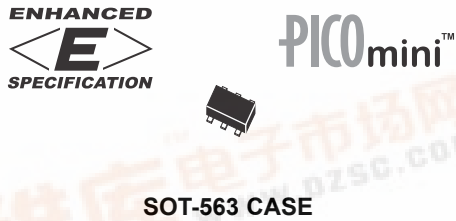


CMLT3904E NPN
CMLT3906E PNP
CMLT3946E NPN/PNP

**ENHANCED SPECIFICATION
COMPLEMENTARY PICOmini™
SILICON TRANSISTORS**



MARKING CODES: CMLT3904E: L04
CMLT3906E: L06
CMLT3946E: L46

**Central™
Semiconductor Corp.**

DESCRIPTION:

The Central Semiconductor CMLT3904E (two single NPN), CMLT3906E (two single PNP), and CMLT3946E (one each NPN and PNP complementary) are combinations of enhanced specification transistors in a space saving SOT-563 package, designed for small signal general purpose amplifier and switching applications.

ENHANCED SPECIFICATIONS:

- ◆ BV_{CBO} from 40V min to 60V min. (PNP)
- ◆ BV_{EBO} from 5.0V min to 6.0V min. (PNP)
- ◆ $V_{CE(SAT)}$ from 0.3V max to 0.2V max. (NPN),
from 0.4V max to 0.2V max. (PNP)
- ◆ h_{FE} from 60 min to 70 min. (NPN/PNP)

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

- ◆ **Collector-Base Voltage**
- ◆ Collector-Emitter Voltage
- ◆ **Emitter-Base Voltage**
- ◆ Collector Current
- Power Dissipation
- Power Dissipation
- Power Dissipation
- Operating and Storage Junction Temperature
- Thermal Resistance

SYMBOL

V_{CBO}	60
V_{CEO}	40
V_{EBO}	6.0
I_C	200
P_D	350
P_D	300
P_D	150
T_J, T_{stg}	-65 to +150
Θ_{JA}	357

UNITS

V
V
V
mA
mW (Note 1)
mW (Note 2)
mW (Note 3)
$^\circ\text{C}$
$^\circ\text{C}/\text{W}$

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

SYMBOL	TEST CONDITIONS	NPN		PNP		UNITS
		MIN	TYP	TYP	MAX	
I_{CEV}	$V_{CE}=30\text{V}, V_{EB}=3.0\text{V}$	-	-	-	50	nA
◆ BV_{CBO}	$I_C=10\mu\text{A}$	60	115	90	-	V
BV_{CEO}	$I_C=1.0\text{mA}$	40	60	55	-	V
◆ BV_{EBO}	$I_E=10\mu\text{A}$	6.0	7.5	7.9	-	V
◆ $V_{CE(SAT)}$	$I_C=10\text{mA}, I_B=1.0\text{mA}$	-	0.057	0.050	0.100	V
◆ $V_{CE(SAT)}$	$I_C=50\text{mA}, I_B=5.0\text{mA}$	-	0.100	0.100	0.200	V
$V_{BE(SAT)}$	$I_C=10\text{mA}, I_B=1.0\text{mA}$	0.65	0.75	0.75	0.85	V
$V_{BE(SAT)}$	$I_C=50\text{mA}, I_B=5.0\text{mA}$	-	0.85	0.85	0.95	V
◆ h_{FE}	$V_{CE}=1.0\text{V}, I_C=0.1\text{mA}$	90	240	130	-	
◆ h_{FE}	$V_{CE}=1.0\text{V}, I_C=1.0\text{mA}$	100	235	150	-	

◆ Enhanced specification.

Notes: (1) Ceramic or aluminum core PC Board with copper mounting pad area of 4.0 mm²
(2) FR-4 Epoxy PC Board with copper mounting pad area of 4.0 mm²
(3) FR-4 Epoxy PC Board with copper mounting pad area of 1.4 mm²

R2 (13-December 2003)



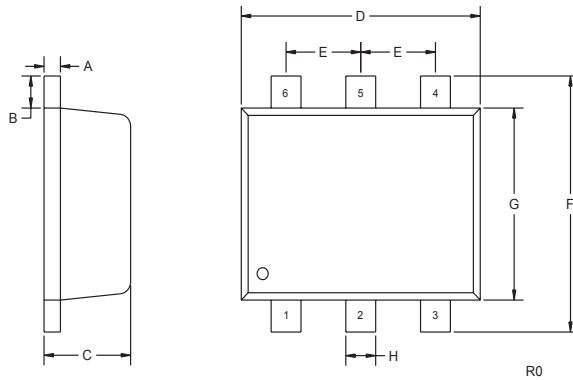
**ENHANCED SPECIFICATION
 COMPLEMENTARY PICOminiTM
 SILICON TRANSISTORS**

ELECTRICAL CHARACTERISTICS (continued)

SYMBOL	TEST CONDITIONS	MIN	NPN		PNP		UNITS
			TYP	TYP	MAX	MAX	
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		k Ω
h_{re}	$V_{CE}=10V, I_C=1.0mA, f=1.0kHz$	0.1			10		$\times 10^{-4}$
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		$\mu mhos$
NF	$V_{CE}=5.0V, I_C=100\mu A, R_S=1.0K\Omega, f=10Hz$ 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

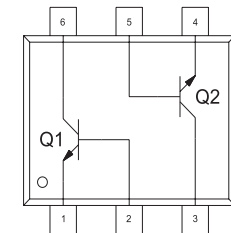
◆ Enhanced specification.

SOT-563 - MECHANICAL OUTLINE

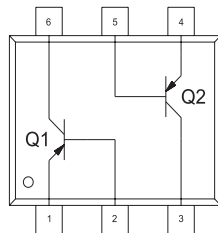


SYMBOL	DIMENSIONS			
	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.004	0.007	0.10	0.18
B	0.008		0.20	
C	0.022	0.024	0.56	0.60
D	0.059	0.067	1.50	1.70
E	0.020		0.50	
F	0.061	0.067	1.55	1.70
G	0.047		1.20	
H	0.006	0.012	0.15	0.30

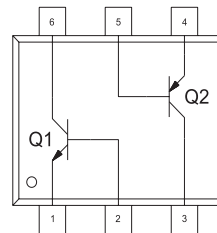
SOT-563 (REV: R0)



CMLT3904E
 MARKING CODE: L04



CMLT3906E
 MARKING CODE: L06



CMLT3946E
 MARKING CODE: L46

LEAD CODE:

- 1) EMITTER Q1
- 2) BASE Q1
- 3) COLLECTOR Q2
- 4) EMITTER Q2
- 5) BASE Q2
- 6) COLLECTOR Q1