

## KC Series



### Chebyshev

Frequency Range from 500 Hz to 10 GHz

Application-Specific Designs

SERIES NUMBER	NUMBER OF POLE PAIRS (ELEMENTS)	INSERTION LOSS at $f_0$ dB TYPICAL	BANDWIDTH SELECTION -3dBc % $f_0$	STOPBAND ATTENUATION dBc MINIMUM	
				FREQUENCY 1	FREQUENCY 2
CENTER FREQUENCY – 500 Hz to 10 GHz – specify any $f_0$ within that range					
KC3	3 (6)	8.0 - 5.0	3 to 5	-50	0.67 x $f_0$ 1.27 x $f_0$
		5.0 - 2.8	> 5 to 10	-50	0.35 x $f_0$ 1.50 x $f_0$
		2.8 - 1.8	> 10 to 15	-40	0.40 x $f_0$ 1.50 x $f_0$
		1.8 - 1.3	> 15 to 20	-40	0.25 x $f_0$ 1.60 x $f_0$
		1.3 - 1.3	> 20 to 25	-40	0.20 x $f_0$ 1.75 x $f_0$
KC4	4 (8)	10.0 - 6.0	3 to 5	-50	0.82 x $f_0$ 1.16 x $f_0$
		6.0 - 3.5	> 5 to 10	-50	0.65 x $f_0$ 1.28 x $f_0$
		3.5 - 2.3	> 10 to 15	-40	0.50 x $f_0$ 1.40 x $f_0$
		2.3 - 1.8	> 15 to 20	-40	0.35 x $f_0$ 1.50 x $f_0$
		1.8 - 1.5	> 20 to 25	-40	0.20 x $f_0$ 1.60 x $f_0$
KC5	5 (10)	10.0 - 7.0	3 to 5	-60	0.82 x $f_0$ 1.15 x $f_0$
		7.0 - 4.0	> 5 to 10	-60	0.70 x $f_0$ 1.25 x $f_0$
		4.0 - 3.0	> 10 to 15	-60	0.55 x $f_0$ 1.35 x $f_0$
		3.0 - 2.0	> 15 to 20	-60	0.56 x $f_0$ 1.34 x $f_0$
		2.0 - 1.8	> 20 to 25	-50	0.43 x $f_0$ 1.43 x $f_0$
KC6	6 (12)	13.0 - 9.0	3 to 5	-60	0.87 x $f_0$ 1.12 x $f_0$
		9.0 - 5.0	> 5 to 10	-60	0.78 x $f_0$ 1.20 x $f_0$
		5.0 - 3.5	> 10 to 15	-60	0.67 x $f_0$ 1.27 x $f_0$
		3.5 - 2.5	> 15 to 20	-60	0.57 x $f_0$ 1.33 x $f_0$
		2.5 - 2.3	> 20 to 25	-60	0.45 x $f_0$ 1.40 x $f_0$
KC7	7 (14)	8.5 - 5.5	5 to 10	-60	0.82 x $f_0$ 1.16 x $f_0$
		5.5 - 4.0	> 10 to 15	-60	0.75 x $f_0$ 1.22 x $f_0$
		4.0 - 3.0	> 15 to 20	-60	0.65 x $f_0$ 1.28 x $f_0$
		3.0 - 2.5	> 20 to 25	-60	0.58 x $f_0$ 1.33 x $f_0$
		CENTER FREQUENCY – 1 kHz to 10 GHz – specify any $f_0$ within that range			
KC8	8 (16)	9.8 - 5.9	5 to 10	-60	0.84 x $f_0$ 1.15 x $f_0$
		5.9 - 4.2	> 10 to 15	-60	0.78 x $f_0$ 1.20 x $f_0$
		4.2 - 3.3	> 15 to 20	-60	0.72 x $f_0$ 1.24 x $f_0$
		3.3 - 2.7	> 20 to 25	-60	0.66 x $f_0$ 1.29 x $f_0$
KC9	9 (18)	11.2 - 6.4	5 to 10	-60	0.86 x $f_0$ 1.14 x $f_0$
		6.4 - 4.7	> 10 to 15	-60	0.81 x $f_0$ 1.18 x $f_0$
		4.7 - 3.7	> 15 to 20	-60	0.75 x $f_0$ 1.23 x $f_0$
		3.7 - 3.0	> 20 to 25	-60	0.70 x $f_0$ 1.27 x $f_0$

Note: TTE's products are made in the USA. Application-specific designs are made to order. Typical delivery is 2 weeks. Expedited lead time of 3-5 days is available on many products.

**For RoHS compliant, add "R" to part number. Example: KC7R-125M-12.5M-50-69A**

TTE designates a component RoHS-compliant by adding "R" (RoHS) within the part number.

These RoHS components meet the  $\leq 0.1\%$  lead requirement and they are compatible with 260°C soldering processes.

#### NOTES:

- Operating Temperature Range: 0°C to +70°C
- Number of Pole Pairs (Elements): 3-9 (6-18)
- VSWR at  $f_0$ : 1.5:1 Typical
- Input Power: 20 mW
- Case Type: Refer to **Case Selection Guide**
- Case Options: PCB, SMT, BNC or SMA
- Normalized Response: Refer to **Graphs**
- Product Info: Refer to **KC Series**

#### TERMINATIONS:

50 $\Omega$	100 MHz - 1 GHz
50 $\Omega$ or 75 $\Omega$	300 kHz - 100 MHz
1 k $\Omega$ - 50 $\Omega$	10 kHz - 300 kHz
10 k $\Omega$ - 1 k $\Omega$	500 Hz - 10 kHz

#### STOPBAND FREQUENCY CALCULATIONS:

Using part number KC7-125M-12.5M-50-69A, we know that the filter is a 7 pole Chebyshev bandpass filter. Scroll down to series number KC7. Moving to the right we select the 10% bandwidth range. Moving to the right again we find the stopband specification listed as -60dBc minimum at 0.82 x  $f_0$  and 1.16 x  $f_0$ . Thus, the -60dBc frequencies are at 102.5 MHz (0.82 x 125 MHz) and at 145 MHz (1.16 x 125 MHz), respectively.

#### PART NUMBER DERIVATION:

KC7	*(T)	** (R)	-125M	-12.5M	-50	-69A
1	2	3	4	5	6	7 8

- Series, KC
- Number of poles, 7
- The "T" option specifies a filter with low THD for ADC/DAC testing. When selected therein, THD is  $> -80\text{dBc}$ ,  $-96\text{dBc}$  typical.
- "R" RoHS compliant. Allow for longer lead time.
- The Center Frequency,  $f_0$
- The -3dBc passband bandwidth. It may also be specified as a percentage of  $f_0$ . Thus, instead of 12.5 MHz, use 10P.
- Terminations
- Case selection from the case selection guide. "T" option cases are larger than standard.