

X2 Frequency Multiplier

KSX2-442+

50Ω Output 1200 to 4400 MHz



Generic photo used for illustration purposes only

CASE STYLE: HV1195

+RoHS Compliant

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

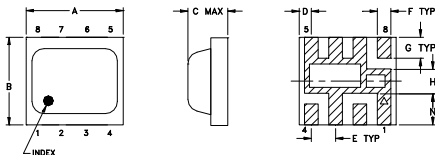
Maximum Ratings

| | |
|---|----------------|
| Operating Temperature | -40°C to 85°C |
| Storage Temperature | -55°C to 100°C |
| RF Input, 25°C | 100 mW |
| Permanent damage may occur if any of these limits are exceeded. | |

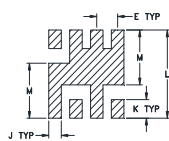
Pin Connections

| | |
|--------------------|-----------|
| INPUT | 4 |
| OUTPUT | 8 |
| 50Ω TERMINATE EXT. | 2 |
| GROUND | 1,3,5,6,7 |

Outline Drawing



PCB Metal Land Pattern

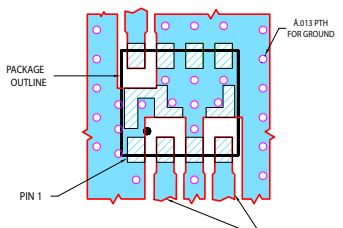


Suggested Layout, Tolerance to be within .002

Outline Dimensions (inch)

| A | B | C | D | E | F | G |
|------|------|--------|------|------|-------|-------|
| .200 | .180 | .087 | .025 | .050 | .028 | .043 |
| 5.08 | 4.57 | 2.2098 | 0.64 | 1.27 | 0.71 | 1.09 |
| H | J | K | L | M | N | wt |
| .050 | .030 | .043 | .204 | .127 | 0.065 | grams |
| 1.27 | 0.76 | 1.09 | 5.18 | 3.23 | 1.65 | 0.08 |

Demo Board MCL P/N: TB-473+ Suggested PCB Layout (PL-287)



NOTES:
1. TRACE WIDTH AND GAP ARE SHOWN FOR ROGERS RO4350B WITH DIELECTRIC THICKNESS .002"±.0015". COPPER: 1/2 OZ EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH AND GAP 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.

Features

- low conversion loss, 11.0 dB typ.
- high fundamental & harmonic suppression, F1, 24 dBc typ.; F3, 30 dBc typ.; F4, 20 dBc typ.
- LTCC design
- low profile, 0.085"
- aqueous washable

Applications

- synthesizers
- local oscillators

Electrical Specifications

| MULTIPLICATION FACTOR | FREQUENCY (MHz) | | INPUT POWER (dBm) | | CONVERSION LOSS (dB) | | *HARMONIC OUTPUT (dBc) | | | | | |
|-----------------------|-----------------|-----------|-------------------|------|----------------------|------|------------------------|------|------|------|----|----|
| | F1 | F2 | | | | | F3 | | F4 | | | |
| | Input | Output | Min. | Max. | Typ. | Max. | Typ. | Min. | Typ. | Min. | | |
| 2 | 600-1200 | 1200-2400 | 7 | 13 | 11 | 14 | 26 | 18 | 35 | 22 | 16 | 11 |
| | 1200-2200 | 2400-4400 | 10 | 15 | 11 | 14.5 | 18 | 11 | 36 | 22 | 25 | 14 |

* Harmonics of input frequency below the power level of F2

Typical Performance Data

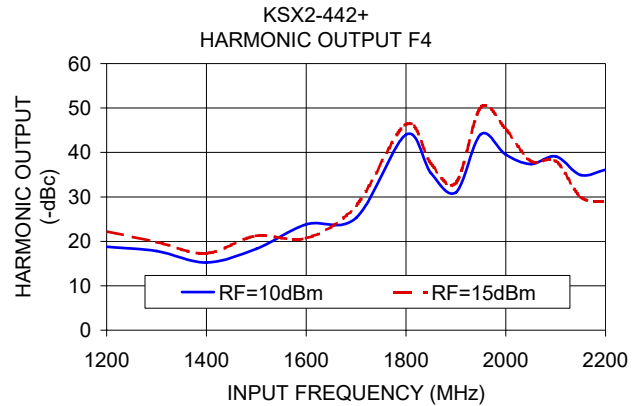
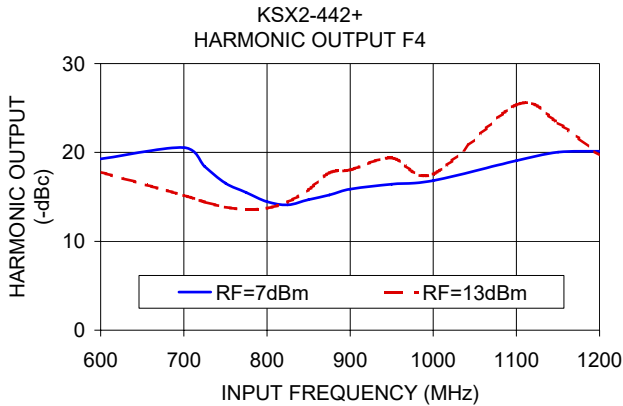
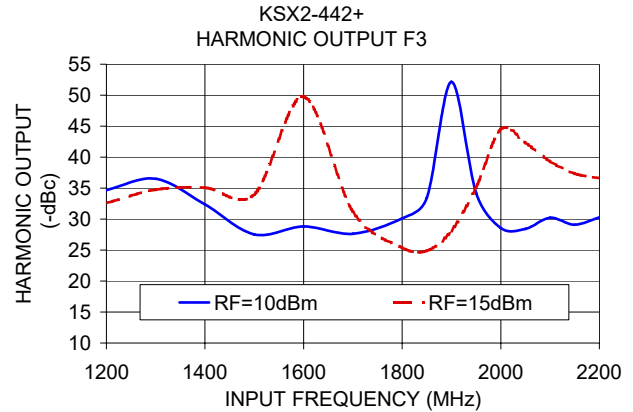
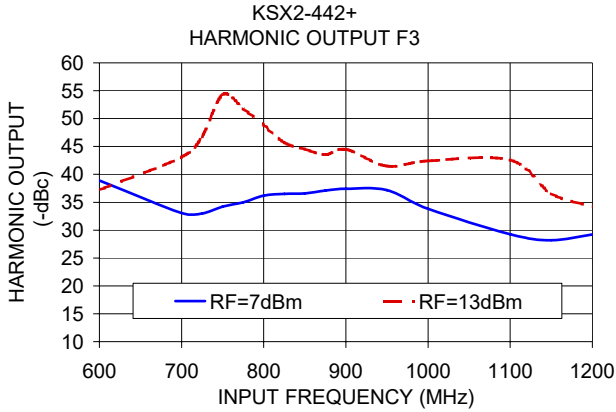
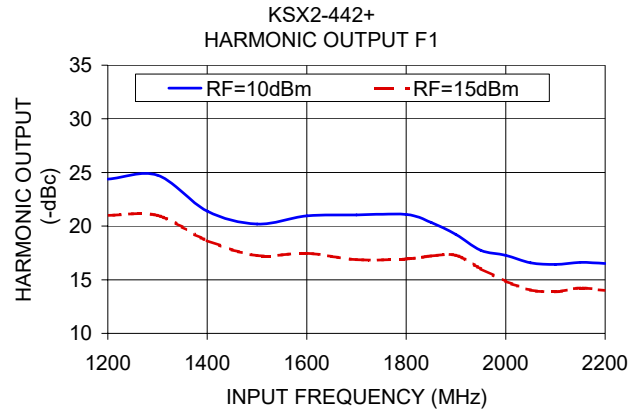
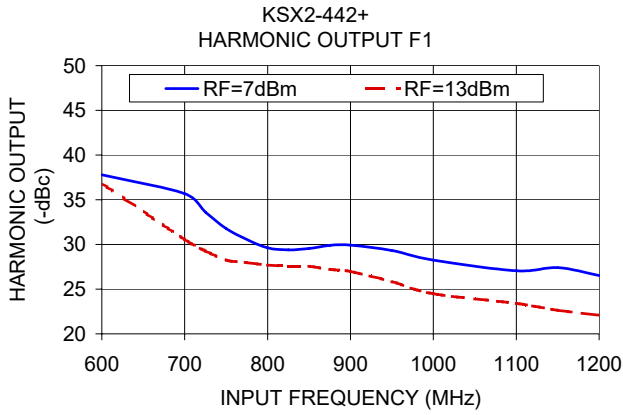
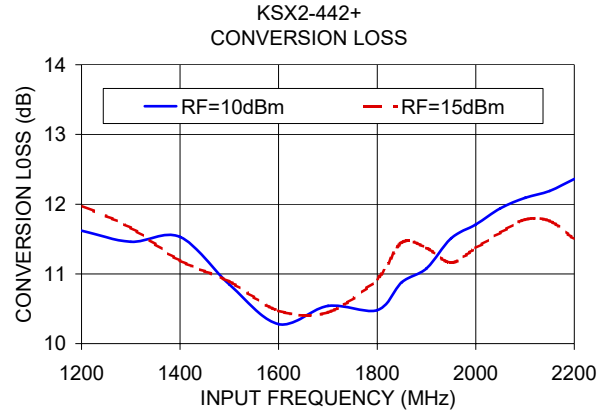
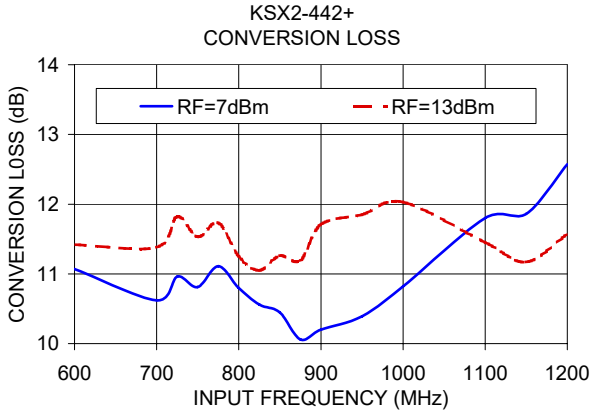
| Input Frequency (MHz) | INPUT RF= 7dBm | | | | INPUT RF= 13dBm | | | |
|-----------------------|----------------------|---------------------------------|-------|-------|----------------------|---------------------------------|-------|-------|
| | Conversion Loss (dB) | Harmonic Output Below F2 (-dBc) | | | Conversion Loss (dB) | Harmonic Output Below F2 (-dBc) | | |
| | | F1 | F3 | F4 | | F1 | F3 | F4 |
| 600.00 | 11.07 | 37.78 | 38.89 | 19.27 | 11.42 | 36.83 | 37.22 | 17.78 |
| 700.00 | 10.62 | 35.69 | 33.05 | 20.55 | 11.38 | 30.55 | 43.10 | 15.17 |
| 725.00 | 10.96 | 33.61 | 32.98 | 18.42 | 11.82 | 29.27 | 46.76 | 14.44 |
| 750.00 | 10.81 | 31.77 | 34.21 | 16.56 | 11.53 | 28.24 | 54.28 | 13.86 |
| 775.00 | 11.11 | 30.55 | 34.97 | 15.48 | 11.73 | 27.98 | 51.80 | 13.59 |
| 800.00 | 10.80 | 29.63 | 36.19 | 14.47 | 11.25 | 27.69 | 48.85 | 13.72 |
| 825.00 | 10.56 | 29.39 | 36.48 | 14.11 | 11.05 | 27.58 | 45.69 | 14.42 |
| 850.00 | 10.45 | 29.55 | 36.57 | 14.68 | 11.26 | 27.56 | 44.52 | 15.79 |
| 875.00 | 10.06 | 29.91 | 37.08 | 15.22 | 11.19 | 27.21 | 43.53 | 17.71 |
| 900.00 | 10.20 | 29.93 | 37.43 | 15.88 | 11.71 | 26.98 | 44.51 | 18.04 |
| 950.00 | 10.39 | 29.32 | 37.16 | 16.42 | 11.85 | 25.83 | 41.50 | 19.39 |
| 1000.00 | 10.82 | 28.26 | 33.82 | 16.84 | 12.03 | 24.49 | 42.41 | 17.55 |
| 1100.00 | 11.80 | 27.05 | 29.27 | 19.07 | 11.45 | 23.40 | 42.59 | 25.36 |
| 1150.00 | 11.86 | 27.42 | 28.19 | 20.03 | 11.17 | 22.65 | 36.52 | 23.32 |
| 1200.00 | 12.57 | 26.52 | 29.22 | 20.14 | 11.57 | 22.07 | 34.21 | 19.68 |

| Input Frequency (MHz) | INPUT RF= 10dBm | | | INPUT RF= 15dBm | | | | |
|-----------------------|----------------------|---------------------------------|-------|-----------------|----------------------|---------------------------------|-------|-------|
| | Conversion Loss (dB) | Harmonic Output Below F2 (-dBc) | | | Conversion Loss (dB) | Harmonic Output Below F2 (-dBc) | | |
| | | F1 | F3 | F4 | | F1 | F3 | F4 |
| 1200.00 | 11.62 | 24.39 | 34.69 | 18.76 | 11.98 | 20.99 | 32.59 | 22.26 |
| 1300.00 | 11.46 | 24.74 | 36.51 | 17.80 | 11.66 | 20.99 | 34.74 | 19.84 |
| 1400.00 | 11.53 | 21.40 | 32.39 | 15.23 | 11.19 | 18.65 | 35.06 | 17.29 |
| 1500.00 | 10.85 | 20.20 | 27.53 | 18.33 | 10.89 | 17.25 | 34.00 | 21.23 |
| 1600.00 | 10.28 | 20.96 | 28.80 | 23.83 | 10.47 | 17.46 | 49.70 | 20.69 |
| 1700.00 | 10.54 | 21.05 | 27.62 | 25.30 | 10.45 | 16.88 | 31.19 | 28.07 |
| 1800.00 | 10.48 | 21.09 | 30.11 | 44.00 | 10.93 | 16.93 | 25.40 | 46.31 |
| 1850.00 | 10.88 | 20.35 | 33.46 | 35.37 | 11.45 | 17.22 | 24.89 | 37.47 |
| 1900.00 | 11.08 | 19.22 | 52.15 | 31.03 | 11.37 | 17.27 | 28.09 | 33.16 |
| 1950.00 | 11.51 | 17.74 | 34.22 | 44.11 | 11.16 | 16.02 | 35.11 | 50.14 |
| 2000.00 | 11.71 | 17.28 | 28.56 | 39.52 | 11.37 | 14.87 | 44.49 | 45.20 |
| 2050.00 | 11.94 | 16.57 | 28.40 | 37.40 | 11.59 | 14.04 | 42.35 | 38.11 |
| 2100.00 | 12.09 | 16.42 | 30.20 | 39.12 | 11.78 | 13.87 | 39.30 | 38.07 |
| 2150.00 | 12.19 | 16.62 | 29.11 | 34.90 | 11.76 | 14.22 | 37.34 | 29.99 |
| 2200.00 | 12.36 | 16.51 | 30.27 | 36.11 | 11.50 | 14.00 | 36.61 | 29.03 |

Notes

- Performance and quality attributes and conditions not expressly stated in this specification document are intended to be excluded and do not form a part of this specification document.
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