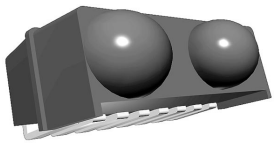
Low Profile Transceiver Module Photo Pin Diode and Infrared Emitter

Description

The miniaturized TFDU2201 is an ideal pin diode transmitter combination in a unique package for applications in telecommunications like mobile phones and pagers. The device is mechanically designed for lowest profile with a height of only 2.8 mm. The device is designed to be compatible to the IrDA standard when using an external receiver IC and IRED driver.

Package



Features

- Package Dimension:
  L 7.1 mm x W 4.55 mm x H 2.75 mm
- SMD Side View
- Fast Pin Photo Diode for Sir and FIR
- Detector with High Efficiency and High Speed at Low Bias Voltage
- Only 30 mA IRED Peak Current During Transmission for IrDA SIR Low Power Standard

Applications

Mobile Phones, Pagers, Personal Digital Assistants (PDA), Handheld Battery Operated Equipment

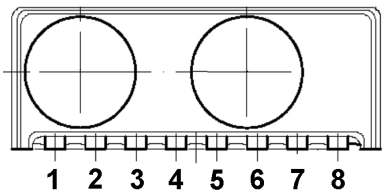
Ordering Information

Part Number	Qty / Reel	Description
TFDU2201–TR1	750	Orientated in carrier tape for side view in mounting
TFDU2201–TR3	2250	Orientated in carrier tape for side view in mounting

Pin Description

Pin	Symbol	Description	I/O	Active
1	IRED GND	IRED Cathode, Ground, to be used as heat sink		
2	IRED GND	IRED Cathode, Ground, to be used as heat sink		
3	IRED Anode	IRED Anode, to be driven by a current source		
4	NC			
5	NC			
6	NC			
7	D_{anode}	Detector Anode		
8	$D_{cathode}$	Detector Cathode		

TFDU2201
Side View



Absolute Maximum Ratings

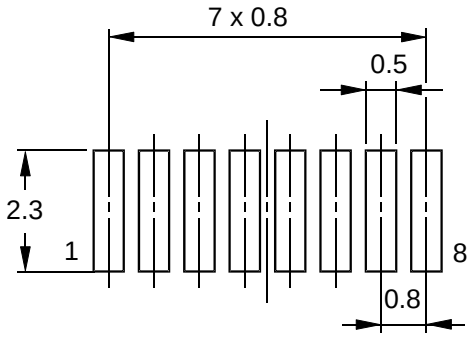
Parameter	Test Conditions	Symbol	Min.	Typ.	Max.	Unit	Remarks
Photo pin Diode, Reverse Voltage Range		V_r	–0.3		12	V	
Photo pin Diode, Reverse Photo Current					10	mA	
Average IRED Current		I_{IRED}(DC)			100	mA	
Repetitive Pulsed IRED Current		I_{IRED}(RP)			550	mA	<90 µs, t_{on}<20%
IRED, Reverse Voltage Range		V_{rIRED}	–0.3		5	V	
Power Dissipation		P_{tot}			200	mW	See Figure 3
Junction Temperature		T_J			125	°C	
Ambient Temperature Range (Operating)		T_{amb}	–25		85	°C	
Storage Temperature Range		T_{stg}	–40		85	°C	
Soldering Temperature	t = 20 s @215°C			215	240	°C	See Vishay IrDA Design Guide
Virtual source size	Method: (1–1/e) encircled energy	d		2		mm	
Compatible to Class 1 operation of IEC 60825 or EN60825 with worst case IrDA SIR pulse pattern, 115.2 kbit/s							

Electrical Characteristics

Tested for the following parameters (T = 25°C, unless otherwise stated)

Parameter	Test Conditions	Symbol	Min.	Typ.	Max.	Unit	Remarks
Transceiver							
Supported Data Rates	Base band		9.6		4000	kbit/s	
Pin Detector Diode							
Spectral Sensitivity	$\|\alpha\| \le \pm 15°$ V_r = 2 V, λ = 875 nm	s_λ	1.0	1.2	1.8	$\frac{nA}{(mW/m^2)}$	
Bias Voltage Range, Detector		V_{Rev}			12	V	
Reverse Leakage Current				0.2		nA	
Spectral Bandwidth		λ	800		950	nm	
Max. Operating Irradiance	$\|\alpha\| \le \pm 90°$ V_{CC} = 2 V	$E_{e,\,max}$	8000	15000		W/m^2	
Rise Time @Load: R = 50 Ω	V_r = 2 V, λ = 875 nm	t_r		40		ns	
Fall Time @Load: R = 50 Ω	V_r = 2 V, λ = 875 nm	t_r		40		ns	
Emitter							
Forward Current Operating Condition for Low Power IrDA Operation	I_e = 4 to 28 mW/sr in $\|\alpha\| \le \pm 15°$	I_{F1}		30		mA	
Output Radiant Intensity, $\|\alpha\| \le \pm 15°$	I_{F1} = 35 mA	I_e	4	8	14	mW/sr	25% duty cycle
	I_{F1} = 350 mA		35			mW/sr	25% duty cycle
Forward Voltage	I_f = 50 mA	V_f	1.2		1.45	V	
Peak Emission Wavelength		λ_p	880		900	nm	
Spectral Emission Bandwidth				45		nm	
Optical Rise/ Falltime	2 MHz Square Wave Signal (duty cycle 1:1)			38		ns	

Recommended SMD Pad Layout



Transceiver leads to be soldered symmetrically on pads

Figure 1. Pad Layout

Recommended Solder Profile

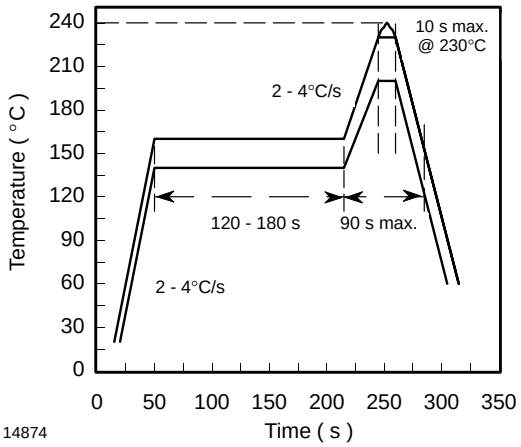


Figure 2. Recommended Solder Profile

Current Derating Diagram

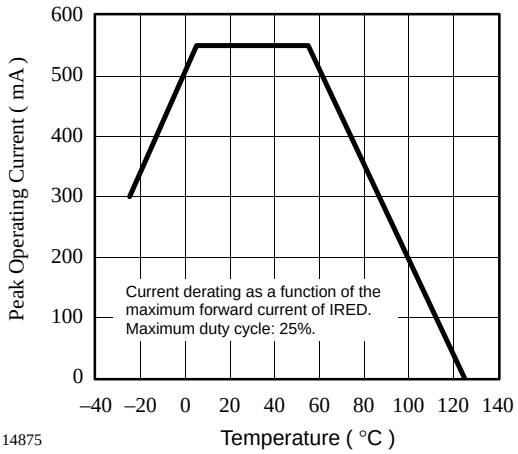
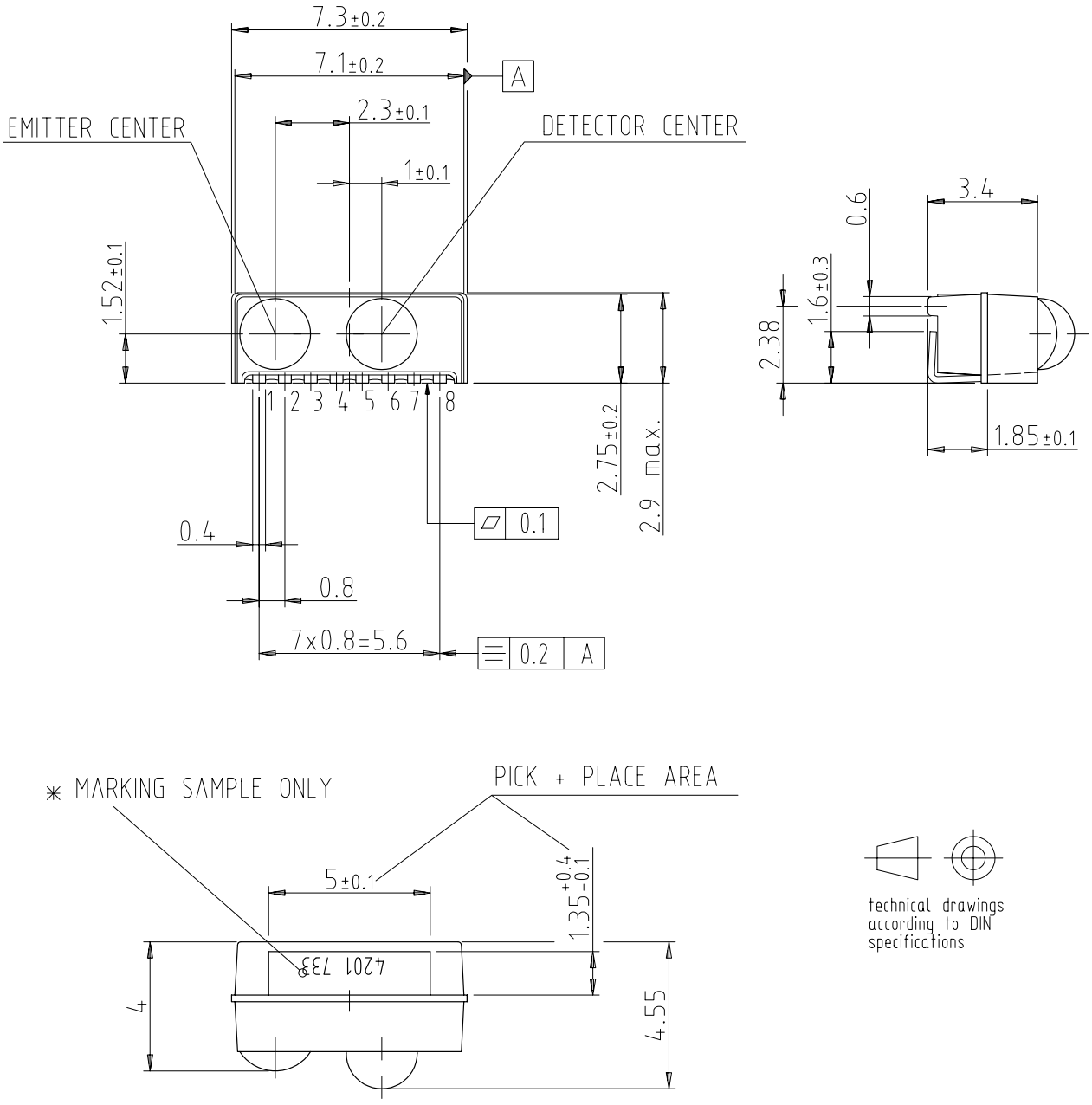


Figure 3. Current Derating Diagram

TFDU2201 – Side View Package (Mechanical Dimensions)



* MARKING ORIENTATION
180 DEGREES ALLOWED

Drawing-No.: 6.550-5185.01-4
Issue: 3; 01.04.99

14484

Revision History:

A0.2, 07/07/1999: New draft edition, for internal use only

A1.0, 17/05/2000: First released version pin diode switching characteristics conditions typos corrected

Ozone Depleting Substances Policy Statement

It is the policy of **Vishay Semiconductor GmbH** to

1. Meet all present and future national and international statutory requirements.

2. Regularly and continuously improve the performance of our products, processes, distribution and operating systems with respect to their impact on the health and safety of our employees and the public, as well as their impact on the environment.

It is particular concern to control or eliminate releases of those substances into the atmosphere which are known as ozone depleting substances (ODSs).

The Montreal Protocol (1987) and its London Amendments (1990) intend to severely restrict the use of ODSs and forbid their use within the next ten years. Various national and international initiatives are pressing for an earlier ban on these substances.

Vishay Semiconductor GmbH has been able to use its policy of continuous improvements to eliminate the use of ODSs listed in the following documents.

1. Annex A, B and list of transitional substances of the Montreal Protocol and the London Amendments respectively

2. Class I and II ozone depleting substances in the Clean Air Act Amendments of 1990 by the Environmental Protection Agency (EPA) in the USA

3. Council Decision 88/540/EEC and 91/690/EEC Annex A, B and C (transitional substances) respectively.

Vishay Semiconductor GmbH can certify that our semiconductors are not manufactured with ozone depleting substances and do not contain such substances.

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