

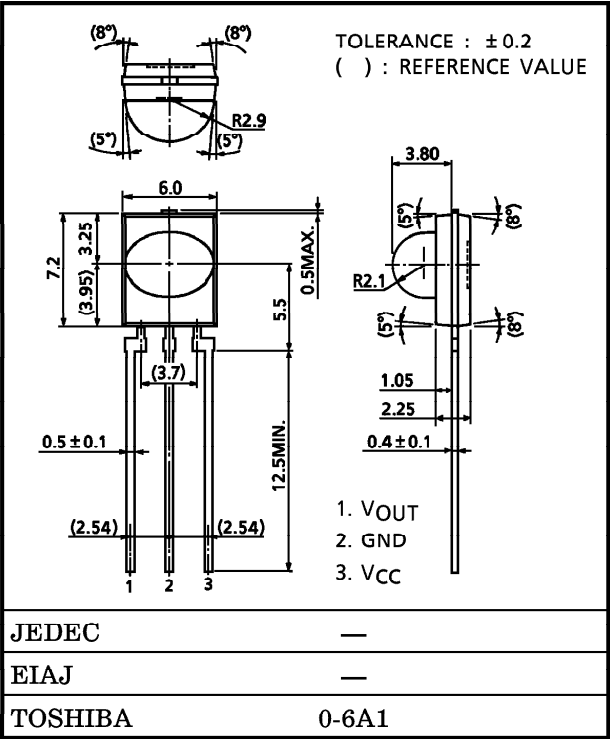
TOSHIBA PHOTO IC Si MONOLYTHIC PHOTO IC

TPS831

HIGH-SPEED OPTICAL REMOTE CONTROLLERS  
CORDLESS CONTROLLERS FOR VIDEO-GAMES  
ELECTRONIC ORGANIZERS AND OTHER NEW  
PORTABLE INFORMATION TOOLS  
IR DATA COMMUNICATION

- The TPS831 is a photo IC which includes a photodiode, I-V converter, band-pass filter and AGC amplifier on a single chip.
- The device's carrier frequency is as follows  
:  $f_0=455\text{kHz}$
- The device's supply voltage is as follows  
:  $V_{CC}=5\text{V}$
- Visible light cut-off frequency : 800nm
- The TLN105B and TLN115A are available as infrared LEDs for remote controllers.

Unit : mm



Weight : 0.3g (Typ.)

MAXIMUM RATINGS (Ta = 25°C)

CHARACTERISTIC	SYMBOL	RATING	UNIT
Supply Voltage	VCC	7	V
Operating Temperature Range	Topr	-20~60	°C
Storage Temperature Range	Tstg	-30~100	°C
Soldering Temperature Range (5s)	Tsol	260	°C

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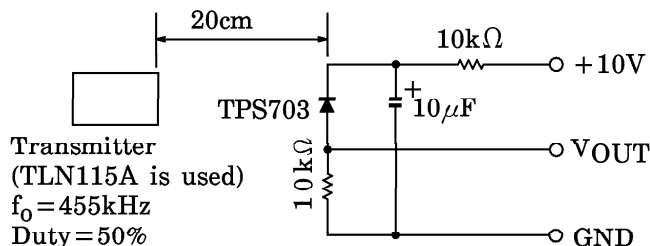
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OPTO-ELECTRICAL CHARACTERISTICS ( $V_{CC} = 5V$ ,  $T_a = 25^\circ C$ ,  $C = 1000pF$  : Note 1)

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Supply Voltage	$V_{CC}$	—	3	5	7	V
Supply Current	$I_{CC}$	$E = 0$	—	1.2	3.0	mA
Electromagnetic Sensitivity	$E_S$	(Note 5)	—	250	—	$V_{p-p}/m$
Transmission Range	$L$ (Note 3)	The burst wave shown in (Note 4) is transmitted by a standard transmitter. (Note 2)	3	5	—	m
High-Level Output Voltage	$V_{OH}$	External light intensity $< 500lx$ Output Current $< 10\mu A$	4.0	—	—	V
Low-Level Output Voltage	$V_{OL}$		—	—	0.5	V
ON Pulse Width	$T_{ON}$	External light intensity $< 500lx$ Output Current $< 10\mu A$	16	25	40	$\mu s$
OFF Pulse Width	$T_{OFF}$		—	63	—	$\mu s$
Carrier Frequency	$f_0$	—	—	455	—	kHz
Radiation Angle	$\theta_H$	Horizontal angle, $L/2$ (Note 6)	$\pm 55$	$\pm 63$	—	$^\circ$
	$\theta_V$	Vertical angle, $L/2$ (Note 6)	$\pm 25$	$\pm 30$	—	$^\circ$

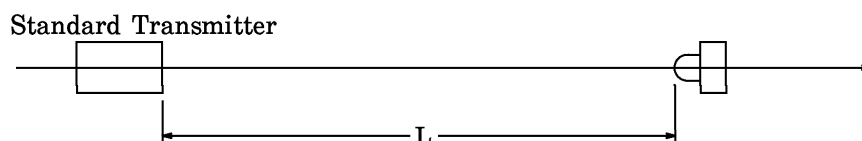
(Note 1) Measurements for the TPS831 are based on a standard circuit that includes a 1000pF capacitor between  $V_O$  and GND to prevent oscillation.

(Note 2) Standard Transmitter

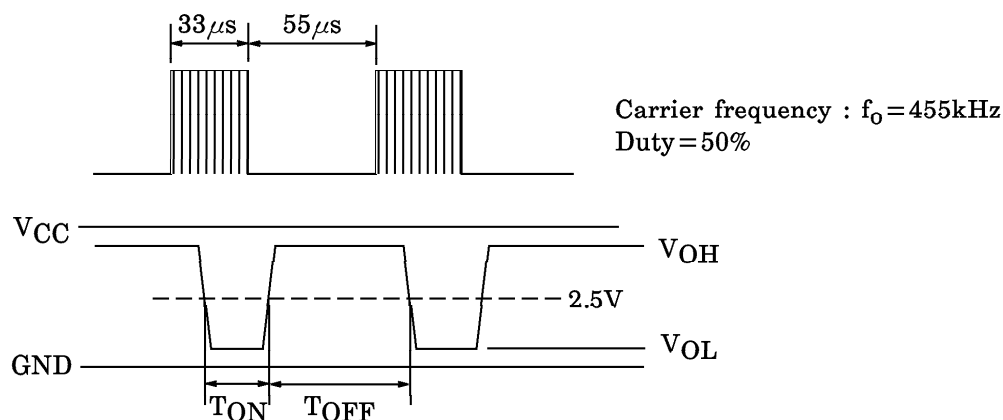


In the figure above, the transmitter shall be set as the output  $V_{OUT}$  will be 80mVpp. The TPS703 in this application has a short circuit current  $I_{sc} = 1.24\mu A$  measured at  $E = 0.1mW/cm^2$ . ( $E$  is the radiant incidence using a CIE standard light source A)

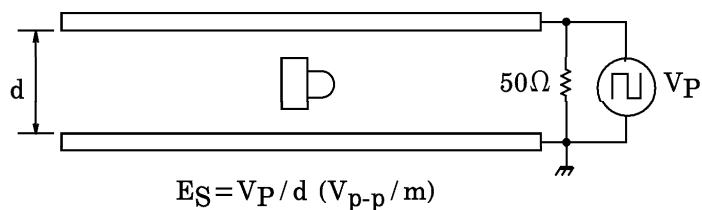
(Note 3) Transmission Distance  $L$



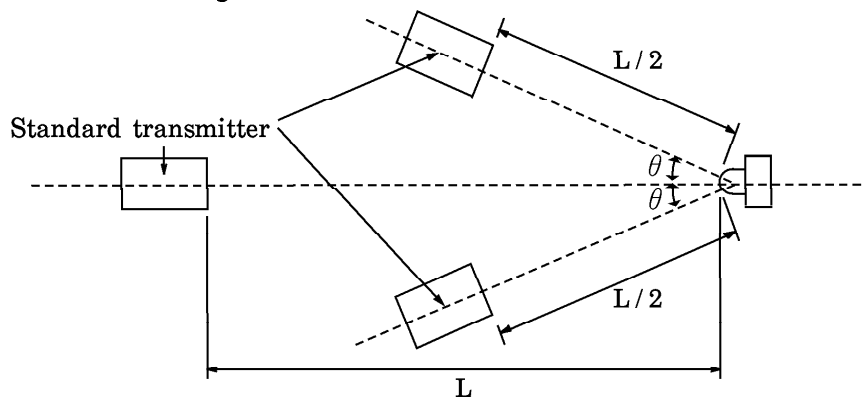
(Note 4) Burst Wave



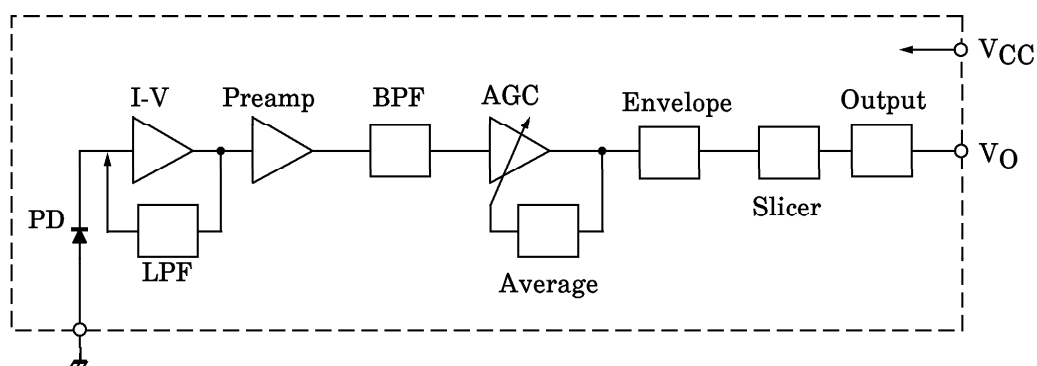
## (Note 5) Electromagnetic Sensitivity



## (Note 6) Radiation Angle



## Circuit Block Diagram



## PRECAUTIONS

1. If a lead is formed, it should be formed at a distance of 2mm from the body of the device. Forming the lead should not cause stress to the body of the device. Soldering must be performed after lead forming.
2. Insert a bypass condenser of up to  $0.01\mu\text{F}$  between  $V_{CC}$  and GND near the device to stabilize the power supply line.
3. Within  $100\mu\text{s}$  of  $V_{CC}$  turning on, the output voltage changes to stabilize the inner circuit.

