



BHW Technologies (博泓微科技有限公司)



Advanced RF IC, Antenna, Filter, RF Front-End
and Wireless System Solutions

BHW AppNote #008

High-Power 5.8GHz RF Front-End Solution Using BHWA555 and
BHWM552 for ETC, V2X and Wireless Video

Rev. 1.3

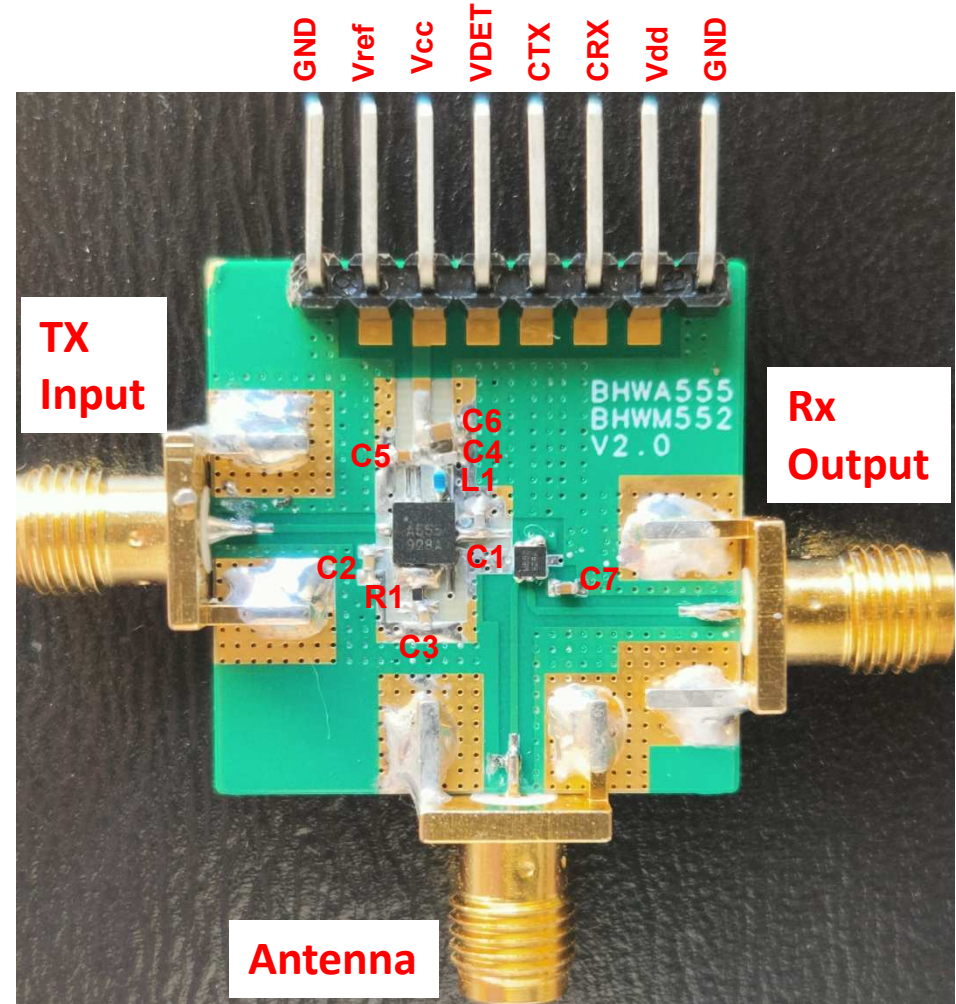
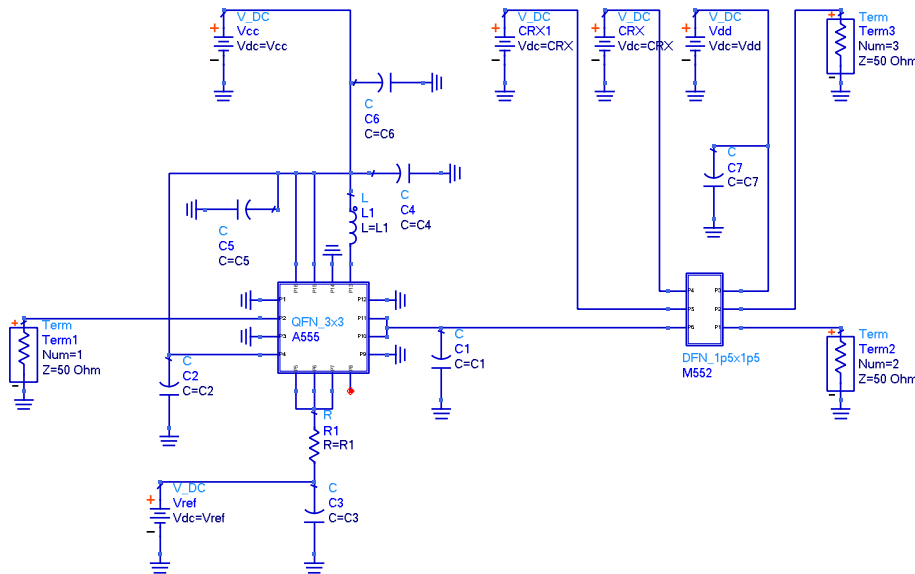
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BHWA555 & BHWM552 Combo EVB



BHWA555 & BHWM552 Combo EVB Tuned for 5.85GHz Applications

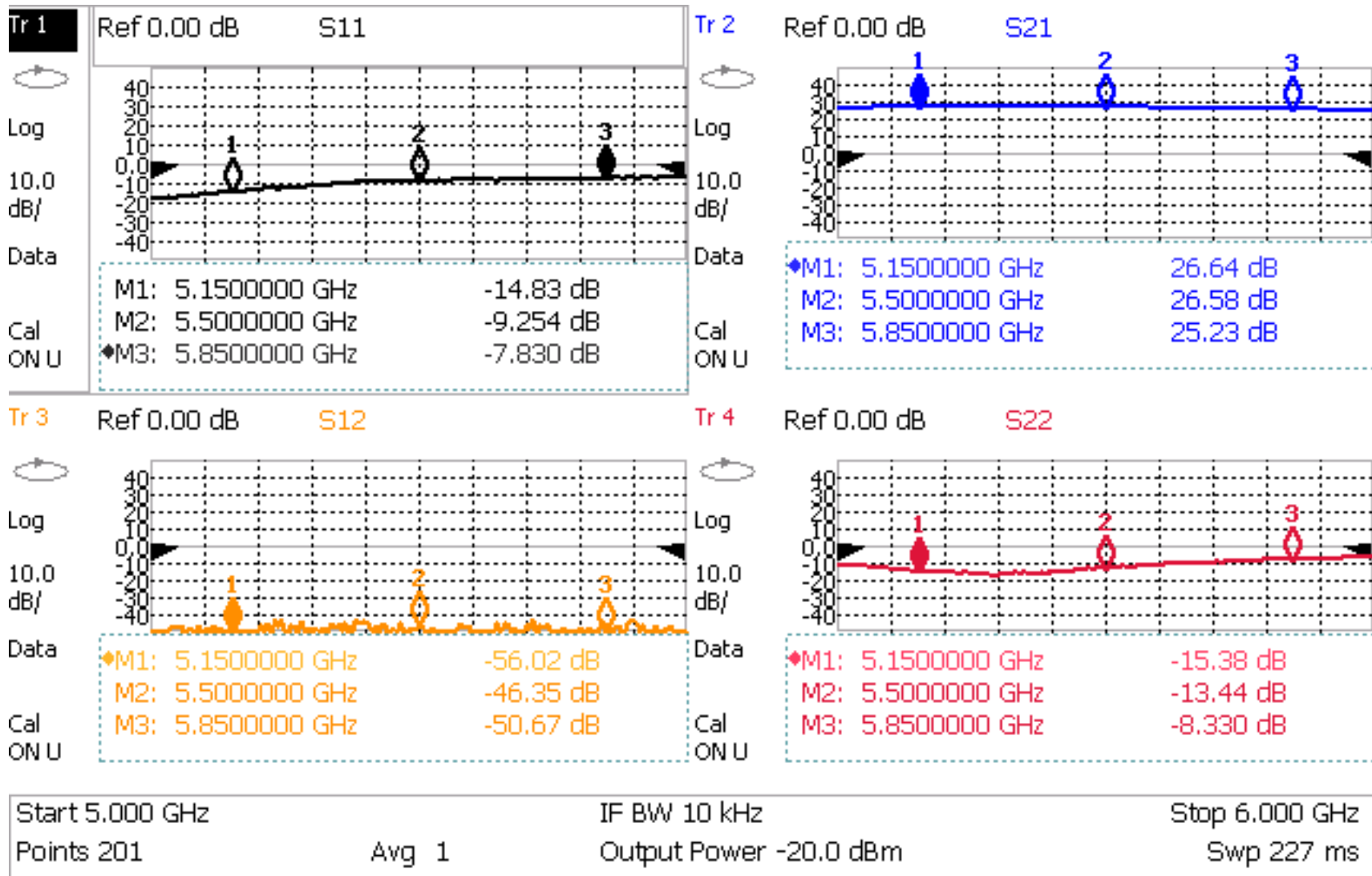
Application Schematic



Recommended BOM for 5.85GHz Operation:

- Capacitors: C1=1pF, C2=C3=1nF, C4=220pF, C5=0.1uF, C6=C7=1uF; C1 at ~1mm from Package Output Edge
- Bias Inductor: L1=3.9nH
- Bias Resistor: R1=750 Ohm for $I_{cq} \sim 150\text{mA}$ at $V_{cc}=V_{ref}=5\text{V}$. Other bias settings available upon request
- Power detection circuit not included. Information available upon request.

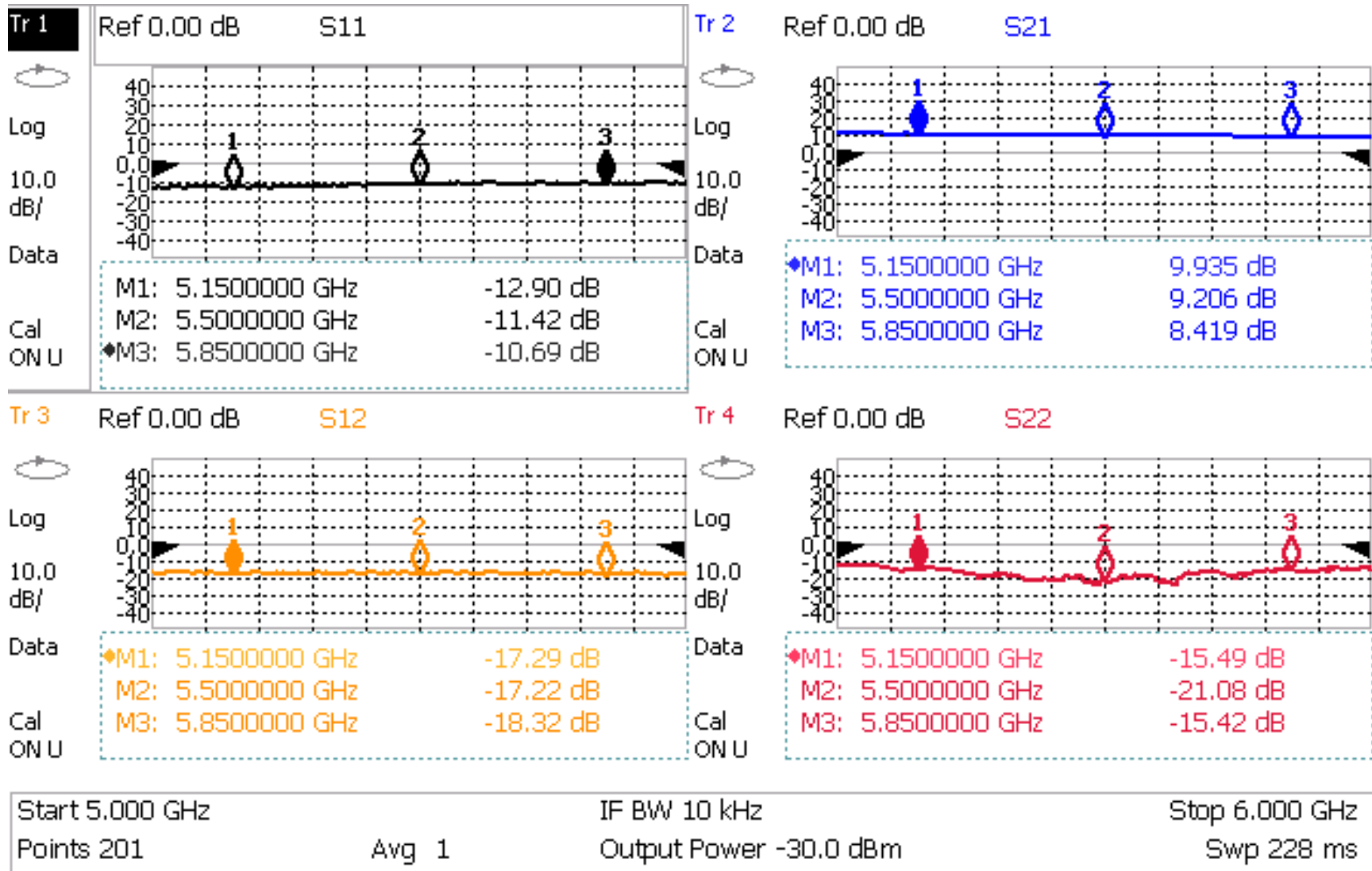
BHWA555 & M552 Combo EVB Tx S-Parameter



Notes:

- Bias Setting: Vcc=Vref=5V, Icq~150mA; Vdd=CTX=3.3V, CRX=0V
- Measured S21 includes PCB and SMA connector losses (~0.5dB at 5.85GHz)

BHWA555 & M552 Combo EVB Rx S-Parameter



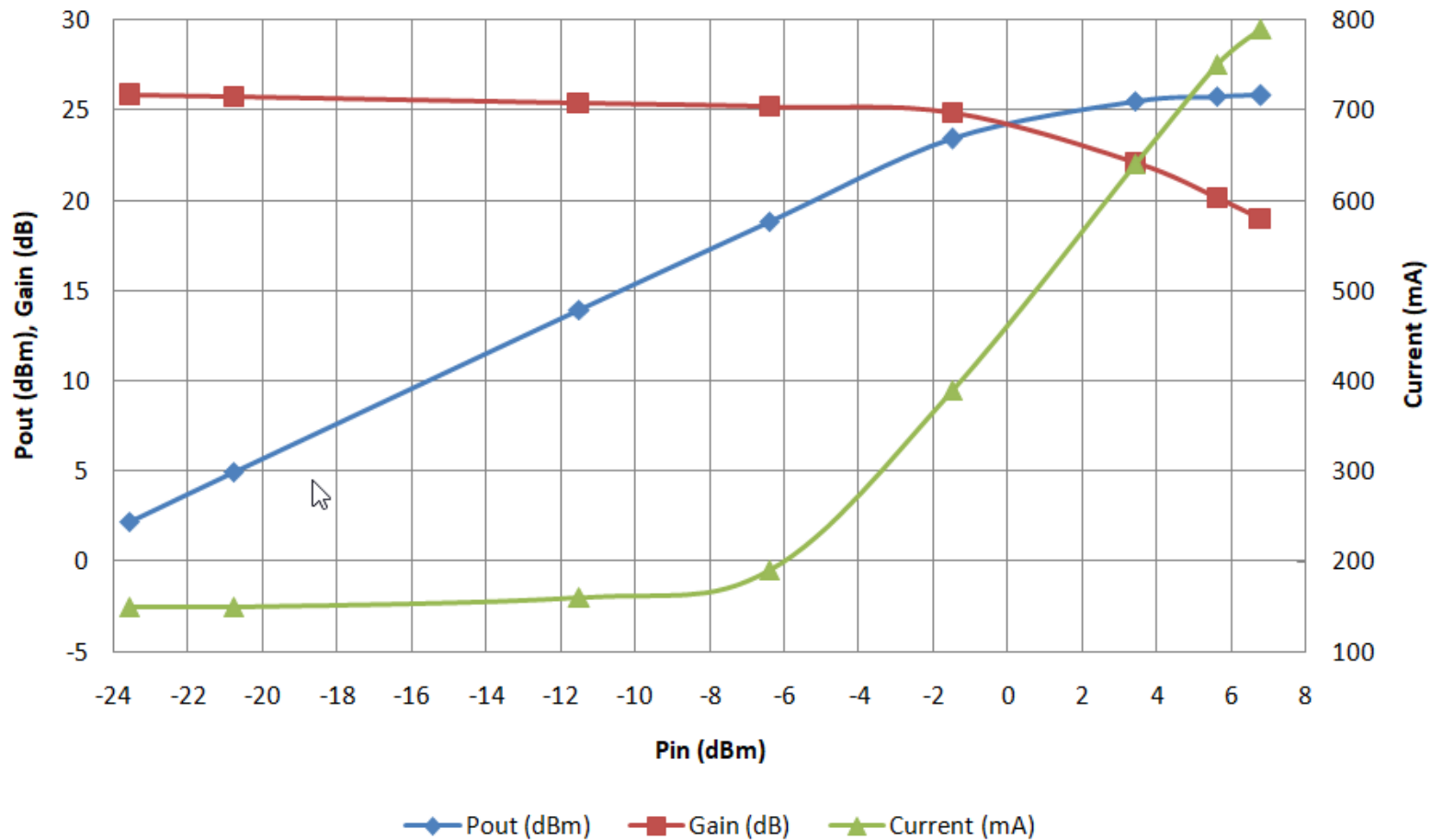
Notes:

- Bias Setting: Vdd=CRX=3.3V, CTX=0V, Idq~14mA
- Measured S21 includes PCB and SMA connector losses (~0.5dB at 5.85GHz)

BHWA555 & M552 Combo EVB Tx Power Sweep



F=5.85GHz, Vcc=Vref=5V, Vdd=CTX=3.3V, CRX=0V



Notes:

- Bias Setting: Vcc=Vref=5V, Vdd=CTX=3.3V, CRX=0V, Icq~150mA.
- For Pin ~ +2dBm at 5.85GHz, Pout ~ 25dBm, Ictotal~560mA
- Test was done at room temperature, CW (100% duty-cycle), on a 25.3x25.3x1.6mm 4-layer EVB without any heat sink
- Expect slightly better results on larger-size PCB, or with good heat sink provision.

BHW RF Front-End AppNote Library



This is an abridged version of BHW AppNote #008. Please contact BHW Support or your local sales rep/distributor for a complete copy of the document and other related information.

BHW RF Front-End Solutions AppNote Library



In addition to standard datasheets and EVB/BOM info, BHW publishes an AppNote series that address various topics on RF front-end design and performance over a wide frequency range from 300MHz to 6GHz, as an effort to assist customers in developing cutting-edge, cost-competitive products:

- BHW AppNote #001 - Cross-Over Cascade of BHWM253 to Boost Tx Power and Rx Sensitivity of 2.4GHz Systems
- BHW AppNote #002 - Accurate Benchmark of GNSS CNO Using the Power-Splitter Method
- BHW AppNote #003 - Boosting Wi-Fi Tx Power and Rx Sensitivity with BHWA251 and BHWM252
- BHW AppNote #004 - UHF 900MHz RF Front-End Solution Using BHWA251 Half-Watt PA and BHWL160 Sub-1dB-NF LNA
- BHW AppNote #005 - Sub-1GHz Applications of BHWA350 2-in-1 Wideband Fully Matched Amplifier
- BHW AppNote #006 - Low-Noise High-IIP3 LNB Architecture for Dual-Band High-Precision GNSS Using Cascade of BHWL160
- BHW AppNote #007 - UWB RF Front-End Solution Using BHWA350 and BHWM552
- BHW AppNote #008 - High-Power 5.8GHz RF Front-End Solution Using BHWA555 and BHWM552 for ETC, V2X and Wireless Video
- BHW AppNote #009 - 5.8GHz RF Front-End Using BHWA350 and BHWM552 for Wireless Audio
- BHW AppNote #010 - Multi-Constellation GNSS Active Antenna Using BHWL161 Cascade and Single-Fed Dual-Band Antenna
- BHW AppNote #011 - BHWL161 Super-Compact Low-Power Low Noise Amplifier for Range Extension of 2.4GHz RC and IoT
- BHW AppNote #012 - Enabling Cost-Effective High-Precision GNSS Using BHWL161 and Linear-Polarization PCB Antenna
- BHW AppNote #013 - GNSS Noise Floor vs Receiver Architecture
- BHW AppNote #014 - Designing Ultra Low-Power High-Performance GNSS Products Using BHWL160 GaAs PHEMT LNA
- BHW AppNote #015 - BHWL161 GNSS Full-Band High-Performance LNA in Super-Compact 1x1mm DFN with Relaxed Pin Pitch
- BHW AppNote #016 - Improving GNSS NF Measurement Accuracy Using Broadband LNA BHWL161 as Pre-Amp
- BHW AppNote #017 - High-Efficiency, Low-NF 2.4GHz Front-End Solution for IoT Using BHWA251 and BHWM252
- BHW AppNote #018 - Optimizing BHWA555 Wideband One-Watt PA for Long-Range 5.8GHz Transmitter Applications
- BHW AppNote #019 - Miniature 2.4GHz RF Front-End with Integrated Chip Antenna and BHWM253 for TWS and IoT
- BHW AppNote #020 - Multiplying the Range for 2.4GHz Music Streaming with BHWR250L Active Integrated Antenna (AiA)
- BHW AppNote #021 - Range Extension for 2.4GHz Wireless Systems with BHWR250M Active Integrated Antenna (AiA)
- BHW AppNote #022 - Enabling Long-Range Angle-of-Arrival for High-Precision Indoor Positioning with BHWR250N RF AiA
- BHW AppNote #023 - Extend the Range for 5.8GHz Audio/Video Streaming with BHWR580M Active Integrated Antenna (AiA)
- BHW AppNote #024 - Improving 5.8GHz Radio Link Budget with BHWR580L Active Integrated Antenna (AiA)
- BHW AppNote #025 - Improving Range and Throughput of 2.4GHz Wi-Fi with BHWR250 Array Antenna
- BHW AppNote #026 - Improving Range and Throughput of 5GHz Wi-Fi with BHWR550 Array Antenna
- BHW AppNote #027 - Multi-Band High-Accuracy GNSS Solutions Using BHWP150 DFN1x1 Ultra-Compact Power Divider & Combiner
- BHW AppNote #028 - Use BHWM252 Cascade to Extend Range of 2.4GHz Wireless Systems with Single-Port SoCs
- BHW AppNote #029 - Improving Range of 2.4GHz Wireless Microphones and Audio Systems with BHWR250A Active Integrated Antenna (AiA)
- BHW AppNote #030 - Simultaneous Improvement in Range and Battery Life of 2.4GHz Wireless Systems with BHWR250M AiA

Contact support@bhwtechnologies.com or BHW distributors/representatives for your copy of the above and new up-coming documents.