

MAX2620 RF Oscillator Tuned from 100MHz to 1050MHz

This application note aids in computing the component values to set the operating frequency of the MAX2620 Oscillator IC. A spreadsheet is provided to aid in calculating components for desired frequencies from 100 MHz to 1050 MHz. A table contains component values for 20 different frequencies over the operating range. Output power is -2dBm, and the frequency error is typically within 5% of the desired value.

The MAX2620 combines a low-noise oscillator with two output buffers and operates from 10MHz to 1050MHz. Operating from a +2.7V to +5.25V supply, this device consumes only 9mA of supply current. The MAX2620 is ideal for a variety of applications due to the large range of operating frequencies. The MAX2620 tank and output matching circuits should be optimized according to the equations on page 9 and 10 of the datasheet. These equations are available in an Excel spreadsheet for quick and easy determination of component values. The Excel spreadsheet can be downloaded at [MAX2620calc.xls](#). A brief description of the component selection process is included in the spreadsheet.

Using the MAX2620 Evaluation kit (see Figure 1), tank and output matching values were determined for $f_{OSC} = 100\text{MHz}$ to 1050MHz. Table 1 lists the components used for each tested frequency. Table 1 also includes the calculated f_{OSC} using the Excel spreadsheet and the listed component values. All parasitic values are the default values in the spreadsheet. New printed circuit layouts require new estimates for parasitic effects to be inserted in the spreadsheet. Notice that the frequency deviations between the measured and calculated values are no greater than 5% in most cases. On the Evaluation kit, the output labeled "OUT" uses a reactive power match (L3 and C13) to maximize output power. Using the values given in the table will achieve an output power of ~ -2dBm at the corresponding frequency.

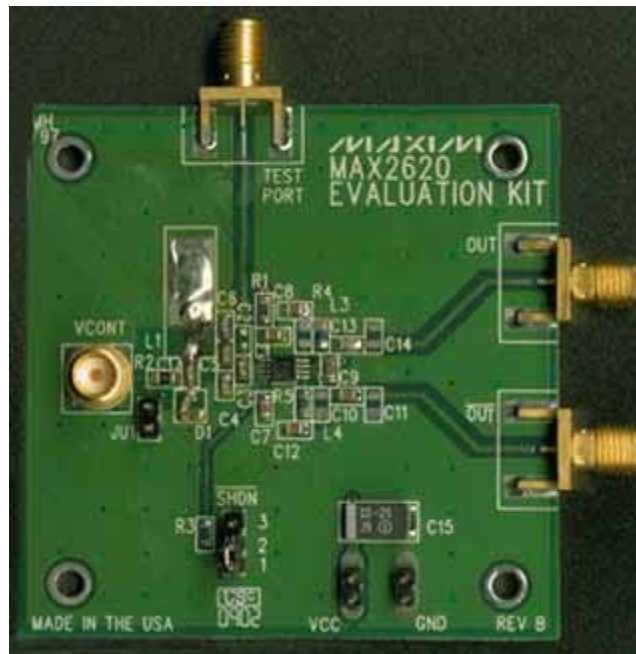


Figure 1. MAX2620 Evaluation Kit allows the operating frequency to be easily changed.

Table 1. Component Values for $f_{OSC} = 100\text{MHz}$ to 1050MHz

f_{OSC} (MHz) MEAS	f_{OSC} (MHz) CALC	C3 (pF)	C4 (pF)	C5 (pF)	C6 (pF)	CD1 (pF)	C17 (pF)	L1 (nH)	C13 (pF)	L3 (nH)
101	98	2.7	6.8	12	15	68	12	86	27	180
150	148	2.7	2.7	10	12	68	12	43	18	100
200	197	2.7	1	6.8	8	68	6.8	35.5	10	68
248	247	2.7	1	5.6	5.6	56	5.6	28	5.6	56
299	297	2.7	1	4.7	4.7	39	4.7	22	5	39
351	351	2.7	1	3.9	4.7	39	3.3	17.5	3.9	33
403	405	2.7	1	3.9	4.7	39	3.9	12.55	3.3	27
451	442	2.7	1	3.3	3.9	27	2.7	12.55	3.3	27
497	505	2.7	1	3.3	3.9	27	2.7	8.8	2.7	22
552	544	2.7	1	3.3	3.3	27	2.7	8.8	2.7	18
597	585	2.7	1	2.7	2.2	18	2.7	18	1.8	18
652	623	2.7	1	1.8	1.8	18	2.2	18	1.8	18
703	704	2.7	1	1.8	1.8	27	1.8	7.15	1.5	12
752	740	1	1	1.8	1.5	22	1.5	7.15	1.5	12
802	770	1	1	1.2	1.2	18	1.5	7.15	1.5	12
851	786	1	1	1.2	1.2	18	1.2	7.15	1.5	12
904	901	2.7	1	1.2	1.2	10	1.2	5.45	1.5	12
950	931	2.7	1	1.2	1	10	1	5.45	1.5	12
1000	977	2.7	1	1.2	0.5	10	1	5.45	1	8.2
1050	994	0.5	0.5	1	0.5	10	1	5.45	1	8.2

Use a high-Q (≥ 100) inductor for L1 whenever possible to guarantee oscillation and best phase noise performance. For applications that require a VCO, CD1 can be replaced with a varactor diode. The MAX2620 Evaluation kit includes a varactor diode for 900MHz applications.

Bill of Materials

Component	Part Number
C3, C4, C5, C6, CD1, C17, C13	Murata GMR39 series
L1	CoilCraft Mini-Spring or Micro-Spring series
L13	Murata LQW1608A series

MORE INFORMATION

MAX2620: [QuickView](#)

-- [Full \(PDF\) Data Sheet \(248k\)](#)

-- [Free Sample](#)