TELEFUNKEN electronic
Creative Technologies

TCSS 111. up to TCSS 421.

T-41-73

Optoelectronic Interrupter with Schmitt-Trigger Output Logic

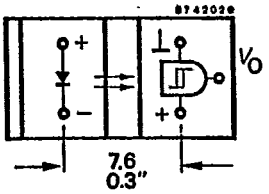
Construction: Emitter: GaAs IR Emitting Diode
Detector: Integrated Optoelectronic Circuit

Applications: Contactless optoelectronic switching and monitoring

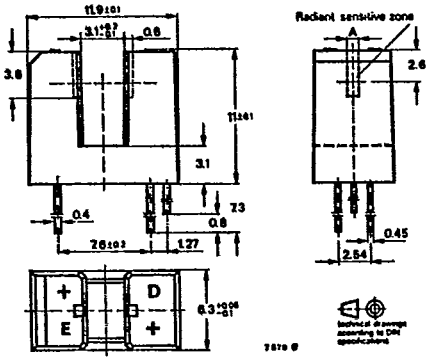
Features:

- Output: active "HIGH"
- Buffer- open collector
- TTL compatible
- Small dimensions
- Case plastic polycarbonate- protected against ambient light
- No adjustment
- Four package variations
- Two aperture variations

Pin connections



Dimensions in mm



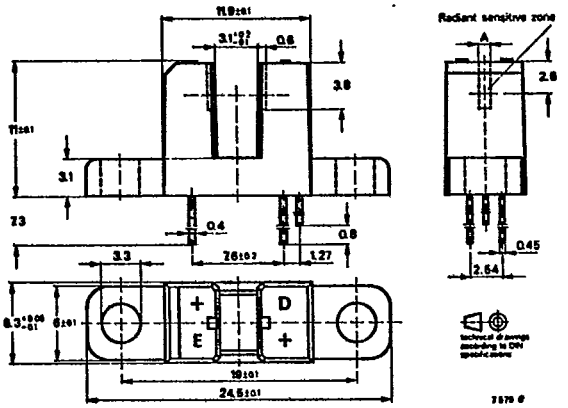
For printed board construction:
TCSS 111. with aperture
1.00 mm (0.04")
TCSS 121. with aperture
0.50 mm (0.02")
Weight max. 0.9 g

Note: Fourth number of type designation: I_{FT} group

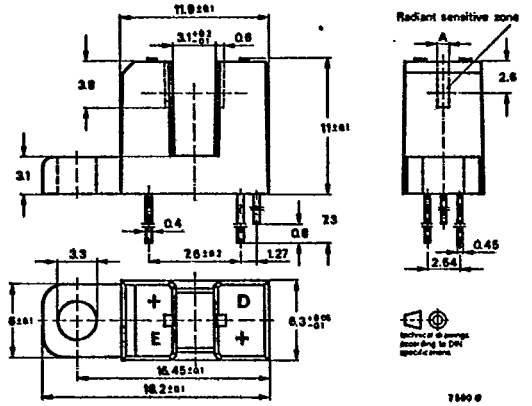
T1.2/1189.1285 E2

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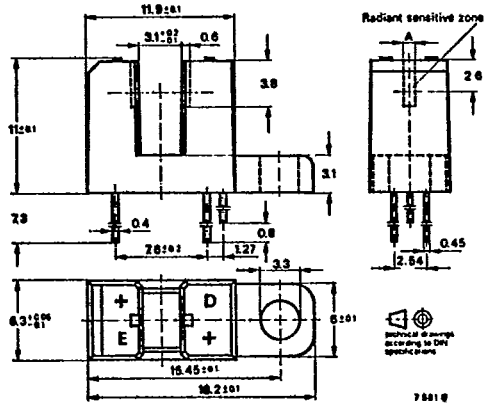
TCSS 111. up to TCSS 421.



With mounting flange on both sides:
TCSS 211. with aperture 1.00 mm (0.04")
TCSS 221. with aperture 0.50 mm (0.02")
Weight max. 1.0 g



With mounting flange on emitter side:
TCSS 311. with aperture 1.00 mm (0.04")
TCSS 321. with aperture 0.50 mm (0.02")
Weight max. 0.95 g



With mounting flange on detector side:
TCSS 411. with aperture 1.00 mm (0.04")
TCSS 421. with aperture 0.50 mm (0.02")
Weight max. 0.95 g

Note: Fourth number type designation: I_{FT} group

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Absolute maximum ratings

Emitter			
Reverse voltage	V_R	6	V
Forward current	I_F	60	mA
Forward surge current $t_p \leq 10\ \mu s$	I_{FSM}	3	A
Power dissipation $T_{amb} \leq 25\ °C$	P_V	100	mW
Junction temperature	T_j	100	°C
Detector			
Supply voltages	V_{S1}	6.5	V
	V_{S2}	18	V
Output current	I_O	20	mA
Power dissipation $T_{amb} \leq 25\ °C$	P_V	250	mW
Junction temperature	T_j	100	°C
Coupled device			
Total power dissipation $T_{amb} \leq 25\ °C$	P_{tot}	350	mW
Ambient temperature range	T_{amb}	−25...+85	°C
Storage temperature range	T_{stg}	−40...+100	°C
Soldering temperature 2 mm from case, $t \leq 5$ s	T_{sd}	260	°C

Electrical characteristics $T_{amb} = 25\ °C$		Min.	Typ.	Max.	
Emitter					
Forward voltage $I_F = 50$ mA	V_F		1.25	1.6	V
Breakdown voltage $I_R = 100\ \mu A$	$V_{(BR)}$	6			V
Junction capacitance $V_R = 0$, $f = 1$ MHz	C_j		50		pF
Detector					
Supply voltage ranges	V_{S1}	4.75		5.25	V
	V_{S2}	4		16	V
Coupled device					
Supply current $V_O = V_{OH}$, $I_F \geq I_{TF}$	I_{S1}		12		mA
$I_F = 0$	I_{S1}		16		mA

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		Min.	Typ.	Max.	
Output current					
V_{S2} = 16 V, $I_F \geq I_{FT}$	I_{OH}			100	µA
Input threshold current					
TCSS 1110...TCSS 4110	I_{FT}		10	20	mA
TCSS 1211...TCSS 4211	I_{FT}		15	30	mA
Hysteresis					
R_L = 270 Ω	ΔI_{FT}		20		%
Output voltage					
I_{OL} = 1.2 mA, I_F = 0	V_{OL}		0.3	0.4	V
Switching frequency					
$I_F \geq I_{FT}$, R_L = 270 Ω	f_{sw}		400		kHz
Switching characteristics					
$V_{S1} = V_{S2}$ = 5 V, I_F = 3 x I_{FT}, R_L = 270 Ω, see test circuit					
Rise time	t_r		30		ns
Turn on time	t_{on}		0.5		µs
Fall time	t_f		10		ns
Turn off time	t_{off}		1.8		µs

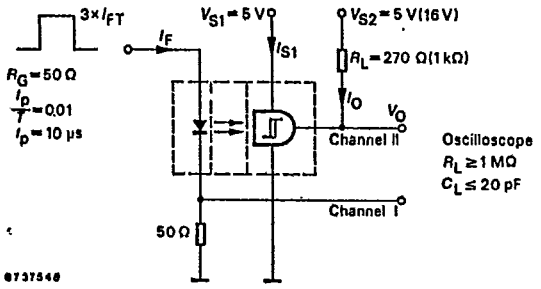


Fig. 1 Test circuit

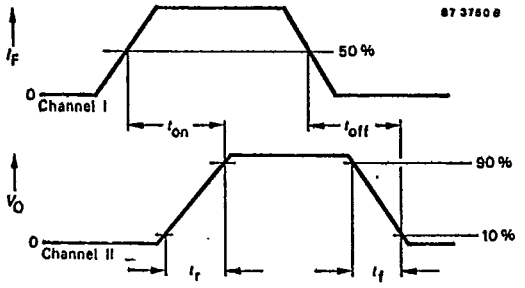


Fig. 2 Pulse diagram

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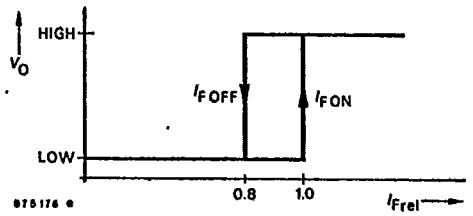
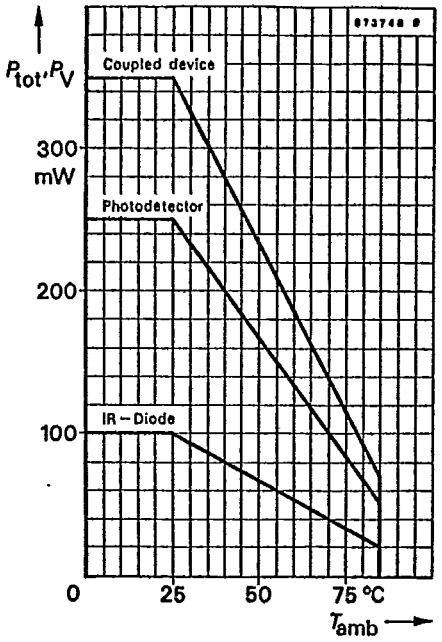
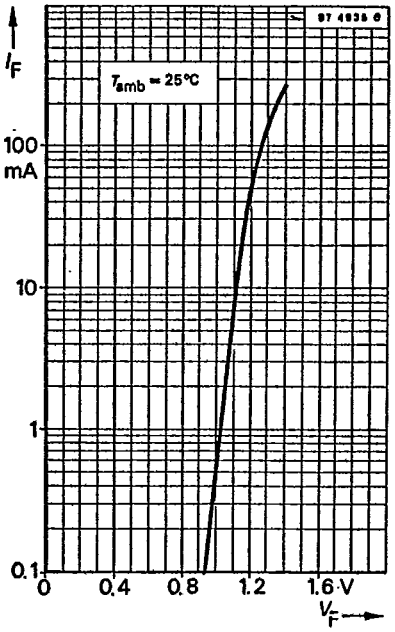


Fig. 3 Hysteresis





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