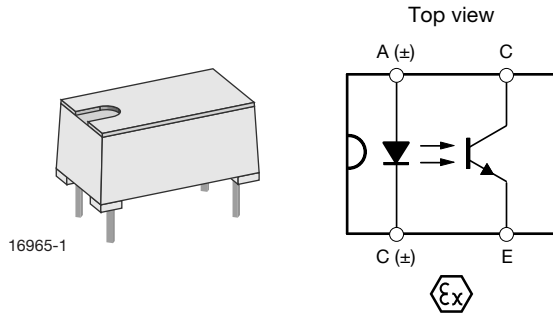


# Optocoupler, Phototransistor Output, ATEX Certified



## DESCRIPTION

The CNY65Exi consists of a phototransistor optically coupled to an infrared-emitting diode in a 4 pin plastic package. The components are mounted opposite one another, with a distance between input and output of > 3.0 mm; meeting the highest of safety requirements.

The CNY65Exi is ATEX certified for explosive atmospheres according to the European Guide line 94/9/EG.

## AGENCY APPROVALS

- ATEX  $\text{Ex}$ : PTB 03 ATEX 2033 U  
 EN 60079-0:2012  
 EN 60079-11:2012  
 EN 60079-26:2007

## FEATURES

- ATEX certificate: PTB 03 ATEX 2033 U  
[www.vishay.com/doc?85361](http://www.vishay.com/doc?85361)
- Suitable for intrinsic safe circuits for gas and dust
- Gas safety provision: II (1) G (EX ia) IIC
- Dust safety provision: II (1) D (EX ia) IIIC
- Conforms to EN60079-0:2012
- Qualified for continuously, longterm, or frequently dangerous explosive environments, zone 0
- Isolation voltage ( $V_{ISO}$ ) of 11 600  $V_{peak}$  for 1 minute
- Distance from emitter to detector through insulation  $\geq 3$  mm
- CTR from 50 % to 300 %
- Very low coupling capacity ( $C_K$ )
  - 0.3 pF superior noise immunity between input and output pins
- Material categorization: for definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)


**RoHS**  
 COMPLIANT

## APPLICATIONS

- Electronics used in potentially explosive gas and dust environments
  - Safety related process automation and instrumentation
  - Natural gas metering and flow measurement
  - Power and motor switching
  - Power supplies, metering, and data acquisition
  - Lighting and signaling
  - Petrol and grain transport and storage

ORDERING INFORMATION		
<div style="display: flex; justify-content: space-around; align-items: center;"> <div style="border: 1px solid black; padding: 2px 5px; margin: 2px;">C</div> <div style="border: 1px solid black; padding: 2px 5px; margin: 2px;">N</div> <div style="border: 1px solid black; padding: 2px 5px; margin: 2px;">Y</div> <div style="border: 1px solid black; padding: 2px 5px; margin: 2px;">6</div> <div style="border: 1px solid black; padding: 2px 5px; margin: 2px;">5</div> <div style="border: 1px solid black; padding: 2px 5px; margin: 2px;">X</div> <div style="border: 1px solid black; padding: 2px 5px; margin: 2px;">E</div> <div style="border: 1px solid black; padding: 2px 5px; margin: 2px;">x</div> <div style="border: 1px solid black; padding: 2px 5px; margin: 2px;">i</div> </div>	PART NUMBER	CTR BIN
	PACKAGE OPTION	
AGENCY CERTIFIED/PACKAGE	CTR (%)	
ATEX	50 to 300	100 to 200
DIP-4, HV, high isolation distance	CNY65Exi	CNY65BExi



ABSOLUTE MAXIMUM RATINGS ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified)				
PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT
<b>INPUT</b>				
Reverse voltage		$V_R$	5	V
Forward current		$I_F$	75	mA
Forward surge current	$t_p \leq 10\text{ }\mu\text{s}$	$I_{FSM}$	1.5	A
Power dissipation		$P_{diss}$	120	mW
Junction temperature		$T_j$	100	$^{\circ}\text{C}$
<b>OUTPUT</b>				
Collector emitter voltage		$V_{CEO}$	32	V
Emitter collector voltage		$V_{ECO}$	7	V
Collector current		$I_C$	50	mA
Collector peak current	$t_p/T = 0.5, t_p \leq 10\text{ ms}$	$I_{CM}$	100	mA
Power dissipation		$P_{diss}$	130	mW
Junction temperature		$T_j$	100	$^{\circ}\text{C}$
<b>COUPLER</b>				
DC isolation test voltage	$t = 1\text{ min}$	$V_{ISO}$	11.6	kV
Total power dissipation		$P_{tot}$	250	mW
Ambient temperature range		$T_{amb}$	-55 to +85	$^{\circ}\text{C}$
Storage temperature range		$T_{stg}$	-55 to +100	$^{\circ}\text{C}$
Soldering temperature	2 mm from case, $t \leq 10\text{ s}$	$T_{slid}$	260	$^{\circ}\text{C}$

**Note**

- Stresses in excess of the absolute Maximum Ratings can cause permanent damage to the device. Functional operation of the device is not implied at these or any other conditions in excess of those given in the operational sections of this document. Exposure to absolute Maximum Rating for extended periods of the time can adversely affect reliability.

ELECTRICAL CHARACTERISTICS ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified)						
PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT
<b>INPUT</b>						
Forward voltage	$I_F = 50\text{ mA}$	$V_F$		1.25	1.6	V
<b>OUTPUT</b>						
Collector emitter voltage	$I_C = 1\text{ mA}$	$V_{CEO}$	32			V
Emitter collector voltage	$I_E = 100\text{ }\mu\text{A}$	$V_{ECO}$	7			V
Collector dark current	$V_{CE} = 20\text{ V}, I_F = 0, E = 0$	$I_{CEO}$			200	nA
<b>COUPLER</b>						
DC isolation test voltage	$t = 1\text{ min}$	$V_{ISO}^{(1)}$	11.6			kV
Isolation resistance	$V_{IO} = 1\text{ kV}$ , 40 % relative humidity	$R_{IO}^{(1)}$		$10^{12}$		$\Omega$
Collector saturation voltage	$I_F = 10\text{ mA}, I_C = 1\text{ mA}$	$V_{CEsat}$			0.3	V
Cut-off frequency	$V_{CE} = 5\text{ V}, I_F = 10\text{ mA}$ , $R_L = 100\text{ }\Omega$	$f_c$	110			kHz
Coupling capacitance	$f = 1\text{ MHz}$	$C_k$		0.3		pF

**Notes**

- Minimum and maximum values are testing requirements. Typical values are characteristics of the device and are the result of engineering evaluation. Typical values are for information only and are not part of the testing requirements.
- (1) Related to standard climate 23/50 DIN 50014.

CURRENT TRANSFER RATIO ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified)							
PARAMETER	TEST CONDITION	PART	SYMBOL	MIN.	TYP.	MAX.	UNIT
$I_C/I_F$	$V_{CE} = 5\text{ V}, I_F = 10\text{ mA}$	CNY65Exi	CTR	50	100	300	%
		CNY65BExi	CTR	100		200	%

<b>SWITCHING CHARACTERISTICS</b> ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified)						
PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT
Delay time	$V_S = 5\text{ V}$ , $I_C = 5\text{ mA}$ , $R_L = 100\ \Omega$ , (see figure 1)	$t_d$		2.6		$\mu\text{s}$
Rise time	$V_S = 5\text{ V}$ , $I_C = 5\text{ mA}$ , $R_L = 100\ \Omega$ , (see figure 1)	$t_r$		2.4		$\mu\text{s}$
Fall time	$V_S = 5\text{ V}$ , $I_C = 5\text{ mA}$ , $R_L = 100\ \Omega$ , (see figure 1)	$t_f$		2.4		$\mu\text{s}$
Storage time	$V_S = 5\text{ V}$ , $I_C = 5\text{ mA}$ , $R_L = 100\ \Omega$ , (see figure 1)	$t_s$		0.3		$\mu\text{s}$
Turn-on time	$V_S = 5\text{ V}$ , $I_C = 5\text{ mA}$ , $R_L = 100\ \Omega$ , (see figure 1)	$t_{on}$		5		$\mu\text{s}$
Turn-off time	$V_S = 5\text{ V}$ , $I_C = 5\text{ mA}$ , $R_L = 100\ \Omega$ , (see figure 1)	$t_{off}$		3		$\mu\text{s}$
Turn-on time	$V_S = 5\text{ V}$ , $I_F = 10\text{ mA}$ , $R_L = 1\text{ k}\Omega$ , (see figure 2)	$t_{on}$		25		$\mu\text{s}$
Turn-off time	$V_S = 5\text{ V}$ , $I_F = 10\text{ mA}$ , $R_L = 1\text{ k}\Omega$ , (see figure 2)	$t_{off}$		42.5		$\mu\text{s}$

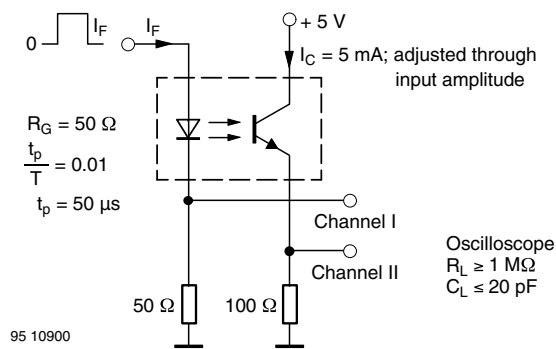


Fig. 1 - Test Circuit, Non-Saturated Operation

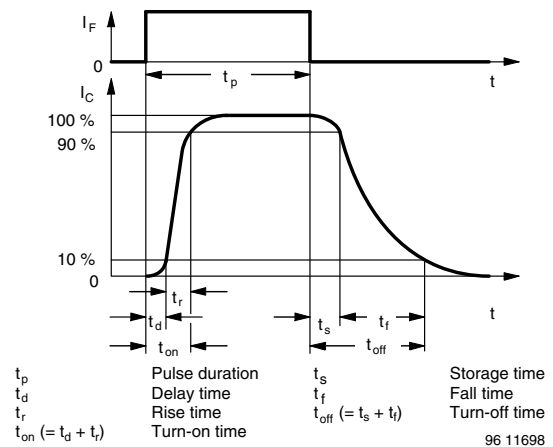


Fig. 3 - Switching Times

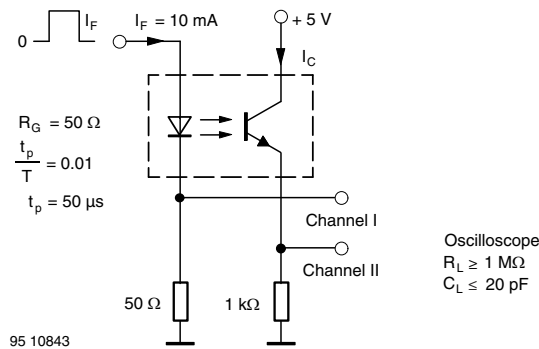


Fig. 2 - Test Circuit, Saturated Operation

**TYPICAL CHARACTERISTICS** ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified)

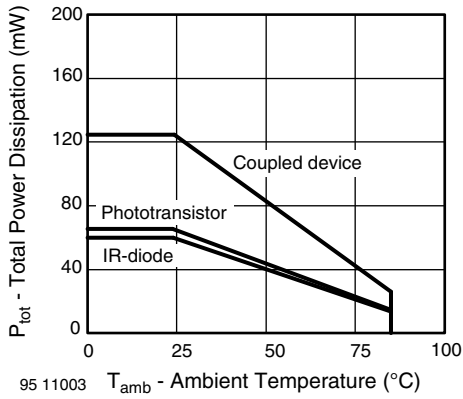


Fig. 4 - Total Power Dissipation vs. Ambient Temperature

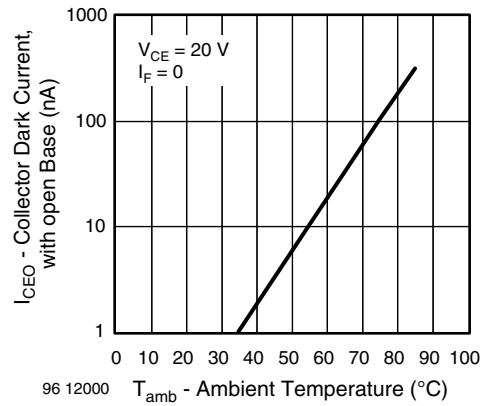
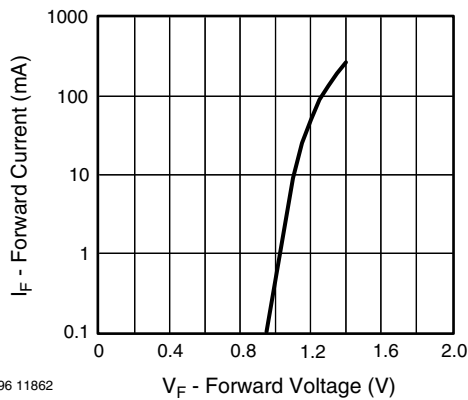
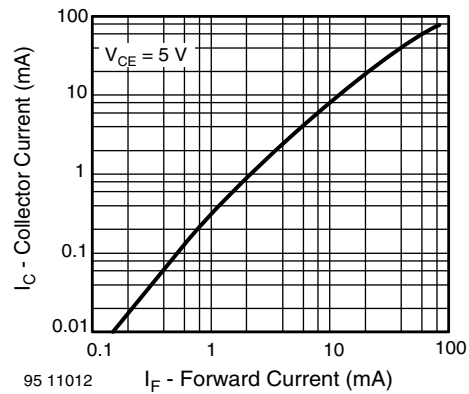


Fig. 7 - Collector Dark Current vs. Ambient Temperature



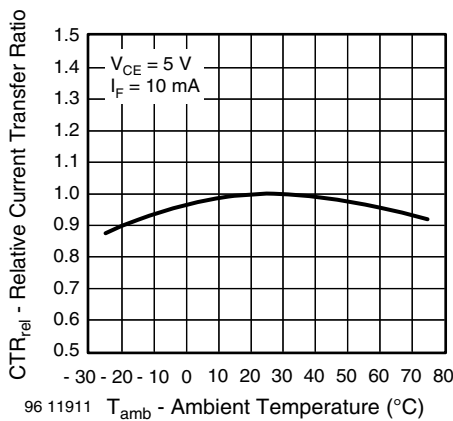
96 11862

Fig. 5 - Forward Current vs. Forward Voltage



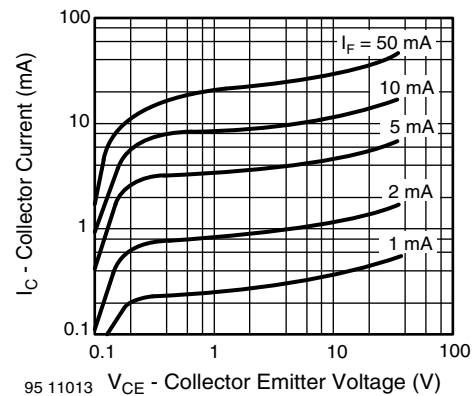
95 11012

Fig. 8 - Collector Current vs. Forward Current



96 11911

Fig. 6 - Relative Current Transfer Ratio vs. Ambient Temperature



95 11013

Fig. 9 - Collector Current vs. Collector Emitter Voltage

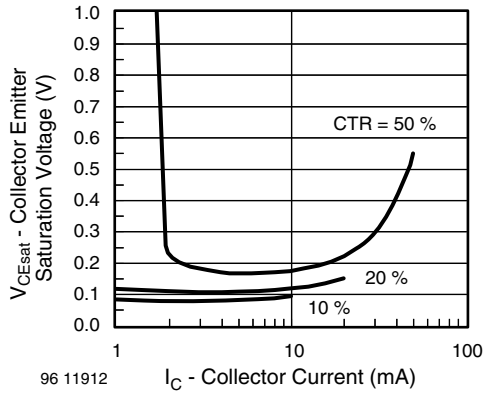


Fig. 10 - Collector Emitter Saturation Voltage vs. Collector Current

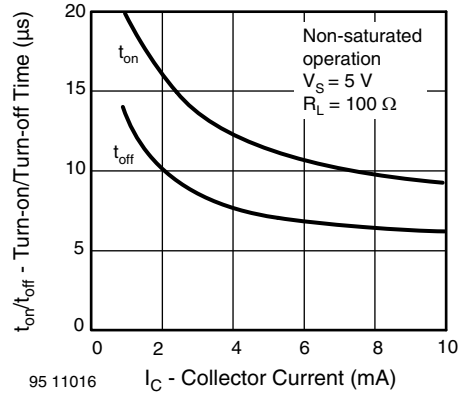


Fig. 13 - Turn-on/Turn-off Time vs. Collector Current

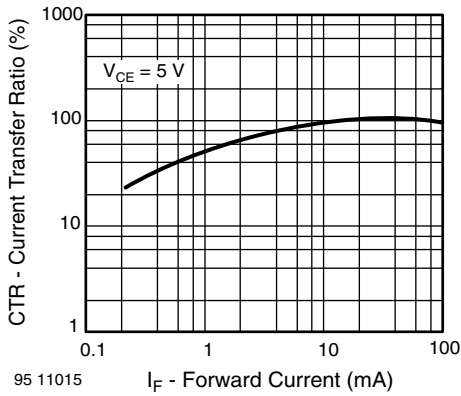


Fig. 11 - Current Transfer Ratio vs. Forward Current

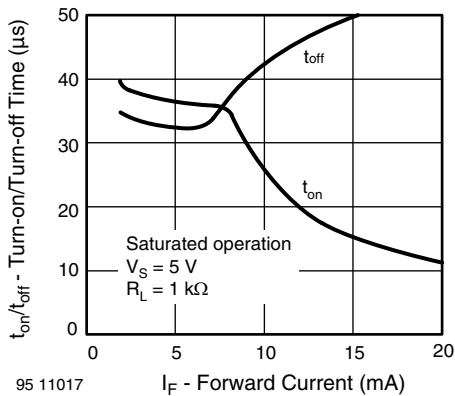
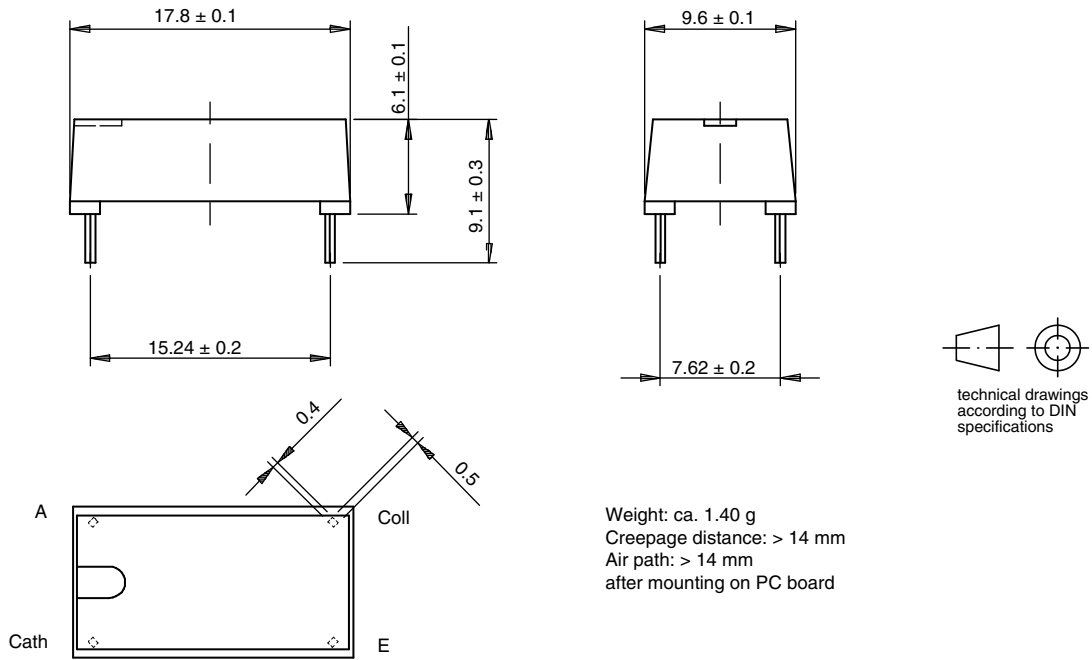


Fig. 12 - Turn-on/Turn-off Time vs. Forward Current

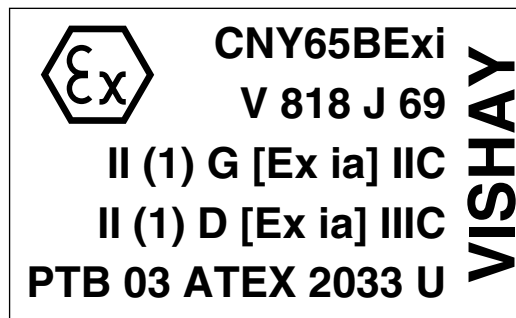


**PACKAGE DIMENSIONS** in millimeters



Drawing-No.: 6.544-5036.01-1  
Issue: 2; 10.11.98  
14763

**PACKAGE MARKING** (example of CNY65BExi)



**HANDLING AND STORAGE CONDITIONS**

ESD level: HBM class 2



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**Please note that some Vishay documentation may still make reference to RoHS Directive 2002/95/EC. We confirm that all the products identified as being compliant to Directive 2002/95/EC conform to Directive 2011/65/EU.**

**Vishay Intertechnology, Inc. hereby certifies that all its products that are identified as Halogen-Free follow Halogen-Free requirements as per JEDEC JS709A standards. Please note that some Vishay documentation may still make reference to the IEC 61249-2-21 definition. We confirm that all the products identified as being compliant to IEC 61249-2-21 conform to JEDEC JS709A standards.**



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- Оперативные поставки широкого спектра электронных компонентов отечественного и импортного производства напрямую от производителей и с крупнейших мировых складов;
- Поставка более 17-ти миллионов наименований электронных компонентов;
- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
- Техническая поддержка проекта, помощь в подборе аналогов, поставка прототипов;
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- Лицензия ФСБ на осуществление работ с использованием сведений, составляющих государственную тайну;
- Поставка специализированных компонентов (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Aeroflex, Peregrine, Syfer, Eurofarad, Texas Instrument, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits, General Dynamics и др.);

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- Подбор аналогов;
- Консультации по применению компонента;
- Поставка образцов и прототипов;
- Техническая поддержка проекта;
- Защита от снятия компонента с производства.



#### Как с нами связаться

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