

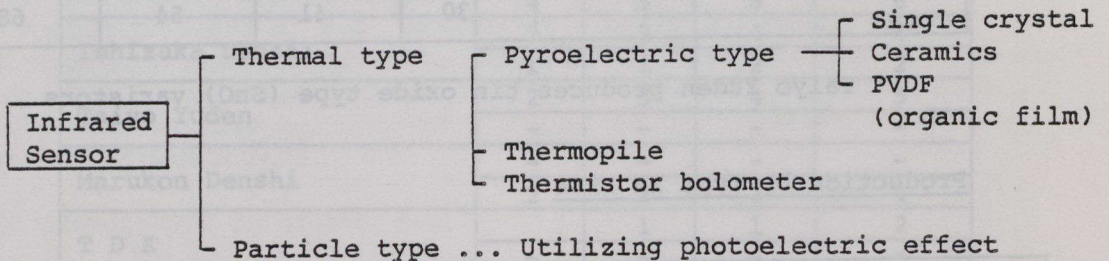
b) Infrared Sensor

Material Used:
LiTaO₃, PZT, PbTiO₃

(a) Classification of Infrared Sensor

Domestically full scale use of infrared sensors started only 5 years ago in 1979. Prior to this period, infrared sensors were the mere small-lot imported products. After 1982, large number of infrared sensors have come into use mostly for consumer products (in particular, for security equipment).

Classification of Infrared Sensors and Major Manufacturers



Although the particle type is superior in its physical properties, in response speed and in sensitivity, they are not suited for consumer products, due to high price and the cooling system using liquid nitrogen.

Presently, the mainstream of application of infrared sensors is to the consumer products in terms of application volume. In relation to this, infrared sensors for consumer application must satisfy requirements with handling convenience and economy. In that sense, pyroelectric type dominates the infrared sensor market.

As aforementioned, pyroelectric type is classified into single crystal, ceramics and organic film by material used. Among these, the organic film is exclusively supplied by Matsushita Electric Industrial Co., Ltd. The reason being the high cost of PVDF material along with the high technology required for processing. Matsushita is the only domestic participant to this market sector and the demand situation for their organic film products is not considered buoyant. As shown in attached Table, single crystal type includes several different sub-types such as lithium tantalate, SBN and the inorganic type like TGS (triglycine sulfite). At present, only lithium tantalate type is in some demand. PZT and PbTiO₃ are in the ceramics type category. Presently in Japan, only PZT is marketed.

Evaluation of physical properties for ceramics and single crystal products is as stated in the reference. However, as the ceramic (PZT) is more profitable than the single crystal (on the cost aspect), PZT is widely used for the consumer products.