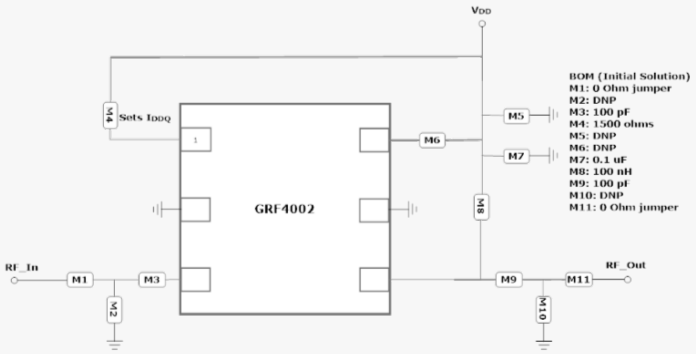
Why Is the DFN-6 Package So Magnificent? Part 2

As we discussed in last month's newsletter, the Guerrilla RF DFN-6 portfolio currently offers a growing tool kit of 20+ devices which employ an identical package, pin out and layout. Selecting a different device and changing a component value, or sometimes placing or not placing a specific matching component, opens up a wide range of gain, NF, linearity and bypass options. The following example will provide a practical demonstration of the design capability offered by this portfolio:

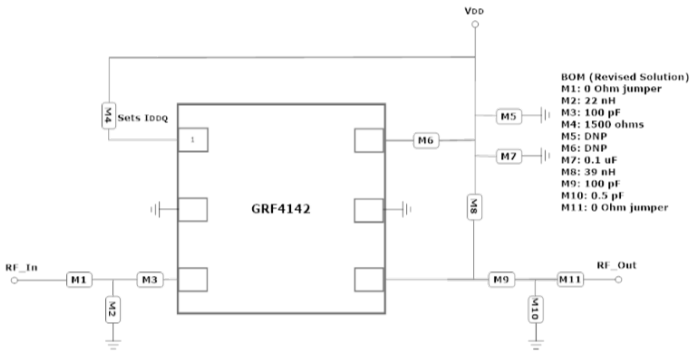
Initial Performance Requirement
Frequency: 2500 MHz
Gain: >= 14.0 dB
Max. NF: <= 1.0 dB
OP1dB: >= 21.0 dBm
OIP3: >= 32.0 dBm
Iddq: <= 80 mA
Vdd: 5.0 V
Bypass Capability: No



Initial Solution:
GRF4002
Gain: 15.0 dB
NF: 0.85 dB
OP1dB: 23.5 dBm
OIP3: 34.0 dBm
Iddq: 70 mA
Bypass: No

For the given initial requirements, GRF4002 has proven to be an excellent solution. But let's say the system dynamic range requirements change and it is determined that your LNA must offer a low-loss bypass capability which GRF4002 does not provide; the other RF requirements remain unchanged. Luckily, thanks to the breadth of the Guerrilla RF DFN-6 portfolio, a drop-in solution to the new requirement exists and it is called GRF4142.

Revised Solution with Bypass:
GRF4142
Gain: 14.5 dB
NF: 0.95 dB
OP1dB: 22.5 dBm
OIP3: 33.0 dBm
Iddq: 70 mA
Bypass: Yes

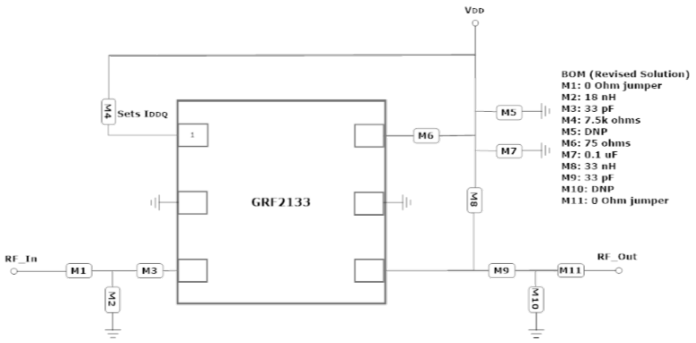


The example above showed how a completely new performance capability (bypass) could be accommodated by a single layout using the Guerrilla RF DFN-6 layout and general purpose schematic. The need to revise the layout for a new part/package was avoided.

Following is an example of how this same layout can be used for a different frequency band, with significantly different RF performance targets. For this example, the goal is to find a single, ultra-high gain LNA to reduce a cascaded lineup of two amplifiers — down to a single device for cost and layout purposes.

Performance Requirements:
Frequency: 1900 MHz
Gain: >= 26.0 dB
Max. NF: <= 1.0 dB
OP1dB: >= 18.0 dBm
OIP3: >= 30.0 dBm
Iddq: <= 80 mA
Vdd: 5.0 V
Bypass Capability: No

Solution: GRF2133
Gain: 28.0 dB
NF: 0.6 dB
OP1dB: 20.0 dBm
OIP3: 31.0 dBm
Iddq: 60 mA



This is yet another example of the design capability offered by the portfolio of 1.5 mm DFN-6 devices. As mentioned above, this family consists of 20+ devices with new devices being added every few months.

Regardless of your application requirements, the Guerrilla RF applications engineering team is happy to help recommend the optimal solution for you. Contact us at applications@guerrilla-rf.com with any questions!