

# Focal Plane Electronics Components Not Handled by I3

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Version FPE-7.0-RR6

## 1 Components to be added at Lincoln Laboratory

### 1.1 Clock oscillator

Interface.bom.txt:U88 OSC 2104D60M0000YAX DNP FP14 Surface Mount Oscillator

### 1.2 ID bits

Encode board serial number by populating selected R80-R84 with zero  $\Omega$  resistors for each binary zero.

Interface.bom.txt:R84 RESISTOR DNP 1% 1/10W 0603 Resistor  
Interface.bom.txt:R83 RESISTOR DNP 1% 1/10W 0603 Resistor  
Interface.bom.txt:R82 RESISTOR DNP 1% 1/10W 0603 Resistor  
Interface.bom.txt:R81 RESISTOR DNP 1% 1/10W 0603 Resistor  
Interface.bom.txt:R80 RESISTOR DNP 1% 1/10W 0603 Resistor

### 1.3 Heater regulators with thermal expoxy

Video.bom.txt:Q5 LM195H DNP unknown T039 unknown  
Video.bom.txt:Q4 LM195H DNP unknown T039 unknown  
Video.bom.txt:Q1 LM195H DNP unknown T039 unknown

## 2 Options we don't intend to implement

### 2.1 Populate R13 with zero $\Omega$ , remove R15 to allow serial clock high above 4.5V

```
Interface.bom.txt:X1/R13 RESISTOR DNP 1% 1/10W 0603 Resistor
Interface.bom.txt:X2/R13 RESISTOR DNP 1% 1/10W 0603 Resistor
Driver.bom.txt:X3/R13 RESISTOR DNP 1% 1/10W 0603 Resistor
Driver.bom.txt:X4/R13 RESISTOR DNP 1% 1/10W 0603 Resistor
```

### 2.2 Populate R14 with zero $\Omega$ , remove R16 to allow reset gate high above 4.5V

```
Interface.bom.txt:X1/R14 RESISTOR DNP 1% 1/10W 0603 Resistor
Interface.bom.txt:X2/R14 RESISTOR DNP 1% 1/10W 0603 Resistor
Driver.bom.txt:X3/R14 RESISTOR DNP 1% 1/10W 0603 Resistor
Driver.bom.txt:X4/R14 RESISTOR DNP 1% 1/10W 0603 Resistor
```

### 2.3 Option to hard wire parallel high to zero volts

To hard-wire the parallel clock high level to ground, in the parallel regulators remove R21, replace C5 with zero  $\Omega$ , and populate R25 with zero  $\Omega$ .

```
Interface.bom.txt:X1/X1/R25 RESISTOR DNP 1% 1/10W 0603 Resistor
Interface.bom.txt:X2/X1/R25 RESISTOR DNP 1% 1/10W 0603 Resistor
Driver.bom.txt:X3/X1/R25 RESISTOR DNP 1% 1/10W 0603 Resistor
Driver.bom.txt:X4/X1/R25 RESISTOR DNP 1% 1/10W 0603 Resistor
```

### 2.4 Light emitting diodes and associated limiting resistors, only for test boards

```
Interface.bom.txt:R51 RESISTOR DNP 1% 1/10W 0603 Resistor
Interface.bom.txt:LED6 LED DNP unknown 0603 LED
Interface.bom.txt:R50 RESISTOR DNP 1% 1/10W 0603 Resistor
Interface.bom.txt:LED5 LED DNP unknown 0603 LED
Interface.bom.txt:R49 RESISTOR DNP 1% 1/10W 0603 Resistor
Interface.bom.txt:LED4 LED DNP unknown 0603 LED
Interface.bom.txt:R48 RESISTOR DNP 1% 1/10W 0603 Resistor
Interface.bom.txt:LED3 LED DNP unknown 0603 LED
Interface.bom.txt:R47 RESISTOR DNP 1% 1/10W 0603 Resistor
Interface.bom.txt:LED2 LED DNP unknown 0603 LED
Interface.bom.txt:R46 RESISTOR DNP 1% 1/10W 0603 Resistor
```

Interface.bom.txt:LED1 LED DNP unknown 0603 LED

## 2.5 Alternate clock oscillator/bypass capacitor pairs

Interface.bom.txt:U8 OSC KC3225A60.0000C3GE00 DNP KYOCERA-KC3225A-CSurface Mount Oscillator

Interface.bom.txt:C8 CAPACITOR 0.1uF DNP 16WVDC X7R 0603 Ceramic capacitor

Interface.bom.txt:U80 1116R60M00000BF DNP unknown Vectron-1116 Surface Mount Oscillator

Interface.bom.txt:C80 CAPACITOR 0.1uF DNP 16WVDC X7R 0603 Ceramic capacitor

## 2.6 Capacitors for suppressing ringing on DAC serial lines, if necessary

Interface.bom.txt:C103 CAPACITOR DNP 25WVDC NP0 0603 Ceramic capacitor

Interface.bom.txt:C102 CAPACITOR DNP 25WVDC NP0 0603 Ceramic capacitor

## 2.7 Test headers

Interface.bom.txt:J8 Header DNP unknown HEADER16 unknown

Interface.bom.txt:J9 HEADER14 DNP unknown HEADER14SMT2MM unknown

## 2.8 Populate C9 to boost -50V to -75V

Video.bom.txt:PP/C9 CAPACITOR DNP 50WVDC X7R 0603 Ceramic capacitor

## 2.9 Backside bias for frontside (not flight) CCD chips

For a focal plane with frontside illuminated chips and common backside connections, populate R54 with zero ohms only for the channel you want to have control the backside bias. For a backside illuminated chip, do not populate.

Video.bom.txt:X1/R54 RESISTOR DNP 1% 1/10W 0603 Resistor

Video.bom.txt:X2/R54 RESISTOR DNP 1% 1/10W 0603 Resistor

Video.bom.txt:X3/R54 RESISTOR DNP 1% 1/10W 0603 Resistor

Video.bom.txt:X4/R54 RESISTOR DNP 1% 1/10W 0603 Resistor

## 2.10 Front end gain adjustment

To increase the front end gain on a CCD measurement chain, replace R8 (suitable value  $3k\Omega$ ), populate C18 (2pF), and populate R7 with a value chosen for the desired gain.

```
Video.bom.txt:X4/X4/R7 RESISTOR DNP 1% 1/10W 0603 Resistor
Video.bom.txt:X4/X4/C18 CAPACITOR DNP 25WVDC X7R 0603 Ceramic capacitor
Video.bom.txt:X4/X3/R7 RESISTOR DNP 1% 1/10W 0603 Resistor
Video.bom.txt:X4/X3/C18 CAPACITOR DNP 25WVDC X7R 0603 Ceramic capacitor
Video.bom.txt:X4/X2/R7 RESISTOR DNP 1% 1/10W 0603 Resistor
Video.bom.txt:X4/X2/C18 CAPACITOR DNP 25WVDC X7R 0603 Ceramic capacitor
Video.bom.txt:X4/X1/R7 RESISTOR DNP 1% 1/10W 0603 Resistor
Video.bom.txt:X4/X1/C18 CAPACITOR DNP 25WVDC X7R 0603 Ceramic capacitor
Video.bom.txt:X3/X4/R7 RESISTOR DNP 1% 1/10W 0603 Resistor
Video.bom.txt:X3/X4/C18 CAPACITOR DNP 25WVDC X7R 0603 Ceramic capacitor
Video.bom.txt:X3/X3/R7 RESISTOR DNP 1% 1/10W 0603 Resistor
Video.bom.txt:X3/X3/C18 CAPACITOR DNP 25WVDC X7R 0603 Ceramic capacitor
Video.bom.txt:X3/X2/R7 RESISTOR DNP 1% 1/10W 0603 Resistor
Video.bom.txt:X3/X2/C18 CAPACITOR DNP 25WVDC X7R 0603 Ceramic capacitor
Video.bom.txt:X3/X1/R7 RESISTOR DNP 1% 1/10W 0603 Resistor
Video.bom.txt:X3/X1/C18 CAPACITOR DNP 25WVDC X7R 0603 Ceramic capacitor
Video.bom.txt:X2/X4/R7 RESISTOR DNP 1% 1/10W 0603 Resistor
Video.bom.txt:X2/X4/C18 CAPACITOR DNP 25WVDC X7R 0603 Ceramic capacitor
Video.bom.txt:X2/X3/R7 RESISTOR DNP 1% 1/10W 0603 Resistor
Video.bom.txt:X2/X3/C18 CAPACITOR DNP 25WVDC X7R 0603 Ceramic capacitor
Video.bom.txt:X2/X2/R7 RESISTOR DNP 1% 1/10W 0603 Resistor
Video.bom.txt:X2/X2/C18 CAPACITOR DNP 25WVDC X7R 0603 Ceramic capacitor
Video.bom.txt:X2/X1/R7 RESISTOR DNP 1% 1/10W 0603 Resistor
Video.bom.txt:X2/X1/C18 CAPACITOR DNP 25WVDC X7R 0603 Ceramic capacitor
Video.bom.txt:X1/X4/R7 RESISTOR DNP 1% 1/10W 0603 Resistor
Video.bom.txt:X1/X4/C18 CAPACITOR DNP 25WVDC X7R 0603 Ceramic capacitor
Video.bom.txt:X1/X3/R7 RESISTOR DNP 1% 1/10W 0603 Resistor
Video.bom.txt:X1/X3/C18 CAPACITOR DNP 25WVDC X7R 0603 Ceramic capacitor
Video.bom.txt:X1/X2/R7 RESISTOR DNP 1% 1/10W 0603 Resistor
Video.bom.txt:X1/X2/C18 CAPACITOR DNP 25WVDC X7R 0603 Ceramic capacitor
Video.bom.txt:X1/X1/R7 RESISTOR DNP 1% 1/10W 0603 Resistor
Video.bom.txt:X1/X1/C18 CAPACITOR DNP 25WVDC X7R 0603 Ceramic capacitor
```

## 3 Not an actual component, footprint only

```
Interface.bom.txt:GP1 CHASSIS DNP unknown CHASSIS Chassis ground
Interface.bom.txt:GP2 CHASSIS DNP unknown CHASSIS Chassis ground
```