

# X5 Frequency Multiplier

50Ω     Output 2250 to 2750 MHz

RMK-5-2751+

## The Big Deal

- High rejection of adjacent harmonics, >57 dBc
- 50 Ω in/out, no tuning necessary
- Very low cost, \$19.95 (qty. 10-49)



CASE STYLE: TT1224

## Product Overview

The RMK-5-2751+ is a cost-effective X5 frequency multiplier that utilizes specially selected silicon Schottky diodes and compatible filter circuitry to achieve a low conversion loss, yet have a high rejection of unwanted harmonics near its F5 output. It makes the RMK-5-2751+ ideal for a wide range of applications. The tiny plastic case, 0.25" x 0.31" x 0.16" high, is aqueous washable and RoHS compliant.

| Feature                                                 | Advantages                                                                                                                                                                                                                                                        |
|---------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <22 dB conversion loss                                  | Efficient choice for multiplying a 500 MHz source to 2.5 GHz output while maintaining useful signal power. Only 17 dBm input required for -5 dBm output, especially useful for low-loss systems such as instrumentation and ISM                                   |
| >57 dB rejection of F4 and F6                           | Proprietary internal circuitry achieves high suppression and minimizes filter requirements for undesired signals, as in wireless Rx/Tx applications including amateur radio, SAB/SAP, RFID, wireless LANs, aviation, PMR, cellular, and satellite communications. |
| Internally balanced to 50Ω in/out, no DC power required | Saves PCB space and simplifies application design, with no external matching or biasing circuits required                                                                                                                                                         |
| Small surface mount package                             | Easily integrated in systems with minimal PCB area available                                                                                                                                                                                                      |

### Notes

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B. Electrical specifications and performance data contained in this specification document are based on Mini-Circuit's applicable established test performance criteria and measurement instructions.  
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**X5**

50Ω

## Output 2250 to 2750 MHz

Operating Temperature -40°C to 85°C

Operating Temperature -40°C to 85°C

|                     |                |
|---------------------|----------------|
| Storage Temperature | -55°C to 100°C |
|---------------------|----------------|

|                |        |
|----------------|--------|
| RF Input Power | 20 dBm |
|----------------|--------|

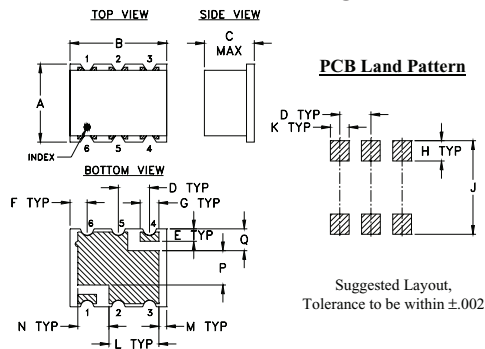
Permanent damage may occur if any of these limits are exceeded

|       |   |
|-------|---|
| INPUT | 1 |
|-------|---|

|        |   |
|--------|---|
| OUTPUT | 4 |
|--------|---|

|        |         |
|--------|---------|
| GROUND | 2 3 5 6 |
|--------|---------|

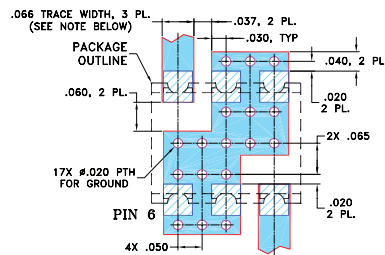
## Outline Drawing



A      B      C      D      E      F      G

| A    | B    | C    | D    | E    | F    | G    | H     |
|------|------|------|------|------|------|------|-------|
| .25  | .31  | .16  | .100 | .040 | .055 | .060 | .065  |
| 6.35 | 7.87 | 4.06 | 2.54 | 1.02 | 1.40 | 1.52 | 1.65  |
| J    | K    | L    | M    | N    | P    | Q    | wt.   |
| .300 | .060 | .160 | .025 | .100 | .110 | .070 | grams |
| 7.62 | 1.52 | 4.06 | 0.64 | 2.54 | 2.79 | 1.78 | 0.16  |

**Demo Board MCL P/N: TB-393**  
**Suggested PCB Layout (PL-258)**



NOTES: 1. TRACE WIDTH IS SHOWN FOR ROGERS RO4350B WITH DIELECTRIC THICKNESS .030"  $\pm$  .002". COPPER: 1/2 OZ. EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH MAY NEED TO BE MODIFIED.

2. BOTTOM SIDE OF THE PCB IS CONTINUOUS GROUND PLANE.

 DENOTES PCB COPPER LAYOUT WITH SMOBC (SOLDER MASK OVER BARE COPPER)

 DENOTES COPPER LAND PATTERN FREE OF SOLDER MASK

- low conversion loss, 22 dB typ.
- high rejection of adjacent harmonics, 58 dBc typ.
- aqueous washable

- synthesizers
- local oscillators
- satellite up and down converters

### Electrical Specifications at 25°C

| Parameter                    |    | Min. | Typ. | Max. | Unit |
|------------------------------|----|------|------|------|------|
| Multiplier Factor            |    | 5    |      |      |      |
| Frequency Range, Input (F1)  |    | 450  | —    | 550  | MHz  |
| Frequency Range, Output (F5) |    | 2250 | —    | 2750 | MHz  |
| Input Power                  |    | —    | 17   | —    | dBm  |
| Conversion Loss              |    | —    | 22   | 24.5 | dB   |
| Harmonic Output*, -dBc       | F1 | 3.0  | 4.8  | —    | dB   |
|                              | F2 | 38   | 67.8 | —    |      |
|                              | F3 | -7   | -3.0 | —    |      |
|                              | F4 | 40   | 54   | —    |      |
|                              | F6 | 40   | 57   | —    |      |
|                              | F7 | 4    | 7    | —    |      |

\* Harmonics of input frequency below the power level of F5

## Typical Performance Data

| Frequency   |              | Conv. Loss (dB) | Harmonic Rejection Below F5, (dB)<br><i>at RF Input Power 17 dBm</i> |       |       |       |       |       |
|-------------|--------------|-----------------|----------------------------------------------------------------------|-------|-------|-------|-------|-------|
| Input (MHz) | Output (MHz) |                 | F5                                                                   | F1    | F2    | F3    | F4    | F6    |
| 450.00      | 2250.00      | 21.33           | 8.82                                                                 | 75.33 | 1.05  | 63.74 | 57.22 | 7.39  |
| 455.00      | 2275.00      | 21.35           | 8.72                                                                 | 74.80 | 0.88  | 63.16 | 57.40 | 7.62  |
| 460.00      | 2300.00      | 21.40           | 8.54                                                                 | 74.41 | 0.77  | 62.42 | 57.40 | 7.79  |
| 465.00      | 2325.00      | 21.36           | 8.35                                                                 | 74.01 | 0.54  | 61.76 | 57.77 | 8.26  |
| 470.00      | 2350.00      | 21.33           | 8.18                                                                 | 73.54 | 0.38  | 61.04 | 57.83 | 8.28  |
| 475.00      | 2375.00      | 21.30           | 7.96                                                                 | 72.89 | 0.25  | 60.45 | 57.95 | 8.51  |
| 480.00      | 2400.00      | 21.26           | 7.82                                                                 | 72.47 | 0.07  | 59.80 | 58.03 | 8.73  |
| 485.00      | 2425.00      | 21.20           | 7.71                                                                 | 72.21 | -0.06 | 59.31 | 57.94 | 8.82  |
| 490.00      | 2450.00      | 21.25           | 7.46                                                                 | 72.09 | -0.35 | 58.94 | 58.08 | 9.03  |
| 495.00      | 2475.00      | 21.28           | 7.30                                                                 | 71.94 | -0.53 | 58.64 | 58.17 | 9.34  |
| 500.00      | 2500.00      | 21.37           | 7.08                                                                 | 71.91 | -0.67 | 58.16 | 58.31 | 9.55  |
| 505.00      | 2525.00      | 21.46           | 6.84                                                                 | 71.50 | -0.95 | 57.71 | 58.38 | 9.80  |
| 510.00      | 2550.00      | 21.53           | 6.58                                                                 | 71.19 | -1.24 | 57.31 | 58.48 | 10.15 |
| 515.00      | 2575.00      | 21.60           | 6.34                                                                 | 70.76 | -1.45 | 57.06 | 58.65 | 10.32 |
| 520.00      | 2600.00      | 21.62           | 6.17                                                                 | 70.53 | -1.64 | 56.67 | 58.85 | 10.42 |
| 525.00      | 2625.00      | 21.66           | 5.92                                                                 | 70.40 | -1.89 | 56.27 | 58.95 | 10.60 |
| 530.00      | 2650.00      | 21.63           | 5.84                                                                 | 70.50 | -1.99 | 55.92 | 59.04 | 10.56 |
| 535.00      | 2675.00      | 21.65           | 5.63                                                                 | 70.45 | -2.20 | 55.63 | 59.32 | 10.87 |
| 540.00      | 2700.00      | 21.76           | 5.42                                                                 | 70.35 | -2.40 | 55.20 | 59.71 | 10.79 |
| 545.00      | 2725.00      | 21.90           | 5.14                                                                 | 70.26 | -2.72 | 54.99 | 60.08 | 11.20 |
| 550.00      | 2750.00      | 22.14           | 4.80                                                                 | 70.14 | -3.02 | 54.73 | 60.27 | 11.43 |



PRICE: \$19.95 ea. QTY (10-49)

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**+RoHS Compliant**

The +Suffix identifies RoHS Compliance. See our web site for RoHS Compliance methodologies and qualifications

## Notes

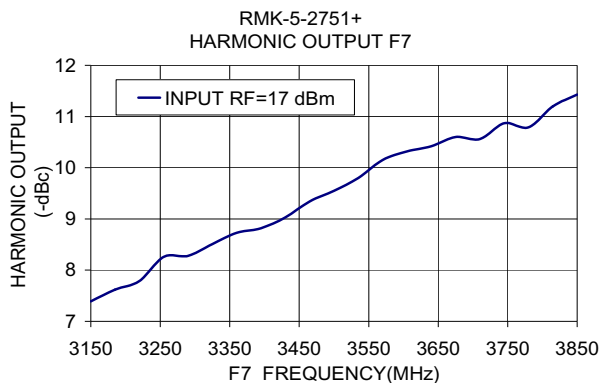
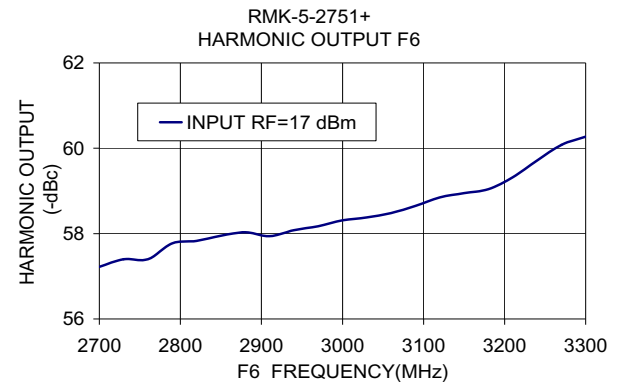
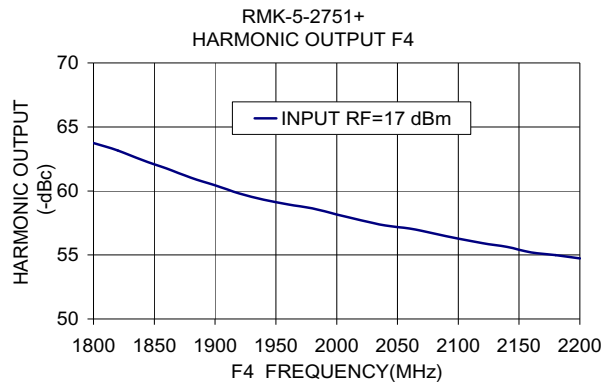
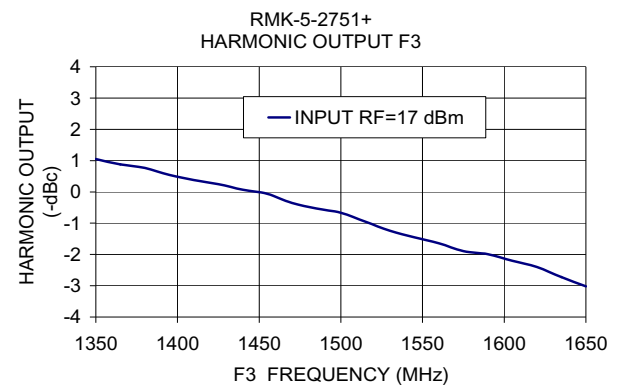
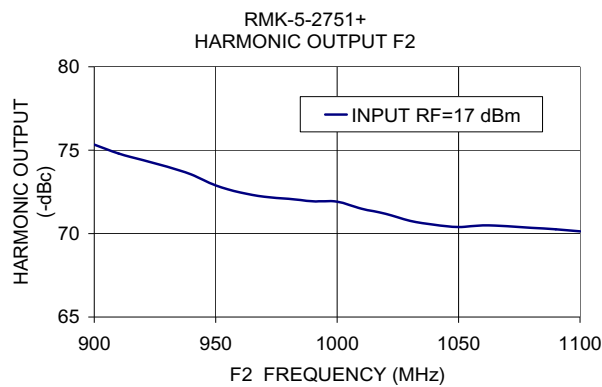
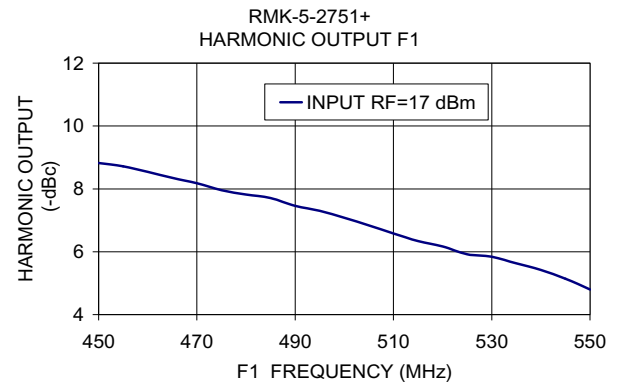
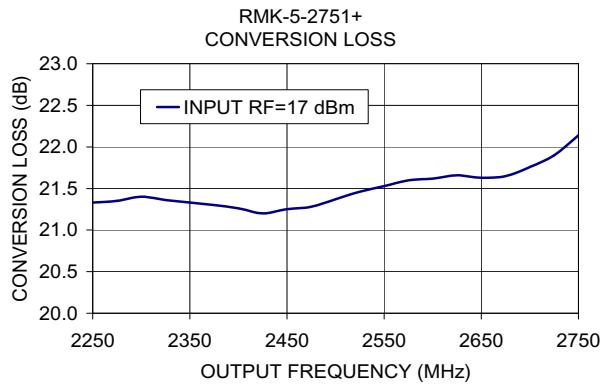
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