellow-green	$I_f = 10\text{mA}$	—	500	—	nm
		Red	$I_f = 20\text{mA}$	—	635	—	
Spectrum radiation bandwidth	$\Delta\lambda$	Yellow-green	$I_f = 10\text{mA}$	—	30	—	nm
		Red	$I_f = 20\text{mA}$	—	35	—	
Reverse current	$I_r$	Yellow-green	$V_R = 4\text{V}$	—	—	10	$\mu\text{A}$
Terminal capacitance	$C_t$	Yellow-green	$V = 0\text{V}$	—	20	—	pF
		Red	$V = 0\text{V}$	—	20	—	
Response frequency	$f_c$	Yellow-green	—	—	4	—	MHz
		Red	—	—	4	—	

Forward current vs. Forward Voltage	Luminous Intensity vs. Forward Current	Forward Current Derating Curve
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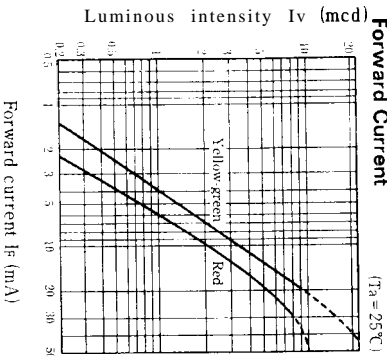
\*3 Tolerance:  $\pm 30\%$

#### ■ Characteristics Diagrams

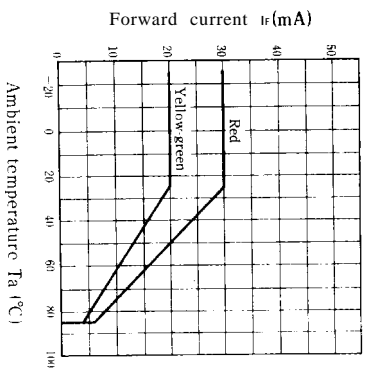
Forward Current vs. Forward Voltage



Luminous Intensity vs. Forward Current

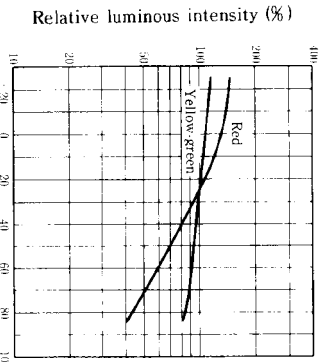


Forward Current Derating Curve



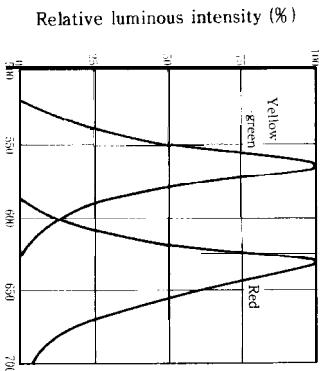
Relative Luminous Intensity vs. Ambient Temperature

$T_a = 25^\circ\text{C}$   
 $I_f = 10\text{mA}$   
 $R_{th(j-c)} = 20\text{mA}$



Spectrum Distribution

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



Ambient temperature  $T_a$  ( $^\circ\text{C}$ )

Wavelength  $\lambda$  (nm)

SHARP

LT1 HP53A (Yellow/Red)

■ **Electro-optical** Characteristics

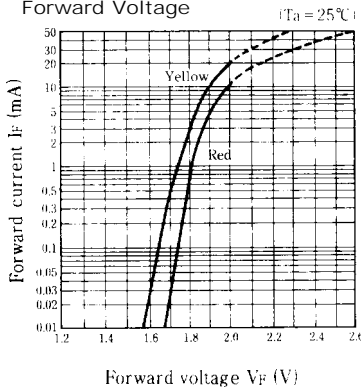
(Ta=25°C)

Parameter	Symbol	Radiation color	Conditions	MIN.	TYP.	MAX.	Unit
Forward voltage	V <sub>F</sub>	Yellow	I <sub>F</sub> = 10mA	—	1.9	2.5	V
		Red	I <sub>F</sub> = 5mA		1.9	2.3	
*3 Luminous intensity	I <sub>v</sub>	Yellow	I <sub>F</sub> = 10mA	0.8	3.1	—	mcd
		Red	I <sub>F</sub> = 5mA	<b>0.3</b>	1.1	—	
Peak emission wavelength	λ <sub>p</sub>	Yellow	I <sub>F</sub> = 10mA		585	—	'm
		Red	I <sub>F</sub> = 5mA		695	—	
Spectrum radiation bandwidth	Δλ	Yellow	I <sub>F</sub> = 10mA		<b>30</b>	—	'm
		Red	I <sub>F</sub> = 5mA		<b>100</b>	—	
Reverse current	I <sub>R</sub>	Yellow	V <sub>R</sub> = 4V			<b>10</b>	μA
		Red	V <sub>R</sub> = 4V			10	
Terminal capacitance	C <sub>t</sub>	Yellow	V = 0V f = 1 MHz		35	—	pF
		Red	V = 0V f = 1 MHz		55	—	
Response frequency	f <sub>c</sub>	Yellow			4	—	'Hz
		Red			4	—	

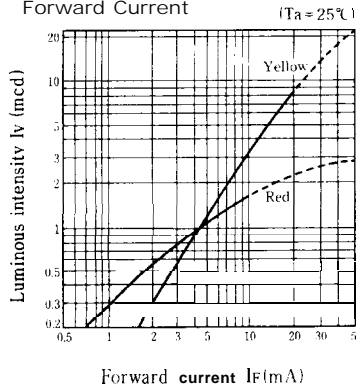
\*3 Tolerance: ±30%

■ **Characteristics Diagrams**

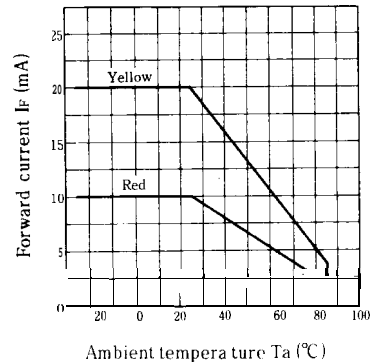
Forward Current vs. Forward Voltage



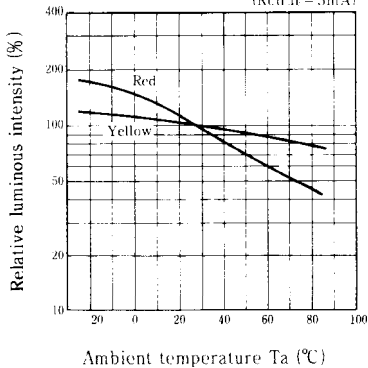
Luminous Intensity vs. Forward Current



Forward Current **Derating** Curve



Relative Luminous Intensity vs. Ambient Temperature (Y: I<sub>F</sub> = 10mA, R: I<sub>F</sub> = 5mA)



**Spectrum Distribution**

