## Component Selection

### Thermal Sensor

#### Melexis MLX90614ESF – XYZ

X: A 5V, B 3V, D medical grade 0.1C

Y: A single zone, C gradient compensated,

Z: A 90, C 35, F 10, H 12 , I 5, deg FOV

AAA, ACC, ACF

BAA, BCA, BCC, BCF ($32), BCI ($41)

**DAA ($20)**, DCA ($21), **DCC ($24)**, DCH ($35), **DCI ($56)**

The ideal sensor is the C or the I version.

#### Melexis MLX90615SSG – DAA or DAG

## Optics

#### Distances of relevance:

The ear to ear distance is 220-230mm, the eye pupil distance 63mm, comfortable reading of a book is at 250 (young) and 400/500mm (old).

At 500mm distance, the FOV for the head width is 26 degrees. A measurement spot of 50mm diameter at 500mm distance has a 5.5 degrees FOV. IMX219 Raspberry Pi Camera has 62deg horizontal and 49 deg vertical field of view.

#### Lens

For improved radiation collection we can collect light with IR lenses. The peak emission wavelength for skin is 9.4 microns and very low at 3 microns. Several lens materials are available

* Zinc Selenide (ZnSe): 0.6-15 micron
* Germanium (Ger): 1.7-16micron
* Silicon (SiO2): 0.25 – 3.4 micron

A plano convex lenses for CO2 laser machining have a diameter of 12 or 20mm diameter. 20mm diameter leases with focal lengths of 38, 50,mm are available inexpensively at aliexpress. Edmund optics has plano convex lenses of 12mm diameter and 13, 20 and 25mm focal length.

If we design a system to image at 500mm and use 38mm focal length the lens is mounted at 41mm. With a 20mm diameter lens and 41mm distance we have FOV of 27.4 degrees.

With the ½ inch lens and 13mm focal length we mount lens at 13.5 and 50deg FOV.