



## DESCRIPTION

SM5038RF is a remote control decoder paired with SM5028RF utilizing CMOS Technology. It has 12-bit 2-state address pins providing a 2<sup>12</sup> address codes; thereby, drastically reducing any code collision and unauthorized code scanning possibilities. SM5038RF is available in several options to suit every application needs : variable number of data output pins, latch or momentary output type.

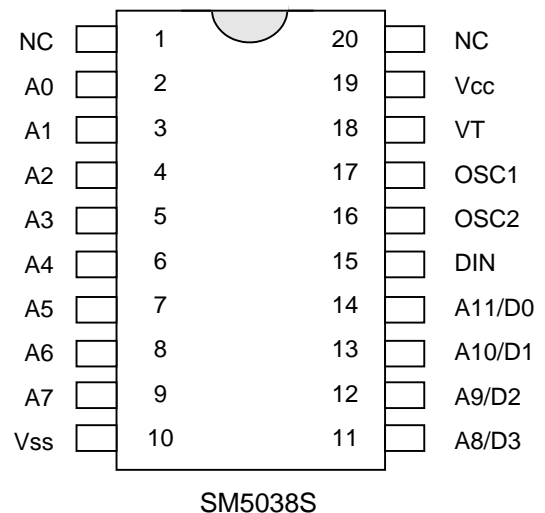
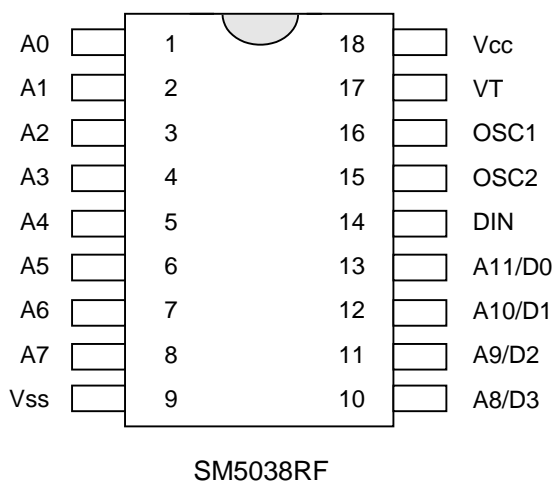
## FEATURES

- \* CMOS Technology
- \* Low Power Consumption
- \* Very High Noise Immunity
- \* Up to 12 2-State Code Address Pins
- \* Wide Range of Operating Voltage:  
Vcc = 3 ~ 12 Volts
- \* Single Resistor Oscillator
- \* Available in DIP and SOP Package

## APPLICATIONS

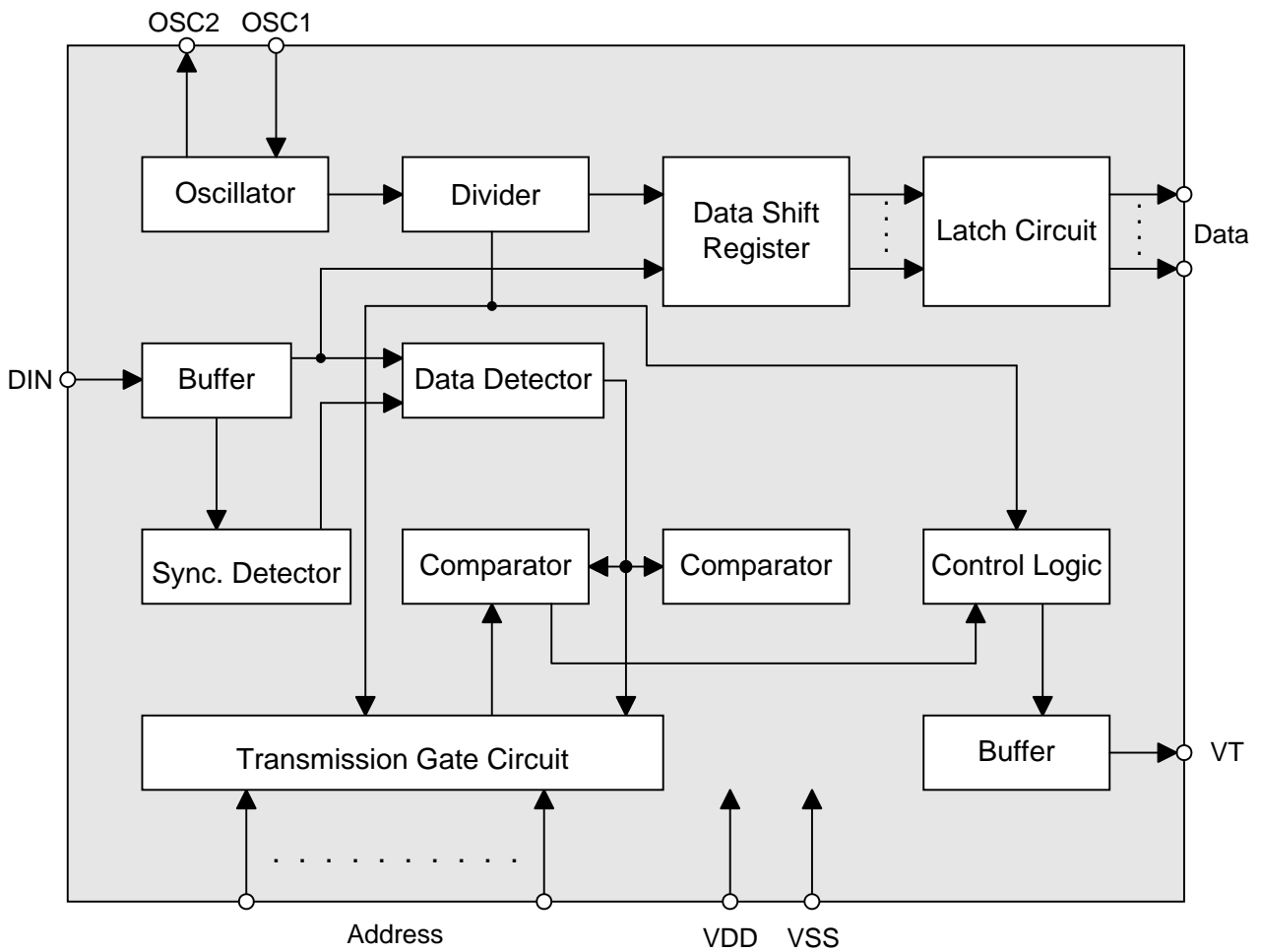
- \* Car Security
- \* Garage Door
- \* Home Security/Automation System
- \* Toys
- \* Remote Control for Industrial Use

## PIN CONFIGURATION ( DIP )





## BLOCK DIAGRAM



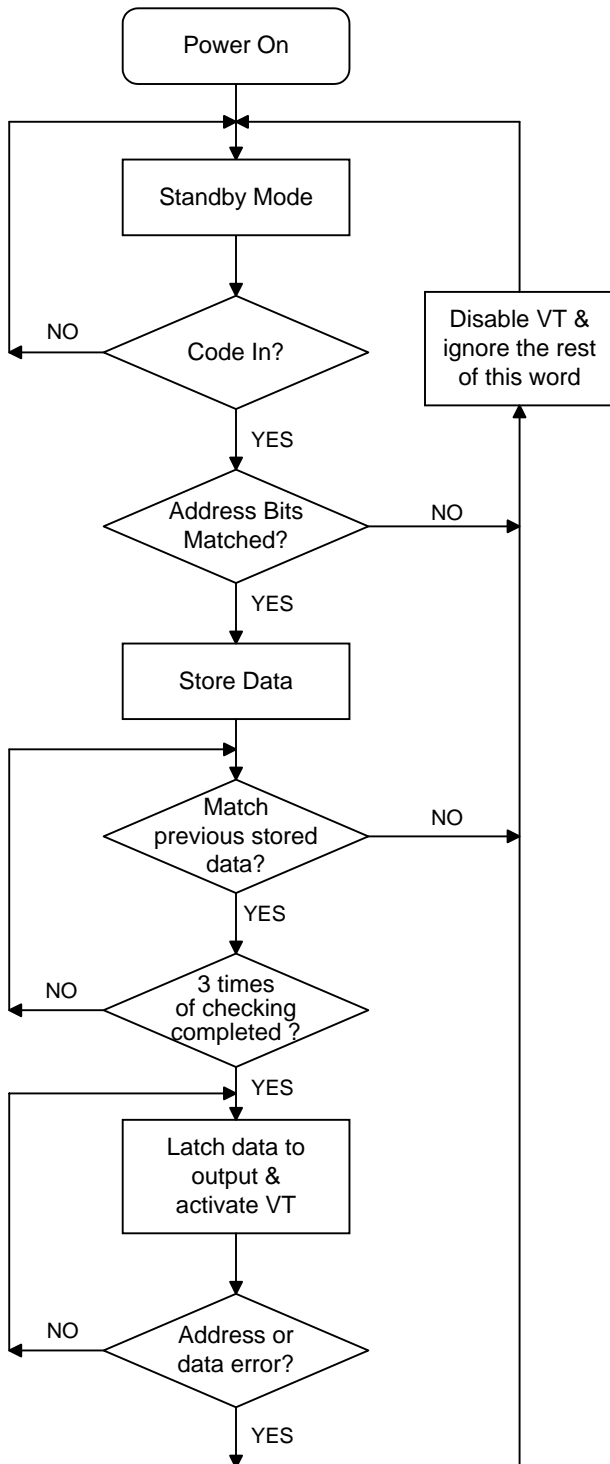


## PIN DESCRIPTION

NO.	PIN NAME	I / O	FUNCTION
1	A0	I	Address input , each pin can be set to "0" , "1".
2	A1	I	
3	A2	I	
4	A3	I	
5	A4	I	
6	A5	I	
7	A6	I	
8	A7	I	
9	Vss	POWER	Negative power supply.
10	D3	O	Address/Data output active high.
11	D2	O	
12	D1	O	
13	D0	O	
14	DI	I	Receive from RF module.
15	OSC1	I	Resistor connected between these two pins determine the system clock.
16	OSC2	O	
17	VT	O	Valid transmission indication.
18	VDD	POWER	Positive power supply.



## Decoder with Data Output Pins



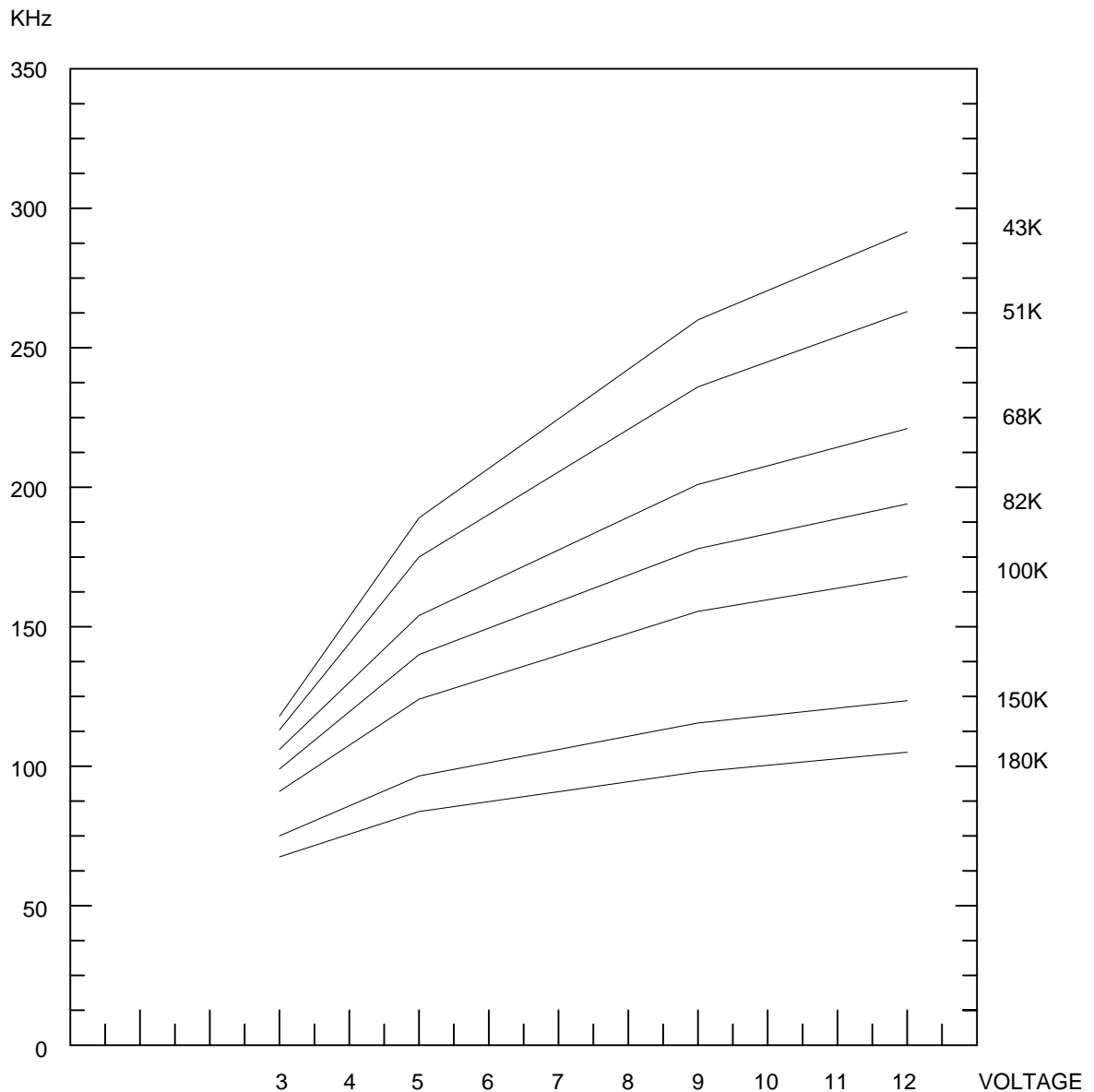
After Power On SM5038RF is set in Address search mode, if SM5038RF finds 3 consecutive Address that matches the Address setting of SM5038RF. SM5038RF will enter Data Compare mode. It will compare perviously 3 received data, if they match then SM5038RF will set VT high and send data O/P.



### Single Resistor Oscillator

SM5038RF's oscillator can be constructed by connecting a resistor between OSC1 and OSC2 pin.

Encoder OSC Frequency



The recommended oscillator frequency is  $F_{oscD} (SM5038RF \text{ decoder}) \approx 10 F_{oscD} (SM028RF \text{ encoder})$



## ABSOLUTE MAXIMUM RATINGS

Parameter	Symbol	Conditions	Ratings	Unit
Supply Voltage	$V_I - V_{SS}$		-0.3~13	V
Input Voltage	$V_{SS} - V_{DD}$		$V_{SS}-0.3\sim V_{DD}+0.3$	V
Operating Temperature	$T_{opr}$		-20~75	°C
Storage Temperature	$T_{stg}$	$V_{DD} - V_{SS} = 12V$	-50~125	°C

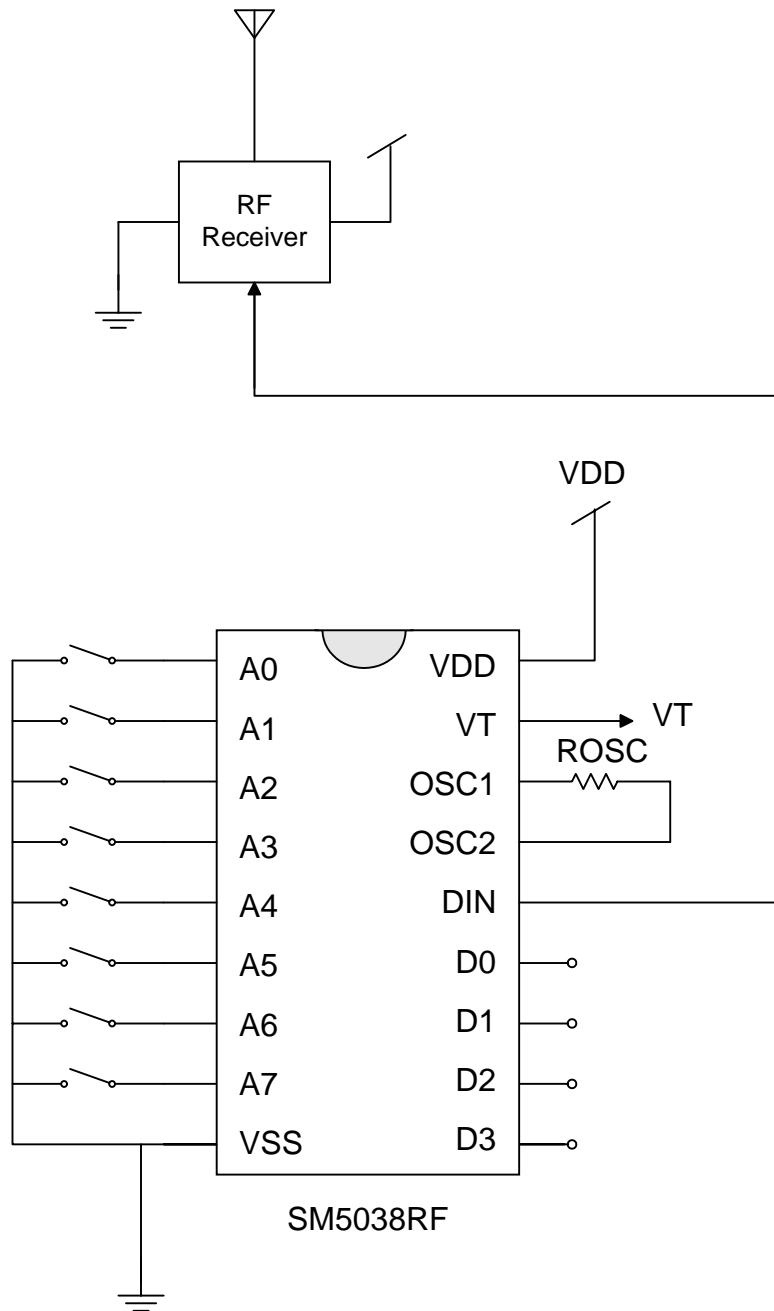
## DC ELECTRICAL CHARACTERISTICS

( $T_a=25\text{ }^\circ\text{C}$ )

PARAMETER	SYMBOL	CONDITIONS	LIMIT			UNIT
			MIN.	TYP.	MAX.	
Operating Voltage	$V_{DD}$		2.4	5	12	V
Standby Current	$I_{STB}$	$V_{DD}=5V$ OSC stop	-	0.1	1	$\mu A$
		$V_{DD}=12V$ OSC stop	-	2	4	$\mu A$
Operating Current	$I_{DD}$	$V_{DD}=5V$ No load $F_{osc}=150kHz$	-	200	400	$\mu A$
Data Output Source Current (D8~D11)	$I_O$	$V_{DD}=5V$ $V_{OH}=4.5V$	-1	-1.6	-	mA
Data Output Sink Current (D8~D11)	$I_O$	$V_{DD}=5V$ $V_{OL}=0.5V$	1	1.6	-	mA
VT Output Source Current VT Output Sink Current	$I_{VT}$	$V_{DD}=5V$ $V_{OH}=4.5V$	-1	-1.6	-	mA
		$V_{DD}=5V$ $V_{OL}=0.5V$	1	1.6	-	mA
"H" Input Voltage	$V_{IH}$	- ( $V_{DD}=5V$ )	3.5	-	5	V
"L" Input Voltage	$V_{IL}$	- ( $V_{DD}=5V$ )	0	-	1	V
Oscillator Frequency	$F_{OCS}$	$V_{DD}=5V$ $R_{OSC}=51k\Omega$	-	150	-	kHz



**APPLICATION CIRCUIT**

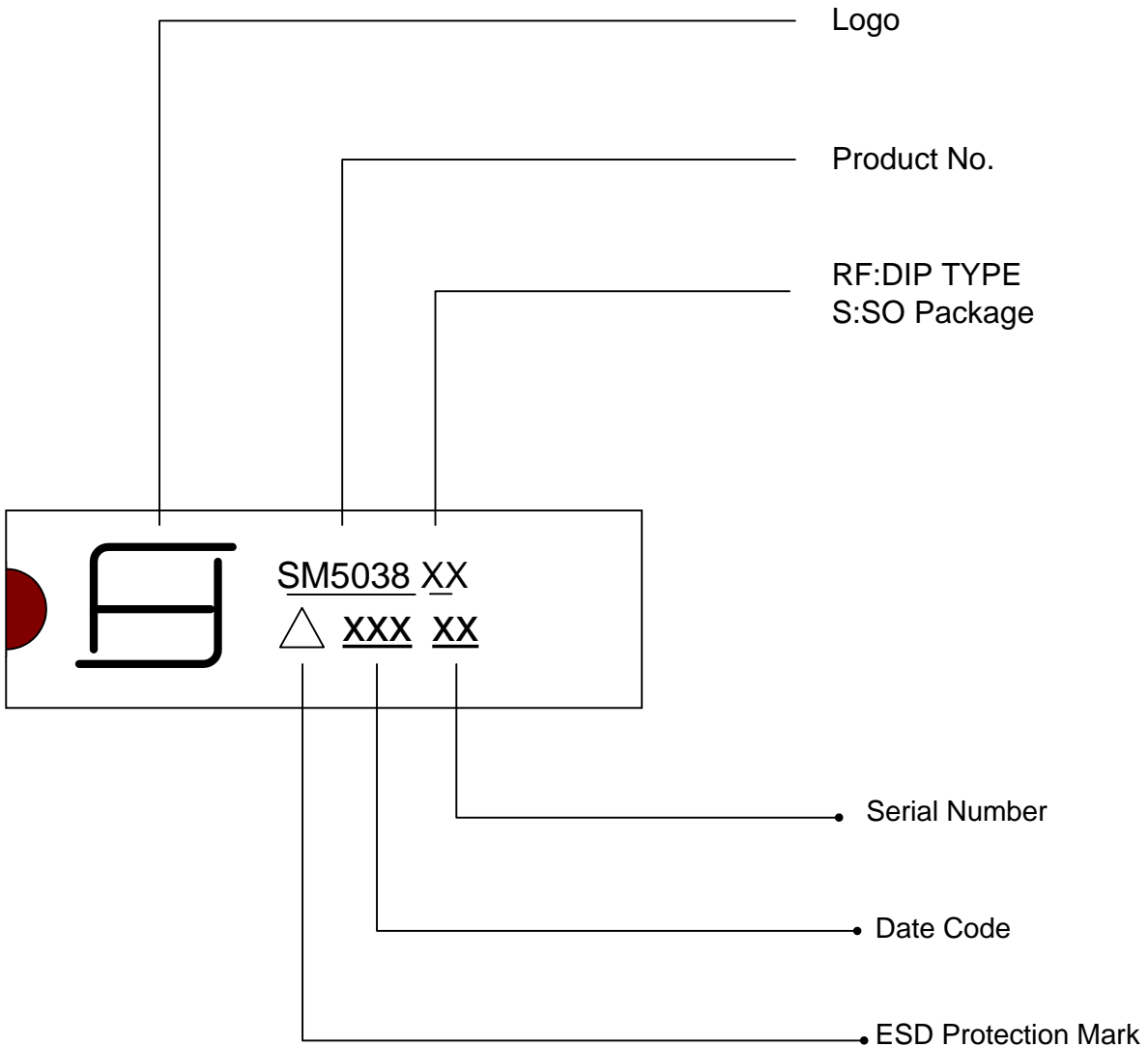




**ORDERING INFORMATION**

Part NO.	Package
SM5038RF	18Pin DIP

Part NO.	Package
SM5038S	20Pin SOP





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