



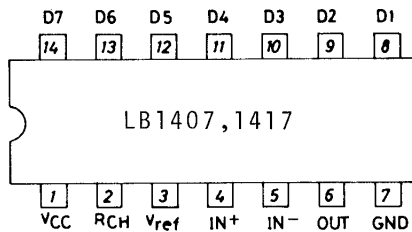
LB1407, 1417

AC/DC Voltage Level Meter

Features and Functions

- The LB1407 and LB1417 are based on dB scale and linear scale respectively.
- The input level is indicated in the form of a bar by means of 7 red/green LEDs.
- The LED current is made variable with an external resistor.
- An input amplifier is built in.
- A wide range of supply voltages is available from 5.5V to 16V.

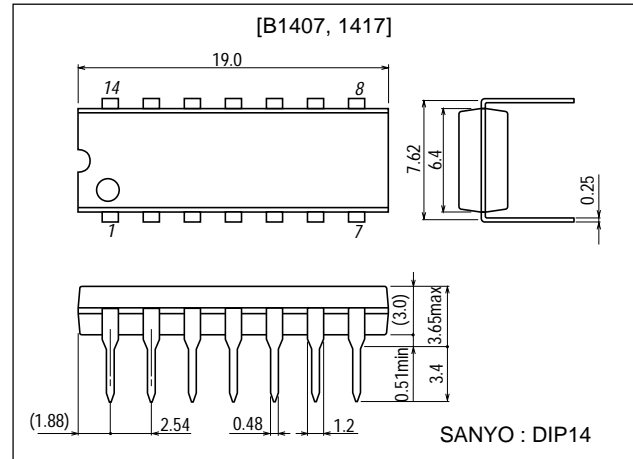
Pin Assignment



Package Dimensions

unit:mm

3003B-DIP14



Comparator Level at Ta = 25°C, V_{CC}=12V

[LB1407]		dB scale	
Comparator level	Pin No.	typ	unit
D1	8	-20	dB
D2	9	-10	dB
D3	10	-6	dB
D4	11	-3	dB
D5	12	0	dB
D6	13	3	dB
D7	14	6	dB

(Reference : Linear scale)

typ	unit
150	mV
485	mV
770	mV
1090	mV
1530	mV
2150	mV
3000	mV

[LB1417]		Linear scale	
Comparator level	Pin No.	typ	unit
D1	8	430	mV
D2	9	840	mV
D3	10	1280	mV
D4	11	1700	mV
D5	12	2150	mV
D6	13	2570	mV
D7	14	3000	mV

(Reference : dB scale)

typ	unit
-14.0	dB
-8.0	dB
-4.4	dB
-1.9	dB
0	dB
1.6	dB
2.9	dB

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Specifications

Absolute Maximum Ratings at $T_a = 25^\circ\text{C}$

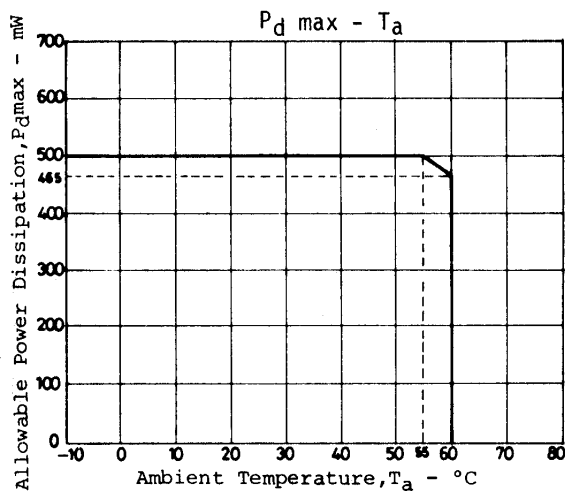
Parameter	Symbol	Conditions	Ratings	Unit
Maximum supply voltage	$V_{CC\text{ max}}$	Pin 1	-0.3 to +18	V
Input voltage	V_{IN}	Pin 4, 5	-0.3 to V_{CC}	V
D ₁ to D ₇ output voltage	$V_{OUT(D)}$	D ₁ to D ₇ OFF	-0.3 to +18	V
D ₁ to D ₉ output current	$I_{OL(D)}$	Pins 8 to 14, D ₁ to D ₇ ON	+30	mA
Reference flow-out current	I_{ref}	Pin 3	-1 to 0	mA
V_{OUT} supply voltage	V_{OUT}	Pin 6	-0.3 to +6	V
Allowable power dissipation	$P_d\text{ max}$	$T_a=55^\circ\text{C}$	500	mW
Operating temperature	T_{opr}		-20 to +60	$^\circ\text{C}$
Storage temperature	T_{stg}		-40 to +125	$^\circ\text{C}$

Allowable Operating Ranges at $T_a = 25^\circ\text{C}$

Parameter	Symbol	Conditions	Ratings	Unit
Recommended supply voltage	V_{CC}	Pin 1	5.5 to 16	V
Input voltage	V_{IN^+} or V_{IN^-}	Pin 4 or 5	-0.3 to V_{CC}	V
Output pin load resistance	R_L	Between pin 6 OUT and pin 7 GND.	15k to 20k	Ω

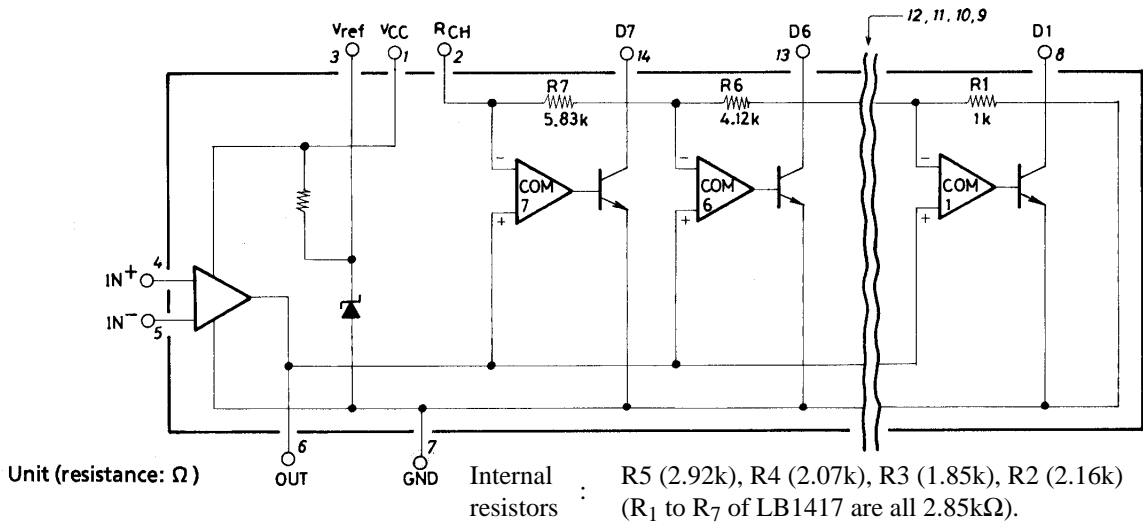
Electrical Characteristics at $T_a = 25^\circ\text{C}$, $V_{CC}=12\text{V}$ (Unless V_{CC} is otherwise specified)

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Input bias current (Amplifier)	$I_{IN^+(A)}$	Pin 4, $V_{IN^+}=0\text{V}$, $V_{IN^-}=3\text{V}$, $\text{GND}=0\text{V}$	-2		0	μA
	$I_{IN^-(A)}$	Pin 5, $V_{IN^+}=3\text{V}$, $V_{IN^-}=0\text{V}$, $\text{GND}=0\text{V}$	-2		0	μA
Input bias current (Comparator)+output leak current	$I_{IN^+(C)+I_{OL(A)}}$	Pin 6, $V_{IN^+}=0\text{V}$, $V_{IN^-}=3\text{V}$, $\text{OUT}=0\text{V}$, $\text{GND}=0\text{V}$	-10		0	μA
Offset voltage (1)	$V_{offset1}$	Pin 6, $V_{CC}=6\text{V}$, $V_{IN^+}=V_{IN^-}=0\text{V}$, $\text{GND}=-6\text{V}$, $\text{GAIN}=20\text{dB}$	-150		+150	mV
Offset voltage (2)	$V_{offset2}$	Pin 6, $V_{IN^+}=V_{IN^-}=0\text{V}$, $\text{GND}=0\text{V}$, $\text{GAIN}=20\text{dB}$	0		+150	mV
Reference voltage	V_{ref}	Pin 2, $I_{ref}=0$ to 1mA	2.7		3.1	V
Current drain	I_{CC}	Pin 1, $V_{IN^+}=3\text{V}$, $V_{IN^-}=0\text{V}$		8	15	mA
Amplifier gain	V_G	Open loop	30			dB
Output flow-out current	I_{OH}	Pin 6, $V_{IN^+}=3\text{V}$, $V_{IN^-}=0\text{V}$, $V_{OUT}=0\text{V}$			-10	mA
Pin D output ON voltage	$V_{OL(D)}$	Pin 8 to 14, D ₁ to D ₇ , $I_{OL}=20\text{mA}$, $V_{IN^+}=3\text{V}$, $V_{IN^-}=0\text{V}$			1.2	V
Pin D output leak current	$I_{OH(D)}$	Pin 8 to 14, D ₁ to D ₇ , $V_{IN^+}=0\text{V}$, $V_{IN^-}=3\text{V}$, V_{D1} to $D7=12\text{V}$			10	μA
Output voltage (Amplifier)	V_{OH}	Pin 6, $V_{CC}=5.5\text{V}$, $V_{IN^+}=3\text{V}$, $V_{IN^-}=0\text{V}$, $R_L=15\text{k}\Omega$	4			V
		Pin 6, $V_{CC}=12\text{V}$, $V_{IN^+}=3\text{V}$, $V_{IN^-}=0\text{V}$, $R_L=15\text{k}\Omega$	9.5			V

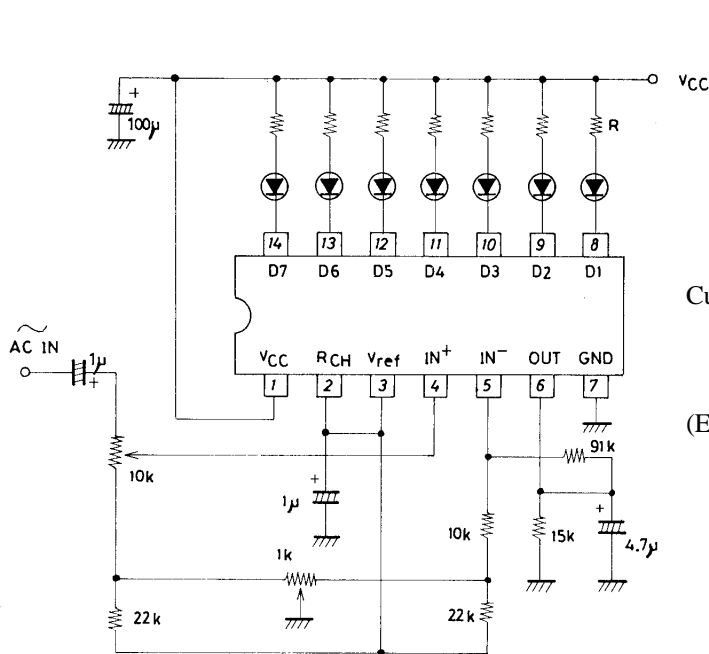


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Equivalent Circuit



Application Circuit



Current flowing to LED :

$$I_{LED} = \frac{V_{CC} - 3}{R}$$

(Example) Assuming $I_{LED} = 10\text{mA}$ at $V_{CC} = 12\text{V}$, R is :

$$R = \frac{12 - 3}{10 \times 10^{-3}} = \frac{9}{10 \times 10^{-3}} = 900\Omega$$

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