

Wednesday, July 21, 2004

From: William Raper

To: Jeff Bessinger

RE: Update of the 6030 motion sensor from Capacitance tuner to SAW based circuit.

Jeff,

Please note the update of the new 6030 PCB to operate on a SAW circuit requires several changes to the RF section.

First of all, note that the capacitors C20-C23 and resistor R29 are no longer needed due to this change.

Also, note the following changes:

1. Transistor Q4 is replaced by Q2 in the new circuit. The older transistor is a thru-hole component, the new transistor, Q2, is a SMD component. Both have similar operational properties.
2. The SAW resonator, X1, has been added. This operates at 315MHz and has no equivalent in the old circuit.
3. The antenna, ANT1, has been relabeled from L2, but has the same functionality.
4. The inductor, L1, remains unchanged.
5. Capacitors, C15 and C16 have been added to filter noise from the RF section of the transmitter and provide clean power.
6. Capacitor C17 is 5.6pF. It was C25, 47pF in the old circuit. This capacitor provides filtering at the transistor emitter.
7. Capacitor C14 is 3.3pF. It was C24, 4.7pF in the old circuit. This capacitor provides emitter to collector feedback at the transistor.
8. R20 is added and is 47 Ohms. It provides current limiting to the transmitter circuit and has no equivalent in the old circuit.
9. C12 is added and is 1pF. It provides antenna isolation from the remainder of the circuit.
10. R23 is 33kOhms and is the equivalent of R28, 100kOhms in the old circuit. This value has been adjusted to limit the current to the base of the transistor, Q2.
11. R24 is 47 Ohms and is the equivalent of R30, 22 Ohms in the old circuit. This value has been adjusted to limit the current thru the emitter of the transistor, Q2.

Please note that this list of changes is also included in a tabular form in the spreadsheet on the next page. This will help to see the changes in a form that is easier to compare.

Thanks,  
William

## 6030 RF SECTION CHANGES 7-12-2004

NEW CIRCUIT			OLD CIRCUIT		
Quantity	Description	Location	Quantity	Description	Location
	<b>PCB ASSEMBLY FOR 6030,PIR-2003</b>			<b>PCB ASSEMBLY FOR 6030,PIR-2003</b>	
1	RES SMD0603 47 OHM 5%	R24	1	RES, 1/8W 22 OHM 5%	R30
1	RES. SMD 0603 33K 5% 0.8x1.6	R23	1	RES, 1/8W 100K OHM 5%	R28
1	RES. SMD 0603 47 OHM 5%	R20		N/A	
1	C. CAP NPO SMD0603 1PF+-.25PF	C12		N/A	
1	CER CAP NPO SMD0603 3.3PF+-.25PF	C14	1	CER CAP NPO 4.7PF	C24
1	CER CAP NPO 5.6PF 0603 +/- .25PF	C17	1	CER CAP NPO 47PF	C25
1	CER.CAP. X7R SMD0603 1000PF	C15		N/A	
1	CER.CAP. Y5V SMD0603 0.1U 20%	C16		N/A	
1	FIX INDUCTOR 47nH5% 1.2X2 0805	L1	1	FIXED INDUCTOR 47nH 5%	L1
1	ANTENNA	ANT1	1	ANTENNA	L2
1	SAW RESONATOR 315MHz	X1		N/A	
1	NPN-MMBTH10LT1 SMD	Q2	1	NPN RF TRANS C1923Y	Q4
	N/A		1	RES, 1/8W 27K,5%	R29
	N/A		1	CER CAP NPO 3PF	C20
	N/A		1	CER CAP NPO 20PF	C23
	N/A		1	CER CAP NPO 5.6PF	C22
	N/A		1	VARIABLE CAP 2-5 PF	C21