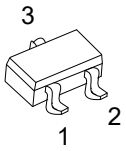
USS4320T **Preliminary** ***NPN SILICON TRANSISTOR***

# 3A, 20V NPN LOW $V_{CE(SAT)}$ TRANSISTOR




SOT-23
(JEDEC TO-236)

## ■ DESCRIPTION

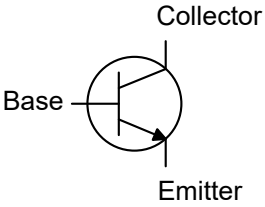
The **USS4320T** is NPN low $V_{CE(SAT)}$ transistor in a medium power and flat lead SOT-23 Surface-Mounted Device (SMD) plastic package.

PNP complement: USS5320T.

## ■ 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 IC
* High energy efficiency due to less heat generation

## ■ EQUIVALENT CIRCUIT



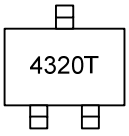

## ■ ORDERING INFORMATION

| Ordering Number | | Package | Pin Assignment | | | Packing |
|---|---|---|---|---|---|---|
| Lead Free | Halogen Free | | 1 | 2 | 3 | |
| USS4320TL-AE3-R | USS4320TG-AE3-R | SOT-23 | B | E | C | Tape Reel |

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

| | |
|---|---|
| USS4320TG-AE3-R<br>(1)Packing Type<br>(2)Package Type<br>(3)Green Package | (1) R: Tape Reel<br>(2) AE3: SOT-23<br>(3) G: Halogen Free and Lead Free, L: Lead Free |

## ■ MARKING



## ■ ABSOLUTE MAXIMUM RATING ($T_A$=25°C, unless otherwise specified)

| PARAMETER | SYMBOL | RATINGS | UNIT |
|---|---|---|---|
| Collector-Base Voltage | $V_{CBO}$ | 20 | V |
| Collector-Emitter Voltage | $V_{CEO}$ | 20 | V |
| Emitter-Base Voltage | $V_{EBO}$ | 5 | V |
| Collector Current | $I_C$ | 2 | A |
| Peak Collector Current | $I_{CM}$ | 5 | A |
| Power Dissipation | $P_C$ | 300 | mW |
| Junction Temperature | $T_J$ | +150 | °C |
| Storage Temperature | $T_{STG}$ | -55 ~ +150 | °C |

Note: 1.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.
2. Device mounted on an FR4 PCB, single-sided copper, tin-plated and standard footprint.

## ■ THERMAL DATA

| PARAMETER | SYMBOL | RATINGS | UNIT |
|---|---|---|---|
| Junction to Ambient | $\theta_{JA}$ | 417 | °C/W |

Note: Device mounted on an FR4 PCB, single-sided copper, tin-plated and standard footprint.

## ■ ELECTRICAL CHARACTERISTICS ($T_A$=25°C, unless otherwise specified)

| PARAMETER | SYMBOL | TEST CONDITIONS | MIN | TYP | MAX | UNIT |
|---|---|---|---|---|---|---|
| Collector-Base Breakdown Voltage | $BV_{CBO}$ | $I_C$=100μA, $I_E$=0 | 20 | | | V |
| Collector-Emitter Breakdown Voltage | $BV_{CEO}$ | $I_C$=1mA, $I_B$=0 | 20 | | | V |
| Emitter-Base Breakdown Voltage | $BV_{EBO}$ | $I_E$=100μA, $I_C$=0 | 5 | | | V |
| Collector-Base Cut-off Current | $I_{CBO}$ | $V_{CB}$=20V | | | 100 | nA |
| Emitter-Base Cut-off Current | $I_{EBO}$ | $V_{EB}$=5V | | | 100 | nA |
| Base-Emitter Saturation Voltage | $V_{BE(SAT)}$ | $I_C$=2A, $I_B$=40mA | | | 1.1 | V |
| | | $I_C$=3A, $I_B$=300mA | | | 1.2 | V |
| Base-Emitter Turn-On Voltage | $V_{BE(ON)}$ | $V_{CE}$=2V, $I_C$=1A | | | 1.2 | V |
| DC Current Gain | $h_{FE}$ | $V_{CE}$=2V, $I_C$=100mA | 220 | | | |
| | | $V_{CE}$=2V, $I_C$=500mA | 220 | | | |
| | | $V_{CE}$=2V, $I_C$=1A | 220 | | | |
| | | $V_{CE}$=2V, $I_C$=2A | 200 | | | |
| | | $V_{CE}$=2V, $I_C$=2A | 150 | | | |
| Collector-Emitter Saturation Voltage | $V_{CE(SAT)}$ | $I_C$=500mA,$I_B$=50mA | | | 70 | mV |
| | | $I_C$=1A, $I_B$=50mA | | | 120 | mV |
| | | $I_C$=2A, $I_B$=40mA | | | 230 | mV |
| | | $I_C$=2A, $I_B$=200mA | | | 210 | mV |
| | | $I_C$=3A, $I_B$=300mA | | | 310 | mV |
| Transition Frequency | $f_T$ | $V_{CE}$=5V, $I_C$=100mA, f=100MHz | 100 | | | MHz |