Chengdu Kingbri Frequency Technology Co., Ltd	PRODUCT TYPE:
	TMF-SMD2016 Oscillator

PRODUCT APPROVAL

ITEM	TMF-SMD2016 Oscillator		
TITLE	01.T.MF.DTGVBS1026000000		
DESCRIPTION	TMF-SMD2016 OSC 26.000000MHz 1.8V		
SEC CODE	-		
APPLIED TO REFERENCE	SAMSUNG ELECTRONICS Co.,Ltd		
WEIGHT	GW box (kg)	NW Reel (g)	Part (g)
	4.202	36	0.012

PATENT NO.	
Vendor Code	DBA4
Green partner registration date	2020/2/24

Drafting	ISS	CHK.(R&D)	CHK.(QA)	APP.
SIGN	杨静			
DATE	2020/2/24	2020/2/24	2020/2/24	2020/2/24

Indemnification

CREC will indemnify, hold harmless, and at Samsung's request, defend Samsung and Samsung's directors, officers, employees, agents and independent contractors from and against any loss,cost, liability or expense (including court costs and reasonable fees of attorneys and other professionals) arising out of or resulting from any third party claim that any Products and/or Components provided by CREC infringes patent, copyright, trade secret right or other intellectual property right. If CREC receives notice of an alleged patent, copyright, trade secret or other intellectual property right infringement or if Samsung's use of the Products and/or the Components provided by CREC shall be prevented by permanent injunction for reasons of patent, copyright or trade secret infringement, CREC may, at its sole option and expense, procure for Samsung the right to continued use of the Products and/or the Components as provided hereunder, or modify the allegedly infringing item such that it is no longer infringing, or replace

Process	Site	TEL	ADDRESS
FAB	Chengdu Kingbri Frequency Technology Co., Ltd	+86-28-66118598	No.8 Beiye Road,West Area of Hi-Tech Zone, Chengdu,sichuan,China
ASSEMBLY			
TEST			
WEB SITE	www.chinacrec.com		

CREC	PRODUCT SPECIFICATION	LANGUAGE English

HISTORY

No	HISTORY	REASON	DATE
1	First	-	2020/2/24
2			
3			
4			
5			
6			
7			

CREC

PRODUCT SPECIFICATION

LANGUAGE

English

【 CONTENTS 】

1 Parra explanation ---- 1
2 SCOPE ---- 1
3 Reference Standard ---- 1
4 TITLE Guide ---- 1
5 Figure ---- 2
5.1 External structure ---- 2
5.2 Marking ---- 2
6 Performance ---- 3
6.1 Electrical Performance ---- 3
7 Measurement Circuit ---- 4
8 IR Reflow Profile ---- 4
9 Recommended Solder Pad---- 5
10 Plating Specification of Leadd---- 5
11 Packing specification ---- 6
11.1 Tape Dimensions ---- 6
11.2 Reel Dimensions ---- 6
12 SMD DATA ---- 7

PRODUCT SPECIFICATION

LANGUAGE

English

1 Parts explanation

This part is a miniature AT cut stirp crystal units with SMD2016 miniature BASE. It is mainly used in mobile , wifi, bluetooth and telecommunications application.

2 SCOPE

This specification only covers CREC's 01.T.MF.DTGVBS1026000000

3 Reference Standard

3.1 MIL-STD-883H :Environmental tests' Mechanical tests.

3.2 MIL-STD-202 : Test Methods for Electronic and Electrical component part.

3.3 IEC 60068-2 :Environmental tests' Mechanical tests.

3.4 ANSI/EIA-481-C : 8mm through 200mm enbossed carrier taping and 24mm punched carrier taping of suface mount components for automatic handling.

3.5 JEDEC J-STD-020C: Soldering

TITLE Guide

01.T.MF.DTGVBS1026000000

Product

Product Series:TCXO

Type:TMF-SMD2016

Supply voltage:1.8V

TCXO

Nominal Frequency:26.000000MHz

Oscillator mode：AT Fundamental

Output:Clipped sine wave 10Kohm/10pF

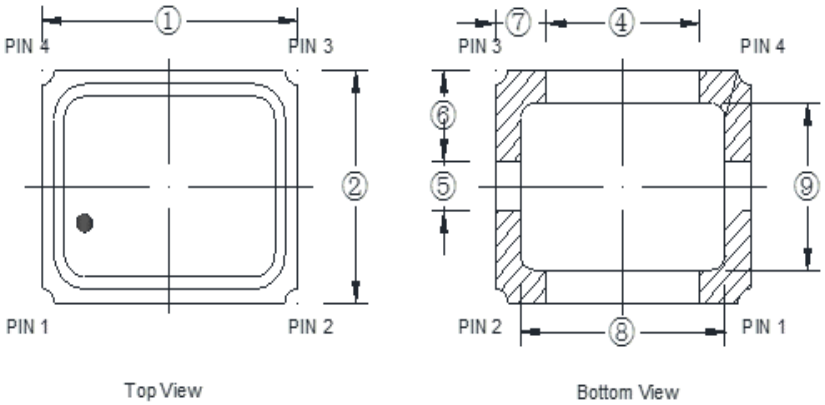
Operating temp range:-40℃~125℃

Frequency stability:±0.5ppm -40℃~85℃

Code	Code meaning	·	Code	Code meanin	·	Code	Code meaning	Code	Code meaning	Type	·	Code	Code meaning	Code	Code meaning	Code	Code meaning	Code	Code meaning	Code	Code meaning	Code	Code meaning	Code	Code meaning
01	成品类	·	T	温度补偿晶体振荡器（TCXO）	·	D	插件产品(DIP)	A	全尺寸(12.8X20.4mm)	TDA	·	A	0.9V	T	TCXO	A	±.005	A	150℃	A	CMOS 15pF/50±5%	1	AT Fundamen	XXXXXXXX	Frequency
								B	假贴片(14.3x8.4mm)	TDB		B	1.2V	A	±5(VCTCXO)	B	±0.1	B	125℃						
								C	全尺寸(26x26mm)	TDC		C	1.5V	B	±8(VCTCXO)	C	±0.14	C	105℃			3	AT 3rd		
						M	贴片陶瓷基座金属封装(TCXO)	A	SMD7050(4Pin)	TMA		D	1.8V	C	±10(VCTCXO)	D	±0.2	D	95℃			5	AT 5rd		
								B	SMD7050(10Pin)	TMB		E	2.0V		Vcon	E	±0.28	E	90℃	B	TTL 15pF/50±5%	7	AT 7rd		
								C	SMD5032	TMC		F	2.5V			F	±0.37	F	85℃						
								D	SMD3225	TMD		G	3.3V			G	±0.5	G	80℃						
								E	SMD2520	TME		H	5.0V			H	±1	H	75℃						
								F	SMD2016	TMF		I	15.0V			I	±1.5	I	70℃	C	CMOS 15pF/50±10%				
								G	SMD1612	TMG						J	±2	J	60℃						
								H	SMD14387	TMH						K	±2.5	K	55℃						
						H	高精度或三级钟(High Precision/stratum 3)	B	SMD5032	THB						L	±4.6	L	50℃	S	Clipped sine wave 10Kohm/10pF				
								C	SMD3225	THC						M	±5	M	40℃						
								D	SMD2520	THD								N	10℃						
								E	SMD2016	THE								O	0℃						
						S	硅振荡器(MEMS-TCXO)	A	SMD7050	TSA								P	-10℃						
								B	SMD5032	TSB								Q	-15℃						
								C	SMD3225	TSC								R	-20℃						
								D	SMD2520	TSD								S	-25℃						
								E	SMD2016	TSE								T	-30℃						
																		U	-35℃						
																		V	-40℃						
																		W	-45℃						

5 Figure

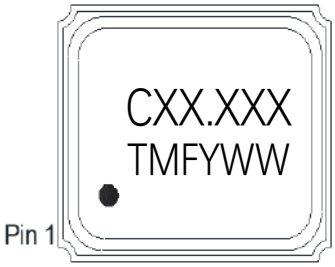
5.1 External structure



Pin	Connection
Pin 1	GND
Pin 2	GND
Pin 3	Output
Pin 4	Vdd

Position	SPEC (mm)	TOLERANCE (mm)	REMARK
①	2.00	±0.10	-
②	1.60	±0.10	-
③	0.70	±0.10	-
④	1.20	±0.10	-
⑤	0.34	±0.10	-
⑥	0.63	±0.10	-
⑦	0.40	±0.10	-
⑧	1.60	±0.10	-
⑨	1.15	±0.10	-

5.2 Marking



No.	Item		E.G.	Remark
1	C	LOGO 1 Digit	C	C: LOGO CREC
2	XX. XXX	Nominal Frequency (MHz) 6 Digit	26.000	26.000=26.000000MHz
3	TMF	MODEL 3 Digit	TMF	TMF=TCXO SMD2016
4	Y	Year: Last 1 Digit	0	0=2020
5	WW	Week Code 2Digit	09	9th Week

Performance

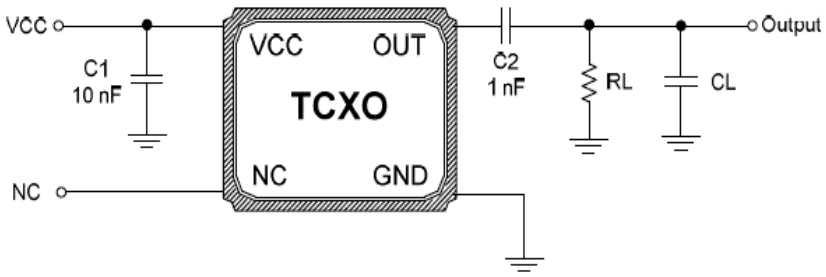
6.1 Electrical Performance

* Measure equipment

Electrical characteristics measured by S&A280B.

No.	Item		Symb.	Electrical Specification				Remark (Humidity: 40%~60%)
				Min.	Type	Max.	Unit	
1	Nominal Frequency		F0	26.000000			MHz	-
2	Output wavform		-	Clipped sine wave			-	-
3	Supply voltage		Vdd	1.71	1.8	1.89	V	at 25 ℃,
4	Current		Icc	-	-	1.5	mA	at 25 ℃,
5	Frequency tolerance		ΔF/F0	-1.5	-	1.5	ppm	at 25 ℃,
6	Operating Temperature Range		T_{OPR}	-40	-	125	℃	
7	Frequency Stability		Tc1	-0.5	-	0.5	ppm	-40~85℃
	Frequency Stability		Tc2	-50	-	50	ppm	-40~125℃
8	Storage Temperature		Tstg	-55	-	125	℃	-
9	Supply voltage stability		-	-0.2	-	0.2	ppm	±5%Vdd at 25 ℃
10	Load sensitivity		-	-0.2	-	0.2	ppm	±10% Load change
11	Output voltage level	Logic "1"	VOH	1.3	-	-	V	at 25±3℃
		Logic "0"	VOL	-	-	0.4	V	at 25±3℃
		Swing level	-	1.0	-	-	V	at 25±3℃
12	Symmertry		Duty	47	-	53	%	at 25±3℃
13	Output load		CL	10Kohm/10pF			-	-
14	Start time		St	-	-	2.0	ms	-
15	RMS Phase Jitter		RMS	-	-	1.0	pSec	12KHz ~5MHz
16	Phase Noise	10Hz offset	-	-	-90	-	dBc/Hz	at 25 ℃,
		100Hz offset	-	-	-115	-	dBc/Hz	at 25 ℃,
		1KHz offset	-	-	-135	-	dBc/Hz	at 25 ℃,
		10KHz offset	-	-	-150	-	dBc/Hz	at 25 ℃,
		100KHz offset	-	-	-152	-	dBc/Hz	at 25 ℃,
17	Aging		Aging	-1	-	1	ppm	
18	Reliability		AEC-Q100					
19	Package type		TMF-SMD2016					

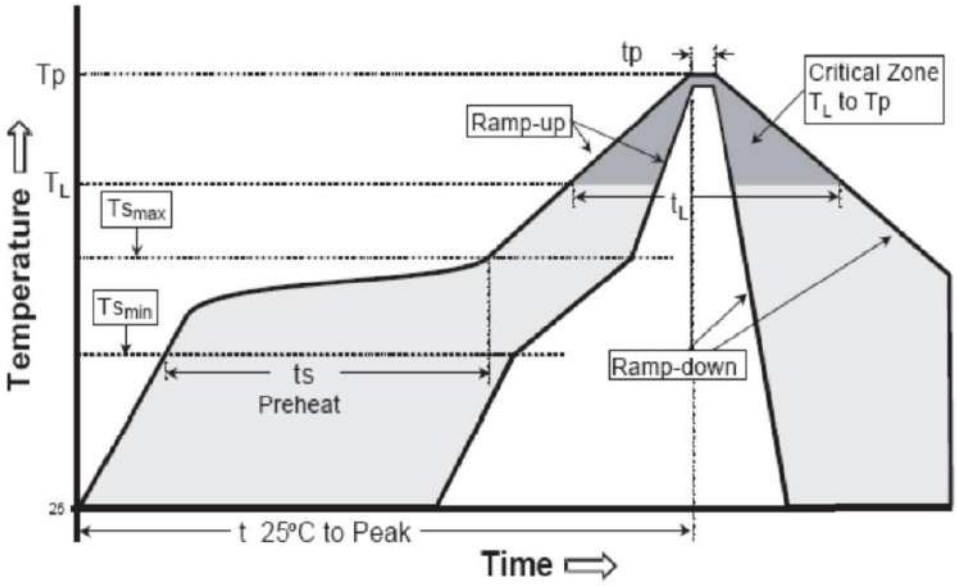
7 Measurement Circuit



External Components

Part	Function
C1	AC Noise Bypass for VCC
C2	DC Block for Output
RL	Load Resistance
CL	Load Capacitance

8 IR Reflow Profile

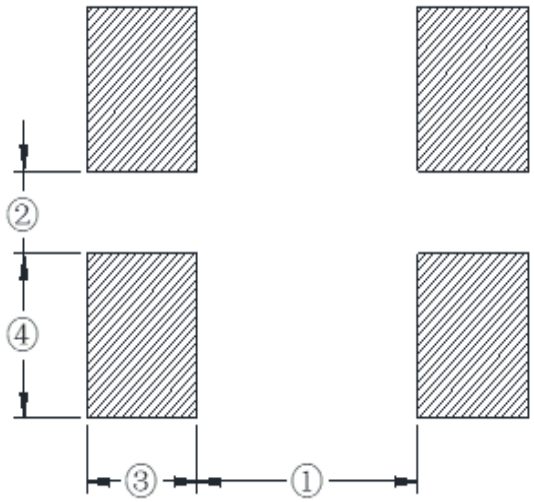


Remark: Referance JEDEC J-STD-020C

Profiles Feature	Pb-Free Assembly
Average Ramp-up Rate (Ts max to Tp)	3℃/second max.
Preheat ■Temperature Min (Ts min) ■Temperature Max (Ts max) ■Time (ts min to ts max)	 125℃ 200℃ 60~180 seconds
Time maintained above ■Temperature (T_L) ■Time (t_L)	 217℃ 60~150 seconds
Peak/Classification Temperature (T_p)	245℃
Time within 5℃ of actual Peak Temperature (t_p)	20~40 seconds
Ramp-down rate	6℃/second Max
Time 25℃ to Peak Temperature	8 minutes Max
Suggest reflow times	3 times

9 Plating Specification of Pin

Recommended Solder Pad



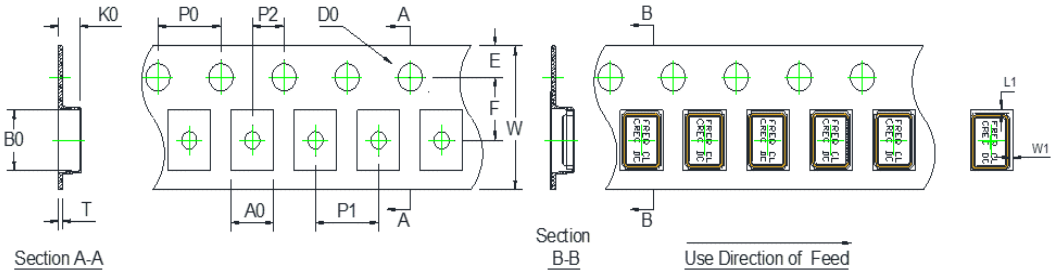
Position	SPEC (mm)	TOLERANCE (mm)	REMARK
①	1.2	±0.1	-
②	0.4	±0.1	-
③	0.6	±0.1	-
④	0.8	±0.1	-

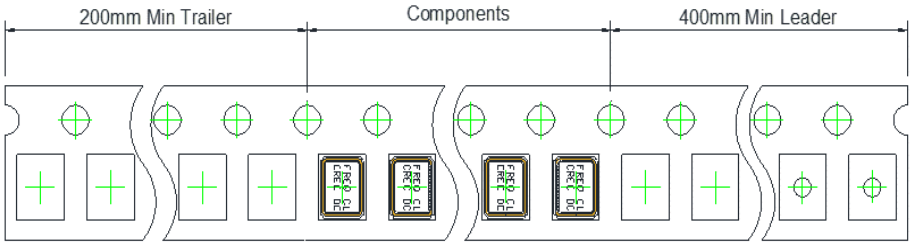
Plating Specification of Lead

Position	Part Name	Material	SPEC（μm）	REMARK
①	Base Material	W (wolfram)	-	X-ray fluorescence thickness gauge
②	Middle Plating	Ni (nickel）	1.27~8.89	
③	Finish Plating	Au (Gold)	0.3~0.7	

11 Packing specification

11.1 Tape Dimensions



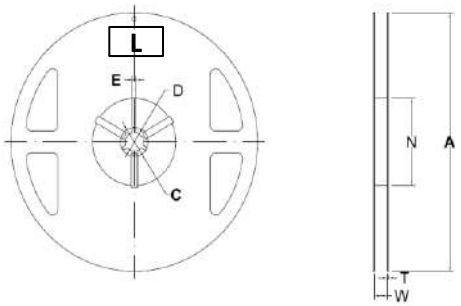


ITEM	W	P1	E	F	D0	P0	P2	A0	B0	K0	T	L1	W1
Spec(mm)	8.00	4.00	1.75	3.50	1.55	4.00	2.00	1.90	2.30	0.95	0.25	0.20	0.20
Tol.(mm)	±0.30	±0.10	±0.22	±0.10	±0.05	±0.10	±0.10	±0.10	±0.10	±0.10	±0.05	±0.05	±0.05

◆ Material of Tape

Item	Material
Carrier tape	PS (Black)
Cover tape	PET

11.2 Reel Dimensions



Item	A	W	N	C	D	E	T	L(Lable size)	
								①	②
SPEC(mm)	178.0	9.0	60.2	20.2	13.2	2.5	1.4	100	50
Tol.(mm)	±2.0	±0.5	±0.5	±1.0	±0.5	±0.5	±0.2	-	-

◆ Material of Tape

Item	Material
REEL	PS (White)

PRODUCT SPECIFICATION

LANGUAGE: English

11 SMD Data

SMD DATA
01.T.MF.DTGVBS1026000000

No.	Item		E.G.	Remark
1	C	LOGO 1 Digit	C	C: LOGO CREC
2	XX.XXX	Nominal Frequency (MHz) 6 Digit	26.000	26.000=26.000000MHz
3	TMF	MODEL 3 Digit	TMF	TMF=TCXO SMD2016
4	Y	Year: Last 1 Digit	0	0=2020
5	WW	Week Code 2Digit	09	9th Week

Actual Component Picture

Polarity picture

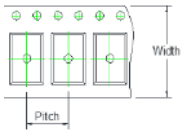
Polarity	Non Polar

Actual Reel Picture(Reel with Real parts, More than 3 pcs)

Use Direction of feed

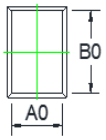
2. Carrier Width, Pitch

Item	Size(mm)
Width	8
Pitch	4
POCKET Material	EMBOSS / PAPER



3. Pocket Size

Item	Size (mm)
B0	2.30
A0	1.90

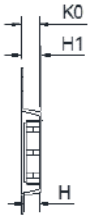


4. Cover tape / carrier Antistatic treatment & Bonding Method

Item	Criteria (100V)
Cover tape Inside	1*10^4 ~ 1*10^10 Ω
Carrier tape	1*10^5 ~ 1*10^9 Ω
Tray	Less than 1*10^8 Ω
Bonding Method	Thermal compression

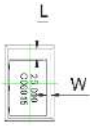
5.Carrier Height

Item	Size(mm)
Nozzle Adsorption depth K0	0.95
Parts Height H (TYP)	0.70
Carrier Height H1	1.20



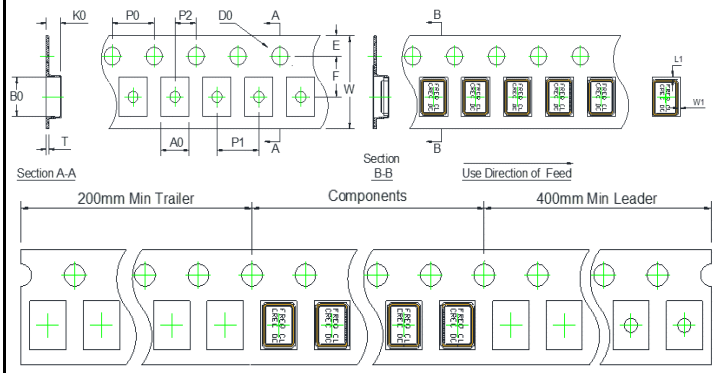
6. Carrier gap between internal and parts

Item	Size(mm)
L	0.20
W	0.20



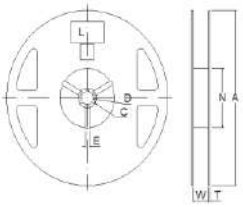
※ Carrier Tape and Reel Drawing

a.Carrier Tape



ITEM	W	P1	E	F	D0	P0	P2	A0	B0	K0	T	L1	W1
Spec(mm)	8.00	4.00	1.75	3.50	1.55	4.00	2.00	1.90	2.30	0.95	0.25	0.20	0.20
Tol.(mm)	±0.30	±0.10	±0.22	±0.10	±0.05	±0.10	±0.10	±0.10	±0.10	±0.10	±0.05	±0.05	±0.05

b.Reel



Item	A	W	N	C	D	E	T	(Lable size) ①	(Lable size) ②
SPEC(mm)	178.0	9.0	60.2	20.2	13.2	2.5	1.4	100	50
Tol.(mm)	±2.0	±0.5	±0.5	±1.0	±0.5	±0.5	±0.2	-	-