



# Smart Energy Solutions

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# Smart Energy Solutions

## Applications

- ZigBee® (IEEE 802.15.4)
- Industrial and Control Unlicensed Band Radios
- Plug-in Hybrid Electric Vehicles (PHEVs)
- 802.15.4g
- Home Security and Automation

## Products

- Front-end Modules (FEMs)
- Power Amplifiers (PAs) and Drivers
- Low Noise Amplifiers (LNAs)
- Power Management
- Switches
- Synthesizers
- Voltage Control Oscillators (VCOs)
- Diodes

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Skyworks lead (Pb)-free products are compliant to all applicable materials legislation. For additional information, please refer to *Skyworks Definition of Lead (Pb)-Free*, document number SQ04-0073. Tin/lead (SnPb) packaging is not recommended for new designs.

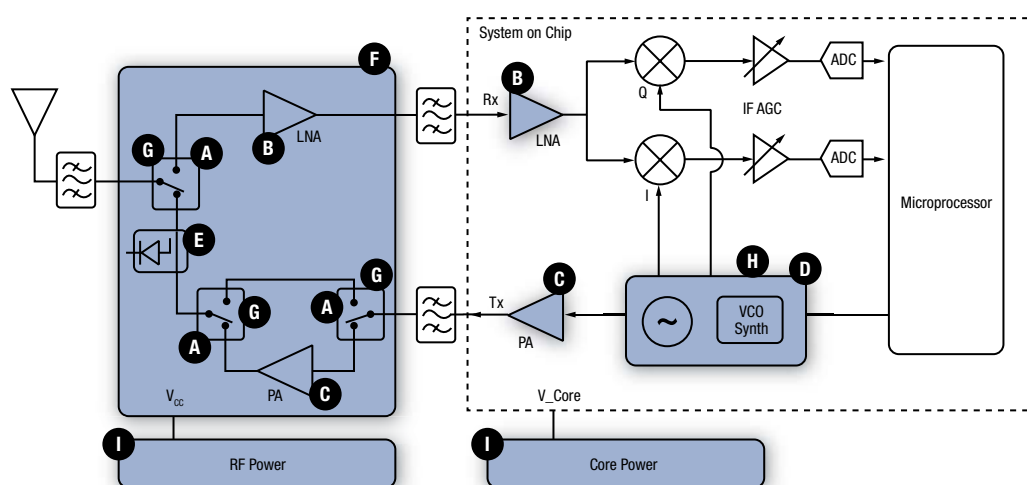


Skyworks Green™ products are compliant to all applicable materials legislation and are halogen-free. For additional information, please refer to *Skyworks Definition of Green™*, document number SQ04-0074.

# Smart Energy Solutions

## The Right Products for Your System Applications

Skyworks is committed to developing leading edge products for designs targeted at < 170, 410–470, 868–930, and 2400–2500 MHz radios. These solutions are ideal for wireless local area networks (WLAN), automated metering infrastructure (AMI), automated meter reading (AMR), professional mobile radio (PMR), and other ISM band applications. Figures 1 through 3 show short range radio, simplified smart communication module, and thermostat block diagrams.



### Switches

- A** AS179-92LF  
AS193-73LF  
SKY13270-92LF  
SKY13299-321LF  
SKY13309-370LF  
SKY13318-321LF  
SKY13348-374LF  
SKY13370-374LF

### PIN Diodes

- G** SMP1302-040LF  
SMP1302-079LF  
SMP1320-040LF  
SMP1320-079LF  
SMP1340-040LF  
SMP1340-079LF  
SMP1345-518

### LNAs

- B** SKY65045-70LF  
SKY65047-360LF  
SKY67013-396LF

### Power Drivers/Amplifiers

- C** SE2425U-R  
SE2433T-R  
SKY65006-348LF  
SKY65009-70LF  
SKY65045-70LF  
SKY65111-348LF  
SKY65116  
SKY65131  
SKY65132  
SKY65135  
SKY65146  
SKY65152  
SKY65162-70LF

### Synthesizers/PLLs/VCOs

- D** SKY72300-21  
SKY72300-362  
SKY72301-22  
SKY72310-362  
SKY73120

### Varactor Diodes

- H** SMV1142-011LF  
SMV1233-011LF  
SMV1235-040LF  
SMV1235-079LF  
SMV1236-004LF  
SMV1247-011LF  
SMV1247-040LF  
SMV1249-040LF  
SMV1249-079LF  
SMV1251-001LF  
SMV1253-079LF  
SMV1255-011LF  
SMV1405-040LF  
SMV1405-079LF  
SMV1408-001LF  
SMV1413-079LF  
SMV1763-040LF  
SMV1763-079LF

### Schottky Diodes

- E** SMS3926-023LF  
SMS3927-023LF  
SMS3928-023LF  
SMS7621-040LF  
SMS7621-060  
SMS7621-079LF  
SMS7630-040LF  
SMS7630-061  
SMS7630-079LF

### Tx/Rx Front-end Modules

- F** SE2431L-R  
SE2432L-R  
SE2435L-R  
SE2436L-R  
SE2438T-R  
SE2442L-R  
SKY66101-11  
SKY66108  
SKY66109-11  
SKY65313-21  
SKY65342-11  
SKY65346-21  
SKY65364-11  
SKY65366-21  
SKY65367-11  
SKY66100-11

### Battery Chargers Linear Chargers

- I** AAT3663  
AAT3681

### Switching Charger

- AAT3620

### Super Capacitor Chargers

- AAT4621  
AAT4712

### DC/DC Converters

#### Step-Down Converters

- AAT2114A  
SKY87201

Figure 1. Short Range Radio Block Diagram

## The Right Products for Your System Applications (Continued)

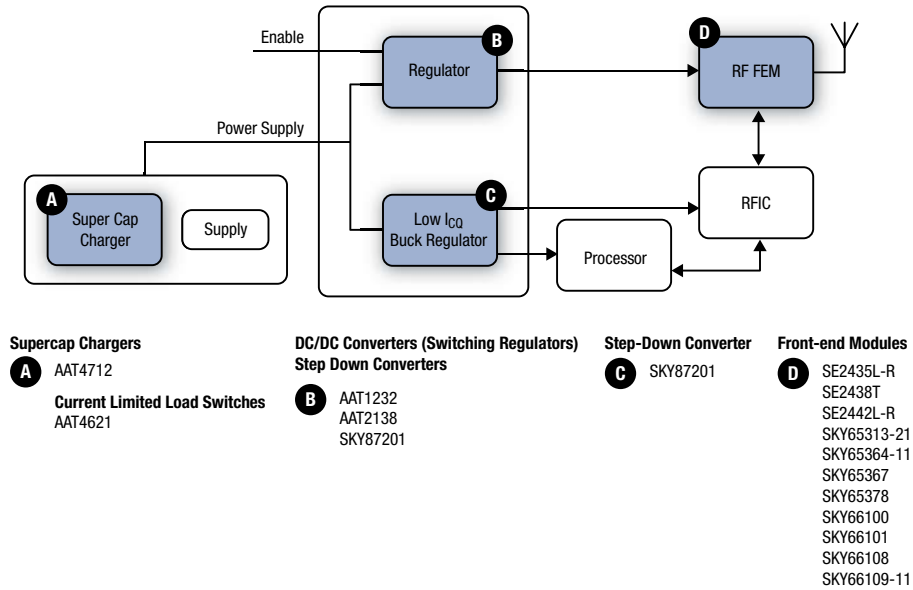


Figure 2. Smart Meter Communication Module (Simplified) Block Diagram

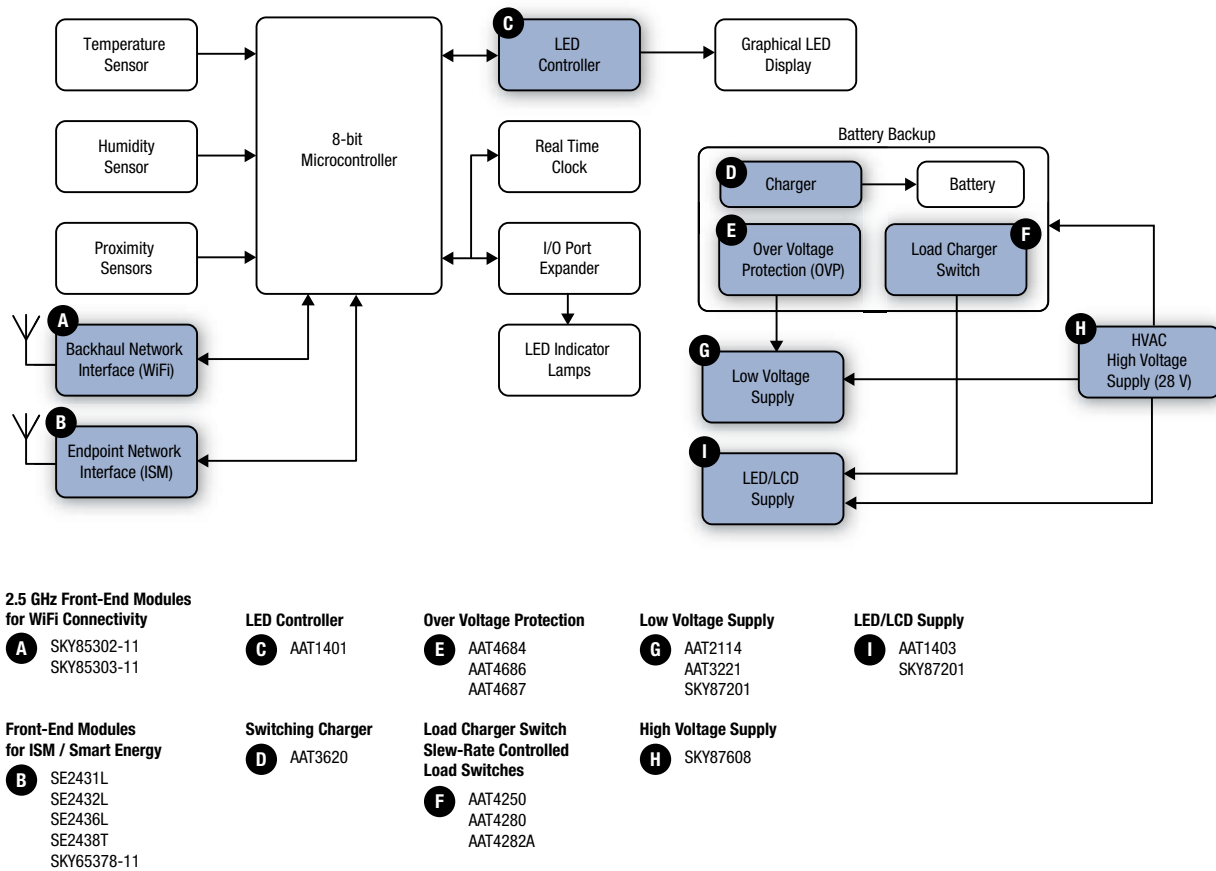


Figure 3. Thermostat Block Diagram

## Custom Front-end Modules (FEMs)

Skyworks' custom FEMs allow for significant size and cost reduction. In addition, many of Skyworks' FEMs are designed to allow for "plug and play" functionality, thus drastically reducing the design time for new products. Customized FEMs can be created depending on transceiver implementation requirements. Various modules are being targeted at < 170, 410–470, 868–930, and 2400–2500 MHz frequency bands. Figure 4 shows a custom FEM block diagram.

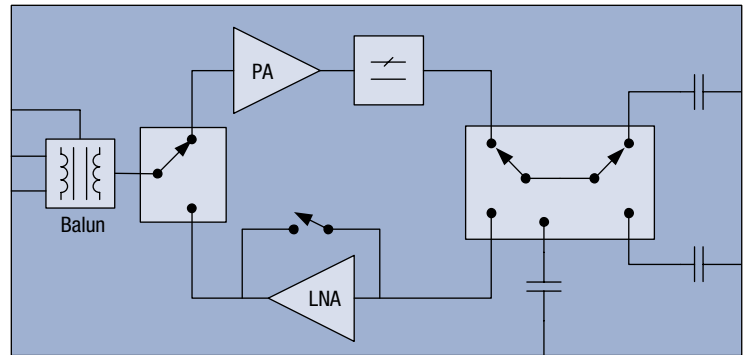


Figure 4. Custom Front-end Module (FEM)

### Possibilities for Integration Include:

- T/R Switches
- Power Amplifiers
- Low Noise Amplifiers (LNAs)
- Mixers
- Harmonic Filters

## Product Specifications

Specification tables for all of our latest Smart Energy products are provided on the following pages.

### FRONT-END MODULES

Table 1. Front-end Modules

| Part Number        | Function                                                                    | P <sub>OUT</sub> (dBm) | Tx Gain (dB) | Rx Gain (dB) | I <sub>CC</sub> Tx (mA) | Package (mm) | Frequency Band (MHz) |         |         |           |
|--------------------|-----------------------------------------------------------------------------|------------------------|--------------|--------------|-------------------------|--------------|----------------------|---------|---------|-----------|
|                    |                                                                             |                        |              |              |                         |              | < 170                | 410–470 | 868–930 | 2400–2500 |
| SKY66100-11        | Tx / Rx Front-end Module with Rx / Tx Bypass                                | 20–27                  | 30           | -0.5         | 110–300                 | MCM 4 x 4    | •                    |         |         |           |
| SKY65367-11        | High Power Tx / Rx Front-end Module with Rx / Tx Bypass                     | 30                     | 35           | -0.5         | 600                     | MCM 4 x 4    | •                    |         |         |           |
| SKY65342-11        | High Power Tx / Rx Front-end Module with Rx Bypass                          | 27–30                  | 34           | -0.6         | 650                     | MCM 8 x 8    |                      | •       |         |           |
| <b>SKY65366-21</b> | High Performance Tx / Rx Front-end Module                                   | 30.5                   | 22           | 22           | 728                     | MCM 6 x 6    |                      | •       |         |           |
| <b>SKY65378-11</b> | Low Power Front-end Module with Tx Bypass and LNA                           | –                      | –            | 14–17        | 3–7 <sup>(1)</sup>      | QFN 4 x 4    |                      |         | •       |           |
| <b>SKY65346-21</b> | Tx / Rx Front-end Module with LNA                                           | 26                     | 35           | 13.7         | 200                     | MCM 5 x 5    |                      |         | •       |           |
| SE2435L-R          | High Power Tx / Rx Front-end Module with LNA                                | 30                     | 28           | 16           | 550                     | QFN 4 x 4    |                      |         | •       |           |
| SE2442L-R          | High Power Tx / Rx Front-end Module with Rx Bypass                          | 30                     | 28           | -0.7         | 550                     | QFN 4 x 4    |                      |         | •       |           |
| SKY65313-21        | Tx / Rx Front-end Module with LNA                                           | 30.5                   | 28           | 16.6         | 695                     | MCM 6 x 6    |                      |         | •       |           |
| SKY65364-11        | High Power Tx / Rx Front-end Module with LNA, PA, Tx / Rx Bypass, HD Filter | 30.5                   | 30           | 15           | 730                     | MCM 6 x 6    |                      |         | •       |           |
| <b>SKY66101-11</b> | High Performance, Highly Integrated Front-end Module                        | 31                     | 25           | 16           | 670                     | MCM 6 x 6    |                      |         | •       |           |
| SE2438T-R          | Low Power Tx / Rx Front-end Module with LNA                                 | 10–14                  | 16           | 12.3         | 20–33                   | QFN 3 x 3    |                      |         |         | •         |
| <b>SKY66108</b>    | Low Power Tx / Rx Front-end Module with LNA                                 | 10–14                  | 16           | 12.3         | 20–33                   | QFN 3 x 3    |                      |         |         | •         |

1. SKY65378: I<sub>CC</sub> Rx gain value shown.

New products indicated in **blue**, **bold** are continually being introduced at Skyworks. For the latest information, please visit the new products section of our Web site at [www.skyworksinc.com](http://www.skyworksinc.com).

## FRONT-END MODULES (CONTINUED)

Table 1. Front-end Modules (Continued)

| Part Number                                                                                         | Function                                             | P <sub>OUT</sub><br>(dBm) | Tx Gain<br>(dB) | Rx Gain<br>(dB) | I <sub>CC</sub> Tx<br>(mA) | Package<br>(mm) | Frequency Band (MHz) |         |         |           |
|-----------------------------------------------------------------------------------------------------|------------------------------------------------------|---------------------------|-----------------|-----------------|----------------------------|-----------------|----------------------|---------|---------|-----------|
|                                                                                                     |                                                      |                           |                 |                 |                            |                 | < 170                | 410–470 | 868–930 | 2400–2500 |
| <b>SKY85302-11</b>                                                                                  | 2.4 GHz, 256 QAM WLAN/Bluetooth® Front-end Module    | 19                        | 26              | 14              | –                          | QFN 2.5 x 2.5   |                      |         |         | •         |
| <b>SKY85303-11</b>                                                                                  | 2.4 GHz, 256 QAM WLAN/Bluetooth® Front-end Module    | 19                        | 26              | 14              | –                          | QFN 2.5 x 2.5   |                      |         |         | •         |
|  SE2431L-R          | Tx / Rx Front-end Module with LNA                    | 20                        | 23              | 12              | 110                        | QFN 3 x 4       |                      |         |         | •         |
|  SE2432L-R          | Tx / Rx Front-end Module with LNA                    | 20                        | 22              | 11.5            | 110                        | QFN 3 x 4       |                      |         |         | •         |
|  SE2436L-R          | High Power Tx / Rx Front-end Module with LNA         | 27                        | 28              | 11.5            | 400                        | QFN 4 x 4       |                      |         |         | •         |
|  <b>SKY66109-11</b> | High Performance, Highly Integrated Front-end Module | 20–24                     | 22              | 12              | 105                        | MCM 3 x 4       |                      |         |         | •         |

## AMPLIFIERS

Table 2. Power Amplifiers

| Part Number                                                                                       | Function                | P <sub>OUT</sub><br>(dBm) | Gain<br>(dB)       | P <sub>1dB</sub><br>(dBm) | I <sub>CC</sub><br>(mA) | Package<br>(mm)  | Frequency Band (MHz) |     |      |
|---------------------------------------------------------------------------------------------------|-------------------------|---------------------------|--------------------|---------------------------|-------------------------|------------------|----------------------|-----|------|
|                                                                                                   |                         |                           |                    |                           |                         |                  | 450                  | 915 | 2400 |
|  SE2433T-R        | 2-Stage Power Amplifier | 24                        | 22                 | 24                        | –                       | QFN 2.5 x 2      |                      |     | •    |
| SKY65116                                                                                          | 2-Stage Power Amplifier | –                         | 33                 | 33                        | 320                     | MCM 8 x 8        | •                    |     |      |
| SKY65111-348LF                                                                                    | 3-Stage Power Amplifier | –                         | 39.5               | 29.5                      | 250                     | QFN 3 x 3        |                      | •   |      |
| SKY65006-348LF                                                                                    | 3-Stage Power Amplifier | –                         | 27.5               | 23.4                      | 50                      | QFN 3 x 3        |                      |     | •    |
| SKY65131                                                                                          | 2-Stage Power Amplifier | –                         | 26                 | 28                        | 150                     | MCM 4 x 4        |                      |     | •    |
| SKY65132                                                                                          | 3-Stage Power Amplifier | –                         | 33                 | 30                        | 330                     | MCM 6 x 6        |                      |     | •    |
|  SKY65009-70LF  | Single Stage Driver     | –                         | 17                 | 25                        | 110                     | SOT-89 4.5 x 2.4 | •                    | •   | •    |
|  SKY65045-70LF  | Single Stage Driver     | –                         | 14 dB @<br>900 MHz | 25                        | 60                      | SOT-89 4.5 x 2.4 | •                    | •   |      |
| SKY65162-70LF                                                                                     | Single Stage Driver     | –                         | 20                 | 29                        | 185                     | SOT-89 4.5 x 2.4 | •                    | •   | •    |
| SKY65152-11                                                                                       | 3-Stage Power Amplifier | –                         | 32                 | 33                        | 490                     | MCM 6 x 6        |                      |     | •    |
|  SKY67130-396LF | Single Stage Driver     | –                         | 13                 | 16                        | 22                      | DFN 2 x 2        | •                    | •   | •    |

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## AMPLIFIERS (CONTINUED)

**Table 3. Low Noise Amplifiers**

| Part Number                                                                                     | Function                      | Gain (dB)         | NF (dB) | I <sub>CC</sub> (mA) | IP <sub>1 dB</sub> (dBm) | Package (mm)     | Frequency Band (MHz) |     |      |
|-------------------------------------------------------------------------------------------------|-------------------------------|-------------------|---------|----------------------|--------------------------|------------------|----------------------|-----|------|
|                                                                                                 |                               |                   |         |                      |                          |                  | 450                  | 915 | 2400 |
|  SKY65050-372LF | LNA, Discrete (250–6000 MHz)  | 16 dB @ 900 MHz   | 0.6     | 10                   | -9                       | SC-70 2.2 x 1.35 | •                    | •   | •    |
|  SKY65047-360LF | LNA with Shutdown Mode        | 16.5 dB @ 915 MHz | 0.85    | 7.8                  | -7                       | QFN 2 x 2        | •                    | •   | •    |
| SKY65405-21                                                                                     | LNA with Shutdown Mode        | 14                | 1       | 12                   | -3                       | QFN 1.5 x 1.5    |                      |     | •    |
|  SKY67012-396LF | LNA, Discrete (300–600 MHz)   | 16                | 0.9     | 15                   | -1                       | DFN 2 x 2        | •                    |     |      |
|  SKY67013-396LF | LNA, Discrete (600–1500 MHz)  | 14.5              | 0.85    | 15                   | 2.5                      | DFN 2 x 2        |                      | •   |      |
|  SKY67014-396LF | LNA, Discrete (1500–3000 MHz) | 12                | 0.95    | 5                    | 5                        | DFN 2 x 2        |                      |     | •    |
|  SKY67110-396LF | LNA, High Linearity           | 21                | 0.65    | 77                   | 2                        | DFN 2 x 2        | •                    |     |      |
|  SKY67101-396LF | LNA, High Linearity           | 17.9              | 0.5     | 56                   | 2.6                      | DFN 2 x 2        |                      | •   |      |
|  SKY67102-396LF | LNA, High Linearity           | 17.2              | 0.8     | 50                   | -1                       | QFN 2 x 2        |                      |     | •    |

## POWER MANAGEMENT

### Battery Chargers

**Table 4. Linear Chargers**

| Part Number                                                                                | Function                                                            | Max. Charge Current (mA) | V <sub>IN</sub> (V) | Package (mm)        |
|--------------------------------------------------------------------------------------------|---------------------------------------------------------------------|--------------------------|---------------------|---------------------|
|  AAT3663 | Linear Li-Ion Battery Charger for Single and Dual Cell Applications | 1000                     | 4.0–13.2            | TDFN 14L 3 x 3      |
|  AAT3681 | USB Port or AC Adapter Lithium-Ion/Polymer Battery Charger          | 300                      | 4.0–6.5             | SC70JW 8L 2.0 x 2.1 |

**Table 5. Switching Charger**

| Part Number                                                                                | Function                             | Switching Frequency (kHz) | V <sub>IN</sub> (V) | Package (mm)   |
|--------------------------------------------------------------------------------------------|--------------------------------------|---------------------------|---------------------|----------------|
|  AAT3620 | Cell Li+ Switch Mode Battery Charger | 1500                      | 4.3–6.0             | TDFN 14L 3 x 3 |

**Table 6. Supercapacitor Chargers**

| Part Number                                                                                | Function                                              | Fault Flag | V <sub>IN</sub> (V) | Package (mm)     |
|--------------------------------------------------------------------------------------------|-------------------------------------------------------|------------|---------------------|------------------|
|  AAT4712 | Supercapacitor Charger with Input Current Limit       | POK; RDY   | 2.5–5.5             | TDFN34 16L 3 x 4 |
|  AAT4621 | PC Card Current Limit Interface and Capacitor Charger | Yes        | 3.0–3.5             | TDFN 14L 3 x 3   |

**POWER MANAGEMENT (CONTINUED)****Voltage Regulation—DC/DC Converters (Switching Regulators)****Table 7. Step Up Converter**

| Part Number                                                                              | Function          | $V_{OUT}$ (V)           | Typ. $I_Q$ ( $\mu$ A) | $I_{OUT}$ (mA) | Package (mm)     |
|------------------------------------------------------------------------------------------|-------------------|-------------------------|-----------------------|----------------|------------------|
|  AAT1219 | Step Up Converter | 2.4 to $V_{OUT} + 0.25$ | 58                    | 1200           | TDFN33 12L 3 x 3 |

**Table 8. Step Down Converter**

| Part Number                                                                                      | Min. $V_{IN}$ (V) | Max. $V_{IN}$ (V) | Min. $V_{OUT}$ (V) | Max. $V_{OUT}$ (V) | $I_{OUT}$ (mA) | $f_{OSC}$ (kHz) | Typ. $I_Q$ ( $\mu$ A) | Package (mm)          |
|--------------------------------------------------------------------------------------------------|-------------------|-------------------|--------------------|--------------------|----------------|-----------------|-----------------------|-----------------------|
|  AAT2114A        | 2.7               | 5.5               | 1                  | $V_{IN}$           | 2500           | 3000            | 70                    | QFN 16L 3 x 3         |
|  AAT2138         | 2.7               | 5.5               | 3                  | $V_{IN}$           | 2500           | 2800            | 90                    | TDFN 14L 3 x 3 x 0.75 |
|  SKY87201-11     | 2.7               | 5.5               | 0.6                | $V_{IN}$           | 600            | 2000            | 37                    | SC70JW 8L 2 x 2.1     |
|  <b>SKY87608</b> | 4.5               | 28                | 0.9                | $0.8 \cdot V_{IN}$ | 3000           | 450             | 1600                  | SOP-8L 5 x 6 x 1.55   |

**Low Drop-Out (LDO) Linear Regulator****Table 9. Low Drop-Out (LDO) Linear Regulator**

| Part Number                                                                                | Function         | $V_{IN}$ (V)    | Typ. $I_Q$ ( $\mu$ A) | Max. $I_{OUT}$ (mA) | Package (mm)                                |
|--------------------------------------------------------------------------------------------|------------------|-----------------|-----------------------|---------------------|---------------------------------------------|
|  AAT3221 | Ultra Low IQ LDO | $V_{OUT} - 5.5$ | 1.1                   | 150                 | SOT-23 5L 2.85 x 2.8<br>SC70JW 8L 2.2 x 2.0 |

**Display and Lighting****White LED Driver****Table 10. Serial Boost White LED Backlight Driver**

| Part Number                                                                                | Number of LEDs | LED Channels | LED(s) per/Ch | Min. $V_{IN}$ (V) | Max. $V_{IN}$ (V) | Interface              | Typ. $I_Q$ ( $\mu$ A) | Peak Efficiency | Current Accuracy (%) | Current Matching (%) | Max. $I_{OUT}$ per/Ch (mA) | Package (mm)                      |
|--------------------------------------------------------------------------------------------|----------------|--------------|---------------|-------------------|-------------------|------------------------|-----------------------|-----------------|----------------------|----------------------|----------------------------|-----------------------------------|
|  AAT1401 | 6              | 1            | 6             | 2.7               | 5.5               | S2Cwire™, Filtered PWM | 0.43                  | 85%             | ±10%                 | N/A                  | 31                         | WLCSP 10L<br>1.545 x 1.145 x 0.62 |
|  AAT1403 | 10             | 1            | 10            | 2.7               | 5.5               | S2Cwire™, Filtered PWM | 0.43                  | 81%             | ±10%                 | N/A                  | 31                         | WLCSP 10L<br>1.545 x 1.145 x 0.62 |



**POWER MANAGEMENT (CONTINUED)****Display and Lighting (Continued)****Table 11. Over Voltage Protection**

| Part Number                                                                              | Number of Channels | Enable | Fault Flag | $I_{LIM}$ | Typ. $R_{DS(ON)}$ (m $\Omega$ ) | $V_{IN}$ (V) | Typ. $I_Q$ ( $\mu$ A) | Package (mm)                    |
|------------------------------------------------------------------------------------------|--------------------|--------|------------|-----------|---------------------------------|--------------|-----------------------|---------------------------------|
|  AAT4684 | 1                  | Yes    | Yes        | 1.8 A     | 100                             | 3.0–14.0     | 30                    | TSOPJW 12L<br>3.0 x 2.85 x 1.02 |
|  AAT4686 | 1                  | Yes    | Yes        | N/A       | N/A                             | 3.0–14.0     | 30                    | SC70JW 8L<br>2.0 x 2.1 x 1.05   |
|  AAT4687 | 1                  | Yes    | Yes        | N/A       | 130                             | 3.0–14.0     | 30                    | SC70JW 10L<br>2.0 x 2.0 x 1.1   |

**Port Protection and Power Distribution****Table 12. Slew Rate Controlled**

| Part Number                                                                                 | Number of Channels | Enable | Turn On Rise Time ( $T_R$ )     | Typ. $R_{DS(ON)}$ (m $\Omega$ ) | $V_{IN}$ (V) | Typ. $I_Q$ ( $\mu$ A) | Package (mm)                                                              |
|---------------------------------------------------------------------------------------------|--------------------|--------|---------------------------------|---------------------------------|--------------|-----------------------|---------------------------------------------------------------------------|
|  AAT4250    | 1                  | Yes    | 1.5 ms                          | 120                             | 1.8–5.5      | 2                     | SOT-23 5L, (SOT25)<br>2.85 x 2.80 x 1.20<br>SC70JW 8L<br>2.0 x 2.1 x 1.05 |
|  AAT4280    | 1                  | Yes    | 0.5 $\mu$ s<br>0.1 ms<br>1.0 ms | 80                              | 1.8–5.5      | 2                     | SOT-23 6L<br>2.85 x 2.80 x 1.20<br>SC70JW8L<br>2.2 x 2.0 x 1.05           |
|  AAT4282A | 2                  | Yes    | 0.5 $\mu$ s<br>0.1 ms<br>1.0 ms | 60                              | 1.5–6.5      | 1                     | FTDFN22-8<br>2.0 x 2.0 x 0.75<br>SC70JW 8L<br>2.2 x 2.0 x 1.05            |
|  AAT4282B | 2                  | Yes    | 0.065 ms<br>0.75 ms             | 67                              | 1.5–6.5      | 0.04                  | TDFN22-8<br>2.0 x 2.0 x 0.75                                              |

## SWITCHES

Table 13. SPDT (SP2T), SP3T, and DPDT RF Switches

| Part Number                                                                                     | Function              | Insertion Loss (dB) | Isolation (dB) | P <sub>1dB</sub> (dBm) | Input IP3 (dBm) | Package (mm)      | Frequency Band (MHz) |     |      |
|-------------------------------------------------------------------------------------------------|-----------------------|---------------------|----------------|------------------------|-----------------|-------------------|----------------------|-----|------|
|                                                                                                 |                       |                     |                |                        |                 |                   | 450                  | 915 | 2400 |
|  SKY13268-344LF | SPDT Switch, Low Loss | 0.3                 | 25             | 30                     | 50              | SOT-666 1.5 x 1.2 | •                    | •   | •    |
|  SKY13309-370LF | SP3T Switch, Low Loss | 0.5                 | 25             | 29                     | —               | QFN 2 x 2         | •                    | •   | •    |
|  AS179-92LF     | SPDT Switch, Low Loss | 0.3                 | 25             | 30                     | 48              | SC-88 2.2 x 2     | •                    | •   | •    |
|  SKY13270-92LF  | SPDT Switch, Low Loss | 0.35                | 24             | >37                    | 56              | SC-88 2.1 x 2.0   | •                    | •   | •    |
| AS193-73LF                                                                                      | SPDT Switch, Low Loss | 0.35                | 24             | 37                     | 55              | SOT-6 2.8 x 2.9   | •                    | •   | •    |
|  SKY13348-374LF | SPDT Switch           | 0.6                 | 27             | 37                     | 52              | DFN 1.5 x 1.5     | •                    | •   | •    |
|  SKY13370-374LF | SPDT Switch           | 0.7                 | 31             | 39                     | 55              | DFN 1.5 x 1.5     | •                    | •   | •    |
| SKY13299-321LF                                                                                  | SPDT Switch           | 0.3–0.75            | 30–22          | 39                     | 57              | QFN 3 x 3         | •                    | •   | •    |
|  SKY13318-321LF | DPDT Switch           | 0.95–1.15           | 22–15          | 34                     | 57              | QFN 3 x 3         | •                    | •   | •    |

## SYNTHESIZERS

Table 14. Dual and Single Fractional-N Synthesizers

| Part Number    | Function                  | Phase Noise (dBc/Hz) | Direct Modulation | I <sub>DD</sub> (mA) | Package (mm)    | Frequency Band (MHz) |     |      |
|----------------|---------------------------|----------------------|-------------------|----------------------|-----------------|----------------------|-----|------|
|                |                           |                      |                   |                      |                 | 450                  | 915 | 2400 |
| SKY72300-21    | Dual Frac-N Synthesizer   | -91                  | FSK, FM, GMSK     | 12.5                 | TSSOP 9.7 x 6.4 | •                    | •   |      |
| SKY72300-362   | Dual Frac-N Synthesizer   | -91                  | FSK, FM, GMSK     | 12.5                 | QFN 4 x 4       | •                    | •   |      |
| SKY72301-22    | Dual Frac-N Synthesizer   | -96                  | FSK, FM, GMSK     | 11                   | TSSOP 9.7 x 6.4 | •                    | •   |      |
| SKY72310-362LF | Single Frac-N Synthesizer | -91                  | FSK, FM, GMSK     | 12.5                 | QFN 4 x 4       | •                    | •   |      |

## VOLTAGE CONTROLLED OSCILLATORS (VCOs)

Table 15. Voltage Controlled Oscillators (VCOs)

| Part Number | Function | Phase Noise (dBc/Hz) | Direct Modulation | I <sub>DD</sub> (mA) | Package (mm) | Frequency Band (MHz) |     |      |
|-------------|----------|----------------------|-------------------|----------------------|--------------|----------------------|-----|------|
|             |          |                      |                   |                      |              | 450                  | 915 | 2400 |
| SKY73120    | CMOS VCO | -110 @ 25 kHz Offset | 0                 | 26                   | MCM 6 x 6    |                      | •   |      |

## DIODES

Table 16. Varactor Diodes for Tuning Applications

| Part Number                                                                                    | Function   | Capacitance ( $C_j$ ) | Capacitance Ratio ( $C_R$ ) | Series Resistance ( $R_s$ )/<br>Quality Factor | Package (mm)       | Frequency Band (MHz) |     |      |
|------------------------------------------------------------------------------------------------|------------|-----------------------|-----------------------------|------------------------------------------------|--------------------|----------------------|-----|------|
|                                                                                                |            |                       |                             |                                                |                    | 450                  | 915 | 2400 |
|  SMV1405-079LF | VCO Tuning | 1.8 pF @ 1 V          | $C_{T0}/C_{T30} = 4.1$      | $Q @ 4 V 50 MHz = 3200$                        | SC-79 1.6 x 0.8    | •                    | •   | •    |
|  SMV1405-040LF | VCO Tuning | 1.8 pF @ 1 V          | $C_{T0}/C_{T30} = 4.1$      | $Q @ 4 V 50 MHz = 3200$                        | 0402 1.0 x 0.6     | •                    | •   | •    |
|  SMV1413-079LF | VCO Tuning | 6.4 pF @ 1 V          | $C_{T0}/C_{T30} = 4.2$      | $Q @ 4 V 50 MHz = 2400$                        | SC-79 1.6 x 0.8    | •                    | •   | •    |
|  SMV1408-001LF | VCO Tuning | 2.9 pF @ 1 V          | $C_{T0}/C_{T30} = 4.1$      | $Q @ 4 V 50 MHz = 2900$                        | SOT-23 2.9 x 2.35  | •                    | •   | •    |
|  SMV1247-011LF | VCO Tuning | 7 pF @ 0.3 V          | $C_{T0.3}/C_{T4.7} = 10$    | $Q @ 3 V 50 MHz = 1500$                        | SOD-323 2.5 x 1.25 | •                    | •   | •    |
|  SMV1247-040LF | VCO Tuning | 7 pF @ 0.3 V          | $C_{T0.3}/C_{T4.7} = 10$    | $Q @ 3 V 50 MHz = 1500$                        | 0402 1.0 x 0.6     | •                    | •   | •    |
|  SMV1249-040LF | VCO Tuning | 31 pF @ 0.3 V         | $C_{T0.3}/C_{T4.7} = 12.1$  | $R_s @ 3 V 500 MHz = 1.2 \Omega$               | 0402 1.0 x 0.6     | •                    | •   | •    |
|  SMV1249-079LF | VCO Tuning | 31 pF @ 0.3 V         | $C_{T0.3}/C_{T4.7} = 12.1$  | $R_s @ 3 V 500 MHz = 2.2 \Omega$               | SC-79 1.6 x 0.8    | •                    | •   | •    |
|  SMV1251-001LF | VCO Tuning | 42 pF @ 0.3 V         | $C_{T0.3}/C_{T4.7} = 12.2$  | $R_s @ 3 V 500 MHz = 1.6 \Omega$               | SOT-23 2.9 x 2.35  | •                    | •   | •    |
|  SMV1253-079LF | VCO Tuning | 53 pF @ 0.3 V         | $C_{T0.3}/C_{T4.7} = 12.3$  | $R_s @ 3 V 500 MHz = 1.4 \Omega$               | SC-79 1.6 x 0.8    | •                    | •   | •    |
|  SMV1255-011LF | VCO Tuning | 64 pF @ 0.3 V         | $C_{T0.3}/C_{T4.7} = 12.3$  | $R_s @ 3 V 500 MHz = 1.3 \Omega$               | SOD-323 2.5 x 1.25 | •                    | •   | •    |
|  SMV1233-011LF | VCO Tuning | 3.3 pF @ 1 V          | $C_{T1}/C_{T3} = 1.5$       | $R_s @ 3 V 500 MHz = 1.2 \Omega$               | SOD-323 2.5 x 1.25 | •                    | •   | •    |
|  SMV1236-004LF | VCO Tuning | 17 pF @ 1 V           | $C_{T1}/C_{T3} = 1.6$       | $R_s @ 3 V 500 MHz = 0.5 \Omega$               | SOT-23 2.9 x 2.35  | •                    | •   | •    |
|  SMV1763-040LF | VCO Tuning | 5.2 pF @ 1 V          | $C_{T0.5}/C_{T2.5} = 2.3$   | $R_s @ 1 V 900 MHz = 0.7 \Omega$               | 0402 1.0 x 0.6     | •                    | •   | •    |
|  SMV1763-079LF | VCO Tuning | 5.2 pF @ 1 V          | $C_{T0.5}/C_{T2.5} = 2.5$   | $R_s @ 1 V 500 MHz = 0.7 \Omega$               | SC-79 1.6 x 0.8    | •                    | •   | •    |
|  SMV1142-011LF | VCO Tuning | 8.2 pF @ 1 V          | $C_{T1}/C_{T3} = 1.5$       | $R_s @ 3 V 500 MHz = 0.7 \Omega$               | SOD-323 2.5 x 1.25 | •                    | •   | •    |
|  SMV1235-079LF | VCO Tuning | 11.5 pF @ 1 V         | $C_{T1}/C_{T3} = 1.8$       | $R_s @ 3 V 500 MHz = 0.6 \Omega$               | SC-79 1.6 x 0.8    | •                    | •   | •    |
|  SMV1235-040LF | VCO Tuning | 11.5 pF @ 1 V         | $C_{T1}/C_{T3} = 1.8$       | $R_s @ 3 V 500 MHz = 0.6 \Omega$               | 0402 1.0 x 0.6     | •                    | •   | •    |

## DIODES (CONTINUED)

Table 17. PIN Diodes for Switching Applications

| Part Number                                                                                    | Function          | Voltage Breakdown ( $V_B$ ) | Capacitance ( $C_T$ ) | Series Resistance ( $R_S$ )  | Package (mm)    | Frequency Band (MHz) |     |      |
|------------------------------------------------------------------------------------------------|-------------------|-----------------------------|-----------------------|------------------------------|-----------------|----------------------|-----|------|
|                                                                                                |                   |                             |                       |                              |                 | 450                  | 915 | 2400 |
| SMP1345-518                                                                                    | Antenna Switch    | 50 V @ 10 $\mu$ A           | 0.18 pF @ 5 V         | $R_S$ @ 10 mA = 1.5 $\Omega$ | LGA 1.2 x 1.4   | •                    | •   | •    |
|  SMP1340-040LF | T/R Switch        | 50 V @ 10 $\mu$ A           | 0.20 pF @ 5 V         | $R_S$ @ 10 mA = 0.9 $\Omega$ | 0402 1.0 x 0.6  | •                    | •   | •    |
|  SMP1340-079LF | Antenna Switch    | 50 V @ 10 $\mu$ A           | 0.20 pF @ 5 V         | $R_S$ @ 10 mA = 0.9 $\Omega$ | SC-79 1.6 x 0.8 | •                    | •   | •    |
|  SMP1320-040LF | T/R Switch        | 50 V @ 10 $\mu$ A           | 0.25 pF @ 30 V        | $R_S$ @ 10 mA = 0.9 $\Omega$ | 0402 1.0 x 0.6  | •                    | •   | •    |
|  SMP1320-079LF | T/R Switch        | 50 V @ 10 $\mu$ A           | 0.30 pF @ 30 V        | $R_S$ @ 10 mA = 0.9 $\Omega$ | SC-79 1.6 x 0.8 | •                    | •   | •    |
|  SMP1302-079LF | Attenuator Switch | 200 V @ 10 $\mu$ A          | 0.30 pF @ 30 V        | $R_S$ @ 10 mA = 3.0 $\Omega$ | SC-79 1.6 x 0.8 | •                    | •   | •    |
|  SMP1302-040LF | T/R Switch        | 50 V @ 10 $\mu$ A           | 0.30 pF @ 30 V        | $R_S$ @ 10 mA = 0.9 $\Omega$ | 0402 1.0 x 0.6  | •                    | •   | •    |

Table 18. Schottky Diodes for Detector and Mixer Applications

| Part Number                                                                                           | Function           | Voltage Breakdown ( $V_B$ ) | Capacitance ( $C_T$ ) | Forward Voltage ( $V_F$ )   | Package (mm)        | Frequency Band (MHz) |     |      |
|-------------------------------------------------------------------------------------------------------|--------------------|-----------------------------|-----------------------|-----------------------------|---------------------|----------------------|-----|------|
|                                                                                                       |                    |                             |                       |                             |                     | 450                  | 915 | 2400 |
|  SMS7630-040LF        | Detector           | 1 V @ 10 $\mu$ A            | 0.30 pF @ 0.15 V      | $V_F$ @ 0.1 mA = 60–120 mV  | SC-79 1.6 x 0.8     | •                    | •   | •    |
|  SMS7630-079LF        | Detector           | 1 V @ 10 $\mu$ A            | 0.30 pF @ 0.15 V      | $V_F$ @ 0.1 mA = 60–120 mV  | 0402 1.0 x 0.6      | •                    | •   | •    |
|  <b>SMS7630-061</b>   | Detector           | 1 V @ 10 $\mu$ A            | 0.30 pF @ 0.15 V      | $V_F$ @ 0.1 mA = 60–120 mV  | 0201 0.60 x 0.30    | •                    | •   | •    |
|  SMS7621-040LF        | Detector/Mixer     | 2 V @ 10 $\mu$ A            | 0.18 pF @ 0.15 V      | $V_F$ @ 1.0 mA = 260–320 mV | 0402 1.0 x 0.6      | •                    | •   | •    |
|  SMS7621-079LF        | Detector/Mixer     | 2 V @ 10 $\mu$ A            | 0.18 pF @ 0.15 V      | $V_F$ @ 1.0 mA = 260–320 mV | SC-79 1.6 x 0.8     | •                    | •   | •    |
|  <b>SMS7621-060</b> | Detector/Mixer     | 2 V @ 10 $\mu$ A            | 0.18 pF @ 0.15 V      | $V_F$ @ 1.0 mA = 260–320 mV | 0201 0.60 x 0.30    | •                    | •   | •    |
| SMS3926-023LF                                                                                         | Low Drive Mixer    | 2 V @ 10 $\mu$ A            | 0.30 pF @ 0 V         | $V_F$ @ 1.0 mA = 200–270 mV | SOT-143 2.37 x 2.92 | •                    | •   | •    |
| SMS3927-023LF                                                                                         | Medium Drive Mixer | 2 V @ 10 $\mu$ A            | 0.30 pF @ 0 V         | $V_F$ @ 1.0 mA = 310–370 mV | SOT-143 2.37 x 2.92 | •                    | •   | •    |
| SMS3928-023LF                                                                                         | High Drive Mixer   | 4 V @ 10 $\mu$ A            | 0.30 pF @ 0 V         | $V_F$ @ 1.0 mA = 520–580 mV | SOT-143 2.37 x 2.92 | •                    | •   | •    |

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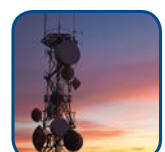
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