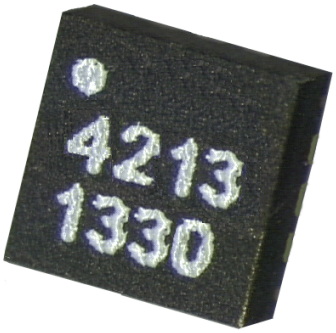
Keysight TC621P
Packaged
GaAs Integrated Directional Detector

HMMC-5632-BLK (Waffle Pack)
HMMC-5632-TR1 (Tape & Reel)
Data Sheet



Package Type: Quad Flat - No Leads (SMT QFN)
Package Dimensions: 2.0 x 2.0 mm (0.079 x 0.079 in)
Package Thickness: 0.85 ± 0.10 mm (0.035 ± 0.0039 in)
Lead Pitch: 0.40 mm (0.016 in)
Lead Width: 0.20 mm (0.008 in)

Features

- Frequency Range: 0.2 to 20 GHz
- Coupling Flatness: ±1 dB
- Directivity: > 15 dB
- Return Loss: > 15 dB
- Insertion Loss: < 1.5 dB
- Sensitivity: 18 mV/mW
- Max Input Power:
  25 dBm @ 70°C
  2:1 Source VSWR
  Output Open Circuit (see figure 5)
- RoHS Compliant SMT
- 2mm x2mm QFN Surface Mount Package

Description

TC621P is a low-loss, directional detector with an integrated diode, capacitor, and resistors on chip.

It is fabricated using the MB6A process at HFTC. The device has bond pads (not beam leaded) and is designed for low cost applications. No external resistors are required.

Application

- Leveling (ALC Loop)

Absolute Maximum Ratings[1][2]

Symbol	Parameters/Conditions	Min.	Max.	Units
P_{max}	Max Instantaneous Input Power (burn-out damage limit)		25	dBm
T_{stg}	Storage Temperature		150	°C
T_{bs}	Package Backside Temperature	–40	+85	°C
T_{stg}	Storage Temperature	–65	+150	°C
T_{assy}[3]	Maximum Solder Reflow Temp. (max. 3 cycles @ 30 sec./cycle)		+260	°C

1. Parameters specified for continuous operation at Tbs ≤ 85°C.,
2. Operation in excess of any one of these conditions may result in permanent damage to this component.
3. Refer to JEDEC J-STD-020D for detailed reflow profile, 3 reflows max.

Moisture Compatibility

Injection mold components like the TC621P in QFN are moisture-sensitive. The product is tested to the Moisture and Reflow Sensitivity Level 3 as per IPC/Jedec J-STD-020 and must be mounted within 168 hours of opening the shipping con-tainer. Store and handle parts for reflow and for rework per IPC/Jedec J-STD-033B. An example of the moisture sensitivity label is shown in Figure 2.

Tape and Reel

The TC621P is available in tape and reel format to facilitate automatic pick and place manufacturing. See Figure 8.

RoHS Compliance

The TC621P is RoHS Compliant. This means the component meets the requirements of the European Parliament and the Council of the European Union "Restriction of Hazardous Substances" Directive 2002/95/EC, commonly known as "RoHS". The six regulated substanc-es are lead, mercury, cadmium, chromium VI (hexavalent), polybro-minated biphenyls (PBB) and polybrominated biphenyl ethers (PBDE). RoHS compliance implies that any residual concentration of these substances is below the RoHS Directive's maximum concentration values (MVC); being less than 1000 ppm by weight for all substances except for cadmium which is less than 100 ppm by weight.

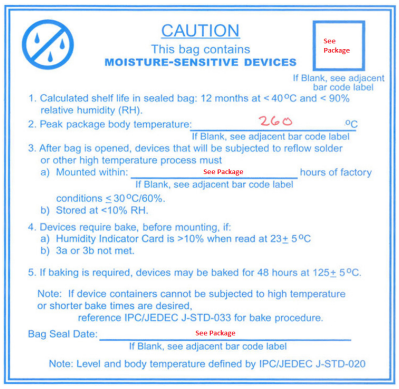


Figure 1. Moisture Sensitivity Label

ESD and Handling Precautions

GaAs MMICs in either chip or SMT packages are ESD sensitive. ESD preventive measures must be employed in all aspects of storage, handling, and assembly.

MMIC ESD precautions, handling considerations, die attach and bond-ing methods are critical factors in successful GaAs MMIC performance and reliability.

Keysight application note #54, "GaAs MMIC ESD, Die Attach and Bonding Guidelines" provides basic informa-tion on these subjects.

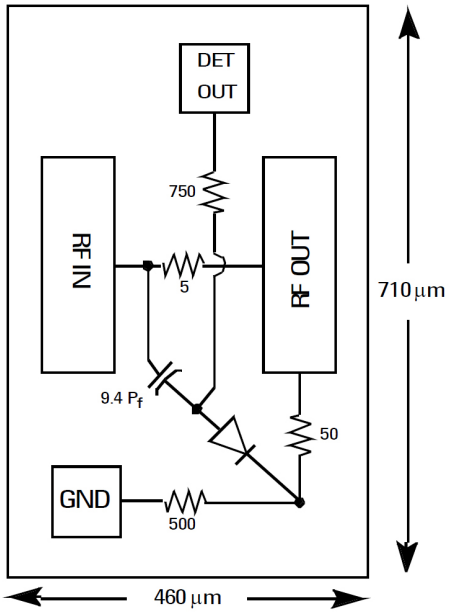


Figure 2. TC621P Schematic

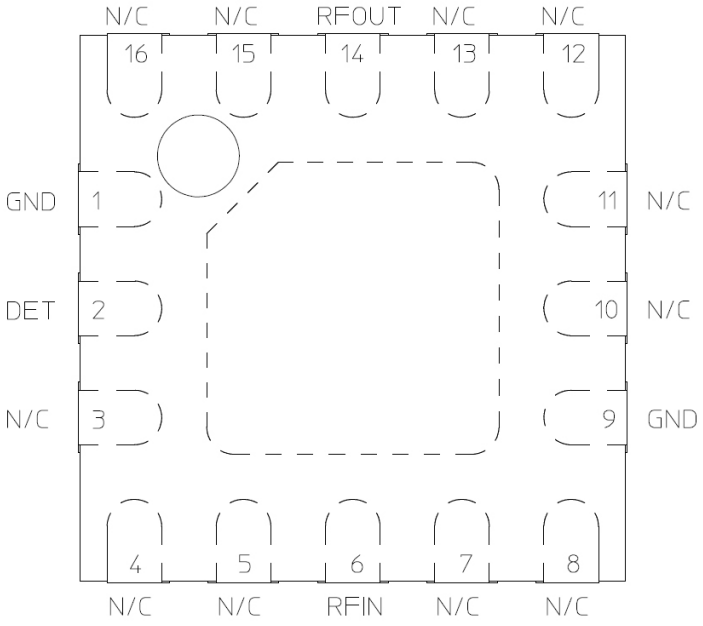


Figure 3. TC621P PinOut Diagram

DOWNLOAD UPDATED FOOTPRINT
FROM MENTOR/EXPEDITION LIBRARY

This footprint is optimized for 10 mil Rogers 4350
layer1 – 2 microstrip with a width of 20 mils.

Vias must be filled and plated over VIPPO
recommend 7.9 mil FHS (no solder mask)

Use grounded 'area filled' copper on opposite side
of the board for proper heatsinking.

Use 'area fill' copper (grounded if possible)
on inner layers for additional heatsinking

Interconnect layers using ground vias at maximum density
around the perimeter of the part for additional heatsinking.

FOR FOOTPRINTS COMPATIBLE WITH OTHER LAYOUT
TOOLS, CONTACT HFTC APPLICATIONS.

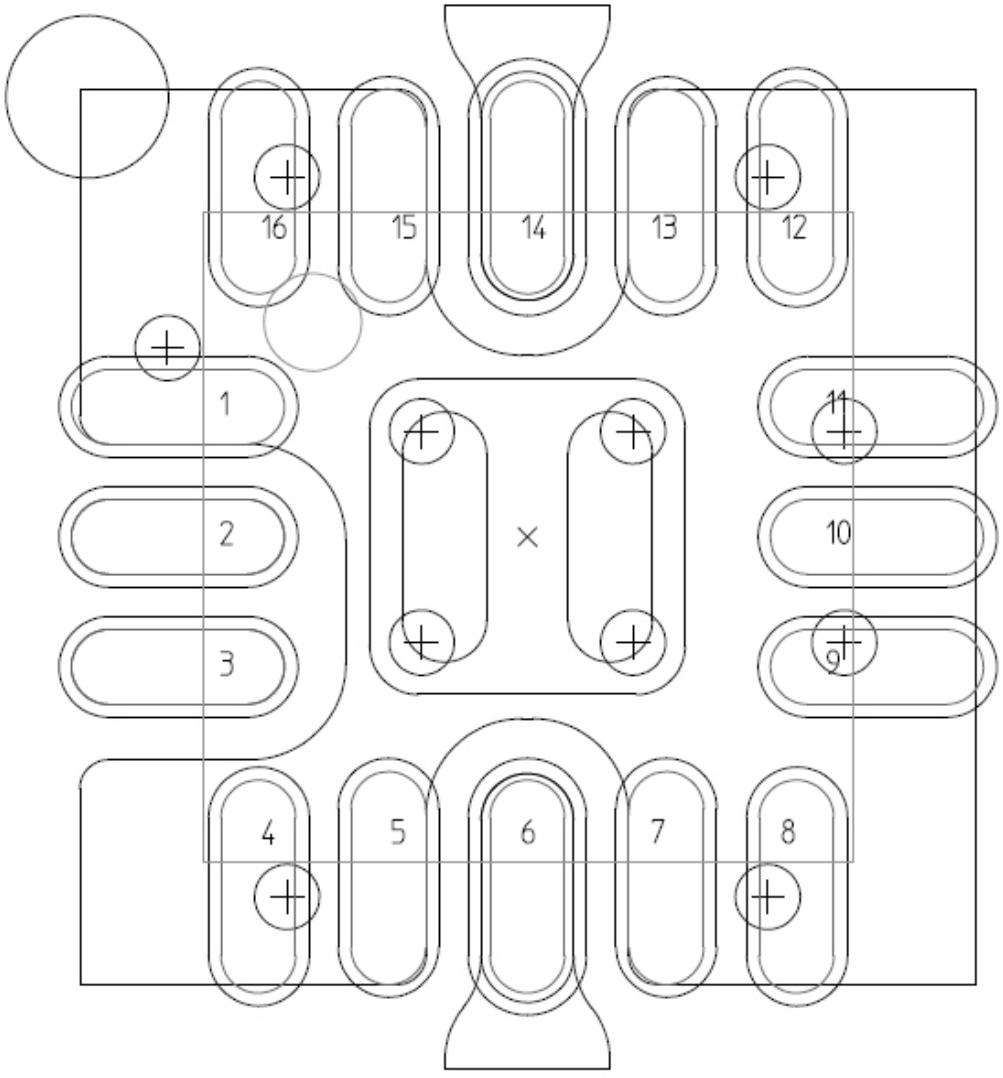


Figure 4. TC621P Footprint Diagram

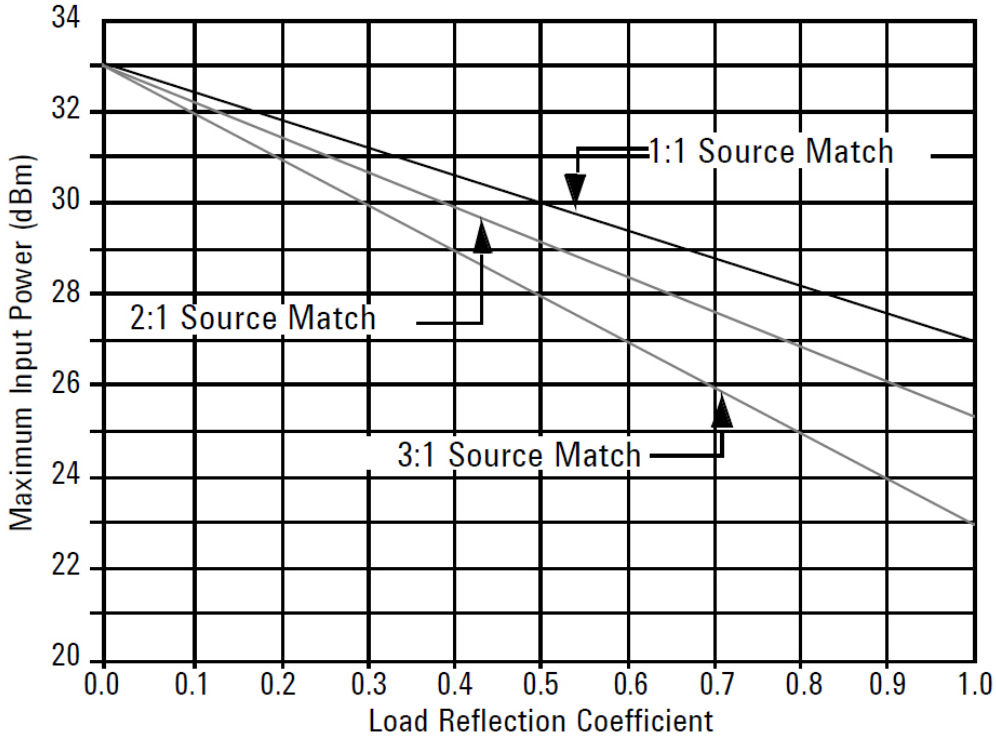


Figure 5. TC621P Safe Operating Region T_{case}: +70°C

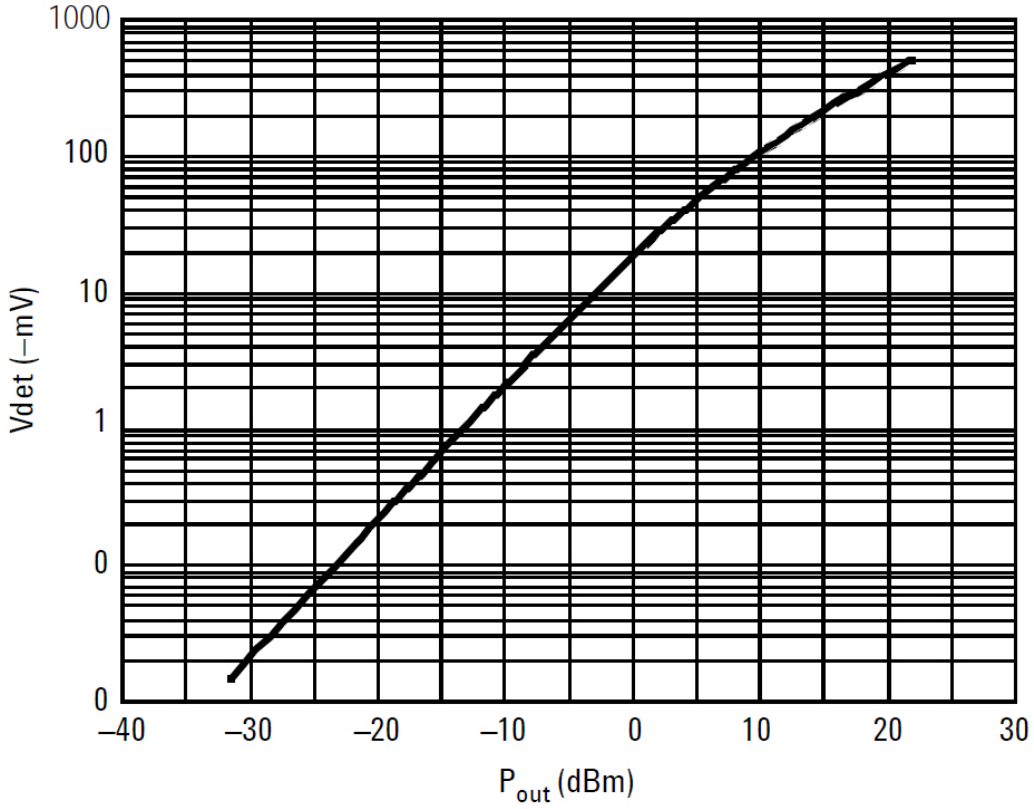


Figure 6. TC621P Typical Transfer Characteristic Temp = +25°C

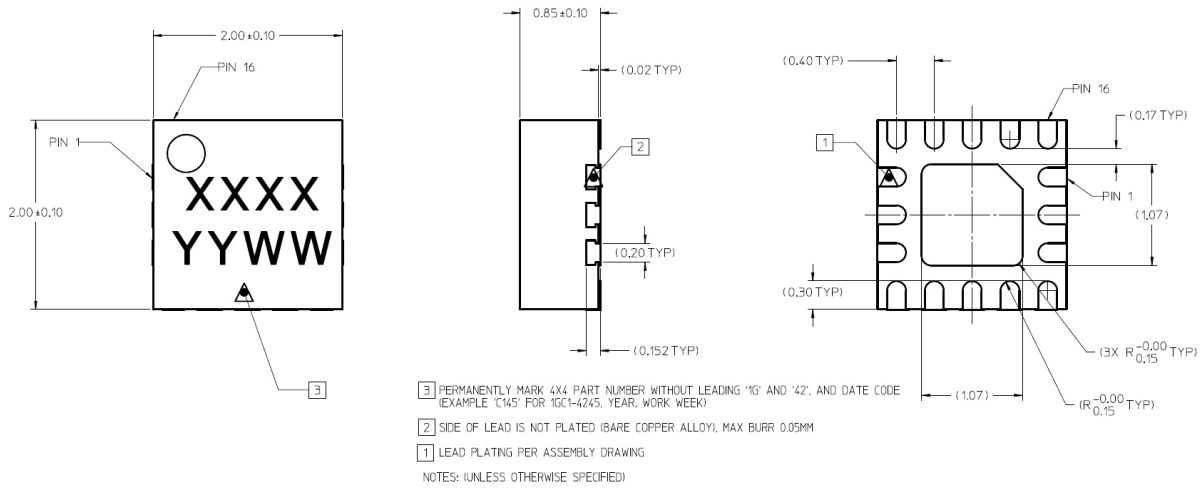


Figure 7. TC621P Dimension Drawing
(dimensions in mm)

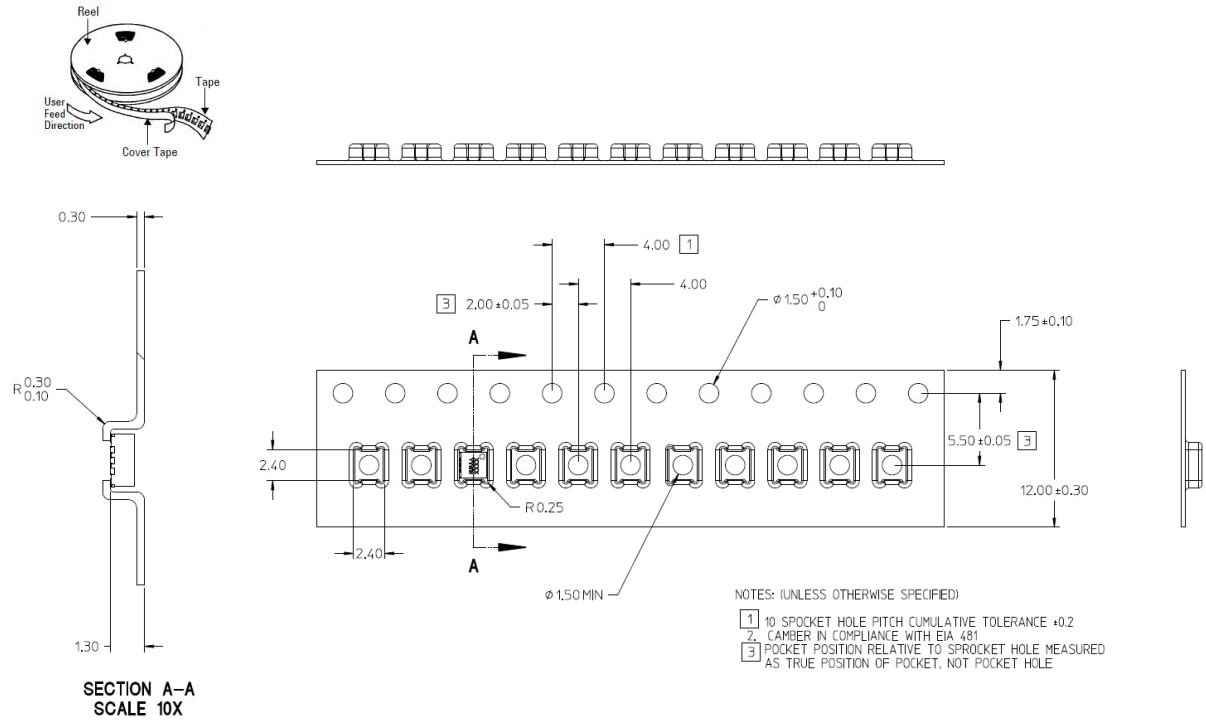


Figure 8. Tape and Reel Information