CUI INC
a bel group

SERIES: V78-1000-SMT | DESCRIPTION: NON-ISOLATED SWITCHING REGULATOR

FEATURES

- 1 A current output
- high efficiency up to 93%
- no heat sink required
- SMT package
- remote on/off control
- low ripple and noise
- short circuit protection, thermal shutdown
- wide temperature (-40°C~+85°C)



RoHS

DISCONTINUED

MODEL

MODEL	input voltage range (Vdc)	output voltage (Vdc)	output current (mA)	output power max (W)	ripple and noise[1] max (mVp-p)	efficiency level[2] typ (%)
V7801-1000-SMT*	4.75 ~ 15	1.5	1,000	1.5	35	76
V7801A-1000-SMT*	4.75 ~ 15	1.8	1,000	1.8	35	79
V7802-1000-SMT*	5 ~ 18	2.5	1,000	2.5	35	83
V7803-1000-SMT	5 ~ 18	3.3	1,000	3.3	35	84
V7805-1000-SMT	7 ~ 18	5.0	1,000	5	35	90
V7806-1000-SMT*	8.5 ~ 18	6.5	1,000	6.5	35	93

Notes: 1. 20 MHz bandwidth
2. Measured at Vin min. and 100% load
*. Discontinued model

PART NUMBER KEY

V78 XX - XXX -SMT- X

- V78 — Base Number
- XX — Output Voltage
- XXX — Output Current
- X — Package Options "blank" = standard, TR = Tape & Reel

INPUT

parameter	conditions/description	min	typ	max	units
operating input voltage	1.5, 1.8 Vdc models 2.5, 3.3 Vdc models 5.0 Vdc model 6.5 Vdc model	4.75 5.0 7.0 8.5	12 12 12 12	15 18 18 18	Vdc Vdc Vdc Vdc
input filter	capacitor		10		µF
remote on/off	on: open or 1.2 < Vc ≤ 6 V off: Vc < 0.6 V				
on/off control current	on: open or 1.2 < Vc ≤ 6 V off: GND or Vc < 0.4 V		100	200	µA
shutdown input current			120	200	µA

OUTPUT

parameter	conditions/description	min	typ	max	units
max capacitive load				1,000	µF
line regulation	measured from low line to high line at 100% load		±0.2	±0.5	%
load regulation	measured from 10% to full load at nominal input		±0.4	±1.0	%
voltage accuracy	measured from low line to high line at 100% load		±2	±3	%
adjustability[1]	1.8 Vdc model 2.5 Vdc model 3.3 Vdc model 5.0 Vdc model	1.5 1.5 1.8 2.5		3.6 3.9 5.5 6.5	Vdc Vdc Vdc Vdc
switching frequency	PWM type		1.4		MHz
temperature coefficient	-40 °C ~ +85 °C ambient			±0.02	%/°C

Notes: 1. Output voltage adjustment must meet Vin-Vo > 2V requirement, see adjustment resistor values on page 4. Not availabe on 1.5 or 6.5 Vdc output models.

PROTECTIONS

parameter	conditions/description	min	typ	max	units
short circuit protection	hiccup, continuous, automatic recovery				
thermal shutdown	internal IC junction		150		°C
current limit			1.8		A

SAFETY AND COMPLIANCE

parameter	conditions/description	min	typ	max	units
thermal resistance				90	°C/W
conducted emissions	CISPR22/EN55022 class A (without external circuit) CISPR22/EN55022 class B (external circuit required, see Figure 1-b)				
rediated emissions	CISPR22/EN55022 class A (external circuit required, see Figure 1-b)				
ESD	IEC/EN 61000-4-2, class B, contact ±6KV/ Air ±8KV				
radiated immunity	IEC/EN 61000-4-3, class A, 10V/m				
EFT/burst	IEC/EN 61000-4-4, class B, ±2KV (external circuit required, see Figure 1-a)				
surge	IEC/EN 61000-4-5, class B, ±2KV (external circuit required, see Figure 1-a)				
conducted immunity	IEC/EN 61000-4-6, class A, 3 Vr.ms				
voltage dips & interruptions	IEC/EN 61000-4-29, class B, 0%-70%				
MTBF	as per MIL-HDBK-217F, 25 °C	1,000,000			hours
RoHS	2011/65/EU				

DISCONTINUED

ENVIRONMENTAL

parameter	conditions/description	min	typ	max	units
case operating temperature				100	°C
opertaing temperature	see derating curve	-40		85	°C
storage temperature		-55		125	°C
storage humidity				95	%
hand soldering	for 10 seconds			260	°C
reflow soldering	refer to IPC/JEDEC J-STD-020D.1			240	°C

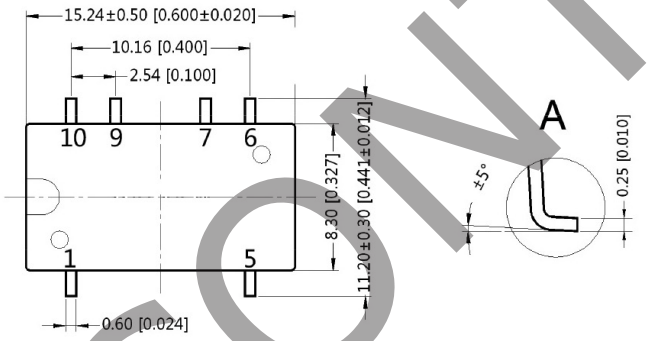
MECHANICAL

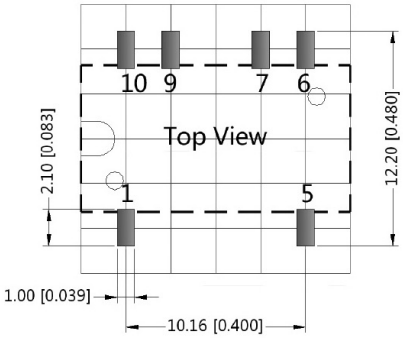
parameter	conditions/description	min	typ	max	units
dimensions	15.24 x 8.30 x 7.25 (0.600 x 0.327 x 0.285)				mm inches
case material	Plastic (UL94-V0)				
weight			2.3		g

MECHANICAL DRAWING

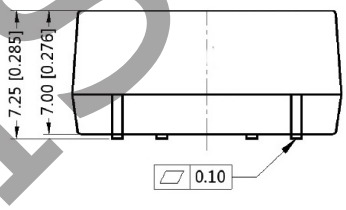
units: mm [in]
pin tolerance: ±0.10 mm [±0.004 in]
general tolerance: ±0.25 mm [±0.010 in]

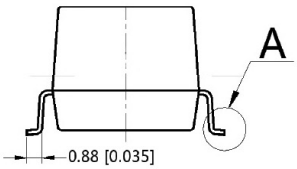
PIN CONNECTIONS	
1	+Vin
7,9	GND
5	+Vout
6	Vadj
10	On/Off





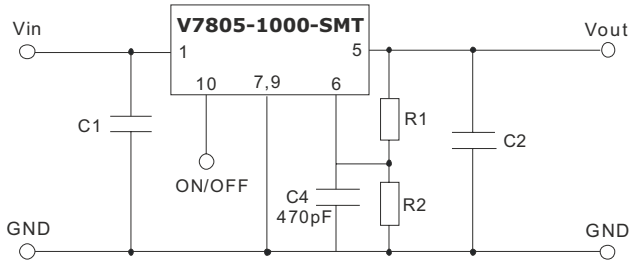
Note: Grid 2.54*2.54mm





DISCONTINUED

TYPICAL APPLICATION CIRCUIT



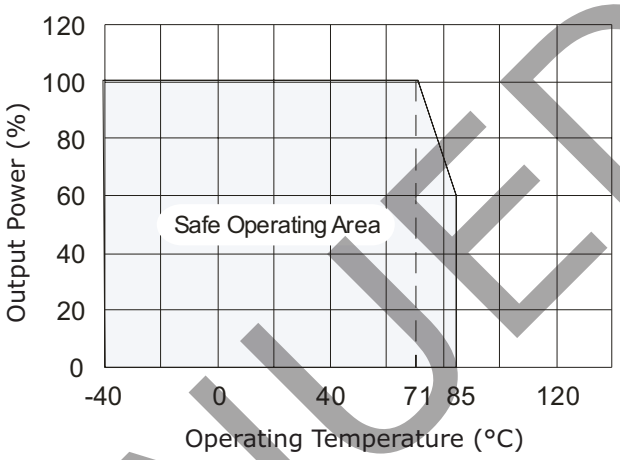
1. C1 and C2 are required for best performance and should be fitted close to the converter pins.

2. See the capacitor values for C1 and C2 in the external capacitor table below. These can be increased if required and tantalum or low ESR electrolytic capacitors will also suffice.

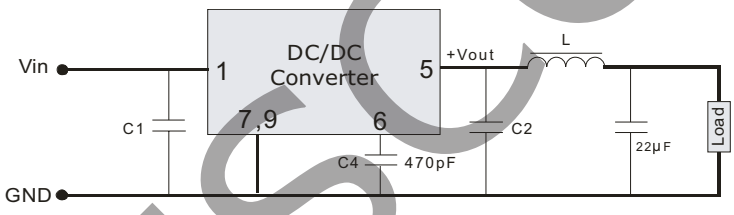
3. No parallel connection or plug and play.

EXTERNAL CAPACITOR TABLE		
MODEL	**C1 (Ceramic)**	**C2 (Ceramic)**
V7801-1000-SMT	10 µF / 25 V	22 µF / 16 V
V7801A-1000-SMT	10 µF / 25 V	22 µF / 16 V
V7802-1000-SMT	10 µF / 25 V	22 µF / 16 V
V7803-1000-SMT	10 µF / 25 V	22 µF / 16 V
V7805-1000-SMT	10 µF / 25 V	22 µF / 16 V
V7806-1000-SMT	10 µF / 25 V	22 µF / 16 V

DERATING CURVE



APPLICATION EXAMPLE



To reduce output ripple, it is recommended to add a LC filter to the output port.

L: Recommended parameter 10 ~ 47µH.

DISCONTINUED

ADJUSTMENT RESISTOR VALUES

MODEL	V7801A-1000		V7802-1000		V7803-1000		V7805-1000	
Vadj (V)	R1 (kΩ)	R2 (kΩ)	R1 (kΩ)	R2 (kΩ)	R1 (kΩ)	R2 (kΩ)	R1 (kΩ)	R2 (kΩ)
1.5	188.1	-	15.4	-	-	-	-	-
1.8	-	-	68.6	-	15.4	-	-	-
2.5	-	81.4	-	-	87	-	9.7	-
3.0	-	32.2	-	88.7	339	-	30.5	-
3.3	-	18.6	-	41.3	-	-	48.8	-
3.6	-	9.5	-	20.1	-	121	75	-
3.9	-	-	-	8.0	-	51.0	115	-
4.5	-	-	-	-	-	16.6	338	-
4.9	-	-	-	-	-	8.0	1,835	-
5.0	-	-	-	-	-	6.5	-	-
5.1	-	-	-	-	-	5.2	-	426
5.5	-	-	-	-	-	1.1	-	58.7
6.0	-	-	-	-	-	-	-	16.9
6.5	-	-	-	-	-	-	-	3.2

The R1, R2 in the above table are used to set the output voltage. If no need to adjust the output voltage, connect a ceramic capacitor to GND with 470pF typical value for increase immunity. Insure the output voltage is in the adjust range or else may cause permanent damage to the device. Fine-tune output voltage must appease Vin-Vo>2V.

EMC RECOMMENDED CIRCUIT

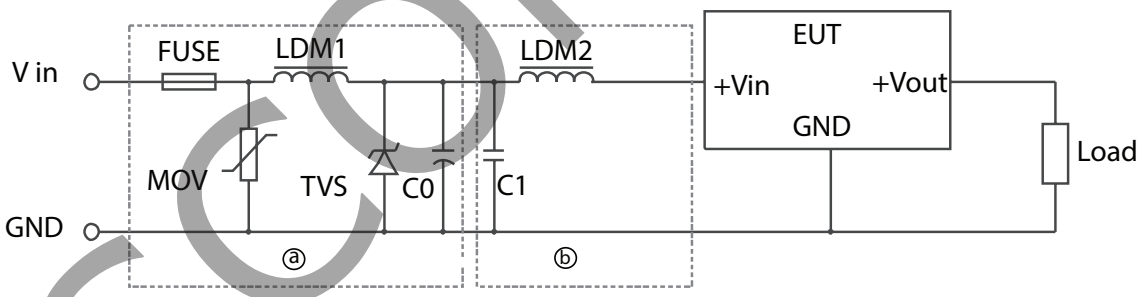


Figure 1

Recommended External Circuit Components	
FUSE	choose according to practical input current
MOV	10D560
LDM1	82μH
TVS	SMCJ36A
C0	120μF/50V
C1	4.7μF/50V
LDM2	33μH

Table 1

DISCONTINUED

REVISION HISTORY

rev.	description	date
1.0	initial release	11/23/2011
1.01	V-Infinity branding removed	09/04/2012
1.02	added TR package option	10/31/2012
1.03	housing width changed, EMC recommendations updated	01/26/2016
1.04	discontinued V7802-1000-SMT model	10/23/2018
1.05	discontinued V7801-1000-SMT, V7801A-1000-SMT models	06/24/2019
1.06	discontinued V7806-1000-SMT model	09/16/2020

The revision history provided is for informational purposes only and is believed to be accurate.

DISCONTINUED

CUI INC
a bel group

Headquarters
20050 SW 112th Ave.
Tualatin, OR 97062
800.275.4899

Fax 503.612.2383
cui.com
techsupport@cui.com

CUI offers a two (2) year limited warranty. Complete warranty information is listed on our website.

CUI reserves the right to make changes to the product at any time without notice. Information provided by CUI is believed to be accurate and reliable. However, no responsibility is assumed by CUI for its use, nor for any infringements of patents or other rights of third parties which may result from its use.

CUI products are not authorized or warranted for use as critical components in equipment that requires an extremely high level of reliability. A critical component is any component of a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or system, or to affect its safety or effectiveness.