**Multichannel on-chip data transmission with InGaN/GaN multiple quantum wells devices**

Feifei Qin1\*, Jiaqi Wu1, Xueyao Lu1, Xiaoxuan Wang2\*, Qing-song Jiang3, Daotong You4, Yang Chen1, Yue Cao1, Lei Zhang1, Junfeng Lu5, Gangyi Zhu1\*, Yongjin Wang1

1GaN Optoelectronic Integration International Cooperation Joint Laboratory of Jiangsu Province, College of Telecommunications and Information Engineering, Nanjing University of Posts and Telecommunications, Nanjing, 210003, China;

2State Key Laboratory of Digital Medical Engineering, School of Biological Science and ·

3Faculty of Electronic Information Engineering, Huaiyin Institute of Technology, Huai’an 223003, China

4Institute of Photonics Technology, College of Physics and Optoelectronic Engineering,Jinan University, Guangzhou 510632, Peoples Republic of China,

5College of Physics, MIIT Key Laboratory of Aerospace Information Materials and Physics, Key Laboratory for Intelligent Nano Materials and Devices, Nanjing University of Aeronautics and Astronautics, Nanjing 211106, China

\*Corresponding author:

[qinfeifei@njupt.edu.cn](mailto:qinfeifei@njupt.edu.cn), [wxxseu@seu.edu.cn](mailto:wxxseu@seu.edu.cn) , [zhugangyi@njupt.edu.cn](mailto:zhugangyi@njupt.edu.cn)

1. **The morphological characteristics of a single device**



Figure S1 (a-d) SEM of individual devices, (e, f) CCD images of individual devices

1. **XRD, Raman and PL characteristics of a single device**



Figure S2 (a) The XRD pattern, (b) Raman spectrum and (c) photoluminescence spectrum of a single device.

**C. Electrical properties of the individual transceiver unit**

****

Figure S3 Spectral sensitivity of devices



Figure S4 eye diagram



Figure S5 Long-term operational stability and reproducibility of GaN devices

**D. On-chip data transmission system and data**



Figure S6 the real images of the date transmission system



Figure S7 The actual signals in the system: (a) text signal, (b) image signal.