

TELIT LUNCH & LEARN

November 22, 2018

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“Look out, Low Battery Alert”

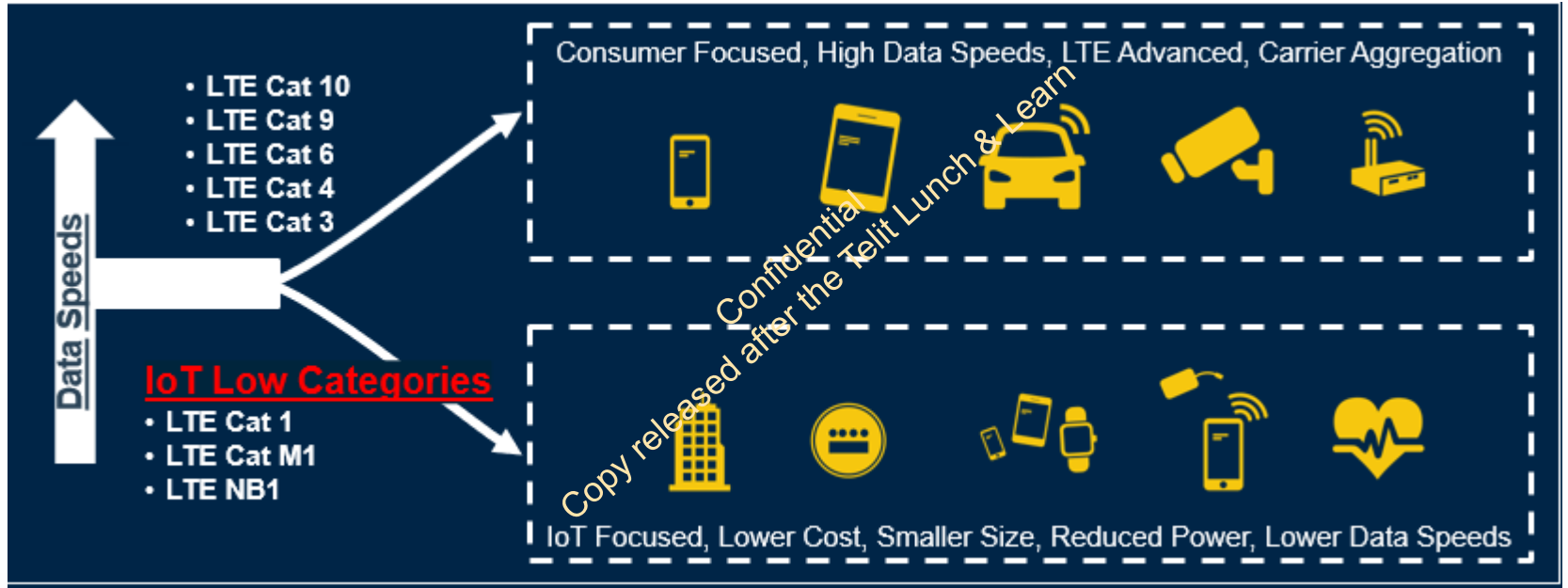


How to use CatM/NB-IoT tech to extend device lifetime

Omer Raviv, *Sales Manager and IoT solution Architect, Telit*



4G LTE Evolution



IoT low data rates characteristics



**Deep
Penetration**



**Mass
Deployment**



**Low
Bandwidth**

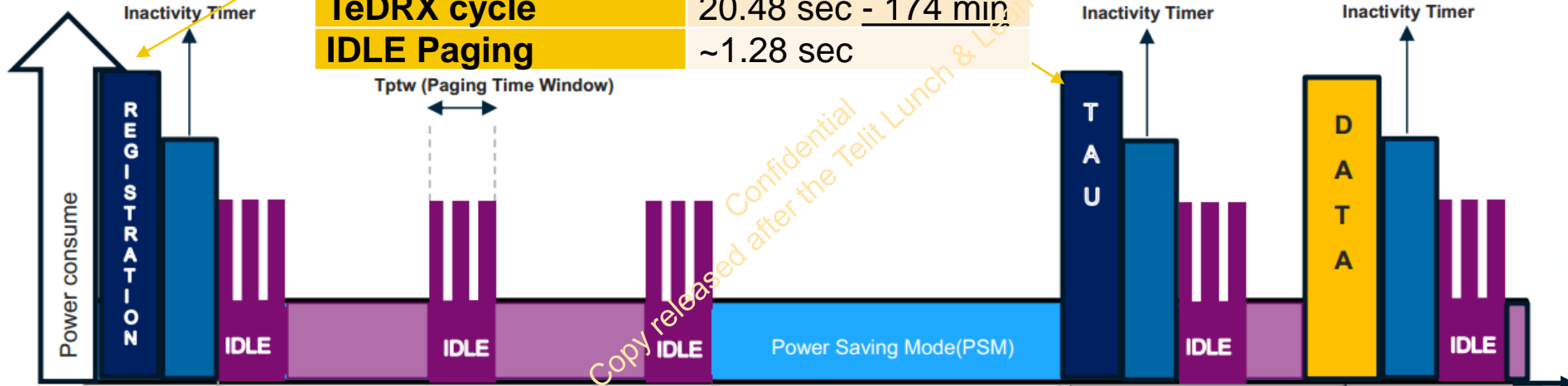


**Device
Cost**

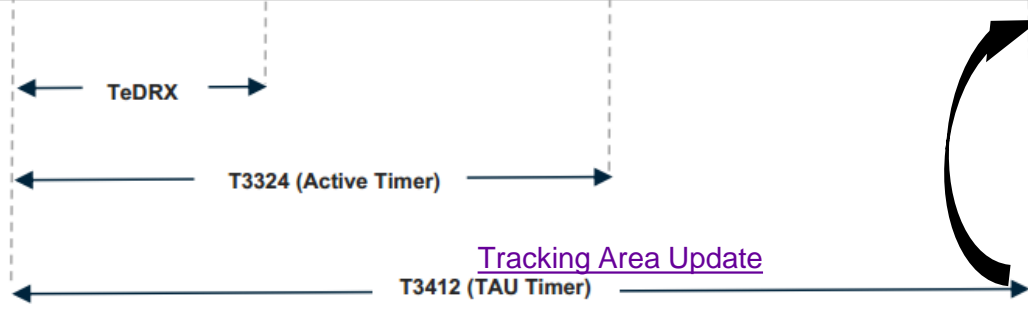
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4G CAT-M/NB-IoT Typical Flow

3GPP Parameters	Range
TAU Timer T3412	10 min - 992 days
Active Timer T3324	upto 186 min
TeDRX cycle	20.48 sec - 174 min
IDLE Paging	~1.28 sec



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PSM Rel13	0.008 mA
eDRX sleep Rel13	0.800 mA
eDRX Paging Rel13	40 mA
Tx DATA CATM	112/190 mA
Tx DATA NBIOT	30/50 mA
Modem Switched off	0.008 mA

Power consumption upon cell technology

	4G (mA) Rel13 3GPP	3G (mA)	2G (mA)
PSM- Power saving	0.008	1.2	2.625
eDRX sleep period	0.800	N/A	N/A
eDRX Paging	38	N/A	N/A
Tx DATA CATM/NB-IOT	151/40	340	259
Module supplied but is switched off	0.008	0.040	0.100

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Timers

Two types of Timers can be requested by the device to the network:

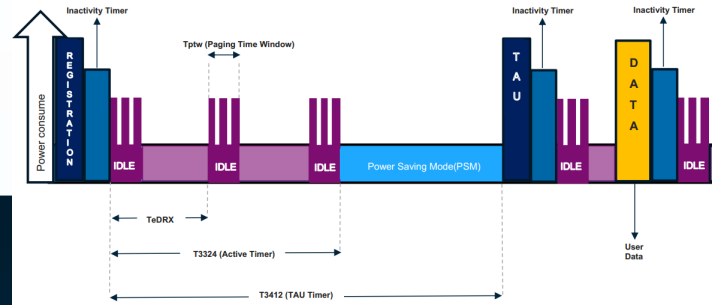
1. T3412 - TAU time

This time defines the interval between two periodic TAUs - Tracking Area Updates

2. T3324 - Active Time

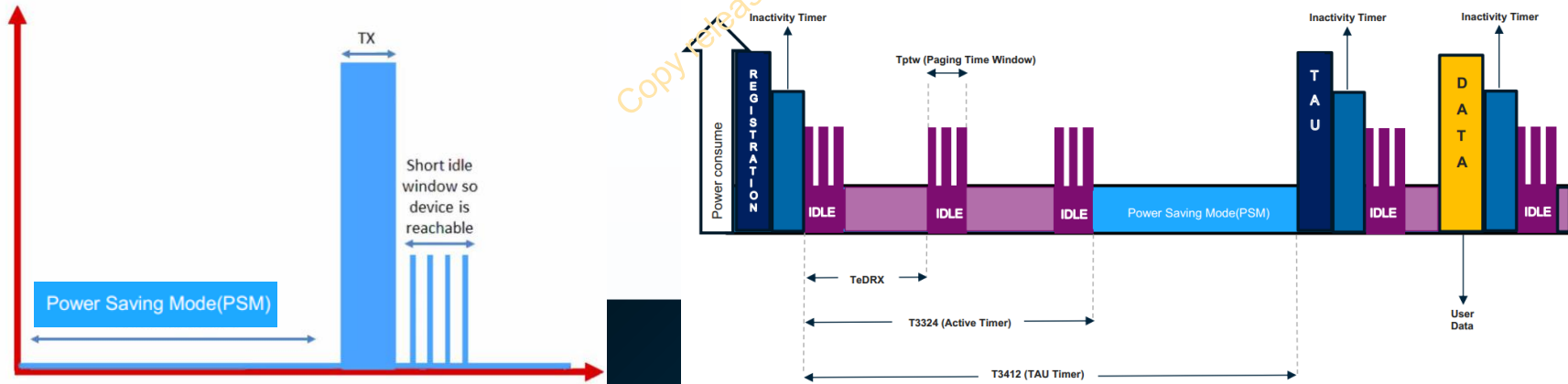
This timer defines the time the IoT device stays in active/idle mode. During this time, the device still performs paging with the network. Once the timer is expired the device will enter PSM mode

The modem can **request** the two timers value, but in the end, the **network makes the decision.**



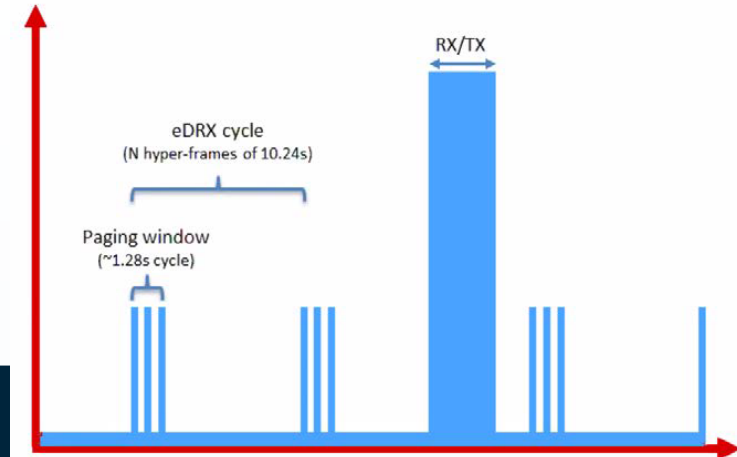
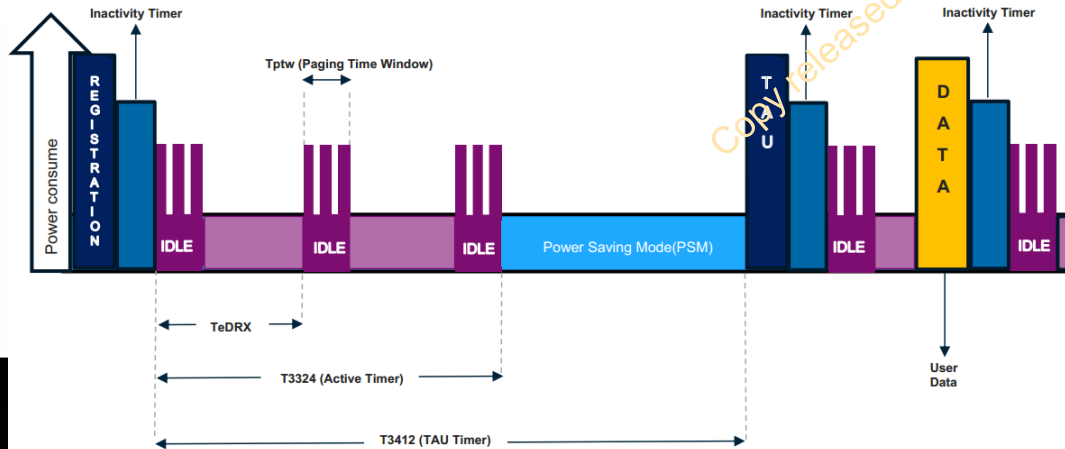
PSM – Power Saving Mode

- Power Saving mode is a feature designed, in **3GPP Rel 12**
- In this state the modem tells the network it is going to go **dormant**
- During the **PSM** time the device **can't receive any incoming message** (Data/SMS) but **its REG on the Network**
- The Module can **leave the PSM** mode at any point in time when there is data to send or when **periodic TAU (Tracking Area Update)** timer expires

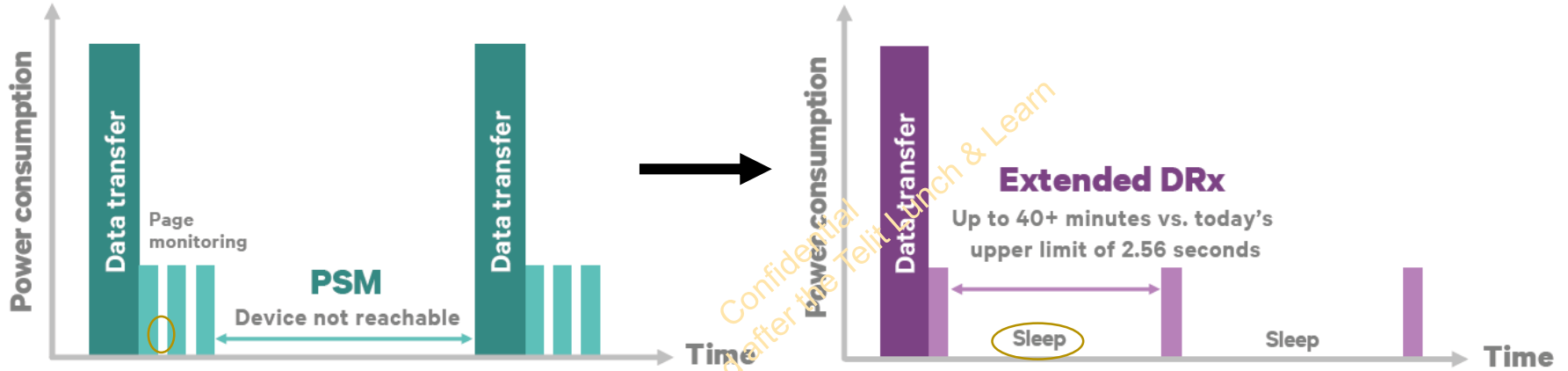


eDRX – Extended Discontinuous Reception

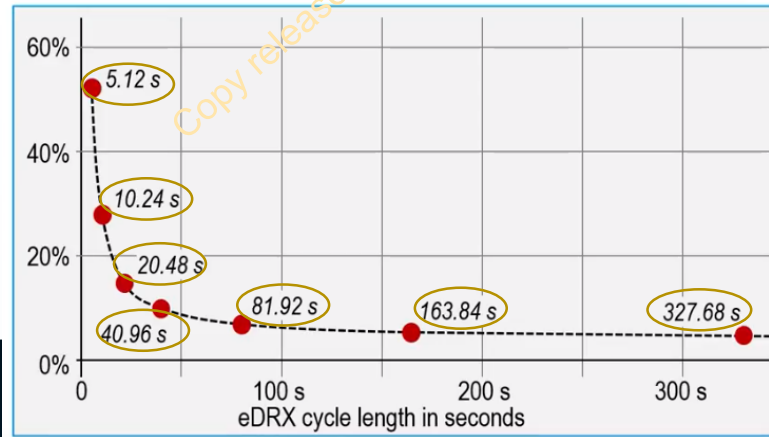
- eDRX is a feature designed, in 3GPP Rel 13, for IoT devices in order to reduce power consumption and increase battery life
- eDRX allows to **increase** the time, in which the IoT device is not listening to the network
- With eDRX **paging** the device **can be reachable** but still keep low power consumption



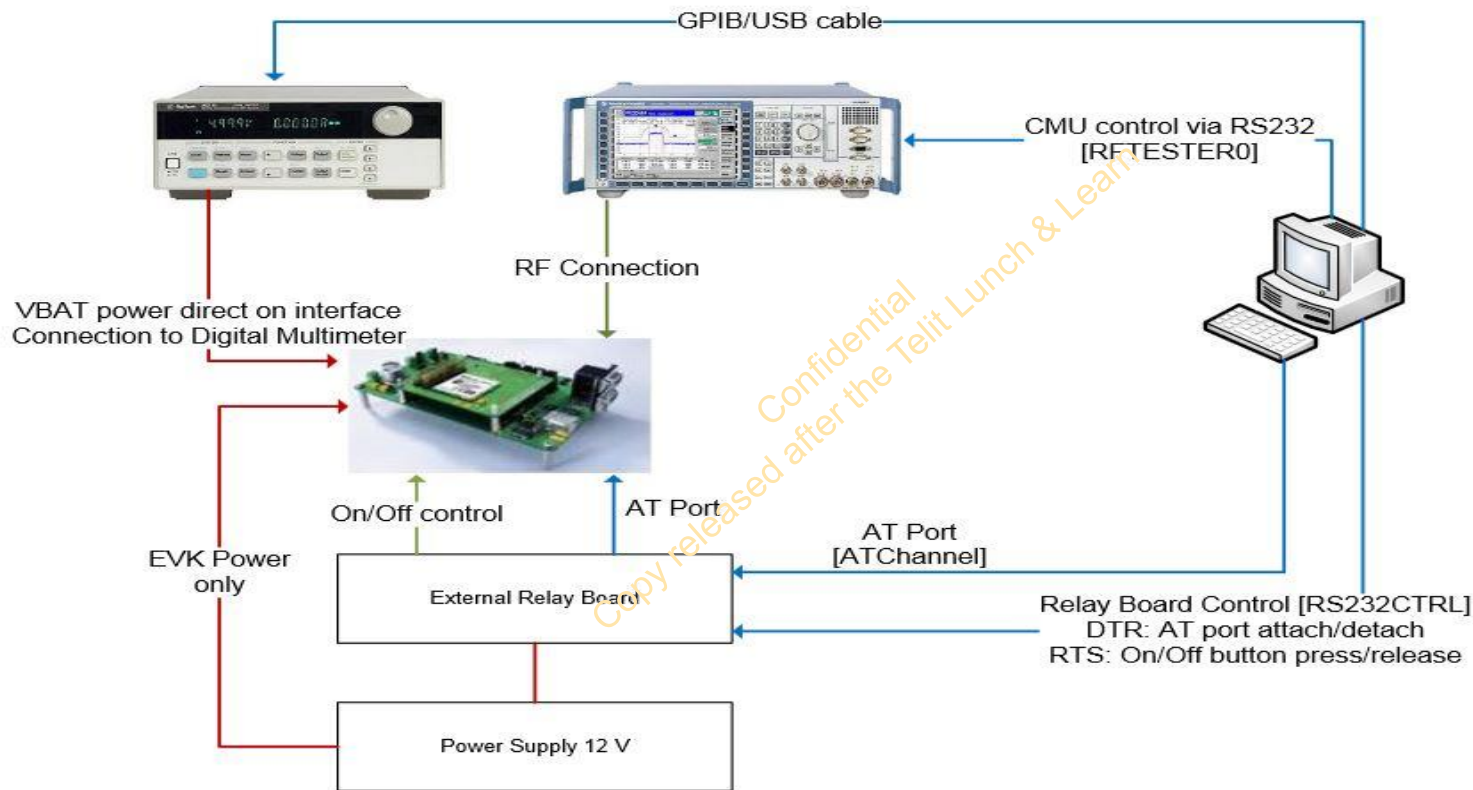
DRX Vs. eDRX



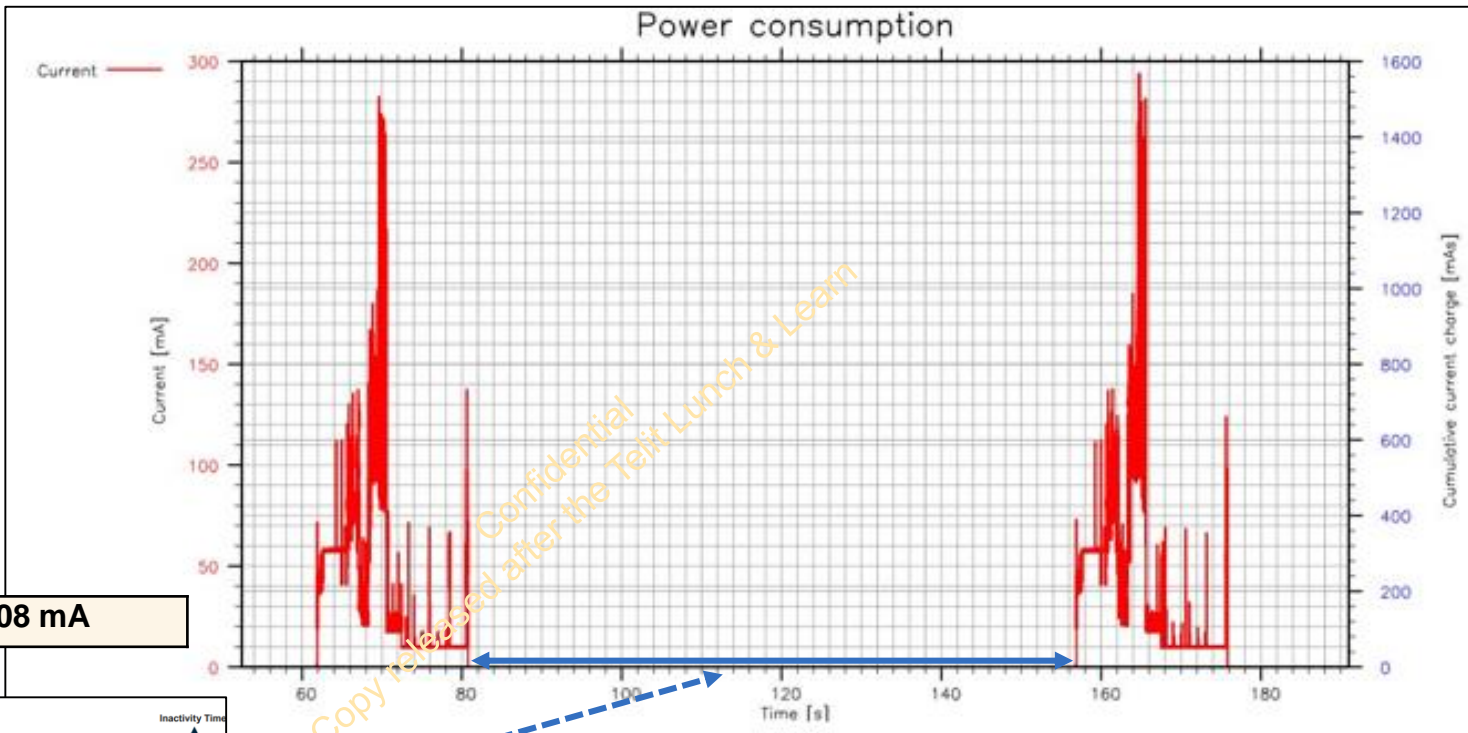
Power Saving Vs. eDRX= 2.56 s



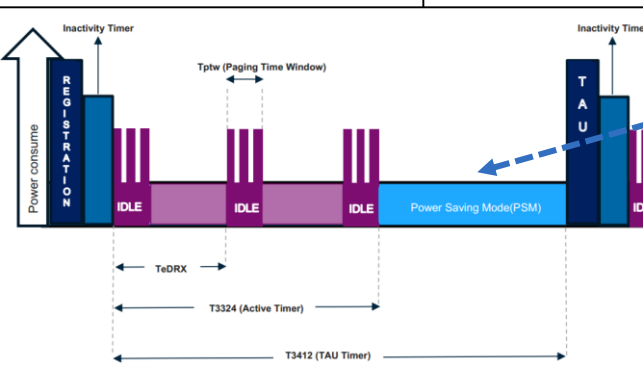
PSM/eDRX Power Measurements with Telit ME910



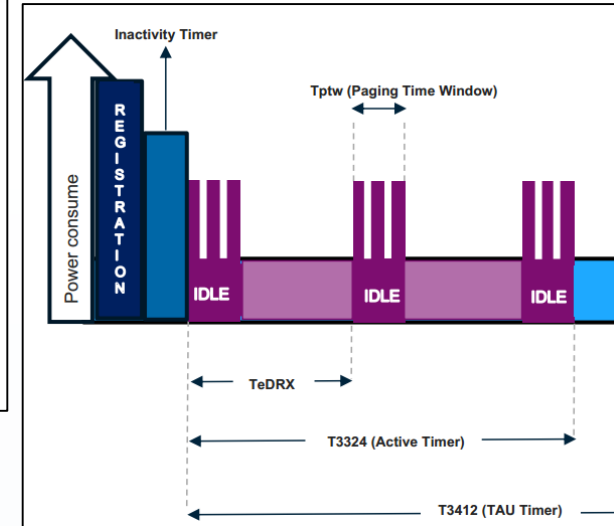
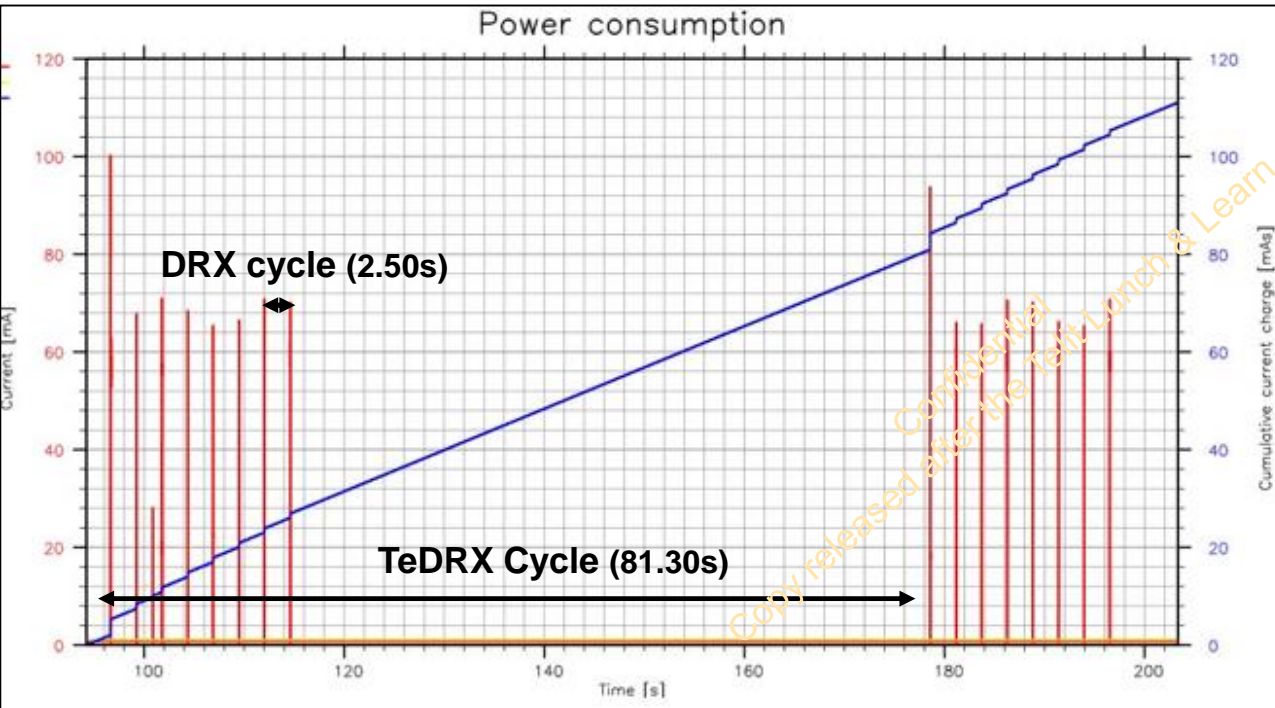
PSM Telit with ME910



PSM Rel13	0.008 mA
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eDRX with Telit ME910





Thank you!

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