



Microchannel Plate -Photomultiplier (MCP-PMT) STN60/STM62



2023 V1

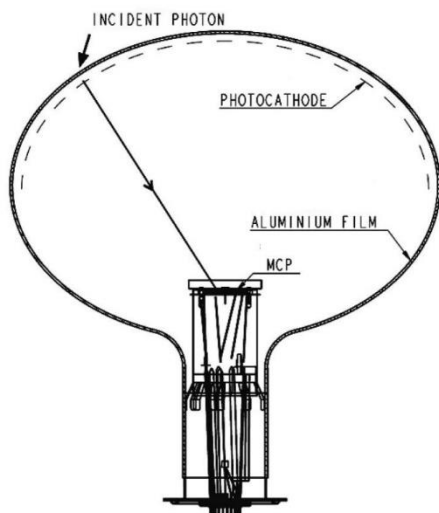
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Microchannel Plate –Photomultiplier(MCP-PMT)

MCP-PMT mainly consists of a photocathode, a microchannel plate multiplication system and an anode. The multiplication system contains a single or multiple microchannel plates. When the weak light signal passes through the photocathode, it will excite the photoelectrons, which will be transported to MCP for multiplication under the proximity-focus electric field or the electrostatic focusing electric field. Finally, the amplified electronic signal will be received by the anode and output through the signal line, so as to realize the detection of single photon and other weak signals.



Large Area of MCP-PMT

Selection Guide for MCP-PMT

Item	Product Name	Shape	Outer Diameter	Inner Diameter	Spectral Range	Peak Wavelength Typ.	Photocathode Integral Luminous Typ.	QE Typ.	Gain Typ.	Anode Sensitivity Typ.	Dark Count Rate Typ.	Peak to Valley Ratio Typ.	Charge Resolution Typ.	Rise Time Typ.
STN6082	Large Area MCP-PMT	Round	Dia.203mm	/	290-650nm	380nm	90A/lm	30% @ 410nm	1×10^7	900A/lm	10 kHz	7	35%	4ns
STN6201	Large Area MCP-PMT	Round	Dia.508mm	/	290-650nm	380nm	90A/lm	30% @ 410nm	1×10^7	900A/lm	30 kHz	7	35%	1.4ns
STN6203	Large Area MCP-PMT	Round	Dia.508mm	/	290-650nm	380nm	90A/lm	30% @ 410nm	1×10^7	900A/lm	20 kHz	4	40%	1.4ns
STN6011	MCP-PMT	Round	Dia.36.6mm	Dia.18mm (min)	115-320nm	250nm	/	15% @ 250nm	1×10^6	/	500Hz	3	35%	1.2ns
STN6012	MCP-PMT	Round	Dia.50mm	Dia.10mm (min)	290-650nm	380nm	70A/lm	22% @ 410nm	1×10^6	/	1000Hz @ 0.2pe	2	45%	180ps
STN6014	MCP-PMT	Round	Dia.36.6mm	Dia.18mm (min)	290-650nm	380nm	70A/lm	22% @ 410nm	1×10^6	/	1000Hz @ 0.2pe	10	30%	1.2ns
STN6015	MCP-PMT	Round	Dia.35.5mm	Dia.18mm (min)	290-650nm	380nm	70A/lm	22% @ 410nm	1×10^6	/	1000Hz @ 0.2pe	3	35%	250ps
STN6021	MCP-PMT	Square	SQ51mm	46mm(min)	280-650nm	380nm	70A/lm	22% @ 410nm	2×10^6	/	500Hz @ 0.2pe	3	35%	300ps

Microchannel Plate –Photomultiplier(MCP-PMT) - Large Area

The large-area MCP-PMT is a vacuum electronic device that converts extremely weak light signals into electrical signals. It is a large-area, high-detection efficiency electrostatic focusing photomultiplier tube with independent intellectual property rights.

This product uses Sb-K-Cs cathode as a photoelectric conversion cathode, which has high quantum efficiency for photons in the 350-450nm wavelength; using a microchannel plate as an electron multiplier tube system, the superposition of two microchannel plates can achieve an electron gain of more than 10^7 . The multiplication distance of the microchannel plate is short, so it has superior time response



Product performance can be customized according to customer needs. At present, the main products are 8-inch and 20-inch MCP-PMT.

Feature

- High gain ,low noise ,fast response
- Good single photon peak-to-valley ratio

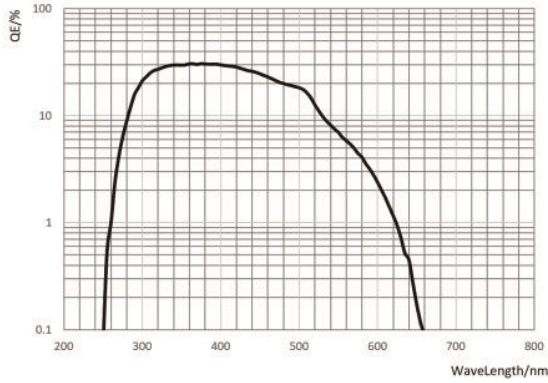
Application

- High energy physics

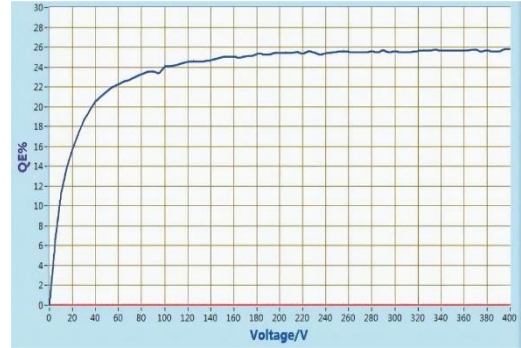
Specification

Parameter		Description									
Window Material		Borosilicate glass									
Photocathode Material		Sb-K-Cs									
Multiplier Structure		MCP									
Operating Ambient Temperature		-30℃~+50℃									
Storage Temperature		-50℃~+50℃									
Model		STN6082			STN6201			STN6203			Unit
Diameter		8			20						Inch
Product Performance		Min.	Typ.	Max.	Min.	Typ.	Max.	Min.	Typ.	Max.	/
Cathode Parameters	Spectral Range	290-650									nm
	QE Peak Wavelength	/	380	/	/	380	/	/	380	/	nm
	Photocathode Integral luminous @410nm/QE	/	90	/	/	90	/	/	90	/	A/lm
		/	30	/	/	30	/	/	30	/	%
Anode Parameters	Supply Voltage	1500	1750	2000	1500	1750	2000	1650	1900	2100	V
	Gain	/	1×10^7	/	/	1×10^7	/	/	1×10^7	/	/
	Anode Sensitivity	/	900	/	/	900	/	/	900	/	A/lm
	Dark Count Rate	/	10	25	/	30	100	/	20	60	kHz
	Peak to Valley Ratio	3	7	/	3	7	/	2.5	4	/	/
	Charge Resolution	/	35	50	/	35	60	/	40	60	%
Time Response	Rise Time	/	4	/	/	1.4	/	/	1.4	/	ns
	TTS	/	1.6	/	/	15	/	/	5	/	ns
	After Pulse Ratio	/	1	/	/	1	/	/	1	/	%

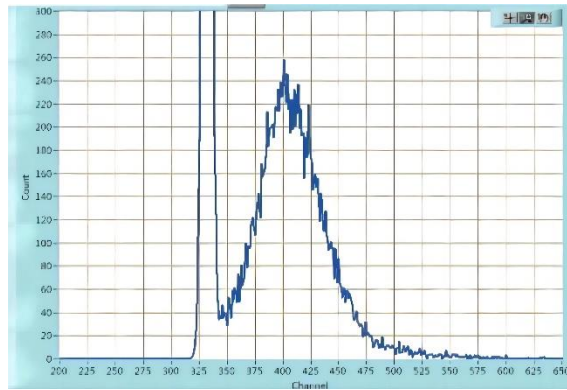
Spectral Graph



Typical Spectral Response Curve

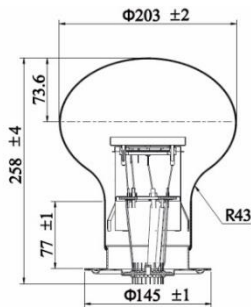


Plateau Characteristics

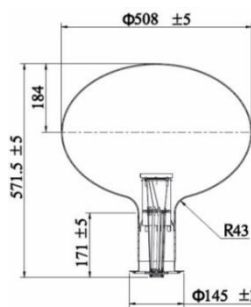


Typical Single Photoelectron Spectrum

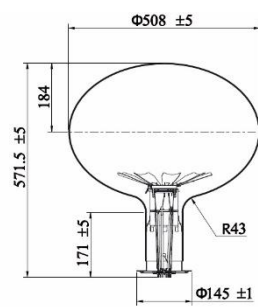
Dimension



STN6082



STN6201



STN6203

Microchannel Plate - Photomultiplier(MCP-PMT) - STN6011

STN6011 is a MCP-PMT featuring fast response ,high sensitivity , large pulsed peak current.

Feature

- Fast response ,high sensitivity
- Large pulsed peak current

Application

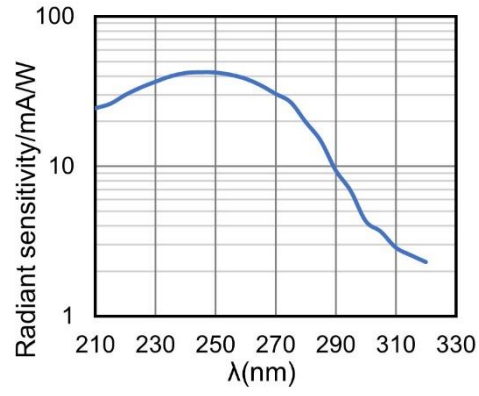
- Ultraviolet communication
- Space exploration



Specification

Parameter		Description			
Window Material		MgF2 glass			
Photocathode Material		CsTe			
Multiplier Structure		2 MCP			
STN6011		Min.	Typ.	Max.	Unit.
Cathode Parameters	Spectral Response	115-320			nm
	Quantum Efficiency Peak Wavelength	/	250	/	nm
	QE@250nm	/	15	/	%
	Radiant Sensitivity@250nm	/	30	/	mAW
Anode Parameters	Supply Voltage	/	1800	2500	V
	Gain	/	1×10^6	/	/
	Dark Count Rate@0.2pe	/	500	2000	Hz
	Charge Resolution	/	35	/	%
	Peak to Valley Ratio	/	3	/	/
	Pulsed Peak Current	/	150	/	/
Time Response	Rise Time	/	1.2	/	ns
	Pulse Width	/	2	/	ns
	Fall Time	/	1.6	/	ns
	TTS@ σ (SPE)	/	50	/	ps
	TTS@ σ (MPE)	/	20	/	ps
Operating Ambient Temperature		-30~+50			°C
Storage Temperature		-50~+50			°C

Spectral Graph

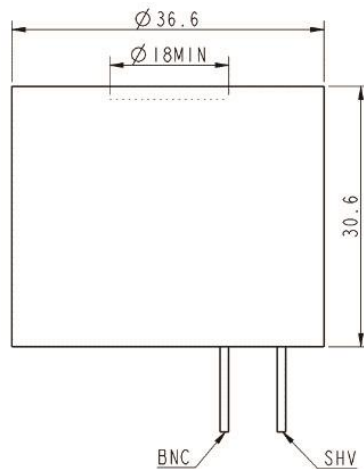


Typical Spectral Response Curve



Typical Single Photoelectron Spectrum

Dimension



Microchannel Plate –Photomultiplier(MCP-PMT) - STN6012

STN6012 is a MCP-PMT featuring fast response ,high gain ,low noise.

Feature

- Fast response ,high gain ,low noise

Application

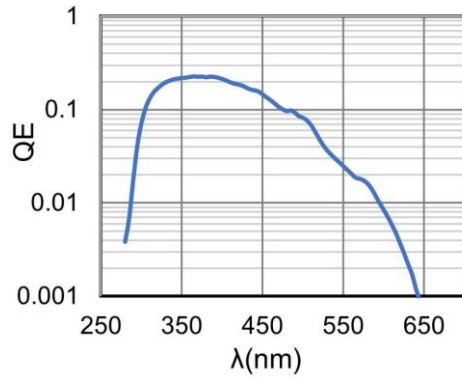
- Molecular science ,medical science
- Biochemistry ,material engineering



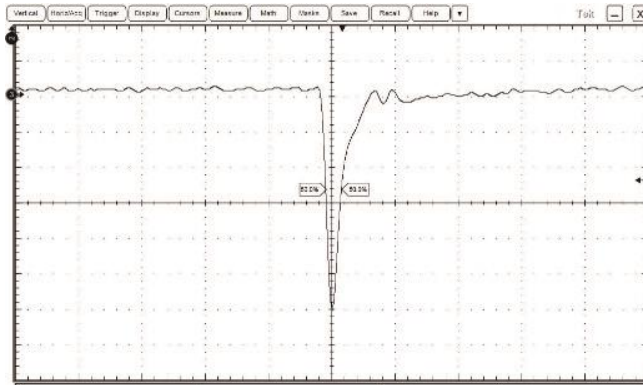
Specification

Parameter		Description			
Window Material		AVG Glass			
Photocathode Material		Bialkali			
Multiplier Structure		2 MCP			
STN6012		Min.	Typ.	Max.	Unit.
Cathode Parameters	Spectral Response	290-650			nm
	Quantum Efficiency Peak Wavelength	/	380	/	nm
	Luminous Sensitivity	/	70	/	μA/lm
	QE @410nm	/	22	/	%
	Radiant Sensitivity@410nm	/	72	/	mA/W
Anode Parameters	Supply Voltage	/	2500	3400	V
	Gain	/	1×10^6	/	/
	Dark Count Rate@0.2pe	/	1000	5000	Hz
	Charge Resolution	/	45	/	%
	Peak to Valley Ratio	/	2	/	/
Time Response	Rise Time	/	180	/	ps
	Pulse Width	/	400	/	ps
	Fall Time	/	750	/	ps
	TTS@σ(SPE)	/	40	/	ps
	TTS@σ (MPE)	/	15	/	ps
Operating Ambient Temperature		-30~+50			°C
Storage Temperature		-50~+50			°C

Spectral Graph

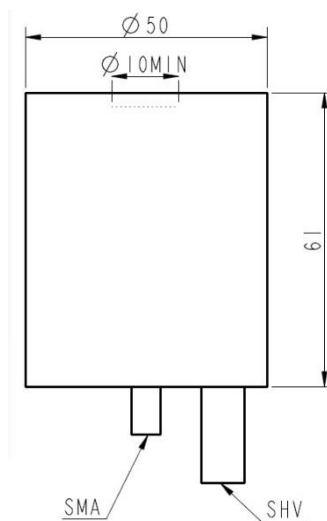


Typical Spectral Response Curve



Typical Single Photoelectron Spectrum

Dimension



Microchannel Plate –Photomultiplier(MCP-PMT) - STN6014

STN6011 is a MCP-PMT featuring high speed ,high gain ,low noise.

Feature

- High speed ,high gain ,low noise

Application

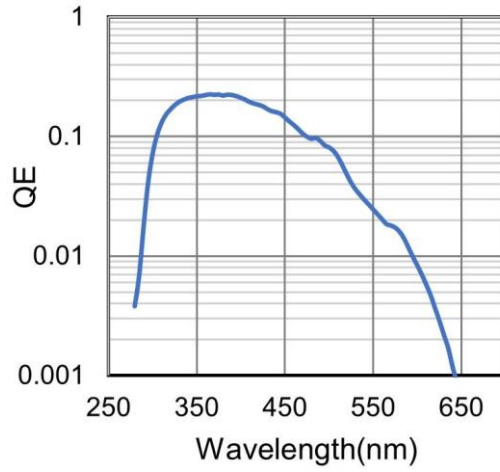
- Molecular science ,medical science
- Biochemistry ,material engineering



Specification

Parameter		Description			
Window Material		AVG Glass			
Photocathode Material		Bialkali			
Multiplier Structure		2 MCP			
STN6014		Min.	Typ.	Max.	Unit.
Cathode Parameters	Spectral Response	290-650			nm
	Quantum Efficiency Peak Wavelength	/	380	/	nm
	Luminous Sensitivity	/	70	/	μA/lm
	QE @410nm	/	22	/	%
	Radiant Sensitivity@410nm	/	72	/	mA/W
Anode Parameters	Supply Voltage	/	1800	2500	V
	Gain	/	1×10^6		/
	Dark Count Rate@0.2pe	/	1000	5000	Hz
	Charge Resolution	/	30	/	%
	Peak to Valley Ratio	/	10	/	/
Time Response	Rise Time	/	1.2	/	ns
	Pulse Width	/	2	/	ns
	Fall Time	/	1.6	/	ns
	TTS@σ(SPE)	/	50	/	ps
	TTS@σ (MPE)	/	20	/	ps
Operating Ambient Temperature		-30~+50			°C
Storage Temperature		-50~+50			°C

Spectral Graph

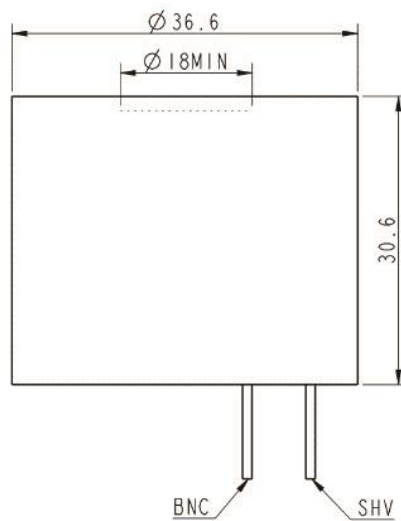


Typical Spectral Response Curve



Typical Single Photoelectron Spectrum

Dimension



Microchannel Plate - Photomultiplier(MCP-PMT) - STN6015

STN6015 is a MCP-PMT featuring high speed ,high gain ,low noise.

Feature

- High speed ,high gain ,low noise

Application

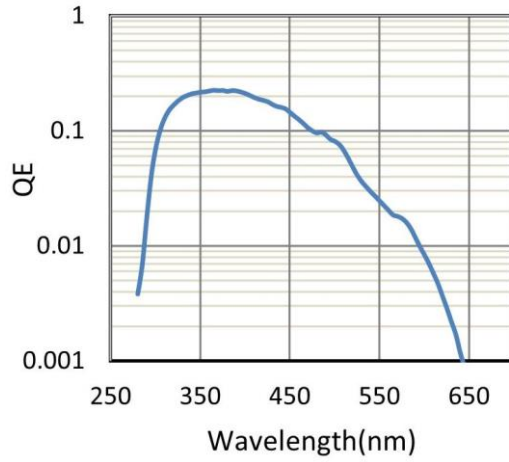
- Specialized medical imaging
- Cherenkov – RICH, TOF, TOP, DIRC
- High energy physics
- Security



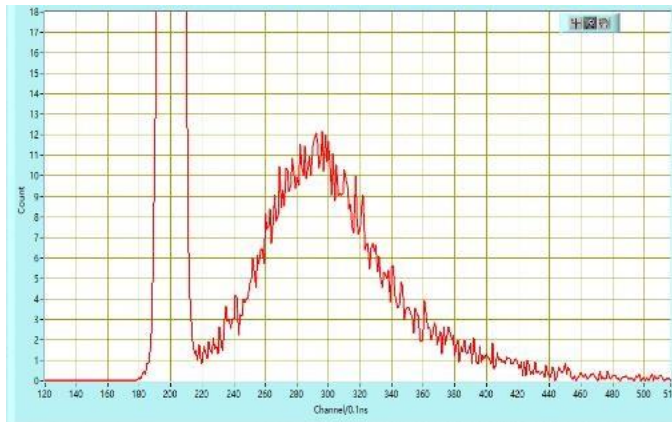
Specification

Parameter		Description			
Window Material		AVG glass			
Photocathode Material		Bialkali			
Multiplier structure		2 MCP			
Anode Structure		2x2			
STN6015		Min.	Typ.	Max.	Unit.
Cathode Parameters	Spectral Response	290-650			nm
	Quantum Efficiency Peak Wavelength	/	380	/	nm
	Luminous Sensitivity	/	70	/	μA/lm
	QE @410nm	/	22	/	%
	Radiant Sensitivity@410nm	/	72	/	mA/W
Anode Parameters	Supply Voltage	/	1700	2500	V
	Gain	/	1×10 ⁶	/	/
	Dark Count Rate@0.2pe(Single Anode)	/	1000	5000	Hz
	Charge Resolution	/	35	/	%
	Peak to Valley Ratio	/	3	/	/
Time Response	Rise Time	/	250	/	ps
	Pulse Width	/	650	/	ps
	Fall Time	/	650	/	ps
	TTS@σ(SPE)	/	50	/	ps
	TTS@σ (MPE)	/	10	/	ps
Operating Ambient Temperature		-30~+50			°C
Storage Temperature		-50~+50			°C

Spectral Graph

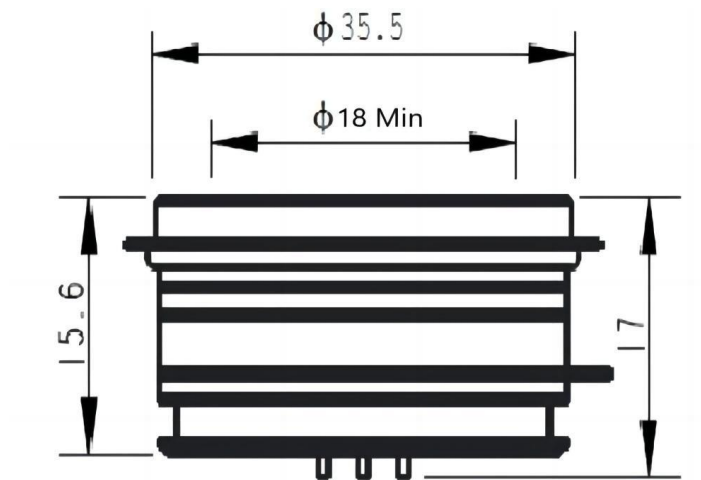


Typical Spectral Response Curve



Typical Single Photoelectron Spectrum

Dimension



Microchannel Plate –Photomultiplier(MCP-PMT) - STN6021

STN6021 is a MCP-PMT featuring high speed ,high gain ,low noise.

Feature

- High speed ,high gain ,low noise

Application

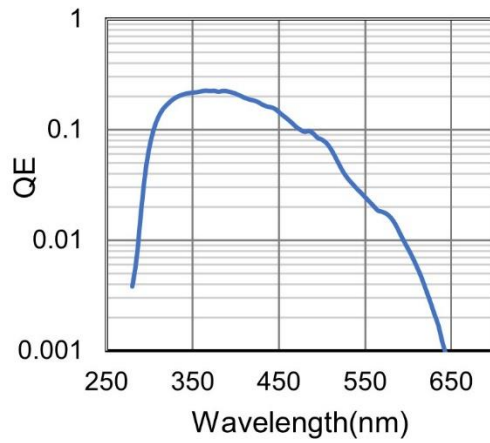
- Specialized medical imaging
- Cherenkov – RICH, TOF, TOP, DIRC
- High energy physics
- Security



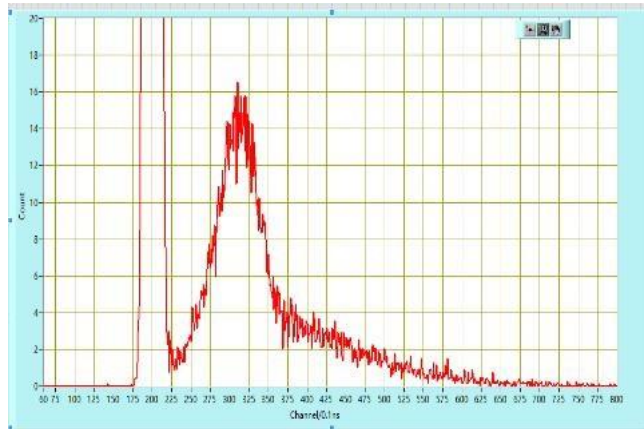
Specification

Parameter		Description			
Window Material		AVG Glass			
Photocathode Material		Bialkali			
Multiplier Structure		2 MCP			
Anode Structure		8 x8			
N6021		Min.	Typ.	Max.	Unit.
Cathode Parameters	Spectral Response	280-650			nm
	Quantum Efficiency Peak Wavelength	/	380	/	nm
	Luminous Sensitivity	/	70	/	μA/lm
	QE @410nm	/	22	/	%
	Radiant Sensitivity@410nm	/	72	/	mA/W
Anode Parameters	Supply Voltage	/	2500	3200	V
	Gain	/	2×10^6	/	/
	Dark Count Rate@0.2pe(single anode)	/	500	5000	Hz
	Charge Resolution	/	35	/	%
	Peak to Valley Ratio	/	3	/	/
Time Response	Rise Time	/	300	/	ps
	Pulse Width	/	650	/	ps
	Fall Time	/	800	/	ps
	TTS@σ(SPE)	/	50	/	ps
	TTS@σ (MPE)	/	15	/	ps
Operating Ambient Temperature		-30~+50			°C
Storage Temperature		-50~+50			°C

Spectral Graph



Typical Spectral Response Curve



Typical Single Photoelectron Spectrum

Dimension

