

Receiver IC for infrared remote control

TSA9455/TSA9456

GENERAL DESCRIPTION

The TSA9455 and TSA9456 are bipolar IC's designed to perform all filter, amplifier and pulse shaping functions required for a fully integrated IR-receiver. The typical signal sent from a IR-transmitter may be biphase coded or pulse distance coded.

FEATURES

- On board voltage reference and ripple rejection.
- Automatic bias level control input stage providing rejection of sunlight and incandescent lamp interferences.
- Limiter.
- Band-pass filter with internal capacitors.
- Amplifiers with controlled gain (AGC) by means of an external capacitor.
- Pulse shaper.
- LS-TTL compatible output buffer.
- Active HIGH output (TSA9455).
- Active LOW output (TSA9456).

QUICK REFERENCE DATA

SYMBOL	PARAMETER	MIN.	TYP.	MAX.	UNIT
V_P	supply voltage range	4	4.5	5	V
I_P	supply current (see note 1)	-	-	2.2	mA
f_o	carrier frequency	-	455	-	kHz
T_{amb}	operating ambient temperature range	-40	-	+85	°C

Note

1. When the output is not loaded.

PINNING

SYMBOL	PIN	DESCRIPTION
-	1	n.c.
INPUT	2	input signal
GND	3	ground
V_P	4	supply voltage
OUTPUT	5	output signal
R_{ref}	6	reference voltage and current input
CAGC	7	AGC control
-	8	n.c.

ORDERING AND PACKAGE INFORMATION

EXTENDED TYPE NUMBER	PACKAGE			
	PINS	PIN POSITION	MATERIAL	CODE
TSA9455, TSA9456	8	DIL	plastic	SOT96A

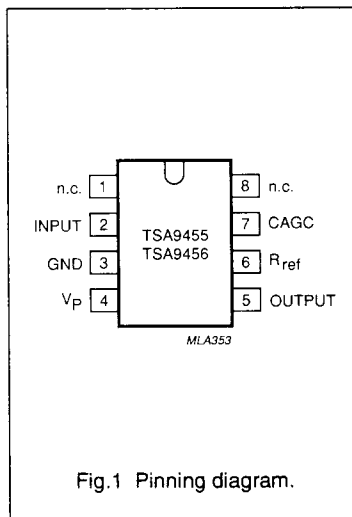
LIMITING VALUES

In accordance with the Absolute Maximum System (IEC 134)

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_P	supply voltage		-0.3	6.5	V
V_O	output voltage		-0.3	6.5	V
I_O	output current DC		-	note 1	mA
P_d	total power dissipation		-	note 1	mW
T_{stg}	storage temperature range		-40	+85	°C
T_{amb}	operating ambient temperature range		-40	+85	°C
T_j	operating junction temperature		-	150	°C

Note

1. Value to be fixed.



Receiver IC for infrared remote control

TSA9455/TSA9456

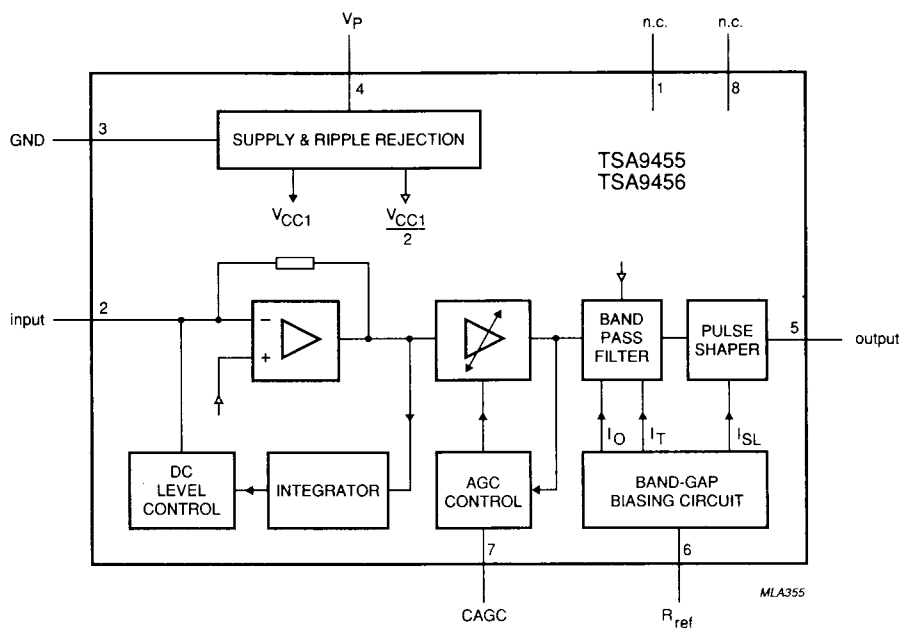


Fig.2 Block diagram.

Receiver IC for infrared remote control

TSA9455/TSA9456

CHARACTERISTICS

 $V_P = +5\text{ V}$; $T_{\text{amb}} = +25\text{ }^{\circ}\text{C}$, unless otherwise specified

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
Supply						
V_P	supply voltage		4	4.5	5	V
I_P	supply current		-	-	note 2	mA
Input stage						
-	DC voltage		-	1.4	-	V
-	compensated DC signal		-	-	3	mA
-	AC signal		-	note 2	-	
Z_i	input impedance		-	note 2	-	
-	sensitivity	note 1	-	note 2	-	nA
Band-pass filter						
f_0	centre frequency		-	455	-	kHz
$\frac{\Delta\phi_0}{f_0}$	tolerance on f_0	$R_{\text{ref}} = \text{note 2}$	-	15	-	%
BW	bandwidth (-3 dB)		-	note 2	-	MHz
AGC detector						
V_{AGC}	control voltage		note 2	-	note 2	V
A_{AGC}	AGC control range		55	60	65	dB
t_{attack}	attack time, see Fig.3	CAGC = note 2	-	10	-	μs
t_{hold}	hold time see, Fig.3	CAGC = note 2	-	1	-	ms
Output						
V_{OH}	signal output voltage, HIGH		3	-	-	V
I_{OH}	signal output current, HIGH		-200	-	-	μA
V_{OL}	output voltage, LOW		0	-	0.4	V
I_{OL}	signal output current, LOW		-	-	1	mA
Switching time (see Fig.4)						
t_r	rise time	$C_L = 15\text{ pF}$	-	note 2	-	ns
t_f	fall time	$C_L = 15\text{ pF}$	-	note 2	-	ns

Notes

1. Peak value of current pulses at f_0 necessary to create correct data at the output. Duty factor = 50%;
 $I_{\text{DC}} = 0$.
2. Value to be fixed.

Receiver IC for infrared remote control

TSA9455/TSA9456

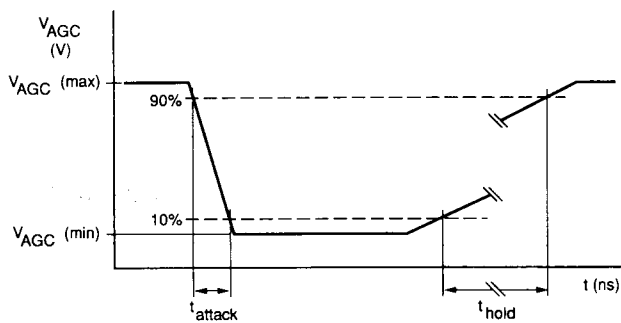


Fig.3 AGC attack and hold times.

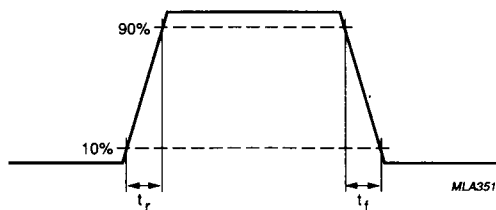
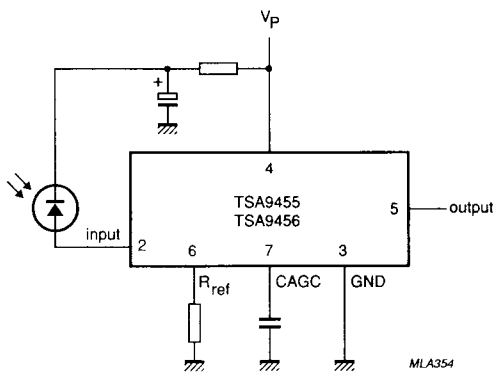
Fig.4 Switching times with a $C_L = 15$ pF at the output.

Fig.5 Typical application diagram.