

## 150mA VOLTAGE REGULATOR (Wide Input Voltage Range)

NO.EA-152-070802

### OUTLINE

The R1514x series are CMOS-based positive voltage regulator (VR) ICs featuring 150mA output current. The R1514xxxxB has features of high input voltage and ultra-low supply current. A peak current limit circuit, a short current limit circuit, and a thermal shutdown circuit are built in the R1514x series.

The operating temperature is  $-40^{\circ}\text{C}$  to  $105^{\circ}\text{C}$  and the maximum input voltage is 36V, the R1514x series are very suitable for power source of car accessories.

The regulator output voltage is fixed in the R1514xxxxB and can be selected with a step of 0.1V in the range of 2.0V to 12.0V. Output voltage accuracy is  $\pm 2\%$ .

The packages for these ICs are the SOT-89-5 for space saving and the HSOP-6J for higher power applications.

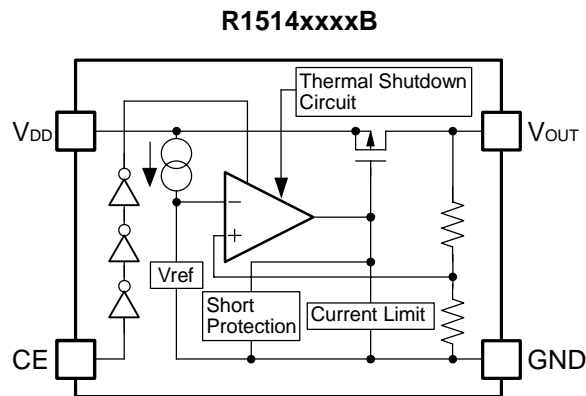
### FEATURES

- Input Voltage ..... Max. 36V
- Supply Current ..... Typ.  $9\mu\text{A}$
- Standby Current ..... Typ.  $0.1\mu\text{A}$
- Temperature-Drift Coefficient of Output Voltage ... Typ.  $\pm 100\text{ppm}/^{\circ}\text{C}$
- Output Current ..... Min. 150mA ( $V_{\text{IN}}=V_{\text{OUT}}+3.0\text{V}$ ; R1514x050B)
- Line Regulation ..... Typ. 0.05%/V
- Output Voltage Accuracy.....  $\pm 2\%$
- Packages ..... SOT-89-5, HSOP-6J
- Output Voltage Range..... Stepwise setting with a step of 0.1V in the range of 2.0V to 12.0V is possible (refer to Selection Guide).
- Built-in Peak Current Limit Circuit
- Built-in Short Current Limit Circuit
- Built-in Thermal Shutdown Circuit
- Operating Temperature .....  $-40^{\circ}\text{C}$  to  $105^{\circ}\text{C}$

### APPLICATIONS

- Power source for home appliances such as refrigerators, rice cookers, electric water warmers, etc.
- Power source for car audio equipment, car navigation system, ETC system, etc.
- Power source for notebook PCs, digital TVs, cordless phones, and private LAN system, etc.
- Power source for office equipment machines such as copiers, printers, facsimiles, scanners, projectors, etc.

## BLOCK DIAGRAM



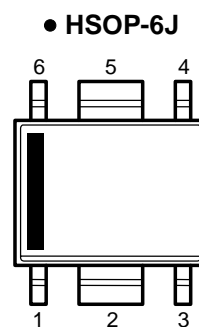
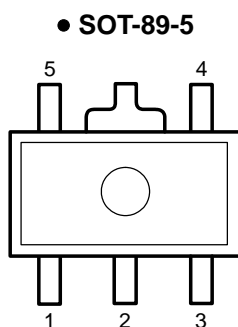
## SELECTION GUIDE

The output voltage, the active type, and the taping type for the ICs can be selected at the user's request. The selection can be made with designating the part number as shown below;

**R1514xxxx-xx-x** ← Part Number  
 ↑ ↑ ↑ ↑ ↑  
 a b c d e

| Code | Contents                                                                                                                 |
|------|--------------------------------------------------------------------------------------------------------------------------|
| a    | Designation of Package Type:<br>H: SOT-89-5<br>S: HSOP-6J                                                                |
| b    | Setting Output Voltage ( $V_{OUT}$ ):<br>Stepwise setting with a step of 0.1V in the range of 2.0V to 12.0V is possible. |
| c    | Designation of Active Type:<br>B: active high                                                                            |
| d    | Designation of Taping Type:<br>T1 (SOT-89-5), E2 (HSOP-6J) (Refer to Taping Specifications)                              |
| e    | Designation of composition of pin plating:<br>-F: Lead free plating                                                      |

## PIN CONFIGURATIONS



## PIN DESCRIPTIONS

### • SOT-89-5

| Pin No. | Symbol    | Description                  |
|---------|-----------|------------------------------|
| 1       | $V_{OUT}$ | Output Pin                   |
| 2       | GND*      | Ground Pin                   |
| 3       | CE        | Chip Enable Pin ("H" Active) |
| 4       | GND*      | Ground Pin                   |
| 5       | $V_{DD}$  | Input Pin                    |

### • HSOP-6J

| Pin No. | Symbol    | Description                  |
|---------|-----------|------------------------------|
| 1       | $V_{OUT}$ | Output Pin                   |
| 2       | GND*      | Ground Pin                   |
| 3       | CE        | Chip Enable Pin ("H" Active) |
| 4       | GND*      | Ground Pin                   |
| 5       | GND*      | Ground Pin                   |
| 6       | $V_{DD}$  | Input Pin                    |

\*) No.2 pin and No.4 pin of SOT-89-5 package must be wired to the GND plane. No.2 pin, No.4 pin and No.5 pin of HSOP-6J package must be wired to the GND plane when it is mounted on board.

## ABSOLUTE MAXIMUM RATINGS

| Symbol    | Item                                        | Rating                       | Unit |
|-----------|---------------------------------------------|------------------------------|------|
| $V_{IN}$  | Input Voltage                               | -0.3 to 50                   | V    |
| $V_{IN}$  | Peak Input Voltage * <sup>1</sup>           | 60                           | V    |
| $V_{CE}$  | Input Voltage (CE Pin)                      | -0.3 to $V_{IN}+0.3 \leq 50$ | V    |
| $V_{OUT}$ | Output Voltage                              | -0.3 to $V_{IN}+0.3 \leq 50$ | V    |
| $I_{OUT}$ | Output Current                              | 250                          | mA   |
| $P_D$     | Power Dissipation (SOT-89-5) * <sup>2</sup> | 900                          | mW   |
|           | Power Dissipation (HSOP-6J) * <sup>2</sup>  | 1700                         |      |
| $T_{opt}$ | Operating Temperature Range                 | -40 to 105                   | °C   |
| $T_{stg}$ | Storage Temperature Range                   | -55 to 125                   | °C   |

\*1) Duration time=200ms

\*2) For Power Dissipation, please refer to PACKAGE INFORMATION to be described.

### ABSOLUTE MAXIMUM RATINGS

Absolute Maximum ratings are threshold limit values that must not be exceeded ever for an instant under any conditions. Moreover, such values for any two items must not be reached simultaneously. Operation above these absolute maximum ratings may cause degradation or permanent damage to the device. These are stress ratings only and do not necessarily imply functional operation below these limits.

## ELECTRICAL CHARACTERISTICS

### • R1514xxxxB

T<sub>opt</sub>=25°C

| Symbol                               | Item                                      | Conditions                                                                                         | Min.                         | Typ. | Max.            | Unit       |
|--------------------------------------|-------------------------------------------|----------------------------------------------------------------------------------------------------|------------------------------|------|-----------------|------------|
| V <sub>IN</sub>                      | Input Voltage                             |                                                                                                    | 4                            |      | 36              | V          |
| I <sub>SS</sub>                      | Supply Current                            | V <sub>IN</sub> =V <sub>OUT</sub> +3.0V, I <sub>OUT</sub> =0mA                                     |                              | 9    | 20              | μA         |
| I <sub>standby</sub>                 | Standby Current                           | V <sub>IN</sub> =36V, V <sub>CE</sub> =0V                                                          |                              | 0.1  | 1.0             | μA         |
| V <sub>OUT</sub>                     | Output Voltage                            | V <sub>IN</sub> =V <sub>OUT</sub> +3.0V, I <sub>OUT</sub> =1mA                                     | ×0.98                        |      | ×1.02           | V          |
| I <sub>OUT</sub>                     | Output Current                            | V <sub>IN</sub> =V <sub>OUT</sub> +3.0V                                                            | Refer to the following table |      |                 |            |
| ΔV <sub>OUT</sub> /ΔI <sub>OUT</sub> | Load Regulation                           | V <sub>IN</sub> =V <sub>OUT</sub> +3.0V,<br>1mA ≤ I <sub>OUT</sub> ≤ 40mA                          | Refer to the following table |      |                 |            |
| ΔV <sub>OUT</sub> /ΔV <sub>IN</sub>  | Line Regulation                           | V <sub>OUT</sub> +1.5V ≤ V <sub>IN</sub> ≤ 36V, I <sub>OUT</sub> =1mA                              |                              | 0.05 | 0.20            | %/V        |
| V <sub>DIF</sub>                     | Dropout Voltage                           | I <sub>OUT</sub> =20mA                                                                             | Refer to the following table |      |                 |            |
| ΔV <sub>OUT</sub> /ΔT <sub>opt</sub> | Output Voltage<br>Temperature Coefficient | V <sub>IN</sub> =V <sub>OUT</sub> +3.0V, I <sub>OUT</sub> =1mA<br>−40°C ≤ T <sub>opt</sub> ≤ 105°C |                              | ±100 |                 | ppm<br>/°C |
| I <sub>lim</sub>                     | Short Current Limit                       | V <sub>OUT</sub> =0V                                                                               |                              | 45   |                 | mA         |
| V <sub>CEH</sub>                     | CE Input Voltage "H"                      |                                                                                                    | 1.5                          |      | V <sub>IN</sub> | V          |
| V <sub>CEL</sub>                     | CE Input Voltage "L"                      |                                                                                                    | 0                            |      | 0.3             | V          |
| T <sub>TSD</sub>                     | Thermal Shutdown<br>Temperature           | Junction Temperature                                                                               |                              | 150  |                 | °C         |
| T <sub>TSR</sub>                     | Thermal Shutdown<br>Released Temperature  | Junction Temperature                                                                               |                              | 125  |                 | °C         |

### • Output Current by Output Voltage

T<sub>opt</sub>=25°C

| Output Voltage<br>V <sub>OUT</sub> (V) | Output Current I <sub>OUT</sub> (mA)    |      |
|----------------------------------------|-----------------------------------------|------|
|                                        | Condition                               | Min. |
| 2.0 ≤ V <sub>OUT</sub> < 3.0           | V <sub>IN</sub> =V <sub>OUT</sub> +3.0V | 100  |
| 3.0 ≤ V <sub>OUT</sub> < 5.0           |                                         | 120  |
| 5.0 ≤ V <sub>OUT</sub> ≤ 12.0          |                                         | 150  |

### • Load Regulation by Output Voltage

T<sub>opt</sub>=25°C

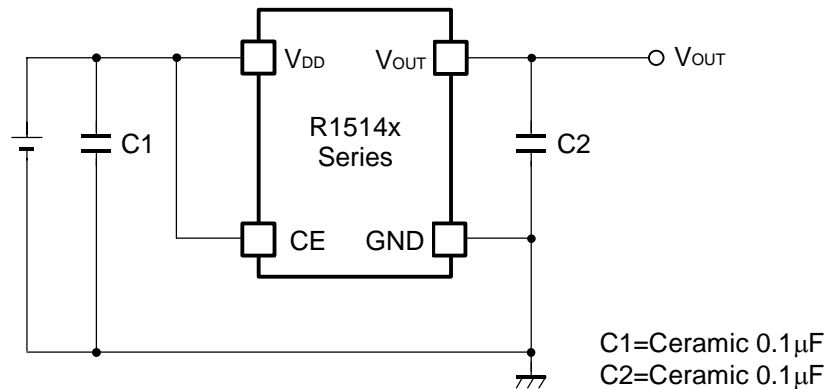
| Output Voltage<br>V <sub>OUT</sub> (V) | Load Regulation ΔV <sub>OUT</sub> /ΔI <sub>OUT</sub> (mV)                |      |      |
|----------------------------------------|--------------------------------------------------------------------------|------|------|
|                                        | Conditions                                                               | Typ. | Max. |
| 2.0 ≤ V <sub>OUT</sub> < 5.0           | V <sub>IN</sub> =V <sub>OUT</sub> +3.0V<br>1mA ≤ I <sub>OUT</sub> ≤ 40mA | 10   | 25   |
| 5.0 ≤ V <sub>OUT</sub> ≤ 12.0          |                                                                          | 20   | 35   |

### • Dropout Voltage by Output Voltage

T<sub>opt</sub>=25°C

| Output Voltage<br>V <sub>OUT</sub> (V) | Dropout Voltage V <sub>DIF</sub> (V) |      |      |
|----------------------------------------|--------------------------------------|------|------|
|                                        | Condition                            | Typ. | Max. |
| 2.0 ≤ V <sub>OUT</sub> < 2.5           | I <sub>OUT</sub> =20mA               | 0.60 | 1.20 |
| 2.5 ≤ V <sub>OUT</sub> < 3.0           |                                      | 0.40 | 0.85 |
| 3.0 ≤ V <sub>OUT</sub> < 4.0           |                                      | 0.35 | 0.60 |
| 4.0 ≤ V <sub>OUT</sub> < 5.0           |                                      | 0.25 | 0.40 |
| 5.0 ≤ V <sub>OUT</sub> ≤ 12.0          |                                      | 0.20 | 0.35 |

## TYPICAL APPLICATION



## TECHNICAL NOTES

When using these ICs, consider the following points:

### Phase Compensation

Phase Compensation of the R1514x Series has been made internally for stable operation even though the load current would vary. Therefore, without the capacitors, C1 and C2, the output voltage is regulated, however, for more stable operation, use capacitors as C1 and C2. Especially, if the input line is long and impedance is high, C1 is necessary. Moreover, if you use rather large C2, transient response will be improved. Recommended value is in the range from 0.1 $\mu$ F to 10 $\mu$ F. Wiring should be made as short as possible.

Connect the capacitor, C1 between V<sub>DD</sub> pin and GND pin and C2 between V<sub>OUT</sub> and GND as close as possible.

### GND wiring of mounting on board

No.2 pin and No.4 pin of SOT-89-5 package must be wired to the GND plane. No.2 pin, No.4 pin and No.5 pin of HSOP-6J package must be wired to the GND plane when it is mounted on board.

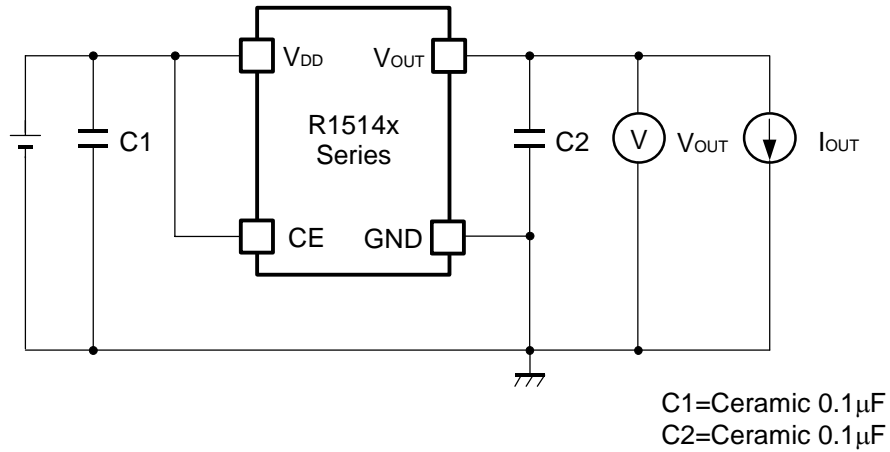
### Thermal Shutdown

Thermal shutdown function is included in the R1514x Series, if the junction temperature is equal or more than +150°C(Typ.), the operation of regulator would stop. After that, when the junction temperature is equal or less than +125°C(Typ.), the operation of regulator would restart. Unless the cause of rising temperature would remove, the regulator repeats on and off, and output waveform would be like consecutive pulses.

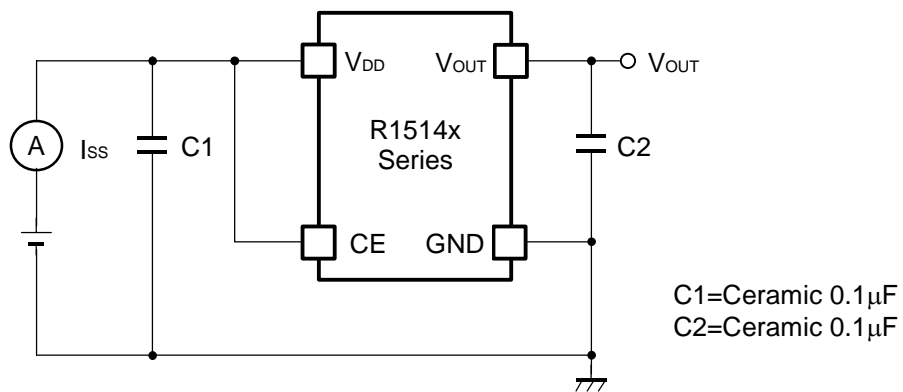
### Chip Enable Circuit

Do not make voltage level of chip enable pin keep floating level, or in between V<sub>CEH</sub> and V<sub>CEL</sub>. Otherwise, the output voltage would be unstable or indefinite, or unexpected current would flow internally.

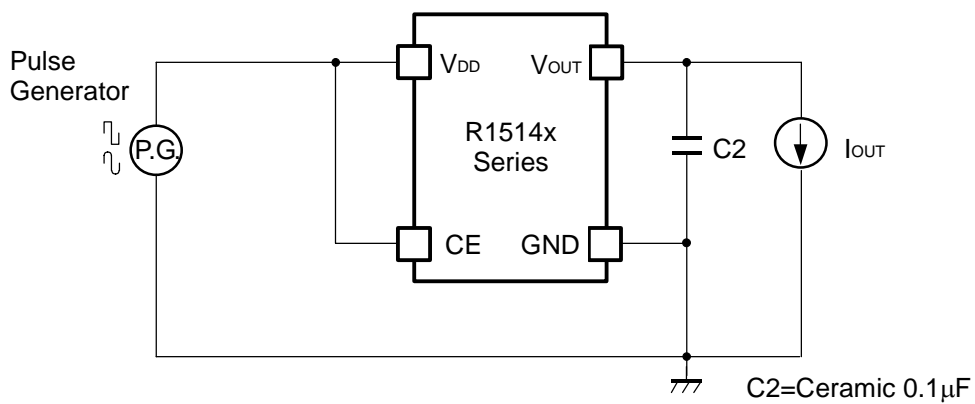
**TEST CIRCUITS**



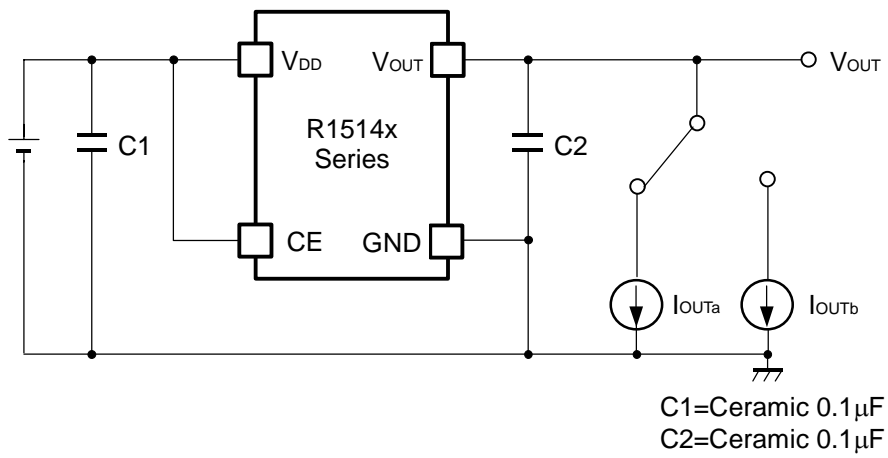
**Basic Test Circuit**



**Test Circuit for Supply Current**



**Test Circuit for Line Transient Response**



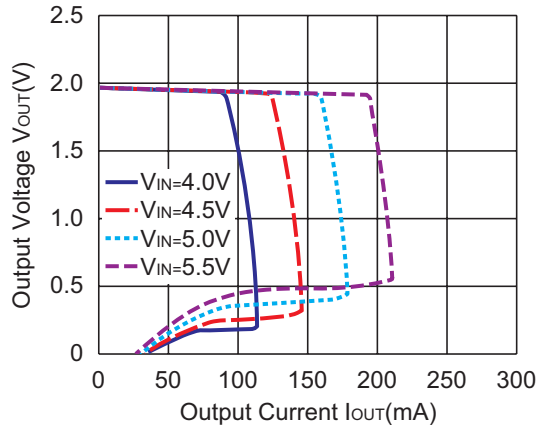
**Test Circuit for Load Transient Response**



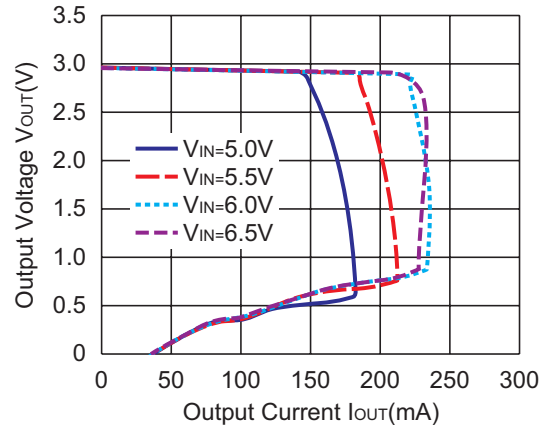
## TYPICAL CHARACTERISTICS

### 1) Output Voltage vs. Output Current (T<sub>opt</sub>=25°C)

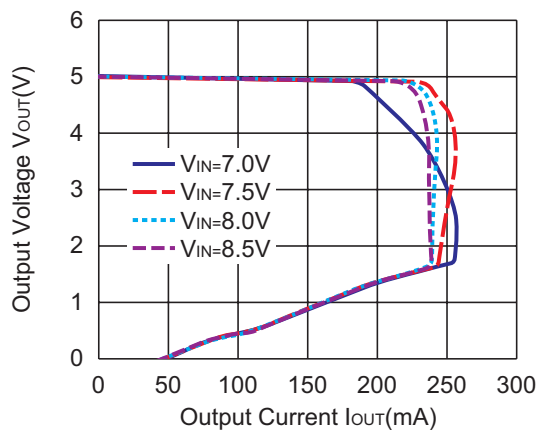
R1514x020B



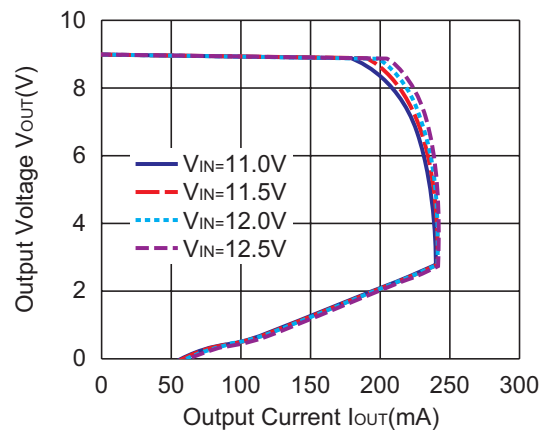
R1514x030B



R1514x050B

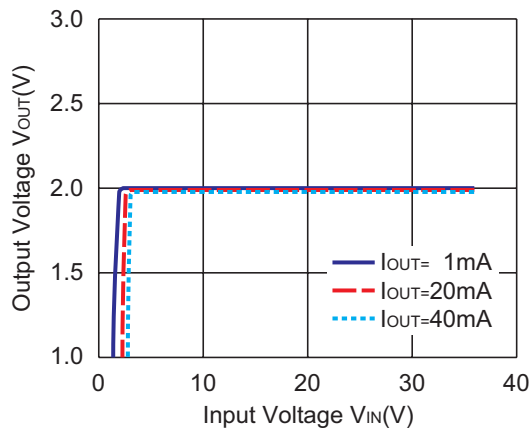


R1514x090B

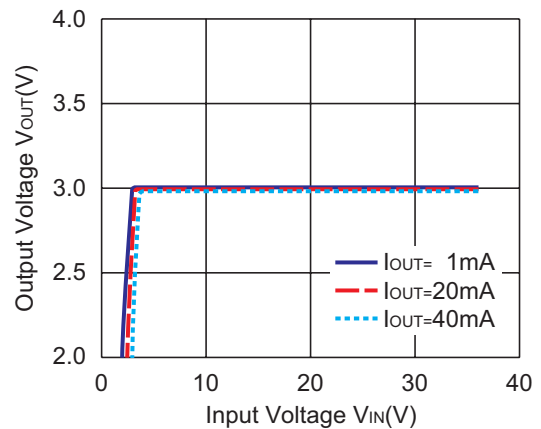


### 2) Output Voltage vs. Input Voltage (T<sub>opt</sub>=25°C)

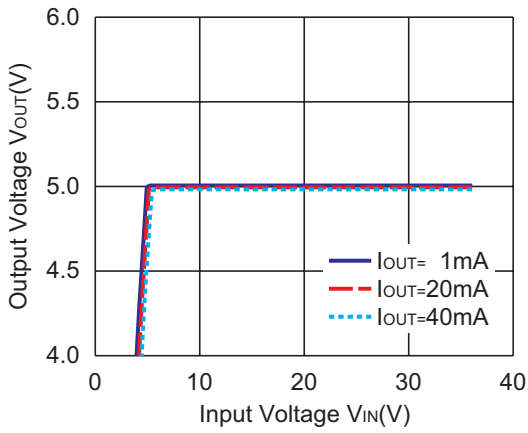
R1514x020B



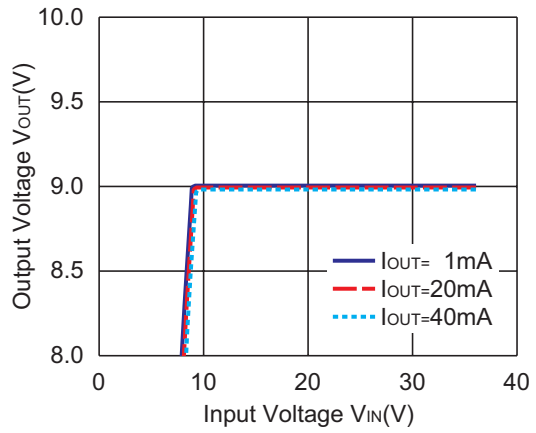
R1514x030B



R1514x050B

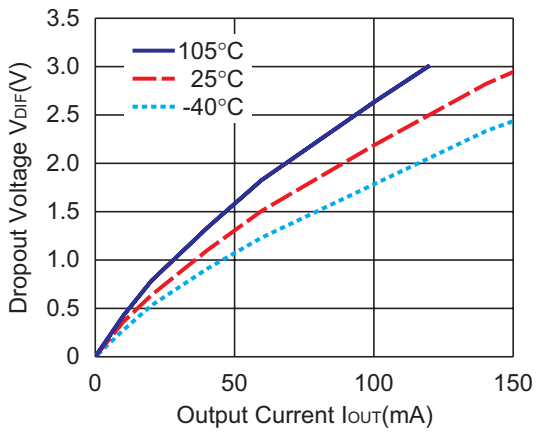


R1514x090B

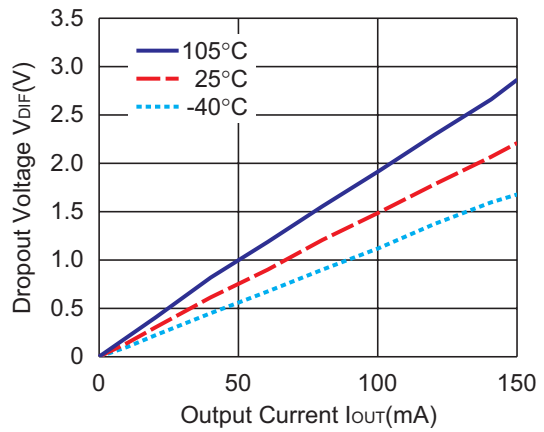


3) Dropout Voltage vs. Output Current

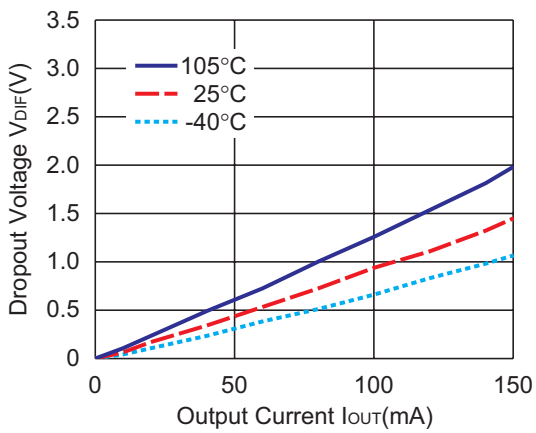
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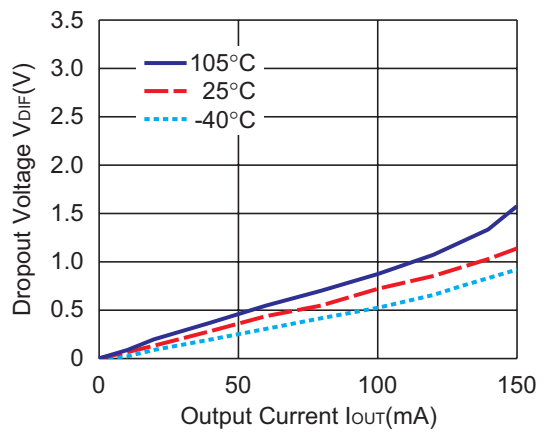
R1514x030B



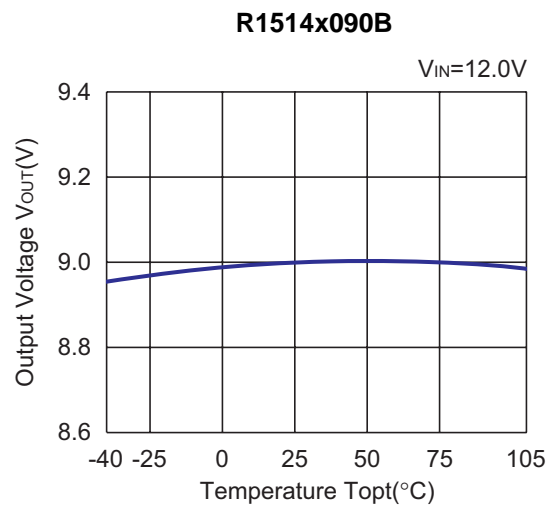
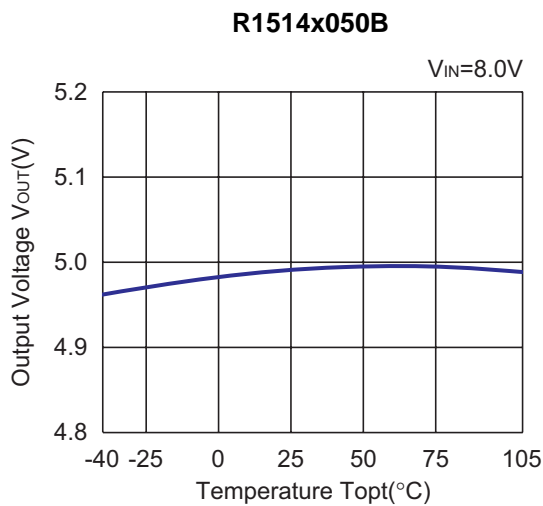
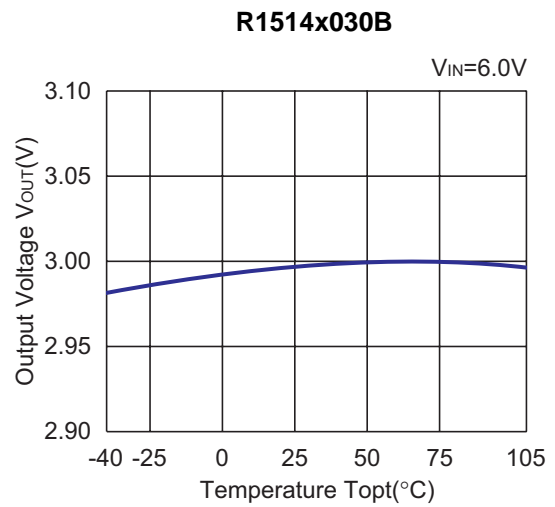
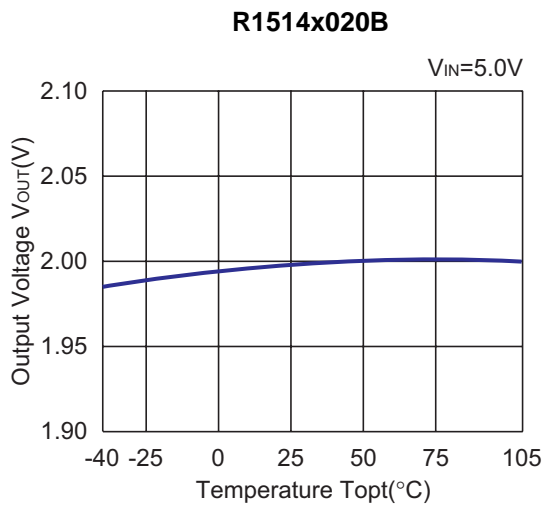
R1514x050B



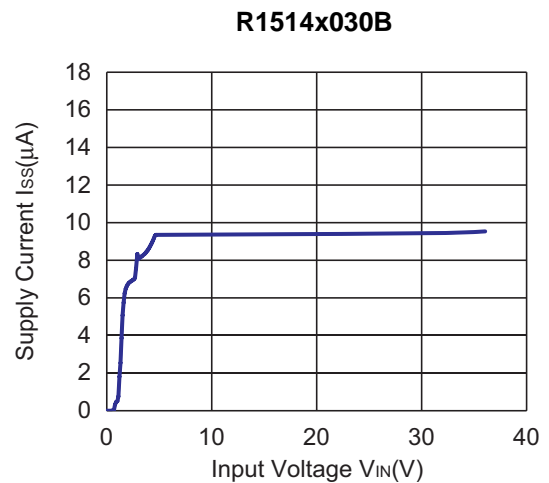
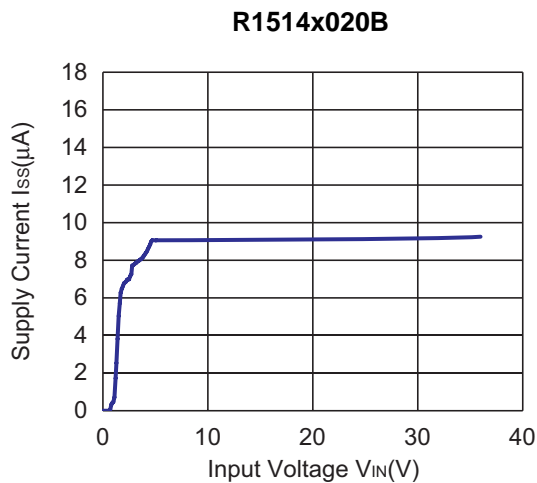
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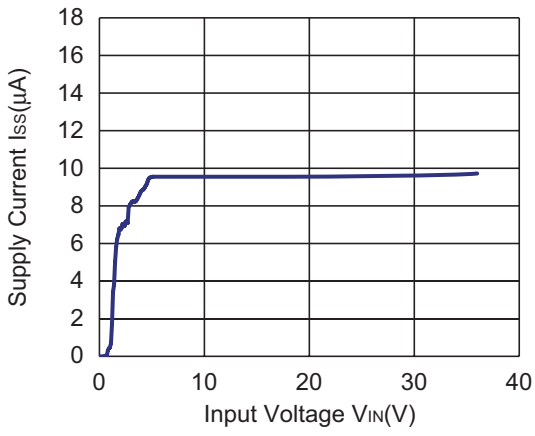
4) Output Voltage vs. Temperature



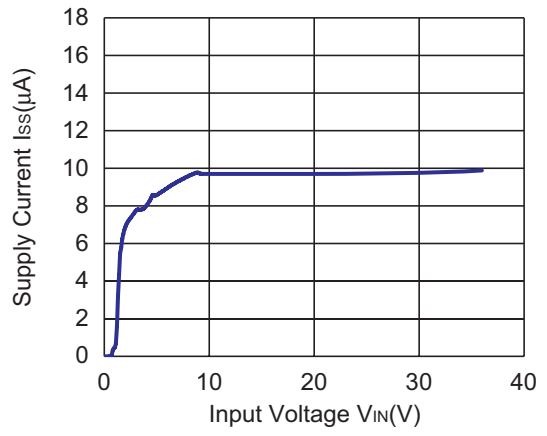
5) Supply Current vs. Input Voltage ( $T_{opt}=25^{\circ}C$ )



R1514x050B

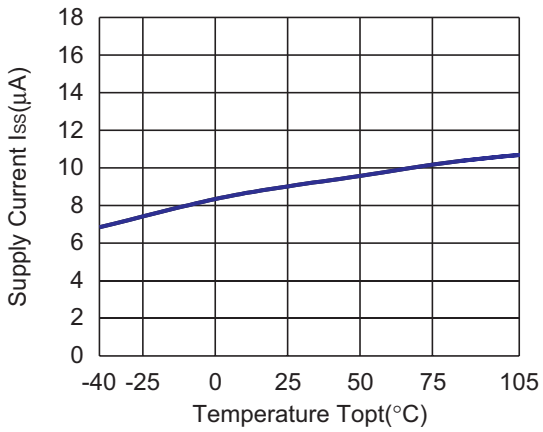


R1514x090B

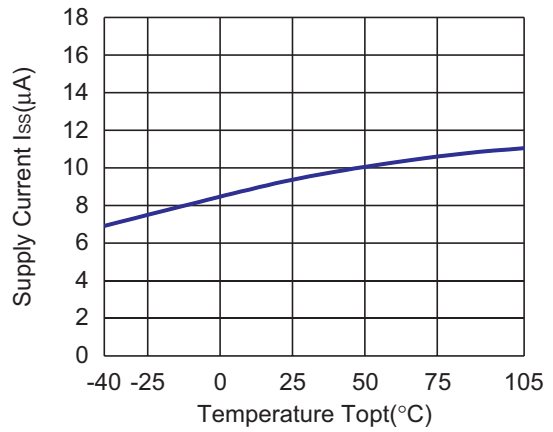


6) Supply Current vs. Temperature

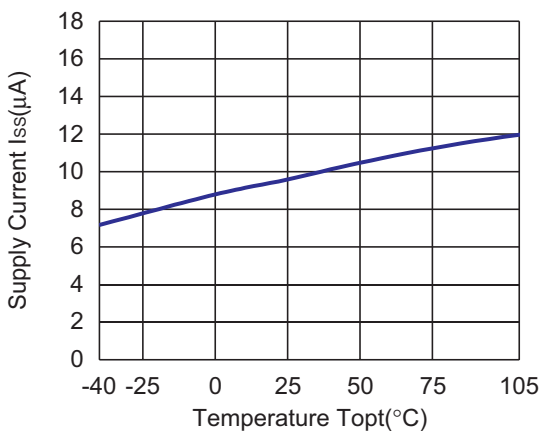
R1514x020B



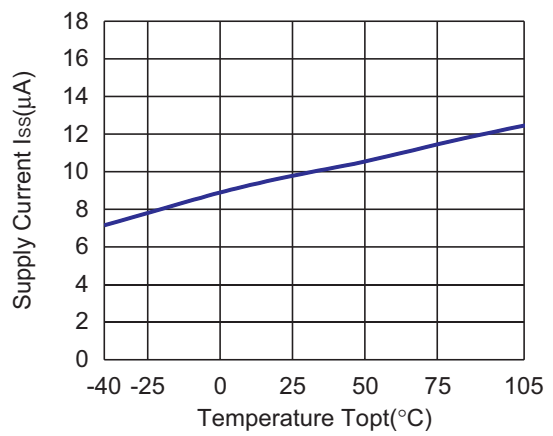
R1514x030B



R1514x050B

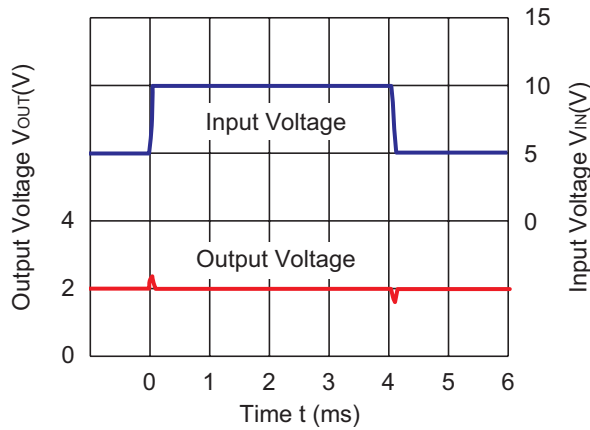


R1514x090B

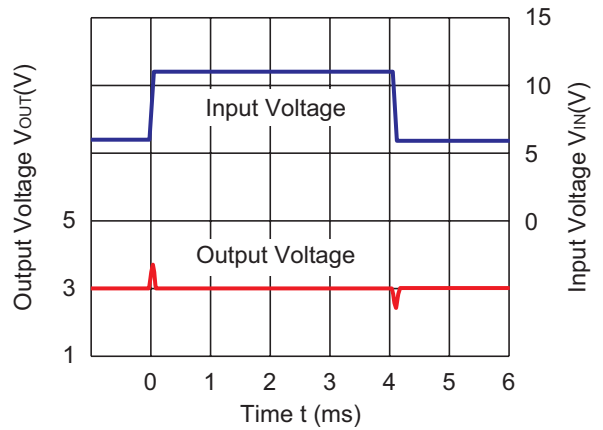


7) Input Transient Response ( $I_{OUT}=1mA$ ,  $t_r=t_f=50\mu s$ ,  $C_2=Ceramic\ 0.1\mu F$ ,  $T_{opt}=25^\circ C$ )

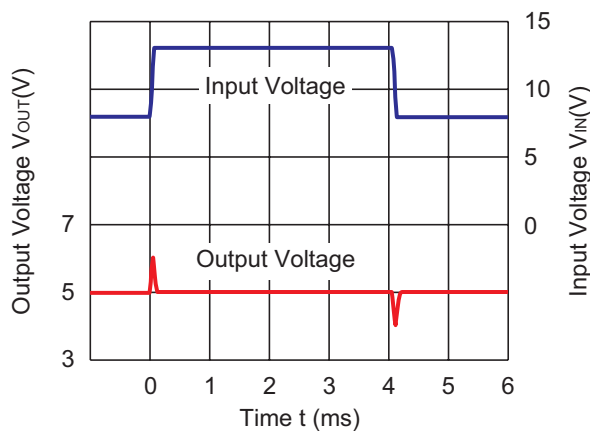
R1514x020B



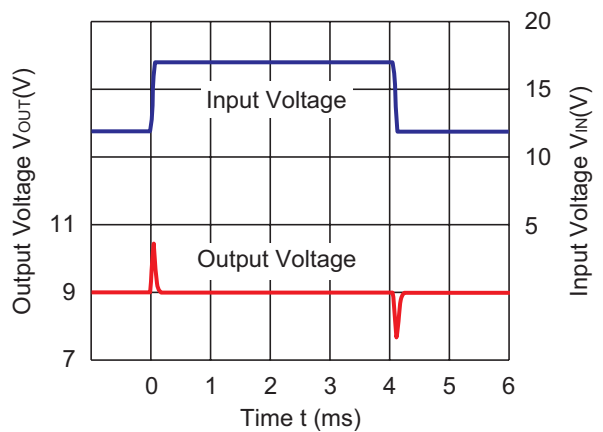
R1514x030B



R1514x050B



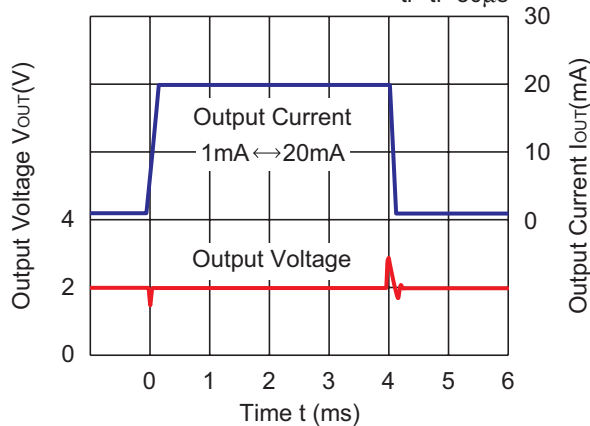
R1514x090B



8) Load Transient Response ( $C_2= Ceramic\ 0.1\mu F$ ,  $T_{opt}=25^\circ C$ )

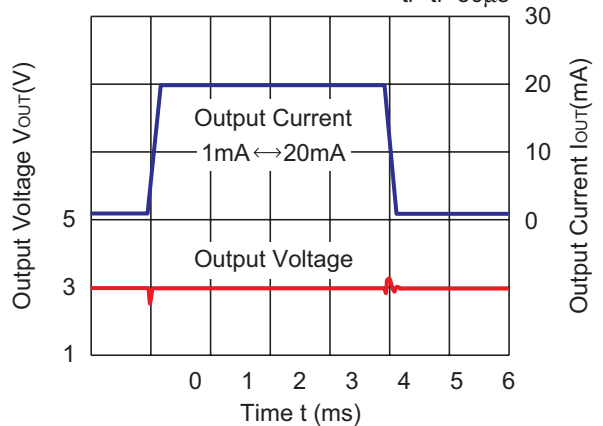
R1514x020B

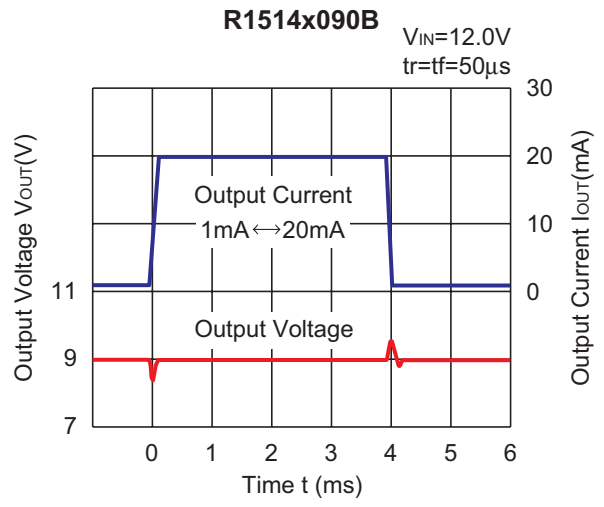
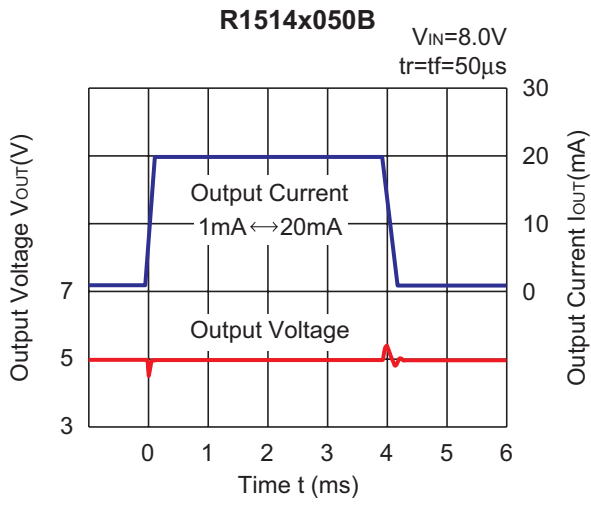
$V_{IN}=5.0V$   
 $t_r=t_f=50\mu s$



R1514x030B

$V_{IN}=6.0V$   
 $t_r=t_f=50\mu s$

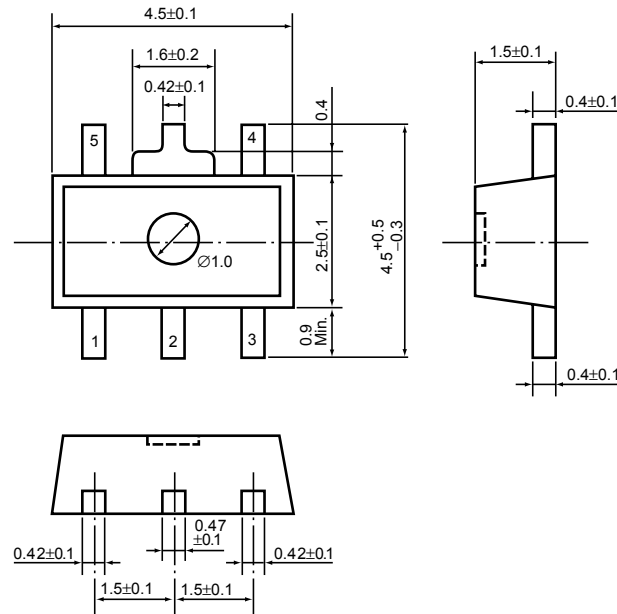




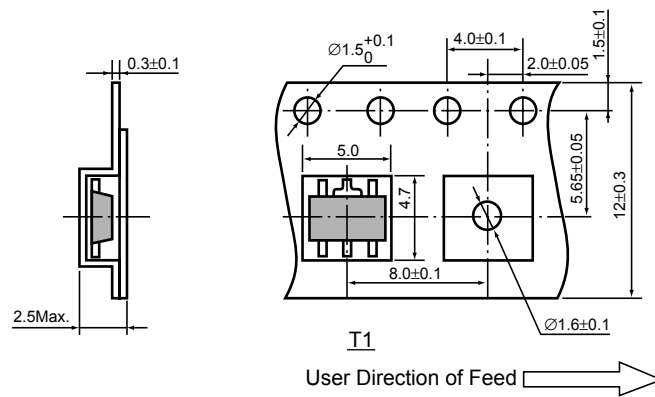
• SOT-89-5

Unit: mm

PACKAGE DIMENSIONS

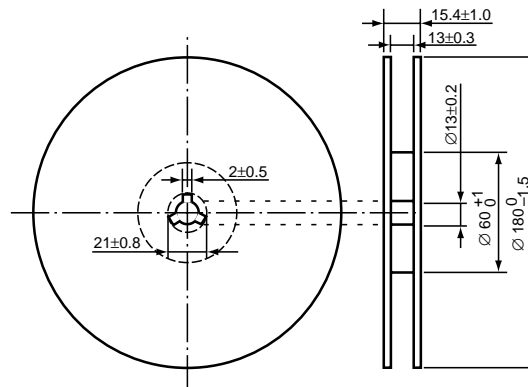


TAPING SPECIFICATION (T1: Standard Type)



TAPING REEL DIMENSIONS REUSE REEL (EIAJ-RRM-12Bc)

(1reel=1000pcs)



### POWER DISSIPATION (SOT-89-5)

This specification is at mounted on board. Power Dissipation ( $P_D$ ) depends on conditions of mounting on board. This specification is based on the measurement at the condition below:

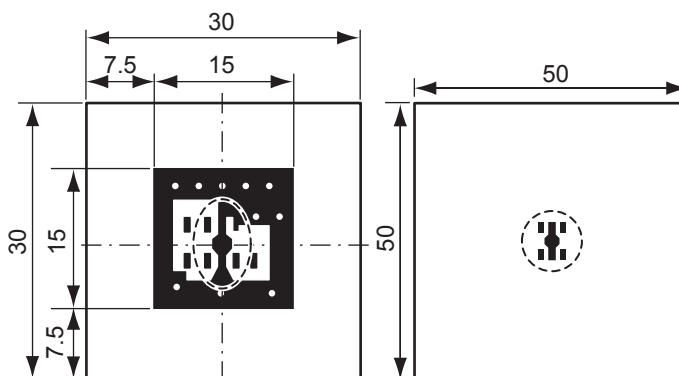
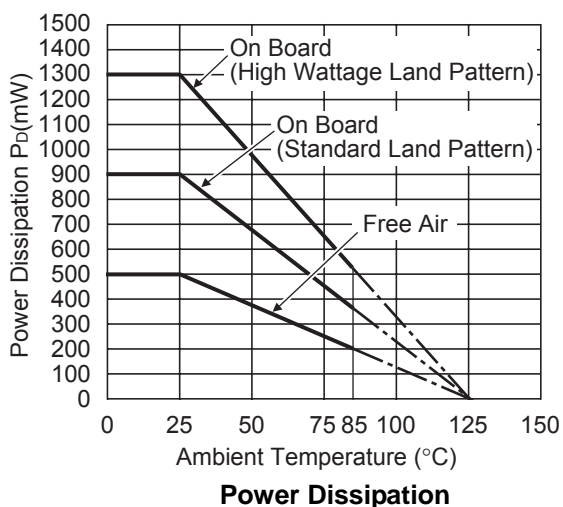
Measurement Conditions

|                  | High Wattage Land Pattern                            | Standard Land Pattern                                |
|------------------|------------------------------------------------------|------------------------------------------------------|
| Environment      | Mounting on Board (Wind velocity=0m/s)               | Mounting on Board (Wind velocity=0m/s)               |
| Board Material   | Glass cloth epoxy plastic (Double sided)             | Glass cloth epoxy plastic (Double sided)             |
| Board Dimensions | 30mm × 30mm × 1.6mm                                  | 50mm × 50mm × 1.6mm                                  |
| Copper Ratio     | Top side : Approx. 20% ,<br>Back side : Approx. 100% | Top side : Approx. 10% ,<br>Back side : Approx. 100% |
| Through-hole     | φ0.85mm × 10pcs                                      | -                                                    |

Measurement Result

( $T_{opt}=25^{\circ}C, T_{jmax}=125^{\circ}C$ )

|                    | High Wattage Land Pattern | Standard Land Pattern | Free Air |
|--------------------|---------------------------|-----------------------|----------|
| Power Dissipation  | 1300mW                    | 900mW                 | 500mW    |
| Thermal Resistance | 77°C/W                    | 111°C/W               | 200°C/W  |

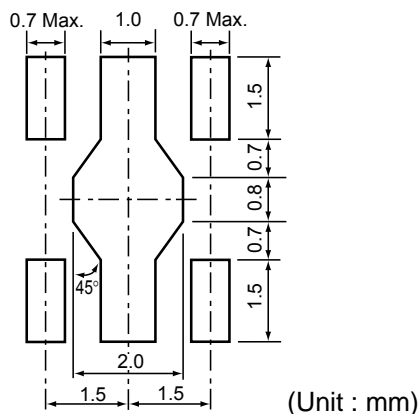


High Wattage Standard

Measurement Board Pattern

○ IC Mount Area (Unit : mm)

### RECOMMENDED LAND PATTERN (SOT-89-5)

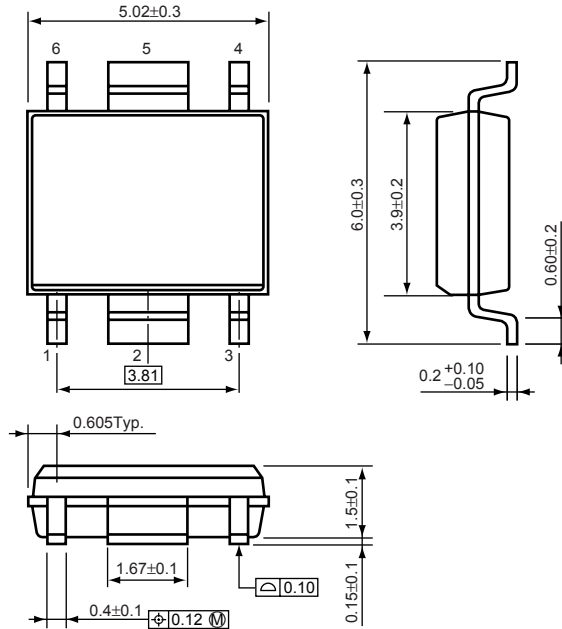




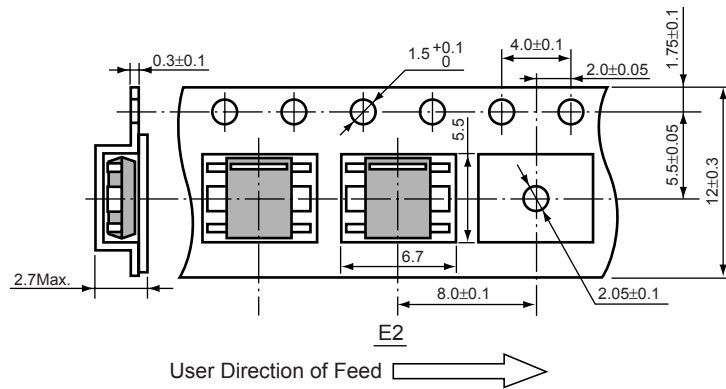
• HSOP-6J

Unit: mm

PACKAGE DIMENSIONS

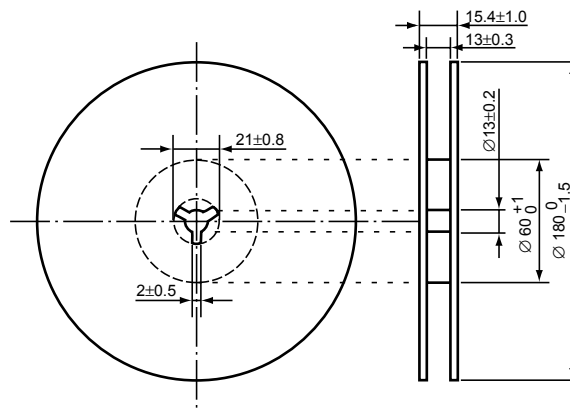


TAPING SPECIFICATION



TAPING REEL DIMENSIONS REUSE REEL (EIAJ-RRM-12Bc)

(1reel=1000pcs)



### POWER DISSIPATION (HSOP-6J)

This specification is at mounted on board. Power Dissipation ( $P_D$ ) depends on conditions of mounting on board. This specification is based on the measurement at the condition below:

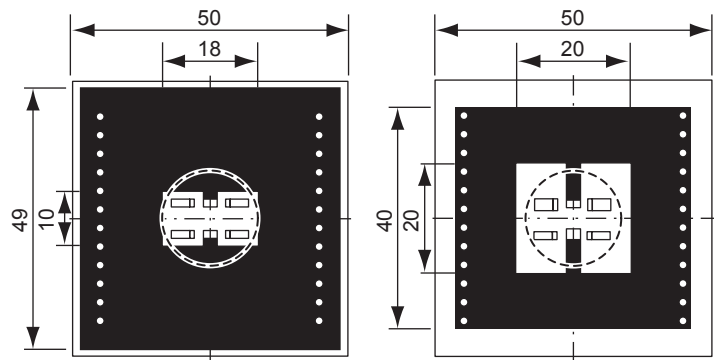
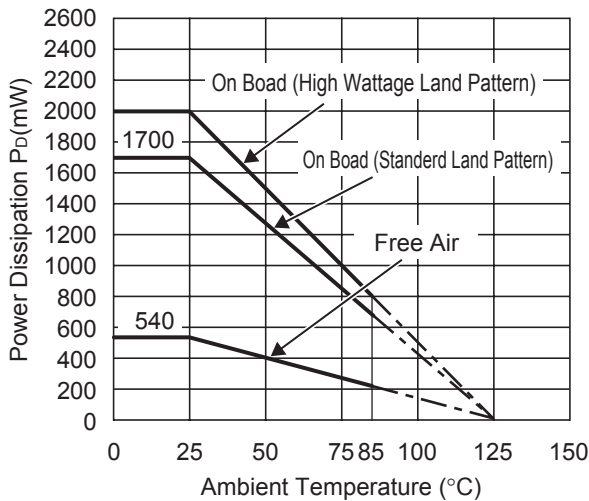
Measurement Conditions

|                  | High Wattage Land Pattern                | Standard Land Pattern                    |
|------------------|------------------------------------------|------------------------------------------|
| Environment      | Mounting on Board (Wind velocity=0m/s)   | Mounting on Board (Wind velocity=0m/s)   |
| Board Material   | Glass cloth epoxy plactic (Double sided) | Glass cloth epoxy plactic (Double sided) |
| Board Dimensions | 50mm × 50mm × 1.6mm                      | 50mm × 50mm × 1.6mm                      |
| Copper Ratio     | 90%                                      | 50%                                      |
| Through-hole     | φ0.5mm × 44pcs                           | φ0.5mm × 44pcs                           |

Measurement Result

( $T_{opt}=25^{\circ}C, T_{jmax}=125^{\circ}C$ )

|                    | High Wattage Land Pattern | Standard Land Pattern | Free Air |
|--------------------|---------------------------|-----------------------|----------|
| Power Dissipation  | 2000mW                    | 1700mW                | 540mW    |
| Thermal Resistance | 50°C/W                    | 59°C/W                | 185°C/W  |

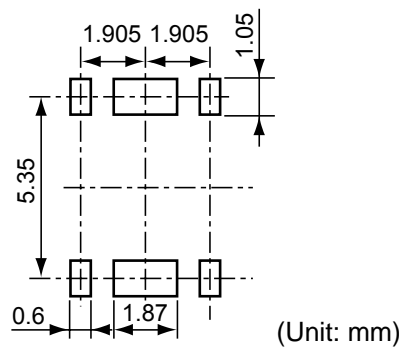


High Wattage Standard

Measurement Board Pattern

○ IC Mount Area Unit : mm

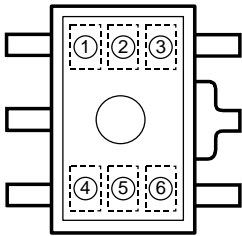
### RECOMMENDED LAND PATTERN (HSOP-6J)



(Unit: mm)

R1514H SERIES MARK SPECIFICATION

• SOT-89-5



- ① : M (fixed)
- ②, ③, ④ : Setting Voltage } (Refer to Part Number vs. Product Code)
- ⑤, ⑥ : Lot Number

• Part Number vs. Product Code

| Part Number | Product Code |   |   |   |
|-------------|--------------|---|---|---|
|             | ①            | ② | ③ | ④ |
| R1514H020B  | M            | 0 | 2 | 0 |
| R1514H021B  | M            | 0 | 2 | 1 |
| R1514H022B  | M            | 0 | 2 | 2 |
| R1514H023B  | M            | 0 | 2 | 3 |
| R1514H024B  | M            | 0 | 2 | 4 |
| R1514H025B  | M            | 0 | 2 | 5 |
| R1514H026B  | M            | 0 | 2 | 6 |
| R1514H027B  | M            | 0 | 2 | 7 |
| R1514H028B  | M            | 0 | 2 | 8 |
| R1514H029B  | M            | 0 | 2 | 9 |
| R1514H030B  | M            | 0 | 3 | 0 |
| R1514H031B  | M            | 0 | 3 | 1 |
| R1514H032B  | M            | 0 | 3 | 2 |
| R1514H033B  | M            | 0 | 3 | 3 |
| R1514H034B  | M            | 0 | 3 | 4 |
| R1514H035B  | M            | 0 | 3 | 5 |
| R1514H036B  | M            | 0 | 3 | 6 |
| R1514H037B  | M            | 0 | 3 | 7 |
| R1514H038B  | M            | 0 | 3 | 8 |
| R1514H039B  | M            | 0 | 3 | 9 |
| R1514H040B  | M            | 0 | 4 | 0 |
| R1514H041B  | M            | 0 | 4 | 1 |
| R1514H042B  | M            | 0 | 4 | 2 |
| R1514H043B  | M            | 0 | 4 | 3 |
| R1514H044B  | M            | 0 | 4 | 4 |
| R1514H045B  | M            | 0 | 4 | 5 |
| R1514H046B  | M            | 0 | 4 | 6 |
| R1514H047B  | M            | 0 | 4 | 7 |
| R1514H048B  | M            | 0 | 4 | 8 |
| R1514H049B  | M            | 0 | 4 | 9 |

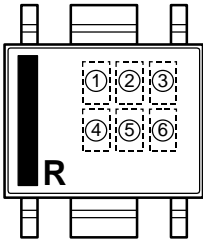
| Part Number | Product Code |   |   |   |
|-------------|--------------|---|---|---|
|             | ①            | ② | ③ | ④ |
| R1514H050B  | M            | 0 | 5 | 0 |
| R1514H051B  | M            | 0 | 5 | 1 |
| R1514H052B  | M            | 0 | 5 | 2 |
| R1514H053B  | M            | 0 | 5 | 3 |
| R1514H054B  | M            | 0 | 5 | 4 |
| R1514H055B  | M            | 0 | 5 | 5 |
| R1514H056B  | M            | 0 | 5 | 6 |
| R1514H057B  | M            | 0 | 5 | 7 |
| R1514H058B  | M            | 0 | 5 | 8 |
| R1514H059B  | M            | 0 | 5 | 9 |
| R1514H060B  | M            | 0 | 6 | 0 |
| R1514H061B  | M            | 0 | 6 | 1 |
| R1514H062B  | M            | 0 | 6 | 2 |
| R1514H063B  | M            | 0 | 6 | 3 |
| R1514H064B  | M            | 0 | 6 | 4 |
| R1514H065B  | M            | 0 | 6 | 5 |
| R1514H066B  | M            | 0 | 6 | 6 |
| R1514H067B  | M            | 0 | 6 | 7 |
| R1514H068B  | M            | 0 | 6 | 8 |
| R1514H069B  | M            | 0 | 6 | 9 |
| R1514H070B  | M            | 0 | 7 | 0 |
| R1514H071B  | M            | 0 | 7 | 1 |
| R1514H072B  | M            | 0 | 7 | 2 |
| R1514H073B  | M            | 0 | 7 | 3 |
| R1514H074B  | M            | 0 | 7 | 4 |
| R1514H075B  | M            | 0 | 7 | 5 |
| R1514H076B  | M            | 0 | 7 | 6 |
| R1514H077B  | M            | 0 | 7 | 7 |
| R1514H078B  | M            | 0 | 7 | 8 |
| R1514H079B  | M            | 0 | 7 | 9 |

| Part Number | Product Code |   |   |   |
|-------------|--------------|---|---|---|
|             | ①            | ② | ③ | ④ |
| R1514H080B  | M            | 0 | 8 | 0 |
| R1514H081B  | M            | 0 | 8 | 1 |
| R1514H082B  | M            | 0 | 8 | 2 |
| R1514H083B  | M            | 0 | 8 | 3 |
| R1514H084B  | M            | 0 | 8 | 4 |
| R1514H085B  | M            | 0 | 8 | 5 |
| R1514H086B  | M            | 0 | 8 | 6 |
| R1514H087B  | M            | 0 | 8 | 7 |
| R1514H088B  | M            | 0 | 8 | 8 |
| R1514H089B  | M            | 0 | 8 | 9 |
| R1514H090B  | M            | 0 | 9 | 0 |
| R1514H091B  | M            | 0 | 9 | 1 |
| R1514H092B  | M            | 0 | 9 | 2 |
| R1514H093B  | M            | 0 | 9 | 3 |
| R1514H094B  | M            | 0 | 9 | 4 |
| R1514H095B  | M            | 0 | 9 | 5 |
| R1514H096B  | M            | 0 | 9 | 6 |
| R1514H097B  | M            | 0 | 9 | 7 |
| R1514H098B  | M            | 0 | 9 | 8 |
| R1514H099B  | M            | 0 | 9 | 9 |
| R1514H100B  | M            | 1 | 0 | 0 |
| R1514H101B  | M            | 1 | 0 | 1 |
| R1514H102B  | M            | 1 | 0 | 2 |
| R1514H103B  | M            | 1 | 0 | 3 |
| R1514H104B  | M            | 1 | 0 | 4 |
| R1514H105B  | M            | 1 | 0 | 5 |
| R1514H106B  | M            | 1 | 0 | 6 |
| R1514H107B  | M            | 1 | 0 | 7 |
| R1514H108B  | M            | 1 | 0 | 8 |
| R1514H109B  | M            | 1 | 0 | 9 |

| Part Number | Product Code |   |   |   |
|-------------|--------------|---|---|---|
|             | ①            | ② | ③ | ④ |
| R1514H110B  | M            | 1 | 1 | 0 |
| R1514H111B  | M            | 1 | 1 | 1 |
| R1514H112B  | M            | 1 | 1 | 2 |
| R1514H113B  | M            | 1 | 1 | 3 |
| R1514H114B  | M            | 1 | 1 | 4 |
| R1514H115B  | M            | 1 | 1 | 5 |
| R1514H116B  | M            | 1 | 1 | 6 |
| R1514H117B  | M            | 1 | 1 | 7 |
| R1514H118B  | M            | 1 | 1 | 8 |
| R1514H119B  | M            | 1 | 1 | 9 |
| R1514H120B  | M            | 1 | 2 | 0 |

R1514S SERIES MARK SPECIFICATION

● HSOP-6J



- ① : E (fixed)
- ②, ③, ④ : Setting Voltage } (Refer to Part Number vs. Product Code)
- ⑤, ⑥ : Lot Number

● Part Number vs. Product Code

| Part Number | Product Code |   |   |   |
|-------------|--------------|---|---|---|
|             | ①            | ② | ③ | ④ |
| R1514S020B  | E            | 0 | 2 | 0 |
| R1514S021B  | E            | 0 | 2 | 1 |
| R1514S022B  | E            | 0 | 2 | 2 |
| R1514S023B  | E            | 0 | 2 | 3 |
| R1514S024B  | E            | 0 | 2 | 4 |
| R1514S025B  | E            | 0 | 2 | 5 |
| R1514S026B  | E            | 0 | 2 | 6 |
| R1514S027B  | E            | 0 | 2 | 7 |
| R1514S028B  | E            | 0 | 2 | 8 |
| R1514S029B  | E            | 0 | 2 | 9 |
| R1514S030B  | E            | 0 | 3 | 0 |
| R1514S031B  | E            | 0 | 3 | 1 |
| R1514S032B  | E            | 0 | 3 | 2 |
| R1514S033B  | E            | 0 | 3 | 3 |
| R1514S034B  | E            | 0 | 3 | 4 |
| R1514S035B  | E            | 0 | 3 | 5 |
| R1514S036B  | E            | 0 | 3 | 6 |
| R1514S037B  | E            | 0 | 3 | 7 |
| R1514S038B  | E            | 0 | 3 | 8 |
| R1514S039B  | E            | 0 | 3 | 9 |
| R1514S040B  | E            | 0 | 4 | 0 |
| R1514S041B  | E            | 0 | 4 | 1 |
| R1514S042B  | E            | 0 | 4 | 2 |
| R1514S043B  | E            | 0 | 4 | 3 |
| R1514S044B  | E            | 0 | 4 | 4 |
| R1514S045B  | E            | 0 | 4 | 5 |
| R1514S046B  | E            | 0 | 4 | 6 |
| R1514S047B  | E            | 0 | 4 | 7 |
| R1514S048B  | E            | 0 | 4 | 8 |
| R1514S049B  | E            | 0 | 4 | 9 |

| Part Number | Product Code |   |   |   |
|-------------|--------------|---|---|---|
|             | ①            | ② | ③ | ④ |
| R1514S050B  | E            | 0 | 5 | 0 |
| R1514S051B  | E            | 0 | 5 | 1 |
| R1514S052B  | E            | 0 | 5 | 2 |
| R1514S053B  | E            | 0 | 5 | 3 |
| R1514S054B  | E            | 0 | 5 | 4 |
| R1514S055B  | E            | 0 | 5 | 5 |
| R1514S056B  | E            | 0 | 5 | 6 |
| R1514S057B  | E            | 0 | 5 | 7 |
| R1514S058B  | E            | 0 | 5 | 8 |
| R1514S059B  | E            | 0 | 5 | 9 |
| R1514S060B  | E            | 0 | 6 | 0 |
| R1514S061B  | E            | 0 | 6 | 1 |
| R1514S062B  | E            | 0 | 6 | 2 |
| R1514S063B  | E            | 0 | 6 | 3 |
| R1514S064B  | E            | 0 | 6 | 4 |
| R1514S065B  | E            | 0 | 6 | 5 |
| R1514S066B  | E            | 0 | 6 | 6 |
| R1514S067B  | E            | 0 | 6 | 7 |
| R1514S068B  | E            | 0 | 6 | 8 |
| R1514S069B  | E            | 0 | 6 | 9 |
| R1514S070B  | E            | 0 | 7 | 0 |
| R1514S071B  | E            | 0 | 7 | 1 |
| R1514S072B  | E            | 0 | 7 | 2 |
| R1514S073B  | E            | 0 | 7 | 3 |
| R1514S074B  | E            | 0 | 7 | 4 |
| R1514S075B  | E            | 0 | 7 | 5 |
| R1514S076B  | E            | 0 | 7 | 6 |
| R1514S077B  | E            | 0 | 7 | 7 |
| R1514S078B  | E            | 0 | 7 | 8 |
| R1514S079B  | E            | 0 | 7 | 9 |

| Part Number | Product Code |   |   |   |
|-------------|--------------|---|---|---|
|             | ①            | ② | ③ | ④ |
| R1514S080B  | E            | 0 | 8 | 0 |
| R1514S081B  | E            | 0 | 8 | 1 |
| R1514S082B  | E            | 0 | 8 | 2 |
| R1514S083B  | E            | 0 | 8 | 3 |
| R1514S084B  | E            | 0 | 8 | 4 |
| R1514S085B  | E            | 0 | 8 | 5 |
| R1514S086B  | E            | 0 | 8 | 6 |
| R1514S087B  | E            | 0 | 8 | 7 |
| R1514S088B  | E            | 0 | 8 | 8 |
| R1514S089B  | E            | 0 | 8 | 9 |
| R1514S090B  | E            | 0 | 9 | 0 |
| R1514S091B  | E            | 0 | 9 | 1 |
| R1514S092B  | E            | 0 | 9 | 2 |
| R1514S093B  | E            | 0 | 9 | 3 |
| R1514S094B  | E            | 0 | 9 | 4 |
| R1514S095B  | E            | 0 | 9 | 5 |
| R1514S096B  | E            | 0 | 9 | 6 |
| R1514S097B  | E            | 0 | 9 | 7 |
| R1514S098B  | E            | 0 | 9 | 8 |
| R1514S099B  | E            | 0 | 9 | 9 |
| R1514S100B  | E            | 1 | 0 | 0 |
| R1514S101B  | E            | 1 | 0 | 1 |
| R1514S102B  | E            | 1 | 0 | 2 |
| R1514S103B  | E            | 1 | 0 | 3 |
| R1514S104B  | E            | 1 | 0 | 4 |
| R1514S105B  | E            | 1 | 0 | 5 |
| R1514S106B  | E            | 1 | 0 | 6 |
| R1514S107B  | E            | 1 | 0 | 7 |
| R1514S108B  | E            | 1 | 0 | 8 |
| R1514S109B  | E            | 1 | 0 | 9 |

| Part Number | Product Code |   |   |   |
|-------------|--------------|---|---|---|
|             | ①            | ② | ③ | ④ |
| R1514S110B  | E            | 1 | 1 | 0 |
| R1514S111B  | E            | 1 | 1 | 1 |
| R1514S112B  | E            | 1 | 1 | 2 |
| R1514S113B  | E            | 1 | 1 | 3 |
| R1514S114B  | E            | 1 | 1 | 4 |
| R1514S115B  | E            | 1 | 1 | 5 |
| R1514S116B  | E            | 1 | 1 | 6 |
| R1514S117B  | E            | 1 | 1 | 7 |
| R1514S118B  | E            | 1 | 1 | 8 |
| R1514S119B  | E            | 1 | 1 | 9 |
| R1514S120B  | E            | 1 | 2 | 0 |

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- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
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- Поставка специализированных компонентов военного и аэрокосмического уровня качества (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Actel, Aeroflex, Peregrine, VPT, Syfer, Eurofarad, Texas Instruments, MS Kennedy, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits, General Dynamics и др.);

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**JONHON**

«**JONHON**» (основан в 1970 г.)

Разъемы специального, военного и аэрокосмического назначения:

(Применяются в военной, авиационной, аэрокосмической, морской, железнодорожной, горно- и нефтедобывающей отраслях промышленности)

«**FORSTAR**» (основан в 1998 г.)

ВЧ соединители, коаксиальные кабели, кабельные сборки и микроволновые компоненты:

(Применяются в телекоммуникациях гражданского и специального назначения, в средствах связи, РЛС, а так же военной, авиационной и аэрокосмической отраслях промышленности).



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