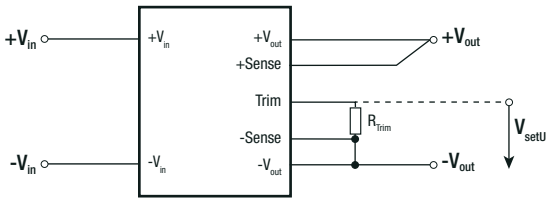
Specifications (measured @ Ta= 25°C, 2.5m/s, nom. Vin, 24Vout and after warm-up unless otherwise stated)

Output Voltage Trimming

The RBBA3000 series offers the feature of trimming the output voltage over a range between 0V and 60V by using precision trim resistors between the Trim and -Sense pin (1% recommended). Undriven Trim pin will set Vout to 0VDC.



$Vout_{max}$	= maximum output voltage	[VDC]
$Vout_{set}$	= trimmed output voltage	[VDC]
k	= trim up factor	[ ]
V_{setU}	= set voltage	[VDC]
V_{ref1}, V_{ref2}	= reference voltage	[VDC]
R_{Trim}	= trim resistor	[Ω]
R_1, R_2	= internal resistors	[Ω]

$Vout_{max}$	R_1	R_2	k	V_{ref1}	V_{ref2}
60VDC	11k83Ω	10k912Ω	0.058	2.366	2.316

Calculation:

$$R_{Trim} = \left[\frac{R_1 \times Vout_{max}}{Vout_{set} + k \times Vout_{max}} \right] - R_2$$

Additionally the Trim pin can be driven from an external voltage source:

$$V_{setU} = V_{ref1} - V_{ref2} \times \left[\frac{Vout_{set}}{Vout_{max}} \right]$$

Practical Example RBBA3000-50 (set Vout to 24VDC):

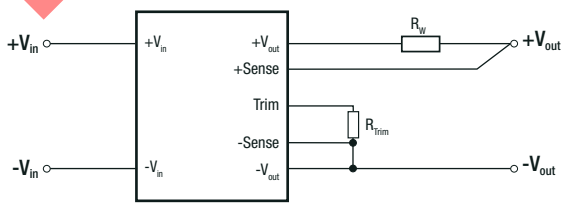
$$R_{Trim} = \left[\frac{11k83 \times 60}{24 - 0.058 \times 60} \right] - 10k912 = \underline{\mathbf{23k68\Omega}}$$

$$V_{setU} = 2.366 - 2.316 \times \left[\frac{24}{60} \right] = \underline{\mathbf{1.44V}}$$

R_{Trim} according to E96 ≈ **23k7Ω**

Preliminary

REMOTE SENSE



The output voltage can be adjusted via the Trim and -Sense functions. The maximum output voltage from Trim and -Sense function combined is 60VDC. The maximum allowed voltage between +Sense and +Vout pins is 6VDC. Derating may be required when using trim and/or sense functions.

R_W ... wire losses
R_{Trim} ... trim resistor

Specifications (measured @ Ta= 25°C, 2.5m/s, nom. Vin, 24Vout and after warm-up unless otherwise stated)

REGULATIONS

Parameter	Condition	Value
Output Accuracy	exclusive R_{Trim} tolerances	±0.5% typ.
Line Regulation	low line to high line, full load	±1.0% typ.
Load Regulation	0% to 100% load	-4.0% x Vout x ($I_{out}/I_{out_{max.}}$)
Transient Response	25% load step recovery time	600mV max. 200µs typ.
Remote Sense	between +Vout and +Sense between -Vout and -Sense	1.0VDC max. 0.2VDC max.

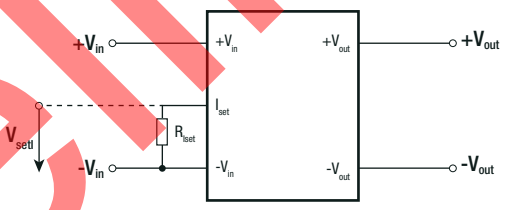
PROTECTIONS

Parameter	Condition	Value
Input Over Voltage Protection	150ms delay	65VDC
Input Over Current Protection	low line to high line	latch off, 55A typ.
Output Short Circuit Protection	fixed using I_{set} (7)	hiccup mode, 55A typ. hiccup mode, 0-50A
Output Over Voltage Protection (OVP)		latch off, 65VDC typ.
Over Temperature Protection (OTP)	case temperature (measured on tc point)	110°C

Notes:

Note7: The RBBA3000 series offers the feature of trimming the output current over a range between 0A and 50A by using an external resistor between the I_{set} and the -Vin pin (1% recommended).

Output Current Setting



$I_{out_{max}}$ = maximum output current [VDC]
$I_{out_{set}}$ = trimmed output current [VDC]
k_1, k_2, k_3 = trim up factor [ ]
V_{setl} = set voltage [VDC]
R_{Iset} = trim resistor [kΩ]

$I_{out_{max}}$	k_1	k_2	k_3
50A	25	3.3	2.5

Calculation:

$$R_{Iset} = \frac{k_1 \times I_{out_{set}}}{k_2 \times I_{out_{max}} - k_3 \times I_{out_{set}}}$$

Additionally the I_{set} pin can be driven from an external voltage source:

$$V_{setl} = k_3 \times \left[\frac{I_{out_{set}}}{I_{out_{max}}}\right]$$

Practical Example RBBA3000-50:

$$R_{Iset} = \frac{25 \times 40}{3.3 \times 50 - 2.5 \times 40} = \underline{15.38k\Omega}$$

$$V_{setl} = 2.5 \times \left[\frac{40}{60}\right] = \underline{1.67V}$$

R_{Iset} according to E96 ≈ **15.4kΩ**

Preliminary