TEMIC
Semiconductors

TCZT8012 PAER

Matchable Pairs - Emitter and Dedector

Description

Pairs of infrared-emitting diode and phototransistor, matched in their optical and electrical features. These pairs enable a lot of applications. They can be used both for transmissive or reflective sensor functions. The peak wavelength of the emitter is **λ = 950 nm**.

Applications

Generally used for industrial processing and controlling, end of tape detector.

Features

. Miniature case with lens
. Detector with optical filter, protected against ambient light
. Detector case black for easy identification of the emitter and detector
. Emitter-angle of half-intensity **±φ = 35°**
. Detector-angle of half sensitivity **φ = 35°**
. Emitter and detector in sideview case
. High CTR > 5%

Absolute Maximum Ratings

Input (Emitter)

Parameters	Test Conditions	Symbol	Value	Unit
Reverse voltage		V_R	6	V
Forward current		I_F	60	mA
Forward surge current	$t_p \le 10\ \mu s$	I_{FSM}	1	A
Power dissipation	$T_{amb} \le 25°C$	P_V	100	mW
Junction temperature		T_j	100	°C

Output (Detector)

Parameters	Test Conditions	Symbol	Value	Unit
Collector emitter voltage		V_{CEO}	70	V
Emitter collector voltage		V_{ECO}	7	V
Collector current		I_C	50	mA
Collector peak current	$t_p/T = 0.5$, $t_p \le 10$ ms	I_{CM}	100	mA
Power dissipation	$T_{amb} \le 25°C$	P_V	150	mW
Junction temperature		T_j	100	°C

Coupler

Parameters	Test Conditions	Symbol	Value	Unit
Operating temperature range		T_{amb}	−55 to +85	°C
Storage temperature range		T_{stg}	−55 to +100	°C
Soldering temperature	2 mm from case, t ≤ 5 s	T_{sd}	260	°C

Switching Characteristics

$V_S = 5$ V

Type	$R_L = 100\ \Omega$ (see figure 1)							$R_L = 1\ k\Omega$		
	t_d[µs]	t_r[µs]	t_{on}[µs]	t_s[µs]	t_f[µs]	t_{off}[µs]	I_C[mA]	t_{on}[µs]	t_{off}[µs]	I_F[mA]
TCZT8012			10			8	2			

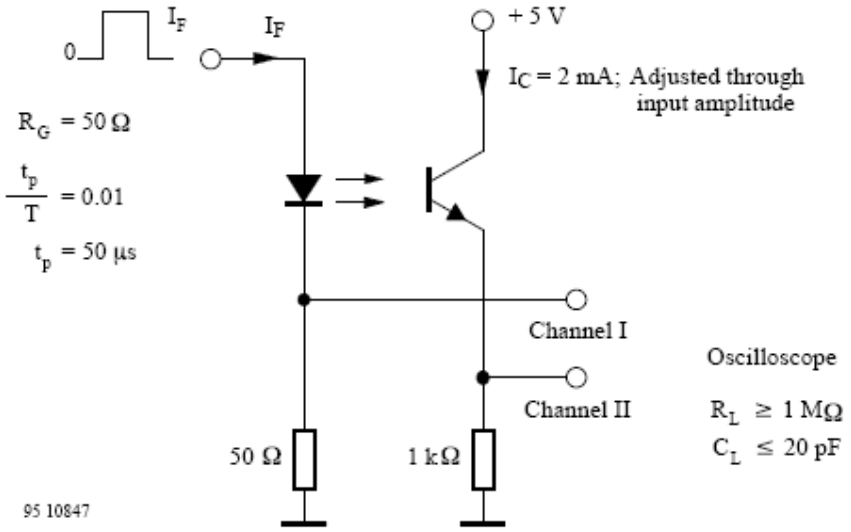


Figure 1. Test circuit

Electrical Characteristics

T_{amb} = 25°C

Input (Emitter)

Parameters	Test Conditions	Symbol	Min.	Typ.	Max.	Unit
Forward voltage	I_F = 50 mA	V_F		1.25	1.6	V
Junction capacitance	V_R = 0, f = 1 MHz	C_j		50		pF

Output (Detector)

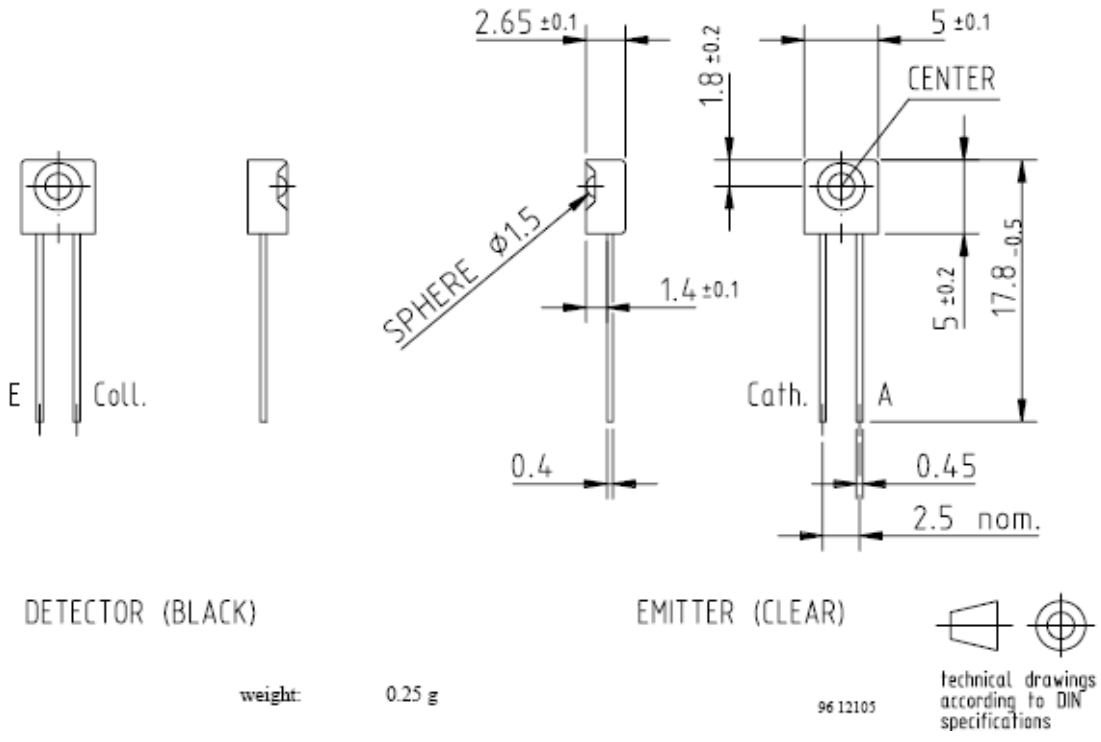
Parameters	Test Conditions	Symbol	Min.	Typ.	Max.	Unit
Collector emitter voltage	I_C = 1 mA	V_{CEO}	70			V
Emitter collector voltage	I_C = 100 µA	V_{ECO}	7			V
Collector dark current	V_{CE} = 25 V, I_f = 0, E = 0	I_{CEO}			100	nA

Emitter and Detector matched [1)]

Parameters	Test Conditions	Symbol	Min.	Typ.	Max.	Unit
Collector current	I_F = 20 mA, V_{CE} = 5 V	I_C	1	2		mA
I_C/I_F	I_F = 20 mA, V_{CE} = 5 V	CTR	0.5	1		
Collector emitter saturation voltage	I_F = 20 mA, I_C = 0.1 mA	V_{CEsat}			0.4	V
Cut-off frequency	I_F = 10 mA, V_{CE} = 5 V, R_L = 100 Ω	f_C		110		kHz
Coupling capacitance	f = 1 MHz	C_k		0.3		pF

1) Characteristics are measured at a distance of 4 mm (0.55") within a common axis of 0.5 mm (0.02") and parallel within 5°.

Dimensions in mm



weight: 0.25 g

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