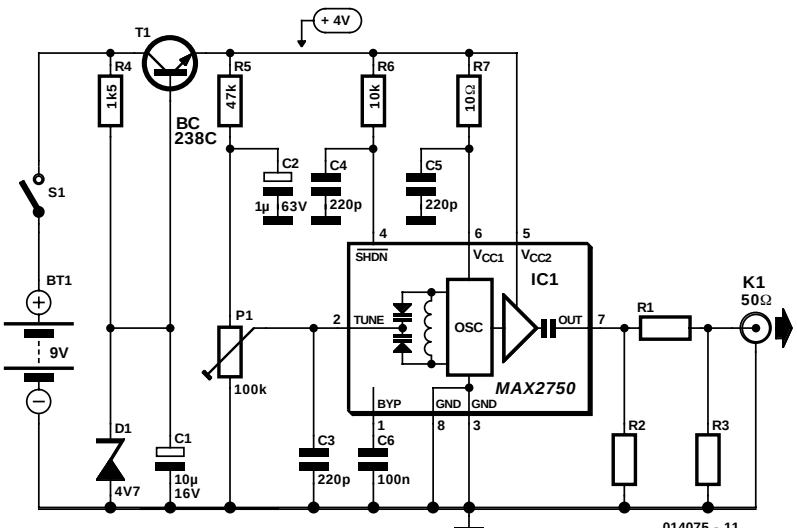
2.5-GHz Signal Source

018

More and more communications systems are operating in the 2.4-GHz ISM (Industrial, Scientific and Medical) band, including Bluetooth, various WLAN (Wireless Local Area Network) and Home-RF systems. A simple test oscillator for the frequency band between 2.4 GHz and 2.5 GHz can prove useful in testing receivers.

Such an oscillator is available from Maxim (www.maxim-ic.com) as a single IC. The MAX2750 covers the frequency range between 2,4 GHz and 2.5 GHz using in internal LC network that can be tuned using a varactor diode that is also built into the IC. An output buffer delivers a level of –3 dBm into 50 Ω. This component is housed in an 8-pin µMAX package.



The circuit is powered from a 9-V battery. The BC238C transistor stabilises the battery voltage at around 4 V. Although the MAX2750 can work with supply voltages

between +2.7 V and +5.5 V, the frequency stability of the free-running oscillator is better with a stabilised supply voltage. All connections to the IC are decoupled using 220pF capacitors, which must be located as close as possible to the IC pins. The tuning voltage at pin 2, TUNE, may lie between +0.4 V and +2.4 V, which provides a tuning range between 2.4 GHz and 2.5 GHz. If it is desired to switch off the oscillator, this can be done by connecting the Shutdown input ($\overline{\text{SHDN}}$) to earth potential. When the IC is shut down, its current consumption drops to around 1 µA. Here the shutdown input is connected to the Vcc potential by a pull-up resistor, so that the oscillator runs.

The –3 dB output level can be reduced using the indicated pi attenuator. A number of resistance values for this attenuator are shown in the table.

(014075-1)

Output level	Attenuation	R1	R2, R3
– 3 dBm	0 dB	0 Ω	–
– 5 dBm	2 dB	10 Ω	470 Ω
– 10 dBm	7 dB	47 Ω	130 Ω
– 15 dBm	12 dB	100 Ω	82.5 Ω
– 23 dBm	20 dB	243 Ω	61.9 Ω