

CMST3904 NPN
CMST3906 PNP

**SUPERmini™
COMPLEMENTARY
SILICON TRANSISTOR**

SUPERmini™



SOT-323 CASE

Central™
Semiconductor Corp.

DESCRIPTION:

The CENTRAL SEMICONDUCTOR CMST3904, CMST3906 types are complementary silicon transistors manufactured by the epitaxial planar process, epoxy molded in a SUPERmini™ surface mount package, designed for small signal general purpose amplifier and switching applications.

MARKING CODES:

CMST3904: 1AC

CMST3906: 2AC

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

	SYMBOL	CMST3904	CMST3906	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
Continuous 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)

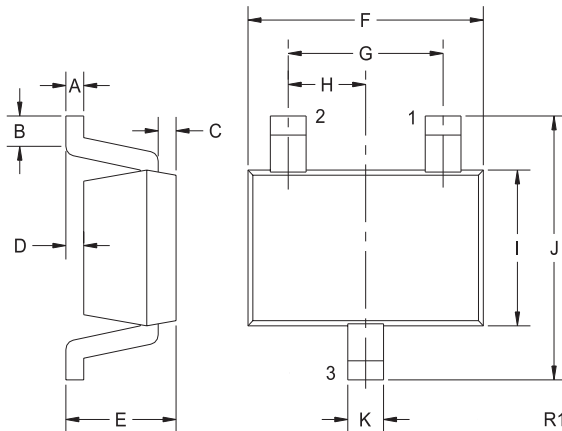
SYMBOL	TEST CONDITIONS	CMST3904		CMST3906		UNITS
		MIN	MAX	MIN	MAX	
I_{CEV}	$V_{CE}=30\text{V}, V_{EB}=3.0\text{V}$		50		50	nA
BV_{CBO}	$I_C=10\mu\text{A}$		60		40	V
BV_{CEO}	$I_C=1.0\text{mA}$		40		40	V
BV_{EBO}	$I_E=10\mu\text{A}$		6.0		5.0	V
$V_{CE(SAT)}$	$I_C=10\text{mA}, I_B=1.0\text{mA}$		0.20		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		
f_T	$V_{CE}=20\text{V}, I_C=10\text{mA}, f=100\text{MHz}$	300		250		MHz

R2 (26-September 2002)

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

SYMBOL	TEST CONDITIONS	CMST3904		CMST3906		UNITS
		MIN	MAX	MIN	MAX	
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	μmhos
NF	$V_{CE}=5.0\text{V}$, $I_C=100\text{mA}$, $R_S=1.0k\Omega$ $f=10\text{Hz}$ to 15.7kHz		5.0		4.0	dB
t_d	$V_{CC}=3.0\text{V}$, $V_{BE}=0.5$, $I_C=10\text{mA}$, $I_{B1}=1.0\text{mA}$		35		35	ns
t_r	$V_{CC}=3.0\text{V}$, $V_{BE}=0.5$, $I_C=10\text{mA}$, $I_{B1}=1.0\text{mA}$		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-323 CASE - MECHANICAL OUTLINE



DIMENSIONS				
SYMBOL	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.004	0.008	0.10	0.20
B	0.004	-	0.10	-
C	0.004	0.008	0.10	0.20
D	-	0.004	-	0.10
E	0.031	0.043	0.80	1.10
F	0.071	0.087	1.80	2.20
G	0.051		1.30	
H	0.026		0.65	
I	0.045	0.053	1.15	1.35
J	0.079	0.087	2.00	2.20
K	0.008	0.016	0.20	0.40

SOT-323 (REV: R1)

LEAD CODE:

- 1) BASE
- 2) EMITTER
- 3) COLLECTOR

MARKING CODES:

CMST3904: 1AC
CMST3906: 2AC

R2 (26-September 2002)

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	$V_{CE}=5.0V, I_C=100mA, R_S=1.0k\Omega$ $f=10Hz$ to $15.7kHz$		5.0		4.0	dB
t_d	$V_{CC}=3.0V, V_{BE}=0.5, I_C=10mA, I_{B1}=1.0mA$		35		35	ns
t_r	$V_{CC}=3.0V, V_{BE}=0.5, I_C=10mA, I_{B1}=1.0mA$		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