NON-ISOLATED DC/DC CONVERTERS
3.3V Input / 5V Output / 4A

bel POWER PRODUCTS

BP02V7PC-04C

V7PC-04C Series

- Nonisolated
- Industry standard pinout
- Fixed frequency
- High efficiency means less power dissipation
- Optimized for cost
- Remote on/off
- Undervoltage lockout
- Over current and short circuit protection
- Industrial temperature range



Description

The Bel V7PC-04C series modules are non-isolated, boost DC/DC power converters that operate from a nominal 3.3V source. These converters provide an output voltage of 5V and are packaged in an industry standard single-in-line footprint with 4A maximum output. Standard features include remote on/off, over current and short circuit protection. A version of this converter is also available without remote on/off. These products may be used almost anywhere 5V is required and a 3.3V source is available. Typical applications include file servers, routers, line cards and other computing and communications equipment.

Applications

- Telecommunications
- Networking
- Computers and peripherals

Part Number Selection

Output Voltage	Input Voltage	Max. Output Current	Max. Output Power	Typical Efficiency	Part Number with Remote On/Off	Part Number without Remote On/Off
5.0V	3.3V	4A	20W	90%	V7PC-04C500	V7PC-04C50N

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Absolute Maximum Ratings

Parameter	Symbol	Min	Typical	Max	Unit
Continuous Input Voltage	Vin	-0.3		5	V
Output Enable Terminal Voltage	Vouten	-0.3		5	V
Ambient Temperature	Tamb	-40		+85	°C
Storage Temperature	Tstor	-55		+100	°C

Note: Use beyond the maximum ratings may cause a reliability degradation of the DC/DC converter or may permanently damage the device.

Input Specifications

Parameter	Symbol	Min	Typical	Max	Units
Operating Input Voltage	Vin	3		4	V
Input Current	Iin			8	A
No Load Input Current				400	mA
Remote Off Input Current			90	150	mA
Input Reflected Ripple Current[1]			25	50	mA_{rms}
Input Reflected Ripple Current (P-P)[1]			120	200	mApk
I^2t Inrush Current Transient			0.01	0.02	A^2s
Turn On Voltage Threshold			2.8	2.9	V
Turn Off Voltage Threshold		1.5	2	2.7	V

Note: Input capacitance 270µF/10V, ESR = 0.03 Ω max at 100kHz @ 25° C.
1. With simulated source impedance of 500nH, 5Hz to 20MHz.

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Output Specifications

Parameter	Symbol	Min	Typical	Max	Units
Output Voltage Set Point[1]	Vout	4.85	5	5.15	V
Load Regulation			10	25	mV
Line Regulation			5	15	mV
Regulation Over Temperature 0° - 70° C			15	45	mV
Total Output Voltage Regulation		4.75		5.25	mV
Output Ripple and Noise[2]			40	100	mVp-p
Output Ripple and Noise[2]			8	25	mVrms
Output Current Range	Iout	0		4	A
Output DC Current Limit	Ioutlim	4.8	6	7	A
Short Circuit Surge	Ioutsurge		0.12	0.2	A^2s
Turn on Time	Ton		50	150	ms
Overshoot at Turn On			0	3	%
Output Capacitance	Cout	0		1600	µF
Transient Response[3]					
ΔV 50% to 100% of Max Load			125	250	mV
Settling Time	Ts		200	500	µs
ΔV 100% to 50% of Max Load			125	250	mV
Settling Time	Ts		200	500	µs

Note: All specifications are typical at nominal input, full load at 25° C unless otherwise stated.
1. Vin = 3.3V, Iout = full load, Ta = 25° C.
2. 0 - 20MHz BW, 0.1µF ceramic cap on output.
3. di/dt = 0.5A/uS, Vin = 3.3VDC, Ta = 25° C, and with a 470µF aluminum cap on output.

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General Specifications

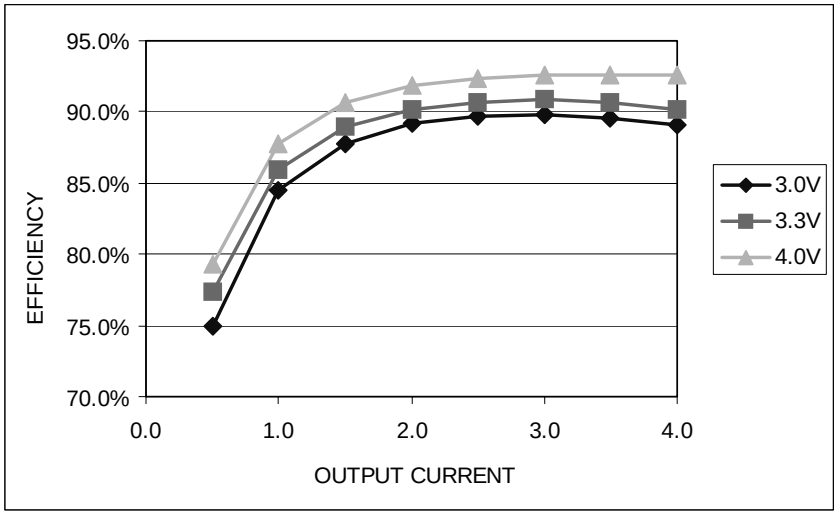
Parameter	Symbol	Min	Typical	Max	Units
Efficiency[1]	η	87	90		%
Switching Frequency	Fsw	180	200	220	kHz
Weight			9.3		g

1. Vin=3.3V, full load and Ta=25° C.

Control Specifications

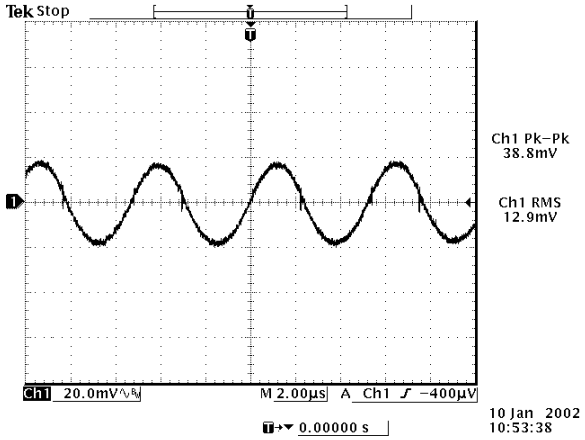
Parameter	Symbol	Min	Typical	Max	Units
Remote On/Off	Vouten				V
Signal Low (Unit Off)		-0.3		0.3	V
Signal High (Unit On)		2.8		5	V

Efficiency Data



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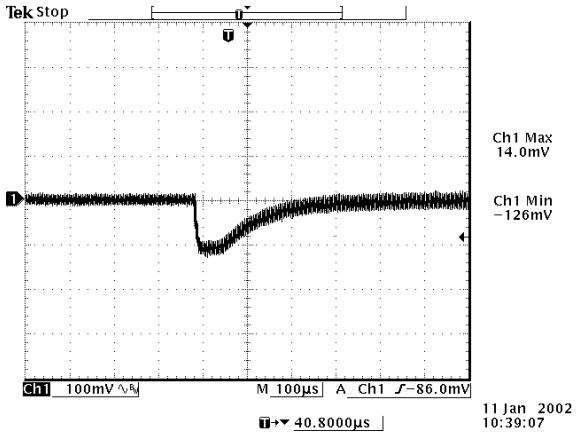
Ripple and Noise



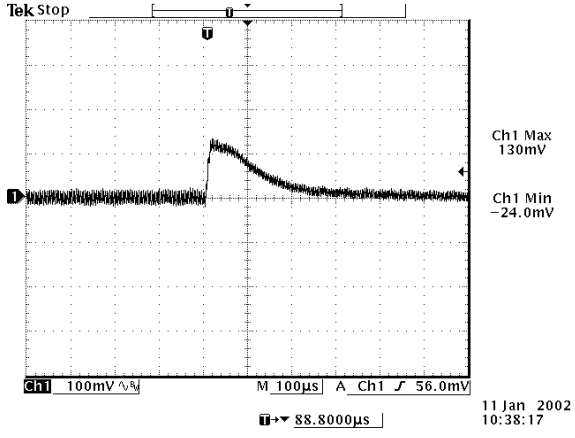
Ripple and noise at full load and 3.3Vdc input and Ta=25° C

Transient Response

Transient response: di/dt = 0.5A/µS, external load capacitance Co = 470µF (electrolytic)



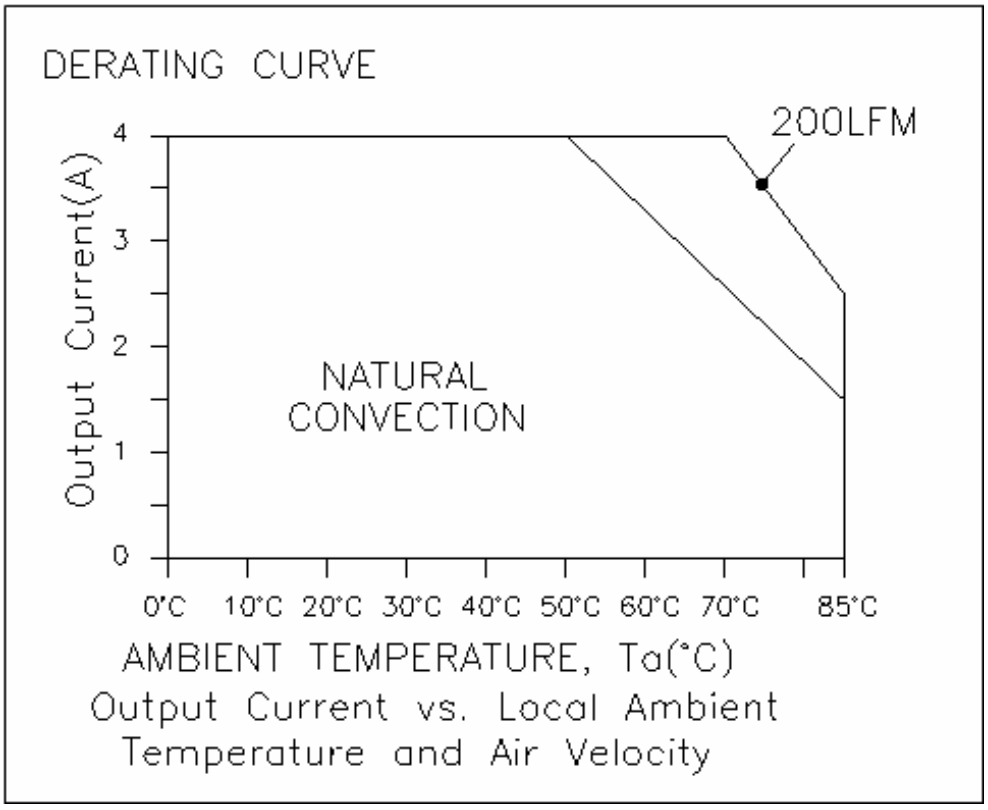
50% to 100% load transients at 3.3V input and Ta=25° C



100% to 50% load transients at 3.3V input and Ta=25° C

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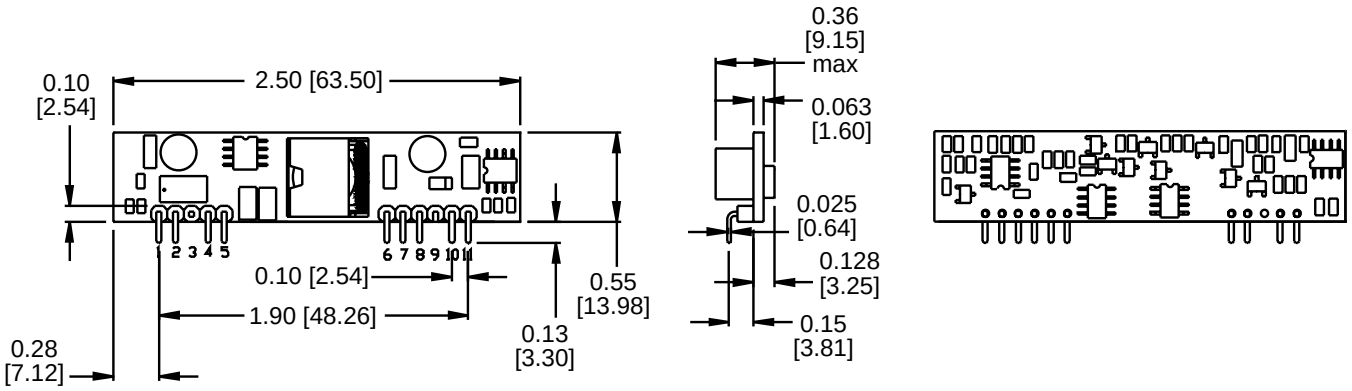
Thermal Considerations



Output Current vs. Local Ambient Temperature and Air Velocity

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Mechanical



Dimensions are in inches [millimeters].
Standard dimension tolerance is ±0.005 [0.13] unless otherwise noted.

Pin	Function
1	+Vo
2	+Vo
3	No Pin
4	-Vo
5	-Vo
6	-Vin
7	-Vin
8	+Vin
9*	No Pin
10	+Vin
11	+Vin

Pin	Function
1	+Vo
2	+Vo
3	No Pin
4	-Vo
5	-Vo
6	-Vin
7	-Vin
8	+Vin
9*	No Pin
10	+Vin
11	+Vin

*Pin 9 used for remote on/off.

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