

MC10ELT22, MC100ELT22

5.0 V Dual TTL to Differential PECL Translator

The MC10ELT/100ELT22 is a dual TTL to differential PECL translator. Because PECL (Positive ECL) levels are used only +5 V and ground are required. The small outline 8-lead package and the low skew, dual gate design of the ELT22 makes it ideal for applications which require the translation of a clock and a data signal.

Features

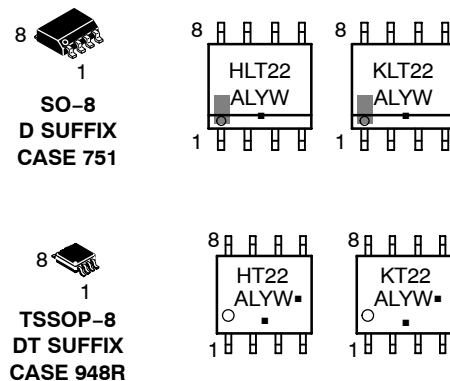
- 1.2 ns Typical Propagation Delay
- < 300 ps Typical Output to Output Skew
- PNP TTL Inputs for Minimal Loading
- Flow Through Pinouts
- Operating Range: $V_{CC} = 4.75 \text{ V}$ to 5.25 V with $GND = 0 \text{ V}$
- No Internal Input Pulldown Resistors
- Pb-Free Packages are Available



ON Semiconductor®

<http://onsemi.com>

MARKING DIAGRAMS*



H = MC10
K = MC100
A = Assembly Location
L = Wafer Lot
Y = Year
W = Work Week
▪ = Pb-Free Package

(Note: Microdot may be in either location)

*For additional information, see Application Note AND8002/D.

ORDERING INFORMATION

See detailed ordering and shipping information in the package dimensions section on page 5 of this data sheet.

MC10ELT22, MC100ELT22

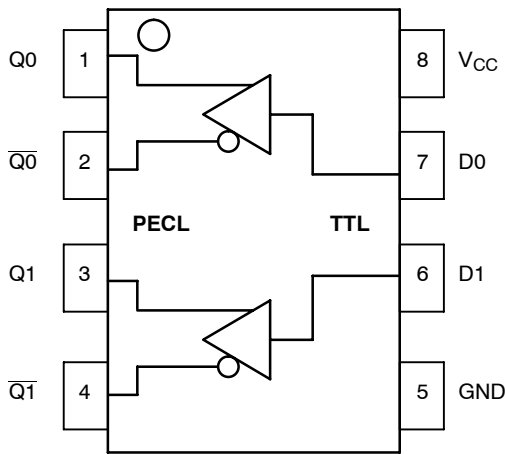


Table 1. PIN DESCRIPTION

| Pin | Function |
|---------------------|----------------------------|
| Qn, \overline{Qn} | PECL Differential Outputs* |
| Dn | TTL Inputs |
| V _{CC} | Positive Supply |
| GND | Ground |

*Output state undetermined when inputs are open.

Figure 1. Logic Diagram and Pinout Assignment

Table 2. ATTRIBUTES

| Characteristics | Value |
|---|-----------------------------------|
| Internal Input Pulldown Resistor | N/A |
| Internal Input Pullup Resistor | N/A |
| ESD Protection | Human Body Model Machine Model |
| | > 2 kV > 200 V |
| Moisture Sensitivity, Indefinite Time Out of Drypack (Note 1) | Level 1 |
| Flammability Rating | Oxygen Index: 28 to 34 |
| | UL 94 V-0 @ 0.125 in |
| Transistor Count | 51 |
| Meets or exceeds JEDEC Spec EIA/JESD78 IC Latchup Test | |

1. For additional information, see Application Note AND8003/D.

MC10ELT22, MC100ELT22

Table 3. MAXIMUM RATINGS

| Symbol | Parameter | Condition 1 | Condition 2 | Rating | Units |
|------------------|--|---------------------|--------------------|--|--------------|
| V _{CC} | Positive Power Supply | GND = 0 V | | 7 | V |
| V _{IN} | Input Voltage | GND = 0 V | | $GND + 0.025 \leq V_I \leq V_{CC} - 0.025$ | V |
| I _{out} | Output Current | Continuous Surge | | 50 100 | mA mA |
| T _A | Operating Temperature Range | | | -40 to +85 | °C |
| T _{stg} | Storage Temperature Range | | | -65 to +150 | °C |
| θ _{JA} | Thermal Resistance (Junction-to-Ambient) | 0 lfpm 500 lfpm | 8 SOIC 8 SOIC | 190 130 | °C/W °C/W |
| θ _{JC} | Thermal Resistance (Junction-to-Case) | Standard Board | 8 SOIC | 41 to 44 | °C/W |
| θ _{JA} | Thermal Resistance (Junction-to-Ambient) | 0 lfpm 500 lfpm | 8 TSSOP 8 TSSOP | 185 140 | °C/W °C/W |
| θ _{JC} | Thermal Resistance (Junction-to-Case) | Standard Board | 8 TSSOP | 41 to 44 ± 5% | °C/W |
| T _{sol} | Wave Solder | <2 to 3 sec @ 248°C | | 265 | °C |

Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.

Table 4. 10ELT SERIES PECL DC CHARACTERISTICS V_{CC} = 5.0 V; GND = 0.0 V (Note 2)

| Symbol | Characteristic | -40°C | | | 25°C | | | 85°C | | | Unit |
|-----------------|------------------------------|-------|------|------|------|------|------|------|------|------|------|
| | | Min | Typ | Max | Min | Typ | Max | Min | Typ | Max | |
| I _{CC} | Power Supply Current | | | 22 | | | 22 | | | 22 | mA |
| V _{OH} | Output HIGH Voltage (Note 3) | 3920 | 4010 | 4110 | 4020 | 4105 | 4190 | 4090 | 4185 | 4280 | mV |
| V _{OL} | Output LOW Voltage (Note 3) | 3050 | 3200 | 3350 | 3050 | 3210 | 3370 | 3050 | 3227 | 3405 | mV |

NOTE: Device will meet the specifications after thermal equilibrium has been established when mounted in a test socket or printed circuit board with maintained transverse airflow greater than 500 lfpm. Electrical parameters are guaranteed only over the declared operating temperature range. Functional operation of the device exceeding these conditions is not implied. Device specification limit values are applied individually under normal operating conditions and not valid simultaneously.

- Output parameters vary 1:1 with V_{CC}. V_{CC} can vary ± 0.25 V.
- Outputs are terminated through a 50 Ω resistor to V_{CC} - 2.0 V.

Table 5. 100ELT SERIES PECL DC CHARACTERISTICS V_{CC} = 5.0 V; GND = 0.0 V (Note 4)

| Symbol | Characteristic | -40°C | | | 25°C | | | 85°C | | | Unit |
|-----------------|------------------------------|-------|------|------|------|------|------|------|------|------|------|
| | | Min | Typ | Max | Min | Typ | Max | Min | Typ | Max | |
| I _{CC} | Power Supply Current | | | 22 | | | 22 | | | 22 | mA |
| V _{OH} | Output HIGH Voltage (Note 5) | 3915 | 3995 | 4120 | 3975 | 4045 | 4120 | 3975 | 4050 | 4120 | mV |
| V _{OL} | Output LOW Voltage (Note 5) | 3170 | 3305 | 3445 | 3190 | 3295 | 3380 | 3190 | 3295 | 3380 | mV |

NOTE: Device will meet the specifications after thermal equilibrium has been established when mounted in a test socket or printed circuit board with maintained transverse airflow greater than 500 lfpm. Electrical parameters are guaranteed only over the declared operating temperature range. Functional operation of the device exceeding these conditions is not implied. Device specification limit values are applied individually under normal operating conditions and not valid simultaneously.

- Output parameters vary 1:1 with V_{CC}. V_{CC} can vary ± 0.25 V.
- Outputs are terminated through a 50 Ω resistor to V_{CC} - 2.0 V.

MC10ELT22, MC100ELT22

Table 6. TTL INPUT DC CHARACTERISTICS $V_{CC} = 4.75\text{ V to }5.25\text{ V}$; $T_A = -40^\circ\text{C to }85^\circ\text{C}$

| Symbol | Characteristic | Condition | Min | Typ | Max | Unit |
|-----------|---------------------------|---|---------------|-----|---------------------------|---------------|
| I_{IH} | Input HIGH Current | $V_{IN} = 2.7\text{ V}$; $V_{IN} = (V_{CC} - 0.025)\text{ V}$ | | | 20 | μA |
| I_{IHH} | Input HIGH Current | $V_{IN} = 7.0\text{ V}$ | | | 100 | μA |
| I_{IL} | Input LOW Current | $V_{IN} = 0.5\text{ V}$; $V_{IN} = (\text{GND} + 0.025)\text{ V}$ | | | -0.6 | mA |
| V_{IK} | Input Clamp Diode Voltage | $I_{IN} = -18\text{ mA}$ | | | -1.2 | V |
| V_{IH} | Input HIGH Voltage | | 2.0 | | $V_{CC} - 0.025\text{ V}$ | V |
| V_{IL} | Input LOW Voltage | | GND + 0.025 V | | 0.8 | V |

NOTE: Device will meet the specifications after thermal equilibrium has been established when mounted in a test socket or printed circuit board with maintained transverse airflow greater than 500 lfm. Electrical parameters are guaranteed only over the declared operating temperature range. Functional operation of the device exceeding these conditions is not implied. Device specification limit values are applied individually under normal operating conditions and not valid simultaneously.

Table 7. AC CHARACTERISTICS $V_{CC} = 4.75\text{ V to }5.25\text{ V}$; $\text{GND} = 0.0\text{ V}$

| Symbol | Characteristic | -40°C | | | 25°C | | | 85°C | | | Unit |
|--------------|---|-------|-----------|------------|------|-----------|------------|------|-----------|------------|------|
| | | Min | Typ | Max | Min | Typ | Max | Min | Typ | Max | |
| f_{MAX} | Maximum Input Frequency | | | | | 500 | | | | | MHz |
| t_{PLH} | Propagation Delay (Note 6) 1.5 V to 50% | 0.6 | | 1.2 | 0.9 | 1.2 | 1.5 | 0.6 | | 1.35 | ns |
| t_{PHL} | Propagation Delay (Note 6) 1.5 V to 50% | 0.4 | | 1.0 | 0.5 | 0.8 | 1.1 | 0.7 | | 1.30 | ns |
| t_{skew} | Within-Device Skew (Note 7) Device-to-Device Skew (Note 8) | | 50 300 | 100 600 | | 50 300 | 100 600 | | 50 350 | 100 750 | ps |
| t_{JITTER} | CLOCK Random Jitter (RMS) | | | | | 0.5 | | | | | ps |
| t_r/t_f | Output Rise/Fall Time (20-80%) | 0.4 | | 1.6 | 0.4 | | 1.6 | 0.4 | | 1.6 | ns |

NOTE: Device will meet the specifications after thermal equilibrium has been established when mounted in a test socket or printed circuit board with maintained transverse airflow greater than 500 lfm. Electrical parameters are guaranteed only over the declared operating temperature range. Functional operation of the device exceeding these conditions is not implied. Device specification limit values are applied individually under normal operating conditions and not valid simultaneously.

6. Specifications for standard TTL input signal.
7. Skew is measured between outputs under identical transitions and conditions on any one device.
8. Device-to-Device Skew for identical transitions at identical V_{CC} levels.

MC10ELT22, MC100ELT22

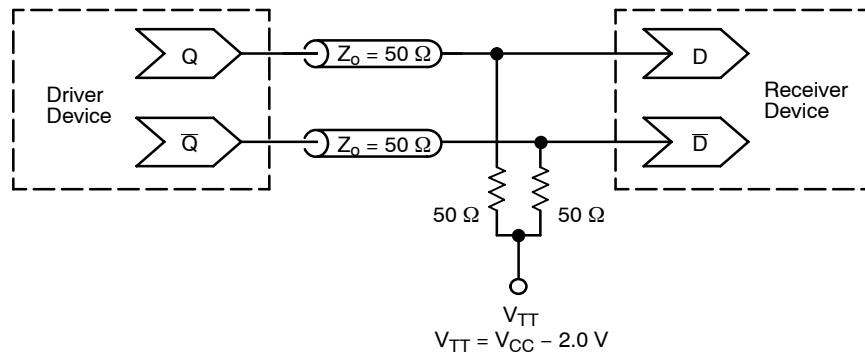


Figure 2. Typical Termination for Output Driver and Device Evaluation
(See Application Note AND8020/D – Termination of ECL Logic Devices.)

ORDERING INFORMATION

| Device | Package | Shipping [†] |
|-----------------|----------------------|-----------------------|
| MC10ELT22D | SO-8 | 98 Units / Rail |
| MC10ELT22DG | SO-8 (Pb-Free) | 98 Units / Rail |
| MC10ELT22DR2 | SO-8 | 2500 Tape & Reel |
| MC10ELT22DR2G | SO-8 (Pb-Free) | 2500 Tape & Reel |
| MC10ELT22DT | TSSOP-8 | 100 Units / Rail |
| MC10ELT22DTG | TSSOP-8 (Pb-Free) | 100 Units / Rail |
| MC10ELT22DTR2 | TSSOP-8 | 2500 Tape & Reel |
| MC10ELT22DTR2G | TSSOP-8 (Pb-Free) | 2500 Tape & Reel |
| MC100ELT22D | SO-8 | 98 Units / Rail |
| MC100ELT22DG | SO-8 (Pb-Free) | 98 Units / Rail |
| MC100ELT22DR2 | SO-8 | 2500 Tape & Reel |
| MC100ELT22DR2G | SO-8 (Pb-Free) | 2500 Tape & Reel |
| MC100ELT22DT | TSSOP-8 | 100 Units / Rail |
| MC100ELT22DTG | TSSOP-8 (Pb-Free) | 100 Units / Rail |
| MC100ELT22DTR2 | TSSOP-8 | 2500 Tape & Reel |
| MC100ELT22DTR2G | TSSOP-8 (Pb-Free) | 2500 Tape & Reel |

[†]For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specification Brochure, BRD8011/D.

MC10ELT22, MC100ELT22

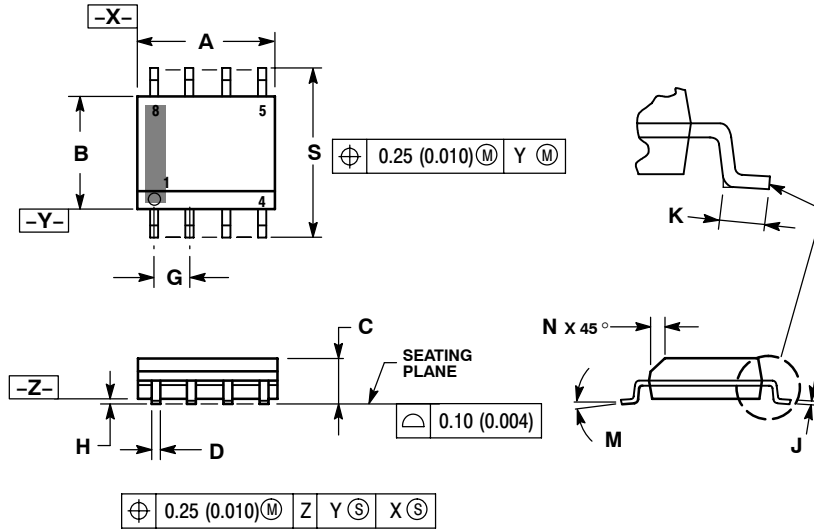
Resource Reference of Application Notes

- AN1405/D** – ECL Clock Distribution Techniques
- AN1406/D** – Designing with PECL (ECL at +5.0 V)
- AN1503/D** – ECLinPS™ I/O SPiCE Modeling Kit
- AN1504/D** – Metastability and the ECLinPS Family
- AN1568/D** – Interfacing Between LVDS and ECL
- AN1672/D** – The ECL Translator Guide
- AND8001/D** – Odd Number Counters Design
- AND8002/D** – Marking and Date Codes
- AND8020/D** – Termination of ECL Logic Devices
- AND8066/D** – Interfacing with ECLinPS
- AND8090/D** – AC Characteristics of ECL Devices

MC10ELT22, MC100ELT22

PACKAGE DIMENSIONS

SOIC-8 NB
CASE 751-07
ISSUE AH

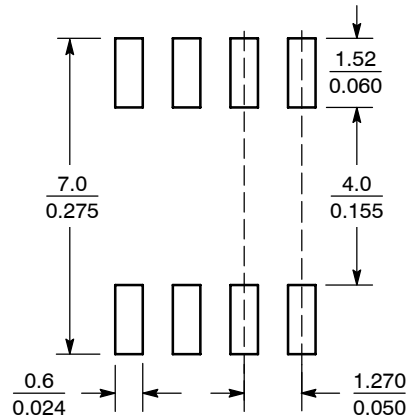


NOTES:

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: MILLIMETER.
3. DIMENSION A AND B DO NOT INCLUDE MOLD PROTRUSION.
4. MAXIMUM MOLD PROTRUSION 0.15 (0.006) PER SIDE.
5. DIMENSION D DOES NOT INCLUDE DAMBAR PROTRUSION. ALLOWABLE DAMBAR PROTRUSION SHALL BE 0.127 (0.005) TOTAL IN EXCESS OF THE D DIMENSION AT MAXIMUM MATERIAL CONDITION.
6. 751-01 THRU 751-06 ARE OBSOLETE. NEW STANDARD IS 751-07.

| DIM | MILLIMETERS | | INCHES | |
|-----|-------------|------|-----------|-------|
| | MIN | MAX | MIN | MAX |
| A | 4.80 | 5.00 | 0.189 | 0.197 |
| B | 3.80 | 4.00 | 0.150 | 0.157 |
| C | 1.35 | 1.75 | 0.053 | 0.069 |
| D | 0.33 | 0.51 | 0.013 | 0.020 |
| G | 1.27 BSC | | 0.050 BSC | |
| H | 0.10 | 0.25 | 0.004 | 0.010 |
| J | 0.19 | 0.25 | 0.007 | 0.010 |
| K | 0.40 | 1.27 | 0.016 | 0.050 |
| M | 0° | 8° | 0° | 8° |
| N | 0.25 | 0.50 | 0.010 | 0.020 |
| S | 5.80 | 6.20 | 0.228 | 0.244 |

SOLDERING FOOTPRINT*



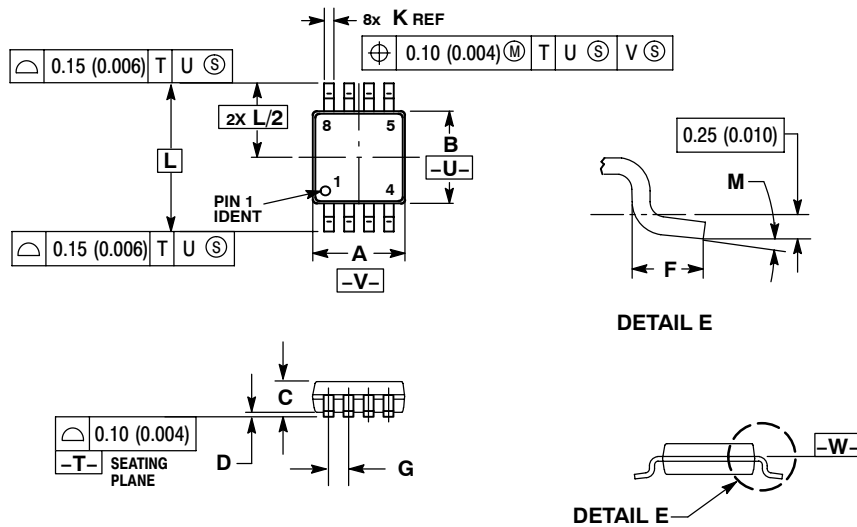
SCALE 6:1 $\left(\frac{\text{mm}}{\text{inches}}\right)$

*For additional information on our Pb-Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

MC10ELT22, MC100ELT22

PACKAGE DIMENSIONS

TSSOP-8
DT SUFFIX
PLASTIC TSSOP PACKAGE
CASE 948R-02
ISSUE A



- NOTES:
1. DIMENSIONS AND TOLERANCING PER ASME Y14.5M, 1994.
 2. CONTROLLING DIMENSION: MILLIMETER.
 3. DIMENSION A DOES NOT INCLUDE MOLD FLASH. PROTRUSIONS OR GATE BURRS. MOLD FLASH OR GATE BURRS SHALL NOT EXCEED 0.15 (0.006) PER SIDE.
 4. DIMENSION B DOES NOT INCLUDE INTERLEAD FLASH OR PROTRUSION. INTERLEAD FLASH OR PROTRUSION SHALL NOT EXCEED 0.25 (0.010) PER SIDE.
 5. TERMINAL NUMBERS ARE SHOWN FOR REFERENCE ONLY.
 6. DIMENSION A AND B ARE TO BE DETERMINED AT DATUM PLANE -W-.

ECLinPS is a trademark of Semiconductor Components Industries, LLC (SCILLC).

ON Semiconductor and **ON** are registered trademarks of Semiconductor Components Industries, LLC (SCILLC). SCILLC reserves the right to make changes without further notice to any products herein. SCILLC makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does SCILLC assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation special, consequential or incidental damages. "Typical" parameters which may be provided in SCILLC data sheets and/or specifications can and do vary in different applications and actual performance may vary over time. All operating parameters, including "Typicals" must be validated for each customer application by customer's technical experts. SCILLC does not convey any license under its patent rights nor the rights of others. SCILLC products are not designed, intended, or authorized for use as components in systems intended for surgical implant into the body, or other applications intended to support or sustain life, or for any other application in which the failure of the SCILLC product could create a situation where personal injury or death may occur. Should Buyer purchase or use SCILLC products for any such unintended or unauthorized application, Buyer shall indemnify and hold SCILLC and its officers, employees, subsidiaries, affiliates, and distributors harmless against all claims, costs, damages, and expenses, and reasonable attorney fees arising out of, directly or indirectly, any claim of personal injury or death associated with such unintended or unauthorized use, even if such claim alleges that SCILLC was negligent regarding the design or manufacture of the part. SCILLC is an Equal Opportunity/Affirmative Action Employer. This literature is subject to all applicable copyright laws and is not for resale in any manner.

PUBLICATION ORDERING INFORMATION

LITERATURE FULFILLMENT:
Literature Distribution Center for ON Semiconductor
P.O. Box 5163, Denver, Colorado 80217 USA
Phone: 303-675-2175 or 800-344-3860 Toll Free USA/Canada
Fax: 303-675-2176 or 800-344-3867 Toll Free USA/Canada
Email: orderlit@onsemi.com

N. American Technical Support: 800-282-9855 Toll Free
USA/Canada
Europe, Middle East and Africa Technical Support:
Phone: 421 33 790 2910
Japan Customer Focus Center
Phone: 81-3-5773-3850

ON Semiconductor Website: www.onsemi.com
Order Literature: <http://www.onsemi.com/orderlit>

For additional information, please contact your local Sales Representative



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

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