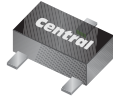


CMUT3904 NPN
CMUT3906 PNP

**SURFACE MOUNT
COMPLEMENTARY
SILICON TRANSISTORS**

ULTRAmi™



SOT-523 CASE

Central™
Semiconductor Corp.

www.centrasemi.com

DESCRIPTION:

The CENTRAL SEMICONDUCTOR CMUT3904, CMUT3906 types are complementary silicon transistors manufactured by the epitaxial planar process, epoxy molded in an ULTRAmi™ surface mount package, designed for small signal general purpose amplifier and switching applications.

**MARKING CODES: CMUT3904: AC1
CMUT3906: AC2**

MAXIMUM RATINGS: ($T_A=25^\circ\text{C}$)

Collector-Base Voltage
Collector-Emitter Voltage
Emitter-Base Voltage
Continuous Collector Current
Power Dissipation
Operating and Storage Junction Temperature
Thermal Resistance

| SYMBOL | CMUT3904 | CMUT3906 | UNITS |
|----------------|----------|-------------|--------------------|
| V_{CBO} | 60 | 40 | V |
| V_{CEO} | 40 | 40 | V |
| V_{EBO} | 6.0 | 5.0 | V |
| I_C | | 200 | mA |
| P_D | | 250 | mW |
| T_J, T_{stg} | | -65 to +150 | $^\circ\text{C}$ |
| θ_{JA} | | 500 | $^\circ\text{C/W}$ |

ELECTRICAL CHARACTERISTICS: ($T_A=25^\circ\text{C}$ unless otherwise noted)

| SYMBOL | TEST CONDITIONS | CMUT3904 | | CMUT3906 | | UNITS |
|---------------|---|----------|------|----------|------|-------|
| | | MIN | MAX | MIN | MAX | |
| I_{CEV} | $V_{CE}=30\text{V}, V_{EB}=3.0\text{V}$ | - | 50 | - | 50 | nA |
| BV_{CBO} | $I_C=10\mu\text{A}$ | 60 | - | 40 | - | V |
| BV_{CEO} | $I_C=1.0\text{mA}$ | 40 | - | 40 | - | V |
| BV_{EBO} | $I_E=10\mu\text{A}$ | 6.0 | - | 5.0 | - | V |
| $V_{CE(SAT)}$ | $I_C=10\text{mA}, I_B=1.0\text{mA}$ | - | 0.20 | - | 0.25 | V |
| $V_{CE(SAT)}$ | $I_C=50\text{mA}, I_B=5.0\text{mA}$ | - | 0.30 | - | 0.40 | V |
| $V_{BE(SAT)}$ | $I_C=10\text{mA}, I_B=1.0\text{mA}$ | 0.65 | 0.85 | 0.65 | 0.85 | V |
| $V_{BE(SAT)}$ | $I_C=50\text{mA}, I_B=5.0\text{mA}$ | - | 0.95 | - | 0.95 | V |
| h_{FE} | $V_{CE}=1.0\text{V}, I_C=0.1\text{mA}$ | 40 | - | - | 60 | |
| h_{FE} | $V_{CE}=1.0\text{V}, I_C=1.0\text{mA}$ | 70 | - | - | 80 | |
| h_{FE} | $V_{CE}=1.0\text{V}, I_C=10\text{mA}$ | 100 | 300 | 100 | 300 | |
| h_{FE} | $V_{CE}=1.0\text{V}, I_C=50\text{mA}$ | 60 | - | 60 | - | |
| h_{FE} | $V_{CE}=1.0\text{V}, I_C=100\text{mA}$ | 30 | - | 30 | - | |

**CMUT3904 NPN
CMUT3906 PNP**

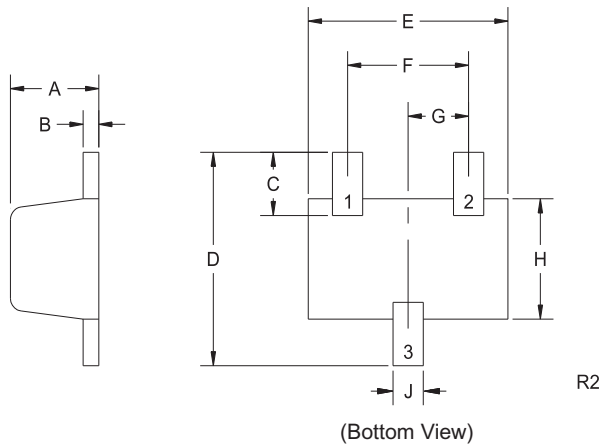
**SURFACE MOUNT
COMPLEMENTARY
SILICON TRANSISTORS**



ELECTRICAL CHARACTERISTICS - Continued: ($T_A=25^\circ\text{C}$ unless otherwise noted)

| SYMBOL | TEST CONDITIONS | CMUT3904 | | CMUT3906 | | UNITS |
|----------|---|----------|-----|----------|-----|------------------|
| | | MIN | MAX | MIN | MAX | |
| f_T | $V_{CE}=20\text{V}$, $I_C=10\text{mA}$, $f=100\text{MHz}$ | 300 | - | 250 | - | MHz |
| C_{ob} | $V_{CB}=5.0\text{V}$, $I_E=0$, $f=1.0\text{MHz}$ | - | 4.0 | - | 4.5 | pF |
| C_{ib} | $V_{BE}=0.5\text{V}$, $I_C=0$, $f=1.0\text{MHz}$ | - | 8.0 | - | 10 | pF |
| h_{ie} | $V_{CE}=10\text{V}$, $I_C=1.0\text{mA}$, $f=1.0\text{kHz}$ | 1.0 | 10 | 2.0 | 12 | $k\Omega$ |
| h_{re} | $V_{CE}=10\text{V}$, $I_C=1.0\text{mA}$, $f=1.0\text{kHz}$ | 0.5 | 8.0 | 0.1 | 10 | $\times 10^{-4}$ |
| h_{fe} | $V_{CE}=10\text{V}$, $I_C=1.0\text{mA}$, $f=1.0\text{kHz}$ | 100 | 400 | 100 | 400 | |
| h_{oe} | $V_{CE}=10\text{V}$, $I_C=1.0\text{mA}$, $f=1.0\text{kHz}$ | 1.0 | 40 | 3.0 | 60 | μS |
| NF | $V_{CE}=5.0\text{V}$, $I_C=100\mu\text{A}$, $R_S=1.0k\Omega$ $f=10\text{Hz}$ to 15.7kHz | - | 5.0 | - | 4.0 | dB |
| t_d | $V_{CC}=3.0\text{V}$, $V_{BE}=0.5\text{V}$, $I_C=10\text{mA}$, $I_{B1}=1.0\text{mA}$ | - | 35 | - | 35 | ns |
| t_r | $V_{CC}=3.0\text{V}$, $V_{BE}=0.5\text{V}$, $I_C=10\text{mA}$, $I_{B1}=1.0\text{mA}$ | - | 35 | - | 35 | ns |
| t_s | $V_{CC}=3.0\text{V}$, $I_C=10\text{mA}$, $I_{B1}=I_{B2}=1.0\text{mA}$ | 200 | - | 225 | - | ns |
| t_f | $V_{CC}=3.0\text{V}$, $I_C=10\text{mA}$, $I_{B1}=I_{B2}=1.0\text{mA}$ | 50 | - | 75 | - | ns |

SOT-523 CASE - MECHANICAL OUTLINE



| SYMBOL | DIMENSIONS | | | |
|--------|------------|-------|-------------|------|
| | INCHES | | MILLIMETERS | |
| | MIN | MAX | MIN | MAX |
| A | 0.023 | 0.031 | 0.58 | 0.78 |
| B | 0.002 | 0.008 | 0.04 | 0.20 |
| C | 0.013 | 0.021 | 0.34 | 0.54 |
| D | 0.059 | 0.067 | 1.50 | 1.70 |
| E | 0.059 | 0.067 | 1.50 | 1.70 |
| F | 0.035 | 0.043 | 0.90 | 1.10 |
| G | 0.020 | | 0.50 | |
| H | 0.031 | 0.039 | 0.78 | 0.98 |
| J | 0.010 | 0.014 | 0.25 | 0.35 |

SOT-523 (REV: R2)

LEAD CODE:

- 1) Base
- 2) Emitter
- 3) Collector

MARKING CODES:

CMUT3904: AC1
CMUT3906: AC2

R2 (9-February 2010)