FN-LINK™
Innovation For Surfing

6188E-UF

Wi-Fi Single-band 1X1

Module Datasheet

6188E-UF Module Datasheet

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Customer Approval : _____ Company

_____ Title

_____ Signature

_____ Date

_____ Fn-Link

Revision History

Version	Date	Revision Content	Draft	Approved
1.0	2018/10/19	New version	Lzm	Jacky
1.1	2018/11/29	Add main chipset	Lzm	Jacky
1.2	2018/12/18	Modify the telephone number	Lzm	Lxy
1.3	2018/12/25	Modify the office and TEL	Lzm	Lxy
1.4	2019/01/08	Add Carrier Tape Detail	Lzm	Lxy
1.5	2019/01/08	Del H40 rate	Wdd	Szs

CONTENTS

1 Overview

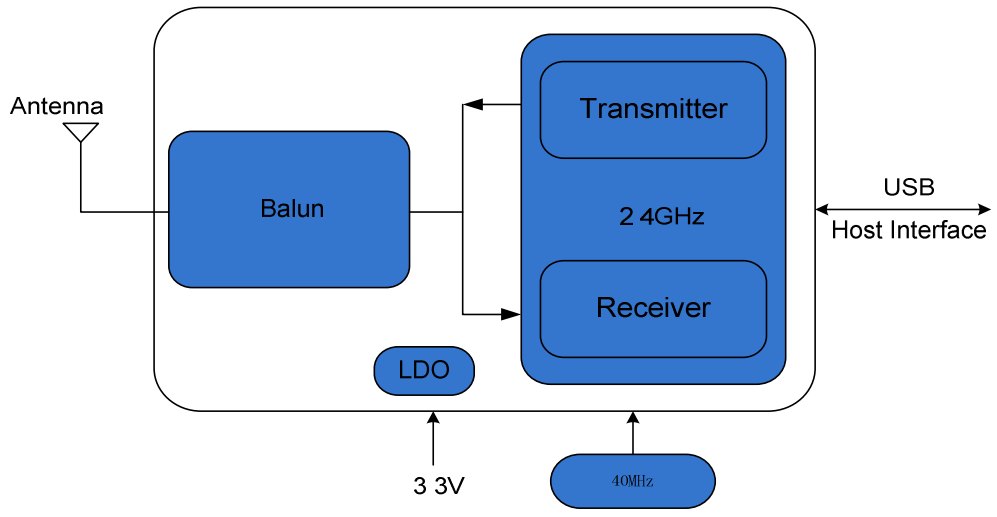
1.1 Introduction

Fn-Link Technology would like to announce a low-cost and low-power consumption module which has all of the Wi-Fi functionalities. It is a highly-integrated IEEE 802.11 a/b/g/n MAC/Baseband/RF WLAN single chip. For Wireless LAN(WLAN)operation. The integrated module provides USB interface for Wi-Fi . The module provides simple legacy and 20MHz co-existence mechanisms to ensure backward and network compatibility.
6188E-UF uses highly integrated Wi-Fi single chip based on advanced COMS process. 6188E-UF integrates whole Wi-Fi function blocks into a chip, such as USB/PCM, MAC, BB, AFE, RFE, PA, EEPROM and LDO/SWR, except fewer passive components remained on PCB.
This compact module is a total solution for Wi-Fi technology. The module is specifically developed for Smart phones and Portable devices.

1.2 Features

- Operate at ISM frequency bands (2.4GHz)
- USB for Wi-Fi
- IEEE standards support: IEEE 802.11b, IEEE 802.11g, IEEE 802.11n, IEEE 802.11d, IEEE 802.11e, IEEE 802.11h, IEEE 802.11i
- Enterprise level security which can apply WPA/WPA2 certification for Wi-Fi.
- Wi-Fi 1 transmitter and 1 receiver allow data rates supporting up to 72.2 Mbps downstream and 72.2 Mbps upstream PHY rates

Block Diagram:



1.3 General Specification

Model Name	6188E-UF
Main Chipset	RTL8188FTV-VQ1-CG
Product Description	Support Wi-Fi functionality
Dimension	L x W x H: 12.2 x 13 x1.5 (typical) mm
Wi-Fi Interface	Support USB2.0
Operating temperature	0°C to 70°C
Storage temperature	-40°C to 125°C
RoHS	All hardware components are fully compliant with EU RoHS directive

1.4 Recommended Operating Rating

	Min.	Typ.	Max.	Unit
Operating Temperature	0	25	70	deg.C
VCC33	3.15	3.3	3.45	V

※1.5 EEPROM Information

WI-FI

Vendor ID	0BDAh
Product ID	F179h

2 Wi-Fi RF Specification

2.1 2.4GHz RF Specification

Feature	Description			
Operating Frequency	2.400～2.4835GHz			
Spectrum Mask	Min. b/g/n	Typ. b/g/n	Max. b/g/n	Unit b/g/n
1st side lobes(to fc ± 11MHZ)	-	-40/-31/-41	-	dBr
2st side lobes(to fc ± 22MHZ)	-	-50/-61/-61	-	dBr

Freq. Tolerance	-20/-20/-20	-	20/20/20	ppm
Standards	Wi-Fi: IEEE 802.11b, IEEE 802.11g, IEEE 802.11n, IEEE 802.11d, IEEE 802.11e, IEEE 802.11h, IEEE 802.11i			
Modulation	Wi-Fi: 802.11b: CCK(11, 5.5Mbps), QPSK(2Mbps), BPSK(1Mbps), 802.11 g/n: OFDM			
PHY Data rates	Wi-Fi: 802.11b: 11,5.5,2,1 Mbps 802.11g: 54,48,36,24,18,12,9,6 Mbps 802.11n: up to 72.2Mbps			
Transmit Output Power	Wi-Fi: 802.11b@11Mbps 16±1.5dBm 802.11g@54Mbps 14±1.5dBm 802.11n@65Mbps 13±1.5dBm (MCS 7_HT20)			
EVM	802.11b /1Mbps : EVM≦-10dB 802.11b /11Mbps : EVM≦-10dB 802.11g /6Mbps : EVM≦-5dB 802.11g /54Mbps : EVM≦-25dB 802.11n /6.5Mbps : EVM≦-5dB 802.11n /65Mbps : EVM≦-28dB			
Receiver Sensitivity (Wi-Fi)	802.11b@8% PER 1Mbps ≦-91dBm 2Mbps≦ -89dBm 5.5Mbps≦ -87dBm 11Mbps ≦-85dBm Max input level≥-8			
	802.11g@10% PER 6Mbps ≦-87dBm 9Mbps ≦-86dBm 12Mbps≦ -84dBm 18Mbps≦ -82dBm 24Mbps≦ -79dBm 36Mbps≦ -75dBm 48Mbps ≦-71dBm 54Mbps ≦-70dBm Max input level≥-20			
	802.11n@10% PER			

	HT20_MCS 0 ≦-87dBm HT20_MCS 1≦ -84dBm HT20_MCS 2 ≦-82dBm HT20_MCS 3 ≦-79dBm HT20_MCS 4 ≦-75dBm HT20_MCS 5 ≦-71dBm HT20_MCS 6 ≦-70dBm HT20_MCS 7 ≦-69dBm Max input level≥-20
Operating Channel	Wi-Fi 2.4GHz: 11: (Ch. 1-11) – United States 13: (Ch. 1-13) – Europe 14: (Ch. 1-14) – Japan
Media Access Control	Wi-Fi: CSMA/CA with ACK
Antenna	External Antenna
Network Architecture	Ad-hoc mode (Peer-to-Peer) Infrastructure mode Software AP Wi-Fi Direct
Security	WPA, WPA-PSK, WPA2, WPA2-PSK, WEP 64bit & 128bit, IEEE 802.11x, IEEE 802.11i
OS Supported	Android /Linux/ Win CE /iOS /XP/WIN7
Host Interface	USB
Operating Voltage	3.3±10% Vdc I/O supply voltage
Dimension	Typical L12.2*W13*H1.5mm

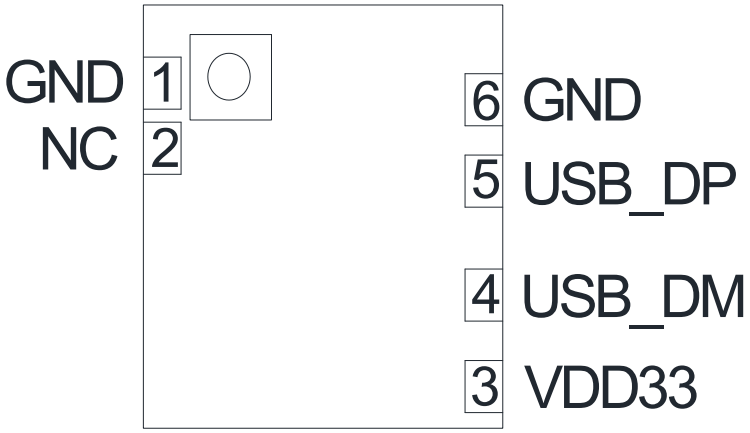
3 Power Consumption

Power Consumption (Typical by using SWR)	TX Mode: (Throughput mode) 230mA (MCS7/BW20) RX Mode: (Throughput mode) 130mA (MCS7/BW20)

4 Pin Assignments

4.1 Pin Outline

< TOP VIEW >



4.2 Pin Definition

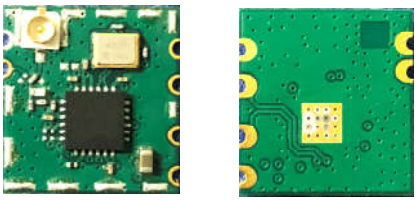
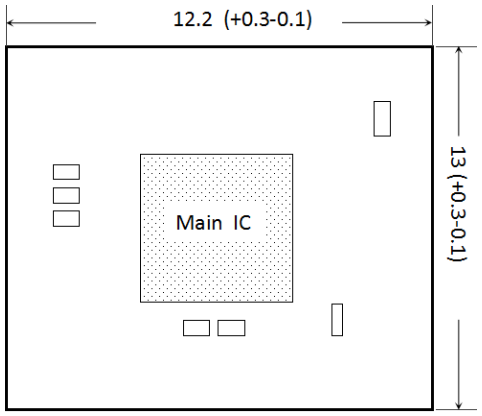
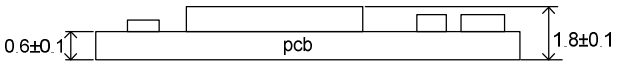
NO	Name	Type	Description	Voltage
1	GND	—	Ground connections	
2	NC	—	NO Connect	
3	VDD33	—	Main power voltage source input 3.3V	3.3V
4	USB_DM	I/O	USB2.0 differential pair for WLAN	
5	USB_DP	I/O	USB2.0 differential pair for WLAN	
6	GND	—	Ground connections	

P:POWER I:INPUT O:OUTPUT

5 Dimensions

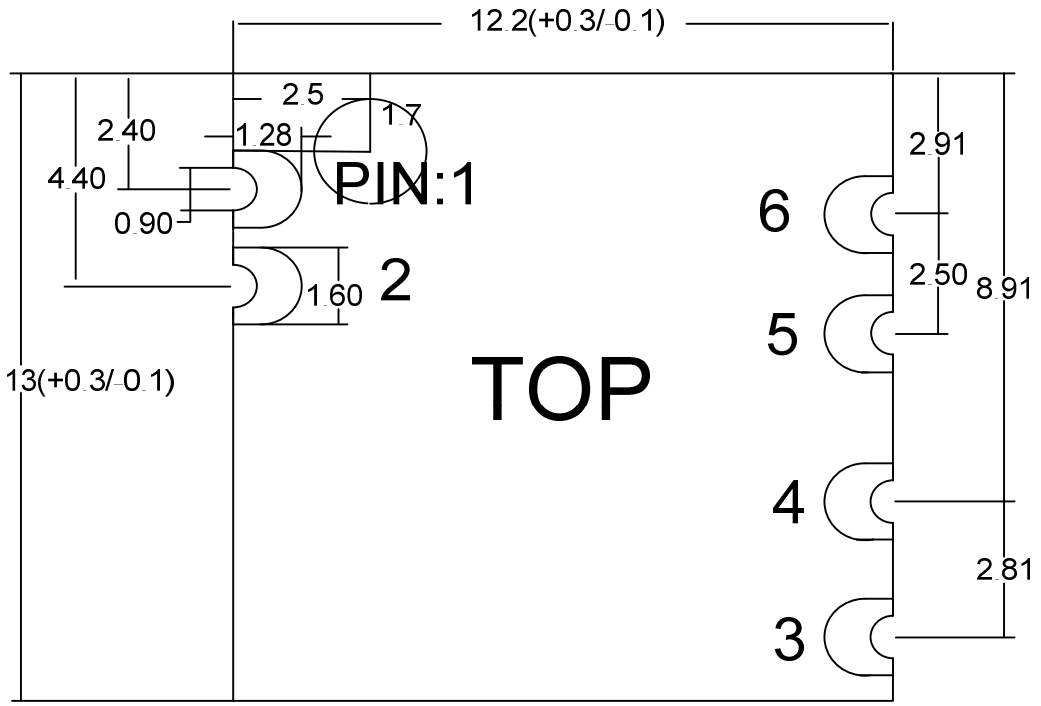
5.1 Physical Dimensions

(Unit: mm)

< TOP VIEW > L x W: 12.2 x 13 mm 	
< Side View > H:1.8 mm	
Weight	0.38g

5.2 Module Physical Dimensions

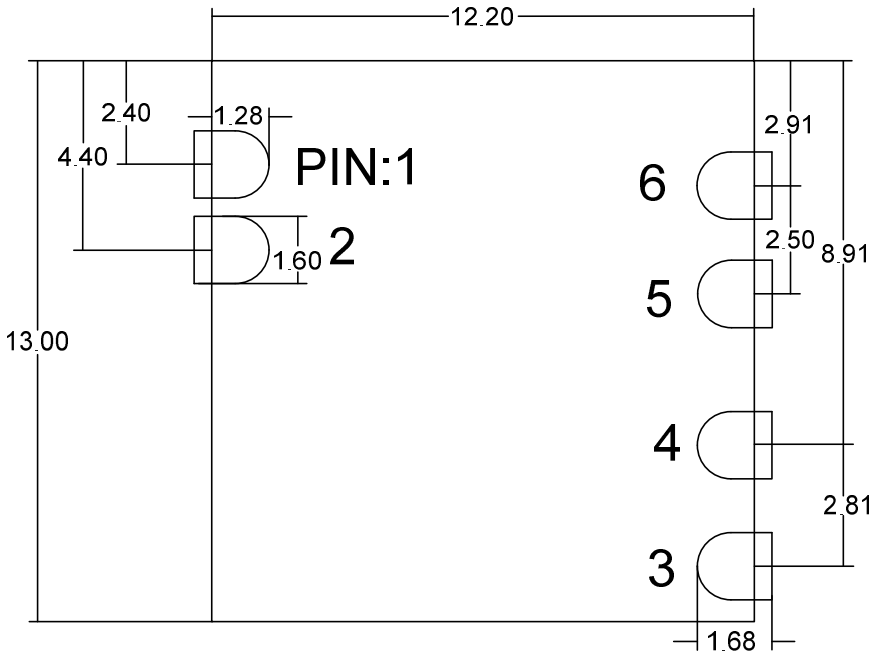
(Unit: mm)



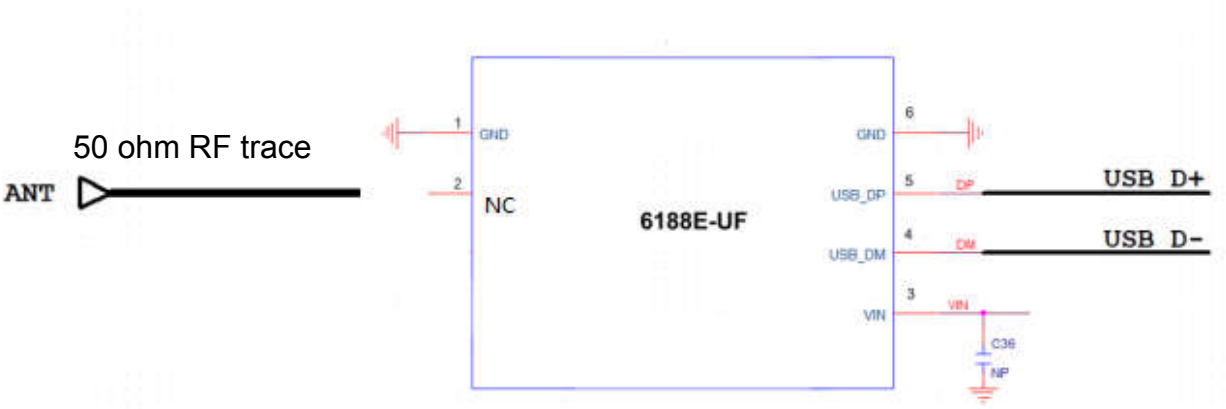
5.3 Layout Recommendation

(Unit: mm)

< TOP VIEW >



6 Reference Design



7 Ordering Information

Part No.	Description
FG6188EUFX-00	RTL8188FTV-VQ1, b/g/n, Wi-Fi, 1T1R, 12.2X13mm, USB Antenna base, PCB Version V1.0

8 The Key Material List

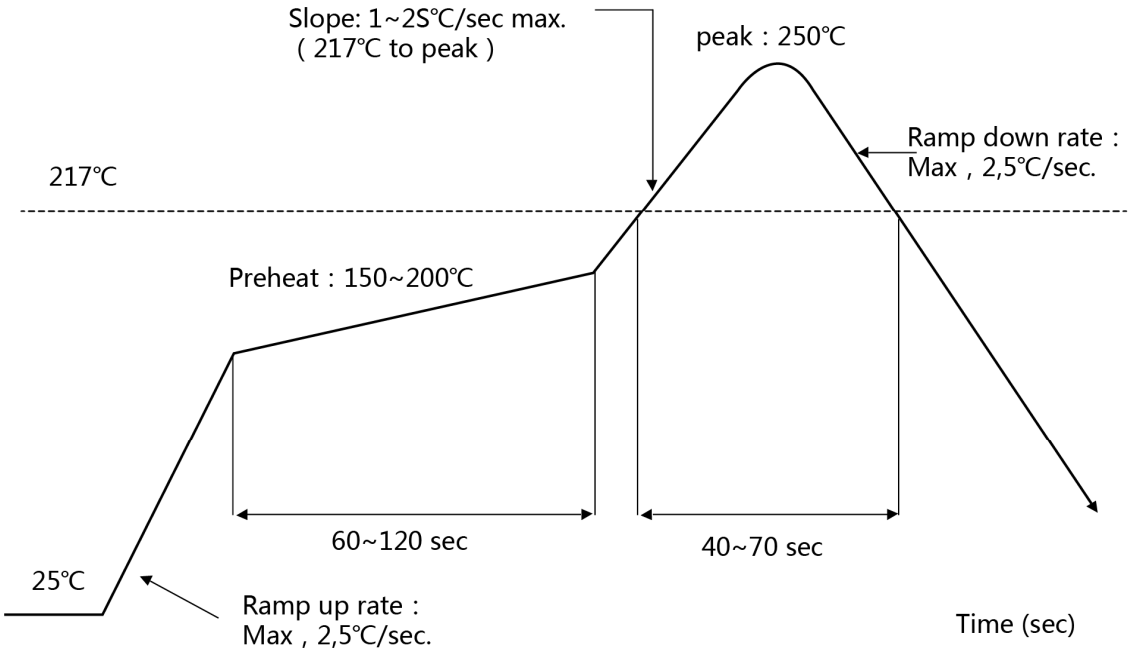
Main	Crystal	XTAL-SMD3.2X2.5, 40MHz, CL=15pF, 10ppm(TKD)
Alternative	Crystal	XTAL-SMD3.2X2.5, 40MHz, CL=15pF, 10ppm TZ0475B (TST)
Alternative	Crystal	XTAL-SMD3.2X2.5, 40MHz, CL=16pF, 10ppm, Hosonic: E3SB40E00004UE
Alternative	Crystal	XTAL-SMD3.2X2.5, 40MHz, CL=15pF, 10ppm, temperature: -20~+85℃, SIWARD：XTL571100-W103-033(SIWARD)
Main	Antenna pedestal	1 generation UFLR-MINIPCL, MRF IRECEPTACLE, MRFR2-0000320
Alternative	Antenna pedestal	1 generation UFLR-MINIPCL, MRF IRECEPTACLE, 19.002A7-0001R0(Jiawo)
Main	Chipset	RTL8188FTV-VQ1-CG QFN24

9 Recommended Reflow Profile

Referred to IPC/JEDEC standard.

Peak Temperature : <250°C

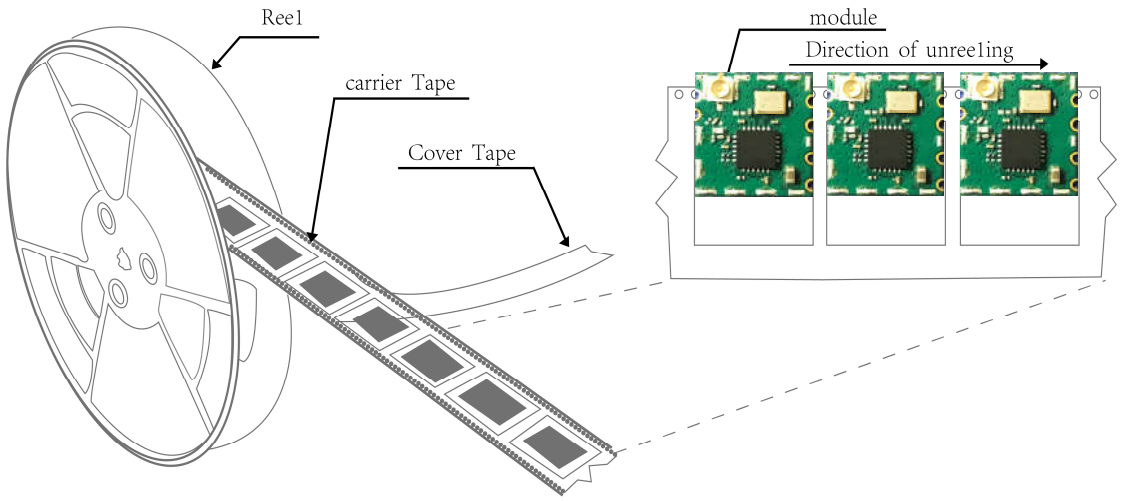
Number of Times : ≤2 times



10 Package Information

10.1 Reel

A roll of 2000pcs



10.2 Packaging Detail

the take-up package

Using self-adhesive tape

Size of black tape:24mm*32.6m the cover tape :21.33mm*32.6m

Color of plastic disc:blue

A roll of 2000pcs

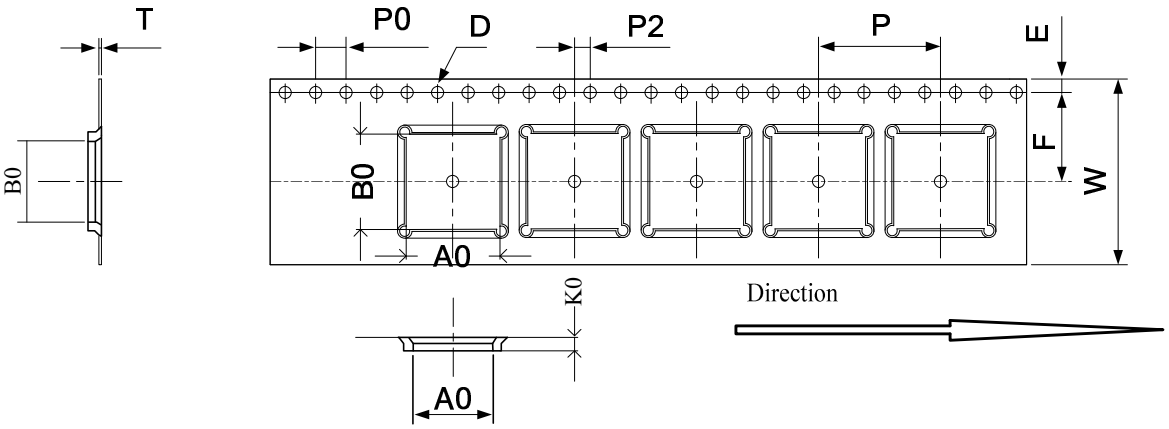
NY bag size:460mm*385mm

size ： 350*350*35mm

The packing case size:350*210*370mm

10.3 Carrier Tape Detail

ITEM	W	A0	B0	D	F	E	K0	P0	P2	P	T
DIM	24	12.61	13.62	1.50	11.5	1.75	1.70	4.0	2.0	16.0	0.30
TOLE	+0.3 -0.3	±0.15	±0.15	+0.1 -0.0	+0.1 -0.1	±0.1	±0.10	±0.1	±0.1	±0.1	±0.05



10.4 Moisture sensitivity

The Modules is a Moisture Sensitive Device level 3, in according with standard IPC/JEDEC J-STD-020, take care
all the relatives requirements for using this kind of components.
Moreover, the customer has to take care of the following conditions:
a) Calculated shelf life in sealed bag: 12 months at <40°C and <90% relative humidity (RH)
b) Environmental condition during the production: 30°C / 60% RH according to IPC/JEDEC J-STD-033A paragraph 5
c) The maximum time between the opening of the sealed bag and the reflow process must be 168 hours if condition
b) “IPC/JEDEC J-STD-033A paragraph 5.2” is respected
d) Baking is required if conditions b) or c) are not respected
e) Baking is required if the humidity indicator inside the bag indicates 10% RH or more