

Photo Modules for PCM Remote Control Systems

Holder and lead variations

Available types for different carrier frequencies

Type	f ₀	Type	f ₀
TSOP1730XX	30 kHz	TSOP1733XX	33 kHz
TSOP1736XX	36 kHz	TSOP1737XX	36.7 kHz
TSOP1738XX	38 kHz	TSOP1740XX	40 kHz
TSOP1756XX	56 kHz		

Description

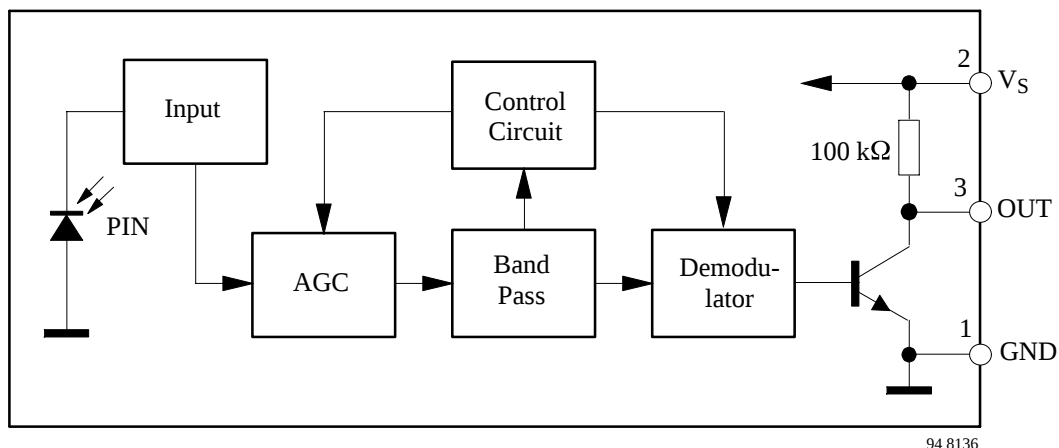
The TSOP17..XX – series are miniaturized receivers for infrared remote control systems. PIN diode and preamplifier are assembled on lead frame, the epoxy package is designed as IR filter. The demodulated output signal can directly be decoded by a microprocessor.

TSOP17.... is the standard IR remote control receiver series, supporting all major transmission codes.

Features

- Photo detector and preamplifier in one package
- Internal filter for PCM frequency
- Improved shielding against electrical field disturbance
- TTL and CMOS compatibility
- Output active low
- Low power consumption
- High immunity against ambient light
- Continuous data transmission possible (1200 bit/s)
- Suitable burst length ≥ 10 cycles/burst

Block Diagram



Absolute Maximum Ratings

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

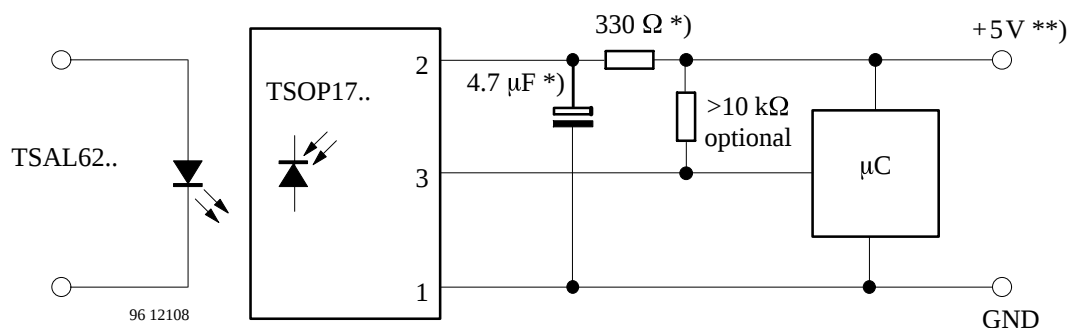
Parameter	Test Conditions	Symbol	Value	Unit
Supply Voltage	(Pin 2)	V_S	-0.3...6.0	V
Supply Current	(Pin 2)	I_S	5	mA
Output Voltage	(Pin 3)	V_O	-0.3...6.0	V
Output Current	(Pin 3)	I_O	5	mA
Junction Temperature		T_j	100	$^{\circ}\text{C}$
Storage Temperature Range		T_{stg}	-25...+85	$^{\circ}\text{C}$
Operating Temperature Range		T_{amb}	-25...+85	$^{\circ}\text{C}$
Power Consumption	($T_{amb} \leq 85^{\circ}\text{C}$)	P_{tot}	50	mW
Soldering Temperature	$t \leq 5\text{ s}$	T_{sd}	260	$^{\circ}\text{C}$

Basic Characteristics

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

Parameter	Test Conditions	Symbol	Min	Typ	Max	Unit
Supply Current (Pin 2)	$V_S = 5\text{ V}, E_v = 0$	I_{SD}	0.4	0.6	0.8	mA
	$V_S = 5\text{ V}, E_v = 40\text{ klx, sunlight}$	I_{SH}		1.0		mA
Transmission Distance	$E_v = 0$, test signal see fig.7, IR diode TSIP5201, $I_F = 400\text{ mA}$	d		35		m
Output Voltage Low (Pin 3)	$I_{OSL} = 0.5\text{ mA}, E_e = 0.7\text{ mW/m}^2$, $f = f_o$, $t_p/T = 0.4$	V_{OSL}			250	mV
Irradiance (30 – 40 kHz)	Pulse width tolerance: $t_{pi} - 5/f_o < t_{po} < t_{pi} + 6/f_o$, test signal (see fig.7)	$E_e \text{ min}$		0.35	0.5	mW/m^2
Irradiance (56 kHz)	Pulse width tolerance: $t_{pi} - 5/f_o < t_{po} < t_{pi} + 6/f_o$, test signal (see fig.7)	$E_e \text{ min}$		0.4	0.6	mW/m^2
Irradiance		$E_e \text{ max}$	30			W/m^2
Directivity	Angle of half transmission distance	$\phi_{1/2}$		± 45		deg

Application Circuit



*) only necessary to suppress power supply disturbances

**) tolerated supply voltage range : $4.5\text{ V} < V_S < 5.5\text{ V}$

Typical Characteristics ($T_{amb} = 25^{\circ}\text{C}$ unless otherwise specified)

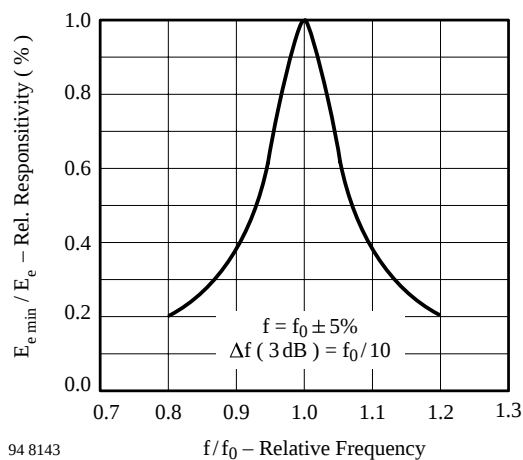


Figure 1. Frequency Dependence of Responsivity

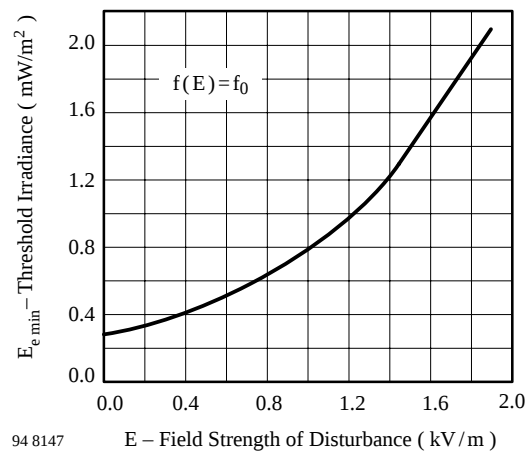


Figure 4. Sensitivity vs. Electric Field Disturbances

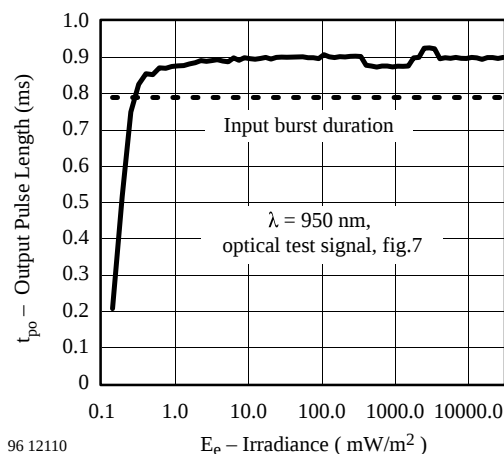


Figure 2. Sensitivity in Dark Ambient

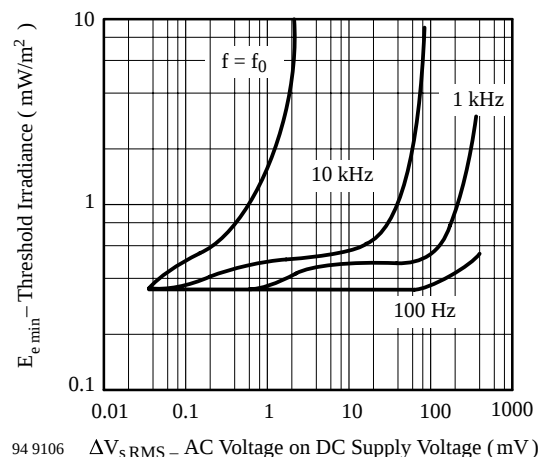


Figure 5. Sensitivity vs. Supply Voltage Disturbances

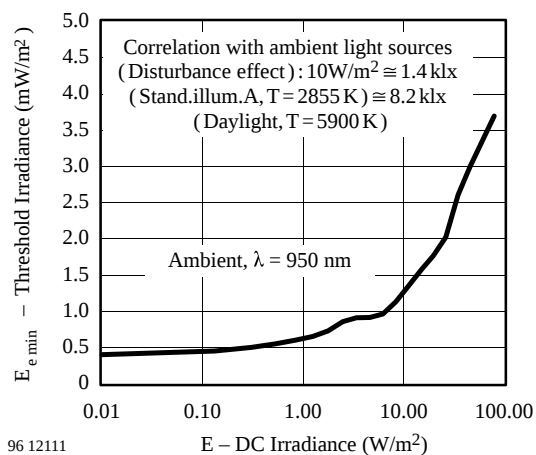


Figure 3. Sensitivity in Bright Ambient

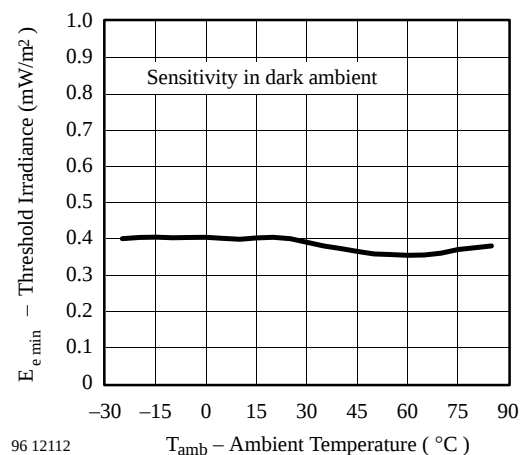


Figure 6. Sensitivity vs. Ambient Temperature

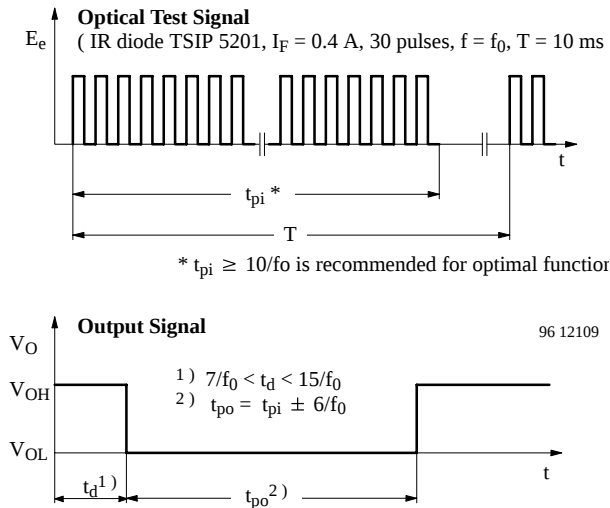


Figure 7. Output Function

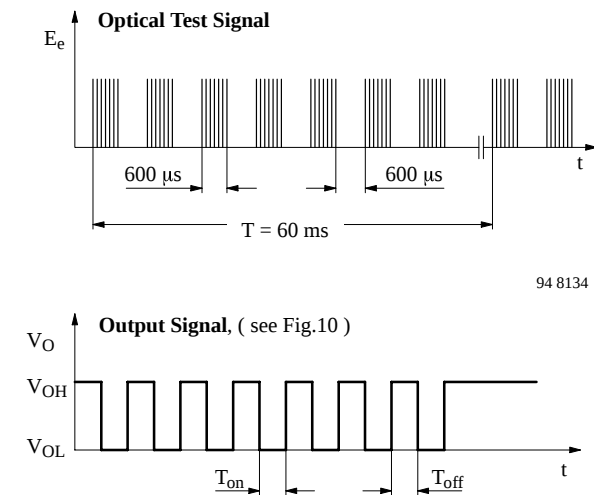


Figure 8. Output Function

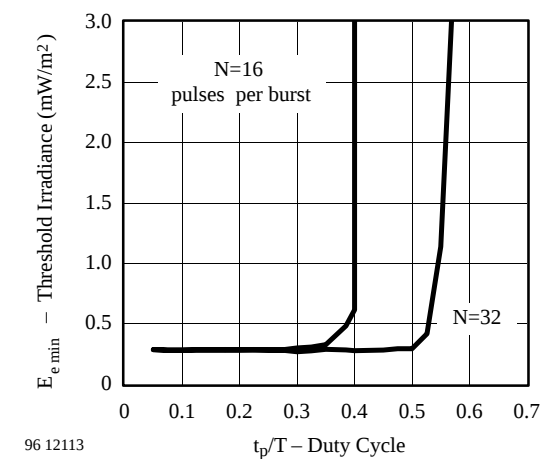


Figure 9. Sensitivity vs. Duty Cycle

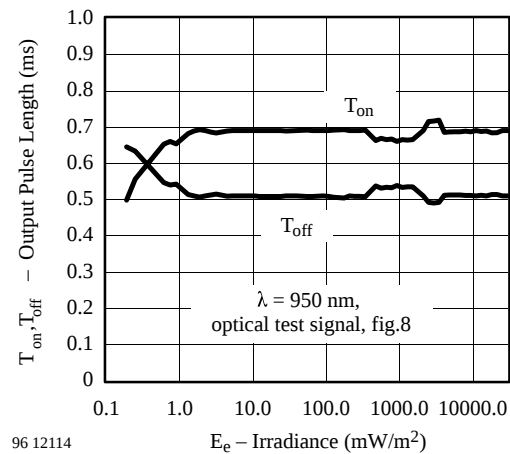


Figure 10. Output Pulse Diagram

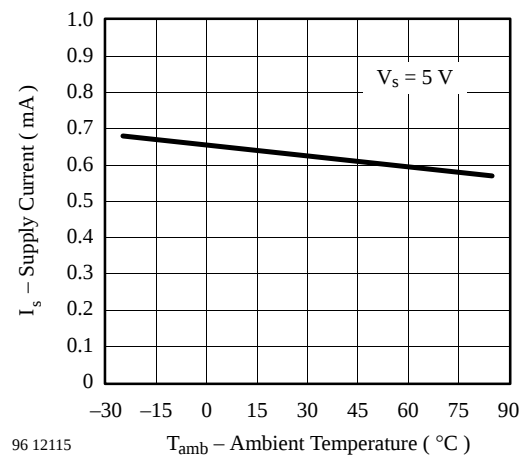


Figure 11. Supply Current vs. Ambient Temperature

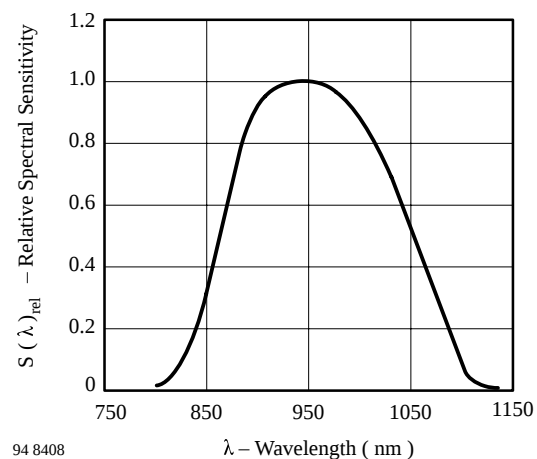


Figure 12. Relative Spectral Sensitivity vs. Wavelength

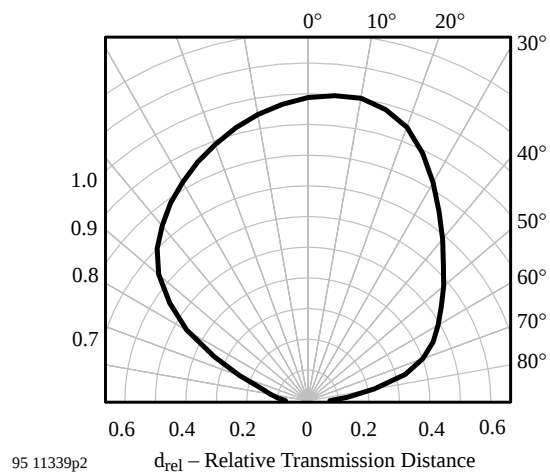


Figure 13. Vertical Directivity ϕ_y

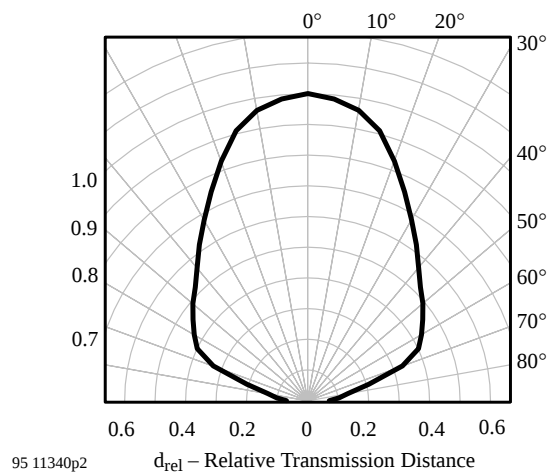


Figure 14. Horizontal Directivity ϕ_x

Technical drawing of the 12826 sensor module, showing three views: top, side, and bottom.

Top View Dimensions:

- Overall width: 14.6 ± 0.5
- Overall height: 20.5 ± 0.5
- Central square area width: 18.8 ± 0.5
- Central square area height: 12.6 ± 0.5
- Pin pitch (horizontal): 2.54 nom.
- Pin pitch (vertical): 2.54 nom.
- Pin width: 0.8 ± 0.1
- Pin spacing: 0.5 ± 0.05
- Pin length: 1.85 ± 0.1
- Pin angle: 7 ± 0.3
- Pin radius: $R2.15$
- Pin label: U_Q
- Pin label: GND
- Pin label: V_{CC}
- Pin label: 0.8 ± 0.1
- Pin label: 0.5 ± 0.05
- Pin label: 1.8 ± 0.1
- Pin label: $3 \times 2.54 = 7.62 \text{ nom.}$

Side View Dimensions:

- Overall height: 14.7 ± 0.2
- Pin height: 3.5 ± 0.2
- Pin width: 1 ± 0.2
- Pin spacing: 2.5 ± 0.1
- Pin label: 8.5 ± 0.15
- Pin label: 7.5 ± 0.15
- Pin label: 0.4 ± 0.05
- Pin label: 2 ± 0.5
- Pin label: 4.55 ± 0.5
- Pin label: 5.6 ± 0.2
- Pin label: 4.5 ± 0.2
- Pin label: 9.6 ± 0.2
- Pin label: 14.45 ± 0.5

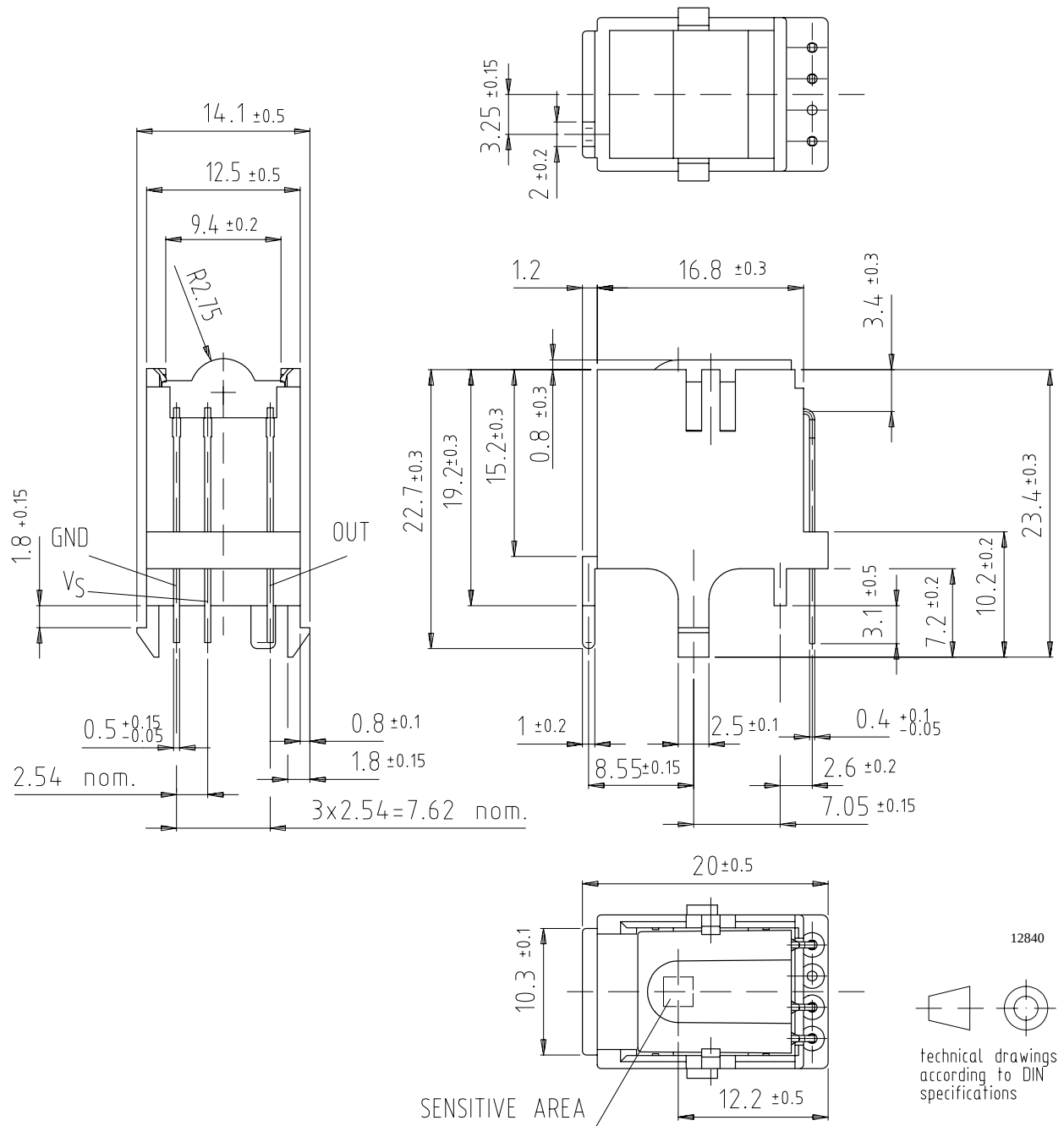
Bottom View Dimensions:

- Overall width: 12.6 ± 0.5
- Overall height: 14.45 ± 0.5
- Pin width: 1 ± 0.2
- Pin spacing: 2.5 ± 0.1
- Pin label: 8.5 ± 0.15
- Pin label: 7.5 ± 0.15
- Pin label: 0.4 ± 0.05
- Pin label: 2 ± 0.5
- Pin label: 4.55 ± 0.5
- Pin label: 5.6 ± 0.2
- Pin label: 4.5 ± 0.2
- Pin label: 9.6 ± 0.2
- Pin label: 14.45 ± 0.5

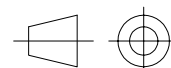
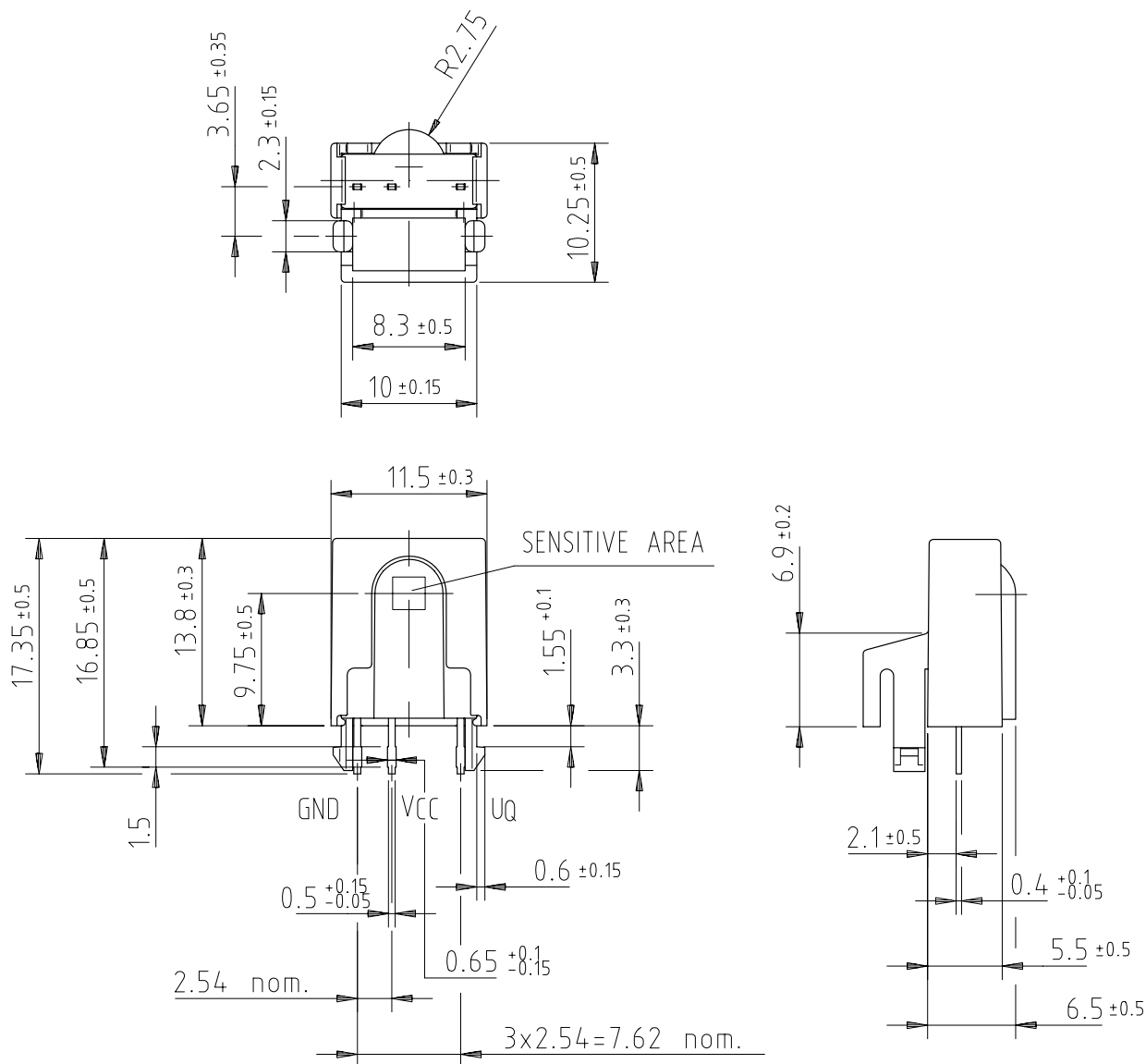
Legend:

- Technical drawings according to DIN specifications

Dimensions of TSOP17..GL1 in mm



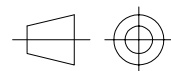
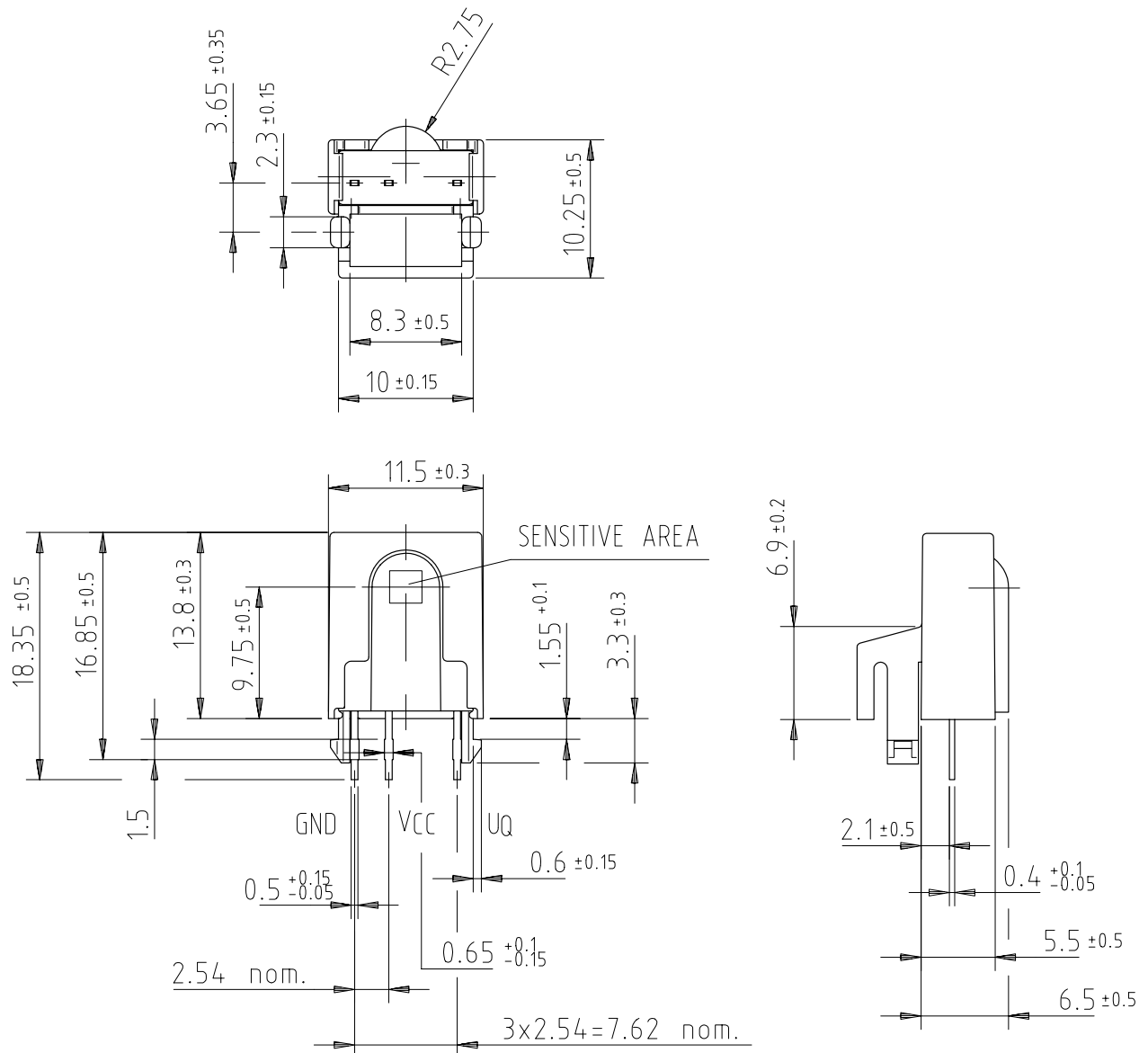
Dimensions of TSOP17..KA1 in mm



technical drawings
according to DIN
specifications

12783

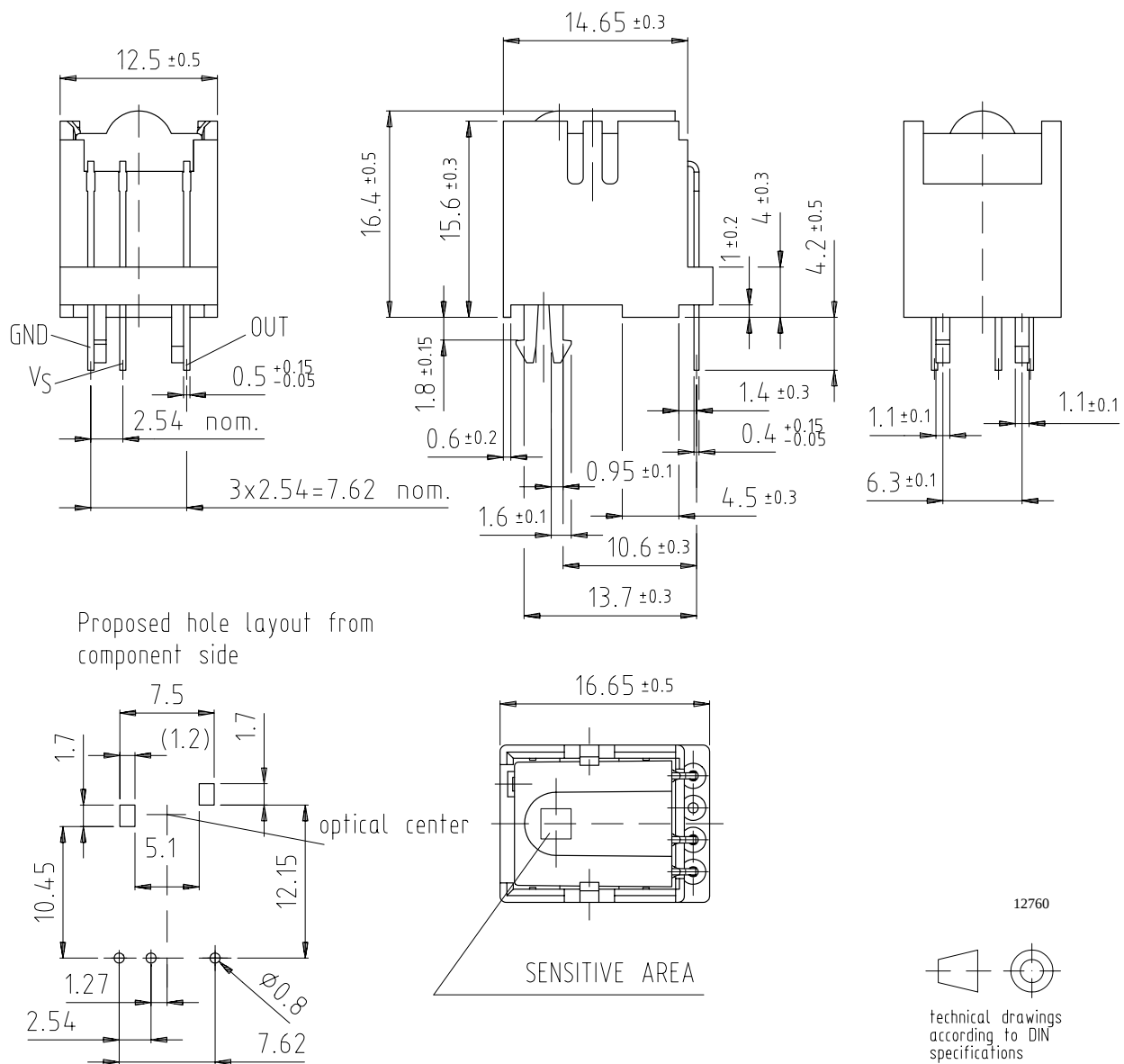
Dimensions of TSOP17..KD1 in mm



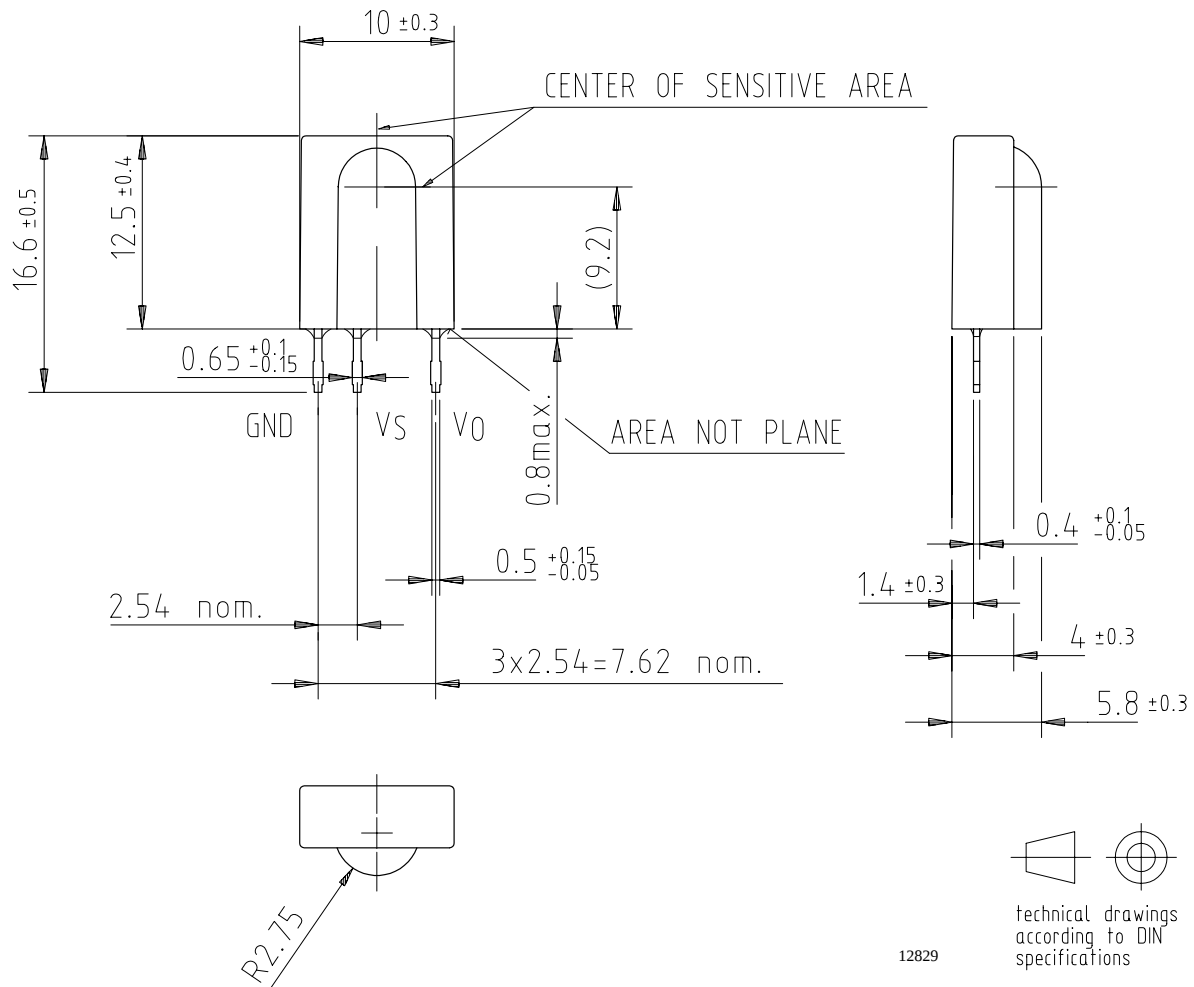
technical drawings
according to DIN
specifications

12823

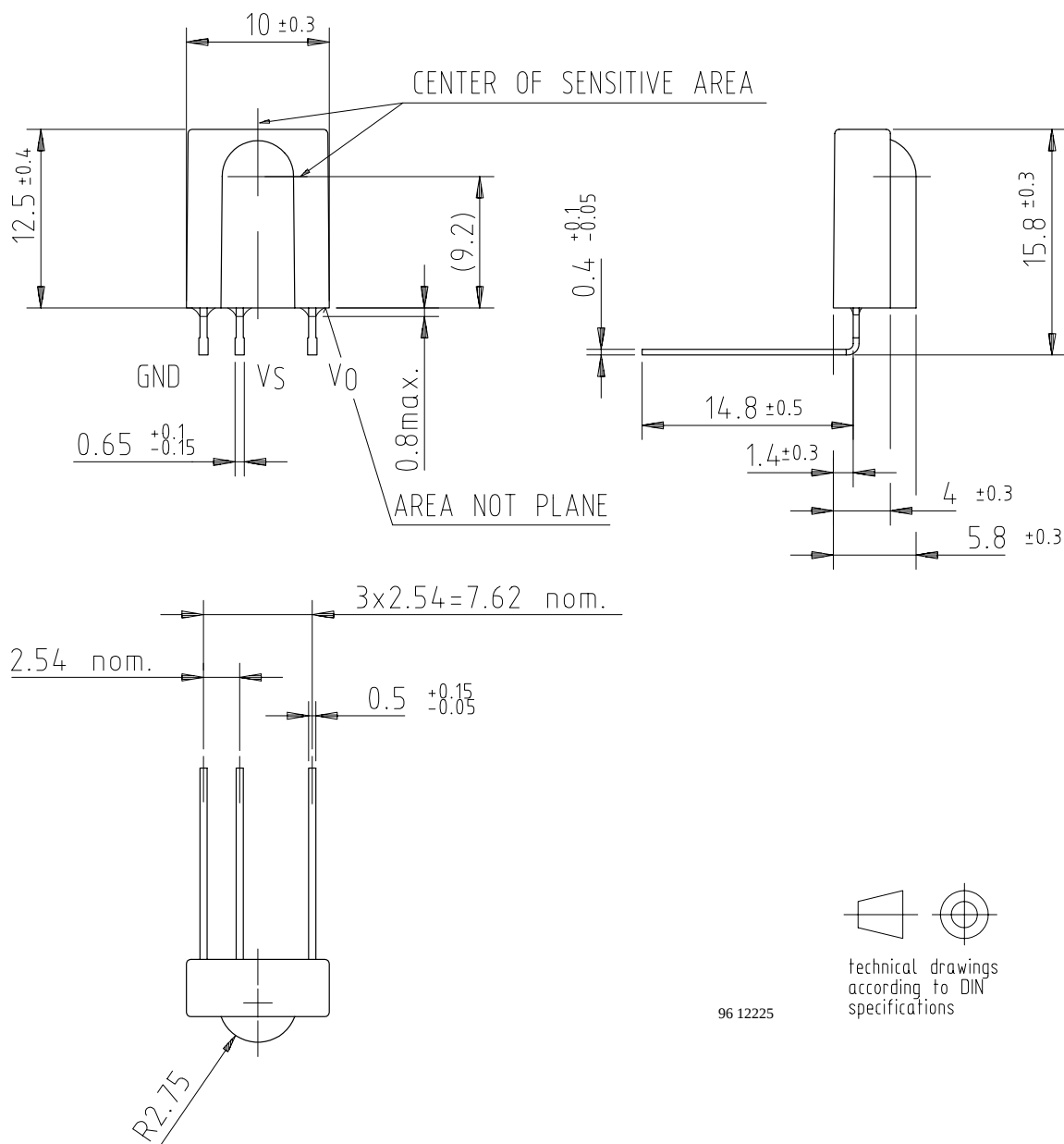
Dimensions of TSOP17..RF1 in mm



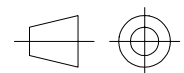
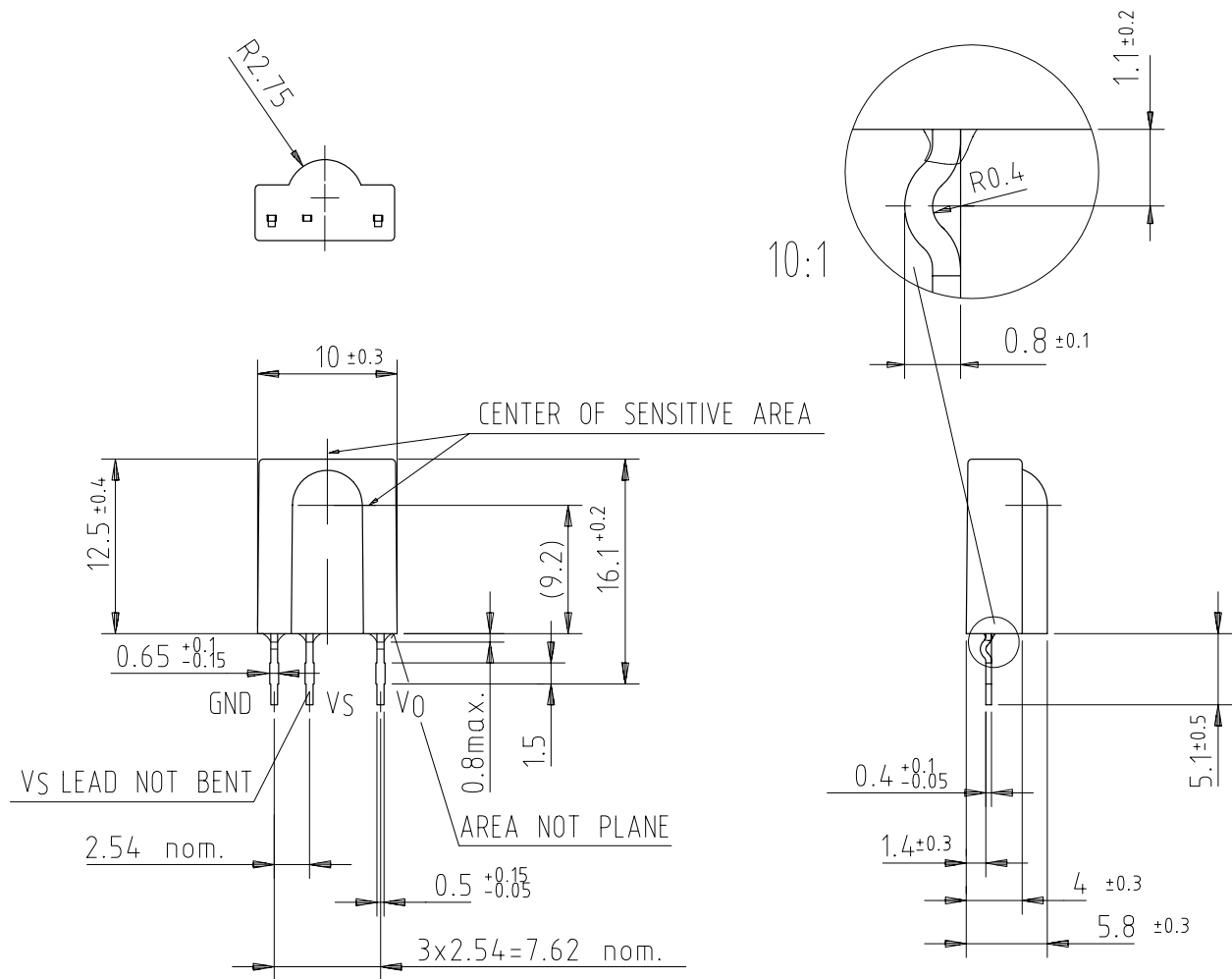
Dimensions of TSOP17..SA1 in mm



Dimensions of TSOP17..SB1 in mm



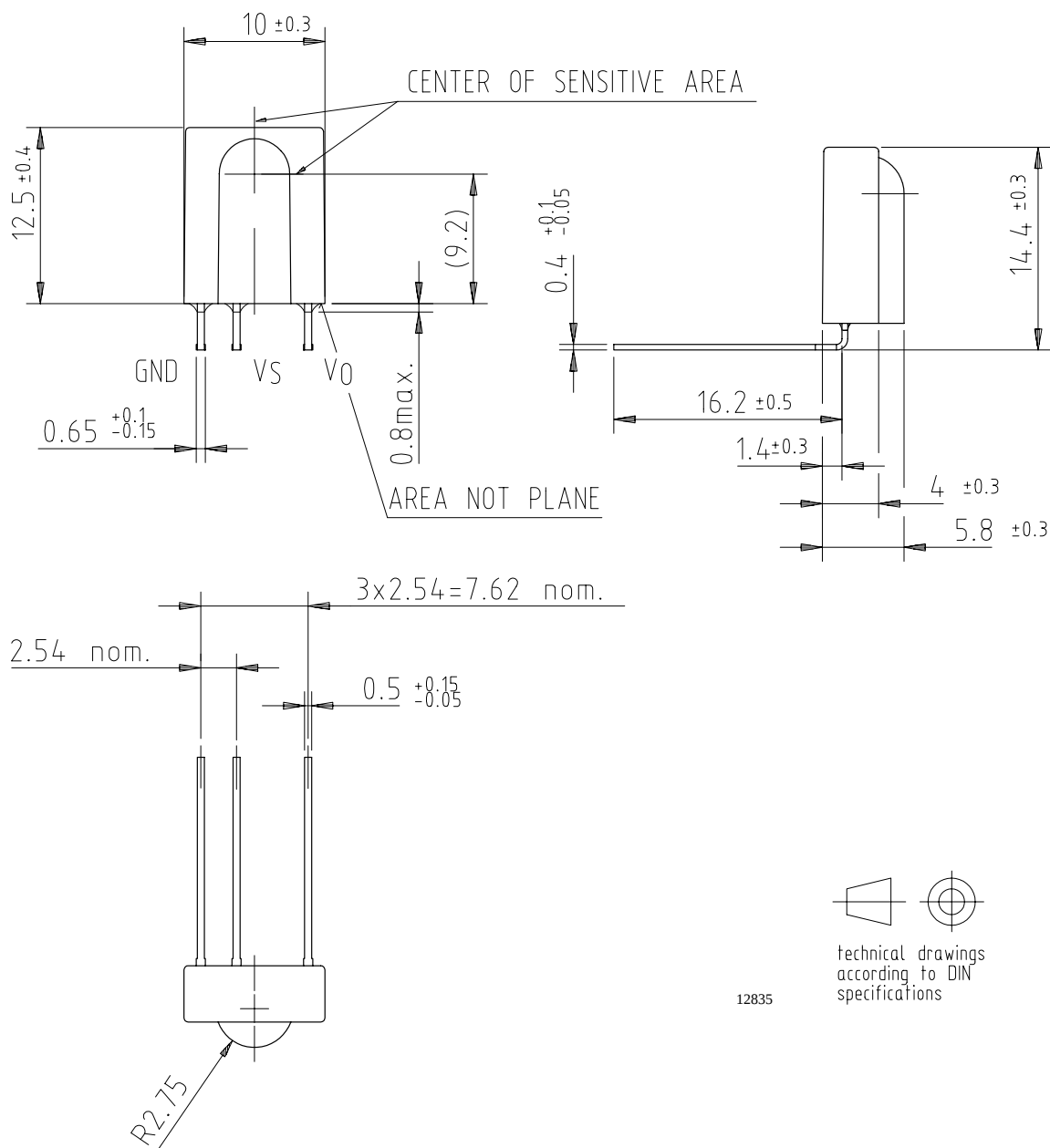
Dimensions of TSOP17..SE1 in mm



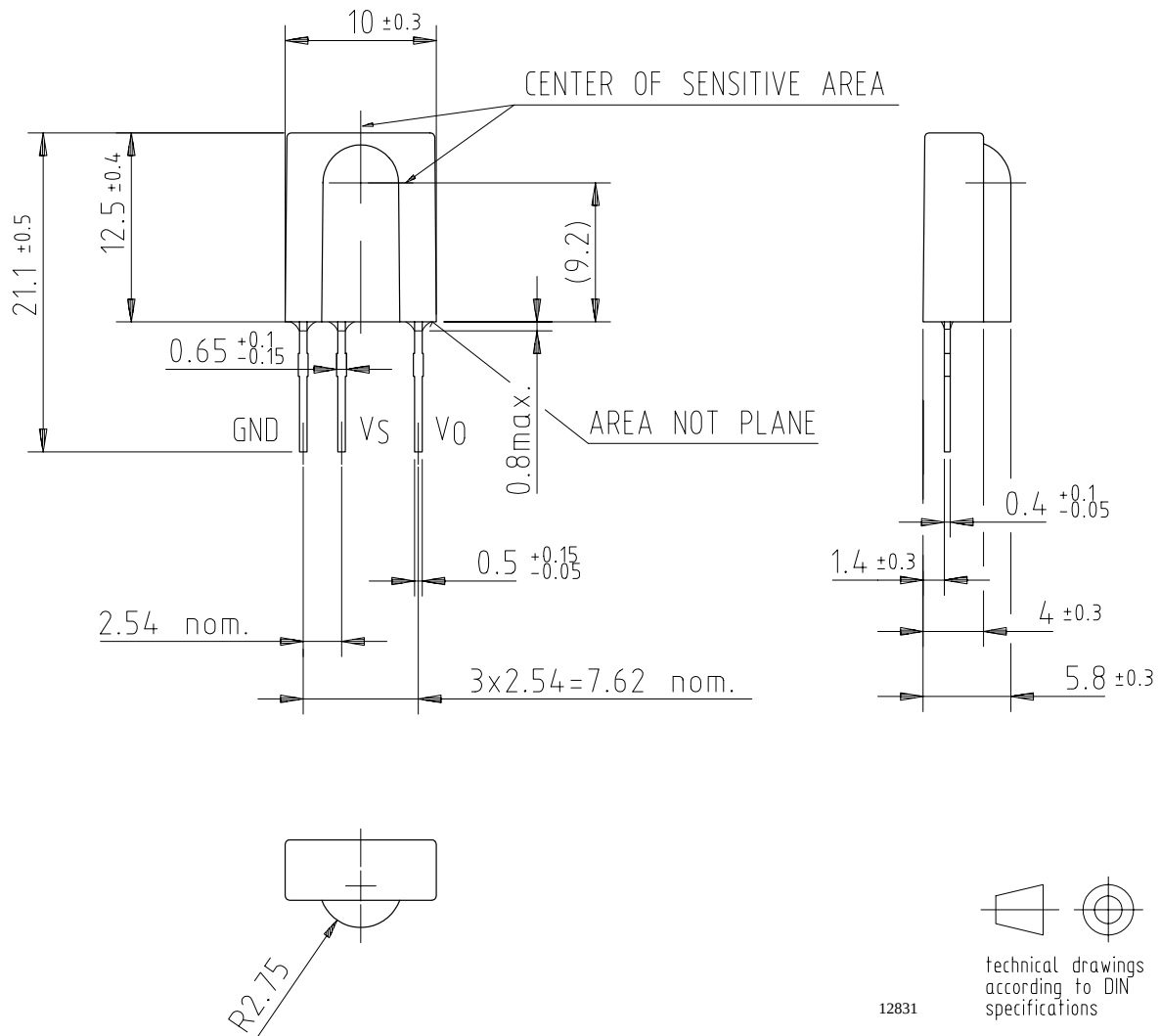
technical drawings
according to DIN
specifications

12830

Dimensions of TSOP17..SF1 in mm



Dimensions of TSOP17..SK1 in mm



Technical drawing of the SMD package for the SSM2165, showing dimensions in millimeters.

Top View Dimensions:

- Overall width: 14.1 ± 0.5
- Distance from left edge to center of pins: 12.5 ± 0.5
- Distance from center of pins to right edge: 9.4 ± 0.2
- Pin pitch: 2.54 nom.
- Distance from left edge to first pin: 0.5 ± 0.15
- Distance between pins: 0.8 ± 0.1
- Distance from last pin to right edge: 0.8 ± 0.1
- Overall length: $3 \times 2.54 = 7.62 \text{ nom.}$
- Radius of the central cutout: $R2.15$

Bottom View Dimensions:

- Overall width: 13.6 ± 0.5
- Distance from left edge to center of pins: 12.5 ± 0.5
- Distance from center of pins to right edge: 9.4 ± 0.2
- Pin pitch: 2.54 nom.
- Distance from left edge to first pin: 0.5 ± 0.15
- Distance between pins: 0.8 ± 0.1
- Distance from last pin to right edge: 0.8 ± 0.1
- Overall length: $3 \times 2.54 = 7.62 \text{ nom.}$
- Radius of the central cutout: $R2.15$

Side View Dimensions:

- Overall height: 19.2 ± 0.3
- Distance from top edge to center of pins: 15.4 ± 0.3
- Distance from center of pins to bottom edge: 3.8 ± 0.3
- Distance from top edge to first pin: 18.5 ± 0.3
- Distance from center of pins to first pin: 15 ± 0.3
- Distance from center of pins to last pin: 11 ± 0.3
- Distance from last pin to bottom edge: 0.8 ± 0.3
- Distance from top edge to last pin: 3.25 ± 0.15
- Distance from center of pins to last pin: 3.25 ± 0.15
- Distance from last pin to bottom edge: 3.05 ± 0.15
- Distance from top edge to center of pins: 15.4 ± 0.3
- Distance from center of pins to bottom edge: 3.8 ± 0.3
- Distance from top edge to first pin: 18.5 ± 0.3
- Distance from center of pins to first pin: 15 ± 0.3
- Distance from center of pins to last pin: 11 ± 0.3
- Distance from last pin to bottom edge: 0.8 ± 0.3
- Distance from top edge to last pin: 3.25 ± 0.15
- Distance from center of pins to last pin: 3.25 ± 0.15
- Distance from last pin to bottom edge: 3.05 ± 0.15

Other Dimensions:

- Distance from top edge to center of pins: 15.4 ± 0.3
- Distance from center of pins to bottom edge: 3.8 ± 0.3
- Distance from top edge to first pin: 18.5 ± 0.3
- Distance from center of pins to first pin: 15 ± 0.3
- Distance from center of pins to last pin: 11 ± 0.3
- Distance from last pin to bottom edge: 0.8 ± 0.3
- Distance from top edge to last pin: 3.25 ± 0.15
- Distance from center of pins to last pin: 3.25 ± 0.15
- Distance from last pin to bottom edge: 3.05 ± 0.15

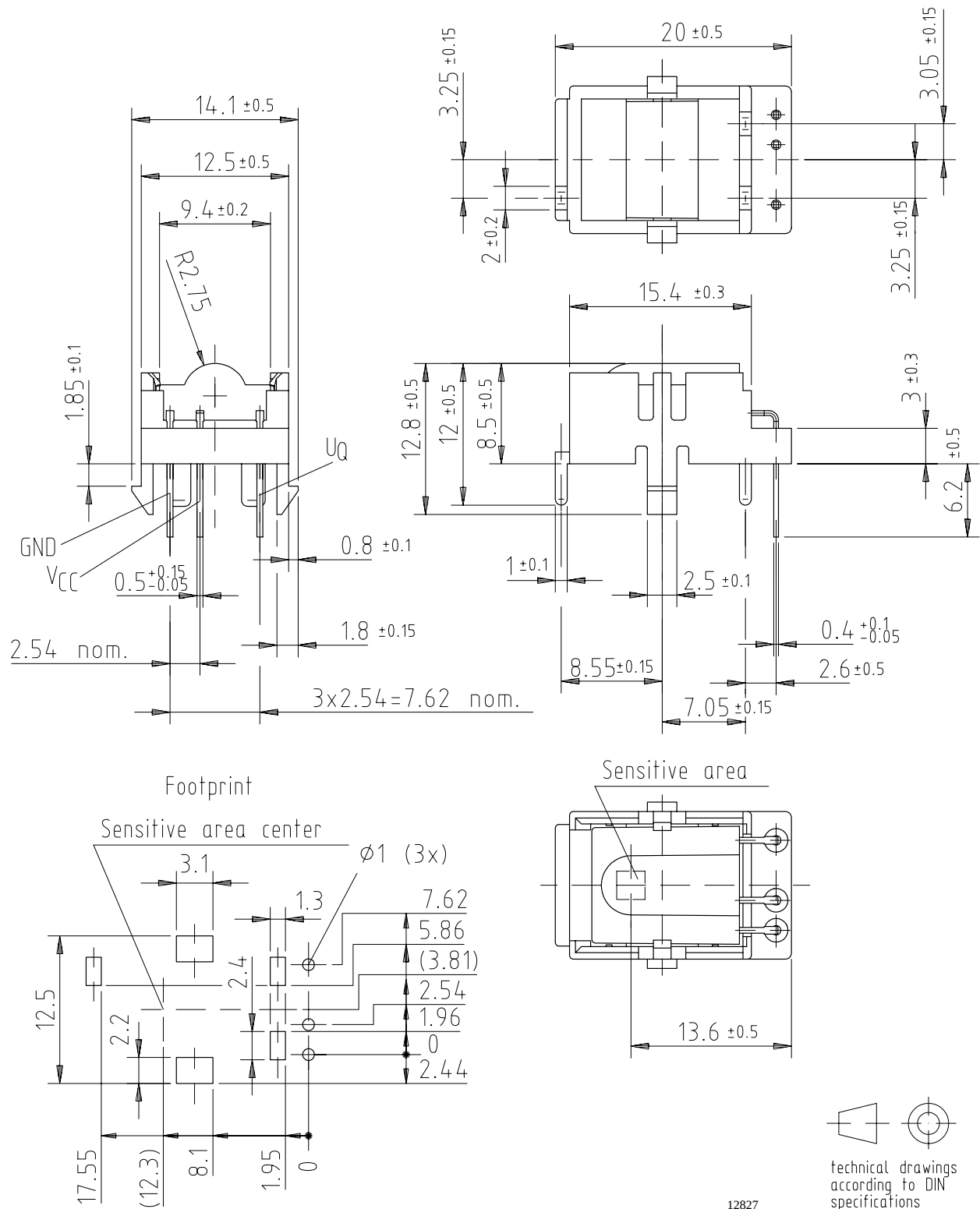
Notes:

- GND: Ground connection
- VCC: Power supply connection
- UQ: Sensitive area

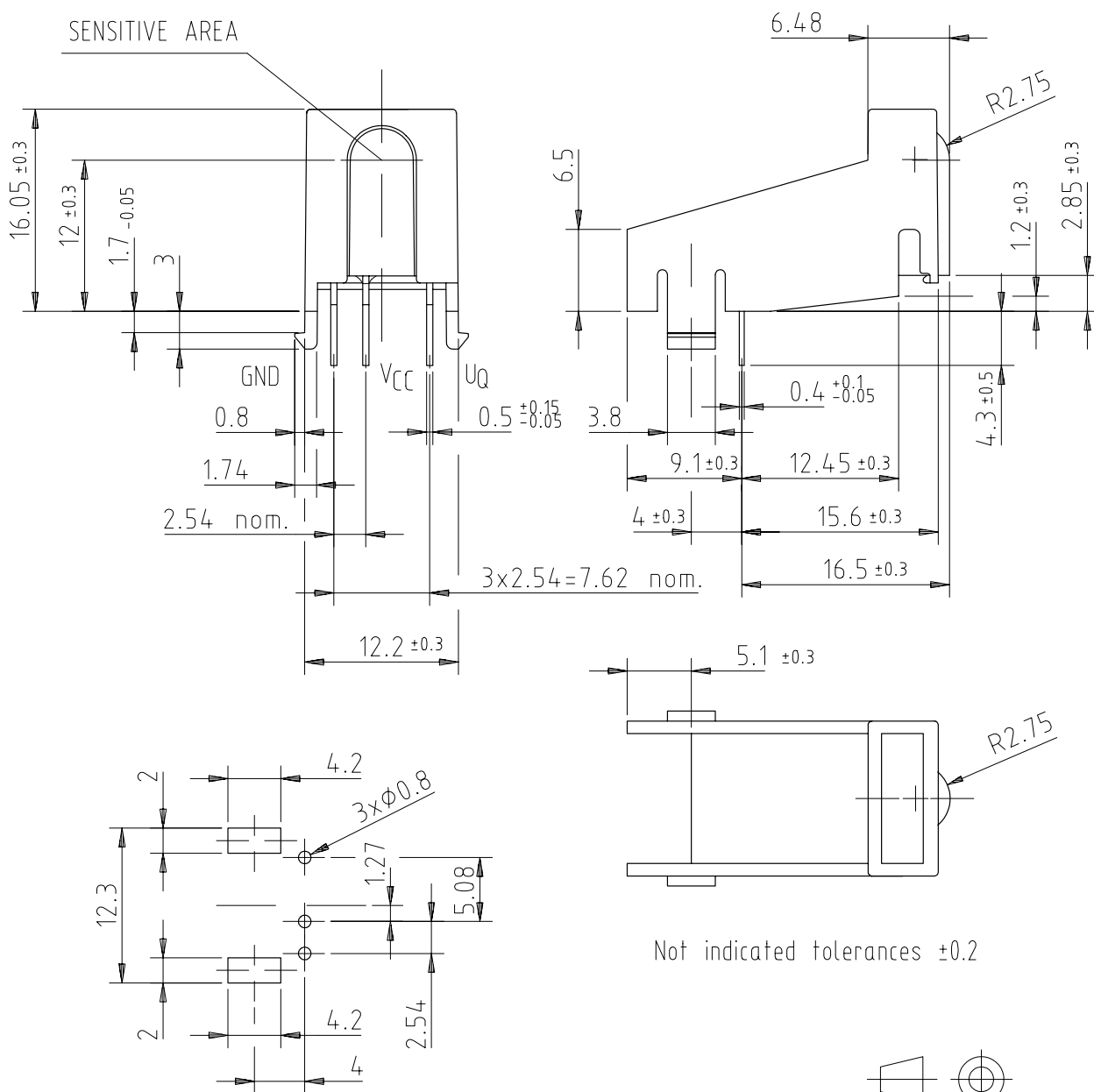
technical drawing according to DIN specifications

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Dimensions of TSOP17..UU1 in mm



Dimensions of TSOP17..WI1 in mm



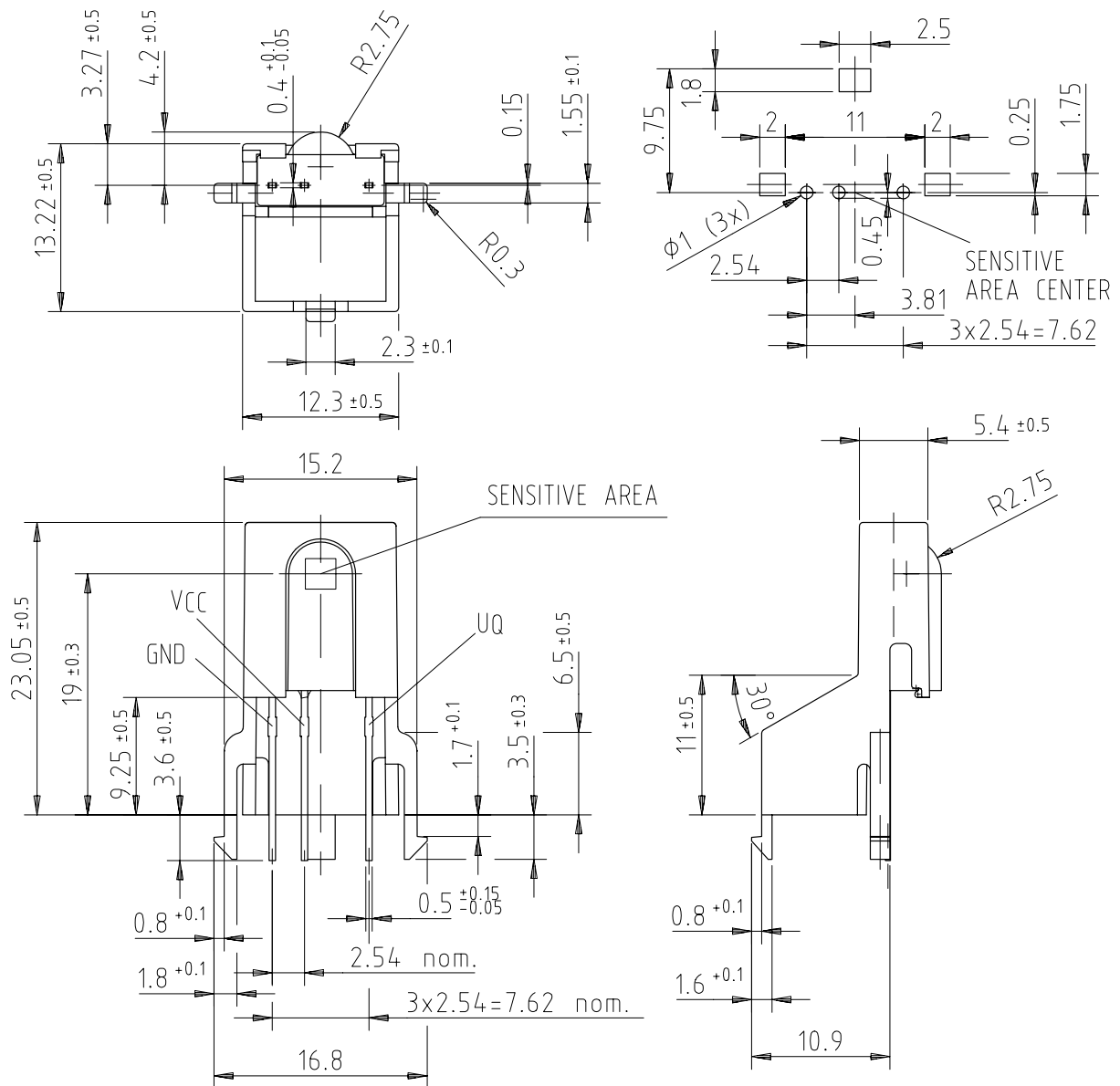
Recommended TEMIC installation dimension diagram

12828

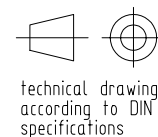
technical drawings
according to DIN
specifications

Dimensions of TSOP17..XG1 in mm

Recommended TEMIC installation dimension diagram
Mount.-side



Not indicated tolerances ± 0.2



96 12224

Ozone Depleting Substances Policy Statement

It is the policy of **TEMIC TELEFUNKEN microelectronic 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.

TEMIC TELEFUNKEN microelectronic GmbH semiconductor division 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.

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

We reserve the right to make changes to improve technical design and may do so without further notice.

Parameters can vary in different applications. All operating parameters must be validated for each customer application by the customer. Should the buyer use TEMIC products for any unintended or unauthorized application, the buyer shall indemnify TEMIC against all claims, costs, damages, and expenses, arising out of, directly or indirectly, any claim of personal damage, injury or death associated with such unintended or unauthorized use.

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