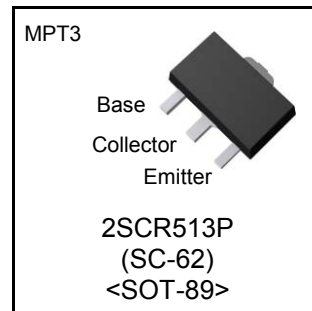


| Parameter | Value |
|-----------|-------|
| V_{CEO} | 50V |
| I_C | 1.0A |

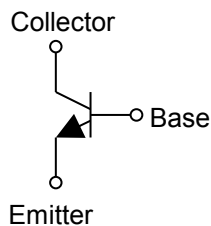
●Features

- 1) Suitable for Middle Power Driver
- 2) Complementary PNP Types : 2SAR513P
- 3) Low $V_{CE(sat)}$
 $V_{CE(sat)}=0.35V(\text{Max.})$
 $(I_C/I_B=500mA/25mA)$
- 4) Lead Free/RoHS Compliant.

●Outline



●Inner circuit



●Applications

Motor driver , LED driver
Power supply

●Packaging specifications

| Part No. | Package | Package size (mm) | Taping code | Reel size (mm) | Tape width (mm) | Basic ordering unit (pcs) | Marking |
|----------|---------|-------------------|-------------|----------------|-----------------|---------------------------|---------|
| 2SCR513P | MPT3 | 4540 | T100 | 180 | 12 | 1,000 | NC |

●Absolute maximum ratings (Ta = 25°C)

| Parameter | Symbol | Values | Unit |
|------------------------------|------------|---------------|------|
| Collector-base voltage | V_{CBO} | 50 | V |
| Collector-emitter voltage | V_{CEO} | 50 | V |
| Emitter-base voltage | V_{EBO} | 6 | V |
| Collector current | DC | I_C | 1.0 |
| | Pulsed | I_{CP}^{*1} | 2.0 |
| Power dissipation | P_D^{*2} | 0.5 | W |
| | P_D^{*3} | 2.0 | W |
| Junction temperature | T_j | 150 | °C |
| Range of storage temperature | T_{stg} | -55 to +150 | °C |

*1 Pw=10ms , single pulse

*2 Each terminal mounted on a reference land

*3 Mounted on a ceramic board (40×40×0.7mm)

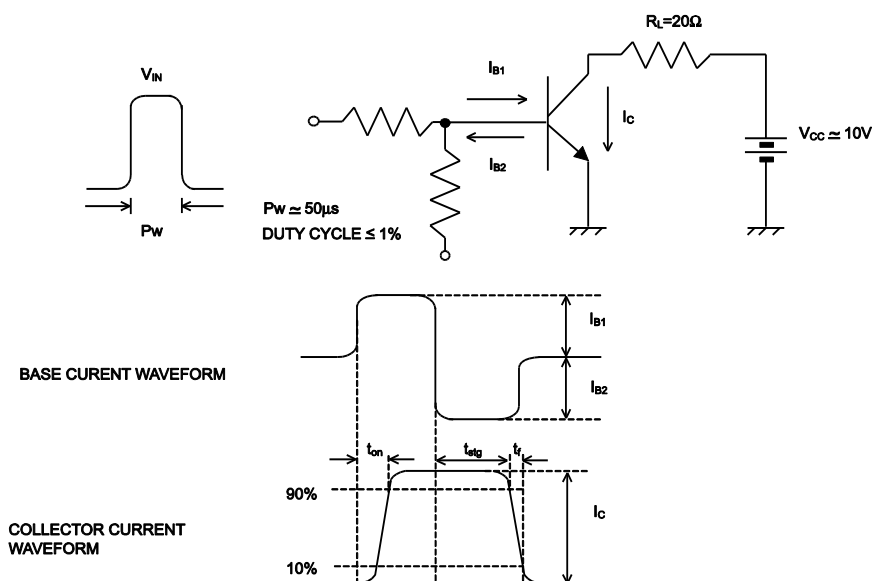
●Electrical characteristics(Ta = 25°C)

| Parameter | Symbol | Conditions | Min. | Typ. | Max. | Unit |
|--------------------------------------|--------------------|---|------|------|------|---------|
| Collector-emitter breakdown voltage | BV_{CEO} | $I_C = 1mA$ | 50 | - | - | V |
| Collector-base breakdown voltage | BV_{CBO} | $I_C = 100\mu A$ | 50 | - | - | V |
| Emitter-base breakdown voltage | BV_{EBO} | $I_E = 100\mu A$ | 6 | - | - | V |
| Collector cut-off current | I_{CBO} | $V_{CB} = 50V$ | - | - | 1 | μA |
| Emitter cut-off current | I_{EBO} | $V_{EB} = 4V$ | - | - | 1 | μA |
| Collector-emitter saturation voltage | $V_{CE(sat)}^{*1}$ | $I_C = 500mA, I_B = 25mA$ | - | 0.13 | 0.35 | V |
| DC current gain | h_{FE} | $V_{CE} = 2V, I_C = 50mA$ | 180 | - | 450 | - |
| Transition frequency | f_T | $V_{CE} = 10V, I_E = -200mA$ $f = 100MHz$ | - | 360 | - | MHz |
| Output capacitance | C_{ob} | $V_{CB} = 10V, I_E = 0A,$ $f = 1MHz$ | - | 7 | - | pF |
| Turn-on time | t_{on}^{*2} | $I_C = 0.5A$ $I_{B1} = 50mA$ $I_{B2} = -50mA$ $V_{CC} \approx 10V$ | - | 40 | - | ns |
| Storage time | t_{stg}^{*2} | | - | 410 | - | ns |
| Fall time | t_f^{*2} | | - | 75 | - | ns |

*1 Pulsed

*2 See switching time test circuit

●Switching time test circuit



●Electrical characteristic curves(Ta = 25°C)

Fig.1 Ground Emitter Propagation Characteristics

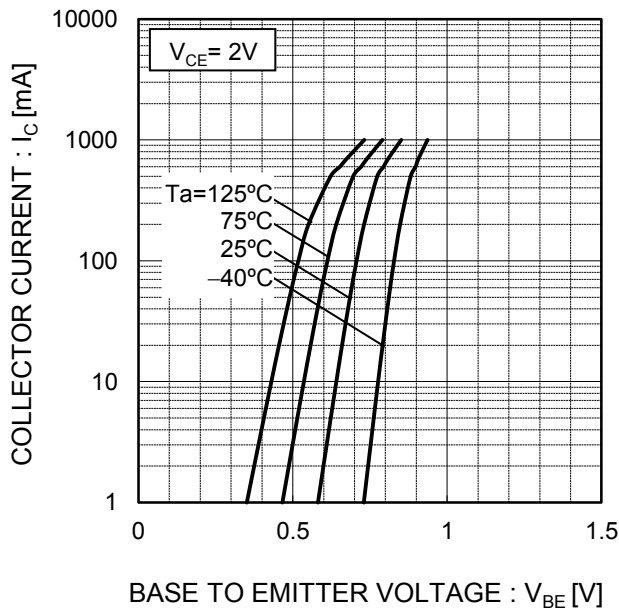


Fig.2 Typical Output Characteristics

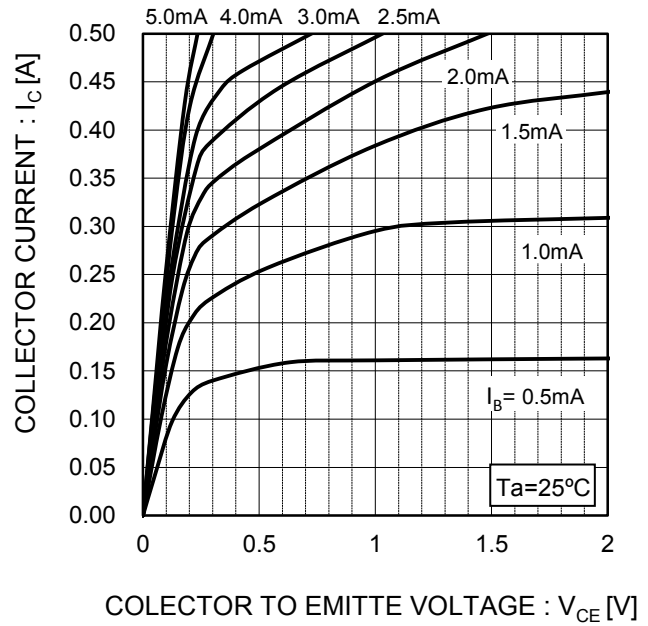


Fig.3 DC Current Gain vs. Collector Current(I)

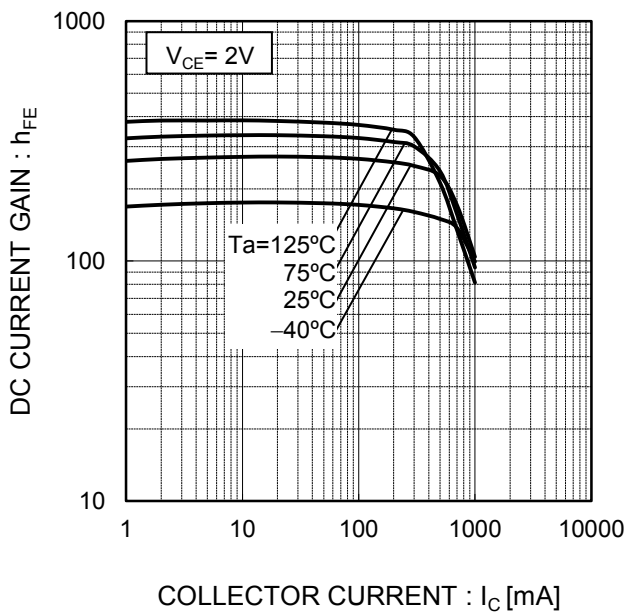
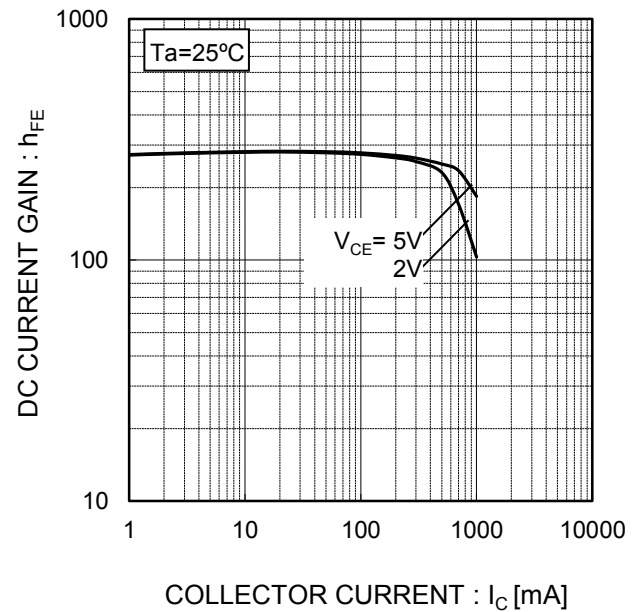


Fig.4 DC current gain vs. output current (II)



●Electrical characteristic curves(Ta = 25°C)

Fig.5 Collector-Emitter Saturation Voltage vs. Collector Current (I)

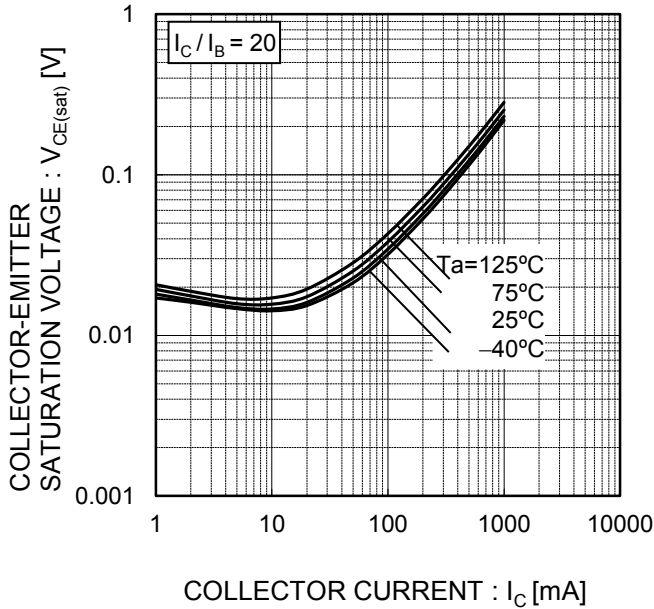


Fig.6 Collector-Emitter Saturation Voltage vs. Collector Current (II)

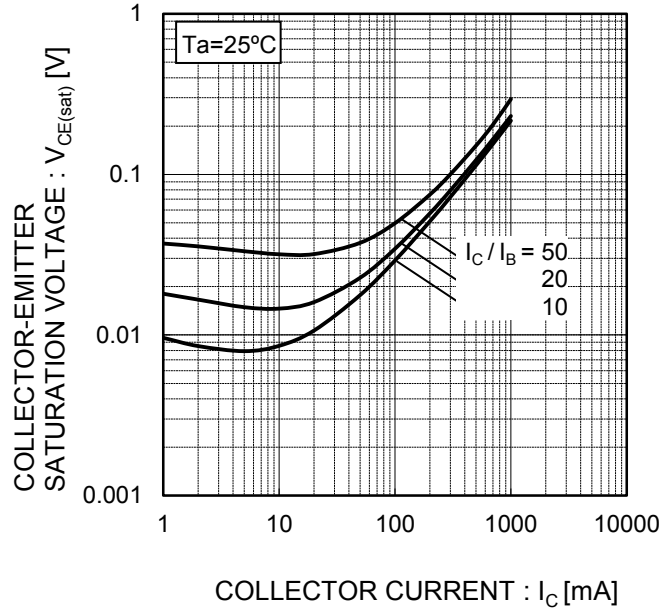


Fig.7 Base-Emitter Saturation Voltage vs. Collector Current

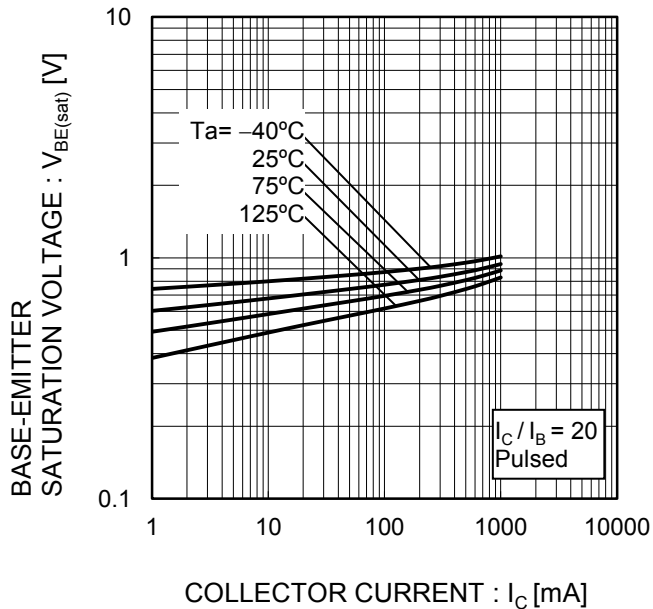
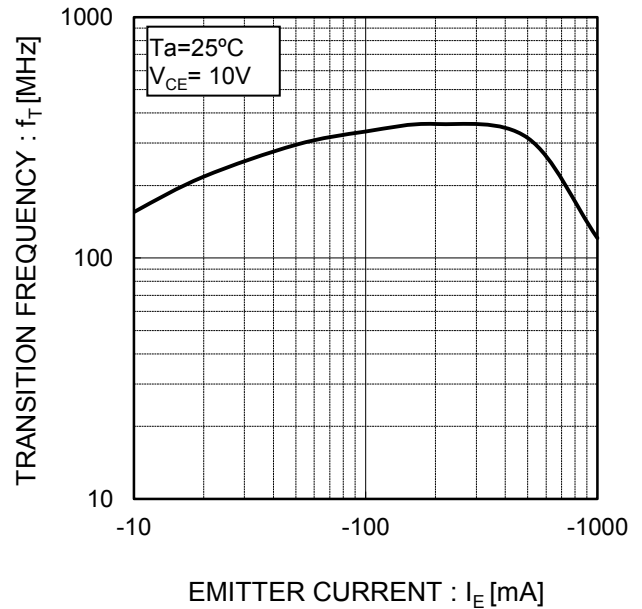


Fig.8 Gain Bandwidth Product vs. Emitter Current



●Electrical characteristic curves(Ta = 25°C)

Fig.9 Emitter input capacitance vs. Emitter-Base Voltage
Collector output capacitance vs. Collector-Base Voltage

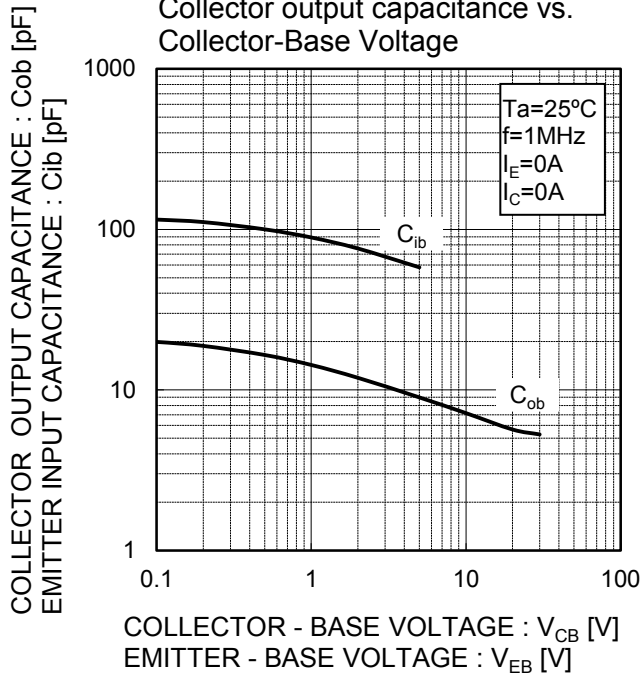
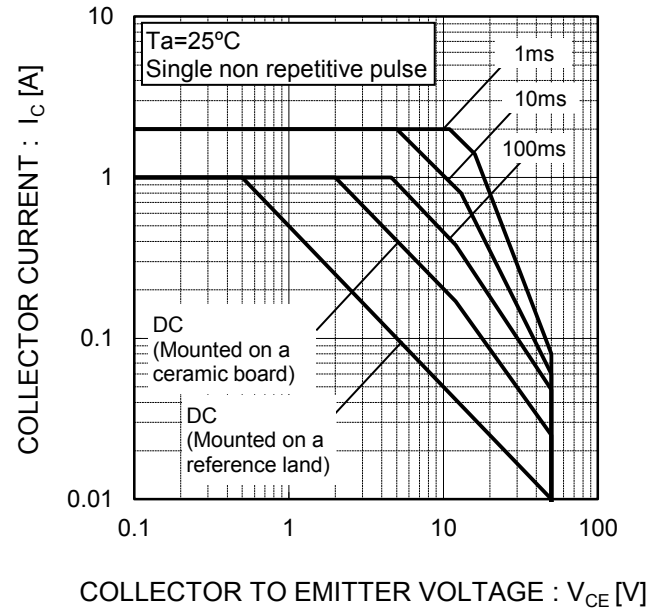
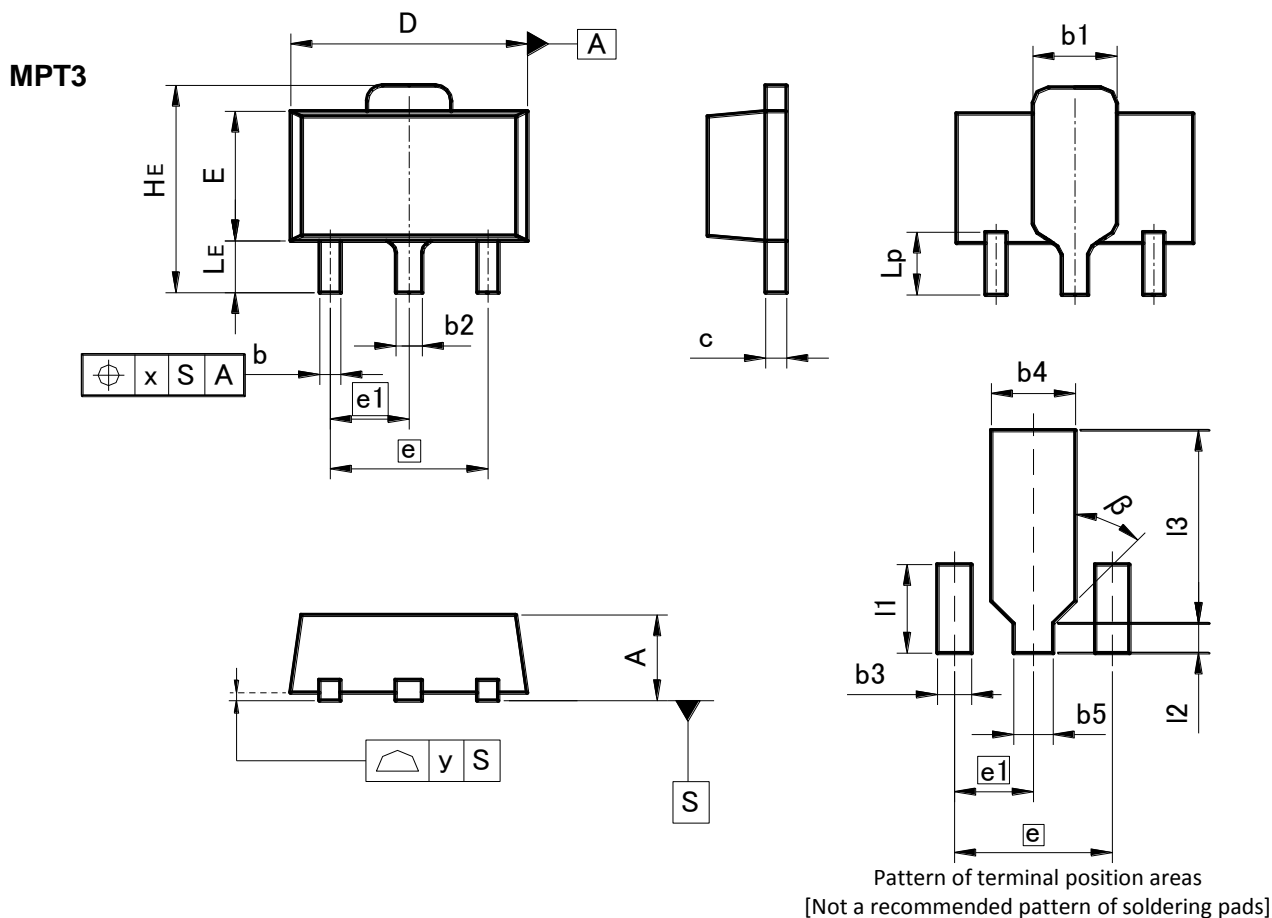


Fig.10 Safe Operating Area



●Dimensions (Unit : mm)



| DIM | MILIMETERS | | INCHES | |
|-----|------------|------|--------|-------|
| | MIN | MAX | MIN | MAX |
| A | 1.40 | 1.50 | 0.055 | 0.059 |
| b | 0.30 | 0.50 | 0.012 | 0.020 |
| b1 | 1.50 | 1.70 | 0.059 | 0.067 |
| b2 | 0.40 | 0.60 | 0.016 | 0.024 |
| c | 0.35 | 0.50 | 0.014 | 0.020 |
| D | 4.40 | 4.70 | 0.173 | 0.185 |
| E | 2.40 | 2.70 | 0.094 | 0.106 |
| e | 3.00 | | 0.118 | |
| e1 | 1.50 | | 0.059 | |
| HE | 3.70 | 4.30 | 0.146 | 0.169 |
| LE | 0.80 | 1.20 | 0.031 | 0.047 |
| Lp | 1.01 | 1.41 | 0.040 | 0.056 |
| x | - | 0.15 | - | 0.006 |
| y | - | 0.10 | - | 0.004 |

| DIM | MILIMETERS | | INCHES | |
|-----|------------|------|--------|-------|
| | MIN | MAX | MIN | MAX |
| b3 | - | 0.65 | - | 0.026 |
| b4 | - | 1.70 | - | 0.067 |
| b5 | - | 0.75 | - | 0.030 |
| I1 | - | 1.71 | - | 0.067 |
| I2 | - | 0.58 | - | 0.023 |
| I3 | - | 3.72 | - | 0.146 |
| β | 45° | | 45° | |

Dimension in mm / inches

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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.