

# DESIGN NOTES

## Multiple Output Range 16-Bit DAC Design Made Simple

Design Note 337

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### Introduction

Precision 16-bit analog outputs with software-configurable output ranges are often needed in industrial process control equipment, analytical and scientific instruments and automatic test equipment. In the past, designing a universal output module was a daunting task and the cost and PCB real estate associated with this function were problematic, if not prohibitive. Figure 1 shows an example of the circuitry formerly required to produce a programmable 16-bit DAC with a variety of

output ranges. However, with the new LTC<sup>®</sup>1592 multiple output range DAC, all of this complexity is unnecessary. Figure 2 shows the compact simplicity of an implementation based on the new LTC1592. All the standard industrial ranges (0V to 5V, 0V to 10V,  $\pm 5V$ ,  $\pm 10V$ ,  $\pm 2.5V$  and  $-2.5V$  to 7.5V) are provided, accurately and under software control.

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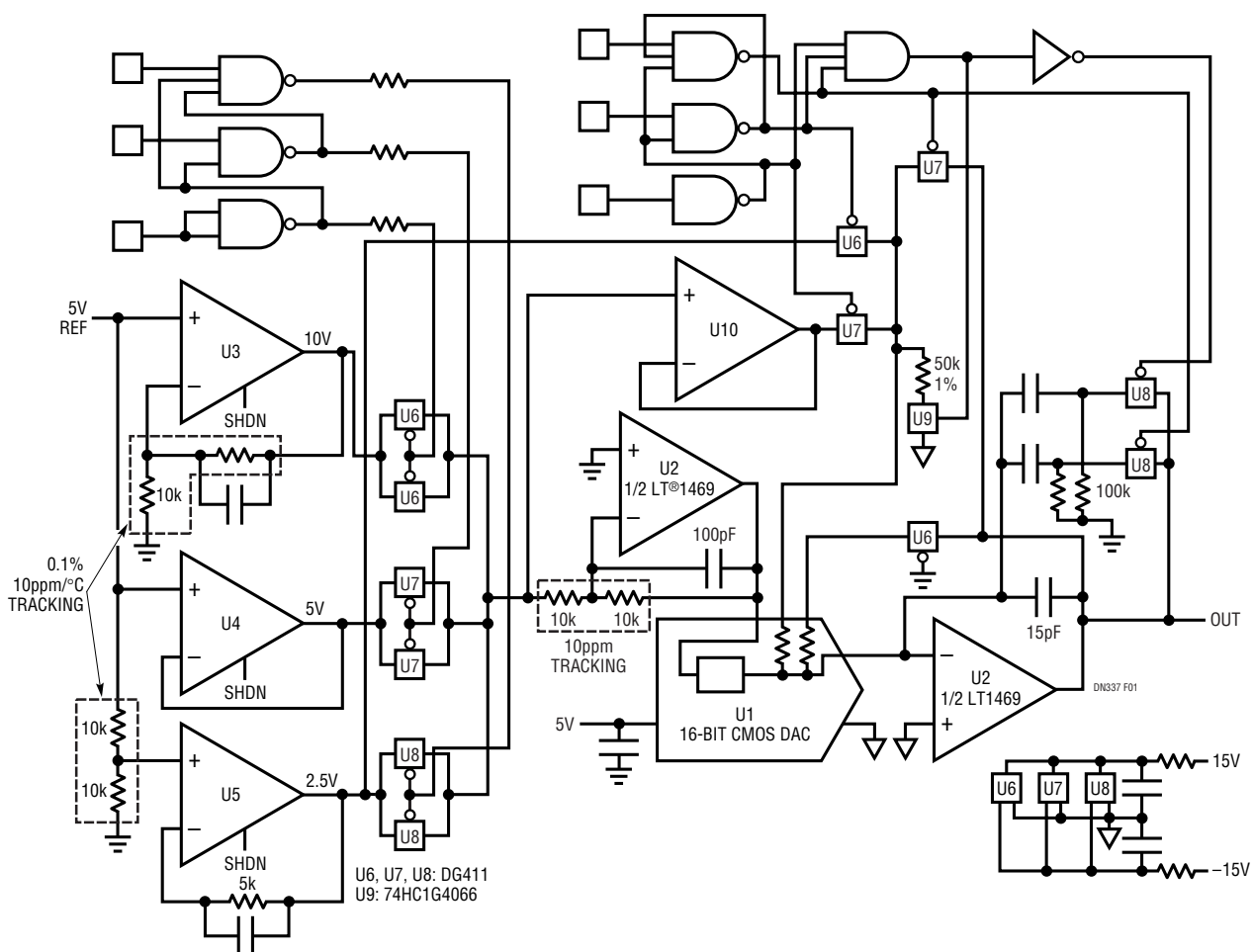


Figure 1. How NOT to Build a Universal 16-Bit Analog Output

