Ground-Detecting Module

LT-GDM-37

Data Sheet

Rev: V1.0

Date：2025/2/21

Based on Packaging and Testing Sensing the Future
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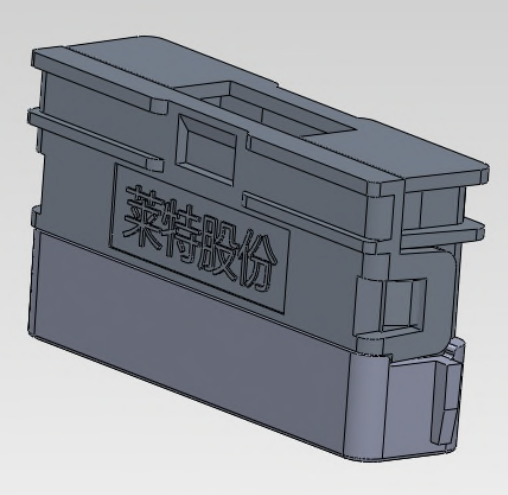
Revision History

Rev	Modify Content	Date
V1.0	New issue	2025/2/21

Catalogue

LT-GDM-37



Ground-Detecting Module

Measuring range: 5-120mm

Output: current value

Feature

★ Dimension: 32.0mm × 8.4mm × 15.65mm
★ Light source wavelength: 940nm
★ Accuracy: Different materials and different colors of the floor
★ Operating Temperature: -10℃~60℃
★ Fast response time
★ Low power consumption
★ Lead-free, RoHS compliant

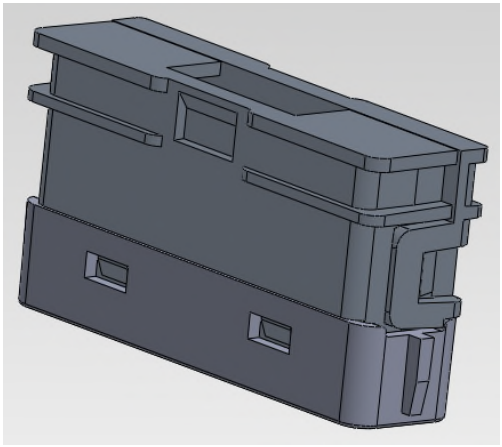
Application

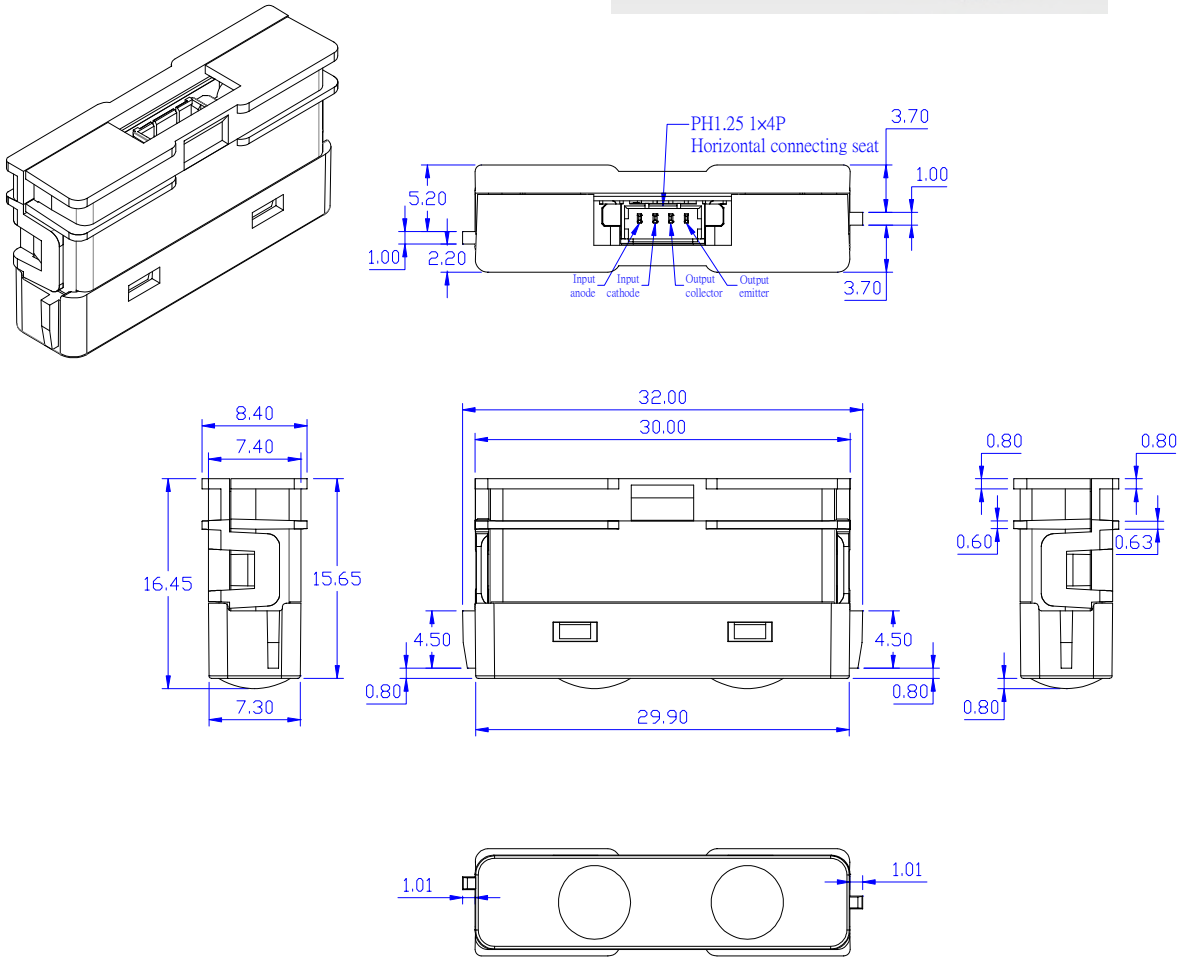
★ Sweeping robot

Product Description

The LT-GDM-37 consists of an IR LED(940nm), a PT detector and a special optical design lens. After the light beam emitted by the LED is illuminated by the lens to the obstacles on the ground and reflected, it is received by the PT detector after focusing through the lens. The signal through the PT terminal is amplified and processed by the host MCU and calculated to judge the state of the ground. The sensor has the characteristics of reliable operation, low power consumption, high sensitivity and high detection accuracy. In particular, it has good measurement consistency for ground objects of different materials and different colors.

● Dimension (unit: mm)





Note:

1. All dimensions are in millimeters.
2. Tolerance is ±0.20mm unless otherwise noted.

● Absolute Maximum Ratings at Ta=25℃

Parameter		Symbol	Ratings	Unit
Input	Power Dissipation	Pd	170	mW
	Reverse Voltage	V_R	5	V
	Forward Current	I_F	100	mA
	Peak Forward Current*1	I_{FP}	250	mA
Output	Collector Power Dissipation	Pc	75	mW
	Collector Current	I_C	20	mA
	Collector-Emitter Voltage	V_{CEO}	30	V
	Emitter-Collector Voltage	V_{ECO}	5	V
Electrostatic Discharge (HBM)		ESD	4000	V
Operating Temperature Range		T_{opr}	-10℃ to + 60℃	℃
Storage Temperature Range		T_{stg}	-30℃ to + 70℃	℃

Note: 1. Pulse width≤0.1msec, duty cycle≤1/10.

● Electrical Optical Characteristics at Ta=25℃

Input						
Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Condition
Peak Wavelength	λp	---	940	---	nm	I_F=50mA
Forward Voltage	V_F	---	1.35	1.60	V	I_F=50mA
Reverse Current	I_R	---	---	10	μA	V_R=5V

Output						
Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Condition
Collector-Emitter Breakdown Voltage	BV_{CEO}	30	---	---	V	I_C=0.1mA Ee=0mW/cm^2
Emitter-Collector Breakdown Voltage	BV_{ECO}	5	---	---	V	I_E=0.1mA Ee=0mW/cm^2
Collector-Emitter Saturation Voltage	$V_{CE(SAT)}$	---	---	0.4	V	I_C=2mA Ee=1.0mW/cm^2
Rise Time	T_r	---	15	---	μs	V_{CC}=5V R_L=1KΩ I_C=1mA
Fall Time	T_f	---	15	---	μs	
Collector Dark Current	I_{CEO}	---	---	100	nA	V_{CE}=10V Ee=0mW/cm^2
On State Collector Current	$I_{C(ON)}$	1.0	5.0	---	mA	V_{CE}=5V I_F=20mA

● ADC value standard

★ The distance from the Ground-Detecting Module to the black carpet is 45mm;

★ The distance from the Ground-Detecting Module to the white paper is 110mm;

★ The black carpet ADC value minus the white paper ADC value＞200;

★ The white paper ADC value TBD;

★ The black carpet and the white paper are provided by customer.

● installation instructions

★ Module should be installed vertically;

★ Module detection end can’t have other optical components that affect the light path;

★ The two modules cannot interfere with each other.

● Usage and instructions

1. Design and use

★ Do not use in liquids, such as water, organic solvents, etc;

★ Do not exert too much force on the module, so as not to damage the plastic shell, lens and other parts;

★ When designing the interface plug-in, be sure to pay attention to the interface direction of the plug-in to avoid the interface direction being reversed;

★ The best distance between the module and the ground is about 20mm;

★ Misjudgment may occur on cobblestone or wool cement floors.

2. Store what you know

★ Do not store in corrosive environment, avoid strong light exposure.

The performance parameters and test methods specified in this specification are mainly for the detection needs of ground materials for products such as sweeping robot. Please read this specification carefully before applying this product to your designed products. Please contact us for any non-such application scenarios.

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