



RFM Integrated Device, Inc.

PRODUCT SPECIFICATION

Part Number: XTL2002

XTAL, 48 MHz, +/-20ppm
-40C to +105C, 9.9pf

Crystal Unit SMD 1.2x1.0 48MHz



Features:

- Surface Mount Hermetic Package
- Excellent Reliability Performance
- Good Frequency Perturbation and Stability over temperature
- Ultra Miniature Package
- Moisture Sensitivity Level (MSL) : Level-1

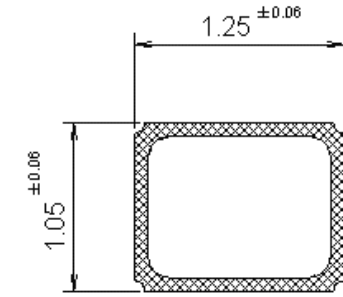
Description and Applications:

Surface mount 1.2mmx1.0mm crystal unit for use in wireless communications devices, especially for a need of ultra miniature package for mobility.

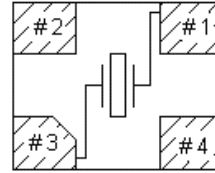
Electrical Specifications:

XTL2002	Specification				
	Characteristic	Min	Nom	Max	Unit
Nominal Frequency		48.000000			MHz
Mode of Oscillation		Fundamental			°C
Storage Temperature Range	-40		125		°C
Operating Temperature Range	-40		105		°C
Frequency Stability over Operating Temperature Range -40°C~100°C (referred to the value at 25°C)	-15		13		ppm
Frequency Make Tolerance(@ 25°C +/- 3°C)	-1		5		ppm
IR Reflow(2 times)	-1		1		ppm
Aging(5 years)	-2		0		ppm
Frequency perturbation(ppm)	-1		1		ppm
Total Budget(ppm)	-20		20		ppm
Equivalent Series Resistance (ESR)	10	17	25		Ω
Nominal Drive Level	0.01	200	300		uW
Motional Inductance	4.3	5.3	7.0		mH
Load Capacitance (CL) (Measure by Saunders(S&A) Network Analyzer 250B)		9.9			pF
Motional Capacitance	1.5	2.5	4.0		fF
Shunt Capacitance	0.3	0.7	1.0		pF
Insulation Resistance(DC 100V)	500				MR

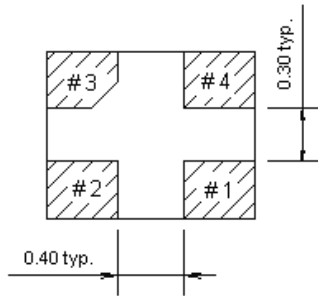
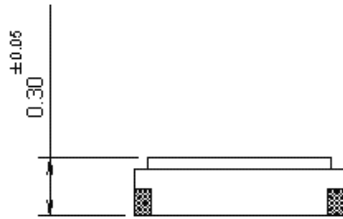
Mechanical Dimensions (mm):



Internal Connections
(Top View)

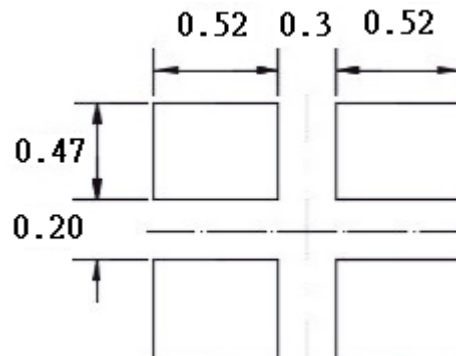


[NOTE] #2 =NC, #4 is connected with a metal cover



	Pin Connection
#1 Pin	IN/OUT
#2 Pin	NC
#3 Pin	IN/OUT
#4 Pin	GND

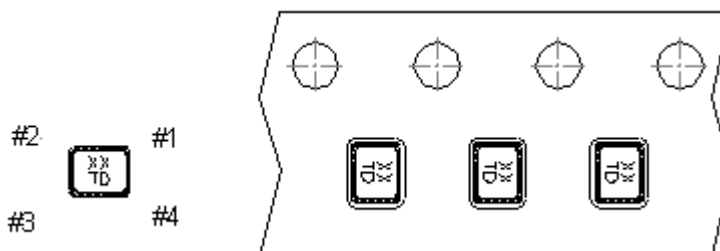
Recommended Land Pattern: (unit: mm)



Marking:

Line 1: XX; Frequency (48)

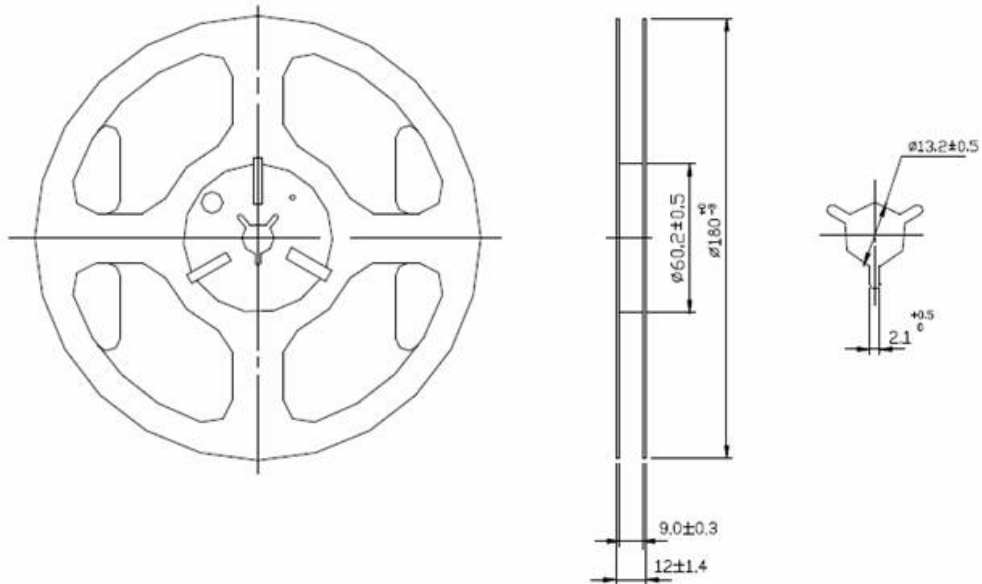
Line 2: T; Traceable Code + D; date Code of Year/Month



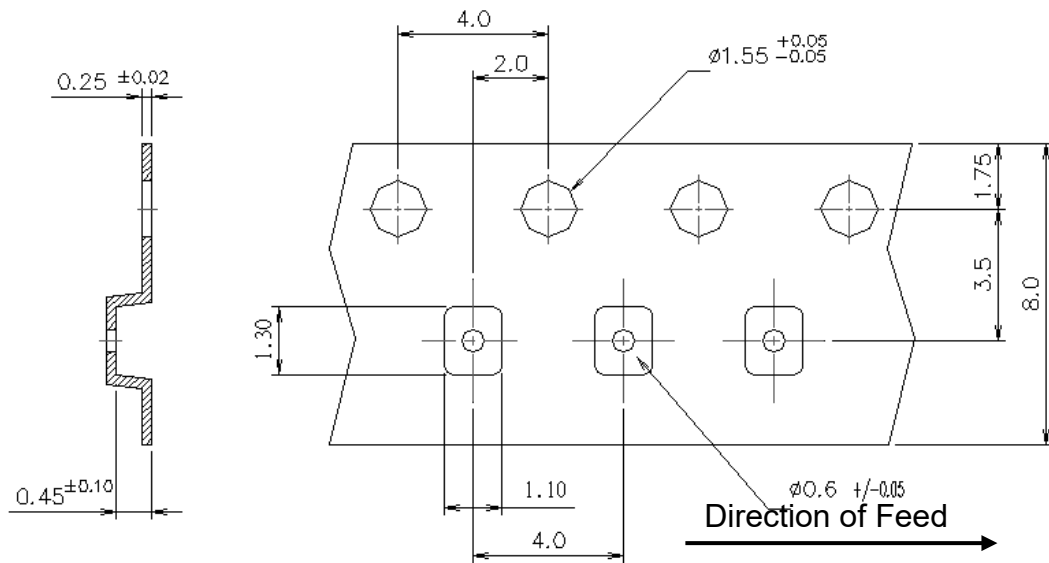
Date Code Table: Year/Month

Year/Month	1	2	3	4	5	6	7	8	9	10	11	12
2012	a	b	c	d	e	f	g	h	i	j	k	m
2013	n	p	q	r	s	t	u	v	w	x	y	z
2014	A	B	C	D	E	F	G	H	J	K	L	M
2015	N	P	Q	R	S	T	U	V	W	X	Y	Z
2016	a	b	c	d	e	f	g	h	i	j	k	m
2017	n	p	q	r	s	t	u	v	w	x	y	z
2018	A	B	C	D	E	F	G	H	J	K	L	M
2019	N	P	Q	R	S	T	U	V	W	X	Y	Z
2020	a	b	c	d	e	f	g	h	i	j	k	m
2021	n	p	q	r	s	t	u	v	w	x	y	z
2022	A	B	C	D	E	F	G	H	J	K	L	M
2023	N	P	Q	R	S	T	U	V	W	X	Y	Z
2024	a	b	c	d	e	f	g	h	i	j	k	m
2025	n	p	q	r	s	t	u	v	w	x	y	z

Reel Dimensions (mm):



Tape Dimensions (mm):

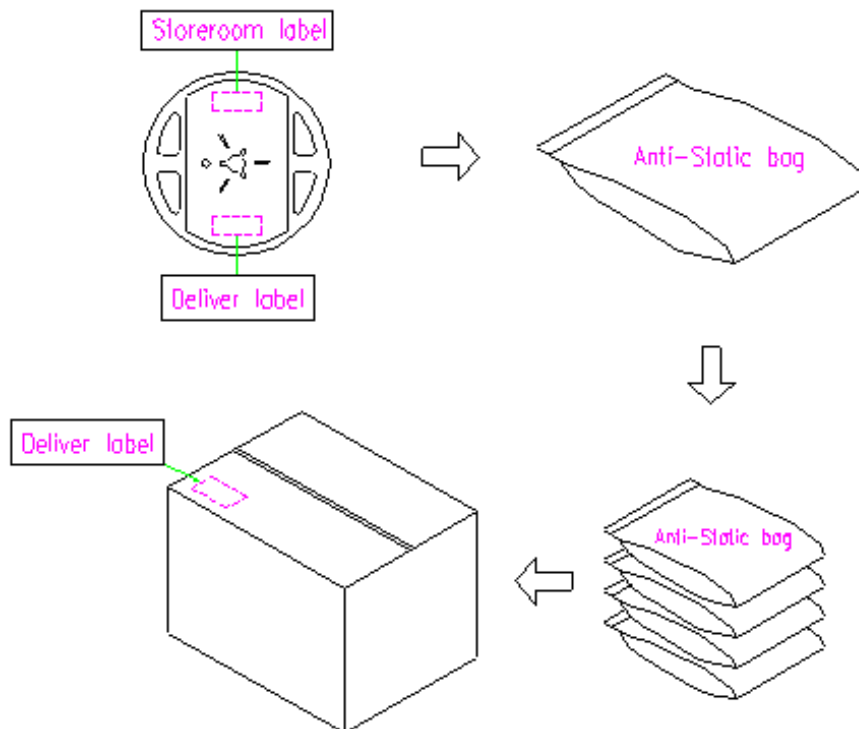


[NOTE]:

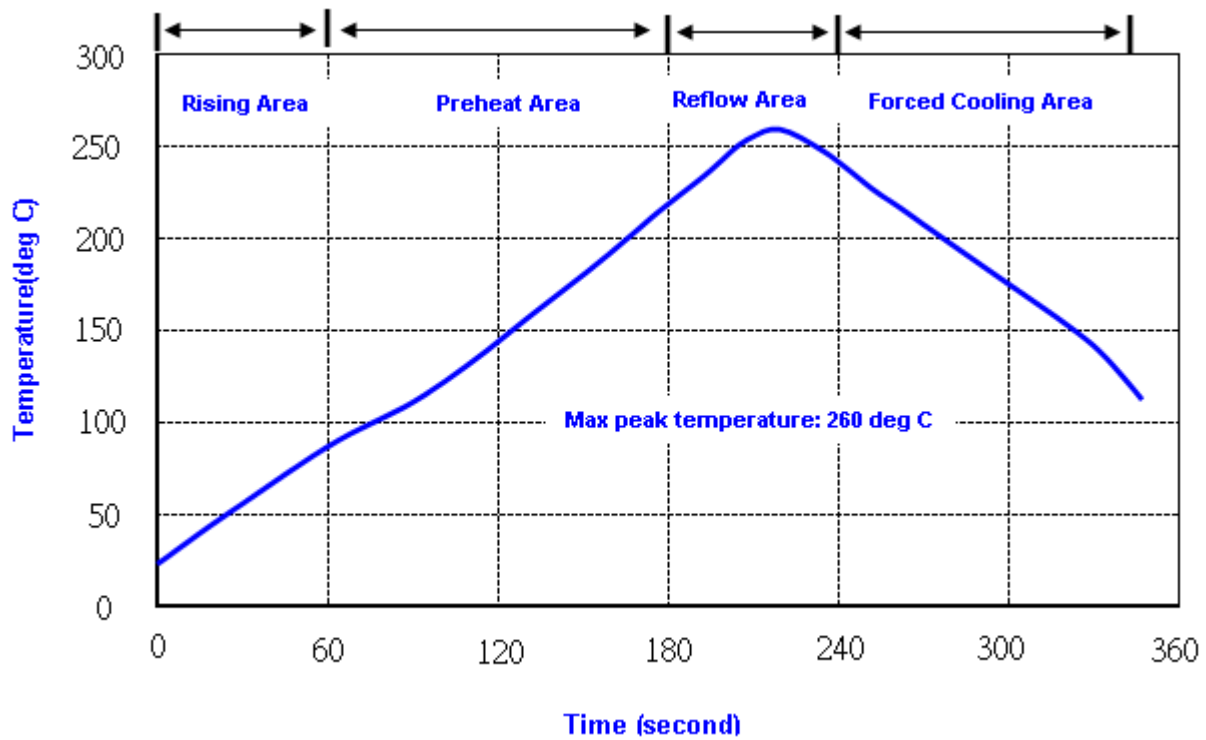
1. Unless otherwise specified tolerance on dimension ± 0.1 mm.
2. Material: conductive polystyrene with color black.
3. 10 pitch cumulative tolerance ± 0.2 mm.

Packing Quantity/Packing:

3K pcs maximum per reel



Reflow Profile:



- Note:**
1. Max peak temperature: 260 \pm 5 deg C; Time: 10 \pm 2 sec
 2. Temperature: 217 \pm 5 deg C; Time: 90~100 sec

Reliability Specifications

Test name	Test process / method	Reference standard
Mechanical characteristics		
resistance to Soldering heat (IR reflow)	Temp./ Duration : 265°C /10sec ×2 times Total time : 4min.(IR-reflow)	EIAJED-4701 -300(301)M(II)
Vibration	Total peak amplitude : 1.5mm Vibration frequency : 10 to 2000 Hz Sweep period : 20 minute Vibration directions : 3 mutually perpendicular Duration : 2 hr / direc.	MIL-STD 202G method 204
Mechanical Shock	directions : 3 impacts per axis Acceleration : 3000g's, +20/-0 % Duration : 0.3 ms (total 18 shocks) Waveform : Half-sine	MIL-STD 202G method 213
Solderability	Solder Temperature:265±5°C Duration time: 5±0.5 seconds.	J-STD-002
Environmental characteristics		
Thermal Shock	Heat cycle conditions -40 °C (30min) ↔ 85 °C (30min) * cycle time : 10 times	MIL-STD 883G method 1010.8
Humidity test	Temperature : 85 ± 2 °C Relative humidity : 85% Duration : 96 hours	MIL-STD 202G method 103
Dry heat (Aging test)	Temperature : 125 ± 2 °C Duration : 168 hours	MIL-STD 202G method 108A
Cold resistance (Low Temp Storage)	Temperature : -40 ± 2 °C Duration : 96 hours	IEC 60068-2-1