

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_{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		

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ELECTRICAL CHARACTERISTICS: Continued

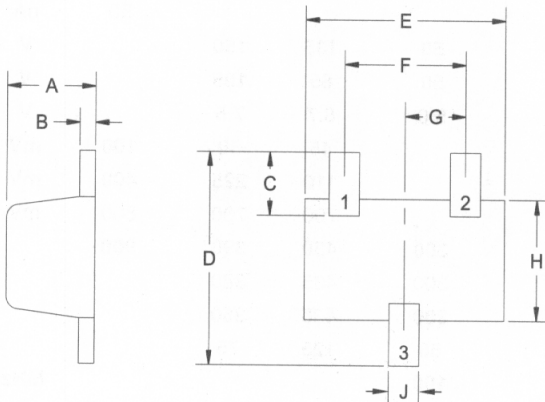
SYMBOL TEST CONDITIONS

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

BOTTOM VIEW



SYMBOL	DIMENSIONS		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

DATA SHEETS

R2