



**CNY 21**  
 UL Recognised  
 VDE tested device<sup>1)</sup>

**Optically Coupled Isolator  
 in TO 116 Case**



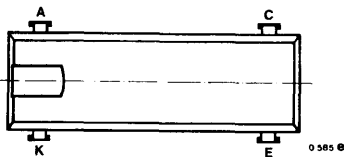
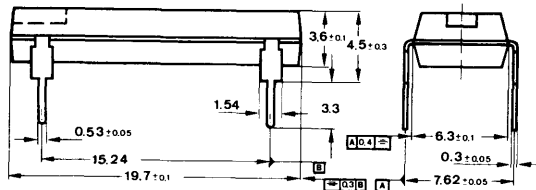
**Construction** Emitter: GaAs Infrared Emitting Diode  
 Detector: Silicon NPN Epitaxial Planar Phototransistor

**Applications:** Galvanically separated circuits,  
 Non-interacting switches

**Features:**

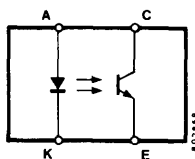
- DC isolation voltage 10 kV–
- Nominal isolation operating voltage<sup>1)</sup>  
 1500 V or 1800 V– for isolation group B  
 according to VDE 0110/11.72
- Test class 25/100/21 DIN 40 045
- Low coupling capacity typ. 0.3 pF
- Current transfer ratio typ. 0.6
- Suitable in circuits with intrinsic safety  
 (Ex) i G 5<sup>2)</sup>

**Dimensions in mm**



Creeping distance  $\geq 12 \text{ mm}^3$   
 Air path  $\geq 9 \text{ mm}^3$

Plastic case  
 $\approx$  JEDEC TO 116  
 Weight max. 1.5 g



<sup>1)</sup> UL Recognised, File No. E-76 222 dated 28. 4. 81, according to VDE test certificate dated 9. 8. 1976 / 2. 7. 1979

<sup>2)</sup> According to test certificate Nr. III B/E-26 507 U of PTB

<sup>3)</sup> Creeping current resistance: Group I according to VDE 0110 § 6 table 3 and DIN 53 480 / VDE 0303 part 1

# CNY 21

## Absolute maximum ratings

### Emitter

Reverse voltage	$V_R$	5	V
Forward current	$I_F$	50	mA
Forward surge current $t_p \leq 10 \mu\text{s}$	$I_{FSM}$	1.5	A
Power dissipation $T_{amb} \leq 25^\circ\text{C}$	$P_V$	120	mW
Junction temperature	$T_j$	100	$^\circ\text{C}$

### Detector

Collector-emitter voltage	$V_{CEO}$	32	V
Emitter-collector voltage	$V_{ECO}$	5	V
Collector current	$I_C$	50	mA
Peak collector current $\frac{t_p}{T} = 0.5, t_p \leq 10 \text{ ms}$	$I_{CM}$	100	mA
Power dissipation $T_{amb} \leq 25^\circ\text{C}$	$P_V$	130	mW
Junction temperature	$T_j$	100	$^\circ\text{C}$

### Coupled device

DC isolation voltage $t = 1 \text{ min}$	$V_{is}^{1)}$	10	kV
Total power dissipation $T_{amb} \leq 25^\circ\text{C}$	$P_{tot}$	250	mW
Storage temperature range	$T_{stg}$	-55 ... +100	$^\circ\text{C}$

## Electrical characteristics

$T_{amb} = 25^\circ\text{C}$

### Emitter

		Min.	Typ.	Max.	
Forward voltage $I_F = 50 \text{ mA}$	$V_F^{*)}$		1.25	1.6	V
Breakdown voltage $I_R = 100 \mu\text{A}$	$V_{(BR)}^{*)}$	5			V
Junction capacitance $V_R = 0, f = 1 \text{ MHz}$	$C_j$		50		pF

\*) AQL = 0.65 %

\*) related to standard climate 23/50 DIN 50 014

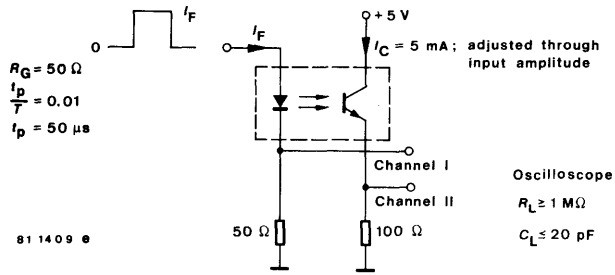
# CNY 21

		Min.	Typ.	Max.	
<b>Detector</b>					
Collector-emitter breakdown voltage $I_C = 1 \text{ mA}$	$V_{(BR)CE0}^*)$	32			V
Collector dark current $V_{CE} = 20 \text{ V}, I_F = 0, E = 0$	$I_{CE0}^*)$		10	200	nA
<b>Coupled device</b>					
DC isolation voltage $t = 1 \text{ min}$	$V_{is}^*)^1)$	10			kV
Isolation resistance $V_{is} = 1000 \text{ V}, 40\% \text{ rel. humidity}$	$R_{is}^1)$		$10^{14}$		$\Omega$
Collector current $I_F = 10 \text{ mA}, V_{CE} = 5 \text{ V}$ $I_F = 20 \text{ mA}, V_{CE} = 5 \text{ V}$	$I_C^*)$ $I_C$	2.5 5	5 10		mA mA
Current transfer ratio $I_F = 10 \text{ mA}, V_{CE} = 5 \text{ V}$	$CTR$	0.25	0.6		
Collector-emitter saturation voltage $I_F = 10 \text{ mA}, I_C = 1 \text{ mA}$	$V_{CEsat}^*)$			0.3	V
Cut-off frequency $I_F = 5 \text{ mA}, V_{CE} = 5 \text{ V}, R_L = 100 \Omega$	$f_c$		170		kHz
Coupling capacitance $f = 1 \text{ MHz}$	$C_k$		0.3		pF
<b>Switching characteristics</b> $V_S = 5 \text{ V}, I_C = 5 \text{ mA}, R_L = 100 \Omega$ , see test circuit					
Delay time	$t_d$		1.8		$\mu\text{s}$
Rise time	$t_r$		1.6		$\mu\text{s}$
Turn-on time	$t_{on}$		3.4		$\mu\text{s}$
Storage time	$t_s$		0.3		$\mu\text{s}$
Fall time	$t_f$		1.7		$\mu\text{s}$
Turn-off time	$t_{off}$		2.0		$\mu\text{s}$

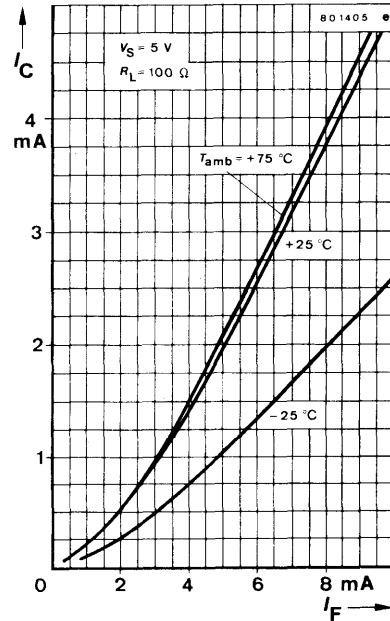
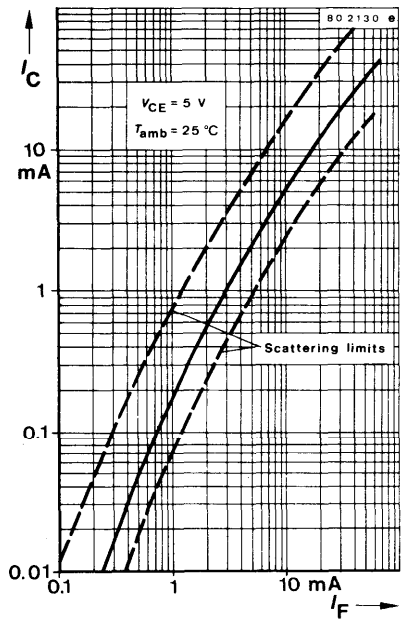
\*) AQL = 0.65 %

<sup>1)</sup> related to standard climate 23/50 DIN 50 014

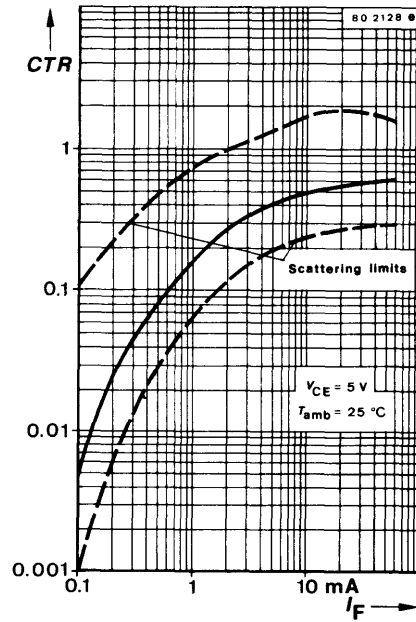
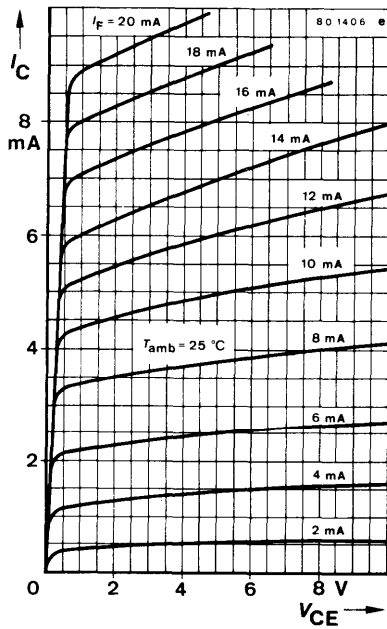
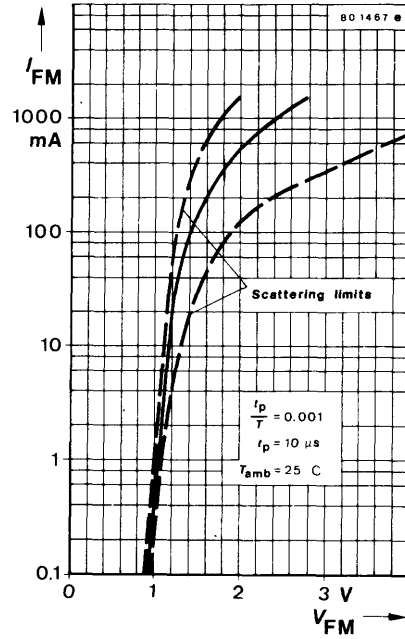
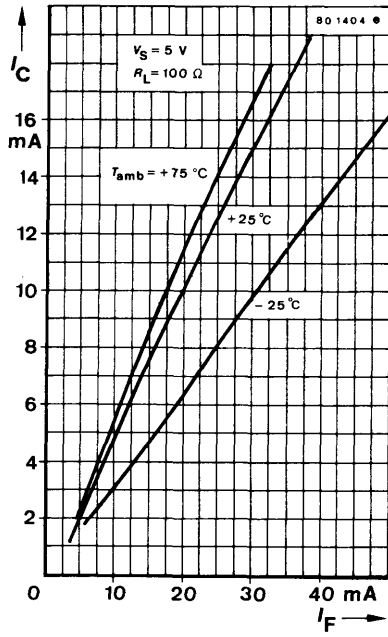
# CNY 21



Test circuit



# CNY 21



# CNY 21

