

**Table A.13-2 – Link Budget for Voice-Rate Forward Link to  
Handheld User Terminal using CDMA**

| <b>Representative Forward Link Budget</b>                            |             |                   |
|--|-------------|-------------------|
| UT Type  |             | Handheld Terminal |
| Carrier Type   |             | CDMA              |
| <b><u>General Parameters</u></b>                                     | <b>Unit</b> |                   |
| E/S elevation angle  | deg         | 28.0              |
| Minimum user elevation angle   | deg         | 20.0              |
| Uplink range   | km          | 38792             |
| Downlink range   | km          | 39554             |
| Uplink frequency   | GHz         | 29.625            |
| Downlink frequency   | GHz         | 2.200             |
| Bandwidth/carrier  | kHz         | 1250.0            |
| <b><u>Uplink</u></b>   |             |                   |
| Uplink E/S antenna diameter  | m           | 11.0              |
| Uplink E/S antenna peak gain   | dBi         | 68.1              |
| E/S antenna pointing error   | dB          | 0.5               |
| Clear-sky uplink EIRP  | dBW         | 39.7              |
| Rain faded uplink EIRP   | dBW         | 56.5              |
| Free space loss  | dB          | 213.7             |
| Rain attenuation   | dB          | 16.8              |
| Satellite antenna pointing error                                     | dB          | 0.3               |
| Satellite antenna receive system noise temp.                         | dB-K        | 30.9              |
| Effective satellite antenna G/T                                      | dB/K        | 24.8              |
| Uplink C/N <sub>0</sub>  | dBHz        | 79.0              |
| Uplink C/IM <sub>0</sub>   | dBHz        | 87.2              |
| Uplink C/I <sub>0ASI</sub>   | dBHz        | 77.9              |
| Uplink C/I <sub>0 Intra-system</sub>                                 | dBHz        | 69.2              |
| Aggregate uplink C/I <sub>0</sub>                                    | dBHz        | 68.7              |
| <b><u>Downlink</u></b>   |             |                   |
| Satellite EIRP/carrier   | dBW         | 43.0              |
| Free space loss  | dB          | 191.2             |
| Atmospheric loss   | dB          | 0.1               |
| User terminal antenna gain   | dB          | 0.0               |
| User terminal system noise temperature                               | dB-K        | 27.0              |
| User terminal G/T  | dB/K        | -27.0             |
| Downlink propagation margin  | dB          | 10.0              |
| Downlink C/N <sub>0</sub>  | dBHz        | 43.2              |
| Downlink C/IM <sub>0</sub>   | dBHz        | 65.0              |
| Downlink C/I <sub>0 Intra-system</sub>                               | dBHz        | 50.0              |
| Downlink C/I <sub>0 ext</sub>  | dBHz        | 53.2              |
| Aggregate downlink C/I <sub>0</sub>                                  | dBHz        | 48.3              |
| <b><u>End-to-End Performance</u></b>                                 |             |                   |
| End-to-end C/N <sub>0</sub>  | dBHz        | 43.2              |
| End-to-end aggregate C/I <sub>0</sub>                                | dBHz        | 48.3              |
| End-to-end C/IM <sub>0</sub>   | dBHz        | 64.9              |
| Total aggregate C/(N <sub>0</sub> +I <sub>0</sub> +IM <sub>0</sub> ) | dBHz        | 42.0              |
| Total aggregate C/(N+I+IM)   | dB          | -18.9             |
| Required C/N   | dB          | -18.9             |
| System Margin  | dB          | 0.0               |