



NPN AF LOW NOISE
SILICON PLANAR EPITAXIAL TRANSISTOR

MICRO ELECTRONICS

GENERAL DESCRIPTION

The CL146 is a NPN silicon planar epitaxial transistor in plastic package designed for hearing aids, watches, paging systems and other equipment where small size is of paramount importance.

T0-92B



ECB

ABSOLUTE MAXIMUM RATINGS

- Collector-Base Voltage
- Collector-Emitter Voltage
- Emitter-Base Voltage
- Collector Current
- Total Power Dissipation at $T_A \leq 45^\circ\text{C}$
- Junction Temperature
- Storage Temperature Range

V_{CBO}	20V
V_{CEO}	20V
V_{EBO}	4V
I_C	50mA
P_{tot}	50mW
T_j	125°C
T_{stg}	-65°C to +125°C

THERMAL RESISTANCE

Junction to Ambient

θ_{ja}	1.6°C/mW
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ELECTRICAL CHARACTERISTICS AT $T_A = 25^\circ\text{C}$

PARAMETER	SYMBOL	146R			146Y			146G			UNIT	TEST CONDITIONS
		MIN	TYP	MAX	MIN	TYP	MAX	MIN	TYP	MAX		
Collector-Base Cutoff Current	I_{CBO}			100			100			100	nA	$V_{CB} = 20V$ $I_E = 0$
Collector-Emitter Knee Voltage	V_{CEK}		200			200			200		mV	$I_C = 2mA$ $I_B = \text{value for which } I_C = 2mA \text{ and } V_{CE} = 1V$
Base-Emitter Voltage	V_{BE}		570			570			570		mV	$V_{CE} = 0.5V$ $I_C = 0.2mA$
Base-Emitter Voltage	V_{BE}		630			630			630		mV	$V_{CE} = 1V$ $I_C = 2mA$
DC Current Gain	HFE	80	120	200	140	220	350	280	380	550		$V_{CE} = 0.5V$ $I_C = 0.2mA$
DC Current Gain	HFE	100			140			280				$V_{CE} = 1V$ $I_C = 2mA$
Noise Figure	NF		1.5			1.5	4		1.5		dB	$V_{CE} = 5V$ $I_C = 0.2mA$ $R_g = 2K\Omega$ $f = 30Hz - 15KHz$
Transition Frequency	f_T		80			110			150		MHz	$V_{CE} = 5V$ $I_C = 2mA$
Collector Capacitance	C_{cb}		2.5			2.5			2.5		pF	$V_{CB} = 5V$ $I_E = 0$ $f = 1MHz$

TYPICAL h-PARAMETERS AT $V_{CE} = 0.5V$, $I_C = 0.2mA$, $f = 1KHz$

PARAMETER	SYMBOL	146R	146Y	146G	UNIT
Input Impedance	h_{ie}	20	30	45	$K\Omega$
Reverse Voltage Transfer Ratio	h_{re}	15	25	40	$\times 10^{-4}$
Small Signal Current Gain	h_{fe}	130	240	400	
Output Admittance	h_{oe}	15	20	35	μS

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