

IS1603 Amp. built-in type OPIC Light Detector T-41-67

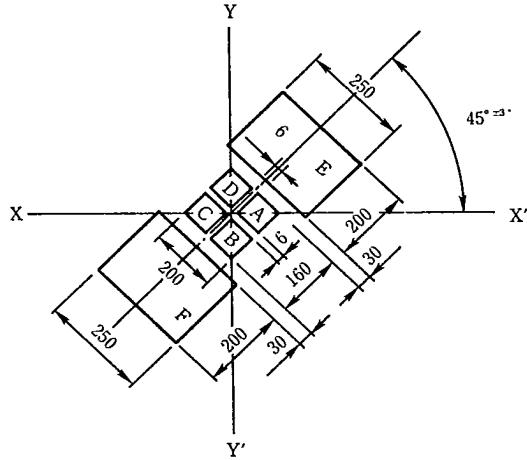
■ Features

1. Built-in high-speed amplifier for video signal
(High cut-off frequency f_c : TYP. 20MHz)
2. Fine pitch
(Chip separation width: $6\mu m$)
3. Compact 10-pin flat package

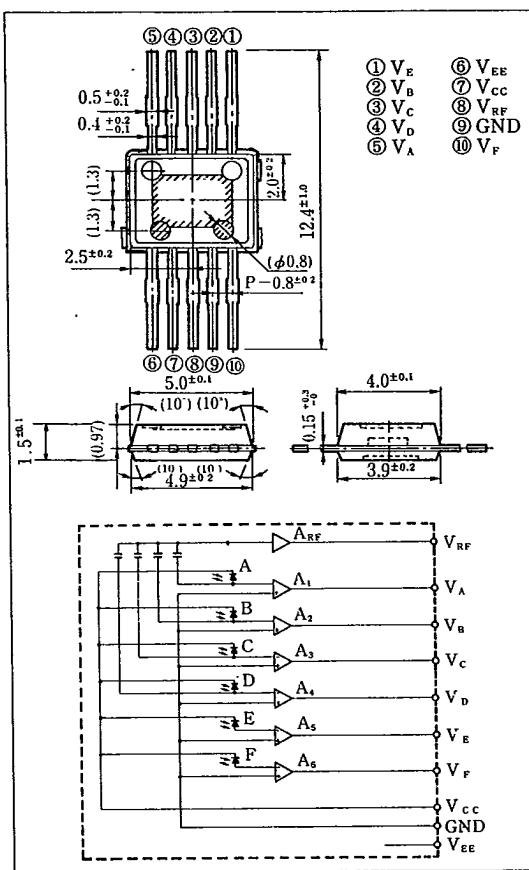
■ Applications

1. Laser disk players
2. CDVs

Enlarged drawing of detector portion (Unit: μm)



■ Outline Dimensions (Unit: mm)



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* OPIC is a trademark of Sharp and stands for Optical IC. It has a light detecting element and signal processing circuitry integrated onto a single chip.

■ Absolute Maximum Ratings

(Ta=25°C)

Parameter	Symbol	Rating	Unit
Supply voltage 1	V _{CC}	6	V
Supply voltage 2	V _{EE}	-6	V
Power dissipation	P	210	mW
Operating temperature	T _{opr}	-20 ~ +65	°C
Storage temperature	T _{stg}	-40 ~ +85	°C
*Soldering temperature	T _{sot}	260	°C

* 1 For 3 seconds at the position of 1mm from the surface of resin edge.

■ Electro-optical Characteristics

(V_{cc}=5V, V_{EE}=-5V, Ta=25°C)

Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit	Applicable terminals
Supply current 1	I _{cc}	No light	—	6	10	mA	
Supply current 2	I _{EE}	No light	-14	-9	—	mA	
RF output off-set voltage	V _{OR}	No light	0	1.0	2.0	V	V _{RF}
Output off-set voltage	V _{OD}	No light	-20	0	+20	mV	V _{O*} , V _{E*} , V _{F*} , V _c
Extremes of off-set voltage	ΔV _{OD}	No light	-20	0	+20	mV	*1
Sensitivity	R _{PRF}	λ = 780nm	20	30	40	mV/μW	V _{RF}
	R _{PD}		16	24.5	33	mV/μW	V _{O*} , V _{E*} , V _{F*} , V _c
Response frequency	* ² f _{C_{RFL}}	R _L = 10kΩ C _L = 10pF -3dB	—	25	35	kHz	V _{RF}
	* ² f _{C_{RFH}}		15	20	—	MHz	V _{RF}
	* ³ f _{C_F}		15	25	—	kHz	V _{O*} , V _{E*} , V _{F*}
	* ³ f _{C_T}		150	250	—	kHz	V _E , V _F
RF output noise level	V _n	f = 8MHz BW = 30kHz	—	-75	-69	dBm	V _{RF}

* 1 (V_A + V_c) - (V_B + V_D), V_E - V_F

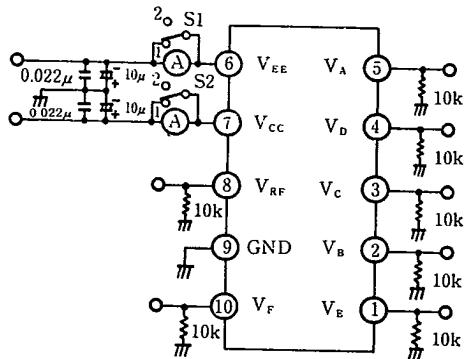
* 2 Response frequency shall measure the frequency at the output -3dB from the output value modulated at the frequency 1MHz.

* 3 Response frequency shall measure the frequency at the output -3dB from the output value modulated at the frequency 1kHz.

■ Recommended Operating Conditions

Parameter	Symbol	MIN.	MAX.	Unit
Supply voltage 1	V _{cc}	4.5	5.5	V
Supply voltage 2	V _{EE}	-4.5	-5.5	V

Test circuit

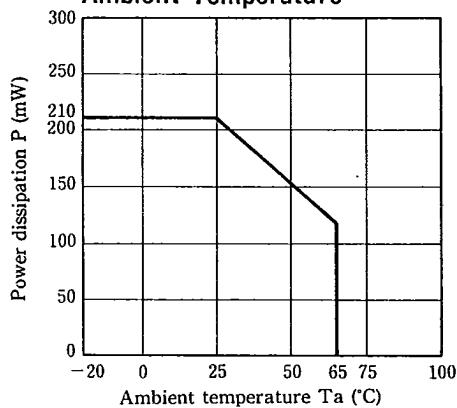
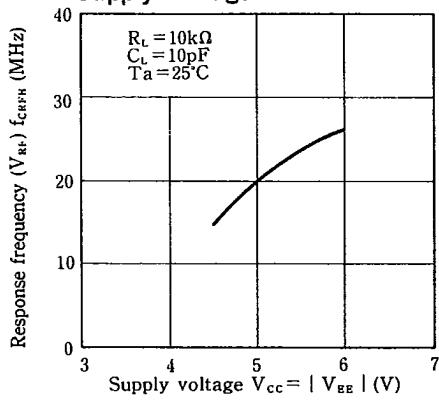
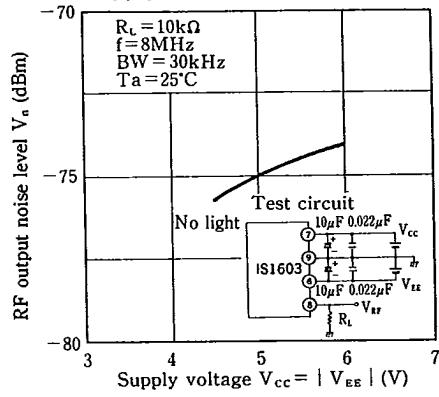
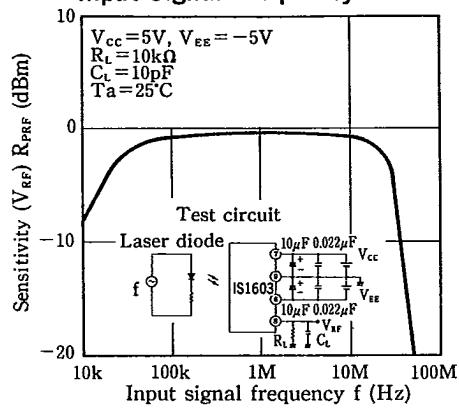
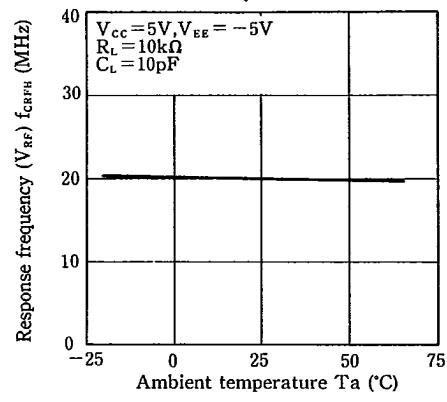
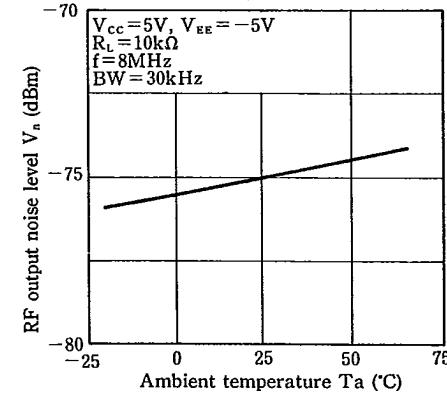


(Switching conditions)

S1 switch shall connect to terminal 2 when measuring I_{EE}, and S1 switch shall connect to terminal 1 when measuring the other electrical characteristics.S2 switch shall connect to terminal 2 when measuring I_{cc}, and S2 switch shall connect to terminal 2 when measuring the other electrical characteristics.

(Incident light conditions)

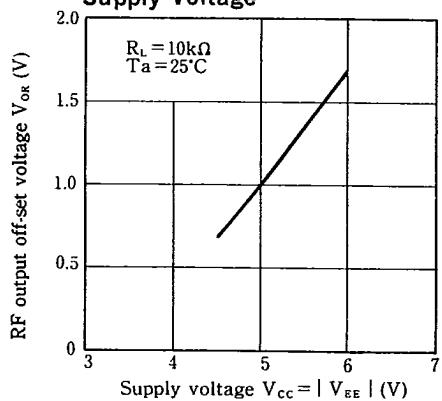
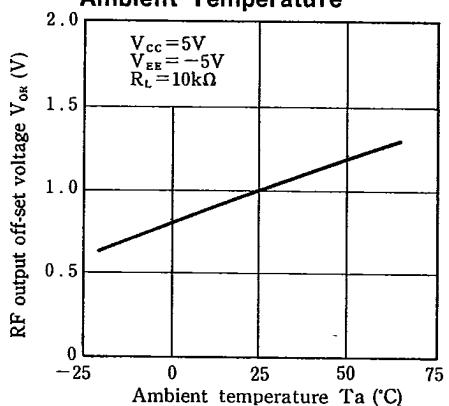
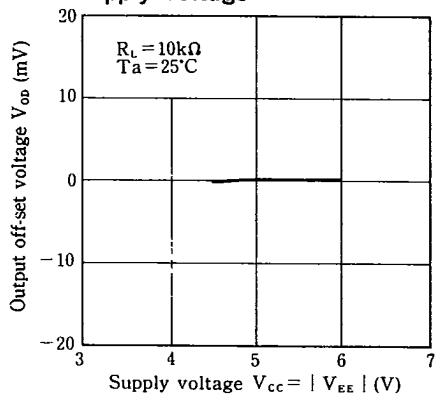
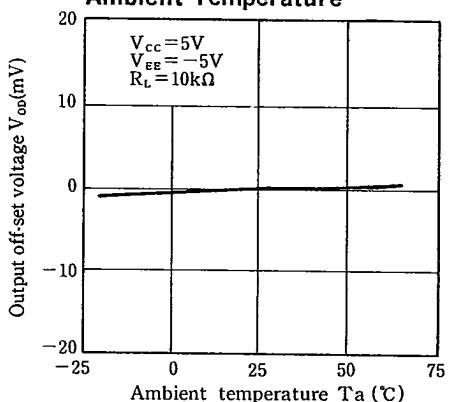
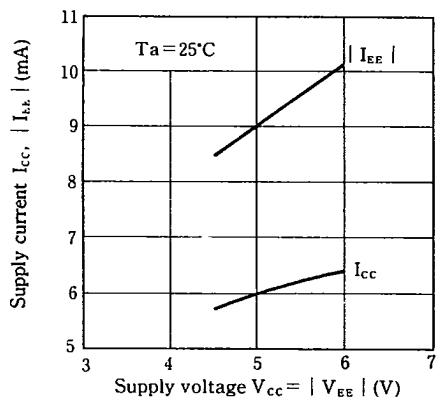
- (i) Laser diode shall be used as a light source.(780nm±5nm)
- (ii) Incident light intensity shall be $\begin{cases} 30\mu\text{W} & \text{at not modulating} \\ 30+10\sin(t)\mu\text{W} & \text{at modulating.} \end{cases}$
- (iii) Diameter of spot during irradiance shall be 40μm, and the center of photodiode shall be positioned at the center of spot.

Fig. 1 Power Dissipation vs. Ambient Temperature**Fig. 3 Response Frequency vs. Supply Voltage****Fig. 5 RF Output Noise Level vs. Supply Voltage****Fig. 2 Sensitivity vs. Input Signal Frequency****Fig. 4 Response Frequency vs. Ambient Temperature****Fig. 6 RF Output Noise Level vs. Ambient Temperature**

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Fig. 7 RF Output Off-set Voltage vs. Supply Voltage**Fig. 8 RF Output Off-set Voltage vs. Ambient Temperature****Fig. 9 Output Off-set Voltage vs. Supply Voltage****Fig. 10 Output Off-set Voltage vs. Ambient Temperature****Fig. 11 Supply Current vs. Supply Voltage**

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