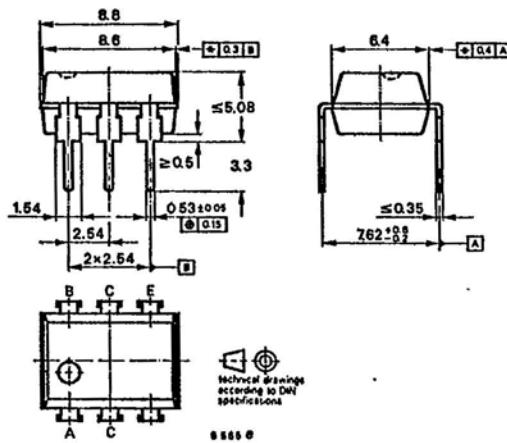
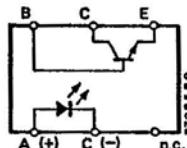



TELEFUNKEN electronic
 Creative Technologies
K 102 P**T-41-83****Optically Coupled Isolator**

- Construction:** Emitter: GaAs IR Emitting Diode
 Detector: Silicon NPN Epitaxial Planar Phototransistor
- Applications:** Galvanically separated circuits,
 non-interacting switches

Features:

- DC isolation test voltage V_{is} 4.4 kV
- Current transfer ratio in groups selected
- Low coupling capacity C_k typ. 0.3 pF
- Low temperature coefficient of CTR
- Test class 25/100/21 DIN 40045

Dimensions in mm**Pin connections****Plastic case****DIP 6****Weight max. 0.7 g****Absolute maximum ratings****Emitter**

Reverse voltage	V_R	5	V
Forward current	I_F	50	mA
Forward surge current $\frac{t_p}{T} \leq 10 \mu s$	I_{FSM}	1.5	A
Power dissipation $T_{emb} \leq 25^\circ C$	P_V	120	mW
Junction temperature	T_J	125	°C

T1.2/1182,1185 E3

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K 102 P**T-41-83****Detector**

Collector base voltage	V_{CBO}	50	V
Collector emitter voltage	V_{CEO}	32	V
Emitter collector voltage	V_{ECO}	7	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 $T_{amb} = 25 \text{ }^{\circ}\text{C}$	P_V	130	mW
Junction temperature	T_J	125	$^{\circ}\text{C}$

Coupled device

DC isolation test voltage $t = 1 \text{ min.}$	$V_{Is}^{(1)}$	4.4	V
Total power dissipation $T_{amb} \leq 25 \text{ }^{\circ}\text{C}$	P_{tot}	250	mW
Ambient temperature range	T_{amb}	-55...+100	$^{\circ}\text{C}$
Storage temperature range	T_{stg}	-55...+125	$^{\circ}\text{C}$
Soldering temperature 2 mm from case, $t \leq 10 \text{ s}$	T_{sd}	260	$^{\circ}\text{C}$

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

Min. Typ. Max.

Emitter

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

Detector

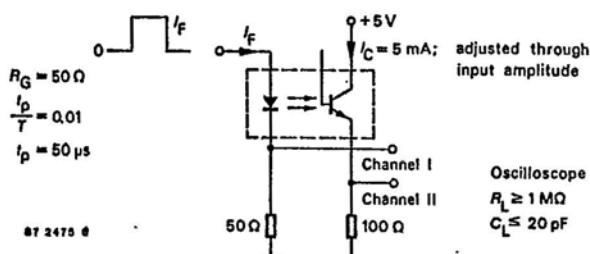
Collector emitter breakdown voltage $I_C = 1 \text{ mA}$	$V_{(BR)CEO}$	32		V
Collector dark current				
$V_{CE} = 20 \text{ V}, I_F = 0, E = 0$	I_{CEO}	200	nA	
$V_{CE} = 10 \text{ V}, I_F = 0, E = 0$	I_{CEO}	50	nA	
$V_{CB} = 10 \text{ V}, I_F = 0, E = 0$	I_{CBO}	20	nA	
Collector emitter saturation voltage $I_C = 1 \text{ mA}, I_F = 10 \text{ mA}$	V_{CEsat}	0.3		V

⁽¹⁾ related to standard climate 23/50 DIN 50014

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Coupled device		Min.	Typ.	Max.	
DC isolation test voltage $t=1$ min	$V_{is}^{(1)}$	4.4			kV
Isolation resistance $V_{10} = 1$ kV, 40% relative humidity	$R_{is}^{(1)}$		10^{12}		Ω
Collector current $V_{CE} = 5$ V, $I_F = 10$ mA	K 102 P1 K 102 P2 K 102 P3	I_C I_C I_C	2 4 6.2	6 8 12.5	mA mA mA
$I_F = 2$ mA	K 102 P2 K 102 P3	I_C I_C	0.4 0.5	1 1.2	mA mA
Current transfer ratio $V_{CE} = 5$ V, $I_F = 10$ mA	K 102 P1 K 102 P2 K 102 P3	CTR CTR CTR	20 40 62	60 80 125	% % %
$I_F = 2$ mA	K 102 P2 K 102 P3	CTR CTR	20 25	50 60	% %
Cut-off frequency $V_{CE} = 5$ V, $I_F = 10$ mA, $R_L = 100 \Omega$	f_g		110		kHz
Coupling capacitance $f = 1$ MHz	C_k		0.3		pF
Switching characteristics $V_S = 5$ V, $I_C = 5$ mA, $R_L = 100 \Omega$, see Fig. 1					
Delay time	t_d		4.0		μs
Rise time	t_r		7.0		μs
Turn-on time	t_{on}		11.0		μs
Storage time	t_s		0.3		μs
Fall time	t_f		6.7		μs
Turn-off time	t_{off}		7.0		μs
Turn-on time $V_S = 5$ V, $I_F = 10$ mA, $R_L = 1 k\Omega$, see Fig. 2	t_{on}		25		μs
Turn-off time	t_{off}		42.5		μs

⁽¹⁾ related to standard climate 23/50 DIN 50014

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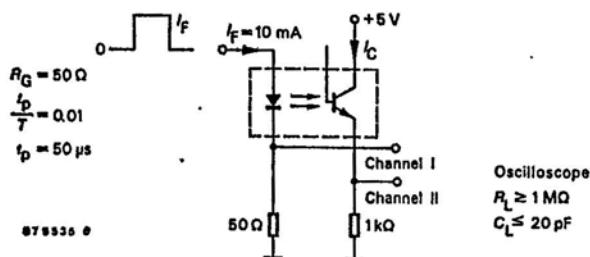
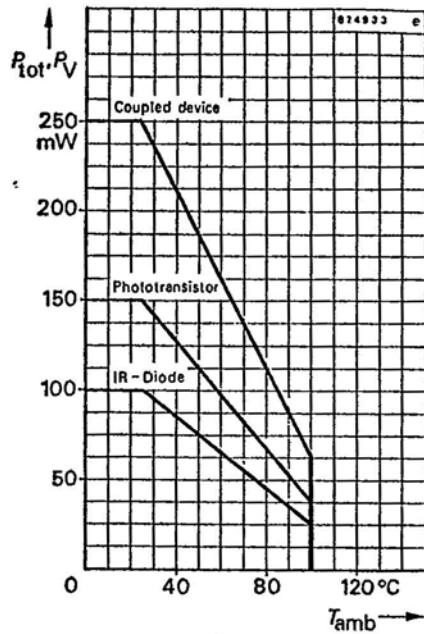
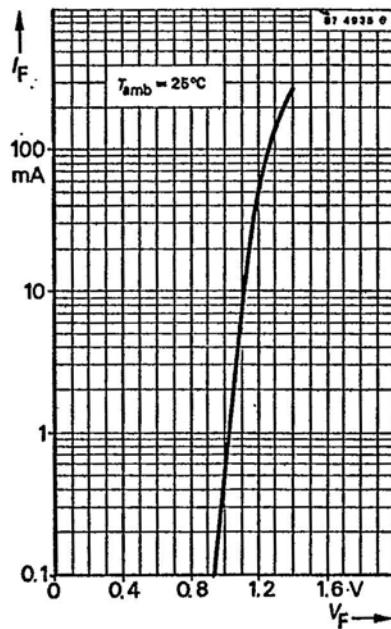


Fig. 2 Test circuit, saturated operation

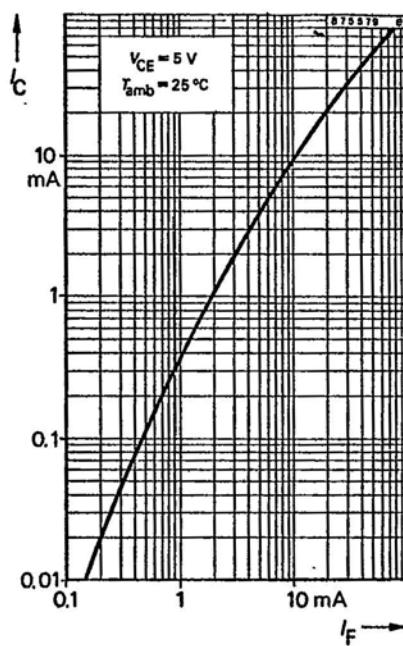
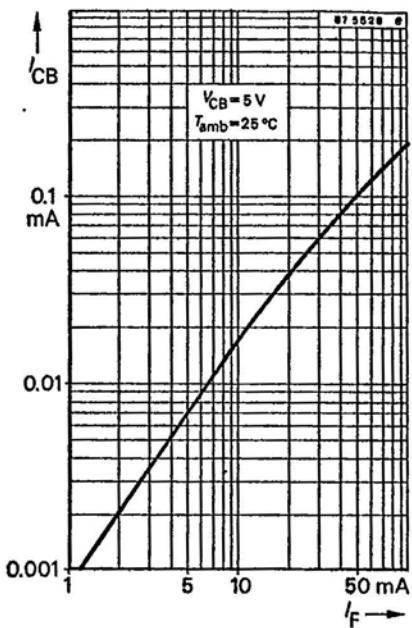
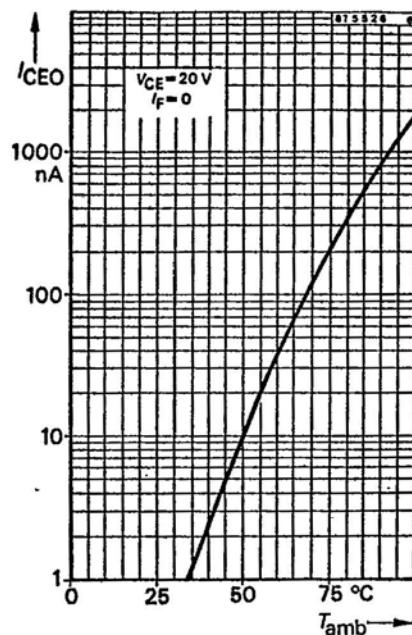
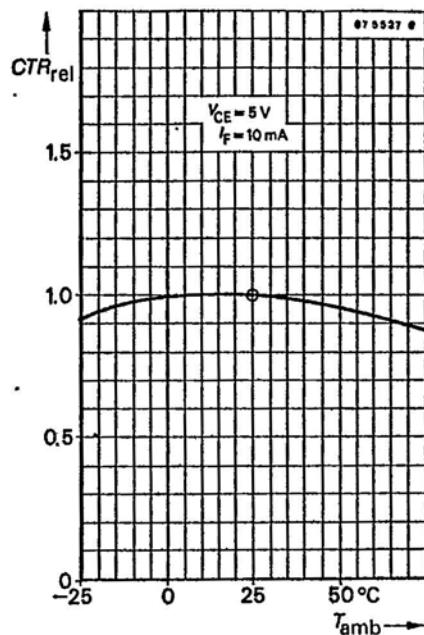
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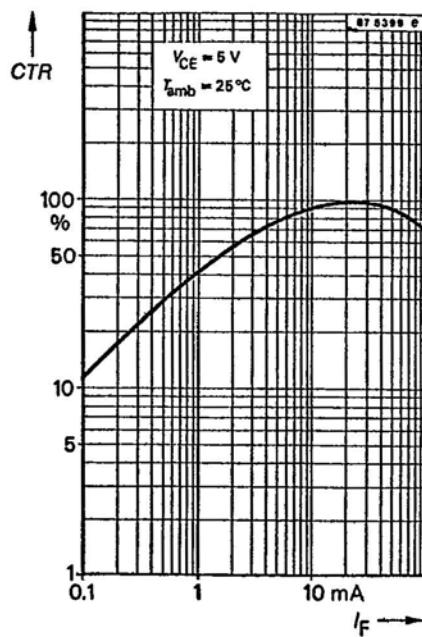
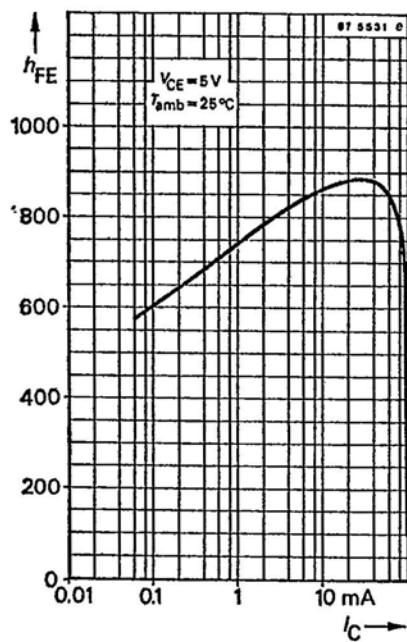
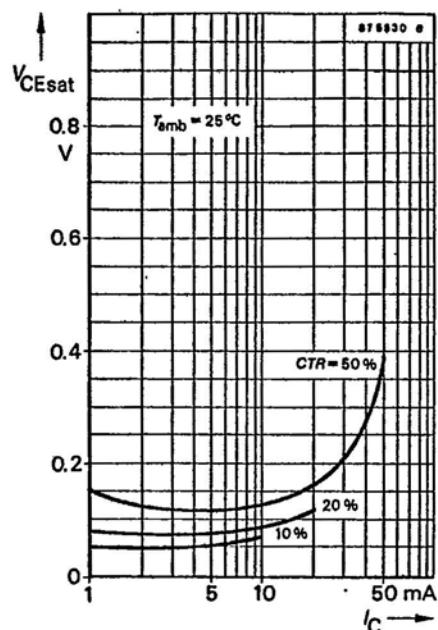
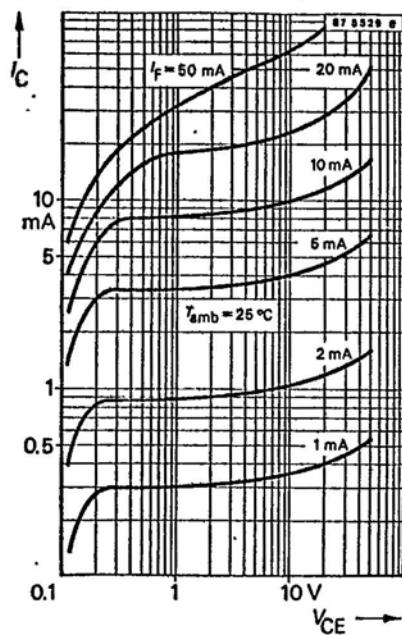
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