

**OVERVIEW**

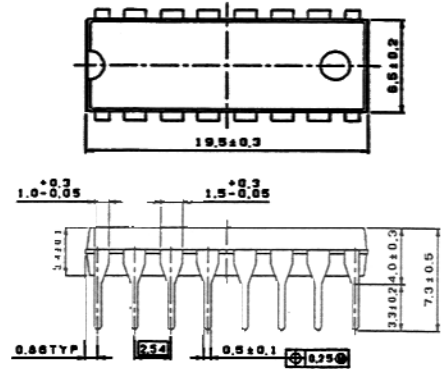
The SM5133SP is a CMOS-LSI that incorporates a PLL for wireless communications. It features 16 communication channels and parallel inputs for communication channel selection. It operates from a 2.4 to 5.5V supply and is available in 16-pin DIP.

**FEATURES**

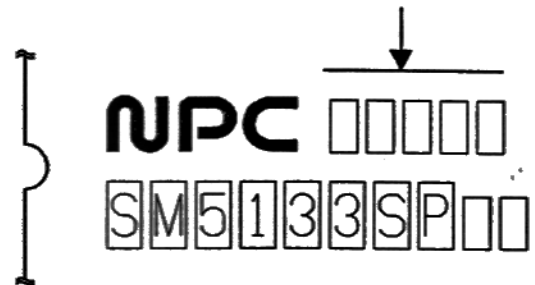
- 16 communication channels
- Parallel channel selection
- 60MHz maximum operating frequency
- 300mV<sub>p-p</sub> (min) input sensitivity
- 5kHz reference frequency
- Molybdenum-gate CMOS process
- 2.4 to 5.5V supply voltage
- 16-pin plastic DIP

**PACKAGE DIMENSIONS**

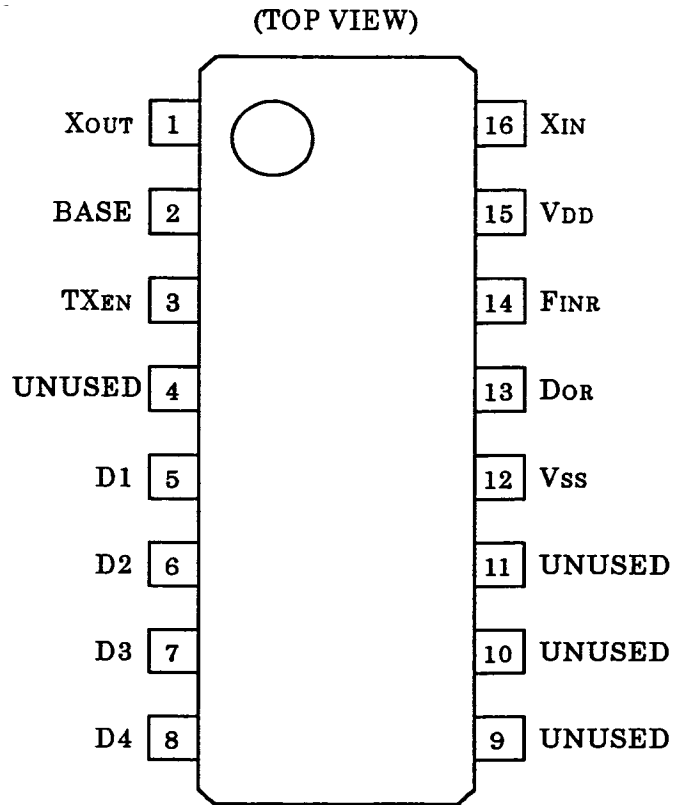
Unit : mm  
Weight : 1.01g



DATE CODE



PINOUT (Top View)



## SPECIFICATIONS

## Absolute Maximum Ratings

Parameter	Symbol	Rating	Unit
Supply voltage range	$V_{DD}-V_{SS}$	-0.3 to 7.0	V
Input voltage range	$V_{IN}$	$V_{SS}$ to $V_{DD}$	V
Operating temperature range	$T_{OPR}$	-30 to 80	°C
Storage temperature range	$T_{STG}$	-40 to 125	°C

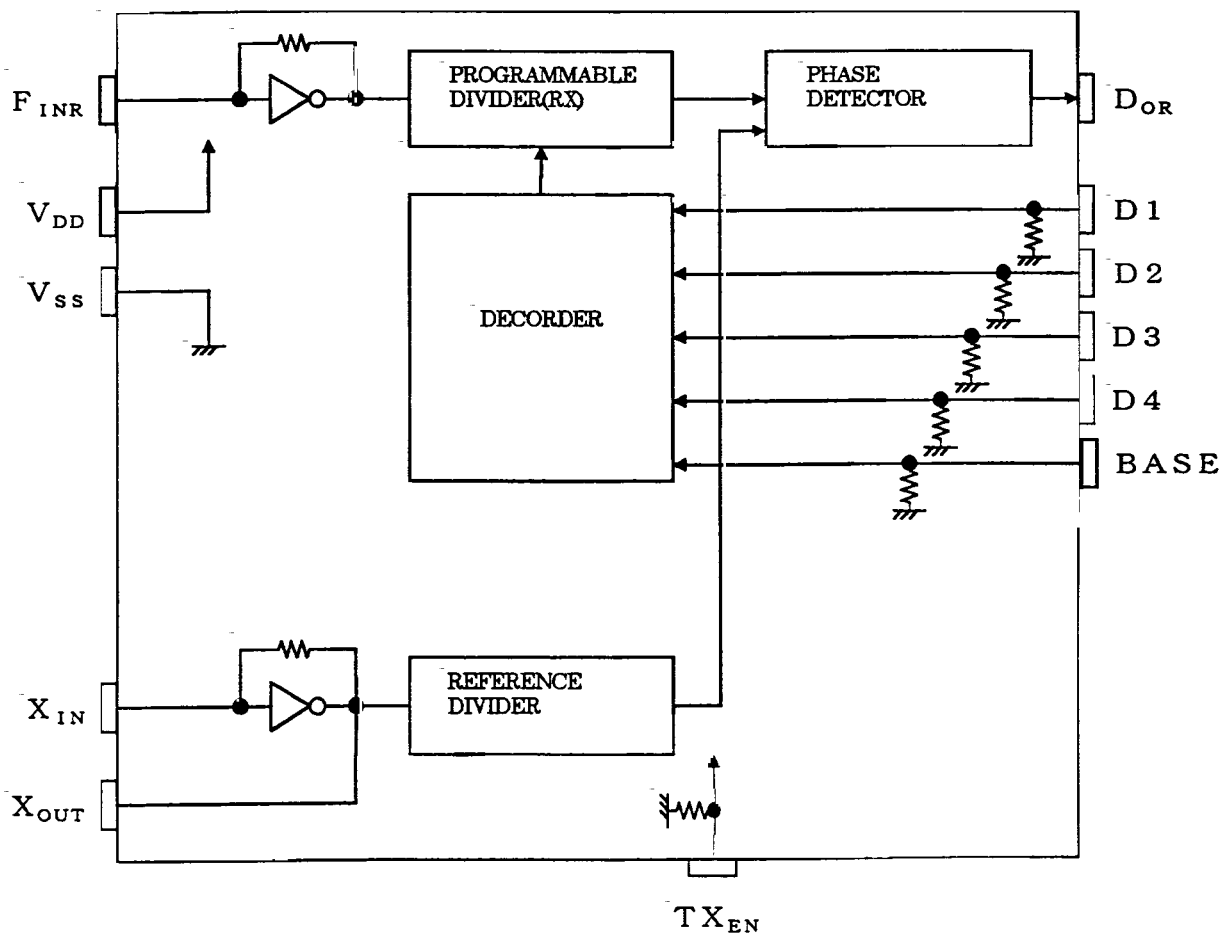
## Electrical Characteristics

Parameter	Symbol	Condition	Rating			Unit
			min	typ	max	
Supply voltage range	$V_{DD}$		2.4		5.5	V
Current consumption	$I_{DD}$	$V_{DD}=3.0V$ $TX_{EN}=LOW$ $F_{RX}=57.3000MHz$ $V_{INR}=300mV_{P-P}$ Sine wave		2.5	5.0	mA
		$V_{DD}=5.0V$ $TX_{EN}=LOW$ $F_{RX}=57.3000MHz$ $V_{INR}=300mV_{P-P}$ Sine wave		9.5		
$F_{INR}$ Maximum receive operating frequency	$f_{RX}$	$V_{INR}=300mV_{P-P}$ Sine Wave	60			MHz
$F_{INR}$ input amplitude	$V_{INR}$	$F_{RX}=60MHz, f_{XIN}=10.24MHz$ Sine Wave	0.3		$V_{DD}-0.5$	$V_{P-P}$
$X_{IN}$ input amplitude	$V_{INX}$		0.8		$V_{DD}-0.5$	
D1 to D4, BASE and $TX_{EN}$ HIGH-level input current	$I_{IH}$	$V_{IH}=V_{DD}$			300	$\mu A$
DOR HIGH-level output current	$I_{OH}$	$V_{OH}=V_{DD}-0.4V$	0.4			mA
DOR LOW-level output current	$I_{OL}$	$V_{OL}=0.4V$	0.4			
D1 to D4, BASE and $TX_{EN}$ HIGH-level input voltage	$V_{IH}$		$V_{DD}-0.4$		$V_{DD}$	V
D1 to D4, BASE and $TX_{EN}$ LOW-level input voltage	$V_{IL}$		0		0.4	

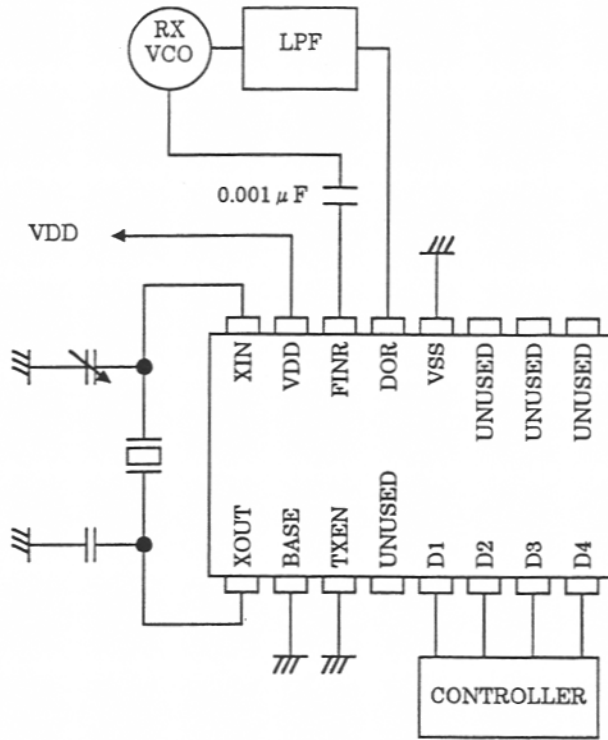
# PIN DESCRIPTION

No.	Name	I/O	Function
1	X <sub>OUT</sub>	O	Crystal oscillator (10.24MHz) and capacitor connection.
2	BASE	I	Mode setting pin. Should be left open or grounded. Internal pull-down resistor.
3	TX <sub>EN</sub>	I	Test pin. Should be left open or grounded. Internal pull-down resistor.
4	UNUSED	-	Unused pin. Should be left open.
5-8	D1 to D4	I	Communication channel select parallel data input. See the Communication Channel Selection. Internal pull-down resistor.
9-11	UNUSED	-	Unused pin. Should be left open.
12	V <sub>SS</sub>	-	Ground.
13	D <sub>OR</sub>	O	Passive lowpass filter connection.
14	F <sub>INR</sub>	I	Programmable divider input. Internal feedback resistor. Allows AC coupling.
15	V <sub>DD</sub>	-	2.4 to 5.5V supply voltage.
16	X <sub>IN</sub>	I	Crystal oscillator and capacitor connection. Internal feedback resistor.

# BLOCK DIAGRAM



TYPICAL APPLICATIONS



X'tal ( 10.24MHz  
CI 20Ω  
CL 30pF )

\*Notes

LPF should be a passive type.

Frequency of VCO should be increased when input voltage shifts higher.

### Communication Channel Selection

The SM5133SP has parallel inputs for communication channel selection.  
The states of D1 to D4 are used to select to one of the available channels.

BASE	D4	D3	D2	D1	Channel	TX <sub>EN</sub> =0 (f <sub>REF</sub> =5.0kHz)	
						f <sub>VCO</sub> (MHz)	N
0	0	0	0	1	1	32.390	6478
	0	0	1	0	2	32.395	6479
	0	0	1	1	3	32.400	6480
	0	1	0	0	4	32.405	6481
	0	1	0	1	5	32.410	6482
	0	1	1	0	6	32.415	6483
	0	1	1	1	7	32.420	6484
	1	0	0	0	8	32.420	6484
	1	0	0	1	9	32.420	6484
	1	0	1	0	10	32.420	6484
	1	0	1	1	11	32.420	6484
	1	1	0	0	12	32.420	6484
	1	1	0	1	13	32.420	6484
	1	1	1	0	14	32.420	6484
	1	1	1	1	15	32.420	6484
	0	0	0	0	0	0	32.420

**\*Notes**

'0' for BASE, D4 to D1 and TX<sub>EN</sub> implies LOW-level input voltage.

'1' implies HIGH-level input voltage.