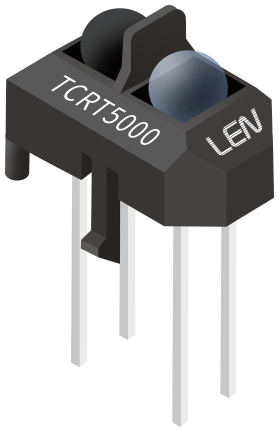
Descriptions

TCRT5000 is a reflective sensors which include an infrared emitter and phototransistor in a leaded package which blocks visible light.

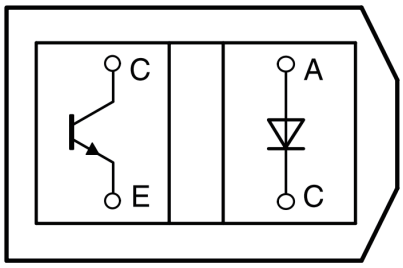


DIP-4

Features

- Daylight blocking filter
- Emitter wavelength 950 nm
- Detector type: Phototransistor
- Peak operating distance: 2.5 mm
- Operating range: 0.2 mm to 15 mm
- Typical output current under test: I_C = 1 mA

Schematic Diagram



Top view

Applications

- Position sensor for shaft encoder
- Limit switch for mechanical motions in VCR
- General purpose - wherever the space is limited
- Detection of reflective material such as paper, IBM cards, magnetic tapes etc.

Ordering Information

Part Number	Package	Shipping Quantity
TCRT5000	DIP-4	500 pcs / Bag , 2000 pcs / Box

Absolute Maximum Ratings (T_A=25°C)

Input (Emitter)				
Parameter	Conditions	Symbol	Ratings	Unit
Reverse Voltage		V_R	5	V
Forward Current		I_F	60	mA
Forward Surge Current	$T_P \leqslant$ 10us	I_{FSM}	3	A
Power Dissipation	$T_A \leqslant$ 25°C	P_D	100	mW
Junction Temperature		T_J	100	°C
Output (Detector)				
Parameter	Conditions	Symbol	Ratings	Unit
Collector-Emitter Voltage		V_{CEO}	70	V
Emitter-Collector Voltage		V_{ECO}	5	V
Collector Current		I_C	100	mA
Power Dissipation	$T_A \leqslant$ 55°C	P_D	100	mW
Junction Temperature		T_J	100	°C
Sensor				
Parameter	Conditions	Symbol	Ratings	Unit
Total Power Dissipation	$T_A \leqslant$ 25°C	P_{TOT}	200	mW
Operating Temperature Range		T_{OPR}	–25 ~ +85	°C
Storage Temperature Range		T_{STG}	–25 ~ +100	°C
Soldering Temperature	2 mm from case T $\leqslant$ 10 s	T_{SOL}	260	°C

Electrical Characteristics (T_A=25°C)

Input (Emitter)						
Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Forward Voltage	V_F	I_F = 60 mA		1.25	1.5	V
Junction Capacitance	C_J	V_R = 0, f = 1 MHz		17		pF
Radiant Intensity	I_E	I_F = 60 mA, T_P = 20 ms			21	mW/sr
Peak Wavelength	λ_P	I_F = 100 mA		940		nm
Virtual Source Diameter	Ø	Method: 63 % encircled energy		2.1		mm
Output (Detector)						
Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Collector-Emitter Voltage	V_{CEO}	I_C = 1 mA	70			V
Emitter-Collector Voltage	V_{ECO}	I_E = 100 µA	7			V
Collector Dark Current	I_{CEO}	V_{CE} = 20 V, I_F = 0, E = 0		10	200	nA
Sensor						
Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Collector Current	I_C	V_{CE} = 5 V, I_F = 10 mA, D = 12 mm	0.5	1	2.1	mA
Collector-Emitter Saturation Voltage	$V_{CE\,(sat)}$	I_F = 10 mA, I_C = 0.1 mA, D = 12 mm			0.4	V

Notes: (*1) See figure 2
(*2) Test surface: Mirror

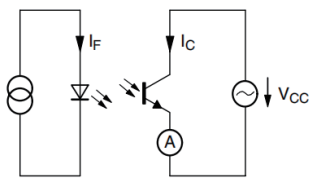


Fig.1 Test Circuit

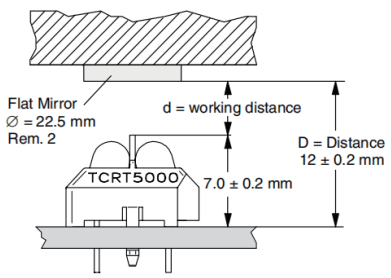


Fig.2 Test Circuit

Typical Characteristics

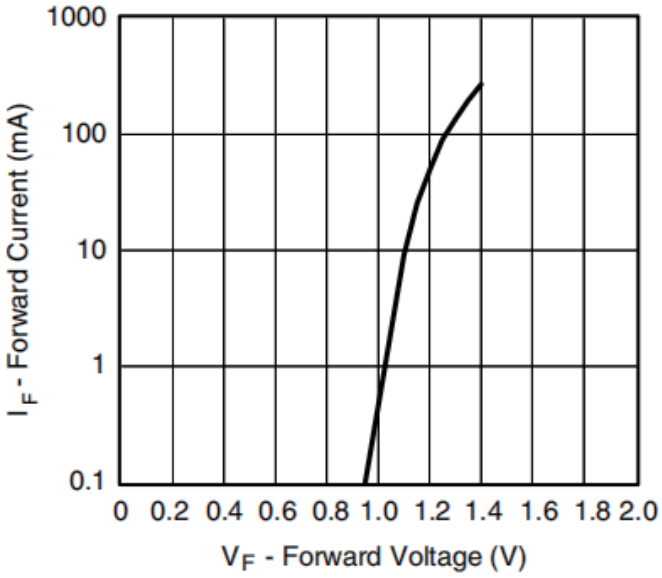


Fig.1 Forward Current vs. Forward Voltage

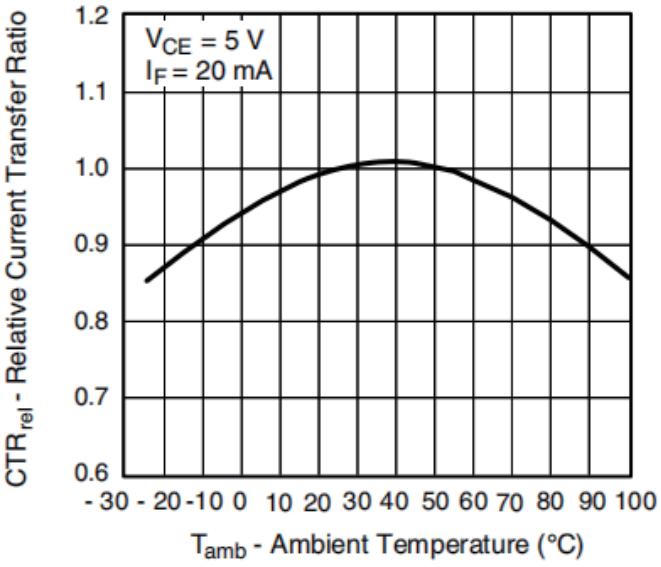


Fig.2 Relative Current Transfer Ratio vs. Ambient Temperature

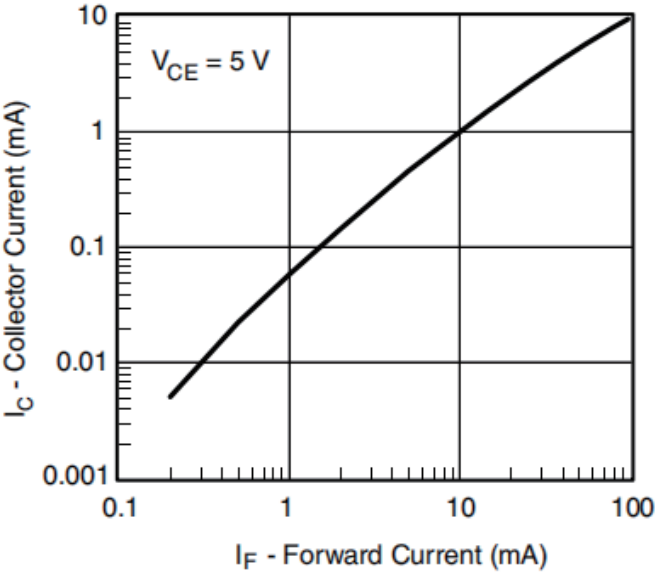


Fig.3 Collector Current vs. Forward Current

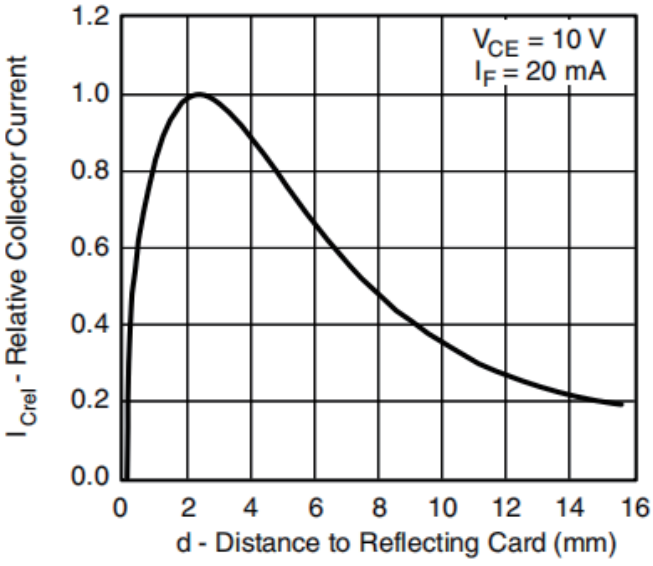


Fig.4 Relative Collector Current vs. Distance

Typical Characteristics

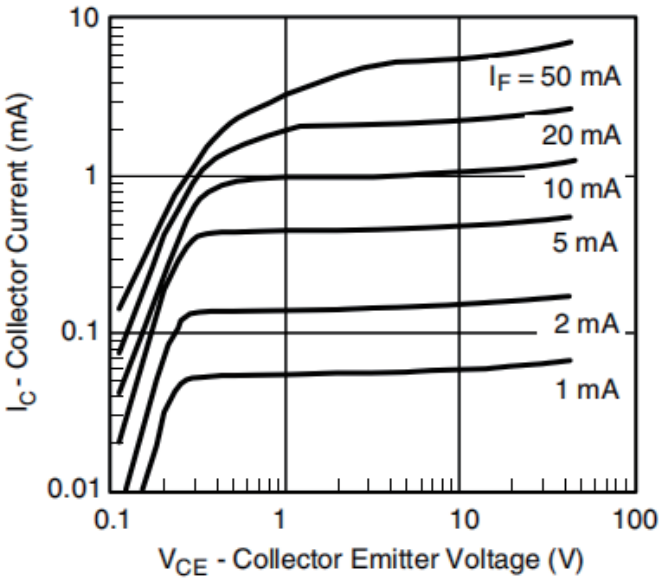


Fig.5 Collector Emitter Saturation Voltage vs. Collector Current

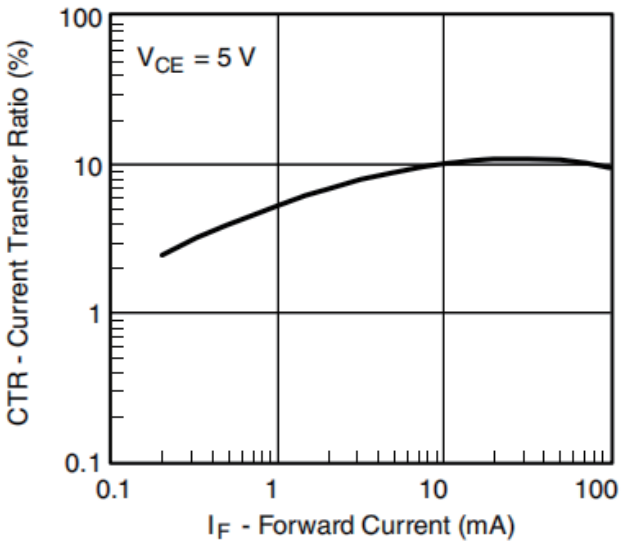


Fig.6 Current Transfer Ratio vs. Forward Current

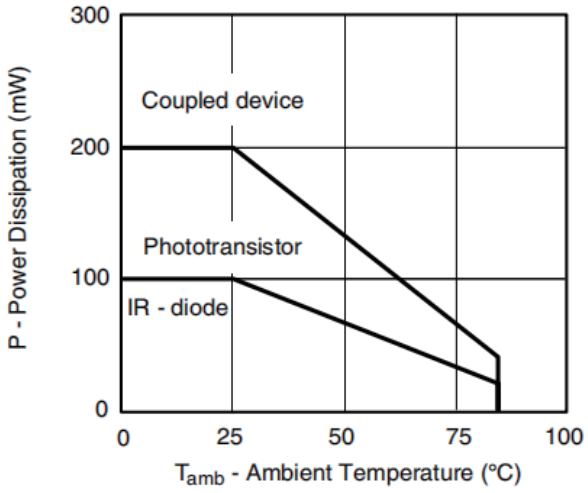
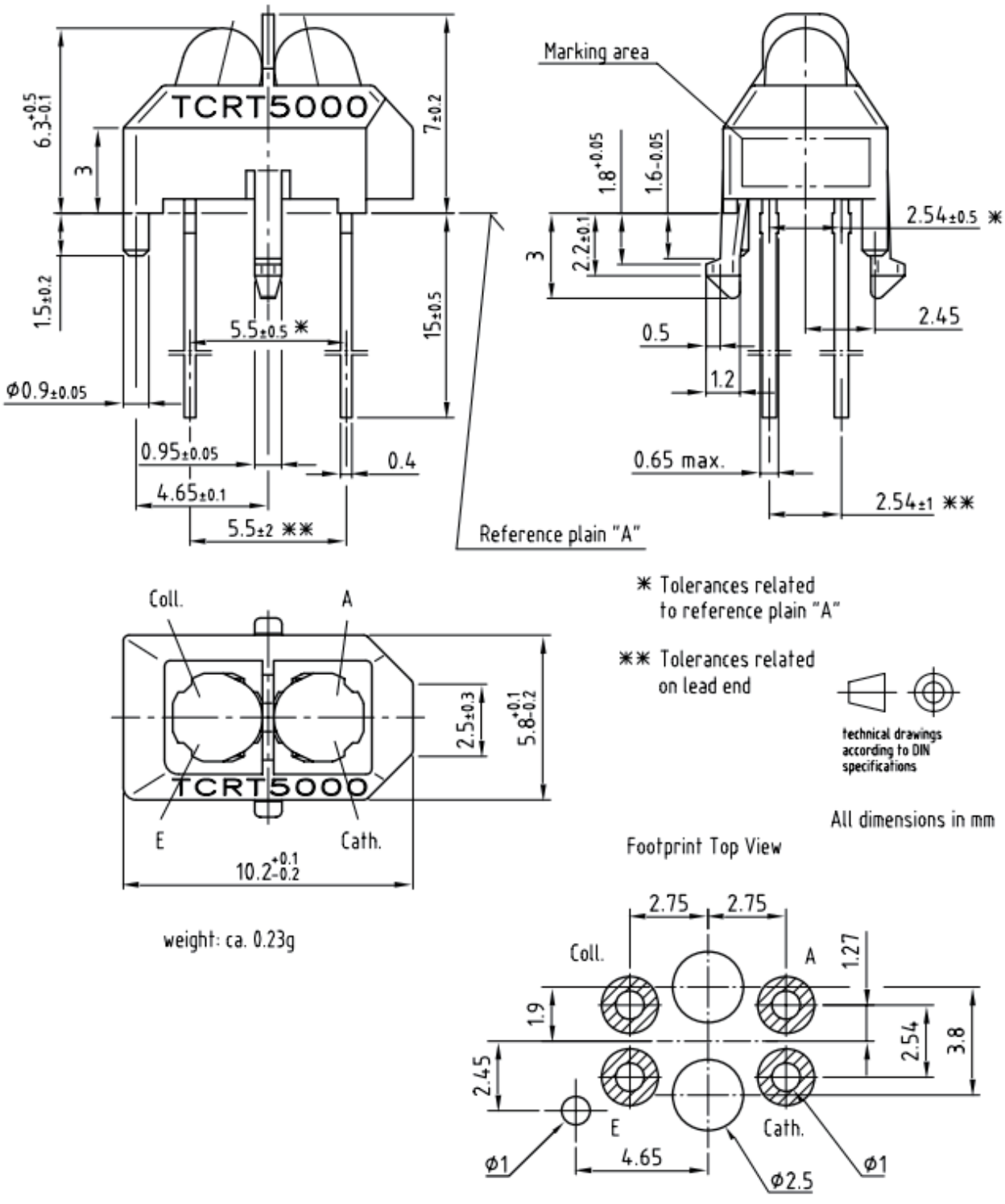


Fig.7 Power Dissipation Limit vs. Ambient Temperature

Package Dimensions

DIP-4



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