Keywords: MAX2281 Cellular CDMA/AMPS Dual-Power Path Power Amplifier Tuned for TDMA

Dec 10, 2001

APPLICATION NOTE 814

MAX2281 Cellular CDMA/AMPS Dual-Power Path Power Amplifier Tuned for TDMA

Additional Information:

- Wireless Product Line Page
- Applications Technical Support

The MAX2281 is a single-supply, low-voltage, linear power amplifier (PA) designed for cellular band applications. Its dual-power path architecture allows efficiency to be optimized at peak output power as well as at a lower, intermediate output power. This significantly extends talk-time compared to solutions that only optimize efficiency at peak output power.

The MAX2281 high-power path delivers +30dBm of output power at a supply current draw of 786mA from a +3.3V voltage supply, while exceeding TDMA ACPR requirements by 3.5dB (adjacent channel) and 5dB (alternate channel). In low-power mode, the MAX2281 delivers +18dBm of output power at a current draw of 119mA from a +3.3V voltage supply, while exceeding ACPR requirements. With the high-power path enabled, the MAX2281 delivers +18dBm of output power at a current draw of 264mA. Comparing high and low-power path performance at +18dBm, the MAX2281 low-power path saves 140mA of supply current for output powers below +18dBm, significantly extending cell-phone talk time. Because of the MAX2281's flexibility, efficiency and ACPR performance can be traded off to meet a particular design requirement.

Refer to **Figures 1** through **9** for performance data for the MAX2281, optimized for dual-power path TDMA operation, over frequency and supply voltage.

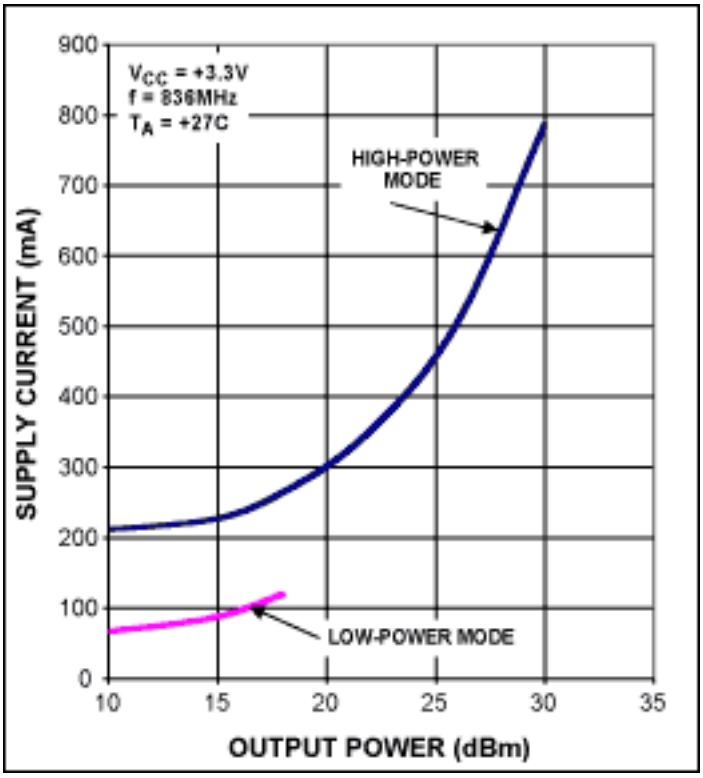

Figure 1. MAX2281 TDMA mode supply current vs output power.

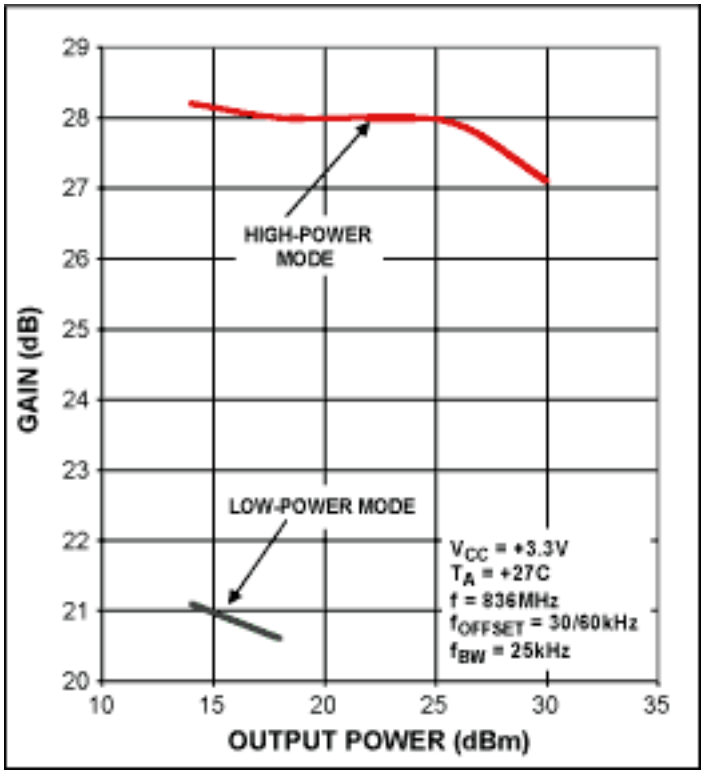

Figure 2. MAX2281 TDMA mode gain vs output power.

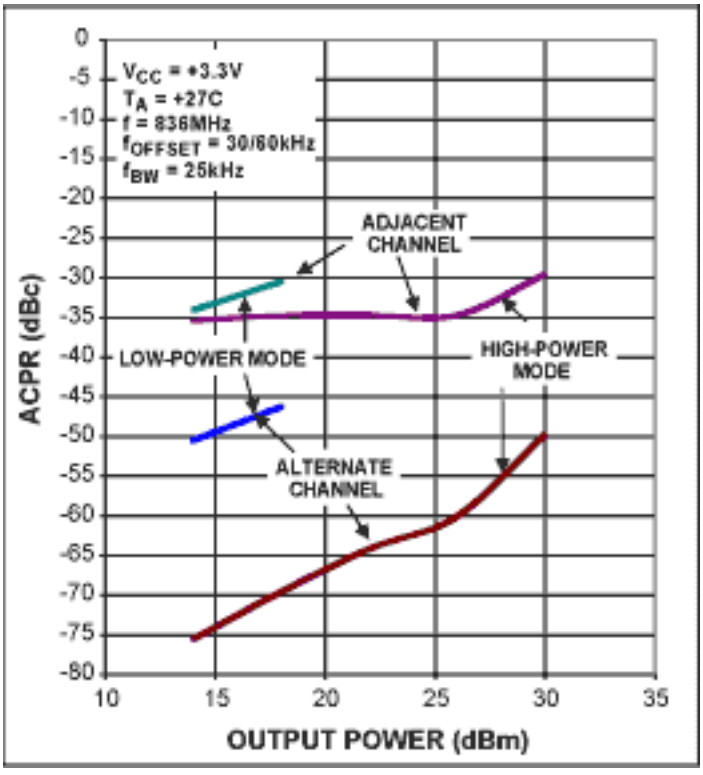

Figure 3. MAX2281 TDMA mode ACPR performance vs output power.

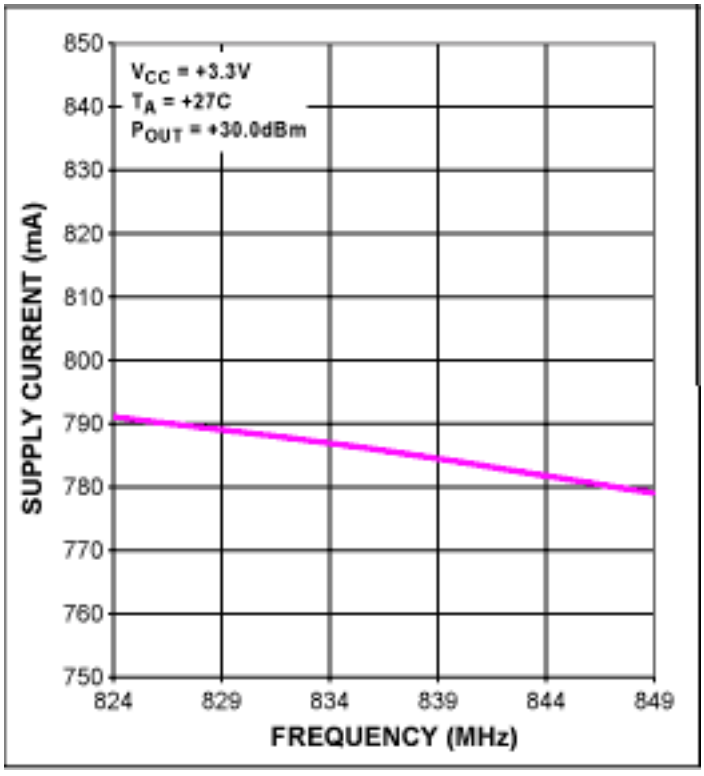

Figure 4. MAX2281 TDMA high-power path supply current vs frequency.

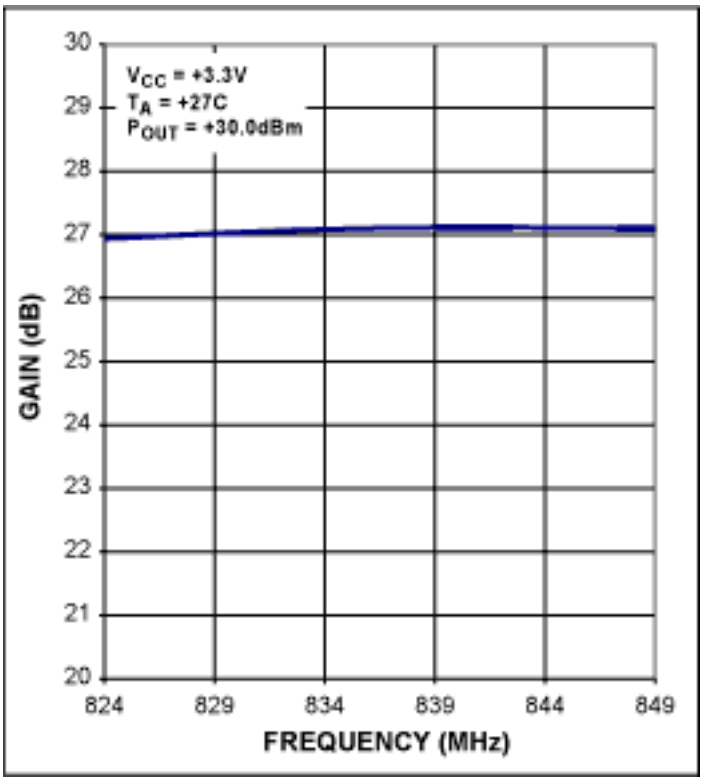

Figure 5. MAX2281 TDMA high-power path gain vs frequency.

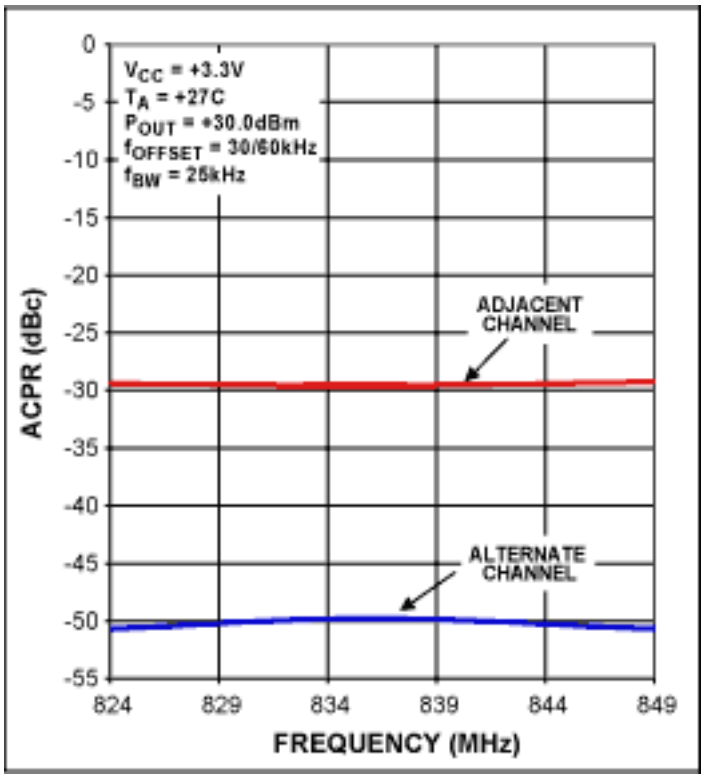

Figure 6. MAX2281 TDMA high-power path ACPR vs frequency.

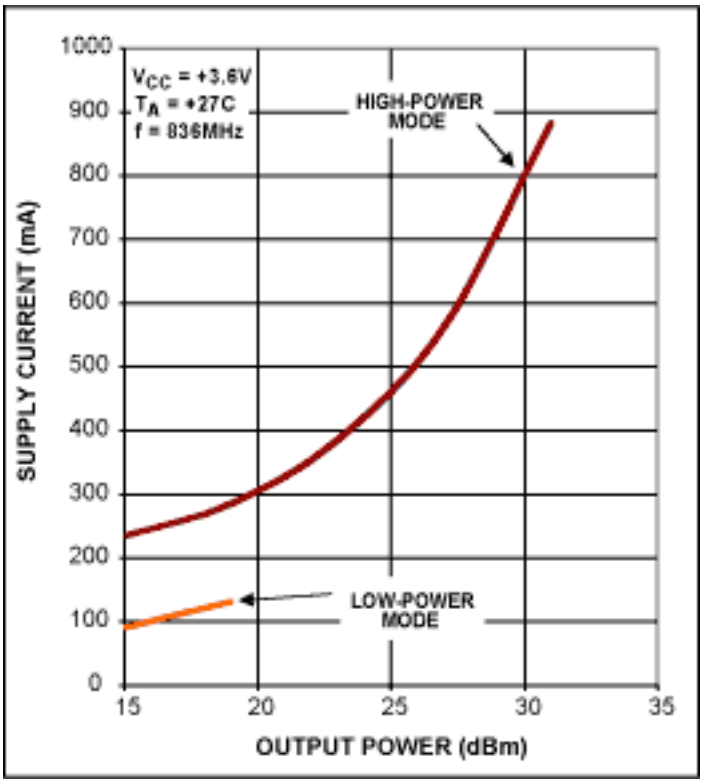

Figure 7. MAX2281 TDMA supply current vs output power at V_{CC} = +3.6V.

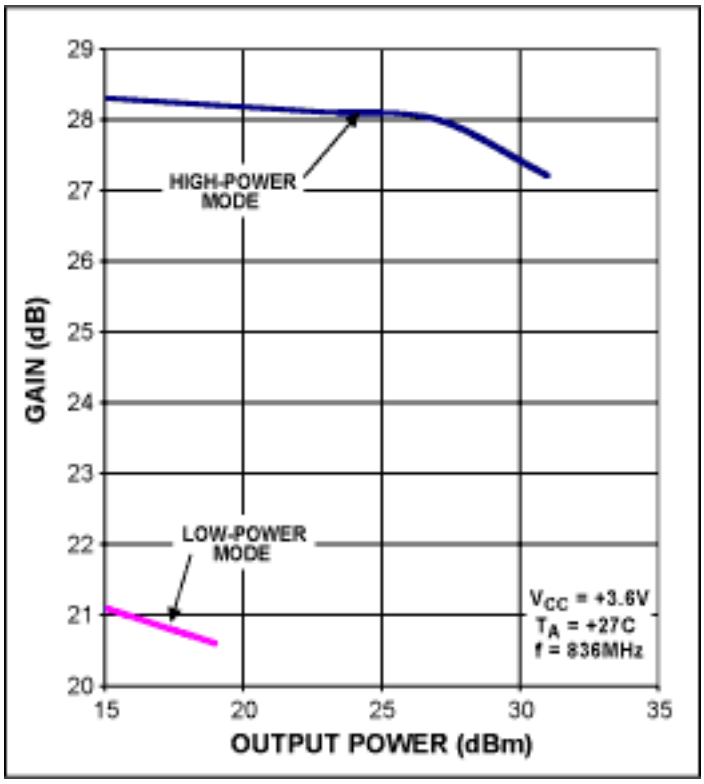

Figure 8. MAX2281 TDMA gain vs output power at V_{CC} = +3.6V.

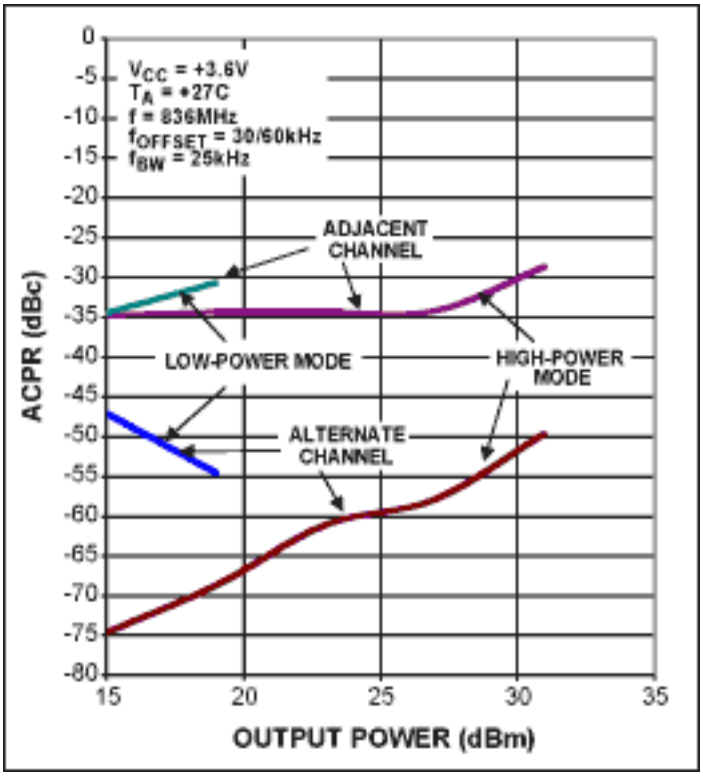

Figure 9. MAX2281 TDMA ACPR vs output power at V_{CC} = +3.6V.

Refer to **Figures 10**, and **11** for the schematic and output component placement guide.

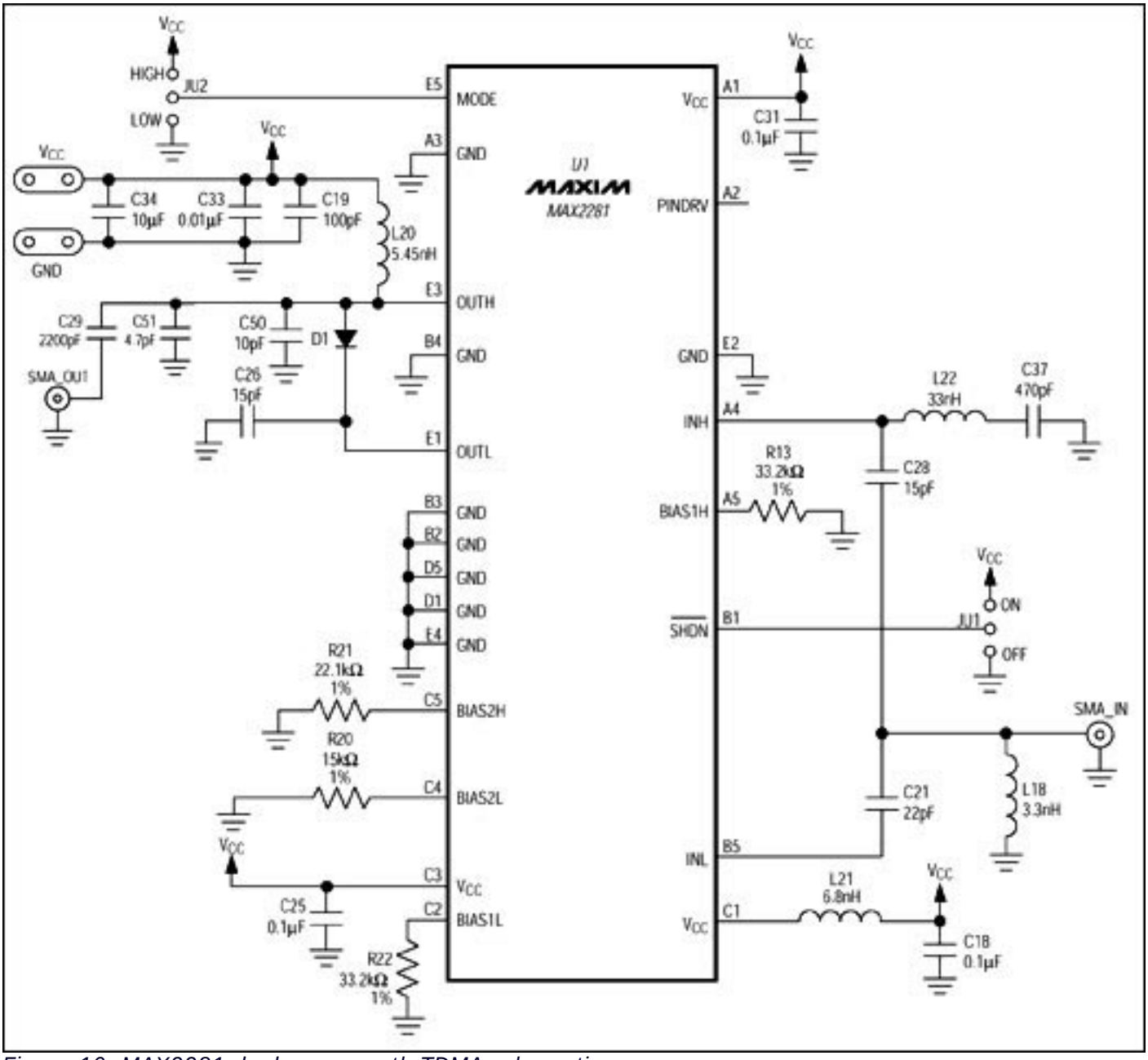

Figure 10. MAX2281 dual-power path TDMA schematic.

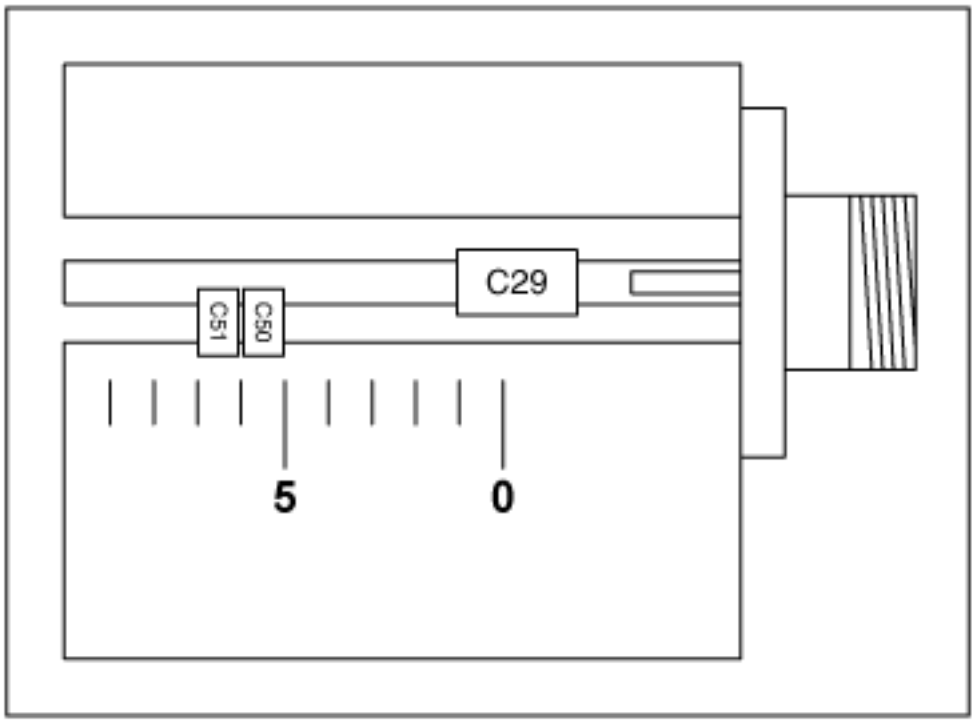

Figure 11. MAX2281TDMA dual-power path EV kit output component placement guide.

Refer to Table 1 for component values.

Table 1. MAX2281 Dual-Power Path TDMA Component List

Designator	Quantity	Description
C18, C25, C31	3	0.1µF capacitors, Murata GRM36X7R104K010A
C19	1	100pF capacitor, Murata GRM36COG101J050A
C21	1	22pF capacitor, Murata GRM36C0G220J050A
C26, C28	2	15pF capacitors, Murata GRM36COG150J050A
C29	1	2200pF capacitor, Murata GRM39X7R222K050A
C33	1	0.01µF capacitor, Murata GRM36X7R103K16A
C34	1	10µF capacitor, 6.3V, Taiyo Yuden 1206
C37	1	470pF capacitor, Murata GRM36X7R471K050A
C50	1	10pF capacitor, Murata GRM36COG100D50
C51	1	4.7pF capacitor, Murata GRM36COG4R7C50
D1	1	Alpha SMP1320-011
L18	1	3.3nH inductor, Murata LQP10A3N3S00
L20	1	5.45nH inductor, Coilcraft 0906-5 air core
L21	1	6.8nH inductor, Murata LQP10A6N8T00
L22	1	33nH inductor, Murata LQP10A33NJ00
R13, R22	1	33.2kΩ ±1% resistor
R20	1	15kΩ ±1% resistor
R21	1	22.1KΩ ±1% resistor

Application Note 814: http://www.maxim-ic.com/an814

More Information

For technical questions and support: http://www.maxim-ic.com/support
For samples: http://www.maxim-ic.com/samples
Other questions and comments: http://www.maxim-ic.com/contact

Related Parts

MAX2281: QuickView

AN814, AN 814, APP814, Appnote814, Appnote 814