



**RACTRON**  
**ELECTRONICS**

深圳市瑞科创电子有限公司

地址：广东深圳市福田区上步南路1001号锦峰大厦A座3楼308-312室  
电话：0755-83062006 82767281 82767282 82767283 32971587  
传真：0755-83004913 www.ractron.com bojillsheng@ractron.com.cn

TCXO RTT 温补晶振 VC-TCXO RTTV 温补压控晶振

SMD5.0X3.2mm DATASHEET

1、FREQUENCY CHARACTERISTICS 频率特性

Parameter	Min	Typ	Max	Units	Test Condition
Nominal Frequency 标称频率	10		40	MHz	
Frequency Tolerance 频差	-1.0		+1.0	ppm	Frequency at 25°C, after reflow
Frequency stability over temperature 温度稳定性	-0.5		+0.5	ppm	Referenced to the frequency at 25°C.
Temperature range 工作温度	-40		+85	°C	Operating temperature range over the frequency stability
Frequency slope of perturbations 斜率	-0.1		+0.1	ppm/°C	Minimum of 1 frequency reading every 2°C over -40°C to +85°C
	-0.2		+0.2	ppm/°C	Minimum of 1 frequency reading every 2°C over -30°C to +85°C
Supply voltage stability	-0.2		+0.2	ppm	Supply voltage varied $\pm 5\%$ at 25°C
Load sensitivity 灵敏度	-0.2		+0.2	ppm	$\pm 10\%$ load change
Aging 老化率	-1.0		+1.0	ppm	first year at 25°C

2、POWER SUPPLY 电源电压

Parameter	Min	Typ	Max	Units	Test Condition
Supply voltage 工作电压	3		3.3	V	
Current 电流功耗			2	mA	At maximum supply voltage

3、CONTROL VOLTAGE 压控调整

Parameter	Min	Typ	Max	Units	Test Condition
Control voltage range	0.65	1.65	2.65	V	
Pulling range	$\pm 5$		$\pm 999$	ppm	Referenced to VCON at 1.65V

4、OSCILLATOR OUTPUT 输出

Parameter	Min	Typ	Max	Units	Test Condition
Output waveform 输出波形	Clipped sine wave			Sine	Hcmos TTL CMOS
Output voltage level 电平	0.8		2	V <sub>p-p</sub>	
Output load 负载	10Kohm//10pF				
Start time 启动时间			2	ms	

5、PHASE NOISE 相位噪声

Parameter	Min	Typ	Max	Units	Test Condition
100Hz offset		-117		dBc/Hz	
1KHz offset		-137		dBc/Hz	
10KHz offset		-149		dBc/Hz	
100KHz offset		-150		dBc/Hz	

6、ENVIRONMENTAL CHARACTERISTICS 环境特性

Parameter	Reference Std.	Test Condition
Vibration Test 振动测试	MIL-STD-883 2007 Condition A JESD22-B103 Condition 1	10~2000Hz, 1.52mm, 20G, each axis for 4 hrs
Thermal Shock 温度冲击	MIL-STD-883 1010 Condition B JESD22-A104 Condition B	-55°C, +125°C soak time is 10 mins with total 200 cycles
Mechanical Shock 机械冲击	MIL-STD-883 2002 Condition B JESD22-B104 Condition B	1500G, half-sine, 0.5ms, each axis for 3 times.
Storage temperature 存储温度	-55°C to +125°C	-55°C to +125°C



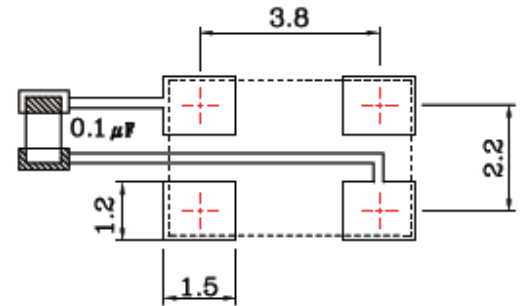
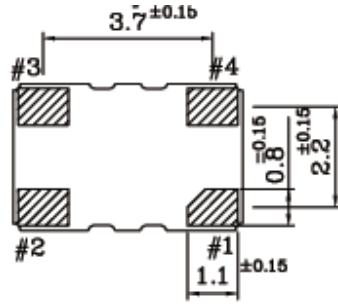
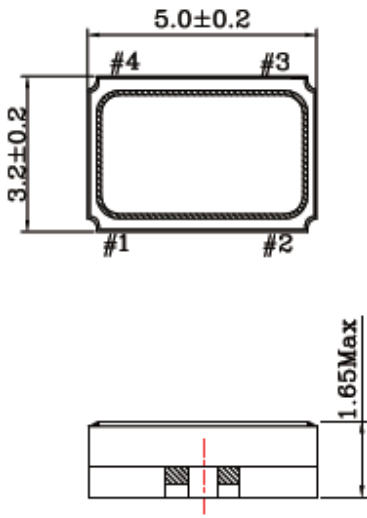
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DIMENSIONS 外形尺寸

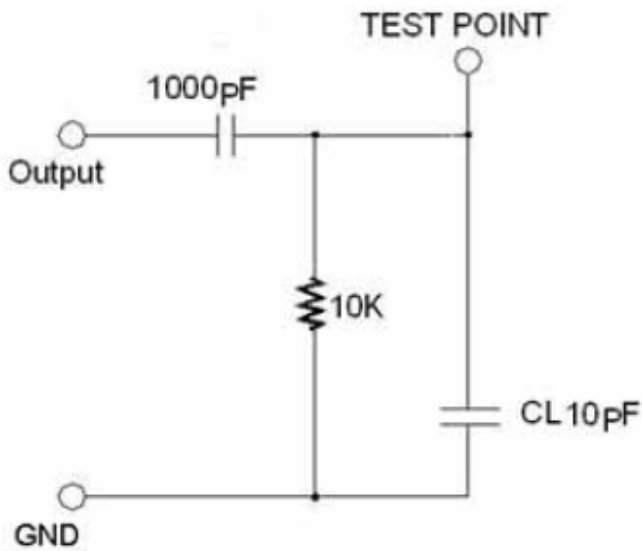
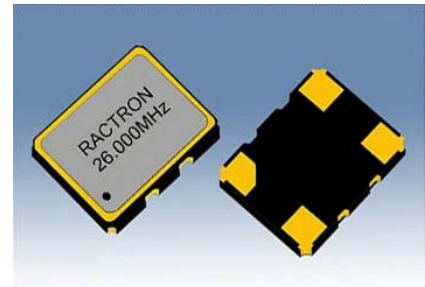
SOLDER PAD LAYOUT 焊接尺寸



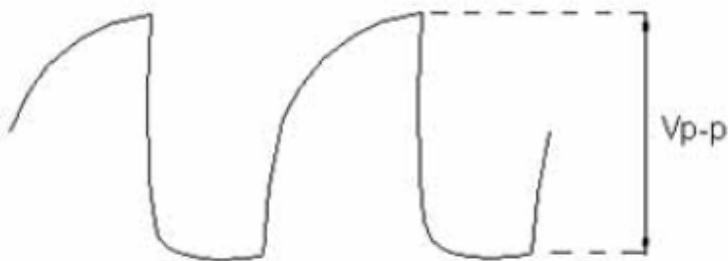
Pin#	Function
1	VCON/TRI-STATE
2	GND
3	OUTPUT
4	VDD

Actual Size 实物图

TEST CIRCUIT 测试电路



OUTPUTWAVE 输出波形



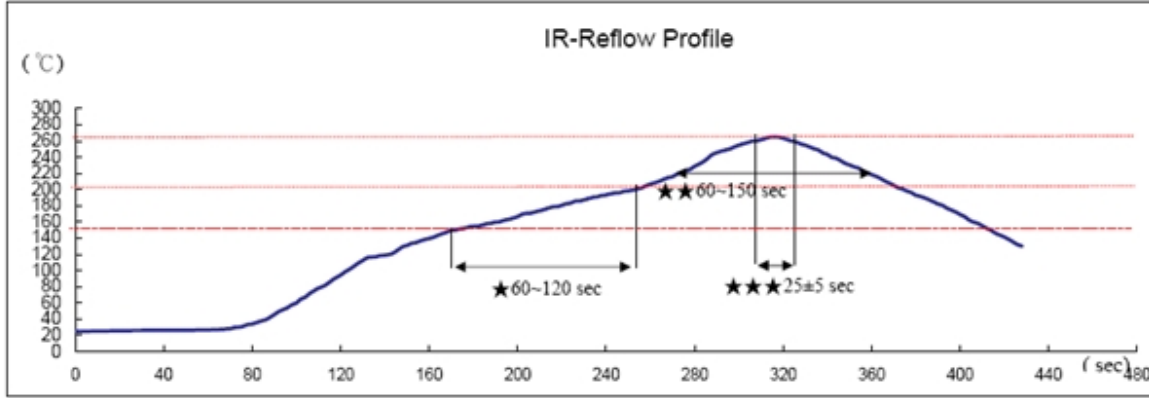


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无铅陶瓷贴片产品回流焊温度曲线



Reference Standard: JEDEC-STD 020

Test conditions: ★Pre-heating : 150°C to 200°C, 60~120secs.  
★★Heating : 217°C, 60~150sec.  
★★★Peak temperature : 260±5°C, 25±5sec.

10MHz 20MHz 电性能测试数据

THE TESTING DATA OF ELECTRICAL CHARACTERISTICS

TEST DATE:01/16/2012  
FREQUENCY:10.000MHZ

PART NO. :  
ORDER NO. :

NO	FREQUENCY @ 25 °C (HZ)	OFFSET (PPM)	ICC (mA)	PULL_H (PPM)	PULL_L (PPM)	FREQ_V_H (V)	FREQ_V_L (V)	START_T (mS)	LINE %	P_P (V)
		0.45	2	12	-4	0.2	0.2	2	10	
		-0.45		4	-12	-0.2	-0.2			0.8
1	10000000.40	0.04	1.10	6.73	-6.44	0.01	-0.01	0.16	0.79	1.25
2	10000000.00	0.00	1.00	6.15	-5.89	0.01	0.00	0.14	0.70	1.24
3	10000000.20	0.02	1.15	6.40	-6.13	0.02	0.00	0.14	0.72	1.24
4	10000000.60	0.06	1.10	6.40	-6.09	0.01	0.00	0.14	0.77	1.24
5	9999999.80	-0.02	1.10	6.51	-6.21	0.01	0.00	0.19	0.84	1.24
6	10000000.60	0.06	1.15	6.73	-6.35	0.02	0.00	0.19	0.83	1.26
7	10000000.60	0.06	1.05	6.42	-6.05	0.02	0.01	0.13	0.82	1.25
8	10000000.50	0.05	1.10	6.21	-5.94	0.02	0.00	0.18	0.71	1.23
9	10000000.20	0.02	1.10	6.89	-6.53	0.01	0.00	0.22	0.84	1.25
10	10000001.10	0.11	1.10	6.73	-6.38	0.01	0.00	0.15	0.81	1.24

OK_QTY	AVG:	0.04	1.10	6.52	-6.20	0.01	0.16	0.78	1.24
10.00	STD:	0.04	0.04	0.25	0.22	0.01	0.03	0.06	0.01
	GA:	8.89	****	-37.08	44.98	7.00	****	****	****
	CP:	4.05	6.86	5.44	6.14	13.33	20.40	55.8 6	18.50
	CPK:	3.69	6.86	3.42	3.38	13.33	20.40	55.8 6	18.50

INSPECTOR: KELLA  
SUPERVISOR: MILLER



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THE TESTING DATA OF ELECTRICAL CHARACTERISTICS

TEST DATE:01/26/2013

PART NO. :

FREQUENCY:20.000MHZ

ORDER NO. :

NO	FREQUENCY @ 25 °C (MHZ)	OFFSET 0.45 -0.45 (PPM)	ICC 2 (mA)	V Ver 0.2 -0.2 (PPM)	START_T 2 (mS)	PULL_H 999 5 (PPM)	PULL_L -5 (PPM)	VP_P 1 (V)	VC L 10 0		
1	20	0	1.7	-0.001	0	0.001	6.5	-6.5	1.22	0.7	OK
2	20	-0.02	1.7	-0.001	-0.004	0.001	6.3	-6.5	1.24	0.5	OK
3	20	0.01	1.8	0.002	-0.002	0.003	6.5	-6.5	1.22	0.5	OK
4	20	0.01	1.8	0.001	-0.002	0.001	6.3	-6.5	1.22	0.4	OK
5	20	0.01	1.7	0.002	0.001	0.02	6.5	-6.7	1.24	0.6	OK
6	20.000001	0.03	1.8	0.002	0.003	0.02	6.9	-6.9	1.25	0.6	OK
7	19.999999	-0.04	1.8	0.002	0	0.002	6.5	-7	1.24	0.4	OK
8	20.000001	0.05	1.8	0.002	0.003	0.02	6.9	-7	1.22	0.5	OK
9	19.999999	-0.03	1.7	0.001	-0.001	0.002	6.8	-7.1	1.22	0.4	OK
10	20	0	1.7	0.002	0.003	0.02	6.4	-6.7	1.24	0.6	OK
11	20.000001	0.04	1.8	0.001	0.001	0.001	6.7	-6.9	1.22	0.5	OK
12	19.999999	-0.04	1.7	0	0.002	0.02	6.5	-6.5	1.22	0.7	OK
13	19.999999	-0.03	1.7	0.003	0.003	0.002	6.8	-7	1.22	0.5	OK
14	19.999999	-0.05	1.8	0.003	0.005	0.001	6.9	-6.9	1.24	0.5	OK
15	19.999999	-0.05	1.7	0.005	0.001	0.001	6.5	-7	1.22	0.5	OK
16	20	0.02	1.7	0.002	0.02	0.02	6.5	-7	1.22	0.6	OK
17	20.000001	0.04	1.8	0.003	0.001	0.001	6.8	-6.8	1.22	0.4	OK
18	20	0.02	1.7	0.006	0.002	0.002	6.5	-7	1.22	0.5	OK
19	20	0.02	1.8	0.004	0.007	0.002	6.7	-6.5	1.22	0.5	OK
20	19.999999	-0.07	1.8	0.004	0.004	0.02	6.5	-6.6	1.22	0.6	OK
	AVG:	0.0	1.7	0.0	0.0	0.0	6.6	-6.8	1.2	0.5	
	STD:	0.0	0.0	0.0	****	0.0	0.2	0.2	0.0	0.1	
	GA:	-1.0									
	CP:	4.4									
	CPK:	116									
		4.4									
		116									

TEST\_QTY: 20

OK\_QTY: 20

NG\_QTY: 0

INSPECTOR: KELLA

SUPERVISOR: MILLER

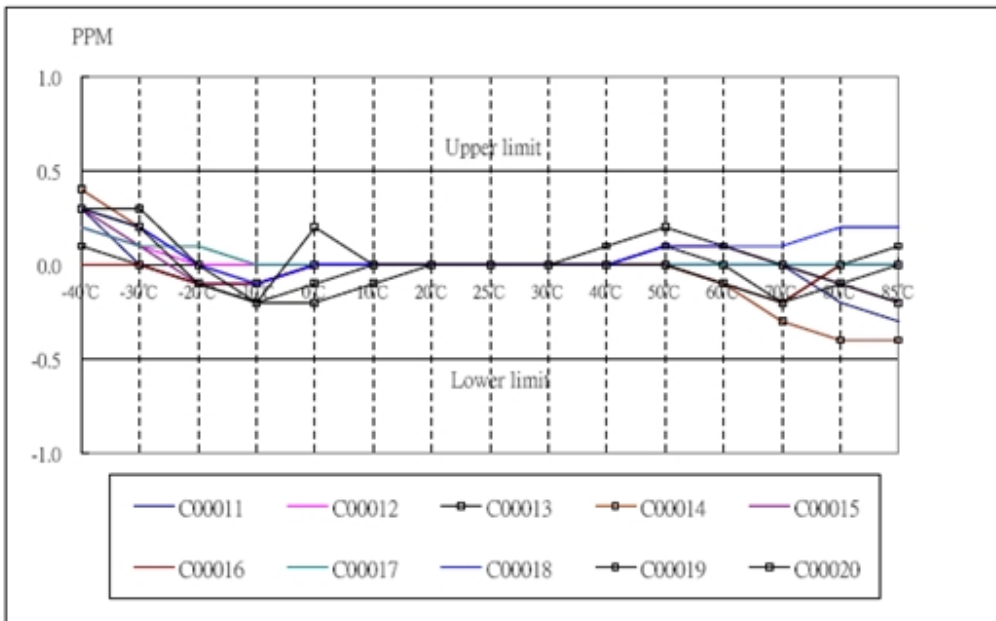
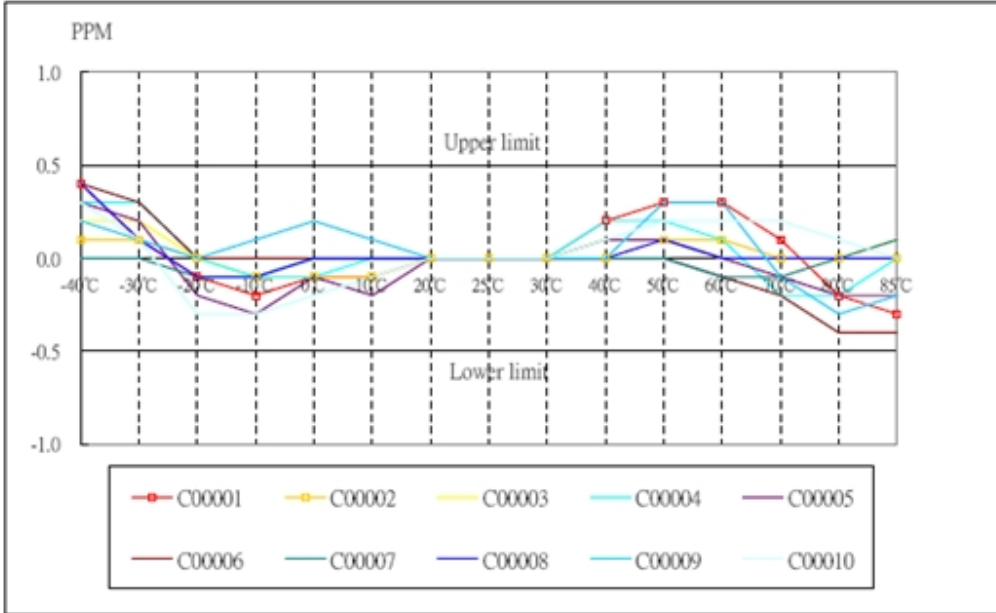


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10MHz 20MHz 温度稳定性测试数据





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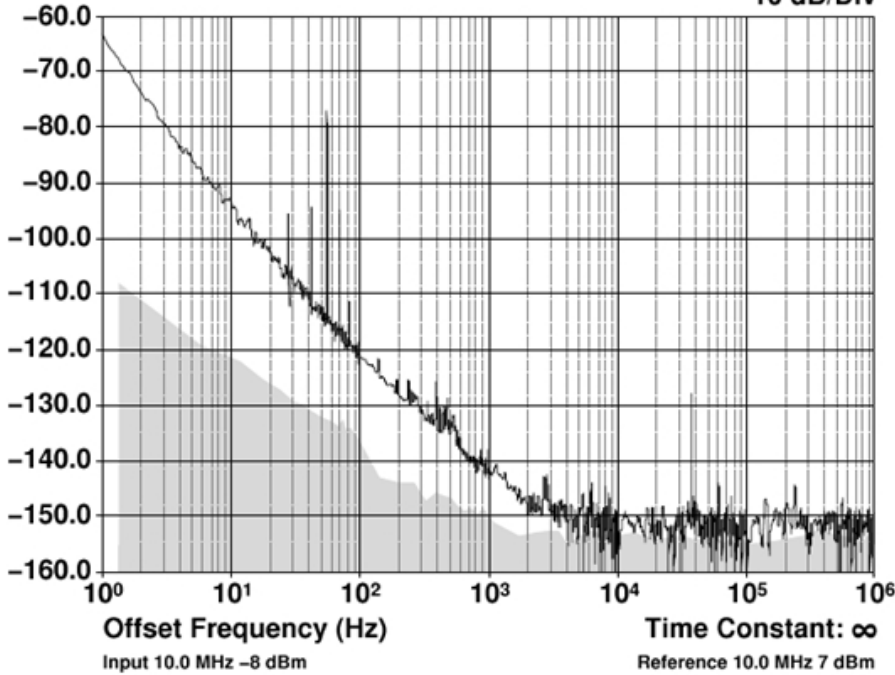
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10MHz 20MHz 相位噪声测试数据

### $\mathcal{L}(f)$ Phase Noise at 10.0 MHz (dBc/Hz)

10 dB/Div



### $\mathcal{L}(f)$ Phase Noise at 20.0 MHz (dBc/Hz)

10 dB/Div

