





Sub -THz Generator and image Camera

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TERAHERTZ IMAGING CAMERAS



Description / Specifications	● STANDARD MODELS Certified frequency range: 50 GHz – 700 GHz			
	TERA-256 	LINEAR* TERA-1024 	TERA-1024 	TERA-4096 
Number of pixels:	256 (16 x 16)	1024 (256 x 4)	1024 (32 x 32)	4096 (64 x 64)
Pixel size (pitch):	1.5 x 1.5 mm	1.5 x 1.5 mm	1.5 x 1.5 mm	1.5 x 1.5 mm
Responsivity:	50 kV/W	50 kV/W	50 kV/W	50 kV/W
Noise Equivalent Power:	1 nW/√Hz	1 nW/√Hz	1 nW/√Hz	1 nW/√Hz
Dimensions of device:	116 x 116 x 44.5 mm	440 x 43 x 89 mm	116 x 116 x 44.5 mm	165 x 165 x 44.5 mm
Power:	5V USB powered	5V USB powered	5V USB powered	5V USB powered
Warranty period:	1.5 years	1.5 years	1.5 years	1.5 years
Software:	Terasense Viewer ® Software			

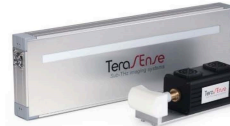
Note: Terasense offers a variety of *custom-tailored* solutions to satisfy other configuration / geometry requirements for sensor arrays.

For LINEAR TERA-1024 THz camera we recommend *THz wave sources for linear imaging scanners* (see page 2).

[CE Certificate of Compliance](#)

● High Speed THz Imaging Scanner-100 GHz (Linear Terahertz Camera at 100 GHz)

Optimized at operating frequency ~100 GHz
INTENDED FOR HIGH SPEED CONVEYOR BELTS



Source Type I

OR



Source Type II

Model / part number:	TeraFAST-256-HS-100		
Number of pixels (scalable*):	256 (256 x 1)	Image acquisition rate:	5000 fps (5 KHz)
Pixel size (pitch):	1.5 x 3 mm	Responsivity:	8000 V/W
Sensor array imaging area:	384 x 3 mm	Min detectable power/pixel:	100 nW (at 5000 fps)
Size of device:	450 x 160 x 44 mm		45 nW (at 1000 fps)
Sync out:	TTL (+5 V)		14 nW (at 100 fps)
Interface:	Mini-USB	Power supply:	24 V/ 20 W
Warranty:	1.5 years	Software included:	TeraFast® Viewer

*NOTES: TeraFAST-256-HS is meant for high speed conveyors. As the number of pixels is scalable, we can add sensor array blocks to accommodate other configuration and geometry requirements.

For TeraFAST-256-HS line scanner and Linear Tera-1024 we recommend one of three types of *THz Wave sources for linear THz cameras / scanners* (see next page). These upgraded THz sources have special THz optics meant to create linear backlight with a uniform intensity distribution for proper focusing of THz beam and spreading THz emission evenly over the sensitive imaging window of the line scanner. Customized TeraFAST-256-HS-140 optimized at 140 GHz is also possible.



• High Speed THz Imaging Scanner - 300 GHz
(Linear Terahertz Camera-300 GHz)



New Model with higher imaging resolution optimized at frequency ~300 GHz
 INTENDED FOR HIGH SPEED CONVEYOR BELTS



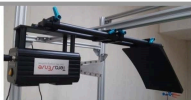

Model / part number:	TeraFAST-256-HS-300/0.5		
Number of pixels (scalable*):	256 (256 x 1)	Pixel size (pitch):	0.5 x 0.5 mm
Sensor array imaging area:	128 x 0.5 mm	Dynamic range:	100 (at 100 fps – 5 cm/s)
Sync out:	TTL (+5 V)		300 (at 10 fps – 0.5 cm/s)
Interface:	Mini-USB	Power supply:	24 V/ 20 W
Warranty:	1.5 years	Software included:	TeraFast® Viewer

*NOTES: TeraFAST-256-HS-300/0.5 is meant for high speed conveyors. As the number of pixels is scalable, we can add sensor array blocks to accommodate other configuration and geometry requirements.


For TeraFAST-256-HS-300/0.5 line scanner we recommend 300 GHz source or 280GHz source models with flat horn (see pages 6-7 below). These THz source has special THz optics meant to create linear backlight with a uniform intensity distribution for proper focusing of THz beam and spreading THz emission evenly over the sensitive imaging window of the line scanner.



• THz Wave Sources for Linear THz cameras / Scanners at 100 GHz

Model name / part number		
Type-I (IMPATT-100-LS-cH/ptfe)	Type-II (IMPATT-100-LS-fH/mirr)	Type-III (MPATTx4-100/400-LS-fH/mirr)
	 	
Frequency: ~ 100 GHz Output power: ~ 80 mW Power per pixel: 20 μW Dynamic range: 24 dB THz optics: PTFE lens Conical horn antenna Linewidth: 1 MHz Technology: IMPATT See IMPATT-100-H/F for specs	Frequency: ~ 100 GHz Output power: up to 110 mW Power per pixel: 140 μW Dynamic range: 30 dB THz optics: Metallic reflection optics High gain flat horn Technology: super-hero IMPATT Linewidth: 1 MHz Incident signal improvement factor: x4 (If compared to IMPATT-100-LS-cH/ptfe)	Frequency: ~ 100 GHz Output power: ≥ 400 mW Power per pixel: 570 uW Dynamic range: ~ 36 dB THz optics: Metallic reflection optics High gain flat horn Technology: super-hero IMPATT Linewidth: 1 MHz Incident signal improvement factor: x16 (If compared to IMPATT-100-LS-cH/ptfe)

• THz Wave Source for Linear THz cameras / Scanners at 140 GHz

Description / Specifications	
	Model: Type-I(b) (IMPATT-140/30-LS-cH/ptfe) Frequency*: ~ 140 GHz Output power: ~ 30 mW output rfpower TTL Modulation (1us rise/fall time) Rigidly fixed conical horn antenna THz optics: PTFE lens (detachable) Protective isolator

TERAHERTZ GENERATORS - 100 GHz

● 100 GHz Wave Source (80 mW)



Description / Specifications

Model: **IMPATT-100/80-H/F**

(IMPATT diode with open flange type, case and current source)

Frequency*: ~ 100 GHz

High output power: ≥ 80 mW output rfpower

Output type: WR-10 -- or -- WR-8 flange (at customer choice)

Alternative Output**: rigidly fixed conical horn antenna (Gaussian beam shape)

TTL Modulation (1us rise/fall time)

Protective isolator

Warranty: 1 year

Note*: This upgraded product has enhanced characteristics and high versatility. It can be used in combination with VDI multipliers.

** Rigidly fixed conical horn antenna as a output option - will be available for a some time (same price), but will be phased out in future.

Detachable high gain conical horn antenna is optional (for WR-flange)

- (see model below.)

● 100 GHz Wave Source with detachable horn



Description / Specifications

Model: **IMPATT-100/80-WR8+Hd**

(IMPATT diode with open flange type, case and current source)

Frequency*: ~ 100 GHz

High output power: ≥ 80 mW output rfpower

Output type: WR-8 -- or -- WR-10 flange (at customer choice)

Detachable high gain conical horn antenna* (Gaussian beam shape)

TTL Modulation (1us rise/fall time)

Protective isolator

Warranty: 1 year

Note*: With this model our customers do not have to choose between WR- flange output and conical horn, because it offers both options!
This upgraded product has enhanced characteristics and high versatility. It can be used in combination with VDI multipliers.

● 100 GHz Wave Source (>180 mW)



Description / Specifications

Model: **IMPATT-100/200-H/F**

(IMPATT diode with open flange type, case and current source)

Frequency: ~ 100 GHz

High output power: ≥ 180 mW output rfpower (up to 200 mW)

TTL Modulation (1us rise/fall time)

Output type: WR-10 -- or -- WR-8 flange** (at customer choice)

Alternative output**: rigidly fixed conical horn antenna (Gaussian beam shape)

Protective isolator

Warranty: 1 year

Note: This upgraded product has enhanced characteristics and high versatility. It can be used in combination with VDI multipliers.

** Rigidly fixed conical horn antenna -as output option - will be available for a some time (same price), but will be phased out in future.

Detachable high gain conical horn antenna is optional (to be attached to WR- flange)

(Gaussian beam shape).

● **100 GHz Wave Source (>400 mW)**



Description / Specifications
<p>Model: POWERSOURCE-100/400-H/F Based on: 'super-hero IMPATT' technology (Open flange type, with case and current source) Frequency: ~ 100 GHz Very high output power*: ≥ 400 mW output rfpower (up to 500 mW) Output type: WR-8 -- or -- WR-10 Alternative output**: rigidly fixed conical horn antenna (Gaussian beam shape) TTL Modulation (1us rise/fall time) Protective isolator Warranty: 1 year</p>

Note: * 400 mW is a minimum guaranteed. The actual power output can be up to 500 mW.

** Rigidly fixed conical horn antenna -as output option - will be available for a some time (same price), but will be phased out in future.

Detachable high gain conical horn antenna is optional (to be attached to WR-flange) (Gaussian beam shape).

Note: Recently the price for this particular model was reduced considerably - as part of our limited-time promotion action.

TERAHERTZ GENERATORS - 140 GHz

● **140 GHz Wave Source (30mW)**



Description / Specifications
<p>Model: IMPATT-140/30-H/F (IMPATT diode with open flange type, case and current source) Frequency: ~ 140 GHz Output power: ~ 30 mW output rfpower Output type: WR-6 flange Alternative output**: rigidly fixed conical horn antenna (Gaussian beam shape) TTL Modulation (1us rise/fall time) Protective isolator Warranty: 1 year</p>

Note*: This upgraded product has enhanced characteristics and high versatility. It can be used in combination with VDI multipliers.

** Rigidly fixed conical horn antenna -as output option - will be available for a some time (same price), but will be phased out in future.

Detachable high gain conical horn antenna is optional (to be attached to WR-flange) (Gaussian beam shape).

● **140 GHz Wave Source with detachable horn**



Description / Specifications
<p>Model: IMPATT-140/30-WR6+Hd (IMPATT diode with open flange type, case and current source) Frequency*: ~ 140 GHz Output power: ~ 30 mW output rfpower TTL Modulation (1us rise/fall time) Output type: WR-6 flange Detachable high gain conical horn antenna (Gaussian beam shape) Protective isolator Warranty: 1 year</p>

Note*: With this model our customers do not have to choose between WR- flange output and conical horn, because it offers both options!
 This upgraded product has enhanced characteristics and high versatility. It can be used in combination with VDI multipliers.

● **140 GHz Wave Source (90 mW)**



Description / Specifications
<p>Model: IMPATT-140/90-H/F (IMPATT diode with open flange type, case and current source) Frequency: ~ 140 GHz Output power: ≥ 90 mW output rfpower Output type: WR-6 flange Alternative output**: rigidly fixed conical horn antenna (Gaussian beam shape) TTL Modulation (1us rise/fall time) Protective isolator Warranty: 1 year</p>

Note*: This upgraded product has enhanced characteristics and high versatility. It can be used in combination with VDI multipliers.
 ** Rigidly fixed conical horn antenna -as output option - will be available for a some time (same price), but will be phased out in future.
Detachable high gain conical horn antenna is optional (to be attached to WR-flange)

TERAHERTZ GENERATOR - 180 GHz

● **180 GHz Wave Source**



Description / Specifications
<p>Model: IMPATT-180/10-H/F (IMPATT diode with open flange type, case and current source) Frequency: ~ 180 GHz Output power: ~ 10 mW output rfpower TTL Modulation (1us rise/fall time) Rigidly fixed conical horn antenna** - or - ● WR-4.3 flange** (at customer's choice) Warranty: 1 year</p>

Note: ** Customer has to choose between high gain horn antenna (option 1) and flange (option 2). Detachable high gain conical horn antenna can also be discussed for additional payment.

TERAHERTZ GENERATOR ~ 200 GHz

● **~200 GHz Wave Source (50mW)**



Description / Specifications
<p>Model: IMPATT-200M/50-H/F (IMPATT diode with open flange type, case and current source) Frequency: ~ 200 GHz Output power: ~ 50 mW output rfpower Frequency multiplier (x2) Output: WR-4 flange TTL Modulation (1us rise/fall time) Warranty: 1 year</p>

Note: Detachable high gain diagonal horn antenna is optional add-on element (attached to WR-flange)

TERAHERTZ GENERATORS - 280 GHz

● 280 GHz Wave Source



Description / Specifications

Model: IMPATT-280M/25-WR3.4-F/H

Based on IMPATT technology

Frequency*: ~ **280 GHz**

High Output power: ~ **25 mW** output rfpower

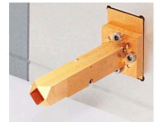
Frequency multiplier (x2)

Output: WR-3.4 flange

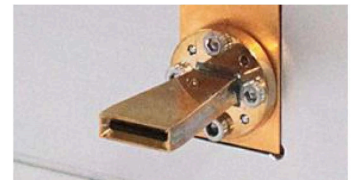
TTL Modulation (1us rise/fall time)

Warranty: 1 year

Note: Detachable high gain diagonal horn antenna is optional add-on element (to be attached to WR-flange).



● 280 GHz Wave Source *with FLAT horn* *(for linear THz scanner at 300 GHz)*



Description / Specifications

Model: IMPATT-280M/25-WR3.4- LS-fH/mirr

Based on IMPATT technology

Frequency*: ~ **280 GHz**

Output power: ~ **25 mW** output rfpower

Frequency multiplier (x2) with WR-3.4 flange

Detachable High gain *FLAT* horn (to create linear THz beam shape)

THz optics: Metallic reflection optics

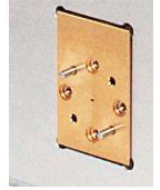
TTL Modulation (1us rise/fall time)

Warranty: 1 year

Note: **This** model is recommended for new THz linear scanner TeraFAST-256-HS-300/0.5 – see page 2
Price for this particular model was recently increased, due to increase in component prices by our suppliers

TERAHERTZ GENERATORS - 300 GHz

● 300 GHz Wave Source



Description / Specifications

Model: **IMPATT-300M/10-WR3.4F/H**

Based on IMPATT technology

Frequency*: ~ 300 GHz

Output power: ~ 10 mW output rfpower

Frequency multiplier (x3) with **WR-3.4 flange**

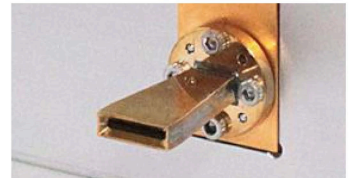
TTL Modulation (1us rise/fall time)

Warranty: 1 year

Note: Detachable high gain diagonal horn antenna is optional add-on element (to be attached to WR-flange).



● 300 GHz Wave Source with *flat horn* (for *linear THz scanner* at 300 GHz)



Description / Specifications

Model: **IMPATT-300M/10-WR3.4- LS-fH/mirr**

Based on IMPATT technology

Frequency*: ~ 300 GHz

Output power: ~ 10 mW output rfpower

Frequency multiplier (x3) with WR-3.4 flange

Detachable High gain *FLAT* horn (to create linear THz beam shape)

THz optics: Metallic reflection optics

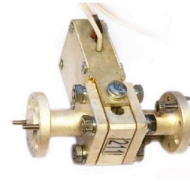
TTL Modulation (1us rise/fall time)

Warranty: 1 year

Note: **This** model is recommended for new THz linear scanner [TeraFAST-256-HS-300/0.5](#) – see page 2
Price for this particular model was recently increased, due to increase in component prices by our suppliers.

● Ultrafast Modulator

(stand-alone device)



Modulator + THz source

Description / Specifications	
Model: MOD-UF/ex	
Base frequency*:	85 – 100, 140 GHz
Switching time:	< 2 ns
Bandwidth:	±1 GHz
Initial loss:	≤ 1.5 dB
Attenuation in locked mode:	≥ 25 dB
Maximum input mw power:	0.6 W
Reciprocal type (S21 = S12)	
Warranty:	1 year

Note: Ultrafast modulator is fully compatible with Terasense wave sources and can accommodate customer's needs for frequencies 100 GHz, 140 GHz and 300 GHz. Other model of Modulator can be used as RF switch and attenuator.

TERAHERTZ DETECTORS (SINGLE-PIXEL)

● Ultrafast THz Detector

Point THz detectors (broad-band)



Description / Specifications	
Model: Ultrafast-150	
Response time:	150 ps
Spectral Range:	50 GHz - 0.7 THz
Responsivity (typical):	0.5 V/W
Noise Equivalent Power:	2 nW/√Hz
Dimensions:	23 x 29 x 6.5 mm
Impedance:	50 Ω
Output connector:	SMA
Warranty:	1.5 years

NOTE: Our detectors are of broad-band type. Client can specify the exact frequency (range) preferred for the final product and Terasense will have it manufactured optimized to customers' specifications. These settings will be preset at factory and will not be adjustable afterwards.

● Fast THz Detector

Point THz detector (broad-band)



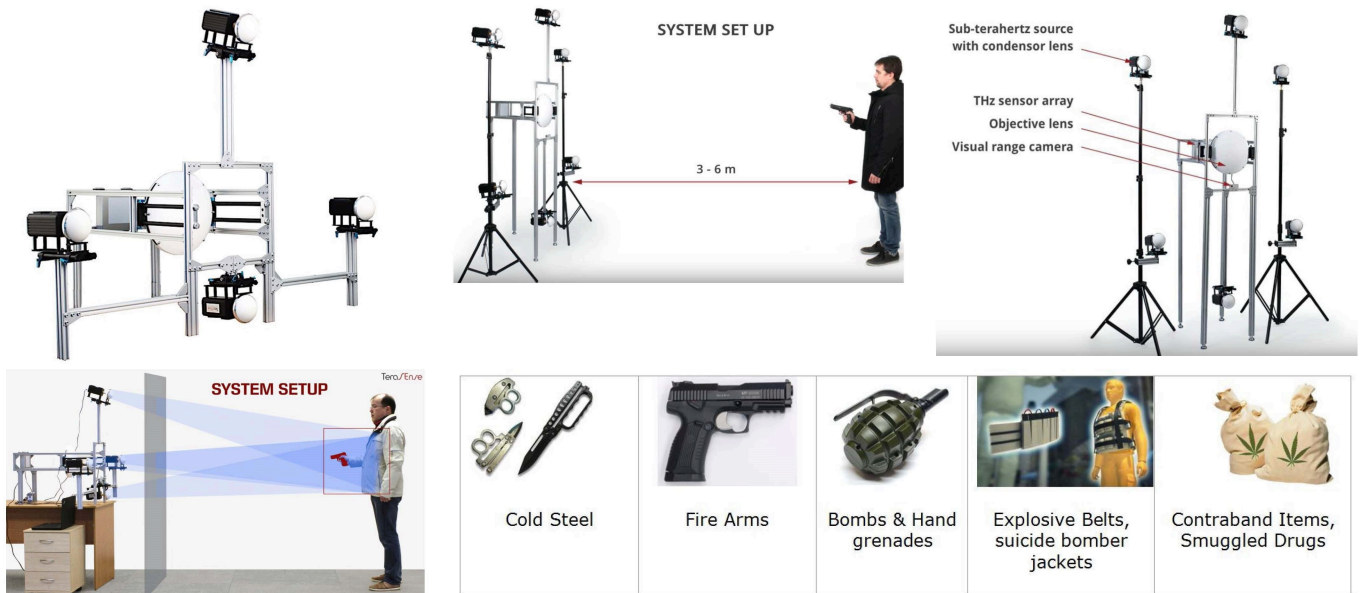
Description / Specifications	
Model: Fast-1	
Response time:	1 μs
Spectral Range:	50 GHz - 0.7 THz
Responsivity (typical):	10 V/W
Noise Equivalent Power:	1 nW/√Hz
Dimensions:	23 x 29 x 6.5 mm
Impedance:	10 kΩ
Output connector:	SMA
Warranty:	1.5 years

NOTE: Our detectors are of broad-band type. Client can specify the exact frequency (range) preferred for the final product and Terasense will have it manufactured optimized to customers' specifications. These settings will be preset at factory and will not be adjustable afterwards.

• TERAHERTZ SECURITY BODY SCANNER

Terahertz Active Standoff Imaging System for Security Screening of people

Intended purpose: detection of various banned i.e. weapons, drugs, explosives etc. hidden under clothes



System parameters / Specifications	Model / part number:	
	TeraSCREEN-1024/3	TeraSCREEN-4096/1.5
Effective imaging range (distance):	~ 3 m – 6 m	~ 3 m – 6 m
Field of view (coverage area):	0.7 x 0.7 m (at 3m) 120 x 120 cm (at 6 m)	0.7 x 0.7 m (at 3m)
Operating frequency:	100 GHz	100 GHz
Sensor Array pixel size:	3 x 3 mm	1.5 x 1.5 mm
Number of pixels in sensor array:	1024 (32 x 32)	4096 (64 x 64)
Cross-range resolution (at 3m):	3 cm	3 cm
THz sources (IMPATT diodes):	4 pcs*	4 pcs*
Frame rate:	Live Stream	Live Stream
Warranty:	1 year	1 year



* Note: the number of THz sources is optional. The more THz sources are used, the better THz image is obtained. We recommend 6 THz sources pointed at the target at different angles, the Effective imaging range (distance) can be extended up to 6 m from the target!

TeraSCREEN-1024/3 ensures the same cross-range resolution and quality of THz image in reflection mode. If required body scanner modules can be added to expand the field of view (effective coverage area on the target).

FUTURE PRODUCTS

● 280 GHz Wave Source

(future product) *

Description / Specifications

Model: IMPATT-280M/50-WR3.4F/H (tentative name)

Based on IMPATT technology

Frequency*: ~ 280 GHz

Extremely High Output power: ~ 50 mW output rf power

Frequency multiplier (x2) with

Output: WR-3.4 flange

TTL Modulation (1us rise/fall time)

Warranty: 1 year

Note: High gain diagonal horn antenna (detachable) is optional for additional payment (see picture below).

* This is a future model that is still in the making. Anticipated date of release is not known yet (anticipated within aprx 1 year).