

CET3904E NPN
CET3906E PNP

**ENHANCED SPECIFICATION
SURFACE MOUNT
COMPLEMENTARY
SILICON TRANSISTORS**



www.centrasemi.com

DESCRIPTION:

The CENTRAL SEMICONDUCTOR CET3904E / 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 a Tiny Leadless Package TLP™, 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: ($T_A=25^\circ\text{C}$)

	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 (Note 1)	P_D	250	mW
Power Dissipation (Note 2)	P_D	430	mW
Operating and Storage Junction Temperature	T_J, T_{stg}	-65 to +150	$^\circ\text{C}$
Thermal Resistance (Note 1)	θ_{JA}	500	$^\circ\text{C}/\text{W}$
Thermal Resistance (Note 2)	θ_{JA}	290	$^\circ\text{C}/\text{W}$

ELECTRICAL CHARACTERISTICS:

SYMBOL	TEST CONDITIONS				UNITS
		MIN	NPN TYP	PNP TYP	
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

R2 (4-January 2010)

CET3904E NPN
CET3906E PNP



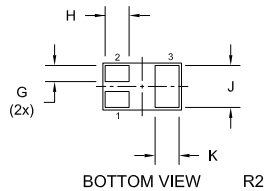
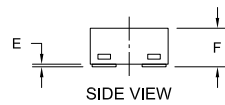
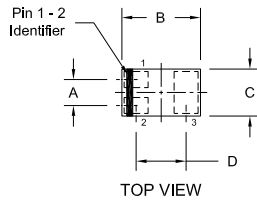
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ELECTRICAL CHARACTERISTICS - Continued:

SYMBOL	TEST CONDITIONS	MIN	NPN	PNP	MAX	UNITS
			TYP	TYP		
◆ 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				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-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
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Central's operations team provides the highest level of support to insure product is delivered on-time.

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- 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.

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- Custom electrical curves
- Environmental regulation compliance
- Customer specific screening
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- Special wafer diffusions
- PbSn plating options
- Package details
- Application notes
- Application and design sample kits
- Custom product and package development

CONTACT US

Corporate Headquarters & Customer Support Team

Central Semiconductor Corp.
145 Adams Avenue
Hauppauge, NY 11788 USA
Main Tel: (631) 435-1110
Main Fax: (631) 435-1824
Support Team Fax: (631) 435-3388
www.centalsemi.com

Worldwide Field Representatives:
www.centalsemi.com/wwreps

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