

# Output Voltage Selection for the TPS62400 Family of Buck Converters

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## ABSTRACT

This application report explains how to determine the output voltage of the TPS62400 after power up and the software adjustable range of voltages.

The TPS62400 family (TPS624xx) of dual output DC-to-DC converters have adjustable output voltages. The output voltage can be programmed with an external resistor divider network to set the output voltage during power up. Then, after power up, the output voltage can be changed via software to several predefined values. The following flowcharts and tables can be used as a quick reference to determine the output voltage range of the TPS624xx after power up and when using software to change the outputs.

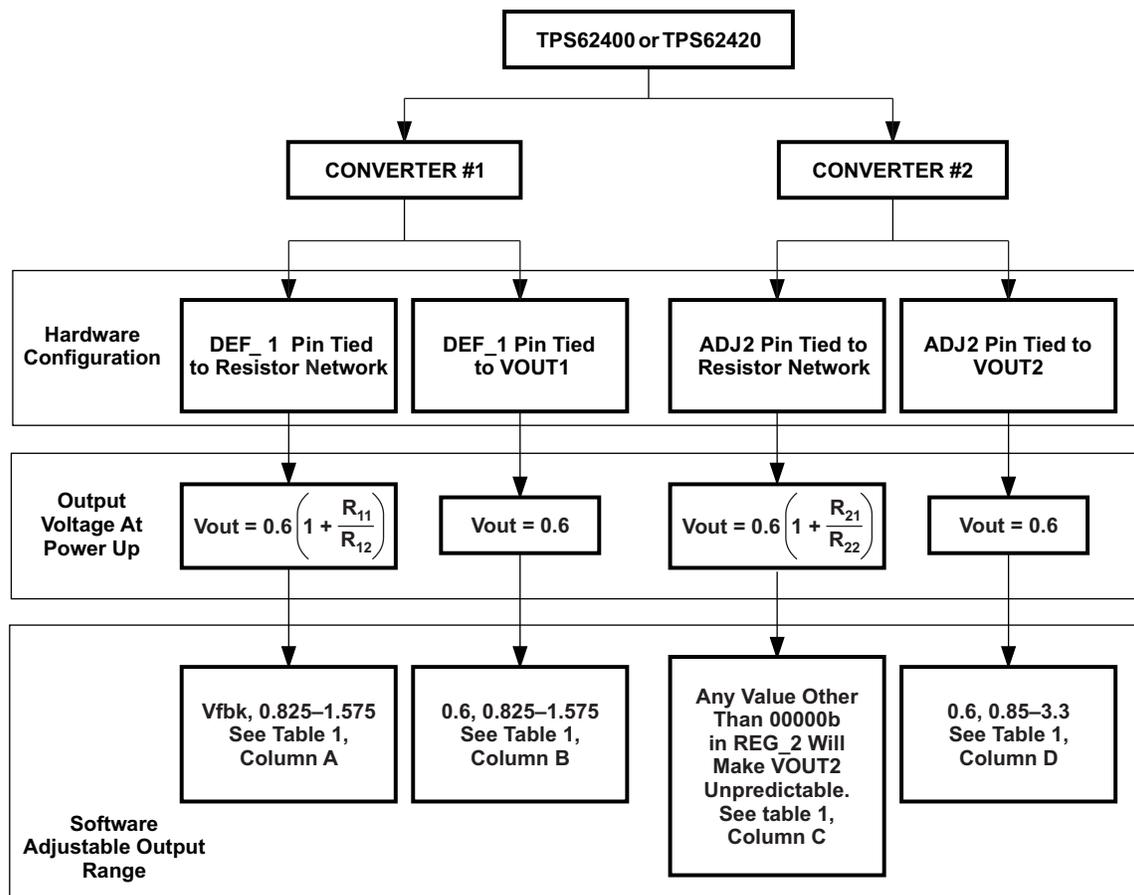


Figure 1. TPS624x0 Output Voltage Flow Chart

**Table 1. TPS624x0 Output Voltage By Programmed Register Value**

Decimal Register Value	Binary Register Value	CONVERTER 1		CONVERTER 2	
		Column A Set by REG_DEF_1_LOW	Column B Set by REG_DEF_1_LOW	Column C Set by REG_DEF_2	Column D Set by REG_DEF_2
0	00000	Vfb <sup>(1)</sup>	0.600	Vfb <sup>(1)</sup>	0.600
1	00001	0.825	0.825	undetermined	0.850
2	00010	0.850	0.850	undetermined	0.900
3	00011	0.875	0.875	undetermined	0.950
4	00100	0.900	0.900	undetermined	1.000
5	00101	0.925	0.925	undetermined	1.050
6	00110	0.950	0.950	undetermined	1.100
7	00111	0.975	0.975	undetermined	1.150
8	01000	1.000	1.000	undetermined	1.200
9	01001	1.025	1.025	undetermined	1.250
10	01010	1.050	1.050	undetermined	1.300
11	01011	1.075	1.075	undetermined	1.350
12	01100	1.100	1.100	undetermined	1.400
13	01101	1.125	1.125	undetermined	1.450
14	01110	1.150	1.150	undetermined	1.500
15	01111	1.175	1.175	undetermined	1.550
16	10000	1.200	1.200	undetermined	1.600
17	10001	1.225	1.225	undetermined	1.700
18	10010	1.250	1.250	undetermined	1.800
19	10011	1.275	1.275	undetermined	1.850
20	10100	1.300	1.300	undetermined	2.000
21	10101	1.325	1.325	undetermined	2.100
22	10110	1.350	1.350	undetermined	2.200
23	10111	1.375	1.375	undetermined	2.300
24	11000	1.400	1.400	undetermined	2.400
25	11001	1.425	1.425	undetermined	2.500
26	11010	1.450	1.450	undetermined	2.600
27	11011	1.475	1.475	undetermined	2.700
28	11100	1.500	1.500	undetermined	2.800
29	11101	1.525	1.525	undetermined	2.850
30	11110	1.550	1.550	undetermined	3.000
31	11111	1.575	1.575	undetermined	3.300

<sup>(1)</sup> Vfb is the voltage set by the external feedback resistor network

The TPS62401 is a fixed output device. The TPS62401 does not support the use of a feedback resistor divider network to set the output voltage after power up. The output voltage after power up is factory programmed to default values. After power up, the TPS62401 output voltage can be adjusted over a range of values using software.

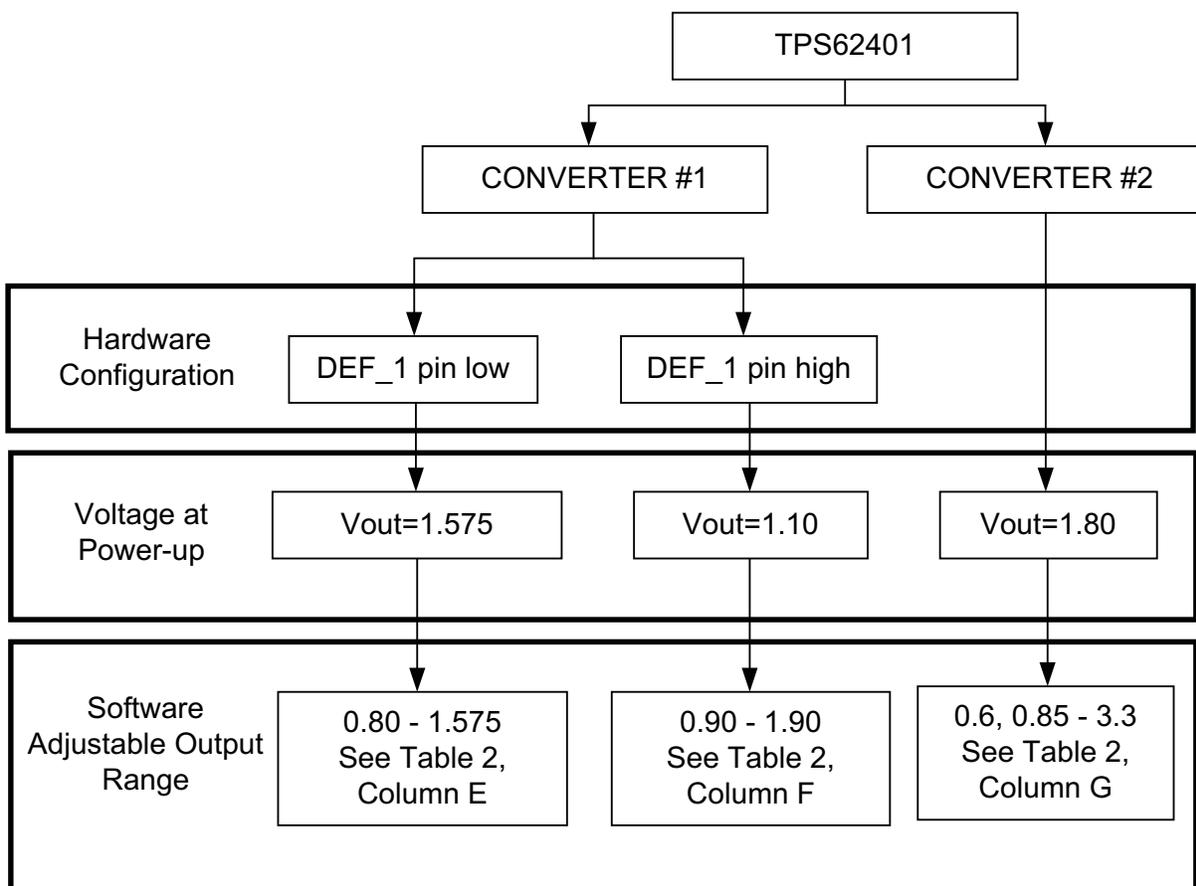


Figure 2. TPS62401 Output Voltage Flow Chart

Table 2. TPS62401 Output Voltage By Programmed Register Value

Decimal Register Value	Binary Register Value	CONVERTER 1		CONVERTER 2
		Column E Set by REG_DEF_1_LOW	Column F Set by REG_DEF_1_HIGH	Column G Set by REG_DEF_2
0	00000	0.800	0.900	0.600
1	00001	0.825	0.925	0.850
2	00010	0.850	0.950	0.900
3	00011	0.875	0.975	0.950
4	00100	0.900	1.000	1.000
5	00101	0.925	1.025	1.050
6	00110	0.950	1.050	1.100
7	00111	0.975	1.075	1.150
8	01000	1.000	1.100	1.200
9	01001	1.025	1.125	1.250
10	01010	1.050	1.150	1.300
11	01011	1.075	1.175	1.350

**Table 2. TPS62401 Output Voltage By Programmed Register Value (continued)**

Decimal Register Value	Binary Register Value	CONVERTER 1		CONVERTER 2
		Column E Set by REG_DEF_1_LOW	Column F Set by REG_DEF_1_HIGH	Column G Set by REG_DEF_2
12	01100	1.100	1.200	1.400
13	01101	1.125	1.225	1.450
14	01110	1.150	1.250	1.500
15	01111	1.175	1.275	1.550
16	10000	1.200	1.300	1.600
17	10001	1.225	1.325	1.700
18	10010	1.250	1.350	1.800
19	10011	1.275	1.375	1.850
20	10100	1.300	1.400	2.000
21	10101	1.325	1.425	2.100
22	10110	1.350	1.450	2.200
23	10111	1.375	1.475	2.300
24	11000	1.400	1.500	2.400
25	11001	1.425	1.525	2.500
26	11010	1.450	1.550	2.600
27	11011	1.475	1.575	2.700
28	11100	1.500	1.600	2.800
29	11101	1.525	1.700	2.850
30	11110	1.550	1.800	3.000
31	11111	1.575	1.900	3.300

**References**

1. *TPS62400/TPS62401, 2.25MHz 400mA/600mA Dual Step-Down Converter in Small 3x3mm QFN Package* data sheet ([SLVS681](#))
2. *TPS62420, 2.25MHz 600mA/1000mA Dual Step Down Converter in Small 3x3mm QFN Package* data sheet ([SLVS676](#))

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