



## USS5140U

Preliminary

PNP SILICON TRANSISTOR

### -1A, -40V PNP LOW $V_{CE(SAT)}$ TRANSISTOR

#### DESCRIPTION

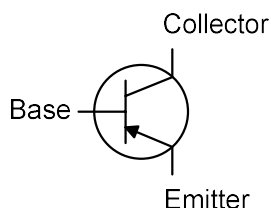
The UTC **USS5140U** is PNP low  $V_{CE(SAT)}$  transistor in a medium power and flat lead SOT-323 Surface-Mounted Device (SMD) plastic package.

PNP complement: USS4140U.

#### FEATURES

- \* Very low collector-emitter saturation voltage  $V_{CE(SAT)}$
- \* High collector current capability  $I_C$  and  $I_{CM}$
- \* High collector current gain ( $h_{FE}$ ) at high  $I_C$
- \* High energy efficiency due to less heat generation

#### EQUIVALENT CIRCUIT



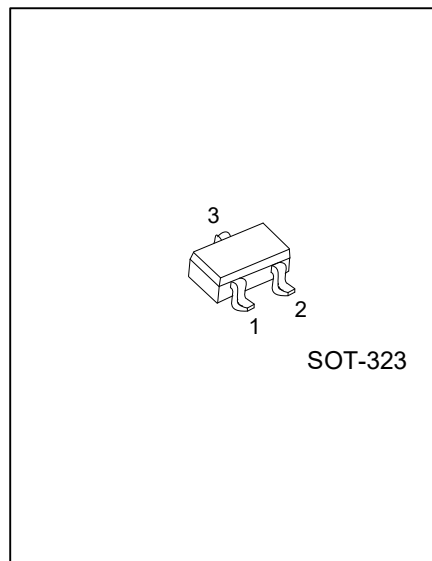
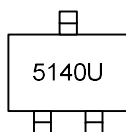
#### ORDERING INFORMATION

| Ordering Number |                 | Package | Pin Assignment |   |   | Packing |
|-----------------|-----------------|---------|----------------|---|---|---------|
| Lead Free       | Halogen Free    |         | 1              | 2 | 3 |         |
| USS5140UL-AL6-R | USS5140UG-AL6-R | SOT-323 | B              | E | C | Tube    |

Note: Pin Assignment: B: Base E: Emitter C: Collector

|                 |                  |                                                 |
|-----------------|------------------|-------------------------------------------------|
| USS5140UG-AL6-R | (1)Packing Type  | (1) R: Tape Reel                                |
|                 | (2)Package Type  | (2) AL6: SOT-323                                |
|                 | (3)Green Package | (3) G: Halogen Free and Lead Free, L: Lead Free |

#### MARKING



■ **ABSOLUTE MAXIMUM RATING** ( $T_A=25^{\circ}\text{C}$ , unless otherwise specified)

| PARAMETER                 | SYMBOL    | RATINGS    | UNIT               |
|---------------------------|-----------|------------|--------------------|
| Collector-Base Voltage    | $V_{CBO}$ | -40        | V                  |
| Collector-Emitter Voltage | $V_{CEO}$ | -40        | V                  |
| Emitter-Base Voltage      | $V_{EBO}$ | -5         | V                  |
| Collector Current         | $I_C$     | -1         | A                  |
| Peak Collector Current    | $I_{CM}$  | -2         | A                  |
| Peak Base Current         | $I_{BM}$  | -1         | A                  |
| Power Dissipation         | $P_C$     | 250        | mW                 |
| Junction Temperature      | $T_J$     | +150       | $^{\circ}\text{C}$ |
| Operating Temperature     | $T_{OPR}$ | -40 ~ +150 | $^{\circ}\text{C}$ |
| Storage Temperature       | $T_{STG}$ | -55 ~ +150 | $^{\circ}\text{C}$ |

Note: Absolute maximum ratings are those values beyond which the device could be permanently damaged.  
Absolute maximum ratings are stress ratings only and functional device operation is not implied.

■ **THERMAL DATA**

| PARAMETER           | SYMBOL        | RATINGS | UNIT                 |
|---------------------|---------------|---------|----------------------|
| Junction to Ambient | $\theta_{JA}$ | 500     | $^{\circ}\text{C/W}$ |

Note: Device mounted on FR-4 substrate PC board, 2oz copper, with 1inch square copper plate.

■ **ELECTRICAL CHARACTERISTICS** ( $T_A=25^{\circ}\text{C}$ , unless otherwise specified)

| PARAMETER                            | SYMBOL        | TEST CONDITIONS                           | MIN | TYP | MAX  | UNIT |
|--------------------------------------|---------------|-------------------------------------------|-----|-----|------|------|
| Collector-Base Breakdown Voltage     | $BV_{CBO}$    | $I_C=-100\mu\text{A}$ , $I_E=0$           | -40 |     |      | V    |
| Collector-Emitter Breakdown Voltage  | $BV_{CEO}$    | $I_C=-10\text{mA}$ , $I_B=0$              | -40 |     |      | V    |
| Emitter-Base Breakdown Voltage       | $BV_{EBO}$    | $I_E=-100\mu\text{A}$ , $I_C=0$           | -5  |     |      | V    |
| Collector-Base Cut-off Current       | $I_{CBO}$     | $V_{CB}=-40\text{V}$ , $I_E=0$            |     |     | -100 | nA   |
| Collector-Emitter Cut-off Current    | $I_{CEO}$     | $V_{CE}=-30\text{V}$ , $I_B=0$            |     |     | -100 | nA   |
| Emitter-Base Cut-off Current         | $I_{EBO}$     | $V_{EB}=-5\text{V}$ , $I_C=0$             |     |     | -100 | nA   |
| Base-Emitter Saturation Voltage      | $V_{BE(sat)}$ | $I_C=-1\text{A}$ , $I_B=-50\text{mA}$     |     |     | -1.1 | V    |
| Base-Emitter Turn-On Voltage         | $V_{BEON}$    | $V_{CE}=-5\text{V}$ , $I_C=-1\text{A}$    |     |     | -1   | V    |
| DC Current Gain                      | $h_{FE}$      | $V_{CE}=-5\text{V}$ , $I_C=-1\text{mA}$   | 300 |     |      |      |
|                                      |               | $V_{CE}=-5\text{V}$ , $I_C=-100\text{mA}$ | 300 |     | 800  |      |
|                                      |               | $V_{CE}=-5\text{V}$ , $I_C=-500\text{mA}$ | 250 |     |      |      |
|                                      |               | $V_{CE}=-5\text{V}$ , $I_C=-1\text{A}$    | 160 |     |      |      |
| Collector-Emitter Saturation Voltage | $V_{CE(sat)}$ | $I_C=-100\text{mA}$ , $I_B=-1\text{mA}$   |     |     | -200 | mV   |
|                                      |               | $I_C=-500\text{mA}$ , $I_B=-50\text{mA}$  |     |     | -250 | mV   |
|                                      |               | $I_C=-1\text{A}$ , $I_B=-100\text{mA}$    |     |     | -500 | mV   |

UTC assumes no responsibility for equipment failures that result from using products at values that exceed, even momentarily, rated values (such as maximum ratings, operating condition ranges, or other parameters) listed in products specifications of any and all UTC products described or contained herein. UTC products are not designed for use in life support appliances, devices or systems where malfunction of these products can be reasonably expected to result in personal injury. Reproduction in whole or in part is prohibited without the prior written consent of the copyright owner. UTC reserves the right to make changes to information published in this document, including without limitation specifications and product descriptions, at any time and without notice. This document supersedes and replaces all information supplied prior to the publication hereof.