

Features

- Ultraminiature 25.4 x 25.4 x 9.9mm Package
- 20 Watts Output Power
- Single or Dual Outputs
- Wide 4:1 Input Voltage Range
- 1.6kVDC Isolation
- Fixed Operating Frequency
- Built-in Class A EMC Filter
- Six-Sided Continuous Shield
- Industry Standard Pinout
- Remote On/Off and Trim pins
- Efficiency to 90%

Description

The RP20-SAW series are ultraminiature wide input voltage range power DC/DC converters in a case half the size of industry standard 20W converters. Despite their small size, the RP20-SAW converters are fully specified devices with output currents up to 4.5 Amps, up to 90% efficiency, no minimum load, 1600VDC isolation, a built-in Class A EMC filter and low ripple/noise figures. The outputs are also fully protected against short circuits, overcurrent and overvoltage. The no load input current is particularly low (only 4mA/6mA). The RP20-SAW series will find many uses in applications where board space and/or board height is at a premium or in battery-powered systems where standby current is important.

Selection Guide 24V and 48V Input Types

Part Number	Input Range VDC	Output Voltage VDC	Output Current mA	Input ⁽¹⁾ Current mA	Efficiency ⁽²⁾ %	Capacitive ⁽³⁾ Load max.
RP20-243.3SAW**	9-36	3.3	4500	6/754	86	7000µF
RP20-2405SAW**	9-36	5	4000	6/980	89	5000µF
RP20-2412SAW**	9-36	12	1670	6/980	89	850µF
RP20-2415SAW**	9-36	15	1330	6/980	89	700µF
RP20-483.3SAW**	18-75	3.3	4500	4/737	87	7000µF
RP20-4805SAW**	18-75	5	4000	4/490	89	5000µF
RP20-4812SAW**	18-75	12	1670	4/490	89	850µF
RP20-4815SAW**	18-75	15	1330	4/484	90	700µF
RP20-2412DAW**	9-36	±12	±833	6/980	89	±500µF
RP20-2415DAW**	9-36	±15	±667	6/969	90	±350µF
RP20-4812DAW**	18-75	±12	±833	4/490	89	±500µF
RP20-4815DAW**	18-75	±15	±667	4/484	90	±350µF

** Standard part is without suffixes and Trim and CTRL pins are not fitted.

* add suffix **/P** for CTRL function with positive logic (1=ON, 0=OFF) including trim pin for single output

* add suffix **/N** for CTRL function with negative logic (0=ON, 1=OFF) including trim pin for single output

* add suffix **-HC** for premounted heatsink and clips

Ordering Examples

RP20-2405SAW/P = 24V 4:1 Input, 5V Output, Positive Logic CTRL pin and Trim pin fitted.

RP20-483.3SAW-HC = 48V 4:1 Input, 3.3V Output, Premounted Heatsink, No Trim or CTRL pins.

RP20-4812DAW/N = 48V 4:1 Input, ±12V Output, Negative Logic CTRL pin

(no trim pin available with dual output)

POWERLINE

DC/DC-Converter

with 3 year Warranty

RECOM

20 Watt Single & Dual Output



**UL-60950-1 Certification
Pending**

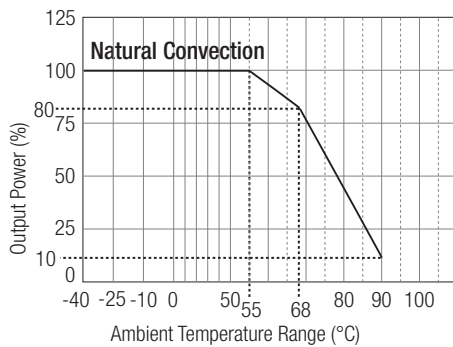
RP20-AW

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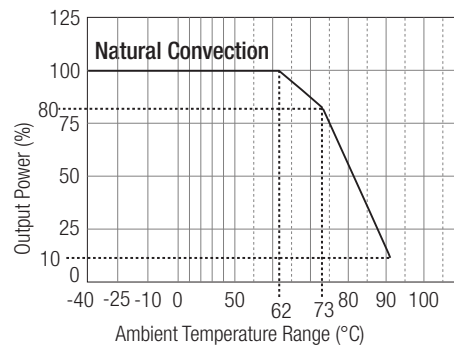
Please Read Application Notes

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Typical Characteristics



RP20-4805SAW



**RP20-4805SAW
With Heat Sink**

Derating graphs are valid only for the shown part numbers. If you need detailed derating-information about a part-number not shown here please contact our technical support service at info@recom-development.at

Specifications (typical at nominal input and 25°C unless otherwise noted)

Input Voltage Range	24V nominal input 48V nominal input	9-36VDC 18-75VDC
Input Filter	Pi Type	EN55022 Class A
Input Surge Voltage (1000 ms max.)	24V Input 48V Input	50VDC 100VDC
Input Reflected Ripple (nominal Vin and full load) (see Note 4)		30mAp-p
Start Up Time (nominal Vin and constant resistor load)		30ms max.
Optional Remote ON/OFF (See Note 5) (Negative logic)	DC-DC ON DC-DC OFF	Short or $0V < V_r < 1.2V$ Open or $3.0V < V_r < 15V$
Remote Pin drive current	Nominal Vin	-0.5mA~1mA
Remote OFF input current	Nominal Vin	2mA
Output Voltage Accuracy (full Load and nominal Vin)		±1%
Optional Output Trim (see Note 5)		±10%
Minimum Load		0%
Line Regulation (low line, high line at full load)	Single Dual	±0.2% ±0.5%
Load Regulation (0% to full load)	Single Dual	±0.2% ±1%
Cross Regulation (Asymmetrical 25% <> 100% load)	Dual Output	±5%
Ripple and Noise (20MHz bandwidth, with 1µF MLCC on output)	3.3, 5V Outputs Others	75mVp-p 100mVp-p
Temperature Coefficient		±0.02%/°C max.
Transient Response (25% load step change)		250µs
Over Voltage Protection	3.3V	3.7-5.4V
Zener diode clamp (only single)	5V 12V 15V	5.4-7.0V 13.5-19.6V 16.8-20.5V
Over Load Protection (% of full load at nominal Vin)		150% typ
Undervoltage Lockout		See Application Notes
Short Circuit Protection		Hiccup, automatic recovery
Efficiency		see „Selection Guide“ table
Isolation Voltage (rated for one minute)	Input - Output	1600VDC
Isolation Resistance		1 GΩ min.
Isolation Capacitance		1500pF max.

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Specifications (typical at nominal input and 25°C unless otherwise noted)

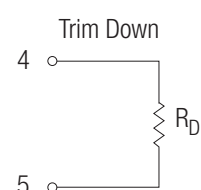
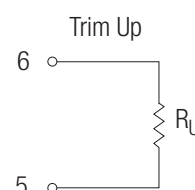
Operating Frequency	330kHz typ	
Operating Temperature Range	-55°C to +90°C (with derating)	
Maximum Case Temperature	+105°C	
Storage Temperature Range	-55°C to +125°C	
Thermal Impedance (see Note 6)	Natural convection	18.2°C/Watt
	Natural convection with Heat Sink	15.8°C/Watt
Thermal Shock	MIL-STD-810F	
Vibration	10-55Hz, 10G, 30 Min. along X, Y and Z	
Relative Humidity	5% to 95% RH	
Case Material	Nickel plated copper	
Base Material	FR4 PCB	
Potting Material	Epoxy (UL94-V0)	
Conducted Emissions	(see Note 7)	EN55022 Class A
Radiated Emissions		EN55022 Class B
ESD	±8kV Air, ±6kV Contact	EN61000-4-2 Perf. Criteria A
Radiated Immunity	10V/m	EN61000-4-3 Perf. Criteria A
Fast Transient	±2kV	EN61000-4-4 Perf. Criteria A
Surge (see note 8)	±2kV	EN61000-4-5 Perf. Criteria A
Conducted Immunity	10Vrms	EN61000-4-6 Perf. Criteria A
Weight	15g	
Packing Quantity	Refer to App Notes for tube dimensions	8 pcs per Tube
Dimensions	25.4 x 25.4 x 9.9mm	
MTBF (see Note 9)	Bellcore TR-NWT-000332	1766 x 10 ³ hours
	MIL-HDBK 217F	553 x 10 ³ hours

Notes :

- Values at nominal input voltage and no load/full load.
- Typical Value at nominal input voltage and full load.
- Test by minimum Vin and constant resistor load.
- Simulated source impedance of 12μH. 12μH inductor in series with +Vin.
- The ON/OFF control function can be positive or negative logic. The pin voltage is referenced to negative input.
Positive logic ON/OFF is marked with suffix-P (eg. RP20-2405SAW/P)
Negative logic ON/OFF is marked with suffix-N (eg. RP20-2405SAW/N).
If no suffix is specified, the control pin will be omitted.
- Optional Heat-sink P/N is 7G-0047-C. Powerline DC/DC Converters can be ordered with pre-mounted heatsinks including antivibration fixing clips (add suffix -HC). See Application Notes for heatsink details.
- Will meet Class B with external common mode filter (see Application Notes). Meets Class A with no external components.
- Requires external capacitor to meet EN61000-4-5: 220μF/100V, low ESR (48mOhm)
- BELLCORE TR-NWT-000332. Case I: 50% Stress, Temperature at 40°C.
MIL-HDBK 217F Notice 2. Ta = 25°C, full load, (Ground Benign, controlled environment).

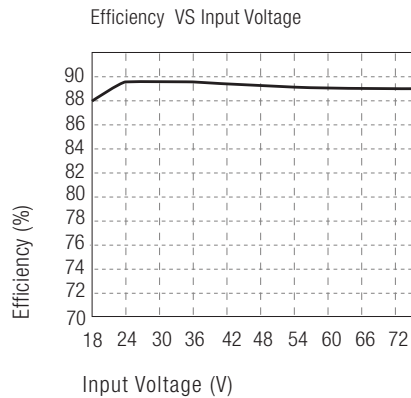
External Output Trimming (optional)

With /CTRL suffix, output can be externally trimmed by using the method shown here.
See Application Notes for details.

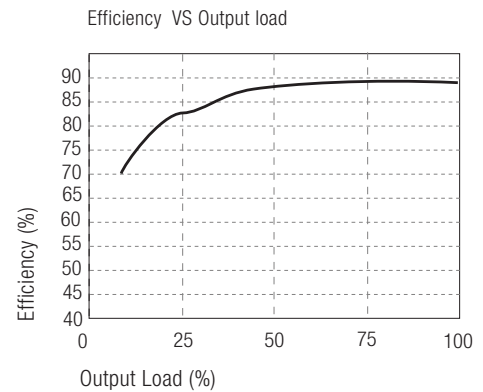


Typical Characteristics

RP20-4805SAW (Full Load)

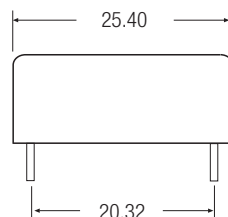
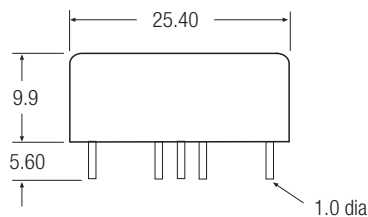


RP20-4805SAW (Vin=48V)



Package Style and Pinning (mm)

3rd angle projection

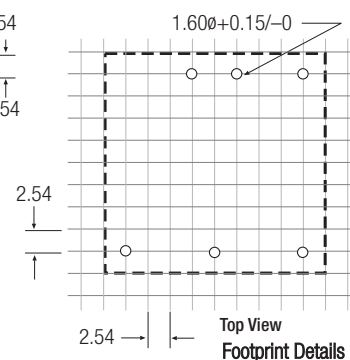
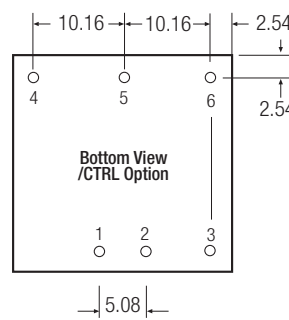
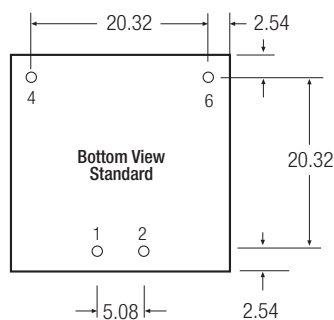


Pin Connections

Pin #	Single	Single/ P or /N	Dual	Dual/ P or /N
1	+Vin	+Vin	+Vin	+Vin
2	-Vin	-Vin	-Vin	-Vin
3	no pin	CTRL	no pin	CTRL
4	+Vout	+Vout	+Vout	+Vout
5	no pin	Trim	Com	Com
6	-Vout	-Vout	-Vout	-Vout

Case Tolerance ± 0.5 mm

Pin Pitch Tolerance ± 0.25 mm



RP20-AW

EMC Filtering

Class B Filter

Vin=24V: C1=4.7 μ F/50V 1812 MLCC, C2 & C3 omitted,
C4 & C5 =470pF/2kV

Vin=48V: C1, C2 & C3 = 2.2 μ F/100V 1812 MLCC,
C4 & C5 =1nF/2kV

