

Lowest-cost, Isolated DC-DC Converter with SN6501

Depending on your application use the minimum configuration in Figure 1 or standard configuration in Figure 2.

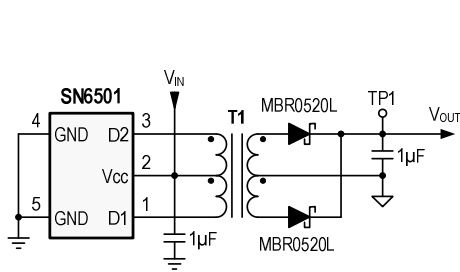


Figure 1. Unregulated output for low-current loads with wide supply range

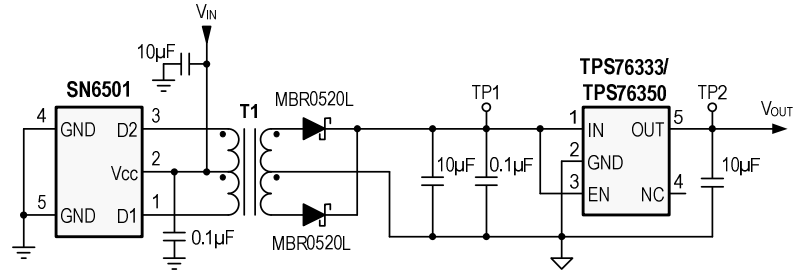


Figure 2. Regulated output for stable supplies and high current loads

The Wuerth-Electronics / Midcom isolation transformers in Table 1 are new, optimized designs for the SN6501, providing high efficiency and small form factor at very low-cost.

The 1:1.1 and 1:1.7 turns-ratios are designed for logic applications with wide supply rails and low load currents. These applications operate without LDO, thus achieving further cost-reduction.

Table 1: Recommended, brand new isolation transformer designs optimized for SN6501

Turns ratio	V-T (Vµs)	Isolation (kV-rms)	Dimensions (mm)	Application	LDO	Figures	Order No.	Manufacturer
1:1.1	11	2500	6.73 x 7.14 x 4.06	5V ⇌ 5V	No	3,4	760390012	Wuerth-Electronics Midcom
1:1.1	7	2500	6.73 x 7.14 x 4.06	3.3V ⇌ 3.3V	No	5,6	760390011	
1:1.7	11	2500	6.73 x 7.14 x 4.06	3.3V ⇌ 5V	No	7,8	760390013	
1:1.3	11	2500	6.73 x 7.14 x 4.06	5V ⇌ 5V 3.3V ⇌ 3.3V	Yes	9,10 11,12	760390014	
1:2.0	11	2500	6.73 x 7.14 x 4.06	3.3V ⇌ 5V	Yes	13,14	760390015	

Some pre-existing isolation transformers that have been tested with SN6501 are listed in Table 2.

Table 2: Standard isolation transformers tested with SN6501

Turns ratio	V-T (Vµs)	Isolation (kV-rms)	Dimensions (mm)	Application	LDO	Figures	Order No.	Manufacturer
1:1.5	11	2500	10 x 12.07 x 5.97	5V ⇌ 5V 3.3V ⇌ 3.3V	Yes	15,16 17,18	750310999	Wuerth-Electronics Midcom
1:2.2	11	2500	10 x 12.07 x 5.97	3.3V ⇌ 5V	Yes	19,20	750310995	
1:1.5	34.4	2500	10.0 x 12.7 x 5.97	5V ⇌ 5V 3.3V ⇌ 3.3V	Yes	21,22 23,24	DA2303-AL	Coilcraft
1:2.2	21.5	2500	10.0 x 12.7 x 5.97	3.3V ⇌ 5V	Yes	25,26	DA2304-AL	
1:2.0	10.2	2500	10.0 x 12.7 x 5.97	3.3V ⇌ 5V	Yes	27,28	MA5632-AL	
1:1.31	50	1500	9.00 x 12.7 x 6.35	5V ⇌ 5V 3.3V ⇌ 3.3V	Yes	29,30 31,32	78253/55MC	Murata
1:2.27	35	1500	9.00 x 12.7 x 6.35	3.3V ⇌ 5V	Yes	33,34	78253/35MC	
1:1.33	50	6000	15.0 x 15.0 x 12.5	5V ⇌ 5V 3.3V ⇌ 3.3V	Yes	35,36 37,38	76253/55ENC	

TYPICAL OPERATING CHARACTERISTICS

Measured with Circuit in Figure 1 at TP1, $T_A = 25^\circ\text{C}$

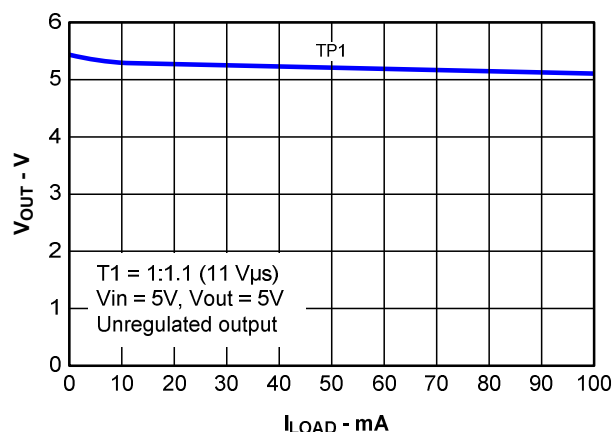


Figure 3. Output Voltage vs. Load Current

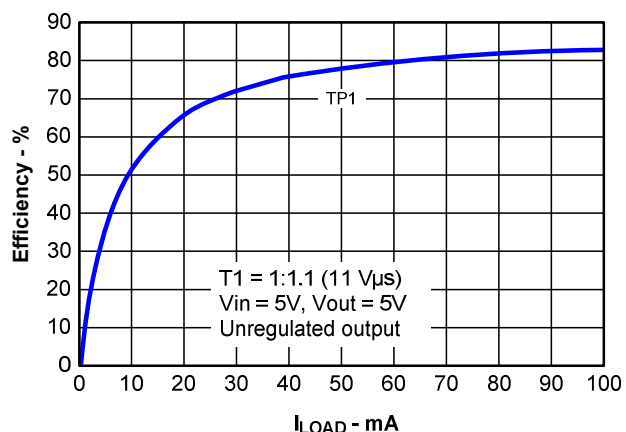


Figure 4. Efficiency vs. Load Current

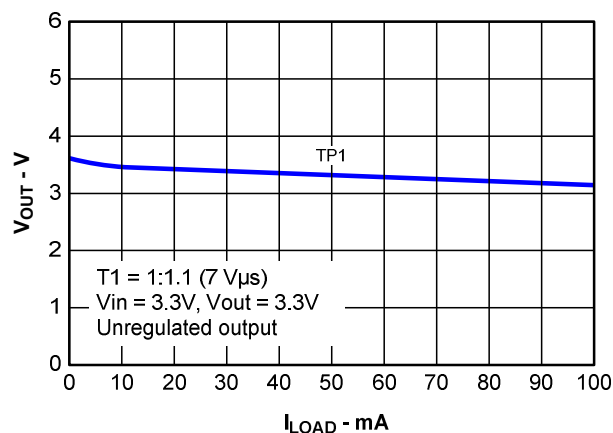


Figure 5. Output Voltage vs. Load Current

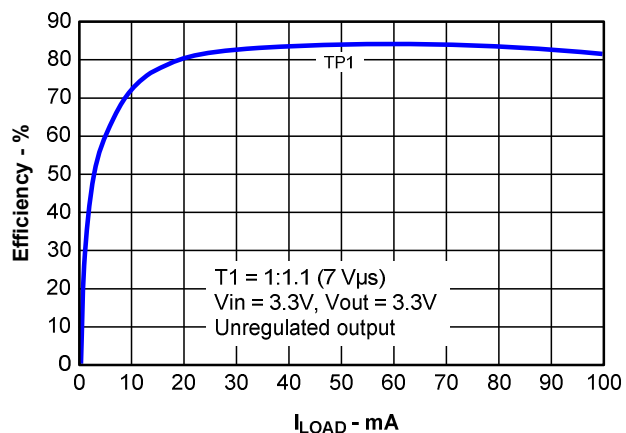


Figure 6. Efficiency vs. Load Current

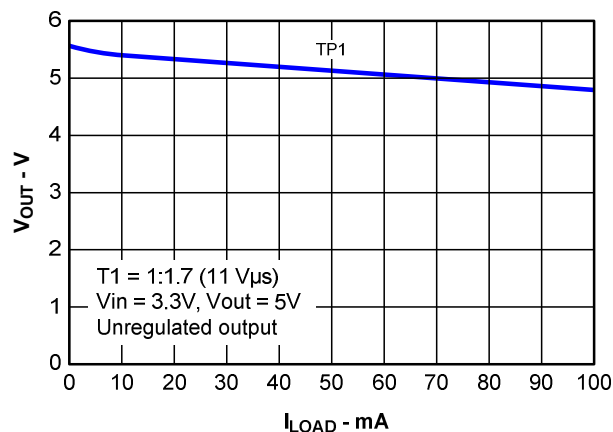


Figure 7. Output Voltage vs. Load Current

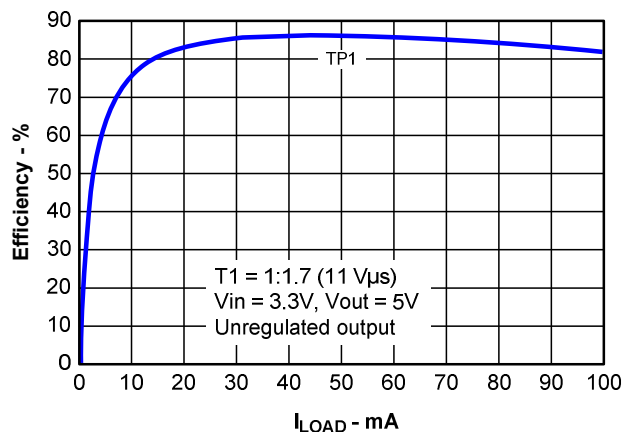


Figure 8. Efficiency vs. Load Current

TYPICAL OPERATING CHARACTERISTICS CONTINUED

Measured with Circuit in Figure 2 at TP1 and TP2, $T_A = 25^{\circ}\text{C}$

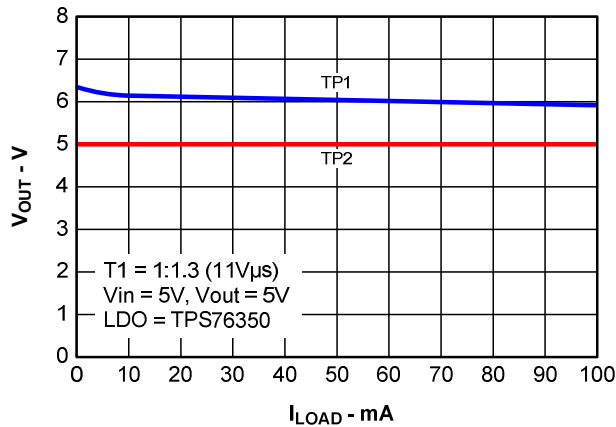


Figure 9. Output Voltage vs. Load Current

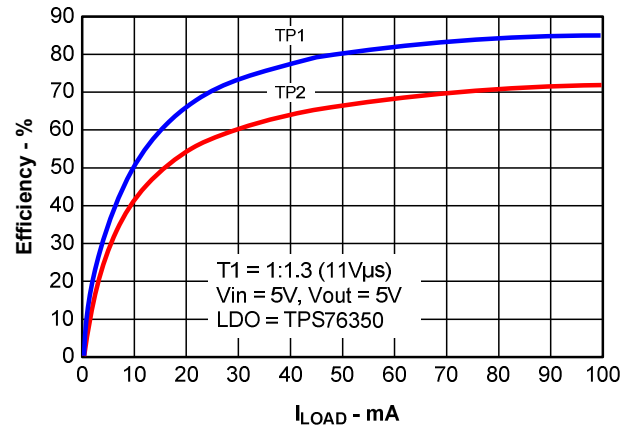


Figure 10. Efficiency vs. Load Current

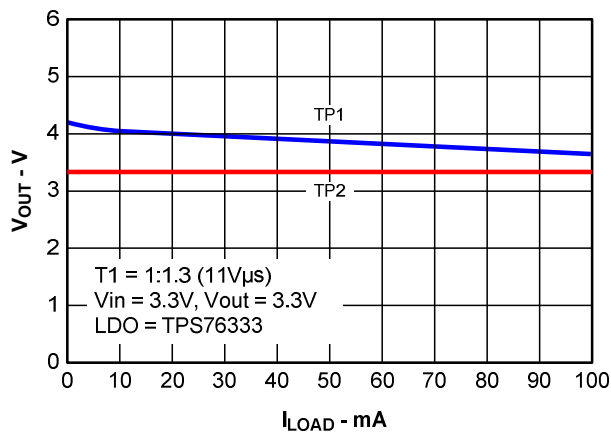


Figure 11. Output Voltage vs. Load Current

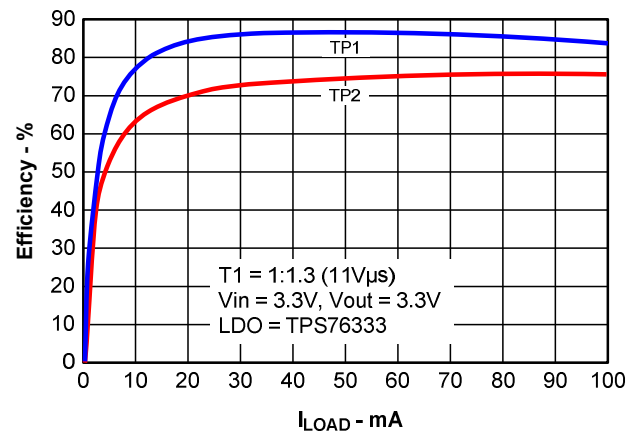


Figure 12. Efficiency vs. Load Current

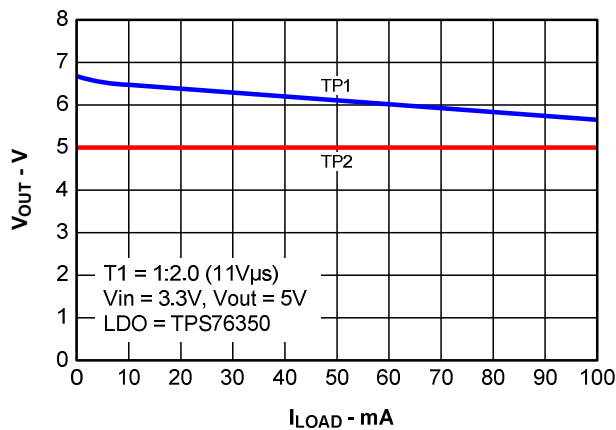


Figure 13. Output Voltage vs. Load Current

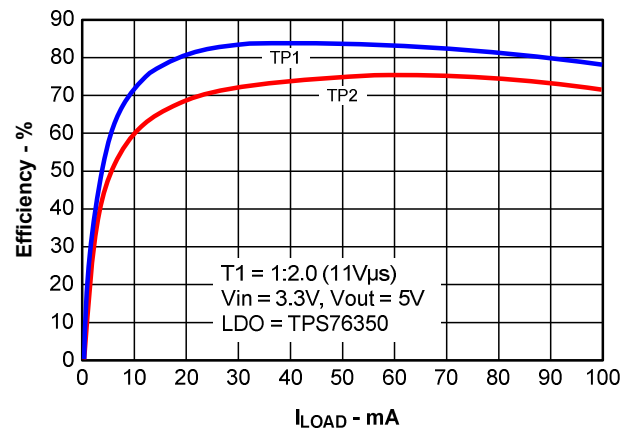


Figure 14. Efficiency vs. Load Current

TYPICAL OPERATING CHARACTERISTICS CONTINUED

Measured with Circuit in Figure 2 at TP1 and TP2, $T_A = 25^\circ\text{C}$

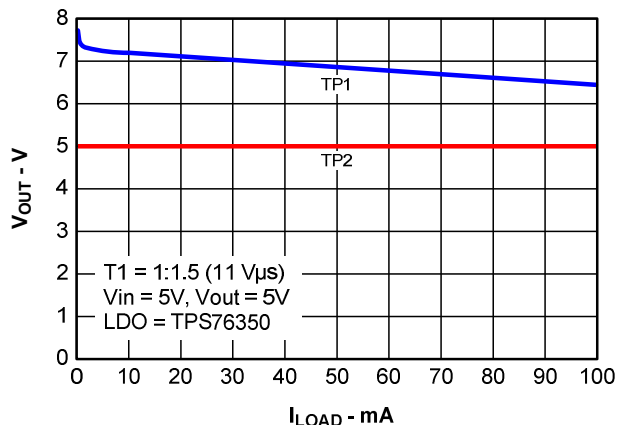


Figure 15. Output Voltage vs. Load Current

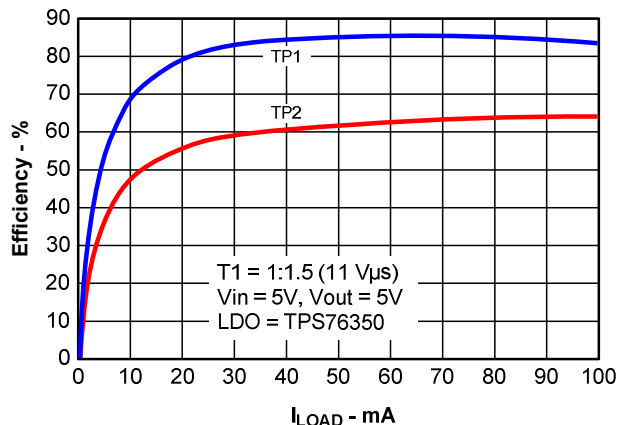


Figure 16. Efficiency vs. Load Current

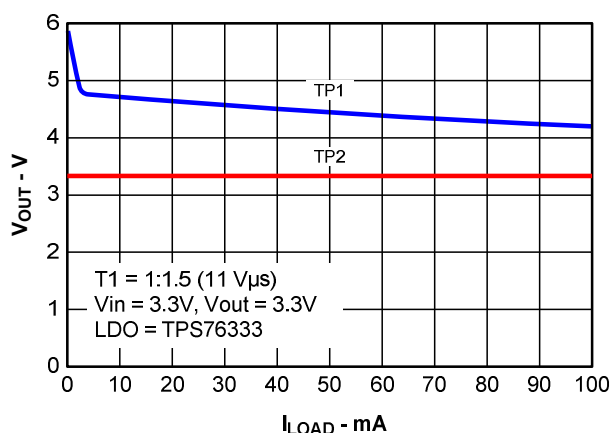


Figure 17. Output Voltage vs. Load Current

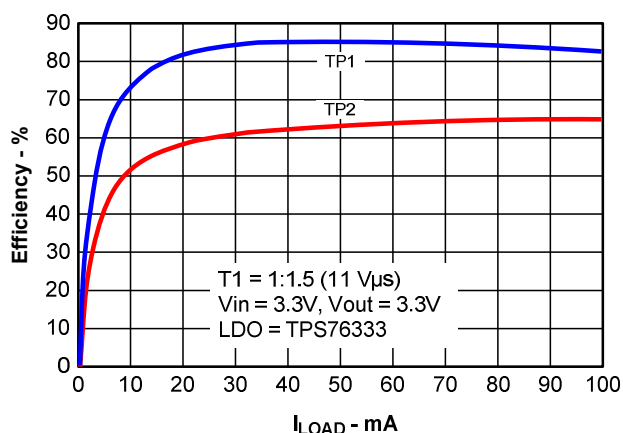


Figure 18. Efficiency vs. Load Current

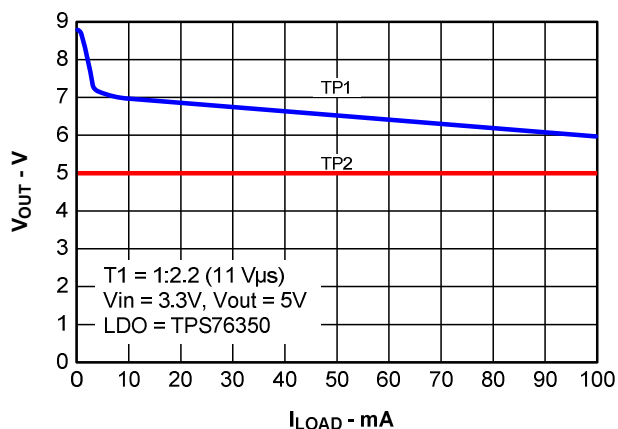


Figure 19. Output Voltage vs. Load Current

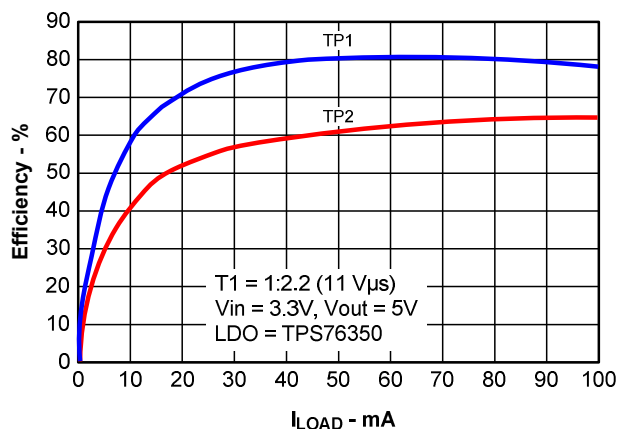


Figure 20. Efficiency vs. Load Current

TYPICAL OPERATING CHARACTERISTICS

Measured with Circuit in Figure 2 at TP1 and TP2, $T_A = 25^{\circ}\text{C}$

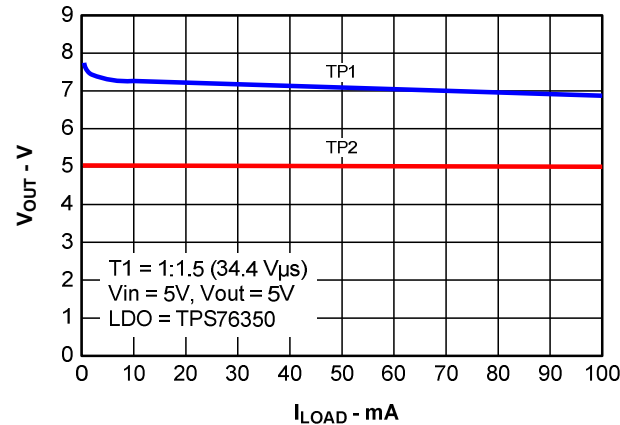


Figure 21. Output Voltage vs. Load Current

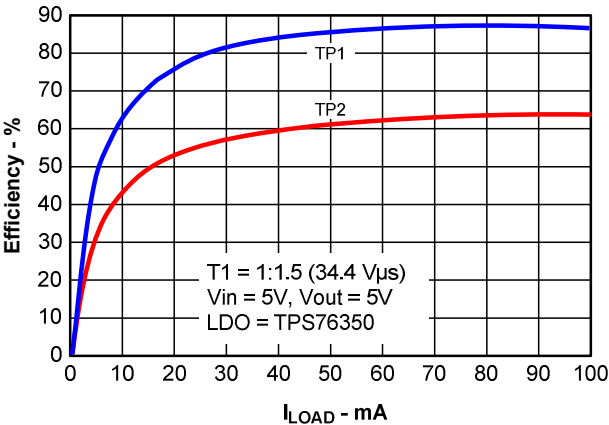


Figure 22. Efficiency vs. Load Current

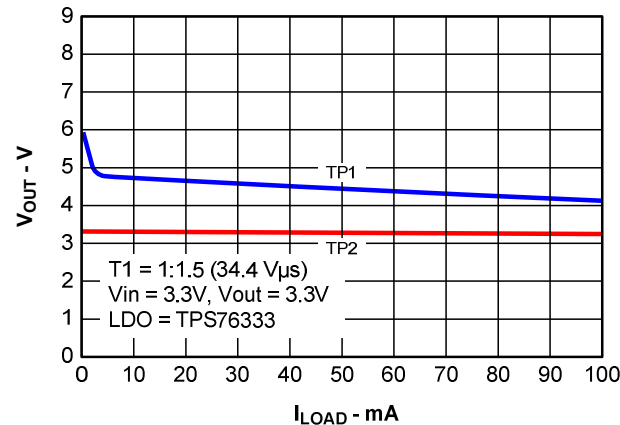


Figure 23. Output Voltage vs. Load Current

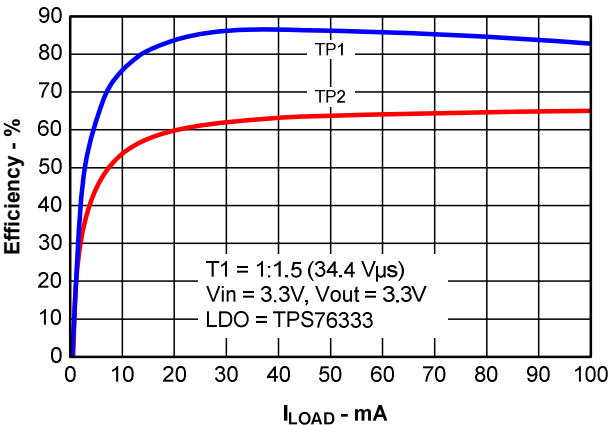


Figure 24. Efficiency vs. Load Current

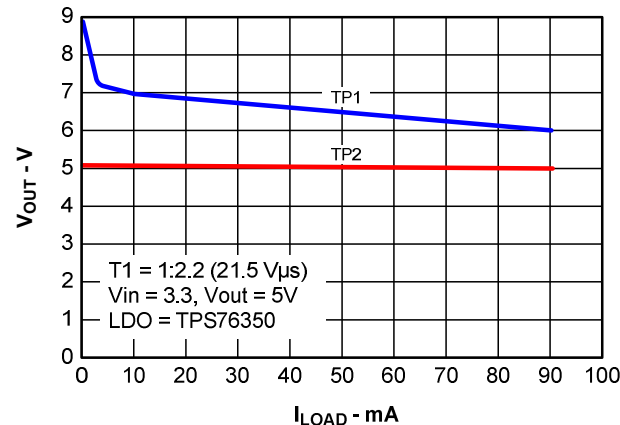


Figure 25. Output Voltage vs. Load Current

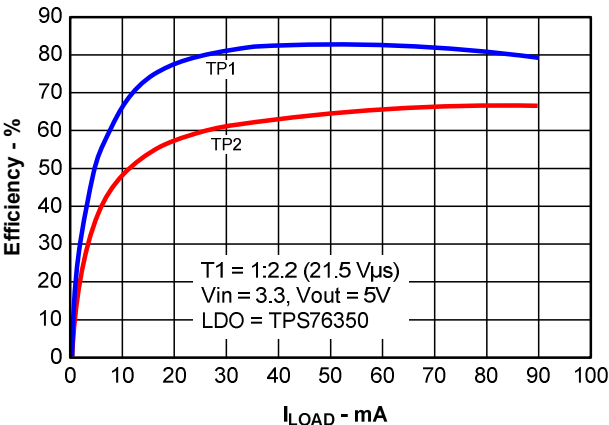


Figure 26. Efficiency vs. Load Current

TYPICAL OPERATING CHARACTERISTICS

Measured with Circuit in Figure 2 at TP1 and TP2, $T_A = 25^\circ\text{C}$

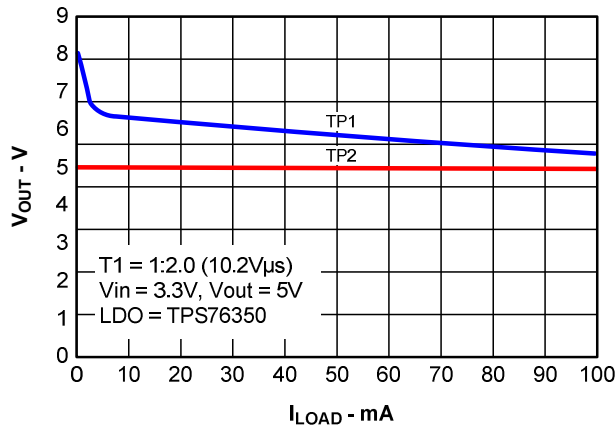


Figure 27. Output Voltage vs. Load Current

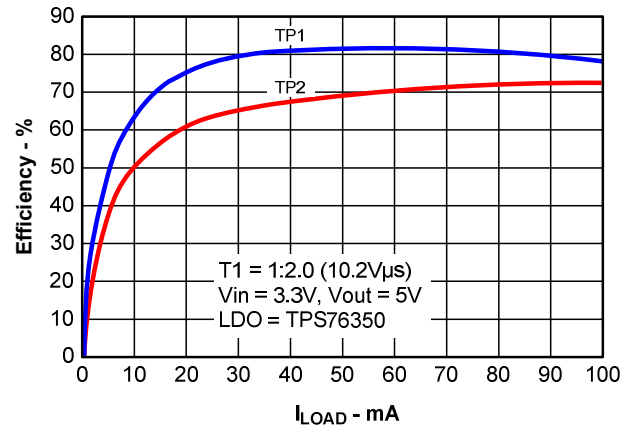


Figure 28. Efficiency vs. Load Current

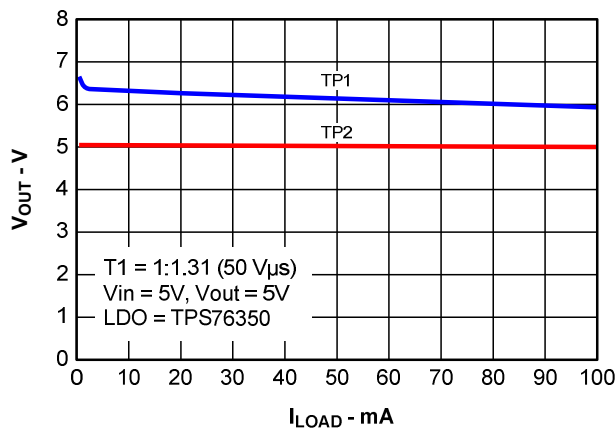


Figure 29. Output Voltage vs. Load Current

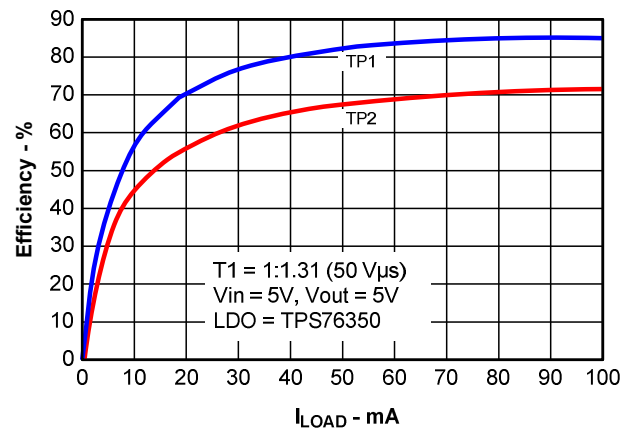


Figure 30. Efficiency vs. Load Current

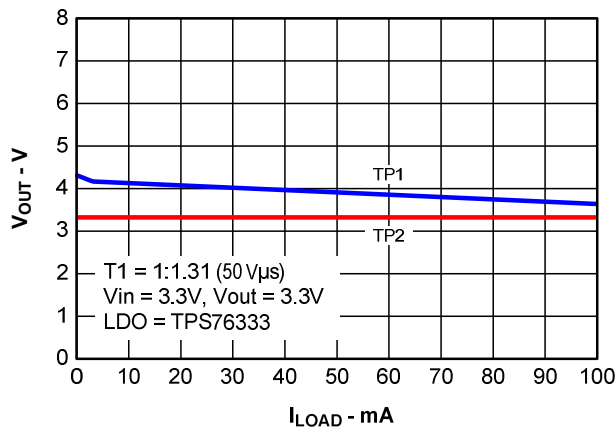


Figure 31. Output Voltage vs. Load Current

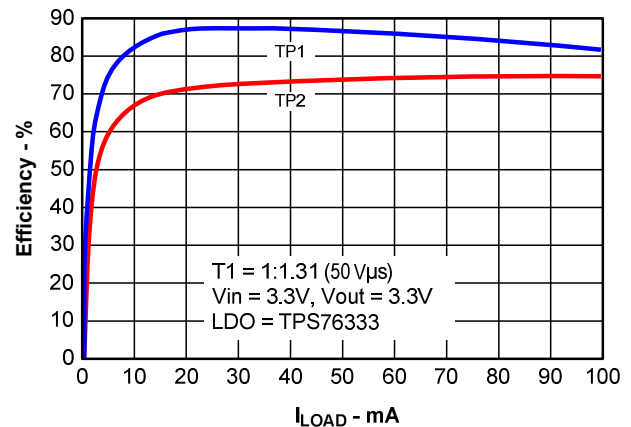


Figure 32. Efficiency vs. Load Current

TYPICAL OPERATING CHARACTERISTICS

Measured with Circuit in Figure 2 at TP1 and TP2, $T_A = 25^{\circ}\text{C}$

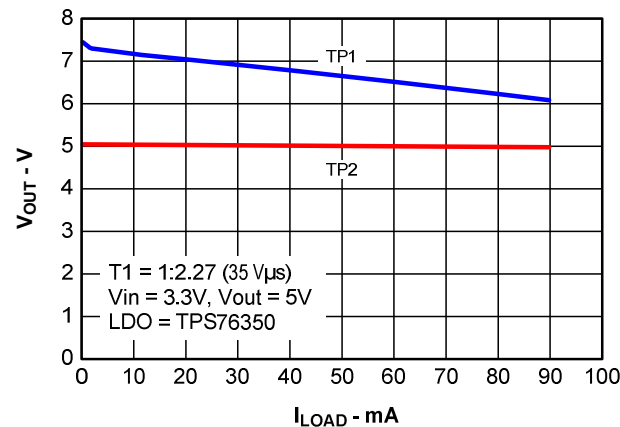


Figure 33. Output Voltage vs. Load Current

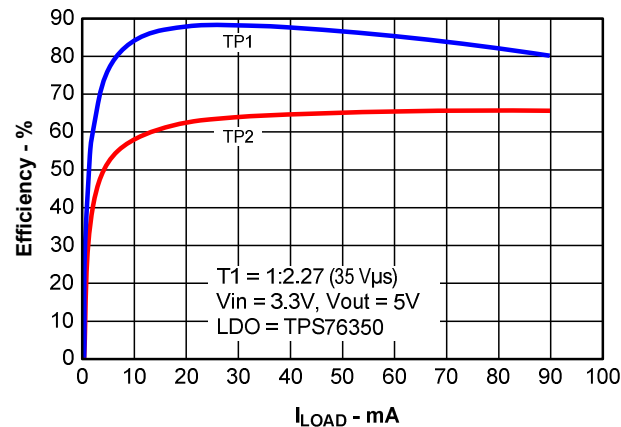


Figure 34. Efficiency vs. Load Current

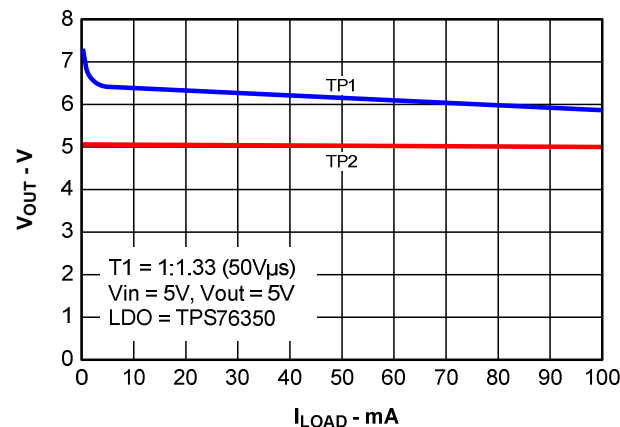


Figure 35. Output Voltage vs. Load Current

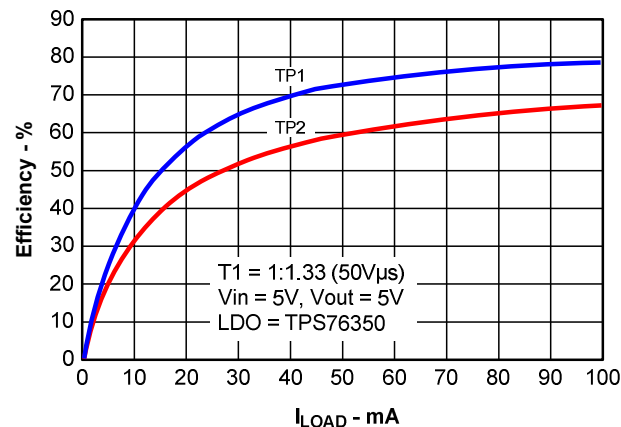


Figure 36. Efficiency vs. Load Current

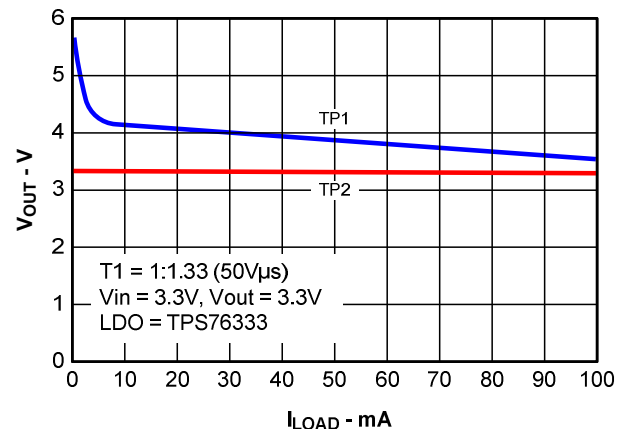


Figure 37. Output Voltage vs. Load Current

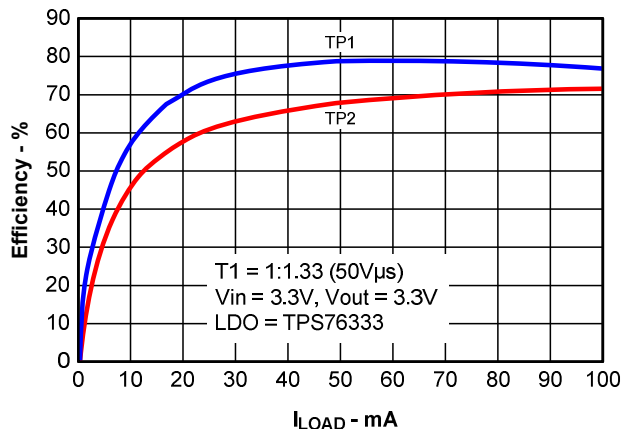


Figure 38. Efficiency vs. Load Current