

# Features

## Regulated Converters

- 6-Side Shielding
- External ON/OFF control
- 1.6kVDC Isolation
- UL/CSA/EN-60950-1 Certified
- 4:1 Input Voltage Range
- Continuous Short Circuit Protection
- Efficiency up to 89.5%
- Fixed Switching Frequency

**RECOM**  
DC/DC Converter

## REC30-Z

**30 Watt**  
**2" x 1.6"**  
**Single and Dual Output**



### Description

The REC30-xxxxS\_DZ -series offer single and dual regulated outputs in a 2"x1.6" package with 1.6kVDC isolation and are suitable for higher power industrial applications. Remote on/off control is standard. The higher current outputs have raised output voltages to compensate for track losses as standard. The converter is fully certified to UL/EN/IEC safety standards.

### Selection Guide

| Part Number   | Input Voltage Range (VDC) | Output Voltage (VDC) | Output Current (mA) | Efficiency typ. (%) | max. Capacitive Load <sup>(1)</sup> (μF) |
|---------------|---------------------------|----------------------|---------------------|---------------------|------------------------------------------|
| REC30-243.4SZ | 9-36                      | 3.4                  | 6000                | 86.5                | 10000                                    |
| REC30-245.1SZ | 9-36                      | 5.1                  | 6000                | 87.5                | 6800                                     |
| REC30-2412SZ  | 9-36                      | 12                   | 2500                | 88.5                | 1800                                     |
| REC30-2415SZ  | 9-36                      | 15                   | 2000                | 89                  | 1000                                     |
| REC30-2412DZ  | 9-36                      | ±12                  | ±1250               | 88.5                | ±800                                     |
| REC30-2415DZ  | 9-36                      | ±15                  | ±1000               | 89                  | ±500                                     |
| REC30-483.4SZ | 18-75                     | 3.4                  | 6000                | 87                  | 10000                                    |
| REC30-485.1SZ | 18-75                     | 5.1                  | 6000                | 88                  | 6800                                     |
| REC30-4812SZ  | 18-75                     | 12                   | 2500                | 89                  | 1800                                     |
| REC30-4815SZ  | 18-75                     | 15                   | 2000                | 89.5                | 1000                                     |
| REC30-4812DZ  | 18-75                     | ±12                  | ±1250               | 88                  | ±800                                     |
| REC30-4815DZ  | 18-75                     | ±15                  | ±1000               | 88.5                | ±500                                     |

#### Notes:

Note1: Max. capacitive load is tested at nominal input voltage and full load.



**UL**  
E224736

IEC/EN60950-1 Certified  
UL60950 Certified  
CSA C22.2 NO. 60950 Certified  
EN55022 Certified

### Model Numbering



#### Ordering Examples:

REC30-4812SZ, Single Output, 18-75Vin (4:1) and 12Vout  
REC30-2412DZ, Dual Output, 9-36Vin (4:1) and ±12Vout

**Specifications** (measured at  $T_a = 25^\circ\text{C}$ , nominal input voltage, full load and after warm up unless otherwise specified)

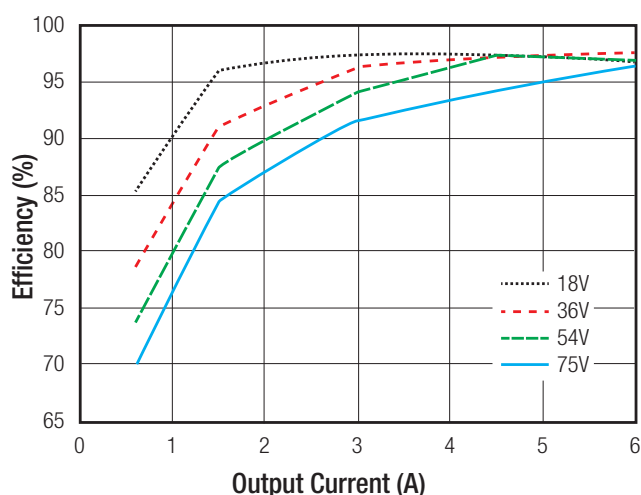
| BASIC CHARACTERISTICS                  |                                                          |                                                                                    |                    |                |
|----------------------------------------|----------------------------------------------------------|------------------------------------------------------------------------------------|--------------------|----------------|
| Parameter                              | Condition                                                | Min.                                                                               | Typ.               | Max.           |
| Input Voltage Range                    | nom. $V_{in} = 24\text{V}$<br>nom. $V_{in} = 48\text{V}$ | 9VDC<br>18VDC                                                                      |                    | 36VDC<br>75VDC |
| Start/up Time                          |                                                          |                                                                                    | 20ms               |                |
|                                        | nom. $V_{in} = 24\text{V}$                               | DC-DC ON<br>DC-DC OFF                                                              | 8.3VDC<br>7.9VDC   |                |
|                                        | nom. $V_{in} = 48\text{V}$                               | DC-DC ON<br>DC-DC OFF                                                              | 17.4VDC<br>16.7VDC |                |
| Remote ON/OFF                          | DC-DC ON<br>DC-DC OFF                                    | Open or $3\text{V} < V_r < 12\text{V}$<br>Short or $0\text{V} < V_r < 1.2\text{V}$ |                    |                |
| Operating Frequency                    |                                                          |                                                                                    | 350kHz             |                |
| Minimum Load                           |                                                          |                                                                                    | 0%                 |                |
| Output Ripple and Noise <sup>(2)</sup> |                                                          |                                                                                    |                    | 100mVp-p       |

**Notes:**

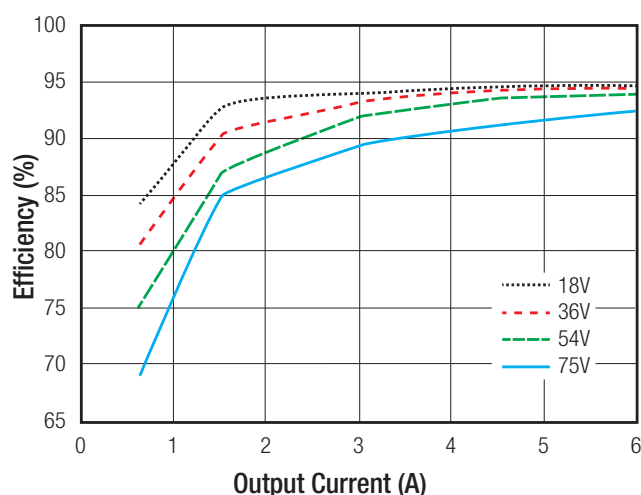
Note2: Ripple and Noise is measured with a 20MHz bandwidth and a 0.1 $\mu\text{F}$  ceramic capacitor.

**Efficiency vs. Load**

**REC30-485.1SZ**



**REC30-4815DZ**



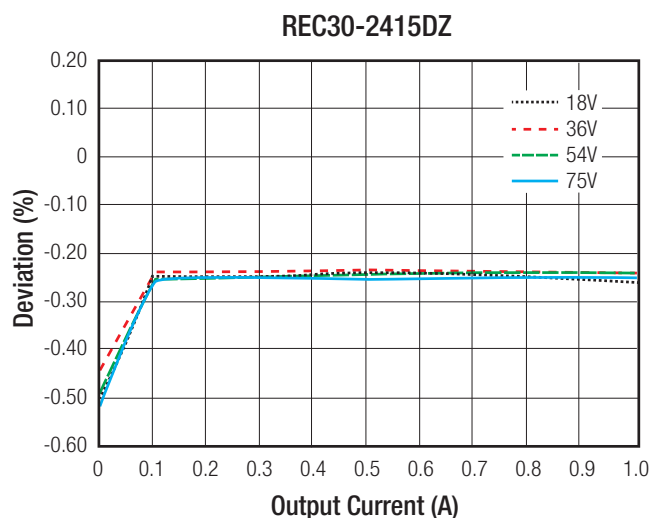
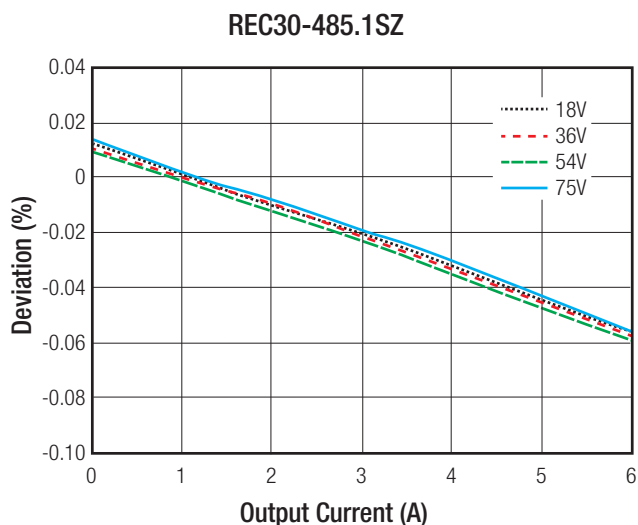
**REGULATIONS**

| Parameter                        | Condition                        | Type          | Values                 |
|----------------------------------|----------------------------------|---------------|------------------------|
| Output Voltage Accuracy          |                                  |               | $\pm 1\%$ max.         |
| Voltage Adjustability            |                                  |               | $\pm 10\%$ typ.        |
| Line Voltage Regulation          | low line to high line, full load |               | $\pm 0.2\%$ max.       |
| Load Voltage Regulation          | 10% to 100% load                 | single output | $\pm 0.5\%$ max.       |
|                                  |                                  | dual output   | $\pm 1\%$ max.         |
| Cross Regulation                 | 25% to 100% load                 | dual output   | $\pm 5\%$ max.         |
| Transient Response Recovery Time | 25% load step change             |               | 250 $\mu\text{s}$ typ. |

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**Specifications** (measured at  $T_a = 25^\circ\text{C}$ , nominal input voltage, full load and after warm up unless otherwise specified)

Deviation vs. Load



### PROTECTIONS

| Parameter                      | Condition           | Value                          |
|--------------------------------|---------------------|--------------------------------|
| Short Circuit Protection (SCP) |                     | continuous, automatic recovery |
| Over Voltage Protection (OVP)  | 3.4V <sub>out</sub> | 4VDC typ.                      |
|                                | 5.1V <sub>out</sub> | 6.2VDC typ.                    |
|                                | 12V <sub>out</sub>  | 15VDC typ.                     |
|                                | 15V <sub>out</sub>  | 18VDC typ.                     |
| Over Load Protection (OLP)     |                     | 180% typ.                      |
| Isolation Voltage              | I/P to O/P          | 1.6kVDC / 1 minute             |
| Isolation Capacitance          |                     | 3900pF typ.                    |
| Isolation Resistance           |                     | 1GΩ min.                       |

### ENVIRONMENTAL

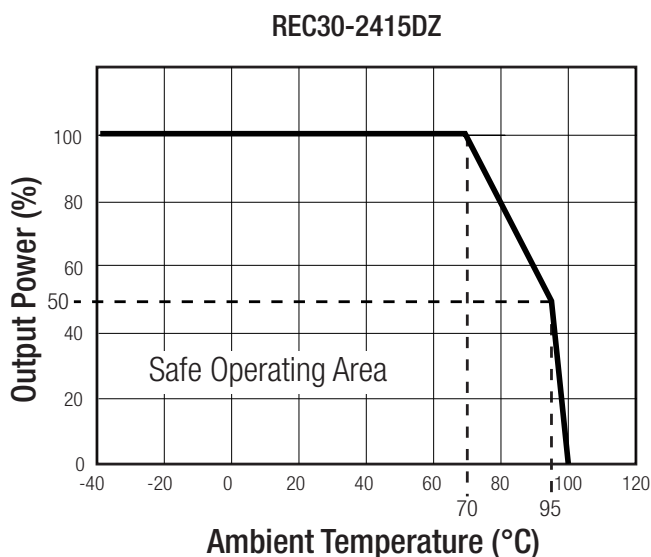
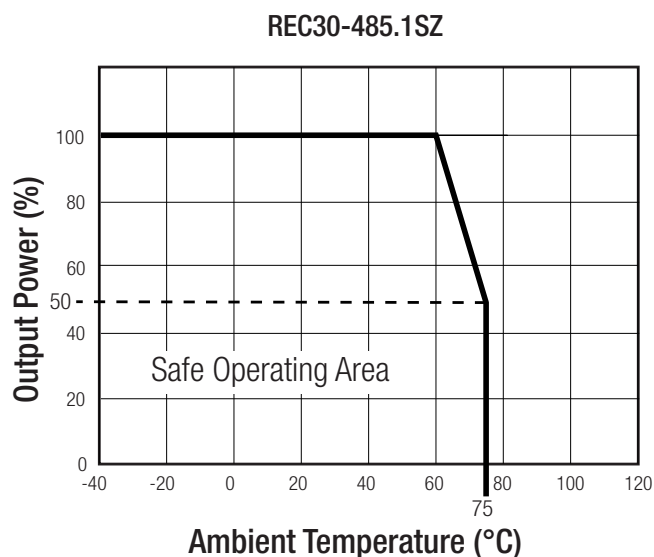
| Parameter                   | Condition                                                   | Value                        |
|-----------------------------|-------------------------------------------------------------|------------------------------|
| Operating Temperature Range | with derating                                               | -40°C to +85°C               |
| Maximum Case Temperature    |                                                             | +105°C                       |
| Temperature Coefficient     |                                                             | ±0.05%/°C                    |
| Thermal Impedance           | natural convection                                          | 8°C/W                        |
| Operating Altitude          |                                                             | 5000m                        |
| Operating Humidity          | non-condensing                                              | 5% - 95% RH max.             |
| Vibration                   |                                                             | MIL-STD-202G                 |
| MTBF                        | according to MIL-HDBK-217F, 25°C, referring to REC30-2415DZ | 1541 x 10 <sup>3</sup> hours |

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**Specifications** (measured at  $T_a = 25^\circ\text{C}$ , nominal input voltage, full load and after warm up unless otherwise specified)

### Derating Graph

@ nominal input voltage, full load and natural convection (20LFM)



### Notes:

Note3: For more details, please contact our technical support service at [TechsupportAT@recom-power.com](mailto:TechsupportAT@recom-power.com)

## SAFETY AND CERTIFICATIONS

| Certificate Type       | Report / File Number | Standard                      |
|------------------------|----------------------|-------------------------------|
| CB General Safety      | E224736              | IEC60950-1, 2nd Edition, 2013 |
| UL General Safety      | E224736              | UL60950-1, 2nd Edition, 2014  |
| EN General Safety      | E224736              | EN60950-1, 2nd Edition, 2013  |
| CAN/CSA General Safety | E224736              | C22.2 No. 60950-1-07, 2014    |

| EMC Compliance       | Condition                                     | Standard / Criterion    |
|----------------------|-----------------------------------------------|-------------------------|
| EMI <sup>(4)</sup>   | with external filter (see filter suggestions) | EN55022, Class A,B      |
| ESD                  | Air: $\pm 8\text{kV}$ ; Contact: $4\text{kV}$ | EN61000-4-2, Criteria B |
| Radiated Immunity    | $10\text{V/m}$                                | EN61000-4-3, Criteria A |
| Fast Transient       | $\pm 1\text{kV}$                              | EN61000-4-4, Criteria B |
| Surge <sup>(5)</sup> | $\pm 1\text{kV}$                              | EN61000-4-5, Criteria A |
| Conducted Immunity   | $10\text{Vr.m.s}$                             | EN61000-4-6, Criteria A |
| Power Magnetic Field | $50\text{Hz } 1\text{A/m (r.m.s)}$            | EN61000-4-8, Criteria A |

### Notes:

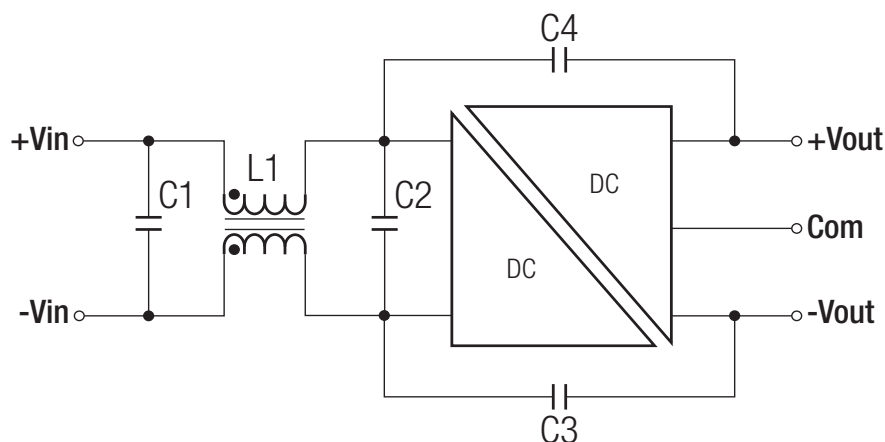
Note4: REC30-Z Series can meet EN55022 Class A without an external filter; meets Class B with external filter.

Note5: An external MOV is required if the module has to meet EN61000-4-5. The MOV suggest: NichTek SVI32-380

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**Specifications** (measured at  $T_a = 25^\circ\text{C}$ , nominal input voltage, full load and after warm up unless otherwise specified)

## EMC Filtering - Suggestions for Class B

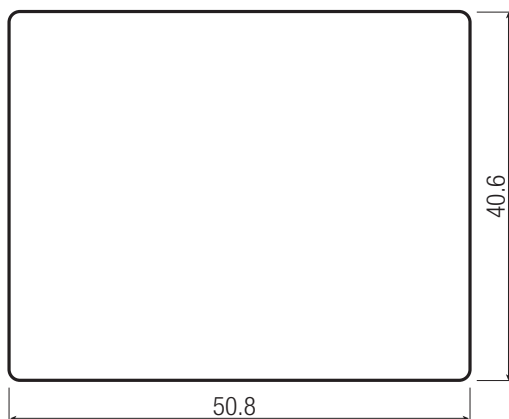


| MODEL        | C1               | C2              | L1             | C3         | C4         |
|--------------|------------------|-----------------|----------------|------------|------------|
| REC30-24xxSZ | 330 $\mu$ F/50V  | 10 $\mu$ F/50V  | 1.3mH<br>ref.: | 2200pF/3kV | NA         |
| REC30-48xxSZ | 330 $\mu$ F/100V | 10 $\mu$ F/100V | 1.3m<br>ref.:  | 2200pF/3kV | NA         |
| REC30-24xxDZ | 330 $\mu$ F/50V  | 10 $\mu$ F/50V  | 1.3mH<br>ref.: | 2200pF/3kV | 2200pF/3kV |
| REC30-48xxDZ | 330 $\mu$ F/100V | 10 $\mu$ F/100V | 1.3mH<br>ref.: | 2200pF/3kV | 2200pF/3kV |

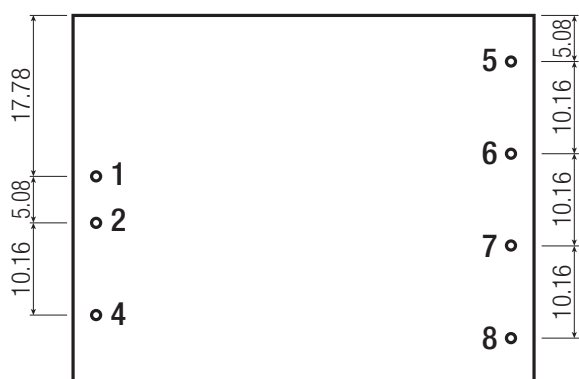
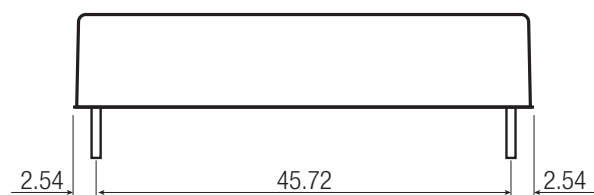
## DIMENSION and PHYSICAL CHARACTERISTICS

| Parameter                 | Type                    | Value                                                                   |
|---------------------------|-------------------------|-------------------------------------------------------------------------|
| Material                  | Case<br>Base<br>Potting | Nickel plated copper<br>non conductive black plastic<br>(UL94V-0) Epoxy |
| Package Dimension (LxWxH) |                         | 50.8 x 40.6 x 10.2mm                                                    |
| Package Weight            |                         | 48g                                                                     |

## Dimension Drawing (mm)



**Specifications** (measured at T<sub>a</sub>= 25°C, nominal input voltage, full load and after warm up unless otherwise specified)



### Pin Connections

| Pin # | Single        | Dual  |
|-------|---------------|-------|
| 1     | +Vin          | +Vin  |
| 2     | -Vin          | -Vin  |
| 4     | Remote ON/OFF |       |
| 5     | No Pin        | +Vout |
| 6     | +Vout         | Com   |
| 7     | -Vout         | -Vout |
| 8     | Trim          | Trim  |

Tolerance: xx.x= ±0.5mm

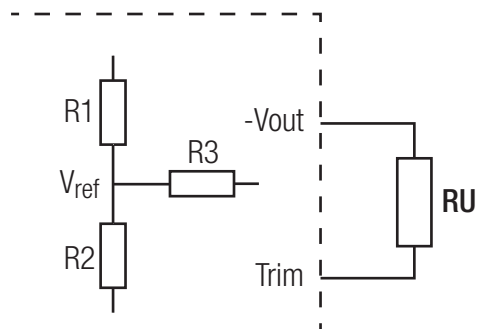
xx.xx= ±0.35mm

Pin: ±0.05mm

## INSTALLATION and APPLICATION

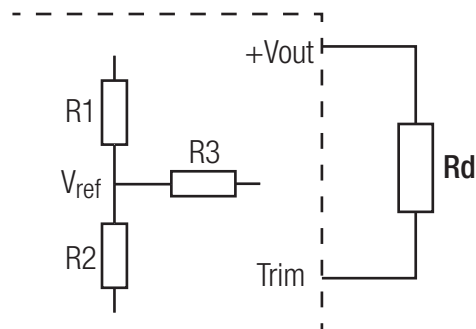
### External Output Voltage Trimming

Trim up



$$RU = \frac{aR2}{R2-a} - R3 \quad a = \frac{Vref}{V0 - Vref} \times R1$$

Trim down



$$Rd = \frac{bR1}{R1-b} - R3 \quad b = \frac{Vref}{V0 - Vref} \times R2$$

### Notes:

- Note6: RU and Rd is mean trim resistor, please check the formula.  
 Note7: a & b: user define parameter, no actual meanings.  
 Note8: V<sub>0</sub> is mean trim up/down voltage.  
 Note9: Value for R<sub>1</sub>, R<sub>2</sub>, R<sub>3</sub> and V<sub>ref</sub> refer to table.

| Output Voltage | 3.4V      | 5.1V      | 12V       | 15V       |
|----------------|-----------|-----------|-----------|-----------|
| R1             | 2.1K      | 2.55K     | 9.53K     | 9.09K     |
| R2             | 1.198561K | 2.449341K | 2.498617K | 1.810845K |
| R3             | 6.8K      | 9.76K     | 16.9K     | 13K       |
| Vref           | 1.240     | 2.500     | 2.500     | 2.500     |

**Specifications** (measured at  $T_a = 25^\circ\text{C}$ , nominal input voltage, full load and after warm up unless otherwise specified)

### PACKAGING INFORMATION

|                             |      |                       |
|-----------------------------|------|-----------------------|
| Packaging Dimension (LxWxH) | Tube | 520.0 x 54.5 x 21.0mm |
| Packaging Quantity          |      | 11pcs                 |
| Storage Temperature Range   |      | -55°C to +125°C       |



Компания «ЭлектроПласт» предлагает заключение долгосрочных отношений при поставках импортных электронных компонентов на взаимовыгодных условиях!

Наши преимущества:

- Оперативные поставки широкого спектра электронных компонентов отечественного и импортного производства напрямую от производителей и с крупнейших мировых складов;
- Поставка более 17-ти миллионов наименований электронных компонентов;
- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
- Техническая поддержка проекта, помощь в подборе аналогов, поставка прототипов;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
- Лицензия ФСБ на осуществление работ с использованием сведений, составляющих государственную тайну;
- Поставка специализированных компонентов (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Aeroflex, Peregrine, Syfer, Eurofarad, Texas Instrument, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits, General Dynamics и др.);

Помимо этого, одним из направлений компании «ЭлектроПласт» является направление «Источники питания». Мы предлагаем Вам помощь Конструкторского отдела:

- Подбор оптимального решения, техническое обоснование при выборе компонента;
- Подбор аналогов;
- Консультации по применению компонента;
- Поставка образцов и прототипов;
- Техническая поддержка проекта;
- Защита от снятия компонента с производства.



#### Как с нами связаться

**Телефон:** 8 (812) 309 58 32 (многоканальный)

**Факс:** 8 (812) 320-02-42

**Электронная почта:** [org@eplast1.ru](mailto:org@eplast1.ru)

**Адрес:** 198099, г. Санкт-Петербург, ул. Калинина, дом 2, корпус 4, литера А.