




**SPECIFICATION SHEET**

<b>SPECIFICATION SHEET NO.</b>	R0702-FM450K0000S004	
<b>DATE</b>	July 02, 2024	
<b>REVISION</b>	A3	Updated With Most Recent Data
<b>DESCRIPTION AND MAIN PARAMETRICS</b>	<p>SMD Ceramic Filter 12065 Type L12.0*W6.5*H3.0mm 4 Pads FM Series            450KHz, Insertion Loss. 4.0dB Max.; 6dB Bandwidth: ±7.5KHz Min.            Input/Output Impedance: 1500 ohm, Operating Temp. Range -20°C ~+85°C            Reflow Profile Condition 260 °C Max. Tape/Reel,            RoHS/RoHS III compliant, RoHS Annex III lead Exemption            (exempt per RoHS EU 2015/863)</p>	
<b>CUSTOMER</b>		
<b>CUSTOMER PART NO.</b>		
<b>CROSS REF. PART NO.</b>		
<b>ORIGINAL MFG/PART NO.</b>	TGS/CFTC 450EW TLH/LTWC450E	
<b>PART CODE</b>	FM450K0000S004	

<b>VENDOR APPROVE</b>			
Issued/Checked/Approved			
DATE: July 02, 2024			

<b>CUSTOMER APPROVE</b>	
DATE:	
7/2/2024	

**KHZ SMD CERAMIC FILTER STANDARD TYPE FM SERIES**

**MAIN FEATURE**

- KHz SMD Ceramic Filter 12065 Type 4 pads
- White case L12.0\*W6.5\*H3.0mm
- Cross More Competitors Part CFWKG Series
- RoHS/RoHS III compliant, RoHS Annex III lead Exemption (exempt per RoHS EU 2015/863)



**APPLICATION**

- Communication Electronics

**HOW TO ORDER**

- Please follow up Part Code Guide and Indicate Part Code When You Order Or RFQ.

**PART CODE GUIDE**

**RFQ**  
Request For Quotation

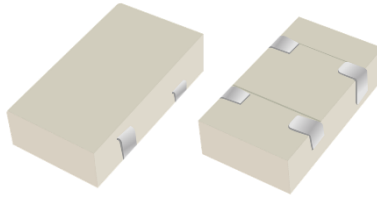
FM	450K0000	S	004
1	2	3	4

1. FM: Part family Code for KHz SMD Ceramic Filter 12065 Type L12.0\*W6.5\*H3.0mm 4 Pads
2. 450K0000: Frequency range code for 450KHz
3. S: SMD type, Package Tape/Reel, 1000pcs/Reel
4. 004: Internal Control Code and Special Parameters Code Letter A~Z, a~z or digits (0-9)

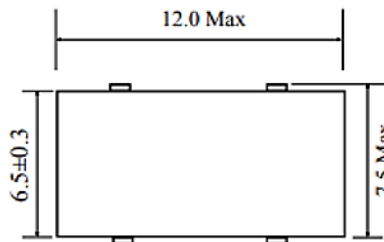
**KHZ SMD CERAMIC FILTER STANDARD TYPE FM SERIES**

**DIMENSION** (Unit: mm)

Image for reference



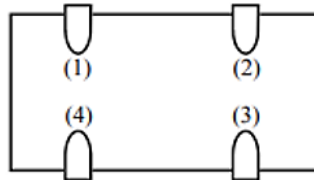
Top View



**Marking**

Line 1: Series Code  
Line 2: Frequency Range  
+Internal Code

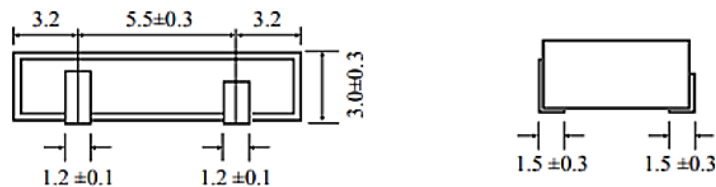
Bottom View



**Connection**

Pad (1): Input  
Pad (2): Output  
Pad (3): Ground  
Pad (4): Ground

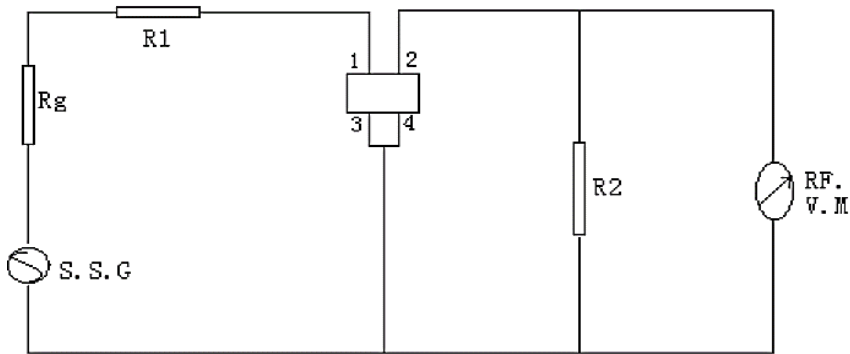
Side View



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**MEASUREMENT**

- Measurement shall be carried out at the standard temperature of  $25 \pm 2^\circ\text{C}$ . If no specific requirements, Test can be carried out under  $5\text{-}35^\circ\text{C}$ .
- Measuring Circuit



$R_g + R_1 = R_2 = \text{Output/input Impedance}$

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**GENERAL ELECTRICAL PARAMETERS**

PARAMETER		UNITS	VALUE			CONDITION
			MIN.	TYPICAL	MAX.	
Operation Temperance		°C	-20		+85	
Storage Temperance		°C	-40		+85	
Temperature Stability		%			±0.5	@ -20°C ~+85°C
Insulation Resistance		MΩ	100			@DC 25V 1 minute
Stop Band Attenuation		dB	45			Within f0± 100KHz
Ripple	FM450K0000S001	dB			2.0	Within f0± 11.0KHz
	FM450K0000S002				2.0	Within f0± 10.0KHz
	FM450K0000S003				2.0	Within f0± 7.0KHz
	<a href="#">FM450K0000S004</a>				2.0	Within f0± 5.0KHz
	FM450K0000S005				2.0	Within f0± 4.0KHz
	FM450K0000S006				2.0	Within f0± 3.0KHz
	FM450K0000S007				2.0	Within f0± 2.0KHz
	FM450K0000S009				2.0	Within f0± 1.0KHz
	FM455K0000S001				2.0	Within f0± 12.0KHz
	FM455K0000S002				2.0	Within f0± 10.0KHz
	FM455K0000S003				2.0	Within f0± 7.0KHz
	FM455K0000S004				2.0	Within f0± 5.0KHz
	FM455K0000S005				2.0	Within f0± 4.0KHz
	FM455K0000S006				2.0	Within f0± 3.0KHz
	FM455K0000S007				2.0	Within f0± 2.0KHz
	FM455K0000S009				2.0	Within f0± 1.0KHz

**KHZ SMD CERAMIC FILTER STANDARD TYPE FM SERIES**

**ELECTRICAL PARAMETERS – FOR DIFFERENT PART CODE- Ta = 25°C**

Part Code	Center Freq.(f0) (Center of 6dB Bandwidth)	3dB Bandwidth	6dB Bandwidth	50dB Bandwidth	Insertion Loss @ Min. Loss Point	Input/ Output Impedance
	KHz	KHz	KHz	KHz	dB	Ω
FM450K0000S001	450±2.0	±11.0 Min.	±15.0 Min.	±30.0 Min.	5.0 Max.	1500
FM450K0000S002	450±1.0	±8.5 Min.	±12.0 Min.	±24.0 Min.	5.0 Max.	1500
FM450K0000S003	450±1.0	±7.0 Min.	±10.5 Min.	±20.0 Min.	5.0 Max.	1500
<b>FM450K0000S004</b>	450±1.0	±5.0 Min.	±7.5 Min.	±15.0 Min.	4.0 Max.	1500
FM450K0000S005	450±1.0	±4.5 Min.	±6.0 Min.	±12.5 Min.	5.0 Max.	1500
FM450K0000S006	450±1.0	±3.0 Min.	±4.5 Min.	±10.0 Min.	4.0 Max.	1500
FM450K0000S007	450±1.0	±2.0 Min.	±3.0 Min.	±9.0 Min.	4.0 Max.	1500
FM450K0000S009	450±1.0	±1.0 Min.	±1.5 Min.	±5.0 Min.	7.0 Max.	1500

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**ELECTRICAL PARAMETERS – FOR DIFFERENT PART CODE- Ta = 25°C**

Part Code	Center Freq.(f0) (Center of 6dB Bandwidth)	3dB Bandwidth	6dB Bandwidth	50dB Bandwidth	Insertion Loss @ Min. Loss Point	Input/ Output Impedance
	KHz	KHz	KHz	KHz	dB	Ω
FM455K0000S001	455±2.0	±11.0 Min.	±15.0 Min.	±30.0 Min.	5.0 Max.	1500
FM455K0000S002	455±1.0	±8.5 Min.	±12.0 Min.	±24.0 Min.	5.0 Max.	1500
FM455K0000S003	455±1.0	±7.0 Min.	±10.0 Min.	±20.0 Min.	5.0 Max.	1500
FM455K0000S004	455±1.0	±5.0 Min.	±7.5 Min.	±15.0 Min.	4.0 Max.	1500
FM455K0000S005	455±1.0	±4.5 Min.	±6.0 Min.	±12.5 Min.	5.0 Max.	1500
FM455K0000S006	455±1.0	±3.0 Min.	±4.5 Min.	±10.0 Min.	5.0 Max.	1500
FM455K0000S007	455±1.0	±2.0 Min.	±3.0 Min.	±9.0 Min.	5.0 Max.	1500
FM455K0000S009	455±1.0	±1.0 Min.	±1.5 Min.	±5.0 Min.	7.0 Max.	1500

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**PHYSICAL CHARACTERISTICS**

TEST ITEMS	MEASUREMENT CONDITION	REQUIREMENT
Random Drop	Filter shall be measured after 3 times random drops from the height of 30cm on concrete floor	No visible damage and it meet Table at Page 5/6/7
Vibration	Filter shall be measured after being applied vibration of amplitude of 1.5mm with 10-55Hz band of vibration frequency to each of 3 perpendicular directions for 2 hours	No visible damage and it meet Table at Page 5/6/7
Solderability	Lead terminals are immersed in aide solder for 5 sec and then immersed in soldering bath of 230±5°C, for 3±0.5 sec.	At least 95% lead terminals shall be covered with solder.
Substrate Bending Test	Apply pressure in the direction of arrow at a rate of about 0.5mm per second until it reaches a bend of 3mm and hold for 30s.	No visible damage and it meet Table at Page 5/6/7
Adhesion	A static load of 20N to the direction of the arrow shall be applied on the core of the component and hold for 10 seconds. Filter shall be soldered correctly and tightly to PCB.	No visible damage and it meet Table at Page 5/6/7
Reflow Soldering	Put on the solder paste on the printed wiring board the samples shall be mounted and soldered under the condition, then it shall be subjected to the room atmosphere for 24 hours prior to the measurement.	No visible damage and it meet Table at Page 5/6/7



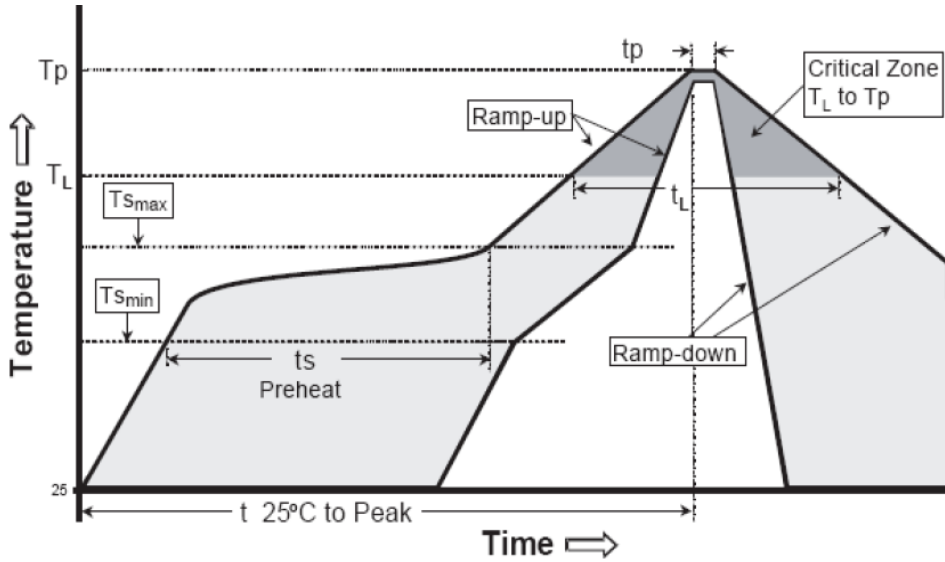
**KHZ SMD CERAMIC FILTER STANDARD TYPE FM SERIES**

**ENVIRONMENTAL CHARACTERISTICS**

TEST ITEMS	MEASUREMENT CONDITION	REQUIREMENT
Humidity	After being placed in a chamber with 90-95% R.H. at 40±2°C for 100 hours and then being placed in room temperature for 1 hour, filter shall be measured.	It shall meet Table at Page 5/6/7
Resistance to Solder Heat	After being placed in a chamber with 80±2°C, for 100 hours and then being placed in room temperature for 1 hour, filter shall be measured.	It shall meet Table at Page 5/6/7
High Temperature	After being placed in a chamber with 80±2°C, for 100 hours and then being placed in room temperature for 1 hour, filter shall be measured.	It shall meet Table at Page 5/6/7
Low Temperature	After being placed in a chamber with -20±2°C, for 100 hours and then being placed in room temperature for 1 hour, filter shall be measured.	It shall meet Table at Page 5/6/7
Heat Shock	After being kept at room temperature, filter shall be placed at temperature of -55 °C, for 30 minutes, then be placed at temperature. 85°C, for 30 minutes. After that returned to -55°C again. Repeated above cycle for 5 times. After being kept in room temp. for 1 hour, filter shall be measured	It shall meet Table at Page 5/6/7

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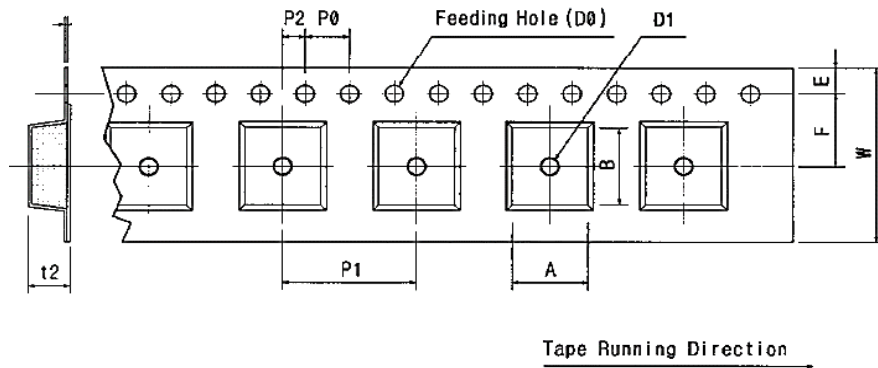
**SUGGESTED REFLOW PROFILE (For Reference Only)**



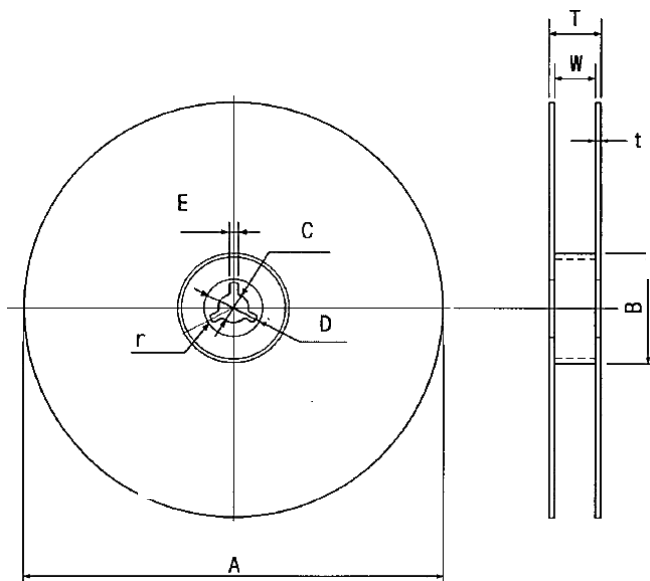
PROFILE FEATURE		PB-FREE ASSEMBLY
Average Ramp-up Rate (Ts Max to Tp)		3°C/second Max
Preheat	Temperature Min (Ts Min.)	125°C
	Temperature Max (Ts Max.)	200°C
	Time (ts Min. to ts Max.)	60~180 seconds
Time maintained above	Temperature (TL)	217°C
	Time (tL)	60~150 seconds
Peak/Classification Temperature (Tp)		260 °C
Time within 5°C of actual Peak Temperature (tp)		20~40 seconds
Ramp-down rate		6 °C /Second Max.
Time 25 °C to Peak Temperature		8 minutes Max.
Suggest reflow times		3 Times Max.

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**REEL AND TAPE DIMENSION** (Unit: mm, 1000pcs/Reel)



Code	Dimension
W	24.0+/-0.30
F	11.5+/-0.05
E	1.75+/-0.10
P 0	4.00+/-0.10
P 1	12.0+/-0.10
P 2	2.00+/-0.05
D 0	∅1.5+/-0.10
D 1	∅1.0+/-0.25
t 1	0.35+/-0.10
t 2	3.20+/-0.10
A	7.70+/-0.10
B	12.0+/-0.10



Code	Dimension
A	∅180+/-1.0
B	∅60+/-0.5
C	∅13.0+/-0.5
E	2.00+/-0.5
W	17.0+/-1.0
T	19.4+/-0.3

## KHZ SMD CERAMIC FILTER STANDARD TYPE FM SERIES

### IMPORTANT NOTES AND DISCLAIMER

1. **ROHS COMPLIANCE:** The levels of RoHS restricted materials in this product are below the maximum concentration values (also referred to as the threshold limits) permitted for such substances, or are used in an exempted application, in accordance with EU RoHS Directive (EU) 2015/863 EC (RoHS3). RoHS Test Report for this product can be obtained at Download Center.
2. **REACH COMPLIANCE:** REACH substances of high concern (SVHCs) information is available for this product. Since the European Chemical Agency (ECHA) has published notice of their intent to frequently revise the SVHC listing for the foreseeable future, REACH Test Report for this product can be obtained at Download Center.
3. All Product parametric performance is indicated in the Electrical Characteristics for the listed herein test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.
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7. *NextGen* products are not authorized for use as critical components in life support devices or systems without express written approval by *NextGen*.
8. *NextGen* requires that customers first obtain an RMA (Returned Merchandise Authorization) number prior to returning any products. Returns must be made within 30 days of the date of invoice, be in the original packaging, unused and like-new condition. At the time of quoting or purchasing, a product may say that it is Non-Cancelable/ Non-Returnable (NCNR). These products are not returnable and not refundable.