

RAA457100GBM

R19AN0047EJ0100

Selection of the Inductor for DCDC Converter

Rev.1.00

Aug. 10, 2017

When the inductor current exceeds a rated current, the inductor may cause magnetic saturation. Magnetic saturation will cause the efficiency decreases and the destruction of IC. Please choose the inductor so that a peak current does not exceed the rated current in the range of use.

The circuit of DCDC converter of the RAA457100 is shown in Figure1. External component values of DCDC converter are shown in the Table 1, and Inductor list is shown Table 2.

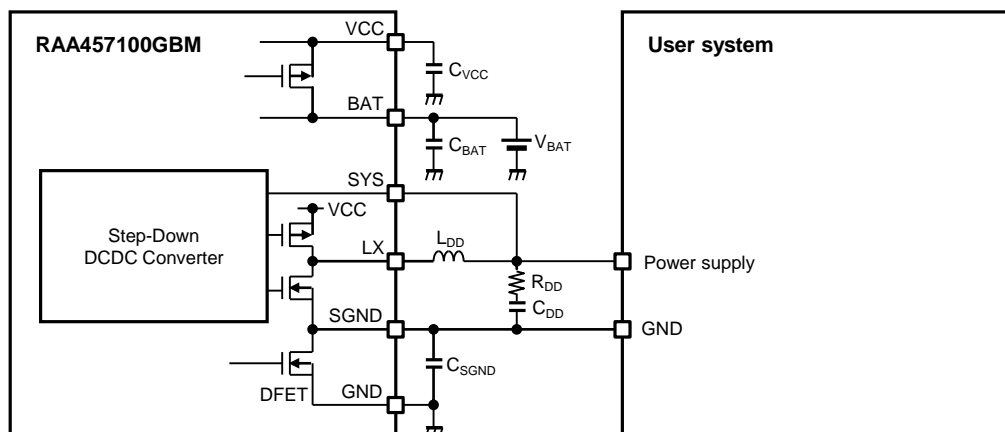


Figure1. The circuit of DCDC converter of the RAA457100

Table 1. External component values of the RAA457100 DCDC converter

Setting voltage of SYS	C _{VCC} [uF]	C _{BAT} [uF]	L _{DD} [uH]	C _{DD} [uF]	C _{SGND} [uF]	R _{DD} [Ω]
1.2V ,1.5V ,1.8V	4.7	1.0	10	3.3	0.47	0
3.0V	4.7	1.0	10	4.7	1.0	0.33

* There is a possibility to change the value for improving the performance.

Table 2. Inductor list

Part Number	Manufacturer	Inductance [uH]	DCR (typ) [Ω]	Isat (typ) [mA]	Size [mm]		
					L(typ)	W(typ)	T(max)
VLS252008ET-100M-CA	TDK Corporation	10	1.026	480	2.5	2.0	0.80
VLS252010CX-100M		10	0.483	750	2.5	2.0	1.0
VLS201610CX-100M		10	0.610	620	2.0	1.6	1.0
LQH2HPN100MGR	Murata Manufacturing Co., Ltd.	10	0.560	700	2.5	2.0	1.0
LQH2HPN100MDR		10	1.200	420	2.5	2.0	0.60
LQH2MPN100MGR		10	0.880	610	2.0	1.6	0.95

* DCR: Series resistance

Isat :Saturation current

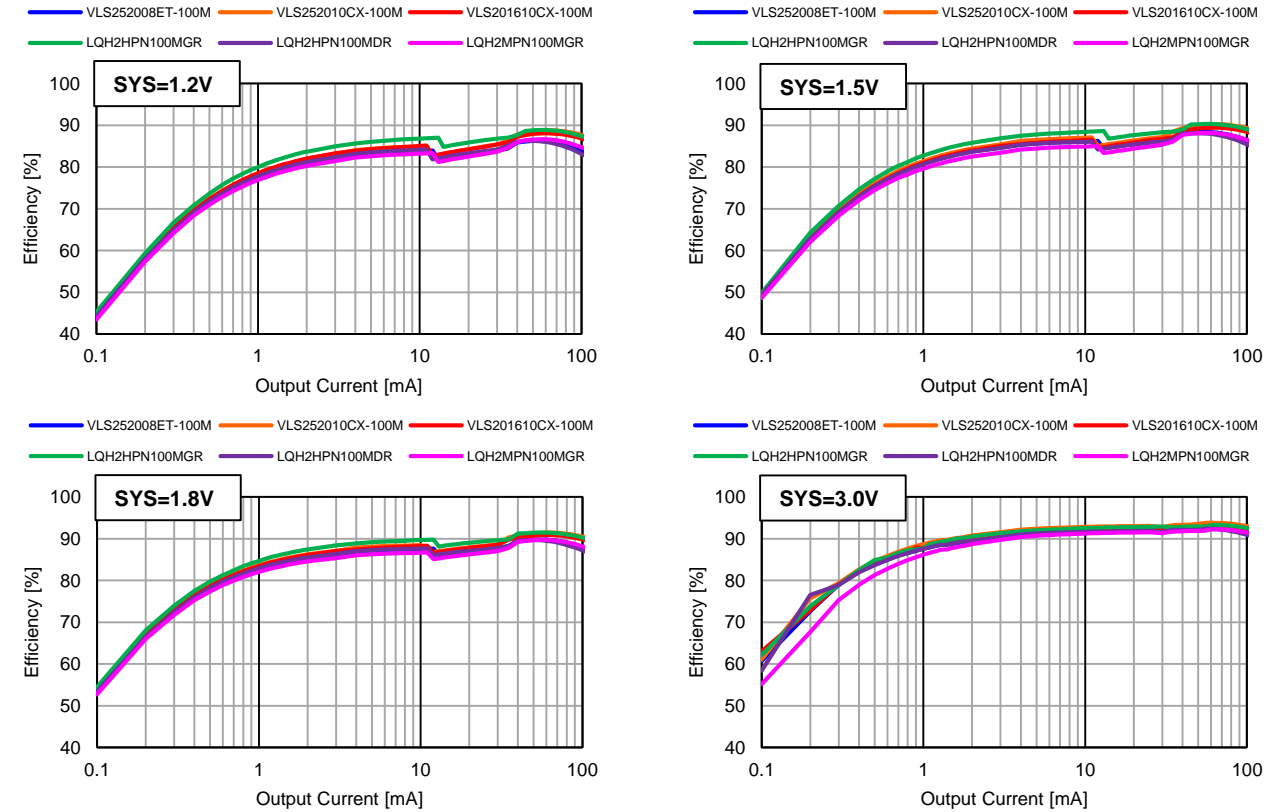
Table 2 is an example and does not limit inductors. Please consider according to the conditions for use.

Please refer to the inductor maker for the details.

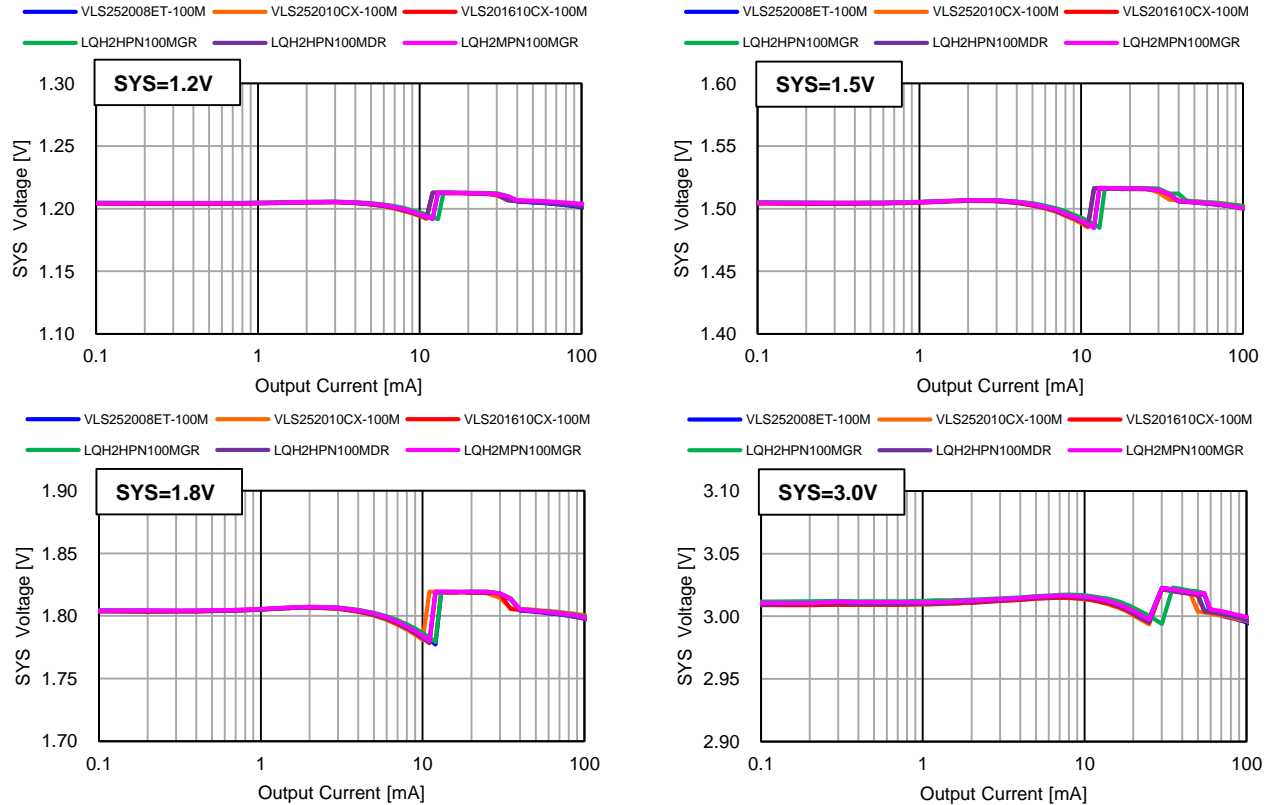
Typical performance characteristics of DCDC converter (for reference)

Typical performance characteristics of DCDC converter are shown blow. These values are reference data, and are not guaranteed. Evaluate the DCDC converter enough, and then select inductor.

■ Efficiency vs. Output current (V_{BAT}=3.8V)

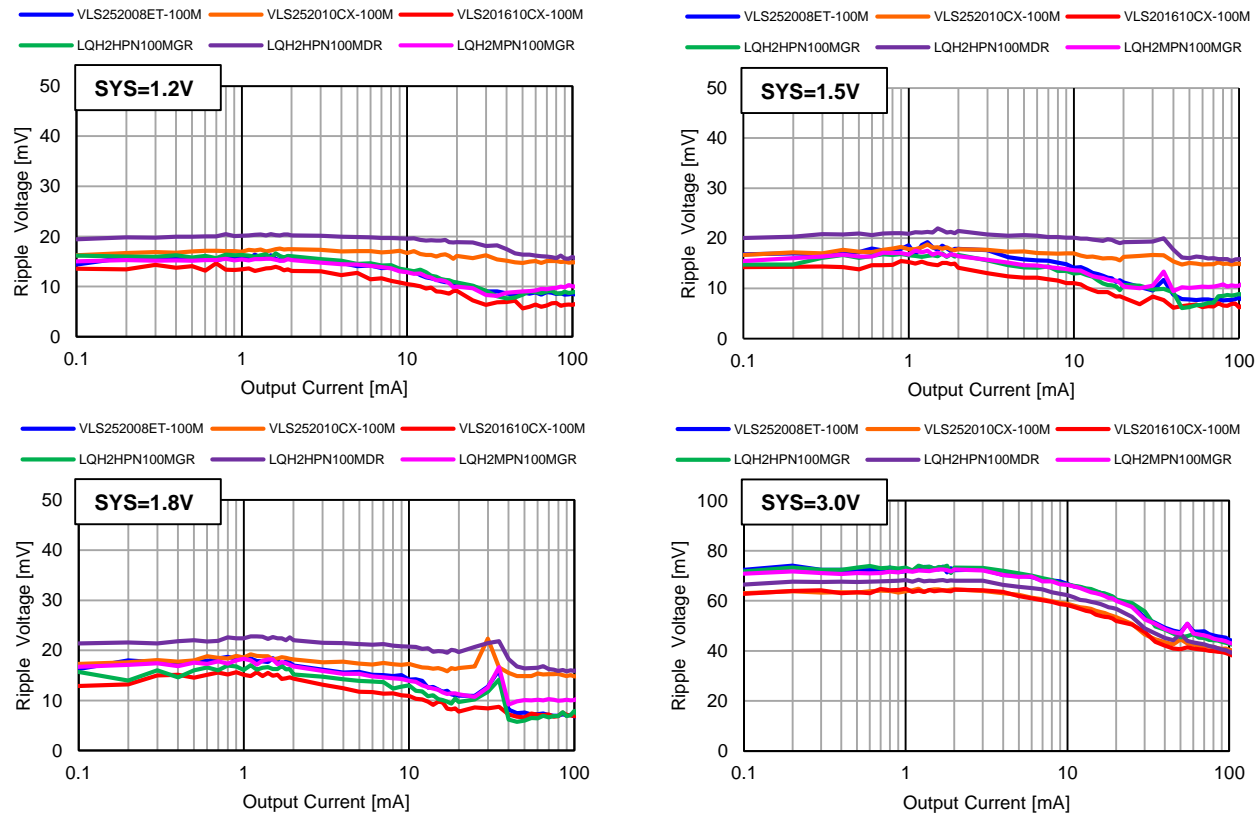


■ Output Voltage vs. Output current (V_{BAT}=3.8V)



Typical performance characteristics of DCDC converter (for reference)

■ Ripple voltage vs. Output current (V_{BAT}=3.8V)



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Revision Record

Rev.	Date	Description	
		Page	Summary
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