




SPECIFICATION SHEET

| | | |
|---|--|-------------------------------|
| SPECIFICATION SHEET NO. | R0628-FL455K0000S116 | |
| DATE | June 28, 2024 | |
| REVISION | A1 | Updated With Most Recent Data |
| DESCRIPTION AND MAIN PARAMETRICS | <p>SMD Ceramic Filter 6560 Type L6.5*W6.0*H4.2mm 3 Pads FL Series 455KHz, Insertion Loss. 5.0dB Max.; 6dB Bandwidth:±4.5KHz Min.</p> <p>Group Delay Time (GDT) Ripple Deviation: 25µSec. Max. within f0 ±3.0KHz</p> <p>Input/Output Impedance: 1500 ohm, Operating Temp. Range -20°C ~+85°C, Reflow Profile Condition 260 °C Max. Tape/Reel,</p> <p>RoHS/RoHS III compliant, RoHS Annex III lead Exemption (exempt per RoHS EU 2015/863)</p> | |
| CUSTOMER | | |
| CUSTOMER PART NO. | | |
| CROSS REF. PART NO. | | |
| ORIGINAL MFG/PART NO. | TGS/CFTC 455KGU TLH/LTUC455KGx | |
| PART CODE | FL455K0000S116 | |

| | | | |
|-------------------------|---|--|---|
| VENDOR APPROVE | | | |
| Issued/Checked/Approved |  |  |  |
| DATE: June 28, 2024 | | | |

| | |
|-------------------------|--|
| CUSTOMER APPROVE | |
| | |
| DATE: | |

6/28/2024

KHZ SMD CERAMIC FILTER GDT TYPE FL SERIES

MAIN FEATURE

- KHz SMD Ceramic Filter 6560 Size 3 pads
- White case, L6.5*W6.0*H4.2mm
- Group Delay Time (GDT) Ripple Deviation: 25µSec. Max. within f0 ±3.0KHz
- Cross More Competitors Part CFUKG 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.

RFQ
Request For Quotation

PART CODE GUIDE

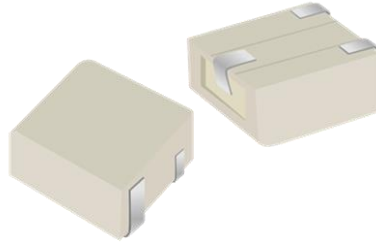
| | | | |
|----|----------|---|-----|
| FL | 455K0000 | S | 116 |
| 1 | 2 | 3 | 4 |

1. FL: Part Family Code for KHz SMD Ceramic Filter 6560 Size L6.5*W6.0*H4.2mm 3 Pads
2. 455K0000: Frequency Range Code For 455KHz
3. S: SMD type, Package Tape/Reel, 1000pcs/Reel
4. 116: Internal Control Code and Special Parameters Code Letter A~Z, a~z or Digits (0-9)

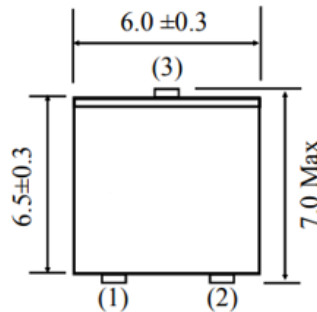
KHZ SMD CERAMIC FILTER GDT TYPE FL SERIES

DIMENSION (Unit: mm)

Image for reference



Top View



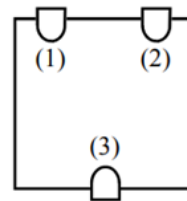
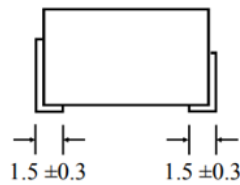
Marking

Line 1: Series Code

Line 2: Frequency Range

+Internal Code

Bottom View



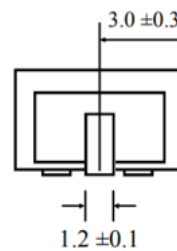
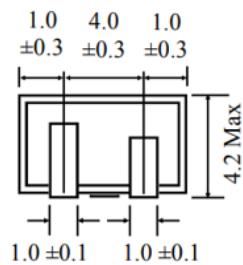
Connection

Pin 1: Input

Pin 2: Output

Pin 3: Ground

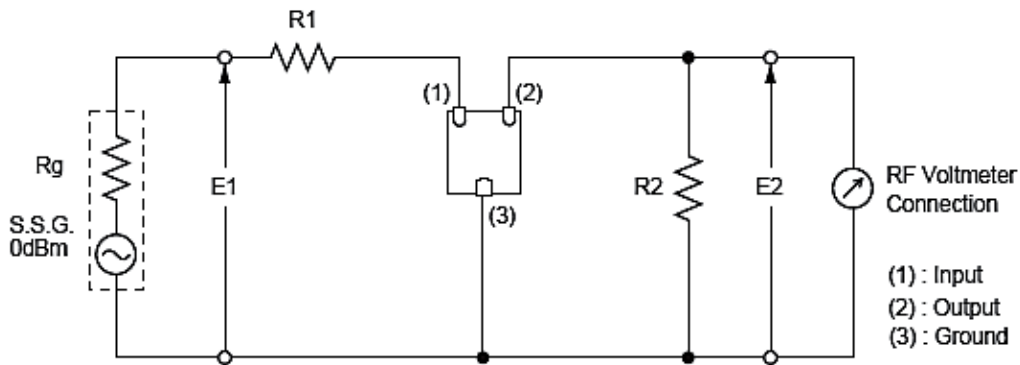
Side View



KHZ SMD CERAMIC FILTER GDT TYPE FL SERIES

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



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

GENERAL ELECTRICAL PARAMETERS

| PARAMETER | UNITS | VALUE | | | CONDITION |
|-----------------------|--------------------|-------|---------|-----------|--|
| | | MIN. | TYPICAL | MAX. | |
| Operation Temperature | $^{\circ}\text{C}$ | -20 | | +85 | |
| Storage Temperature | $^{\circ}\text{C}$ | -40 | | +85 | |
| Temperature Stability | % | | | ± 0.5 | @ $-20^{\circ}\text{C} \sim +85^{\circ}\text{C}$ |
| Insulation Resistance | $\text{M}\Omega$ | 100 | | | @DC 25V 1 minute |

KHZ SMD CERAMIC FILTER GDT TYPE FL SERIES
ELECTRICAL PARAMETERS – FOR DIFFERENT PART CODE

| Part Code | Center Freq.(f0) (Center of 6dB Bandwidth) | 3dB Bandwidth | 6dB Bandwidth | 40dB Bandwidth | Stop Band Attenuation |
|--------------------------------|--|------------------|------------------|-------------------|--------------------------------|
| | KHz | KHz | KHz | KHz | dB |
| FL450K0000S110 | 450±2.0 | ±12.0 Min. | ±17.5 Min. | ±40.0 Min. | 25 Min. (within f0± 100KHz) |
| FL450K0000S111 | 450±1.5 | ±12.0 Min. | ±15.0 Min. | ±35.0 Min. | 25 Min. (within f0± 100KHz) |
| FL450K0000S112 | 450±1.5 | ±10.0 Min. | ±12.5 Min. | ±30.0 Min. | 25 Min. (within f0± 100KHz) |
| FL450K0000S113 | 450±1.0 | ±7.5 Min. | ±10.0 Min. | ±25.0 Min. | 25 Min. (within f0± 100KHz) |
| FL450K0000S114 | 450±1.0 | ±5.0 Min. | ±7.5 Min. | ±20.0 Min. | 25 Min. (within f0± 100KHz) |
| FL450K0000S115 | 450±1.5 | ±4.0 Min. | ±6.0 Min. | ±15.0 Min. | 25 Min. (within f0± 100KHz) |
| FL450K0000S116 | 450±1.0 | ±3.0 Min. | ±4.5 Min. | ±12.5 Min. | 25 Min. (within f0± 100KHz) |
| FL450K0000S117 | 450±1.0 | ±2.0 Min. | ±3.0 Min. | ±10.0 Min. | 25 Min. (within f0± 100KHz) |
| FL455K0000S110 | 455±2.0 | ±12.0 Min. | ±17.5 Min. | ±40.0 Min. | 25 Min. (within f0± 100KHz) |
| FL455K0000S111 | 455±1.5 | ±12.0 Min. | ±15.0 Min. | ±35.0 Min. | 25 Min. (within f0± 100KHz) |
| FL455K0000S112 | 455±1.5 | ±10.0 Min. | ±12.5 Min. | ±30.0 Min. | 25 Min. (within f0± 100KHz) |
| FL455K0000S113 | 455±1.0 | ±7.5 Min. | ±10.0 Min. | ±25.0 Min. | 25 Min. (within f0± 100KHz) |
| FL455K0000S114 | 455±1.0 | ±5.0 Min. | ±7.5 Min. | ±20.0 Min. | 25 Min. (within f0± 100KHz) |
| FL455K0000S115 | 455±1.5 | ±4.0 Min. | ±6.0 Min. | ±15.0 Min. | 25 Min. (within f0± 100KHz) |
| FL455K0000S116 | 455±1.0 | ±3.0 Min. | ±4.5 Min. | ±12.5 Min. | 25 Min. (within f0± 100KHz) |
| FL455K0000S117 | 455±1.0 | ±2.0 Min. | ±3.0 Min. | ±10.0 Min. | 25 Min. (within f0± 100KHz) |

KHZ SMD CERAMIC FILTER GDT TYPE FL SERIES
ELECTRICAL PARAMETERS – FOR DIFFERENT PART CODE

| Part Code | Ripple | Insertion Loss @ Min. Loss Point | Spurious Response (0.1 ~ 1MHz) | GDT Ripple Deviation | Input/ Output Impedance |
|----------------|----------------------------|----------------------------------|--------------------------------|---------------------------|-------------------------|
| | dB | dB | dB | µsec. | Ω |
| FL450K0000S110 | 1.0 Max. (within f0±12KHz) | 4.0 Max. | 20 Min. | 15 Max. (within fo±12KHz) | 1000 |
| FL450K0000S111 | 1.0 Max. (within f0±10KHz) | 5.0 Max. | 20 Min. | 15 Max. (within fo±2KHz) | 1000 |
| FL450K0000S112 | 1.0 Max. (within f0±8KHz) | 5.0 Max. | 20 Min. | 15 Max. (within fo±8KHz) | 1000 |
| FL450K0000S113 | 1.0 Max. (within f0±7KHz) | 5.0 Max. | 20 Min. | 20 Max. (within fo±7KHz) | 1500 |
| FL450K0000S114 | 1.0 Max. (within f0±5KHz) | 5.0 Max. | 20 Min. | 25 Max. (within fo±5KHz) | 1500 |
| FL450K0000S115 | 1.0 Max. (within f0±5KHz) | 5.0 Max. | 20 Min. | 25 Max. (within fo±4KHz) | 1500 |
| FL450K0000S116 | 1.0 Max. (within f0±5KHz) | 5.0 Max. | 20 Min. | 25 Max. (within fo±3KHz) | 1500 |
| FL450K0000S117 | 1.0 Max. (within f0±2KHz) | 6.0 Max. | 20 Min. | 25 Max. (within fo±2KHz) | 1500 |
| FL455K0000S110 | 1.0 Max. (within f0±12KHz) | 4.0 Max. | 20 Min. | 15 Max. (within fo±12KHz) | 1000 |
| FL455K0000S111 | 1.0 Max. (within f0±10KHz) | 5.0 Max. | 20 Min. | 15 Max. (within fo±2KHz) | 1000 |
| FL455K0000S112 | 1.0 Max. (within f0±8KHz) | 5.0 Max. | 20 Min. | 15 Max. (within fo±5KHz) | 1000 |
| FL455K0000S113 | 1.0 Max. (within f0±7KHz) | 5.0 Max. | 20 Min. | 20 Max. (within fo±7KHz) | 1500 |
| FL455K0000S114 | 1.0 Max. (within f0±5KHz) | 5.0 Max. | 20 Min. | 25 Max. (within fo±5KHz) | 1500 |
| FL455K0000S115 | 1.0 Max. (within f0±5KHz) | 5.0 Max. | 20 Min. | 25 Max. (within fo±4KHz) | 1000 |
| FL455K0000S116 | 1.0 Max. (within f0±5KHz) | 5.0 Max. | 20 Min. | 25 Max. (within fo±3KHz) | 1500 |
| FL455K0000S117 | 1.0 Max. (within f0±2KHz) | 6.0 Max. | 20 Min. | 25 Max. (within fo±2KHz) | 1500 |

KHZ SMD CERAMIC FILTER GDT TYPE FL SERIES

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 4/5/6 |
| 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 damage and it meet Table at Page 4/5/6 |
| 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 damage, no cut-off and it meet Table at Page 4/5/6 |
| 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 damage, no cut-off and it meet Table at Page 4/5/6 |
| 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 damage, no cut-off and it meet Table at Page 4/5/6 |

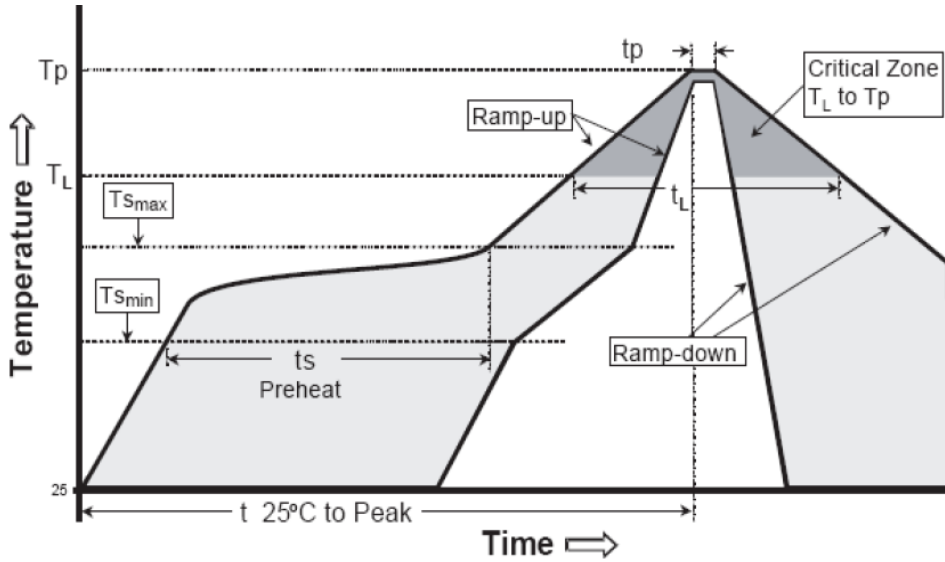
KHZ SMD CERAMIC FILTER GDT TYPE FL SERIES

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 4/5/6 |
| 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 4/5/6 |
| 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 4/5/6 |
| 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 4/5/6 |
| 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 4/5/6 |

KHZ SMD CERAMIC FILTER GDT TYPE FL SERIES

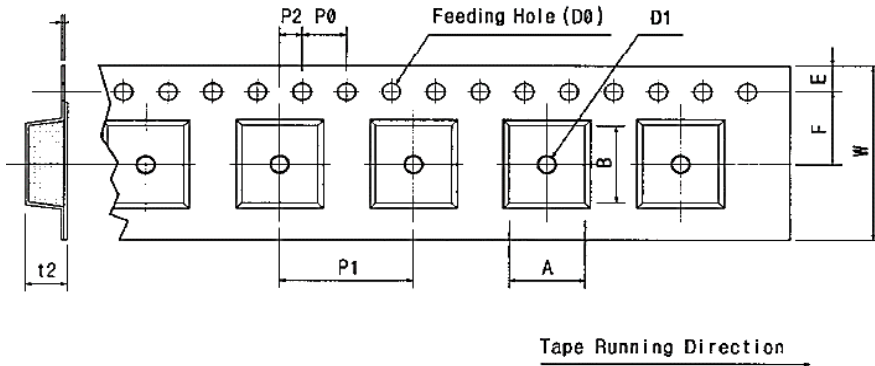
SUGGESTED REFLOW PROFILE (For Reference Only)



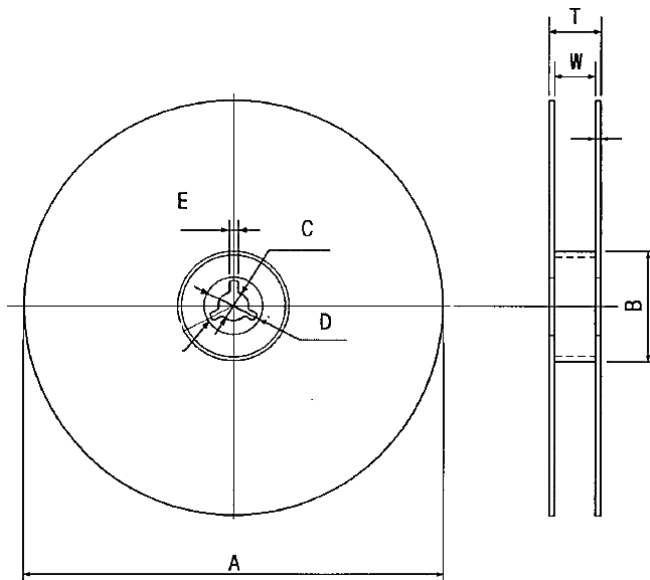
| PROFILE FEATURE | | PB-FREE ASSEMBLY |
|---|---------------------------|-------------------|
| Average Ramp-up Rate (Ts Max to Tp) | | 3°C/second Max |
| Preheat | Temperature Min (Ts Min.) | 125°C |
| | Temperature Max (Ts Max.) | 200°C |
| | Time (ts Min. to ts Max.) | 60 ~ 180 seconds |
| Time maintained 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 | | 2 Times Max. |

KHZ SMD CERAMIC FILTER GDT TYPE FL SERIES

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



| CODE | DIMENSION |
|------|-------------|
| W | 16.0+/-0.30 |
| F | 7.50+/-0.05 |
| E | 1.75+/-0.10 |
| P 0 | 4.00+/-0.10 |
| P 1 | 8.00+/-0.10 |
| P 2 | 2.00+/-0.05 |
| D 0 | Ø1.5+/-0.10 |
| D 1 | Ø1.0+/-0.25 |
| t 2 | 4.20+/-0.10 |
| A | 6.70+/-0.10 |
| B | 6.30+/-0.10 |



| CODE | DIMENSION |
|------|-------------|
| A | Ø180+/-1.0 |
| B | Ø60+/-0.5 |
| C | Ø13.0+/-0.5 |
| E | 2.00+/-0.5 |
| W | 17.0+/-1.0 |
| T | 19.4+/-0.3 |

KHZ SMD CERAMIC FILTER GDT TYPE FL 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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