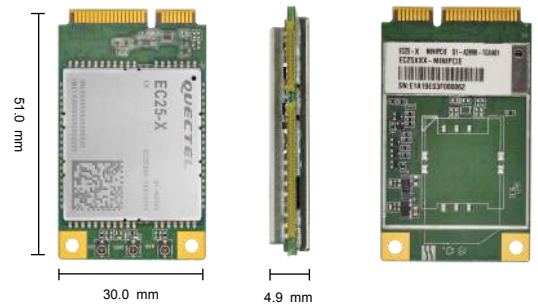


# Quectel

## EC25 Series Mini PCIe

### IoT/M2M-optimized LTE Cat 4 Module



Quectel EC25 Mini PCIe is a series of LTE category 4 module adopting standard PCI Express® Mini Card form factor (Mini PCIe). It is optimized specially for M2M and IoT applications, and delivers 150 Mbps downlink and 50 Mbps uplink data rates.

EC25 series Mini PCIe contains 12 variants: EC25-E Mini PCIe, EC25-EU Mini PCIe, EC25-EUX Mini PCIe, EC25-J Mini PCIe, EC25-A Mini PCIe, EC25-V Mini PCIe, EC25-AF Mini PCIe, EC25-AFX Mini PCIe, EC25-AFXD Mini PCIe (Data-only), EC25-MX Mini PCIe, EC25-AU Mini PCIe and EC25-AUX Mini PCIe. This makes it backward-compatible with existing EDGE and GSM/GPRS networks, ensuring that it can be connected even in remote areas devoid of 4G or 3G coverage.

EC25 series Mini PCIe supports Qualcomm® IZat™ location technology Gen8C Lite (GPS, GLONASS, BeiDou/Compass, Galileo and QZSS). The integrated GNSS greatly simplifies product design, and provides quicker, more accurate and more dependable positioning.

A rich set of Internet protocols, industry-standard interfaces and abundant functionalities (USB serial drivers for Windows 7/8/8.1/10, Linux, Android) extend the applicability of the module to a wide range of M2M applications such as industrial router, industrial PDA, rugged tablet PC, video surveillance and digital signage.



## Key Features

- ✓ LTE category 4 module optimized for broadband IoT applications
- ✓ Worldwide LTE, UMTS/HSPA(+) and GSM/GPRS/EDGE coverage
- ✓ Standard PCI Express® Mini Card form factor (Mini PCIe) ideal for manufacturers to easily integrate wireless connectivity into their devices
- ✓ MIMO technology meets demands for data rate and link reliability in modem wireless communication systems
- ✓ Multi-constellation GNSS receiver available for applications requiring fast and accurate fixes in any environment



LTE Cat 4  
Max. 150 Mbps (DL)  
Max. 50 Mbps (UL)



Max. 42 Mbps (DL)  
Max. 5.76 Mbps (UL)



Mini PCIe  
Package



Embedded Abundant  
Protocols



Multi-constellation  
GNSS



USB 2.0 High Speed  
Interface



Quectel Enhanced  
AT Commands



USB Drivers

# Quectel EC25 Series Mini PCIe

LTE Cat 4	EC25-E Mini PCIe	EC25-EU Mini PCIe	EC25-EUX Mini PCIe	EC25-J Mini PCIe
<b>Region/Operator</b>	EMEA/ South Korea/ Thailand/ India	EMEA/Thailand	EMEA/Thailand	Japan
<b>Dimensions (mm)</b>	30.0 × 51.0 × 4.9	30.0 × 51.0 × 4.9	30.0 × 51.0 × 4.9	30.0 × 51.0 × 4.9
<b>Temperature Range</b>				
<b>Operating Temperature</b>	-35°C to +75°C	-35°C to +75°C	-35°C to +75°C	-35°C to +75°C
<b>Extended Temperature</b>	-40°C to +80°C	-40°C to +80°C	-40°C to +80°C	-40°C to +80°C
<b>Frequency Bands</b>				
<b>LTE-FDD</b>	B1/B3/B5/B7/B8/B20	B1/B3/B7/B8/B20/B28A	B1/B3/B7/B8/B20/B28A	B1/B3/B8/B18/B19/B26
<b>LTE-TDD</b>	B38/B40/B41	B38/B40/B41	B38/B40/B41	B41
<b>WCDMA</b>	B1/B5/B8	B1/B8	B1/B8	B1/B6/B8/B19
<b>GSM/EDGE</b>	B3/B8	B3/B8	B3/B8	/
<b>GNSS</b>	GPS/GLONASS/BeiDou (Compass)/Galileo/QZSS (Optional)	GPS/GLONASS/BeiDou (Compass)/Galileo/QZSS (Optional)	GPS/GLONASS/BeiDou (Compass)/Galileo/QZSS (Optional)	GPS/GLONASS/BeiDou (Compass)/Galileo/QZSS (Optional)
<b>Certifications</b>				
<b>Carrier</b>	<b>Global:</b> Vodafone <b>Europe:</b> Deutsche Telekom/Telefónica <b>South Korea:</b> SKT/KT*/LGU+*	<b>Europe:</b> Deutsche Telekom/ British Telecom	/	<b>Japan:</b> NTT DOCOMO/SoftBank/KDDI
<b>Regulatory</b>	<b>Global:</b> GCF <b>Europe:</b> CE <b>South Korea:</b> KC <b>Taiwan (China):</b> NCC <b>Australia/New Zealand:</b> RCM <b>Thailand:</b> NBTC <b>Russia:</b> FAC <b>South Africa:</b> ICASA	<b>Global:</b> GCF <b>Europe:</b> CE <b>Taiwan (China):</b> NCC <b>Australia/New Zealand:</b> RCM	<b>Global:</b> GCF <b>Europe:</b> CE <b>Taiwan (China):</b> NCC <b>Australia/New Zealand:</b> RCM	<b>Japan:</b> JATE/TELECOM
<b>Others</b>	RoHS/WHQL	RoHS/WHQL	RoHS/WHQL	RoHS/WHQL
<b>Data Transmission</b>				
<b>LTE-FDD Data Rates (Mbps)</b>	150 (DL)/ 50 (UL)	150 (DL)/ 50 (UL)	150 (DL)/ 50 (UL)	150 (DL)/ 50 (UL)
<b>LTE-TDD Data Rates (Mbps)</b>	130 (DL)/ 30 (UL)	130 (DL)/ 30 (UL)	130 (DL)/ 30 (UL)	130 (DL)/ 30 (UL)
<b>DC-HSPA+ Data Rates (Mbps)</b>	42 (DL)/ 5.76 (UL)	42 (DL)/ 5.76 (UL)	42 (DL)/ 5.76 (UL)	42 (DL)/ 5.76 (UL)
<b>WCDMA Data Rates (kbps)</b>	384 (DL)/ 384 (UL)	384 (DL)/ 384 (UL)	384 (DL)/ 384 (UL)	384 (DL)/ 384 (UL)
<b>EDGE Data Rates (kbps)</b>	296 (DL)/ 236.8 (UL)	296 (DL)/ 236.8 (UL)	296 (DL)/ 236.8 (UL)	/
<b>GPRS Data Rates (kbps)</b>	107(DL)/ 85.6 (UL)	107(DL)/ 85.6 (UL)	107(DL)/ 85.6 (UL)	/
<b>Interfaces</b>				
<b>(U)SIM</b>	x 1	x 1	x 1	x 1
<b>USB 2.0</b>	x 1	x 1	x 1	x 1
<b>Audio Digital (PCM)</b>	x 1	x 1	x 1	x 1
<b>I2C</b>	x 1	x 1	x 1	x 1
<b>LED_WWAN#</b>	x 1	x 1	x 1	x 1
<b>W_DISABLE#</b>	x 1	x 1	x 1	x 1
<b>UART</b>	x 1	x 1	x 1	x 1
<b>PERST#</b>	x 1	x 1	x 1	x 1
<b>Voice</b>				
<b>Speech Codec Modes</b>	HR/FR/EFR/AMR/AMR-WB	HR/FR/EFR/AMR/AMR-WB	HR/FR/EFR/AMR/AMR-WB	HR/FR/EFR/AMR/AMR-WB
<b>Echo Arithmetic</b>	Echo Cancellation/Noise Suppression	Echo Cancellation/Noise Suppression	Echo Cancellation/Noise Suppression	Echo Cancellation/Noise Suppression
<b>VoLTE</b>	Digital Audio and VoLTE (Voice over LTE)	Digital Audio and VoLTE (Voice over LTE)	Digital Audio and VoLTE (Voice over LTE)	Digital Audio and VoLTE (Voice over LTE)
<b>Enhanced Features</b>				
<b>DTMF</b>	●	●	●	●
<b>DFOTA</b>	●	●	●	●
<b>QMI/ RmNet</b>	●	●	●	●
<b>Audio Playback*/Audio Recording*</b>	Optional	Optional	Optional	Optional
<b>QuecLocator®</b>	●	●	●	●
<b>QuecFile®</b>	●	●	●	●
<b>(U)SIM Card Detection</b>	●	●	●	●
<b>Drivers</b>				
<b>USB Serial Driver</b>	Windows 7/8/8.1/10, Linux 2.6–5.4, Android 4.x–9.x	Windows 7/8/8.1/10, Linux 2.6–5.4, Android 4.x–9.x	Windows 7/8/8.1/10, Linux 2.6–5.4, Android 4.x–9.x	Windows 7/8/8.1/10, Linux 2.6–5.4, Android 4.x–9.x
<b>GNSS Driver</b>	Android 4.x–9.x	Android 4.x–9.x	Android 4.x–9.x	Android 4.x–9.x
<b>RIL Driver</b>	Android 4.x–10.x	Android 4.x–10.x	Android 4.x–10.x	Android 4.x–10.x
<b>NDIS</b>	Windows 7/ 8/ 8.1/ 10	Windows 7/ 8/ 8.1/ 10	Windows 7/ 8/ 8.1/ 10	Windows 7/ 8/ 8.1/ 10
<b>MBIM</b>	Windows 8/8.1/10, Linux 3.18–5.4	Windows 8/8.1/10, Linux 3.18–5.4	/	Windows 8/8.1/10, Linux 3.18–5.4
<b>GobiNet Driver</b>	Linux 2.6–5.4	Linux 2.6–5.4	Linux 2.6–5.4	Linux 2.6–5.4
<b>QMI_WWAN Driver</b>	Linux 3.4–5.4	Linux 3.4–5.4	Linux 3.4–5.4	Linux 3.4–5.4
<b>Electrical Features</b>				
<b>Supply Voltage Range</b>	3.0–3.6 V, 3.3 V Typ.	3.0–3.6 V, 3.3 V Typ.	3.0–3.6 V, 3.3 V Typ.	3.0–3.6 V, 3.3 V Typ.
<b>Power Consumption</b>	3.9 mA @ Sleep, Typ. 30 mA @ Idle	3.4 mA @ Sleep, Typ. 23.3 mA @ Idle	1.69 mA @ Sleep, Typ. 18.51 mA @ Idle	3.2 mA @ Sleep, Typ. 31.5 mA @ Idle

**Notes:**  
1. \* means under development.  
2. ● means supported.

# Quectel EC25 Series Mini PCIe

LTE Cat 4	EC25-A Mini PCIe	EC25-V Mini PCIe	EC25-AF Mini PCIe	EC25-AFX Mini PCIe	EC25-AFXD Mini PCIe (Data-only)
<b>Region/Operator</b>	North America	America Verizon	North America	North America	North America
<b>Dimensions (mm)</b>	30.0 × 51.0 × 4.9	30.0 × 51.0 × 4.9	30.0 × 51.0 × 4.9	30.0 × 51.0 × 4.9	30.0 × 51.0 × 4.9
<b>Temperature Range</b>					
<b>Operating Temperature</b>	-35°C to +75°C	-35°C to +75°C	-35°C to +75°C	-35°C to +75°C	-35°C to +75°C
<b>Extended Temperature</b>	-40°C to +80°C	-40°C to +80°C	-40°C to +80°C	-40°C to +80°C	-40°C to +80°C
<b>Frequency Bands</b>					
<b>LTE-FDD</b>	B2/B4/B12	B4/B13	B2/B4/B5/B12/B13/B14/B66/	B2/B4/B5/B12/B13/B14/B66/B71	B2/B4/B5/B12/B13/B14/B66/B71
<b>LTE-TDD</b>	/	/	/	/	/
<b>WCDMA</b>	B2/B4/B5	/	B2/B4/B5	B2/B4/B5	B2/B4/B5
<b>GSM/EDGE</b>	/	/	/	/	/
<b>GNSS</b>	GPS/GLONASS/BeiDou (Compass)/Galileo/QZSS (Optional)	GPS/GLONASS/BeiDou (Compass)/Galileo/QZSS (Optional)	GPS/GLONASS/BeiDou (Compass)/Galileo/QZSS (Optional)	GPS/GLONASS/BeiDou (Compass)/Galileo/QZSS (Optional)	GPS/GLONASS/BeiDou (Compass)/Galileo/QZSS (Optional)
<b>Certifications</b>					
<b>Carrier</b>	America: AT&T/T-Mobile Canada: Rogers/Telus	America: Verizon	America: Verizon/ AT&T (FirstNet)/T-Mobile Canada: Rogers/Telus	America: Verizon/ AT&T (FirstNet)*	America: Verizon* / AT&T (FirstNet)*/T-Mobile*
<b>Regulatory</b>	America: FCC North America: PTCRB Canada: IC	Global: GCF America: FCC	Global: GCF America: FCC North America: PTCRB Canada: IC	Global: GCF America: FCC North America: PTCRB Canada: IC	Global: GCF America: FCC North America: PTCRB
<b>Others</b>	RoHS/WHQL	RoHS/WHQL	RoHS/WHQL	RoHS/WHQL	RoHS/WHQL
<b>Data Transmission</b>					
<b>LTE-FDD Data Rates (Mbps)</b>	150 (DL)/ 50 (UL)	150 (DL)/ 50 (UL)	150 (DL)/ 50 (UL)	150 (DL)/ 50 (UL)	150 (DL)/ 50 (UL)
<b>LTE-TDD Data Rates (Mbps)</b>	/	/	/	/	/
<b>DC-HSPA+ Data Rates (Mbps)</b>	42 (DL)/ 5.76 (UL)	/	42 (DL)/ 5.76 (UL)	42 (DL)/ 5.76 (UL)	42 (DL)/ 5.76 (UL)
<b>WCDMA Data Rates (kbps)</b>	384 (DL)/ 384 (UL)	/	384 (DL)/ 384 (UL)	384 (DL)/ 384 (UL)	384 (DL)/ 384 (UL)
<b>EDGE Data Rates (kbps)</b>	/	/	/	/	/
<b>GPRS Data Rates (kbps)</b>	/	/	/	/	/
<b>Interfaces</b>					
<b>(U)SIM</b>	x 1	x 1	x 1	x 1	x 1
<b>USB 2.0</b>	x 1	x 1	x 1	x 1	x 1
<b>Audio Digital (PCM)</b>	x 1	x 1	x 1	x 1	x 1
<b>I2C</b>	x 1	x 1	x 1	x 1	x 1
<b>LED_WWAN#</b>	x 1	x 1	x 1	x 1	x 1
<b>W_DISABLE#</b>	x 1	x 1	x 1	x 1	x 1
<b>UART</b>	x 1	x 1	x 1	x 1	x 1
<b>PERST#</b>	x 1	x 1	x 1	x 1	x 1
<b>Voice</b>					
<b>Speech Codec Modes</b>	HR/FR/EFR/AMR/AMR-WB	HR/FR/EFR/AMR/AMR-WB	HR/FR/EFR/AMR/AMR-WB	HR/FR/EFR/AMR/AMR-WB	/
<b>Echo Arithmetic</b>	Echo Cancellation/ Noise Suppression	Echo Cancellation/ Noise Suppression	Echo Cancellation/ Noise Suppression	Echo Cancellation/ Noise Suppression	/
<b>VoLTE</b>	Digital Audio and VoLTE (Voice over LTE) (Optional)	Digital Audio and VoLTE (Voice over LTE) (Optional)	Digital Audio and VoLTE (Voice over LTE) (Optional)	Digital Audio and VoLTE (Voice over LTE) (Optional)	/
<b>Enhanced Features</b>					
<b>DTMF</b>	●	●	●	●	/
<b>DFOTA</b>	●	●	●	●	●
<b>QMI/ RmNet</b>	●	●	●	●	●
<b>Audio Playback*/ Audio Recording*</b>	Optional	Optional	Optional	Optional	Optional
<b>QuecLocator®</b>	*	●	●	●	●
<b>QuecFile®</b>	●	●	●	●	●
<b>(U)SIM Card Detection</b>	●	●	●	●	●
<b>Drivers</b>					
<b>USB Serial Driver</b>	Windows 7/8/8.1/10, Linux 2.6–5.4, Android 4.x–9.x	Windows 7/8/8.1/10, Linux 2.6–5.4, Android 4.x–9.x	Windows 7/8/8.1/10, Linux 2.6–5.4, Android 4.x–9.x	Windows 7/8/8.1/10, Linux 2.6–5.4, Android 4.x–9.x	Windows 7/8/8.1/10, Linux 2.6–5.4, Android 4.x–9.x
<b>GNSS Driver</b>	Android 4.x–9.x	Android 4.x–9.x	Android 4.x–9.x	Android 4.x–9.x	Android 4.x–9.x
<b>RIL Driver</b>	Android 4.x–10.x	Android 4.x–10.x	Android 4.x–10.x	Android 4.x–10.x	Android 4.x–10.x
<b>NDIS</b>	Windows 7/ 8/ 8.1/ 10	Windows 7/ 8/ 8.1/ 10	Windows 7/ 8/ 8.1/ 10	Windows 7/ 8/ 8.1/ 10	Windows 7/ 8/ 8.1/ 10
<b>MBIM</b>	Windows 8/8.1/10, Linux 3.18–5.4	Windows 8/8.1/10, Linux 3.18–5.4	Windows 8/8.1/10, Linux 3.18–5.4	/	/
<b>GobiNet Driver</b>	Linux 2.6–5.4	Linux 2.6–5.4	Linux 2.6–5.4	Linux 2.6–5.4	Linux 2.6–5.4
<b>QMI_WWAN Driver</b>	Linux 3.4–5.4	Linux 3.4–5.4	Linux 3.4–5.4	Linux 3.4–5.4	Linux 3.4–5.4
<b>Electrical Features</b>					
<b>Supply Voltage Range</b>	3.0–3.6 V, 3.3 V Typ.	3.0–3.6 V, 3.3 V Typ.	3.0–3.6 V, 3.3 V Typ.	3.0–3.6 V, 3.3 V Typ.	3.0–3.6 V, 3.3 V Typ.
<b>Power Consumption</b>	3.6 mA @ Sleep, Typ. 27 mA @ Idle	3.4 mA @ Sleep, Typ. 30 mA @ Idle	2.2 mA @ Sleep, Typ. 21.7 mA @ Idle	1.67 mA @ Sleep, Typ. 22 mA @ Idle	1.67 mA @ Sleep, Typ. 22 mA @ Idle

# Quectel EC25 Series Mini PCIe

LTE Cat 4	EC25-MX Mini PCIe	EC25-AU Mini PCIe	EC25-AUX Mini PCIe
<b>Region/Operator</b>	Mexico	Latin America/Australia/New Zealand	Latin America/Australia/New Zealand
<b>Dimensions (mm)</b>	30.0 × 51.0 × 4.9	30.0 × 51.0 × 4.9	30.0 × 51.0 × 4.9
<b>Temperature Range</b>			
<b>Operating Temperature</b>	-35°C to +75°C	-35°C to +75°C	-35°C to +75°C
<b>Extended Temperature</b>	-40°C to +80°C	-40°C to +80°C	-40°C to +80°C
<b>Frequency Bands</b>			
<b>LTE-FDD</b>	B2/B4/B5/B7/B28/B66	B1/B2 <sup>①</sup> /B3/B4/B5/B7/B8/B28	B1/B2 <sup>①</sup> /B3/B4/B5/B7/B8/B28
<b>LTE-TDD</b>	/	B40	B40
<b>WCDMA</b>	B2/B4/B5	B1/B2/B5/B8	B1/B2/B4/B5/B8
<b>GSM/EDGE</b>	/	B2/B3/B5/B8	B2/B3/B5/B8
<b>GNSS</b>	/	GPS/GLONASS/BeiDou (Compass)/Galileo/QZSS (Optional)	GPS/GLONASS/BeiDou (Compass)/Galileo/QZSS (Optional)
<b>Certifications</b>			
<b>Carrier</b>	/	<b>Australia:</b> Telstra	/
<b>Regulatory</b>	<b>America:</b> FCC <b>North America:</b> PTCRB <b>Mexico:</b> IFETEL	<b>Global:</b> GCF <b>America:</b> FCC <b>Taiwan (China):</b> NCC <b>Brazil:</b> Anatel <b>Australia/New Zealand:</b> RCM	<b>Europe:</b> CE <b>America:</b> FCC <b>Taiwan (China):</b> NCC <b>Brazil:</b> Anatel <b>Australia/New Zealand:</b> RCM
<b>Others</b>	RoHS/WHQL	RoHS/WHQL	RoHS/WHQL
<b>Data Transmission</b>			
<b>LTE-FDD Data Rates (Mbps)</b>	150 (DL)/ 50 (UL)	150 (DL)/ 50 (UL)	150 (DL)/ 50 (UL)
<b>LTE-TDD Data Rates (Mbps)</b>	/	130 (DL)/ 30 (UL)	130 (DL)/ 30 (UL)
<b>DC-HSPA+ Data Rates (Mbps)</b>	42 (DL)/ 5.76 (UL)	42 (DL)/ 5.76 (UL)	42 (DL)/ 5.76 (UL)
<b>WCDMA Data Rates (kbps)</b>	384 (DL)/ 384 (UL)	384 (DL)/ 384 (UL)	384 (DL)/ 384 (UL)
<b>EDGE Data Rates (kbps)</b>	/	296 (DL)/ 236.8 (UL)	296 (DL)/ 236.8 (UL)
<b>GPRS Data Rates (kbps)</b>	/	107 (DL)/ 85.6 (UL)	107 (DL)/ 85.6 (UL)
<b>Interfaces</b>			
<b>(U)SIM</b>	x 1	x 1	x 1
<b>USB 2.0</b>	x 1	x 1	x 1
<b>Audio Digital (PCM)</b>	x 1	x 1	x 1
<b>I2C</b>	x 1	x 1	x 1
<b>LED_WWAN#</b>	x 1	x 1	x 1
<b>W_DISABLE#</b>	x 1	x 1	x 1
<b>UART</b>	x 1	x 1	x 1
<b>PERST#</b>	x 1	x 1	x 1
<b>Voice</b>			
<b>Speech Codec Modes</b>	HR/FR/EFR/AMR/AMR-WB	HR/FR/EFR/AMR/AMR-WB	HR/FR/EFR/AMR/AMR-WB
<b>Echo Arithmetic</b>	Echo Cancellation/Noise Suppression	Echo Cancellation/Noise Suppression	Echo Cancellation/Noise Suppression
<b>VoLTE</b>	Digital Audio and VoLTE (Voice over LTE)	Digital Audio and VoLTE (Voice over LTE) (Optional)	Digital Audio and VoLTE (Voice over LTE) (Optional)
<b>Enhanced Features</b>			
<b>DTMF</b>	●	●	●
<b>DFOTA</b>	●	●	●
<b>QMI/ RmNet</b>	●	●	●
<b>Audio Playback*/Audio Recording*</b>	Optional	Optional	Optional
<b>QuecLocator<sup>®</sup></b>	●	●	●
<b>QuecFile</b>	●	●	●
<b>(U)SIM Card Detection</b>	●	●	●
<b>Drivers</b>			
<b>USB Serial Driver</b>	Windows 7/8/8.1/10, Linux 2.6–5.4, Android 4.x–9.x	Windows 7/8/8.1/10, Linux 2.6–5.4, Android 4.x–9.x	Windows 7/8/8.1/10, Linux 2.6–5.4, Android 4.x–9.x
<b>GNSS Driver</b>	/	Android 4.x–9.x	Android 4.x–9.x
<b>RIL Driver</b>	Android 4.x–10.x	Android 4.x–10.x	Android 4.x–10.x
<b>NDIS</b>	Windows 7/ 8/ 8.1/ 10	Windows 7/ 8/ 8.1/ 10	Windows 7/ 8/ 8.1/ 10
<b>MBIM</b>	/	Windows 8/8.1/10, Linux 3.18–5.4	/
<b>GobiNet Driver</b>	Linux 2.6–5.4	Linux 2.6–5.4	Linux 2.6–5.4
<b>QMI_WWAN Driver</b>	Linux 3.4–5.4	Linux 3.4–5.4	Linux 3.4–5.4
<b>Electrical Features</b>			
<b>Supply Voltage Range</b>	3.0–3.6 V, 3.3 V Typ.	3.0–3.6 V, 3.3 V Typ.	3.0–3.6 V, 3.3 V Typ.
<b>Power Consumption</b>	1.55 mA @ Sleep, Typ. 20 mA @ Idle	2.6 mA @ Sleep, Typ. 22 mA @ Idle	1.9 mA @ Sleep, Typ. 23.4 mA @ Idle

#### Notes:

- ① LTE-FDD B2 of EC25-AU Mini PCIe and EC25-AUX Mini PCIe does not support Rx-diversity.
- \* means under development.
- means supported.