SERIES: NQB | DESCRIPTION: BUS CONVERTER

FEATURES
- industry standard quarter-brick
- 58.4 x 36.8 x 12.2 mm (2.3 x 1.45 x 0.48 in.)
- high efficiency, 96% typ. at 12 V out, 100% load
- 1500 Vdc input to output isolation
- meets safety requirements according to IEC/EN/UL60950

GENERAL CHARACTERISTICS
- load sharing characteristics
- input under/over voltage protection
- over temperature protection
- output over voltage protection
- output short circuit protection
- on/off control
- input 36~60 V, output 60 A / 720 W

novum advanced power

solus A CUI TOPOLOGY

RoHS

MODEL

MODEL	output voltage nominal (Vdc)	output current max (A)	output wattage max (W)	efficiency typ (%)
NQB2060	12	60	720[7]	95.7

PART NUMBER KEY

NQB X 060 - X XX XX X - XXX

DOSA Pinout:
1 = First Generation DOSA (2 output pins)
2 = Second Generation DOSA (4 output pins)

Input Range:
W = Wide Range
M = Mid Range (36~60 Vin)
N = Narrow Range

Output Voltage:
12 = 12 Vout
09 = 9.6 Vout

Pin Length:
A = 0.11"
B = 0.15"
C = 0.25"

Logic:
N = Neg
P = Pos

Thermal Management:
Blank = None
B = Base Plate
L = Heat sink w/Longitudinal fins
H = Heat sink w/Horizontal fins

Custom Designation:
Blank = No Custom
CXX = Customer Specific

notes: 1: T_{amb}= -40 ~ +85°C, V_i= 36 ~ 60 V, Airflow= 600 LFM (3.0 m/s) unless otherwise specified under conditions/description.
Typical values given at: T_{amb}= +25°C, V_i= 48 V, max. I_o, unless otherwise specified under conditions/description.
2: Stress in excess of absolute maximum ratings may cause permanent damage. Absolute maximum ratings, sometimes referred to as no destruction limits, are normally tested with one parameter at a time exceeding the limits of output data or electrical characteristics. If exposed to stress above these limits, functions and performance may degrade in an unspecified manner.
3: Measured at 20 MHz bandwidth with a 10 µF tantalum cap and a 0.1 µF ceramic cap on the output.

ABSOLUTE MAXIMUM RATINGS[2]

parameter	conditions/description	min	nom	max	units
operating temperature (T_{amb})		-40		85	°C
storage temperature (T_S)		-55		125	°C
input voltage (V_I)		-0.3		60	Vdc
isolation voltage	input to output			1500	Vdc
input voltage transient (V_{tr})	t_p 100 ms			75	Vdc
on/off control pin voltage ($V_{on/off}$)		-0.3		15	Vdc

INPUT[1]

parameter	conditions/description	min	nom	max	units
voltage (V_I)		36		60	Vdc
over voltage protection (OVP)	module shuts down		63		Vdc
turn-off voltage (V_{Ioff})	decreasing input voltage	32	33	34	Vdc
turn-on voltage (V_{Ion})	increasing input voltage	34	35	36	Vdc
switching frequency	0 ~ 100% of max. I_O		205		kHz
stand-by power (P_{off})	V_I= 48 V (turned off with On/Off)		0.2		W
power dissipation (P_d)	max. I_O		32	40	W
idling power (P_{li})	I_O= 0 A, V_I= 48 V		7.0		W
efficiency (η)	50% of max. I_O, V_I= 48 V max. I_O, V_I= 48 V		96.3 95.7		% %

OUTPUT[1]

parameter	conditions/description	min	nom	max	units
voltage initial setting and accuracy (V_{Oi})	T_{amb}= 25°C, V_I= 48 V, 100% of max. I_O		12.00		Vdc
voltage tolerance band (V_O)	0 ~ 100% of max. I_O, VI= 38 ~ 60 V		TBD		Vdc
idling voltage (V_O)	I_O= 0 A		12.6		Vdc
line regulation (V_O)	V_I= 38 ~ 60 V, max I_O		TBD		Vdc
load regulation (V_O)	V_I= 48 V, 0 ~ 100% of max. I_O		TBD		Vdc
load transient voltage deviation (V_{tr})	V_I= 48 V, Load step 25-75-25% of max. I_O, di/dt= 5 A/µs		TBD		Vdc
load transient recovery time (t_{tr})	V_I= 48 V, Load step 25-75-25% of max. I_O, di/dt= 5 A/µs		TBD		ms
ramp-up time (t_r)	from 10 ~ 90% of V_{Oi}, 0 ~ 100% of max. I_O		1.0		ms
start-up time (t_s)	from V_I connection ~ 90% of V_{Oi}, 0 ~ 100% of max. I_O		3.0		ms
V_I shut-down fall time (t_f)	from V_I off to 10% of V_O, max. I_O		0.05		ms
t_{on} start-up time ($t_{on/off}$)	max. I_O		2.0		ms
t_{on} shutdown fall time ($t_{on/off}$)	from t_{off} to 10% of V_O, max. I_O		0.05		ms
ripple & noise[3] (V_{Oac})	max. I_O		TBD		mvP-P
over voltage protection (OVP)			13.5		Vdc

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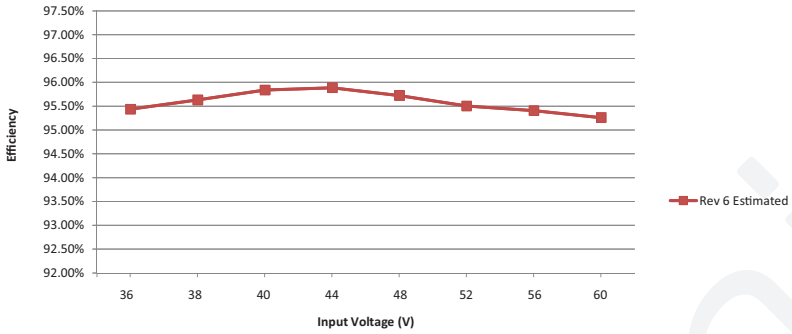
SAFETY AND GENERAL

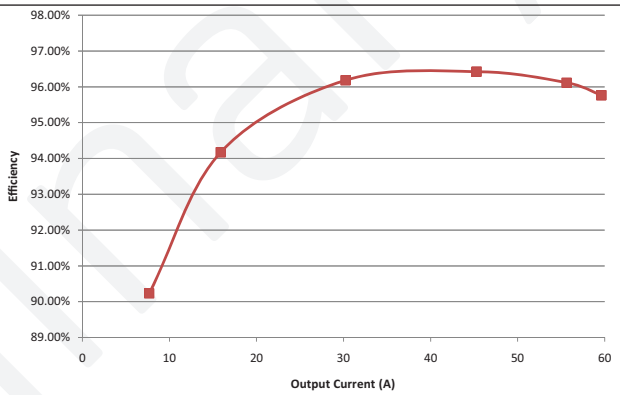
parameter	conditions/description	min	nom	max	units
over temp. protection (OVT)	shutdown hysteresis		135 20		°C °C
RoHS compliant	yes				
current limit threshold (I_{lim})	T_{amb} < max. T_{amb}		63		A
US Patents	7812577 and 7777458				

EFFICIENCY vs INPUT VOLTAGE



Iout = 60A, Ta = 25°C

EFFICIENCY



Vin = 48V, Ta = 25°C

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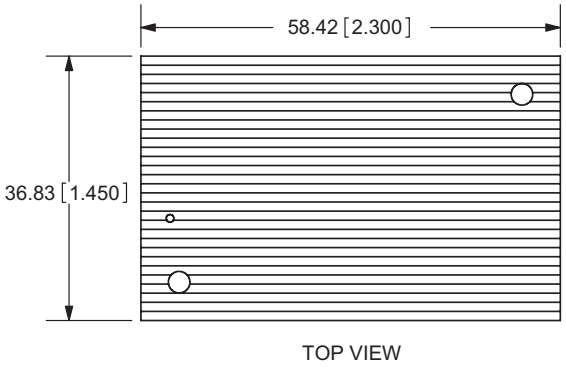
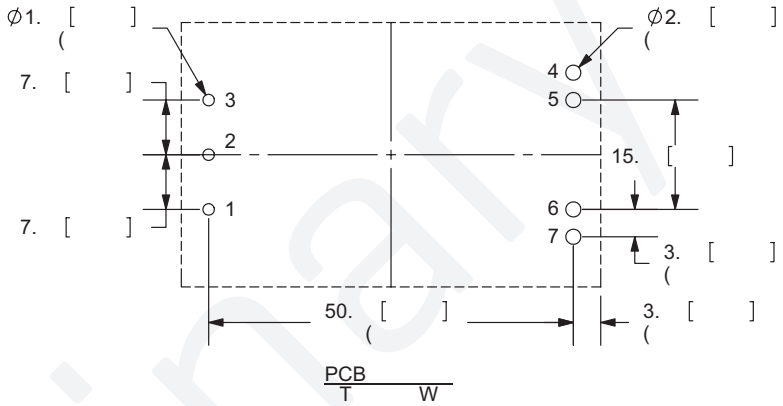
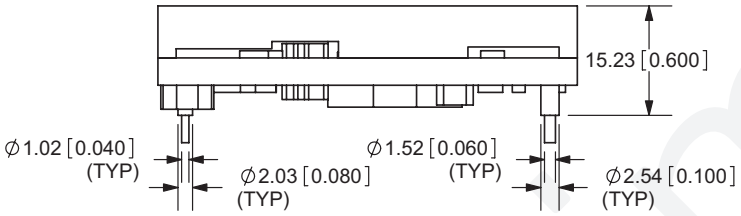
MECHANICAL DRAWING

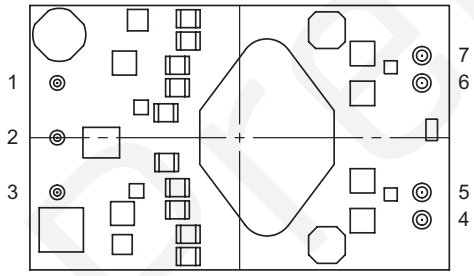


TOP VIEW



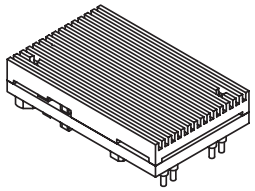


SIDE VIEW



BOTTOM VIEW

PINOUT	
1	-
2	on/off
3	+
4	-Vout
5	+Vout
6	-Vout
7	+Vout



SCALE: 1:2

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±
SPECI D

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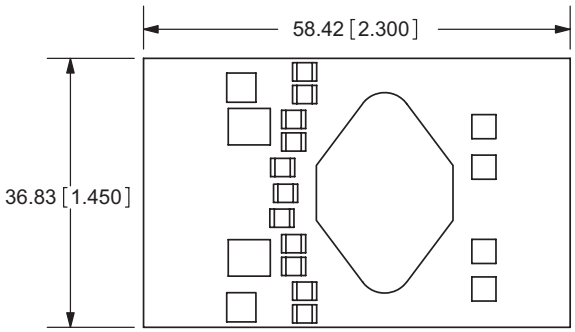
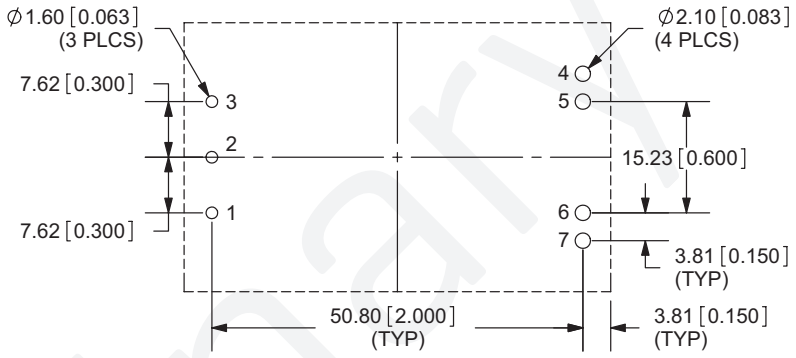
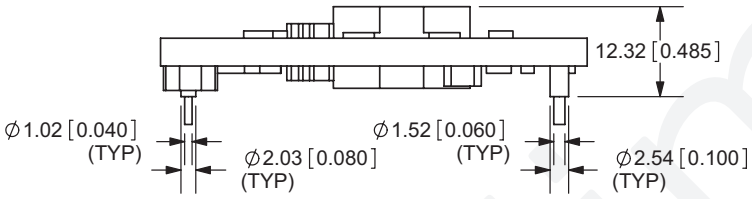


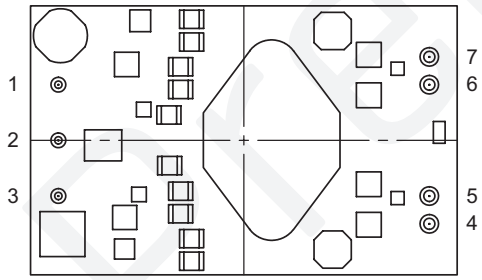
TOP VIEW



PCB LAYOUT
TOP VIEW

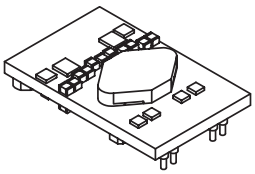


SIDE VIEW



BOTTOM VIEW

PINOUT	
1	-Vin
2	on/off
3	+Vin
4	-Vout
5	+Vout
6	-Vout
7	+Vout



SCALE: 1:2

TOLERANCE:
±0.3mm UNLESS OTHERWISE SPECIFIED

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CURRENT SHARING

Multiple NQB2060 modules can be operated in parallel for current sharing or redundancy applications by simply tying the respective inputs and outputs of each module together on dedicated power and ground copper planes within the PCB. The Solus topology will inherently share current between modules without the need for additional output capacitance. Sharing within 10% of full load rating can be expected between modules across all loading conditions. The Solus topology is not dependant on precisely balanced impedance paths within the circuit. However, to optimize module performance, care should be taken to maintain equal input and output impedance paths for each module. If one or more modules connected to a common load is disabled, the other modules will automatically pick up the load provided that the rated power of each remaining module is not exceeded.

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REVISION HISTORY

rev.	description	date
0.7	initial release	03/02/2011
0.71	added efficiency graphs	03/23/2011
0.72	added current sharing data	03/31/2011
0.73	updated part number key	04/20/2011
0.74	updated efficiency	06/09/2011
0.9	prepare for engineering	7/18/2011

The revision history provided is for informational purposes only and is believed to be accurate.

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