

Features

Switching Regulator

- Designed for 4-20mA loop operation and energy scavenging applications
- Open frame SMD design
- -40°C to +105°C operating temperature @ full load
- Continuous short circuit protection
- No minimum load required
- 5000m operating altitude



R420-1.8/PL

Low Current Regulator



Description

The R420 has been designed for auxiliary power from 4-20mA loops and other low power budget applications that require a maximum input current <3.6mA. This low profile SMD converter delivers a regulated, short-circuit protected output that can be adjusted between 1.8V and 5V with a single external resistor and delivers three times the output current of equivalent linear regulators to power microprocessors, data-loggers and HART digital modems without affecting the analog 4-20mA signal. The R420 will also find many applications in energy scavenging and indoor solar powered circuits.

Selection Guide

Part Number	Input Voltage Range [VDC]	Adjustable Output Voltage Range [VDC]	Output Current [mA]	Efficiency typ. ⁽¹⁾ [%]	Max. Capacitive Load ⁽²⁾ [µF]
R420-1.8/PL	10-36	1.8-5.0	10	76	1000

Notes:

- Note1: Efficiency is tested at 10-36VDC, full load and +25°C ambient
 Note2: Max cap load is tested at nominal input and full resistive load

Model Numbering

R420-1.8/PL — Packaging ⁽³⁾

Notes:

Note3: add suffix "-R" for tape and reel packaging

Ordering Examples:

- R420-1.8/PL, standard tray packaging (40pcs/Tray)
 R420-1.8/PL-R, tape and reel packaging (400pcs/T&R)

EN60950-1 certified
 EN55032 certified

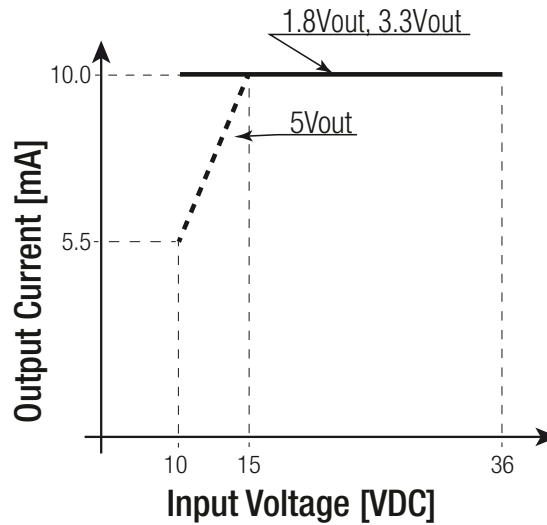
Specifications (measured @ Ta= 25°C, full load, nominal input voltage and after warm-up)

BASIC CHARACTERISTICS					
Parameter	Condition	Min.	Typ.	Max.	
Internal Input Filter				1µF capacitor	
Input Voltage Range	nom. Vin= 24VDC	10VDC	24VDC	36VDC	
Quiescent Current			0.5mA	1mA	
Under Voltage Lockout	DC-DC ON DC-DC OFF		6VDC 5VDC		
Output Voltage Trimming	with 3.75kΩ			5VDC	
Minimum Load		0%			
ON/OFF CTRL	DC-DC ON DC-DC OFF			Open or 2V<Vr<5V Short or 0V<Vr<0.2Vr	
Internal Operating Frequency		45kHz	50kHz	52kHz	
Output Ripple and Noise	20MHz BW, 0-100% load			30mVp-p	

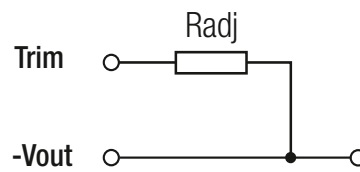
continued on next page

Specifications (measured @ Ta= 25°C, full load, nominal input voltage and after warm-up)

Output Current vs. Input Voltage



Output Voltage Trimming



Radj (kΩ)	Vout
Open	1.8V
8	3.3V
3.75	5.0V

REGULATIONS

Parameter	Condition	Value
Output Voltage Accuracy	100% load	±2.0% typ.
Line Voltage Regulation	low line to high line, full load	0.2% typ. / 0.5% max.
Load Voltage Regulation	10% to 100% load	0.5% typ. / 0.8% max.
Transient Response	with 100µF output capacitor, 100% <-> 50% load	±75mV typ. / ±100mV max.

PROTECTIONS

Parameter	Condition	Value
Short Circuit Protection (SCP)		continuous, automatic recovery

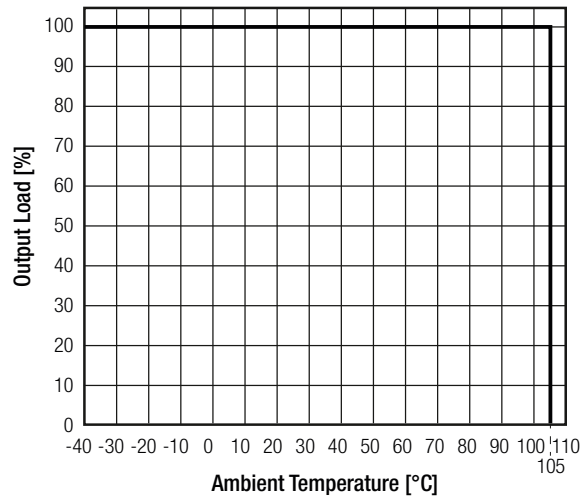
ENVIRONMENTAL

Parameter	Condition	Value	
Operating Temperature Range	without derating (see graph)	-40°C to +105°C	
Operating Altitude		5000m	
Operating Humidity	non-condensing	95% RH max.	
Pollution Degree		PD2	
Vibration		10-55Hz, 2G, 30min along X, Y and Z	
MTBF	MIL-HDBK 217F, G.B.	+25°C	7395 x 10 ³ hours
	MIL-HDBK 217F, G.B.	+71°C	1242 x 10 ³ hours

continued on next page

Specifications (measured @ Ta= 25°C, full load, nominal input voltage and after warm-up)

Derating Graph



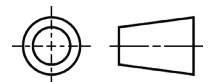
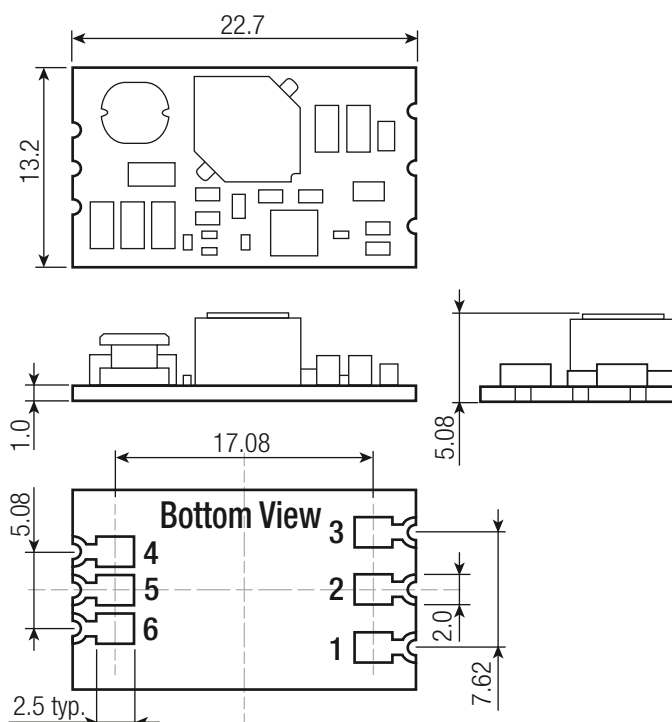
SAFETY AND CERTIFICATIONS

Certificate Type	Report / File Number	Standard
Information Technology Equipment - General Requirments for Safety	L0339m12-A-L	EN60950-1, 2nd Edition, A2:2013
EAC	RU-AT.49.09571	TP TC 004/2011
RoHs2+		RoHS 2011/65/EU + AM2015/863
EMI Compliance	Condition	Standard / Criterion
Electromagnetic compatibility of multimedia equipment - Emission requirements	without external filter	EN55032, Class A and B

DIMENSION and PHYSICAL CHARACTERISTICS

Parameter	Type	Value
Material	PCB	FR4, (UL94 V-0)
Package Dimension (LxWxH)		22.7 x 13.2 x 5.08mm
Package Weight		2.2g typ.

Dimension Drawing (mm)



Pin Connections

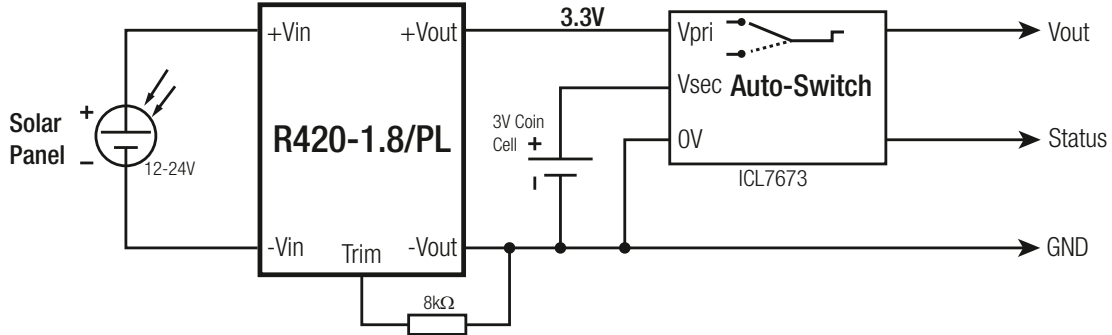
Pin #	Function
1	-Vin
2	+Vin
3	CTRL
4	+Vout
5	-Vout
6	TRIM

Tolerance: xx.x= ±0.5mm
xx.xx= ±0.25mm

Specifications (measured @ Ta= 25°C, full load, nominal input voltage and after warm-up)

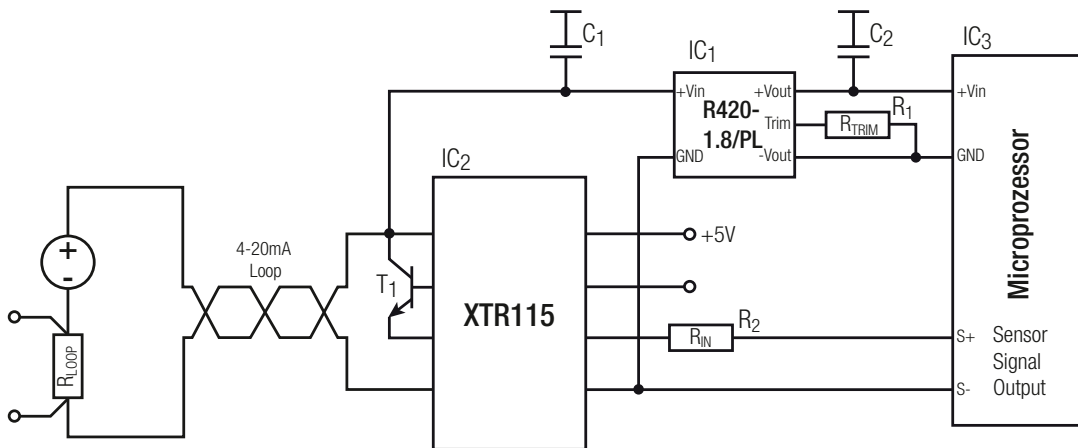
INSTALLATION and APPLICATION

Solar Application

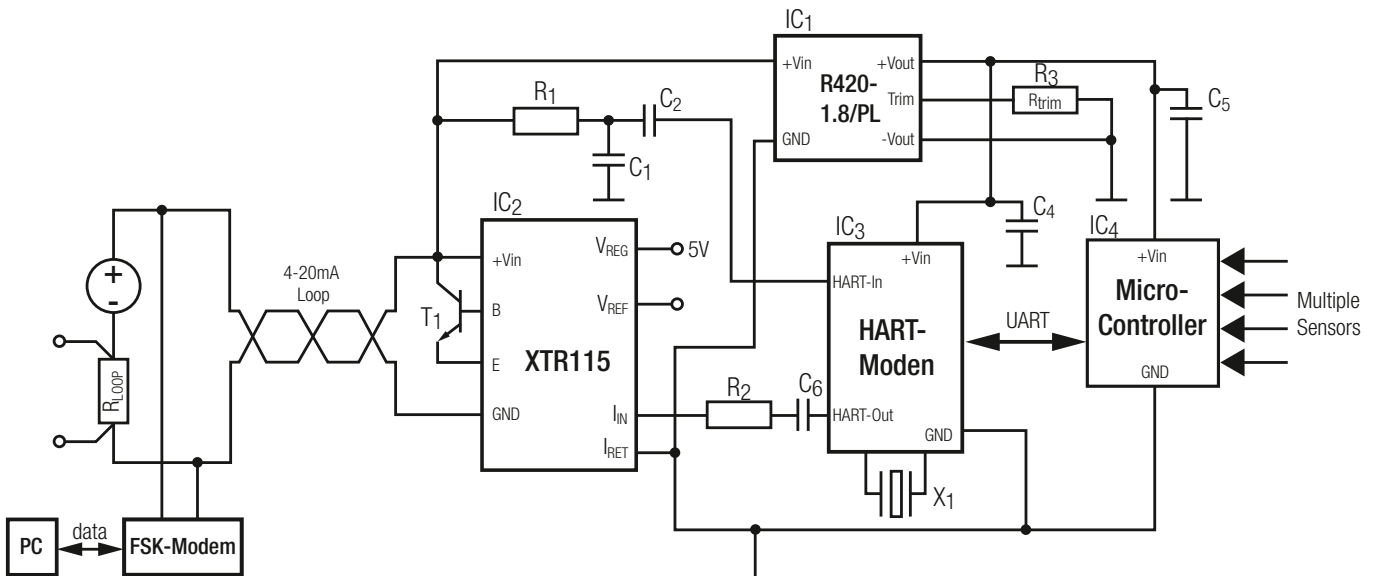


Solar-powered regulated 3.3V supply with automatic switch-over to 3V battery back-up.

Sensor Application



HART-Application



Specifications (measured @ Ta= 25°C, full load, nominal input voltage and after warm-up)

PACKAGING INFORMATION		
Packaging Dimension (LxWxH)	tray (carton)	260.0 x 205.0 x 25.0mm
	tape and reel (carton)	385.0 x 375.0 x 70.0mm
	reel	330.0 x 330.0 x 50.0mm
Packaging Quantity	tray	40pcs
	tape and reel	400pcs
Tape and Reel Width		44mm
Storage Temperature Range		-55°C to +125°C
Storage Humidity	non-condensing	95%, RH max.

The product information and specifications may be subject to changes even without prior written notice. The product has been designed for various applications; its suitability lies in the responsibility of each customer. The products are not authorized for use in safety-critical applications without RECOM's explicit written consent. A safety-critical application is an application where a failure may reasonably be expected to endanger or cause loss of life, inflict bodily harm or damage property. The applicant shall indemnify and hold harmless RECOM, its affiliated companies and its representatives against any damage claims in connection with the unauthorized use of RECOM products in such safety-critical applications.