



USS4160DPN

DUAL TRANSISTOR

COMPLEMENTARY NPN/PNP TRANSISTOR

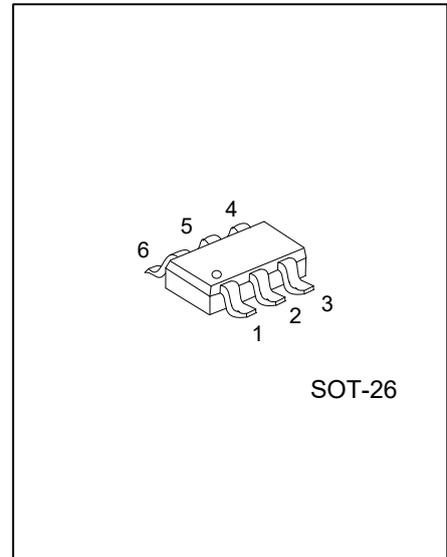
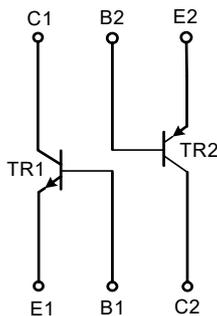
DESCRIPTION

The UTC **USS4160DPN** is an NPN and a PNP bipolar junction transistor (BJT). it uses UTC's advanced technology to provide the customers with low collector -emitter saturation voltage, etc.

FEATURES

- * NPN/PNP silicon transistor
- * Ideal for Low Power Amplification and Switching
- * Low collector-emitter saturation voltage
- * High DC current Gain
- * Simplify circuit design
- * Epitaxial Planar Die Construction

EQUIVALENT CIRCUIT



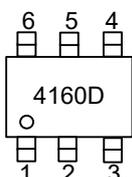
ORDERING INFORMATION

| Ordering Number | | Package | Pin Assignment | | | | | | Packing |
|-------------------|-------------------|---------|----------------|----|----|----|----|----|-----------|
| Lead Free | Halogen Free | | 1 | 2 | 3 | 4 | 5 | 6 | |
| USS4160DPNL-AG6-R | USS4160DPNG-AG6-R | SOT-26 | E1 | B1 | C2 | E2 | B2 | C1 | Tape Reel |

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

| | | |
|-------------------|------------------|---|
| USS4160DPNG-AG6-R | (1)Packing Type | (1) R: Tape Reel |
| | (2)Package Type | (2) AG6: SOT-26 |
| | (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 |
|---------------------------|-----------|------------|-----------|------------------|
| | | TR1 (NPN) | TR2 (PNP) | |
| Collector-Base Voltage | V_{CBO} | 80 | -80 | V |
| Collector-Emitter Voltage | V_{CEO} | 60 | -60 | V |
| Emitter-Base Voltage | V_{EBO} | 5 | -5 | V |
| Collector Current | I_C | 1 | -1 | A |
| Power Dissipation | P_C | 290 | | mW |
| Junction Temperature | T_J | +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 | θ_{JA} | 431 | $^\circ\text{C/W}$ |

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)

TR1 (NPN)

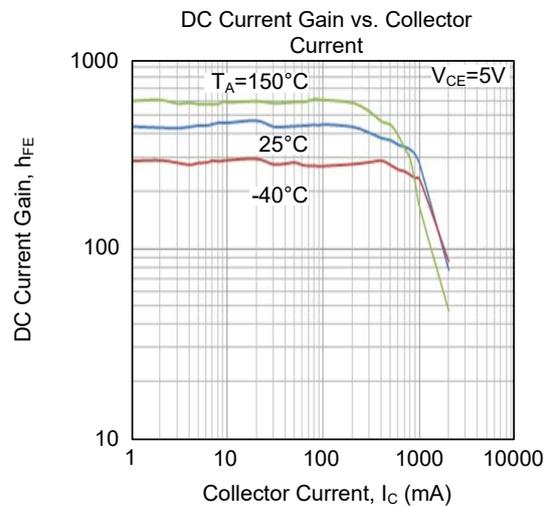
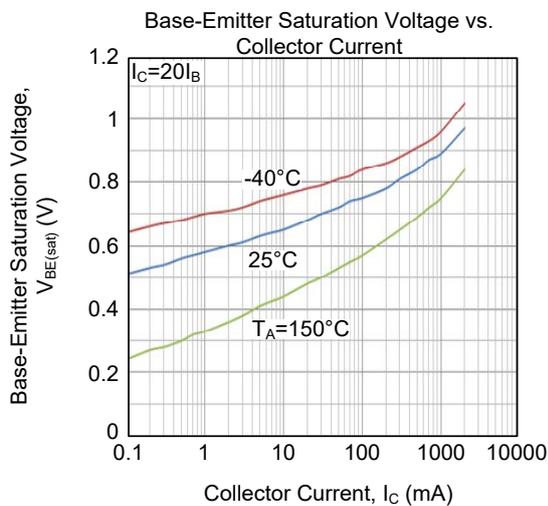
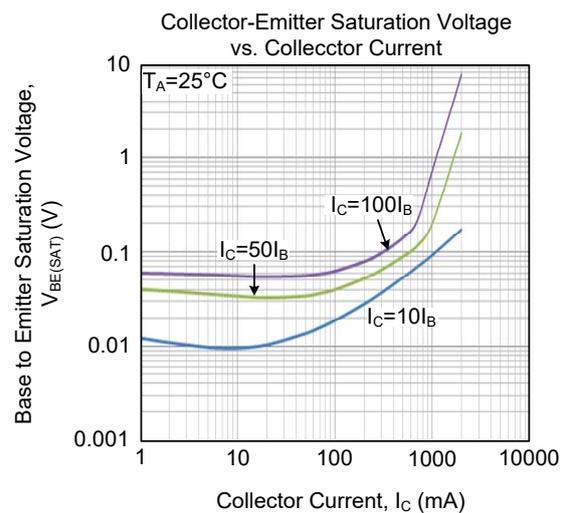
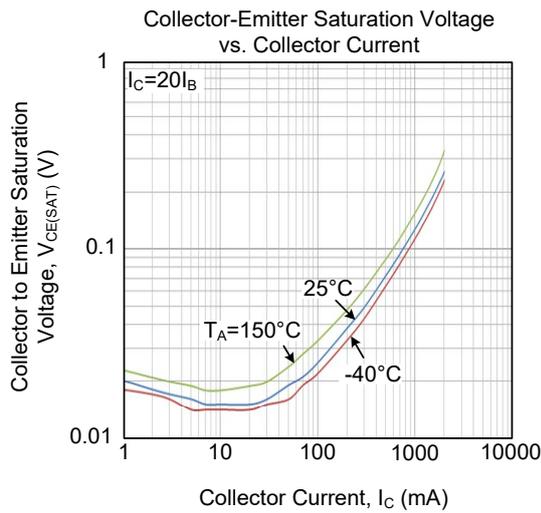
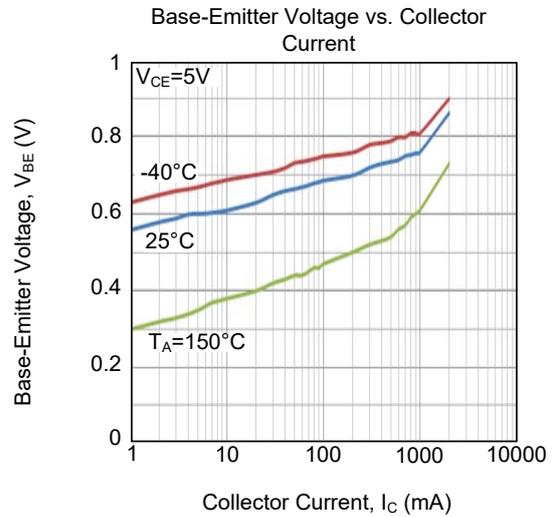
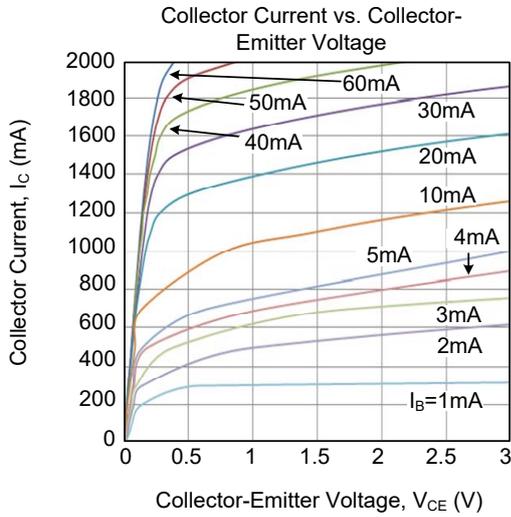
| PARAMETER | SYMBOL | TEST CONDITIONS | MIN | TYP | MAX | UNIT |
|--------------------------------------|---------------|--------------------------------------|-----|-----|-----|------|
| Collector-Base Breakdown Voltage | BV_{CBO} | $I_C=100\mu\text{A}, I_E=0$ | 80 | | | V |
| Collector-Emitter Breakdown Voltage | BV_{CEO} | $I_C=1\text{mA}, I_B=0$ | 60 | | | 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} | $V_{CB}=60\text{V}, I_E=0$ | | | 100 | nA |
| Collector-Emitter Cut-off Current | I_{CES} | $V_{CE}=60\text{V}, V_{BE}=0$ | | | 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} | $V_{CE}=5\text{V}, I_C=1\text{A}$ | | | 0.9 | V |
| DC Current Gain | h_{FE} | $V_{CE}=5\text{V}, I_C=1\text{mA}$ | 250 | | | |
| | | $V_{CE}=5\text{V}, I_C=500\text{mA}$ | 200 | | | |
| | | $V_{CE}=5\text{V}, I_C=1\text{A}$ | 100 | | | |
| Collector-Emitter Saturation Voltage | $V_{CE(sat)}$ | $I_C=100\text{mA}, I_B=1\text{mA}$ | | | 110 | mV |
| | | $I_C=500\text{mA}, I_B=50\text{mA}$ | | | 140 | mV |
| | | $I_C=1\text{A}, I_B=100\text{mA}$ | | | 250 | mV |

TR2 (PNP)

| PARAMETER | SYMBOL | TEST CONDITIONS | MIN | TYP | MAX | UNIT |
|--------------------------------------|---------------|--|-----|-----|------|------|
| Collector-Base Breakdown Voltage | BV_{CBO} | $I_C=-100\mu\text{A}, I_E=0$ | -80 | | | V |
| Collector-Emitter Breakdown Voltage | BV_{CEO} | $I_C=-1\text{mA}, I_B=0$ | -60 | | | 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} | $V_{CB}=-60\text{V}, I_E=0$ | | | -100 | nA |
| Collector-Emitter Cut-off Current | I_{CES} | $V_{CE}=-60\text{V}, V_{BE}=0$ | | | -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} | $V_{CE}=-5\text{V}, I_C=-1\text{A}$ | | | -0.9 | V |
| DC Current Gain | h_{FE} | $V_{CE}=-5\text{V}, I_C=-1\text{mA}$ | 200 | | | |
| | | $V_{CE}=-5\text{V}, I_C=-500\text{mA}$ | 150 | | | |
| | | $V_{CE}=-5\text{V}, I_C=-1\text{A}$ | 100 | | | |
| Collector-Emitter Saturation Voltage | $V_{CE(sat)}$ | $I_C=-100\text{mA}, I_B=-1\text{mA}$ | | | -165 | mV |
| | | $I_C=-500\text{mA}, I_B=-50\text{mA}$ | | | -175 | mV |
| | | $I_C=-1\text{A}, I_B=-100\text{mA}$ | | | -330 | mV |

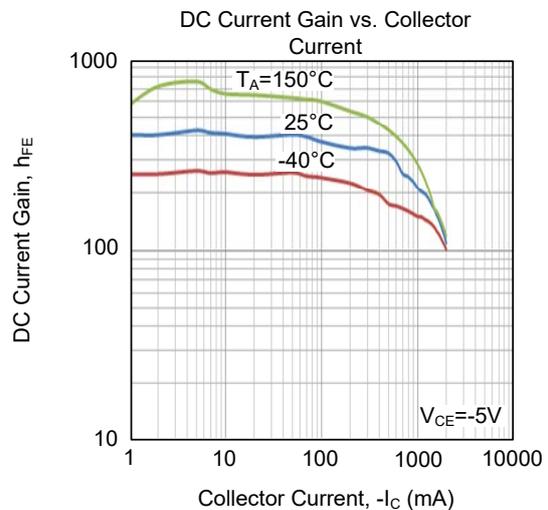
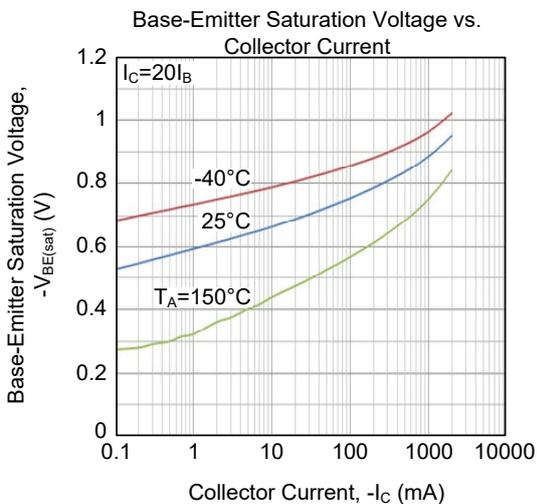
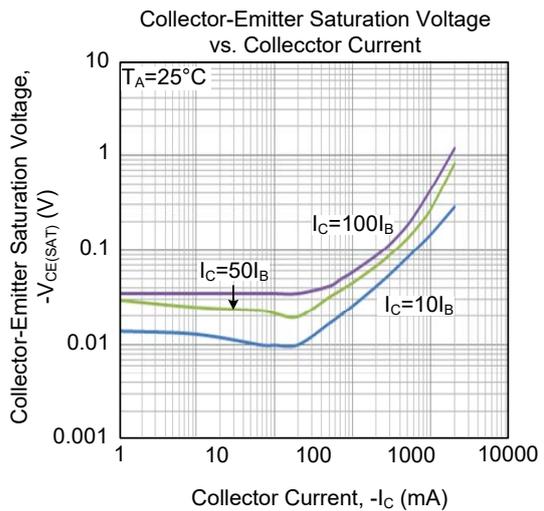
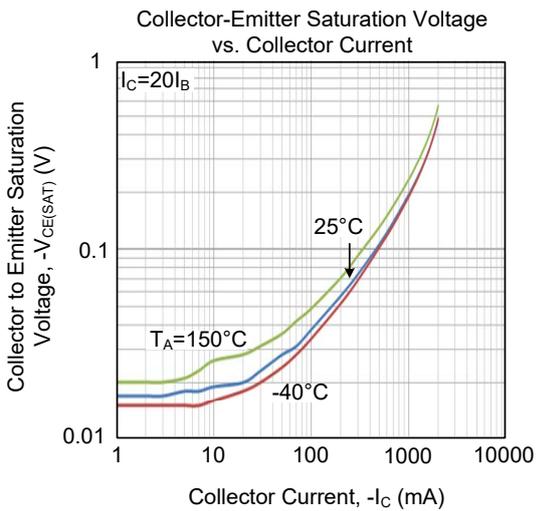
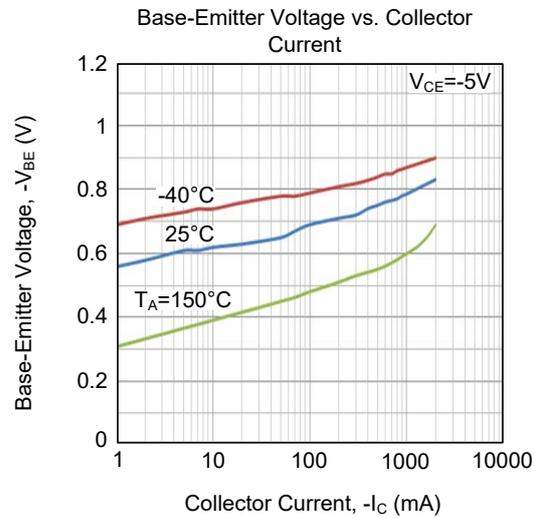
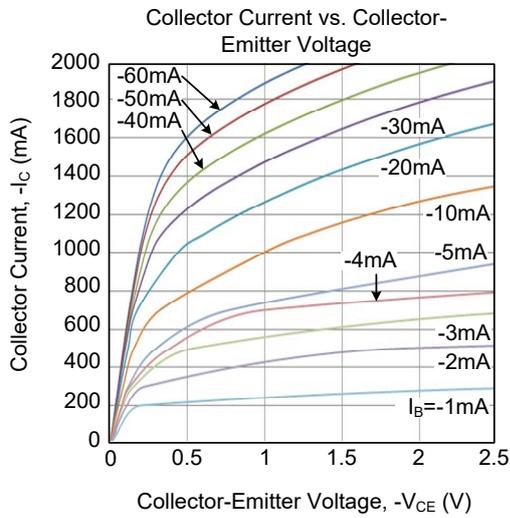
■ TYPICAL CHARACTERISTICS

TR1 (NPN)

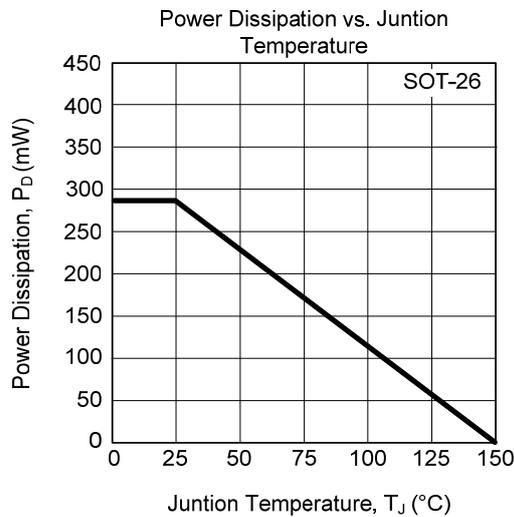


■ TYPICAL CHARACTERISTICS

TR2 (PNP)



■ TYPICAL CHARACTERISTICS (Cont.)



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.