



SPARK TECHNOLOGY LIMITED

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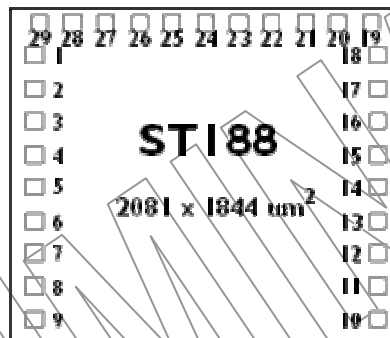
ST188 – 5.3KHz ASK Receiver (pre 1.5)

● DESCRIPTION

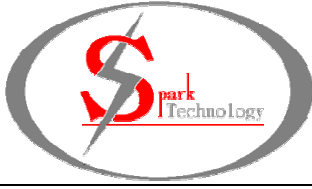
The ST188 is an integrated ASK receiver circuit for wireless heart rate monitor (Polar compatible). It is designed for battery applications with high input sensitivity.

● FEATURES

- Single chip ASK receiver
- Supply voltage range 2.3...5 V
- Temperature range 0 .. 50 °C
- High Input sensitivity
- Very low power consumption
- Frequency range 4 .. 8 kHz
- Dice in tray



Pin No	X co/um	Y co/um	Pin No	X co/um	Y co/um
1	12.5	27.5	23	962.5	1737.3
2	12.5	217.5	22	1152.5	1737.3
3	12.5	407.5	21	1342.5	1737.3
4	12.5	597.5	20	1532.5	1737.3
5	12.5	787.5	19	1722.5	1737.3
6	12.5	977.5	18	1973.4	1547.5
7	12.5	1167.5	17	1973.4	1357.5
8	12.5	1357.5	16	1973.4	1167.5
9	12.5	1547.5	15	1973.4	977.5
29	12.5	1737.3	14	1973.4	787.5
28	27.5	1737.3	13	1973.4	597.5
27	202.5	1737.3	12	1973.4	407.5
26	392.5	1737.3	11	1973.4	217.5
25	582.5	1737.3	10	1973.4	27.5
24	772.5	1737.3			



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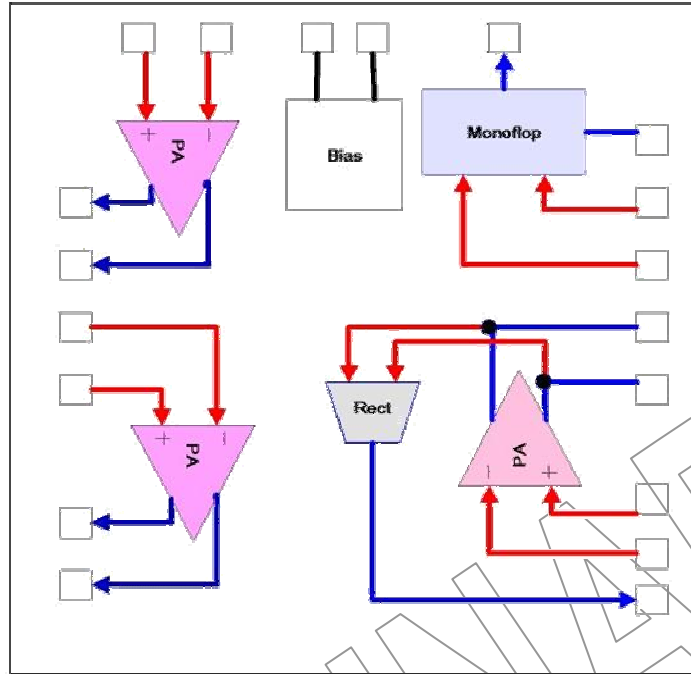
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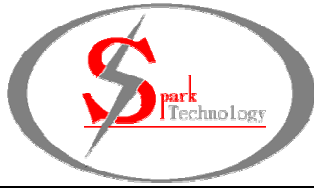
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• Block Diagram





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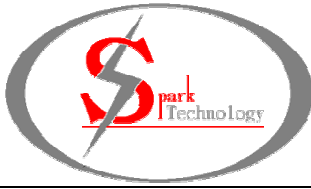
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• Pin Description

Pin No.	NAME	DESCRIPTION	RANGE
1	REGULATOR	Voltage regulator enable pin (Active high)	0 - VDD
2	PA1-PIN4	Low noise preamp 1 negative output	1.8V
3	PA1-PIN5	Low noise preamp 1 positive output	1.8V
4	PA2-PIN2	Low noise preamp 2 negative input	1V
5	PA2-PIN3	Low noise preamp 2 positive input	1V
6	PA2-PIN4	Low noise preamp 2 negative output	1.8V
7	PA2-PIN5	Low noise preamp 2 positive output	1.8V
8	PA3-PIN2	Low noise preamp 2 negative input	1V
9	PA3-PIN3	Low noise preamp 2 positive input	1V
10	OUT2	ASK signal rectified output (Normal Low, Active High)	0 - VDD
11	PA3-PIN4	Low noise preamp 3 negative output	1.8V
12	PA3-PIN5	Low noise preamp 3 positive output	1.8V
13	VIN -	Monostable negative input	
14	VIN +	Monostable positive input	
15	NBAIS	Monostable negative bias	1V
16	PBAIS	Monostable positive bias	1V
17	COUT	Time constant control for pulse width	1.8V
18	OUT	ASK signal non-rectified output	0 - VDD
19	CAP+RES	Rectifying capacitor input	0 - 0.7V
20	PCTRL	Power control (Normal High, Active Low)	0 - VDD
21	PS	Power Supply VCC (Connect to Battery +ve)	2.3 - 5.0V
22	VDD	Internal Voltage Supply	2.1 - 4.3V
23	GND	Ground	0
24	PREAMP_BIAS	PREAMP internal bias	VDD - 0.7V
25	BIAS	Resistor BIAS for Whole Circuit	1Mohm
26	DC	DC correction pin	Follow AGC
27	AGC	Automatic Gain Control Pin	0 - 2V
28	PA1 IN -	Low noise preamp 1 negative output	1.8V
29	PA1 IN +	Low noise preamp 1 positive output	1.8V

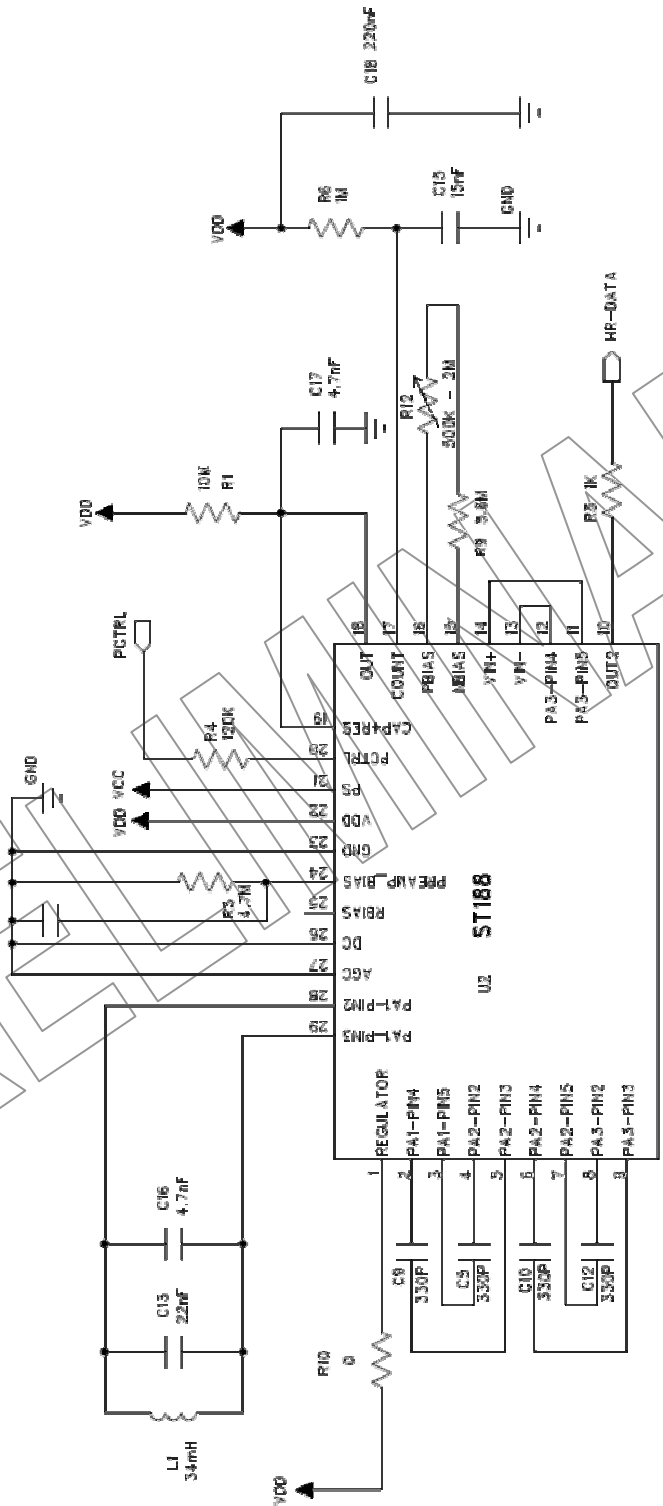


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• Application Circuit

- Heart beat receiver (clocks, ergometers, any heart beat monitor)





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• Absolute Maximum Ratings

The maximum ratings may not be exceeded under any circumstances.

#	Symbol	Parameter	Min	Max	Unit
1	V _{DD}	Supply voltage	-0.5	5.0	V
2	V _P	Voltage at any pin	-0.5	V _{DD} +0.5	V
3	P _{tot}	Total power dissipation		0.55	mW
4	T _{stg}	Storage temperature range	-55	125	°C

• Electrical Characteristics

Operational Range

#	Symbol	Parameter	Min	Max	Unit
1	V _{DD}	Supply voltage	2.3	5	V
2	T _A	Ambient temperature	0	50	°C
3	f _{OP}	Operational frequency	4	8	kHz

DC Characteristics

Conditions for # 1 - 6 (unless otherwise specified): V_{DD} = 3V; T_A = 27°C; V_{PDN} = 0V; V_{IN} = 0; V_{G1} = V_{G2} = open

#	Symbol	Parameter	Conditions	Min	Typ	Max	Unit
1	I _{DD0}	Quiescent current	V _{PDN} =V _{DD}		0.02	0.1	μA
2	I _{DD}	Current consumption			60	100	μA
3	-I _{PDN}	Switch current			3.5	6	μA
4	V _{OL}	Output Voltage – logic low	R _L =60k			0.5	V
5	I _{OH}	Output Current – logic high				0.5	μA
6	-I _{OL}	Output Current – logic low	R _L =0	30	130		μA



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AC Characteristics

Conditions for # 1 - 3 (unless otherwise specified): $V_{DD} = 3V$; $T_A = 27^{\circ}C$; $V_{PDN} = 0V$; $V_{IN} = 0$; $V_{G1} = V_{G2} = \text{open}$

#	Symbol	Parameter	Conditions	Min	Typ	Max	Unit
1	$V_{in\ MIN}$	Minimum input sensitivity			15	30	μV
2	$V_{in\ MAX}$	Maximum input voltage		30	50		mV
3 ¹	t_w	Output pulse width	$C_p = 220pF$	300	400	500	us

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-
-
-
-
-
-

● CONTACT INFORMATION

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