



iTM4339

Sub-GHz FSK Transceiver Module for
433MHz Band

Module Datasheet

Revision History

Date	Revision Content	Revised By	Version
2017/09/25	- Initial released	Issac Chen	0.1
2018/04/13	- Formal released	Issac Chen	1.0
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1. General Description

The iTM4339 SIP module is designed for 433MHz ISM band wireless applications using AMICCOM's A7139 FSK/GFSK transceiver chipset. This compact module features a fully programmable frequency synthesizer by SPI interface. The maximum data rate is up to 100kbps (by using 12.8MHz crystal, or 250kbps by using 16MHz crystal)

iTM4339 is optimized for very low power consumption. In addition, it can offer a very good link budget with a high efficient class-E power amplifier up to 20dBm and a low phase noise receiver. Therefore, iTM4339 is very suitable for battery powered application with a nice LOS (line-of-sight) wireless range.

2. Features

- RF Chipset : AMICCOM A7139
- Frequency band: 433 MHz.
- Programmable data rate from 2Kbps to 100Kbps
- Programmable TX power level from – 34dBm to 20dBm.
- On chip regulator, supports input voltage 1.9 ~ 3.6 V.
- Ultra low deep-sleep mode current consumption 0.3uA
- RX mode current consumption (AGC Off): 3.8mA
- High RX sensitivity -108dBm@100Kbps data rate
- Easy to use.

3. Electrical Specification

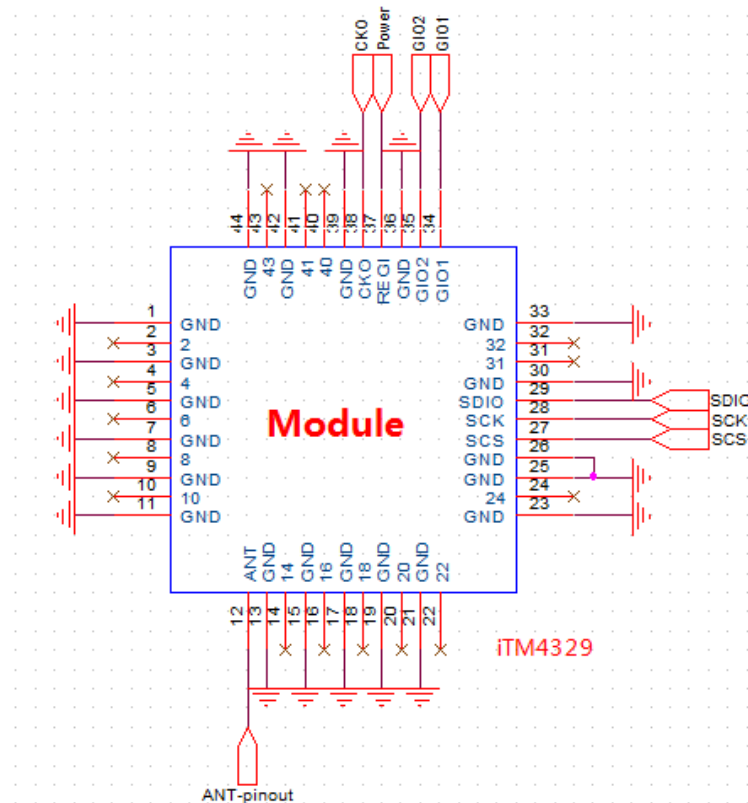
Item	Specification	Remark
Supply Voltage	2.2V~3.6V	
Current Consumption	0.2uA @Deep Sleep mode 1.5uA @Sleep mode(WOR off) 2.5uA @Sleep mode(WOR on) 0.14mA @Idle mode 0.5mA @Stand-by mode 2.0mA @PLL mode 3.8mA @Rx mode(AGC OFF) 3.0mA @Low current Rx mode(AGC OFF) 13.5mA @Tx mode (> -31dBm,TBG=0, TDC=0, PAC=0) 31.5mA @Tx mode (12.5dBm,TBG=5, TDC=0, PAC=0) 77mA @Tx mode (19.5dBm,TBG=7, TDC=2, PAC=1)	Typical +3.3V, 25°C *1
Frequency	433.92 MHz	ISM band
TX Output Power	18.5 dBm (TBG=5, TDC=1, PAC=1) 9.18 dBm (Pass CE)	Typical, +3.3V, 25°C *1
RX Sensitivity	-118 dBm @ 2 Kbps mode, Dev = 8 KHz, IFBW=50KHz -116 dBm @ 2 Kbps mode, Dev = 8 KHz, IFBW=100KHz -115 dBm @ 10 Kbps mode, Dev = 1875 KHz, IFBW=50KHz -116 dBm @ 10 Kbps mode, Dev = 37.5 KHz, IFBW=100KHz -110 dBm @ 50 Kbps mode, Dev = 18.75 KHz, IFBW=50KHz -108 dBm @ 100 Kbps mode, Dev = 37.5 KHz, IFBW=100KHz -105 dBm @ 100 Kbps mode, low current mode -105 dBm @ 150 Kbps mode, Dev = 56.25 KHz, IFBW=150KHz -102 dBm @ 250 Kbps mode, Dev = 93.75 KHz, IFBW=250KHz	BER ≤ 1E-3 +3.3V, 25°C *2
Modulation	FSK	
Operating Temp.	-40 ~ 85 °C	

* 1 To pass CE, the setting of TBG, TDC, PAC maybe changed with different antenna

*2 For 250Kbps data rate mode, customers should use 16MHz X'tal.

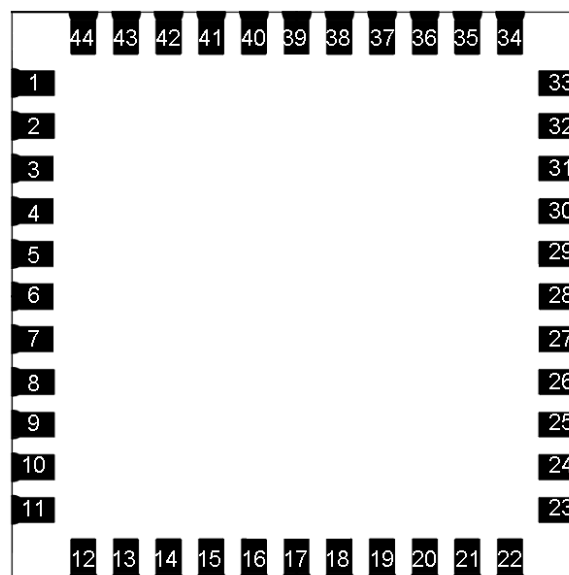
4. Pin Assignments

4.1 Schematic Diagram



4.2 PCB Pin Outline (12X12mm)

< TOP VIEW >



4.3 Pin Definition

NO	Name	Type	Description
1	GND	G	Ground connections
2	NC	—	Not connected
3	GND	G	Ground connections
4	NC	—	Not connected
5	GND	G	Ground connections
6	NC	—	Not connected
7	GND	G	Ground connections
8	NC	—	Not connected
9	GND	G	Ground connections
10	NC	—	Not connected
11	GND	G	Ground connections
12	ANT	I/O	RF input/output
13	GND	G	Ground connections
14	NC	—	Not connected
15	GND	G	Ground connections
16	NC	—	Not connected
17	GND	G	Ground connections
18	NC	—	Not connected
19	GND	G	Ground connections
20	NC	—	Not connected
21	GND	G	Ground connections
22	NC	—	Not connected
23	GND	G	Ground connections
24	NC	—	Not connected
25	GND	G	Ground connections
26	GND	G	Ground connections
27	SCS	I	SPI Select Input
28	SCK	I	SPI Clock Input
29	SDIO	I/O	SPI Data I/O
30	GND	G	Ground connections
31	NC	—	Not connected
32	NC	—	Not connected
33	GND	G	Ground connections
34	GIO1	I/O	Multi-function IO 1 / SPI data output

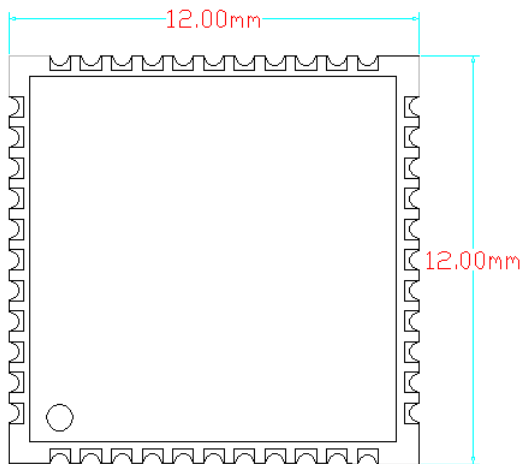
35	GIO2	I/O	Multi-function IO 2 / SPI data output
36	GND	G	Ground connections
37	REG_I	P	Voltage supply Input
38	CKO	O	Multi-function clock output
39	GND	G	Ground connections
40	NC	—	Not connected
41	NC	—	Not connected
42	GND	G	Ground connections
43	NC	—	Not connected
44	GND	G	Ground connections

5. Dimensions

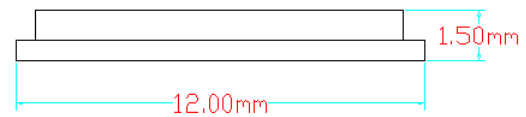
5.1 Physical Dimension

(Unit: mm)

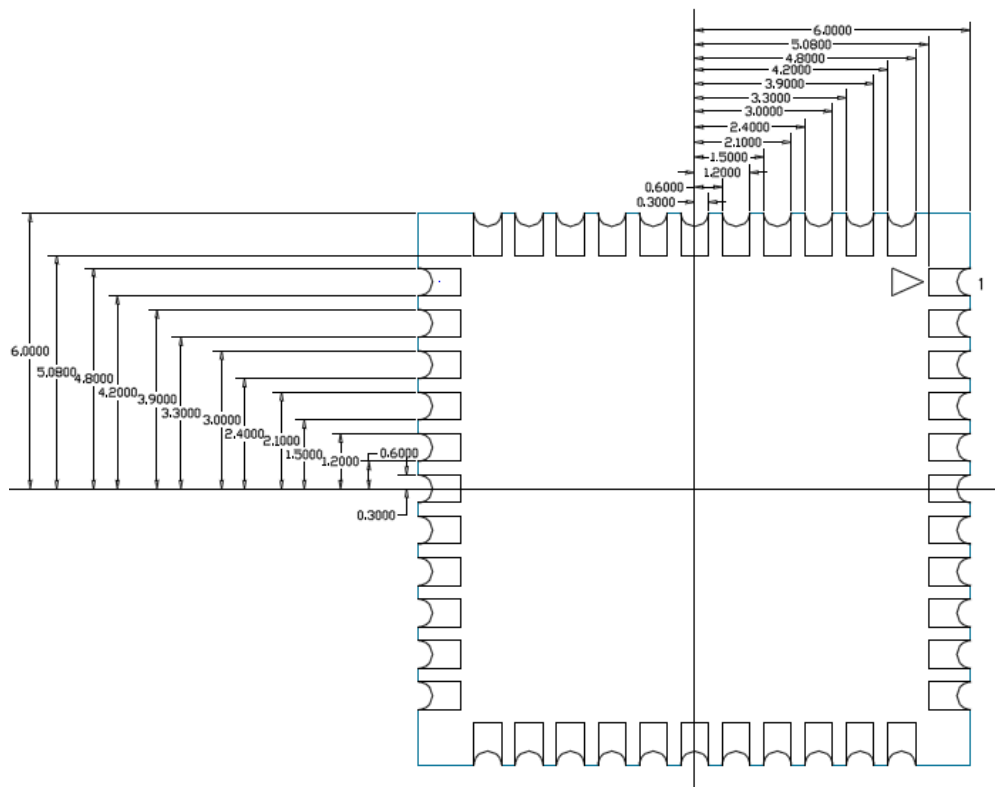
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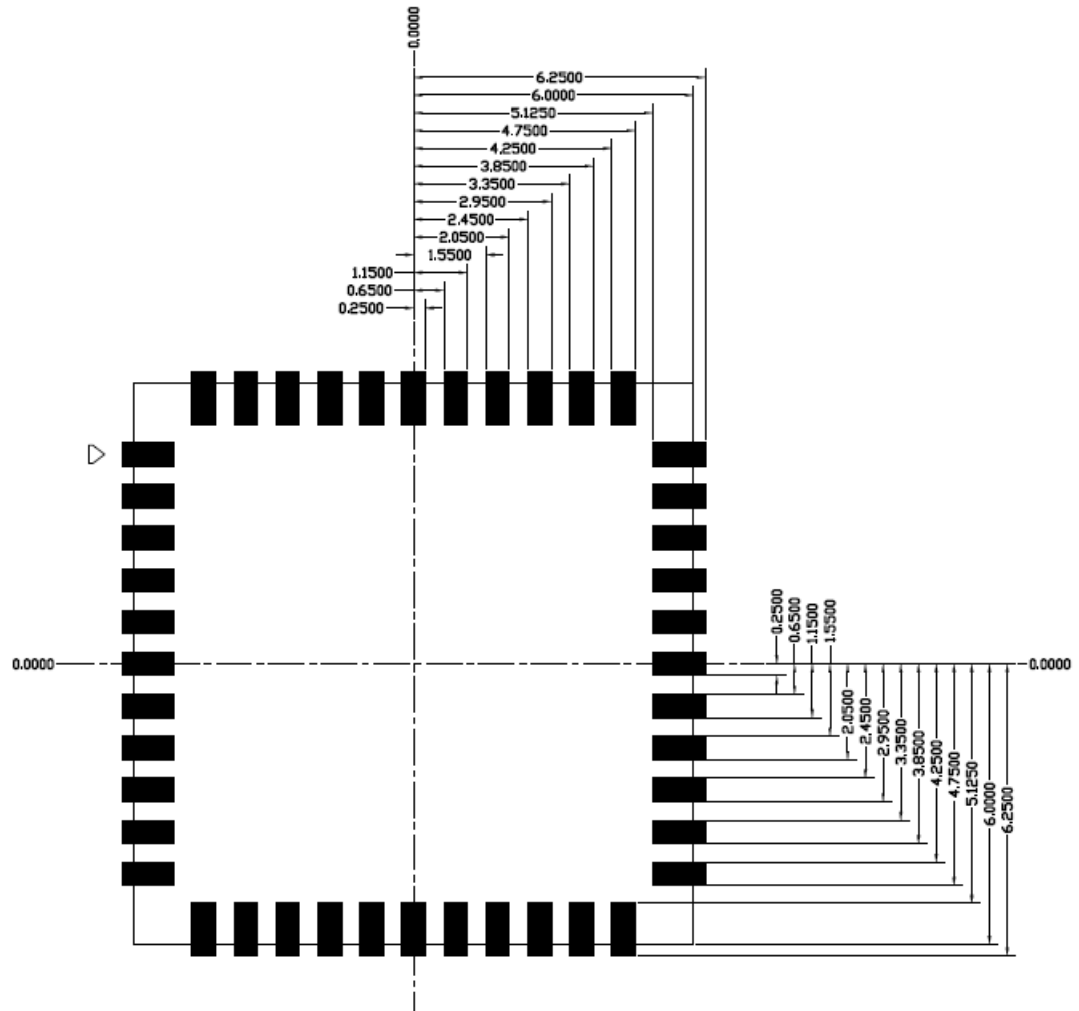


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5.2 Layout Recommendation

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6. Host Interface Timing Diagram

6.1 SPI Timing Diagram

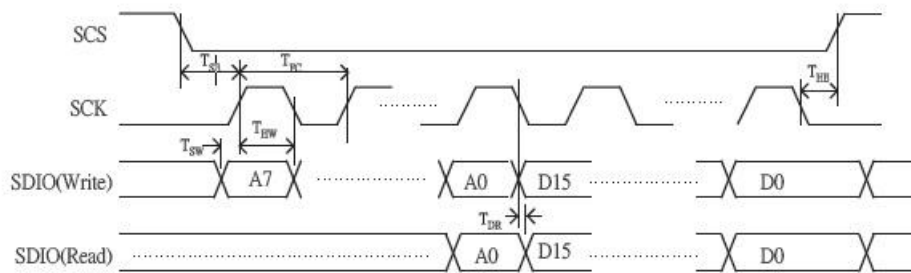
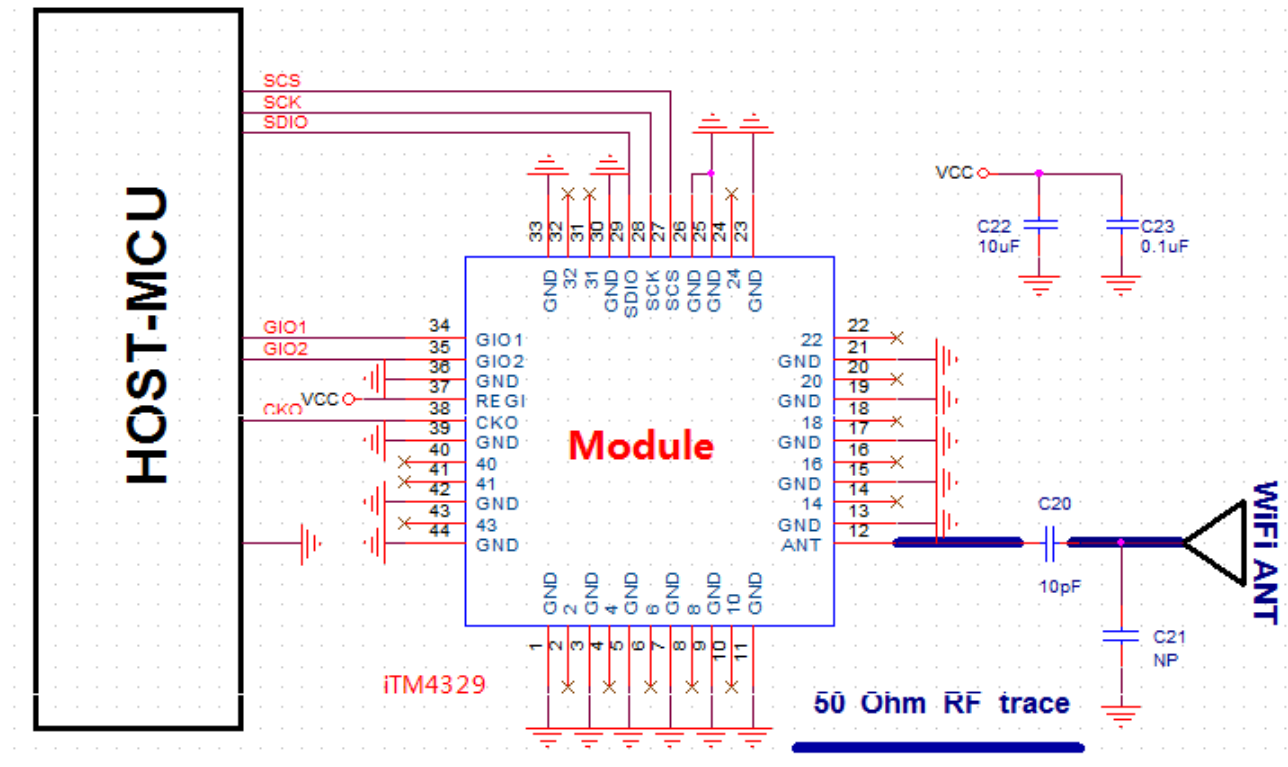


Figure 10.3 SPI timing sequence

Parameter	Description	Min.	Max.	Unit
T_{FC}	Clock frequency.		10	MHz
T_{SE}	SCS setup time.	50		ns
T_{HE}	SCS hold time.	50		ns
T_{SW}	SDIO setup time.	50		ns
T_{HW}	SDIO hold time.	50		ns
T_{DR}	SDIO delay time.	0	100	ns
T_{HR}	SDIO hold time.	0		ns

7. Reference Design

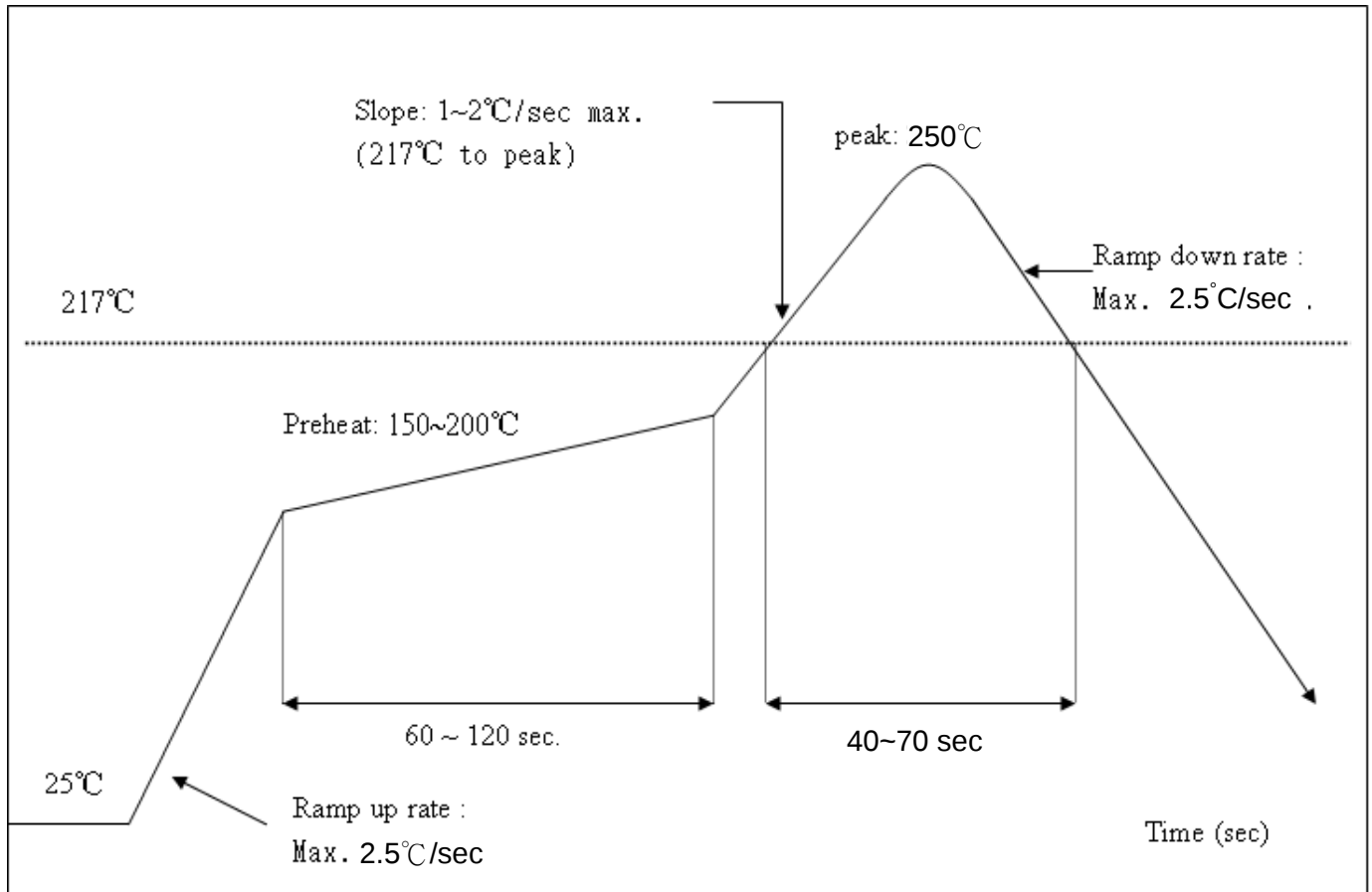


8. Recommended Reflow Profile

Referred to IPC/JEDEC standard.

Peak Temperature : $<250^{\circ}\text{C}$

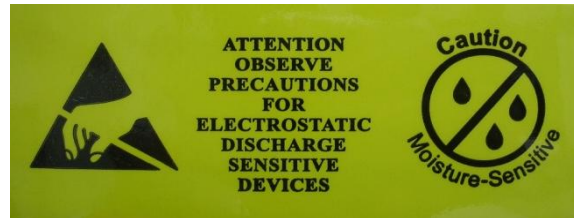
Number of Times : ≤ 2 times



9. Packing Information

9.1 Label

Label A → Anti-static and humidity notice



Label B → MSL caution / Storage Condition

	Caution	LEVEL
	This bag contains MOISTURE-SENSITIVE DEVICES	 If blank, see adjacent bar code label
1. Calculated shelf life in sealed bag: 12 months at <40°C and <90% relative humidity (RH) 2. Peak package body temperature: _____ °C # blank, see adjacent bar code label 3. After bag is opened, devices that will be subjected to reflow solder or other high temperature process must be a) Mounted within: _____ hours of factory conditions # blank, see adjacent bar code label ≤30°C/60% RH, or b) Stored per J-STD-033 4. Devices require bake, before mounting, if: a) Humidity Indicator Card reads >10% for level 2a - 5a devices or >60% for level 2 devices when read at 23 ± 5°C b) 3a or 3b are not met 5. If baking is required, refer to IPC/JEDEC J-STD-033 for bake procedure Bag Seal Date: _____ # blank, see adjacent bar code label Note: Level and body temperature defined by IPC/JEDEC J-STD-020		

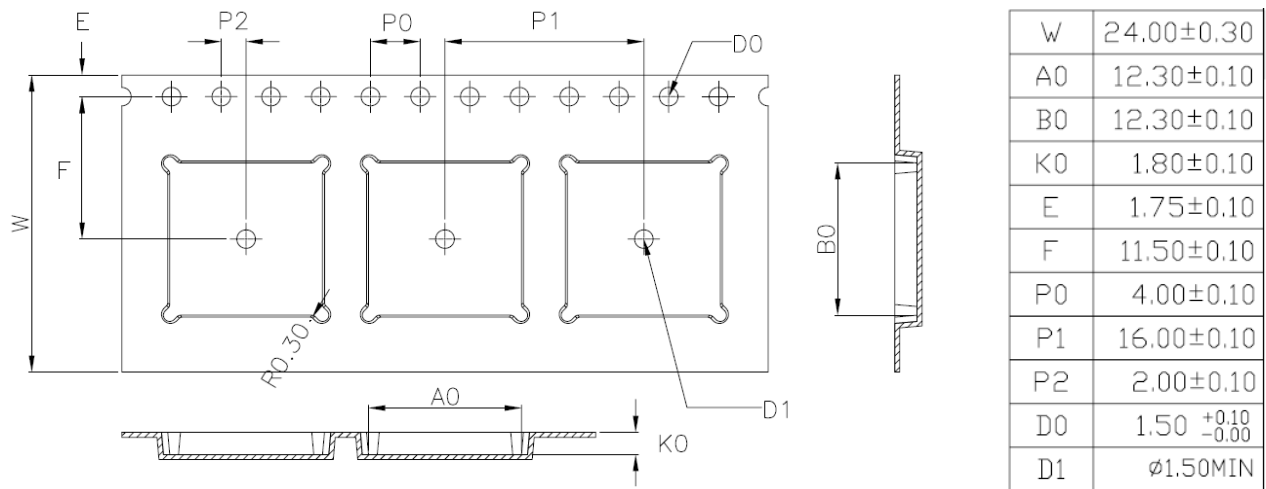
Label C → Inner box label .

PKG S/N :	
Model:	
P/N :	
Qty :	
Date Code :	
Lot Code :	

Label D → Carton box label .

iotTech Corporation	
Model Name :	
Part No :	
Quantity :	
Lot D/C :	
Manufacture :	

9.2 Dimension



1. 10 sprocket hole pitch cumulative tolerance ± 0.20 .
2. Carrier camber is within 1 mm in 250 mm.
3. Material : Black Conductive Polystyrene Alloy.
4. All dimensions meet EIA-481-D requirements.
5. Thickness : 0.30 ± 0.05 mm.
6. Packing length per 22" reel : 98.5 Meters.(1:3)
7. Component load per 13" reel : 1500 pcs.

