

# iC212

## HIGHSPEED PHOTORECEIVER



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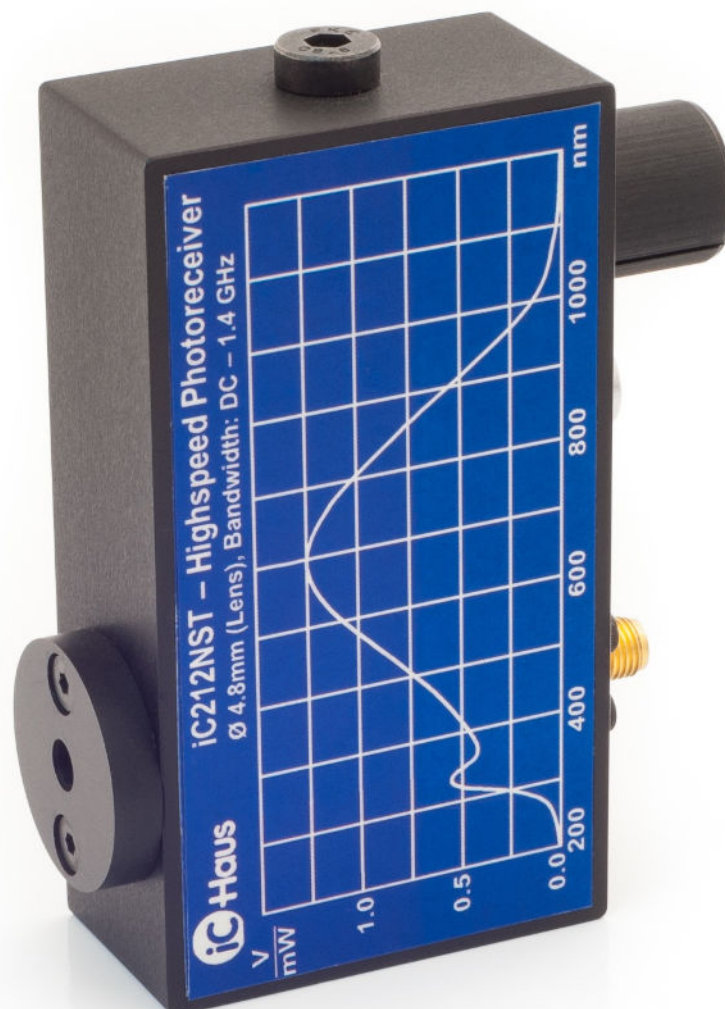
### FEATURES

- ◆ Bandwidth DC to 1.4 GHz
- ◆ Si PIN photodiode,  $\varnothing$  0.2 mm for "No Slow Tail" (NST) option
- ◆ InGaAs photodiode,  $\varnothing$  0.1 mm for "Near Infrared" (NIR) option
- ◆ Spectral response range  $\lambda = 320$  to 1000 nm (NST)
- ◆ Spectral response range  $\lambda = 800$  to 1800 nm (NIR)
- ◆ Amplifier transimpedance (gain) 3.125 V/mA
- ◆ Max. conversion gain 1.25 V/mW @ 700 nm (NST)
- ◆ Max. conversion gain 3.25 V/mW @ 1500 nm (NIR)

### APPLICATIONS

- ◆ Fast pulse and transient measurement
- ◆ Optical front-end for oscilloscopes

### DEVICE



# iC212

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### DESCRIPTION

The iC-Haus Highspeed Photoreceiver iC212 has been developed for optical high speed measurement. With its bandwidth ranging from DC up to 1.4 GHz it detects photo signals from constant light to high speed with rise times down to 200 ps. The iC212 Highspeed Photoreceiver also features offset adjustment to compensate DC levels of the input signal.

The photodiode used with the standard "no slow tail" (NST, blue label) version covers a spectral range from 320 to 1000 nm with an active area diameter of about  $\varnothing$  0.2 mm, which is increased by a  $\varnothing$  4.6 mm lens, re-

sulting in an effective usable area of typical 12.5 mm<sup>2</sup>. The Highspeed Photoreceiver is able to detect power levels in the sub mW range at GHz speed.

The "Near Infrared" (NIR, orange label) version covers a spectral range from ca. 800 to 1800 nm.

The iC212 Highspeed Photoreceiver comes with M6 mounting holes for integration in optical bench systems and an optional fiber-optic input adapter for optical fiber coupling.

### ABSOLUTE MAXIMUM RATINGS

Beyond these values damage may occur; device operation is not guaranteed.

Item No.	Symbol	Parameter	Conditions			Unit
				Min.	Max.	
G001	Pmax	Optical Input Power			10	mW
G002	Vs	Power Supply Voltage			20	V

### ELECTRICAL CHARACTERISTICS

Test Conditions: Vs = 18 V, Ta = 25 °C\*, System Impedance 50  $\Omega$

Item No.	Symbol	Parameter	Conditions				Unit
				Min.	Typ.	Max.	
<b>Gain</b>							
101	A	Amplifier Transimpedance Conversion Gain	50 $\Omega$ load; NST: $\lambda$ = 700 nm NIR: $\lambda$ = 1500 nm	3.125 1.25 3.25			V/mA V/mW V/mW
<b>Frequency Response</b>							
201	fmax	Upper Cut-Off Frequency	-3 dB	1.4			Ghz
202	$\Delta$ A	Gain Flatness		$\pm$ 1			dB
203	tr	Rise Time	10 to 90%	280			ps
204	tpd	Propagation Delay	optical in => electrical out, 50% to 50%	750			ps
<b>Detector</b>							
301	d	Active Area Diameter	NST NIR	0.2 0.1			mm mm
302	Aeff	Effective Active Area	4.6 mm lens	12.5			mm <sup>2</sup>
303	$\lambda$	Spectral Range	NST NIR	320 800		1000 1800	nm nm
304	Pmax	Max. Optical Input Power	NST: average NST: linear amplification @ 700 nm NIR: linear amplification @ 1500 nm	10 770 320			mW $\mu$ W $\mu$ W
305	NEP	Noise equivalent power	including amplifier noise, f = 1 GHz		115		pW/ $\sqrt$ Hz
<b>Output</b>							
401	Rout	Output Impedance		50			$\Omega$
402	Vout	Output Voltage Swing	50 $\Omega$ load, for linear amplification	-0.3		1.0	V
403	Vos	Offset Voltage (adjustable) <sup>†</sup>	DC offset cancellation	-1.25		0.15	V
404	Pos	Offset (adjustable) <sup>†</sup>	equivalent optical power	-92		750	$\mu$ W
405	twu	Warm-Up Time	stable offset voltage	30			min

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### ELECTRICAL CHARACTERISTICS

Test Conditions:  $V_s = 18\text{ V}$ ,  $T_a = 25\text{ }^\circ\text{C}^*$ , System Impedance  $50\ \Omega$

Item No.	Symbol	Parameter	Conditions				Unit
				Min.	Typ.	Max.	
<b>Power Supply</b>							
501	$V_s$	Supply Voltage				18	V
502	$I_s$	Supply Current		150			mA

\* Caution! Even during regular operation, the aluminum case of the photoreceiver may heat up to  $40\text{ }^\circ\text{C}$  max.

† The output is clipped to  $-0.5\text{ V}$ , if the offset voltage is less than  $0.5\text{ V}$  and no DC light is present.

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## HIGHSPEED PHOTORECEIVER



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### CONTENTS

The purchased parts package includes

- Highspeed Photoreceiver iC212 (picture shows standard NST option)
- Power adapter (230 VAC)
- Coaxial cable with SMA plugs
- SMA to BNC adapter
- Fiber adapter



Figure 1: Box contents

## DIMENSIONS

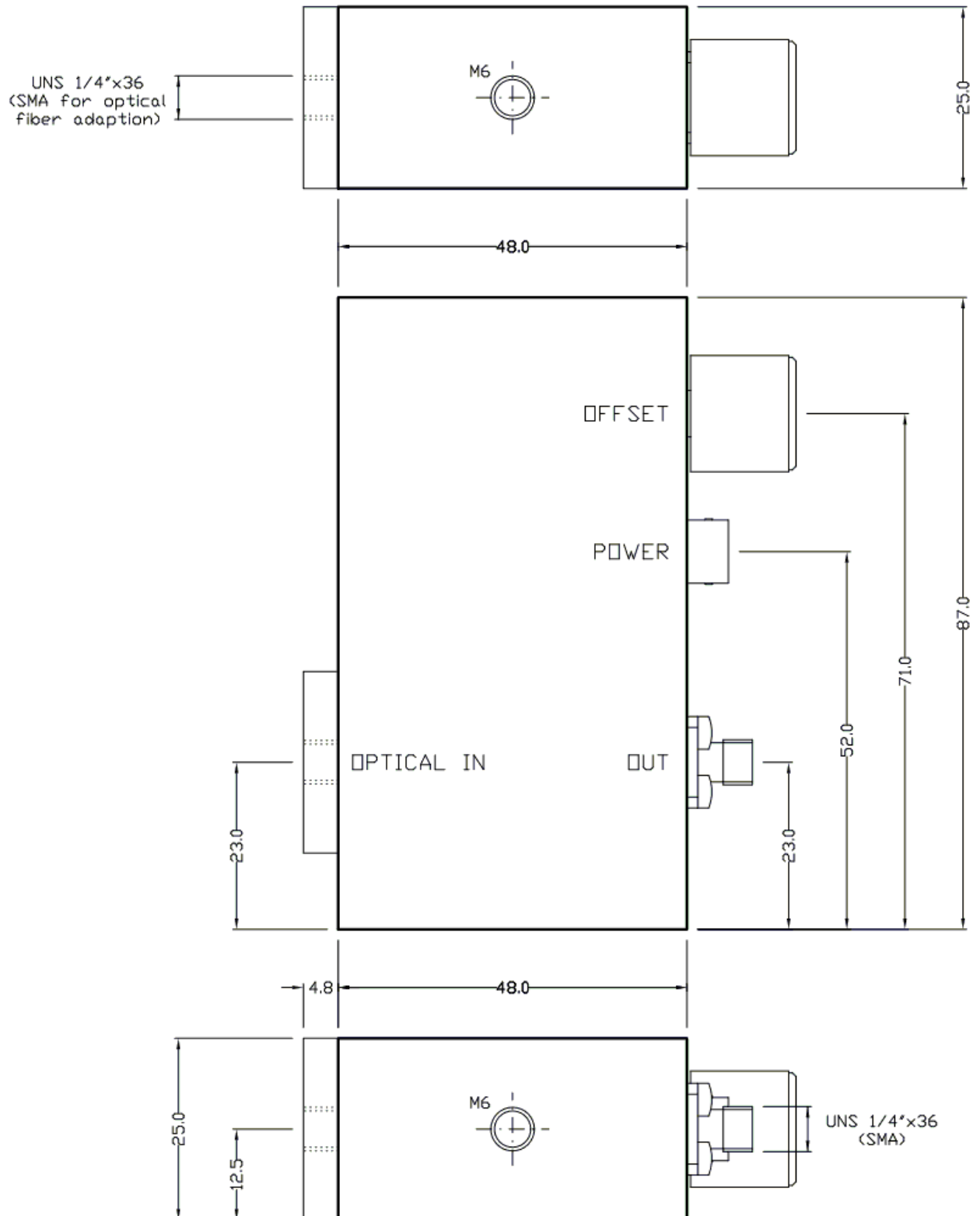


Figure 2: Case dimensions (all units in mm)

**CONNECTORS**

Input	
NST	Optical, micro bench adaption - Free-space measurement (default) - SMA fiber adapter (optional)
NIR	FC/PC fiber adapter with integrated photodiode - Lens cap for free-space measurement (default)
Output	SMA Connector
Power Supply	DC power connector, 5.5 mm/2.1 mm +: Vs+ -: Vs-



Table 1: Connectors

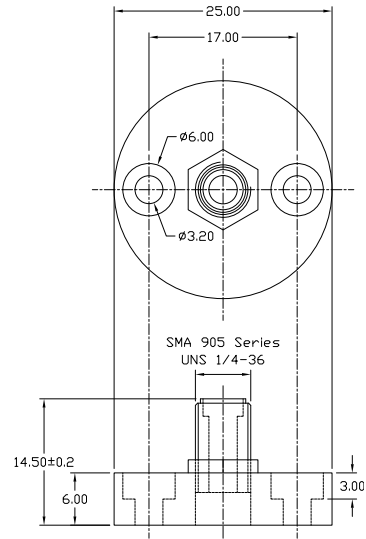


Figure 3: SMA fiber adapter (NST version only)

**RESPONSE**

**Standard "No Slow Tail" (NST) option**

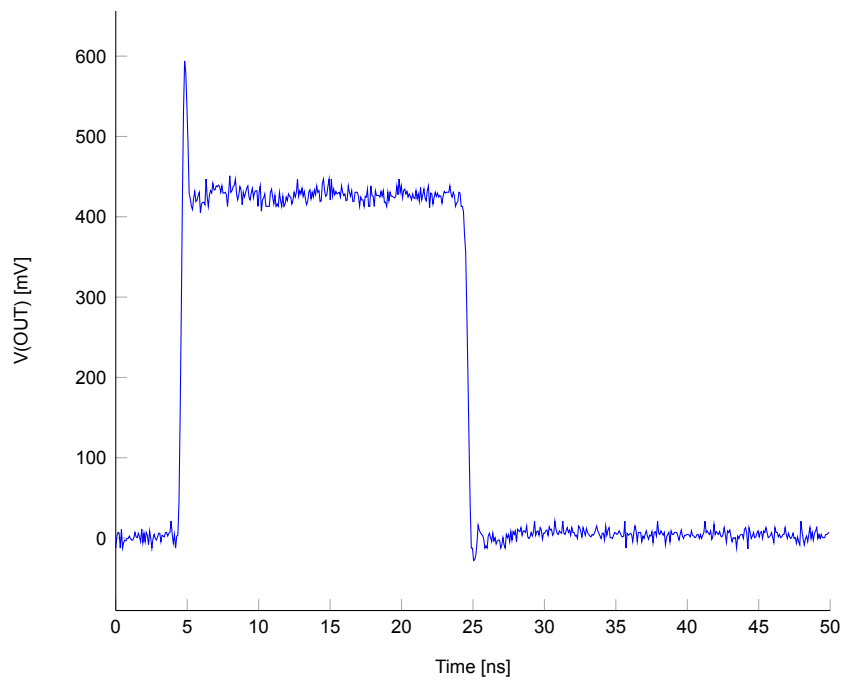


Figure 4: Pulse response (NST)

**"Near Infrared" (NIR) option**

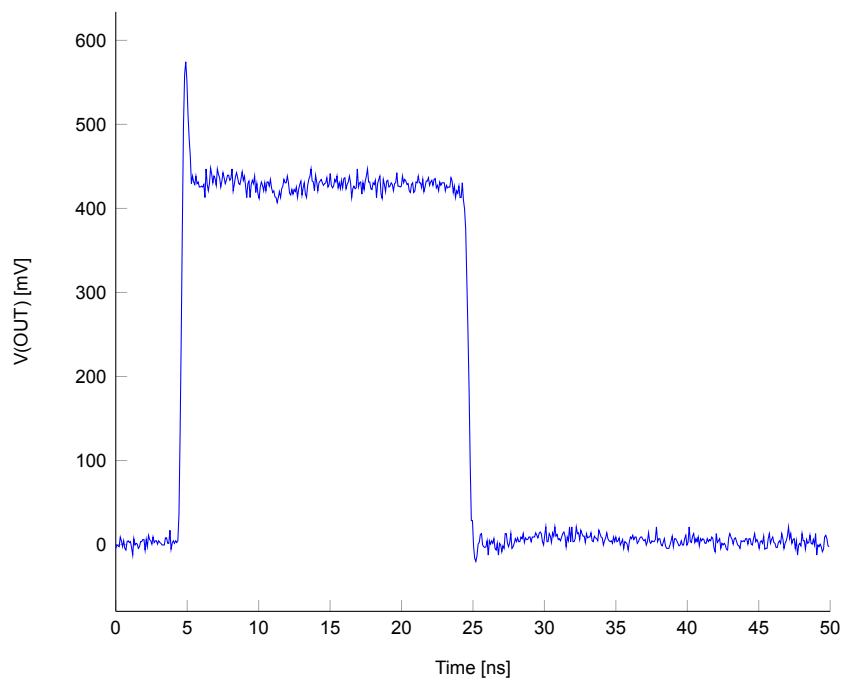


Figure 5: Pulse response (NIR)

### Spectral response

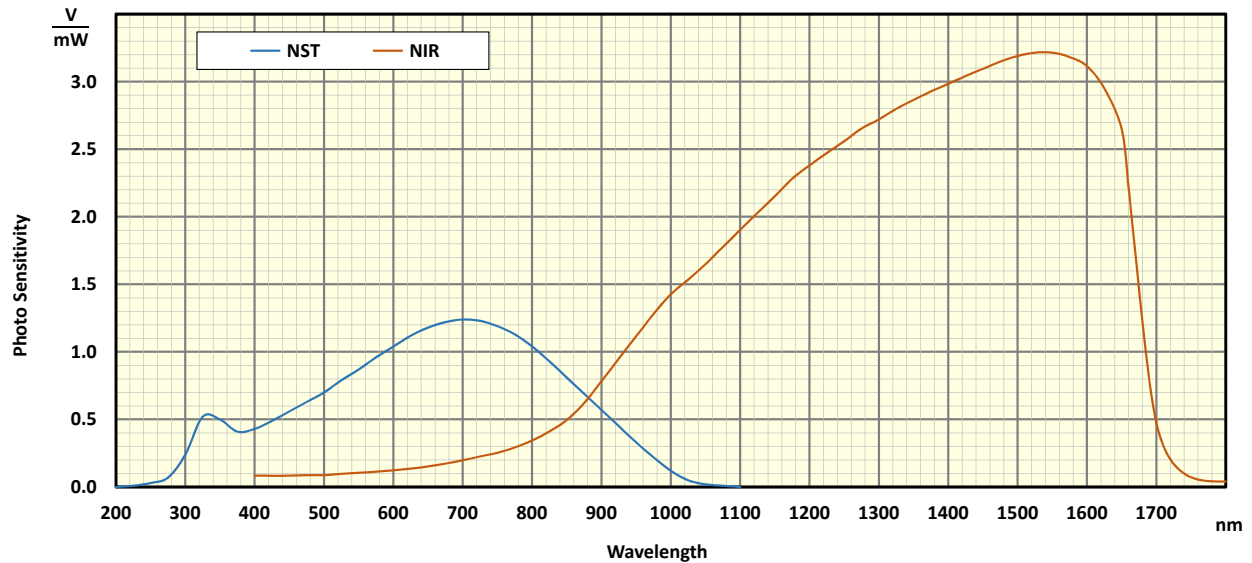


Figure 6: Spectral response

### DISPOSAL INSTRUCTIONS

Electrical and electronic equipment must not be disposed with consumers waste. Its components must be recycled or disposed apart from each other. Otherwise contaminative and hazardous substances can pollute our environment. The customer is committed by law to dispose electrical and electronic devices to the producer, the dealer or public collecting points at the end

of the devices lifetime for free. For simplification for the customer and to ensure the environmental protection, iC-Haus requests the customer to send back the iC212 free of charge after lifetime. iC-Haus will disassemble and recycle all parts properly and in accordance with the applicable standards.

### REVISION HISTORY

Rel.	Rel. Date*	Chapter	Modification	Page
B1	2015-07-30	FEATURES	NIR version added	1
		DEVICE	New standard NST version shown	1
		DESCRIPTION	NIR version added	2
		ELECTRICAL CHARACTERISTICS	NIR version added	2
		CONTENTS	New standard NST version shwon	4
		DIMENSIONS	Fiber adapter added	5
		CONNECTORS	Lens dropped	6
		RESPONSE	NIR version added	8
		APPLICATION NOTES	Equipment used: iC227, HV1M, HG2D added	15
		ORDERING INFORMATION	NIR version added	16

Rel.	Rel. Date*	Chapter	Modification	Page
C1	2019-03-15	DEVICE	New product photo	1
		ELECTRICAL CHARACTERISTICS	Single 18 V supply	3
		CONNECTORS	Pin configuration	6
		RESPONSE	Pulse response NIR added	8



Rel.	Rel. Date*	Chapter	Modification	Page
C2	2020-03-17	CONTENTS	New picture box contents	4
		CONNECTORS	Input NST/NIR updated	6
		RESPONSE	Pulse response x-axis scale corrected	7
		RESPONSE	New diagram spectral response	8
		APPLICATION NOTES	Application notes moved to seperate document	

Rel.	Rel. Date*	Chapter	Modification	Page
C3	2021-01-08	CONNECTORS	Table 1 and Figure 3 updated	6
		DISPOSAL INSTRUCTIONS	New	8
		ATTACHMENTS	CE Declaration added	11

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\* Release Date format: YYYY-MM-DD

**ORDERING INFORMATION**

Type	Options	Order Designation
iC212	Standard "No Slow Tail" (NST) "Near Infrared" (NIR)	iC212 iC212NIR

Please send your purchase orders to our order handling team:

**Fax: +49 (0) 61 35 - 92 92 - 692**  
**E-Mail: [dispo@ichaus.com](mailto:dispo@ichaus.com)**

For technical support, information about prices and terms of delivery please contact:

**iC-Haus GmbH**  
**Am Kuemmerling 18**  
**D-55294 Bodenheim**  
**GERMANY**

**Tel.: +49 (0) 61 35 - 92 92 - 0**  
**Fax: +49 (0) 61 35 - 92 92 - 192**  
**Web: <http://www.ichaus.com>**  
**E-Mail: [sales@ichaus.com](mailto:sales@ichaus.com)**

**Appointed local distributors: [http://www.ichaus.com/sales\\_partners](http://www.ichaus.com/sales_partners)**

## European Conformity Declaration

### iC212 Highspeed Photoreceiver

<b>Manufacturer:</b>	iC-Haus GmbH Am Kuemmerling 18 55294 Bodenheim Phone: +49-6135-9292-0 <a href="https://www.ichaus.de">https://www.ichaus.de</a>
<b>Product Description:</b>	iC212 High-Speed Photoreceiver
<b>Product Category:</b>	Electrical equipment for measurement, control and laboratory use.

We hereby declare that the product conforms to the Restriction of certain Hazardous Substances Directive 2011/65/EU.

**Date Issued:**

September 15, 2020

**Authorized Signature:**



Dr. Heiner Flocke, CEO