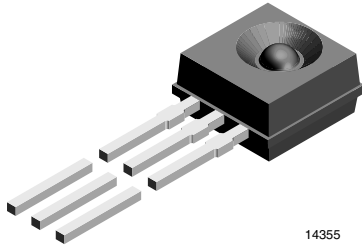


Silicon Photo Schmitt Trigger with Digital Output, RoHS Compliant



DESCRIPTION

TEKS5400 is a photo Schmitt Trigger with high radiant sensitivity, molded in a plastic package with side view lens and daylight blocking filter. Filter bandwidth is matched with 900 nm to 950 nm IR emitters.

FEATURES

- Package type: leaded
- Package form: side view lens
- Dimensions (L x W x H in mm): 5 x 2.65 x 5
- High radiant sensitivity
- Daylight blocking filter matched with 940 nm IR emitters
- Angle of half sensitivity: $\varphi = \pm 30^\circ$
- Supply voltage range: 4.5 V to 16 V
- Low current consumption: 2 mA
- High EMI protection
- TTL and CMOS compatible
- Open collector output
- Output signal level active "low"
- Package matched with IR emitter series TSKS5400
- Lead (Pb)-free component in accordance with RoHS 2002/95/EC and WEEE 2002/96/EC


RoHS
COMPLIANT

APPLICATIONS

- Shaft encoder
- Transmissive sensor
- Reflective sensor

PRODUCT SUMMARY

COMPONENT	V_{OL} (V)	φ (deg)	$\lambda_{0.5}$ (nm)
TEKS5400-FSZ	0.2	± 30	600 to 1020
TEKS5400-FGZ	0.2	± 30	600 to 1020

Note

Test conditions see table "Basic Characteristics"

ORDERING INFORMATION

ORDERING CODE	PACKAGING	REMARKS	PACKAGE FORM
TEKS5400-FSZ	Tape and ammpack	MOQ: 2000 pcs, 2000 pcs/ammopack, pitch: 1.27 mm	Side view lens
TEKS5400-FGZ	Tape and ammpack	MOQ: 2000 pcs, 2000 pcs/ammopack, pitch: 2.00 mm	Side view lens

Note

MOQ: minimum order quantity

ABSOLUTE MAXIMUM RATINGS

PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT
Supply voltage		V_{S1}	18	V
Output current		I_O	20	mA
Power dissipation		P_V	100	mW
Junction temperature		T_j	100	$^\circ\text{C}$
Operating temperature range		T_{amb}	- 25 to + 85	$^\circ\text{C}$
Storage temperature range		T_{stg}	- 40 to + 100	$^\circ\text{C}$
Soldering temperature	$t \leq 5$ s, 2 mm from body	T_{sd}	260	$^\circ\text{C}$
Thermal resistance junction/ambient	J-STD-051, soldered on PCB	R_{thJA}	270	K/W

Note

$T_{amb} = 25$ $^\circ\text{C}$, unless otherwise specified

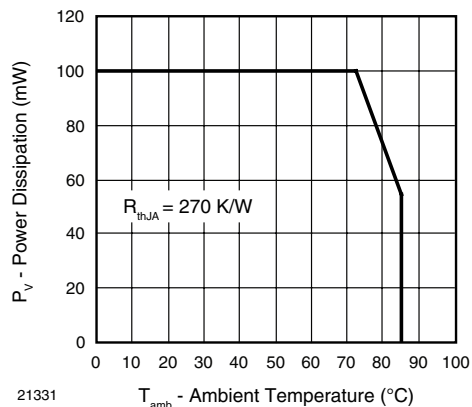


Fig. 1 - Power Dissipation Limit vs. Ambient Temperature

HANDLING PRECAUTIONS

Caution: connect a capacitor C of 100 nF between V_{S1} and ground!

BASIC CHARACTERISTICS						
PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT
Supply voltage		V_{S1}/V_{S2}	4.5		16	V
Supply current	$V_{S1} = 16\text{ V}$	I_{S1}		2	5	mA
Irradiance for threshold "on"	$\lambda = 950\text{ nm}, V_{S1} = 5\text{ V}$	$E_{e\text{on}}$	25	50	85	$\mu\text{W}/\text{cm}^2$
Hysteresis	$V_{S1} = 5\text{ V}$	$E_{e\text{off}}/E_{e\text{on}}$		80		%
Angle of half sensitivity		ϕ		± 30		deg
Wavelength of peak sensitivity		λ_p		920		nm
Range of spectral bandwidth		$\lambda_{0.5}$		600 to 1020		nm
Output voltage	$I_{OL} = 16\text{ mA}, V_{S1} = 5\text{ V}, E_e \geq E_{e\text{on}}$	V_{OL}		0.2	0.4	V
High level output current	$V_{S1} = V_{S2} = 16\text{ V}, I_F = 0$	I_{OH}			1	μA
Rise time	$V_{S1} = V_{S2} = 5\text{ V}, R_L = 1\text{ k}\Omega, E_e = 3 \times E_{e\text{on}}, \lambda = 950\text{ nm}$	t_r		100		ns
Fall time	$V_{S1} = V_{S2} = 5\text{ V}, R_L = 1\text{ k}\Omega, E_e = 3 \times E_{e\text{on}}, \lambda = 950\text{ nm}$	t_f		20		ns
Turn-on time	$V_{S1} = V_{S2} = 5\text{ V}, R_L = 1\text{ k}\Omega, E_e = 3 \times E_{e\text{on}}, \lambda = 950\text{ nm}$	t_{on}		1.5		μs
Turn-off time	$V_{S1} = V_{S2} = 5\text{ V}, R_L = 1\text{ k}\Omega, E_e = 3 \times E_{e\text{on}}, \lambda = 950\text{ nm}$	t_{off}		3		μs
Cut off frequency	$V_{S1} = V_{S2} = 5\text{ V}, R_L = 1\text{ k}\Omega, E_e = 3 \times E_{e\text{on}}, \lambda = 950\text{ nm}$	f_c		200		kHz

Note

$T_{\text{amb}} = 25\text{ }^\circ\text{C}$, unless otherwise specified

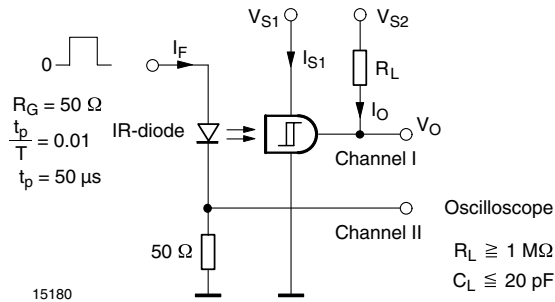


Fig. 2 - Test Circuit

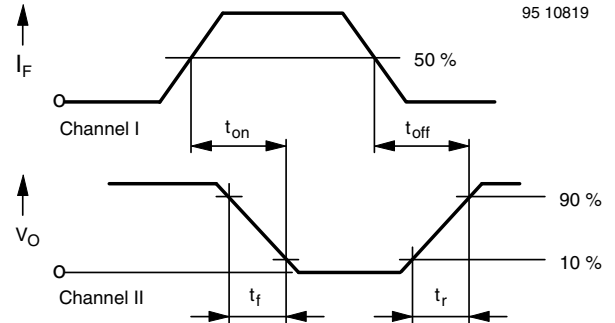


Fig. 3 - Pulse Diagram

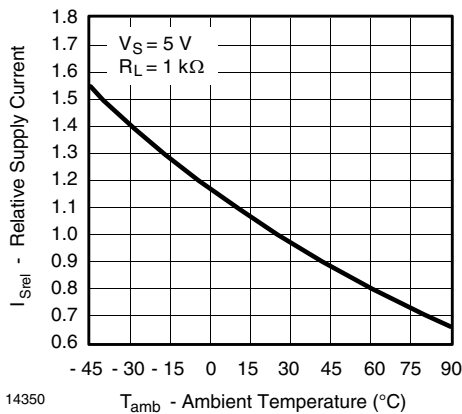
BASIC CHARACTERISTICS
 $T_{amb} = 25\text{ }^{\circ}\text{C}$, unless otherwise specified


Fig. 4 - Rel. Supply Current vs. Ambient Temperature

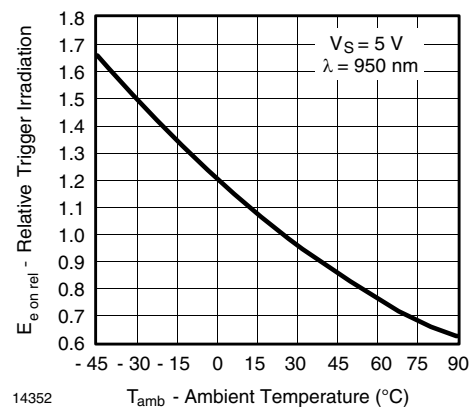


Fig. 6 - Relative Trigger Irradiation vs. Ambient Temperature

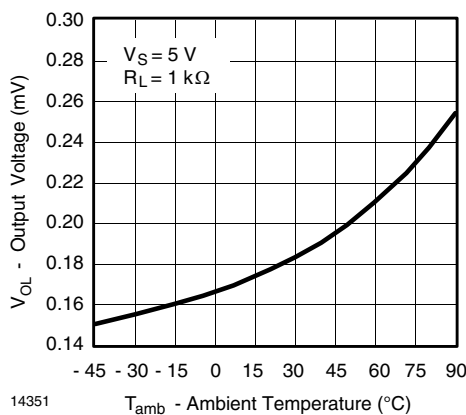


Fig. 5 - Output Voltage vs. Ambient Temperature

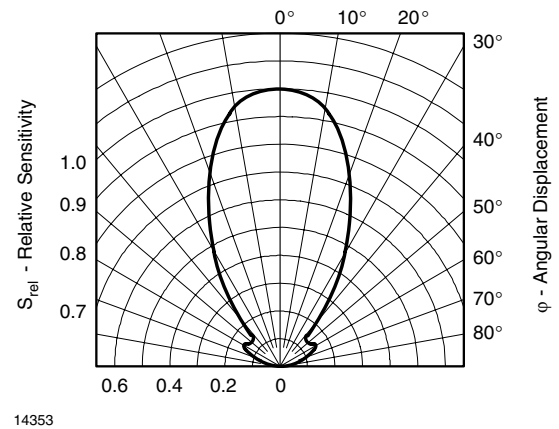


Fig. 7 - Relative Radiant Sensitivity vs. Angular Displacement

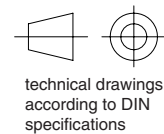
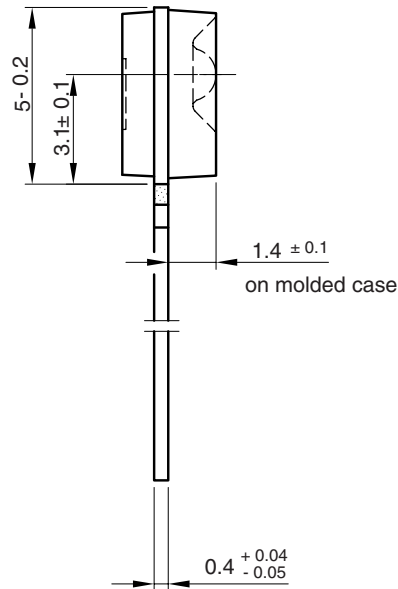
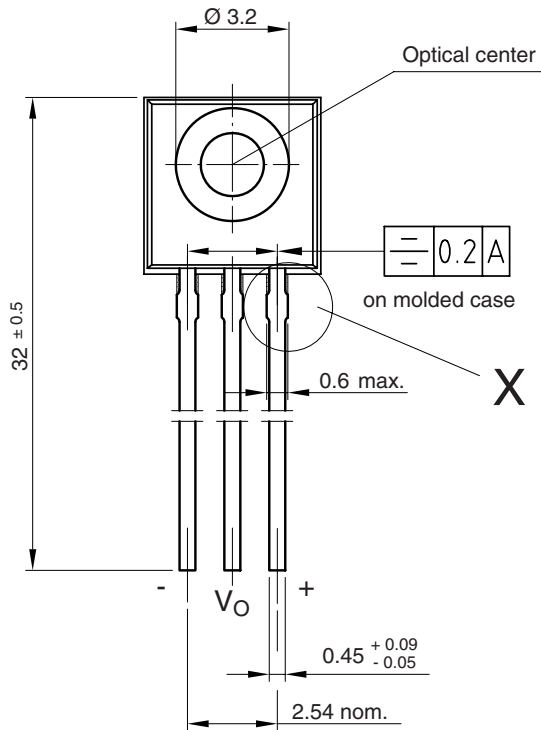
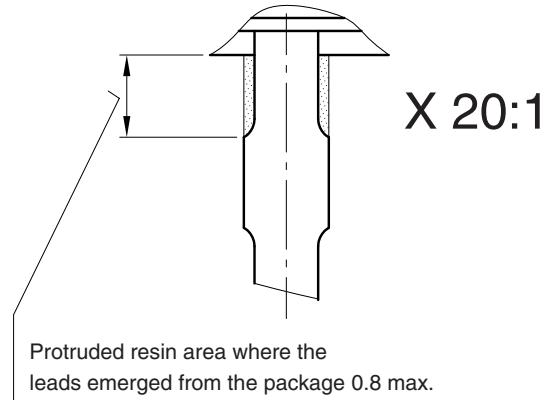
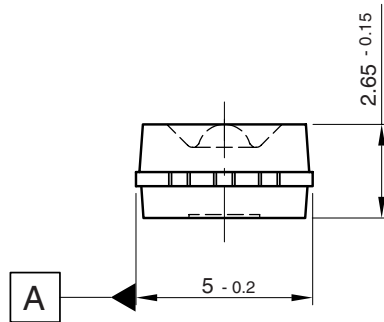
TEKS5400

Vishay Semiconductors

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PACKAGE DIMENSIONS in millimeters



technical drawings according to DIN specifications

Lead spacing is measured where the leads emerged from the package

Drawing-No.: 6.544-5309.51-4
Issue: 8; 16.05.02
14346



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