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Specifications measured at Ta = 25°C, nominal input voltage, full load otherwise noted

BASIC CHARACTERISTICS					
Parameter	Condition		Min.	Typ.	Max.
Input Voltage Range	nom. Vin= 12V nom. Vin= 24V nom. Vin= 48V		9VDC 18VDC 36VDC	12VDC 24VDC 48VDC	18VDC 36VDC 75VDC
Under Voltage Lockout (UVLO)	Vin = 12V	DC-DC ON DC-DC OFF		8VDC	9VDC
	Vin = 24V	DC-DC ON DC-DC OFF		16VDC	17.8VDC
	Vin = 48V	DC-DC ON DC-DC OFF		34VDC	36VDC
Input Filter					L-C Type
Input Reflected Ripple Current ⁽⁵⁾	nominal Vin and full load			40mA _{p-p}	
Input Surge Voltage	Vin = 12V, 100ms max. Vin = 24V, 100ms max. Vin = 48V, 100ms max.				36VDC 50VDC 100VDC
Start-up time	Power up			25ms	
	Remote ON/OFF			25ms	
			270kHz	300kHz	330kHz
Minimum Load	of full load				
	Single Dual and Triple		0% 10%		
Ripple and Noise	measured by 20MHz bandwidth with a 0.1µF/50V MLCC		Single	3.3Vout, 5 Vout 12Vout, 15Vout	50mV _{p-p} 75mV _{p-p}
			Dual	12Vout 15Vout	120mV _{p-p} 150mV _{p-p}
			Triple	3.3Vout, 5 Vout 12Vout, 15Vout	50mV _{p-p} 75mV _{p-p}
Remote ON/OFF ⁽⁶⁾	Positive Logic	DC-DC ON DC-DC OFF	Open or 3.0V < Vr < 12V Short or 0V < Vr < 1.2V		
Input current of Remote pin (CTRL)	DC-DC OFF			2.5mA	
	DC-DC ON		-0.5mA		0.5mA

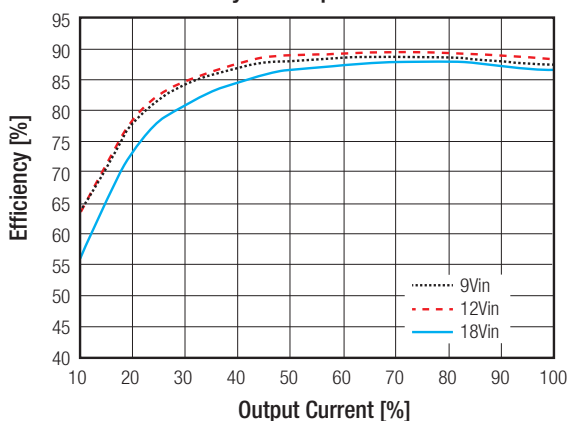
Notes:

Note5: Simulated source impedance of 12µH. 12µH inductor in series with +Vin.

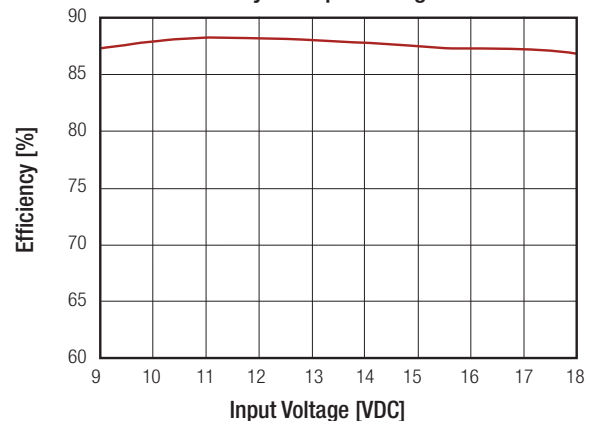
Note6: The ON/OFF control pin voltage is referenced to -Vin pin.

RP40-1205SG

Efficiency vs. Output Current



Efficiency vs. Input Voltage

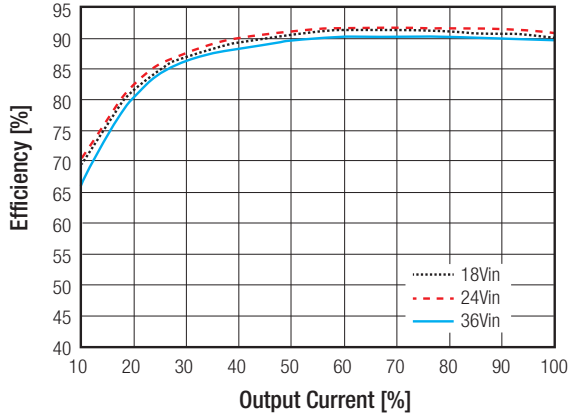


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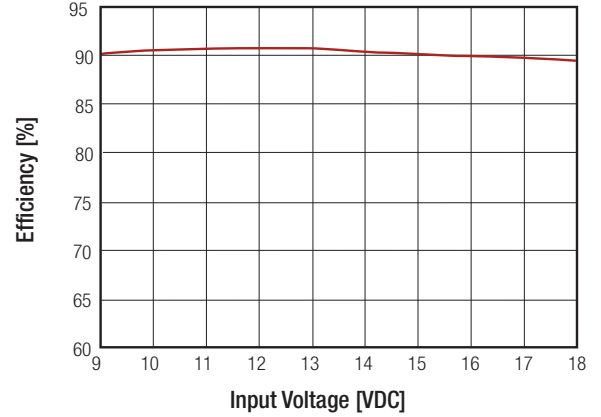
Specifications measured at $T_a = 25^\circ\text{C}$, nominal input voltage, full load otherwise noted

RP40-2405SG

Efficiency vs. Output Current

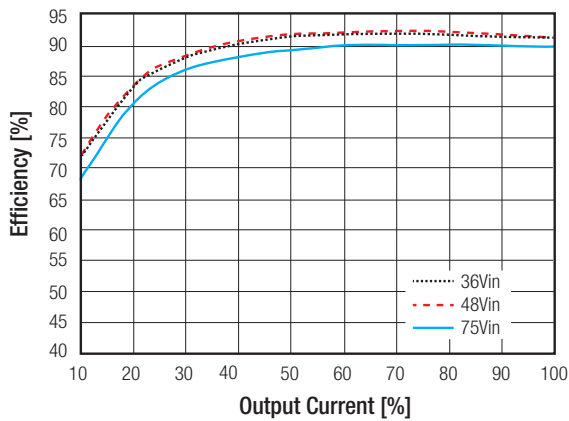


Efficiency vs. Input Voltage

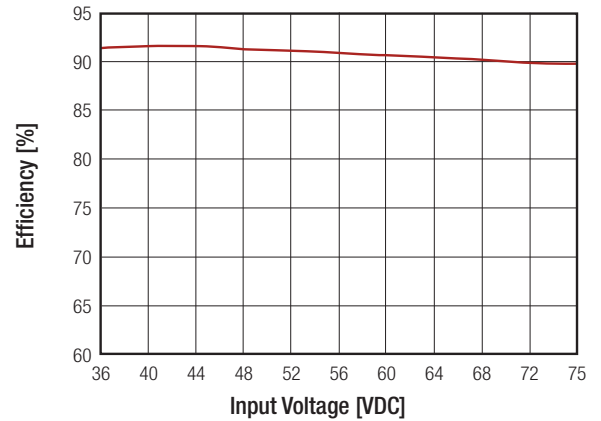


RP40-4805SG

Efficiency vs. Output Current



Efficiency vs. Input Voltage



Specifications measured at Ta = 25°C, nominal input voltage, full load otherwise noted

REGULATIONS		
Parameter	Condition	Value
Output Voltage Accuracy	Single & Dual Triple Main Triple Auxiliary	±1.0% max. ±1.0% max. ±5.0% max.
Voltage Adjustability ⁽⁷⁾		±10% max.
Line Voltage Regulation	low line, high line at full load Single & Dual Triple Main Triple Auxiliary	±0.5% max. ±1.0% max. ±5.0% max.
Load Voltage Regulation	Single/Dual min. load to full load	Single Dual ±0.5% max. ±1.0% max.
	Triple: main output (3.3, 5 Vout) 10% to 100% with 10% to 100% balanced on auxiliaries.	Triple Main ±2.0% max.
	Auxiliary outputs 10% to 100% balanced on all outputs	Auxiliary ±5.0% max.
Cross Regulation	asymmetrical 25%/100% FL	Dual ±5.0% max.
	Triple: main output (3.3, 5Vout) 100%load, auxiliary 100%, other auxiliary 25% to 100% load or main output (3.3, 5Vout) 25%, auxiliary 25%, other auxiliary 25% to 100%	Triple 3.3Vout, 5Vout Triple 12Vout, 15Vout ±1.0% max. ±5.0% max.
Transient Response recovery time	25% load step change	250µs typ.

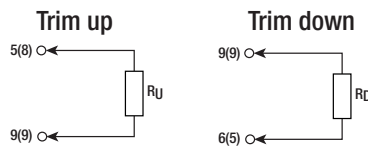
Notes:

Note7: For the single output: Maximum output deviation is 10% inclusive of remote sense and trim. If remote sense is not being use, the +Sense should be connected to its corresponding +Vout and likewise the -Sense should be conneted to its corresponding -Vout.

External Output Trimming

Output Voltage Trimming

Some single/dual output Powerline converters offer the feature of trimming the output voltage over a certain range around the nominal value by using external trim resistors. No general equation can be given for calculating the trim resistors, but the following trimtables give typical values for chosing these trimming resistors. If voltages between the given trim points are required, extrapolate between the two nearest given values to work out the resistor required or use a variable resistor to set the output voltage. Output can be externally trimmed by using the method shown below.



RP40-xx3.3S

Trim up	1	2	3	4	5	6	7	8	9	10	%
Vout =	3.333	3.366	3.399	3.432	3.465	3.498	3.531	3.564	3.597	3.63	Volts
R _U =	57.93	26.16	15.58	10.28	7.11	4.99	3.48	2.34	1.46	0.75	kOhms
Trim down	1	2	3	4	5	6	7	8	9	10	%
Vout =	3.267	3.234	3.201	3.168	3.135	3.102	3.069	3.036	3.003	2.97	Volts
R _D =	69.47	31.23	18.49	12.12	8.29	5.74	3.92	2.56	1.50	0.65	kOhms

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Specifications measured at $T_a = 25^\circ\text{C}$, nominal input voltage, full load otherwise noted

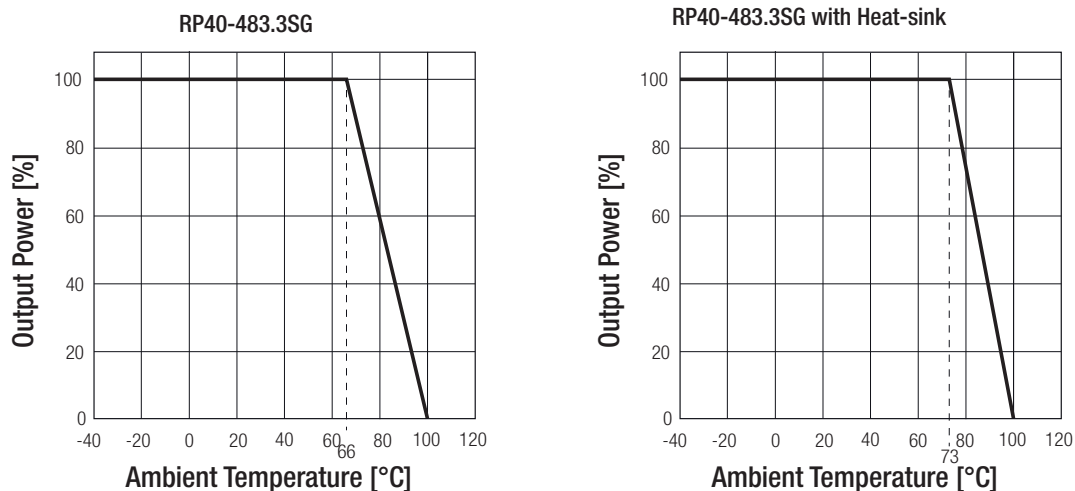
RP40-xx05SG											
Trim up	1	2	3	4	5	6	7	8	9	10	%
V _{out} =	5.05	5.01	5.15	5.20	5.25	5.30	5.35	5.4	5.45	5.50	Volts
R _U =	36.57	16.58	9.92	6.58	4.59	3.25	2.30	1.59	1.03	0.59	kOhms
Trim down	1	2	3	4	5	6	7	8	9	10	%
V _{out} =	4.95	4.90	4.85	4.80	4.75	4.70	4.65	4.60	4.55	4.50	Volts
R _D =	45.53	20.61	12.31	8.15	5.66	4.00	2.81	1.92	1.23	0.68	kOhms
RP40-xx12SF											
Trim up	1	2	3	4	5	6	7	8	9	10	%
V _{out} =	12.12	12.24	12.36	12.48	12.60	12.72	12.84	12.96	13.08	13.20	Volts
R _U =	367.91	165.95	98.64	64.98	44.78	31.32	21.70	14.49	8.88	4.39	kOhms
Trim down	1	2	3	4	5	6	7	8	9	10	%
V _{out} =	11.88	11.76	11.64	11.52	11.40	11.28	11.16	11.04	10.92	10.8	Volts
R _D =	460.99	207.95	123.60	81.42	56.12	39.25	27.20	18.16	11.13	5.51	kOhms
RP40-xx15SG											
Trim up	1	2	3	4	5	6	7	8	9	10	%
V _{out} =	15.15	15.3	15.45	15.60	15.75	15.90	16.05	16.20	16.35	16.50	Volts
R _U =	404.18	180.59	106.06	68.80	46.44	31.53	20.88	12.90	6.69	1.72	kOhms
Trim down	1	2	3	4	5	6	7	8	9	10	%
V _{out} =	14.85	14.70	14.55	14.40	14.25	14.10	13.95	13.80	13.65	13.50	Volts
R _D =	499.82	223.41	131.27	85.20	57.56	39.14	25.97	16.10	8.42	2.282	kOhms
Dual Output Voltage Trim Tables											
RP40-xx12DG											
Trim up	1	2	3	4	5	6	7	8	9	10	%
V _{out} =	24.24	24.48	24.72	24.96	25.20	25.44	25.68	25.92	26.16	26.40	Volts
R _U =	218.21	98.10	58.07	38.05	26.04	18.03	12.32	8.03	4.69	2.02	kOhms
Trim down	1	2	3	4	5	6	7	8	9	10	%
V _{out} =	23.76	23.52	23.28	23.04	22.80	22.56	22.32	22.08	21.84	21.6	Volts
R _D =	273.44	123.02	72.87	47.80	32.76	22.73	15.57	10.20	6.02	2.67	kOhms
RP40-xx15DG											
Trim up	1	2	3	4	5	6	7	8	9	10	%
V _{out} =	30.30	30.60	30.90	31.20	31.50	31.80	32.10	32.40	32.70	33.00	Volts
R _U =	268.29	120.64	71.43	46.82	32.06	22.21	15.10	9.91	5.81	2.53	kOhms
Trim down	1	2	3	4	5	6	7	8	9	10	%
V _{out} =	29.70	29.40	29.10	28.80	28.50	28.20	27.90	27.60	27.30	27.00	Volts
R _D =	337.71	152.02	90.13	59.18	40.61	28.23	19.39	12.76	7.60	3.47	kOhms

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PROTECTIONS			
Parameter	Condition	Value	
Short Circuit Protection (SCP)		continuous, automatic recovery	
Over Voltage Protection (OVP)	Zener Diode Clamp	3.3Vout	3.9VDC
		5Vout	6.2VDC
		12Vout	15VDC
		15Vout	18VDC
Over Temperature Protection (OTP)		115°C typ.	
Over Load Protection (OLP)	% of Iout rated	150% typ.	
Isolation Voltage	I/P to O/P	1.6kVDC/ 1 minute	
	I/P to O/P to case	1.6kVDC/ 1 minute	
Isolation Resistance	500VDC	1GΩ min.	
Isolation Capacitance		1000pF max.	
Notes: Note8: This power module is not internally fused. An input line fuse must always be used.			

ENVIRONMENTAL		
Parameter	Condition	Value
Operating Temperature Range	without derating	-40°C to +66°C
	with derating	-40°C to +100°C
Maximum Case Temperature		+100°C max.
Temperature Coefficient		±0.02%/°C max.
Thermal Impedance	natural convection (20LFM) without Heat-sink	9.2°C/Watt
	natural convection (20LFM) with Heat-sink	7.6°C/Watt
Operating Humidity		5% - 95% RH
Thermal Shock		MIL-STD-810F
Vibration		MIL-STD-810F
MTBF	MIL-HDBK-217F	9224 x 10 ² hours
	BELLCORE TR-NWT-000332 ⁽⁹⁾	1398 x 10 ³ hours

Derating Graph⁽¹⁰⁾



Notes:
 Note9: BELLCORE TR-NWT-000332. Case I: 50% Stress, Temperature at 40°C (Ground fixed and controlled environment).
 Note10: 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 techsupportAT@recom-power.com

Specifications measured at Ta = 25°C, nominal input voltage, full load otherwise noted

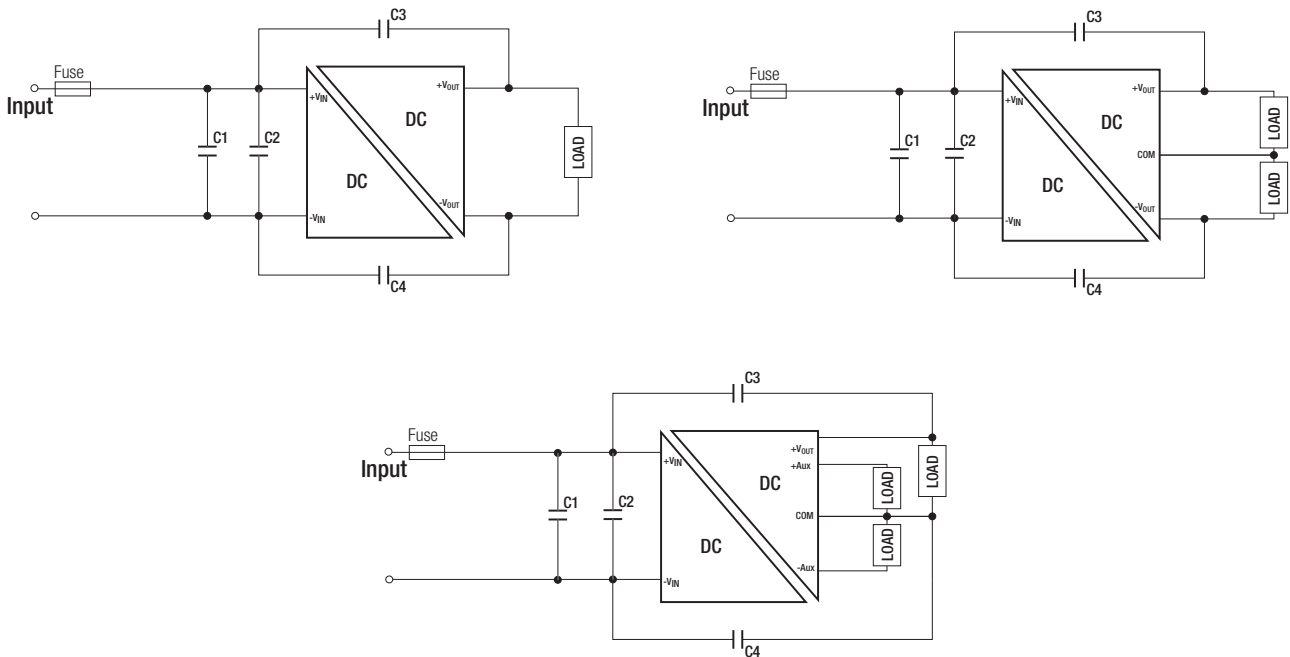
SAFETY AND CERTIFICATIONS		
Certificate Type (Safety)	Report / File Number	Standard
UL General Safety	E196683	UL60950-1 1st. Ed.: 2003 C22.2 No. 60950 1st. Ed.: 2003
EMC Compliance		
EMC Compliance	Condition	Standard / Criterion
EMI Standard ⁽¹¹⁾	with external filter	EN55022, Class A or B
ESD	Air ±8kV and Contact ±6kC	EN61000-4-2, Criteria B
Radiated Immunity	10 V/m	EN61000-4-3, Criteria A
Fast Transient ⁽¹²⁾	±2kV	EN61000-4-4, Criteria B
Surge ⁽¹²⁾	±1kV	EN61000-4-5, Criteria B
Conducted Immunity	10 Vr.m.s	EN61000-4-6, Criteria A

Notes:

Note11: The standard modules meet EMI Class A or Class B with external components, see filter suggestions below.

Note12: An external input filter capacitor is required if the module has to meet EN61000-4-4, EN61000-4-5. The filter capacitor Recom suggests: Nippon chemi-con KY series, 220µF/100V

EMI Filtering Class A

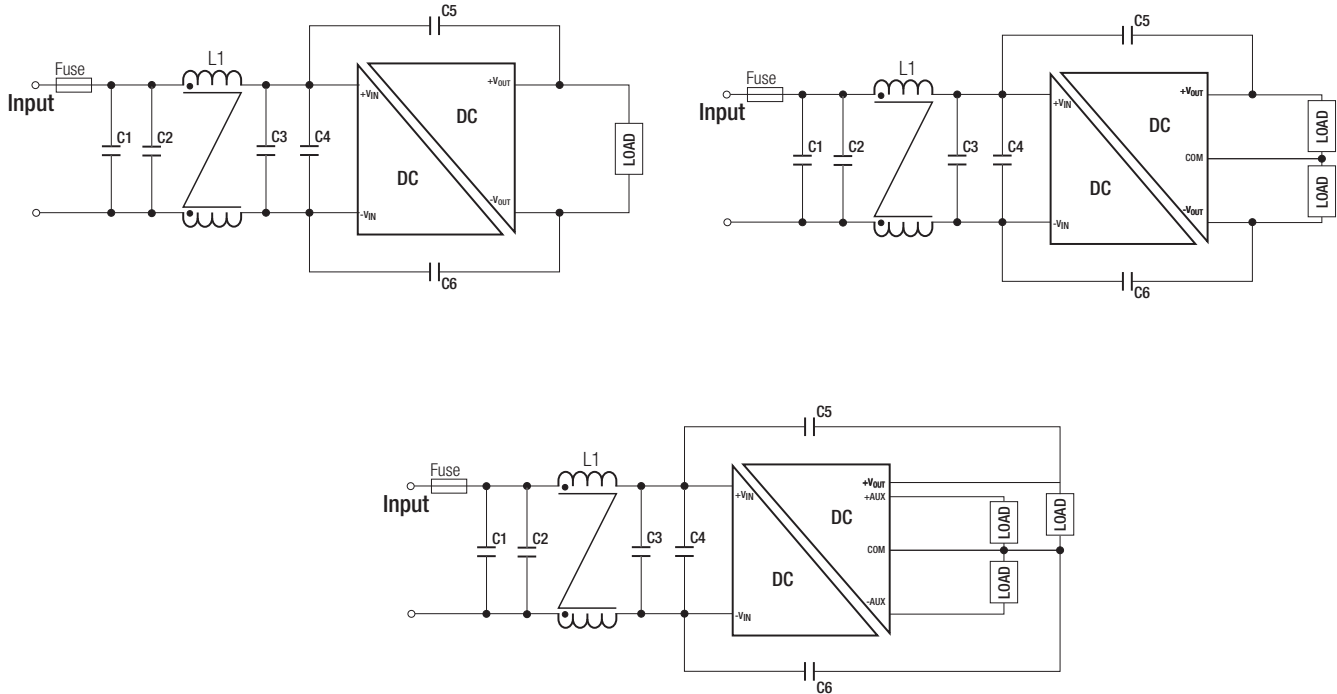


MODEL	C1	C2	C3/C4
RP40-12xxSG RP40-12xxDG RP40-12xxTG	6.8µF/50V 1812 MLCC	N/A	1000pF/2kV 1808 MLCC
RP40-24xxSG RP40-24xxDG RP40-24xxTG	6.8µF/50V 1812 MLCC	N/A	1000pF/2kV 1808 MLCC
RP40-48xxSG RP40-48xxDG RP40-48xxTG	2.2µF/100V 1812 MLCC	N/A	1000pF/2kV 1808 MLCC

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Specifications measured at $T_a = 25^\circ\text{C}$, nominal input voltage, full load otherwise noted

EMI Filtering Class B



MODEL	C1	C2	C3	C4	C5/C6	L1
RP40-12xxSG RP40-12xxDG RP40-12xxTG	4.7 $\mu\text{F}/50\text{V}$ 1812 MLCC	N/A	4.7F/50V 1812 MLCC	N/A	1000pF/2kV 1808 MLCC	CMC: 450 μH ref.: WE 7448227005 ref.: CMC-05
RP40-24xxSG RP40-24xxDG RP40-24xxTG	6.8 $\mu\text{F}/50\text{V}$ 1812 MLCC	N/A	6.8 $\mu\text{F}/50\text{V}$ 1812 MLCC	N/A	1000pF/2kV 1808 MLCC	CMC: 450 μH ref.: WE 7448227005 ref.: CMC-05
RP40-48xxSG RP40-48xxDG RP40-48xxTG	2.2 $\mu\text{F}/100\text{V}$ 1812 MLCC	2.2 $\mu\text{F}/100\text{V}$ 1812 MLCC	6.8 $\mu\text{F}/50\text{V}$ 1812 MLCC	2.2 $\mu\text{F}/100\text{V}$ 1812 MLCC	1000pF/2kV 1808 MLCC	CMC: 830 μH ref.: WE 744822301 ref.: CMC-08

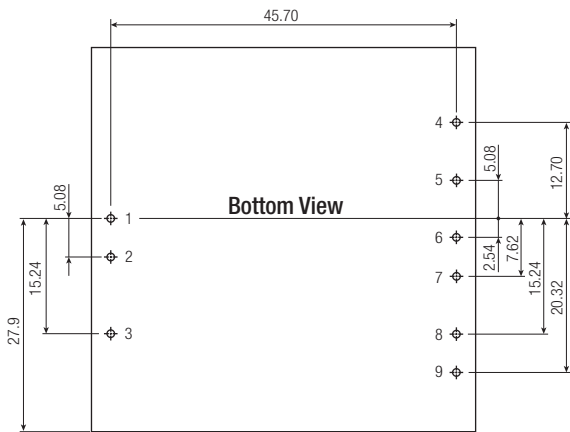
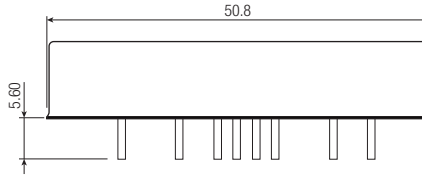
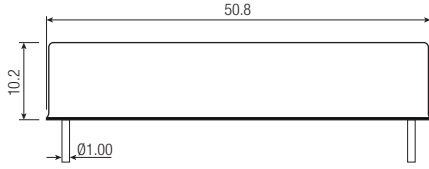
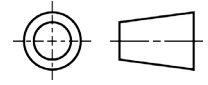
DIMENSIONS and PHYSICAL CHARACTERISTICS

Parameter	Type	Value
Material	Case	Nickel coated copper
	Base	FR4 PCB
	Potting	Epoxy (UL94-V0)
Package Dimensions (LxWxH)	without Heat-sink	50.8 x 50.8 x 10.2mm
	with Heat-sink	56.8 x 50.8 x 17.0mm
Package Weight	without Heat-sink	60g
	with Heat-sink	81.06g

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Specifications measured at Ta = 25°C, nominal input voltage, full load otherwise noted

Dimension Drawing (mm)

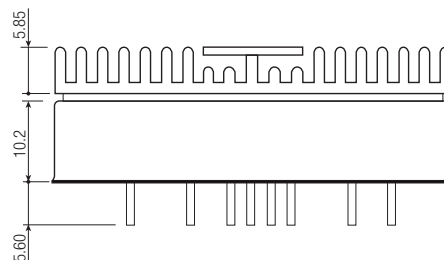
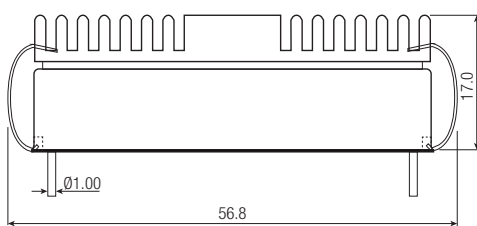
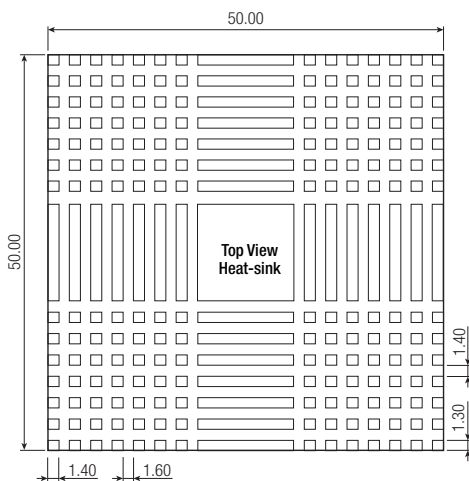


Pin Connections

Pin #	Single	Dual	Triple
1	+Vin	+Vin	+Vin
2	-Vin	-Vin	-Vin
3	CTRL	CTRL	CTRL
4	NC	No Pin	+Aux
5	-Sense ⁽⁷⁾	+Vout	Com
6	+Sense ⁽⁷⁾	Com	-Aux
7	+Vout	Com	+Vout
8	-Vout	-Vout	Com
9	Trim	Trim	NC

NC: No Connection
Pin Pitch Tolerance $\pm 0.25\text{mm}$
Pin dimension tolerance $\pm 0.1\text{mm}$
Tolerance: X.X $\pm 0.5\text{mm}$
X.XX $\pm 0.25\text{mm}$

Dimension Drawing (mm) with Heat-sink



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PACKAGING INFORMATION		
Parameter	Type	Value
Packaging Quantity	without Heat-sink	Tube 4pcs.
	with Heat-sink	Tray 12pcs.
Storage Temperature Range		-55°C to +125°C
Storage Humidity		5% - 95% RH