

CMUT3904 NPN  
CMUT3906 PNP

**SURFACE MOUNT SILICON  
COMPLEMENTARY TRANSISTORS**



**SOT-523 CASE**



[www.centralemi.com](http://www.centralemi.com)

**DESCRIPTION:**

The CENTRAL SEMICONDUCTOR CMUT3904 and CMUT3906 are complementary silicon transistors manufactured by the epitaxial planar process, epoxy molded in an SOT-523 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	$^\circ\text{C}$
$\theta_{JA}$		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	-	

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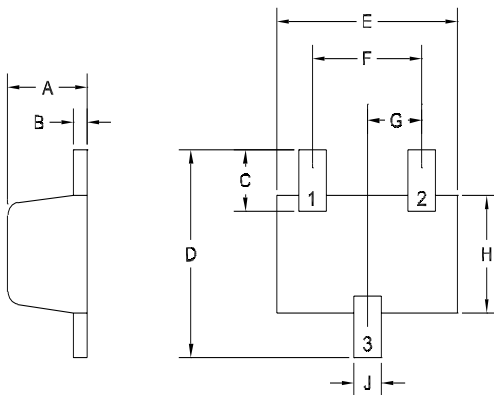
**SURFACE MOUNT SILICON  
COMPLEMENTARY TRANSISTORS**



**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
$C_{ib}$	$V_{BE}=0.5\text{V}$ , $I_C=0$ , $f=1.0\text{MHz}$	-	12	-	12	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	$\mu\text{S}$
NF	$V_{CE}=5.0\text{V}$ , $I_C=100\mu\text{A}$ , $R_S=1.0\text{k}\Omega$ $f=10\text{Hz}$ to $15.7\text{kHz}$	-	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
$t_s$	$V_{CC}=3.0\text{V}$ , $I_C=10\text{mA}$ , $I_{B1}=I_{B2}=1.0\text{mA}$	-	170	-	170	ns
$t_f$	$V_{CC}=3.0\text{V}$ , $I_C=10\text{mA}$ , $I_{B1}=I_{B2}=1.0\text{mA}$	-	80	-	80	ns

**SOT-523 CASE - MECHANICAL OUTLINE**



(Bottom View)

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

## OUTSTANDING SUPPORT AND SUPERIOR SERVICES



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### PRODUCT SUPPORT

Central's operations team provides the highest level of support to insure product is delivered on-time.

- Supply management (Customer portals)
- Inventory bonding
- Consolidated shipping options
- Custom bar coding for shipments
- Custom product packing

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### DESIGNER SUPPORT/SERVICES

Central's applications engineering team is ready to discuss your design challenges. Just ask.

- Free quick ship samples (2<sup>nd</sup> day air)
- Online technical data and parametric search
- SPICE models
- Custom electrical curves
- Environmental regulation compliance
- Customer specific screening
- Up-screening capabilities
- Special wafer diffusions
- PbSn plating options
- Package details
- Application notes
- Application and design sample kits
- Custom product and package development

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### REQUESTING PRODUCT PLATING

1. If requesting Tin/Lead plated devices, add the suffix "TIN/LEAD" to the part number when ordering (example: 2N2222A TIN/LEAD).
2. If requesting Lead (Pb) Free plated devices, add the suffix "PBFREE" to the part number when ordering (example: 2N2222A PBFREE).

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### CONTACT US

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