



三合微科股份有限公司
SAMHOP Microelectronics Corp.

SM5162

3¹² RF ENCODER

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3¹² RF ENCODER

GENERAL DESCRIPTION

The SM5162 is a RF remote control encoder paired with SM5172. It utilizes CMOS technology. The chip has 12 bits of 3-state address pins that provides 3¹² codes. SM5162/ SM5172 pair is suitable for use on remote controller.

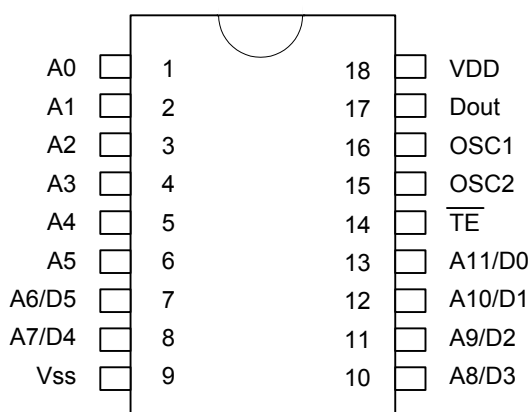
FEATURES

- * CMOS technology
- * Low power consumption
- * 12 tri-state pins
- * Wide range operating voltage, Vcc = 3- 12V
- * Up to six data bits
- * High noise immunity

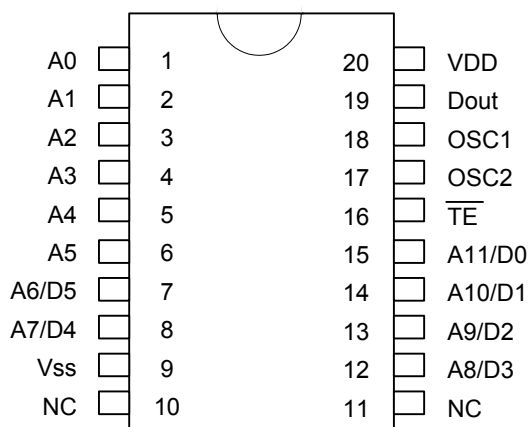
APPLICATIONS

- * Car Security
- * Garage Door
- * Ceiling Fan
- * Home Security/Automatic
- * Toys

PIN ASSIGNMENTS



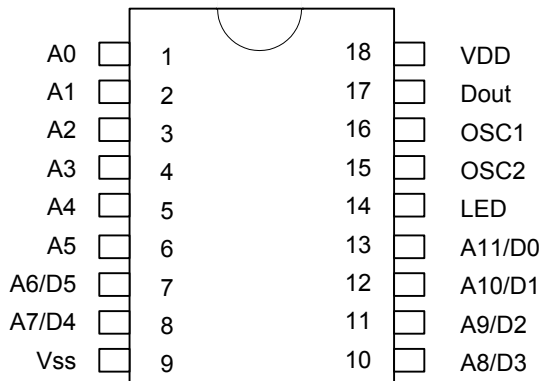
SM5162



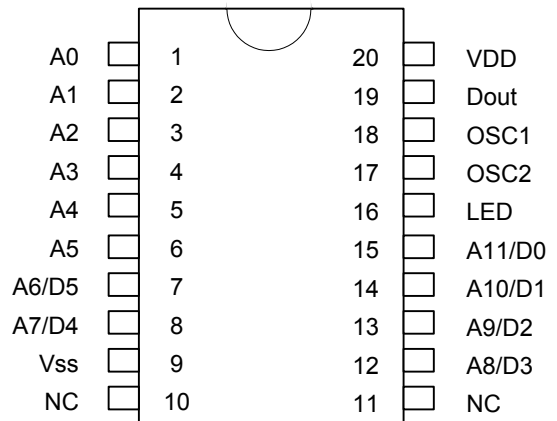
SM5162S



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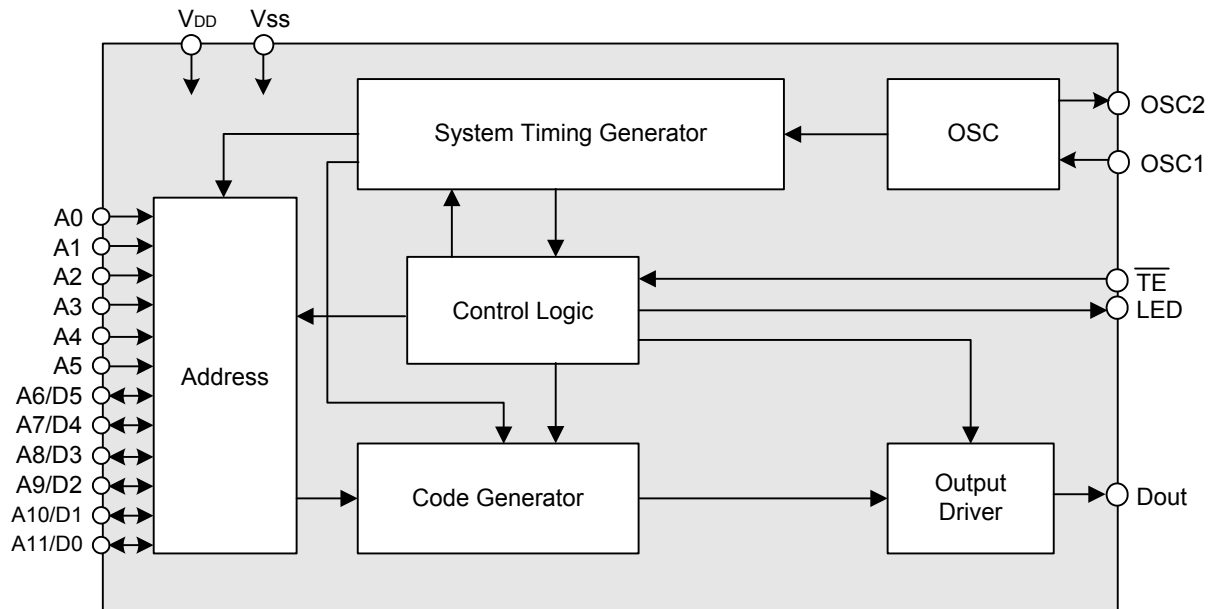


SM5162-DX



SM5162S-DX

BLOCK DIAGRAM



**3¹² RF ENCODER****PIN DESCRIPTION**

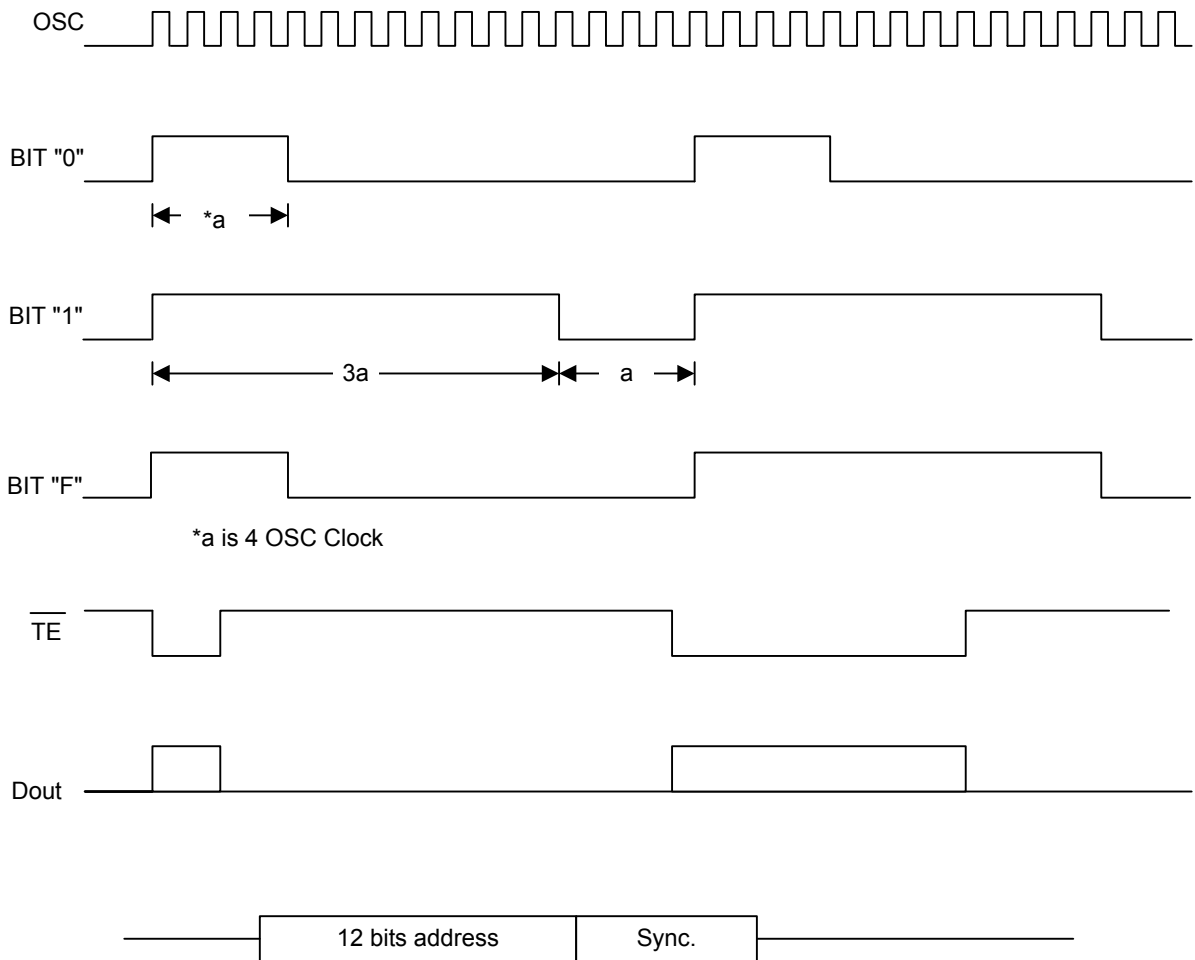
No.	Pin Name	I/O	Function Operation
1	A0	I	Address input, each pin can be set to "0", "1" , or floating.
2	A1	I	
3	A2	I	
4	A3	I	
5	A4	I	
6	A5	I	
7	A6/D5	I/O	Address input or data output.
8	A7/D4	I/O	
9	VSS	POWER	Negative power supply.
10	A8/D3	I/O	Address input or Data output.
11	A9/D2	I/O	
12	A10/D1	I/O	
13	A11/D0	I/O	
14	$\overline{\text{TE}}$	I	Enables transmission.
	LED	O	LED Output.
15	OSC2	O	Resistor connected between these two pins determine the system clock.
16	OSC1	I	
17	Dout	O	Serial output of encoded signals.
18	VDD	POWER	Positive power supply.



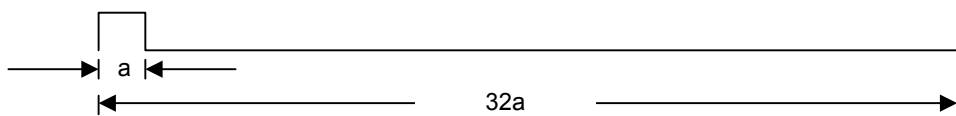
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FUNCTION DESCRIPTION

1. Data Format



Synchronisation Bit waveform is :

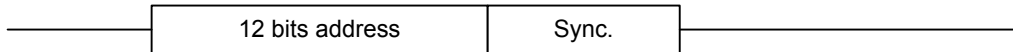




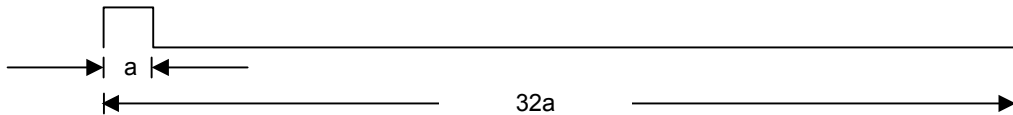
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2. Frame Format

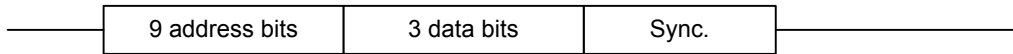
When SM5162 is used for no data, transmitting format is :



Synchronisation Bit waveform is :



When data type of SM5162 is used, address bits will decrease accordingly. For example, in 3 data type where address is 9 bits, transmitting format is :



SM5162/SM5172 has 12 bits including a maximum of 6 data bits.

first transmission bit
in real signal A0 will be receive first.

A0	A1	A2	A3	A4	A5	A6	A7	A8	A9	A10	A11	Sync.	According to
A0	A1	A2	A3	A4	A5	A6	A7	A8	A9	A10	A11	Sync.	SM5172
A0	A1	A2	A3	A4	A5	A6	A7	A8	A9	D1	D0	Sync.	SM5172-M2/L2
A0	A1	A2	A3	A4	A5	A6	A7	A8	D2	D1	D0	Sync.	SM5172-M3/L3
A0	A1	A2	A3	A4	A5	A6	A7	D3	D2	D1	D0	Sync.	SM5172-M4/L4
A0	A1	A2	A3	A4	A5	A6	D4	D3	D2	D1	D0	Sync.	SM5172-M5/L5
A0	A1	A2	A3	A4	A5	D5	D4	D3	D2	D1	D0	Sync.	SM5172-M6/L6

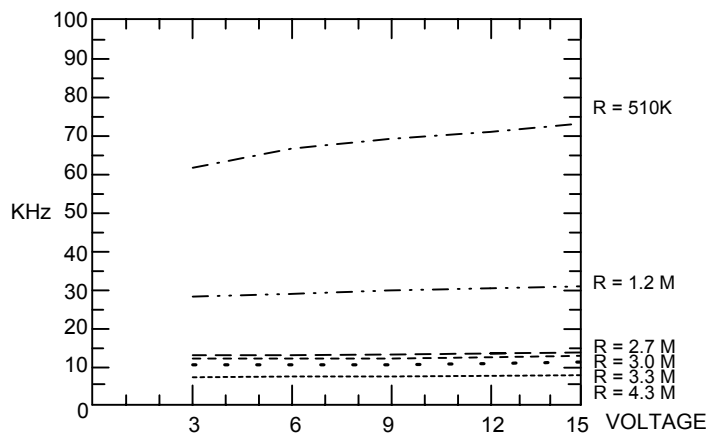


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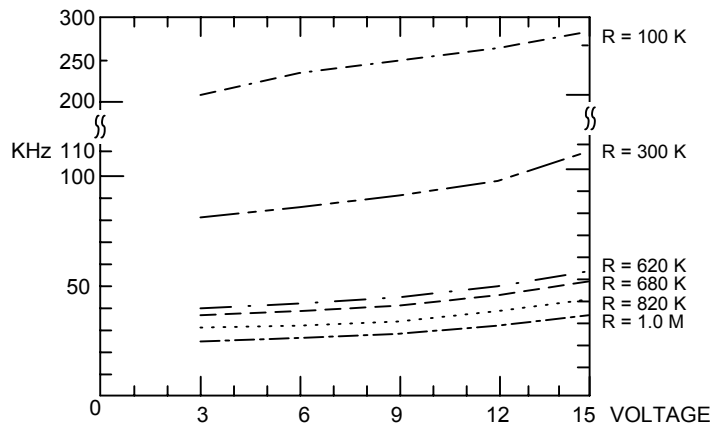
Single Resistor Oscillator

SM5162's oscillator be constructed by connecting a resistor between OSC1 and OSC2 pin. SM5172's OSC frequency must be 1.8 to 5.8 ratio more than SM5162.

Encoder OSC Frequency (SM5162)



Dncoder OSC Frequency (SM5172)



Suggested oscillator resistor of SM5162/ SM5172:

SM5162 (Encoder)	SM5172 (Decoder)
4.7M Ω	820K Ω
3.0M Ω	620K Ω
2.2M Ω	300K Ω
1.2M Ω	180K Ω

**3¹² RF ENCODER****ABSOLUTE MAXIMUM RATINGS**

Parameter	Symbol	Conditions	Ratings	Unit
Supply Voltage	V _{DD} - V _{SS}		-0.3 ~ 16	V
Input Voltage	V _I - V _{SS}		V _{SS} - 0.3 ~ V _{DD} + 0.3	V
Output Voltage	V _O - V _{SS}		V _{SS} - 0.3 ~ V _{DD} + 0.3	V
Maximum power dissipation	P _a	V _{DD} - V _{SS} = 12 V	500	mW
Operating Temperature	T _{opr}		-20 ~ 70	
Storage Temperature	T _{stg}		-40 ~ 125	

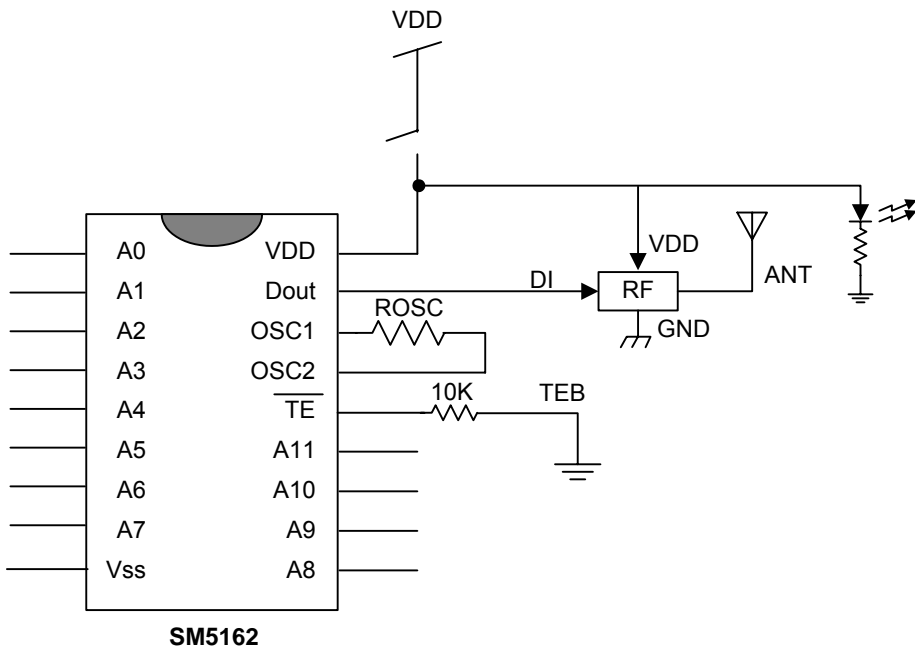
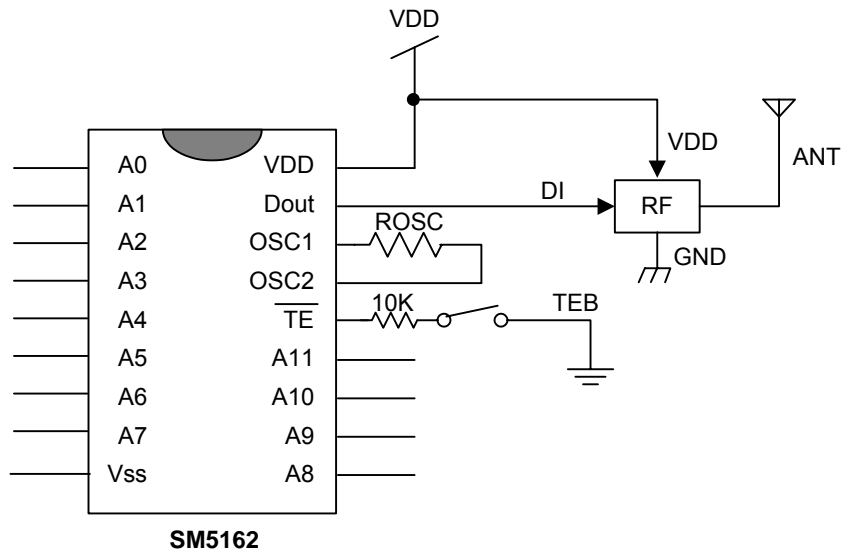
DC ELECTRICAL CHARACTERISTICS

Parameter	Symbol	Conditions	Limit			Unit
			Min.	Typ.	Max.	
Supply Voltage	V _{CC}		3		12	V
Standby Current	I _{STB}	V _{DD} =12V OSC stop AO - A11 open		0.02	0.3	μA
Output Drive Current (Dout)	I _{OH}	V _{DD} = 5V V _{OH} = 4V V _{DD} = 8V V _{OH} = 6.4V V _{DD} = 12V V _{OH} = 9.6V	- 2 - 6 -14			mA
Output Sinking Current (Dout)	I _{OL}	V _{DD} = 5V V _{OL} = 1V V _{DD} = 8V V _{OL} = 1.6V V _{DD} = 12V V _{OL} = 2.4V	5 13 23			mA
\overline{TE} Current	I _{TE}	V _{DD} = 5V V _{DD} = 9V V _{DD} = 12V		5 15 27		μA



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APPLICATION CIRCUIT

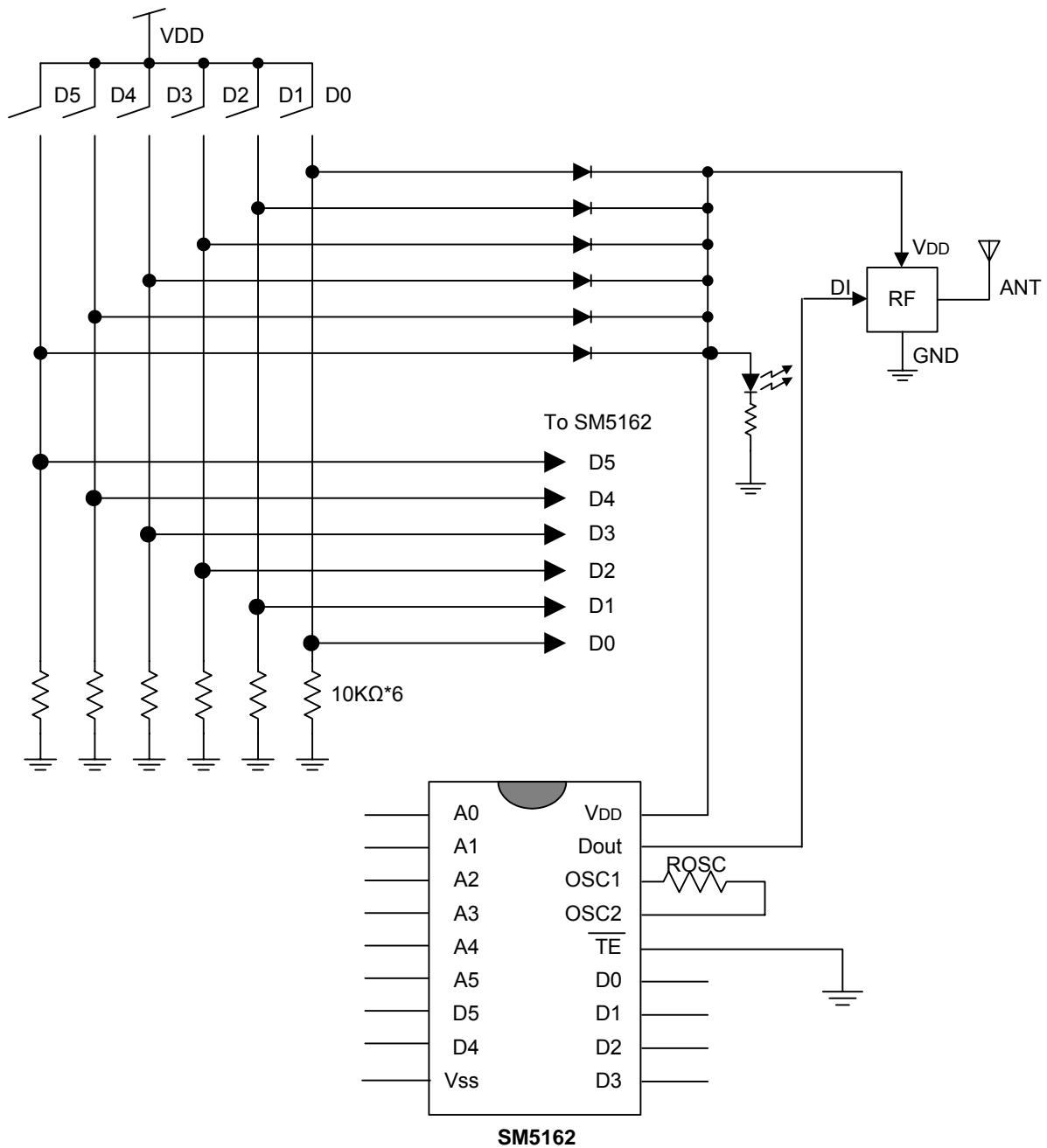


RF : Module reference to Page12



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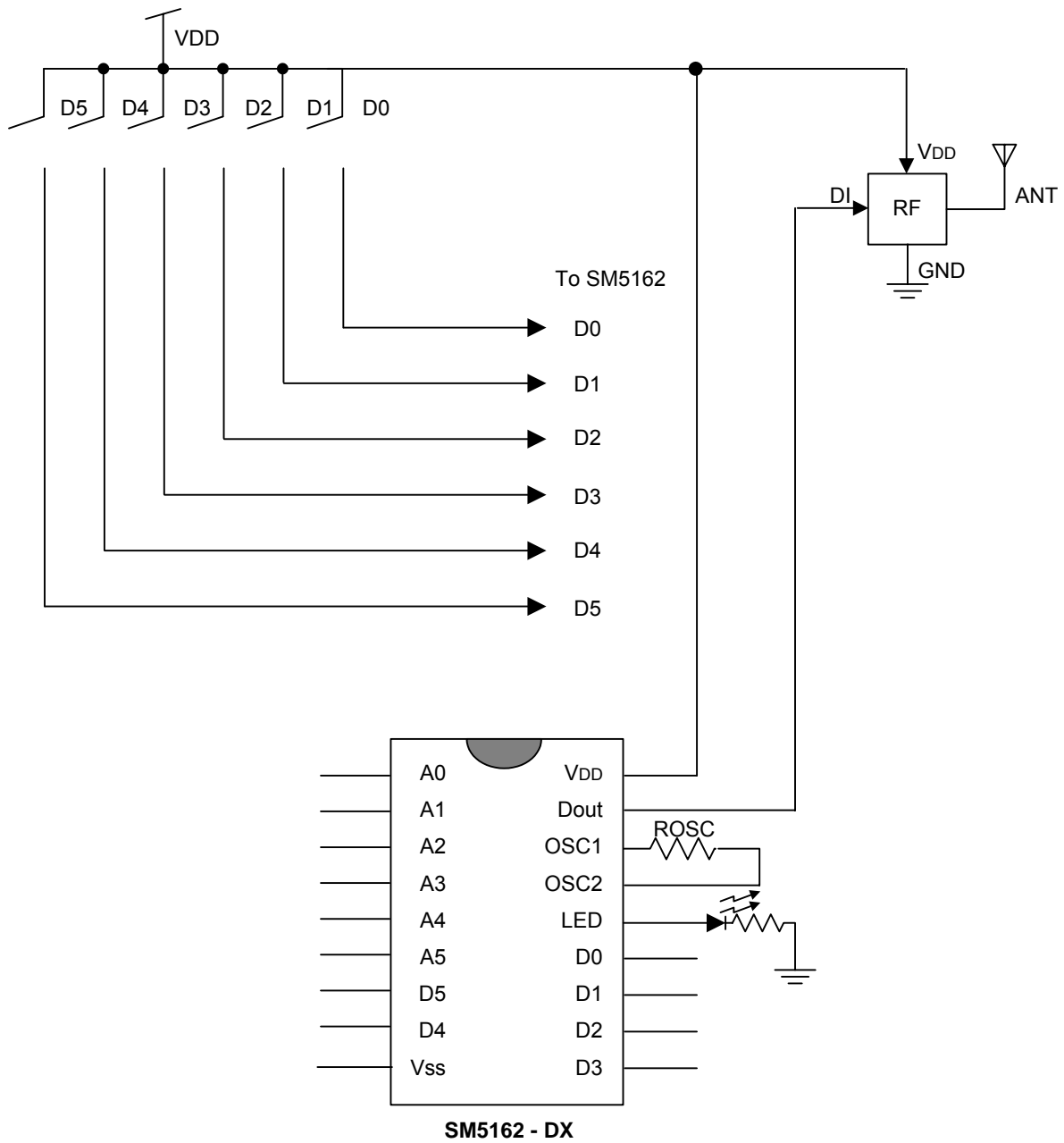
APPLICATION CIRCUIT





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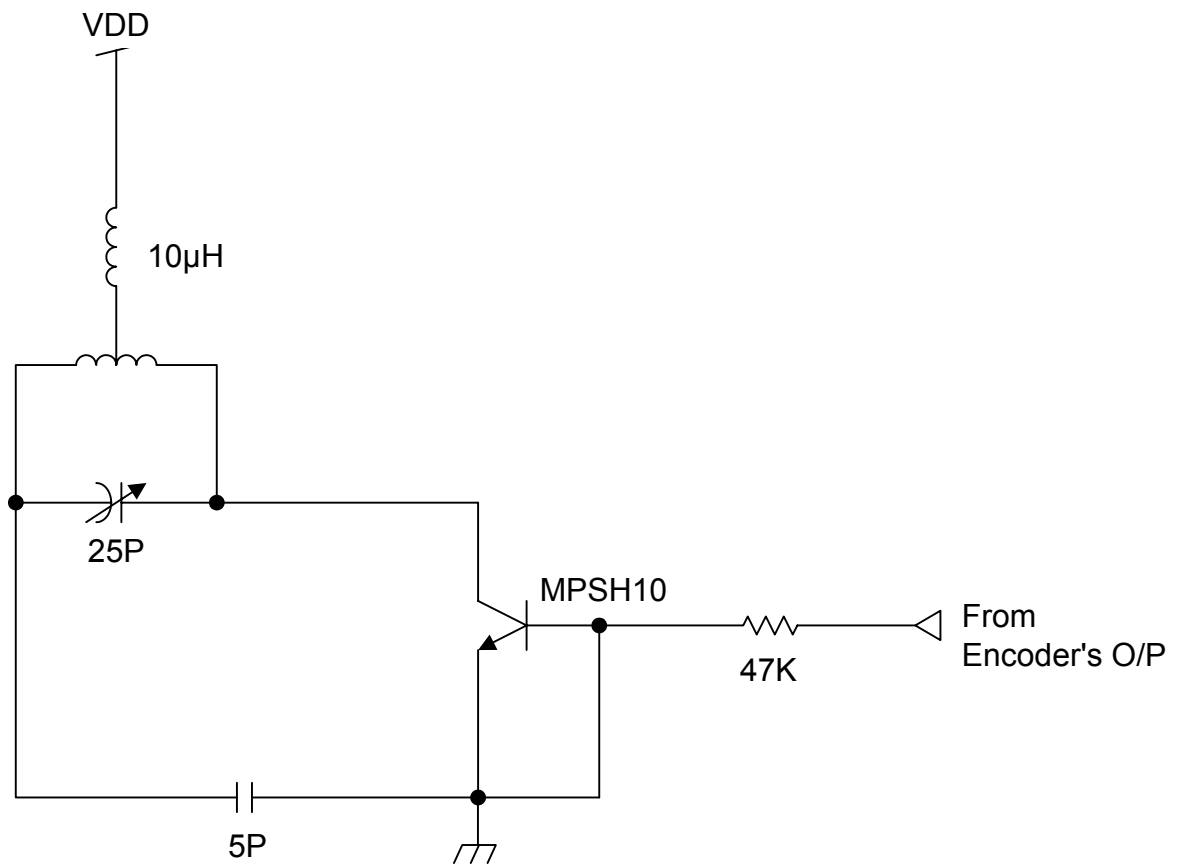
APPLICATION CIRCUIT





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RF APPLICATION CIRCUIT



RF CIRCUIT



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ORDERING INFORMATION

Part No.	Package
SM5162	18 Pin DIP

Part No.	Package
SM5162S	20 Pin SOP

