



## APPLICATION SOLUTION BRIEF

# GaN 50V RF Power Amplifier Applications

### Typical Power Requirement Specifications

- Power
  - » Macro BTS; Up to 800 W
  - » RRH; 200 W to 600 W
- Output
  - » 50 V nominal
  - » 25 V to 57 V trim required
- Environmental
  - » Wide temperature range of -40 to +100°C baseplate
  - » Application is usually an IP sealed enclosure
- Compliance requirements
  - » Full Telecom Standards to be adhered to
- Size, connectivity, form factor
  - » To be industry standard baseplate brick-factor footprints

RF power amplifier applications can split to a few different types. The DCDC power conversion that is required by the different types of applications is defined by the range that the RF antennae is designed to transmit to, the expected speed of the transmission and ultimately, the power-amplifier power rating required to achieve these functions. Typically, the voltage required by GaN Power amplifier's is between 48 V and 52 Vdc.

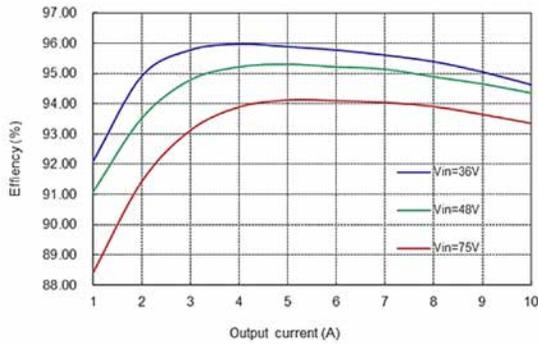
The power required is dependent on the RF power demand from the system. This in turn defines the power rating of the power-conversion product that is required in that application. These power ratings can vary between 100 W and 800 W depending

on the system. For example, the micro base station (BTS) may need in the range of 5 W to 40 W of RF power, which means between 150 W and 350 W of DCDC power conversion is likely to be required, where macro base stations require up to 800 W of DCDC power conversion. GaN power amplifiers are usually used for the highest power systems due to the improved efficiency they can achieve.

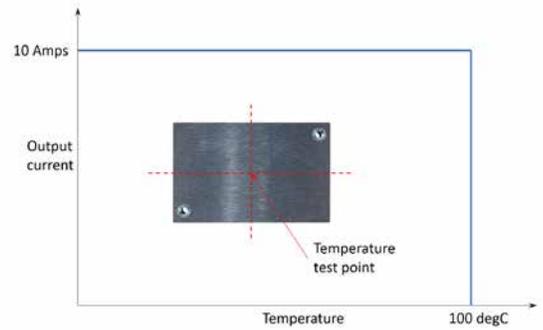
The highest priority when selecting the DCDC power conversions solution is the highest efficiency possible at the power rating optimized for the application. The deployment locations can be anywhere from the very hottest environments to the very coldest.



### High efficiency at 95%



### Fold back output OCP



Artesyn's DCDC converters address these application demands. All of the DCDC converters possess high conversion efficiency in the region of 95% and their calculated reliability exceeds 1.5 million hours. Additionally, the current limiting characteristic of Artesyn's DCDC modules exhibits an auto-recovery over current protection mode of operation even if the unit gets overloaded.

Artesyn's DCDC converters have been specifically designed to be contact-cooled inside an I.P. sealed enclosure. All of the units have a baseplate that can be thermally bonded to the host enclosure. The full power rating of the unit will be available as long as the baseplate remains less than 100 degrees Centigrade. The family comprises of solutions that have a wide output trim range of any voltage between 50% and 118% of the nominal output voltage.



Base Station type	RF power expected in the application	Power level and solution required to supply the PA	Module solution type
Multi-carry Macro/RRH	4x30 W, 8x10 W	Requiring up to 800 W	AGQ500, AGF600, ADH700, AGF800
Macro BTS	40 W, 60 W, 80 W	Requiring between 600 W and 800 W	
Micro BTS	5 W-40 W	Requiring 150 W, 250 W, 350 W	
RRH	5 W, 40-80 W, 100 W	Requiring 250 W, 350 W, 450 W, 600 W	

In summary this family of 50 V units address the requirements of the power levels required in the applications at the high efficiencies required, the wide-range of environmental temperature conditions that could be expected, the demands for contact-cooled solutions, the functions of widely adjustable outputs and output current limit characteristics.

All of these attributes make these units ideally suited to providing power conversion solutions into the demands of GaN RF Power Amplifier applications.

[www.artesyn.com](http://www.artesyn.com)  
 +1 888 412 7832

Artesyn Embedded Technologies, Artesyn Embedded Power, Artesyn, and all Artesyn related logos are trademarks and service marks of Artesyn Embedded Technologies, Inc. All other names and logos referred to are trade names, trademarks, or registered trademarks of their respective owners. Specifications are subject to change without notice. © 2019 Artesyn Embedded Technologies, Inc. All rights reserved. For full legal terms and conditions, please visit [www.artesyn.com/legal](http://www.artesyn.com/legal).  
 GaN 50V RF Application Solution Brief - October 2019