




**SPECIFICATION SHEET**

<b>SPECIFICATION SHEET NO.</b>	Q0201- XV16M00000S412
<b>DATE</b>	Feb. 01, 2023
<b>REVISION</b>	A1
<b>DESCRIPTION</b>	MHz SMD Crystal, Seam Seal, L2.0*W1.6*H0.5mm, 4 pads, CM21 series 16.0000MHz, Tolerance +/-10ppm, Load Capacitor 12pF, Frequency stability +/-30ppm @Operating Temp. Range -40°C ~+85°C, ESR 150 ohm Max, Reflow Profile Condition 260 °C Max. Tape/Reel, 3000pcs/Reel RoHS/RoHS III compliant
<b>CUSTOMER</b>	
<b>CUSTOMER PART NUMBER</b>	
<b>CROSS REF. PART NUMBER</b>	
<b>ORIGINAL PART NUMBER</b>	TGS CM21-16M0A10-12-30-40-150TLF
<b>PART CODE</b>	XV16M00000S412

<b>VENDOR APPROVE</b>			
Issued/Checked/Approved			
DATE: Feb. 01, 2023			

<b>CUSTOMER APPROVE</b>	
DATE:	

2/1/2023

**MAIN FEATURE**

- SMD Crystal, Seam Seal, L2.0\*W1.6\*H0.5mm, 4 pads
- Low cost, High precision, High frequency stability
- Reflow Profile Condition 260 °C Max.
- Cross more competitors part
- RoHS/RoHS III compliant



**APPLICATION**

- Bluetooth, wireless communication set
- Communication Electronics

**PART CODE GUIDE**

**RFQ**

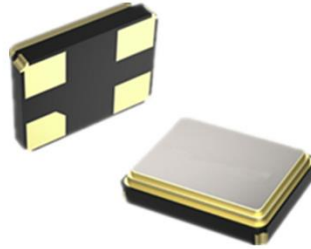
[Request For Quotation](#)

XV	16M00000	S	412
1	2	3	4

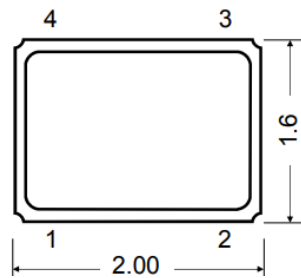
- 1) XV: Part family Code for SMD Crystal, Seam Seal, L2.0\*W1.6\*H0.5mm, 4 pads (CM21 Series)
- 2) 16M00000: Frequency range code for 16.0000MHz
- 3) S: SMD type, Package Tape/Reel, 3000pcs/Reel
- 4) 412: Specification code for original part No.: **TGS CM21-16M0A10-12-30-40-150TLF**

**DIMENSION (Unit: mm, Tol. +/-0.15mm)**

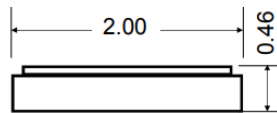
Image for reference



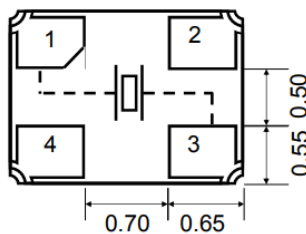
CM21



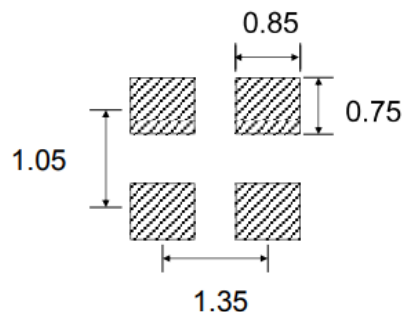
**Marking**  
Standard



**Connection**  
#1 Crystal  
#2 Ground  
#3 Crystal  
#4 Ground



Recommend Pad Layout



**SMD CRYSTAL 2016 TYPE 4 PADS**
**ELECTRICAL PARAMETERS**

Parameter	Part No. Symbol	Units	Value			Condition
			Min.	Typical	Max.	
Original Manufacturer	TGS	TGS Crystals				
Holder Type	CM21	SMD Crystal, Seam Seal, L2.0*W1.6*H0.5mm, 4 pads				
Frequency Range	16M0	MHz	16.000			
Mode of Oscillation	A	Fundamental				
Frequency Tolerance	10	ppm	-10		+10	@25°C
Load Capacitance	-12	pF	12			
Stability over Operation Temperature	-30	ppm	-30		+30	
Operation Temperature	-40	°C	-40		+85	
Storage Temperature		°C	-55		+125	
Equivalent Series Resistance (ESR)	-150	Ω			150	
Drive Level		μW			100	
Shunt Capacitance (C0)		pF	0		7.0	
Motional Capacitance (C1)		fF	N/A			
DLD2		Ω	N/A			
FLD2		ppm	N/A			
RDL2		Ω	N/A			
SPDB		dB	N/A			
Aging		ppm/year			±3	@1 <sup>st</sup> year
Insulation Resistance		MΩ	500			@100Vdc ± 15Vdc
Others	Package	T	Tape/Reel			
	RoHS Status	LF	RoHS III compliant			
	Add Value		N/A			
	Internal Control Code *		N/A			

Note: 1) Original Part Number: TGS CM21-16M0A10-12-30-40-150TLF

2) \* Internal Control Code- 2 letter or digits; Blank: N/A

2/1/2023

**RELIABILITY**

Test Items	Test Method And Conditions	Reference Documents
High Temperature High Humidity Storage	Temperature: 85°C±3°C Relative Humidity:85%RH Time: 96 Hours	JIS C5023
High Temperature Storage	Temperature: 125°C±3°C Time: 96 Hours.	MIL-STD-883E Method 1005.8
Low Temperature Storage	Temperature: -40°C±3°C Time: 96 Hours.	MIL-STD-883E Method 1013
Thermal Shock	Temperature 1: -55°C±5°C Temperature 2: 85°C±5 °C Temperature change between T1 and T2 5 min 10cycles maintain T1 and T2 for 30 minutes each cycle	MIL-STD-202F Method 107 Condition A
Resistance to Solder Heat	Solder Temperature: 260°C±5°C Time: 10±1 Seconds	MIL-STD-202F Method 210E
Solderability	The solder pot temperature is 245±5°C , dwell time 5±0.5sec	J-STD-002B
Drop Test	3 Times Free Fall from 50cm height table to 3cm thickness hard wood board	J-STD-002B
Mechanical Shock	Half sine wave,1000 G 3 Times for all 3 directions(X,Y Z)	MIL STD 202F Method 213B
Vibration	Frequency Range: 10Hz ~ 55Hz Amplitude: 0.75mm 2 Hours in each direction, total 6 Hours	MIL-STD-883E Method 2007.3
Leakage Test	Take measurements with a helium Leakage detector Leakage Rates≤1×10 <sup>-3</sup> Pa cm <sup>3</sup> /s	MIL-STD-883E

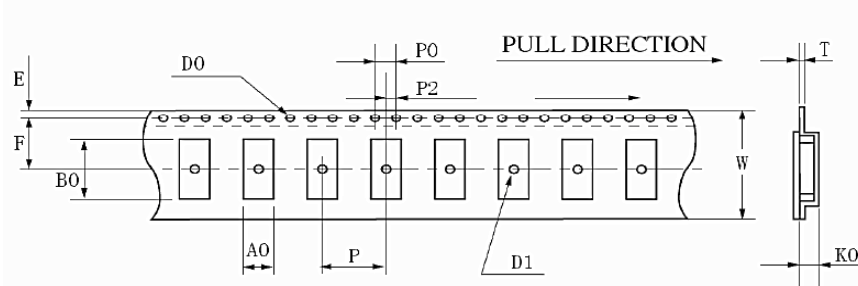
**SUGGESTED REFLOW PROFILE (For Reference Only)**



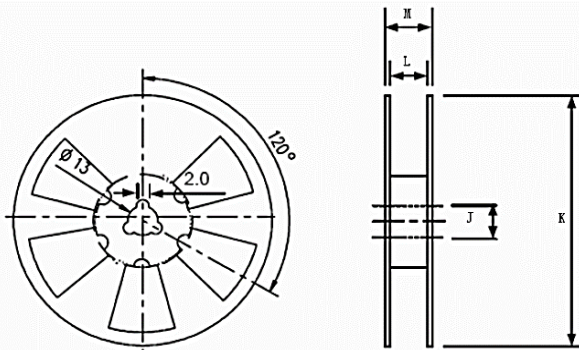
<b>Profile Feature</b>		Pb-Free Assembly
<b>Average Ramp-up Rate (Ts Max to Tp)</b>		3°C/second Max
<b>Preheat</b>	<b>Temperature Min (Ts Min.)</b>	125°C
	<b>Temperature Max (Ts Max.)</b>	200°C
	<b>Time (ts Min. to ts Max.)</b>	60 ~ 180 seconds
<b>Time maintained above</b>	<b>Temperature (T<sub>L</sub>)</b>	217°C
	<b>Time (t<sub>L</sub>)</b>	60 ~ 150 seconds
<b>Peak/Classification Temperature (T<sub>p</sub>)</b>		260 °C
<b>Time within 5°C of actual Peak Temperature (t<sub>p</sub>)</b>		20 ~ 40 seconds
<b>Ramp-down rate</b>		6 °C /Second Max.
<b>Time 25 °C to Peak Temperature</b>		8 minutes Max.
<b>Suggest reflow times</b>		3 Times Max.

**TAPE/REEL (Unit: mm)**

All Devices are packed in accordance with EIA standard RS-481-2 and specifications., 3000pcs/Reel



W	8.00+/-0.2
E	1.75+/-0.1
F	3.5+/-0.05
T	0.25+/-0.05
P	4.0+/-0.1
P0	4.0+/-0.1
P2	2.0+/-0.1
D0	Ø1.55+0.05
D1	Ø1.1+0.05
A0	1.2+/-0.1
K0	0.65+/-0.1
B0	2.2+/-0.1



DIMENSIONS	J	K	L	M	pcs/Reel(unit:mm)
	13	178	8	11.5	Standard Reel Quality is 3,000pcs per reel

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2/1/2023