

LEADTEK GPS MODULE LR9548S Specifications Sheet

Features:

- ▶ *SiRF StarIII low power chipset*
- ▶ *Compact module size for easy integration : 24 x 20 x 2.9 mm*
- ▶ *Multiple I/O pins reserved for customizing special user applications*
- ▶ *RoHS compliance (lead-free)*



Revision History:			
Revision	Release Date	Issuer	Change Description
1.7	2008/05/15	M. Huang	Modify operation temperature range and product dimension tolerance



Introduction

The Leadtek LR9548S GPS module is a high sensitivity, low power, Surface Mount Device (SMD). This 20-channel global positioning system (GPS) receiver is designed for a wide range of OEM applications and is based on the GPS signal search capabilities of the SiRFstarIII™ low power single chipset, SiRF's newest chipset technology. The LR9548S is also pin-to-pin compatible with the LR9805-III (LR9548) for easier and faster transition.

The LR9548S is designed to allow quick and easy integration into GPS-related applications such as:

- ▶ PDA, Pocket PC, and other computing devices
- ▶ Car and Marine Navigation
- ▶ Fleet Management /Asset Tracking
- ▶ AVL and Location-Based Services
- ▶ Hand-Held Device for Personal Positioning and Navigation

Features

Hardware and Software

- ▶ Based on the high performance features of the SiRFstarIII low power single chipset
- ▶ Compact module size for easy integration: 24x20x2.9 mm (0.94x0.79x0.11 in)
- ▶ Fully automatic assembly: reflow solder assembly ready
- ▶ Hardware compatible with SiRF GSW3 v3.2.4 software
- ▶ Multiple I/O pins reserved for customizing special user applications
- ▶ RoHS compliance

Performance

- ▶ Cold/Warm/Hot Start Time: 42/38/1 sec. at open sky and stationary environments.
- ▶ Reacquisition Time: 0.1 second
- ▶ RF Metal Shield for best performance in noisy environments
- ▶ Multi-path Mitigation Hardware

Interface

- ▶ TTL level serial port for GPS communications interface
- ▶ Protocol: NMEA-0183/SiRF Binary (default NMEA)
- ▶ Baud Rate: 4800,9600,19200,38400,57600 bps

Advantages

- ▶ Ideal for high volume mass production(Taping reel package)
- ▶ Cost saving through elimination of RF and board to board digital connectors
- ▶ Flexible and cost effective hardware design for different application needs
- ▶ Secure SMD PCB mounting method

Specifications

Technical Specifications

Feature	Item	Description
Chipset	GSC3f	SiRFstarIII low power single chipset
General	Frequency	L1, 1575.42 MHz
	C/A code	1.023 MHz chip rate
	Channels	20
Accuracy	Position	10 meters, 2D RMS < 5 meters 2D RMS, WAAS corrected
	Velocity	0.1 meters/second
	Time	1 microsecond synchronized to GPS time
Datum	Default	WGS-84
	Other	selectable for other Datum
Time to First Fix (TTFF) (Open Sky & Stationary Requirements)	Reacquisition	0.1 sec., average
	Snap start	1 sec., average
	Hot start	1 sec., average typical TTFF
	Warm start	38 sec., average typical TTFF
Dynamic Conditions	Cold start	42 sec., average typical TTFF
	Altitude	18,000 meters (60,000 feet) max.
	Velocity	515 meters/second (1000 knots) max.
	Acceleration	4g, max.
Power	Jerk	20 meters/second ³ , max.
	Main power input	3.3 ~ 5.0 VDC input
	Power consumption	≈165 mW (continuous mode)
	Supply Current	≈49 mA
Serial Port	Backup Power	1.65 ~ 5.0 VDC input.
	Electrical interface	Two full duplex serial TTL interface.
Time-1PPS Pulse	Protocol messages	NMEA-0183@4800 bps (Default)
	Level	TTL
Time-1PPS Pulse	Pulse duration	The 1PPS pulse width is 1 μs, this 1PPS is NOT suited to steer various oscillators (timing receivers, telecommunications system, etc).
	Time reference	At the pulse positive edge.
	Measurement	Aligned to GPS second, ±1 microsecond

Environmental Characteristics

Items	Description
Operating temperature range	-30 deg. C to +85 deg. C
Storage temperature range	-55 deg. C to +100 deg. C

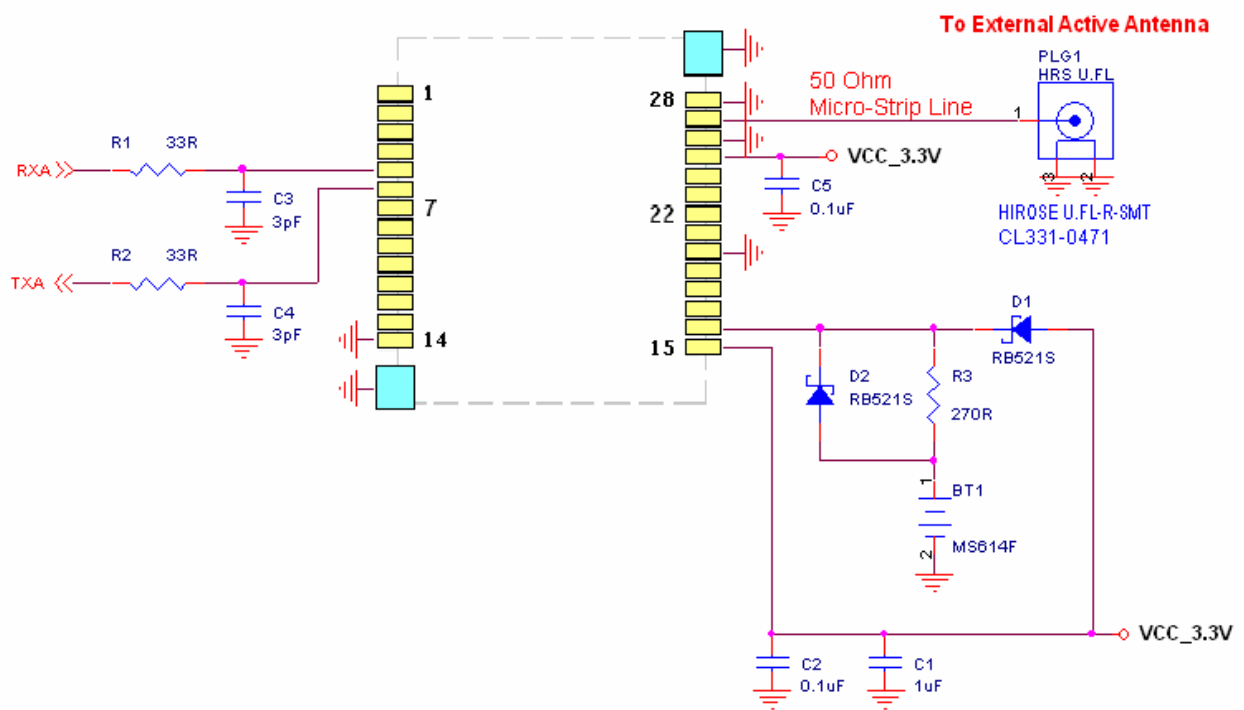
Physical Characteristics

Items	Description
Length	24 mm \pm 0.3mm (0.94in)
Width	20 mm \pm 0.3mm (0.79 in)
Height	2.9 mm \pm 0.3mm (0.11 in)
Weight	2.5g

Interface Specifications

Items	Description
I/O	28 pin SMD micro package

Reference Design



- All ground pads attach directly to ground plane by way of via.
- All components are reference only.

Software

The Leadtek LR9548S module includes GSW3.2.4, the SiRF standard GPS software for SiRFstarIII low power single chipset receivers. Features include:

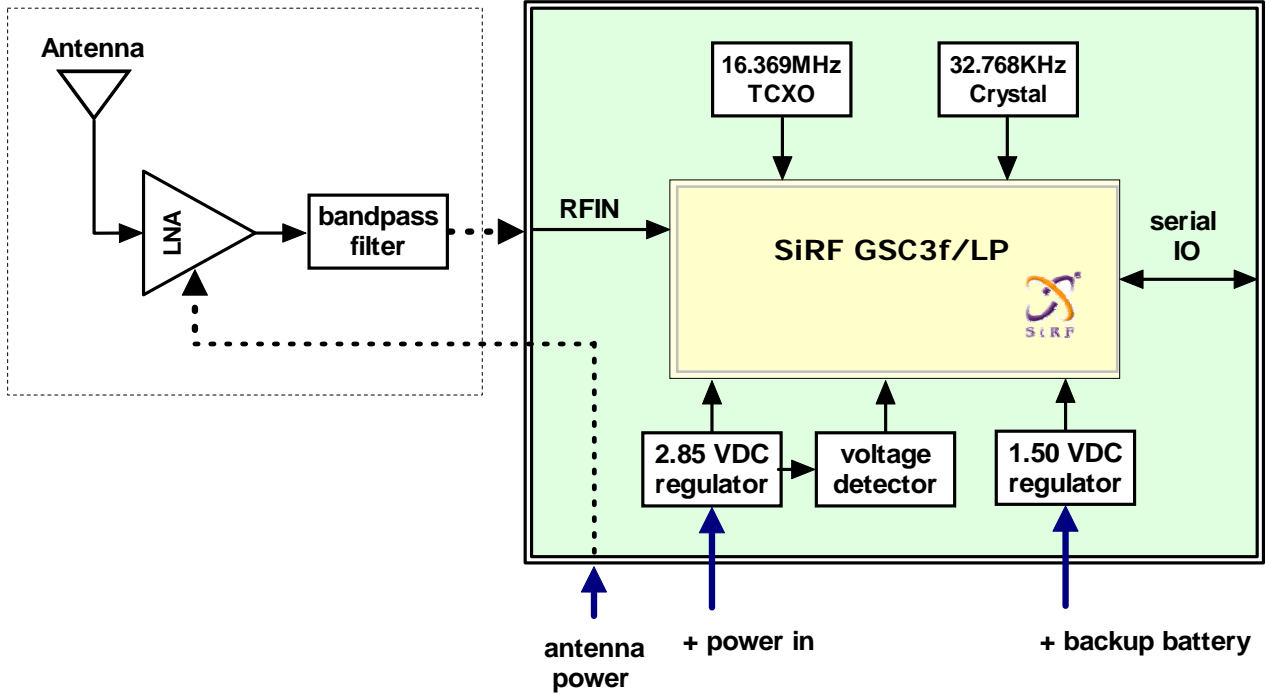
- ▶ Excellent sensitivity
- ▶ High configurability
- ▶ 1 Hz position update rate
- ▶ Supports use of satellite-based augmentation systems like the US WAAS or European EGNOS system
- ▶ Real-time Operating System (RTOS) friendly
- ▶ Capable of outputting either NMEA(default) or SiRF proprietary binary protocols
- ▶ Designed to accept custom user tasks executed on the integrated ARM7TDM1 processor
- ▶ Runs in full power operation (default) or optional power saving modes
- ▶
- ▶ Default configuration is as follows:

Item	Description
Core of firmware	SiRF GSW3.2.4
Baud rate	4800,9600,19200,38400,57600 bps
Code type	NMEA-0183 ASCII
Datum	WGS-84
Protocol message	GGA(1sec), GSA(1sec), GSV(1sec), RMC(1sec), VTG(1sec)
Output frequency	1 Hz

Electrical Specifications

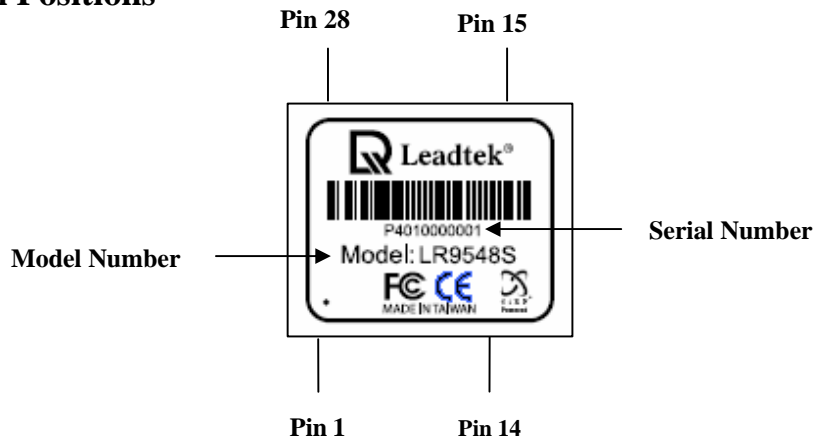
Block Diagram

9548S Block Diagram



Interface Specification

Photos and Pin Positions



Pin Settings

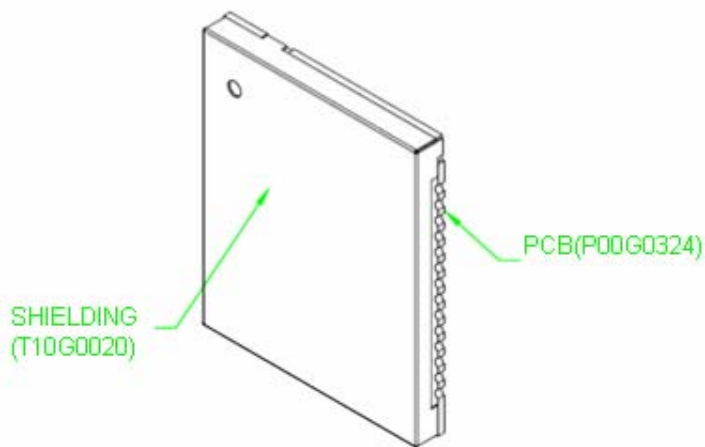
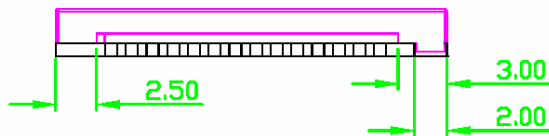
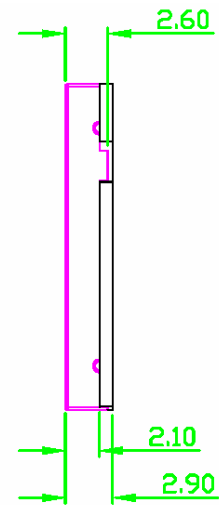
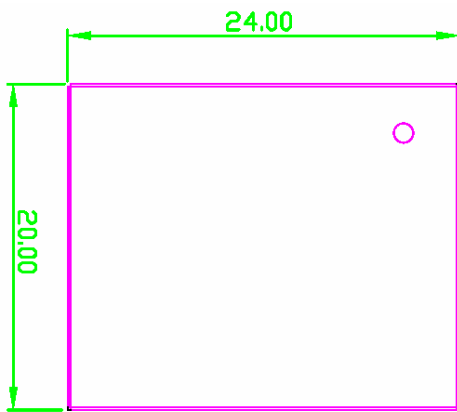
PIN	Name	Type	Description
1	NC	N/C	Not connected, keep floating
2	NC	N/C	Not connected, keep floating
3	NC	N/C	Not connected, keep floating
4	RXDB	I	TTL UART Port B input. If not used, keep floating
5	RXDA	I	TTL UART Port A input
6	TXDA	O	TTL UART Port A output
7	NC	N/C	Not connected, keep floating
8	TIMEMARK	I/O	1 PPS timemark output
9	NC	N/C	Not connected, keep floating
10	GPIO13	I/O	Reserved, keep floating
11	GPIO0	I/O	Reserved, keep floating
12	GPIO1	I/O	Reserved, keep floating
13	GPIO14	I/O	Reserved, keep floating
14	GND	PWR	Ground
15	VCC_IN	PWR	3.2~5.0V DC supply input
16	VSTBY	PWR	Apply 1.65~5.0V DC for backup RTC & SRAM.
17	BOOTSEL	I	Pull high for programming mode. If not used, keep floating
18	RESETN	I	Reset pin, active low, If not used, keep floating
19	GPIO15	I/O	Reserved, keep floating
20	GND	PWR	Ground
21	NC	N/C	Not connected, keep floating
22	NC	N/C	Not connected, keep floating
23	TXDB	O	TTL UART Port B output. If not used, keep floating
24	NC	N/C	Not connected, keep floating
25	ANTPWR	PWR	Antenna power input
26	GND	PWR	Ground
27	RFIN	I	RF Signal input
28	GND	PWR	Ground

Mechanical Dimensions

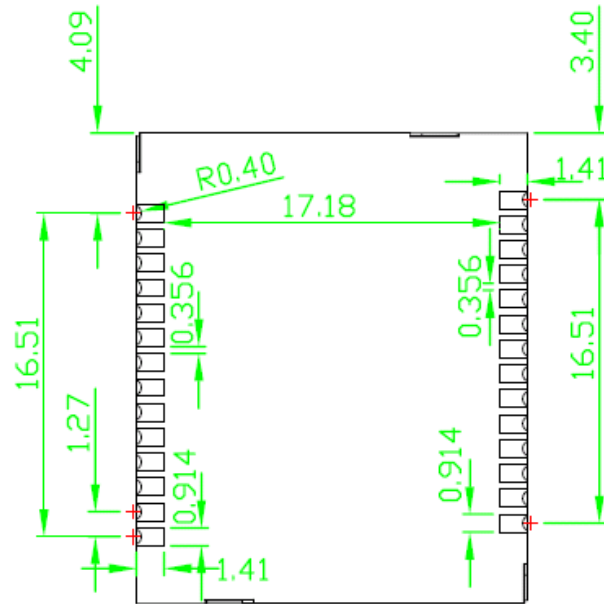
Outline Drawing

Tolerance:

Length	24.0 ± 0.3 mm
Width	20.0 ± 0.3 mm
Height	2.90 ± 0.3 mm



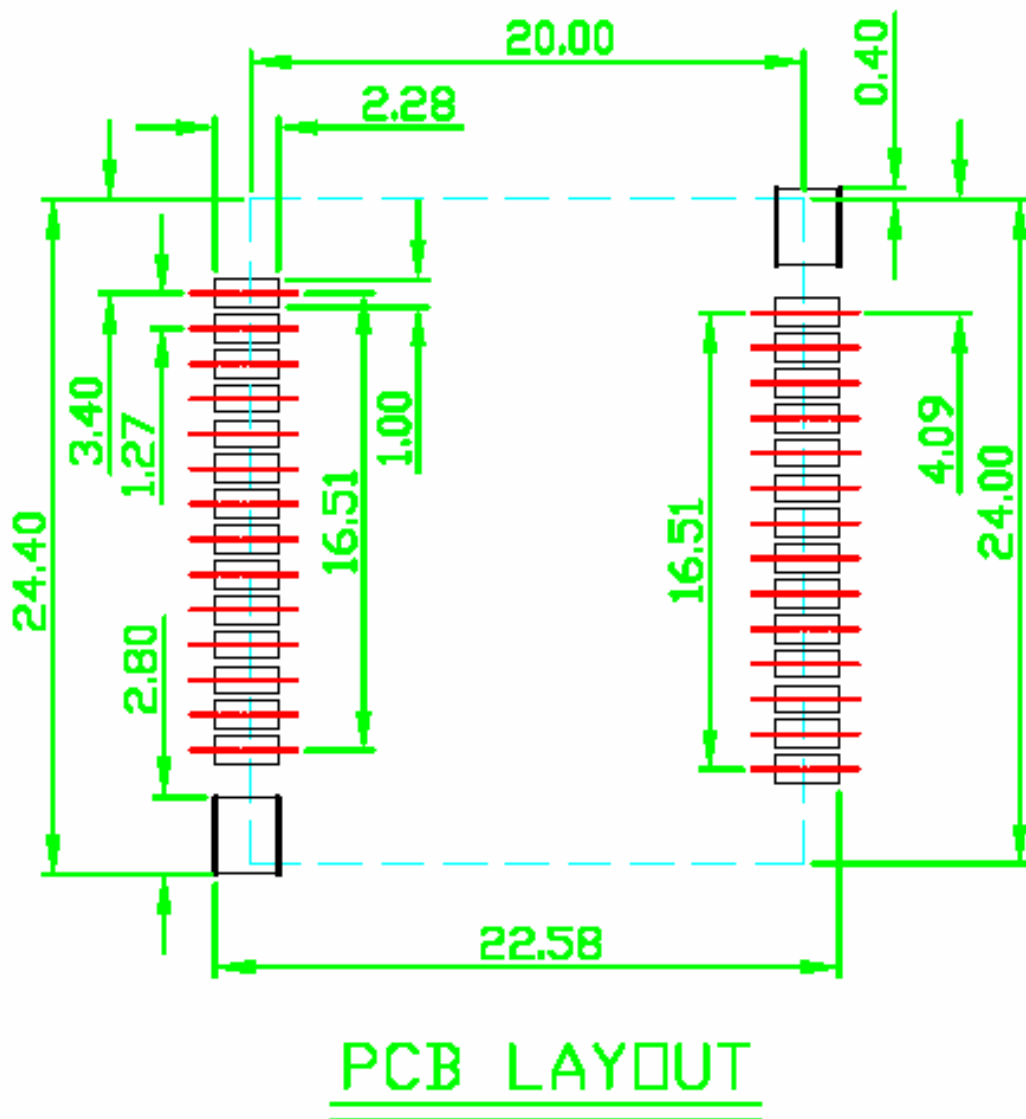
(Bottom view)



PCB PAD

Recommended Footprint

(Unit : mm)



Package Specification

(Unit : mm)

LR9548S modules are shipped in the plastic carrier tape on the reel. Each 13” reel can hold maximum 500 pcs of modules. The tape and reel dimensions are shown in the following figures.

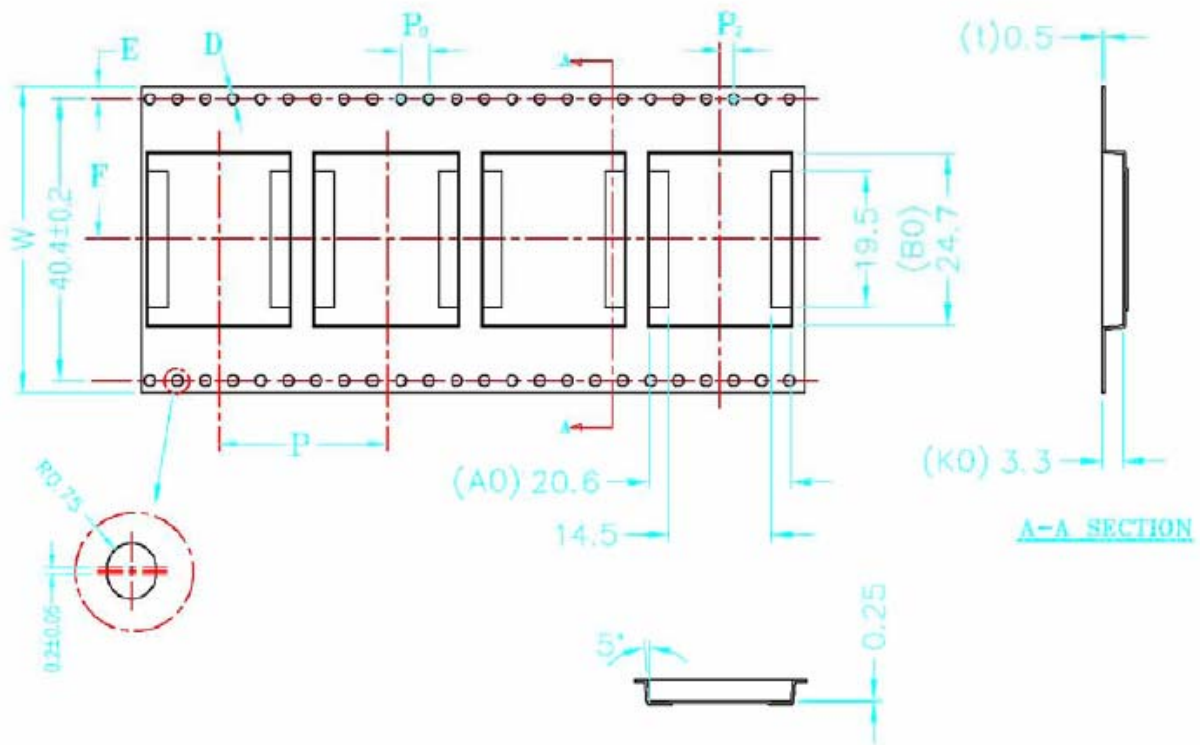


Figure1: Carrier tape dimensions

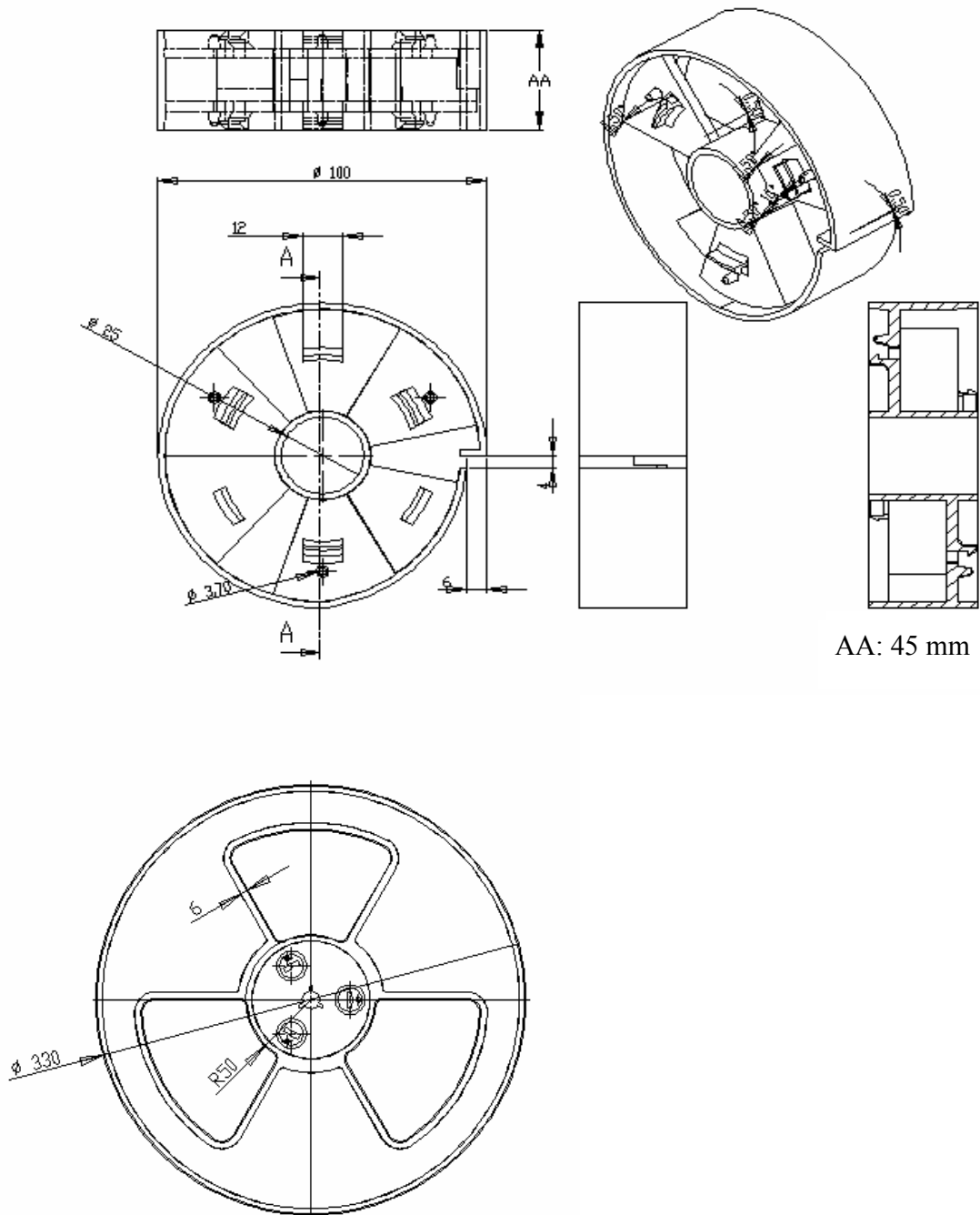


Figure 2: Reel dimensions