

CMUT3904 NPN
CMUT3906 PNP

SURFACE MOUNT
ULTRAmiTM
COMPLEMENTARY
SILICON TRANSISTORS

ULTRAmiTM



SOT-523 CASE

CentralTM

Semiconductor Corp.

DESCRIPTION:

The CENTRAL SEMICONDUCTOR CMUT3904, CMUT3906 types are complementary silicon transistors manufactured by the epitaxial planar process, epoxy molded in an ULTRAmiTM 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_{CBO}	60	40	V
Collector-Emitter Voltage	V_{CEO}	40	40	V
Emitter-Base Voltage	V_{EBO}	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	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		

R1 (12-February 2003)

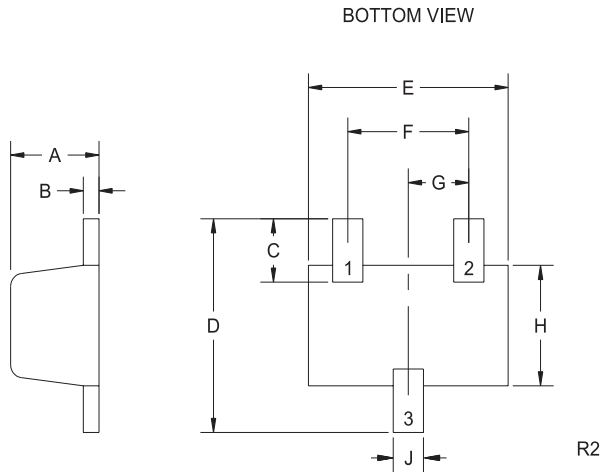
ELECTRICAL CHARACTERISTICS: Continued

SYMBOL TEST CONDITIONS

f_T	$V_{CE}=20V, I_C=10mA, f=100MHz$
C_{ob}	$V_{CB}=5.0V, I_E=0, f=1.0MHz$
C_{ib}	$V_{BE}=0.5V, I_C=0, f=1.0MHz$
h_{ie}	$V_{CE}=10V, I_C=1.0mA, f=1.0kHz$
h_{re}	$V_{CE}=10V, I_C=1.0mA, f=1.0kHz$
h_{fe}	$V_{CE}=10V, I_C=1.0mA, f=1.0kHz$
h_{oe}	$V_{CE}=10V, I_C=1.0mA, f=1.0kHz$
NF	$V_{CE}=5.0V, I_C=100\mu A, R_S=1.0k\Omega$ $f=10Hz$ to $15.7kHz$
t_d	$V_{CC}=3.0V, V_{BE}=0.5V, I_C=10mA, I_{B1}=1.0mA$
t_r	$V_{CC}=3.0V, V_{BE}=0.5V, I_C=10mA, I_{B1}=1.0mA$
t_s	$V_{CC}=3.0V, I_C=10mA, I_{B1}=I_{B2}=1.0mA$
t_f	$V_{CC}=3.0V, I_C=10mA, I_{B1}=I_{B2}=1.0mA$

CMUT3904		CMUT3906		UNITS
MIN	MAX	MIN	MAX	
300		250		MHz
	4.0		4.5	pF
	8.0		10	pF
1.0	10	2.0	12	k Ω
0.5	8.0	0.1	10	$\times 10^{-4}$
100	400	100	400	
1.0	40	3.0	60	$\mu mhos$
	5.0		4.0	dB
	35		35	ns
	35		35	ns
200		225		ns
50		75		ns

SOT-523 CASE - MECHANICAL OUTLINE



DIMENSIONS				
SYMBOL	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