Features

RoHS compliant

- **Related to railways applications**
- Wide 4 : 1 Input Voltage Range(43~160V)
- Remote On/Off
- High Efficiency up to 86%
- Input / Output Isolation Voltage: 1.5k VDC
- Extended Operating Temperature Range: -40℃ to +85℃
- Output Short Circuit Protection:
  Hiccup, continuous & Auto Recovery
- Over Voltage Protection: Clamp Mode
- Shielded Metal Case with Insulated Baseplate
- Lead Free Design, RoHS Compliant
- 24pin DIP Package with Industry-Standard Footprint
- Customer Design Available

Description

The ROB8W Series are isolated 8W DC/DC converters. Designed with highly efficiency, allow the operating temperature range of these units to be -40℃ to +85℃ in a 24 pin DIP package with industry-standard footprint. Further features include wide 4 : 1 input voltage range, remote on/off control, short-circuit protection and over voltage protection.

Applications

These converters are well suitable for battery operated equipment, measurement equipment, telecom, wireless network, Industry control system, railway application everywhere where isolated, tightly regulated voltages and compact size are required.

Technical Specification

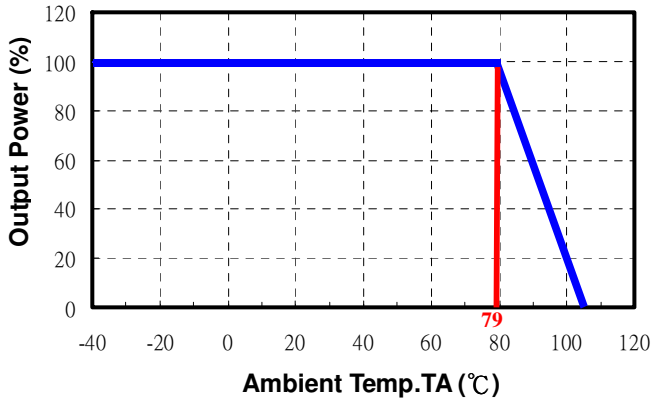
All specifications are typical at nominal input, full load and 25℃ unless otherwise stated.

Model Number	Input Voltage Range	Output Voltage (Vdc)	Output Current (mA)		Input Current (mA)		Eff .(2) (%)	Capacitive Load, max.(3) (uF)
			Min. Load(1)	Full. Load	No Load	Full Load		
ROB8-110S0W	43~160V Nominal:110Vdc	3.3	0	2400	8	95	80	4700
ROB8-110S1W		5	0	1600	8	91	84	4700
ROB8-110S2W		12	0	665	4	89	86	1000
ROB8-110S3W		15	0	535	5	90	85	470
ROB8-110D1W		±5	0	±800	4	94	82	1000
ROB8-110D2W		±12	0	±335	5	90	85	470
ROB8-110D3W		±15	0	±265	4	90	85	330

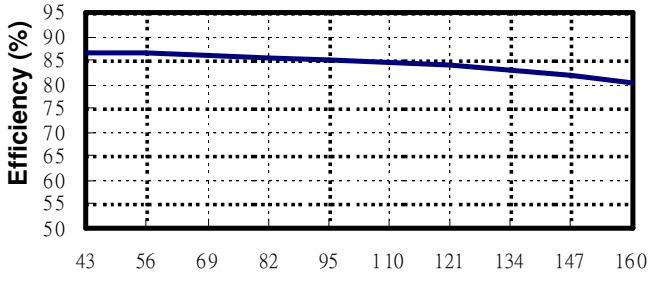
Input Specifications		
Input Voltage	110V nominal input	43-160V
Input filter		Pi Type
Input surge voltage (100ms max.)	110V input	170V
Input reflected ripple current	Nominal Vin and full load	250mAp-p typ.
Start up time	Nominal Vin and constant resistive load	75ms typ.
Remote ON/OFF	Converter: ON	Open or 3.5V＜Vr＜12V
	Converter: OFF	Short (3) or 0V＜Vr＜0.7V
Sourcing current of remote control pin	Nominal Vin	＜0.2 mA
Idle input current (at Remote OFF state)	Nominal Vin	＜6 mA
Environmental Specifications		
Operating ambient temperature		-40℃ to +85℃ (with derating)
Maximum case temperature		+100℃
Storage temperature range		-55℃ to +105℃
Relative humidity		5% to 95% RH
Temperature coefficient		±0.02% / ℃ max.
Output Specifications		
Output power		8 Watts max.
Voltage accuracy	Full load and nominal Vin	±1%
Minimum load		See table
Line regulation	LL to HL at full load	±0.5%
Load Regulation	25% load to full load Single	±1%
	Balanced load Dual	±1%
	Unbalanced load 25% to 100% full load	±5%
Ripple and Noise	20MHz bandwidth	75mVp-p max.
Over voltage protection (Zener Diode Clamp)	3.3Vout models	3.9V
	5Vout models	6.2V
	12Vout models	15V
	15Vout models	18V
Capacitive load		See table
Over load protection	% of full load at nominal input	150% typ.
Short circuit protection		Hiccup, continuous (Auto Recovery)
Transient response settling time	50% load step change	290μs typ.
Transient response over shoot	di/dt=0.8A/μs	≤ ±5% of Vo

General Specifications		
Efficiency	Nominal input	See table
Isolation voltage	Input to output	1500VDC
Isolation resistance	500VDC	10^9 Ohms min.
Isolation capacitance		1000pF typ.
Switching frequency		330kHz typ.
Reliability, calculated MTBF		2.11 × 10^6 Hrs
Physical Specifications		
Case material		Nickel-coated copper
Base material		Non-conductive black plastic
Potting material		Silicon rubber (UL94V-0)
Dimensions		1.25 × 0.80 × 0.40 Inch (31.75 × 20.32 × 10.16 mm)
Weight		18g (0.62oz) typ.

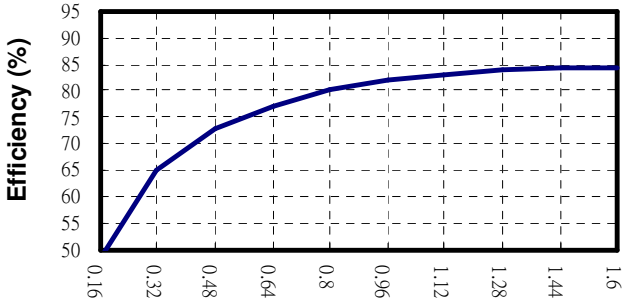
BOB8W Series
Power Derating Curve(4)



ROB8-110S1W
Input voltage vs. Efficiency



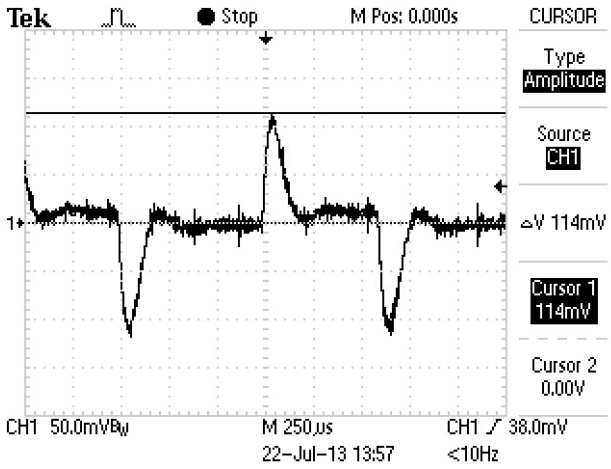
ROB8-110S1W
Output Current vs. Efficiency



Input voltage (V) **Output Current (A)**

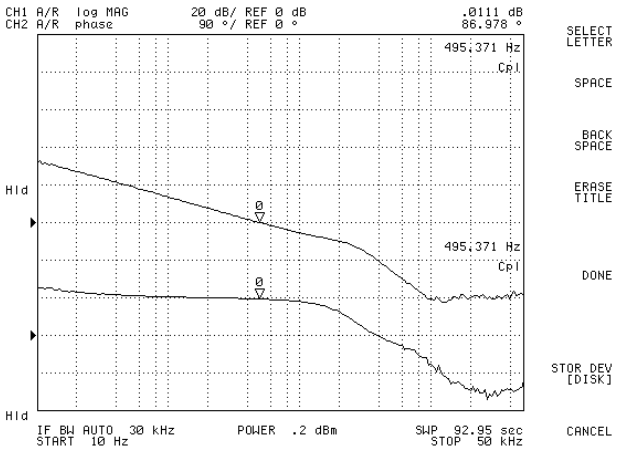
ROB8-110S1W

Transient Response at 50%~100% Max Load



ROB8-110S1W

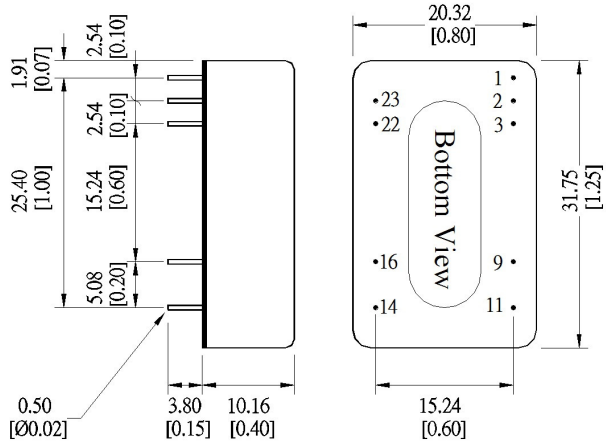
Loop Gain & Phase at Vi=110V,Full Load



Note

1. Typical value, tested at nominal input and full load.
2. For each output.
3. Short to -Vin (Pin 2,3).
4. Based on ROB8-110S1W.

Mechanical Dimensions



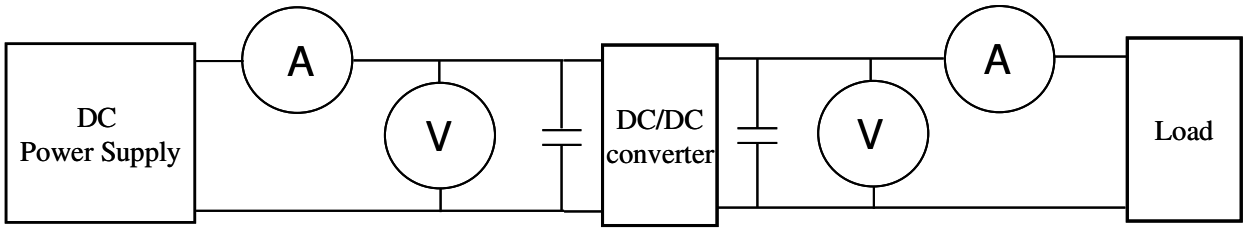
Unit: mm [inch]
Tolerance:±0.5[0.02]

Pin Assignment		
Pin	Single	Dual
1	Remote On/Off	
2	-Vin	-Vin
3	-Vin	-Vin
9	No function	Common
11	No function	-Vout
14	+Vout	+Vout
16	-Vout	Common
22	+Vin	+Vin
23	+Vin	+Vin

Specifications subject to change without notice.

Test Configurations

All specifications are typical at nominal input, full load and 25℃ unless otherwise stated.



◎DC Power Supply: It offers a wide voltage and current range precisely.

◎Current meter (A): Accuracy➔ 200μA ~ 200mA 4 ranges±(0.2% rdg + 2 digits)

2000mA ~ 20A 2 ranges±(0.3% rdg + 2 digits).

◎Voltage meter (V): Accuracy➔ ±(0.03% rdg + 4 digits).

◎Load: At full load.

◎Wires: The resistance of the wires must be small.

1. Input voltage range: Narrow input voltage range（±10%）、wide input voltage range (2:1 and 4:1）。

EX: Narrow input voltage range（±10%）

5V nominal input	➔	4.5~5.5V
12V nominal input	➔	10.8~13.2V
24V nominal input	➔	21.6~26.4V

Wide input voltage range 2:1

5V nominal input	➔	4.5~9V
12V nominal input	➔	9~18V
24V nominal input	➔	18~36V
48V nominal input	➔	36~75V

Wide input voltage range 4:1 (W)

24V nominal input	➔	9~36V
48V nominal input	➔	18~75V
110V nominal input	➔	43~160V

2. Input power :

Pin = Vin x Iin

Vin：Input voltage
Iin：Input current

3. Output power :

Pout = Vout x Iout

Vout：Output voltage
Iout：Output current

4. Efficiency :

$$\text{Efficiency} = \frac{\text{Pout}}{\text{Pin}} \times 100\%$$

Pout: Output power
Pin: Input power

5. Voltage accuracy:

$$\frac{|\text{Vout-Vout(nominal)}|}{\text{Vout}} \times 100\%$$

Vout：Output voltage
Vout(nominal)：Nominal output voltage

6. Line regulation: (1) Wide input voltage range and regulated output voltage series.

$$\frac{|\,Vout(LL)-Vout(HL)\,|}{Vout(LL)} \times 100\%$$

LL: Low Line input voltage
HL: High Line input voltage

(2) Narrow input voltage range（±10%）and unregulated output voltage series.

$$\text{Line regulation} = \left| \frac{\Delta Vout}{\Delta Vin} \right|$$

$$\Delta Vout = \frac{Vout(+10\%)-Vout(-10\%)}{Vout} \times 100\%$$

Vout(+10%)：Output voltage at Vin = 1.1xVin(nominal)&full load

Vout(-10%)：Output voltage at Vin = 0.9xVin(nominal)&full load

Vout：Output voltage at Vin = Vin(nominal)&full load

$$\Delta Vin = \frac{Vin(+10\%)-Vin(-10\%)}{Vin(nominal)} \times 100\%$$

Vin(+10%)：Input voltage = 1.1xVin(nominal)

Vin(-10%)：Input voltage = 0.9xVin(nominal)

Vin(nominal)：Nominal Input voltage

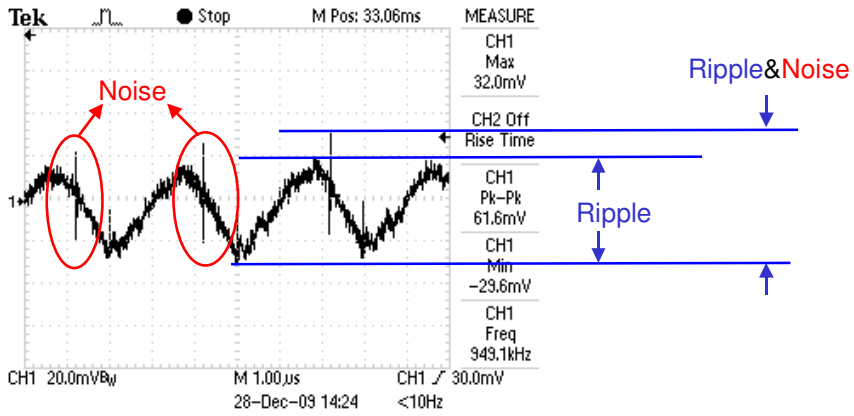
7. Load regulation :

$$\frac{|\,Vout(FL)-Vout(NL)\,|}{Vout(FL)} \times 100\%$$

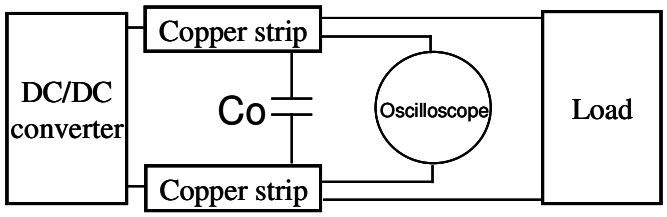
Vout(FL): Output voltage at full load

Vout(NL): Output voltage at 25% full load or 10% full load

8. Ripple and Noise: as shown below. The bandwidth is 0-20MHz.

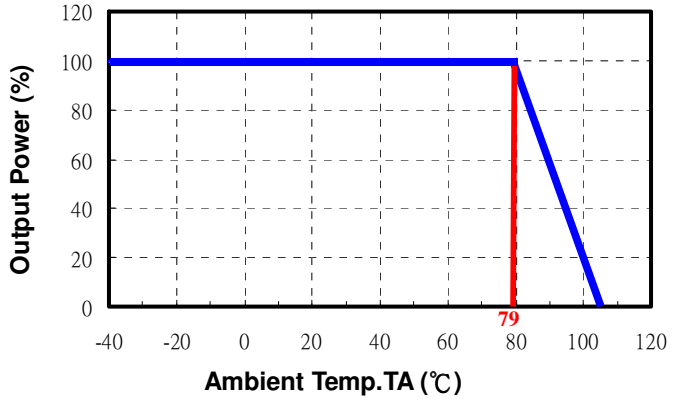


Output Ripple&Noise measurement test circuit: as shown below.



Co: usually 0.47uF.

9. Temperature derating curve: The DC-DC converter will operate over a wider temperature range if less power is drawn from the output and the device is already running. The temperature derating curve shows the operating power-temperature range. As shown below.



10. Switching frequency: The nominal operating frequency of the DC-DC converters.

11. Input to output isolation: The dielectric breakdown strength test between input and output circuits. This is the isolation voltage the device is capable of withstanding for a specified time, usually 1 second or 1 minute.