Description :

RT6688 IS A RF REMOTE CONTROL DECODER AND ENCODER PAIRED WITH RT6588 ENCODER. MAXIMUM UP TO 12 BITS OF TRI-STATE ADDRESS PIN PROVIDING UP TO 531,441 ADDRESS CODES.

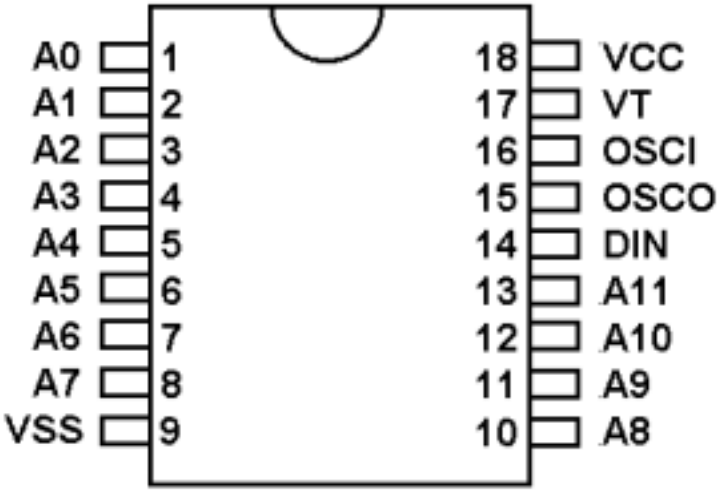
FEATURES :

1. LOW POWER CONSUMPTION.
2. UP TO 12 TRI-STATE CODE ADDRESS PINS.
3. UP TO 6 DATA PINS OUTPUT.
4. MAXIMUM OPERATING OUTPUT: 4V~15V.
5. SINGLE RESISTOR OSCILLATOR.
6. TWO KIND OF DATA OUTPUT: LATCH OR MOMENTARY.

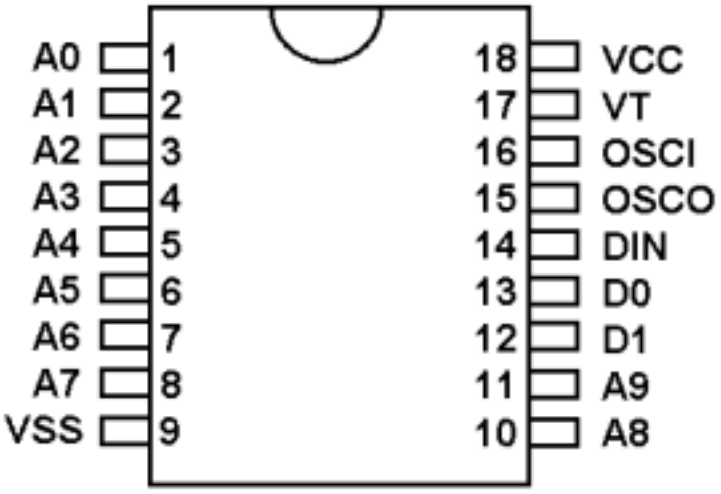
APPLICATIONS :

1. CAR AND MOTORCYCLE SECURITY SYSTEMS.
2. DOORBELL.
3. HOME APPLIANCES REMOTE CONTROL.
4. REMOTE CONTROL TOY.
5. HOME AUTOMATION SYSTEMS AND OTHER REMOTE CONTROL APPLICATIONS.

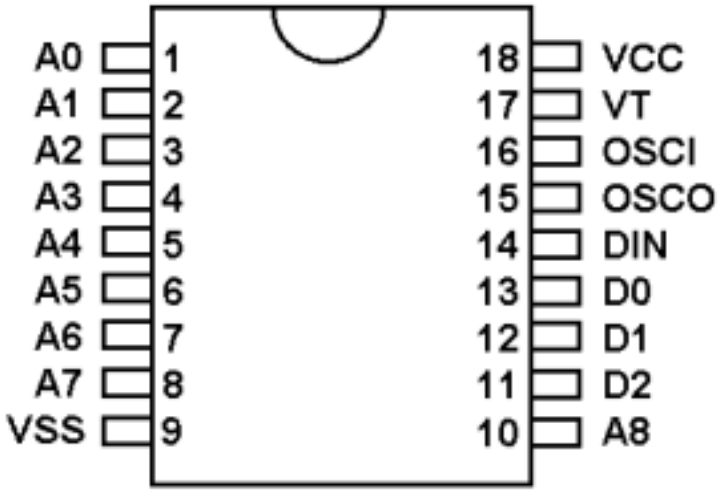
PIN ASSIGNMENT :



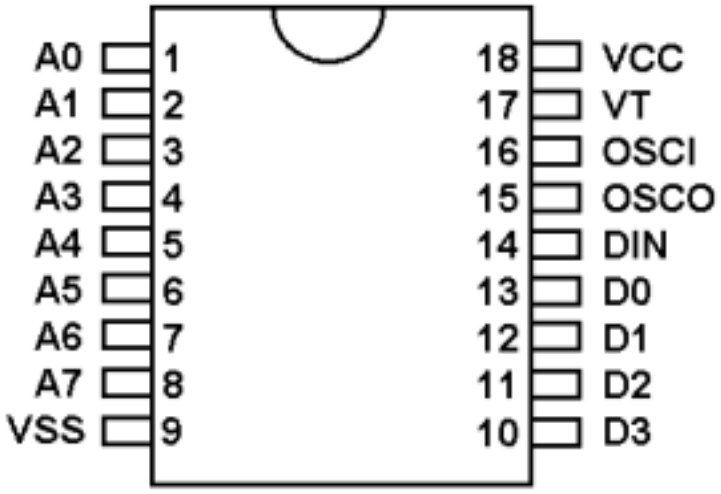
RT6688P



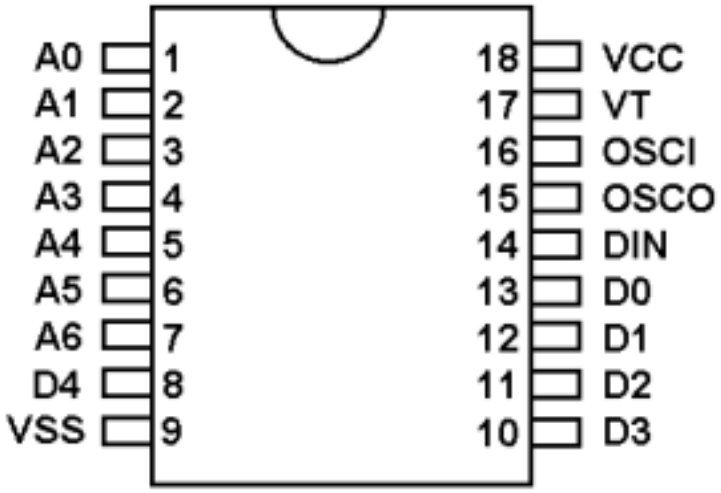
RT6688P M2/L2



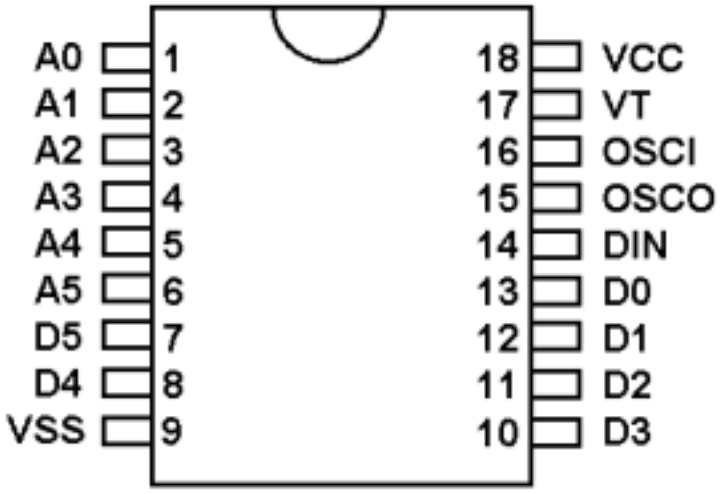
RT6688P M3/L3



RT6688P M4/L4



RT6688P M5/L5



RT6688P M6/L6

PIN DESCRIPTION :

PIN NO.	PIN Name	DESCRIPTION	I/O
1~6	A0~A5	6 ADDRESS INPUT PIN. CAN BE SET IN TRI-STATE. EACH PIN CAN BE SET TO ”0”, “1” OR “F” FLOATING.	I
7~8 10~13	A6/D5~A11/D0	EACH OF THOSE 6 INDIVIDUAL PIN CAN BE SET FOR ADDRESS OR DATA OUTPUT, RT6688 HAS FEW VERSION TO SELECT BY INDIVIDUAL ADDRESS AND DATA BIT. IF IT IS SET AS A INPUT PIN, THEN IT WILL BE THE SAME AS A0~A5. IF IT IS SET AS A OUTPUT PIN, THEN THE RECEIVING CODE ADDRESS AND THE CODE ADDRESS OF RT6688 IS MATCH, THE DATA WILL SET TO RT6688 TO DATA OUTPUT.	I/O
14	DIN	TRANSMISSION INPUT PIN FOR RT6688 TO RECEIVE, IT CONTAINED A SERIAL OF DATA INPUT, FULL DETAIL DESCRIBE IN FURTHER PAGE SHOWN.	I
15	OSCI	WHEN THIS TWO PINS IS CONNECTED BY A RESISTOR, THE OSCILLATION FREQUENCY WILL BE DEFINED BY RT6688 INTERNALLY.	I
16	OSCO		O
17	VT	VALID TRANSMISSION SIGNAL . IF RT6688 RECEIVED A VALID CODE, IT WILL OUTPUT “H”, ELSE, IT WILL OUTPUT ”L”.	O
18	VCC	POSITIVE POWER SUPPLY(+4V~+15V).	
9	VSS	NEGATIVE POWER SUPPLY(0V).	

FUNCTIONAL DESCRIPTION :

RT6688 IS RF A REMOTE CONTROL DECODER AND ENCODER PAIRED WITH RT6588 ENCODER. IT ENCODES SERIAL OF CODE WORD THROUGH DIN PIN FOR INTERNAL DECODE PURPOSE. THE CODE WORD INCLUDE ADDRESS BIT, DATA BIT AND SYNC BIT, HOW TO DIFFERENCIATE A VALID TRANSMISSION?

1. WITH 2 CONTINUOUS SERIA L ADDRESS CODES MATCH WITH RT6688 SETTING ADDRESS, THE VT OUTPUT PIN WILL GO “HIGH”.

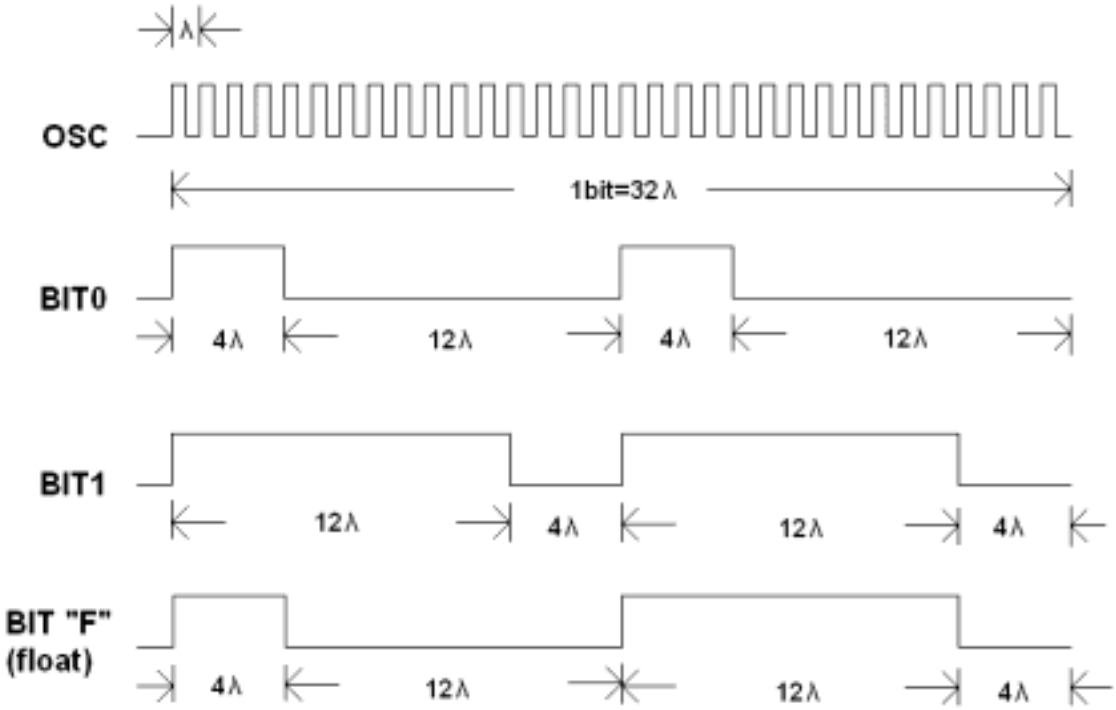
2. WITH 2 CONTINUOUS SERIAL ADDRESS AND DATA CODES MATCH WITH RT6688, IF DATA BIT DECODE TO BE “1” THEN OUTPUT WILL GO “HIGH”. IF DECODE TO BE “0” THEN OUTPUT WILL GO “LOW”.

DATA FORMAT :

CODE WORD CONSIST OF 13 DATA BIT, IT INCLUDES 12 DATA/ADDRESS BIT AND ONE SYNCHRONOUS BIT.

ADDRESS/DATA BIT WAVEFORM :

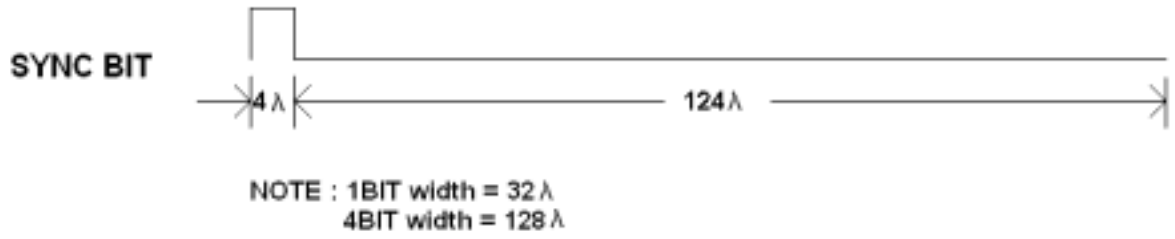
BIT CAN BE DESIGNATED AS BIT “0” , “1” OR “FLOATING” EACH PULSE CYCLE HAS 32 OSCILLATING TIME PERIOD. THE DIAGRAM BELOW ARE THE FURTHER DETAILS:



λ : OSCILLATING TIME PERIOD
ONLY ADDRESS BIT “F” IS VALID, IF IT IS A DATA BIT “F”, IT WILL DEFINED AS BIT “1”.

SYNCHRONOUS BIT WAVEFORM

THE SYNCHRONOUS BIT WAVEFORM IS 4 BITS LONG WITH 128 OSCILLATING TIME PERIOD, IT SHOWN AS BELOW:



CODE WORD：

CODE WORD CONSIST OF 13 BITS, IT TRANSMIT SERIALLY THROUGH RT6688 RECEIVING DIN INPUT PIN, THE SERIAL OF ADDRESS/DATA BIT ONLY CAN BE RECONIGNED BY THE VERSION OF RT6688 SHOWN AS THE TABLES BELOW:

RT6688

A0	A1	A2	A3	A4	A5	A6	A7	A8	A9	A10	A11	SYNC

RT6688 M2/L2

A0	A1	A2	A3	A4	A5	A6	A7	A8	A9	D1	D0	SYNC

RT6688 M3/L3

A0	A1	A2	A3	A4	A5	A6	A7	A8	D2	D1	D0	SYNC

RT6688 M4/L4

A0	A1	A2	A3	A4	A5	A6	A7	D3	D2	D1	D0	SYNC

RT6688 M5/L5

A0	A1	A2	A3	A4	A5	A6	D4	D3	D2	D1	D0	SYNC

RT6688 M6/L6

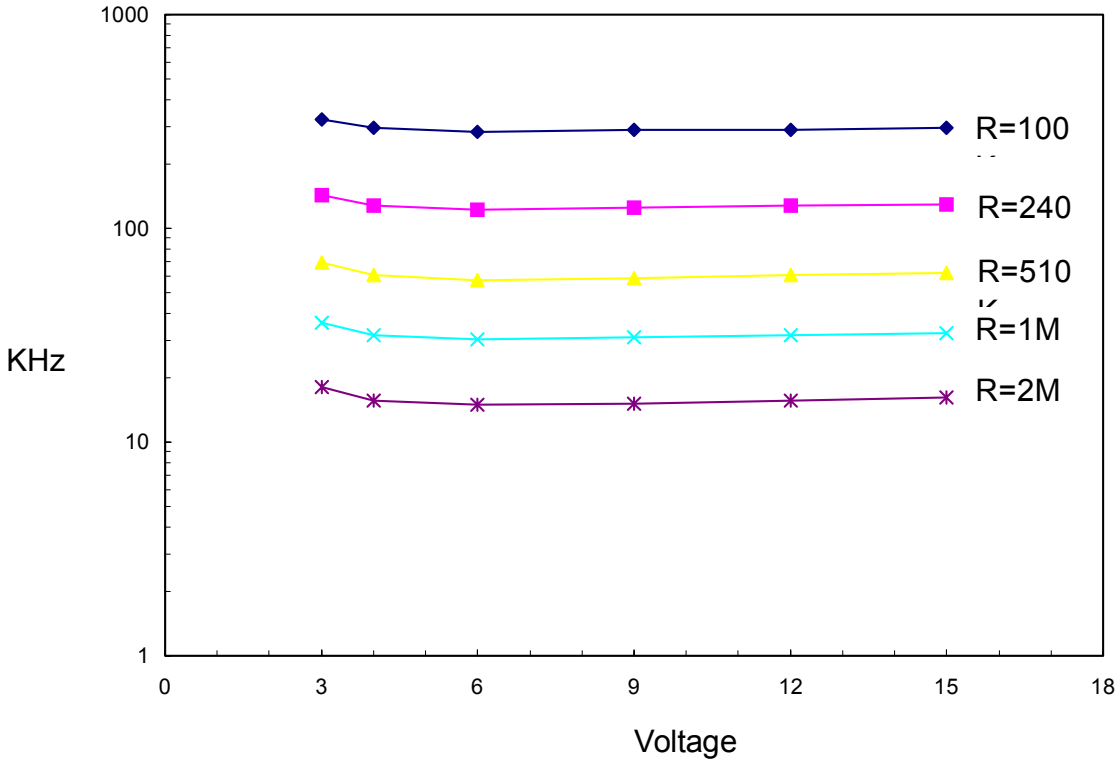
A0	A1	A2	A3	A4	A5	D5	D4	D3	D2	D1	D0	SYNC

1 CODE WORD

Mx： Momentary type.
Lx ： Latch type.

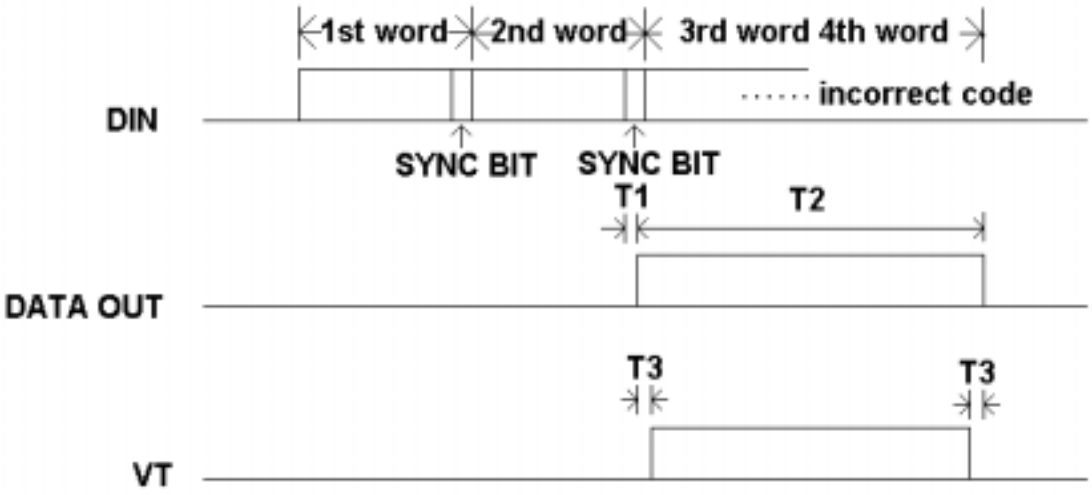
SINGLE RESISTOR OSCILLATION :

BUILT-IN OSCILLATION CIRCUIT. RT6688 ALSO ALLOW TO CONNECT EXTERNAL RESISTOR BETWEEN OSCI AND OSCO. FOR RT6688 TO DECODE A VALID WAVEFORM, THE OSCILLATION FREQUENCY OF RT6688 MUST BE 2.5 ~ 8 TIMES THEN THE TRANSMITION RT6588. THE TABLE SHOWN BELOW ARE THE TYPICAL OSCILLATOR FREQUENCY WITH VARIOUS RESISTOR VALUES FOR BOTH RT6588 AND RT6688.



VALID TRANSMISSION：

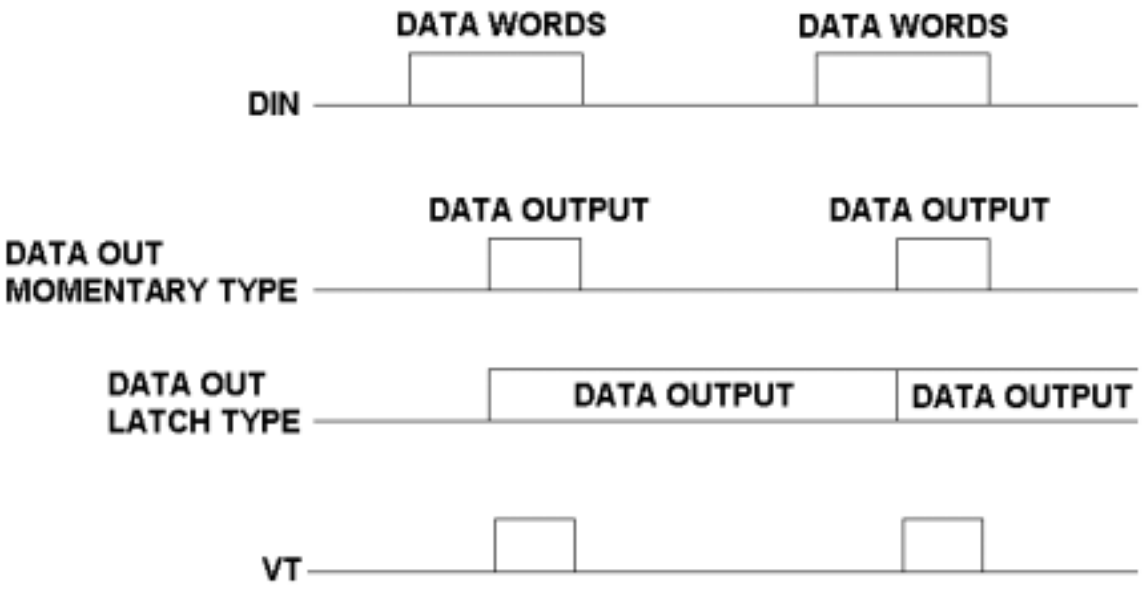
WHEN RT6688 RECEIVED A SERIAL OF CODE WORD, IT WILL DEFINE ITSELF WHETHER IT IS A VALID CODE, IF IT IS NOT, IT WILL CONSIDERED A INVALID CODE, IF IT RECEIVED A SERIAL ADDRESS/DATA CODE MATCH WITH RT6688, WITH 2 CONTINUOUS SERIA L ADDRESS CODES MATCH WITH RT6688, THEN ONLY BE CONSIDER AS A VALID CODE, VT WILL BE CHANGE TO “HIGH” ; THE FOLLOWING DIAGRAM ARE THE DATA OUTPUT TIMING DIAGRAM, 1ST AND 2ND WORD ARE CONSIDER A SERIAL VALID CODE, 3RD AND 4TH ARE CONSIDER INVALID CODE.



T1=8 osc clock
T2=2 code word width
T3=1 osc clock

LATCH & MOMENTARY :

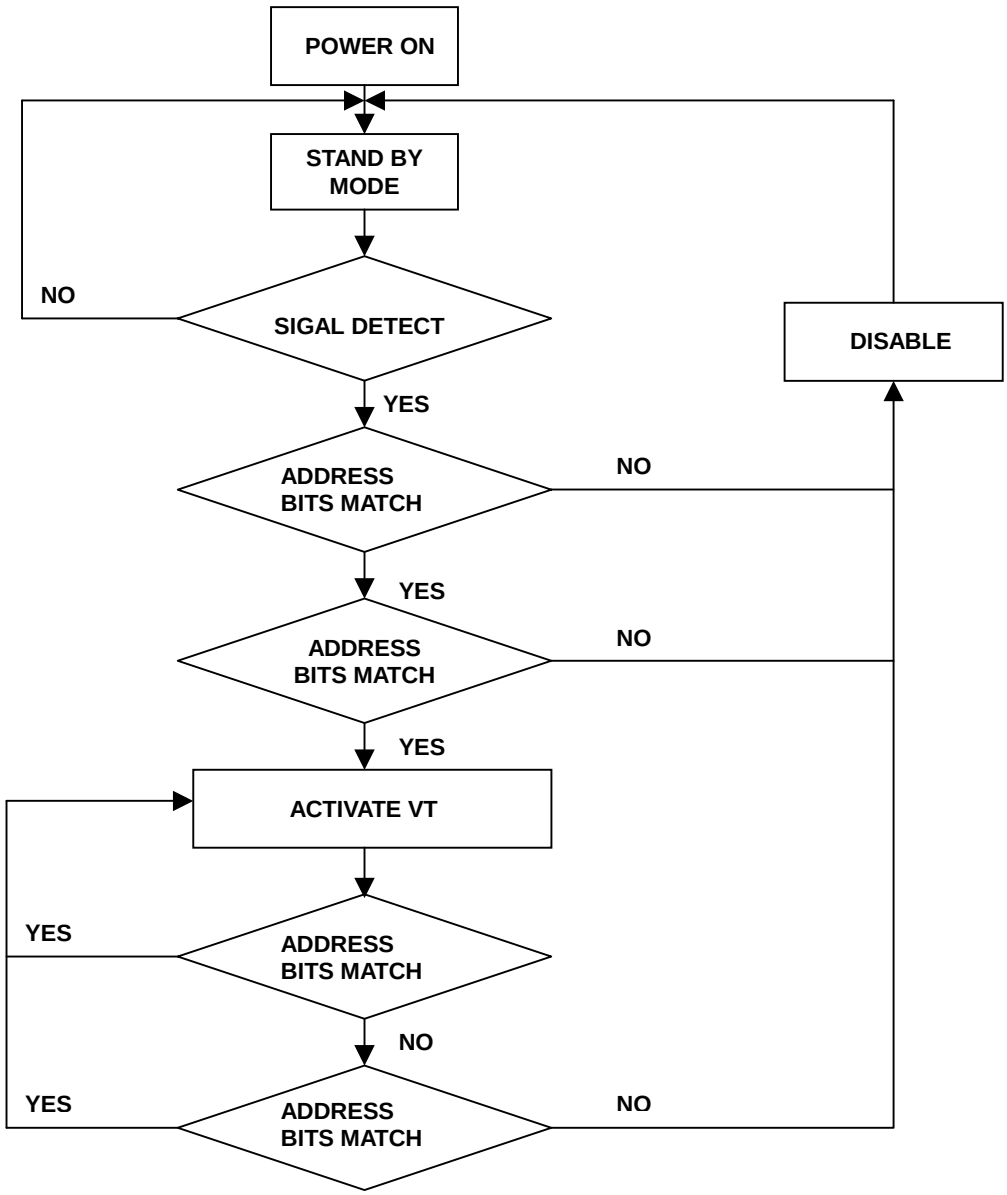
RT6688 HAVE TWO DIFFERENCE DATA OUTPUT TYPE: THE LATCH TYPE(RT6688LX) ACTIVATES THE DATA OUT DURING TRANSMISSION AND THIS DATA IS SUSTAINED IN THE MEMORY UNTIL ANOTHER DATA IS ENTERED. MOMENTARY TYPE (RT6688MX) ACTIVATES THE DATA OUT ONLY DURING TRANSMISSION. THE DATA DOES NOT REMAIN IN THE MEMORY AFTER TRANSMISSION IS COMPLETED. PLEASE REFER THE DIAGRAM AS BELOW :



FLOWCHART

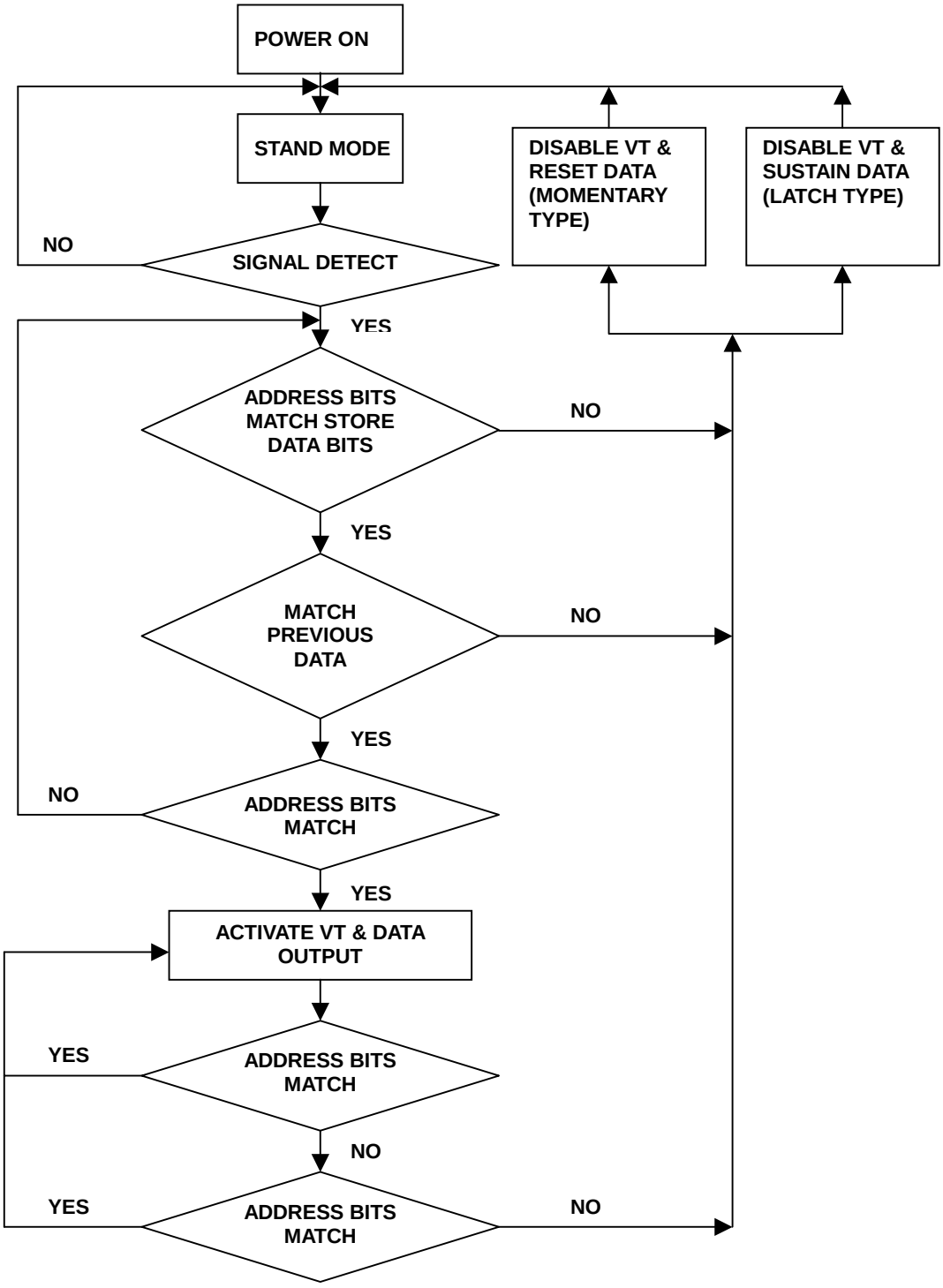
A、WITHOUT DATA OUT

1. RT6688 IS IN THE STANDY MODE WHEN THE POWER IS ON.
2. SEARCH FOR SIGNAL (SERIAL OF CODE) IF WITHOUT ANY SIGNAL, RT6688 WILL STILL REMAIN IN STANDBY MODE UNTIL THE SIGNAL IS RECEIVED, RT6688 WILL COMPARED WITH THE ADDRESS CONFIGULATION OF THE PINS.
3. AFTER COMPARING THE 2 CONTINUOUS SAME SET OF SERIAL OF CODES / ADDRESS,



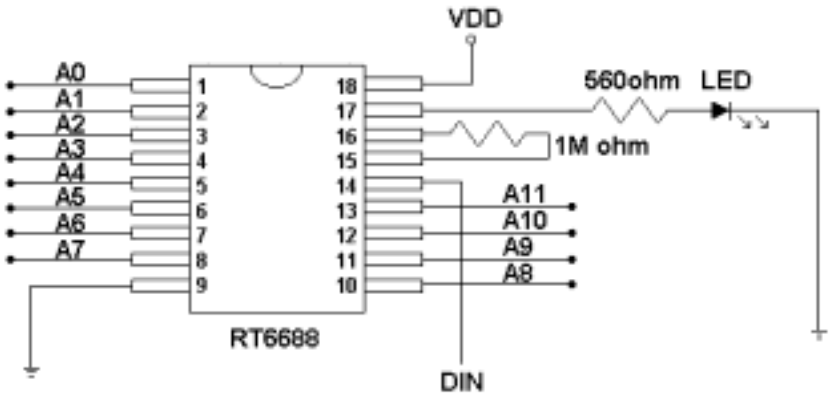
B、WITH DATA OUT

THE FLOWCHART IS SAME AS ABOVE, ONLY WITH DATA OUTPUT. IT WILL CONSIDER A VALID CODE ONLY TRANSMIT WITH 2 CONTINUOUS SAME SET OF SERIAL OF CODES / ADDRESS, THE FLOWCHART IS AS FOLLOW :



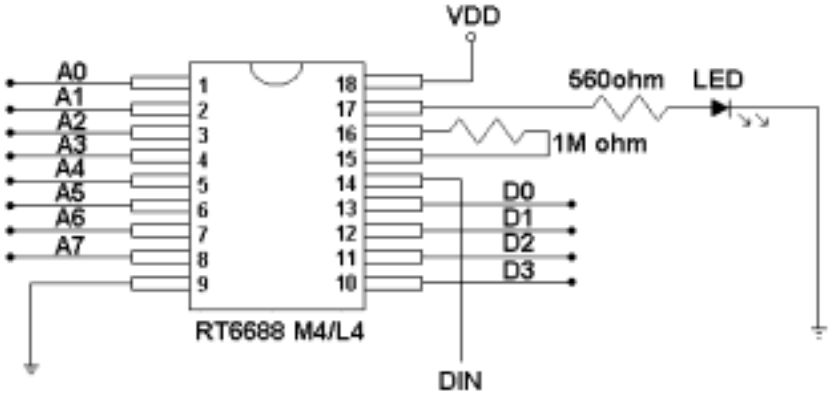
APPLICATION CIRCUIT：

RT6688 APPLICATION CORCUIT



PS. PIN 1~8, 10~13 IS 3-STATE INPUT

RT6688 M4/L4 APPLICATION CIRCUIT



PS. PIN 1~8 IS 3-STATE INPUT
PIN 10~13 IS OUTPUT

Absolute Maximum Ratings

Symbol	Parameter	Condition	Rating	Unit
V_{CC}	Supply voltage		-0.3~16.0	V
V_I	Input voltage		-0.3~Vcc+0.3	V
V_O	Output voltage		-0.3~Vcc+0.3	V
P_{dis}	Max. power dissipation	V_{CC}=12V	300	mW
T_{OP}	Operating Temperature		-20 ~ 70	℃
T_{st}	Storage Temperature		-40 ~ 125	℃

DC Electrical Characteristics

Symbol	Parameter	Condition	Min.	Typ.	Max.	Unit
V_{CC}	Supply voltage		4		15	VOLT
I_{sb}	Stand By Current	V_{CC} =12V DIN=0V OSCI=0V		0.1	1	μA
I_{OH}	Data Out Source Current	V_{CC}=12V V_{OH}=6V	-10			mA
I_{OL}	Data Out Sink Current	V_{CC}=12V V_{OH}=6V	9			mA
V_{IH}	“H” Input	VCC	0.7VCC		VCC	V
V_{IL}	“L” Input	VCC	0		0.3VCC	V