

# Flex Power Modules

DC/DC solutions  
for industrial and  
transportation/railway  
2023



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# Our DC/DC portfolio

## The industrial market

The industrial market needs high reliability, high performance and rugged DC/DC solutions for a wide range of applications, including:

- Process control
- Factory automation
- Robotics
- Test and measurement
- Automatic test equipment
- Alternative energy
- Smart grids

These DC/DC solutions often run from 24V and/or 12V supply voltages, rather than the 48V more widely found in information and communication technology (ICT) applications.

Flex Power Modules has expanded its DC/DC portfolio for the industrial market.

### Features of our industrial DC/DC converters

- Fully encapsulated designs in most cases
- Ultra-wide 4:1 and 8:1 input ranges
- Meets IEC/EN/UL62368-1 (previously 60950-1)
- Isolation voltages from 1500V to 6000V
- MTBF figures up to 171Mhrs

## The transportation/railway market

Modern railway systems require a wide range of DC/DC converters to power monitoring and control units to help assure high reliability and high performance.

### Meet stringent electrical and environmental specifications

Flex Power Modules provides a series of power modules for railway systems designed to meet the most stringent electrical and environmental specifications. These products can work under dust, moisture, severe vibration and other harsh conditions. Our transportation/railway DC/DC converters meet European standard EN 50155, the internationally recognized standard for railway applications.

### Features of our transportation/railway DC/DC converters

- Compliant to EN50155
- Ultra-wide input ranges from 12-160V
- Up to 4000V Isolation

# Power modules for industrial & 12/24/36/48V transportation

Digital and analog power modules for Radio Frequency Power Applications (RFPA), Microwave and Small Cell Applications, from smallest form factor of a 1/16 brick up to 1/2 brick size.

## PUA-A series (1W) | SIP4

### Key Features:

- No minimum load required
- Isolation voltage 2000V
- MTBF figures up to 13 Mhrs
- Meets IEC/EN/UL62368-1



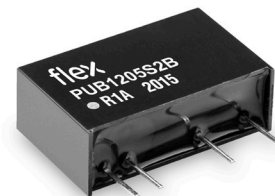
**Dimensions:** 11.5 x 6 x 10 mm (0.45 x 0.23 x 0.36 in)

SERIES NAME	V <sub>IN</sub> (V)	V <sub>OUT</sub> (V)	POWER (W)	EFFICIENCY (%)	Isolation (V)
PUA-1A	3.3/5/12/24	3.3/5/12/15	1	75-84	2000

## PUA-B series (1-2W) | SIP7

### Key Features:

- No minimum load required
- Isolation voltage 4000V
- MTBF figures up to 18 Mhrs
- Meets IEC/EN/UL62368-1



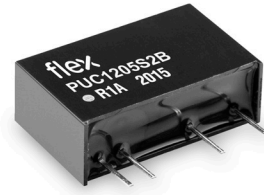
**Dimensions:** 19.7 x 7.1 x 11.5 mm (0.78 x 0.28 x 0.45 in)

SERIES NAME	V <sub>IN</sub> (V)	V <sub>OUT</sub> (V)	POWER (W)	EFFICIENCY (%)	Isolation (V)
PUB-1B	3.3/5/12/15/24	3.3/12/±12/±15/ (+15/-9)/(+15/-3)	1	74-82	4000
PUB-2B	3.3/5/12/24	3.3/12/±12/±15/ (+15/-9)	2	77-86	4000

## PUC-B series (1-2W) | SIP7

### Key Features:

- No minimum load required
- Isolation voltage 6000V
- MTBF figures up to 15 Mhrs
- Meets IEC/EN/UL62368-1
- Reinforced insulation



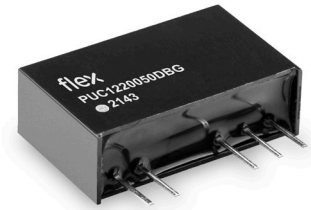
**Dimensions:** 19.7 x 7.1 x 11.5 mm (0.78 x 0.28 x 0.45 in)

SERIES NAME	V <sub>IN</sub> (V)	V <sub>OUT</sub> (V)	POWER (W)	EFFICIENCY (%)	Isolation (V)
PUC-1B	5/12/15/24	3.3/5/12/±5/±12/±15	1	76-80	6000
PUC-2B	5/12/24	3.3/5/12/±5/±12/±15	2	77-85	6000

## PUC-BG series (2W) | SIP7

### Key Features:

- Designed for gate drive applications
- Isolation voltage 6200V
- Ultra low capacitance (< 6 pF)
- MTBF figures up to 13 Mhrs



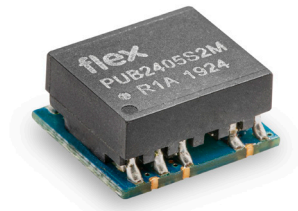
**Dimensions:** 19.5 x 9.8 x 12.5 mm (0.77 x 0.39 x 0.49 in)

SERIES NAME	V <sub>IN</sub> (V)	V <sub>OUT</sub> (V)	POWER (W)	EFFICIENCY (%)	Isolation (V)
PUC-2BG	12/15/24	5+15/-3; +15/-5 +15/-9; +15/-15 +17/-9; +18/-2.5 +18/-5; +18/-9 +20/-3.5; +20/-5	2	77-81	6200

## PUB-M series (1-2W) | SMD

### Key Features:

- No minimum load required
- Isolation voltage 3000V
- MTBF figures up to 18 Mhrs
- Meets IEC/EN/UL62368-1



**Dimensions:** 15.25 x 11.2 x 8 mm (0.6 x 0.44 x 0.31 in)

SERIES NAME	V <sub>IN</sub> (V)	V <sub>OUT</sub> (V)	POWER (W)	EFFICIENCY (%)	Isolation (V)
PUB-1M	5/12/24	5	1	75-81	3000
PUB-2M	5/12/24	5/12/24	2	78-83	3000

## PKV (1.65-3W) | DIL package

### Key Features:

- Fully encapsulated package
- Wide 4:1 input range
- Isolation voltage 1500V
- MTBF > 0.65 Mhrs



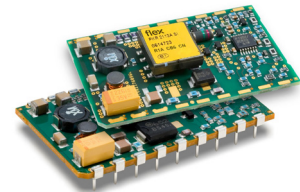
**Dimensions:** 31.8 x 20.3 x 10.7 mm (1.25 x 0.80 x 0.42 in)

SERIES NAME	V <sub>IN</sub> RANGE (V <sub>DC</sub> )	V <sub>OUT</sub> NOMINAL (V <sub>DC</sub> )	I <sub>OUT</sub> (A)	POWER (W)	EFFICIENCY (%)
PKV3211PI	9-36	5	0.5	2.5	82
PKV3313PI	9-36	12	0.3	3	82
PKV3315PI	9-36	15	0.2	3	82
PKV3222PI	9-36	+5/-5	0.25/0.25	2.5	82
PKV3321PI	9-36	+12/-12	0.1/0.1	3	82
PKV3325PI	9-36	+15/-15	0.1/0.1	3	80
PKV5211PI	18-72	5	0.5	2.5	82
PKV5315PI	18-72	15	0.2	3	82
PKV5222PI	18-72	+5/-5	0.25/0.25	2.5	82
PKV5321PI	18-72	+12/-12	0.1/0.1	3	82
PKV5325PI	18-72	+15/-15	0.1/0.1	3	82

## PKR (6-15W) | 1.11" x 1.88" through hole and SMD

### Key Features:

- Cost effective open frame design
- Wide 4:1 and 2:1 input range
- Meets IEC/EN/UL62368-1 (previously 60950-1)
- 1500V isolation
- MTBF figure up to 6 Mhrs



**Dimensions:** 47.8 x 28.1 x 8.0 mm (1.88 x 1.11 x 0.32 in)

SERIES NAME	V <sub>IN</sub> RANGE (V <sub>DC</sub> )	V <sub>OUT</sub> NOMINAL (V <sub>DC</sub> )	I <sub>OUT</sub> (A)	POWER (W)	EFFICIENCY (%)
PKR2610A	18-36	3.3	2	6.6	82
PKR2111A	18-36	5	2	10	85
PKR2113A	18-36	12	1	12	87.5
PKR2221A	18-36	+12/-12	0.6/0.6	14.9	86.6
PKR4211A	36-75	5	3	15	83

## PKE (15-30W) | 1"x 1" package

### Key Features:

- Fully encapsulated package
- Wide 4:1 input range
- Meets IEC/EN/UL62368-1 (previously 60950-1)
- Isolation voltage up to 1500V
- MTBF up to 5 Mhrs



**Dimensions:** 25.4 x 25.4 x 10.8 mm (1.0 x 1.0 x 0.43 in)

SERIES NAME	V <sub>IN</sub> RANGE (V <sub>DC</sub> )	V <sub>OUT</sub> NOMINAL (V <sub>DC</sub> )	I <sub>OUT</sub> (A)	POWER (W)	EFFICIENCY (%)
PKE3210	9-36	3.3	4.5	15	84.6
PKE3211	9-36	5	3	15	88
PKE3213	9-36	12	1.3	15	86.5
PKE3215	9-36	15	1	15	85.8
PKE3221	9-36	+12/-12	0.6/0.6	30	84
PKE3321	9-36	+12/-12	1.25/1.25	15	88
PKE3225	9-36	+15/-15	0.5/0.5	30	84
PKE3325	9-36	+15/-15	1/1	15	88
PKE3310	9-36	3.3	7	23	87
PKE3311	9-36	5	6	30	90
PKE3313	9-36	12	2.5	30	90
PKE3315	9-36	15	2	30	90
PKE3316Z	9-36	24	1.3	30	90
PKE3316J	9-36	48	0.6	30	89
PKE3316H	9-36	54	0.46	25	89
PKE5210	18-75	3.3	4.5	15	84.1
PKE5211	18-75	5	3	15	84.3
PKE5213	18-75	12	1.3	15	86.3
PKE5215	18-75	15	1	15	84.4
PKE5221	18-75	+12/-12	0.6/0.6	15	83
PKE5321	18-75	+12/-12	1.25/1.25	30	83
PKE5225	18-75	+15/-15	0.5/0.5	15	83
PKE5325	18-75	+15/-15	1/1	30	88
PKE5310	18-75	3.3	7	23	87
PKE5311	18-75	5	6	30	90
PKE5313	18-75	12	2.5	30	90
PKE5315	18-75	15	2	30	90
PKE5316Z	18-75	24	1.3	30	90
PKE5316J	18-75	48	0.6	30	89
PKE5316H	18-75	54	0.46	25	89

## PKE-A (40-60W) | 1"x 2" package

### Key Features:

- Fully encapsulated package
- Ultra-wide 8:1 input range
- Meets IEC/EN/UL62368-1 (previously 60950-1)
- Isolation up to 2250V
- MTBF up to 4 Mhrs



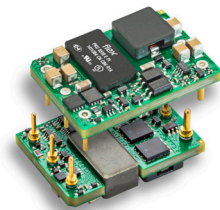
**Dimensions:** 50.8 x 25.4 x 11.9 mm (2.0 x 1.0 x 0.47 in)

SERIES NAME	V <sub>IN</sub> RANGE (V <sub>DC</sub> )	V <sub>OUT</sub> NOMINAL (V <sub>DC</sub> )	I <sub>OUT</sub> (A)	POWER (W)	EFFICIENCY (%)
PKE8410A	9-75	3.3	9.1	40	87
PKE8411A	9-75	5	8	40	88
PKE8413A	9-75	12	3.3	40	91
PKE8415A	9-75	15	2.7	40	89
PKE8416ZA	9-75	24	1.7	40	90
PKE8416JA	9-75	48	0.8	40	91
PKE8416HA	9-75	54	0.7	40	91
PKE3611A	9-75	5	12	60	90
PKE3613A	9-75	12	5	60	91
PKE3616ZA	9-75	24	2.5	60	91
PKE3616JA	9-75	48	1.25	60	91
PKE3616HA	9-75	54	1.11	60	91

## PKU-E (50W) | 1/16 brick through hole and SMD package

### Key Features:

- Open frame designs
- Wide 4:1 input range
- Meets IEC/EN/UL62368-1 (previously 60950-1)
- 2250V isolation
- MTBF figures up to 4.9 Mhrs



**Dimensions:** 33.02 x 22.86 x 9.4 mm (1.3 x 0.9 x 0.37 in)

SERIES NAME	V <sub>IN</sub> RANGE (V <sub>DC</sub> )	V <sub>OUT</sub> NOMINAL (V <sub>DC</sub> )	I <sub>OUT</sub> (A)	POWER (W)	EFFICIENCY (%)
PKU5510E	18-75	3.3	15	50	92
PKU5511E	18-75	5	10	50	92
PKU5513E	18-75	12	4.2	50	91.7



## PKU-S (50W) | 1/16 brick

### Key Features:

- Wide 4:1 input range
- Isolation voltage up to 2250V
- MTBF figures up to 8 Mhrs



**Dimensions:** 35.3 x 25 x 10.4 mm (1.39 x 0.98 x 0.41 in)

SERIES NAME	V <sub>IN</sub> RANGE (V <sub>DC</sub> )	V <sub>OUT</sub> NOMINAL (V <sub>DC</sub> )	I <sub>OUT</sub> (A)	POWER (W)	EFFICIENCY (%)
PKU3510S	9-36	3.3	15	50	90
PKU3511S	9-36	5	10	50	90
PKU3513S	9-36	12	4.2	50	88
PKU3515S	9-36	15	3.3	50	88
PKU3516ZS	9-36	24	2.1	50	91
PKU5510S	18-75	3.3	15	50	90
PKU5511S	18-75	5	10	50	90
PKU5513S	18-75	12	4.2	50	90
PKU5515S	18-75	15	3.3	50	90
PKU5516ZS	18-75	24	2.1	50	91

## PKJ (200W) | 1/2 brick package

### Key Features:

- Wide input range
- 4000V isolation



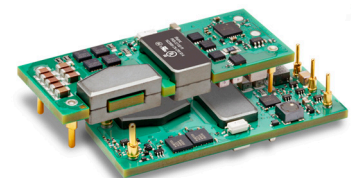
**Dimensions:** 61 x 57.9 x 12.7 mm (2.4 x 2.3 x 0.5 in)

SERIES NAME	V <sub>IN</sub> RANGE (V <sub>DC</sub> )	V <sub>OUT</sub> NOMINAL (V <sub>DC</sub> )	I <sub>OUT</sub> (A)	POWER (W)	EFFICIENCY (%)
PKJ8213PI	9-75	12	16.67	200	92
PKJ8216ZPI	9-75	24	8.33	200	92
PKJ8216JPI	9-75	48	4.17	200	92
PKJ8216H	9-75	54	3.7	200	92

## PKB-D (240W) | 1/8 brick through hole and SMD package

### Key Features:

- Wide 2:1 input range
- 2250V isolation
- MTBF figures up to 10 Mhrs



**Dimensions:** 58.4 x 22.7 x 9.6-13.2 mm (2.3 x 0.9 x 0.38-0.52 in)

SERIES NAME	V <sub>IN</sub> RANGE (V <sub>DC</sub> )	V <sub>OUT</sub> NOMINAL (V <sub>DC</sub> )	I <sub>OUT</sub> (A)	POWER (W)	EFFICIENCY (%)
PKB2213D	18-36	12	20	240	95
PKB5213D	18-60	12	20	240	95

# Power modules for 72/96/110V railway systems

In the transportation sector DC/DC converters for railways have special characteristics and must withstand greater disruptive forces, are subject to greater demands for operational safety, durability and thermal shock.

## PKE-A (30W) | 1"x 2" package

### Key Features:

- Fully encapsulated package
- Wide 43-160 V input range for 72/96/110V applications
- Meets IEC/EN/UL62368-1 (previously 60950-1) and EN50155
- Isolation voltage up to 2250V
- MTBF figures up to 5 Mhrs



**Dimensions:** 50.8 x 25.4 x 11.4 mm (2.0 x 1.0 x 0.45 in)

SERIES NAME	V <sub>IN</sub> RANGE (V <sub>DC</sub> )	V <sub>OUT</sub> NOMINAL (V <sub>DC</sub> )	I <sub>OUT</sub> (A)	POWER (W)	EFFICIENCY (%)
PKE7311API	43-160	5	6	30	88
PKE7313API	43-160	12	2.5	30	90
PKE7315API	43-160	15	2	30	90
PKE7316ZAPI	43-160	24	1.3	30	89
PKE7316JAPI	43-160	48	0.6	30	88
PKE7316HAPI	43-160	54	0.5	30	88

## PKM-A (100-150W) | 1/4 brick package

### Key Features:

- Fully encapsulated package
- Wide 60-160V input range for 110V applications
- Meets IEC/EN/UL62368-1 (previously 60950-1) and EN50155
- Isolation voltage up to 4000V
- MTBF figures up to 4 Mhrs

**Dimensions:** 57.9 x 36.8 x 12.7 mm (2.28 x 1.45 x 0.5 in)



PKM-A with heatsink



PKM-A

SERIES NAME	V <sub>IN</sub> RANGE (V <sub>DC</sub> )	V <sub>OUT</sub> NOMINAL (V <sub>DC</sub> )	I <sub>OUT</sub> (A)	POWER (W)	EFFICIENCY (%)
PKM7111A	60-160	5	20	100	86
PKM7113A	60-160	12	8.3	100	86
PKM7115A	60-160	15	6.7	100	86
PKM7116ZA	60-160	24	4.2	100	89
PKM7116JA	60-160	48	2.1	100	90
PKM7116HA	60-160	54	1.85	100	90
PKM7213A	60-160	12	12.5	150	86
PKM7215A	60-160	15	10	150	88
PKM721ZA	60-160	24	6.3	150	89
PKM7216JA	60-160	48	3.13	150	90
PKM7216HA	60-160	54	2.78	150	90

## PKJ (200-300W) | 1/2 brick package

### Key Features:

- Fully encapsulated package
- Wide 60-160V input range for 110V applications
- Meets IEC/EN/UL62368-1 (previously 60950-1) and EN50155
- 4000V isolation
- MTBF figures up to 5 Mhrs



**Dimensions:** 61 x 57.9 x 12.7 mm (2.4 x 2.3 x 0.5 in)

SERIES NAME	V <sub>IN</sub> RANGE (V <sub>DC</sub> )	V <sub>OUT</sub> NOMINAL (V <sub>DC</sub> )	I <sub>OUT</sub> (A)	POWER (W)	EFFICIENCY (%)
PKJ7213PI	60-160	12	16.8	200	89
PKJ7217KPI	60-160	13.8	14.5	200	89
PKJ7215PI	60-160	15	14.5	200	89
PKJ7216ZPI	60-160	24	8.4	200	91
PKJ7216JPI	60-160	48	4.2	200	91
PKJ7216HPI	60-160	54	3.7	200	91
PKJ7313PI	60-160	12	25	300	89
PKJ7317KPI	60-160	13.8	21.7	300	89
PKJ7315PI	60-160	15	20	300	89
PKJ7316ZPI	60-160	24	12.5	300	90
PKJ7316JPI	60-160	48	6.3	300	90
PKJ7316HPI	60-160	54	5.6	300	91

# Ultra-wide input power modules for 24-110V railway applications

## PKM-W (50-150W) | 1/4 brick package

### Key Features:

- Fully encapsulated package
- Ultra-wide 12/14-160V input range for universal railway applications
- Meets IEC/EN/UL62368-1 (previously 60950-1) and EN50155
- 4000V isolation
- MTBF figures up to 5.8 Mhrs



**Dimensions:** 57.9 x 36.8 x 12.7 mm (2.28 x 1.45 x 0.5 in) / 62 x 40 x 13 mm (2.44 x 1.57 x 0.51 in)

SERIES NAME	V <sub>IN</sub> RANGE (V <sub>DC</sub> )	V <sub>OUT</sub> NOMINAL (V <sub>DC</sub> )	I <sub>OUT</sub> (A)	POWER (W)	EFFICIENCY (%)
PKM7510WPI	12-160	3.3	15.2A	50	86
PKM7511WPI	12-160	5	10	50	87
PKM7513WPI	12-160	12	4.17	50	90
PKM7517KWPI	12-160	13.8	3.62	50	90
PKM7515WPI	12-160	15	3.33	50	90
PKM7516ZWPI	12-160	24	2.08	50	90
PKM7516JWPI	12-160	48	1.04	50	89
PKM7516HWPI	12-160	54	0.93	50	89
PKM7111WPI	14-160	5	20	100	89
PKM7113WPI	14-160	12	8.34	100	87
PKM7117KWPI	14-160	13.8	7.24	100	90
PKM7115WPI	14-160	15	6.66	100	90
PKM7116ZWPI	14-160	24	4.16	100	90
PKM7116JWPI	14-160	48	2.08	100	89
PKM7116HWPI	14-160	54	1.86	100	89
PKM7213WPI	14-160	12	12.5	150	91
PKM7216ZWPI	14-160	24	6.2	150	91
PKM7216JWPI	14-160	48	3.13	150	91

## PKJ-W (200W) | 1/2 brick package

### Key Features:

- Fully encapsulated
- Ultra-wide input voltage 14-160V
- EN50155 compatible
- 4000V isolation



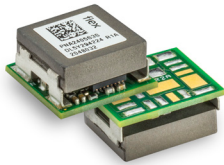
**Dimensions:** 61x57.9x12.7 mm

SERIES NAME	V <sub>IN</sub> RANGE (V <sub>DC</sub> )	V <sub>OUT</sub> NOMINAL (V <sub>DC</sub> )	I <sub>OUT</sub> (A)	POWER (W)	EFFICIENCY (%)
PKJ7213W	14-160	12	16.7	200	90
PKJ7215W	14-160	15	13.3	200	90
PKJ7217KW	14-160	13.8	14.5	200	90
PKJ7216ZW	14-160	24	8.3	200	90
PKJ7216JW	14-160	48	4.2	200	90
PKJ7216HW	14-160	54	3.7	200	90

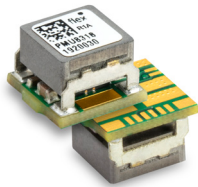
# Point of Load (PoL)

Flex Power Modules has also a wide range of Point of Load (PoL) products. Here is a selection of our PoL products, applicable for industrial, transportation and ICT market. The BMR-families below incorporate a digital interface for easy monitoring, configuration and control.

PNA



PMU



BMR461



BMR462



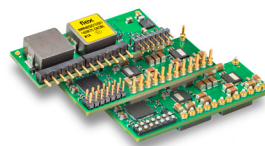
BMR463



BMR464



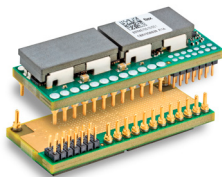
BMR465



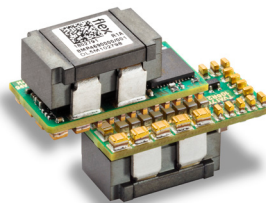
BMR466



BMR467



BMR469



BMR474



BMR473



SERIES NAME	V <sub>IN</sub> (V)	V <sub>OUT</sub> (V)	I <sub>OUT</sub> (A)	PACKAGE
PMU	4.5-17	0.6-5.0	4/6/8	LGA
BMR461	4.5-14	0.6-5.0	6/12/18	LGA (BGA)
BMR462	4.5-14	0.6-5.0	12	TH/SMD/SIP
BMR463	4.5-14	0.6-3.3	20/25	TH/SMD/SIP
BMR464	4.5-14	0.6-3.3	40/50	TH/SMD/SIP
BMR466	4.5-14	0.6-1.8	60	LGA (BGA)
BMR465	7.5-14	0.6-1.8	90	TH/SMD/SIP
BMR467	7.5-14	0.6-1.8	120	TH/SMD/SIP
BMR469	7.5-14	0.6-5.0	2x40/2x25	SMD
BMR474	6.0-15	0.6-3.3	80	SIP
BMR473	6.0-15	0.6-5.0	40	SIP/BGA
PNA	9-36	0.9-5.5	6	LGA

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