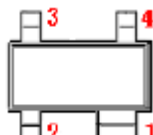


## NPN SILICON RF TRANSISTOR

### Feature

High gain:  $|S_{21e}|_2$  TYP. Value is 13dB @  $V_{CE}=8V$ ,  $I_C=40mA$ ,  $f=0.9GHz$   
 Low noise: NF TYP. Value is 1.8dB @  $V_{CE}=10V$ ,  $I_C=10mA$ ,  $f=0.9GHz$   
 $f_T$ (TYP.): TYP. Value is 9GHz @  $V_{CE}=8V$ ,  $I_C=40mA$ ,  $f=1GHz$

| TYPE      | PACKAGE   | MARKING | PACKING | PIN NO.                                                                              |
|-----------|-----------|---------|---------|--------------------------------------------------------------------------------------|
| BFG540    | SOT -143B | N37     | 3K/REEL |   |
| BFG540-X  | SOT -143B | N43     | 3K/REEL |                                                                                      |
| BFG540-XR | SOT -143R | N49     | 3K/REEL |  |

### Absolute Maximum Ratings $T_A=25^{\circ}C$ Unless Otherwise noted

| PARAMETER                           | SYMBLE    | MAXIMUM VALUE           | UNIT        |
|-------------------------------------|-----------|-------------------------|-------------|
| Collector-base breakdown voltage    | $V_{CBO}$ | 20                      | V           |
| Collector-emitter breakdown voltage | $V_{CEO}$ | 10                      | V           |
| Emitter-base breakdown voltage      | $V_{EBO}$ | 2.5                     | V           |
| Collector current                   | $I_C$     | 120                     | mA          |
| Collector Power Dissipation         | $P_D$     | 200                     | mW          |
| Junction Temperature                | $T_j$     | 150                     | $^{\circ}C$ |
| Storage Temperature                 | $T_{stg}$ | $65 \sim +150^{\circ}C$ | $T_{stg}$   |

### hFE Classification

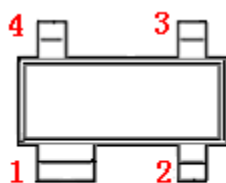
| Classification |           | A      | B      | C       | D       | E       |
|----------------|-----------|--------|--------|---------|---------|---------|
| TYPE           | BFG540    | N37    |        |         |         |         |
|                | BFG540-X  | N43    |        |         |         |         |
|                | BFG540-XR | N49    |        |         |         |         |
| hFE            |           | 60~100 | 90~140 | 130~180 | 170~250 | 250~300 |

# BFG540 BFG540-X BFG540-XR

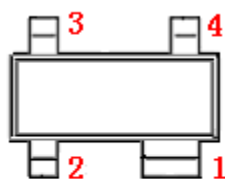
## ELECTRICAL CHARACTERISTICS ( $T_a=25^{\circ}\text{C}$ unless otherwise specified)

| PARAMETER                        | SYMBLE        | MIN. | TYP. | MAX. | UNIT          | TEST CONDITION                                        |
|----------------------------------|---------------|------|------|------|---------------|-------------------------------------------------------|
| Collector-base breakdown voltage | $V_{CBO}$     | 20   |      |      | V             | $I_C=1.0\mu\text{A}$                                  |
| Collector cut-off current        | $I_{CBO}$     |      |      | 0.1  | $\mu\text{A}$ | $V_{CB}=10\text{V}$                                   |
| Emitter cut-off current          | $I_{EBO}$     |      |      | 0.1  | $\mu\text{A}$ | $V_{EB}=1\text{V}$                                    |
| DC current gain                  | $h_{FE}^*$    | 60   | 150  | 300  |               | $V_{CE}=5\text{V}, I_C=15\text{mA}$                   |
| Transit frequency                | $f_T$         |      | 9    |      | GHz           | $V_{CE}=8\text{V}, I_C=40\text{mA}, f=1\text{GHz}$    |
| Output feedback capacitance      | $C_{re}$      |      | 0.65 | 1.0  | pF            | $V_{CB}=10\text{V}, I_E=0\text{mA}, f=1\text{MHz}$    |
| Power gain                       | $ S_{21e} _2$ |      | 13   |      | dB            | $V_{CE}=8\text{V}, I_C=40\text{mA}, f=0.9\text{GHz}$  |
| Noise factor                     | NF            |      | 1.8  |      | dB            | $V_{CE}=10\text{V}, I_C=10\text{mA}, f=0.9\text{GHz}$ |
|                                  |               |      | 3.0  |      |               | $V_{CE}=10\text{V}, I_C=40\text{mA}, f=0.9\text{GHz}$ |

## PACKAGE MODE



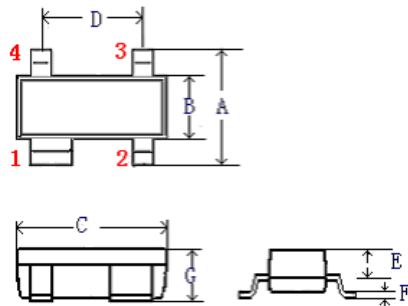
SOT-143B



SOT-143R

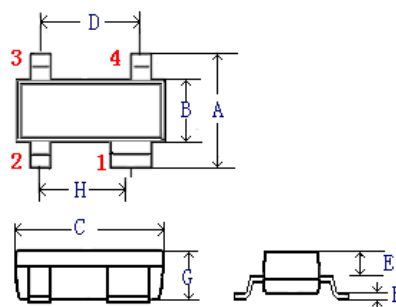
| TYPE      | PACKAGE   | MARKING | PIN arrangement |         |         |         |
|-----------|-----------|---------|-----------------|---------|---------|---------|
|           |           |         | PIN 1           | PIN 2   | PIN 3   | PIN 4   |
| BFG540    | SOT -143B | N37     | Collector       | Base    | Emitter | Emitter |
| BFG540-X  | SOT -143B | N43     | Collector       | Emitter | Base    | Emitter |
| BFG540-XR | SOT -143R | N49     | Collector       | Emitter | Base    | Emitter |

## SOT-143B Dimension



| SYMBLE | MIN (mm) | MAX (mm) |
|--------|----------|----------|
| A      | 2.4      | 2.5      |
| B      | 1.2      | 1.4      |
| C      | 2.8      | 3.0      |
| D      | 1.9      |          |
| E      | 0.45     | 0.55     |
| F      | 0.09     | 0.15     |
| G      | 0.9      | 1.1      |
| H      | 1.7      |          |

## SOT-143R Dimension



| SYMBLE | MIN (mm) | MAX (mm) |
|--------|----------|----------|
| A      | 2.4      | 2.5      |
| B      | 1.2      | 1.4      |
| C      | 2.8      | 3.0      |
| D      | 1.9      |          |
| E      | 0.45     | 0.55     |
| F      | 0.09     | 0.15     |
| G      | 0.9      | 1.1      |
| H      | 1.7      |          |

