

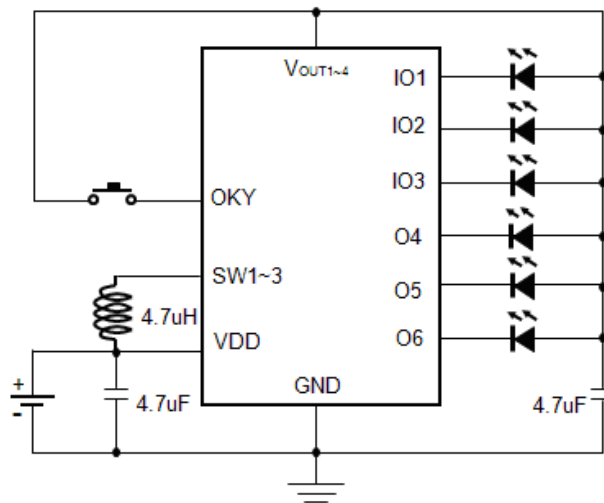
Comparison of Inductors for NY1C007A Efficiency

Description: While using NY1C007A, the selected inductors will affect the conversion efficiency of the boost.




Reason: NY1C007A will vary in conversion efficiency with different internal resistance of the inductors. The internal resistance of the inductor also affects the maximum current I_{OUT} .

Solution: The following information can help you choose the inductor you need.

1. In the NY1C007A application circuit, there is a 4.7uH inductor as shown below. At present, common inductors in the market include SMD coil inductors, color code inductors or SMD general inductors. According to different inductor processes, the internal DC resistance (DCR) of inductors are different, which will affect the conversion efficiency of NY1C007A, as shown in the following table.



NY1C007A single button trigger application circuit diagram

Name	SMD Coil Inductor (SLF6045T)	Color Code Inductor	SMD General Inductor (1206)
Exterior			
DCR	0.026Ω	0.320Ω	0.520Ω
Price	High	Middle	Low
Manufacturing	Easy	Difficult	Easy

2. The lower the resistance of the inductor, the better the conversion efficiency. The suitable inductor can be selected according to different applications. The conversion efficiency of different inductors under different conditions is as follows.

V_{OUT}=3.5V Conversion Efficiency								
Inductor Type	I _{OUT}	V _{DD}						
		0.9V	1.1V	1.2V	1.5V	1.8V	2.4V	3.0V
SMD Coil Inductor (SLF6045)	10mA	79.13%	79.28%	80.36%	82.00%	84.80%	85.07%	87.98%
	20mA	81.80%	83.49%	83.89%	81.47%	86.88%	86.16%	88.69%
	30mA	82.56%	83.99%	84.82%	86.95%	82.49%	87.22%	89.59%
	50mA	79.56%	83.52%	84.39%	87.41%	88.17%	88.69%	90.16%
	100mA	65.05%	80.04%	82.63%	86.99%	89.18%	88.14%	87.89%
	150mA	-	67.43%	72.36%	83.46%	87.06%	92.71%	86.59%
	200mA	-	-	-	78.77%	85.26%	90.79%	91.45%
	250mA	-	-	-	73.69%	81.82%	89.61%	92.60%
Color Code Inductor	10mA	79.65%	79.51%	79.67%	81.27%	84.03%	86.12%	88.03%
	20mA	80.71%	82.89%	83.99%	81.09%	86.36%	86.75%	88.41%
	30mA	80.40%	82.99%	84.39%	86.56%	86.82%	88.79%	88.97%
	50mA	74.64%	81.36%	83.16%	85.96%	87.89%	87.65%	89.40%
	100mA	-	62.71%	76.06%	83.28%	86.95%	88.01%	87.07%
	150mA	-	-	-	76.93%	83.37%	89.74%	85.51%
	200mA	-	-	-	65.20%	78.12%	88.13%	90.98%
	250mA	-	-	-	-	71.87%	85.15%	90.99%
SMD General Inductor (1206)	10mA	68.58%	68.90%	69.10%	71.31%	72.15%	79.28%	82.20%
	20mA	65.18%	69.92%	71.01%	74.56%	74.11%	79.40%	81.59%
	30mA	62.09%	67.90%	69.47%	74.17%	76.61%	80.38%	83.53%
	50mA	48.12%	61.97%	65.37%	71.96%	75.58%	82.83%	81.13%
	100mA	-	-	-	60.72%	67.83%	81.27%	86.33%
	150mA	-	-	-	-	62.48%	76.34%	85.54%
	200mA	-	-	-	-	-	71.84%	85.76%
	250mA	-	-	-	-	-	70.60%	82.94%

Note: “-” means that the NY1C007A is too low in power conversion efficiency to provide sufficient output power to achieve normal V_{OUT} and I_{OUT} ($P_{OUT} = V_{OUT} \times I_{OUT}$).

V _{OUT} =3.3V Conversion Efficiency								
Inductor Type	I _{OUT}	V _{DD}						
		0.9V	1.1V	1.2V	1.5V	1.8V	2.4V	3.0V
SMD Coil Inductor (SLF6045)	10mA	80.07%	81.77%	82.32%	82.44%	83.26%	87.46%	90.15%
	20mA	82.82%	84.45%	84.87%	86.16%	86.91%	88.06%	90.90%
	30mA	84.36%	84.84%	86.09%	88.01%	88.80%	90.31%	91.58%
	50mA	80.68%	85.52%	86.08%	88.04%	88.85%	90.59%	91.53%
	100mA	68.82%	82.33%	83.84%	87.78%	90.08%	93.02%	89.01%
	150mA	-	71.72%	75.84%	84.94%	88.49%	92.74%	86.31%
	200mA	-	-	-	81.02%	86.38%	91.78%	94.05%
	250mA	-	-	-	75.98%	83.70%	90.47%	93.00%
Color Code Inductor	10mA	81.18%	82.74%	82.48%	83.63%	83.78%	87.81%	90.15%
	20mA	82.48%	84.33%	85.32%	86.65%	87.39%	88.27%	90.90%
	30mA	82.62%	84.72%	85.97%	87.25%	88.46%	90.11%	91.48%
	50mA	75.53%	82.57%	83.95%	86.90%	88.78%	89.67%	90.77%
	100mA	-	73.47%	77.77%	84.82%	88.11%	91.88%	88.75%
	150mA	-	-	61.55%	78.90%	84.96%	91.45%	85.33%
	200mA	-	-	-	70.74%	81.07%	89.39%	92.64%
	250mA	-	-	-	-	76.03%	86.84%	90.91%
SMD General Inductor (1206)	10mA	71.16%	73.40%	73.94%	77.10%	78.44%	81.09%	85.40%
	20mA	69.87%	73.05%	74.11%	77.34%	80.06%	83.84%	86.96%
	30mA	66.60%	70.65%	72.42%	76.09%	79.57%	84.53%	87.87%
	50mA	47.84%	65.32%	67.73%	73.96%	77.87%	84.45%	85.99%
	100mA	-	-	-	65.31%	71.28%	83.02%	86.78%
	150mA	-	-	-	-	65.80%	78.76%	89.33%
	200mA	-	-	-	-	-	75.48%	88.56%
	250mA	-	-	-	-	-	72.29%	86.23%

Note: “-” means that the NY1C007A is too low in power conversion efficiency to provide sufficient output power to achieve normal V_{OUT} and I_{OUT} (P_{OUT} = V_{OUT} x I_{OUT}).

V _{OUT} =3.0V Conversion Efficiency								
Inductor Type	I _{OUT}	V _{DD}						
		0.9V	1.1V	1.2V	1.5V	1.8V	2.4V	3.0V
SMD Coil Inductor (SLF6045)	10mA	78.83%	79.66%	79.99%	81.35%	84.44%	87.85%	86.08%
	20mA	81.70%	83.06%	83.92%	83.77%	82.19%	87.96%	85.73%
	30mA	82.38%	84.12%	84.26%	86.02%	85.94%	88.83%	85.83%
	50mA	80.21%	83.95%	85.35%	86.83%	88.20%	89.36%	88.07%
	100mA	72.89%	81.84%	84.11%	87.92%	89.84%	90.35%	83.95%
	150mA	-	64.47%	77.89%	85.64%	89.00%	91.16%	84.73%
	200mA	-	-	-	81.89%	86.58%	92.19%	83.82%
	250mA	-	-	-	72.83%	84.13%	90.59%	83.28%
Color Code Inductor	10mA	79.12%	80.25%	80.42%	81.08%	85.26%	87.25%	85.38%
	20mA	81.12%	83.40%	83.88%	84.27%	83.57%	87.15%	85.06%
	30mA	80.82%	83.17%	83.95%	86.47%	83.89%	87.38%	84.88%
	50mA	76.99%	83.84%	85.14%	86.75%	88.68%	88.68%	87.43%
	100mA	-	76.02%	79.64%	85.29%	89.45%	84.69%	83.47%
	150mA	-	-	65.13%	80.67%	86.26%	90.44%	82.76%
	200mA	-	-	-	73.86%	82.56%	90.03%	82.26%
	250mA	-	-	-	-	77.78%	87.85%	81.61%
SMD General Inductor (1206)	10mA	71.39%	72.28%	72.18%	75.00%	77.54%	81.50%	84.59%
	20mA	69.74%	73.68%	74.22%	78.00%	78.39%	82.34%	84.66%
	30mA	68.27%	72.00%	72.63%	77.20%	81.46%	83.03%	86.26%
	50mA	53.58%	68.38%	70.47%	75.87%	80.66%	81.11%	87.10%
	100mA	-	-	-	68.66%	76.36%	85.48%	83.68%
	150mA	-	-	-	-	71.10%	84.04%	83.01%
	200mA	-	-	-	-	-	81.80%	84.92%
	250mA	-	-	-	-	-	77.19%	86.25%

Note: “-” means that the NY1C007A is too low in power conversion efficiency to provide sufficient output power to achieve normal V_{OUT} and I_{OUT} (P_{OUT} = V_{OUT} x I_{OUT}).

V _{OUT} =2.7V Conversion Efficiency								
Inductor Type	I _{OUT}	V _{DD}						
		0.9V	1.1V	1.2V	1.5V	1.8V	2.4V	3.0V
SMD Coil Inductor (SLF6045)	10mA	80.23%	79.74%	82.17%	83.85%	85.30%	86.49%	80.01%
	20mA	83.74%	85.04%	84.42%	84.25%	86.88%	86.75%	80.36%
	30mA	83.64%	84.63%	85.73%	85.11%	88.15%	85.22%	79.80%
	50mA	81.26%	84.29%	85.82%	87.66%	86.01%	90.04%	80.78%
	100mA	73.49%	82.49%	84.29%	88.36%	90.19%	89.20%	82.62%
	150mA	-	75.57%	78.57%	86.11%	89.73%	88.85%	80.37%
	200mA	-	-	-	82.46%	87.18%	90.32%	81.44%
	250mA	-	-	-	69.44%	84.58%	91.44%	81.08%
Color Code Inductor	10mA	79.44%	79.77%	81.56%	82.87%	84.18%	85.83%	79.90%
	20mA	82.83%	84.73%	83.06%	82.71%	86.82%	85.05%	79.81%
	30mA	81.81%	83.62%	85.01%	83.82%	87.50%	86.74%	79.42%
	50mA	75.21%	82.18%	84.12%	86.78%	84.81%	87.20%	80.07%
	100mA	-	76.48%	79.14%	85.60%	88.53%	87.86%	82.53%
	150mA	--	-	70.42%	81.55%	86.60%	87.19%	79.45%
	200mA	-	-	-	74.65%	82.92%	89.54%	80.42%
	250mA	-	-	-	-	78.73%	88.43%	79.49%
SMD General Inductor (1206)	10mA	69.68%	70.12%	70.59%	73.00%	73.11%	80.82%	80.27%
	20mA	69.24%	72.65%	74.38%	74.27%	75.00%	81.58%	81.35%
	30mA	65.74%	69.66%	72.02%	76.85%	77.47%	83.35%	80.85%
	50mA	54.99%	64.94%	67.70%	74.72%	79.92%	81.20%	79.75%
	100mA	-	-	-	67.19%	74.93%	84.95%	82.39%
	150mA	-	-	-	-	69.23%	84.62%	80.91%
	200mA	-	-	-	-	-	82.20%	80.43%
	250mA	-	-	-	-	-	78.31%	79.12%

Note: “-” means that the NY1C007A is too low in power conversion efficiency to provide sufficient output power to achieve normal V_{OUT} and I_{OUT} (P_{OUT} = V_{OUT} × I_{OUT}).