



**THE DATASHEET OF
CET3906E TR PBFREE**



CET3904E NPN
CET3906E PNP

**ENHANCED SPECIFICATION
SURFACE MOUNT SILICON
COMPLEMENTARY TRANSISTORS**



www.centrasemi.com



Top View Bottom View
SOT-883L CASE

DESCRIPTION:

The CENTRAL SEMICONDUCTOR CET3904E and CET3906E 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 SOT-883L surface mount package, these components provide performance characteristics suitable for the most demanding size constrained applications.

**MARKING CODES: CET3904E: C
CET3906E: D**

FEATURES:

- Device is **Halogen Free** by design
- 250mW power dissipation
- Low $V_{CE(SAT)}$ 0.1V TYP @ 50mA
- Small, TLP™ 1x0.4mm, SOT-883L leadless, low profile, surface mount package

APPLICATIONS:

- DC-DC converters
- Battery powered devices including cell phones and digital cameras

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

◆ Collector-Base Voltage	
Collector-Emitter Voltage	
◆ Emitter-Base Voltage	
Continuous Collector Current	
Power Dissipation (Note 1)	
Power Dissipation (Note 2)	
Operating and Storage Junction Temperature	
Thermal Resistance (Note 1)	
Thermal Resistance (Note 2)	

SYMBOL		UNITS
V_{CBO}	60	V
V_{CEO}	40	V
V_{EBO}	6.0	V
I_C	200	mA
P_D	250	mW
P_D	430	mW
T_J, T_{stg}	-65 to +150	$^\circ\text{C}$
θ_{JA}	500	$^\circ\text{C/W}$
θ_{JA}	290	$^\circ\text{C/W}$

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

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

◆ Enhanced specification

Notes: 1) FR-4 epoxy PC board, standard mounting conditions.
2) FR-4 epoxy PC board with collector mounting pad area of 1 cm².

CET3904E NPN
CET3906E PNP



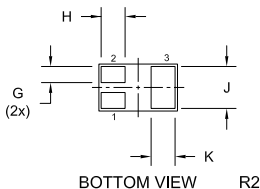
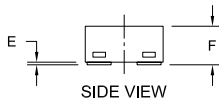
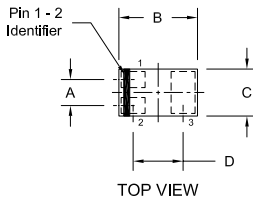
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ELECTRICAL CHARACTERISTICS - Continued: ($T_A=25^\circ\text{C}$)

SYMBOL	TEST CONDITIONS	NPN		PNP		UNITS
		MIN	TYP	TYP	MAX	
◆ 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		
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}	$V_{BE}=0.5V, I_C=0, f=1.0MHz$				12	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	μS
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	$V_{CC}=3.0V, I_C=10mA, I_{B1}=I_{B2}=1.0mA$				170	ns
t_f	$V_{CC}=3.0V, I_C=10mA, I_{B1}=I_{B2}=1.0mA$				80	ns

◆ Enhanced specification

SOT-883L CASE - MECHANICAL OUTLINE



SYMBOL	DIMENSIONS			
	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.014		0.35	
B	0.037	0.041	0.95	1.05
C	0.022	0.026	0.55	0.65
D	0.026		0.65	
E	0.000	0.002	0.00	0.05
F	0.012	0.016	0.30	0.40
G	0.005	0.007	0.13	0.18
H	0.008	0.012	0.20	0.30
J	0.018	0.022	0.45	0.55
K	0.008	0.012	0.20	0.30

SOT-883L (REV:R2)

LEAD CODE:

- 1) Base
- 2) Emitter
- 3) Collector

MARKING CODES:

CET3904E: C
CET3906E: D

R4 (15-September 2022)

OUTSTANDING SUPPORT AND SUPERIOR SERVICES



PRODUCT SUPPORT

Central's operations team provides the highest level of support to insure product is delivered on-time.

- Supply management (Customer portals)
- Inventory bonding
- Consolidated shipping options
- Custom bar coding for shipments
- Custom product packing

DESIGNER SUPPORT/SERVICES

Central's applications engineering team is ready to discuss your design challenges. Just ask.

- Free quick ship samples (2nd day air)
- Online technical data and parametric search
- SPICE models
- Custom electrical curves
- Environmental regulation compliance
- Customer specific screening
- Up-screening capabilities
- Special wafer diffusions
- PbSn plating options
- Package details
- Application notes
- Application and design sample kits
- Custom product and package development

REQUESTING PRODUCT PLATING

1. If requesting Tin/Lead plated devices, add the suffix "TIN/LEAD" to the part number when ordering (example: 2N2222A TIN/LEAD).
2. If requesting Lead (Pb) Free plated devices, add the suffix "PBFREE" to the part number when ordering (example: 2N2222A PBFREE).

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