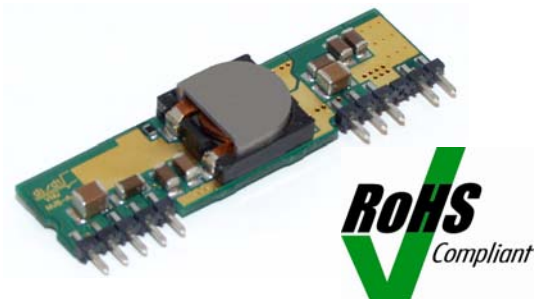


The **maxVZ** Products: Y-Series



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 10 A (36.3 W)
- No derating up to 85 °C
- 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 YNV05T10 non-isolated DC-DC converter delivers up to 10 A of output current in an industry-standard through-hole Single In-Line Package (SIP). 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. The YNV05T10 provides an extremely tight regulated programmable output voltage from 0.7525 V to 3.63 V.

YNV05T10 converters provide exceptional thermal performance, even in high temperature environments with minimal airflow. No derating is needed up to 85 °C under natural convection conditions. This is accomplished through the use of circuitry, packaging, and processing techniques to achieve ultra-high efficiency and excellent thermal management, along with 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: $T_A=25^{\circ}\text{C}$, Airflow=200 LFM (1 m/s), $V_{in}=5\text{ VDC}$, $V_{out} = 0.7525 - 3.63\text{V}$, unless otherwise specified.

PARAMETER	NOTES	MIN	TYP	MAX	UNITS
ABSOLUTE MAXIMUM RATINGS					
Input Voltage	Continuous	-0.3		6	VDC
Operating Ambient Temperature		-40		85	$^{\circ}\text{C}$
Storage Temperature		-55		125	$^{\circ}\text{C}$
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 $V_{in} =$ (Converter Enabled, then V_{in} applied)	From $V_{in} = V_{in}(\text{min})$ to $V_o=0.1* V_o(\text{nom})$		3.5		ms
With Enable ($V_{in} = V_{in}(\text{nom})$ applied, then enabled)	From enable to $V_o= 0.1*V_o(\text{nom})$		3.5		ms
Rise time ² (Full resistive load)	From $0.1*V_o(\text{nom})$ to $0.9*V_o(\text{nom})$		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: $T_A=25^{\circ}\text{C}$, Airflow=200 LFM (1 m/s), $V_{in}=5\text{ VDC}$, $V_{out} = 0.7525 - 3.63\text{V}$, unless otherwise specified.

PARAMETER	NOTES	MIN	TYP	MAX	UNITS
INPUT CHARACTERISTICS					
Operating Input Voltage Range	For $V_{out} > 2.5\text{V}$	4.5	5.0	5.5	VDC
	For $V_{out} \leq 2.5\text{V}$	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					
$V_{in} = 4.5\text{V}$, $I_{out} = 10\text{A}$	$V_{OUT} = 3.3\text{ VDC}$			7.8	ADC
$V_{in} = 3.0\text{V}$, $I_{out} = 10\text{A}$	$V_{OUT} = 2.5\text{ VDC}$			9	ADC
$V_{in} = 3.0\text{V}$, $I_{out} = 10\text{A}$	$V_{OUT} = 2.0\text{ VDC}$			7.3	ADC
$V_{in} = 3.0\text{V}$, $I_{out} = 10\text{A}$	$V_{OUT} = 1.8\text{ VDC}$			6.7	ADC
$V_{in} = 3.0\text{V}$, $I_{out} = 10\text{A}$	$V_{OUT} = 1.5\text{ VDC}$			5.7	ADC
$V_{in} = 3.0\text{V}$, $I_{out} = 10\text{A}$	$V_{OUT} = 1.2\text{ VDC}$			4.7	ADC
$V_{in} = 3.0\text{V}$, $I_{out} = 10\text{A}$	$V_{OUT} = 1.0\text{ VDC}$			4.0	ADC
$V_{in} = 3.0\text{V}$, $I_{out} = 10\text{A}$	$V_{OUT} = 0.7525\text{ VDC}$			3.3	ADC
Input Stand-by Current (Converter disabled)	$V_{in} = 5.0\text{ VDC}$		10		mA
Input No Load Current (Converter enabled)	$V_{in} = 5.5\text{ VDC}$				
	$V_{OUT} = 3.3\text{ VDC}$		90		mA
	$V_{OUT} = 2.5\text{ VDC}$		85		mA
	$V_{OUT} = 2.0\text{ VDC}$		80		mA
	$V_{OUT} = 1.8\text{ VDC}$		75		mA
	$V_{OUT} = 1.5\text{ VDC}$		70		mA
	$V_{OUT} = 1.2\text{ VDC}$		65		mA
	$V_{OUT} = 1.0\text{ VDC}$		60		mA
Input Reflected-Ripple Current - \hat{I}_s	$V_{OUT} = 1.0\text{ VDC}$		50		mA
	$V_{OUT} = 0.7525\text{ VDC}$		15		mA _{p-p}
	See Fig. G for setup. (BW=20MHz)				

Electrical Specifications (continued)

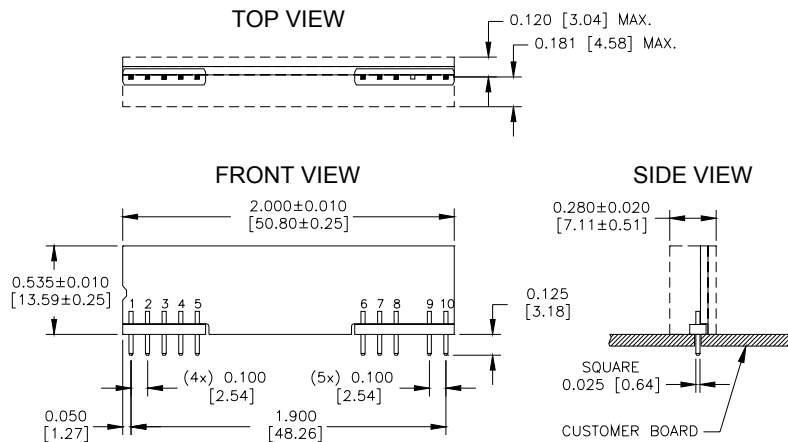
Conditions: $T_A=25^{\circ}\text{C}$, Airflow=200 LFM (1 m/s), $V_{in}=5\text{ VDC}$, $V_{out} = 0.7525 - 3.63\text{V}$, unless otherwise specified.

PARAMETER	NOTES	MIN	TYP	MAX	UNITS
OUTPUT CHARACTERISTICS					
Output Voltage Set Point (no load)		-1.5	V_{out}	+1.5	% V_{out}
Output Regulation ¹					
Over Line	$V_{in} = 3.0\text{V} - 5.5\text{V}$, Full resistive load		0.2		% V_{out}
Over Load	From no load to full load		0.4		% V_{out}
Output Voltage Tolerance (Over all operating input voltage, resistive load and temperature conditions until end of life)		-3		+3	% V_{out}
Output Ripple and Noise - 20MHz bandwidth (Fig. G)	Over line, load and temperature				
Peak-to-Peak	$V_{out} = 3.3\text{V}$ Full load		40	70	mV _{P-P}
Peak-to-Peak	$V_{out} = 0.7525\text{V}$ Full load		20	40	mV _{P-P}
External Load Capacitance	Plus full load (resistive)				
Min ESR > 1m Ω				1,000	μF
Min ESR > 10 m Ω				5,000	μF
Output Current Range		0		10	A
Output Current Limit Inception (I_{OUT})			15	18.5	A
Output Short- Circuit Current (Hiccup mode)	Short=10 m Ω , continuous		3		Arms
DYNAMIC RESPONSE					
Load current change from 5A – 10A, di/dt = 5 A/ μS	$C_o = 100\ \mu\text{F}$ ceramic + 1 μF ceramic		120 ²		mV
Settling Time ($V_{OUT} < 10\%$ peak deviation)			40		μs
Unloading current change 10A – 5A, di/dt =-5 A/ μS	$C_o = 100\ \mu\text{F}$ ceramic + 1 μF ceramic		125 ²		mV
Settling Time ($V_{OUT} < 10\%$ peak deviation)			40		μs
EFFICIENCY					
	Full load (5A)				
	$V_{OUT} = 3.3\text{ VDC}$		95.5		%
	$V_{OUT} = 2.5\text{ VDC}$		93.5		%
	$V_{OUT} = 2.0\text{ VDC}$		92.0		%
	$V_{OUT} = 1.8\text{ VDC}$		91.5		%
	$V_{OUT} = 1.5\text{ VDC}$		90.0		%
	$V_{OUT} = 1.2\text{ VDC}$		88.5		%
	$V_{OUT} = 1.0\text{ VDC}$		86.5		%
	$V_{OUT} = 0.7525\text{ VDC}$		83.0		%

Note:

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

Physical Information



**YNV05T10 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

YNV05T10 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]

Product Series	Input Voltage	Mounting Scheme	Rated Load Current		Enable Logic	Environmental
YNV	05	T	10	-	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 YNV05T10-0: 3.0V – 5.5 V input, thru-hole (SIP), 10 A at 0.7525 V to 3.63 V output, standard enable logic, and RoHS lead solder exemption compliant. Please consult factory regarding availability of a specific version.						

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