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

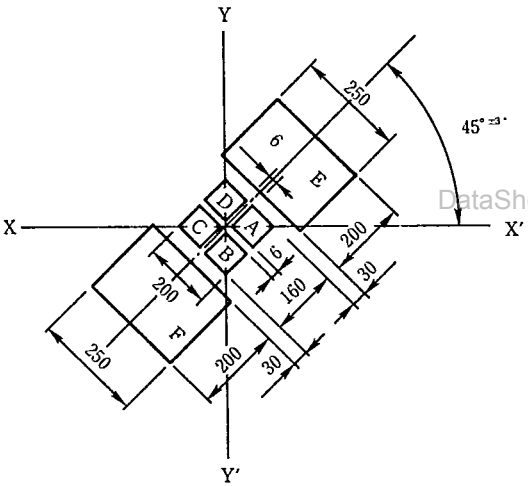
■ Features

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

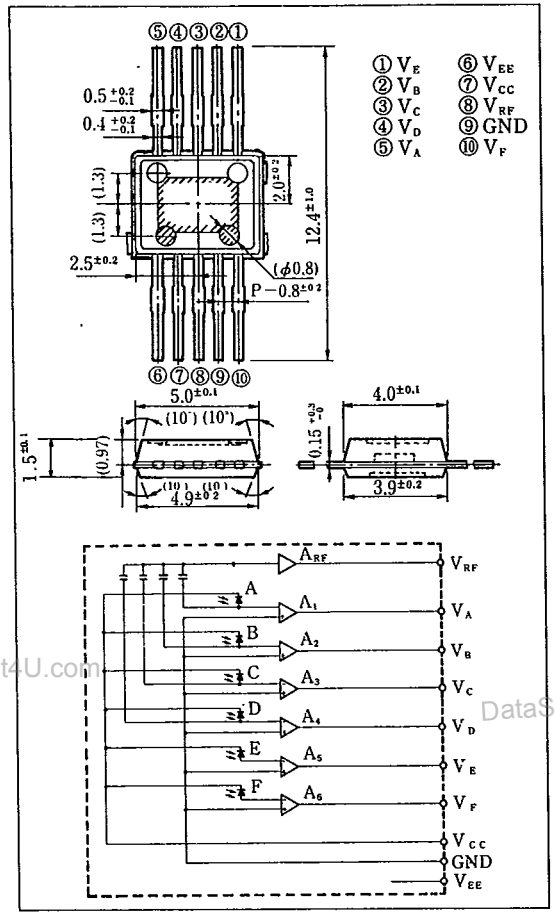
■ Applications

1. Laser disk players
2. CDVs

Enlarged drawing of detector portion (Unit: μm)



■ Outline Dimensions (Unit: mm)



※ 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
*1Soldering temperature	T_{sol}	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)

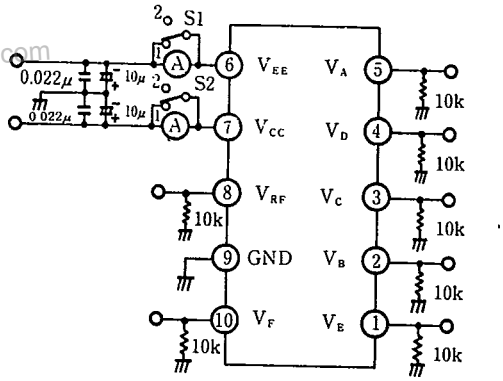
Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit	Applicable terminals
Supply current 1	I_{CC}	No light	—	6	10	mA	
Supply current 2	I_{EE}	No light	−14	−9	—	mA	
RF output off-set voltage	V_{OR}	No light	0	1.0	2.0	V	V_{RF}
Output off-set voltage	V_{OD}	No light	−20	0	+20	mV	V_A, V_B, V_C V_D, V_E, V_F
Extremes 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_A, V_B, V_C V_D, V_E, V_F
Response frequency	*2f_{CRFL}	R_L=10kΩ C_L=10pF −3dB	—	25	35	kHz	V_{RF}
	*2f_{CRFH}		15	20	—	MHz	V_{RF}
	*3f_{CF}		15	25	—	kHz	V_A, V_B V_C, V_D
	*3f_{CT}		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 { 30μW at not modulating / 30+10 sin(t)μW at modulating.
(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

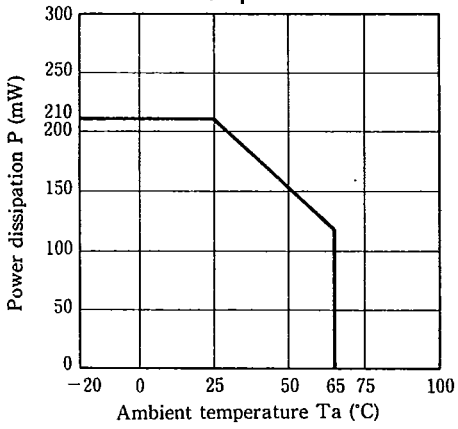


Fig. 2 Sensitivity vs. Input Signal Frequency

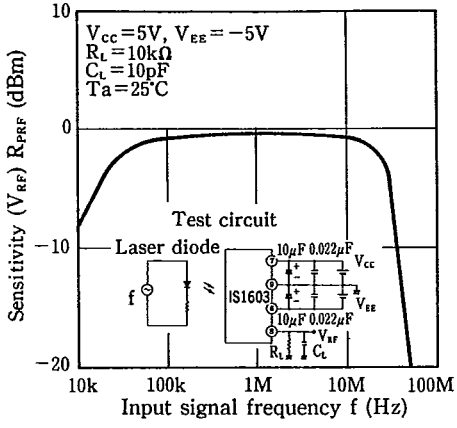


Fig. 3 Response Frequency vs. Supply Voltage

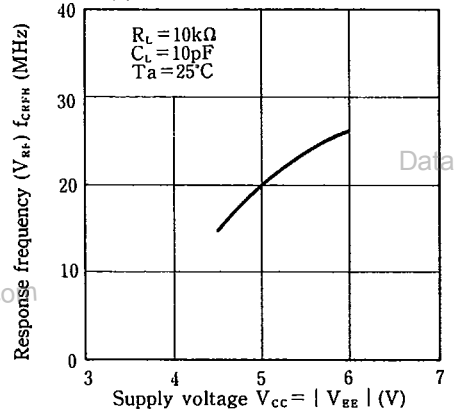


Fig. 4 Response Frequency vs. Ambient Temperature

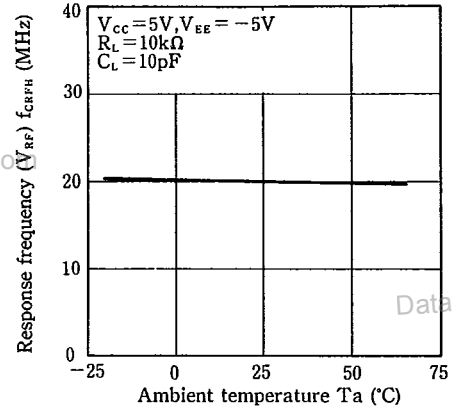


Fig. 5 RF Output Noise Level vs. Supply Voltage

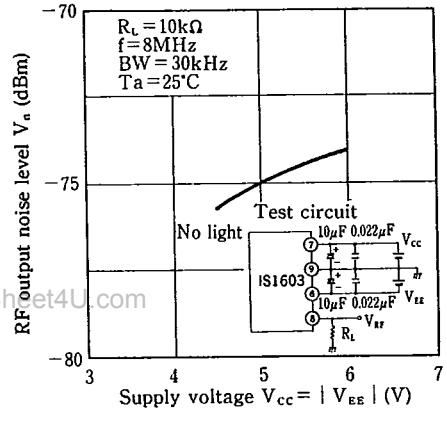


Fig. 6 RF Output Noise Level vs. Ambient Temperature

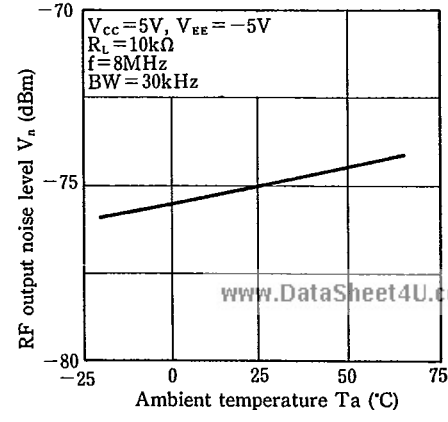


Fig. 7 RF Output Off-set Voltage vs. Supply Voltage

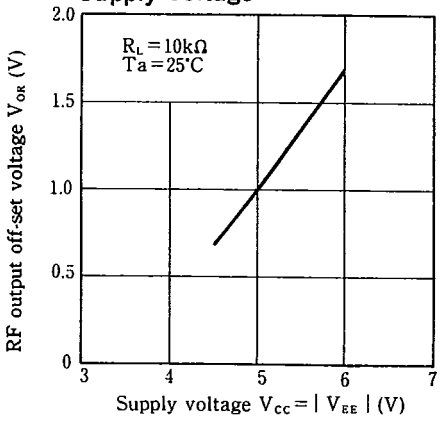


Fig. 8 RF Output Off-set Voltage vs. Ambient Temperature

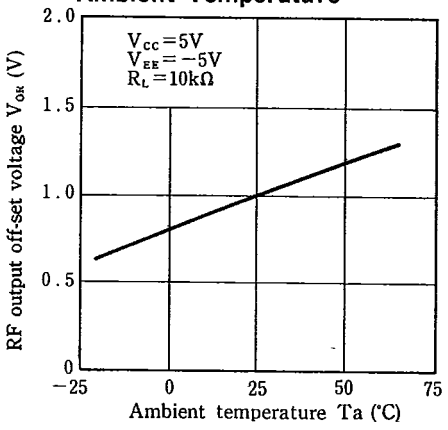


Fig.9 Output Off-set Voltage vs. Supply Voltage

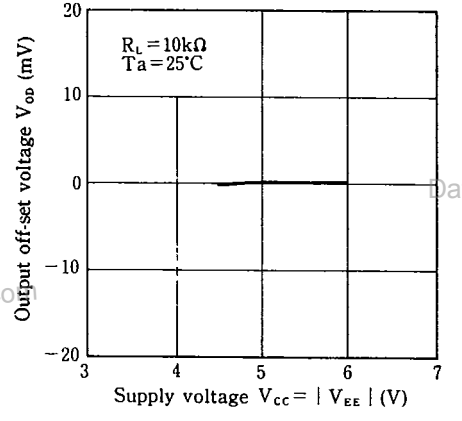


Fig.10 Output Off-set Voltage vs. Ambient Temperature

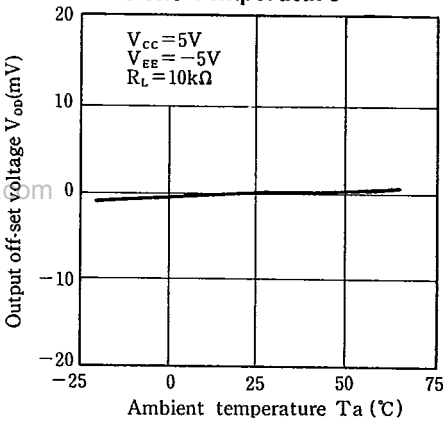


Fig. 11 Supply Current vs. Supply Voltage