

CMUT3904 NPN  
CMUT3906 PNP

SURFACE MOUNT  
ULTRAmi™  
COMPLEMENTARY  
SILICON TRANSISTORS

ULTRAmi™



SOT-523 CASE

# Central™

**Semiconductor Corp.**

**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 CODE:** CMUT3904: AC1  
CMUT3906: AC2

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

	SYMBOL	CMUT3904	CMUT3906	UNITS
Collector-Base Voltage	$V_{CB0}$	60	40	V
Collector-Emitter Voltage	$V_{CE0}$	40	40	V
Emitter-Base Voltage	$V_{EB0}$	6.0	5.0	V
Collector Current	$I_C$		200	mA
Power Dissipation	$P_D$		250	mW
Operating and Storage				
Junction Temperature	$T_J, T_{stg}$		-65 to +150	$^\circ\text{C}$
Thermal Resistance	$\theta_{JA}$		500	$^\circ\text{C/W}$

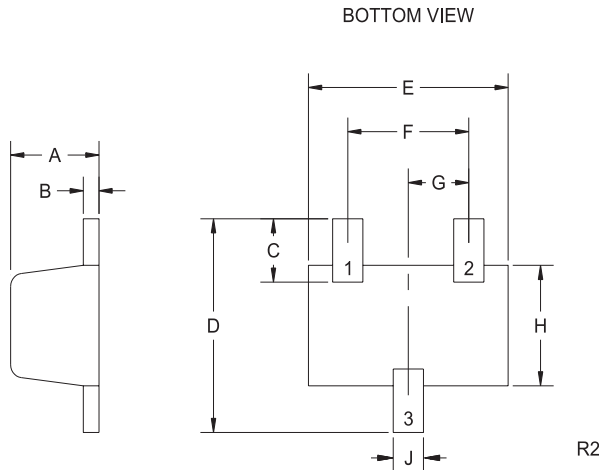
**ELECTRICAL CHARACTERISTICS:** ( $T_A=25^\circ\text{C}$  unless otherwise noted)

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
$BV_{CB0}$	$I_C=10\mu\text{A}$	60		40		V
$BV_{CE0}$	$I_C=1.0\text{mA}$	40		40		V
$BV_{EB0}$	$I_E=10\mu\text{A}$	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		

**ELECTRICAL CHARACTERISTICS:** Continued

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