

## DUAL AUDIO POWER AMPLIFIER

### ■ GENERAL DESCRIPTION

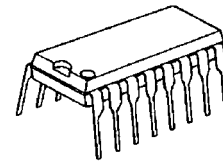
The NJW1105 is a dual audio amplifier which supplies 2.4W ( 1.2W/channel ) to 8Ω loads at 5V. Its features are wide operating voltage range from 4V to 12V and low consumption output by Bi-MOS technology.

The NJW1105 is suitable for speaker amplifier required high output power, such as personal computers, camcorders, and others. It includes thermally protected and mute on/off circuit.

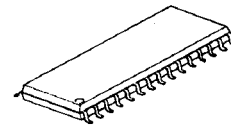
### ■ FEATURES

- Operating Voltage (  $V^+ = 4V \sim 12V$  )
- Output Power ( 1.2W/ch at  $V^+ = 5V, R_L = 8\Omega$  )
- Supply Current ( 35mA MAX. )
- Supply Current on Mute ( 3.5mA MAX. )
- Bi-MOS Technology
- Package Outline DIP16, SDMP30, SSOP20-F1

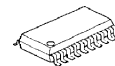
### ■ PACKAGE OUTLINE



NJW1105D

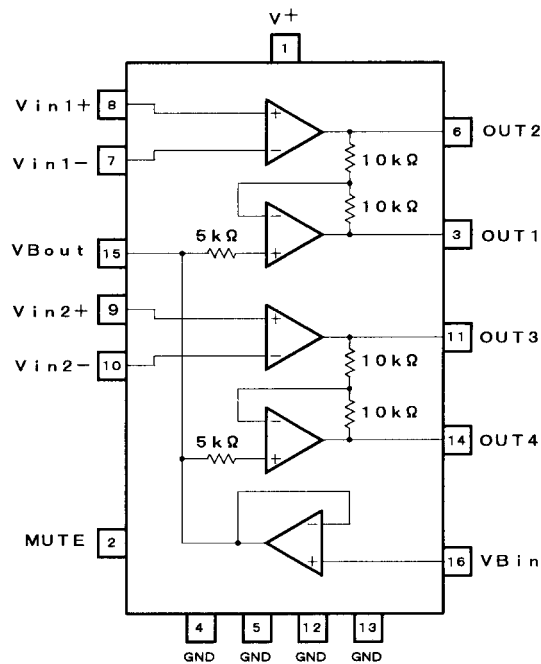


NJW1105M



NJW1105VF1

### ■ BLOCK DIAGRAM



( Package DIP16 )

# NJW1105

## ■ ABSOLUTE MAXIMUM RATINGS

( Ta=25°C )

| PARAMETER                   | SYMBOL           | RATINGS  | UNIT |
|-----------------------------|------------------|--|------|
| Supply Voltage              | V <sup>+</sup>   | 15   | V    |
| Operating Current           | I <sub>o</sub>   | 1  | A    |
| Mute Terminal Current       | I <sub>M</sub>   | 1.0  | mA   |
| Power Dissipation           | P <sub>D</sub>   | ( SSOP20 ) 0.75<br>( DIP16 ) 1.9<br>( SDMP30 ) 1.8 ( note1 ) | W    |
| Operating Temperature Range | T <sub>opr</sub> | -40~+85  | °C   |
| Storage Temperature Range   | T <sub>stg</sub> | -40~+150   | °C   |

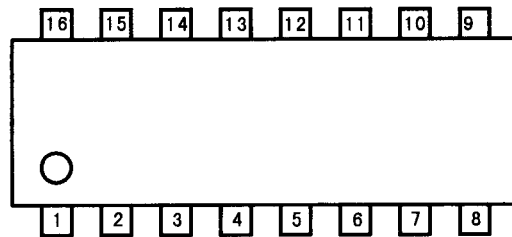
( note 1 ) At on PC board.

## ■ ELECTRICAL CHARACTERISTICS

( V<sup>+</sup>=5.0V, Ta=25°C )

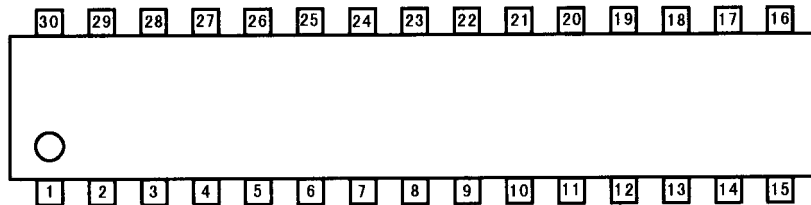
| PARAMETER                         | SYMBOL           | TEST CONDITION  | MIN. | TYP. | MAX. | UNIT |
|-----------------------------------|------------------|---|------|------|------|------|
| [ ALL ]                           |                  |   |      |      |      |      |
| Operating Supply Voltage Range    | V <sup>+</sup>   |   | 4    | 5    | 12   | V    |
| Mute OFF Current Dissipation      | I <sub>cc1</sub> | V <sub>M</sub> =4.2V, V <sub>IN</sub> =2.5V             | -    | 20   | 35   | mA   |
| Mute ON Current Dissipation       | I <sub>cc2</sub> | V <sub>M</sub> =0V, V <sub>IN</sub> =2.5V               | -    | 2    | 3.5  | mA   |
| [ POWER AMPLIFIER ]               |                  |   |      |      |      |      |
| Output Offset Voltage             | ΔV <sub>O</sub>  | R <sub>L</sub> =8Ω                                      | -50  | -    | 50   | mV   |
| Input Bias Current                | I <sub>B</sub>   |   | -    | -    | 300  | nA   |
| Output Power                      | P <sub>O1</sub>  | THD=10%, f=1kHz, R <sub>L</sub> =8Ω                     | -    | 1.2  | -    | W    |
|                                   | P <sub>O2</sub>  | THD=10%, f=1kHz, R <sub>L</sub> =8Ω, V <sup>+</sup> =7V | -    | 2.5  | -    | W    |
| Total Harmonic Distortion         | THD              | R <sub>L</sub> =8Ω, P <sub>O</sub> =800mW, f=1kHz       | -    | 0.35 | -    | %    |
| Power Supply Rejection Ratio      | PSRR             | f=1kHz  | -    | 45   | -    | dB   |
| Voltage Gain                      | A <sub>V</sub>   | AMP2, AMP3, R <sub>L</sub> =2kΩ, V <sub>IN</sub> =2.5V  | 35   | 50   | -    | dB   |
| [ BUFFER AMPLIFIER ]              |                  |   |      |      |      |      |
| Input Output Potential Difference | V <sub>BO</sub>  |   | -30  | 0    | 30   | mV   |
| Input Voltage Range               | V <sub>BI</sub>  |   | 1.5  | 2.5  | 3.5  | V    |
| Output Voltage Range              | ΔV <sub>BO</sub> | I <sub>L</sub> =-5mA, I <sub>L</sub> =+5mA              | -    | -    | -50  | mV   |
| [ MUTING ]                        |                  |   |      |      |      |      |
| Mute OFF Voltage                  | V <sub>MH</sub>  |   | 3.5  | 4.2  | -    | V    |
| Mute ON Voltage                   | V <sub>ML</sub>  |   | -    | 0.8  | 1.0  | V    |
| Mute Sink Current                 | I <sub>M</sub>   | V <sub>M</sub> =5V                                      | 70   | 100  | 130  | μA   |

## ■ PIN CONFIGURATION



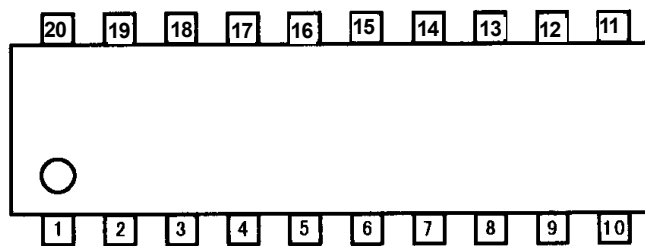
DIP16

- |                   |              |
|-------------------|--------------|
| 1. V <sup>+</sup> | 9. Vin2 (+)  |
| 2. MUTE           | 10. Vin2 (-) |
| 3. OUT1           | 11. OUT3     |
| 4. GND            | 12. GND      |
| 5. GND            | 13. GND      |
| 6. OUT2           | 14. OUT4     |
| 7. Vin1 (-)       | 15. VBout    |
| 8. Vin1 (+)       | 16. VBin     |



SDMP30

- |                   |              |
|-------------------|--------------|
| 1. GND            | 16. GND      |
| 2. GND            | 17. GND      |
| 3. OUT4           | 18. OUT2     |
| 4. NC             | 19. NC       |
| 5. NC             | 20. NC       |
| 6. VBout          | 21. Vin1 (-) |
| 7. VBin           | 22. Vin1 (+) |
| 8. NC             | 23. NC       |
| 9. V <sup>+</sup> | 24. Vin2 (+) |
| 10. MUTE          | 25. Vin2 (-) |
| 11. NC            | 26. NC       |
| 12. NC            | 27. NC       |
| 13. OUT1          | 28. OUT3     |
| 14. GND           | 29. GND      |
| 15. GND           | 30. GND      |



## SSOP-20

- |                   |             |
|-------------------|-------------|
| 1. V <sup>+</sup> | 11. Vin2(+) |
| 2. V <sup>+</sup> | 12. Vin2(-) |
| 3. MUTE           | 13. OUT3    |
| 4. OUT1           | 14. GND     |
| 5. GND            | 15. GND     |
| 6. GND            | 16. OUT4    |
| 7. OUT2           | 17. NC      |
| 8. Vin1(-)        | 18. NC      |
| 9. Vin1(+)        | 19. VBout   |
| 10. NC            | 20. VBin    |

## ■ TERMINAL EXPLANATION

| PIN NO.            |                    |   | PIN NAME | FUNCTION  | INSIDE EQUIVALENT CIRCUIT |
|--------------------|--------------------|---|----------|---|---------------------------|
| SSOP-20            | DIP-16             | SDMP-30   |          |   |                           |
| 5<br>6<br>14<br>15 | 4<br>5<br>12<br>13 | 1<br>2<br>14<br>15<br>16<br>17<br>29<br>30            | GND      | Recommend expanding the island in order to heat radiation properties.   |                           |
| 16                 | 14                 | 3   | OUT4     | Output terminal of AMP4.<br>OUT4 signal is opposite phase against OUT3. |                           |
| 10<br>17<br>18     | -                  | 4<br>5<br>8<br>11<br>12<br>19<br>20<br>23<br>26<br>27 | NC       | Non-connection terminal.<br>Recommend connecting to GND.                |                           |

# NJW1105

## ■ TERMINAL EXPLANATION

| PIN NO. |        |         | PIN NAME | FUNCTION   | INSIDE EQUIVALENT CIRCUIT  |
|---------|--------|---------|----------|--|--|
| SSOP-20 | DIP-16 | SDMP-30 |          |  |  |
| 19      | 15     | 6       | VBout    | An buffer amplifier output.                        | <p>The diagram shows a push-pull output stage. The output node is connected to a 400Ω resistor. The circuit is powered by V+ and GND.</p>                        |
| 20      | 16     | 7       | VBin     | An buffer amplifier input.                         | <p>The diagram shows a differential input stage. The input nodes are connected to 400Ω resistors. The circuit is powered by V+ and GND.</p>                      |
| 1<br>2  | 1      | 9       | Vcc      | Supply Voltage.                                    |  |
| 3       | 2      | 10      | MUTE     | A mute input.<br>Pull down by 50kΩ (TYP) resistor. | <p>The diagram shows a mute input stage. The input node is connected to a 400Ω resistor and a 50kΩ pull-down resistor. The circuit is powered by V+ and GND.</p> |

## ■ TERMINAL EXPLANATION

| PIN NO. |        |         | PIN NAME | FUNCTION   | INSIDE EQUIVALENT CIRCUIT |
|---------|--------|---------|----------|--|---------------------------|
| SSOP-20 | DIP-16 | SDMP-30 |          |  |                           |
| 4       | 3      | 13      | OUT1     | Output terminal of AMP.1.<br>OUT1 signal is opposite phase against OUT2. |                           |
| 7       | 6      | 18      | OUT2     | Output terminal of AMP.2.  |                           |
| 8       | 7      | 21      | Vin1(-)  | Inverting input terminal of AMP.2.                                       |                           |
| 9       | 8      | 22      | Vin1(+)  | Non-inverting input terminal of AMP.2.                                   |                           |

# NJW1105

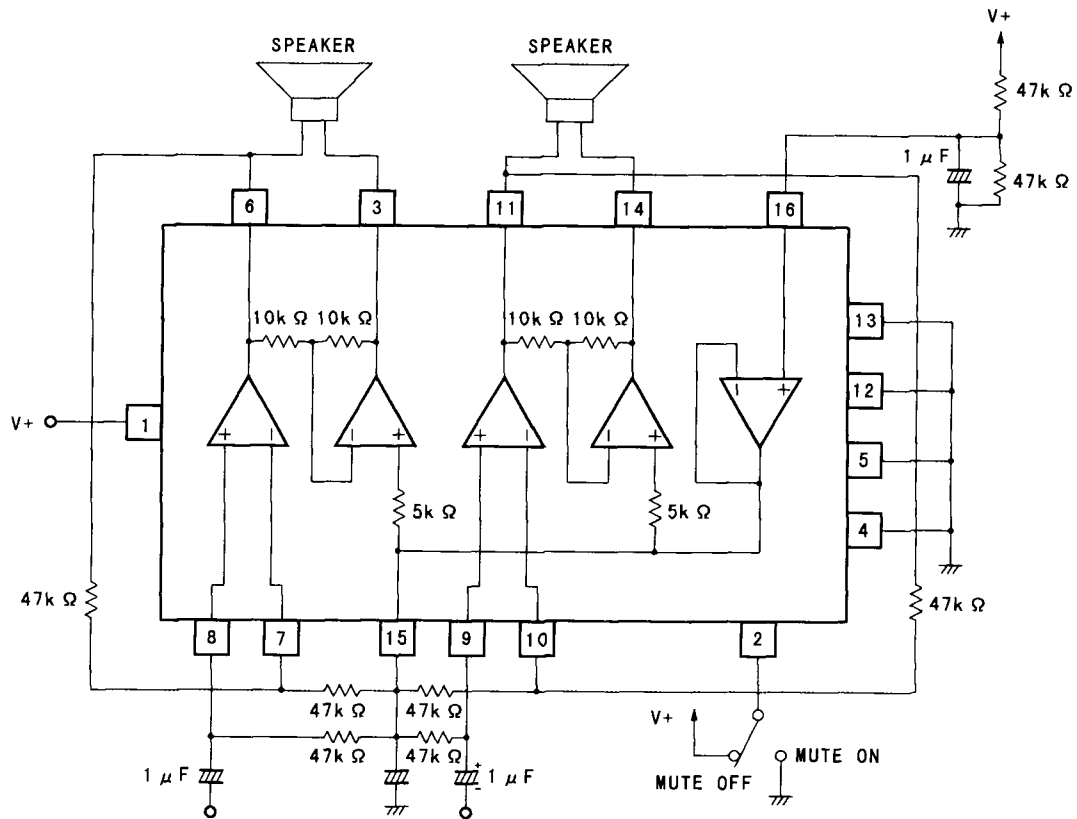
## ■ TERMINAL EXPLANATION

| PIN NO. |        |         | PIN NAME | FUNCTION                              | INSIDE EQUIVALENT CIRCUIT |
|---------|--------|---------|----------|---------------------------------------|---------------------------|
| SSOP-20 | DIP-16 | SDMP-30 |          |                                       |                           |
| 11      | 9      | 24      | Vin2(+)  | Inverting input terminal of AMP3.     |                           |
| 12      | 10     | 25      | Vin2(-)  | Non-inverting input terminal of AMP3. |                           |
| 13      | 11     | 28      | OUT3     | Output terminal of AMP3.              |                           |



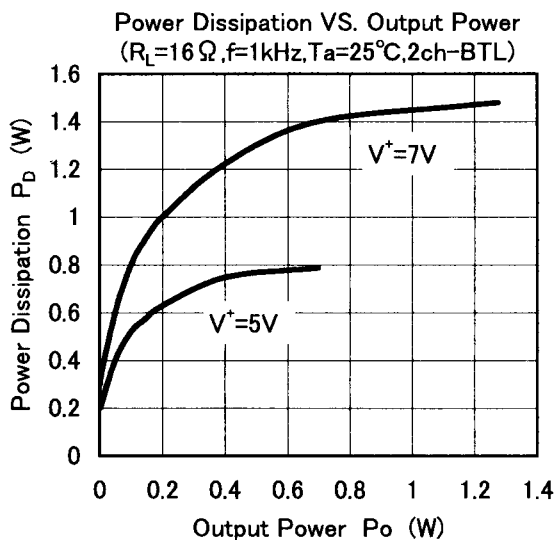
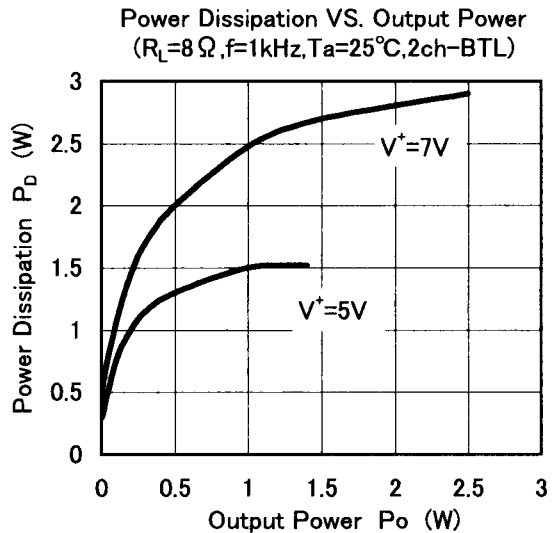
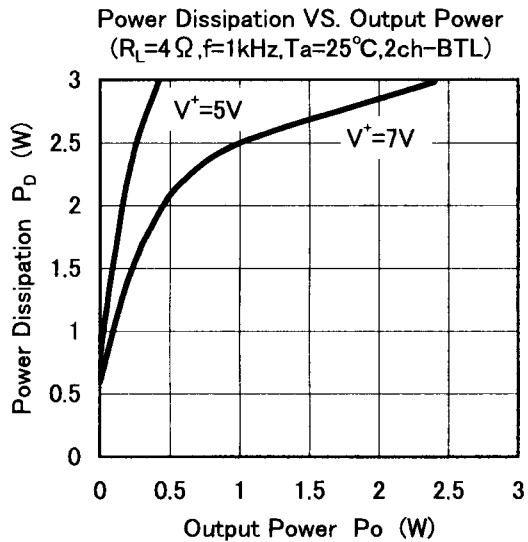
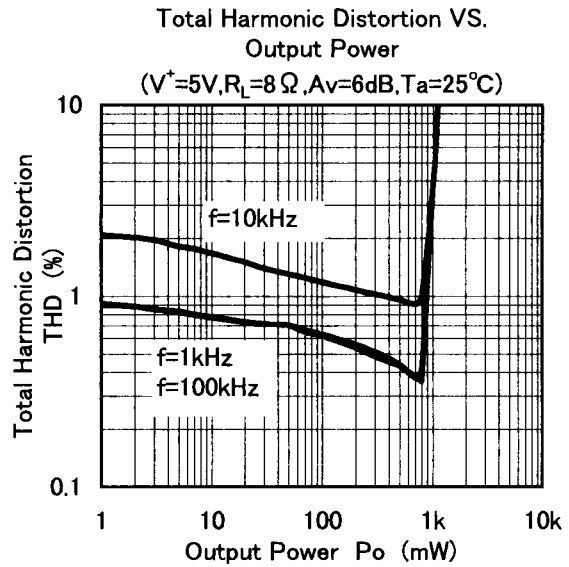
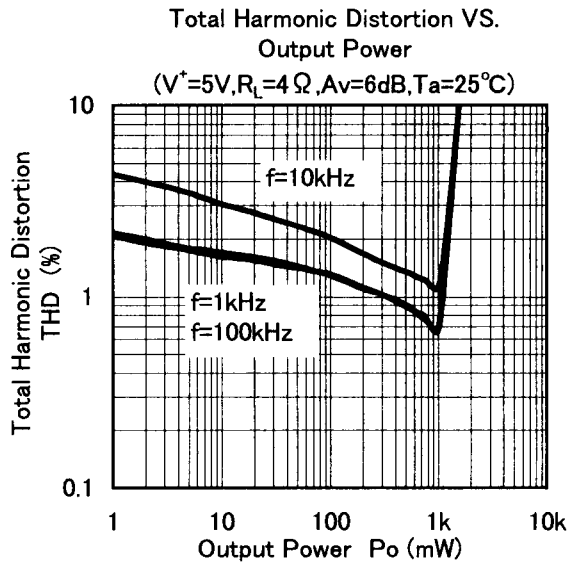
## APPLICATION CIRCUIT

(1) BTL

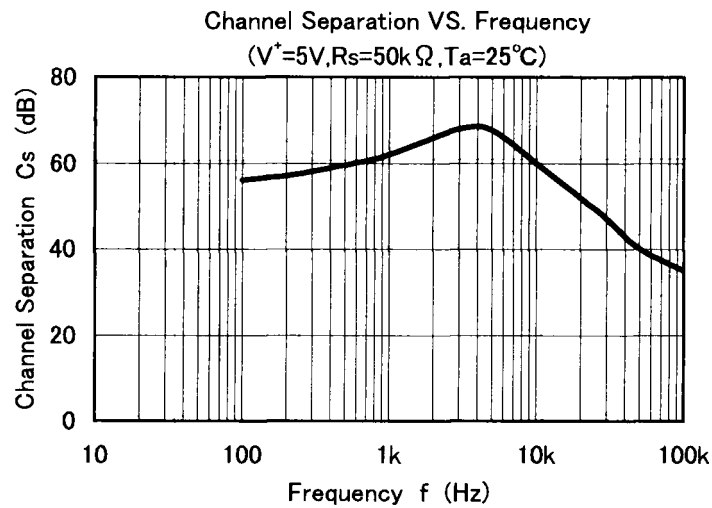
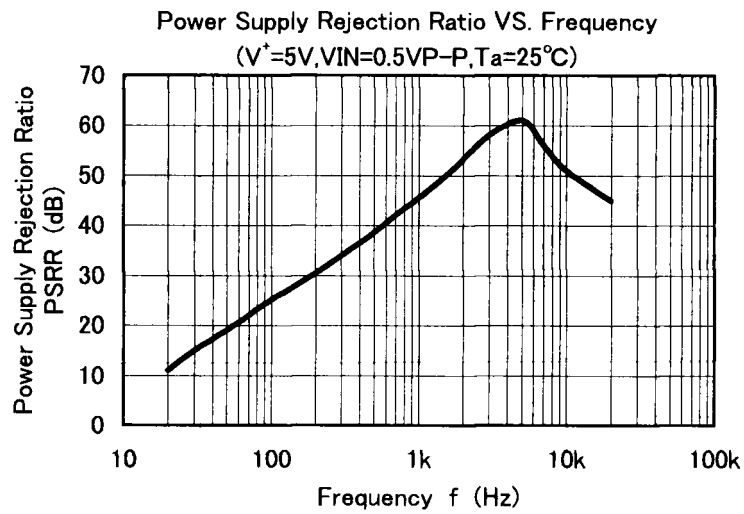


(The number in "( )" indicates a pin number of SDMP.)

## ■ TYPICAL CHARACTERISTICS



## ■ TYPICAL CHARACTERISTICS



**[CAUTION]**

The specifications on this databook are only given for information, without any guarantee as regards either mistakes or omissions. The application circuits in this databook are described only to show representative usages of the product and not intended for the guarantee or permission of any right including the industrial rights.



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.