Near-Infrared (0.9 - 1.7 μm) 640x512 InGaAs Focal Plane Array

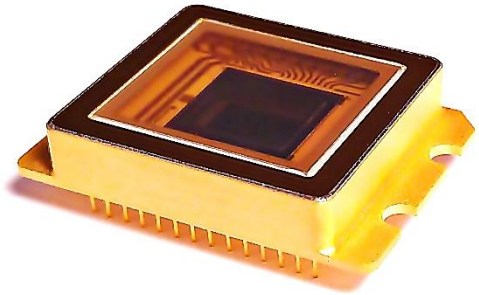
FPA0640P15F-17-T1: with 1-Stage High-Voltage Thermoelectric Cooler
FPA0640P15F-17-T1X: with 1-Stage High-Current Thermoelectric Cooler
FPA0640P15F-17-T2: with 2-Stage Thermoelectric Cooler

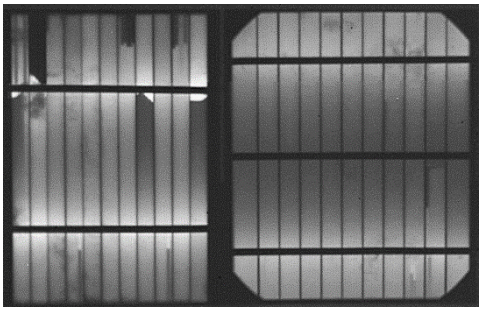
FEATURES

- 640x512 Array Format
- 0.9μm-1.7μm Spectral Range
- 28-pin Metal SDIP Package
- Embedded Thermoelectric Cooler
- Typical Pixel Operability >99.5%
- Quantum Efficiency >70%
- Built-in Temperature Sensor
- Snapshot ITR/IWR and IMRO Readout Modes
- 2, 4 or 8 Outputs with up to 18MHz Pixel Rate
- Windowing Capability

APPLICATIONS

- Near-Infrared Imaging
- Covert Surveillance
- Semiconductor/Solar Panel Inspection
- Medical Science and Biology
- Fiberoptic Telecommunication
- See through Fog / Smoke
- Ice / Slush / Moisture Mapping
- Industrial Thermal Imaging
- Astronomy and Scientific





GENERAL DESCRIPTIONS

PARAMETER	UNIT	VALUE
Sensor Technology	---	Planar InGaAs PIN
Spectral Range	μm	0.9 -1.7
Actual Pixel Array	---	640 x 512
Effective Pixel Array	---	636 x 508
Pixel Pitch	μm	15
Image Size	mm	9.6 x 7.68
Package Type	---	28-pin Metal SDIP Package
Package Size L x W x T	mm	36.1 x 25.4 x 7.3 (without pins)
Weight	g	19.5 (±0.5) (all models)

SPECIFICATIONS ([1]ITS = 20°C)

Parameter		Unit	Typical Value	Conditions
[2,3]Dark Current		fA	≤ 20	Photopixel Biased @ -0.5 V
[2,3]Quantum Efficiency * Fill Factor (QEFF)		%	≥ 70	λ = 1.0 μm - 1.6 μm
[2,3]Response Nonuniformity		%	≤ 5	At 50% Well Occupation
[2,3]Response Nonlinearity (Max. Peak-to-Peak Deviation)		%	≤ 2	15% - 85% Well Occupation Range
[3,4]Charge Capacity	@High Gain, 46.2 μV/e^-	Me^-	0.041	ROIC Specifications
	@Mid Gain, 16.2 μV/e^-		0.118	
	@Low Gain, 1.39 μV/e^-		1.380	
Readout Noise		e^-	≤ 65	High Gain, Integration Time = 3.33 ms
Noise-Equivalent Irradiance (NEI)		ph# / cm^2-s	≤ 1.1 x 10^{10}	High Gain, Integration Time = 3.33 ms, λ = 1.55 μm
Mean Detectivity		cm-√Hz / W	≥ 5.7 x 10^{12}	
Output Swing		V	2.3	
[3]Minimum Integration Period		μs	<1	
[2,3]Pixel Operability		%	≥ 99.5	Percentage of Pixels with QEFF Deviation within ±20%*(QEFF Mean).
[5]Maximum Cooling Capability (ΔT_{MAX})	FPA0640P15F-17-T1(X)	°C	≥ 40	$T_{Heatsink}$ = 20°C
	FPA0640P15F-17-T2		≥ 60	

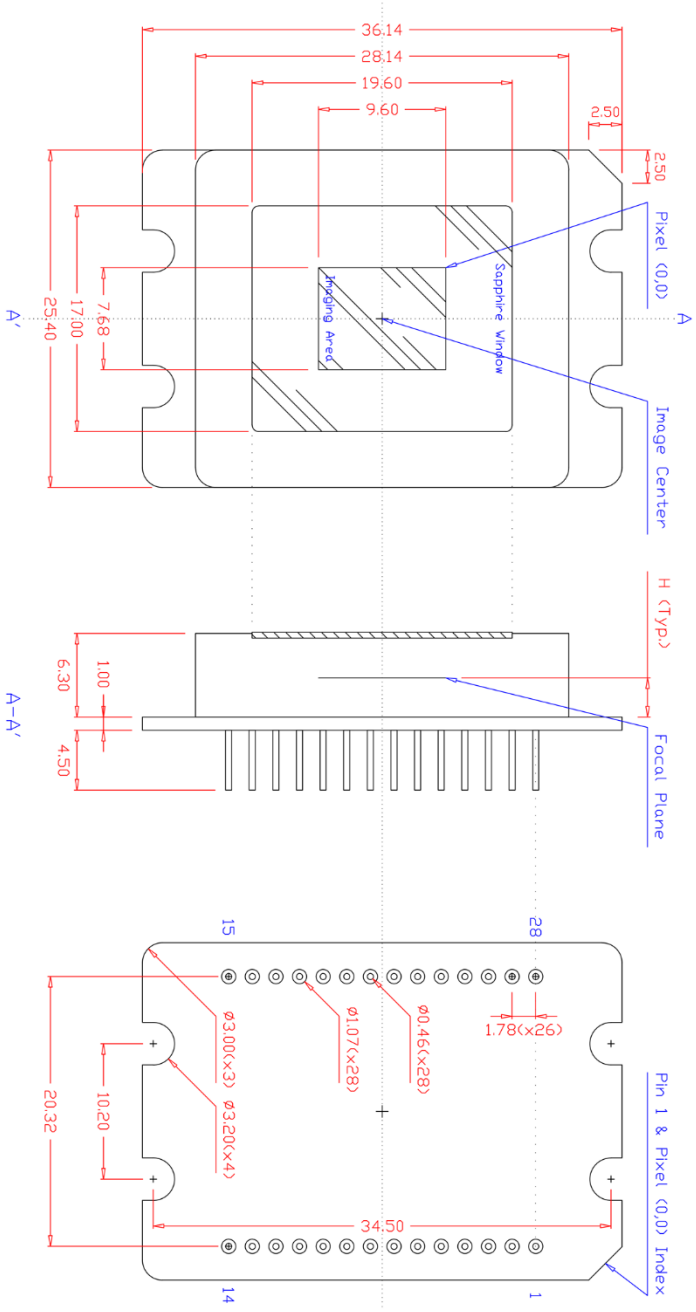
1. Readings from integrated temperature sensor (ITS).
2. These items are defined for central effective pixel array (636x508). Their values correspond to default operation conditions.
3. Contact us for further information.
4. These values are ROIC-version dependent.
5. Adequate heatsink and thermal interface material are the prerequisites for stable operation.

ABSOLUTE MAXIMUM RATINGS

Parameter		Unit	Min.	Max.
[6]Operating Temperature		°C	-40	+70
[6]Storage Temperature		°C	-40	+70
[7]Power Consumption		mW	---	200
[8]TEC Bias	FPA0640P15F-17-T1	V	---	12
	FPA0640P15F-17-T1X		---	6
	FPA0640P15F-17-T2		---	10
[8]TEC Current	FPA0640P15F-17-T1	A	---	1.4
	FPA0640P15F-17-T1X		---	2.6
	FPA0640P15F-17-T2		---	2.1

6. Non-condensing environment.
7. Without powering on the thermoelectric cooler.
8. Applied to Pin-1 for cooling operation. Operation above these maximum ratings causes excessive (local) heat accumulation and may result in permanent damage to the cooler.

PACKAGE OUTLINE (Unit: mm)



TOP VIEW

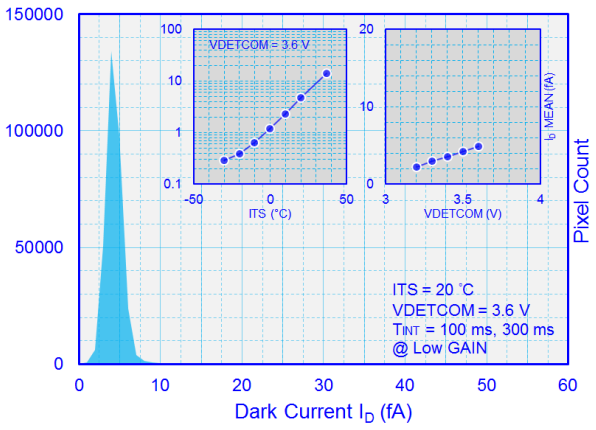
SIDE VIEW

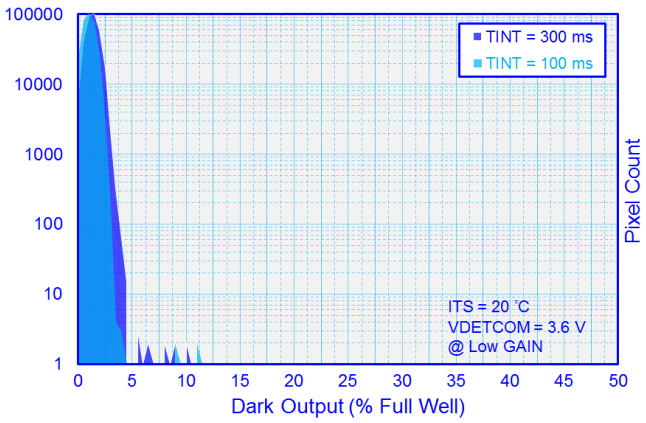
Model	H
FPA0640P15F-17-T1(X)	2.95
FPA0640P15F-17-T2	4.05

BOTTOM VIEW

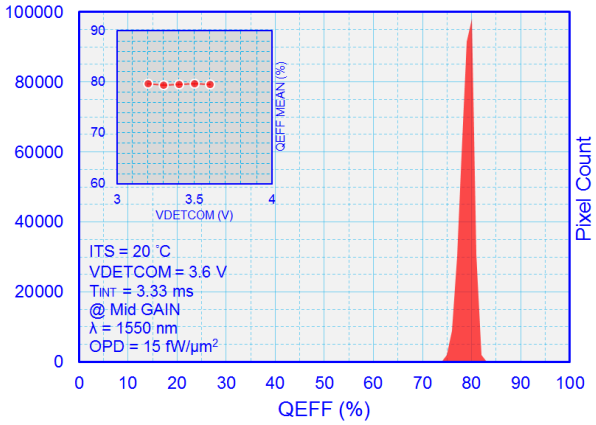
EXAMPLE CURVES

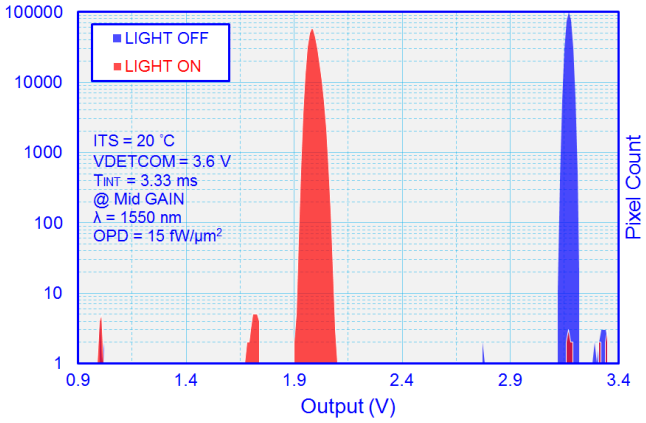
Histograms of Dark Condition



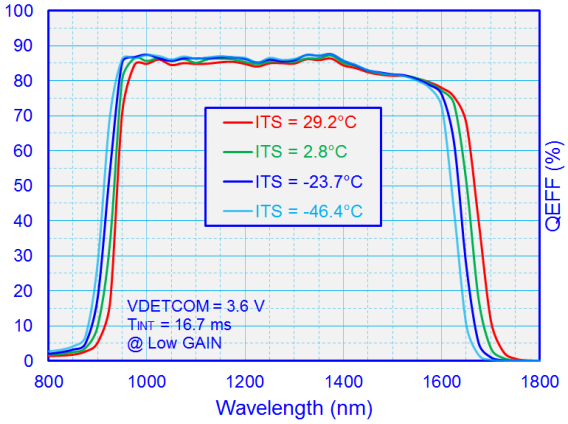


Histograms of Illumination Condition

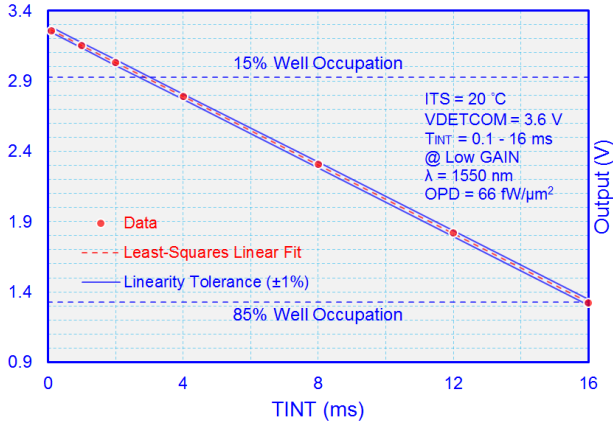




QEFF Spectrum



Output Linearity



Note: The example curves are subject to change without notice.