YNV12T05 DC-DC Converter Data Sheet
9.6-14 VDC Input; 0.7525-5.5 VDC Programmable @ 5 A

RoHS Compliant

The maXyz Products: Y-Series

Features

- RoHS lead-free solder and lead-solder-exempted products are available
- Delivers up to 5 A (27.5 W)
- Industry-standard footprint and pinout
- Single-in-Line (SIP) Package:
  - 0.90” x 0.40” x 0.213”
  - 22.86 mm x 10.16 mm x 5.41 mm
- Weight: 0.07 oz [2.00 g]
- Synchronous Buck Converter Topology
- Start-up into pre-biased output
- No minimum load required
- Operating ambient temperature: -40 °C to 85 °C
- Remote ON/OFF
- Fixed-frequency operation
- Auto-reset output overcurrent protection
- Auto-reset overtemperature protection
- High reliability, MTBF approx. 71.8 million hours
- All materials meet UL94, V-0 flammability rating
- UL60950 recognition in U.S. & Canada, and DEMKO certification per IEC/EN60950

Applications

- Intermediate Bus Architectures
- Telecommunications
- Data communications
- Distributed Power Architectures
- Servers, workstations

Benefits

- High efficiency – no heat sink required
- Reduces Total Solution Board Area
- Minimizes part numbers in Inventory

Description

The YNV12T05 non-isolated DC-DC converters deliver up to 5 A of output current in an industry-standard through-hole (SIP) package. The YNV12T05 converters operate from a 9.6 VDC–14 VDC input. These converters are ideal choices for Intermediate Bus Architectures where Point-of-Load power delivery is generally a requirement. They provide a resistor-programmable regulated output voltage of 0.7525 to 5.5 VDC.

The YNV12T05 converters provide exceptional thermal performance, even in high temperature environments with minimal airflow. This is accomplished through the use of circuit, packaging and processing techniques to achieve ultra-high efficiency, excellent thermal management, and a very sleek body profile.

The sleek body profile and the preclusion of heat sinks minimize impedance to system airflow, thus enhancing cooling for both upstream and downstream devices. The use of 100% automation for assembly, coupled with advanced power electronics and thermal design, results in a product with extremely high reliability.

Electrical Specifications

Conditions: T_A = 25ºC, Airflow = 300 LFM (1.5 m/s), Vin = 12 VDC, Vout = 0.7525 - 5.5 VDC, unless otherwise specified.

Parameter	Notes	Min	Typ	Max	Units
Absolute Maximum Ratings					
Input Voltage	Continuous	-0.3		15	VDC
Operating Ambient Temperature		-40		85	°C
Storage Temperature		-55		125	°C
Feature Characteristics					
Switching Frequency			480		kHz
Output Voltage Trim Range[1]	By external resistor, See Trim Table 1	0.7525		5.5	VDC
Remote Sense Compensation[1]	Percent of V_{OUT}(NOM)			0.5	VDC
Turn-On Delay Time[2]	Full resistive load				
With Vin (Converter Enabled, then Vin applied)	From Vin = Vin(min) to Vo=0.1* Vo(nom)		6.5		ms
With Enable (Vin = Vin(nom) applied, then enabled)	From enable to Vo = 0.1*Vo(nom)		6.5		ms
Rise time[2] (Full resistive load)	From 0.1*Vo(nom) to 0.9*Vo(nom)		6.5		ms
ON/OFF Control (Negative Logic)[3]					
Converter Off		2.4		Vin	VDC
Converter On		-5		0.8	VDC

Additional Notes:
1. The output voltage should not exceed 5.5V (taking into account both the programming and remote sense compensation).
2. Note that start-up time is the sum of turn-on delay time and rise time.
3. The converter is on if ON/OFF pin is left open.

Electrical Specifications (continued)

Conditions: T_A = 25ºC, Airflow = 300 LFM (1.5 m/s), Vin = 12 VDC, Vout = 0.7525 - 5.5 VDC, unless otherwise specified.

Parameter	Notes	Min	Typ	Max	Units
Input Characteristics					
Operating Input Voltage Range		9.6	12	14	VDC
Input Under Voltage Lockout					
Turn-on Threshold			9.2		VDC
Turn-off Threshold			8.4		VDC
Maximum Input Current	5 ADC Out @ 9.6 VDC In				
	V_{OUT} = 5.0 VDC			2.9	ADC
	V_{OUT} = 3.3 VDC			2.0	ADC
	V_{OUT} = 2.5 VDC			1.6	ADC
	V_{OUT} = 2.0 VDC			1.3	ADC
	V_{OUT} = 1.8 VDC			1.2	ADC
	V_{OUT} = 1.5 VDC			1.0	ADC
	V_{OUT} = 1.2 VDC			0.85	ADC
	V_{OUT} = 1.0 VDC			0.75	ADC
	V_{OUT} = 0.7525 VDC			0.6	ADC
Input Stand-by Current (Converter disabled)			5		mA
Input No Load Current (Converter enabled)	V_{OUT} = 5.0 VDC		85		mA
	V_{OUT} = 3.3 VDC		65		mA
	V_{OUT} = 2.5 VDC		55		mA
	V_{OUT} = 2.0 VDC		45		mA
	V_{OUT} = 1.8 VDC		40		mA
	V_{OUT} = 1.5 VDC		35		mA
	V_{OUT} = 1.2 VDC		30		mA
	V_{OUT} = 1.0 VDC		25		mA
	V_{OUT} = 0.7525 VDC		20		mA
Input Reflected-Ripple Current - i_S	See Fig. D for setup. (BW = 20 MHz)		10		mA_{P-P}

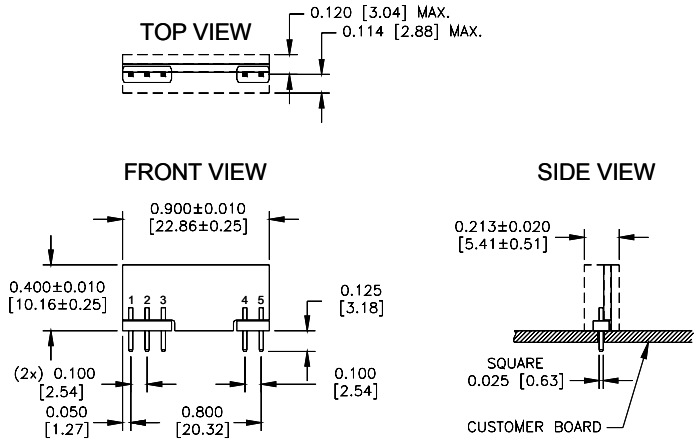
Electrical Specifications (continued)

Conditions: T_A = 25ºC, Airflow = 300 LFM (1.5 m/s), Vin = 12 VDC, Vout = 0.7525 - 5.5 VDC, unless otherwise specified.

Parameter	Notes	Min	Typ	Max	Units
Output Characteristics					
Output Voltage Set Point (no load)		-1.5	Vout	+1.5	%Vout
Output Regulation					
Over Line	Full resistive load @ 3.3 VDC		1		mV
Over Load	From no load to full load		0.25		%Vout
Output Voltage Range (Over all operating input voltage, resistive load and temperature conditions until end of life)		-2.5		+2.5	%Vout
Output Ripple and Noise – 20 MHz bandwidth	Over line, load and temperature (Fig. D)				
Peak-to-Peak	V_{OUT} = 1.0 VDC		10	20	mV_{P-P}
Peak-to-Peak	V_{OUT} = 5.0 VDC		25	40	mV_{P-P}
External Load Capacitance	Plus full load (resistive)				
Min ESR > 1mΩ				1,000	µF
Min ESR > 10 mΩ				2,000	µF
Output Current Range		0		5	ADC
Output Current Limit Inception (I_{OUT})			8.5		ADC
Output Short- Circuit Current , RMS Value	Short = 10 mΩ, continuous		2		Arms
Dynamic Response					
Iout step from 2.5 A to 5 A with di/dt = 5 A/µs	Co = 47 µF tant. + 1 µF ceramic		120[1]		mV
Settling Time (V_{OUT} < 10% peak deviation)			60		µs
Iout step change from 5 A to 2.5 A with di/dt = -5 A/µs	Co = 47 µF tant. + 1 µF ceramic		120[1]		mV
Settling Time (V_{OUT} < 10% peak deviation)			60		µs
Efficiency	Full load (5 A)				
	V_{OUT} = 5.0 VDC		90.0		%
	V_{OUT} = 3.3 VDC		86.0		%
	V_{OUT} = 2.5 VDC		83.0		%
	V_{OUT} = 2.0 VDC		81.0		%
	V_{OUT} = 1.8 VDC		80.0		%
	V_{OUT} = 1.5 VDC		78.0		%
	V_{OUT} = 1.2 VDC		75.5		%
	V_{OUT} = 1.0 VDC		73.0		%
	V_{OUT} = 0.7525 VDC		68.0		%

Additional Notes:
1. See attached waveforms for dynamic response and settling time for different output voltages.

Physical Information



YNV12T05 Pinout

(Through Hole - SIP)

Pad/Pin Connections	
Pad/Pin #	**Function**
1	Vout
2	Trim
3	GND
4	Vin
5	ON / OFF

YNV12T05 Platform Notes

- All dimensions are in inches [mm]
- Connector Material: Copper
- Connector Finish: Tin
- Converter Weight: 0.07 oz [2.00 g]
- Converter Height: 0.41" Max.
- Recommended Through Hole Via/Pad: Min. 0.043" X 0.064" [1.09 x 1.63]

Converter Part Numbering/Ordering Information

Product Series	Input Voltage	Mounting Scheme	Rated Load Current		Environmental
YNV	**12**	**T**	**05**	**–**	
Y-Series	9.6 – 14 VDC	T ⇒ Through Hole (SIP)	5 A (0.7525 to 5.5 VDC)		No Suffix ⇒ RoHS lead solder exemption compliant G ⇒ RoHS compliant for all six substances
The example above describes P/N YNV12T05: 9.6 – 14 VDC input, through-hole (SIP), 5 A at 0.7525 to 5.5 VDC output, standard enable logic, and RoHS lead-solder-exemption compliancy. Please consult factory regarding availability of a specific version.					