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:

5G NR URLLC

(1)

(2) URLCC

(3)

:

(1) 5G R16 URLLC for high-speed scenarios

(2)

:

/ FDD 5G/B5G

TDD TDD URLLC

:

:

5G

:

:

5G

(1)

(2) mMTC

(3)

:

1

2

3

4

5 3

6 2

:

HBM2

:

idea DC

:

fabric

:

:

VoD 4K VR

5G/NR Phase-1

NR

Xcast

Xcast ad/hoc V2X

:

2 2 2

E

EA

, : , ,

:

, , , ,

10. 11.

12.

:

1. 2.

3.

4.

:

1

2

3 4

:

1 2

3 ,4

:

modeboard

UI

:

1

1

2

UI

60 1 +

100 60 1 +

2

3 FL

3

:

,

:

1 2

3

:

android android

MTK

1.

2.

3.

4.

5.

:

2.

:

LTE B46 wifi 5G

100dB LTE wifi

:

1 100dB

2,

:

1 OID

2 IBE

3 IBE

1 IBE

2 IBE

3 IBE

:

：

5G

5G

5G

1.

2. 5G

3. 5G

4.

：

1. (Moving Target Defense, MTD)

2. MTD

3. MTD

1.

2.

3.

AI

:

1

2 Spark API

3

Spark

1

2

Spark

API AI Explorer

DB-Scan ANN/DNN

3

:

1 FULL-DUPLEX

2

3 vectoring MIMO

1 FULL-DUPLEX

2 TDSL Tbps

:

1. WDM PON

2. 1.5W 25G WDM PON

SFP

FRM

3. 2

1.25G 1.5W

2.

3. 1

:

1. DWDM
2. APD

1. 16 2dB
2.
3. 1

:

1 wifi 802.11n 1*1/2*2/3*3 zigbee 3.0 wifi/zigbee PCB wifi

2 wifi/zigbee

3 Qualcomm/Broadcom/MTK/Realtek WiFi Soc NXP/Silicon Labs/TI zigbee

4 WiFi/zigbee

wif/zigbee wifi AP zigbee AP 50%

:

WDM PON ONU

1

2

3 WDM

WDM PON 10G

32 /40 80

:

2.4GHz 5GHz

1

2

3

10cm

:

FTTH DSG Docsis Setbox Gateway VoD

PON DSG

1 CMTS CM RF RF IP IP RF

CMTS/CM IP VOD

2 CM CMTS IP

RF return over PON

:

RFID

1 1

2 2-10mm

3

4 1 40kbit/s,

-18 dBm UHF-RFID

5. 2 10kbit/s

6 0.1mW

1

2

3

4

:

1 FPGA LPM(Longest Prefix Match)

LRID VPNID

LRID VPNID IP

LRID VPNID

LRID VPNID

2 FPGA ACL(Access-control List)

ACL ACL 640bit

ACL ACL

1

1 LPM IPV4 8M IPV6 4M

2 (ACL) IPV4 200bit 512K IPV6 500bit 378k

2

LPM(IPV4 iPV6) 453MPPS + (ACL) : 1359MPPS

3 1) SDK 4G 2) 6G

4 / / 400K/S

1)

2) ZTE

3) FPGA

:

UNI

OAM

ID

L3

:

1

2 PTN/OTN/IPRAN/IP/PON

3

1

2 >99% 10min

3 >99% 1ms

:

1

2

1

2

:

1

2

1

2

:

:

4TOPS

1

:

1

2 initial silicon

3 RX PAM4 CDR

:

1 56G PAM4 SERDES ZXIC serdes

1

:

IP ,

SM2/SM3/SM4 ECC SPA/DPA IP .

FIB IP

:

IP

1

:

14b 1GSPS AD

:

ADC AD

14bit 1GSPS AD

1

ADC

:

1 BCDR IP input

2 BCDR ZXIC

3

:

IP MPW 10G BCDR

1

:

:

serdes

1

:

:

28G/56G/112G

1

:

:

1

:

:

ADDA

1

:

3D

3D 2

:

2

:

:

3D

:

1 EMC

2 EMC

1

EMI

50%

2

10%

：

DC/DC

36 72VDC 12V 2%

800W 36.8mm 57.9mm 12.7mm

1.

2. 1

3. 2 36 72VDC 12V 2%

800W 36.8mm 57.9mm 12.7mm

：

0.9

0.2

:

flotherm 30%

:

:

1

2 3.5GHz 5GHz 35-40
0.0004

3 0.05mm

:

1

2 0.05mm

:

1

2 950W/m.k, 2.2g/cm3

3 800x100x 1.0~5.0 mm

:

1

2 800X100X1 600X400X7mm

3

:

a

99.9%

b AOI 100%

:

1. AOI 99.9%

2. AOI 60% 60%

:

AI

:

1 99.5%

2 <0.5s

3 AI

4

:

3D 3D PCB

3D PCB 3D

:

1 0.1mm

2 3D

3 PCB 300mmx400mm 3D 2s

4

:

visual SLAM

AGV

AGV

1 1cm

2 1m/s

3

:

:

:

5G

5G 26G (3.5G) ,

：

5G

5G 26G MEMS

：

SiC FJ_JBS

SiC FJ_JBS

650V/1200V 40

：

SiC JBS

1 SiC JBS

2 SiC JBS 650V/40A

1200V/40A

：

InAs/AlSb HEMT

1 HEMT

2 HEMT

3 HEMT

4

:

InP InP HBT InP HEMT Si SiGe HBT InP HBT InP HBT

Kirk InP HBT

1THz InP HBT

Si

Si / InP InP 2DEG Si-InP

1 Si-InP

2

:

1 ABS-PC

2 ABS-PC

1 ABS-PC

MDF 2 ABS-PC