

2 Watt DC-DC Converters

With input to output isolation

Input: 18...70 V DC

Output: 5, 12, 15 V DC
 one or two outputs

Description

The ITS series of DC-DC converters have been developed to power electronic circuits, eg. telephone systems components, control modules and small appliances. They are also suitable for applications with variable input voltages or with input transients. The ITS converters feature high efficiency, high reliability, and good dynamic response to load changes and at startup. Efficiency is high and practically constant over the entire input voltage range. The ITS modules are short-circuit-proof.



Features

- Wide input voltage range flexible application range
- Input filter low noise level
- SD-shutdown input controllable with logic signal
- High efficiency (typ. 80%) low heat generation
- Continuous short-circuit-proof safe and simple handling
- 40 pin DIL package size economical use of PCB area
- Height of only 10.5 mm compact circuitry and system design
- No derating full load capability over full ambient temperature range

Benefits

Applications

Power supply for Op Amps, A/D converters, D/A converters
 Power supply for μ Ps, RAMs, CMOS

Type Survey

Output 1		Output 2		Input Voltage Range	Group	Type
$+U_{o1 \text{ nom}}$	$+I_{o1 \text{ nom}}$	$-U_{o2 \text{ nom}}$	$-I_{o2 \text{ nom}}$	U_i		
5 V	300 mA	-	-	18...70 V DC	01	48 ITS 2-05-T
12 V	170 mA	-	-			48 ITS 2-12-T
15 V	140 mA	-	-			48 ITS 2-15-T
+5 V	+250 mA	-5 V	-50 mA		02	48 ITS 2-0505-T
+12 V	+85 mA	-12 V	-85 mA			48 ITS 2-1212-T
+15 V	+70 mA	-15 V	-70 mA			48 ITS 2-1515-T

Other types with different input and output specifications available upon request.

Electrical Characteristics

- $T_A = +25^\circ\text{C}$, unless otherwise specified

Characteristics		Conditions	48 ITS 2-05...			48 ITS 2-12...			48 ITS 2-15...			Unit		
			min	typ	max	min	typ	max	min	typ	max			
Input														
U_i	Input voltage		$T_{A \text{ min}} \dots T_{A \text{ max}}$ $I_o = 0 \dots I_{o \text{ max}}$		18	70		18	70		18	70		V DC
I_{i0}	No load input current		$U_{i \text{ min}} \dots U_{i \text{ max}}$ $T_{A \text{ min}} \dots T_{A \text{ max}}$		2		2		2		2		mA	
I_{iSD}	No load input current in Shutdown condition		$U_{i \text{ min}} \dots U_{i \text{ max}}$ $T_{A \text{ min}} \dots T_{A \text{ max}}$		1.3		1.3		1.3		1.3		mA	
I_{iL}	Input current limitation response		$U_{i \text{ min}} \dots U_{i \text{ max}}$ $T_{A \text{ min}} \dots T_{A \text{ max}}$		1.5		1.5		1.5		1.5		$I_{i \text{ nom}}$	
$I_{i \text{ rfi}}$	RFI input current		$I_o = 0 \dots I_{o \text{ max}}$		30		30		30		30		mA _{pp}	
U_{SD}	Shutdown voltage for converter		operating		open or +8...+10		open or +8...+10		open or +8...+10		open or +8...+10		V DC	
			not operating		-0.3...+2		-0.3...+2		-0.3...+2		-0.3...+2			
Output														
U_o	Output voltage		$U_{i \text{ min}} \dots U_{i \text{ max}}, I_{o \text{ nom}}$ $T_{A \text{ min}} \dots T_{A \text{ max}}$		4.90	5.00	5.10	11.76	12.00	12.24	14.70	15.00	15.30	V DC
I_o	Output current	Group 01	$U_{i \text{ min}} \dots U_{i \text{ max}}$ $T_{A \text{ min}} \dots T_{A \text{ max}}$		300			170			140			mA
		Group 02	$U_{i \text{ min}} \dots U_{i \text{ max}}$ $T_{A \text{ min}} \dots T_{A \text{ max}}$		+250 / -50			+85 / -85			+70 / -70			
u_o	Ripple at output (BW = 20 MHz)		$U_{i \text{ min}} \dots U_{i \text{ max}}, I_{o \text{ max}}$		100			100			100			mV _{pp}
ΔU_{oU}	Static control deviation versus input voltage U_i		$U_{i \text{ min}} \dots U_{i \text{ max}}, I_{o \text{ nom}}$		±10			±24			±30			mV
ΔU_{oI}	Static control deviation versus output current I_o		$U_{i \text{ min}} \dots U_{i \text{ max}}$ $I_o = 0.25 \dots I_{o \text{ nom}}$		±100			±240			±300			mV
α_{uo}	Temperature coefficient $\Delta U_o / \Delta T_C$		$U_{i \text{ nom}}, I_{o \text{ nom}}$		±0.02			±0.02			±0.02			%/K
f_s	Switching frequency		$U_{i \text{ min}} \dots U_{i \text{ max}}, I_{o \text{ nom}}$ $T_{A \text{ min}} \dots T_{A \text{ max}}$		50			50			50			kHz
—	Output overvoltage limitation		—		6.25			15			18.75			V DC
Efficiency														
η	Efficiency		$U_i = 48 \text{ V DC}$ $I_{o \text{ max}}$		77	80		77	80		77	80		%
Isolation														
U_{is}	Isolation test voltage input-output		Inputs short-circuited, outputs short-circuited.		500			500			500			V DC
C_{io}	Coupling capacitor				300			300			300			pF

Maximum Ratings

Characteristics	Conditions	min	max	Unit
T_A	Ambient temperature	-25	+71	$^\circ\text{C}$
T_C	Case temperature		+91	
T_S	Storage temperature		+100	

The case temperature T_C must not exceed $+91^\circ\text{C}$. In applications with limited free air convection, additional measures must be taken (either larger spacing or a fan) to avoid case temperatures higher than $+91^\circ\text{C}$.

Shutdown Description

The shutdown terminal is used to switch the converter output voltage U_o on and off via a control signal. See page 2, "Electrical Characteristics."

When the shutdown terminal is open, or $+8...+10$ V, the output voltage of the converter is switched **on**.
When the shutdown terminal voltage is $-0.3...+2$ V, the output voltage of the converter is switched **off**.

Block Diagrams

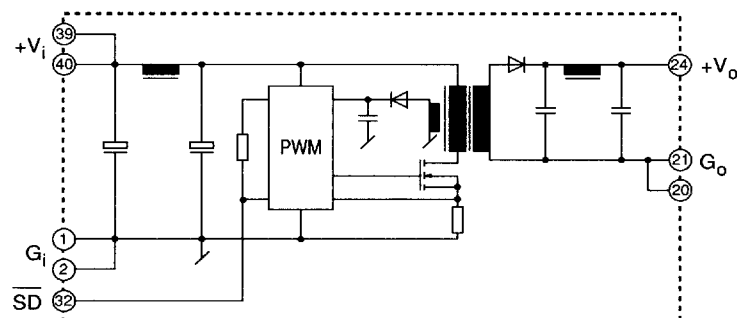


Fig. 1
ITS group 01

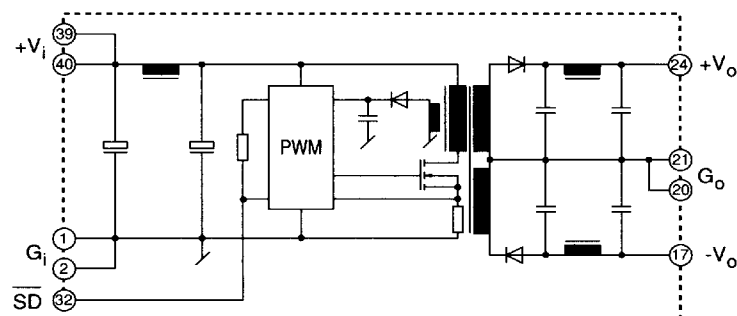


Fig. 2
ITS group 02

Mechanical Data

Dimensions in mm, tolerances ± 0.3 mm, unless otherwise specified.

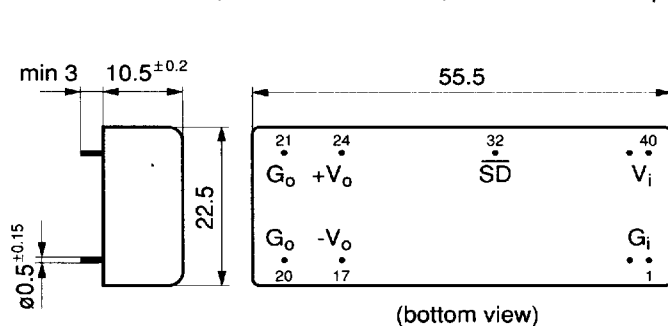


Fig. 3
Case: 48 ITS 2
Weight: 25 g

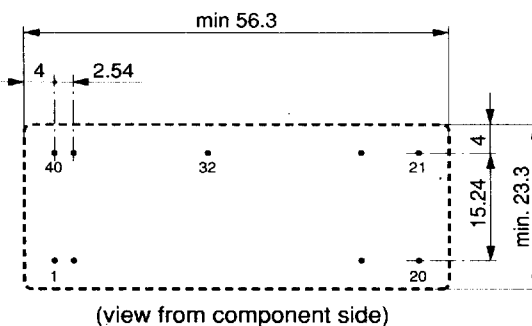


Fig. 4
48 ITS 2 hole location for PCB mounting
Hole diameter: 0.8 ± 0.1 mm
--- Space reserved for regulator



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Type Designation

		Designation:	Type
Nominal input voltage ($U_{i \text{ nom}}$)	48	48	ITS
Family	ITS	ITS	2-1212-T
Nominal output power (watts)	2	2	
Nominal output voltage ($+U_{o1 \text{ nom}}$)	5	5	
	12		
	15		
Nominal output voltage ($-U_{o2 \text{ nom}}$)	5	5	
	12		
	15		
Ambient temperature range ($T_A = -25...+71^\circ\text{C}$)	T	T	

Represented by:

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