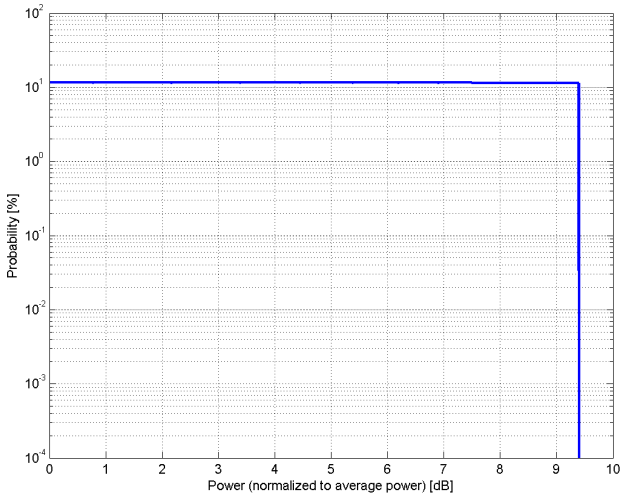
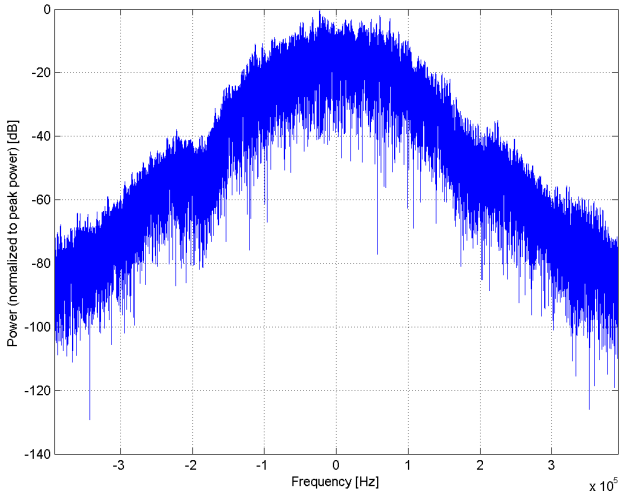
**Calibration Laboratory of**
Schmid & Partner
Engineering AG
**Zeughausstrasse 43, 8004 Zurich, Switzerland**

| | |
|---|---|
| Name: | **GSM-FDD (TDMA, GMSK)** |
| Group: | GSM |
| UID: | 10021-DAC |
| PAR: [1] | **9.39 dB** |
| MIF: [2] | **3.63 dB** |
| Standard Reference: | ETSI TS 100 909 V8.9.0 (2005-01)<br>FCC OET KDB 941225, D03 and D04 |
| Category: | Periodic pulsed modulation |
| Modulation: | GMSK |
| Frequency Band: | GSM 450 (450.4 - 457.6 MHz)<br>GSM 480 (478.8 - 486.0 MHz)<br>GSM 710 (698.0 - 716.0 MHz)<br>GSM 750 (747.0 - 763.0 MHz)<br>GSM 850 (824.0 - 849.0 MHz)<br>P-GSM 900 (890.0 - 915.0 MHz)<br>E-GSM 900 (880.0 - 915.0 MHz)<br>R-GSM 900 (876.0 - 915.0 MHz)<br>DCS 1800 (1710.0 - 1785.0 MHz)<br>PCS 1900 (1850.0 - 1910.0 MHz)<br>ER-GSM 900 (873.0 - 915.0 MHz)<br>Validation band (0.0 - 6000.0 MHz) |
| Detailed Specification: | Active Slot: TN0<br>Data: PN9 continuous<br>Frame: composed out of 8 Slots<br>Multiframe: 26th (IDLE) Frame set blank<br>Slottype & -timing: Normal burst for GMSK |
| Bandwidth: | 0.2 MHz |
| Integration Time: | 120.0 ms |

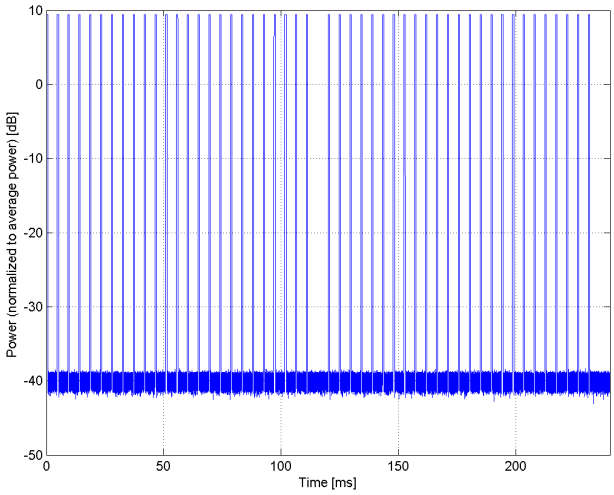
[1] PAR (0.1%) in accordance with FCC KDB 971168, Section 6.0 "'Measurement of the Peak-to-Average Power Ratio (PAPR)'"
[2] Modulation Interference Factor (MIF) value valid only in conjunction with advanced probe response linearization calibration for the same communication system (same UID and version).




**Complementary Cumulative Distribution Function (CCDF)**




**Frequency Domain**




**Time Domain**

**Calibration Laboratory of**
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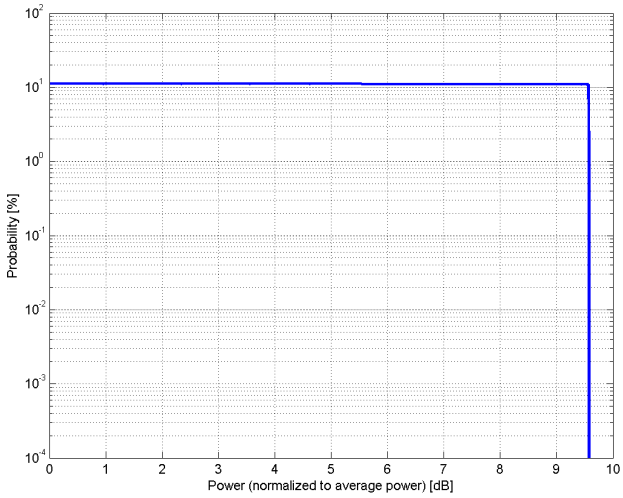
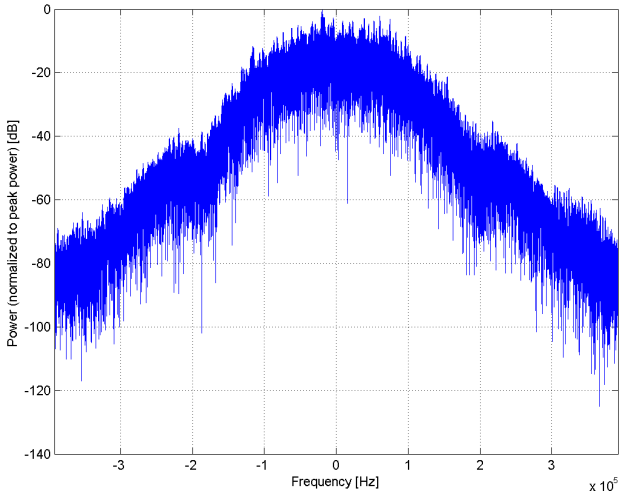
| | |
|---|---|
| Name: | **GPRS-FDD (TDMA, GMSK, TN 0)** |
| Group: | GSM |
| UID: | 10023-DAC |
| PAR: [1] | **9.57 dB** |
| MIF: [2] | **3.80 dB** |
| Standard Reference: | ETSI TS 100 909 V8.9.0 (2005-01)<br>FCC OET KDB 941225, D03 and D04 |
| Category: | Periodic pulsed modulation |
| Modulation: | GMSK |
| Frequency Band: | GSM 450 (450.4 - 457.6 MHz)<br>GSM 480 (478.8 - 486.0 MHz)<br>GSM 710 (698.0 - 716.0 MHz)<br>GSM 750 (747.0 - 763.0 MHz)<br>GSM 850 (824.0 - 849.0 MHz)<br>P-GSM 900 (890.0 - 915.0 MHz)<br>E-GSM 900 (880.0 - 915.0 MHz)<br>R-GSM 900 (876.0 - 915.0 MHz)<br>DCS 1800 (1710.0 - 1785.0 MHz)<br>PCS 1900 (1850.0 - 1910.0 MHz)<br>ER-GSM 900 (873.0 - 915.0 MHz)<br>Validation band (0.0 - 6000.0 MHz) |
| Detailed Specification: | Active Slot: TN0<br>Data: PN9 continuous<br>Frame: composed out of 8 Slots<br>Multiframe: 13th (PTCCH) and 26th (IDLE) Frame set blank<br>Slottype & -timing: Normal burst for GMSK |
| Bandwidth: | 0.2 MHz |
| Integration Time: | 60.0 ms |

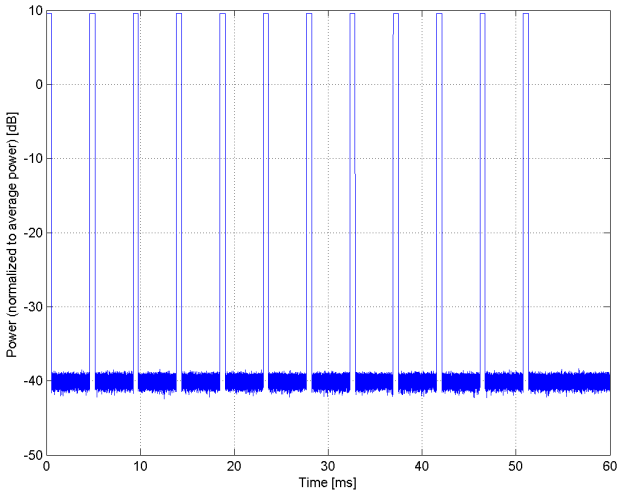
1 PAR (0.1%) in accordance with FCC KDB 971168, Section 6.0 "'Measurement of the Peak-to-Average Power Ratio (PAPR)'"
2 Modulation Interference Factor (MIF) value valid only in conjunction with advanced probe response linearization calibration for the same communication system (same UID and version).




**Complementary Cumulative Distribution Function (CCDF)**




**Frequency Domain**




**Time Domain**

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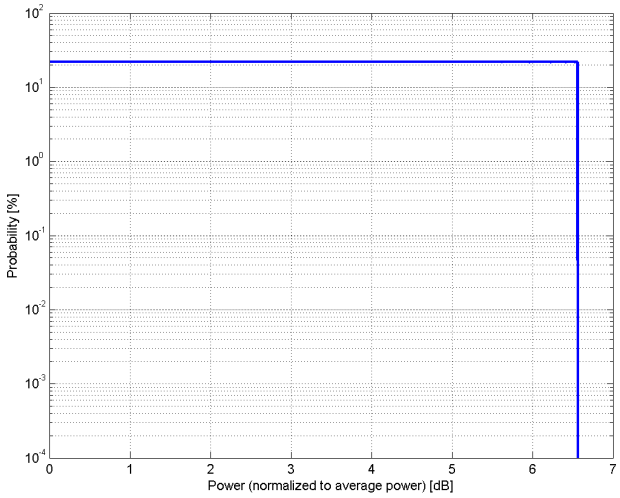
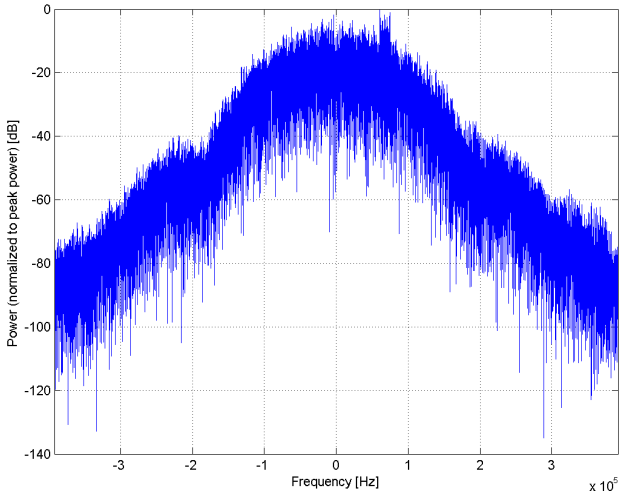
| | |
|---|---|
| Name: | **GPRS-FDD (TDMA, GMSK, TN 0-1)** |
| Group: | GSM |
| UID: | 10024-DAC |
| PAR: [1] | **6.56 dB** |
| MIF: [2] | **1.15 dB** |
| Standard Reference: | ETSI TS 100 909 V8.9.0 (2005-01)<br>FCC OET KDB 941225, D03 and D04 |
| Category: | Periodic pulsed modulation |
| Modulation: | GMSK |
| Frequency Band: | GSM 450 (450.4 - 457.6 MHz)<br>GSM 480 (478.8 - 486.0 MHz)<br>GSM 710 (698.0 - 716.0 MHz)<br>GSM 750 (747.0 - 763.0 MHz)<br>GSM 850 (824.0 - 849.0 MHz)<br>P-GSM 900 (890.0 - 915.0 MHz)<br>E-GSM 900 (880.0 - 915.0 MHz)<br>R-GSM 900 (876.0 - 915.0 MHz)<br>DCS 1800 (1710.0 - 1785.0 MHz)<br>PCS 1900 (1850.0 - 1910.0 MHz)<br>ER-GSM 900 (873.0 - 915.0 MHz)<br>Validation band (0.0 - 6000.0 MHz) |
| Detailed Specification: | Active Slots: TN0, TN1<br>Data: PN9 continuous<br>Frame: composed out of 8 Slots<br>Multiframe: 13th (PTCCH) and 26th (IDLE) Frame set blank<br>Slottype & -timing: Normal burst for GMSK |
| Bandwidth: | 0.2 MHz |
| Integration Time: | 60.0 ms |

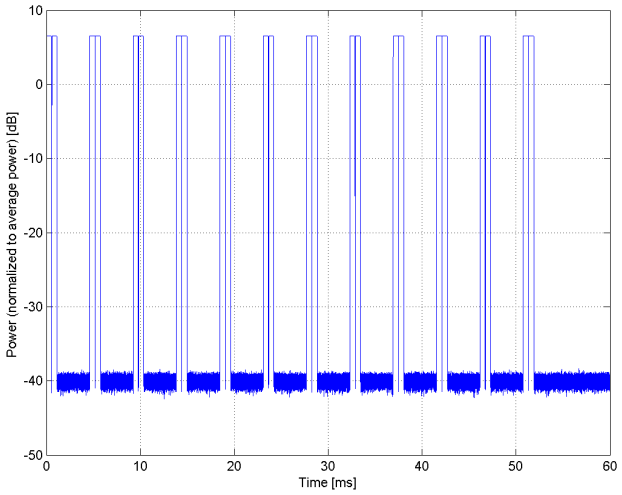
1 PAR (0.1%) in accordance with FCC KDB 971168, Section 6.0 "'Measurement of the Peak-to-Average Power Ratio (PAPR)'"
2 Modulation Interference Factor (MIF) value valid only in conjunction with advanced probe response linearization calibration for the same communication system (same UID and version).




**Complementary Cumulative Distribution Function (CCDF)**




**Frequency Domain**




**Time Domain**

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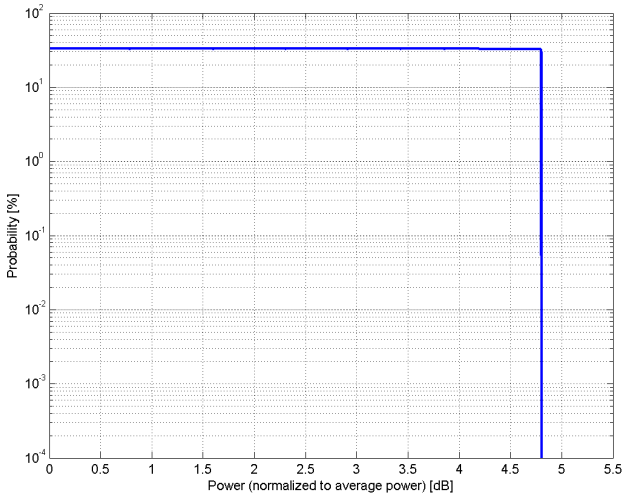
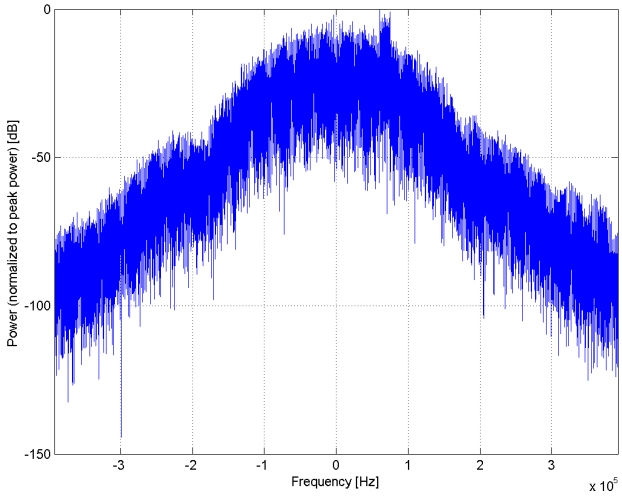
| | |
|---|---|
| Name: | **GPRS-FDD (TDMA, GMSK, TN 0-1-2)** |
| Group: | GSM |
| UID: | 10027-DAC |
| PAR: [1] | **4.80 dB** |
| MIF: [2] | **-0.67 dB** |
| Standard Reference: | ETSI TS 100 909 V8.9.0 (2005-01)<br>FCC OET KDB 941225, D03 and D04 |
| Category: | Periodic pulsed modulation |
| Modulation: | GMSK |
| Frequency Band: | GSM 450 (450.4 - 457.6 MHz)<br>GSM 480 (478.8 - 486.0 MHz)<br>GSM 710 (698.0 - 716.0 MHz)<br>GSM 750 (747.0 - 763.0 MHz)<br>GSM 850 (824.0 - 849.0 MHz)<br>P-GSM 900 (890.0 - 915.0 MHz)<br>E-GSM 900 (880.0 - 915.0 MHz)<br>R-GSM 900 (876.0 - 915.0 MHz)<br>DCS 1800 (1710.0 - 1785.0 MHz)<br>PCS 1900 (1850.0 - 1910.0 MHz)<br>ER-GSM 900 (873.0 - 915.0 MHz)<br>Validation band (0.0 - 6000.0 MHz) |
| Detailed Specification: | Active Slots: TN0, TN1, TN2<br>Data: PN9 continuous<br>Frame: composed out of 8 Slots<br>Multiframe: 13th (PTCCH) and 26th (IDLE) Frame set blank<br>Slottype & -timing: Normal burst for GMSK |
| Bandwidth: | 0.2 MHz |
| Integration Time: | 60.0 ms |

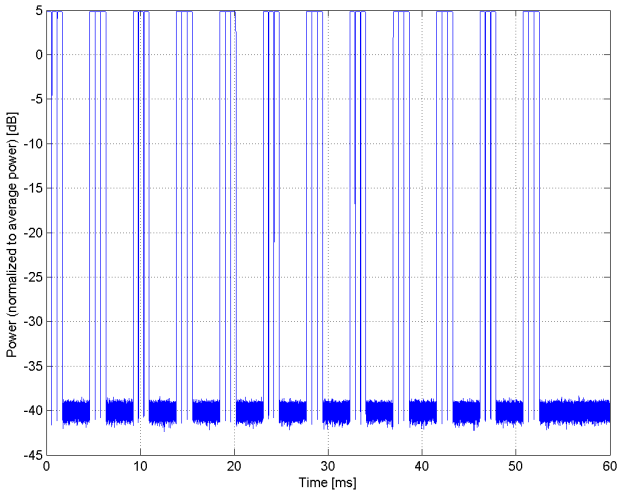
[1] PAR (0.1%) in accordance with FCC KDB 971168, Section 6.0 "'Measurement of the Peak-to-Average Power Ratio (PAPR)'"
[2] Modulation Interference Factor (MIF) value valid only in conjunction with advanced probe response linearization calibration for the same communication system (same UID and version).




**Complementary Cumulative Distribution Function (CCDF)**




**Frequency Domain**




**Time Domain**

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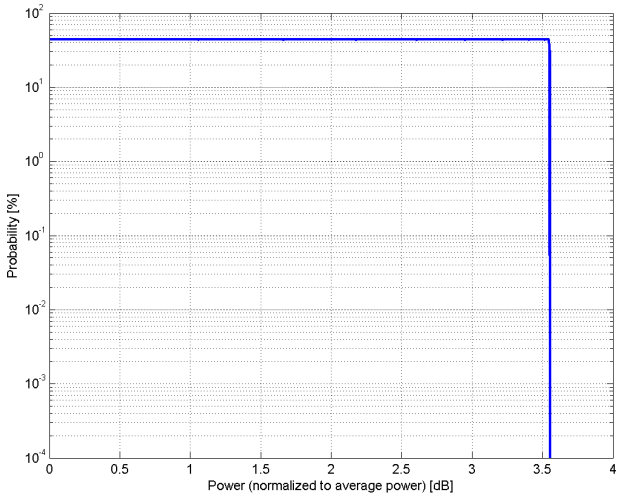
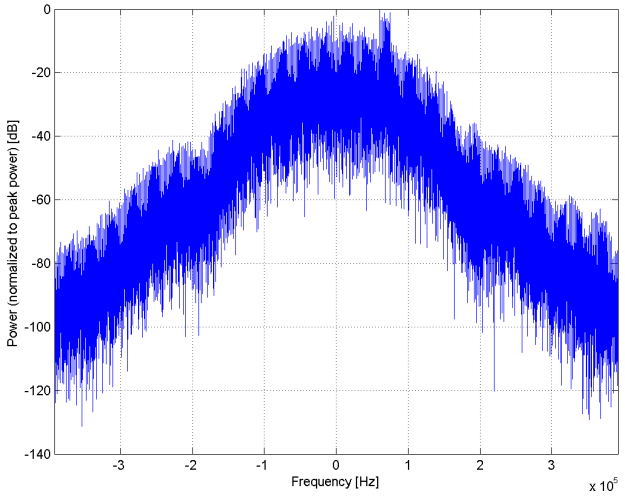
**Zeughausstrasse 43, 8004 Zurich, Switzerland**

| | |
|---|---|
| Name: | **GPRS-FDD (TDMA, GMSK, TN 0-1-2-3)** |
| Group: | GSM |
| UID: | 10028-DAC |
| PAR: [1] | **3.55 dB** |
| MIF: [2] | **-2.05 dB** |
| Standard Reference: | ETSI TS 100 909 V8.9.0 (2005-01)<br>FCC OET KDB 941225, D03 and D04 |
| Category: | Periodic pulsed modulation |
| Modulation: | GMSK |
| Frequency Band: | GSM 450 (450.4 - 457.6 MHz)<br>GSM 480 (478.8 - 486.0 MHz)<br>GSM 710 (698.0 - 716.0 MHz)<br>GSM 750 (747.0 - 763.0 MHz)<br>GSM 850 (824.0 - 849.0 MHz)<br>P-GSM 900 (890.0 - 915.0 MHz)<br>E-GSM 900 (880.0 - 915.0 MHz)<br>R-GSM 900 (876.0 - 915.0 MHz)<br>DCS 1800 (1710.0 - 1785.0 MHz)<br>PCS 1900 (1850.0 - 1910.0 MHz)<br>ER-GSM 900 (873.0 - 915.0 MHz)<br>Validation band (0.0 - 6000.0 MHz) |
| Detailed Specification: | Active Slots: TN0, TN1, TN2, TN3<br>Data: PN9 continuous<br>Frame: composed out of 8 Slots<br>Multiframe: 13th (PTCCH) and 26th (IDLE) Frame set blank<br>Slottype & -timing: Normal burst for GMSK |
| Bandwidth: | 0.2 MHz |
| Integration Time: | 60.0 ms |

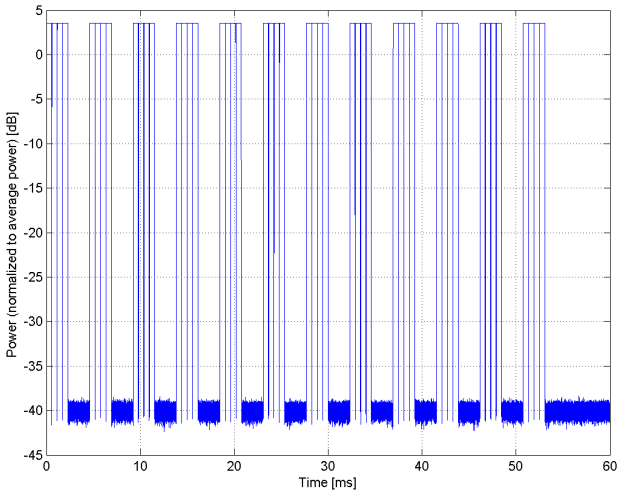
[1] PAR (0.1%) in accordance with FCC KDB 971168, Section 6.0 "'Measurement of the Peak-to-Average Power Ratio (PAPR)'"
[2] Modulation Interference Factor (MIF) value valid only in conjunction with advanced probe response linearization calibration for the same communication system (same UID and version).




**Complementary Cumulative Distribution Function (CCDF)**




**Frequency Domain**




**Time Domain**

**Calibration Laboratory of**
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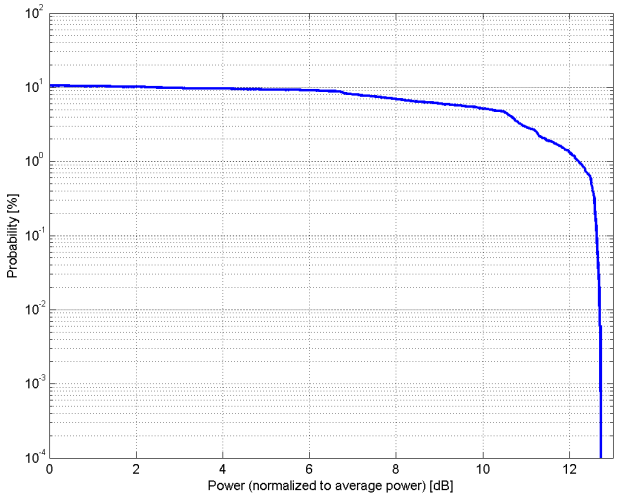
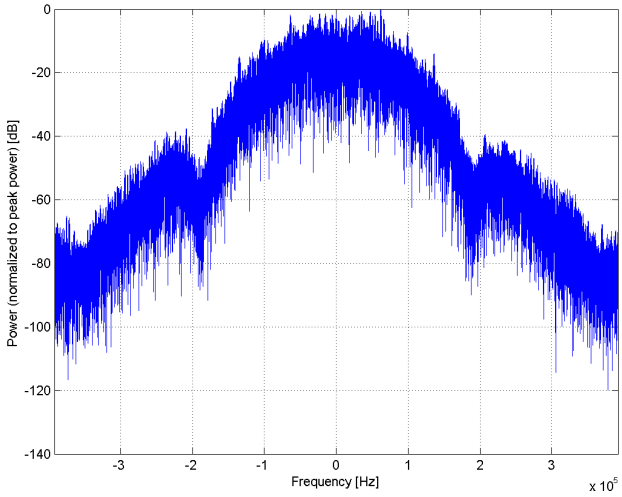
**Zeughausstrasse 43, 8004 Zurich, Switzerland**

| | |
|---|---|
| Name: | **EDGE-FDD (TDMA, 8PSK, TN 0)** |
| Group: | GSM |
| UID: | 10025-DAC |
| PAR: [1] | **12.62 dB** |
| MIF: [2] | **3.75 dB** |
| Standard Reference: | ETSI TS 100 909 V8.9.0 (2005-01)<br>FCC OET KDB 941225, D03 and D04 |
| Category: | Periodic pulsed modulation |
| Modulation: | 8PSK |
| Frequency Band: | GSM 450 (450.4 - 457.6 MHz)<br>GSM 480 (478.8 - 486.0 MHz)<br>GSM 710 (698.0 - 716.0 MHz)<br>GSM 750 (747.0 - 763.0 MHz)<br>GSM 850 (824.0 - 849.0 MHz)<br>P-GSM 900 (890.0 - 915.0 MHz)<br>E-GSM 900 (880.0 - 915.0 MHz)<br>R-GSM 900 (876.0 - 915.0 MHz)<br>DCS 1800 (1710.0 - 1785.0 MHz)<br>PCS 1900 (1850.0 - 1910.0 MHz)<br>ER-GSM 900 (873.0 - 915.0 MHz)<br>Validation band (0.0 - 6000.0 MHz) |
| Detailed Specification: | Active Slot: TN0<br>Data: PN9 continuous<br>Frame: composed out of 8 Slots<br>Multiframe: 13th (PTCCH) and 26th (IDLE) Frame set blank<br>Slottype & -timing: Normal burst for 8PSK |
| Bandwidth: | 0.2 MHz |
| Integration Time: | 60.0 ms |

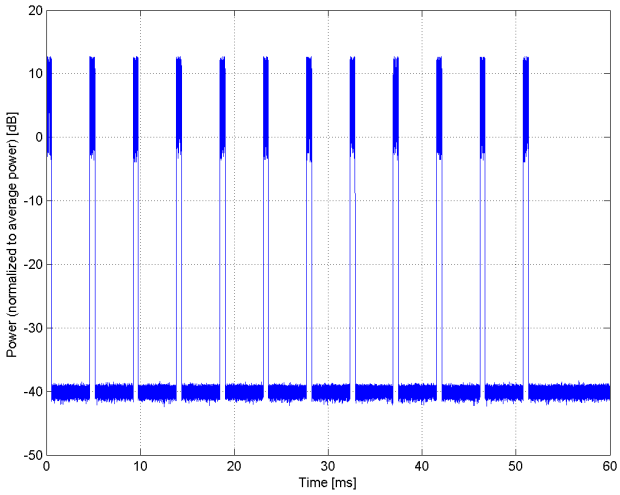
[1] PAR (0.1%) in accordance with FCC KDB 971168, Section 6.0 "'Measurement of the Peak-to-Average Power Ratio (PAPR)'"
[2] Modulation Interference Factor (MIF) value valid only in conjunction with advanced probe response linearization calibration for the same communication system (same UID and version).




**Complementary Cumulative Distribution Function (CCDF)**




**Frequency Domain**




**Time Domain**

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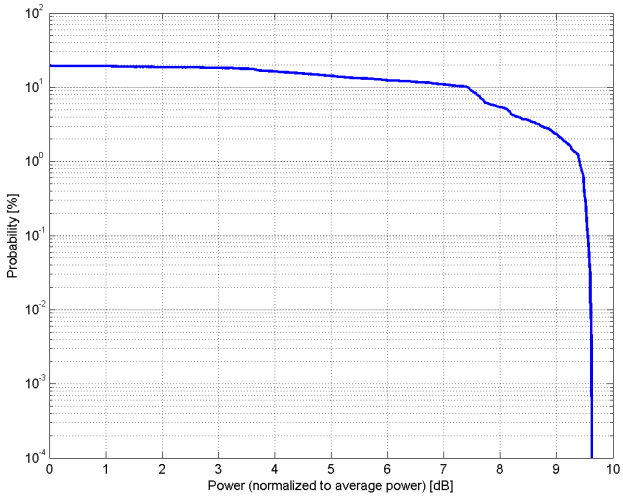
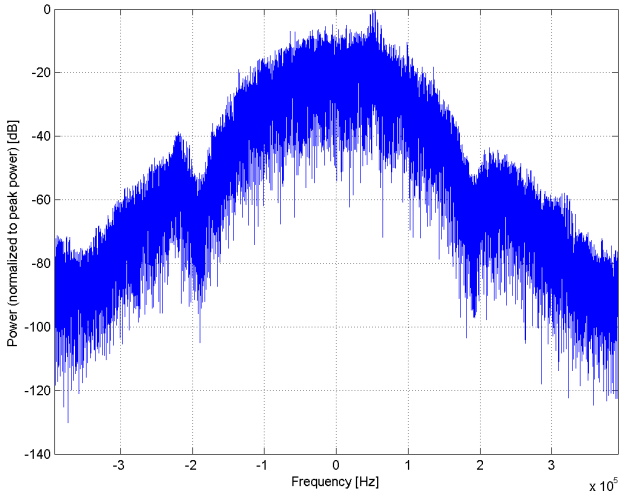
| | |
|---|---|
| Name: | **EDGE-FDD (TDMA, 8PSK, TN 0-1)** |
| Group: | GSM |
| UID: | 10026-DAC |
| PAR: [1] | **9.55 dB** |
| MIF: [2] | **1.23 dB** |
| Standard Reference: | ETSI TS 100 909 V8.9.0 (2005-01)<br>FCC OET KDB 941225, D03 and D04 |
| Category: | Periodic pulsed modulation |
| Modulation: | 8PSK |
| Frequency Band: | GSM 450 (450.4 - 457.6 MHz)<br>GSM 480 (478.8 - 486.0 MHz)<br>GSM 710 (698.0 - 716.0 MHz)<br>GSM 750 (747.0 - 763.0 MHz)<br>GSM 850 (824.0 - 849.0 MHz)<br>P-GSM 900 (890.0 - 915.0 MHz)<br>E-GSM 900 (880.0 - 915.0 MHz)<br>R-GSM 900 (876.0 - 915.0 MHz)<br>DCS 1800 (1710.0 - 1785.0 MHz)<br>PCS 1900 (1850.0 - 1910.0 MHz)<br>ER-GSM 900 (873.0 - 915.0 MHz)<br>Validation band (0.0 - 6000.0 MHz) |
| Detailed Specification: | Active Slot:s TN0, TN1<br>Data: PN9 continuous<br>Frame: composed out of 8 Slots<br>Multiframe: 13th (PTCCH) and 26th (IDLE) Frame set blank<br>Slottype & -timing: Normal burst for 8PSK |
| Bandwidth: | 0.2 MHz |
| Integration Time: | 60.0 ms |

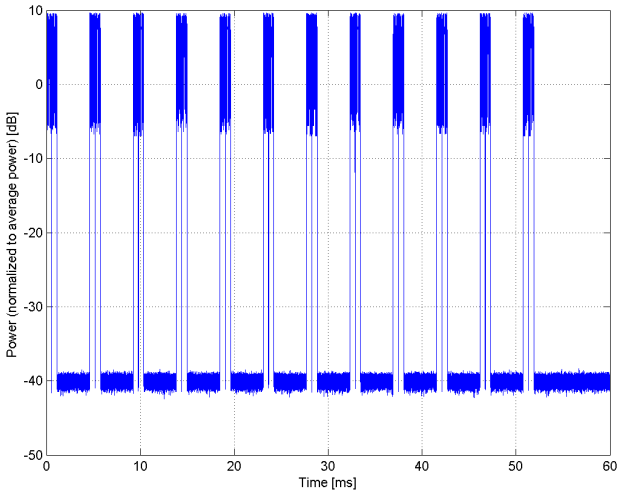
[1] PAR (0.1%) in accordance with FCC KDB 971168, Section 6.0 "'Measurement of the Peak-to-Average Power Ratio (PAPR)'"
[2] Modulation Interference Factor (MIF) value valid only in conjunction with advanced probe response linearization calibration for the same communication system (same UID and version).




**Complementary Cumulative Distribution Function (CCDF)**




**Frequency Domain**




**Time Domain**

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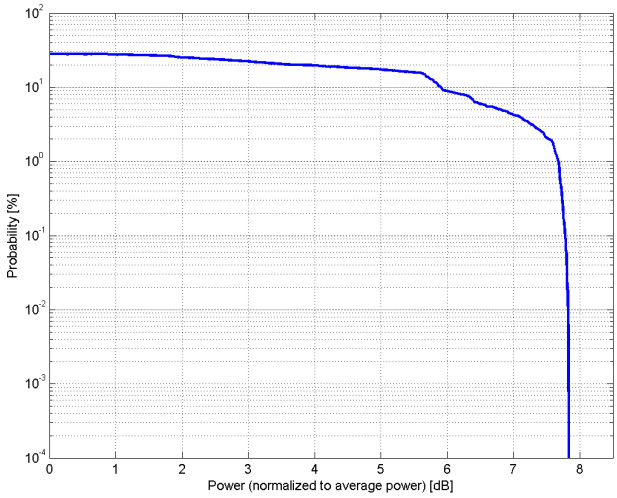
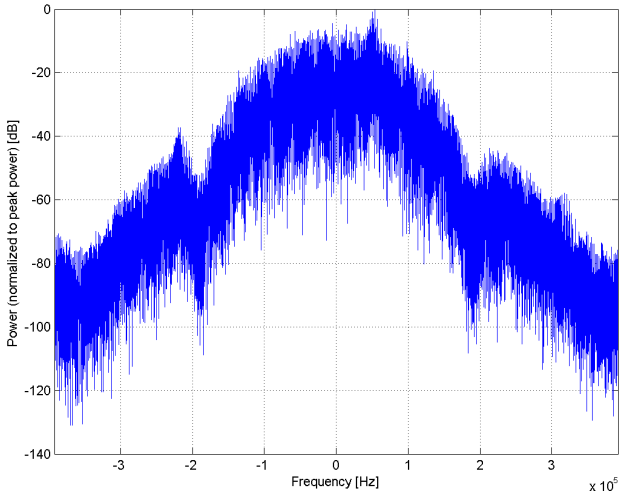
| | |
|---|---|
| Name: | **EDGE-FDD (TDMA, 8PSK, TN 0-1-2)** |
| Group: | GSM |
| UID: | 10029-DAC |
| PAR: [1] | **7.78 dB** |
| MIF: [2] | **-0.52 dB** |
| Standard Reference: | ETSI TS 100 909 V8.9.0 (2005-01)<br>FCC OET KDB 941225, D03 and D04 |
| Category: | Periodic pulsed modulation |
| Modulation: | 8PSK |
| Frequency Band: | GSM 450 (450.4 - 457.6 MHz)<br>GSM 480 (478.8 - 486.0 MHz)<br>GSM 710 (698.0 - 716.0 MHz)<br>GSM 750 (747.0 - 763.0 MHz)<br>GSM 850 (824.0 - 849.0 MHz)<br>P-GSM 900 (890.0 - 915.0 MHz)<br>E-GSM 900 (880.0 - 915.0 MHz)<br>R-GSM 900 (876.0 - 915.0 MHz)<br>DCS 1800 (1710.0 - 1785.0 MHz)<br>PCS 1900 (1850.0 - 1910.0 MHz)<br>ER-GSM 900 (873.0 - 915.0 MHz)<br>Validation band (0.0 - 6000.0 MHz) |
| Detailed Specification: | Active Slots: TN0, TN1, TN2<br>Data: PN9 continuous<br>Frame: composed out of 8 Slots<br>Multiframe: 13th (PTCCH) and 26th (IDLE) Frame set blank<br>Slottype & -timing: Normal burst for 8PSK |
| Bandwidth: | 0.2 MHz |
| Integration Time: | 60.0 ms |

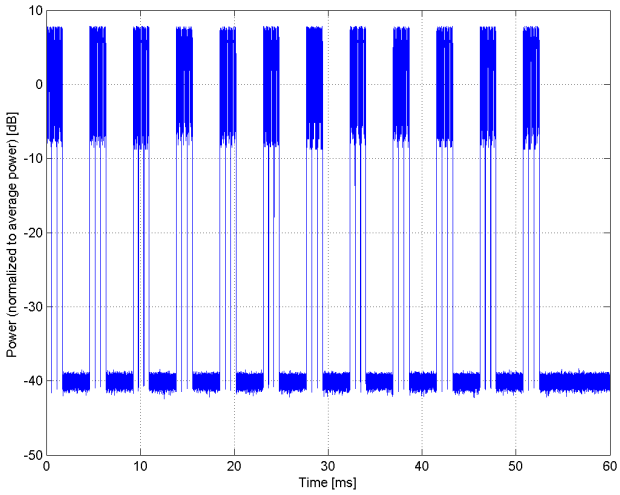
1 PAR (0.1%) in accordance with FCC KDB 971168, Section 6.0 "'Measurement of the Peak-to-Average Power Ratio (PAPR)'"
2 Modulation Interference Factor (MIF) value valid only in conjunction with advanced probe response linearization calibration for the same communication system (same UID and version).




**Complementary Cumulative Distribution Function (CCDF)**




**Frequency Domain**

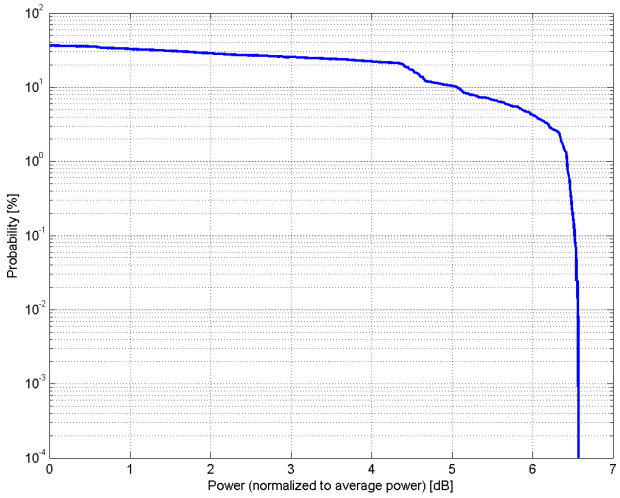



**Time Domain**

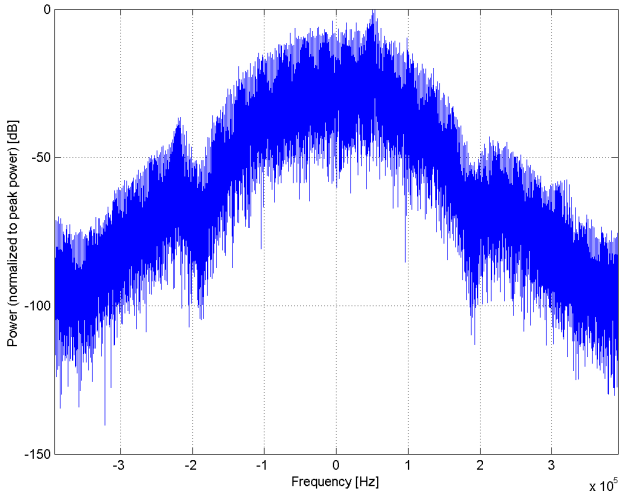
**Calibration Laboratory of**
Schmid & Partner
Engineering AG
**Zeughausstrasse 43, 8004 Zurich, Switzerland**

| | |
|---|---|
| Name: | **EDGE-FDD (TDMA, 8PSK, TN 0-1-2-3)** |
| Group: | GSM |
| UID: | 10058-DAC |
| PAR: [1] | **6.52 dB** |
| MIF: [2] | **-1.82 dB** |
| Standard Reference: | ETSI TS 100 909 V8.9.0 (2005-01)<br>FCC OET KDB 941225, D03 and D04 |
| Category: | Periodic pulsed modulation |
| Modulation: | 8PSK |
| Frequency Band: | GSM 450 (450.4 - 457.6 MHz)<br>GSM 480 (478.8 - 486.0 MHz)<br>GSM 710 (698.0 - 716.0 MHz)<br>GSM 750 (747.0 - 763.0 MHz)<br>GSM 850 (824.0 - 849.0 MHz)<br>P-GSM 900 (890.0 - 915.0 MHz)<br>E-GSM 900 (880.0 - 915.0 MHz)<br>R-GSM 900 (876.0 - 915.0 MHz)<br>DCS 1800 (1710.0 - 1785.0 MHz)<br>PCS 1900 (1850.0 - 1910.0 MHz)<br>ER-GSM 900 (873.0 - 915.0 MHz)<br>Validation band (0.0 - 6000.0 MHz) |
| Detailed Specification: | Active Slots: TN0, TN1, TN2, TN3<br>Data: PN9 continuous<br>Frame: composed out of 8 Slots<br>Multiframe: 13th (PTCCH) and 26th (IDLE) Frame set blank<br>Slottype & -timing: Normal burst for 8PSK |
| Bandwidth: | 0.2 MHz |
| Integration Time: | 60.0 ms |

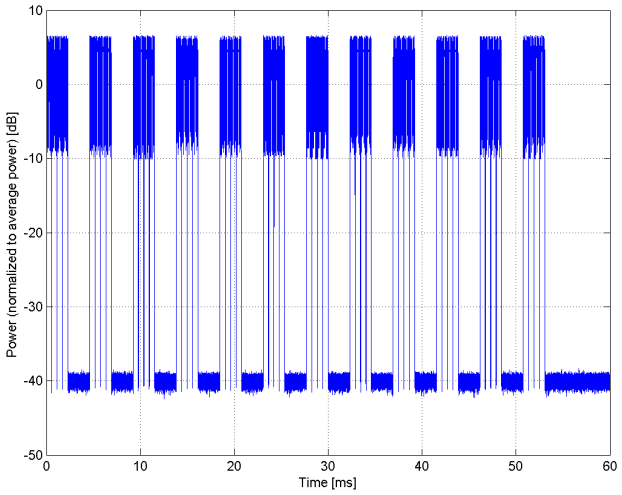
[1] PAR (0.1%) in accordance with FCC KDB 971168, Section 6.0 "'Measurement of the Peak-to-Average Power Ratio (PAPR)'"
[2] Modulation Interference Factor (MIF) value valid only in conjunction with advanced probe response linearization calibration for the same communication system (same UID and version).




**Complementary Cumulative Distribution Function (CCDF)**




**Frequency Domain**




**Time Domain**

**Calibration Laboratory of**
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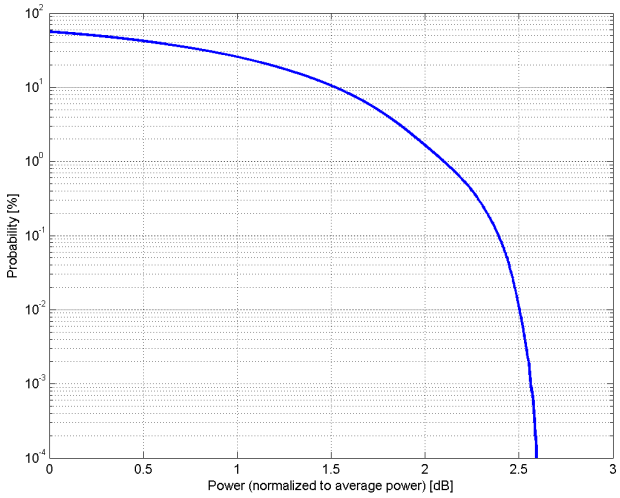
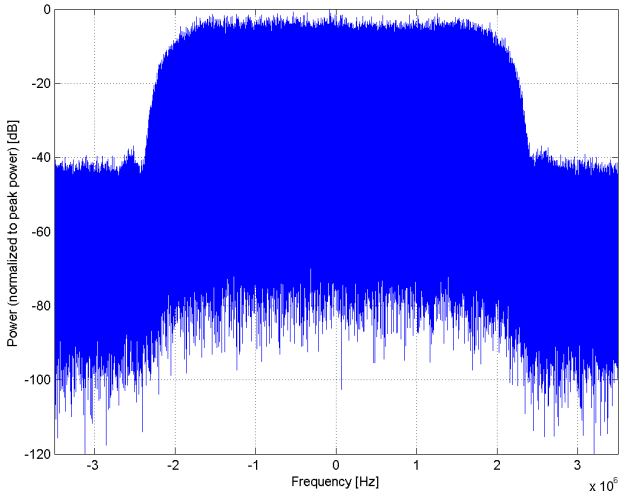
**Zeughausstrasse 43, 8004 Zurich, Switzerland**

| | |
|---|---|
| Name: | **UMTS-FDD (WCDMA, AMR)** |
| Group: | WCDMA |
| UID: | 10460-AAA |
| PAR: [1] | **2.39 dB** |
| MIF: [2] | **-25.43 dB** |
| Standard Reference: | FCC OET KDB 941225 D01 SAR test for 3G devices v03 |
| Category: | Random amplitude modulation |
| Modulation: | QPSK |
| Frequency Band: | Band 1, UTRA/FDD (1920.0-1980.0 MHz, 20000)<br>Band 2, UTRA/FDD (1850.0-1910.0 MHz, 20001)<br>Band 3, UTRA/FDD (1710.0-1785.0 MHz, 20002)<br>Band 4, UTRA/FDD (1710.0-1755.0 MHz, 20003)<br>Band 5, UTRA/FDD (824.0-849.0 MHz, 20004)<br>Band 6, UTRA/FDD (830.0-840.0 MHz, 20005)<br>Band 7, UTRA/FDD (2500.0-2570.0 MHz, 20006)<br>Band 8, UTRA/FDD (880.0-915.0 MHz, 20007)<br>Band 9, UTRA/FDD (1749.9-1784.9 MHz, 20008)<br>Band 10, UTRA/FDD (1710.0-1770.0 MHz, 20009)<br>Band 11, UTRA/FDD (1427.9-1452.9 MHz, 20010)<br>Band 12, UTRA/FDD (698.0-716.0 MHz, 20011)<br>Band 13, UTRA/FDD (777.0-787.0 MHz, 20012)<br>Band 14, UTRA/FDD (788.0-798.0 MHz, 20013)<br>Band 19, UTRA/FDD (830.0-845.0 MHz, 20130)<br>Band 20, UTRA/FDD (832.0-862.0 MHz, 20131)<br>Band 21, UTRA/FDD (1447.9-1462.9 MHz, 20132)<br>Band 22, UTRA/FDD (3410.0-3490.0 MHz, 20217)<br>Band 25, UTRA/FDD (1850.0-1915.0 MHz, 20218)<br>Band 26, UTRA/FDD (814.0-849.0 MHz, 20219) |
| Detailed Specification: | Dedicated Channel Type: 12.2 kbps AMR<br>3.4 kbps SRB |
| Bandwidth: | 5.0 MHz |
| Integration Time: | 100.0 ms |

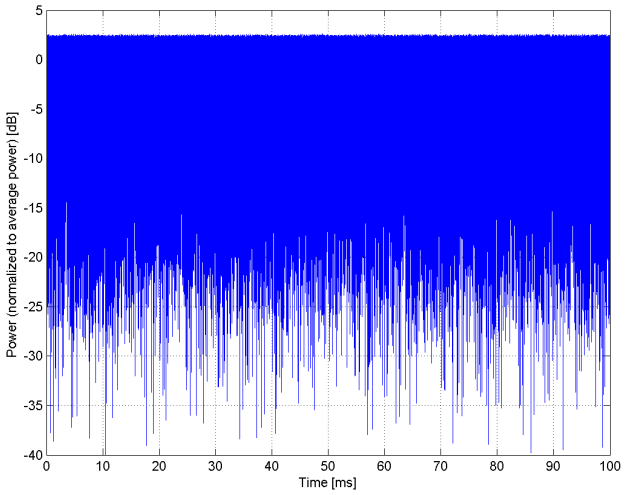
[1] PAR (0.1%) in accordance with FCC KDB 971168, Section 6.0 "'Measurement of the Peak-to-Average Power Ratio (PAPR)'"
[2] Modulation Interference Factor (MIF) value valid only in conjunction with advanced probe response linearization calibration for the same communication system (same UID and version).




**Complementary Cumulative Distribution Function (CCDF)**




**Frequency Domain**




**Time Domain**

**Calibration Laboratory of**
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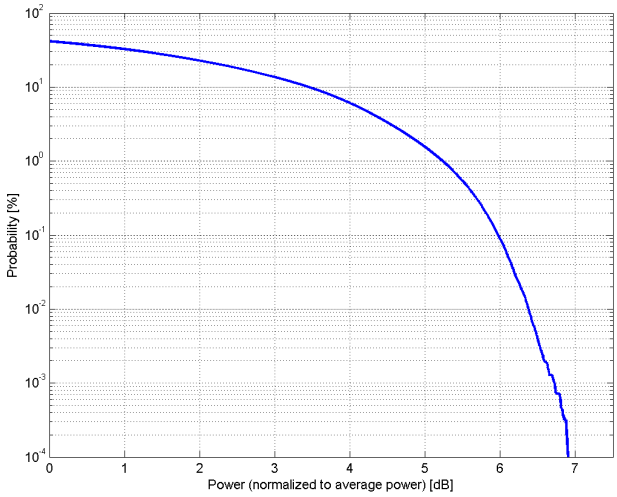
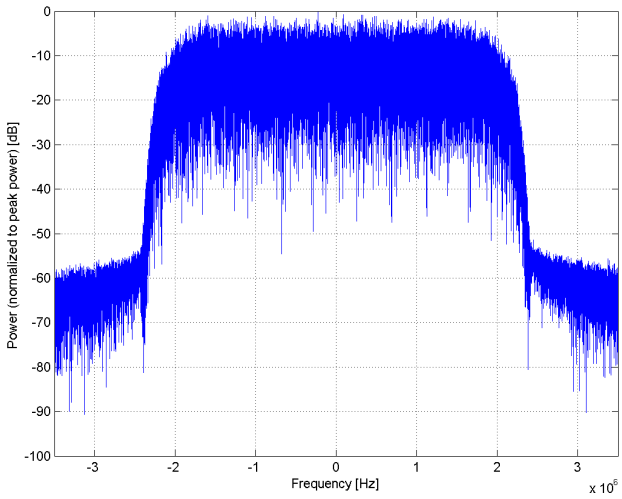
**Zeughausstrasse 43, 8004 Zurich, Switzerland**

| | |
|---|---|
| Name: | **UMTS-FDD (HSPA+)** |
| Group: | WCDMA |
| UID: | 10225-CAB |
| PAR: [1] | **5.97 dB** |
| MIF: [2] | **-20.39 dB** |
| Standard Reference: | 3GPP Rel 7 TS 34.121<br>FCC OET KDB 941225 D01 SAR test for 3G devices v02<br>FCC OET KDB 941225 D02 Guidance for 3GPP R6 and R7 HSPA v02v01 |
| Category: | Random amplitude modulation |
| Modulation: | 16QAM |
| Frequency Band: | Band 1, UTRA/FDD (1920.0-1980.0 MHz, 20000)<br>Band 2, UTRA/FDD (1850.0-1910.0 MHz, 20001)<br>Band 3, UTRA/FDD (1710.0-1785.0 MHz, 20002)<br>Band 4, UTRA/FDD (1710.0-1755.0 MHz, 20003)<br>Band 5, UTRA/FDD (824.0-849.0 MHz, 20004)<br>Band 6, UTRA/FDD (830.0-840.0 MHz, 20005)<br>Band 7, UTRA/FDD (2500.0-2570.0 MHz, 20006)<br>Band 8, UTRA/FDD (880.0-915.0 MHz, 20007)<br>Band 9, UTRA/FDD (1749.9-1784.9 MHz, 20008)<br>Band 10, UTRA/FDD (1710.0-1770.0 MHz, 20009)<br>Band 11, UTRA/FDD (1427.9-1452.9 MHz, 20010)<br>Band 12, UTRA/FDD (698.0-716.0 MHz, 20011)<br>Band 13, UTRA/FDD (777.0-787.0 MHz, 20012)<br>Band 14, UTRA/FDD (788.0-798.0 MHz, 20013)<br>Band 19, UTRA/FDD (830.0-845.0 MHz, 20130)<br>Band 20, UTRA/FDD (832.0-862.0 MHz, 20131)<br>Band 21, UTRA/FDD (1447.9-1462.9 MHz, 20132)<br>Band 22, UTRA/FDD (3410.0-3490.0 MHz, 20217)<br>Band 25, UTRA/FDD (1850.0-1915.0 MHz, 20218)<br>Band 26, UTRA/FDD (814.0-849.0 MHz, 20219) |
| Detailed Specification: | 12.2 kbps RMC, FRC H-Set 2<br>CQI value: 2<br>Sub-test 2 Conditions:<br>DPCCH gain factor (Beta_c) = 6/15<br>DPDCH gain factor (Beta_d): 15/15<br>E-DPDCH Settings:<br>Symbol Rate: 2x1960 Mbps<br>Modulation 4PAM<br>Data Type: PN9 |
| Bandwidth: | 5.0 MHz |
| Integration Time: | 100.0 ms |

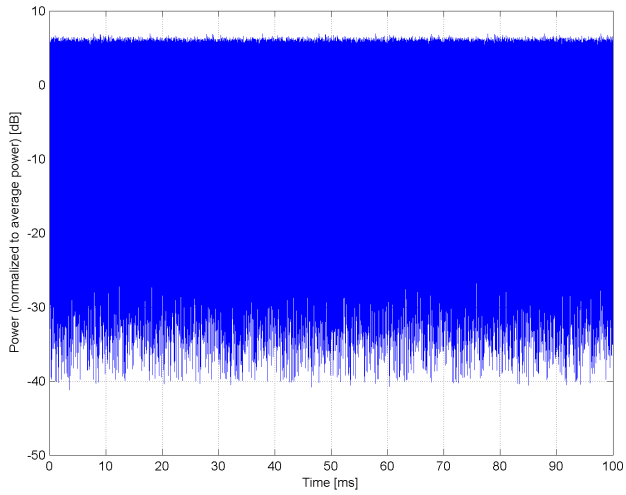
[1] PAR (0.1%) in accordance with FCC KDB 971168, Section 6.0 "'Measurement of the Peak-to-Average Power Ratio (PAPR)'"
[2] Modulation Interference Factor (MIF) value valid only in conjunction with advanced probe response linearization calibration for the same communication system (same UID and version).




**Complementary Cumulative Distribution Function (CCDF)**




**Frequency Domain**



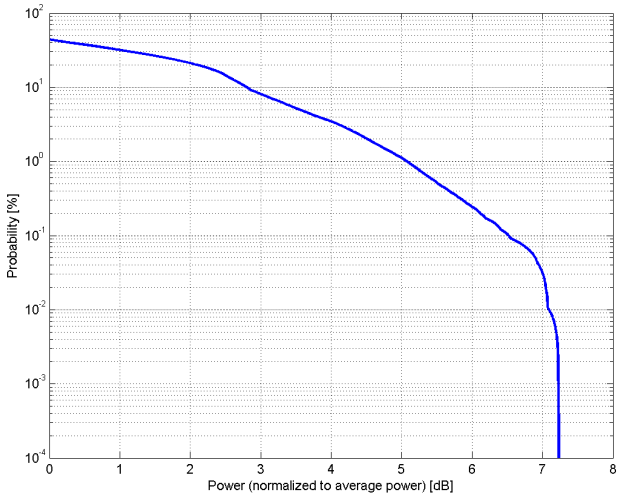

**Time Domain**

**Calibration Laboratory of**
Schmid & Partner
Engineering AG
**Zeughausstrasse 43, 8004 Zurich, Switzerland**

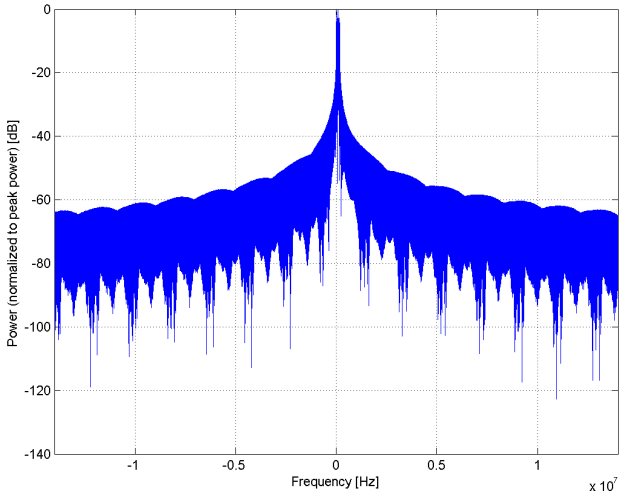
| | |
|---|---|
| Name: | **LTE-FDD (SC-FDMA, 1 RB, 20 MHz, 16-QAM)** |
| Group: | LTE-FDD |
| UID: | 10170-CAE |
| PAR: [1] | **6.52 dB** |
| MIF: [2] | **-9.76 dB** |
| Standard Reference: | 3GPP / ETSI TS 136.101 V8.4.0<br>3GPP / ETSI TS 136.213 V8.4.0<br>FCC OET KDB 941225 D05 SAR for LTE Devices v01 |
| Category: | Random amplitude modulation |
| Modulation: | 16-QAM |
| Frequency Band: | Band 1, E-UTRA/FDD (1920.0 - 1980.0 MHz)<br>Band 2, E-UTRA/FDD (1850.0 - 1910.0 MHz)<br>Band 3, E-UTRA/FDD (1710.0 - 1785.0 MHz)<br>Band 4, E-UTRA/FDD (1710.0 - 1755.0 MHz)<br>Band 7, E-UTRA/FDD (2500.0 - 2570.0 MHz)<br>Band 9, E-UTRA/FDD (1749.9 - 1784.9 MHz)<br>Band 10, E-UTRA/FDD (1710.0 - 1770.0 MHz)<br>Band 20, E-UTRA/FDD (832.0 - 862.0 MHz)<br>Band 22, E-UTRA/FDD (3410.0 - 3490.0 MHz)<br>Band 23, E-UTRA/FDD (2000.0 - 2020.0 MHz)<br>Band 25, E-UTRA/FDD (1850.0 - 1915.0 MHz)<br>Band 28 E-UTRA/FDD (703.0 - 748.0 MHz)<br>Band 65, E-UTRA/FDD (1920.0 - 2010.0 MHz)<br>Band 66, E-UTRA/FDD (1710.0 - 1780.0 MHz)<br>Band 70, E-UTRA/FDD (1695.0 - 1710.0 MHz)<br>Band 71, E-UTRA/FDD (663.0 - 698.0 MHz)<br>Band 74, E-UTRA/FDD (1427.0 - 1470.0 MHz)<br>Validation band (0.0 - 6000.0 MHz) |
| Detailed Specification: | Modulation Scheme: SC-FDMA<br>Number of PUSCHs: 1<br>Settings for Subframe #0 to #9:<br>Modulation Scheme: 16QAM<br>Data Type: UL-SCH<br>Number RB: 1<br>Transport Block Size: 256<br>TBS Index: 14<br>MCS Index: 15<br>Data Type: PN9 |
| Bandwidth: | 20.0 MHz |
| Integration Time: | 10.0 ms |

1 PAR (0.1%) in accordance with FCC KDB 971168, Section 6.0 "'Measurement of the Peak-to-Average Power Ratio (PAPR)"'

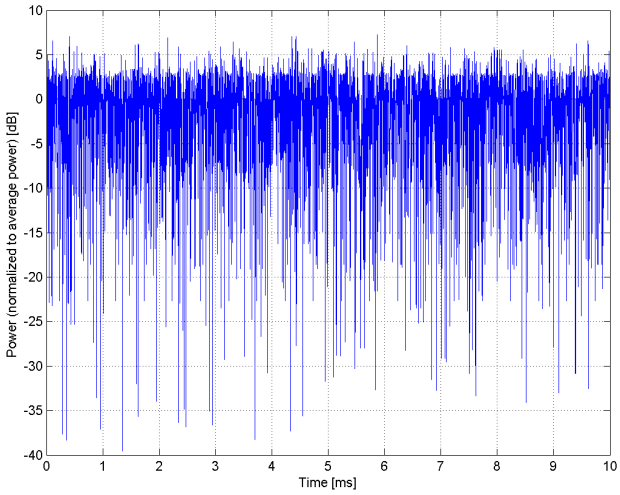
2 Modulation Interference Factor (MIF) value valid only in conjunction with advanced probe response linearization calibration for the same communication system (same UID and version).




**Complementary Cumulative Distribution Function (CCDF)**




**Frequency Domain**

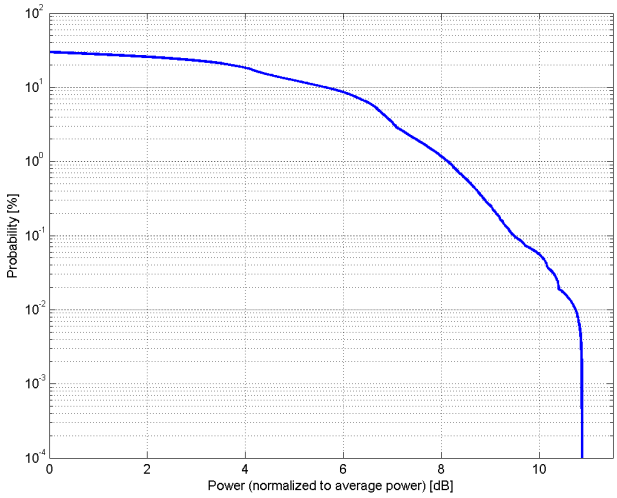



**Time Domain**

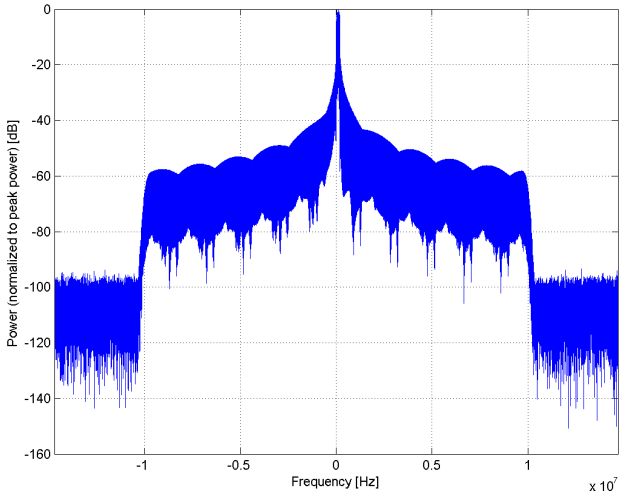
**Calibration Laboratory of**
Schmid & Partner
Engineering AG
**Zeughausstrasse 43, 8004 Zurich, Switzerland**

| | |
|---|---|
| Name: | **LTE-TDD (SC-FDMA, 1 RB, 20 MHz, 16-QAM)** |
| Group: | LTE-TDD |
| UID: | 10173-CAG |
| PAR: [1] | **9.48 dB** |
| MIF: [2] | **-1.44 dB** |
| Standard Reference: | 3GPP / ETSI TS 136.101 V8.4.0<br>3GPP / ETSI TS 136.213 V8.4.0<br>FCC OET KDB 941225 D05 SAR for LTE Devices v02 |
| Category: | Random amplitude modulation |
| Modulation: | 16-QAM |
| Frequency Band: | Band 33, E-UTRA/TDD (1900.0 - 1920.0 MHz)<br>Band 35, E-UTRA/TDD (1850.0 - 1910.0 MHz)<br>Band 36, E-UTRA/TDD (1930.0 - 1990.0 MHz)<br>Band 37, E-UTRA/TDD (1910.0 - 1930.0 MHz)<br>Band 38, E-UTRA/TDD (2570.0 - 2620.0 MHz)<br>Band 39, E-UTRA/TDD (1880.0 - 1920.0 MHz)<br>Band 40, E-UTRA/TDD (2300.0 - 2400.0 MHz)<br>Band 41, E-UTRA/TDD (2496.0 - 2690.0 MHz)<br>Band 42, E-UTRA/TDD (3400.0 - 3600.0 MHz)<br>Band 43, E-UTRA/TDD (3600.0 - 3800.0 MHz)<br>Band 44, E-UTRA/TDD (703.0 - 803.0 MHz)<br>Band 45, E-UTRA/FDD (1447.0 - 1467.0 MHz)<br>Band 46, E-UTRA/FDD (5150.0 - 5925.0 MHz)<br>Band 47, E-UTRA/TDD (5855.0 - 5925.0 MHz)<br>Band 48, E-UTRA/TDD (3550.0 - 3700.0 MHz)<br>Band 49, E-UTRA/TDD (3550.0 - 3700.0 MHz)<br>Band 50, E-UTRA/TDD (1432.0 - 1517.0 MHz)<br>Band 76, E-UTRA/FDD (3300.0 - 3400.0 MHz)<br>Validation band (0.0 - 6000.0 MHz) |
| Detailed Specification: | Modulation Scheme: SC-FDMA<br>Uplink-downlink configuration: 1<br>Special Subframe configuration: 4<br>Number of Frames: 1<br>Settings for UL Subframe 2,3,7,8:<br>Number of PUSCHs: 1<br>Modulation Scheme: 16QAM<br>Allocated RB: 1<br>Start Number of RB: 50<br>Data Type: PN9fix |
| Bandwidth: | 20.0 MHz |
| Integration Time: | 6.0 ms |

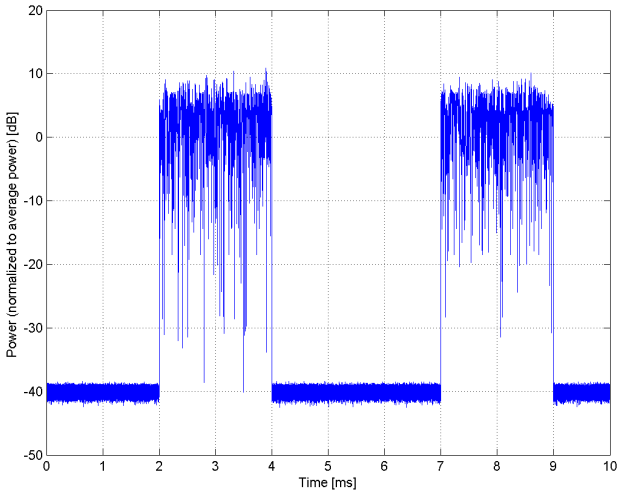
[1] PAR (0.1%) in accordance with FCC KDB 971168, Section 6.0 "'Measurement of the Peak-to-Average Power Ratio (PAPR)'"
[2] Modulation Interference Factor (MIF) value valid only in conjunction with advanced probe response linearization calibration for the same communication system (same UID and version).




**Complementary Cumulative Distribution Function (CCDF)**




**Frequency Domain**




**Time Domain**

**Calibration Laboratory of**
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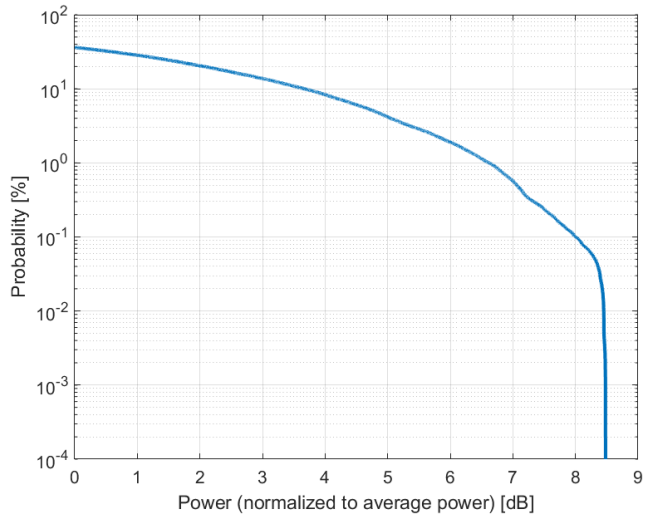
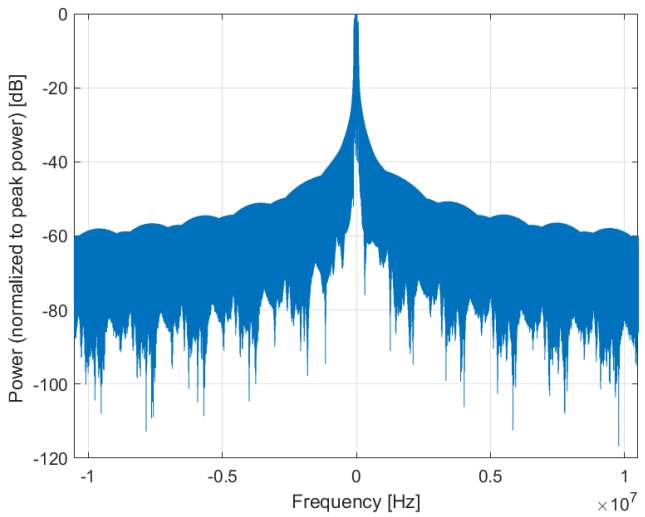
**Zeughausstrasse 43, 8004 Zurich, Switzerland**

| | |
|---|---|
| Name: | **5G NR (CP-OFDM, 1 RB, 15 MHz, QPSK, 15 kHz)** |
| Group: | 5G NR FR1 TDD |
| UID: | 10769-AAB |
| PAR: [1] | **8.01 dB** |
| MIF: [2] | **-12.08 dB** |
| Standard Reference: | SPEAG |
| Category: | Random amplitude modulation |
| Modulation: | QPSK |
| Frequency Band: | Band n34 (2010 - 2025 MHz)<br>Band n38 (2570 - 2620 MHz)<br>Band n39 (1880 - 1920 MHz)<br>Band n40 (2300 - 2400 MHz)<br>Band n41 (2496 - 2690 MHz)<br>Band n48 (3550 - 3700 MHz)<br>Band n50 (1432 - 1517 MHz)<br>Band n77 (3300 - 4200 MHz)<br>Band n78 (3300 - 3800 MHz)<br>Band n79 (4400 - 5000 MHz)<br>Validation band (0.0 - 6000.0 MHz) |
| Detailed Specification: | Multiplexing Scheme: CP-OFDM<br>Modulation Scheme: QPSK<br>Subcarrier Spacing: 15 kHz<br>Number RBs: 1<br>Slot Format Index: 14<br>Data Type: PN9 |
| Bandwidth: | 15.0 MHz |
| Integration Time: | 10.0 ms |

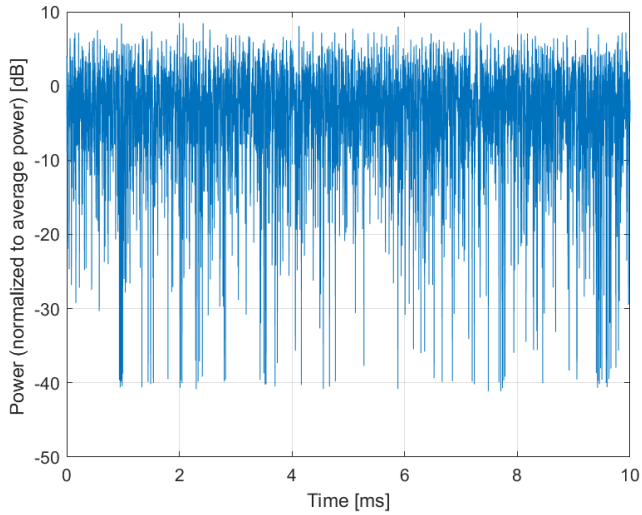
[1] PAR (0.1%) in accordance with FCC KDB 971168, Section 6.0 "'Measurement of the Peak-to-Average Power Ratio (PAPR)'"
[2] Modulation Interference Factor (MIF) value valid only in conjunction with advanced probe response linearization calibration for the same communication system (same UID and version).




**Complementary Cumulative Distribution Function (CCDF)**




**Frequency Domain**




**Time Domain**

**Calibration Laboratory of**
Schmid & Partner
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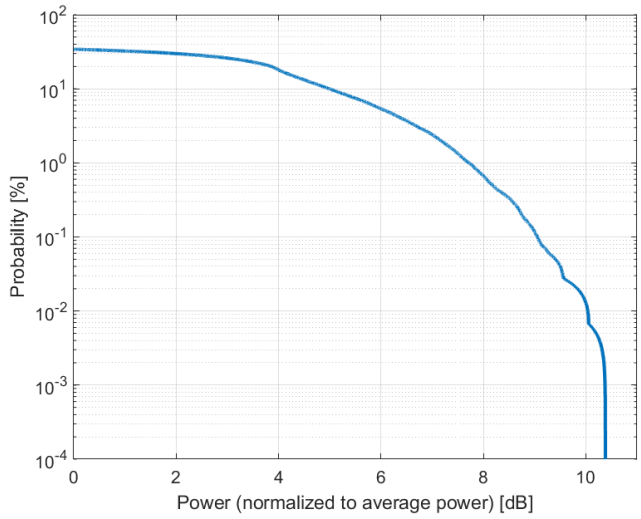
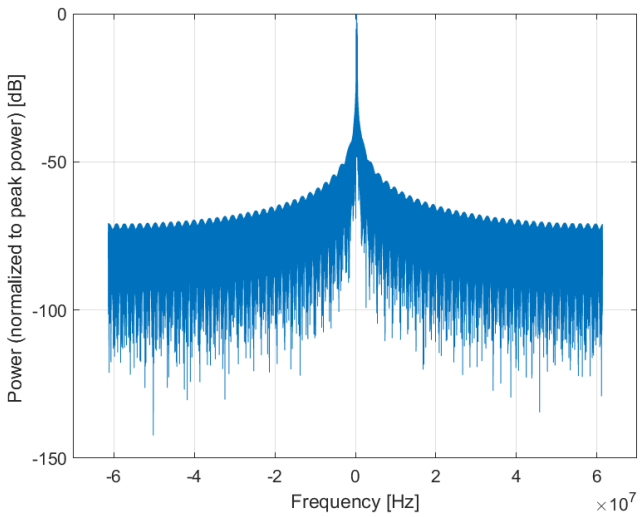
**Zeughausstrasse 43, 8004 Zurich, Switzerland**

| | |
|---|---|
| Name: | **5G NR (DFT-s-OFDM, 1 RB, 100 MHz, QPSK, 30 kHz)** |
| Group: | 5G NR FR1 TDD |
| UID: | 10973-AAB |
| PAR: [1] | **9.06 dB** |
| MIF: [2] | **-1.64 dB** |
| Standard Reference: | SPEAG |
| Category: | Random amplitude modulation |
| Modulation: | QPSK |
| Frequency Band: | Band n41 (2496 - 2690 MHz)<br>Band n48 (3550 - 3700 MHz)<br>Band n77 (3300 - 4200 MHz)<br>Band n78 (3300 - 3800 MHz)<br>Band n79 (4400 - 5000 MHz)<br>Band n90 (2496 - 2690 MHz)<br>Validation band (0.0 - 6000.0 MHz) |
| Detailed Specification: | Multiplexing Scheme: DFT-s-OFDM<br>Modulation Scheme: QPSK<br>Subcarrier Spacing: 30 kHz<br>Number RBs: 1<br>Slot Format Index: -<br>Data Type: PN9 |
| Bandwidth: | 100.0 MHz |
| Integration Time: | 10.0 ms |

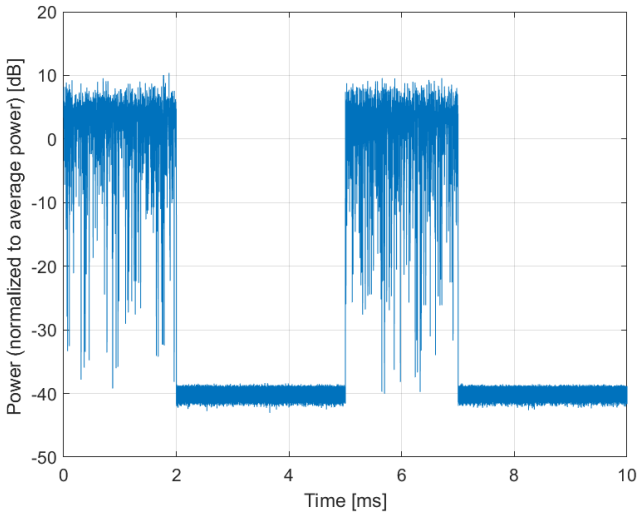
[1] PAR (0.1%) in accordance with FCC KDB 971168, Section 6.0 "'Measurement of the Peak-to-Average Power Ratio (PAPR)'"
[2] Modulation Interference Factor (MIF) value valid only in conjunction with advanced probe response linearization calibration for the same communication system (same UID and version).




**Complementary Cumulative Distribution Function (CCDF)**




**Frequency Domain**




**Time Domain**

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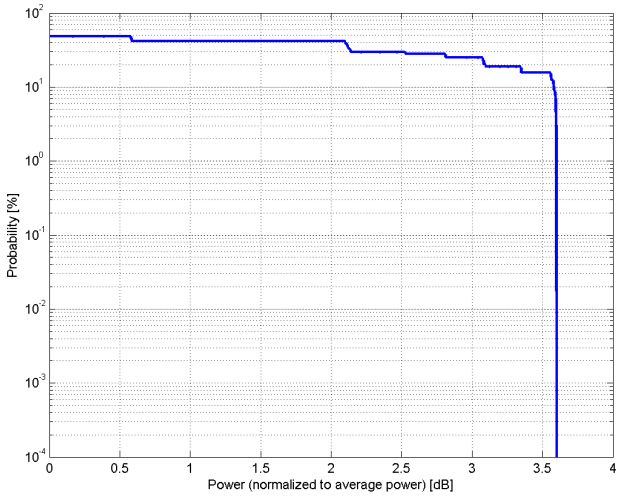
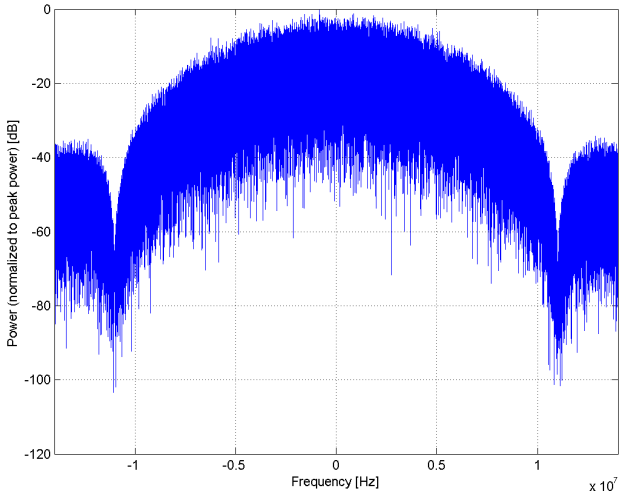
| | |
|---|---|
| Name: | **IEEE 802.11b WiFi 2.4 GHz (DSSS, 11 Mbps)** |
| Group: | WLAN |
| UID: | 10061-CAB |
| PAR: [1] | **3.60 dB** |
| MIF: [2] | **-2.02 dB** |
| Standard Reference: | IEEE 802.11b-1999 , Part 11, FCC SAR meas for 802 11 a b g v01r02 (248227 D01) |
| Category: | Random amplitude modulation |
| Modulation: | DQPSK |
| Frequency Band: | WLAN 2.4GHz (2412.0-2484.0 MHz, 20230) |
| Detailed Specification: | Data Rate: 11 Mbps<br>Spreading, Coding: CCK<br>PPDU format: Long Preamble & Heading<br>PSDU Length: 1024<br>PSDU Data: PN9 |
| Bandwidth: | 20.0 MHz |
| Integration Time: | 1.5 ms |

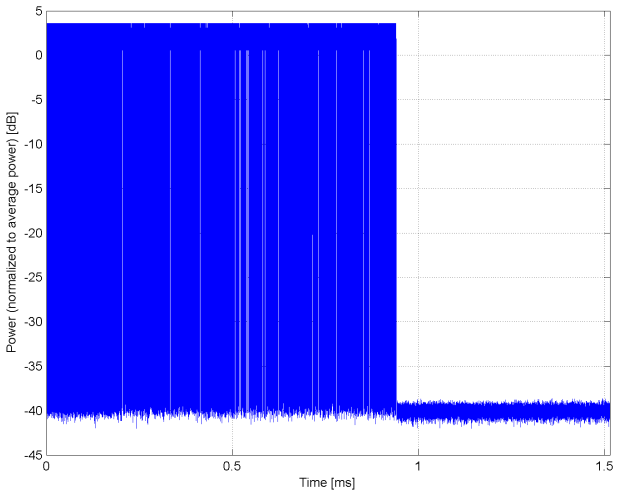
[1] PAR (0.1%) in accordance with FCC KDB 971168, Section 6.0 "'Measurement of the Peak-to-Average Power Ratio (PAPR)'"
[2] Modulation Interference Factor (MIF) value valid only in conjunction with advanced probe response linearization calibration for the same communication system (same UID and version).




**Complementary Cumulative Distribution Function (CCDF)**




**Frequency Domain**




**Time Domain**

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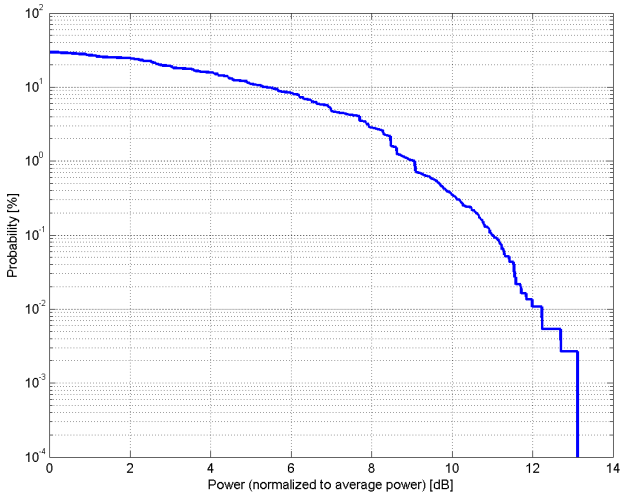
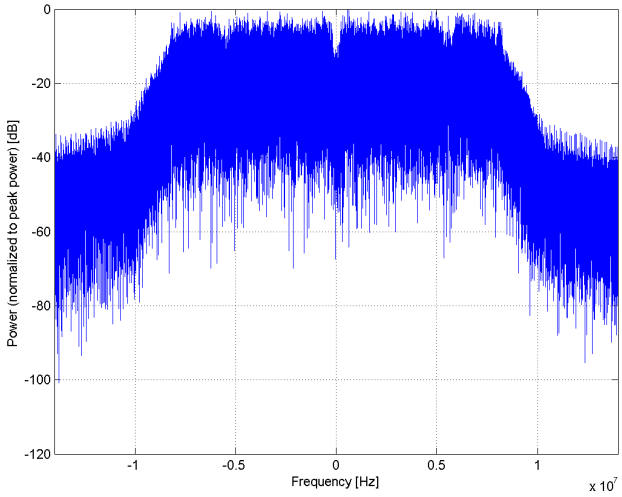
| | |
|---|---|
| Name: | **IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 54 Mbps)** |
| Group: | WLAN |
| UID: | 10077-CAB |
| PAR: [1] | **11.00 dB** |
| MIF: [2] | **0.12 dB** |
| Standard Reference: | IEEE 802.11g-2003 , Part 11<br>FCC SAR meas for 802 11 a b g v01r02 (248227 D01) |
| Category: | Random amplitude modulation |
| Modulation: | 64-QAM |
| Frequency Band: | WLAN 2.4GHz (2412.0-2484.0 MHz, 20230) |
| Detailed Specification: | Data Rate: 54 Mbps<br>Coding Rate: 3/4<br>Coded bits per subcarrier: 6<br>Coded bits per OFDM symbol: 288<br>Data bits per OFDM symbol: 216<br>PSDU Length: 1000 Bytes<br>PSDU Data: PN9 |
| Bandwidth: | 20.0 MHz |
| Integration Time: | 0.9 ms |

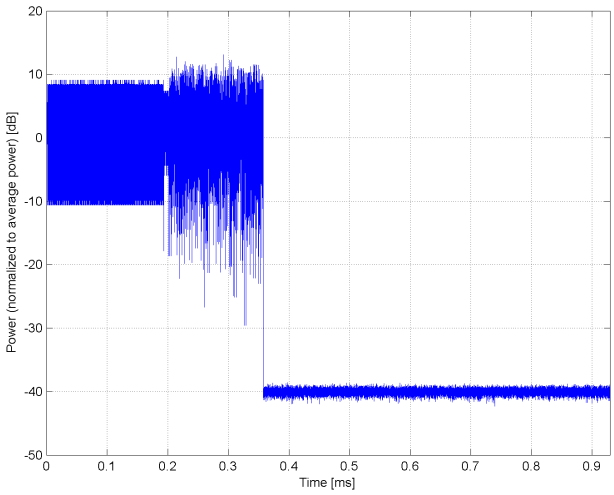
[1] PAR (0.1%) in accordance with FCC KDB 971168, Section 6.0 "'Measurement of the Peak-to-Average Power Ratio (PAPR)'"
[2] Modulation Interference Factor (MIF) value valid only in conjunction with advanced probe response linearization calibration for the same communication system (same UID and version).




**Complementary Cumulative Distribution Function (CCDF)**




**Frequency Domain**




**Time Domain**

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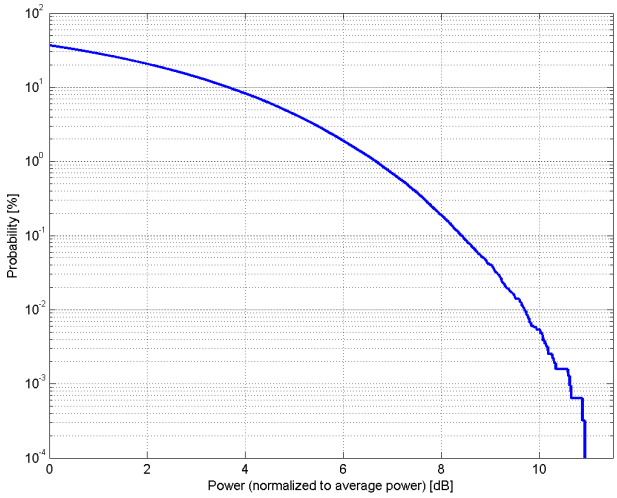
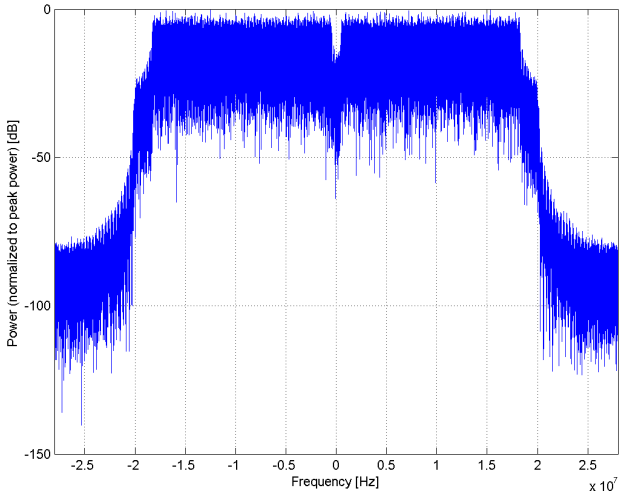
| | |
|---|---|
| Name: | **IEEE 802.11n (HT Greenfield, 150 Mbps, 64-QAM)** |
| Group: | WLAN |
| UID: | 10427-AAB |
| PAR: [1] | **8.41 dB** |
| MIF: [2] | **-13.44 dB** |
| Standard Reference: | IEEE 802.11n-2009 |
| Category: | Random amplitude modulation |
| Modulation: | BPSK |
| Frequency Band: | WLAN 2.4GHz (2412.0 - 2484.0 MHz)<br>WLAN 5GHz (4915.0 - 5825.0 MHz)<br>U-NII-1, U-NII-2A (5170 - 5330 MHz)<br>U-NII-2C Standalone (5490 - 5710 MHz)<br>U-NII-2C <5.65 GHz (5490 - 5650 MHz)<br>U-NII-3 Standalone (5735 - 5835 MHz)<br>U-NII-2C, U-NII-3 (5650 - 5835 MHz)<br>Validation band (0.0 - 6000.0 MHz) |
| Detailed Specification: | Modulation: 64-QAM<br>Data Rate: 150 Mbps<br>PPDU Format: HT Greenfield<br>PPDU Type: 40 MHz<br>MCS Index: 7<br>Guard Interval: Short<br>Duty Cycle: 99% |
| Bandwidth: | 40.0 MHz |
| Integration Time: | 2.0 ms |

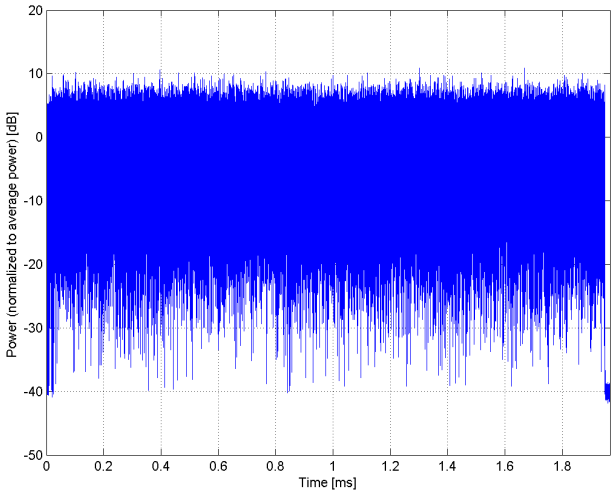
[1] PAR (0.1%) in accordance with FCC KDB 971168, Section 6.0 "'Measurement of the Peak-to-Average Power Ratio (PAPR)'"
[2] Modulation Interference Factor (MIF) value valid only in conjunction with advanced probe response linearization calibration for the same communication system (same UID and version).




**Complementary Cumulative Distribution Function (CCDF)**




**Frequency Domain**




**Time Domain**

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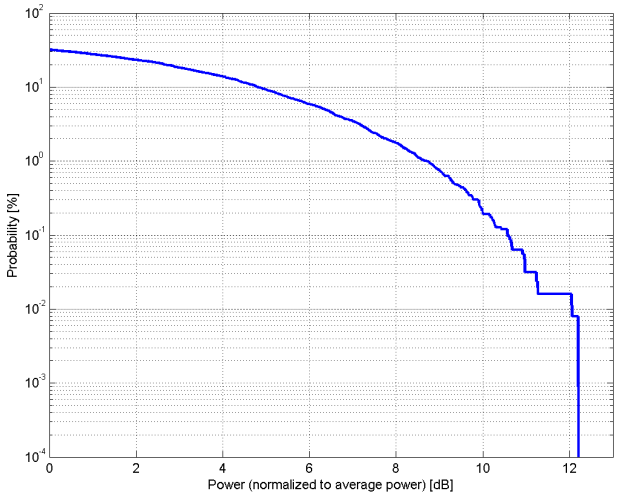
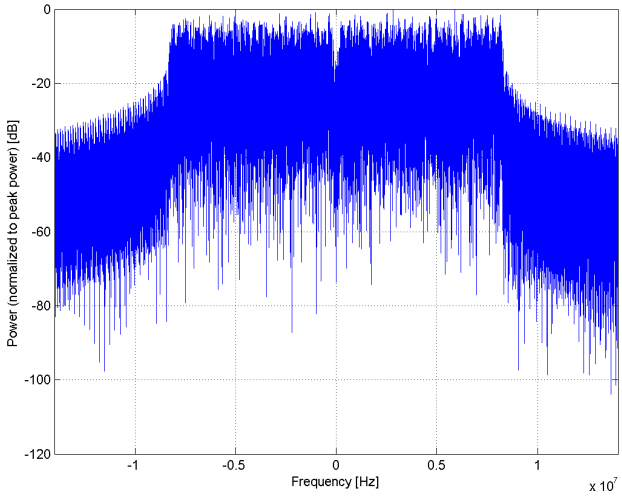
| | |
|---|---|
| Name: | **IEEE 802.11a/h WiFi 5 GHz (OFDM, 54 Mbps)** |
| Group: | WLAN |
| UID: | 10069-CAC |
| PAR: [1] | **10.56 dB** |
| MIF: [2] | **-3.15 dB** |
| Standard Reference: | IEEE 802.11a-1999 (R2003) , Part 11<br>IEEE 802.11h-2003 , Part 11<br>FCC SAR meas for 802 11 a b g v01r02 (248227 D01) |
| Category: | Random amplitude modulation |
| Modulation: | 64-QAM |
| Frequency Band: | WLAN 5GHz (4915.0 - 5825.0 MHz)<br>U-NII-1, U-NII-2A (5170 - 5330 MHz)<br>U-NII-2C Standalone (5490 - 5710 MHz)<br>U-NII-2C <5.65 GHz (5490 - 5650 MHz)<br>U-NII-3 Standalone (5735 - 5835 MHz)<br>U-NII-2C, U-NII-3 (5650 - 5835 MHz)<br>Validation band (0.0 - 6000.0 MHz) |
| Detailed Specification: | Data Rate: 54 Mbps<br>Coding Rate: 3/4<br>Coded bits per subcarrier: 6<br>Coded bits per OFDM symbol: 288<br>Data bits per OFDM symbol: 216<br>PSDU Length: 1000 Bytes<br>PSDU Data: PN9 |
| Bandwidth: | 20.0 MHz |
| Integration Time: | 0.3 ms |

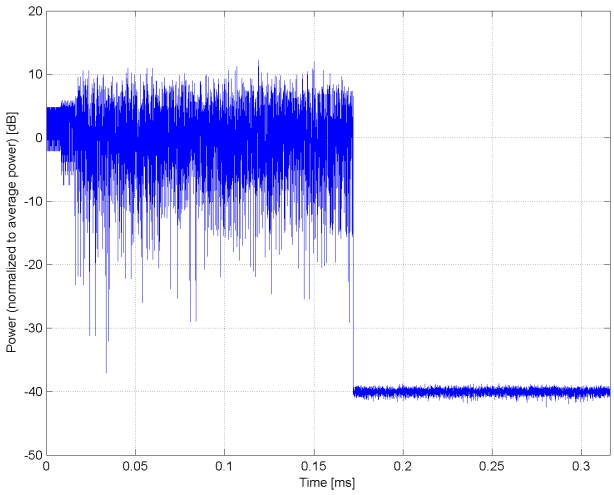
1 PAR (0.1%) in accordance with FCC KDB 971168, Section 6.0 "'Measurement of the Peak-to-Average Power Ratio (PAPR)'"
2 Modulation Interference Factor (MIF) value valid only in conjunction with advanced probe response linearization calibration for the same communication system (same UID and version).




**Complementary Cumulative Distribution Function (CCDF)**




**Frequency Domain**




**Time Domain**

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| | |
|---|---|
| Name: | **IEEE 802.11ac WiFi (40MHz, MCS0, 90pc duty cycle)** |
| Group: | WLAN |
| UID: | 10616-AAB |
| PAR: [1] | **8.82 dB** |
| MIF: [2] | **-5.57 dB** |
| Standard Reference: | IEEE 802.11-2013<br>FCC OET KDB 248227 D01 802.11 Wi-Fi SAR v02r01 |
| Category: | Random amplitude modulation |
| Modulation: | BPSK |
| Frequency Band: | WLAN 2.4GHz (2412.0 - 2484.0 MHz)<br>WLAN 5GHz (4915.0 - 5825.0 MHz)<br>U-NII-1, U-NII-2A (5170 - 5330 MHz)<br>U-NII-2C Standalone (5490 - 5710 MHz)<br>U-NII-2C <5.65 GHz (5490 - 5650 MHz)<br>U-NII-3 Standalone (5735 - 5835 MHz)<br>U-NII-2C, U-NII-3 (5650 - 5835 MHz)<br>Validation band (0.0 - 6000.0 MHz) |
| Detailed Specification: | Bandwidth: 40MHz<br>Duty cycle: 90%<br>MCS: 0<br>Number of spatial streams: 1<br>MPDU length: 8192 |
| Bandwidth: | 40.0 MHz |
| Integration Time: | 5.4 ms |

[1] PAR (0.1%) in accordance with FCC KDB 971168, Section 6.0 "'Measurement of the Peak-to-Average Power Ratio (PAPR)'"
[2] Modulation Interference Factor (MIF) value valid only in conjunction with advanced probe response linearization calibration for the same communication system (same UID and version).

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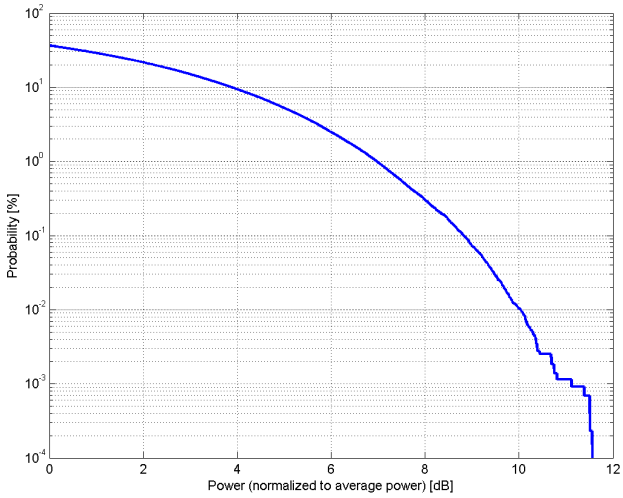
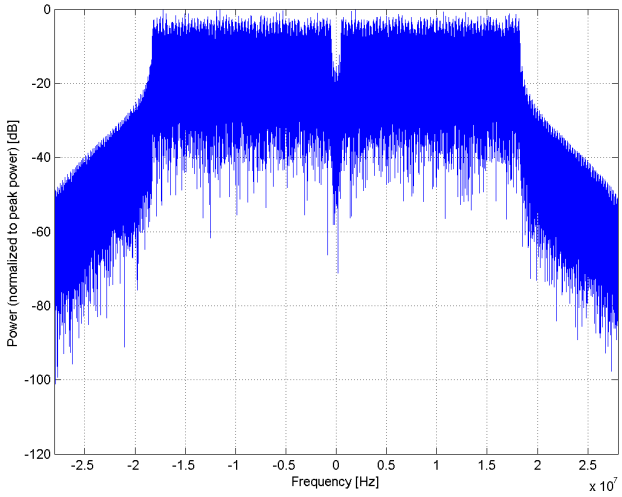
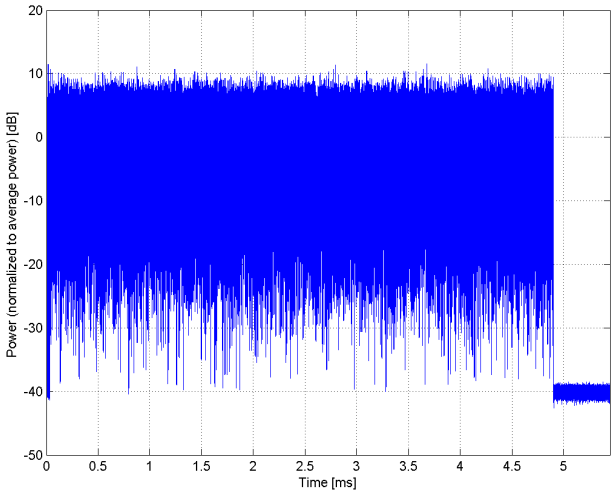



**Complementary Cumulative Distribution Function (CCDF)**




**Frequency Domain**




**Time Domain**

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| | |
|---|---|
| Name: | **IEEE 802.11ax (20MHz, MCS0, 90pc duty cycle)** |
| Group: | WLAN |
| UID: | 10671-AAC |
| PAR: [1] | **9.09 dB** |
| MIF: [2] | **-5.58 dB** |
| Standard Reference: | SPEAG |
| Category: | Random amplitude modulation |
| Modulation: | BPSK |
| Frequency Band: | WLAN 2.4GHz (2412.0 - 2484.0 MHz)<br>WLAN 5GHz (4915.0 - 5825.0 MHz)<br>U-NII-1, U-NII-2A (5170 - 5330 MHz)<br>U-NII-2C Standalone (5490 - 5710 MHz)<br>U-NII-2C <5.65 GHz (5490 - 5650 MHz)<br>U-NII-3 Standalone (5735 - 5835 MHz)<br>U-NII-2C, U-NII-3 (5650 - 5835 MHz)<br>U-NII-5 (5925 - 6425 MHz)<br>U-NII-6 (6425 - 6525 MHz)<br>U-NII-7 (6525 - 6875 MHz)<br>U-NII-8 (6875 - 7125 MHz)<br>U-NII-4 (5.825 - 5.925 MHz)<br>Validation band (0.0 - 6000.0 MHz) |
| Detailed Specification: | Bandwidth: 20MHz<br>Duty Cycle: 90%<br>Number of spatial stream: 1 |
| Bandwidth: | 20.0 MHz |
| Integration Time: | 5.0 ms |

[1] PAR (0.1%) in accordance with FCC KDB 971168, Section 6.0 "'Measurement of the Peak-to-Average Power Ratio (PAPR)'"
[2] Modulation Interference Factor (MIF) value valid only in conjunction with advanced probe response linearization calibration for the same communication system (same UID and version).

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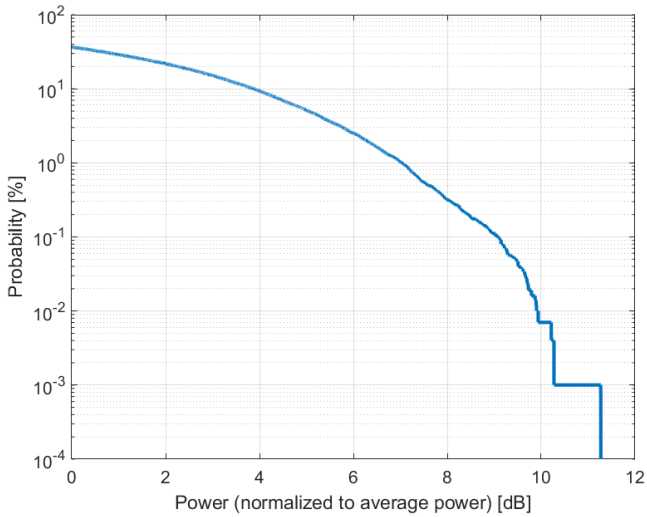
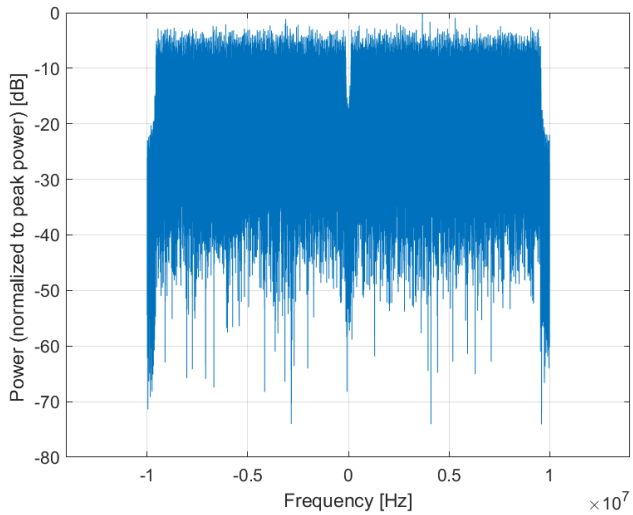
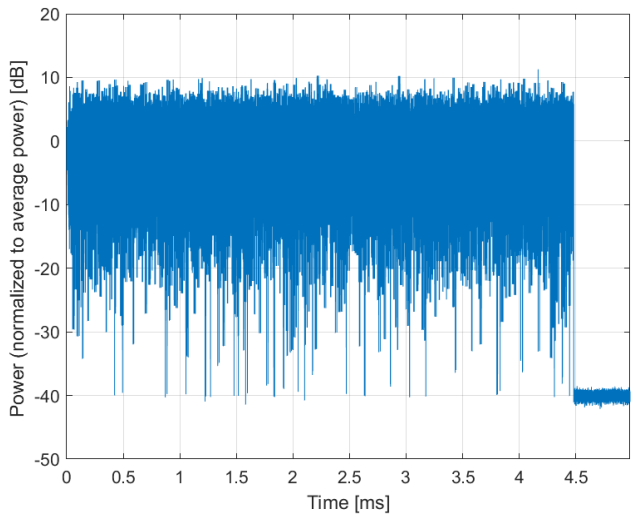



**Complementary Cumulative Distribution Function (CCDF)**




**Frequency Domain**




**Time Domain**