

## Glossary

Printing speed (IPS) : Speed of printing characters on paper. The unit IPS stands for Inch Per Second, which shows a distance printed per second in inch.

Dot density (dots / mm, DPI) : Resolution of the heating elements is represented either by the number of dots per millimeter (dots / mm) or by the number of dots per inch (dots / inch, DPI). Dots / mm and DPI have the following relation:

$$[\text{Dots / mm}] = [\text{DPI}] / 25.4$$

Scanning line time (SLT) : Scanning line time (SLT) shows the cycle to energize the heating elements. SLT, actual printing speed (IPS), and dot density (DPI) have the following relation:

$$\text{SLT} = 1 / (\text{DPI} \times \text{IPS})$$

Applied energy (Eo, mj / dot) : Applied energy is energy to be applied so that the heating element is heated to the required temperature (product of electric power and time). Applied energy in the specifications shows the energy consumed in the heating elements. Total energy that must be applied to the printhead must include the above energy and reactive energy that is consumed in driving circuits and other electrodes. These calculating conditions are specified in each specification. Applied energy determines the life of a thermal printhead. Care must be taken so that the applied energy does not exceed the maximum applied energy shown in the specifications of each printhead. (Refer to the energy limit curve shown in each data sheet.)

Dot pitch : Distance between the centers of adjacent heating elements.

Common voltage (V<sub>H</sub>) : Power supply voltage to provide energy applied to the heating elements. The resistance value of the heating elements must be selected depending on the level of the common voltage to be used. Normally the common voltage is 5 V, 12 V, or 24 V. A thermal printhead also requires power supply voltage for the driver IC (V<sub>DD</sub>, +5V).

Heating element : Resistor that generates heat in printing. The size and composition of heating elements must be considered according to applications and conditions. Thick film type and thin film type have different characteristics.

Heat history control : (See explanation.)

Latch : One of the functions of the driver IC. This represents an area to temporarily save external printing data from the shift register or a control signal for that.

Driving time (On time) : Period for energizing the heating elements. This period is normally given by a strobe signal. For a built-in heat history control thermal printhead, this period is given by a start signal.

Printing life : Life of a thermal printhead ends when the resistance value of a heating element changes 15% or more from the initial value. Life is classified into the two categories.

- Pulse life : Number of pulses energized under the standard printing conditions.
- Running life : Life when heat sensitive paper is moved under the standard printing conditions.

Chopper drive : Surface temperature of the heating elements rises exponentially when energy is applied. Chopper drive controls conducting period (ON period) so that the surface temperature will not become too high for printing. The figure shows that chopper drive enables printing without increasing the temperature of the heating elements higher than necessary. Chopper drive is an effective way to increase the life of printheads.

Split printing : A line thermal printhead contains many heating elements. Applying power to all of these heating elements simultaneously causes heavy load on the power supply and voltage loss inside the head. So printing action is split to alleviate this. Split printing is done with a strobe signal.

Data splitting : Time to send printing data to a thermal printhead may sometimes cause trouble in printing cycles. This is especially true in high speed printing and complicated external control. In this case, time to send printing data is shortened by dividing data into smaller chunks.

Thermistor : An independent thermistor is mounted to monitor the temperature of a thermal printhead. The temperature of the circuit board of the thermal printhead must be controlled so that it does not exceed a specified temperature by referring to the temperature detected by the thermistor.

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