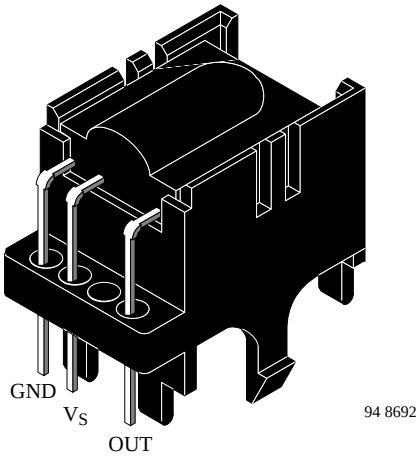
Photo Modules for PCM Remote Control Systems

Special series with short integration time for short burst codes or enhanced data rates

Available types for different carrier frequencies

Type	f_0	Type	f_0
TFMT 1300	30 kHz	TFMT 1330	33 kHz
TFMT 1360	36 kHz	TFMT 1370	36.7 kHz
TFMT 1380	38 kHz	TFMT 1400	40 kHz
TFMT 1560	56 kHz		



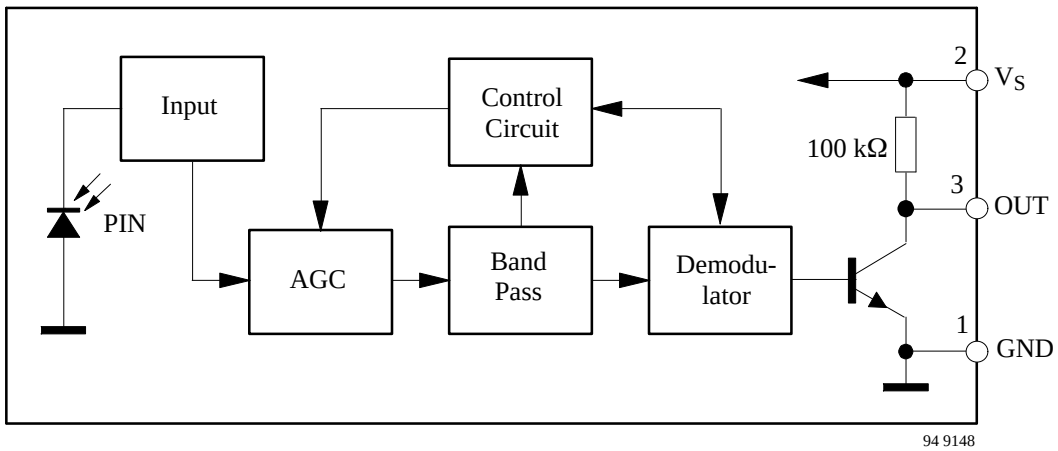
Description

The TFMT 1..0 – 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. The main benefit is the reliable function even in disturbed ambient and the protection against uncontrolled output pulses.

Features

- Receiver module for transmission codes with short bursts (N ≧ 6 pulses per bit)
- Photo detector and preamplifier in one package
- Output active low (active high modules: TFMT 1..9)
- Internal filter for PCM frequency
- High immunity against ambient light, optimized against burst noise
- Improved shielding against electric field disturbance
- 5 Volt supply voltage, low power consumption
- TTL and CMOS compatibility
- Low power consumption (typical 2.5 mW)
- 2.4 kbit/s data transmission rate possible (N=6, f_o=56 kHz)

Block Diagram



Absolute Maximum Ratings

T_{amb} = 25°C

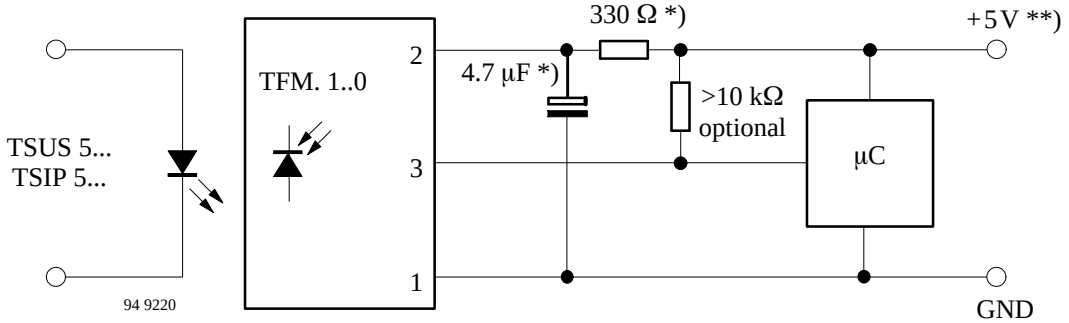
Parameter	Test Conditions	Symbol	Value	Unit
Supply Voltage	(Pin 2)	V_S	–0.3...6.0	V
Supply Current	(Pin 2)	I_S	5	mA
Output Voltage	(Pin 3)	V_O	–0.3...6.0	V
Output Current	(Pin 3)	I_O	5	mA
Junction Temperature		T_j	100	˚C
Storage Temperature Range		T_{stg}	–25...+85	˚C
Operating Temperature Range		T_{amb}	–25...+85	˚C
Power Consumption	(T_{amb} ≦ 85 ˚C)	P_{tot}	50	mW
Soldering Temperature	t ≦ 10 s	T_{sd}	260	˚C

Basic Characteristics

T_{amb} = 25°C

Parameter	Test Conditions	Symbol	Min	Typ	Max	Unit
Supply Current (Pin 2)	V_S = 5 V, E_v = 0	I_{SD}	0.4	0.5	0.8	mA
Supply Current (Pin 2)	V_S = 5 V, E_v = 40 klx, sunlight	I_{SH}		1.0		mA
Transmission Distance	E_v = 0, Test signal see Fig.7, IR diode TSIP5201, I_F = 1.5 A	d		32		m
Output Voltage Low (Pin 3)	I_{OSL} = 0.5 mA,E_e = 0.7 mW/m^2, f = f_o, Test signal see Fig.7	V_{OSL}			250	mV
Irradiance (30 – 40 kHz)	Test signal see Fig.7	$E_{e\ min}$		0.4	0.6	mW/m^2
Irradiance (56 kHz)	Test signal see Fig.7	$E_{e\ min}$		0.45	0.7	mW/m^2
Irradiance	Test signal see Fig.7	$E_{e\ max}$	20			W/m^2
Directivity	Angle of half transmission distance	$\varphi_{1/2}$		±55		deg

Application Circuit



*) only necessary to supress power supply disturbances
**) tolerated supply voltage range : 4.5 V < V_S < 5.5 V

Typical Characteristics (T_{amb} = 25°C unless otherwise specified)

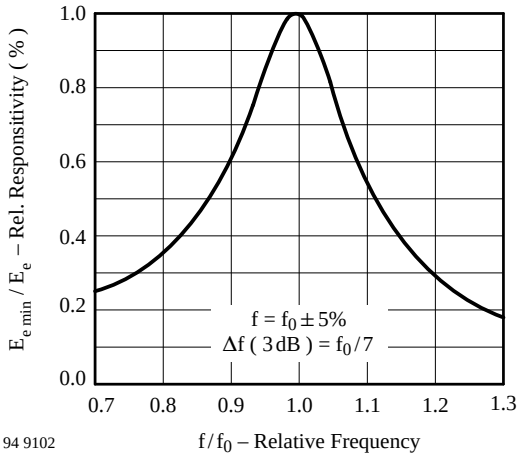


Figure 1 : Frequency Dependence of Responsivity

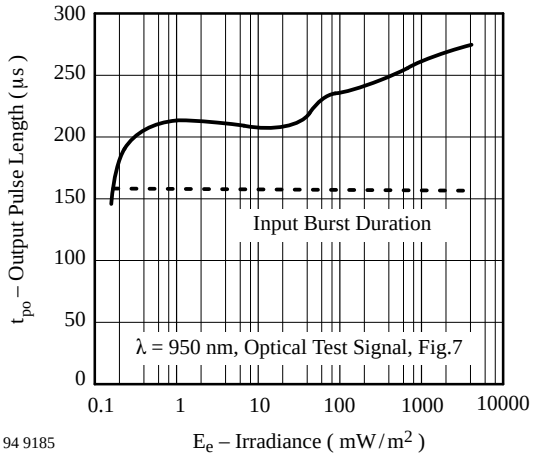


Figure 2 : Sensitivity in Dark Ambient

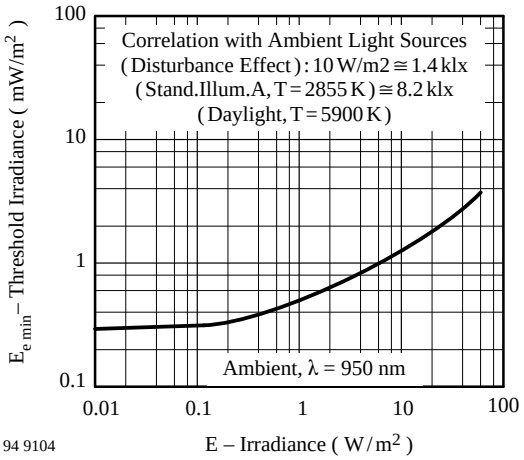


Figure 3 : Sensitivity in Bright Ambient

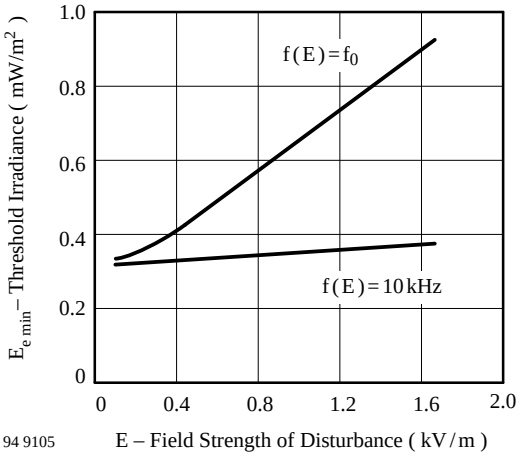


Figure 4 : Sensitivity vs. Electric Field Disturbances

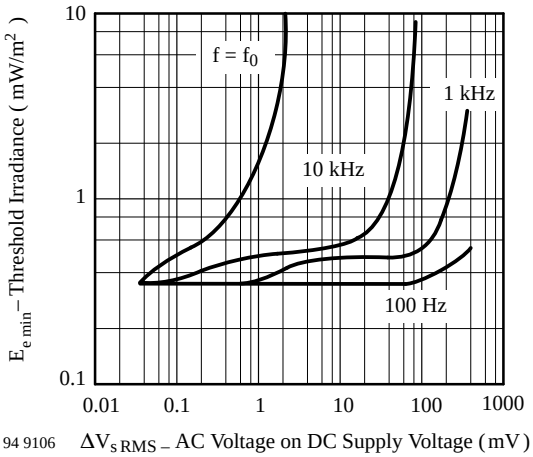


Figure 5 : Sensitivity vs. Supply Voltage Disturbances

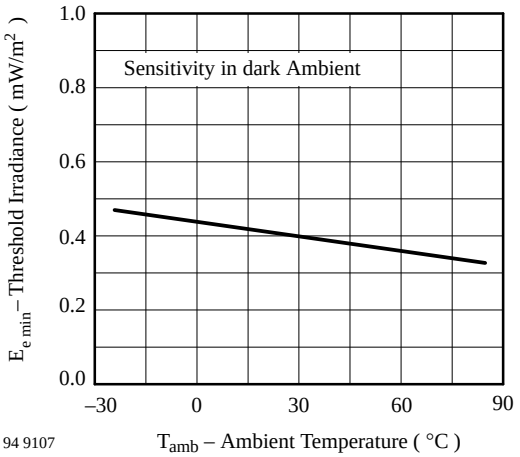
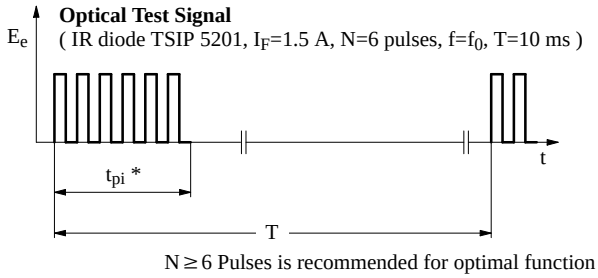


Figure 6 : Sensitivity vs. Ambient Temperature



N ≥ 6 Pulses is recommended for optimal function

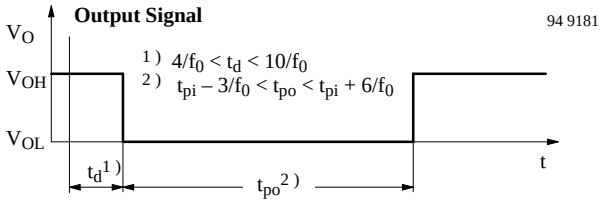
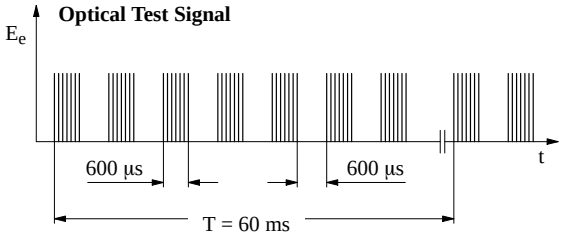


Figure 7 : Output Function



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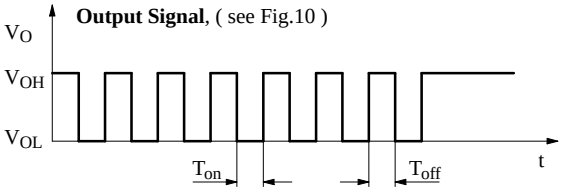


Figure 8 : Output Function

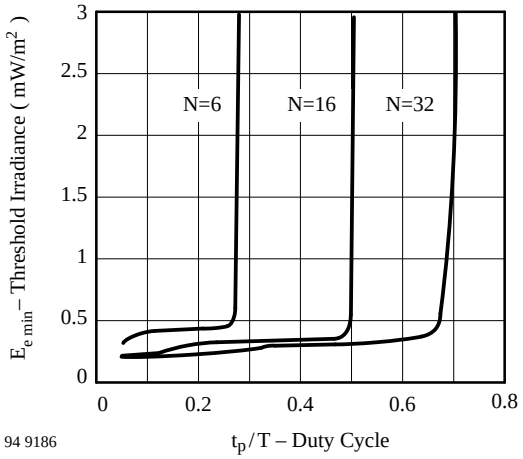


Figure 9 : Sensitivity vs. Duty Cycle

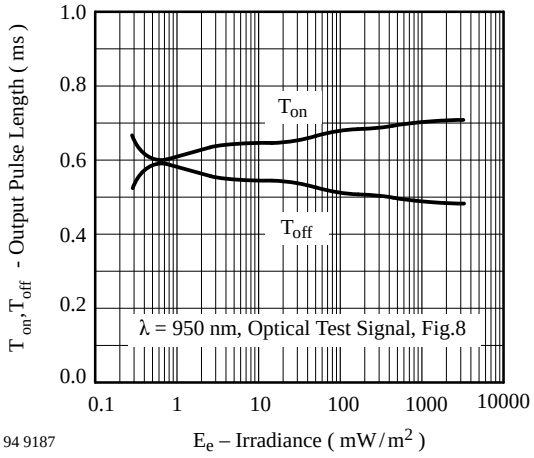


Figure 10 : Output Pulse Diagram

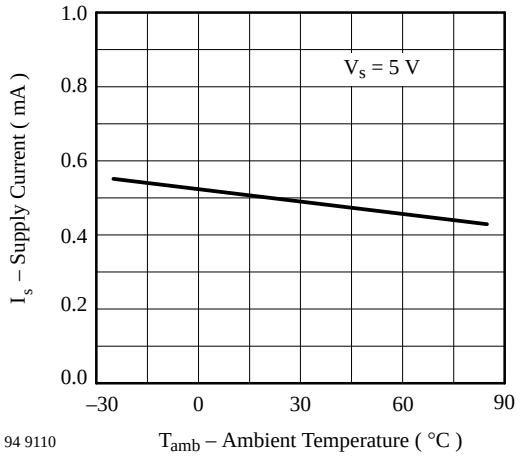


Figure 11 : Supply Current vs. Ambient Temperature

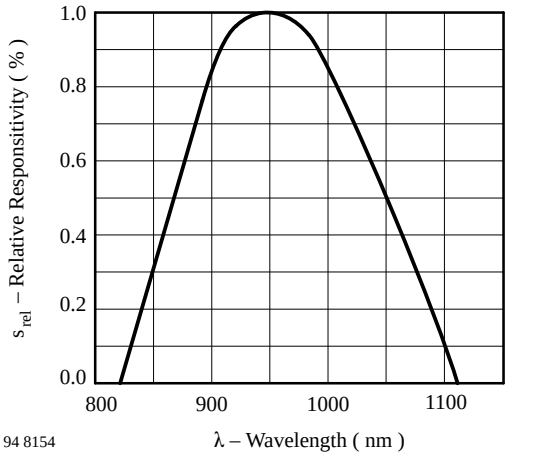


Figure 12 : Spectral Response

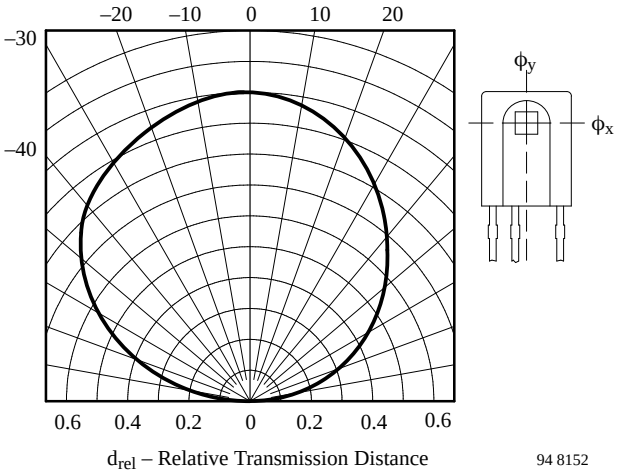


Figure 13 : Vertical Directivity φ_y

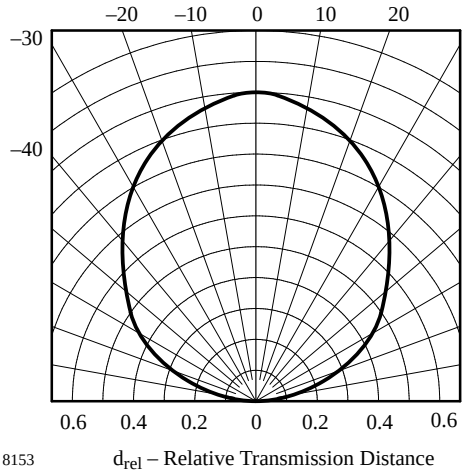
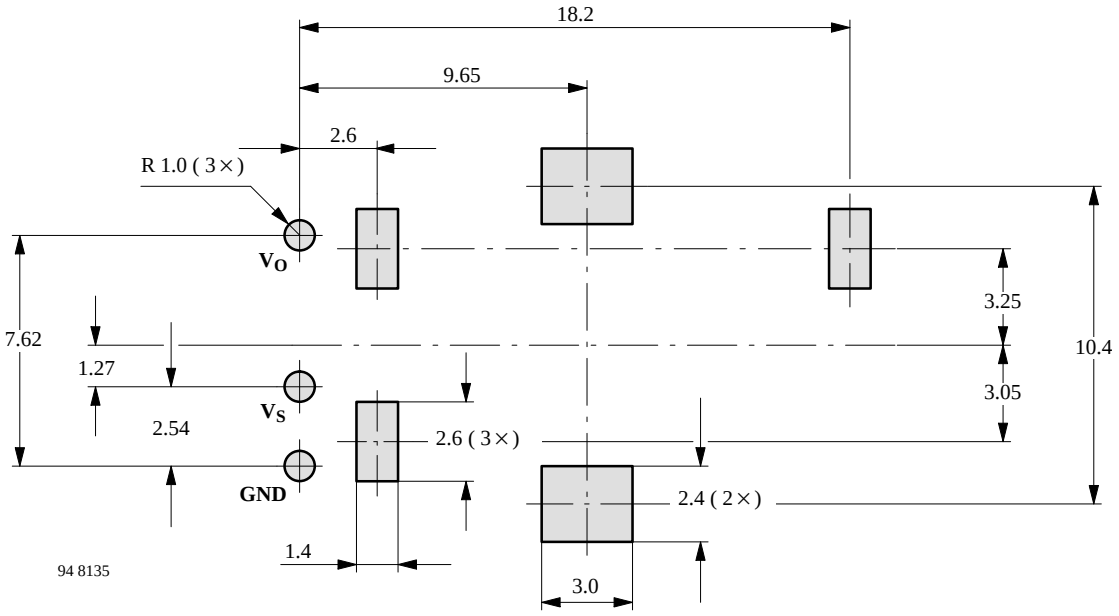
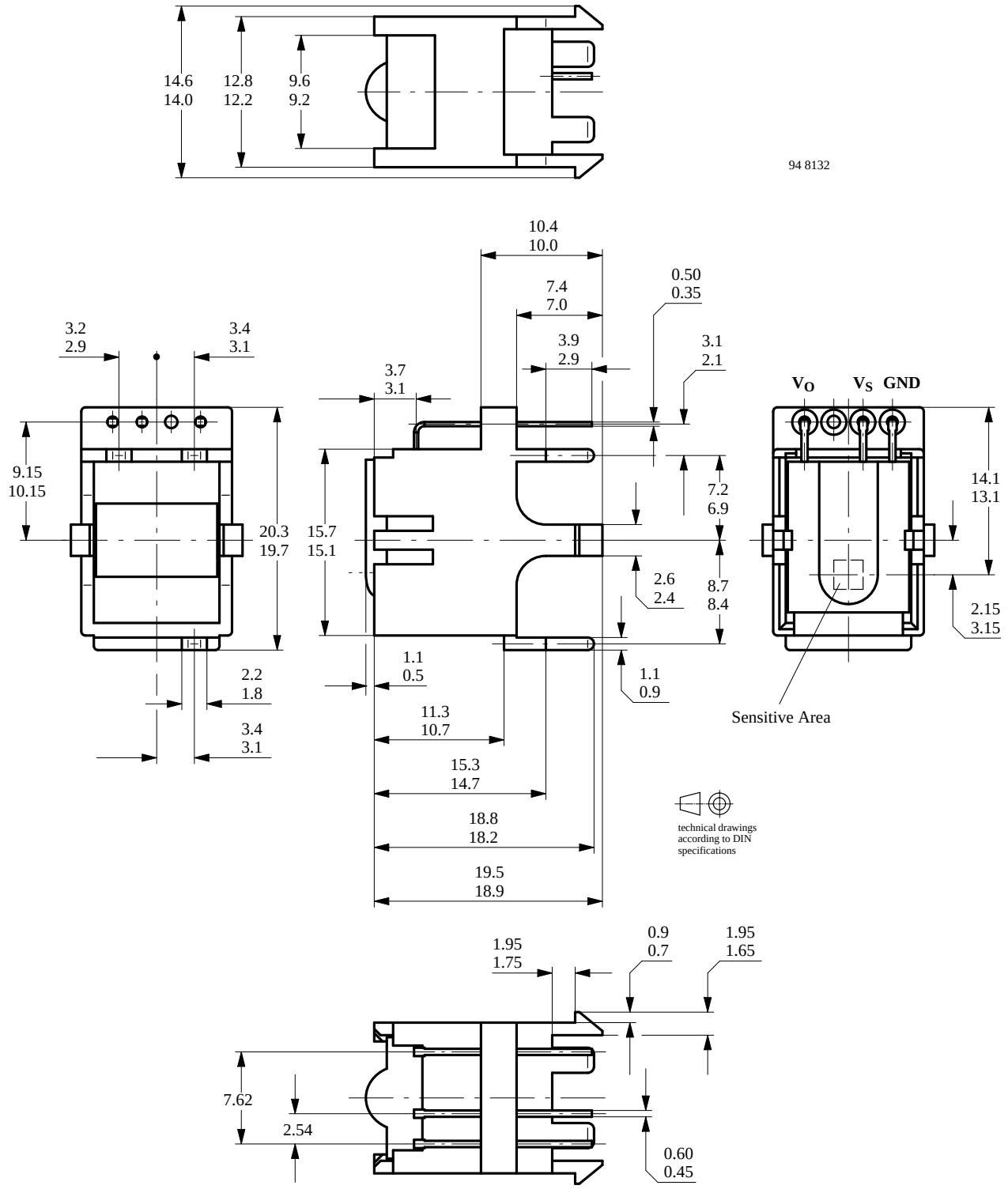


Figure 14 : Horizontal Directivity φ_x

Board Hole Diagram (Solder side, dimensions in mm, tolerances ±0.3 mm)



Dimensions in mm



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