

TELEFUNKEN electronic
Creative Technologies

TCSS 111. up to TCSS 421.

T-41-73

Optoelectronic Interrupter with Schmitt-Trigger Output Logic

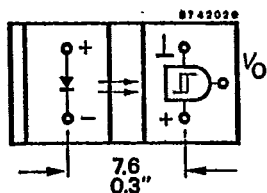
Construction: Emitter: GaAs IR Emitting Diode
Detector: Integrated Optoelectronic Circuit

Applications: Contactless optoelectronic switching and monitoring

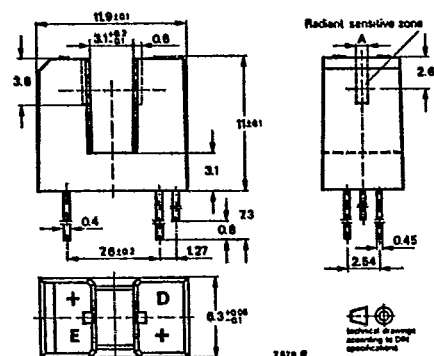
Features:

- 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")

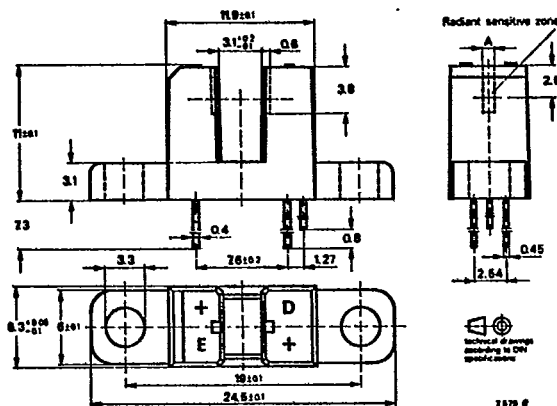
Weight max. 0.9 g

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

T1.2/1189.1285 E2

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TCSS 111. up to TCSS 421.

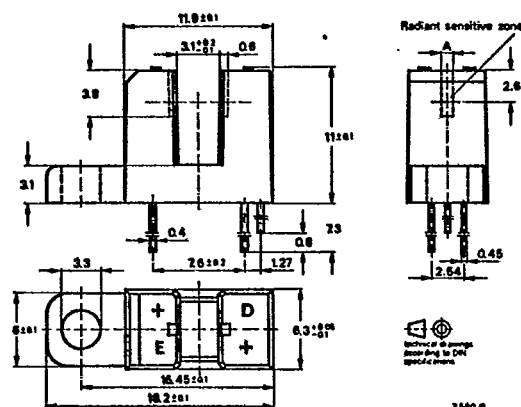


With mounting flange on both sides:

TCSS 211. with aperture 1.00 mm (0.04")

TCSS 221. with aperture 0.50 mm (0.02")

Weight max. 1.0 g

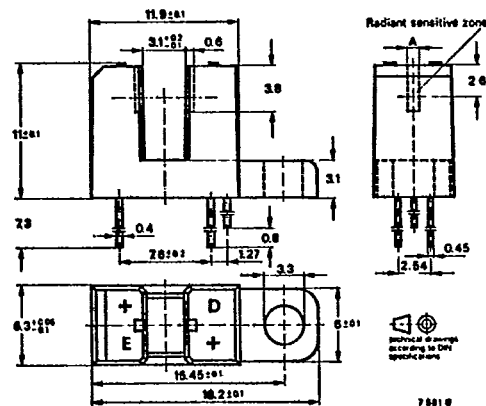


With mounting flange on emitter side:

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: /_{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 $T_{amb} \leq 25^\circ C$	P_V	100	mW
Junction temperature	T_J	100	$^\circ C$

Detector

Supply voltages	V_{S1}	6.5	V
	V_{S2}	18	V
Output current	I_O	20	mA
Power dissipation $T_{amb} \leq 25^\circ C$	P_V	250	mW
Junction temperature	T_J	100	$^\circ C$

Coupled device

Total power dissipation $T_{amb} \leq 25^\circ C$	P_{tot}	350	mW
Ambient temperature range	T_{amb}	-25...+85	$^\circ C$
Storage temperature range	T_{stg}	-40...+100	$^\circ C$
Soldering temperature 2 mm from case, $t \leq 5 s$	T_{sd}	260	$^\circ C$

Electrical characteristics

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

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 $V_{S2} = 16\text{ V}, I_F \geq I_{FT}$	I_{OH}		100 μA
Input threshold current TCSS 1110...TCSS 4110 TCSS 1211...TCSS 4211	I_{FT} I_{FT}	10 15	20 30 mA
Hysteresis $R_L = 270\ \Omega$	ΔI_{FT}	20	%
Output voltage $I_{OL} = 1.2\text{ mA}, I_F = 0$	V_{OL}	0.3	0.4 V
Switching frequency $I_F \geq I_{FT}, R_L = 270\ \Omega$	f_{sw}	400	kHz

Switching characteristics
 $V_{S1} = V_{S2} = 5\text{ V}, I_F = 3 \times I_{FT}, R_L = 270\ \Omega$,
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

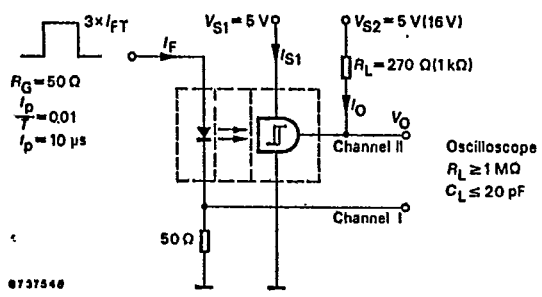


Fig. 1 Test circuit

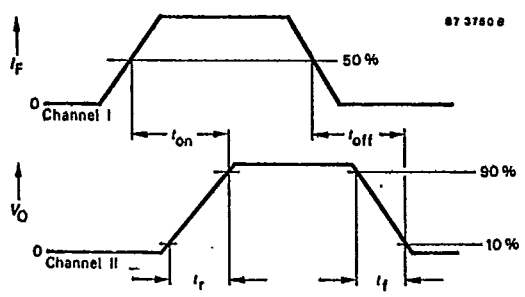
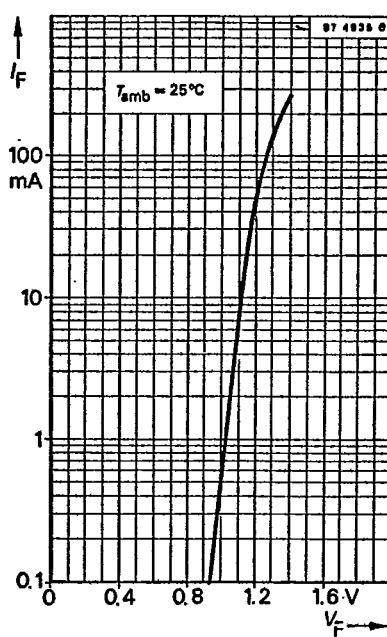
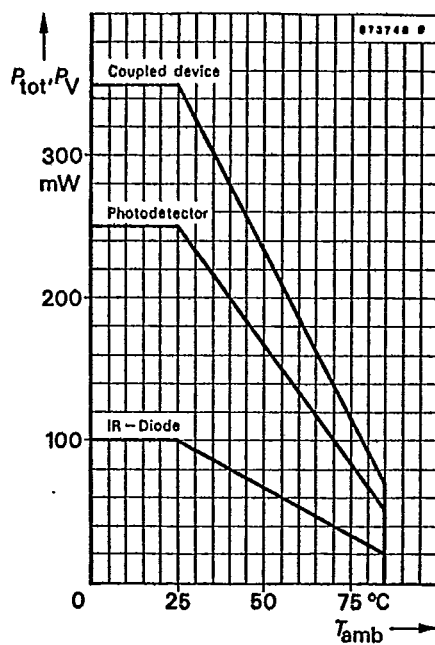
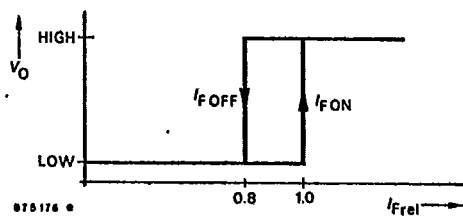


Fig. 2 Pulse diagram

TCSS 111. up to TCSS 421.

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