HT12M
2^{12} Decoder Doorbell

Features

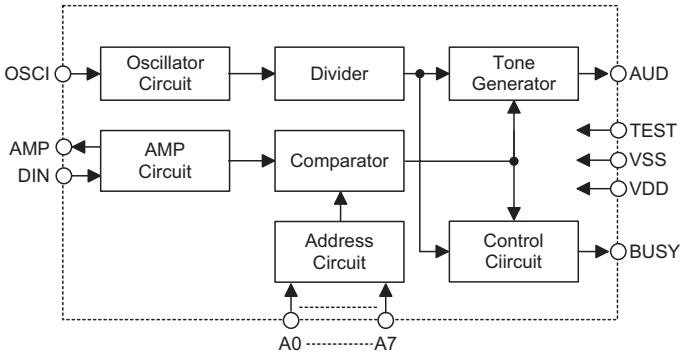
- Operating voltage: 2.4V~5.0V
- Built-in AMP
- 2channel dual tone generator
- One Pin oscillator
- Current type D/A Output
- HT12E encoder pair with
- Tone optional: Ding-Dong/Westminster tunes
- 16-pin DIP package

General Description

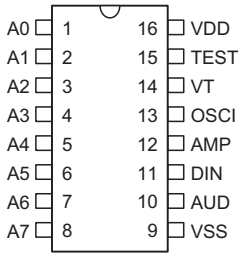
The main application area for the HT12M device is for remote control doorbells working together with HT12E. Containing all the functions of the Holtek HT12D decoder and with an added amplifier and melody generator, the device eliminates the need for customers to incorporate an external op-amp and melody generator IC within their product applications, in the process significantly reducing overall product costs.

In addition to being fully compatible with the HT12D circuitry, the device includes the following features; internal Inverting AMP with can also operate as standard independent inverter, internal 2 channel tone generator and current type Audio output.

Block Diagram

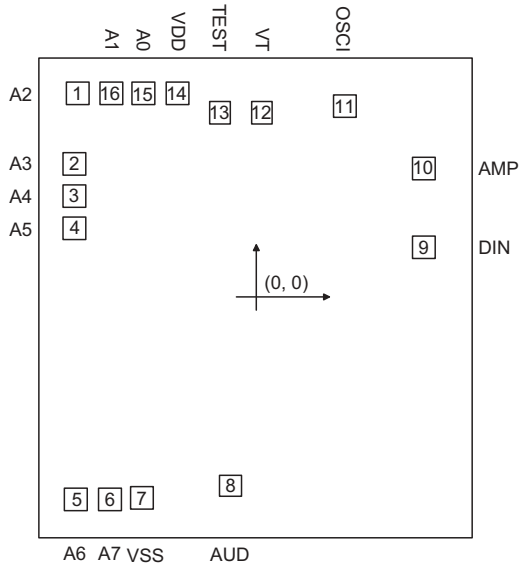


Pin Assignment



HT12M
– 16 DIP-A

Pad Assignment



Chip Size: 1530 × 1690 μm

Pad Coordinates

Unit: μm

Pad No.	X	Y
1	–610.00	701.90
2	–622.00	461.60
3	–622.00	350.60
4	–622.00	239.70
5	–616.00	–695.20
6	–502.00	–695.20
7	–388.50	–687.70
8	–87.95	–647.80
9	575.80	172.40
10	575.80	444.20
11	308.30	660.40
12	22.10	635.90
13	-122.40	638.40
14	-270.40	701.90
15	–384.50	701.90
16	–495.50	701.90

* The IC substrate should be connected to VSS in the PCB layout artwork.

Pin Description

Pin No.	Pin Name	I/O	Internal Connection	Description
1~8	A0~A7	I	NMOS Open Drain	Address pin.
9	VSS	—	—	Negative power supply, ground
10	AUD	O	PMOS Open Drain	Audio out
11	DIN	I	COMS In	Serial data input
12	AMP	O	CMOS	Amp feed back
13	OSCI	I	—	Oscillator input pin.
14	VT	O	CMOS	Busy, data valid
15	TEST	I	CMOS In	Test pin.
16	VDD	—	—	Positive power supply

Absolute Maximum Ratings

Supply Voltage .....–0.3V to 5.5V

Input Voltage .....V_{SS}–0.3V to V_{DD}+0.3V

Storage Temperature .....–50°C to 125°C

Operating Temperature .....–25°C to 70°C

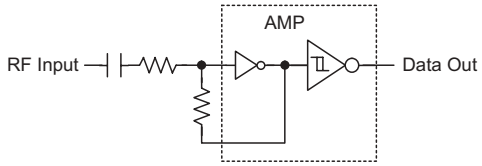
Note: These are stress ratings only. Stresses exceeding the range specified under "Absolute Maximum Ratings" may cause substantial damage to the device. Functional operation of this device at other conditions beyond those listed in the specification is not implied and prolonged exposure to extreme conditions may affect device reliability.

D.C. Characteristics

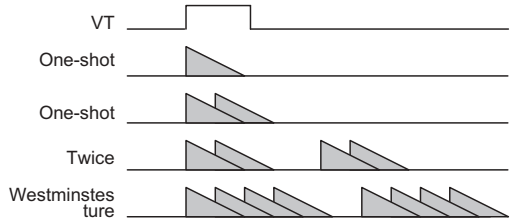
Symbol	Parameter	Test Conditions		Min.	Typ.	Max.	Unit
		V_{DD}	Conditions				
V_{DD}	Operating Voltage	—	—	2.4	—	5	V
I_{STB}	Standby Current	5V	OSC stop amp off	—	0.1	1	μA
		5V	OSC stop amp on	—	10	20	μA
I_{DD}	Operating Current	5V	No load f_{OSC}=150kHz	—	1.5	2	mA
I_{AUD}	AUD output current	5V	Transistor B load	3	5	—	mA
I_{VT}	VT Output Source Current	5V	V_{OH}=4.5V	–2	–3	—	mA
	VT Output Sink Current	5V	V_{OL}=0.5V	2	3	—	mA
V_{IH}	High Input Voltage	5V	—	3.5	—	5	V
V_{IL}	Low Input Voltage	5V	—	0	—	1	V
f_{OSC}	Oscillator Frequency	5V	ROSC=820kΩ	—	190	—	kHz

Functional Description

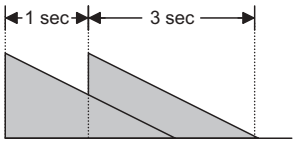
Built-in inverter amp

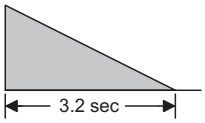


Trigger mode



Single tone has 4 second total length, dual tone has 1 second total length.





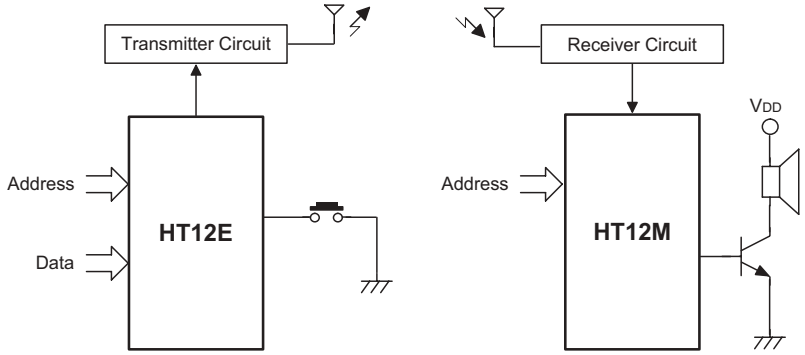
The Ding-Dong sound: is determined by the D8~D11 pins on the HT12E. While the Re-trigger/Non-trigger function is determined by the D11 pin on the HT12E.

	D11	D10	D9	D8	Sound	Notes
1		0	0	0	Me	1
2		0	0	1	Me Do	2
3		0	1	0	Me Do — Me Do	Repeat
4		0	1	1	Me/Do	Single tone
5		1	0	0	Me Do Re So — So Re Me Do	Westminster tune
6		1	0	1	Me/Do Do/So	Double tone
7		1	1	0	So Re Me Do	4
8		1	1	1	Me/Do Do/So — Me/Do Do/So	Dual Tone-repeat

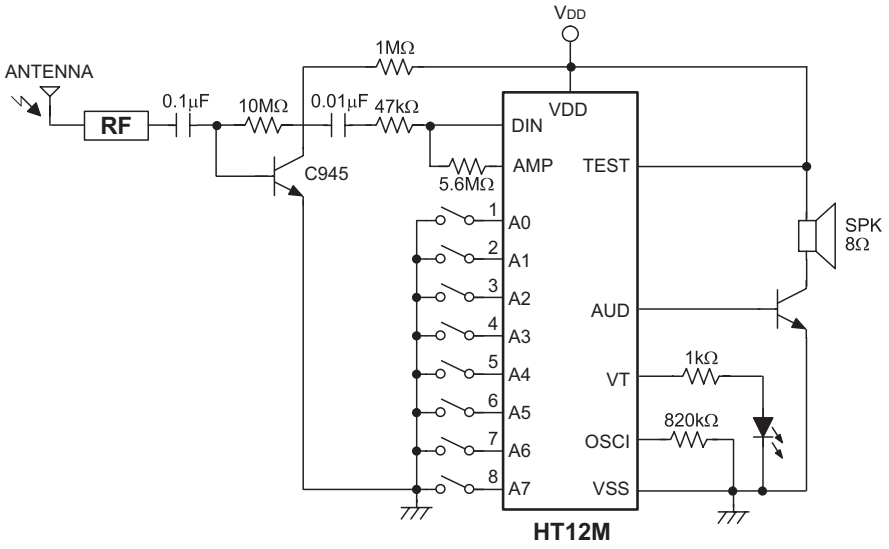
Section time: 0.8secretary × 2 = 1.6sec

Application Circuit

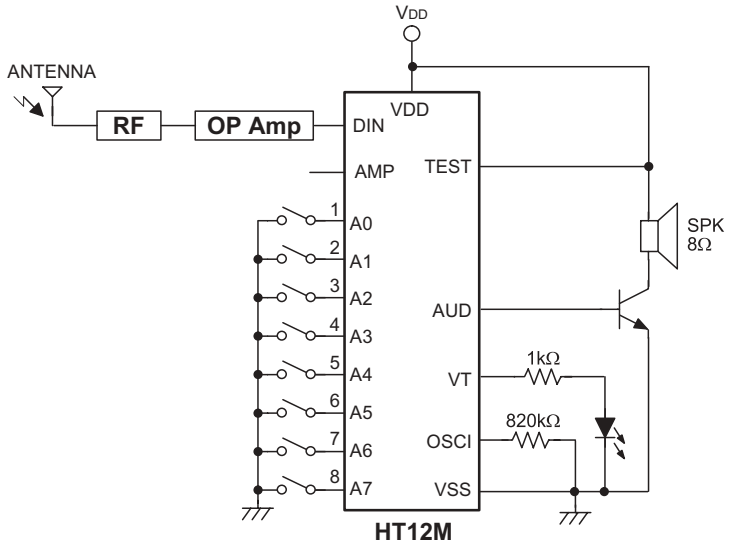
HT12E/HT12M pairing application circuit



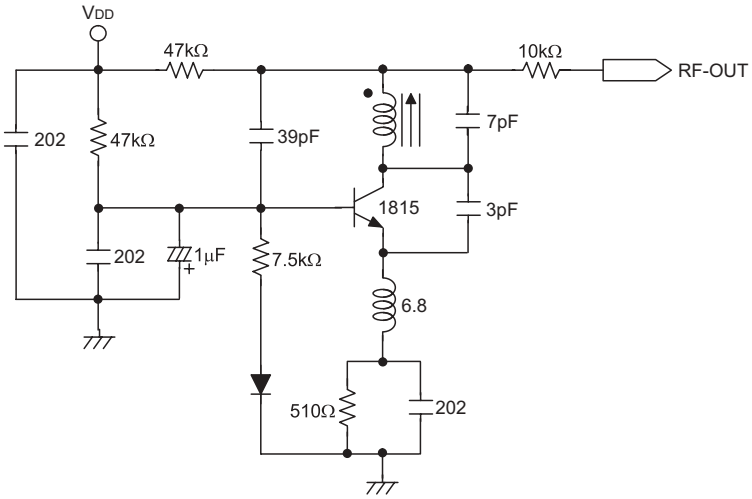
Using internal OP amplifier circuit



Using external OP amplifier circuit



Typical RF-Receiver circuit



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