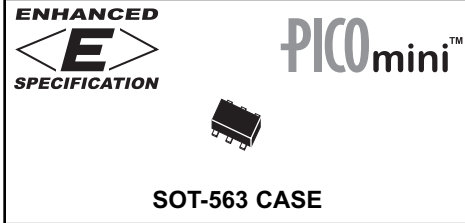




CMLT3904E CMLT3904EG\* NPN  
 CMLT3906E CMLT3906EG\* PNP  
 CMLT3946E CMLT3946EG\* NPN/PNP

**ENHANCED SPECIFICATION  
 COMPLEMENTARY PICOmini™  
 SILICON TRANSISTORS**



# Central™

## Semiconductor Corp.

**DESCRIPTION:**

These CENTRAL SEMICONDUCTOR devices are combinations of dual, enhanced specification transistors in a space saving SOT-563 package, designed for small signal general purpose amplifier and switching applications.

<b>MARKING CODES:</b>	<b>CMLT3904E:</b>	<b>L04</b>
	<b>CMLT3906E:</b>	<b>L06</b>
	<b>CMLT3946E:</b>	<b>L46</b>
	<b>CMLT3904EG*:</b>	<b>C4G</b>
	<b>CMLT3906EG*:</b>	<b>C6G</b>
	<b>CMLT3946EG*:</b>	<b>46G</b>

\* Device is **Halogen Free** by design

**ENHANCED SPECIFICATIONS:**

- ◆  $V_{CB0}$  from 40V MIN to 60V MIN (PNP)
- ◆  $V_{EB0}$  from 5.0V MIN to 6.0V MIN (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 (Note 1)  
Power Dissipation (Note 2)  
Power Dissipation (Note 3)  
Operating and Storage Junction Temperature  
Thermal Resistance

- ◆  $V_{CE(SAT)}$  from 0.3V MAX to 0.2V MAX (NPN)  
from 0.4V MAX to 0.2V MAX (PNP)

SYMBOL		UNITS
$V_{CB0}$	60	V
$V_{CEO}$	40	V
$V_{EB0}$	6.0	V
$I_C$	200	mA
$P_D$	350	mW
$P_D$	300	mW
$P_D$	150	mW
$T_J, T_{stg}$	-65 to +150	°C
$\Theta_{JA}$	357	°C/W

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

SYMBOL	TEST CONDITIONS	NPN		PNP		UNITS
		MIN	TYP	TYP	MAX	
$I_{CEV}$	$V_{CE}=30V, V_{EB}=3.0V$	-	-	-	50	nA
◆ $BV_{CB0}$	$I_C=10\mu A$	60	115	90	-	V
$BV_{CEO}$	$I_C=1.0mA$	40	60	55	-	V
◆ $BV_{EB0}$	$I_E=10\mu A$	6.0	7.5	7.9	-	V
◆ $V_{CE(SAT)}$	$I_C=10mA, I_B=1.0mA$	-	0.057	0.050	0.100	V
◆ $V_{CE(SAT)}$	$I_C=50mA, I_B=5.0mA$	-	0.100	0.100	0.200	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	-	
$h_{FE}$	$V_{CE}=1.0V, I_C=10mA$	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	-	

◆ Enhanced Specification

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

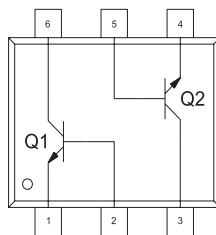
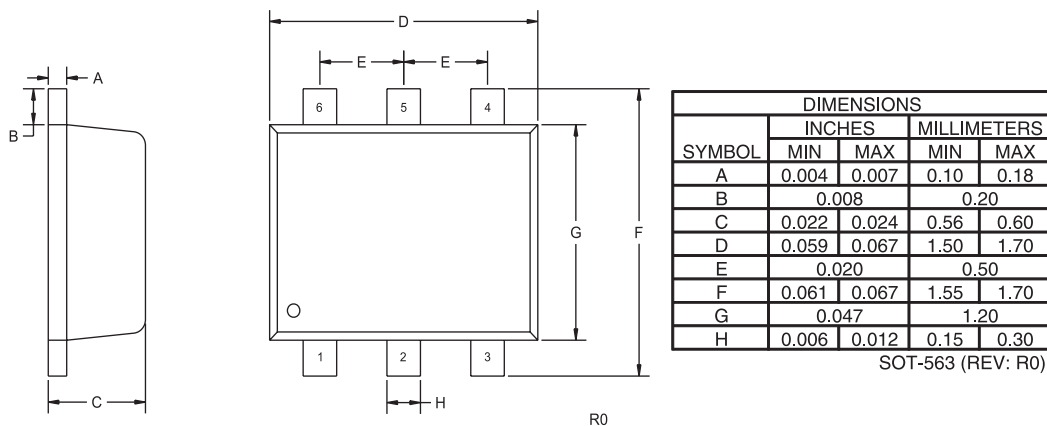
R3 (23-January 2009)

**ENHANCED SPECIFICATION  
 COMPLEMENTARY PICOMini™  
 SILICON TRANSISTORS**

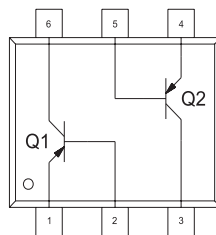
**ELECTRICAL CHARACTERISTICS PER TRANSISTOR - Continued: ( $T_A=25^\circ\text{C}$ )**

SYMBOL	TEST CONDITIONS	MIN	MAX	UNITS
$f_T$	$V_{CE}=20\text{V}$ , $I_C=10\text{mA}$ , $f=100\text{MHz}$	300		MHz
$C_{ob}$	$V_{CB}=5.0\text{V}$ , $I_E=0$ , $f=1.0\text{MHz}$		4.0	pF
$C_{ib}$	$V_{BE}=0.5\text{V}$ , $I_C=0$ , $f=1.0\text{MHz}$		8.0	pF
$h_{ie}$	$V_{CE}=10\text{V}$ , $I_C=1.0\text{mA}$ , $f=1.0\text{kHz}$	1.0	12	$k\Omega$
$h_{re}$	$V_{CE}=10\text{V}$ , $I_C=1.0\text{mA}$ , $f=1.0\text{kHz}$	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	
$h_{oe}$	$V_{CE}=10\text{V}$ , $I_C=1.0\text{mA}$ , $f=1.0\text{kHz}$	1.0	60	$\mu\text{S}$
NF	$V_{CE}=5.0\text{V}$ , $I_C=100\mu\text{A}$ , $R_S=1.0k\Omega$ $f=10\text{Hz}$ to $15.7\text{kHz}$		4.0	dB
$t_d$	$V_{CC}=3.0\text{V}$ , $V_{BE}=0.5\text{V}$ , $I_C=10\text{mA}$ , $I_{B1}=1.0\text{mA}$		35	ns
$t_r$	$V_{CC}=3.0\text{V}$ , $V_{BE}=0.5\text{V}$ , $I_C=10\text{mA}$ , $I_{B1}=1.0\text{mA}$		35	ns
$t_s$	$V_{CC}=3.0\text{V}$ , $I_C=10\text{mA}$ , $I_{B1}=I_{B2}=1.0\text{mA}$		200	ns
$t_f$	$V_{CC}=3.0\text{V}$ , $I_C=10\text{mA}$ , $I_{B1}=I_{B2}=1.0\text{mA}$		50	ns

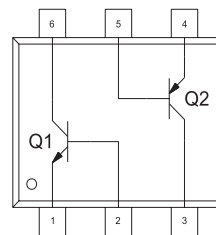
**SOT-563 CASE - MECHANICAL OUTLINE**



**CMLT3904E  
 CMLT3904EG\***



**CMLT3906E  
 CMLT3906EG\***



**CMLT3946E  
 CMLT3946EG\***

**LEAD CODE:**

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

\* Device is *Halogen Free* by design