

LTE (FDD) Transmitter Characteristics

Parameter	Base Station			Mobile/Portable Station		
	Limit ^{vii} (dBm)	Meas BW ^{viii}	ΔF (MHz)	Limit ^{ix} (dBm)	Meas BW	ΔF (MHz)
Emission Bandwidth (MHz)	1.4, 3, 5, 10, 15 and 20 MHz ⁱ With signal bandwidths of 1.08, 2.7, 4.5, 9, 13.5 and 18 MHz			1.4, 3, 5, 10, 15 and 20 MHz ⁱⁱ With signal bandwidths of 1.08, 2.7, 4.5, 9, 13.5 and 18 MHz ⁱⁱⁱ		
Power (EIRP) (dBm)/antenna	61 (up to 5 MHz channel) 64 (> 10 MHz channel) (power control range of 20 dB) ^{iv}			23 ^v (power control range of 63 dB) ^{vi}		
Emission Spectrum [Emission limit (dBm) as a Function of Frequency Offset of measurement filter center frequency (ΔF) from channel edge (MHz)]	<u>5 MHz Channel (BS)</u>			<u>5 MHz Channel (UE)</u>		
	-15	30 kHz	$0 \leq \Delta F < 1$	-15	30 kHz	$\pm 0-1$
	-13	<u>1 MHz</u>	$1 \leq \Delta F$	-13	1 MHz	$\pm 1-2.5$
				-13	1 MHz	$\pm 2.5-2.8$
				-13	1 MHz	$\pm 2.8-5$
				-13	1 MHz	$\pm 5-6$
				-25	1 MHz	$\pm 6-10$
				-30	1 MHz	\pm above 10
	<u>10 MHz Channel (BS)</u>			<u>10 MHz Channel (UE)</u>		
	-13	100 kHz	$0 \leq \Delta F < 1$	-18	30 kHz	$\pm 0-1$
	-13	<u>1 MHz</u>	$1 \leq \Delta F$	-13	1 MHz	$\pm 1-2.5$
				-13	1 MHz	$\pm 2.5-2.8$
				-13	1 MHz	$\pm 2.8-5$
				-13	1 MHz	$\pm 5-6$
				-13	1 MHz	$\pm 6-10$
				-25	1 MHz	$\pm 10-15$
				-30	1 MHz	\pm above 15
	<u>15 MHz Channel (BS)</u>			<u>15 MHz Channel (UE)</u>		
	-15	100 kHz	$0 \leq \Delta F < 1$	-20	30 kHz	$\pm 0-1$
	-13	<u>1 MHz</u>	$1 \leq \Delta F$	-13	1 MHz	$\pm 1-2.5$
				-13	1 MHz	$\pm 2.5-2.8$
				-13	1 MHz	$\pm 2.8-5$
				-13	1 MHz	$\pm 5-6$
				-13	1 MHz	$\pm 6-10$
				-13	1 MHz	$\pm 10-15$
				-25	1 MHz	$\pm 15-20$
				-30	1 MHz	\pm above 20
	<u>20 MHz Channel (BS)</u>			<u>20 MHz Channel (UE)</u>		
	-16	100 kHz	$0 \leq \Delta F < 1$	-21	30 kHz	$\pm 0-1$
	-13	<u>1 MHz</u>	$1 \leq \Delta F$	-13	1 MHz	$\pm 1-2.5$
				-13	1 MHz	$\pm 2.5-2.8$
				-13	1 MHz	$\pm 2.8-5$
				-13	1 MHz	$\pm 5-6$
				-13	1 MHz	$\pm 6-10$
				-13	1 MHz	$\pm 10-15$
				-13	1 MHz	$\pm 15-20$
				-25	1 MHz	$\pm 20-25$
				-30	1 MHz	\pm above 25
Antenna Gain (Mainbeam) (dBi)	18			0		

Azimuth Off-Axis Antenna Pattern (dBi as a function of off-axis angle in degrees)	Modified ITU-R Recommendation F.1336-2	Omni-directional
Elevation Off-Axis Antenna Pattern (dBi as a function of off-axis angle in degrees)	ITU-R Recommendation F.1336-2	Omni-directional
Antenna Height (meters) ¹	30 (Urban/Suburban) 15 to 60 (Rural)	1.5 to 10
Antenna Polarization	Linear	Linear
Antenna Azimuth 3 dB Beamwidth (degrees) ³	70	360
Antenna Down Tilt Angle (degrees)	3	0
Cable, Insertion, or Other Losses (dB)	2	0

Note 1: For single entry analysis, the maximum antenna height of 60 meters for base stations and 1.5 meters for mobile/portable stations will be used. For aggregate analysis antenna heights will be varied between the minimum and maximum values shown in the table.

Note 3: A base station typically has three sectors each 120 degrees wide.

LTE (FDD) Receiver Characteristics

Parameter	Base Station		Mobile/Portable Station	
Receiver Channel Bandwidth (MHz)	1.4, 3, 5, 10, 15 and 20 With signal bandwidths of 1.08, 2.7, 4.5, 9, 13.5 and 18 MHz		1.4, 3, 5, 10, 15 and 20 With signal bandwidths of 1.08, 2.7, 4.5, 9, 13.5 and 18 MHz	
Adjacent Channel Selectivity (ACS)	Channel BW Wide Area BS	Wide Area BS Wanted Signal Mean Power (dBm)	Channel BW	ACS (dB)
	1.4 MHz	-95.8 ($P_{\text{REFSENS}} + 11\text{dB}$)	1.4 MHz	33
	3 MHz	-95.0 ($P_{\text{REFSENS}} + 8\text{dB}$)	3 MHz	33
	5 MHz	-95.5 ($P_{\text{REFSENS}} + 6\text{dB}$)	5 MHz	33
	10 MHz	-95.5 ($P_{\text{REFSENS}} + 6\text{dB}$)	10 MHz	33
	15 MHz	-95.5 ($P_{\text{REFSENS}} + 6\text{dB}$)	15 MHz	30
	20 MHz	-95.5 ($P_{\text{REFSENS}} + 6\text{dB}$)	20 MHz	27
	Reference TS 36.104 Table 7.5.1-3	Interfering signal mean power: -52 dBm ^x	Reference TS 36.101 Table 7.5.1-1	
	Channel BW Local Area BS	Local Area BS Wanted Signal Mean Power (dBm)		
	1.4 MHz	-87.8 ($P_{\text{REFSENS}} + 11\text{dB}$)		
	3 MHz	-87.0 ($P_{\text{REFSENS}} + 8\text{dB}$)		
	5 MHz	-87.5 ($P_{\text{REFSENS}} + 6\text{dB}$)		
	10 MHz	-87.5 ($P_{\text{REFSENS}} + 6\text{dB}$)		
	15 MHz	-87.5 ($P_{\text{REFSENS}} + 6\text{dB}$)		
	20 MHz	-87.5 ($P_{\text{REFSENS}} + 6\text{dB}$)		
	Reference TS 36.104 Table 7.5.1-4	Interfering signal mean power: -44 dBm ^{xi}		
Noise Figure (dB)	5		9	
Reference Sensitivity (dBm) P_{REFSENS} for Wide Area BS ^{xii}	1.4 MHz	-106.8	1.4 MHz	-101.7
	3 MHz	-103.0	3 MHz	-98.7
	5 MHz	-101.5	5 MHz	-92.2
	10 MHz	-101.5	10 MHz	-91
	15 MHz	-101.5	15 MHz	
	20 MHz	-101.5	20 MHz	
Reference Sensitivity (dBm) P_{REFSENS} for Local Area BS	1.4 MHz	-98.8		
	3 MHz	-95.0		
	5 MHz	-93.5		
	10 MHz	-93.5		
	15 MHz	-93.5		
	20 MHz	-93.5		

Parameter	Base Station	Mobile/Portable Station
Antenna Gain (Mainbeam) (dBi)	18	0
Azimuth Off-Axis Antenna Pattern (dBi as a function of off-axis angle in degrees)	Modified ITU-R Recommendation F.1336-2	Omni-directional
Elevation Off-Axis Antenna Pattern (dBi as a function of off-axis angle in degrees)	ITU-R Recommendation F.1336-2	Omni-directional
Antenna Polarization	Linear	Linear
Antenna Height (meters) ¹	30 (Urban/Suburban) 15 to 60(Rural)	1.5 to 10
Antenna Azimuth 3 dB Beamwidth (degrees) ²	70	360
Antenna Down Tilt Angle (degrees)	3	0
Cable, Insertion, or Other Losses (dB)	2	0
<p>Note 1: For single entry analysis the maximum antenna height of 60 meters for base stations and 1.5 meters for mobile/portable stations will be used. For aggregate analysis antenna heights will be varied between the minimum and maximum values shown in the table.</p> <p>Note 2: A base station typically has three sectors each 120 degrees wide.</p>		

- ⁱ See 3GPP TS 36.104, §5.6.
- ⁱⁱ See 3GPP TS 36.101, §5.6.
- ⁱⁱⁱ See 3GPP TS 36.101, §6.6.2.3.2 at Table 6.6.2.3.2-1 for E-UTRA channel Measurement bandwidth.
- ^{iv} See 3GPP TS 36.104, §6.3.2.1, 20 dB is for a 20 MHz channel bandwidth, dynamic power range will be reduced as channel bandwidth is decreased.
- ^v See 3GPP TS 36.101, §6.2.2.
- ^{vi} See 3GPP TS 36.101, §6.3.2 for minimum transmit power of -40 dBm, with maximum transmit power of 23 dBm the power control range is 63 dB.
- ^{vii} Values are only valid if the operating frequency is above 1 GHz. See 3GPP TS 36.104, §6.6.3.2.1 for band class 4, Table 6.6.3.2.1-6 and 6.6.3.3-2.
- ^{viii} See 3GPP TS 36.104 Tables 6.6.3.2.1-6 and 6.6.3.3-2 for frequency offset of measurement filter center frequency.
- ^{ix} See 3GPP TS 36.101. For 5 MHz channel at frequencies above 10 MHz offset the spurious emission levels apply from §6.6.4.1.2, for 10 MHz channels at frequencies above 15 MHz the spurious emission levels apply from §6.6.4.1.2.
- ^x This interfering signal mean power is for a wanted signal mean power at $P_{REFSENS} + x\text{dB}$ (where $x=6\text{dB}$ for 3-20MHz channels and 11dB for 1.4MHz channel). One way to interpret this spec is that this is the maximum interference level for $x\text{dB}$ desense criterion. For instance, if 1dB desense is used in the coexistence studies, a conversion can be done to adjust for the lower desense criterion. For example, if adjacent channel selectivity is specified as -52dBm and wanted signal mean power is $P_{REFSENS} + 6\text{dB}$, the level can be adjusted by 11dB for the smaller sensitivity degradation allowed giving -52-11= -63dBm:
- 6 dB desense: maximum interference = Noise floor + 4.74 dB
 - 1 dB desense: maximum interference = Noise floor - 5.87 dB

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- xi Same as in endnote x, interfering signal mean power can be adjusted for 1dB desense if this criterion is used in the coexistence studies. For example, in the case of wanted signal mean power at $P_{\text{REFSENS}} + 6\text{dB}$, the level can be adjusted by 11dB for the smaller sensitivity degradation allowed giving $-44-11=-55\text{dBm}$.
- xii See 3GPP TS 36.104, §7.2. P_{REFSENS} is the power level of a single instance of the reference measurement channel. This requirement shall be met for each consecutive application of a single instance of FRC A1-3 mapped to disjoint frequency ranges with a width of 25 resource blocks each.