CMNT3904E NPN
CMNT3906E PNP

ENHANCED SPECIFICATION
SURFACE MOUNT
COMPLEMENTARY
SILICON TRANSISTOR

FEMTOmini™

ENHANCED E SPECIFICATION

SOT-953 CASE

Central Semiconductor Corp.

www.centralsemi.com

DESCRIPTION:

The CENTRAL SEMICONDUCTOR CMNT3904E and CMNT3906E Low $V_{CE(SAT)}$ NPN and PNP Transistors, respectively, are designed for applications where ultra small size and power dissipation are the prime requirements. Packaged in an FEMTOmini™ SOT-953 package, these components provide performance characteristics suitable for the most demanding size constrained applications.

MARKING CODES: CMNT3904E: CL
CMNT3906E: CM

FEATURES

- Very Small Package Size
- Low Package Profile, 0.5mm
- 200mA Collector Current
- Low $V_{CE(SAT)}$ (0.1V Typ @ 50mA)
- Small, FEMTOmini™ 1 x 0.8mm, SOT-953 Surface Mount Package

APPLICATIONS

- DC / DC Converters
- Voltage Clamping
- Protection Circuits
- Battery powered equipment including: Cell Phones, Digital Cameras, Pagers, PDAs, Laptop Computers, etc.

MAXIMUM RATINGS: (T_A=25°C)	**SYMBOL**		**UNITS**
♦ **Collector-Base Voltage**	**V_{CBO}**	**60**	**V**
Collector-Emitter Voltage	V_{CEO}	40	V
♦ **Emitter-Base Voltage**	**V_{EBO}**	**6.0**	**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	°C
Thermal Resistance	Θ_{JA}	500	°C/W

ELECTRICAL CHARACTERISTICS: (T_A=25°C unless otherwise noted)

			NPN	PNP		
SYMBOL	**TEST CONDITIONS**	**MIN**	**TYP**	**TYP**	**MAX**	**UNITS**
I_{CEV}	V_{CE}=30V, V_{EB}=3.0V				50	nA
♦ **BV_{CBO}**	**I_C=10µA**	**60**	**115**	**90**		**V**
BV_{CEO}	I_C=1.0mA	40	60	55		V
♦ **BV_{EBO}**	**I_E=10µA**	**6.0**	**7.5**	**7.9**		**V**
♦ **$V_{CE(SAT)}$**	**I_C=10mA, I_B=1.0mA**		**.057**	**.05**	**0.1**	**V**
♦ **$V_{CE(SAT)}$**	**I_C=50mA, I_B=5.0mA**		**0.1**	**0.1**	**0.2**	**V**
$V_{BE(SAT)}$	I_C=10mA, I_B=1.0mA	0.65	0.75	0.75	0.85	V
$V_{BE(SAT)}$	I_C=50mA, I_B=5.0mA		0.85	0.85	0.95	V
♦ **h_{FE}**	**V_{CE}=1.0V, I_C=0.1mA**	**90**	**240**	**130**		
♦ **h_{FE}**	**V_{CE}=1.0V, I_C=1.0mA**	**100**	**235**	**150**		

♦ Enhanced Specification

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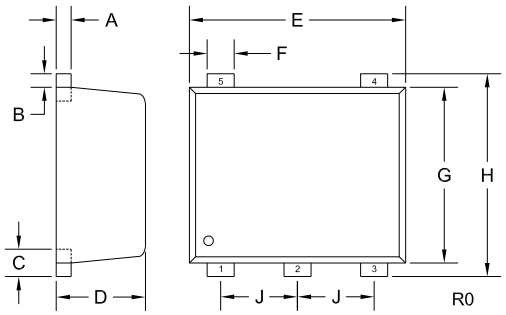
ELECTRICAL CHARACTERISTICS - Continued:

SYMBOL	TEST CONDITIONS	MIN	NPN TYP	PNP TYP	MAX	UNITS
h_{FE}	V_{CE}=1.0V, I_C=10mA	100	215	150	300	
♦ **h_{FE}**	**V_{CE}=1.0V, I_C=50mA**	**70**	**110**	**120**		
h_{FE}	V_{CE}=1.0V, I_C=100mA	30	50	55		
f_T	V_{CE}=20V, I_C=10mA, f=100MHz	300				MHz
C_{ob}	V_{CB}=5.0V, I_E=0, f=1.0MHz				4.0	pF
C_{ib}	V_{BE}=0.5V, I_C=0, f=1.0MHz				8.0	pF
h_{ie}	V_{CE}=10V, I_C=1.0mA, f=1.0kHz	1.0			12	kΩ
h_{re}	V_{CE}=10V, I_C=1.0mA, f=1.0kHz	0.1			10	$X10^{-4}$
h_{fe}	V_{CE}=10V, I_C=1.0mA, f=1.0kHz	100			400	
h_{oe}	V_{CE}=10V, I_C=1.0mA, f=1.0kHz	1.0			60	μS
NF	V_{CE}=5.0V, I_C=100μA, R_S =1.0kΩ, f=10Hz to 15.7kHz				4.0	dB
t_d	V_{CC}=3.0V, V_{BE}=0.5V, I_C=10mA, I_{B1}=1.0mA				35	ns
t_r	V_{CC}=3.0V, V_{BE}=0.5V, I_C=10mA, I_{B1}=1.0mA				35	ns
t_s	V_{CC}=3.0V, I_C=10mA, I_{B1}=I_{B2}=1.0mA				200	ns
t_f	V_{CC}=3.0V, I_C=10mA, I_{B1}=I_{B2}=1.0mA				50	ns

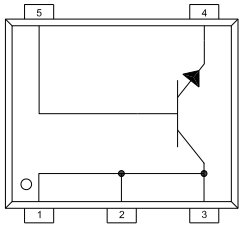
♦ Enhanced Specification

SOT-953 CASE - MECHANICAL OUTLINE

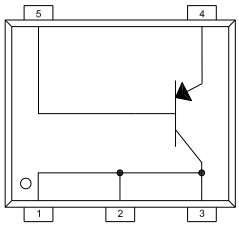


DIMENSIONS				
SYMBOL	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.002	0.006	0.050	0.150
B	0.002	0.006	0.050	0.150
C	0.005	0.007	0.125	0.175
D	0.016	0.020	0.400	0.500
E	0.037	0.041	0.950	1.050
F	0.004	0.008	0.100	0.200
G	0.030	0.033	0.750	0.850
H	0.037	0.041	0.950	1.050
J	0.014		0.350	

SOT-953 (REV: R0)



CMNT3904E
MARKING CODE: CL



CMNT3906E
MARKING CODE: CM

LEAD CODE:
1) Collector
2) Collector
3) Collector
4) Emitter
5) Base

R2 (25-January 2010)