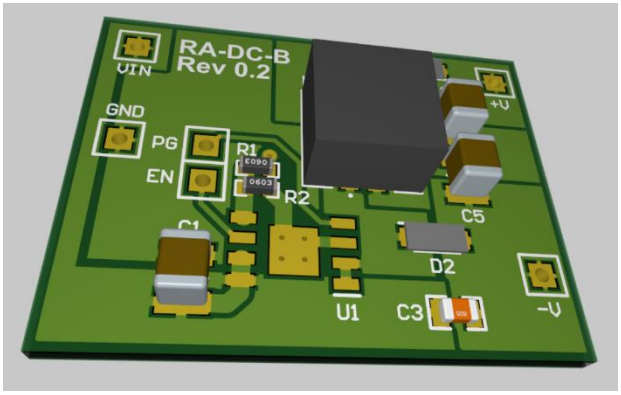
Audio Power Module

General Description

The Resolute Audio DCBXX range of power modules provides a bipolar regulated power supply for audio product design available in ±5, ±12, ±15, or ±18V variants. The module is designed to be a convenient alternative to discrete power supply design and facilitate rapid product design.



Features

- Wide operating Input Voltage 5 to 24V
- Available with fixed bipolar output voltages of ±5, ±12, ±15, or ±18V(other options available on request)
- Oscillating Frequency 450kHz
- Over Current Protection
- Thermal Shutdown Protection
- Standby enable and power good pin

Architecture

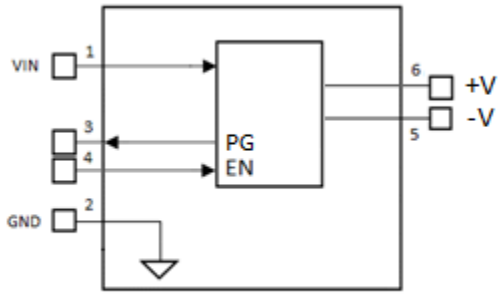


Figure 1 - Block Diagram

Pin	Name	Description
1	VIN	Positive input voltage referenced to GND
2	GND	Common ground connection for VIN and output voltages
3	PG	Power Good
4	EN	Enable pin for +V and -V supplies
5	-V	Regulated negative output
6	+V	Regulated positive output

Table 1 - Pin Description

Characteristics		Conditions	Min	Typ	Max	Unit
V_{IN}	Supply Voltage		+5	-	+24	V
f_{OSC}	Oscillation Frequency		405	450	495	kHz
V_{DD_EN}	Enable pin		1.6	V_{IN}	V_{IN}	V

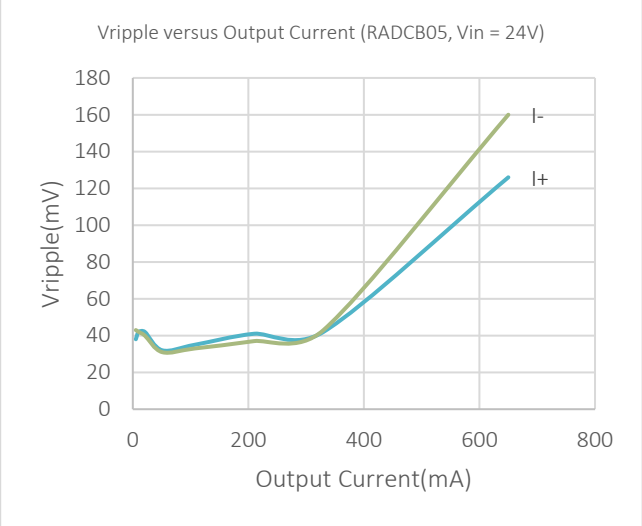
Table 2 - Electrical Characteristics

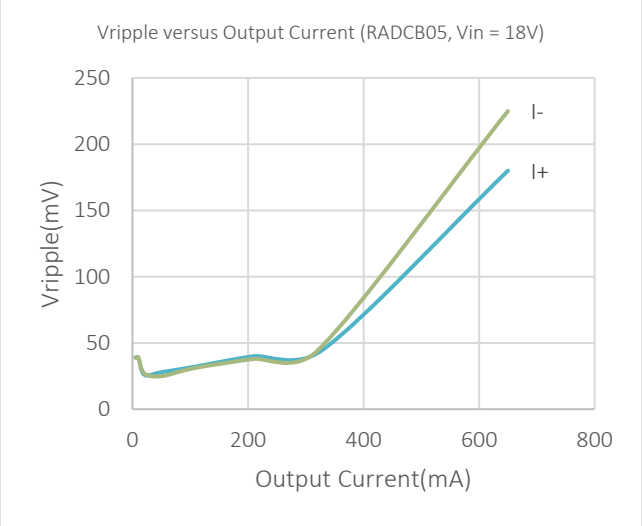
Model	V_{IN}(V)	V_{OUT}(V)	I_{OUT}(mA)	Vripple(mV) (V_{IN}=15V, LOAD=47Ω)	Quiescent Current(mA)	Efficiency(%) (V_{IN}=15V, LOAD=47Ω)
RADCB05	24V	±5	400[(1)]	~80	3.4	82
RADCB12	24V	±12	250[(1)]	~95	5.2	80
RADCB15	24V	±15	150[(1)]	~70	6.6	80
RADCB18	18V	±18	150[(1)]	~80	9.2	82

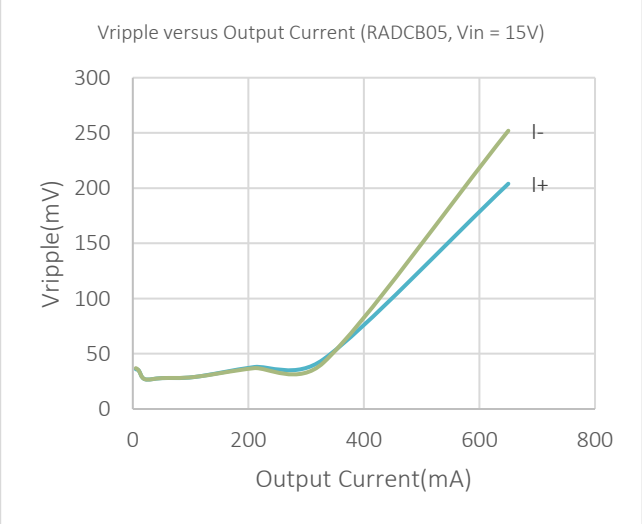
[(1)]Value is per rail and recommended for low-noise applications

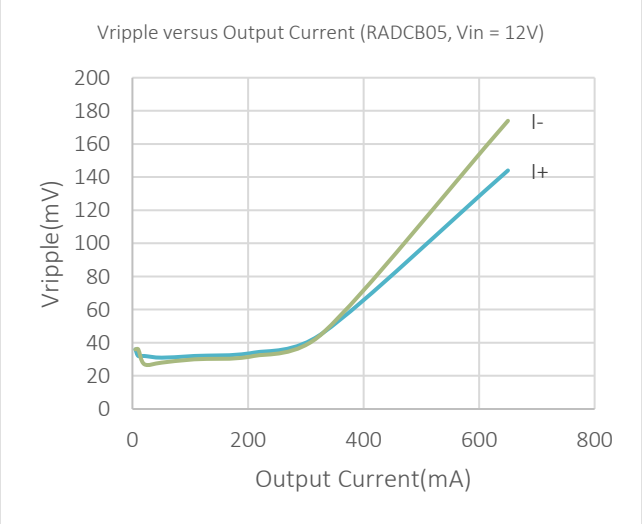
VIN(V)	+I_{OUT}(mA)	-I_{OUT}(mA)	Efficiency(%)	Vripple+(mV)	Vripple-(mV)
24	400	400	70	45	45
18	400	400	75	45	45
15	400	400	80	45	45
12	400	400	80	50	50
9	350	350	75	55	50
6	150	150	80	45	40
5	150	150	80	40	40

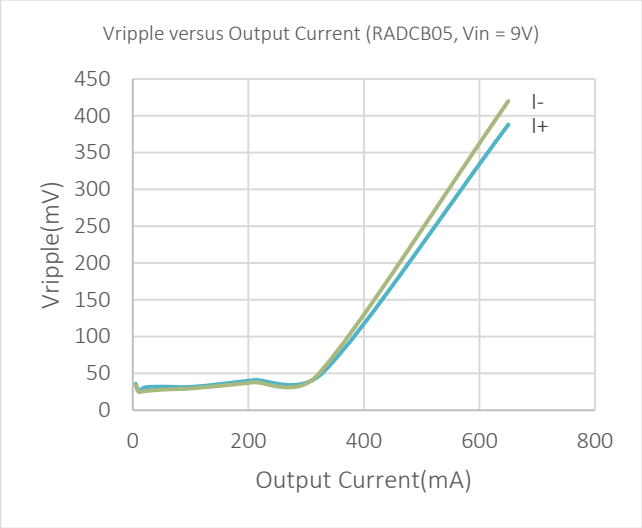
Table 3 - Output Current for various input voltages(RC-DC-B05)

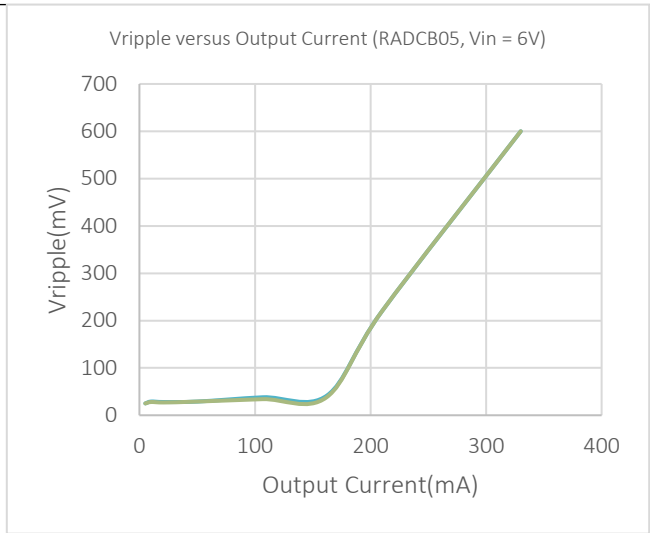


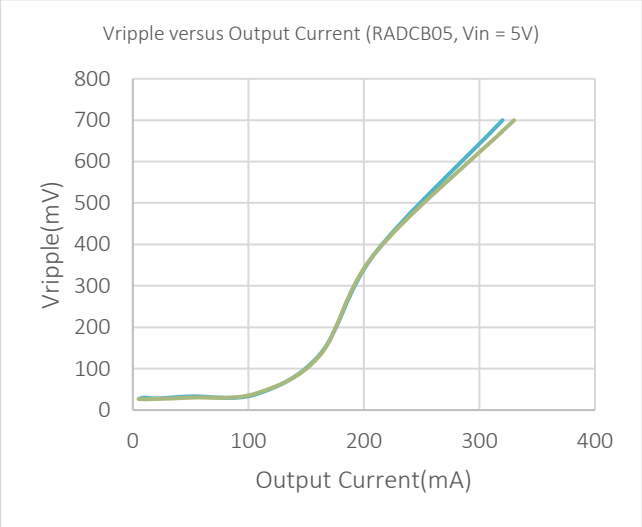












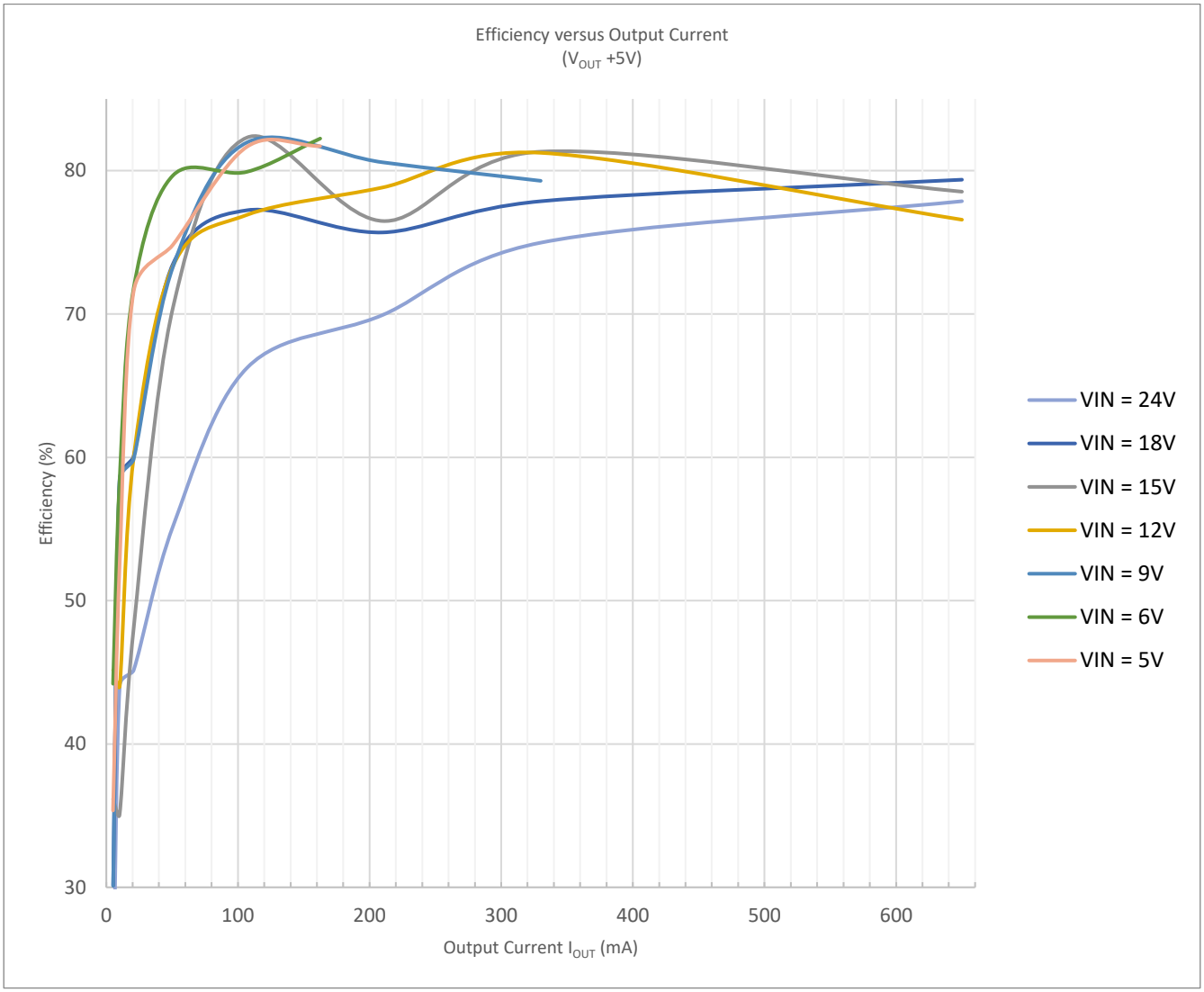
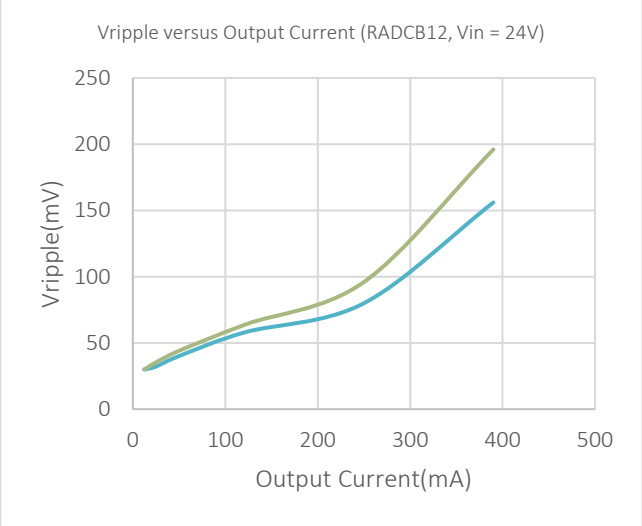
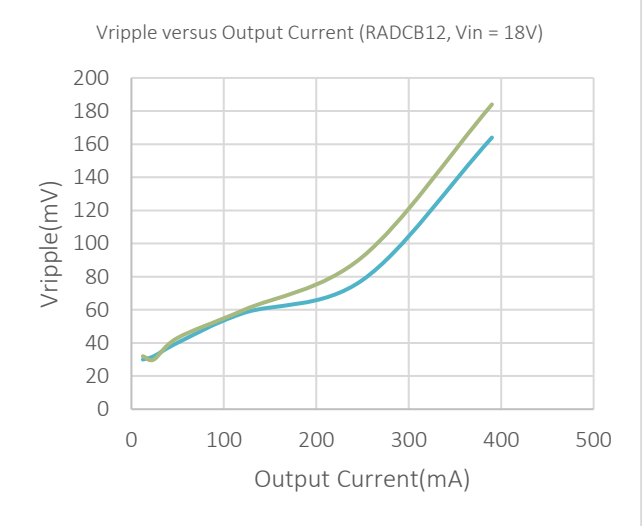


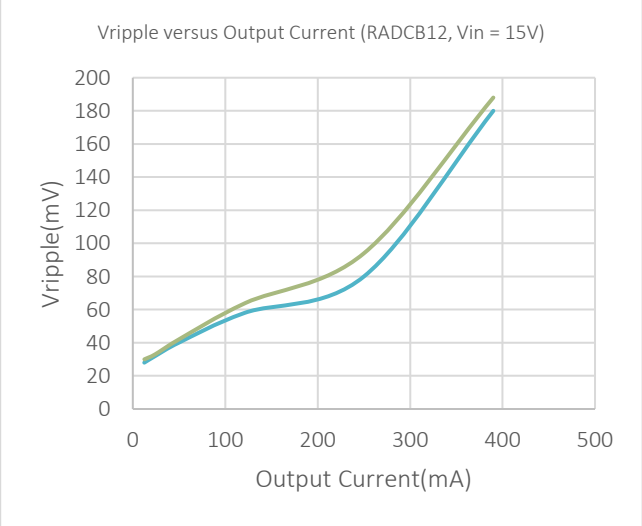
Figure 2 - Efficiency versus Output Current(RADCB05)

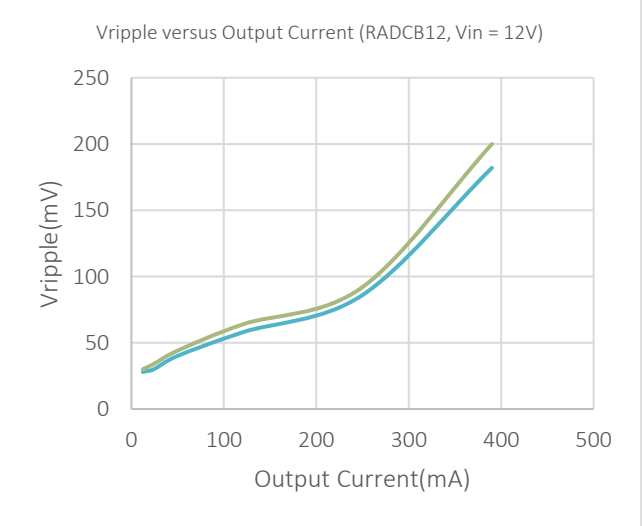
VIN(V)	+I_{OUT}(mA)	-I_{OUT}(mA)	Efficiency(%)	VrippleMAX+(mV)	VrippleMAX-(mV)
24	250	250	75	80	100
18	250	250	80	80	95
15	250	250	80	80	95
12	250	250	80	90	95
9	250	250	80	100	95
6	150	150	80	65	70
5	150	150	80	70	70

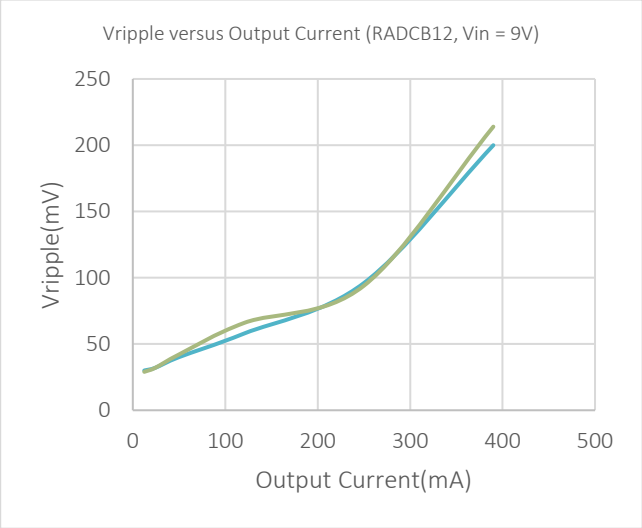
Table 4- Output Current for various input voltages(RADCB12)

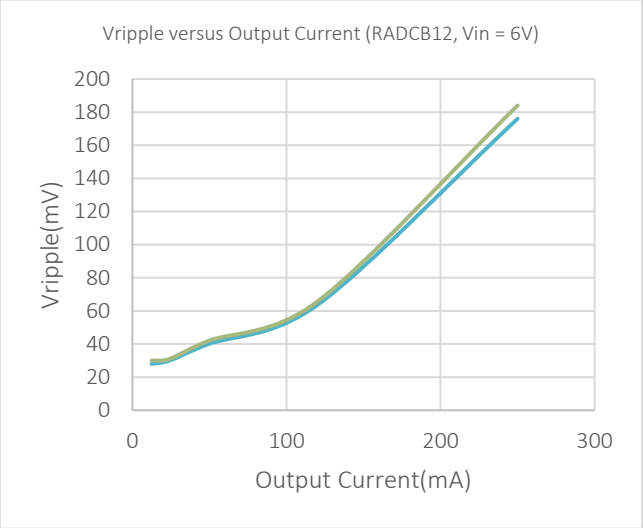


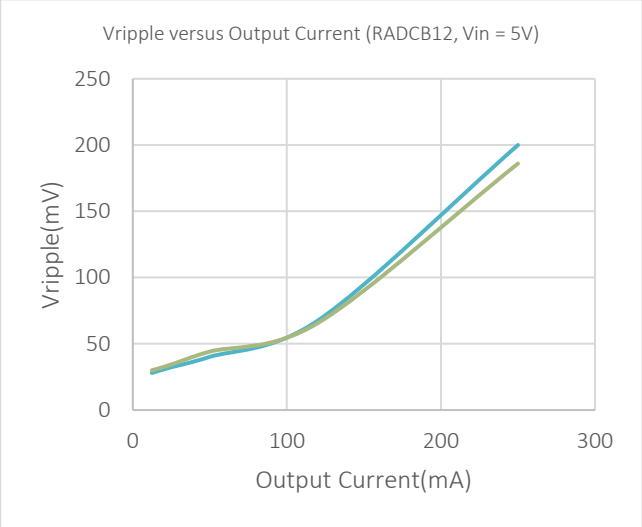












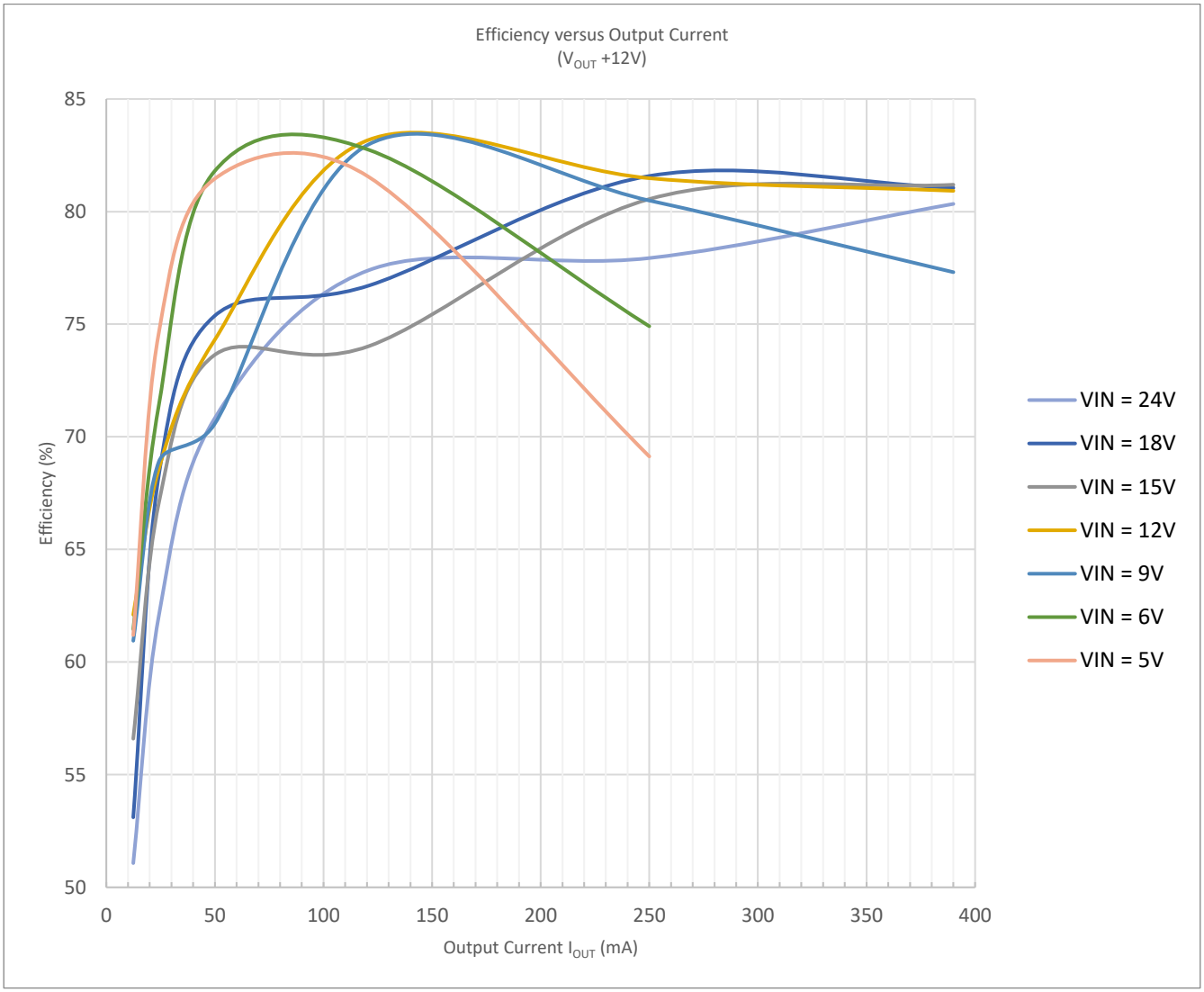
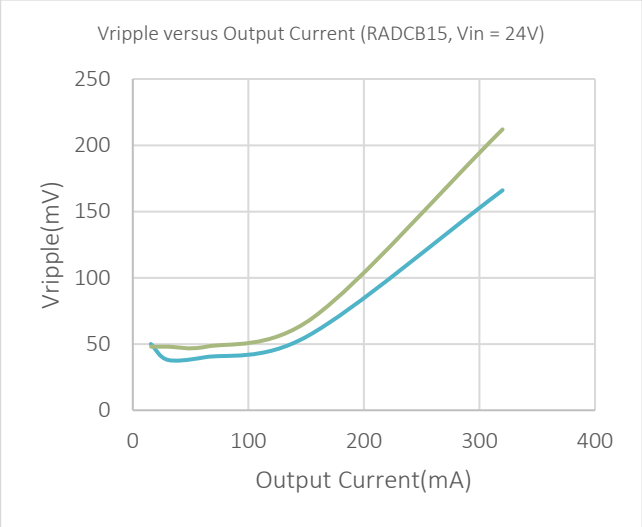
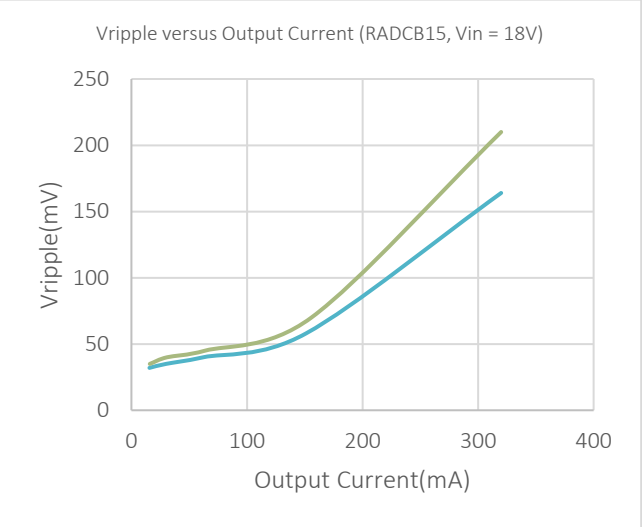


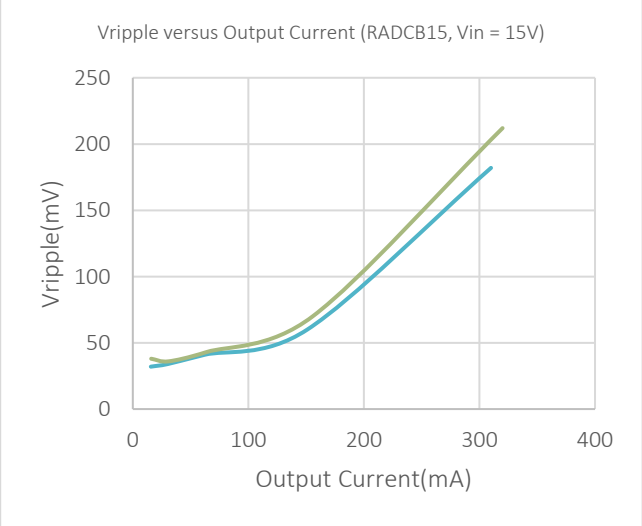
Figure 3 - Efficiency versus Output Current(RADCB12)

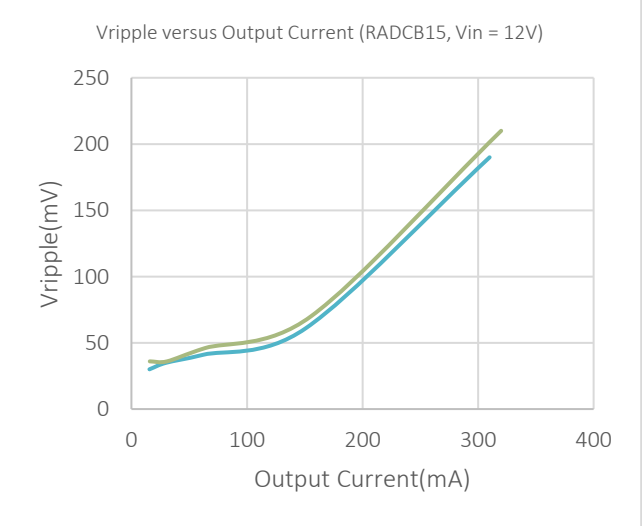
VIN(V)	+I_{OUT}(mA)	-I_{OUT}(mA)	Efficiency(%)	VrippleMAX+(mV)	VrippleMAX-(mV)
24	150	150	80	60	70
18	150	150	80	60	70
15	150	150	80	60	70
12	150	150	80	65	70
9	150	150	75	70	70
6	150	150	75	75	80
5	150	150	75	80	85

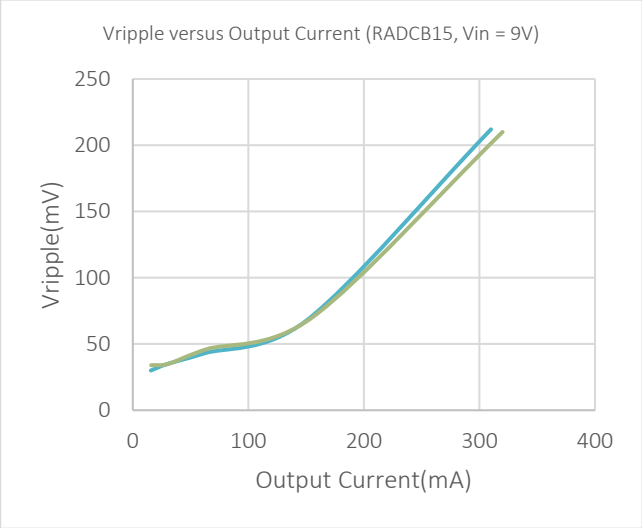
Table 5- Output Current for various input voltages(RCDCB15)

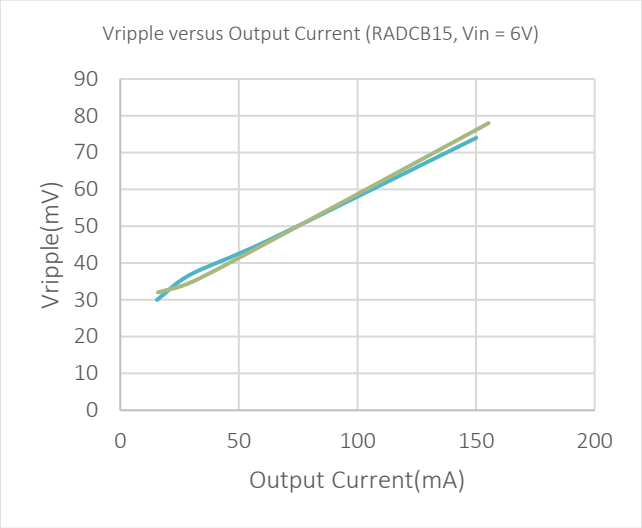


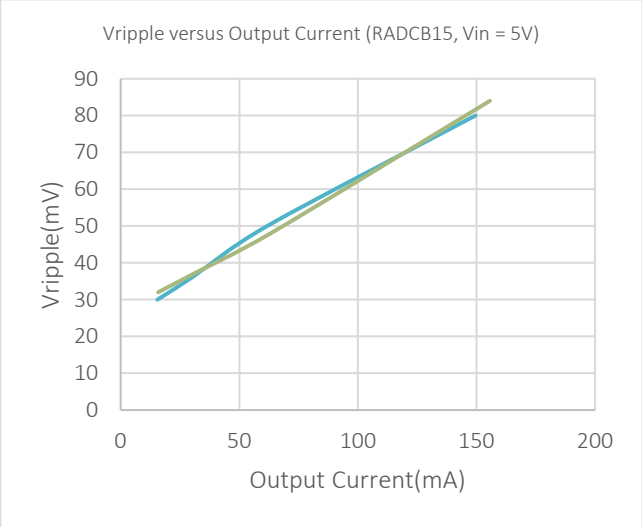












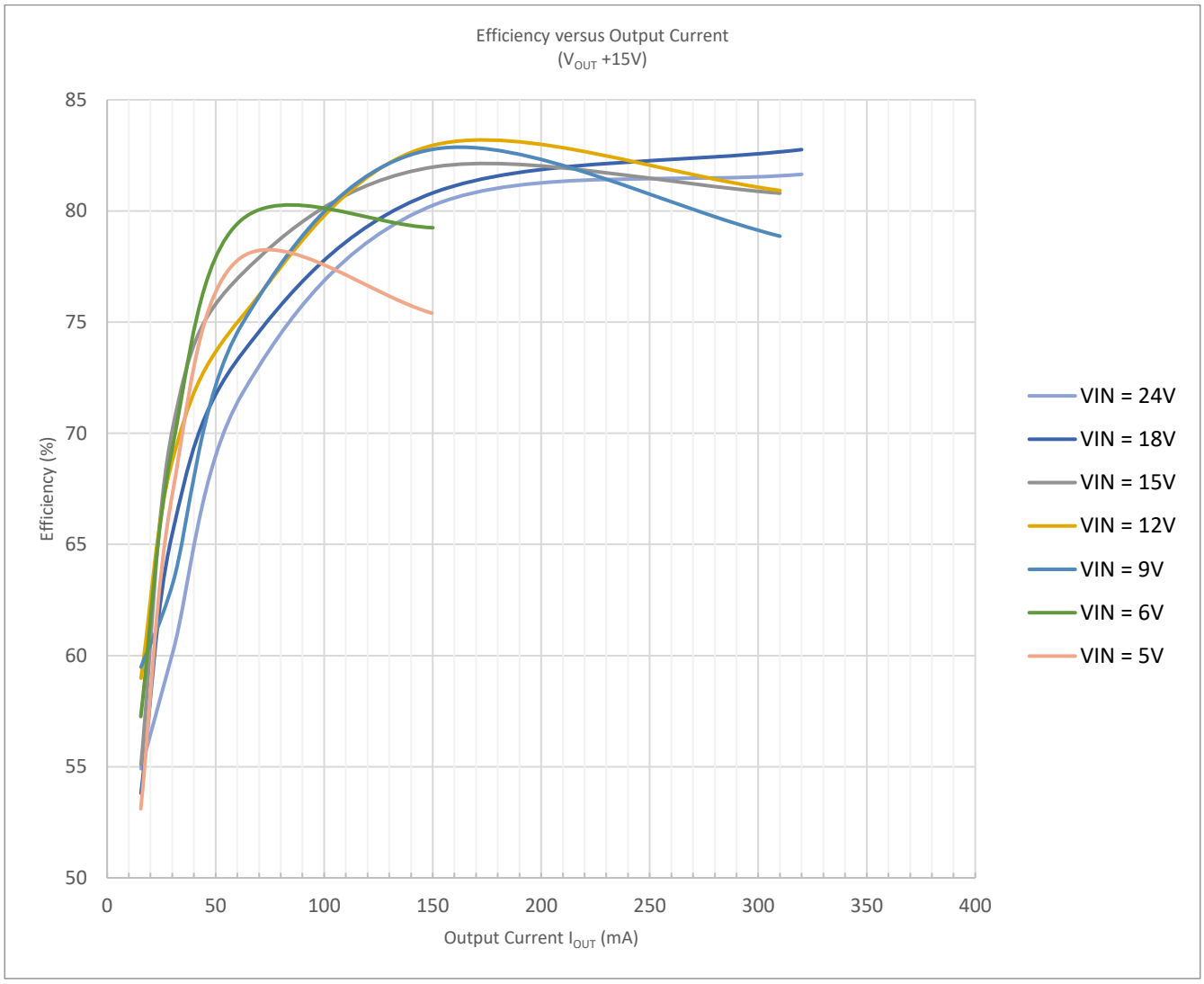
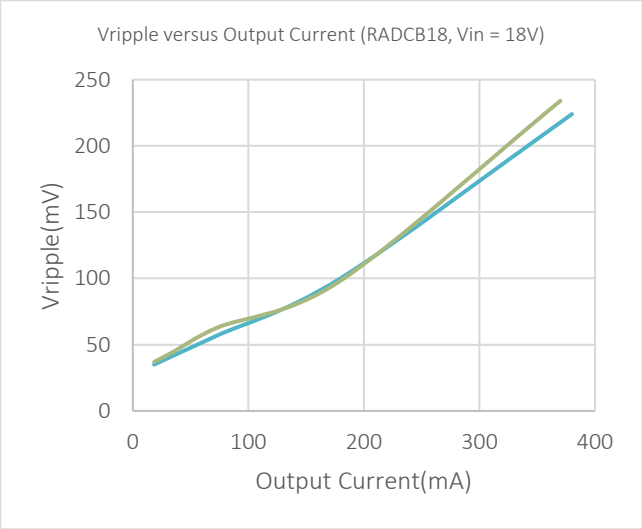
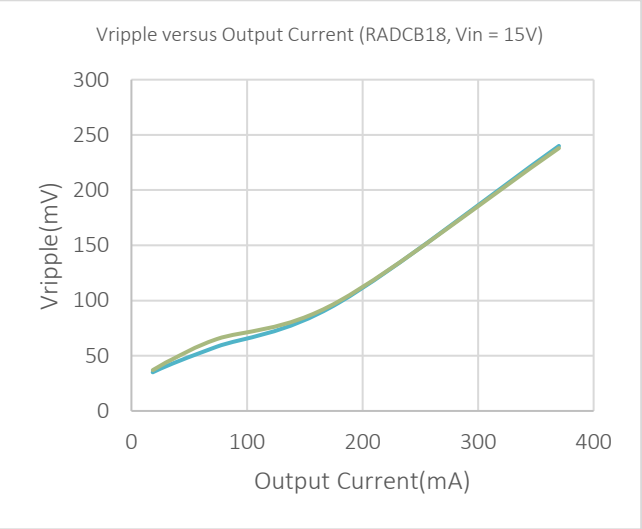


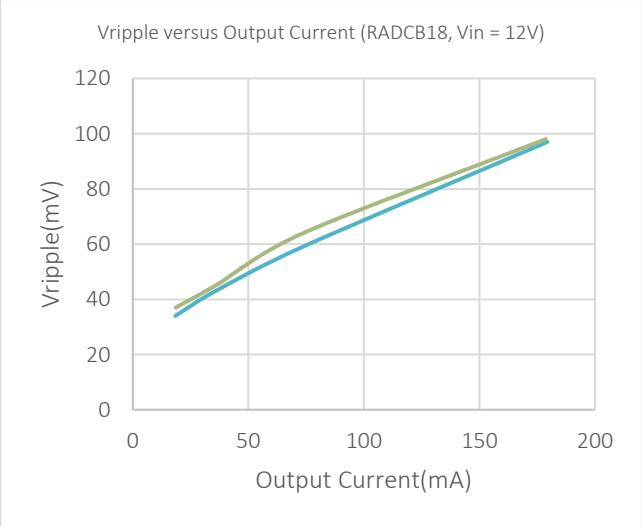
Figure 4 - Efficiency versus Output Current(RADCB15)

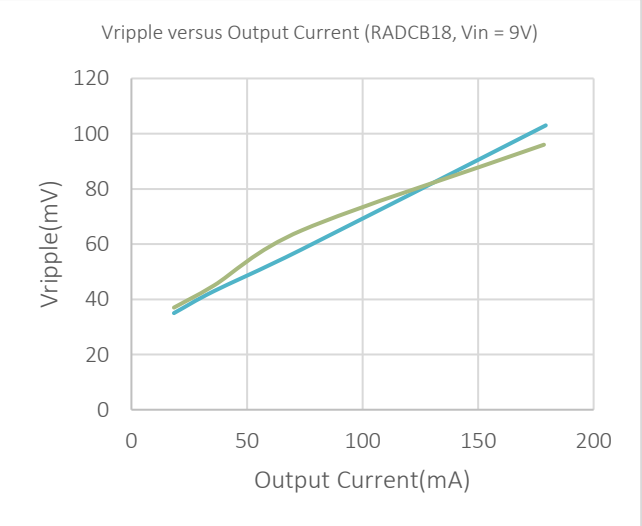
VIN(V)	+I_{OUT}(mA)	-I_{OUT}(mA)	Efficiency(%)	Vripple+(mV)	Vripple-(mV)
18	150	150	80	100	100
15	150	150	80	100	100
12	150	150	85	100	100
9	150	150	80	105	100
6	100	100	80	65	70
5	100	100	70	65	70

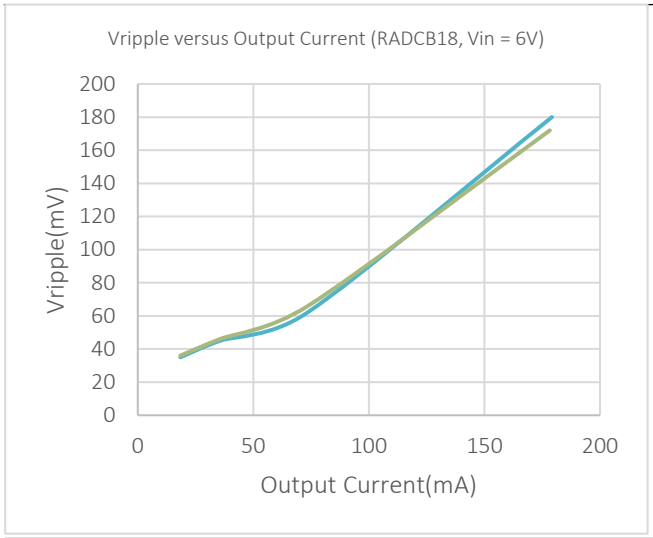
Table 6- Output Current for various input voltages(RCDCB18)

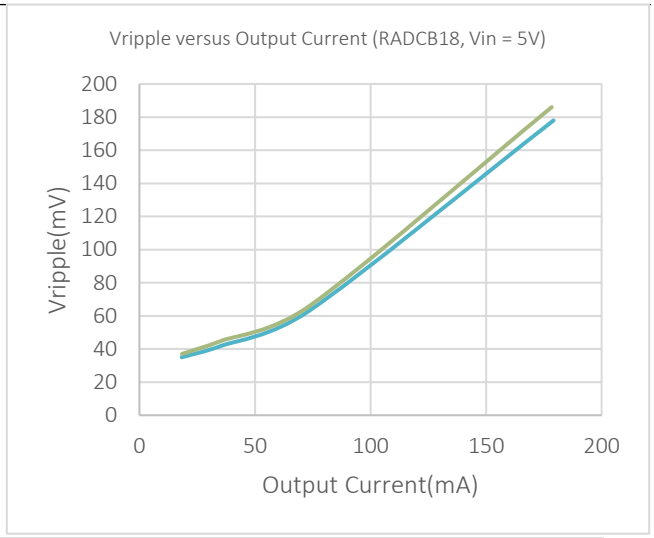












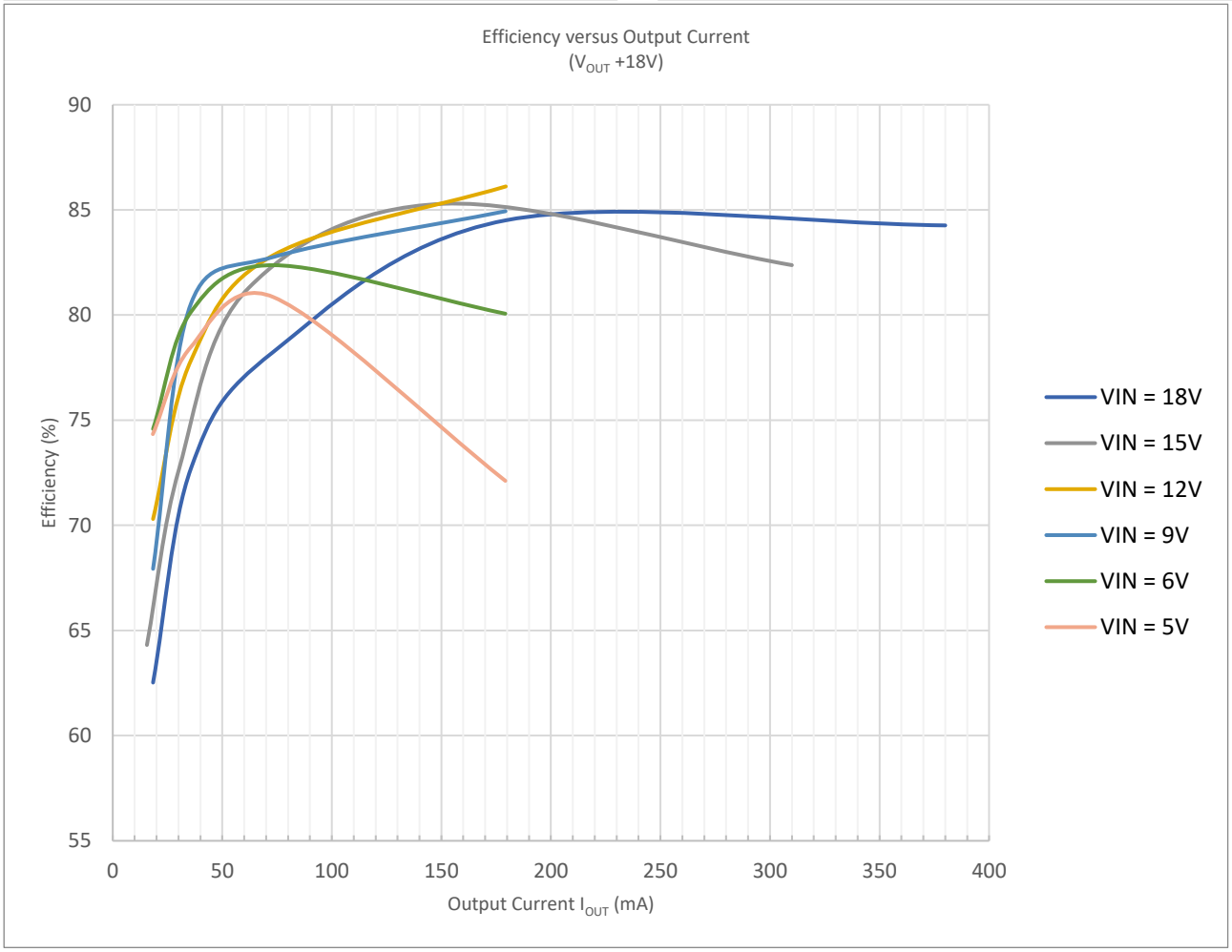


Figure 5 - Efficiency versus Output Current(RADCB18)

Characteristics		Min	Typ	Max	Unit
ENABLED	V_{ENABLE}	1.6	-	V_{IN}	V
DISABLED	$V_{DISABLE}$	0	-	0.5	V
Pull Down Resistor	R_{PULL_DOWN}		450		kΩ

Table 7 - Enable pin

Operation

To permanently enable the +V, -V supplies, the EN enable pin can be connected directly to VIN.

To have discrete control using an MCU, the enable pins can instead be pulled high when supplies are required and pulled low or left open circuit for standby mode. The enable pins are internally pulled down with a 450kΩ resistor.

The open-drain PG power good pin goes high impedance when the output is stable.

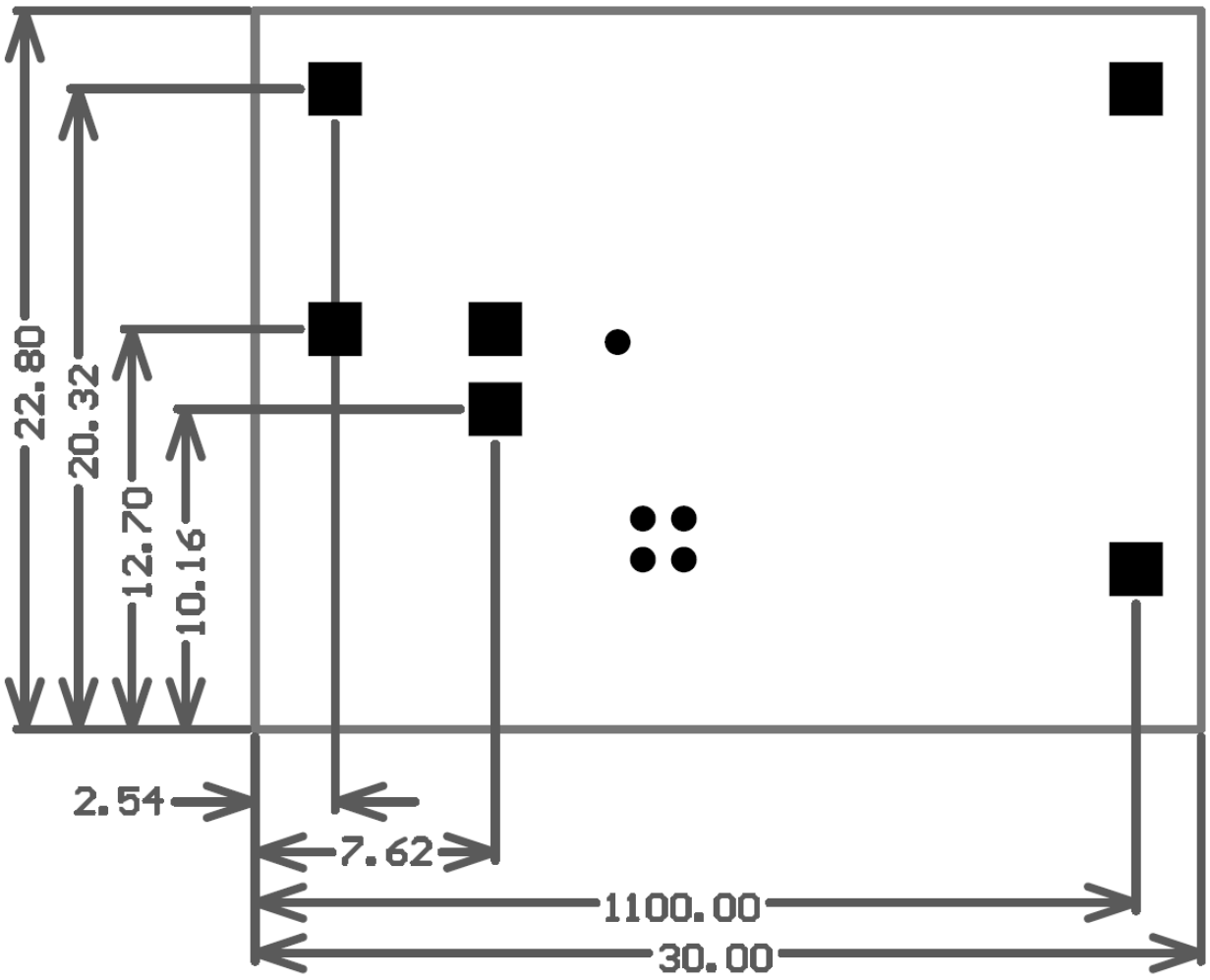


Figure 6 - Mechanical Specification

Symbol	Parameter	Value	Unit
L	Length	30	mm
W	Width	22.8	mm
H	Height	12	mm
Mass	Weight	5	g

Table 8 - Mechanical Specification

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