SC1905 100MHz Performance Data at 3.55GHz
With NXP A3I35D025WN Doherty PA
Test Set-up with SC1905 and NXP A3I35D025WN at 3.55GHz
SC1905-EVK3400 Test Conditions with NXP Doherty A3I35D025WN

- 100MHz LTE, 5 contiguous 20MHz Carriers (8dB PAR)
- 100MHz LTE, 2 non-contiguous 20MHz Carriers (8dB PAR)
- Amplifier Data
  - NXP A3I35D025WN, Doherty, LDMOS
  - Operating Frequency: 3400-3800 MHz, tuned for 3400-3600MHz
  - Frequency tested: 3550 MHz
  - Video Bandwidth: 400MHz
  - Gain = ~27dB; Psat = P3dB= ~ 45dBm
  - Vdd=28V
- RFIN Level needs to be higher at 3.5GHz than at other frequencies of operation.
  - Recommendation for all bands (except 3400-3800MHz) is 1<RFIN AGC (PDET)<8
  - For 3400-3800MHz, recommend using 7<RFIN AGC (PDET)<14
A3I35D025WN

- 28 V LDMOS
- 35 W Peak, 5 W Avg
- 3200-4000 MHz
- >24dB Gain
- >27% efficiency @ 9 dB OBO in Doherty
- Symmetrical Doherty
- TO-270WB low-Rjc plastic package
- 1.7° thermal resistance

Available Reference Circuits:

Typical line-up:

- Driver: MMZ3833B
- Final stage: A3I35D025WN

Comments:

- Internal baseband termination for wide instantaneous bandwidth applications
- On-chip matching (50 ohm input, DC blocked)
- Integrated quiescent current temperature compensation with enable/disable function
- Designed for predistortion error correction systems

Available Reference Circuits:

<table>
<thead>
<tr>
<th>Frequency</th>
<th>G_{PE} (dB)</th>
<th>PAE (%)</th>
<th>ACPR (dBc)</th>
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</thead>
<tbody>
<tr>
<td>3400 MHz</td>
<td>28.5</td>
<td>16.5</td>
<td>-46.5</td>
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<tr>
<td>3500 MHz</td>
<td>28.8</td>
<td>17.0</td>
<td>-46.3</td>
</tr>
<tr>
<td>3600 MHz</td>
<td>28.9</td>
<td>17.3</td>
<td>-46.1</td>
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<td>3700 MHz</td>
<td>28.7</td>
<td>17.7</td>
<td>-46.4</td>
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<tr>
<td>3800 MHz</td>
<td>28.5</td>
<td>17.9</td>
<td>-46.2</td>
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</table>
ACLR Performance with 5x20MHz (8dB PAR) at 3.55GHz

ACLR (dBc) vs. PA output Power (dBm)

ACLR: Lineariser OFF
ACLR: Lineariser ON
Efficiency

30 31 32 33 34 35 36
30 31 32 33 34 35 36
0.00 5.00 10.00 15.00 20.00 25.00 30.00
0.00 5.00 10.00 15.00 20.00 25.00 30.00
Maxim Integrated
Contiguous Carrier Configuration 5x20MHz (8dB PAR)
ACLR Performance with 5x20MHz (8dB PAR) at 3.5GHz
36dBm. Efficiency: 24.5%

SC1905 OFF
-34.6/-33.1dBC

15dB correction

SC1905 ON
-49.7/-48.5dBc
Non-Contiguous Carrier Configuration

Required Configuration for Non-contiguous carrier configuration
Min Frequency = Max Frequency
Linearizer Operation Mode 1 to Improve In-Band Correction

Wideband Parameters to be configured to define the 4 adaptation zone

<table>
<thead>
<tr>
<th>Group</th>
<th>Variable Name</th>
<th>Address</th>
<th>Value</th>
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</thead>
<tbody>
<tr>
<td>WideBand</td>
<td>NoobWeightFactorUpper</td>
<td>0xFD95</td>
<td>0</td>
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<tr>
<td>WideBand</td>
<td>LowerSemFreqB_MHz</td>
<td>0xFCF0</td>
<td>-79</td>
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<tr>
<td>WideBand</td>
<td>SemMeasBW_MHz</td>
<td>0xFC10</td>
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<tr>
<td>WideBand</td>
<td>UpperSemFreqA_MHz</td>
<td>0xFCF1</td>
<td>3</td>
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<tr>
<td>WideBand</td>
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<td>0xFCF2</td>
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<tr>
<td>WideBand</td>
<td>UpperSemFreqB_MHz</td>
<td>0xFCF3</td>
<td>3</td>
</tr>
<tr>
<td>WideBand</td>
<td>Linearizer Operation Mode</td>
<td>0xFD5E</td>
<td>1</td>
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<tr>
<td>WideBand</td>
<td>NoobWeightFactorLower</td>
<td>0xFD94</td>
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<td>WideBand</td>
<td>Customer Definable Guard Bin</td>
<td>0xFC62</td>
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The 4 red zones are defined by the different wideband parameters in the ACCP Config tab of the AdvGUI2.5.10
ACLR Performance with 10001 100MHz (8dB PAR) at 3.55GHz

ACLR (dBc)

PA Output Power (dBm)

Efficiency (%)
ACLR Performance with 5x20MHz 10001 (~8dB PAR) at 3.55GHz 37.5dBm. Efficiency: 27.25%

<table>
<thead>
<tr>
<th>Maxim Integrated</th>
<th>SC1905 OFF</th>
<th>Out-of-band IMs</th>
<th>-37/-38.6dBC</th>
<th>In-band IMs</th>
<th>-0.7/-1.5dBm</th>
</tr>
</thead>
<tbody>
<tr>
<td>SC1905 ON</td>
<td></td>
<td>Out-of-band IMs</td>
<td>-51.2/-50.1dBc</td>
<td>In-band IMs</td>
<td>-14.8/-13.9dBm</td>
</tr>
</tbody>
</table>

12-14dB Correction for Out-of-band and for In-band