

开关稳压器 IC 系列

降压转换器 IC 的
设定输出电压电阻一览表

具有代表性的降压开关稳压器 IC、根据外部电阻的设定得到需要的输出电压。这个应用手册提供了简单的从各种各样内部基准电压 V_{REF} 到设定输出电压电阻的一览表。

●适用于以下构成的降压转换器

这个应用手册提供的电阻一览表适用于图 Figure 1. 所示构成的降压开关稳压器 IC。

输出电压 V_O 被反馈电阻 R_1 和 R_2 分压，从误差放大器的反向输入端进行输入。输入电压和基准电压 V_{REF} 相比较，误差放大器把误差信号输出到下一个电路中。PWM 比较器根据误差信号，驱动输出端的开关 MOS，把输出信号 V_O 推移到所指定的电压值。这个图所显示的是简单的电路构成图，根据电源电路方式的不同，误差放大器输出和输出端的开关 MOS 之间还会搭载各种功能框图。

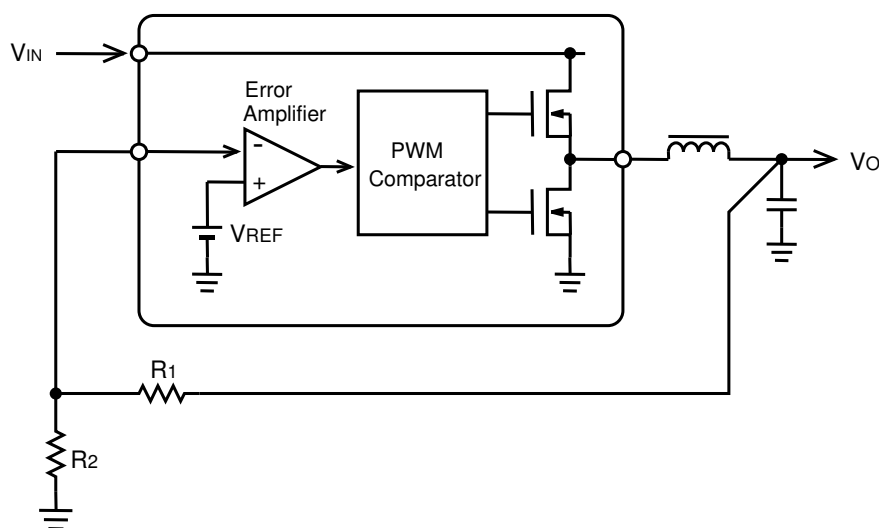


Figure 1. 具有代表性的降压转换电路的构成

●输出电压 V_O 的计算

输出电压 V_O 是通过 Figure 1. 的外部电阻 R_1 和 R_2 设定得到的值。输出电压 V_O 通过以下公式表示。

$$V_O = \frac{R_1 + R_2}{R_2} \times V_{REF} \quad (V)$$

V_{REF} : IC 内部的基准电压 (V)

(1)

R_1 和 R_2 的电阻比由以下公式表示。

$$\frac{R_1}{R_2} = \frac{V_O}{V_{REF}} - 1$$

(2)

●下一页是 IC 内部基准电压 V_{REF} 是 0.7V、0.75V、0.8V、0.9V、1.0V 时的电阻一览表。

●表 1 当 $V_{REF}=0.7V$ 时的电阻 R_1 、 R_2

Vo (V)	R1/R2	R1 (kΩ)	R2 (kΩ)	Vo' (V)	Error (%)
0.7	-	0	-	0.7	0
0.75	0.071	13	180	0.7506	+0.074
	0.071	5.1	68+3.3	0.7501	+0.009
0.8	0.143	4.3	30	0.8003	+0.042
0.85	0.214	12	56	0.85	0
0.9	0.286	16	56	0.9	0
0.95	0.357	20	56	0.95	0
1	0.429	24	56	1.	0
1.05	0.5	15	30	1.05	0
1.1	0.571	39	68	1.1015	+0.134
	0.571	16	18+10	1.1	0
1.15	0.643	36	56	1.15	0
1.2	0.714	13	18	1.2056	+0.463
	0.714	12	10+6.8	1.2	0
1.25	0.786	12	15	1.26	+0.8
	0.786	22	18+10	1.25	0
1.3	0.857	11	13	1.2923	-0.592
	0.857	24	18+10	1.3	0
1.35	0.929	12	13	1.346	-0.285
	0.929	39	27+15	1.35	0
1.4	1.	22	22	1.4	0
1.45	1.071	16	15	1.447	-0.230
	1.071	12	10+1.2	1.45	0
1.5	1.143	15	13	1.5077	+0.513
	1.143	33+4.7	33	1.4997	-0.02
1.55	1.214	68	56	1.55	0
1.6	1.286	13	10	1.61	+0.625
	1.286	36	18+10	1.6	0
1.65	1.357	15	11	1.6545	+0.275
	1.357	68+1.2	51	1.6498	-0.012
1.7	1.429	13	9.1	1.7	0
1.75	1.5	15	10	1.75	0
1.8	1.571	47	30	1.7967	-0.185
	1.571	33+4.7	24	1.7996	-0.023
1.85	1.643	15	9.1	1.8538	+0.208
	1.643	82+10	56	1.85	0
1.9	1.714	62	36	1.9056	+0.292
	1.714	10+5.6	9.1	1.9	0
1.95	1.786	100	56	1.95	0
2	1.857	56	30	2.0067	+0.333
	1.857	47	22+3.3	2.0004	+0.02
2.05	1.929	33+5.6	20	2.051	+0.049
2.1	2.	20	10	2.1	0
2.2	2.143	12	5.6	2.2	0
2.3	2.286	62	27	2.3074	+0.322
	2.286	47+3.3	22	2.3005	+0.02
2.4	2.429	39	16	2.4063	+0.26
	2.429	68	18+10	2.4	0
2.5	2.571	100	39	2.4949	-0.205
	2.571	33+5.6	15	2.5013	+0.053
2.6	2.714	30	11	2.6091	+0.35
	2.714	22+2.7	9.1	2.6	0
2.65	2.786	10+5.6	5.6	2.65	0
2.7	2.857	16	5.6	2.7	0
2.75	2.929	82	18+10	2.75	0
2.8	3.	30	10	2.8	0
2.85	3.071	120	39	2.8538	+0.135
	3.071	15+2.2	5.6	2.85	0
2.9	3.143	160	51	2.8961	-0.135
	3.143	33+4.7	12	2.8992	-0.029

Vo (V)	R1/R2	R1 (kΩ)	R2 (kΩ)	Vo' (V)	Error (%)
3	3.286	27	8.2	3.0049	+0.163
	3.286	47+5.6	16	3.0013	+0.042
3.1	3.429	82	24	3.0917	-0.269
	3.429	33+4.7	11	3.0991	-0.029
3.15	3.5	56	16	3.15	0
3.2	3.571	20	5.6	3.2	0
3.25	3.643	43	10+1.8	3.2508	+0.026
3.3	3.714	82	22	3.3091	+0.275
	3.714	68	15+3.3	3.3011	+0.033
3.4	3.857	150	39	3.3923	-0.226
	3.857	33+5.6	10	3.402	+0.059
3.5	4.	30	7.5	3.5	0
3.6	4.143	91	22	3.5955	-0.126
	4.143	33+4.7	9.1	3.6	0
3.7	4.286	39	9.1	3.7	0
3.8	4.429	120	27	3.8111	+0.292
	4.429	33+3.3	8.2	3.7988	-0.032
3.9	4.571	82	18	3.8889	-0.285
	4.571	47+3.3	11	3.9009	+0.023
4	4.714	47	10	3.99	-0.25
	4.714	68+2.7	15	3.9993	-0.017
4.1	4.857	33	6.8	4.0971	-0.072
4.2	5.	75	15	4.2	0
4.3	5.143	82	16	4.2875	-0.291
	5.143	22+6.8	5.6	4.3	0
4.4	5.286	36	6.8	4.4059	+0.134
	5.286	91	15+2.2	4.4035	+0.079
4.5	5.429	130	24	4.4917	-0.185
	5.429	33+3.9	6.8	4.4985	-0.033
4.6	5.571	100	18	4.5889	-0.242
	5.571	68	10+2.2	4.6016	+0.036
4.7	5.714	47	8.2	4.7122	+0.259
	5.714	22+10	5.6	4.7	0
4.8	5.857	30	5.1	4.8176	+0.368
	5.857	68+8.2	13	4.8031	+0.064
4.9	6.	120	20	4.9	0
5	6.143	56	9.1	5.0077	+0.154
	6.143	75	10+2.2	5.0033	+0.066
5.5	6.857	110	16	5.5125	+0.227
	6.857	150+1	22	5.5045	+0.083
6	7.571	47	6.2	6.0065	+0.108
	7.571	33+5.6	5.1	5.998	-0.033
7	9.	180	20	7.	0
7.7	10.	100	10	7.7	0
8	10.429	160	15	8.1667	+2.083
	10.429	120	10+1.5	8.0043	+0.054
9	11.857	130	11	8.9727	-0.303
	11.857	56+33	7.5	9.0067	+0.074
10	13.286	100	7.5	10.0333	+0.333
	13.286	100+33	10	10.01	+0.1
12	16.143	100	6.2	11.9903	-0.081
14.4	19.571	82+10	4.7	14.4021	+0.015
15	20.429	150	7.5	14.7	-2
	20.429	100+39	6.8	15.0088	+0.059
18	24.714	150	6.2	17.6355	-2.025
	24.714	150+3.3	6.2	18.0081	+0.045
20	27.571	130	4.7	20.0617	+0.309
	27.571	150+4.7	5.6	20.0375	+0.187
24	33.286	160	4.7	24.5298	+2.207
	33.286	150+6.8	4.7	24.0532	+0.222

• 根据使用 IC，电阻的设定范围也有限制。请参考各 IC 的 Datasheet。

●表 2 当 $V_{REF}=0.75V$ 时的电阻 R_1 、 R_2

Vo (V)	R1/R2	R1 (kΩ)	R2 (kΩ)	Vo' (V)	Error (%)
0.75	-	0	-	0.75	0
0.8	0.0666...	2	30	0.8	0
0.85	0.1333...	6.8	51	0.85	0
0.9	0.2	3	15	0.9	0
0.95	0.2666...	20	75	0.95	0
1	0.3333...	13	39	1.	0
1.05	0.4	12	30	1.05	0
1.1	0.4666...	5.6	12	1.1	0
1.15	0.5333...	16	30	1.15	0
1.2	0.6	12	20	1.2	0
1.25	0.6666...	10	15	1.25	0
1.3	0.7333...	11	15	1.3	0
1.35	0.8	12	15	1.35	0
1.4	0.8666...	13	15	1.4	0
1.45	0.9333...	15	16	1.4531	+0.216
	0.9333...	10+1.2	12	1.45	0
1.5	1	10	10	1.5	0
1.55	1.0666...	16	15	1.55	0
1.6	1.1333...	18	16	1.5938	-0.391
	1.1333...	33+1	30	1.6	0
1.65	1.2	12	10	1.65	0
1.7	1.2666...	15	12	1.6875	-0.735
	1.2666...	33+1.2	27	1.7	0
1.75	1.3333...	16	12	1.75	0
1.8	1.4	18	13	1.7885	-0.641
	1.4	10+6.8	12	1.8	0
1.85	1.4666...	22	15	1.85	0
1.9	1.5333...	20	13	1.9038	+0.202
	1.5333...	22+1	15	1.9	0
1.95	1.6	16	10	1.95	0
2	1.6666...	20	12	2.	0
2.05	1.7333...	13	7.5	2.05	0
2.1	1.8	18	10	2.1	0
2.2	1.9333...	12	6.2	2.2016	+0.073
	1.9333...	15+8.2	12	2.2	0
2.3	2.0666...	62	30	2.3	0
2.4	2.2	22	10	2.4	0
2.5	2.3333...	56	24	2.5	0
2.6	2.4666...	27	11	2.5909	-0.35
	2.4666...	22+15	15	2.6	0
2.65	2.5333...	33	13	2.6538	+0.145
	2.5333...	18+1	7.5	2.65	0
2.7	2.6	39	15	2.7	0
2.75	2.6666...	20	7.5	2.75	0
2.8	2.7333...	82	30	2.8	0
2.85	2.8	56	20	2.85	0
2.9	2.8666...	43	15	2.9	0
3	3	36	12	3.	0
3.1	3.1333...	47	15	3.1	0
3.15	3.2	24	7.5	3.15	0
3.2	3.2666...	36	11	3.2045	+0.142
	3.2666...	39+10	15	3.2	0

Vo (V)	R1/R2	R1 (kΩ)	R2 (kΩ)	Vo' (V)	Error (%)
3.25	3.3333...	100	30	3.25	0
3.3	3.4	51	15	3.3	0
3.4	3.5333...	24	6.8	3.3971	-0.087
	3.5333...	47	12+1.3	3.4004	+0.011
3.5	3.6666...	110	30	3.5	0
3.6	3.8	91	24	3.5938	-0.174
	3.8	47+10	15	3.6	0
3.7	3.9333...	22	5.6	3.6964	-0.097
	3.9333...	47+12	15	3.7	0
3.8	4.0666...	110	27	3.8056	+0.146
	4.0666...	47+1.8	12	3.8	0
3.9	4.2	75	18	3.875	-0.641
	4.2	27+15	10	3.9	0
4	4.3333...	130	30	4.	0
4.1	4.4666...	120	27	4.0833	-0.407
	4.4666...	15+10	5.6	4.0982	-0.044
4.2	4.6	110	24	4.1875	-0.298
	4.6	47+8.2	12	4.2	0
4.3	4.7333...	43	9.1	4.294	-0.141
	4.7333...	56+15	15	4.3	0
4.4	4.8666...	33	6.8	4.3897	-0.234
	4.8666...	56	10+1.5	4.4022	+0.049
4.5	5	75	15	4.5	0
4.6	5.1333...	82	16	4.5938	-0.136
	5.1333...	100+2.7	20	4.6013	+0.027
4.7	5.2666...	43	8.2	4.6829	-0.363
	5.2666...	33+15	9.1	4.706	+0.129
4.8	5.4	130	24	4.8125	+0.26
	5.4	39+15	10	4.8	0
4.9	5.5333...	100	18	4.9167	+0.34
	5.5333...	68+15	15	4.9	0
5	5.6666...	68	12	5.	0
5.5	6.3333...	43	6.8	5.4926	-0.134
	6.3333...	68+27	15	5.5	0
6	7	91	13	6.	0
7	8.3333...	100	12	7.	0
7.7	9.2666...	120	13	7.6731	-0.35
	9.2666...	68+1.5	7.5	7.7	0
8	9.6666...	100	10	8.25	+3.125
	9.6666...	33+27	6.2	8.0081	+0.1
9	11	110	10	9.	0
10	12.3333...	160	13	9.9808	-0.192
	12.3333...	100+1.2	8.2	10.0061	+0.061
12	15	150	10	12.	0
	15	150	8.2	14.4695	+0.483
14.4	18.2	150	8.2	14.4265	+0.184
	18.2	68+56	6.8	14.4265	+0.184
15	19	130	6.8	15.0882	+0.588
	19	82+15	5.1	15.0147	+0.098
18	23	130	5.6	18.1607	+0.893
	23	100+8.2	4.7	18.016	+0.089
20	25.6666...	110	4.3	19.936	-0.32
24	31	160	5.1	24.2794	+1.164
	31	150+8.2	5.1	24.0147	+0.061

・根据使用 IC，电阻的设定范围也有限制。请参考各 IC 的 Datasheet。

●表 3 当 $V_{REF}=0.8V$ 时的电阻 R_1 、 R_2

V_O (V)	R_1/R_2	R_1 (k Ω)	R_2 (k Ω)	V_O' (V)	Error (%)
0.8	-	0	-	0.8	0
0.85	0.063	7.5	120	0.85	0
0.9	0.125	3	24	0.9	0
0.95	0.188	30	160	0.95	0
1	0.25	7.5	30	1.	0
1.05	0.313	7.5	24	1.05	0
1.1	0.375	7.5	20	1.1	0
1.15	0.438	33	75	1.152	+0.174
	0.438	10+1.8	27	1.1496	-0.032
1.2	0.5	12	24	1.2	0
1.25	0.563	6.2	11	1.2509	+0.073
1.3	0.625	7.5	12	1.3	0
1.35	0.688	11	16	1.35	0
1.4	0.75	12	16	1.4	0
1.45	0.813	13	16	1.45	0
1.5	0.875	13	15	1.4933	-0.444
	0.875	39+10	56	1.5	0
1.55	0.938	15	16	1.55	0
1.6	1.	22	22	1.6	0
1.65	1.063	16	15	1.6533	+0.202
	1.063	51	33+15	1.65	0
1.7	1.125	18	16	1.7	0
1.75	1.188	51	43	1.7489	-0.066
1.8	1.25	15	12	1.8	0
1.85	1.313	100	68+8.2	1.8499	-0.007
1.9	1.375	22	16	1.9	0
1.95	1.438	56	39	1.9487	-0.066
	1.438	22+1	16	1.95	0
2	1.5	27	18	2.	0
2.05	1.563	15+10	16	2.05	0
2.1	1.625	39	24	2.1	0
2.2	1.75	68	39	2.1949	-0.233
	1.75	18+10	16	2.2	0
2.3	1.875	30	16	2.3	0
2.4	2.	24	12	2.4	0
2.5	2.125	51	24	2.5	0
2.6	2.25	27	12	2.6	0
2.65	2.313	22+15	16	2.65	0
2.7	2.375	43	18	2.7111	+0.412
	2.375	47+10	24	2.7	0
2.75	2.438	39	16	2.75	0
2.8	2.5	30	12	2.8	0
2.85	2.563	82	32	2.85	0
2.9	2.625	47	18	2.8889	-0.383
	2.625	27+15	16	2.9	0
3	2.75	33	12	3.	0
3.1	2.875	43	15	3.0933	-0.215
	2.875	33+1.5	12	3.1	0
3.15	2.938	47	16	3.15	0

V_O (V)	R_1/R_2	R_1 (k Ω)	R_2 (k Ω)	V_O' (V)	Error (%)
3.2	3.	30	10	3.2	0
3.25	3.063	39+10	16	3.25	0
3.3	3.125	75	24	3.3	0
3.4	3.25	39	12	3.4	0
3.5	3.375	91	27	3.4963	-0.106
	3.375	39+15	16	3.5	0
3.6	3.5	56	16	3.6	0
3.7	3.625	33	9.1	3.7011	+0.03
	3.625	100+1.5	18+10	3.7	0
3.8	3.75	75	20	3.8	0
3.9	3.875	62	16	3.9	0
4	4.	120	30	4.	0
4.1	4.125	62	15	4.1067	+0.163
	4.125	33+33	16	4.1	0
4.2	4.25	51	12	4.2	0
4.3	4.375	36	8.2	4.3122	+0.284
	4.375	39+10	10+1.2	4.3	0
4.4	4.5	68	15	4.4267	+0.606
	4.5	39+15	12	4.4	0
4.5	4.625	51	11	4.5091	+0.202
	4.625	47+27	16	4.5	0
4.6	4.75	39	8.2	4.6049	+0.106
	4.75	47+10	12	4.6	0
4.7	4.875	160	33	4.6788	-0.451
	4.875	68+10	16	4.7	0
4.8	5.	75	15	4.8	0
4.9	5.125	82	16	4.9	0
5	5.25	43	8.2	4.9951	-0.098
	5.25	150+39	36	5.	0
5.5	5.875	130	22	5.5273	+0.496
	5.875	47+47	16	5.5	0
6	6.5	130	20	6.	0
7	7.75	100	13	6.9538	-0.659
	7.75	68+56	16	7.	0
7.7	8.625	22+22	5.1	7.702	+0.025
8	9.	180	20	8.	0
9	10.25	100	10	8.8	-2.222
	10.25	160	10+5.6	9.0051	+0.057
10	11.5	150	13	10.0308	+0.308
	11.5	68+47	10	10.	0
12	14.	180	13	11.8769	-1.026
	14.	120+20	10	12.	0
14.4	17.	150+4.7	9.1	14.4	0
15	17.75	110	6.2	14.9935	-0.043
18	21.5	110	5.1	18.0549	+0.305
	21.5	68+33	4.7	17.9915	-0.047
20	24.	180	7.5	20.	0
24	29.	180	6.2	24.0258	+0.108

・根据使用 IC，电阻的设定范围也有限制。请参考各 IC 的 Datasheet。

●表 4 当 $V_{REF}=0.9V$ 时的电阻 R_1 、 R_2

Vo (V)	R1/R2	R1 (kΩ)	R2 (kΩ)	Vo' (V)	Error (%)
0.9	-	0	-	0.9	0
0.95	0.0555...	10	180	0.95	0
1	0.1111...	6.2	56	0.9996	-0.036
1.05	0.1666...	2	12	1.05	0
1.1	0.2222...	15	68	1.0985	-0.134
	0.2222...	10	33+12	1.1	0
1.15	0.2777...	10	36	1.15	0
1.2	0.3333...	10	30	1.2	0
1.25	0.3888...	6.2	16	1.2488	-0.1
1.3	0.4444...	12	27	1.3	0
1.35	0.5	12	24	1.35	0
1.4	0.5555...	15	27	1.4	0
1.45	0.6111...	11	18	1.45	0
1.5	0.6666...	18	27	1.5	0
1.55	0.7222...	13	18	1.55	0
1.6	0.7777...	10	13	1.5923	-0.481
	0.7777...	16	15+5.6	1.599	-0.061
1.65	0.8333...	10	12	1.65	0
1.7	0.8888...	16	18	1.7	0
1.75	0.9444...	15	16	1.7438	-0.357
	0.9444...	33+1	36	1.75	0
1.8	1	22	22	1.8	0
1.85	1.0555...	15+8.2	22	1.8491	-0.049
1.9	1.1111...	20	18	1.9	0
1.95	1.1666...	18+10	24	1.95	0
2	1.2222...	22	18	2.	0
2.05	1.2777...	22+1	18	2.05	0
2.1	1.3333...	24	18	2.1	0
2.2	1.4444...	39	27	2.2	0
2.3	1.5555...	56	36	2.3	0
2.4	1.6666...	20	12	2.4	0
2.5	1.7777...	39	22	2.4955	-0.182
	1.7777...	22+10	18	2.5	0
2.6	1.8888...	51	27	2.6	0
2.65	1.9444...	56	22+6.8	2.65	0
2.7	2	30	15	2.7	0
2.75	2.0555...	22+15	18	2.75	0
2.8	2.1111...	91	43	2.8047	+0.166
	2.1111...	47+10	27	2.8	0
2.85	2.1666...	39	18	2.85	0
2.9	2.2222...	33	15	2.88	-0.69
	2.2222...	47+33	36	2.9	0
3	2.3333...	56	24	3.	0
3.1	2.4444...	39	16	3.0938	+0.202
	2.4444...	22+22	18	3.1	0
3.15	2.5	30	12	3.15	0

Vo (V)	R1/R2	R1 (kΩ)	R2 (kΩ)	Vo' (V)	Error (%)
3.2	2.5555...	110	43	3.2023	+0.073
3.25	2.6111...	47	18	3.25	0
3.3	2.6666...	20	7.5	3.3	0
3.4	2.7777...	75	27	3.4	0
3.5	2.8888...	18	6.2	3.5129	+0.369
	2.8888...	68+10	27	3.5	0
3.6	3	36	12	3.6	0
3.7	3.1111...	56	18	3.7	0
3.8	3.2222...	20	6.2	3.8032	+0.085
3.9	3.333...	100	30	3.9	0
4	3.4444...	62	18	4.	0
4.1	3.5555...	22	6.2	4.0935	-0.157
	3.5555...	160	33+12	4.1	0
4.2	3.666...	110	30	4.2	0
4.3	3.7777...	68	18	4.3	0
4.4	3.8888...	39	10	4.41	+0.227
	3.8888...	15+6.8	5.6	4.4036	+0.081
4.5	4	30	7.5	4.5	0
4.6	4.1111...	23	5.6	4.5964	-0.078
4.7	4.2222...	68	16	4.725	+0.532
	4.2222...	62	10+4.7	4.6959	-0.087
4.8	4.3333...	130	30	4.8	0
4.9	4.4444...	120	27	4.9	0
5	4.5555...	82	18	5.	0
5.5	5.1111...	51	10	5.49	-0.182
	5.1111...	68	10+3.3	5.5015	+0.027
6	5.6666...	68	12	6.	0
7	6.7777...	68	10	7.02	+0.286
	6.7777...	27+15	6.2	6.9968	-0.046
7.7	7.5555...	68+68	18	7.7	0
8	7.8888...	120	15	8.1	+1.25
	7.8888...	120+22	18	8.	0
9	9	180	20	9.	0
10	10.1111...	100	90	9.9	-1
	10.1111...	100+82	18	10.	0
12	12.3333...	160	13	11.9769	-0.192
	12.3333...	100+1.2	8.2	12.0073	+0.061
14.4	15	180	12	14.4	0
15	15.6666...	130	8.2	15.1683	+1.122
	15.6666...	150+6.8	10	15.012	+0.08
18	6.8	180+10	130	18.1059	+0.588
	19	180+10	10	18.	0
20	21.2222...	160	7.5	20.1	+0.5
	21.2222...	100+8.2	5.1	19.9941	-0.029
24	25.6666...	160	6.2	24.1258	+0.524
	25.6666...	160	6.2+0.033	24.0028	+0.012

・根据使用 IC，电阻的设定范围也有限制。请参考各 IC 的 Datasheet。

●表 5 当 $V_{REF}=1.0V$ 时的电阻 R_1 、 R_2

V_O (V)	R_1/R_2	R_1 (k Ω)	R_2 (k Ω)	V_O' (V)	Error (%)
1	-	0	-	1.	0
1.05	0.05	0.75	15	1.05	0
1.1	0.1	2	20	1.1	0
1.15	0.15	15	100	1.15	0
1.2	0.2	3	15	1.2	0
1.25	0.25	7.5	30	1.25	0
1.3	0.3	30	100	1.3	0
	0.3	7.5	15+10	1.3	0
1.35	0.35	5.6	16	1.35	0
1.4	0.4	12	30	1.4	0
1.45	0.45	6.8	15	1.4533	+0.230
	0.45	15+1.2	36	1.45	0
1.5	0.5	10	20	1.5	0
1.55	0.55	11	20	1.55	0
1.6	0.6	12	20	1.6	0
1.65	0.65	13	20	1.65	0
1.7	0.7	9.1	13	1.7	0
1.75	0.75	12	16	1.75	0
1.8	0.8	12	15	1.8	0
1.85	0.85	11	13	1.8462	-0.208
	0.85	51	33+27	1.85	0
1.9	0.9	18	20	1.9	0
1.95	0.95	15	16	1.9375	-0.641
	0.95	33+1.2	36	1.95	0
2	1	22	22	2.	0
2.05	1.05	16	15	2.0667	+0.813
	1.05	10+6.8	16	2.05	0
2.1	1.1	22	20	2.1	0
2.2	1.2	24	20	2.2	0
2.3	1.3	39	30	2.3	0
2.4	1.4	18	13	2.3846	-0.641
	1.4	27+15	30	2.4	0
2.5	1.5	33	22	2.5	0
2.6	1.6	24	15	2.6	0
2.65	1.65	33	20	2.65	0
2.7	1.7	51	30	2.7	0
2.75	1.75	18+10	16	2.75	0
2.8	1.8	27	15	2.8	0
2.85	1.85	24	13	2.8462	-0.135
	1.85	37	20	2.85	0
2.9	1.9	82	43	2.907	+0.241
	1.9	18+1	10	2.9	0
3	2	36	18	3.	0

V_O (V)	R_1/R_2	R_1 (k Ω)	R_2 (k Ω)	V_O' (V)	Error (%)
3.1	2.1	82	39	3.1026	+0.083
	2.1	27+15	20	3.1	0
3.15	2.15	43	20	3.15	0
3.2	2.2	22	10	3.2	0
3.25	2.25	27	12	3.25	0
3.3	2.3	62	27	3.2963	-0.112
	2.3	22+1	10	3.3	0
3.4	2.4	24	10	3.4	0
3.5	2.5	30	12	3.5	0
3.6	2.6	39	15	3.6	0
3.7	2.7	27	10	3.7	0
3.8	2.8	56	20	3.8	0
3.9	2.9	18	6.2	3.9032	+0.083
	2.9	33+1.8	12	3.9	0
4	3	36	12	4.	0
4.1	3.1	62	20	4.1	0
4.2	3.2	24	7.5	4.2	0
4.3	3.3	33	10	4.3	0
4.4	3.4	51	15	4.4	0
4.5	3.5	56	16	4.5	0
4.6	3.6	36	10	4.6	0
4.7	3.7	100	27	4.7037	+0.079
	3.7	22+15	10	4.7	0
4.8	3.8	91	24	4.7917	-0.174
	3.8	47+10	15	4.8	0
4.9	3.9	39	10	4.9	0
5	4	120	30	5.	0
5.5	4.5	68	15	5.5333	+0.606
	4.5	68+22	20	5.5	0
6	5	75	15	6.	0
7	6	120	20	7.	0
7.7	6.7	39+22	9.1	7.7033	+0.043
8	7	91	13	8.	0
9	8	120	15	9.	0
10	9	180	20	10.	0
12	11	110	10	12.	0
14.4	13.4	100+22	9.1	14.4066	+0.046
15	14	180	13	14.8462	-1.026
	14	100+68	12	15.	0
18	17	130	7.5	18.3333	+1.852
	17	150+4.7	9.1	18.	0
20	19	130	6.8	20.1176	+0.588
	19	180+10	10	20.	0
24	23	150+39	8.2	24.0488	+0.203

・根据使用 IC，电阻的设定范围也有限制。请参考各 IC 的 Datasheet。

●关于电阻

反馈电阻的阻值根据使用 IC 不同分为 2 大类。其中一类 IC 被设计为不需要节能工作或者面向大电流应用，此类 IC 使用几十 $k\Omega$ 的反馈电阻。因为反馈电阻是几十 $k\Omega$ ，如果使用几百 $k\Omega$ 以上电阻的话，反馈电路的阻抗会变的很高，工作不稳定，有可能因为噪音发生误动作。同样如果使用几 $k\Omega$ 以下电阻的话，反馈电路会增加无效电流使得效率低下。

另一类 IC 被设计成节能型，此类 IC 使用几百 $k\Omega$ 的反馈电阻。这样减少反馈电阻的无效电流、提高效率。此类 IC 的反馈电阻被设定成几百 $k\Omega$ 也能够稳定工作。

所使用 IC 的 Datasheet 上会记载参考电阻，推荐使用差异并不是很大的电阻。

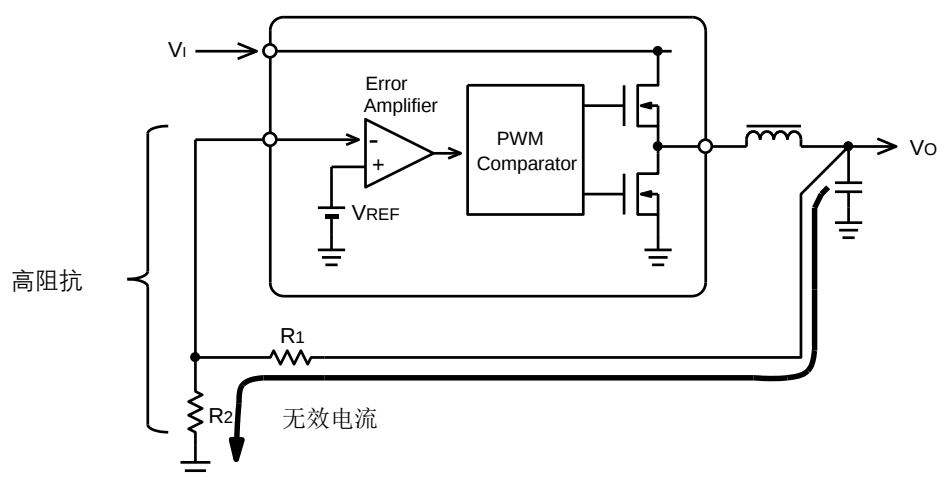


Figure 2. 反馈电阻考虑要点

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