mmTron
Unleashing the mmWave Frontier

# TMC928-D
## 13.32-15.20 GHz VCO

## Product Features

- RF frequency: 13.32 to 15.20 GHz
- Pout: 8 dBm
- Phase Noise: -112 dBc/Hz @100 kHz Typ.
- Package Size: 32-pin, X=5.0 mm, Y=5.0 mm
- DC Power: 5 VDC, IC=250 mA
- Vtune: 2-13V

## Application

- Point to Point Radio
- Instrumentation
- SATCOM
- Military Radar, EW

## Product Description

The TMC928D is a GaAs/InGaP Heterojunction Bipolar Transistor (HBT) MMIC VCOs. The TMC928D has built-in integrate resonator, negative resistance devices, and varactor diodes. Due to the VCO's monolithic IC structure, the VCO's phase noise performance is excellent over temperature, shock, and process variations. Power output is +8 dBm typical from a +5V supply voltage. The TMC928D voltage-controlled oscillator can be offered as a packaged part as TMC928. The leadless QFN 5x5 mm surface mount package requires no external matching components.

***Electrical Performance :*** **Ta = 25 °C, VCC=+5V, ICC=250mA**

| | min | Typ | Max | Units |
|---|---|---|---|---|
| **Frequency** | 13.32 | | 15.2 | GHz |
| **Power Output** | 3 | 8 | 10 | dB |
| **SSB Phase Noise @ 100 kHz Offset, Vtune= +5V** | | -112 | | dBc/Hz |
| **Tune Voltage** | 2 | | 13 | V |
| **Tune Port Leakage Current (Vtune= 13V)** | | | 10 | uA |

mmTron Inc. reserves the right to make changes to the product(s) or information contained herein without notice
Version 3.5 2025 © mmTron, Inc.



## Electrostatic Discharge Caution

This integrated circuit can be damaged by ESD. mmTron Inc. recommends that all integrated circuits be handled with appropriate precautions. Failure to observe proper handling and installation procedures can cause damage. ESD damage can range from subtle performance degradation to complete device failure. Precision integrated circuits may be more susceptible to damage because very small parametric changes could cause the device not to meet its published specifications. III-V MMICs are ESD-sensitive. Preventative ESD measures must be employed in all aspects of storage, handling, and assembly. MMIC ESD precautions, handling considerations, and die-attach and bonding methods are critical factors in successful III-V MMIC performance and reliability.




## RoHS Compliant

This part is RoHS compliant, meeting the requirements of the EU Restriction of Hazardous Substances Directive 2002/95/EC, commonly known as RoHS. Six substances are regulated: lead, mercury, cadmium, chromium VI (hexavalent chromium), polybrominated biphenyls (PBB), and polybrominated biphenyl ethers (PBDE). RoHS compliance requires that any residual concentration of these substances is below the Directive's maximum concentration values (MCV): cadmium 100ppm by weight and all others 1000ppm by weight.

# Disclaimer and Warranty Statement

**© 2025 mmTron Inc. (“mmTron”). All rights reserved.**

The information contained in this datasheet is for reference only. All specifications are subject to change without prior notice.
Except as provided in its Terms and Conditions of Sale or any separate agreement, mmTron assumes no liability or responsibility whatsoever, including for (i) errors or omissions in these materials; (ii) failure to update these materials; or (iii) conflicts or incompatibilities arising from future changes to specifications and product descriptions, which mmTron may make at any time, without notice. These materials grant no license, express or implied, to any intellectual property rights. THESE MATERIALS ARE PROVIDED "AS IS" WITH NO WARRANTY OR LIABILITY, EXPRESS OR IMPLIED, RELATING TO SALE AND/OR USE OF mmTron PRODUCTS INCLUDING FITNESS FOR A PARTICULAR PURPOSE, MERCHANTABILITY, INFRINGEMENT OF INTELLECTUAL PROPERTY RIGHT, ACCURACY OR COMPLETENESS, OR SPECIAL, INDIRECT, INCIDENTAL, OR CONSEQUENTIAL DAMAGES WHICH MAY RESULT FROM USE OF THESE MATERIALS.

mmTron products are not intended for use in medical, lifesaving or life sustaining applications. mmTron customers using or selling mmTron products for use in such applications do so at their own risk and agree to fully indemnify mmTron for any damages resulting from such improper use or sale. These items are controlled by the U.S. Government and authorized for export only to the country of ultimate destination for use by the ultimate consignee or end-user(s) herein identified. They may not be resold, transferred, or otherwise disposed of, to any other country or to any person other than the authorized ultimate consignee or end-user(s), either in their original form or after being incorporated into other items, without first obtaining approval from the U.S. government or as otherwise authorized by U.S. law and regulations’.
The product layout, and specification are mmTron Proprietary and confidential information. The recipient agrees not to copy, alter, modify, reverse engineer, or attempt to derive the composition or underlying information, structure or ideas of any Confidential Information and must not remove, overprint, deface or change any notice of confidentiality, copyright, trademark, logo, legend or other notices of ownership from any originals or copies of mmTron’s information.