

Optocoupler with Phototransistor Output

Description

The CNY65Exi consists of a phototransistor optically coupled to a gallium arsenide infrared-emitting diode in a 4-lead plastic package.

The single components are mounted in opposite one-another, providing a distance between input and output for highest safety requirements of > 3 mm.

Applications

Galvanically separated circuits, suitable for intrinsic safety circuits

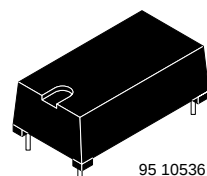
Electrical apparatus used in a potentially explosive atmosphere:

EN 50014-1977/VDE 0171 Part 1/5.78

General instructions

EN 50020-1977/VDE 0171 Part 7/5.78

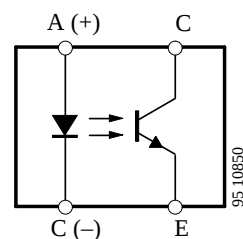
Intrinsic safety 'i' section: 5.5, 5.5.4, 5.7



95 10536

Features

- Suitable for intrinsic safety circuits according to test certificate No. Ex-81/2158 of PTB
- Isolation material according to UL94 – VO – flammability class
- Low temperature coefficient of CTR
- Creepage current resistance of isolation material according to VDE 0303/DIN 53480: $KC \geq 475$
- Isolation test voltage 11.6 kV
- Test class 25/100/21 DIN 40045
- Very low coupling capacity of typical 0.3 pF therefore high noise voltage resistant
- Current Transfer Ratio (CTR) = 50 to 300%
- Coupling System J



Order Instruction

Ordering Code	CTR Ranking	Remarks
CNY65Exi	50 to 300%	Exi = Intrinsic safety



Absolute Maximum Ratings

Input (Emitter)

Parameter	Test Conditions	Symbol	Value	Unit
Reverse voltage		V_R	5	V
Forward Current		I_F	75	mA
Forward surge current	$t_p \leq 10 \mu s$	I_{FSM}	1.5	A
Power dissipation	$T_{amb} \leq 25^\circ C$	P_V	120	mW
Junction temperature		T_j	100	$^\circ C$

Output (Detector)

Parameter	Test Conditions	Symbol	Value	Unit
Collector emitter voltage		V_{CEO}	32	V
Emitter collector voltage		V_{ECO}	7	V
Collector current		I_C	50	mA
Collector peak current	$t_p/T = 0.5, t_p \leq 10 ms$	I_{CM}	100	mA
Power dissipation	$T_{amb} \leq 25^\circ C$	P_V	130	mW
Junction temperature		T_j	100	$^\circ C$

Coupler

Parameter	Test Conditions	Symbol	Value	Unit
DC isolation test voltage	$t = 1 min$	V_{IO}	11.6	kV
Total power dissipation	$T_{amb} \leq 25^\circ C$	P_{tot}	250	mW
Ambient temperature range		T_{amb}	-55 to +85	$^\circ C$
Storage temperature range		T_{stg}	-55 to +100	$^\circ C$
Soldering temperature	2 mm from case, $t \leq 10 s$	T_{sd}	260	$^\circ C$

Electrical Characteristics ($T_{amb} = 25^{\circ}\text{C}$)

Input (Emitter)

Parameter	Test Conditions	Symbol	Min.	Typ.	Max.	Unit
Forward voltage	$I_F = 50 \text{ mA}$	V_F		1.25	1.6	V

Output (Detector)

Parameter	Test Conditions	Symbol	Min.	Typ.	Max.	Unit
Collector emitter voltage	$I_C = 1 \text{ mA}$	V_{CEO}	32			V
Emitter collector voltage	$I_E = 100 \mu\text{A}$	V_{ECO}	7			V
Collector dark current	$V_{CE} = 20 \text{ V}$, $I_F = 0$, $E = 0$	I_{CEO}			200	nA

Coupler

Parameter	Test Conditions	Symbol	Min.	Typ.	Max.	Unit
DC isolation test voltage	$t = 1 \text{ min}$	$V_{IO}^{1)}$	11.6			kV
Isolation resistance	$V_{IO} = 1 \text{ kV}$, 40% relative humidity	$R_{IO}^{1)}$		10^{12}		Ω
Collector saturation voltage	$I_F = 10 \text{ mA}$, $I_C = 1 \text{ mA}$	V_{CEsat}			0.3	V
Cut-off frequency	$V_{CE} = 5 \text{ V}$, $I_F = 10 \text{ mA}$, $R_L = 100 \Omega$	f_c	110			kHz
Coupling capacitance	$f = 1 \text{ MHz}$	C_k		0.3		pF

¹⁾ Related to standard climate 23/50 DIN 50014

Current Transfer Ratio (CTR)

Parameter	Test Conditions	Type	Symbol	Min.	Typ.	Max.	Unit
I_C/I_F	$V_{CE} = 5 \text{ V}$, $I_F = 10 \text{ mA}$	CNY65Exi	CTR	0.5	1	3	

Switching Characteristics

Parameter	Test Conditions	Symbol	Typ.	Unit
Delay time	$V_S = 5\text{ V}$, $I_C = 5\text{ mA}$, $R_L = 100\ \Omega$ (see figure 1)	t_d	2.6	μs
Rise time		t_r	2.4	μs
Fall time		t_f	2.4	μs
Storage time		t_s	0.3	μs
Turn-on time		t_{on}	5.0	μs
Turn-off time	$V_S = 5\text{ V}$, $I_F = 10\text{ mA}$, $R_L = 1\text{ k}\Omega$ (see figure 2)	t_{off}	3.0	μs
Turn-on time		t_{on}	25.0	μs
Turn-off time		t_{off}	42.5	μs

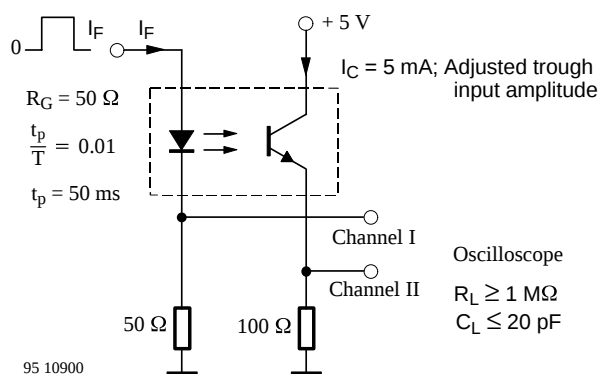


Figure 1. Test circuit, non-saturated operation

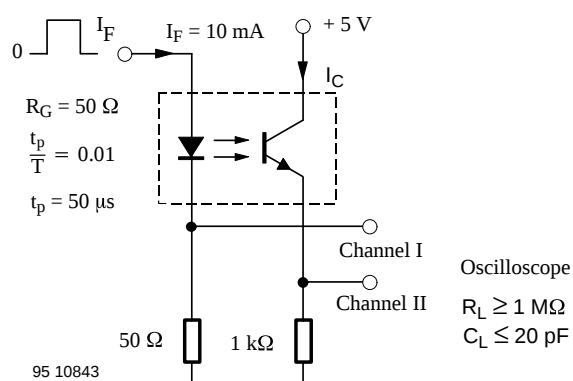


Figure 2. Test circuit, saturated operation

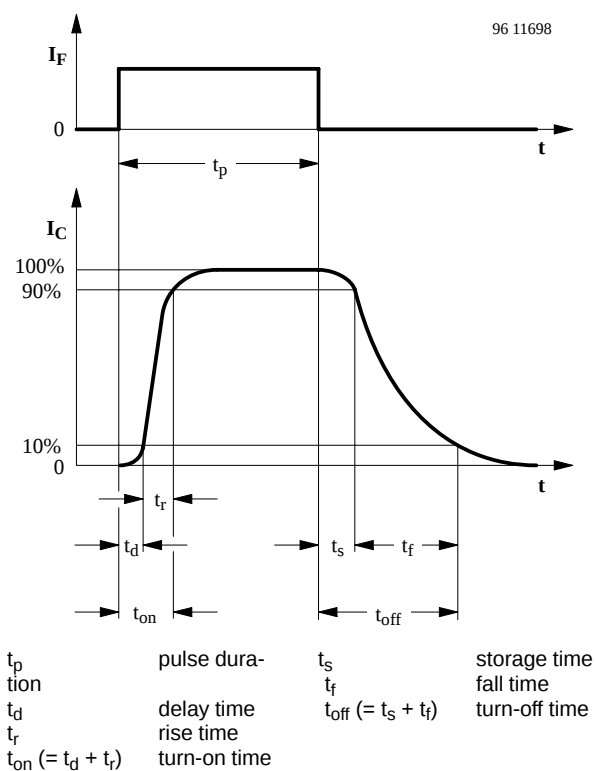


Figure 3. Switching times

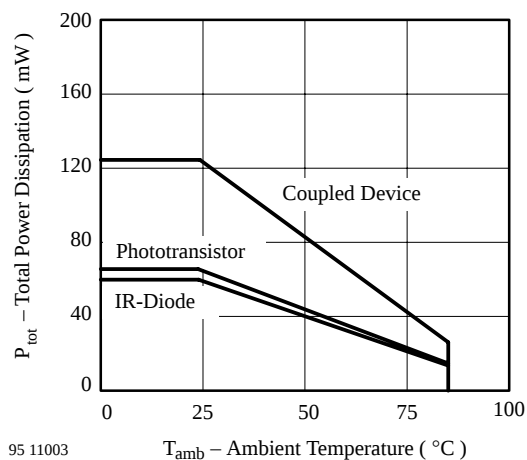
Typical Characteristics ($T_{amb} = 25^{\circ}\text{C}$, unless otherwise specified)


Figure 4. Total Power Dissipation vs. Ambient Temperature

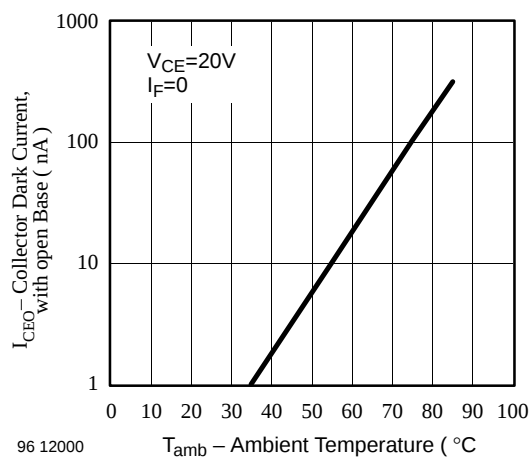


Figure 7. Collector Dark Current vs. Ambient Temperature

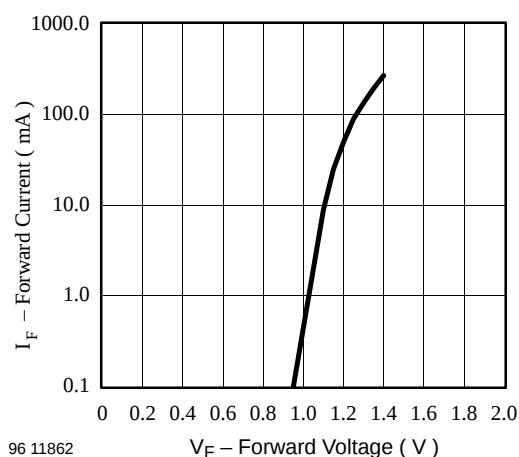


Figure 5. Forward Current vs. Forward Voltage

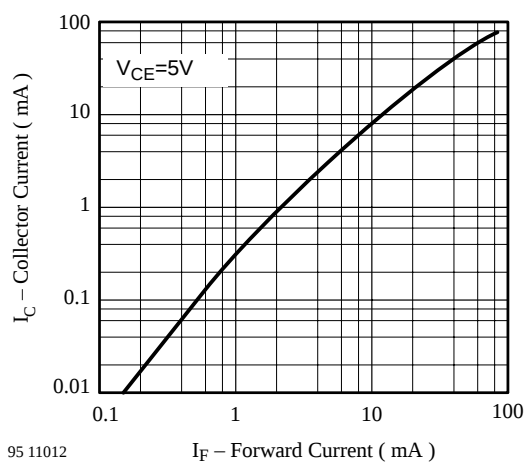


Figure 8. Collector Current vs. Forward Current

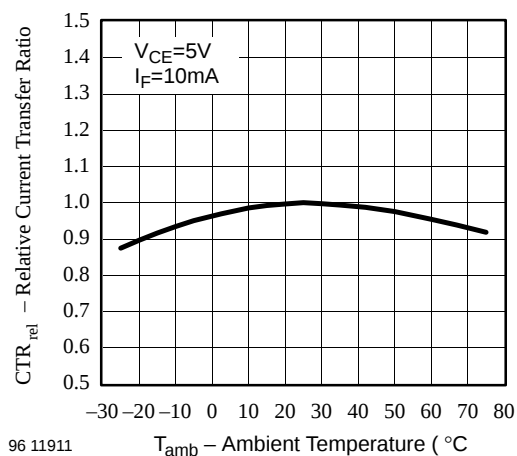


Figure 6. Relative Current Transfer Ratio vs. Ambient Temperature

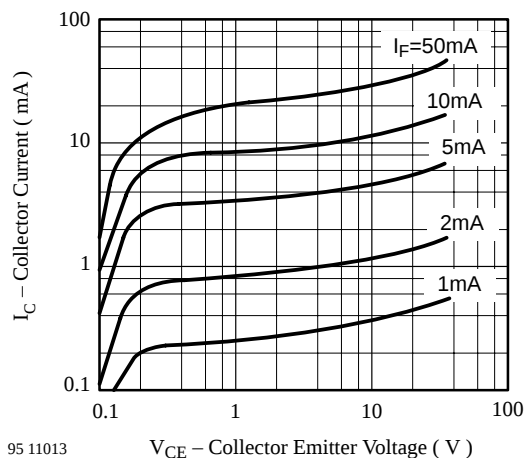


Figure 9. Collector Current vs. Collector Emitter Voltage

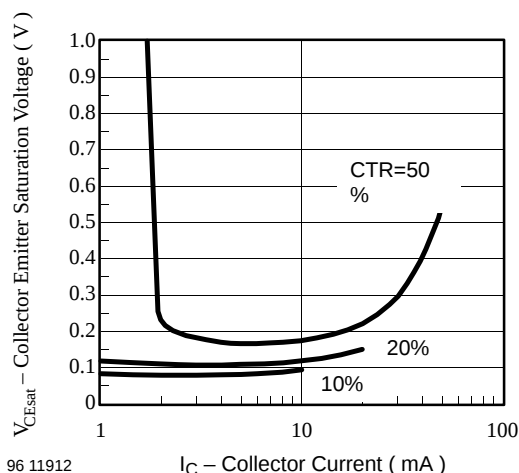


Figure 10. Collector Emitter Saturation Voltage vs. Collector Current

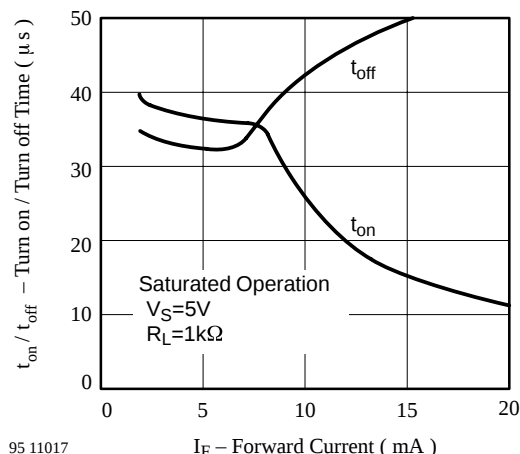


Figure 12. Turn on / off Time vs. Forward Current

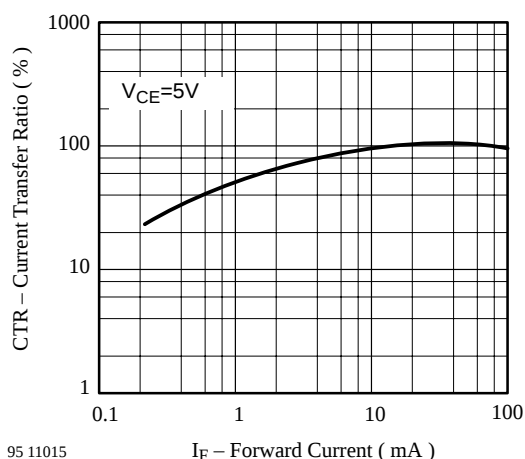


Figure 11. Current Transfer Ratio vs. Forward Current

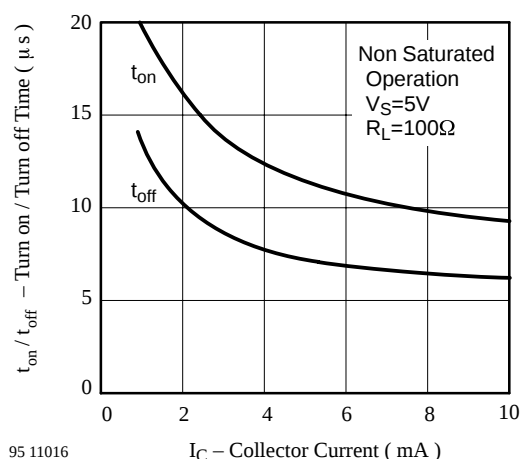


Figure 13. Turn on / off Time vs. Collector Current

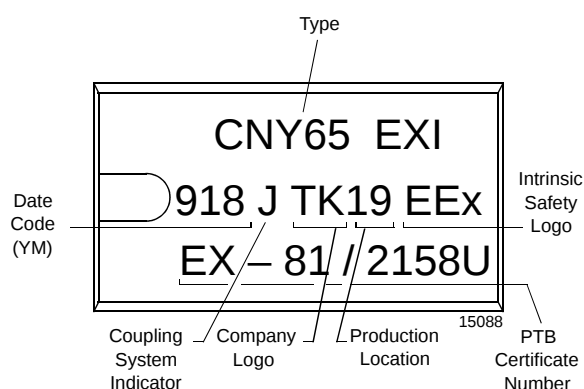
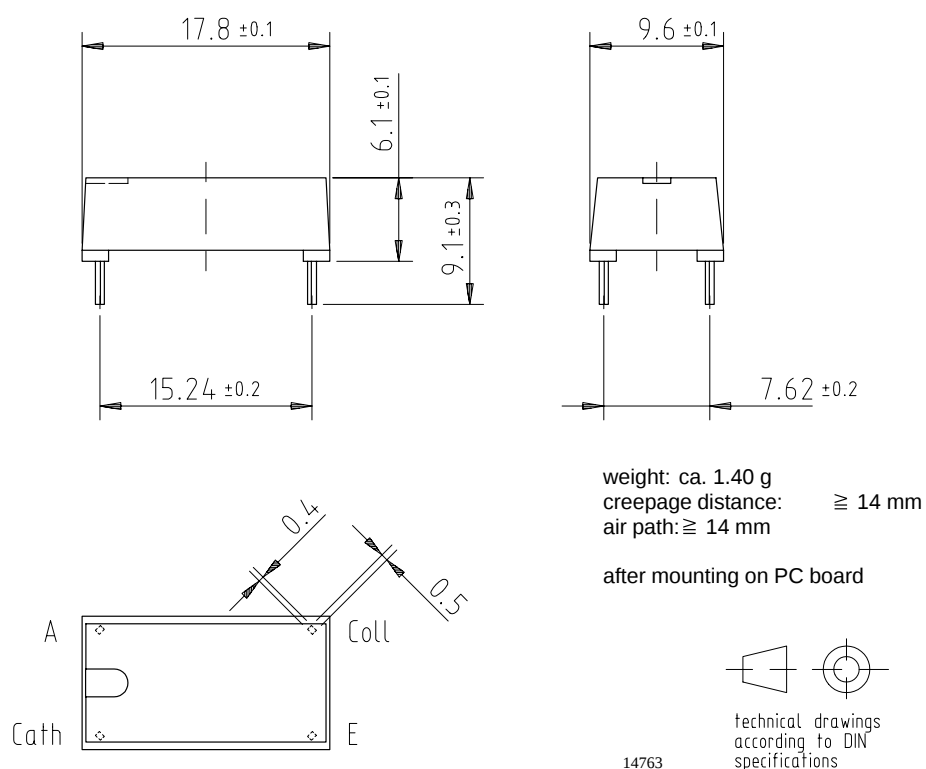


Figure 14. Marking example

Dimensions of CNY65Exi in mm



Данный компонент на территории Российской Федерации

Вы можете приобрести в компании MosChip.

Для оперативного оформления запроса Вам необходимо перейти по данной ссылке:

<http://moschip.ru/get-element>

Вы можете разместить у нас заказ для любого Вашего проекта, будь то серийное производство или разработка единичного прибора.

В нашем ассортименте представлены ведущие мировые производители активных и пассивных электронных компонентов.

Нашей специализацией является поставка электронной компонентной базы двойного назначения, продукции таких производителей как XILINX, Intel (ex.ALTERA), Vicor, Microchip, Texas Instruments, Analog Devices, Mini-Circuits, Amphenol, Glenair.

Сотрудничество с глобальными дистрибьюторами электронных компонентов, предоставляет возможность заказывать и получать с международных складов практически любой перечень компонентов в оптимальные для Вас сроки.

На всех этапах разработки и производства наши партнеры могут получить квалифицированную поддержку опытных инженеров.

Система менеджмента качества компании отвечает требованиям в соответствии с ГОСТ Р ИСО 9001, ГОСТ РВ 0015-002 и ЭС РД 009

Офис по работе с юридическими лицами:

105318, г.Москва, ул.Щербаковская д.3, офис 1107, 1118, ДЦ «Щербаковский»

Телефон: +7 495 668-12-70 (многоканальный)

Факс: +7 495 668-12-70 (доб.304)

E-mail: info@moschip.ru

Skype отдела продаж:

moschip.ru

moschip.ru_4

moschip.ru_6

moschip.ru_9