NetPower

DC-DC CONVERTERS SELECTION GUIDE 2021

LEADING THE ADVANCEMENT OF POWER CONVERSION

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Contents

Your Reliable Partner

NetPower is committed to meeting customer requirements and increasing customer satisfaction through the continual improvement of its products and the quality management system.

- Extensive Experience in High-Reliability Designs
- Leading Efficiencies - up to 97%
- High Power Density - up to 800W in a Quarter Brick Package
- Millions of Hours of MTBF
- Millions of Products Used Worldwide
- In-Depth Application Support and Flexible Order Fulfillment
- ISO9001, ISO14001, IATF 16949 Certified Facilities

Isolated DC-DC Converters

Features

◎ High efficiency using synchronous rectifiers
◎ 8:1, 4:1 and 2:1 input range
◎ Output power from 1W to multi-kilowatts
◎ Over-voltage, over-current, short-circuit, and over temperature protections
◎ Adjustable output voltage
◎ Fixed frequency operation
◎ Current sharing on selected products
◎ Wide operating temperature range

Packaging

◎ Industry standard footprint
Full brick: 4.46" x 2.28"
Half brick: 2.41" x 2.28"
Quarter brick: 2.28" x 1.46"
Eighth brick: 2.30" x 0.91"
Sixteenth brick: 1.31" x 0.91"
Thirty-second brick: 0.93" x 0.76"
◎ Open frame, baseplate, encapsulated, conformal coating, SMD, DIP, chassis mounting, DIN-rail

Safety

◎ UL 62368 recognized
◎ Basic and reinforced insulation

Industrial and Telecom DC-DC Converters

9-75VDC Input

Brick Converters (26W~120W)

Series	Power	Efficiency	Output Voltage				Isolation	Package
			3.3V	5V	12V	15V		
S(Y)RS5①	26W ~ 36W	Up to 93%	8A	6A	3A		1500VDC	Sixteenth brick
Q(Y)PS5①	84W ~ 120W	Up to 93%			7A 10A	8A	2250VDC	Quarter brick

9-36VDC Input

Lower Power Converters (3W~20W)

Series	Power	Efficiency	Output Voltage										Isolation	Package
			3.3V	5V	9V	12V	15V	24V	±5V	±9V	±12V	±15V	±24V	
LMS1-STC	3W	Up to 83%		600mA		250mA	200mA	125mA						1500VDC	SMD
LMS1-ZPC LMB1-ZPC③	5W 6W	Up to 88%	1.5A	1.2A	667mA	500mA	400mA	250mA	±600mA	±333mA	±250mA	±200mA	±125mA	1500VDC	DIP
LMS1-YMC LMB1-YMC③	5W 6W 8W 10W	Up to 88%	1.5A 2.4A	1.2A 2A	667mA 1.111A	500mA 833mA	400mA 667mA	250mA 416mA	±600mA ±1A	±555mA	±250mA ±416mA	±200mA ±333mA	±125mA ±208mA	1500VDC	DIP
LMS1-PPC LMB1-PPC③	5W 6W	Up to 88%	1.5A	1.2A	667mA	500mA	400mA	250mA	±600mA		±250mA	±200mA		3000VDC	DIP
LMS1-LPC LMB1-LPC③	8W 10W 17W 20W	Up to 89%	2.4A 5A	2A 4A	1.111A 2.222A	833mA 1.667A	667mA 1.334A	416mA 833mA	±1A		±416mA	±333mA		3000VDC	DIP
LMS1-LPC LMB1-LPC③	17W 20W	Up to 90%	5A	4A	2.222A	1.667A	1.333A	834mA	±2A	±1.111A	±834mA	±667mA		1500VDC	DIP

①: Y stands for encapsulated converters
③: S stands for single output
B stands for dual outputs

9-36VDC Input

Brick Converters (15W~300W)

Series	Power	Efficiency	Output Voltage									Isolation	Package
			3.3V	5V	6V	8V	12V	15V	28V	48V	56V		
M(Y)RS1①	15W ~ 28W	Up to 88%	7A	3A 5A		3A	2A		1A			1500VDC	Thirty-second brick
L(Y)RS1①	25W	Up to 86.5%	7A②				1.5A②					1500VDC	1x1
S(Y)RS1①	30W ~ 60W	Up to 92%	10A 15A	8A 12A	5A	4A 7A	3A 5A	2A 4A				1500VDC	Sixteenth brick
E(Y)RS1①	75W ~ 140W	Up to 92%		20A 25A			10A	5A 8A	3A 5A			2250VDC	Eighth brick
Q(Y)PS1①	100W ~ 200W	Up to 93%	30A	30A 40A			12A		5A	3A	2A	2250VDC	Quarter brick
H(Y)PS1①	240W ~ 300W	Up to 91%		50A			20A	20A	10A	6A		2250VDC	Half brick

18-36VDC Input

Brick Converters (15W~600W)

Series	Power	Efficiency	Output Voltage								Isolation	Package
			3.3V	5V	6V	8V	12V	15V	28V	48V		
M(Y)RS2①	15W ~ 45W	Up to 88%	10A	8A	5A	5A	3A	1A 3A	1.5A		1500VDC	Thirty-second brick
S(Y)RS2①	18W ~ 90W	Up to 92%	10A 15A 25A	8A 12A 17A	3A 6A 10A 12A	8A 11A	3A 7.5A	3A 6A	2.5A		1500VDC	Sixteenth brick
E(Y)RS2①	50W ~ 140W	Up to 92.5%	15A 35A	10A 15A 25A		15A	10A		3A 5A	2A	2250VDC	Eighth brick
Q(Y)PS2①	120W ~ 240W	Up to 92%	60A	25A 40A	33A	25A	10A 17A 20A		5A 7A	4A	2250VDC	Quarter brick
Q(Y)BC2①	250W ~ 360W	Up to 92.5%		50A			25A 30A		11A		2250VDC	Quarter brick
H(Y)PS2①	280W ~ 600W	Up to 93%		80A		50A 65A	38A 50A		10A 17A	10.5A	2250VDC	Half brick

①: Y stands for encapsulated converters
②: To be released

18-75VDC Input

Lower Power Converters (5W~20W)

Series	Power	Efficiency	Output Voltage										Isolation	Package
			3.3V	5V	9V	12V	15V	24V	±5V	±12V	±15V	±24V		
LMS3-ZPC LMB3-ZPC③	5W 6W	Up to 88%	1.5A	1.2A		500mA	400mA	250mA	±600mA	±250mA	±200mA		1500VDC	DIP
LMS3-YMC LMB3-YMC③	5W 6W 8W 10W	Up to 88%	1.5A 2.4A	1.2A 2A		500mA 833mA	400mA 667mA	250mA 416mA	±600mA ±1A	±250mA ±416mA	±200mA ±333mA	 ±208mA	1500VDC	DIP
LMS3-PPC	5W 6W	Up to 88%	1.5A	1.2A		500mA	400mA	250mA					3000VDC	DIP
LMS3-LPC LMB3-LPC③	8W 10W 17W 20W	Up to 89%	2.4A 5A	2A 4A		833mA 1.667A	667mA 1.334A	416mA 833mA	±1A	±416mA	±333mA		3000VDC	DIP
LMS3-LDC LMB3-LDC③	17W 20W	Up to 90%	5A	4A	2.222A	1.667A	1.333A	834mA	±2A	±834mA	±667mA		1500VDC	DIP

18-75VDC Input

Brick Converters (20W~360W)

Series	Power	Efficiency	Output Voltage								Isolation	Package
			3.3V	5V	8V	12V	15V	28V	32V	48V		
L(Y)RS3-W①	20W	Up to 87%	7A	4A		1.5A					2250VDC	1x1
S(Y)RS3-W①	32W ~ 72W	Up to 92%	10A 15A 20A	8A 10A 12A	4A 7A	3A 5A 6A	3A 4A				1500VDC	Sixteenth brick
E(Y)RS3-W①	45W ~ 144W	Up to 92%	20A 30A 35A	9A 14A 20A	15A	6A 9A 10A		4A 5A	3A	3A	2250VDC	Eighth brick
Q(Y)PS3-W①	96W ~ 228W	Up to 93.5%	35A 60A	25A 40A	25A	17A 19A	13A	5A		2A	2250VDC	Quarter brick
H(Y)PS3-W①	250W ~ 360W	Up to 91%		50A		30A					2250VDC	Half brick

①: Y stands for encapsulated converters
③: S stands for single output
B stands for dual outputs

36-75VDC Input

Brick Converters (15W~800W)

Series	Power	Efficiency	Output Voltage										Isolation	Package
			1.5V	2.5V	3.3V	5V	8V	9.6V	12V	15V	28V	48V		
MRS4	15W ~ 40W	Up to 89.2%			10A	3A 5A 8A			3A				1500VDC	Thirty-second brick
SRS4	33W ~ 100W	Up to 92.5%	30A	20A 30A	10A 18A 25A 30A	8A 13A 17A	8A 11A		3A 5A 8A	6A	2.5A		1500VDC	Sixteenth brick
ERS4	50W ~ 144W	Up to 93%	40A	35A	20A 25A 30A 40A	10A 15A 20A			7A 10A	5A	5A	3A	2250VDC	Eighth brick
EBC4	175W ~ 280W	Up to 95%			60A	35A 42A		26A			10A		2250VDC	Eighth brick
EBE4	204W ~ 400W	Up to 95%							17A 22A 30A 33A				2250VDC	Eighth brick
QPS4	96W ~ 240W	Up to 93.5%	65A 100A	60A		40A	30A		19A	13A		2.5A	2250VDC	Quarter brick
QBC4	300W ~ 400W	Up to 95.5%				60A 70A		41.5A	28A 33A				2250VDC	Quarter brick
QBE4	420W ~ 720W	Up to 95.5%					53A	53A	42A 50A 60A		14.5A②	12A②	2250VDC	Quarter brick
HPS4	400W ~ 500W	Up to 94%				80A			40A		18A	10A	2250VDC	Half brick
FPS4	700W ~ 800W	Up to 93.5%									25A 28A		2250VDC	Full brick

40-60VDC Input

Brick Converters (500W~800W)

Series	Power	Efficiency	Output Voltage	Isolation	Package
			12V		
EBE4	500W	Up to 95.2%	40A	2250VDC	Eighth brick
QBE4	800W	Up to 96.8%	67A	2250VDC	Quarter brick

②: To be released

Railway DC-DC Converters (Compliant to EN50155)

Highlights

◎ High efficiency up to 92%
◎ Output power up to 800W
◎ 3000VAC input to output isolation
◎ Wide input ranges: 4:1, 8:1, 12:1
◎ Encapsulated for harsh environments
◎ Design to meet EN50155

16-160VDC Input

Series	Power	Efficiency	Output Voltage			Isolation	Package
			5V	12V	24V		
QYR9S	50W	Up to 87%	10A	4.2A	2.1A	3000VAC	Quarter brick

34-160VDC Input

Series	Power	Efficiency	Output Voltage				Isolation	Package
			5V	12V	24V	48V		
QYR6A	60W ~ 150W	Up to 91%	24A	5A 10A	3A 5A	2.5A 3.2A	3000VAC	Quarter brick
HYR6A	250W	Up to 91%	50A	20A	10A		3000VAC	Half brick

66-160VDC Input

Series	Power	Efficiency	Output Voltage						Isolation	Package
			5V	12V	13.8V	24V	48V	56V		
QYR7A	150W	Up to 90%	25A	12A	7A②	6A	3A	3.3A	3000VAC	Quarter brick
HYR7A	240W ~ 300W	Up to 91%	50A 60A	20A 25A	22A①	10A 12.5A	5A 6.3A		3000VAC	Half brick
FYR7A	300W ~ 400W	Up to 92%		25A 33A		16.7A	6.3A 8.3A		3000VAC	Full brick
FYV7A	800W	Up to 92%		66A		33A	17A		3000VAC	Full brick

①: Input Voltage 43-160V
②: To be released

High Input Voltage DC-DC Converters

Highlights

◎ High efficiency up to 94%
◎ Output power up to 1008W
◎ Current share available
◎ 4250VDC and 2250VDC input to output isolation
◎ Industry standard footprint
◎ Encapsulated for harsh environments

180-400VDC Input

Series	Power	Efficiency	Output Voltage						Isolation	Package
			5V	12V	15V	28V	48V	56V		
HYUEA	300W ~ 400W	Up to 92%	60A	25A		11A	7A	6A	4250VDC	Half brick
FYUEA	500W ~ 800W	Up to 94%	100A	67A	54A	28A	17A	14A	4250VDC	Full brick

300-500VDC Input

Series	Power	Efficiency	Output Voltage					Isolation	Package
			5V	8.5V	12V	28V	48V		
HYVEC	300W ~ 400W	Up to 91.5%	60A			14.5A		2250VDC	Half brick
FYVEC	663W ~ 1000W	Up to 93%		78A	80A	28A 36A	21A	2250VDC	Full brick

400-650VDC Input

Series	Power	Efficiency	Output Voltage				Isolation	Package
			12V	28V	36V	48V		
HYVGA	360W	Up to 90%	30A	12.5A			2250VDC	Half brick
FYVGA	540W ~ 1008W	Up to 92%	57A	28A 36A	17A 22A	17A	2250VDC	Full brick

Non-Isolated DC-DC Converters

Features

◎ High efficiency up to 96%
◎ Multiple input voltage ranges
◎ Over-voltage, over-current, short-circuit, and over temperature protection
◎ Output voltage tracking on selected codes
◎ High current up to 60A
◎ Load sharing on selected codes

Packaging

◎ Standard footprints
◎ SMT, SIP, BMP and Through-hole packages
◎ Open frame, baseplate and encapsulated

Safety

◎ UL 60950-1 2nd recognized

2.5-18VDC Input

Input Voltage (V)	Series	Output Voltage (V)	Output Current (A)	Efficiency	Package	Size (in)
2.5-5.5	NAT0 NAS0 NBS0	0.75-3.63 0.75-3.63 0.75-3.63	12-20 12-20 8	Up to 96%	SIP SMT SMT	2.00 x 0.50 x 0.25 1.30 x 0.53 x 0.25 1.10 x 0.45 x 0.25
4.5-14	NKS1	0.59-5.5	6-12	Up to 93.3%	SMT	0.48 x 0.48 x 0.35
7.0-14	NRT1	1.2-6	10	Up to 95%	SIP	0.42 x 0.66 x 0.38
8.0-16	NCT1	0.8-5.5	45-60	Up to 93%	SMT, SIP, Horizontal TH	2.00 x 0.68 x 0.39
8.5-16	NBS1	0.75-5.5	8	Up to 91%	SMT	1.10 x 0.45 x 0.25
8.5-18	NAT1 NAS1 NES1	0.75-5.5 0.75-5.5 0.75-5.5	12-20 12-20 16-30	Up to 96%	SIP SMT SMT	2.00 x 0.50 x 0.25 1.30 x 0.53 x 0.25 1.30 x 0.53 x 0.38

9-36VDC Input

Input Voltage (V)	Series	Output Voltage (V)	Output Current (A)	Efficiency	Package	Size (in)
9-36	NAT2 NAS2 NBS2	3-6 3-6 3-6	10 10 3.5	Up to 88%	SIP SMT SMT	2.00 x 0.50 x 0.25 1.30 x 0.53 x 0.25 1.10 x 0.45 x 0.25
18-36	NAT3 NAS3 NBS3	5-15.5 5-15.5 5-15.5	9 9 3.5	Up to 94%	SIP SMT SMT	2.00 x 0.50 x 0.25 1.30 x 0.53 x 0.25 1.10 x 0.45 x 0.25
18-36	NPS3	0.9-3.3	15	Up to 80%	SMT	1.10 x 0.72 x 0.37

9-60VDC Input

Input Voltage (V)	Series	Output Voltage (V)	Output Current (A)	Efficiency	Package	Size (in)
9-53	N(Y)XS	3.3-36	12, 20, 26	Up to 97%	BMP	1.31 x 0.91 x 0.37
9-60	NYWH5	0-60	40	Up to 97%	BMP	2.40 x 2.50 x 0.51
9-60	NYWQ5	0-60	25	Up to 97%	BMP	2.40 x 1.55 x 0.50

VPX Power Supplies

The VPX power supplies are compliant with VITA 62, MIL-STD-704, MIL-STD-461 and MIL-STD-810G. These VPX power supplies have up to 6 outputs and deliver up to 1000W total power with a typical efficiency of 90%. Available in 3U and 6U packages, these VPX power supplies are designed for conduction cooling and are equipped with high speed backplane connectors.

Highlights

◎ 18-400VDC and 85-264VAC input voltage ranges
◎ Output power up to 1000W
◎ Built-in input EMI filtering
◎ Input reverse polarity protection
◎ Current share available
◎ Industry standard packages
◎ Operating temperature range: -40°C to +85°C

Series	Package	Power	Efficiency	Input Voltage	Output Voltage					
					+12V	+5V	+3.3V	+3.3V AUX	+12V AUX	-12V AUX
VPX	3U	500W	88%	18-36VDC	0 - 40A	0 - 25A	0 - 25A	0 - 6A	0 - 1A	0 - 1A
VPX	6U	1000W	90%	18-36VDC	0 - 80A	0 - 30A	/	0 - 15A	0 - 1A	0 - 1A
VPX	6U	900W	90%	180-400VDC	0 - 64A	0 - 30A	/	0 - 40A	0 - 1A	0 - 1A
VPX	6U	432W	90%	85-264VAC	0 - 25A	0 - 30A	/	0 - 40A	0 - 1A	0 - 1A

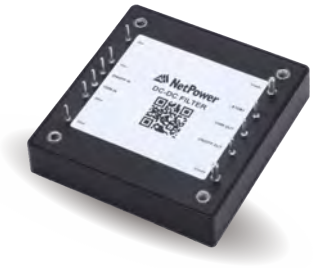
DC-DC Filters

Transient Suppression EMI Filters

The HPFS2030R-H transient suppression EMI filter module provides suppression of transients defined in MIL-STD-1275D and DEF-STAN 61-5 as well as filtering of conducted EMI over the entire frequency range regulated by FCC and CISPR.

Highlights

◎ Input voltage surge and spike suppression
◎ Input reverse polarity protection
◎ Soft start circuitry to limit in-rush charging current
◎ 1,500V input/output to common mode isolation
◎ Wide operating temperature range from -40°C to +100°C



Part Number	Description	Input Voltage	Output Current	Power	Size
HPFS2030R-H	Filter	16-40V	30A	480W	Half Brick

EMI Filters

The PFT series EMI filters are designed to attenuate both differential-mode and common-mode conducted noises generated by DC-DC converters. These filters are optimized to provide high insertion loss over the entire frequency range regulated by FCC and CISPR for conducted emissions. These EMI filter modules support up to 80V operating voltages.

Highlights

◎ 80V maximum input voltage
◎ Compatible to most industry standard DC-DC converters
◎ Industry standard package
◎ Wide operating temperature range: -40°C to +100°C

Part Number	Description	Input	Output	Size (in)
PFT0H005J8	Filter	80V/5A	80V/5A	1.00 x 1.00 x 0.50
PFT0H007J8	Filter	80V/7A	80V/7A	1.00 x 1.00 x 0.50
PFT0H010J8	Filter	80V/10A	80V/10A	2.04 x 1.04 x 0.50
PFT0H020J8	Filter	80V/20A	80V/20A	2.04 x 1.69 x 0.50
PFT0H030J8	Filter	80V/30A	80V/30A	2.44 x 1.03 x 0.50

Heatsinks

Standard Brick Size Heatsinks

NetPower heatsinks are suitable for industry standard DC-DC power modules and are available in various sizes and fin orientations. These heatsinks improve thermal performance of power modules in convection cooling.

Part Number	Size	Height Options (in)	Orientation
HSxxxLSA	1/16 Brick	0.24 / 0.45 / 0.90	Lengthwise
HSxxxCSA	1/16 Brick	0.24 / 0.45 / 0.90	Crosswise
HSxxxLEx	1/8 Brick	0.24 / 0.45 / 0.90	Lengthwise
HSxxxCEx	1/8 Brick	0.24 / 0.45 / 0.90	Crosswise
HSxxxLQA	1/4 Brick	0.24 / 0.45 / 0.90	Lengthwise
HSxxxCQA	1/4 Brick	0.24 / 0.45 / 0.90	Crosswise
HSxxxLHA②	1/2 Brick	0.24 / 0.45 / 0.90	Lengthwise
HSxxxCHA	1/2 Brick	0.24 / 0.45 / 0.90	Crosswise
HSxxxLFA	Full Brick	0.24 / 0.45 / 0.90	Lengthwise
HSxxxCFA②	Full Brick	0.24 / 0.45 / 0.90	Crosswise

②: To be released

Custom Power Supplies & Accessories

Based on its mature platforms or standard modular products, NetPower can quickly design and develop semi and full custom products. The customization may range from minor changes to the standard products to full custom designs to satisfy specific electrical, mechanical, thermal, and environmental requirements.

Custom Power Supplies

Highlights

- ◎ Mature technology and proven high reliability
- ◎ Wide input range and power ratings
- ◎ Excellent thermal performance
- ◎ Low noise
- ◎ High efficiency and power density
- ◎ Protection against abnormal conditions
- ◎ Fast development cycle

Examples:

Input: 120-240VAC/90-380VDC
Output: 52VDC/150W
Efficiency: 88%
Size: 8.42" x 2.60" x 1.63"

Input: 26-72VDC
Output: 3.3VDC, +/-5.1VDC, 10.4/8.6VDC (switchable) 13VDC
Efficiency: 80%
Size: 4.17" x 2.28" x 0.61"

Input: 36-75VDC
Output: 12V/450W
Efficiency: 95.5%
Size: 2.29" x 1.46" x 0.60"

Input: 26-72VDC
Output: 3.3VDC, +/-5.1VDC, 10.4/8.6VDC (switchable) 13VDC
Efficiency: 87%
Size: 4.53" x 2.36" x 0.67"

Input: 18-36VDC
Output: 56VDC/250W
Efficiency: 90%
Size: 8.13" x 5.09" x 0.85"

Input: 19-36VDC
Output: 56VDC/400W
Efficiency: 91%
Size: 9.10" x 5.71" x 1.77"

Custom Heatsinks

Highlights

◎ Different sizes and fin orientations are available
◎ CNC and extrusion process
◎ Anodized surface
◎ Wiredrawing and sand blasting
◎ Fast development cycle

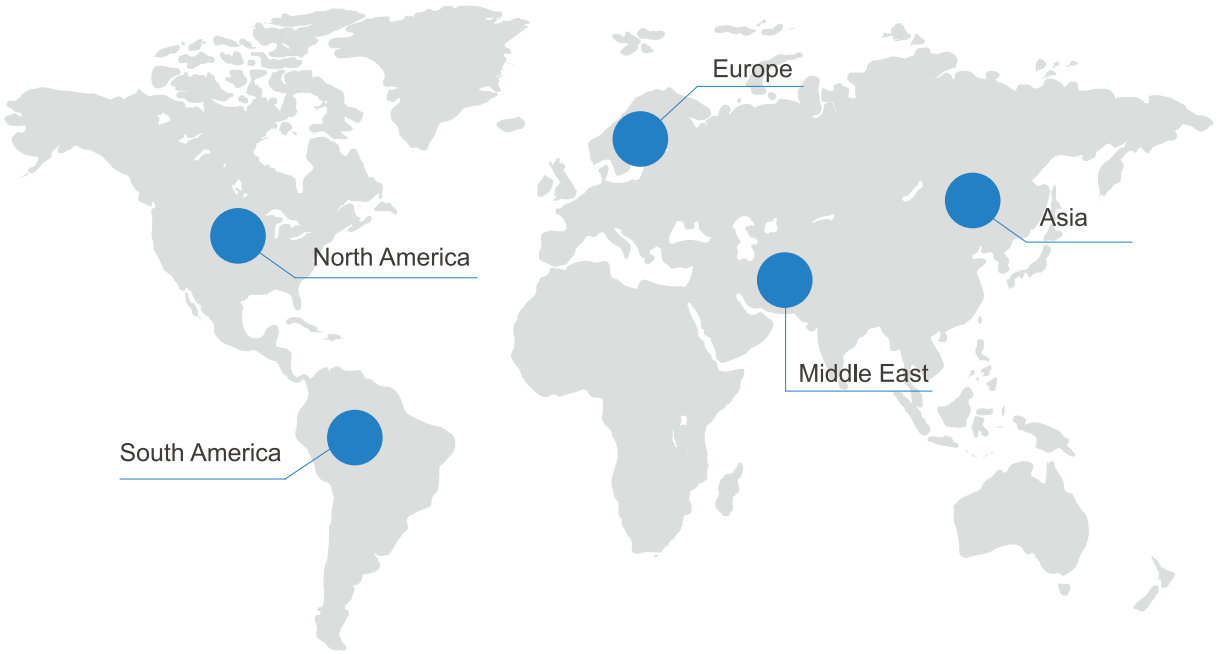
Example:

Size: 6.06" x 3.70" x 0.77"
Material: Aluminum
Surface: Black oxidation

Standard Package & Size

Unit: inch (LxWxH)

Package	Open Frame	Baseplate	Encapsulated Baseplate	Encapsulated Flange
1/32 Brick	0.93 x 0.76 x 0.42	1.02 x 0.76 x 0.50	1.13 x 0.87 x 0.50	1.71 x 0.87 x 0.50
1/16 Brick	1.31 x 0.91 x 0.39	1.31 x 0.91 x 0.50	1.43 x 1.03 x 0.50	1.43 x 1.50 x 0.50
1/8 Brick	2.30 x 0.90 x 0.41	2.30 x 0.90 x 0.50	2.42 x 1.02 x 0.50	2.42 x 1.45 x 0.50
1/4 Brick	2.29 x 1.46 x 0.40	2.29 x 1.46 x 0.50	2.40 x 1.55 x 0.50	2.40 x 2.20 x 0.50
1/2 Brick	2.29 x 2.41 x 0.39	2.29 x 2.41 x 0.51	2.40 x 2.50 x 0.51	/
Full Brick	4.46 x 2.28 x 0.40	4.60 x 2.40 x 0.51	4.58 x 2.40 x 0.51	/



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