

DATA SHEET

For a complete data sheet, please also download:

- The IC04 LOCMOS HE4000B Logic Family Specifications HEF, HEC
- The IC04 LOCMOS HE4000B Logic Package Outlines/Information HEF, HEC

HEF4007UB

gates

Dual complementary pair and inverter

Product specification
File under Integrated Circuits, IC04

January 1995

Dual complementary pair and inverter

HEF4007UB
gates

DESCRIPTION

The HEF4007UB is a dual complementary pair and an inverter with access to each device. It has three n-channel and three p-channel enhancement mode MOS transistors.

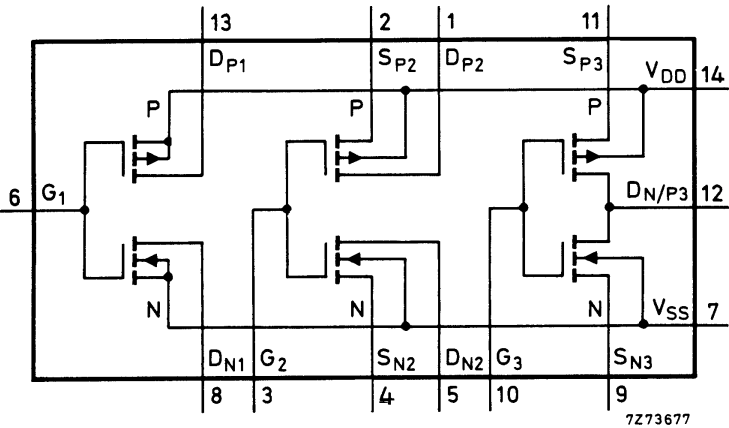


Fig.1 Schematic diagram.

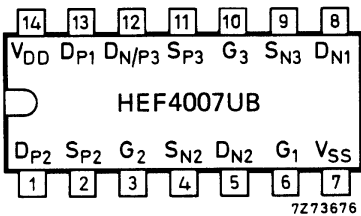


Fig.2 Pinning diagram.

PINNING

- SP2, SP3 source connections to 2nd and 3rd p-channel transistors
- DP1, DP2 drain connections from the 1st and 2nd p-channel transistors
- DN1, DN2 drain connections from the 1st and 2nd n-channel transistors
- SN2, SN3 source connections to the 2nd and 3rd n-channel transistors
- DN/P3 common connection to the 3rd p-channel and n-channel transistor drains
- G1 to G3 gate connections to n-channel and p-channel of the three transistor pairs

FAMILY DATA, I_{DD} LIMITS category GATES

See Family Specifications for V_{IH}/V_{IL} unbuffered stages

- HEF4007UBP(N): 14-lead DIL; plastic (SOT27-1)
- HEF4007UBD(F): 14-lead DIL; ceramic (cerdip) (SOT73)
- HEF4007UBT(D): 14-lead SO; plastic (SOT108-1)
- (): Package Designator North America

Dual complementary pair and inverter

HEF4007UB
gates

AC CHARACTERISTICS

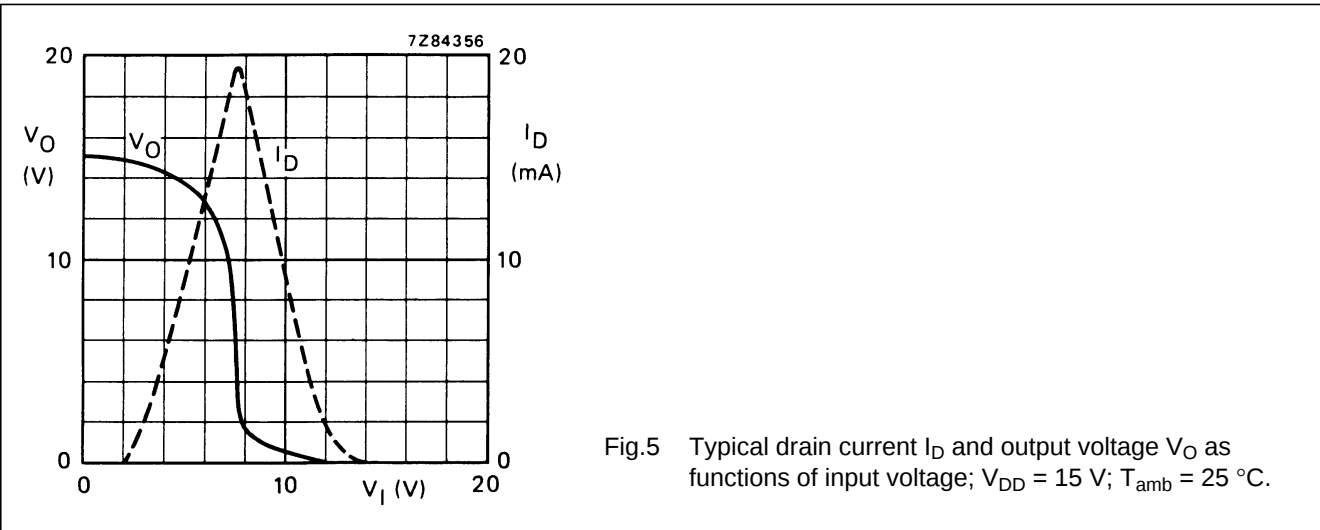
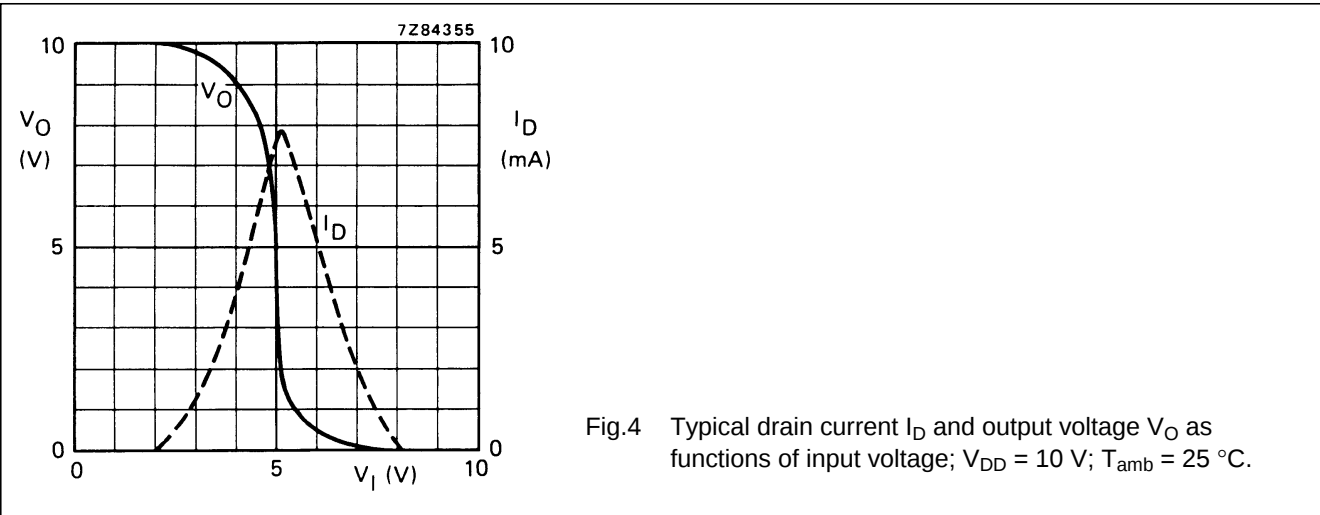
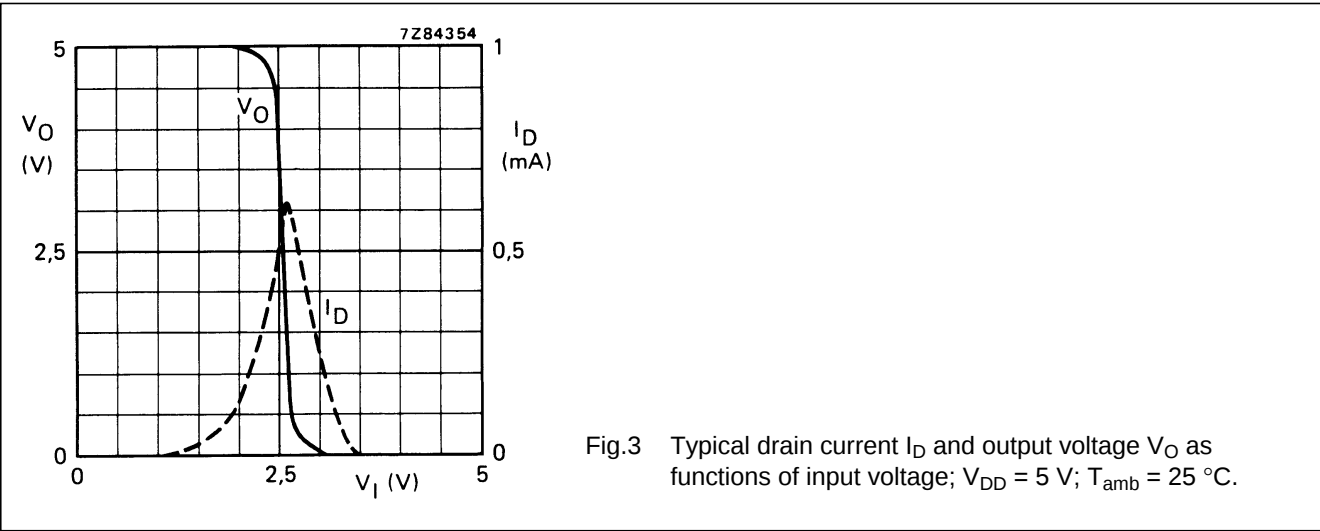
 $V_{SS} = 0$ V; $T_{amb} = 25$ °C; $C_L = 50$ pF; input transition times ≤ 20 ns

	V_{DD} V	SYMBOL	TYP.	MAX.		TYPICAL EXTRAPOLATION FORMULA
Propagation delays $G_n \rightarrow D_N ; D_P$ HIGH to LOW	5	t_{PHL}	40	80	ns	13 ns + (0,55 ns/pF) C_L
	10		20	40	ns	9 ns + (0,23 ns/pF) C_L
	15		15	30	ns	7 ns + (0,16 ns/pF) C_L
LOW to HIGH	5	t_{PLH}	40	75	ns	13 ns + (0,55 ns/pF) C_L
	10		20	40	ns	9 ns + (0,23 ns/pF) C_L
	15		15	30	ns	7 ns + (0,16 ns/pF) C_L
Output transition times HIGH to LOW	5	t_{THL}	60	120	ns	10 ns + (1,0 ns/pF) C_L
	10		30	60	ns	9 ns + (0,42 ns/pF) C_L
	15		20	40	ns	6 ns + (0,28 ns/pF) C_L
LOW to HIGH	5	t_{TLH}	60	120	ns	10 ns + (1,0 ns/pF) C_L
	10		30	60	ns	9 ns + (0,42 ns/pF) C_L
	15		20	40	ns	6 ns + (0,28 ns/pF) C_L

	V_{DD} V	TYPICAL FORMULA FOR P (μ W)	
Dynamic power dissipation per package (P)	5	$4500 f_i + \sum (f_o C_L) \times V_{DD}^2$	where f_i = input freq. (MHz) f_o = output freq. (MHz) C_L = load capacitance (pF) $\sum(f_o C_L)$ = sum of outputs V_{DD} = supply voltage (V)
	10	$20\,000 f_i + \sum (f_o C_L) \times V_{DD}^2$	
	15	$50\,000 f_i + \sum (f_o C_L) \times V_{DD}^2$	

Dual complementary pair and inverter

HEF4007UB
gates



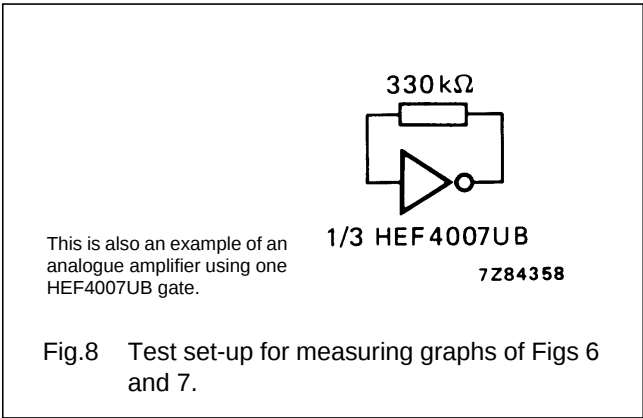
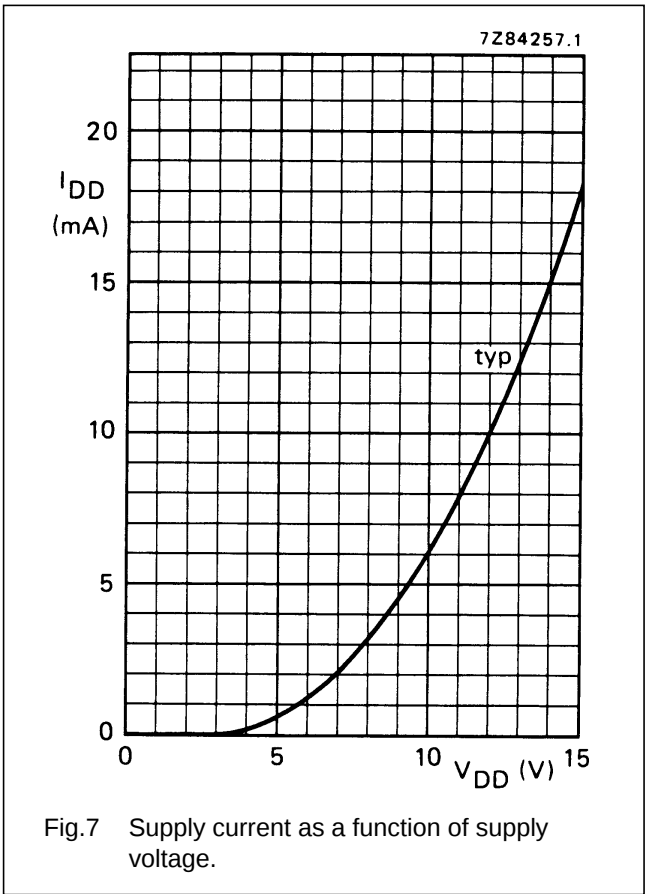
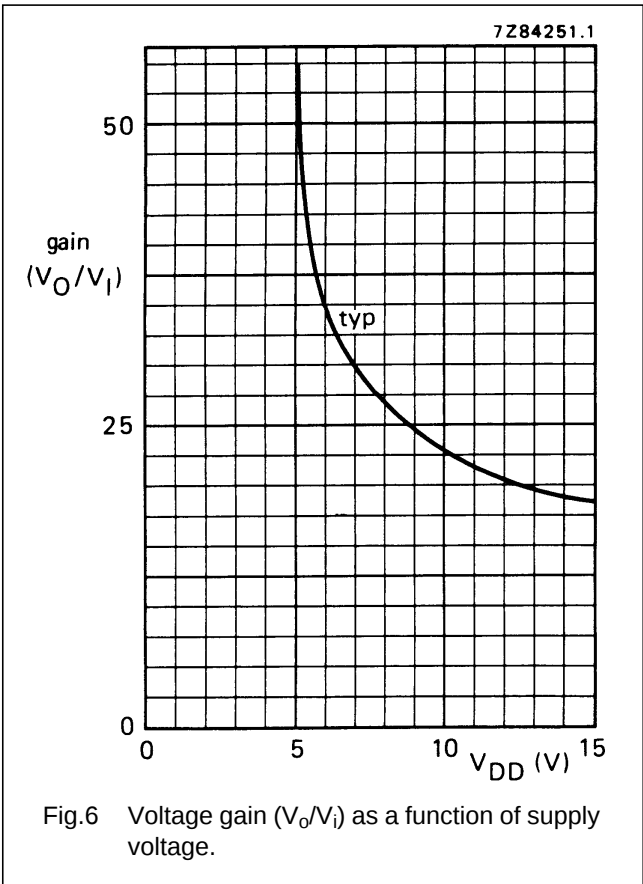
Dual complementary pair and inverter

HEF4007UB
gates

APPLICATION INFORMATION

Some examples of applications for the HEF4007UB are:

- High input impedance amplifiers
- Linear amplifiers
- (Crystal) oscillators
- High-current sink and source drivers
- High impedance buffers.



Dual complementary pair and inverter

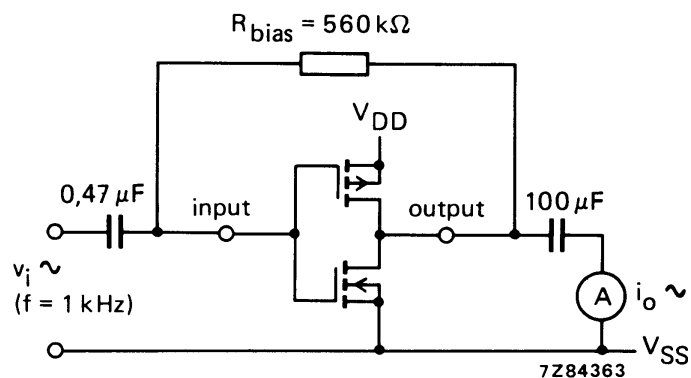
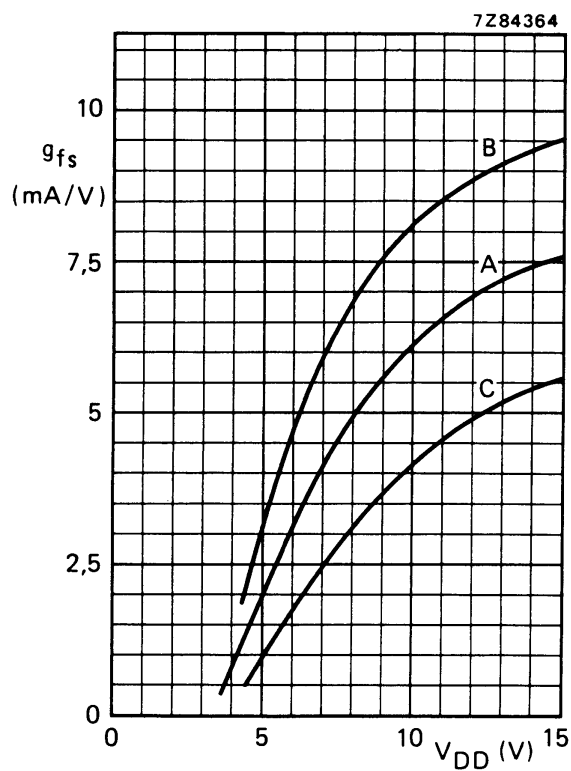
HEF4007UB
gates

Fig.9 Test set-up for measuring forward transconductance $g_{fs} = di_o/dv_i$ at v_o is constant (see also graph Fig.10).



- A: average,
 B: average + 2 s,
 C: average - 2 s, in where 's' is the observed standard deviation.

Fig.10 Typical forward transconductance g_{fs} as a function of the supply voltage at $T_{amb} = 25^\circ\text{C}$.

Dual complementary pair and inverter

HEF4007UB
gates

Figures 11 to 14 show some applications in which the HEF4007UB is used.

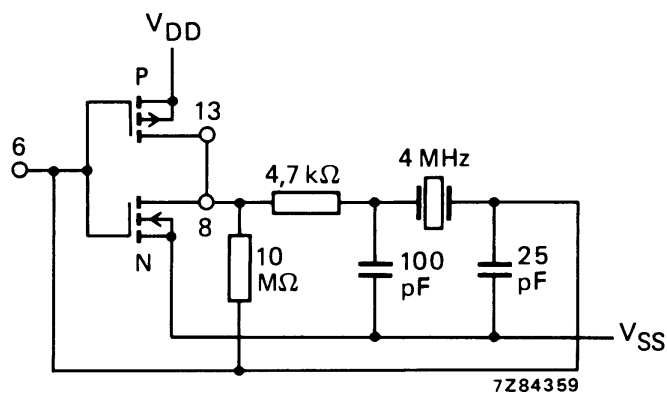


Fig.11 4 MHz crystal oscillator.

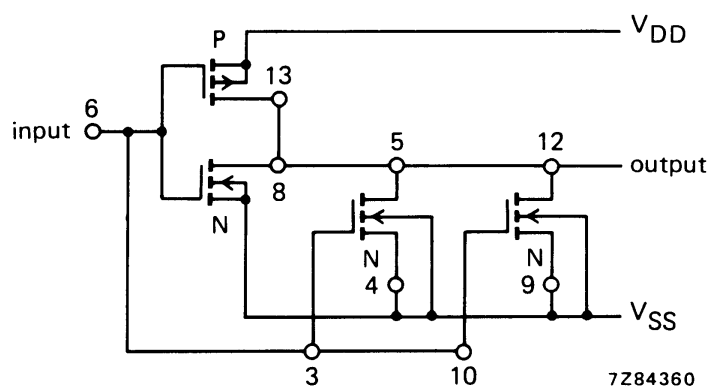


Fig.12 High current sink driver.

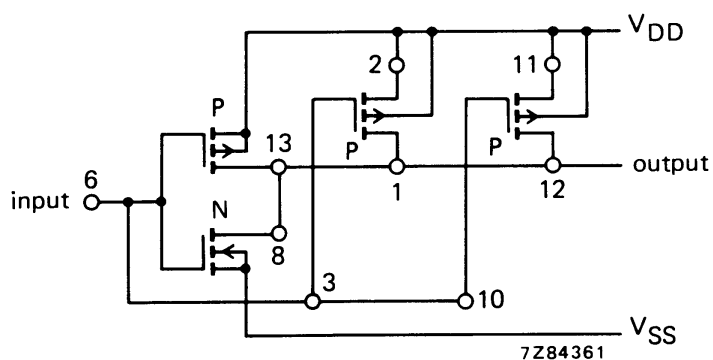


Fig.13 High current source driver.

Dual complementary pair and inverter

HEF4007UB
gates

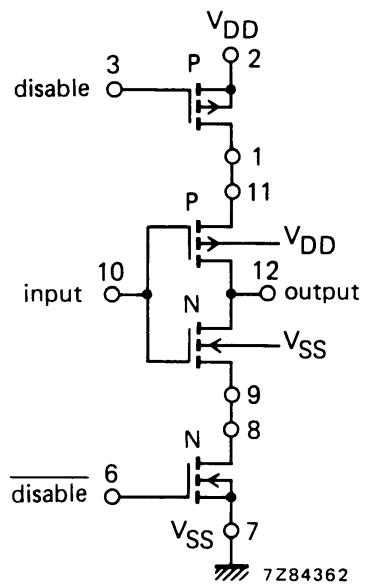


Fig.14 High impedance buffer.

FUNCTION TABLE for Fig.14.

INPUT	DISABLE	OUTPUT
H	L	L
L	L	H
X	H	open

Notes

- 1. H = HIGH state (the more positive voltage)
L = LOW state (the less positive voltage)
X = state is immaterial

NOTE

Rules for maintaining electrical isolation between transistors and monolithic substrate:

- Pin number 14 must be maintained at the most positive (or equally positive) potential with respect to any other pin of the HEF4007UB.
- Pin number 7 must be maintained at the most negative (or equally negative) potential with respect to any other pin of the HEF4007UB.

Violation of these rules will result in improper transistor operation and/or possible permanent damage to the HEF4007UB.



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.