

Point / strip Display the drive

Overview

LM3914 is a single-chip integrated circuit that detects analog voltage levels and drives 10 LEDs to provide linear analog display. A single pin changes change point display to bar display. The currently driving LED is adjustable and programmable without resistance. This function allows for the entire operating system voltage of less than 3V.

The circuit contains its own adjustable reference voltage and accumulation rate 10 step divider. Low-bias current input buffer

Signal up to low to ground or V – can be received. Moreover, it does not require Protection for the $\pm 35V$ input. The input buffer drives independent comparators of ten reference precision frequency dividers. Therefore, the indicating nonlinearity can generally be maintained at 0.5% even over a wide temperature range.

LM3914 designed versatility so controller, visual alert and extended scale capabilities can be easily added to the display system. The circuit can drive multiple colors of LED or low current incandescent lamps. Many LM3914 s can "link" to form a display of more than 20 to 100 segments.

Pressure divider

Both ends of it are externally

available, so 2 drives can be made into zero center meters.

The LM3914 is very easy to use as an analog instrument circuit. A 1.2V full range meter requires only one resistance and a single power supply of 3 V to 15 V except for 10 display V. If 1 resistance is a potentiometer, it becomes the LED brightness control. The simplified block diagram illustrates such an extremely simple external circuit.

In point mode, there is a little overlap between the segments or

Fout (about 1 mV). This ensures that all LEDs do not extinguish immediately, thus avoiding any ambiguous display. Various novel displays are possible.

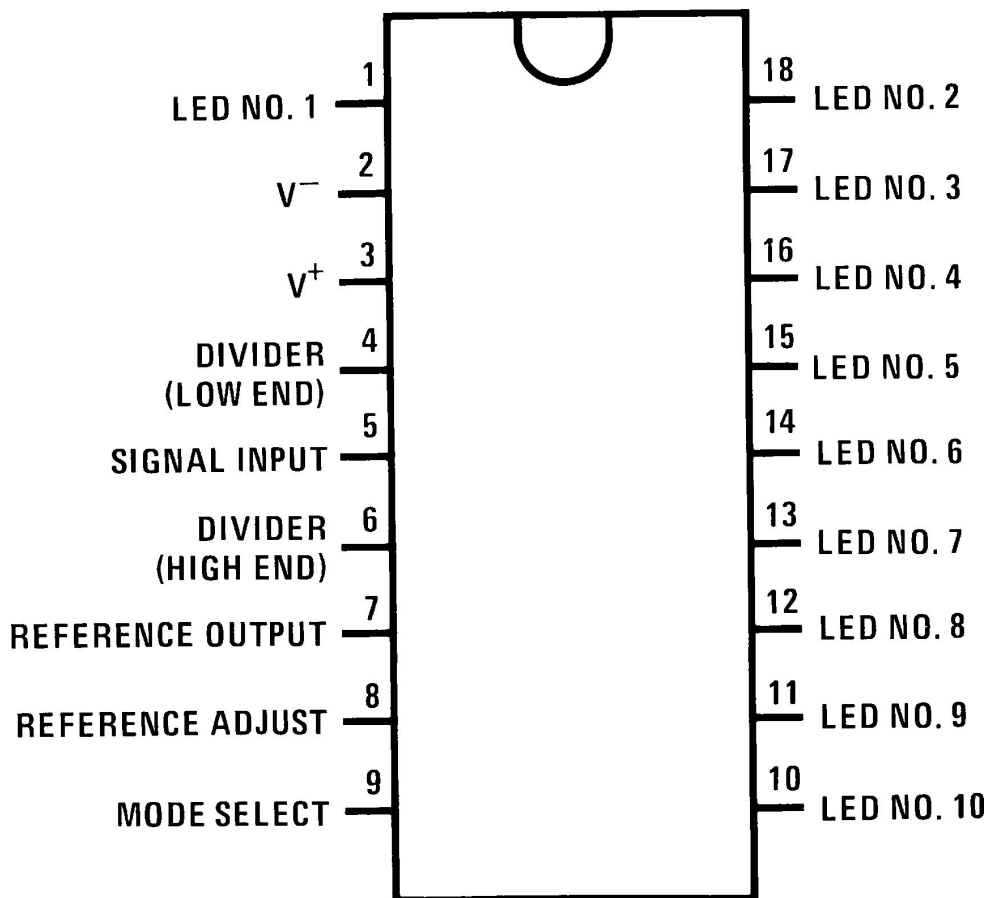
A large part of the display flexibility comes from the fact that all outputs are separate DC voltage stabilization currents. Various effects can be achieved by modulating these currents. Individual outputs can simultaneously drive the transistor and LED, and therefore perform controller functions including "segment" control. The LM3914 can also act as a programmer or a sequencer.

LM3914 operating temperature at 0°C ~70°C, encapsulated as DIP18.

Features

- Can drive the LED, LCD, vacuum fluorescent lamp
 - External switching point / bar display mode
 - Scalable to a display of 100 steps
 - Internal reference voltage range 1.2V ~12V
 - Single power supply is less than 3V
 - The Input terminal is on the ground
 - Output current adjustable range: 2mA~30mA
 - There is no multiplex switching or interaction between the outputs
 - Input the voltage to withstand the $\pm 35V$ without damage or incorrect output
 - The output current is adjustable and the collector is open
- Can drive the TTL or CMOS directly
 - The internal 10-order pressure divider hangs at both ends to set a wide adjustment range

Foot chart

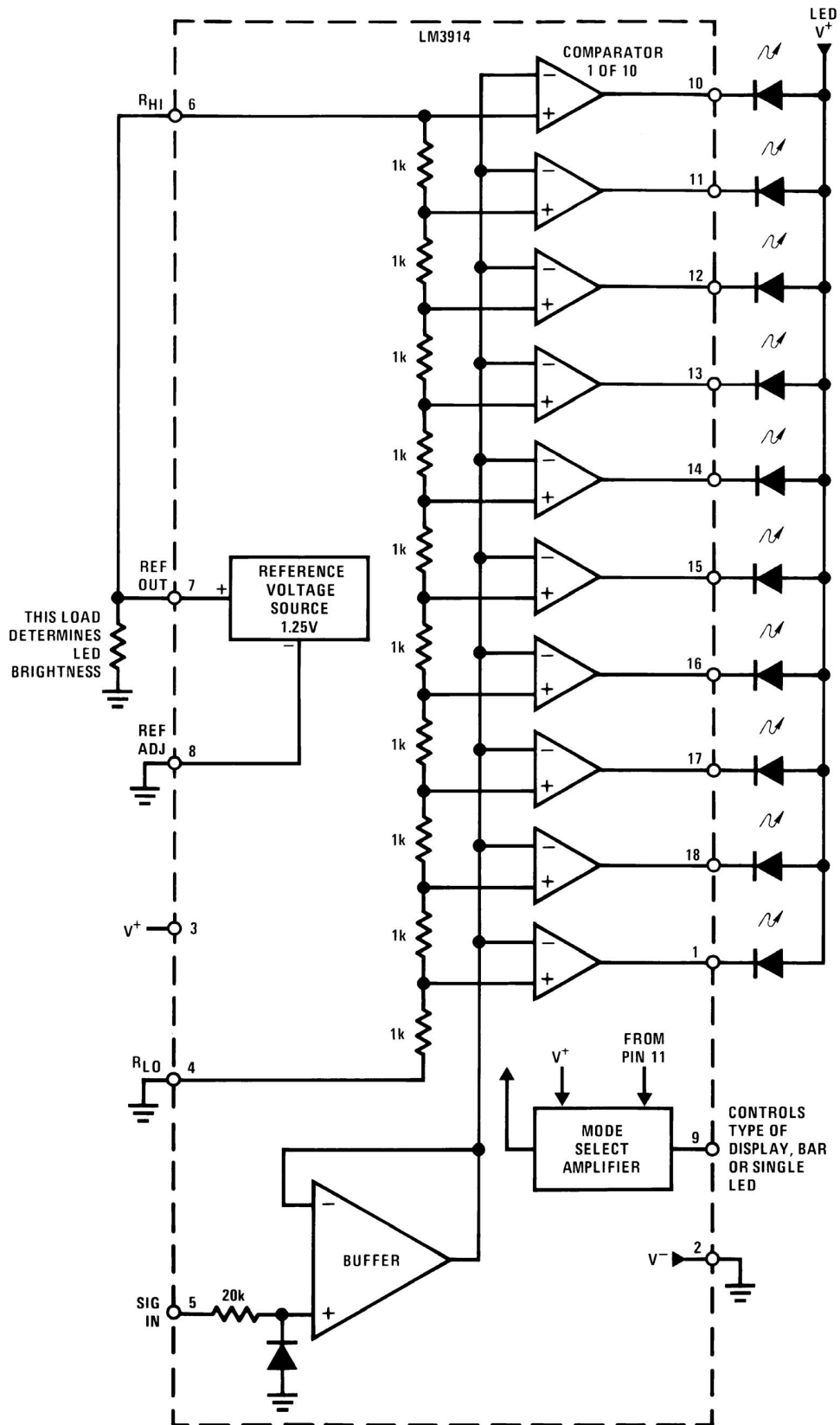


Limit parameters

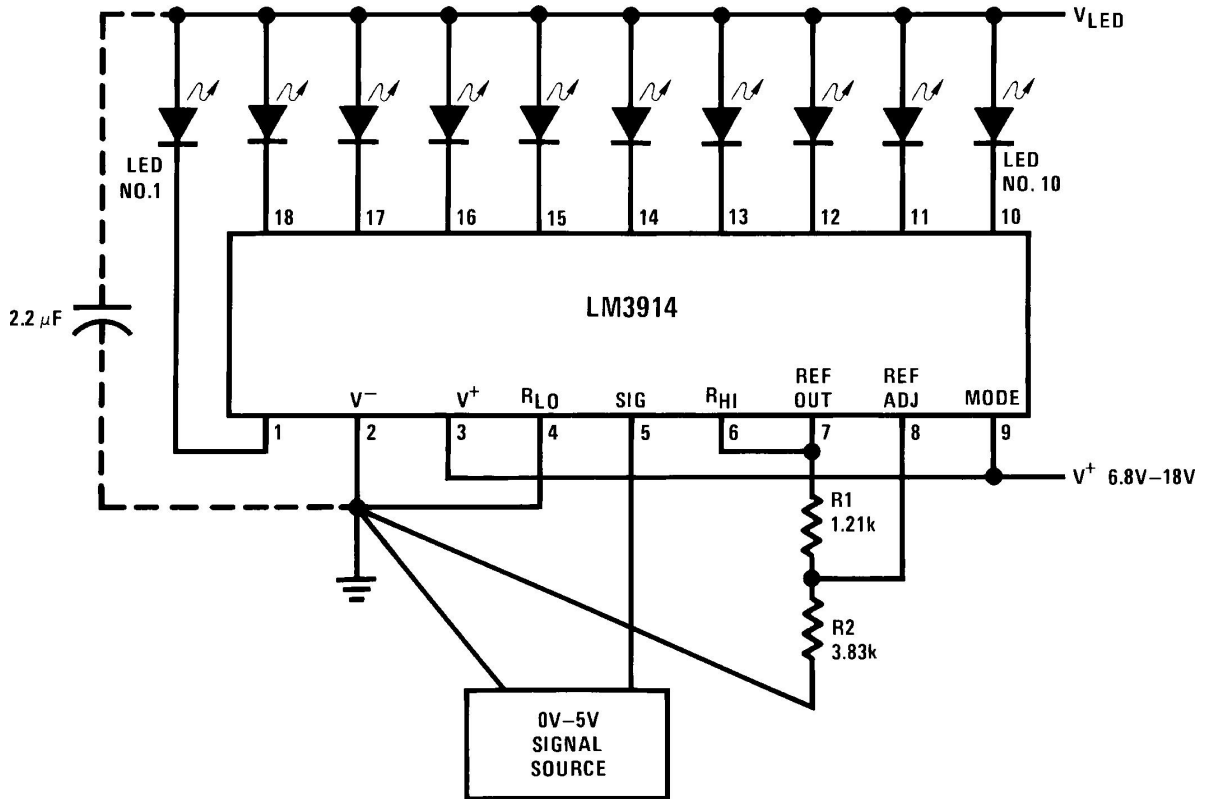
Parameter name	Value
Power consumption (DIP)	1365mW.
Supply voltage	25V.
Output the drive voltage	25V.
Input the signal voltage	± 35V.
Pressure divider input voltage	-100mV to V ⁺ .
Load current	10mA.
Storage temperature	-55°C to 150°C.

range	
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Internal structure diagram



Typical application diagram



Note:

$$\text{Ref Out } V = 1.25 \left(1 + \frac{R2}{R1} \right)$$

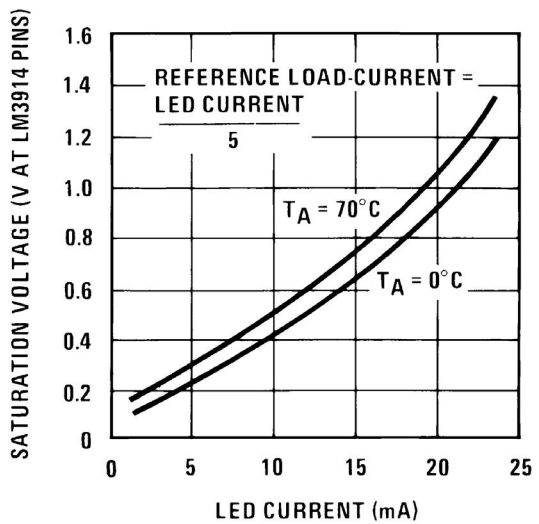
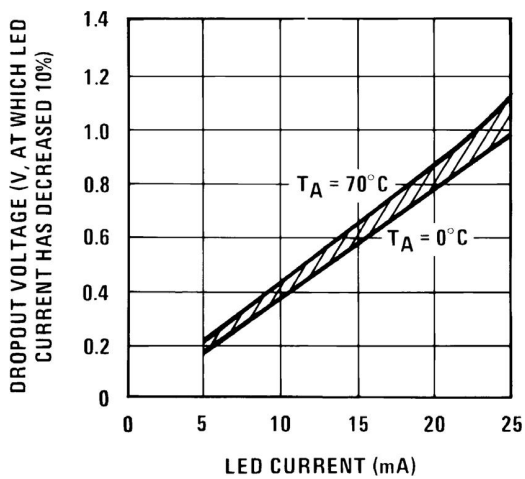
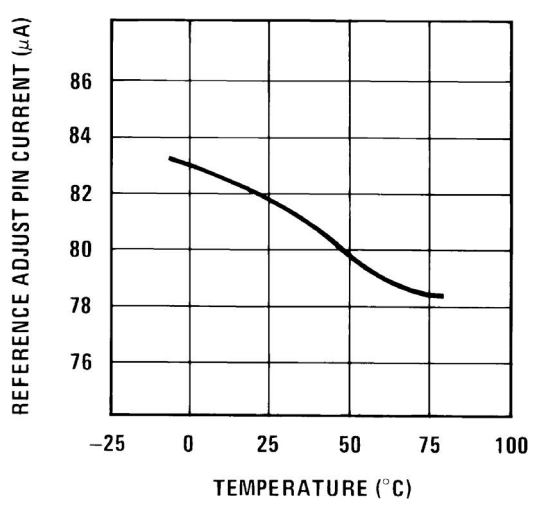
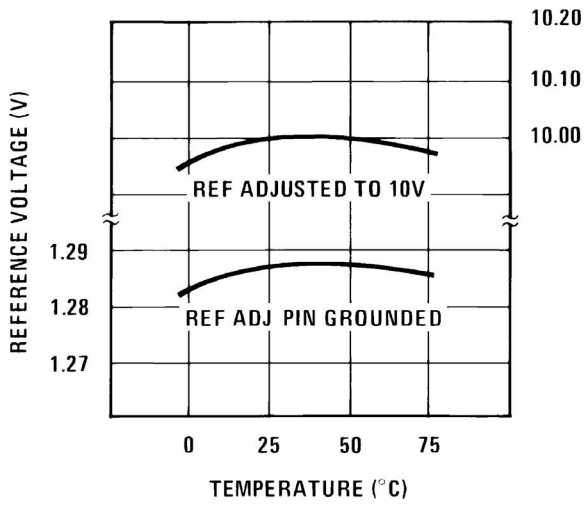
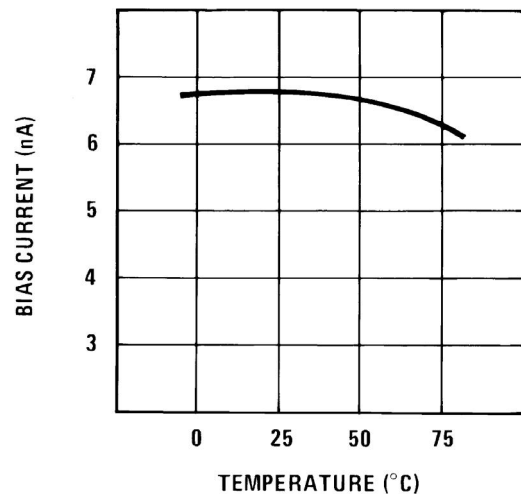
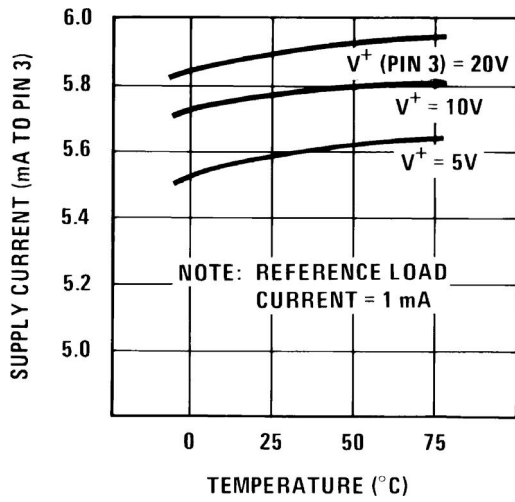
$$I_{\text{LED}} \cong \frac{12.5}{R1}$$

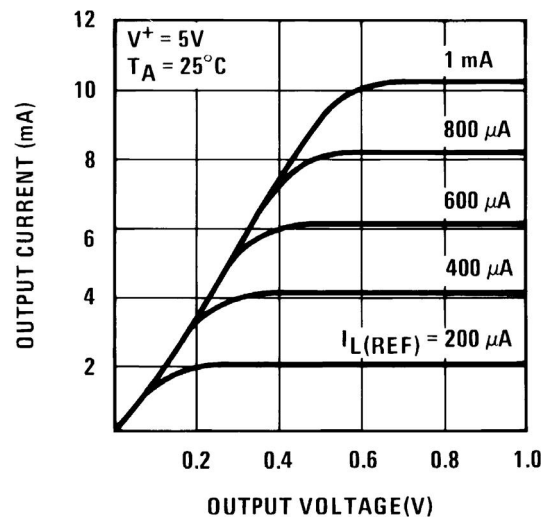
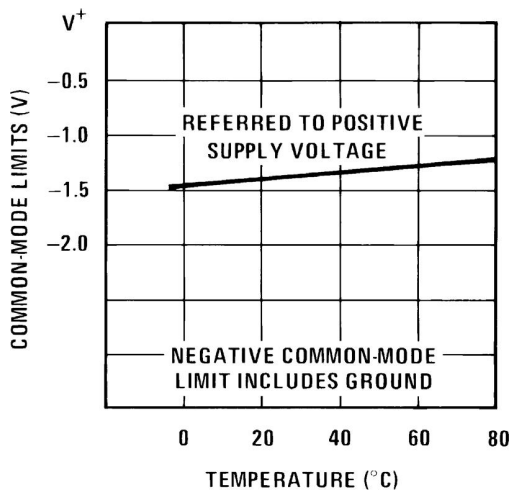
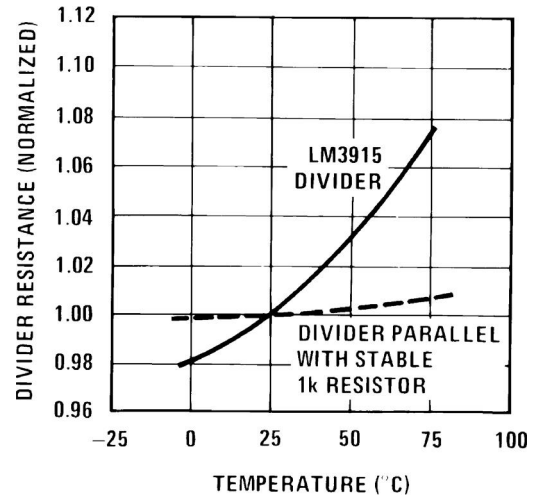
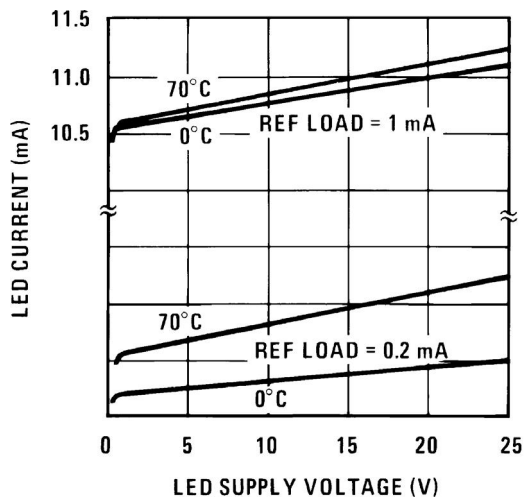
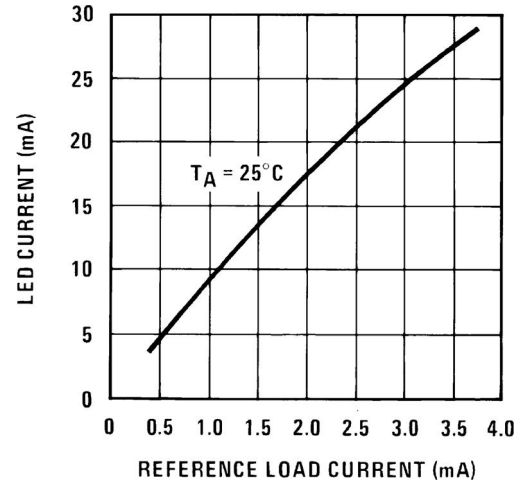
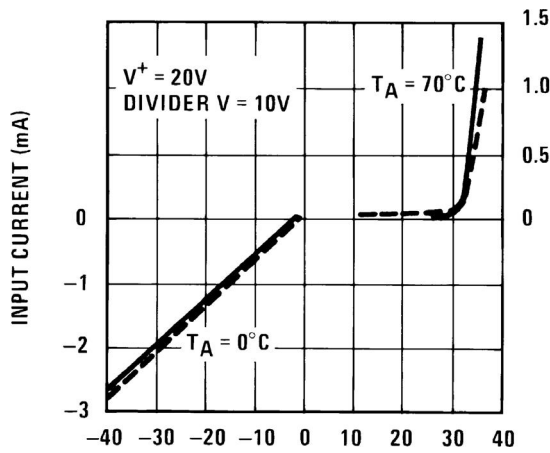
Electrical parameters: (No special description, $T_a = 25^\circ\text{C}$)

Parameters	Conditions	Minimum value	Typical values	Maximum value	Unit No
Comparator					
Disordered voltage (buffer and first comparator)	$0V \leq V_{RLO} = V_{RHI} \leq 12V, I_{LED} = 1\text{mA}$	-	3	10	mV.

Piezo-split resistance	6 Foot to 4 foot	8	12	17	kΩ.
Precision			0.5	2	%
Reference voltage					
Output voltage	$0.1\text{m A} \leq I_{L(R E F)} \leq 4\text{m A}, V_{+} = V_{L E D} = 5\text{V}.$	1.2	1.28	1.34	V.
Linear adjustment rate	$3\text{V} \leq V_{+} \leq 18\text{V}.$	-	0.01	0.03	% / V.
Load adjustment rate	$0.1\text{m A} \leq I_{L(R E F)} \leq 4\text{m A}, V_{+} = V_{L E D} = 5\text{V}.$	-	0.4	2	%
Output voltage (Change with the temperature)	$0^{\circ}\text{C} \leq T_{a} \leq +70^{\circ}\text{C}, I_{L(R E F)} = 1\text{m A}, V_{+} = V_{L E D} = 5\text{V}.$	-	1	-	%
A d j u s t foot current		-	75	120	uA.
Output drive					
LED current	$V_{+} = V_{L E D} = 5\text{V}, I_{L(R E F)} = 1\text{m A}.$	7	10	13	mA.
LED current difference (between maximum and minimum current)	$V_{L E D} = 5\text{V}, I_{L E D} = 2\text{m A}, V_{L E D} = 5\text{V}, I_{L E D} = 20\text{m A}.$	-	0.12	0.4	mA.
		-	1.2	3	
LED current adjustment rate	$2\text{V} \leq V_{L E D} \leq 17\text{V}, I_{L E D} = 2\text{m A}, I_{L E D} = 20\text{mA}.$	-	0.1	0.25	mA.
		-	1	3	
Output pressure difference	$V_{L E D}(\text{o n}) = 20\text{m A}, V_{L E D} = 5\text{V}, \Delta I_{L E D} = 2\text{mA}.$	-	-	1.5	V.
Saturated voltage	$I_{L E D} = 2\text{m A}, I_{L(R E F)} = 0.4\text{m A}.$	-	0.15	0.4	V.
Output leakage current (per collector)	Bar-mode	-	0.1	10	uA.
Output leakage current is 10-18 feet 1. Foot	Point like mode	-	0.1	10	uA.
		60	150	450	uA.
Standby static current (all output turned off)	$V_{+} = +5\text{V}, I_{L(R E F)} = 0.2\text{mA}.$	-	2.4	4.2	mA.
	$V_{+} = +20\text{V}, I_{L(R E F)} = 1\text{m A}.$	-	6.1	9.2	mA.

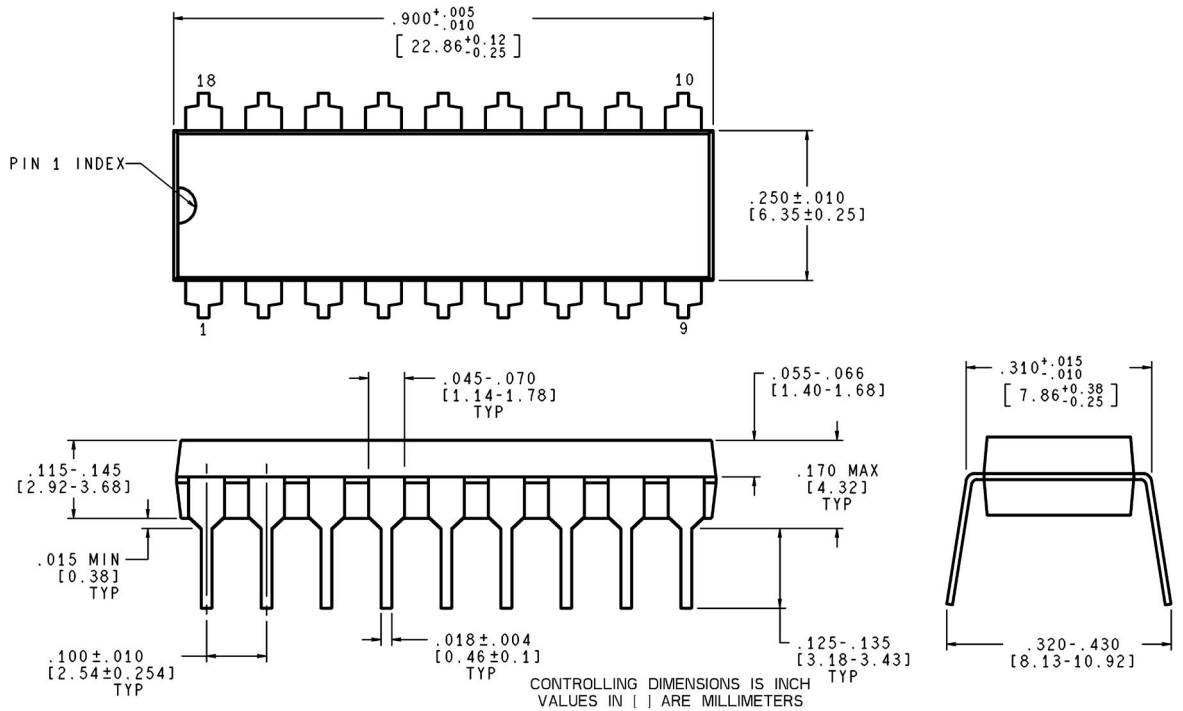
Typical waveform diagram



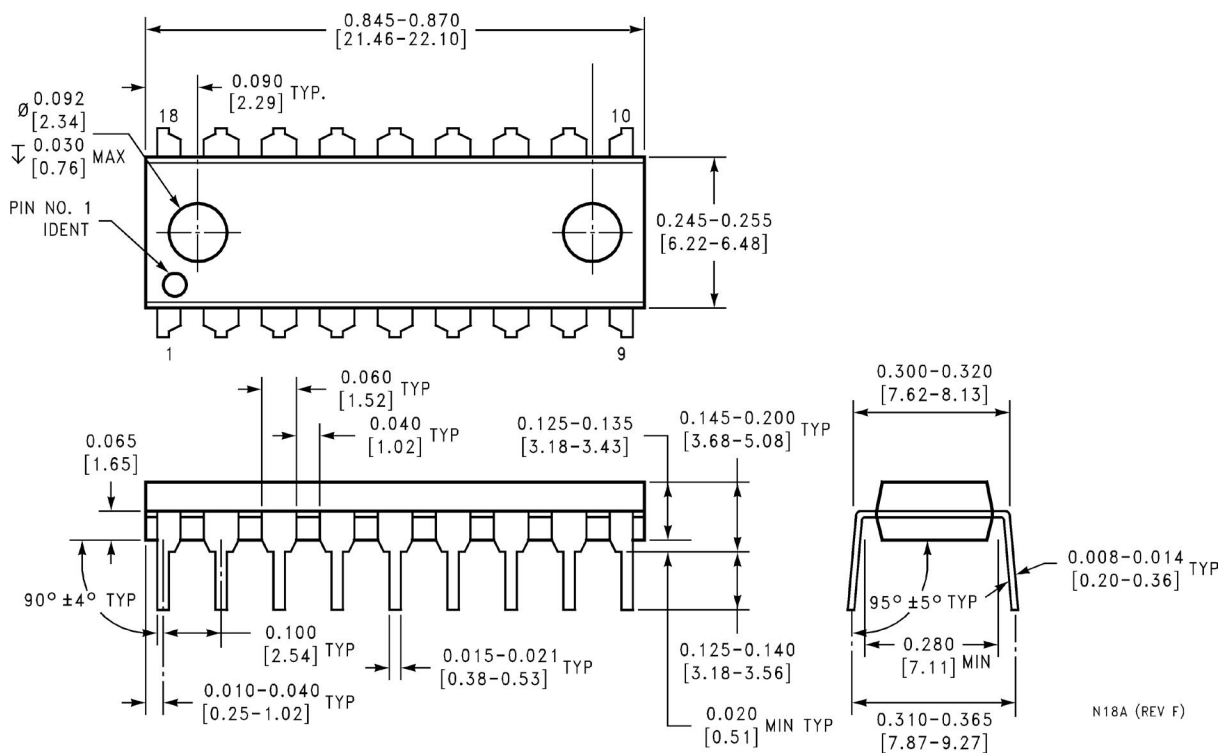


**Packag
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informa
tion**

DIP18.



NA18A (Rev A)



N18A (REV F)