

3GPP TSG RAN Meeting #80
La Jolla, USA, 11-14 June 2018

RP-180893

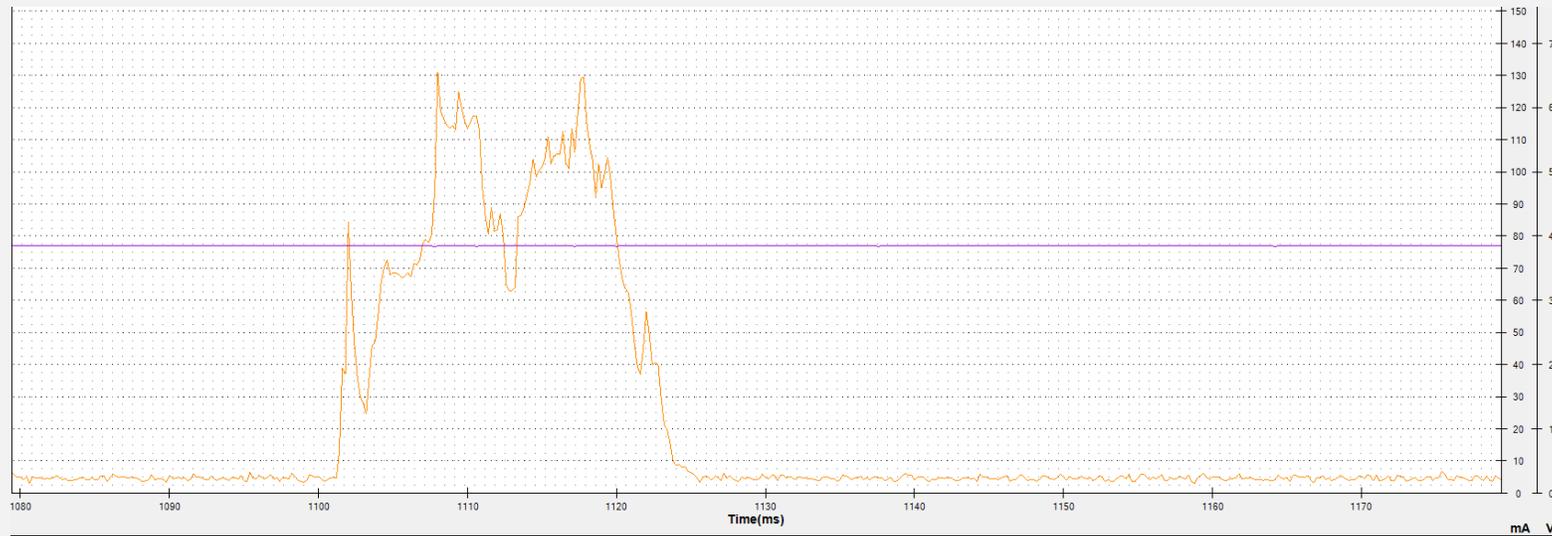
Agenda Item: 9.1.8
Document for: Discussion



Motivation for UE power savings in Rel-16 Huawei, HiSilicon

Power consumption in IDLE state

- In each DRX cycle, UE performs both RRM measurements and paging monitoring
 - Large part of power consumption is for RRM measurements
 - In NR, PF/PO and the measurement window SMTC are configured separately, thus more power consumption will be needed if PF/PO and SMTC are not aligned.

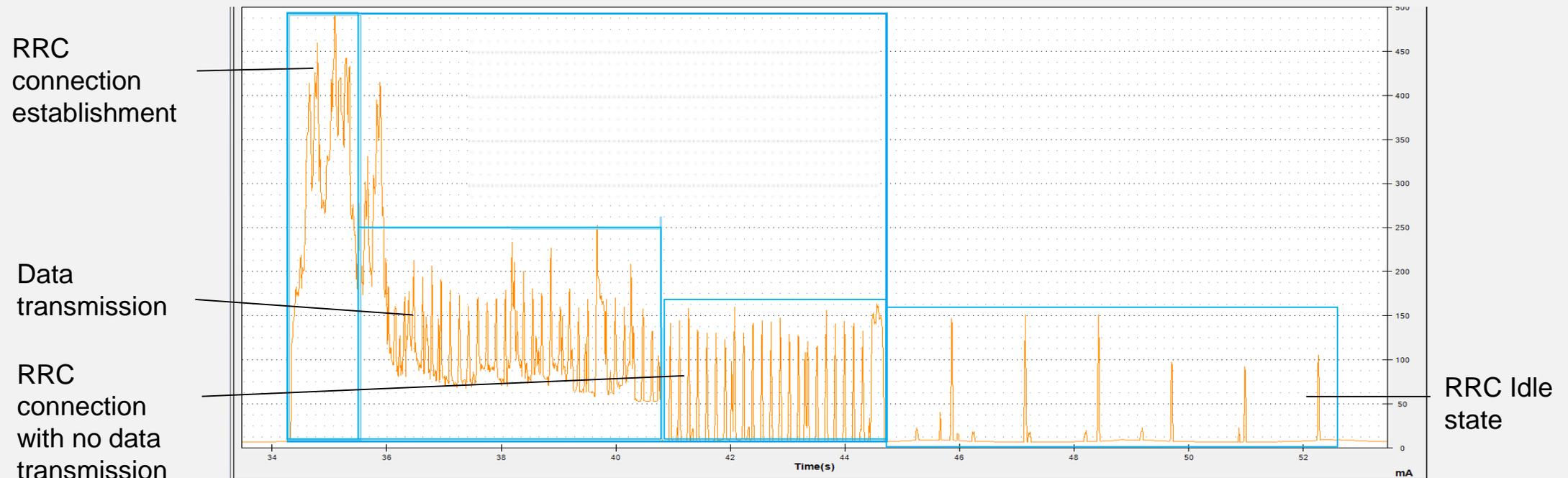


One example of the UE electrical current consumption in one duty cycle

- DRX parameters can already be negotiated between UE and MME
- eDRX parameters can already be used to extend cycle length

Power consumption in CONNECTED state

- In UMTS, fast dormancy can be used to save UE power
- In LTE system, 1 bit “Power Preference Indication” (PPI) is specified for UE to indicate lower power consumption preference. It is up to eNB implementation whether or not to react to this bit.
- UE will waste power if it cannot quickly release the RRC connection



Power consumption in CONNECTED state

- **The higher the capability the UE's receiver uses for baseband and RF, the higher will be its power consumption**
- **In both LTE and NR, UE should report its highest capability to the network**
- **In some scenarios, it is not necessary for UE to turn on all its RF capabilities and enable all baseband features for receiving data and transmitting data**
 - It is the network's final decision on how to configure UE's radio capabilities, but assistance information from UE will help the network to take decisions more precisely
 - e.g. modulation order, CA/DC capability, number of CCs, bandwidth of BWP, MIMO capability can be negotiated between UE and system for power saving

Power consumption in CONNECTED state

- **C-DRX has been specified to save UE power consumption.**
- **C-DRX parameters have been found to be very diverse among different network deployments**
 - OnDuration: 2, 4, 6, 8, 10 sub-frames (ms)
 - InActivity: 3, 40, 80, 100, 200 sub-frames (ms)
 - LongCycle: 40, 80, 320 sub-frames (ms)
 - ShortCycle: 20, 40, 80 sub-frames (ms)
- **Users utilize very diverse applications, with very diverse traffic statistics. Even users with the same applications can present different traffic statistics.**
- **It is difficult for the network to estimate and configure precise C-DRX parameters to optimize for each or all UEs**

Technical scope of UE power saving in Rel.16

■ In RRC CONNECTED state:

- UE-assisted dynamic capability reconfiguration of CA/DC/BWP/MIMO
- UE-assisted dynamic adaptation of C-DRX configuration
- UE-assisted RRC release

■ In RRC IDLE state:

- Relaxed RRM measurements

Thank you !

