YNV05T16 DC-DC Converter Data Sheet
3.0-5.5 VDC Input; 0.7525-3.63 VDC Programmable @ 16 A

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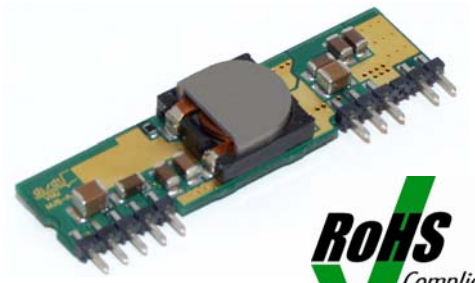
The maXyz Products: Y-Series



RoHS Compliant

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

Features

- RoHS lead-free solder and lead-solder-exempted products are available
- Delivers up to 16 A (53 W)
- Industry-standard footprint and pinout
- Single-in-Line Package (SIP): 2.0” x 0.535” x 0.28” (50.8 x 13.59 x 7.11 mm)
- Weight: 0.26 oz [7.28 g]
- Synchronous buck converter topology
- Start-up into pre-biased output
- No minimum load required
- Programmable output voltage via external resistor
- Operating ambient temperature: -40 °C to 85 °C
- Remote output sense
- Remote ON/OFF (Positive or Negative)
- Fixed-frequency operation
- Auto-reset output overcurrent protection
- Auto-reset overtemperature protection
- High reliability, MTBF = TBD Million Hours
- All materials meet UL94, V-0 flammability rating
- UL 60950 recognition in U.S. & Canada, and DEMKO certification per IEC/EN 60950

Description

The YNV05T16 non-isolated DC-DC converter delivers up to 16 A of output current in an industry-standard through hole SIP package. Operating from a 3.0 – 5.5 V input, this converter is an ideal choice for Intermediate Bus Architectures where point-of-load power delivery is generally a requirement. It provides an extremely-tight regulated programmable output voltage from 0.7525 V to 3.63 V.

The YNV05T16 converter provides exceptional thermal performance, even in high temperature environments with minimal airflow. This is accomplished through the use of circuitry, 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=25 ºC, Airflow=200 LFM (1 m/s), Vin = 5 VDC, Vout = 0.7525 - 3.63 V, unless otherwise specified.

PARAMETER	NOTES	MIN	TYP	MAX	UNITS
ABSOLUTE MAXIMUM RATINGS					
Input Voltage	Continuous	-0.3		6	VDC
Operating Ambient Temperature		-40		85	°C
Storage Temperature		-55		125	°C
FEATURE CHARACTERISTICS					
Switching Frequency			300		kHz
Output Voltage Programming Range[1]	By external resistor, See Trim Table 1	0.7525		3.63	VDC
Remote Sense Compensation[1]				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)		3.5		ms
With Enable (Vin = Vin(nom) applied, then enabled)	From enable to Vo= 0.1*Vo(nom)		3.5		ms
Rise time[2] (Full resistive load)	From 0.1*Vo(nom) to 0.9*Vo (nom)		3.5		ms
ON/OFF Control (Positive Logic)[3]					
Converter Off		-5		0.8	VDC
Converter On		2.4		5.5	VDC
ON/OFF Control (Negative Logic)[3]					
Converter Off		2.4		5.5	VDC
Converter On		-5		0.8	VDC

Note:

1. The output voltage should not exceed 3.63V (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=25 ºC, Airflow=200 LFM (1 m/s), Vin = 5 VDC, Vout = 0.7525 - 3.63 V, unless otherwise specified.

PARAMETER	NOTES	MIN	TYP	MAX	UNITS
INPUT CHARACTERISTICS					
Operating Input Voltage Range	For Vout > 2.5V	4.5	5.0	5.5	VDC
	For Vout ≤ 2.5V	3.0	5.0	5.5	VDC
Input Under Voltage Lockout					
Turn-on Threshold			2.05	2.15	VDC
Turn-off Threshold		1.75	1.9		VDC
Maximum Input Current					
Vin = 4.5V, Iout = 16A	V_{OUT} = 3.3 VDC			12.7	ADC
Vin = 3.0V, Iout = 16A	V_{OUT} = 2.5 VDC			14.7	ADC
Vin = 3.0V, Iout = 16A	V_{OUT} = 2.0 VDC			11.9	ADC
Vin = 3.0V, Iout = 16A	V_{OUT} = 1.8 VDC			10.8	ADC
Vin = 3.0V, Iout = 16A	V_{OUT} = 1.5 VDC			9.5	ADC
Vin = 3.0V, Iout = 16A	V_{OUT} = 1.2 VDC			7.8	ADC
Vin = 3.0V, Iout = 16A	V_{OUT} = 1.0 VDC			6.5	ADC
Vin = 3.0V, Iout = 16A	V_{OUT} = 0.7525 VDC			5.1	ADC
Input Stand-by Current (Converter disabled)	Vin = 5.0 VDC		10		mA
Input No Load Current (Converter enabled)	Vin = 5.5 VDC				
	V_{OUT} = 3.3 VDC		90		mA
	V_{OUT} = 2.5 VDC		85		mA
	V_{OUT} = 2.0 VDC		80		mA
	V_{OUT} = 1.8 VDC		75		mA
	V_{OUT} = 1.5 VDC		70		mA
	V_{OUT} = 1.2 VDC		65		mA
	V_{OUT} = 1.0 VDC		60		mA
	V_{OUT} = 0.7525 VDC		50		mA
Input Reflected-Ripple Current - i_S	See Fig. G for setup. (BW = 20 MHz)		15		mA_{P-P}

Electrical Specifications (continued)

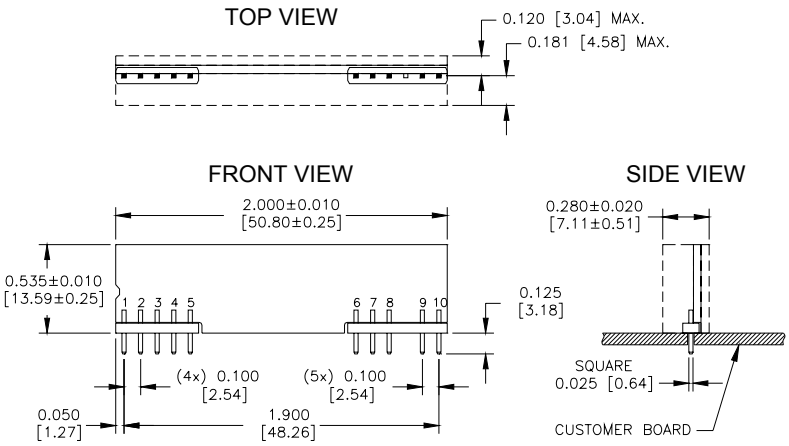
Conditions: T_A=25 ºC, Airflow=200 LFM (1 m/s), Vin =5 VDC, Vout = 0.7525 – 3.63 V, unless otherwise specified.

PARAMETER	NOTES	MIN	TYP	MAX	UNITS
OUTPUT CHARACTERISTICS					
Output Voltage Set Point (no load)		-1.5	Vout	+1.5	%Vout
Output Regulation[1]					
Over Line	Full resistive load		0.2		%Vout
Over Load	From no load to full load		0.5		%Vout
Output Voltage Tolerance (Over all operating input voltage, resistive load and temperature conditions until end of life)		-3		+3	%Vout
Output Ripple and Noise - 20MHz bandwidth (Fig. G)	Over line, load and temperature				
Peak-to-Peak	Vout = 3.3V Full load		30	60	mV_{P-P}
Peak-to-Peak	Vout = 0.7525V Full load		15	30	mV_{P-P}
External Load Capacitance	Plus full load (resistive)				
Min ESR > 1mΩ				1,000	µF
Min ESR > 10 mΩ				5,000	µF
Output Current Range		0		16	A
Output Current Limit Inception (I_{OUT})			20	28	A
Output Short- Circuit Current (Hiccup mode)	Short=10 mΩ, continuous		6		Arms
DYNAMIC RESPONSE					
Load current change from 8A – 16A, di/dt = 5 A/µS	Co = 100 µF ceramic + 1 µF ceramic		160[2]		mV
Settling Time (V_{OUT} < 10% peak deviation)			40		µs
Unloading current change 16A – 8A, di/dt = -5 A/µS	Co = 100 µF ceramic + 1 µF ceramic		160[2]		mV
Settling Time (V_{OUT} < 10% peak deviation)			40		µs
EFFICIENCY	Full load (16A)				
	V_{OUT} = 3.3 VDC		93.5		%
	V_{OUT} = 2.5 VDC		92.0		%
	V_{OUT} = 2.0 VDC		90.5		%
	V_{OUT} = 1.8 VDC		89.5		%
	V_{OUT} = 1.5 VDC		88.0		%
	V_{OUT} = 1.2 VDC		85.5		%
	V_{OUT} = 1.0 VDC		83.5		%
	V_{OUT} = 0.7525 VDC		79.5		%

Note:

1. Trim resistor connected across the GND (pin 5) and TRIM pins of the converter.
2. See waveforms for dynamic response and settling time for different output voltages.

Physical Information



YNV05T16 Pinout
(Through Hole - SIP)

Pad/Pin Connections	
Pad/Pin #	**Function**
1	Vout
2	Vout
3	Vout SENSE
4	Vout
5	GND
6	GND
7	Vin
8	Vin
9	TRIM
10	ON/OFF

YNV05T16 Platform Notes

- All dimensions are in inches [mm]
- Connector Material: Phosphor Bronze/ Brass Alloy 360
- Connector Finish: Tin over Nickel
- Converter Weight: 0.26 oz [7.28 g]
- Converter Height: 0.545" Max.
- Recommended Through Hole Via/Pad: Min. 0.043" X 0.064" [1.09 x 1.63 mm]

Converter Part Numbering/Ordering Information

Product Series	Input Voltage	Mounting Scheme	Rated Load Current		Enable Logic	Environmental
YNV	**05**	**T**	**16**	**–**	**0**	
Y-Series	3.0V – 5.5 V	T ⇒ Through-Hole - SIP	16A (0.7525V to 3.63V)		0 ⇒ Standard (Positive Logic) D ⇒ Opposite of Standard (Negative Logic)	No Suffix ⇒ RoHS lead solder exemption compliant G ⇒ RoHS compliant for all six substances
The example above describes P/N YNV05T16-0: 3.0V – 5.5V input, thru-hole (SIP), 16A at 0.7525V to 3.63V output, standard enable logic, and RoHS lead solder exemption compliant. Please consult factory regarding availability of a specific version.						