# MAX20335 Evaluation Kit

# Evaluates: MAX20335

## General Description

The MAX20335 evaluation kit (EV kit) is a fully assembled and tested circuit for evaluating the MAX20335 wearable charge-management solution with I²C capability for low-power wearable application. The device includes a linear battery charger, smart power selector, two ultra-low quiescent current buck regulators, and three low-dropout (LDO) linear regulators.

Refer to the MAX20335 IC data sheet for detailed information regarding the operation and features of the devices.

## Features

- RoHS Compliant
- Proven PCB Layout
- Full Assembled and Tested
- I²C Serial Interface

## Quick Start

### Required Equipment

- Adjustable power supply with 0V to 5V capability
- Digital multimeter (DMM)
- I²C controller device
- GPIO controller device
- Cables with grabber connections

### Optional Equipment

- Second power supply for LDOs

### Procedure

The EV kit is fully assembled and tested. Follow the steps below to verify basic board operation:

**Caution: Do not turn on the power supply and external devices until all connections are completed.**

1) Connect PFN1 (J2 pin 11) to the GPIO controller output. Alternatively, PFN1 can be connected to a 3V IO supply through a 10k pullup resistor. This procedure assumes that a GPIO controller is used.
2) Connect the I²C Controller device to GND, SDA (J1 pin 6) and SCL (J1 pin 7).
3) Set the power supply voltage to 3.7V and turn off the supply.
4) Connect the positive terminal of the 3.7V power supply to BAT (J1 pin 4) and the negative terminal to GND (J3 pin 1 ).
5) Turn on the 3.7V power supply.
6) Turn on the GPIO controller device and I2C controller device.
7) Set GPIO controller to output logic-high to PFN1 to power on the MAX20335.
8) Measure the voltage on SYS (J1 pin 3) and confirm that it equals the battery voltage.
9) To enable Buck1 output, use the I²C controller to set Buck1En[1:0] to “01” by writing value “0xE9” to register 0x0D. Measure B1OUT (J2 pin 6) and confirm that it equals 1.2V.
10) To enable Buck2 output, Use the I²C controller to set Buck2En[1:0] to “01” by writing value “0xE9” to register 0x0F. Measure B2OUT (J2 pin 5) and confirm that it equals 1.8V.
11) **Optional:** To test any one of the LDOs, set the second power supply voltage to the desired LDO input voltage. Turn it off and then connect the positive terminal to the LDO input and the negative terminal to GND. Turn it on. To enable the LDO output, use the I2C controller to write value “0xE2” to the register LDO1Cfg, LDO2Cfg, or LDO3Cfg corresponding to the LDO under test. Measure the voltage of the LDO output and confirm that it matches the default setting: 0.8V (LDO1), 0.9V (LDO2), and 0.9V (LDO3).
12) The EV Kit is ready for additional evaluation.

## Detailed Description of Hardware

The MAX20335 evaluation kit (EV Kit) evaluates the MAX20335 wearable charge-management solution.

See Table 1 thru Table 3 for pin descriptions of the three connectors (J1–J3).

***Ordering Information** appears at end of data sheet.*

## Table 1. Connector J1

| PIN | MAX20335 | DESCRIPTION |
|---|---|---|
| 1 | GND | Ground |
| 2 | MON | Voltage Monitor Output |
| 3 | N.C. | Not Connected |
| 4 | INT | Open-drain Active-low Interrupt Output |
| 5 | RST | Power-On Reset Output. |
| 6 | SDA | I²C Serial Data Input / Output |
| 7 | SCL | I²C Serial Clock Input |
| 8 | MPC1 | Multipurpose Configuration Input 1 |
| 9 | MPC0 | Multipurpose Configuration Input 0 |
| 10 | PFN2 | Power Function Control Input / Output |
| 11 | PFN1 | Power Function Control Input |
| 12 | GND | Ground |

## Table 2. Connector J2

| PIN | SIGNAL | DESCRIPTION |
|---|---|---|
| 1 | L3IN | LDO3 Input |
| 2 | L3OUT | LDO3 Output |
| 3 | L2OUT | LDO2 Output |
| 4 | L1OUT | LDO1 Output |
| 5 | B2OUT | Buck Regulator 2 Output |
| 6 | B1OUT | Buck Regulator 1 Output |
| 7 | L2IN | LDO2 Input |
| 8 | L1IN | LDO1 Input |

## Table 3. Connector J3

| PIN | SIGNAL | DESCRIPTION |
|---|---|---|
| 1 | GND | Ground |
| 2 | CHRGIN | Charger Input |
| 3 | SYS | System Load Connection |
| 4 | BAT | Battery |
| 5 | THM | Battery Temperature Thermistor Connection |
| 6 | CAP | Bypass for Internal LDO |
| 7 | SET | External Resistor Connection for Configuring Battery Charge Current |
| 8 | LED | LED Current Sink Input |
| 9 | N.C. | Not Connected |
| 10 | N.C. | Not Connected |
| 11 | N.C. | Not Connected |
| 12 | GND | Ground |

## Component Suppliers

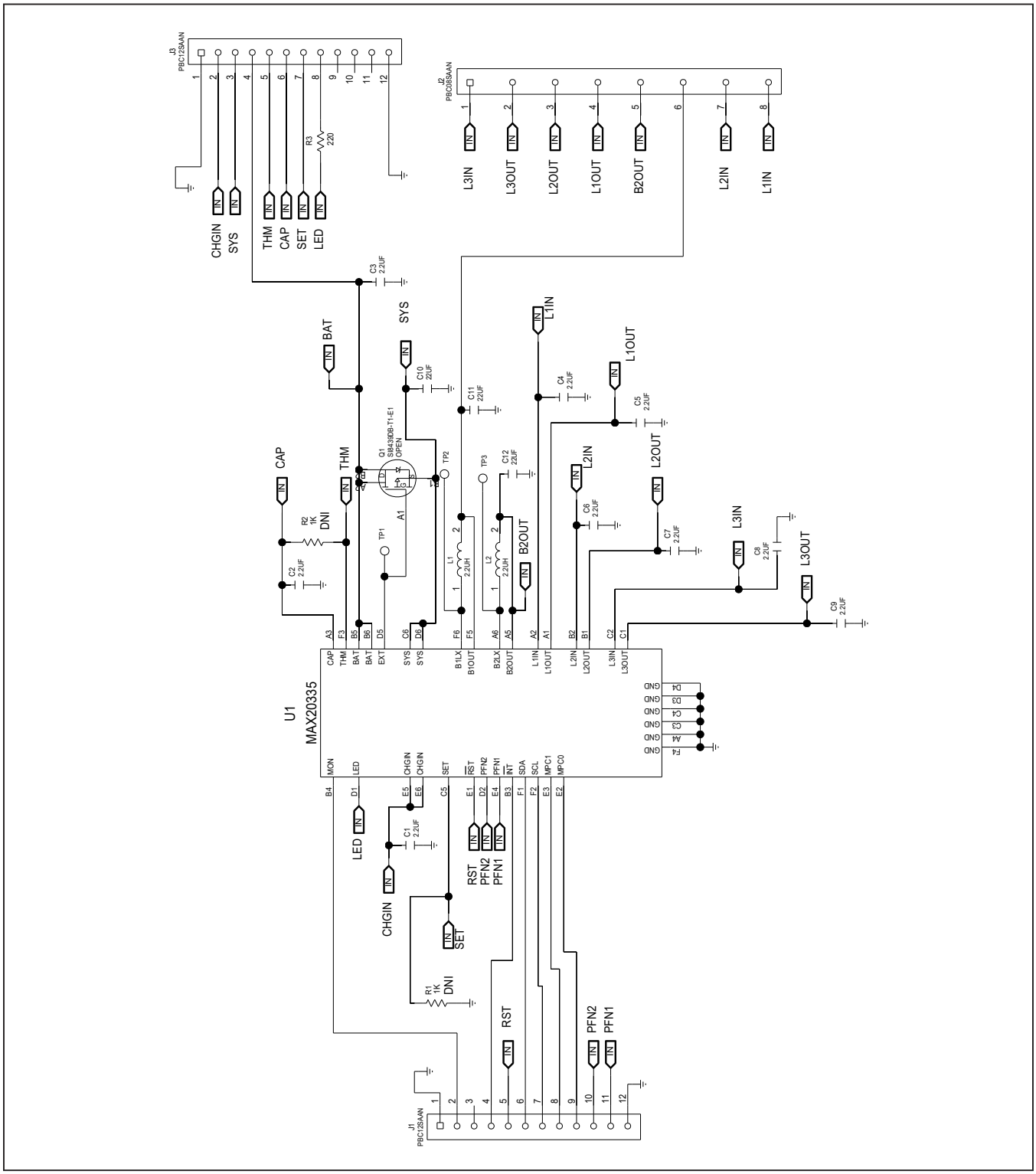
| SUPPLIER | WEBSITE |
|---|---|
| Murata Americas | www.murata.com |
| TDK Corp | www.component.tdk.com |

***Note:*** *Indicate that you are using the MAX20335 when contacting these component suppliers.*

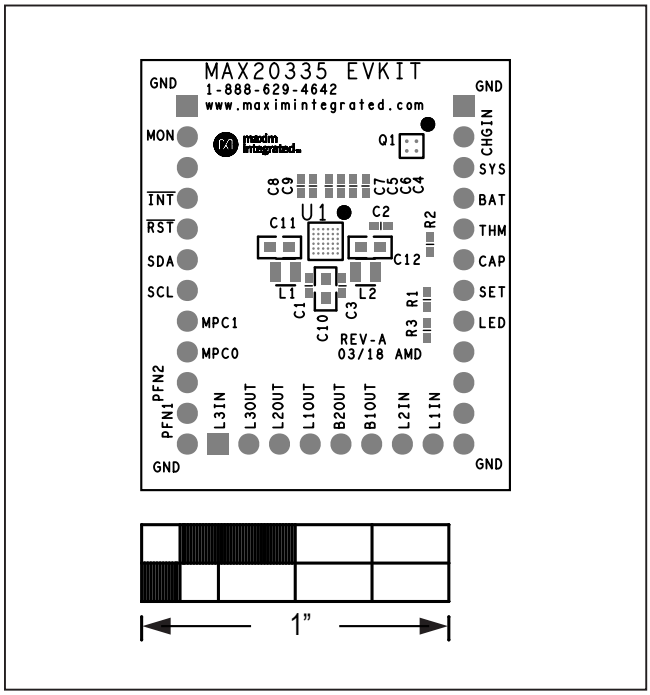
## MAX20335 EV System Bill of Materials

| ITEM | REF_DES | DNI/DNP | QTY | MFG PART # | MANUFACTURER | VALUE | DESCRIPTION |
|---|---|---|---|---|---|---|---|
| 1 | C1-C9 | - | 9 | C1005X5R1V225M050BC | TDK | 2.2UF | CAPACITOR; SMT (0402); CERAMIC CHIP; 2.2UF; 35V; TOL=20%; MODEL=C SERIES; TG=-55 DEGC TO +85 DEGC; TC=X5R |
| 2 | C10-C12 | - | 3 | C1608X5R0J226M080AC | TDK | 22UF | CAPACITOR; SMT (0603); CERAMIC CHIP; 22UF; 6.3V; TOL=20%; MODEL=C SERIES; TG=-55 DEGC TO +85 DEGC; TC=X5R |
| 3 | J1, J3 | - | 2 | PBC12SAAN | SULLINS ELECTRONICS CORP. | PBC12SAAN | CONNECTOR; MALE; THROUGH HOLE; BREAKAWAY; STRAIGHT; 12PINS; -65 DEGC TO +125 DEGC |
| 4 | J2 | - | 1 | PBC08SAAN | SULLINS ELECTRONICS CORP. | PBC08SAAN | CONNECTOR; MALE; THROUGH HOLE; BREAKAWAY; STRAIGHT; 8PINS; -65 DEGC TO +125 DEGC |
| 5 | L1, L2 | - | 2 | DFE201610E-2R2M | TOKO | 2.2UH | INDUCTOR; SMT (2016); METAL ALLOY CHIP; 2.2UH; TOL=+/-20%; 2.6A |
| 6 | R3 | - | 1 | ERA-2AED221 | PANASONIC | 220 | RESISTOR; 0402; 220 OHM; 0.5%; 25PPM; 0.063W; THIN FILM |
| 7 | U1 | - | 1 | MAX20335 | MAXIM | MAX20335 | EVKIT PART - IC; PWRM; WEARABLE CHARGE MANAGEMENT SOLUTION; WLP36; |
| 8 | PCB | - | 1 | MAX | MAXIM | PCB | PCB:MAX |
| 9 | Q1 | DNP | 0 | SI8439DB-T1-E1 | VISHAY SILICONIX | SI8439DB-T1-E1 | TRAN; P-CHANNEL 8V (D-S) MOSFET; PCH; SMT; PD-(2.7W); I-(-9.2A); V-(-8V) |
| 10 | R1, R2 | DNP | 0 | RG1005P-102-D | SUSUMU CO LTD. | 1K | RESISTOR; 0402; 1K OHM; 0.5%; 25PPM; 0.0625W; THIN FILM |
| TOTAL | | | 20 | | | | |

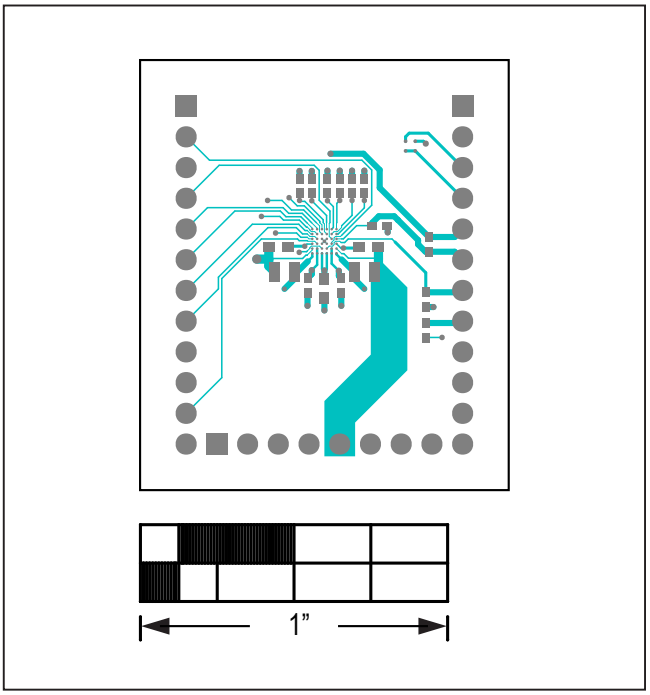
## MAX20335 EV System Schematic



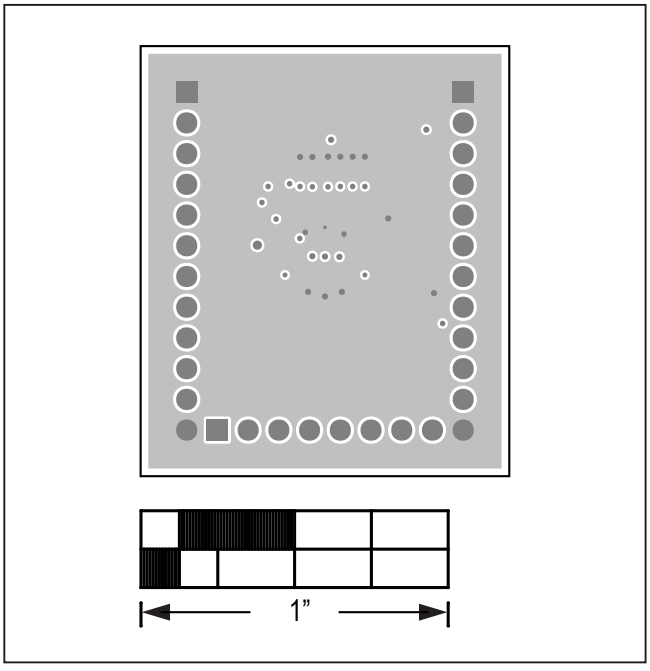
## MAX20335 EV System PCB Layout




*MAX20335 EV Kit—Top Silkscreen*

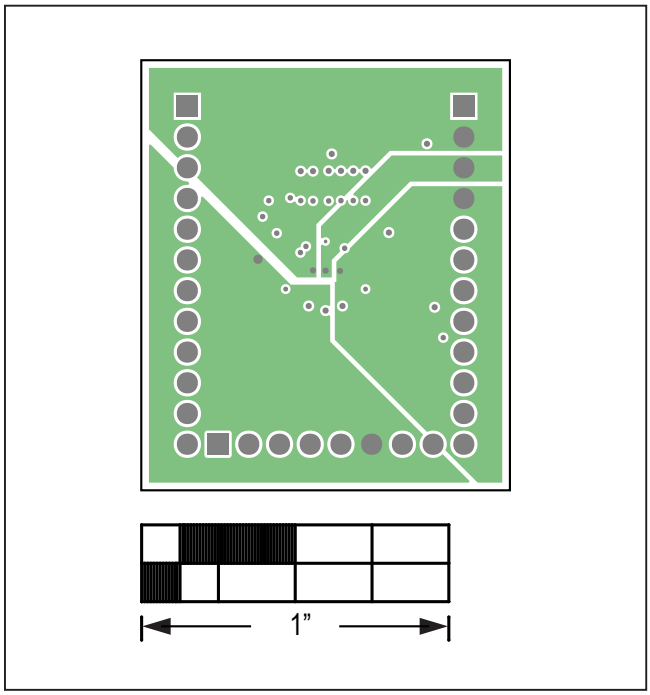



*MAX20335 EV Kit—Top*

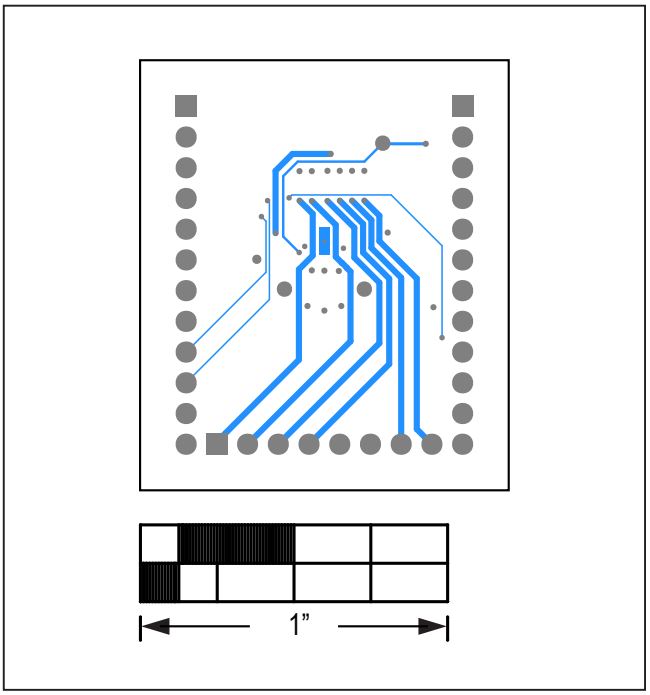



*MAX20335 EV Kit—Layer 2*

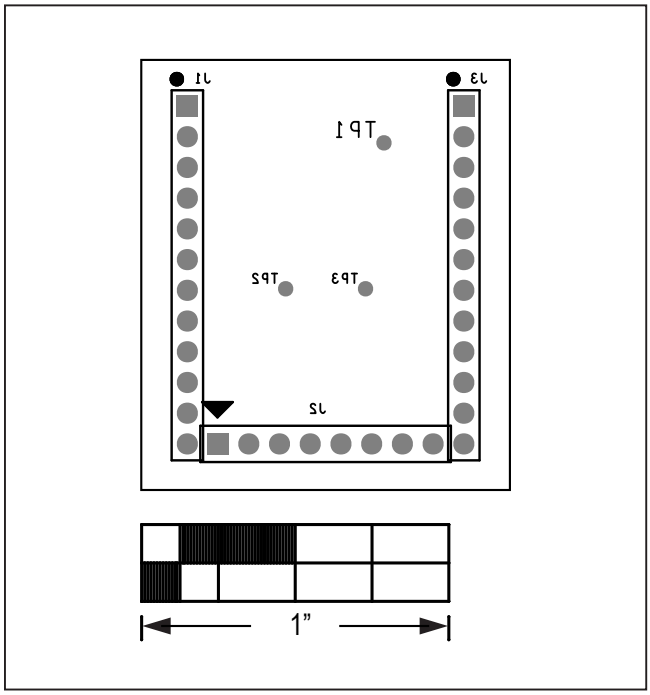
## MAX20335 EV System PCB Layout (continued)




*MAX20335 EV Kit—Layer 3*




*MAX20335 EV Kit—Bottom*




*MAX20335 EV Kit—Bottom Silkscreen*

## Ordering Information

| PART | TYPE |
|---|---|
| MAX20335EVKIT# | EV Kit |

*#Denotes RoHS compliant.*

## Revision History

| REVISION NUMBER | REVISION DATE | DESCRIPTION | PAGES CHANGED |
|---|---|---|---|
| 0 | 4/18 | Initial release | — |
| 1 | 2/19 | Added *Quick Start* section | 1 |

For pricing, delivery, and ordering information, please visit Maxim Integrated's online storefront at https://www.maximintegrated.com/en/storefront/storefront.html.

Стандарт Электрон Связь

Мы молодая и активно развивающаяся компания в области поставок электронных компонентов. Мы поставляем электронные компоненты отечественного и импортного производства напрямую от производителей и с крупнейших складов мира.

Благодаря сотрудничеству с мировыми поставщиками мы осуществляем комплексные и плановые поставки широчайшего спектра электронных компонентов.

Собственная эффективная логистика и склад в обеспечивает надежную поставку продукции в точно указанные сроки по всей России.

Мы осуществляем техническую поддержку нашим клиентам и предпродажную проверку качества продукции. На все поставляемые продукты мы предоставляем гарантию .

Осуществляем поставки продукции под контролем ВП МО РФ на предприятия военно-промышленного комплекса России , а также работаем в рамках 275 ФЗ с открытием отдельных счетов в уполномоченном банке. Система менеджмента качества компании соответствует требованиям ГОСТ ISO 9001.

Минимальные сроки поставки, гибкие цены, неограниченный ассортимент и индивидуальный подход к клиентам являются основой для выстраивания долгосрочного и эффективного сотрудничества с предприятиями радиоэлектронной промышленности, предприятиями ВПК и научно-исследовательскими институтами России.

С нами вы становитесь еще успешнее!

**Наши контакты:**

**Телефон:** +7 812 627 14 35

**Электронная почта:** sales@st-electron.ru

**Адрес:** 198099, Санкт-Петербург,
Промышленная ул, дом № 19, литера Н,
помещение 100-Н Офис 331