DATA SHEET

SKY77517–21 TX-RX iPAC™ FEM for Dual-Band GSM/GPRS

Applications

- Dual-band cellular handsets encompassing
  - Class 4 GSM850
  - PCS1900
  - Class 12 GPRS multi-slot operation

Features

- High efficiency
  - GSM850 48%
  - PCS 41%
- Low transmit supply current
  - GSM850 1.26 A
  - PCS1900 0.9 A
- Internal ICC sense resistor for iPAC
- Closed loop iPAC
- 50 Ω matched Input/Output
- TX–VCO-to-antenna and antenna-to-RX-SAW filter RF interface
- TX harmonics below –33 dBm
- PHEMT RF switches afford high linearity, low insertion loss, and less than 20 µA supply current in receive modes
- Small outline: 6 mm x 8 mm
- Low profile: 1.2 mm
- Compatible with multiple logic families
- Low APC current: 25 µA

NEW Skyworks offers lead (Pb)-free, RoHS (Restriction of Hazardous Substances)-compliant packaging.

Description

The SKY77517–21 is a transmit and receive front-end module (FEM) with Integrated Power Amplifier Control (iPAC™) for dual-band cellular handsets comprising GSM850 and PCS1900 operation. Designed in a low profile, compact form factor, the SKY77517–21 offers a complete Transmit VCO-to-Antenna and Antenna-to-Receive SAW filter solution. The FEM also supports Class 12 General Packet Radio Service (GPRS) multi-slot operation.

The module consists of a GSM850 PA block and a PCS1900 PA block, impedance-matching circuitry for 50 Ω input and output impedances, TX harmonics filtering, high linearity and low insertion loss PHEMT RF switches, diplexer and a Power Amplifier Control (PAC) block with internal current sense resistor. A custom BiCMOS integrated circuit provides the internal PAC function and decoder circuitry to control the RF switches. The two Heterojunction Bipolar Transistor (HBT) PA blocks are fabricated onto a single Gallium Arsenide (GaAs) die. One PA block supports the GSM850 band and the other PA block supports the PCS1900 band. Both PA blocks share common power supply pads to distribute current. The output of each PA block and the outputs to the two receive pads are connected to the antenna pad through PHEMT RF switches and a diplexer. The GaAs die, PHEMT die, Silicon (Si) die and passive components are mounted on a multi-layer laminate substrate. The assembly is encapsulated with plastic overmold.

Band selection and control of transmit and receive modes are performed using two external control pads. Refer to the functional block diagram in Figure 1 below. The band select pad (BS) selects between GSM and PCS modes of operation. The transmit enable (TX_EN) pad controls receive or transmit mode of the respective RF switch (TX = logic 1). Proper timing between transmit enable (TX_EN) and Analog Power Control (VRAMP) allows for high isolation between the antenna and TX-VCO while the VCO is being tuned prior to the transmit burst.

The SKY77517 is compatible with logic levels from 1.2 V to VCC for BS and TX_EN pads, depending on the level applied to the VLOGIC pad. This feature provides additional flexibility for the designer in the selection of FEM interface control logic.

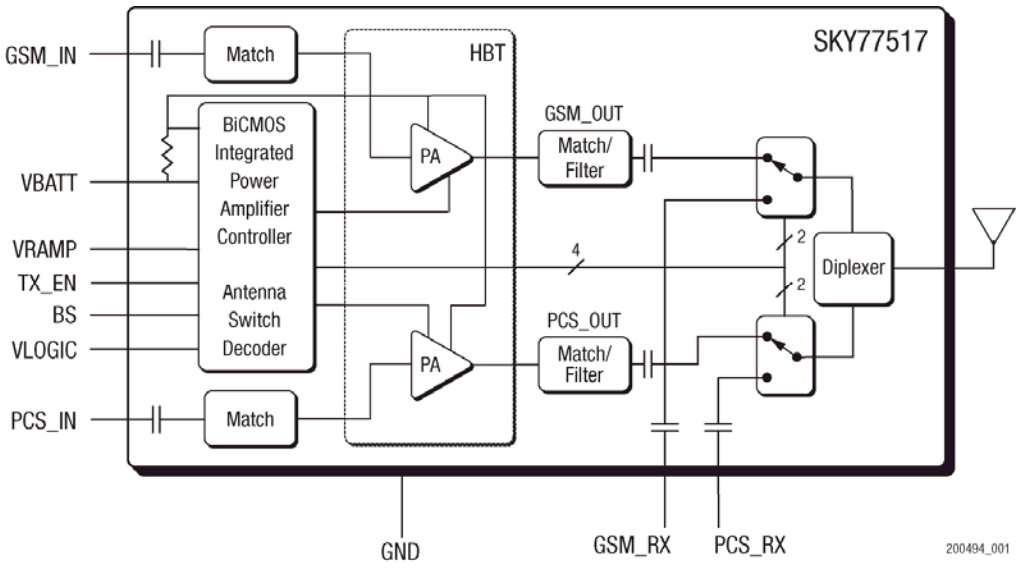


Figure 1. Functional Block Diagram

Electrical Specifications

The following tables list the electrical characteristics of the SKY77517–21 Front-End Module. The absolute maximum ratings and recommended operating conditions for the SKY77517–21 are listed in Table 1 and Table 2, respectively. Table 3 specifies the mode control logic and Table 4 contains the electrical characteristics of the SKY77517–21 for modes GSM850 and PCS1900. Figure 2 presents an application schematic for the SKY77517–21.

The SKY77517–21 is a static-sensitive electronic device and should not be stored or operated near strong electrostatic fields. Detailed information on device dimensions, pad descriptions, packaging and handling can be found in later sections of this data sheet.

Table 1. Absolute Maximum Ratings

Parameter	Minimum	Maximum	Unit
Input Power (P_{IN})	—	15	dBm
Supply Voltage (V_{CC}), Standby $V_{RAMP} \leq 0.3$ V $V_{LOGIC} \leq 0.5$ V	—	7	V
Control Voltage (V_{RAMP})	–0.5	V_{CC_MAX} – 0.2 V (See Table 4)	V
Storage Temperature	–55	150	°C

Table 2. Recommended Operating Conditions

Parameter	Minimum	Typical	Maximum	Unit
Supply Voltage (V_{CC})	2.7	3.3	4.8	V
Supply Current (I_{CC})	0		1.8	A
Operating Case Temperature (T_{CASE}) [1] 1-Slot (12.5% duty cycle)	–20		85	°C
2-Slot (25% duty cycle)	–20		85	

[1] Case Operating Temperature refers to the temperature of the GROUND PAD on the underside of the package.

Table 3. SKY77517–21 Mode Control Logic

Mode	V_{LOGIC}	Input Control Bits	
		TX_En	BS
STANDBY	0	X [1]	X [1]
GSM_RX	1	0	0
PCS_RX	1	0	1
GSM_TX	1	1	0
PCS_TX	1	1	1

[1] X = don't care

Table 4. SKY77517–21 Electrical Specifications [1] *(1 of 5)*

General							
Parameter		**Symbol**	**Test Condition**	**Minimum**	**Typical**	**Maximum**	**Units**
Supply voltage		V_{CC}	—	2.7	3.3	4.8	V
Power control impedance		Z_{VRAMP}	—		300		kΩ
VLOGIC control voltage	LOW	V_{LOGIC_LOW}	—	–0.1	—	0.5	V
	HIGH	V_{LOGIC_HIGH}		1.2	—	V_{CC}	
VLOGIC current		I_{VLOGIC}	VLOGIC ≤ 2.7 V TX_EN ≤ 0.4 V BS ≤ 0.4 V	—	1	20	µA
Band Select control voltage	LOW	V_{BS_LOW}	—	–0.1	—	30% V_{LOGIC}	V
	HIGH	V_{BS_HIGH}		70% V_{LOGIC}	—	V_{LOGIC}	
Band Select current		I_{BS}	BS ≤ 2.7 V	—	8	20	µA
TX_EN control voltage	LOW	$V_{TX\_EN\_LOW}$	—	–0.1	—	30% V_{LOGIC}	V
	HIGH	$V_{TX\_EN\_HIGH}$		70% V_{LOGIC}	—	V_{LOGIC}	
TX_EN current		I_{TX_EN}	TX_EN ≤ 2.7 V	—	8	20	µA
Leakage current	Standby Mode	I_{QS}	V_{CC} ≤ 4.8 V V_{LOGIC} = V_{LOGIC_LOW} V_{RAMP} ≤ 0.1 V TX_EN ≤ 0.4 V BS ≤ 0.4 V BS ≥ V_{LOGIC} – 0.4 V T_{CASE} = 25 °C P_{IN} ≤ –60 dBm	—	2	10	µA
	Receive Mode	I_{QRX}	V_{CC} ≤ 4.8 V 1.2 V ≤ V_{LOGIC} ≤ 2.7 V V_{RAMP} ≤ 0.1 V TX_EN ≤ 0.4 V BS ≤ 0.4 V BS ≥ V_{LOGIC} – 0.4 V T_{CASE} = 25 °C P_{IN} ≤ –60 dBm	—	15	50	

Table 4. SKY77517–21 Electrical Specifications [1] *(2 of 5)*

GSM850 Mode (f = 824 to 849 MHz and P_{IN} = 0 to 6 dBm)						
Parameter	**Symbol**	**Test Condition**	**Minimum**	**Typical**	**Maximum**	**Units**
Frequency range	f	—	824	—	849	MHz
Input power	P_{IN}	—	0	—	6	dBm
Analog power control voltage	V_{RAMP}	—	0.2	—	1.8	V
Power Added Efficiency	PAE	V_{CC} = 3.3 V P_{OUT} = 33 dBm TX_EN = $V_{TX\_EN\_HIGH}$ V_{RAMP} set for P_{OUT} = 33 dBm pulse width 577 µs duty cycle 1:8 T_{CASE} = 25 °C	41	48	—	%
Supply Current @ Rated Power	I_{CC}_33 dBm	V_{CC} = 3.3 V P_{IN} = 3 dBm P_{OUT} = 33 dBm TX_EN = $V_{TX\_EN\_HIGH}$ V_{RAMP} set for P_{OUT} = 33 dBm pulse width 577 µs duty cycle 1:8 T_{CASE} = 25 °C	—	1.26	1.48	A
Supply Current @ Minimum Power	I_{CC}_5 dBm	V_{CC} = 3.3 V P_{IN} = 3 dBm P_{OUT} = 5 dBm TX_EN = $V_{TX\_EN\_HIGH}$ V_{RAMP} set for P_{OUT} = 5 dBm pulse width 577 µs duty cycle 1:8 T_{CASE} = 25 °C	—	53	60	mA
Harmonics 2nd to 13th	$2f_0$ to $13f_0$	BW = 3 MHz 5 dBm ≤ P_{OUT} ≤ 33 dBm V_{RAMP} controlled [6]	—	–40	–33	dBm
Output power	P_{OUT}	V_{CC} = 3.3 V T_{CASE} = 25 °C P_{IN} = 0 dBm	33.0	33.7	—	dBm
	$P_{OUT\_MAX\ LOW\ VOLTAGE}$	V_{CC} = 2.7 V TX_EN = $V_{TX\_EN\_HIGH}$ T_{CASE} = –20 °C to 85 °C P_{IN} = 0 dBm	30.5	32.2	—	
	$P_{OUT\_MAX\ HIGH\ VOLTAGE}$	V_{CC} = 4.8 V TX_EN = $V_{TX\_EN\_HIGH}$ T_{CASE} = –20 °C to 85 °C P_{IN} = 0 dBm	30.5	34.5	—	
Input VSWR	Γ_{IN}	P_{OUT} = 5 to 33 dBm V_{RAMP} controlled [6]	—	1.5:1	2.5:1	
Forward isolation [4]	P_{OUT_RX}	P_{IN} = 6 dBm V_{RAMP} ≤ 0.1 V V_{LOGIC} = V_{LOGIC_HIGH} TX_EN = $V_{TX\_EN\_LOW}$ Mode = GSM_RX (see Table 3)	—	–55	–45	dBm
	$P_{OUT\_ENABLED\_TX}$	P_{IN} = 6 dBm V_{RAMP} ≤ 0.1 V V_{LOGIC} = V_{LOGIC_HIGH} TX_EN = $V_{TX\_EN\_HIGH}$ Mode = GSM_TX (see Table 3)	—	–25	–5	
Coupling of GSM850 TX output (f0) to GSM_RX output pad [4]	CGHI_TX-RX_F0	5 dBm ≤ P_{OUT} ≤ 33 dBm Mode = GSM_TX (see Table 3)	—	3	11	dBm
Coupling of GSM850 TX output ($2f_0$, $3f_0$) to PCS_RX output pad [4]	CGHI_TX-PCS_RX	5 dBm ≤ P_{OUT} ≤ 33 dBm Mode = GSM_TX (see Table 3)	—	–45	–36	dBm

Table 4. SKY77517–21 Electrical Specifications [1] *(3 of 5)*

GSM850 Mode (f = 824 to 849 MHz and P_{IN} = 0 to 6 dBm) [continued]						
Parameter	**Symbol**	**Test Condition**	**Minimum**	**Typical**	**Maximum**	**Units**
Spurious	Spur	All combinations of the following parameters: V_{RAMP} = controlled [2] P_{IN} = min. to max. V_{CC} = 2.7 V to 4.8 V Load VSWR = 12:1, all phase angles	No parasitic oscillation > –36 dBm			
Load mismatch	Load	All combinations of the following parameters: V_{RAMP} = controlled [2] P_{IN} = min. to max. V_{CC} = 2.7 V to 4.8 V Load VSWR = 20:1, all phase angles	No module damage or permanent degradation			
RX Band Spurious	RX_{SPUR}	At f_0 + 20 MHz (869 to 894 MHz) RBW = 100 kHz V_{CC} = 3.3 V 5 dBm ≤ P_{OUT} ≤ 33 dBm T_{CASE} = 25 °C	—	–84	–83	dBm
		At 1930 to 1990 MHz RBW = 100 kHz V_{CC} = 3.3 V T_{CASE} = 25 °C 5 dBm ≤ P_{OUT} ≤ 33 dBm	—	–101	–84	
Power control dynamic range	PC_{DR}		30	50	—	dB
Power control variation — Control level 5-15 (V_{CC} ≥ 3.3 V)	PC_V	P_{OUT} 13 to 33 dBm T_{CASE} = 25 °C	–1.0	—	1.0	dB
		P_{OUT} 13 to 33 dBm	–1.5	—	1.5	
Power control variation — Control level 16-19		P_{OUT} 5 to 11 dBm T_{CASE} = 25 °C	–2.0	—	2.0	
		P_{OUT} 5 to 11 dBm	–3.5	—	3.5	
Power control slope	PC_S	5 to 33 dBm	—	—	150	dB/V
GSM850 RECEIVE (f = 869 to 894 MHz) Mode = GSM_RX						
Parameter	**Symbol**	**Test Condition**	**Minimum**	**Typical**	**Maximum**	**Units**
Frequency range	f	—	869	—	894	MHz
Insertion Loss, ANT to GSM_RX [4]	IL GSM_RX	—	—	1.0	1.3	dB
VSWR ANT, GSM_RX [4]	Γ_{IN}, Γ_{OUT}	—	—	1.2:1	1.5:1	

Table 4. SKY77517–21 Electrical Specifications [1] *(4 of 5)*

PCS1900 Mode (f = 1850 to 1910 MHz and P_{IN} = 0 to 6 dBm)						
Parameter	**Symbol**	**Test Condition**	**Minimum**	**Typical**	**Maximum**	**Units**
Frequency range	f	—	1850	—	1910	MHz
Input power	P_{IN}	—	0	—	6	dBm
Analog power control voltage	V_{RAMP}	—	0.2	—	1.8	V
Power Added Efficiency	PAE	V_{CC} = 3.3 V P_{OUT} = 31 dBm TX_EN = $V_{TX\_EN\_HIGH}$ V_{RAMP} set for P_{OUT} = 31 dBm pulse width 577 µs duty cycle 1:8 T_{CASE} = 25 °C	35	41	—	%
Supply Current @ Rated Power	I_{CC}_31 dBm	V_{CC} = 3.3 V P_{IN} = 3 dBm P_{OUT} = 31 dBm TX_EN = $V_{TX\_EN\_HIGH}$ V_{RAMP} set for P_{OUT} = 31 dBm pulse width 577 µs duty cycle 1:8 T_{CASE} = 25 °C	—	0.93	1.04	A
Supply Current @ Minimum Power	I_{CC}_0 dBm	V_{CC} = 3.3 V P_{IN} = 3 dBm P_{OUT} = 0 dBm TX_EN = $V_{TX\_EN\_HIGH}$ V_{RAMP} set for P_{OUT} = 0 dBm pulse width 577 µs duty cycle 1:8 T_{CASE} = 25 °C	—	45	55	mA
Harmonics 2nd, 6th to 7th	2f0, 6f0 to 7f0	BW = 3 MHz, 0 dBm ≤ P_{OUT} ≤ 31 dBm V_{RAMP} controlled [5]	—	–40	–33	dBm
Harmonics 3rd	3f0		—	–35`	–28	
Harmonics 4th	4f0		—	–35	–30	
Harmonics 5th	5f0		—	–30	–25	
Output power	P_{OUT}	V_{CC} = 3.3 V T_{CASE} = 25 °C P_{IN} = 0 dBm	31.0	32.0	—	dBm
	P_{OUT} _MAX LOW VOLTAGE	V_{CC} = 2.7 V TX_EN = $V_{TX\_EN\_HIGH}$ T_{CASE} = –20 °C to 85 °C P_{IN} = 0 dBm	28.5	30.0	—	
	P_{OUT} _MAX HIGH VOLTAGE	V_{CC} = 4.8 V TX_EN = $V_{TX\_EN\_HIGH}$ T_{CASE} = –20 °C to 85 °C P_{IN} = 0 dBm	28.5	32.5	—	
Input VSWR	Γ_{IN}	P_{OUT} = 0 to 31 dBm V_{RAMP} controlled [5]	—	1.5:1	2.5:1	—
Forward isolation [4]	$P_{OUT\ RX}$	P_{IN} = 6 dBm V_{RAMP} ≤ 0.1 V V_{LOGIC} = $V_{TX\_EN\_HIGH}$ TX_EN = $V_{TX\_EN\_LOW}$ Mode=PCS_RX (see Table 3)	—	–60	–53	dBm
	$P_{OUT\_ENABLED\_TX}$	P_{IN} = 6 dBm V_{RAMP} ≤ 0.1 V V_{LOGIC} = V_{LOGIC_HIGH} TX_EN = $V_{TX\_EN\_HIGH}$ Mode = PCS_TX (see Table 3)	—	–35	–5	
Coupling of PCS TX output to Receive RF output pad [4]	CPCS_TX-RX_F0	0 dBm ≤ P_{OUT} ≤ 31 dBm Mode = PCS_TX (see Table 3)	—	2	9	dBm

Table 4. SKY77517–21 Electrical Specifications [1] *(5 of 5)*

PCS1900 Mode (f = 1850 to 1910 MHz and PIN = 0 to 6 dBm) [continued]						
Parameter	**Symbol**	**Test Condition**	**Minimum**	**Typical**	**Maximum**	**Units**
Spurious	Spur	All combinations of the following parameters: V_{RAMP} = controlled [3] P_{IN} = min. to max V_{CC} = 2.7 V to 4.8 V Load VSWR = 12:1, all phase angles	No parasitic oscillation > –36 dBm			
Load mismatch	Load	All combinations of the following parameters: V_{RAMP} = controlled [3] P_{IN} = min. to max. V_{CC} = 2.7 V to 4.8 V Load VSWR = 20:1, all phase angles	No module damage or permanent degradation			
RX Band Spurious	RX_{SPUR}	At f_0 + 20 MHz (1930 to 1990 MHz) RBW = 100 kHz V_{CC} = 3.3 V T_{CASE} = 25 °C 0 dBm ≤ P_{OUT} ≤ 31 dBm	—	–83	–78	dBm
		869 to 894 MHz RBW = 100 kHz V_{CC} = 3.3 V T_{CASE} = 25 °C 0 dBm ≤ P_{OUT} ≤ 31 dBm	—	—	–87	
Power control dynamic range	PC_{DR}		35	50	—	dB
Power control variation — Control level 0-8, V_{CC} ≥ 3.3 V	PC_V	P_{OUT} 14 to 30 dBm T_{CASE} = 25 °C	–1.5	—	1.5	dB
		P_{OUT} 14 to 30 dBm	–2.0	—	2.0	
Power control variation — Control level 9-13		P_{OUT} 4 to 12 dBm T_{CASE} = 25 °C	–2.5	—	2.5	
		P_{OUT} 4 to 12 dBm	–3.5	—	3.5	
Power control variation — Control level 14-15		P_{OUT} 0 to 2 dBm T_{CASE} = 25 °C	–3.0	—	3.0	
		P_{OUT} 0 to 2 dBm	–4.5	—	4.5	
Power control slope	PC_S	0 to 30 dBm	—	—	150	dB/V
PCS1900 RECEIVE (f = 1930 to 1990 MHz) Mode = PCS_RX						
Parameter	**Symbol**	**Test Condition**	Minimum	Typical	Maximum	Units
Frequency range	f	—	1930	—	1990	MHz
Insertion Loss, ANT to PCS_RX [4]	IL PCS_RX	—	—	1.2	1.5	dB
VSWR ANT, PCS_RX [4]	Γ_{IN}, Γ_{OUT}	—	—	1.2:1	1.5:1	

[1] Unless specified otherwise:
T_{CASE} = –20 °C to max. operating temperature (see Table 2), RL = 50 Ω, pulsed operation with pulse width ≤ 1154 µs and duty cycle ≤ 2:8, V_{CC} = 2.7 V to 4.8 V.

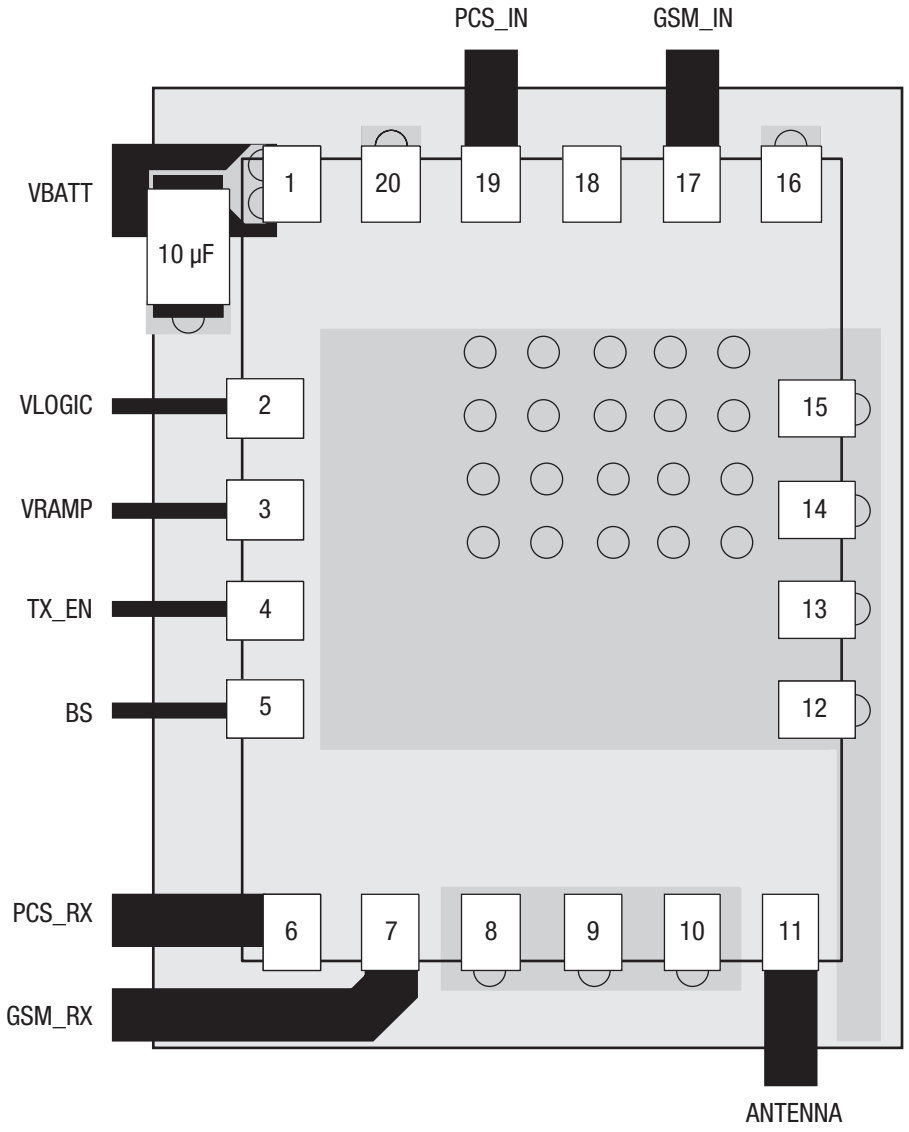
[2] I_{CC} = 0A to xA, where x = current at P_{OUT} = 33 dBm, 50 Ω load, and V_{CC} = 3.3 V.

[3] I_{CC} = 0A to xA, where x = current at P_{OUT} = 31 dBm, 50 Ω load, and V_{CC} = 3.3 V

[4] Terminate all unused RF ports with 50 Ω loads

[5] Max V_{RAMP} = V_{RAMP} @ P_{OUT} =31 dBm, 50 Ω load, T_{CASE} 25 °C, P_{IN} = 3 dBm

[6] Max V_{RAMP} = V_{RAMP} @ P_{OUT} =33 dBm, 50 Ω load, T_{CASE} 25 °C, P_{IN} = 3 dBm



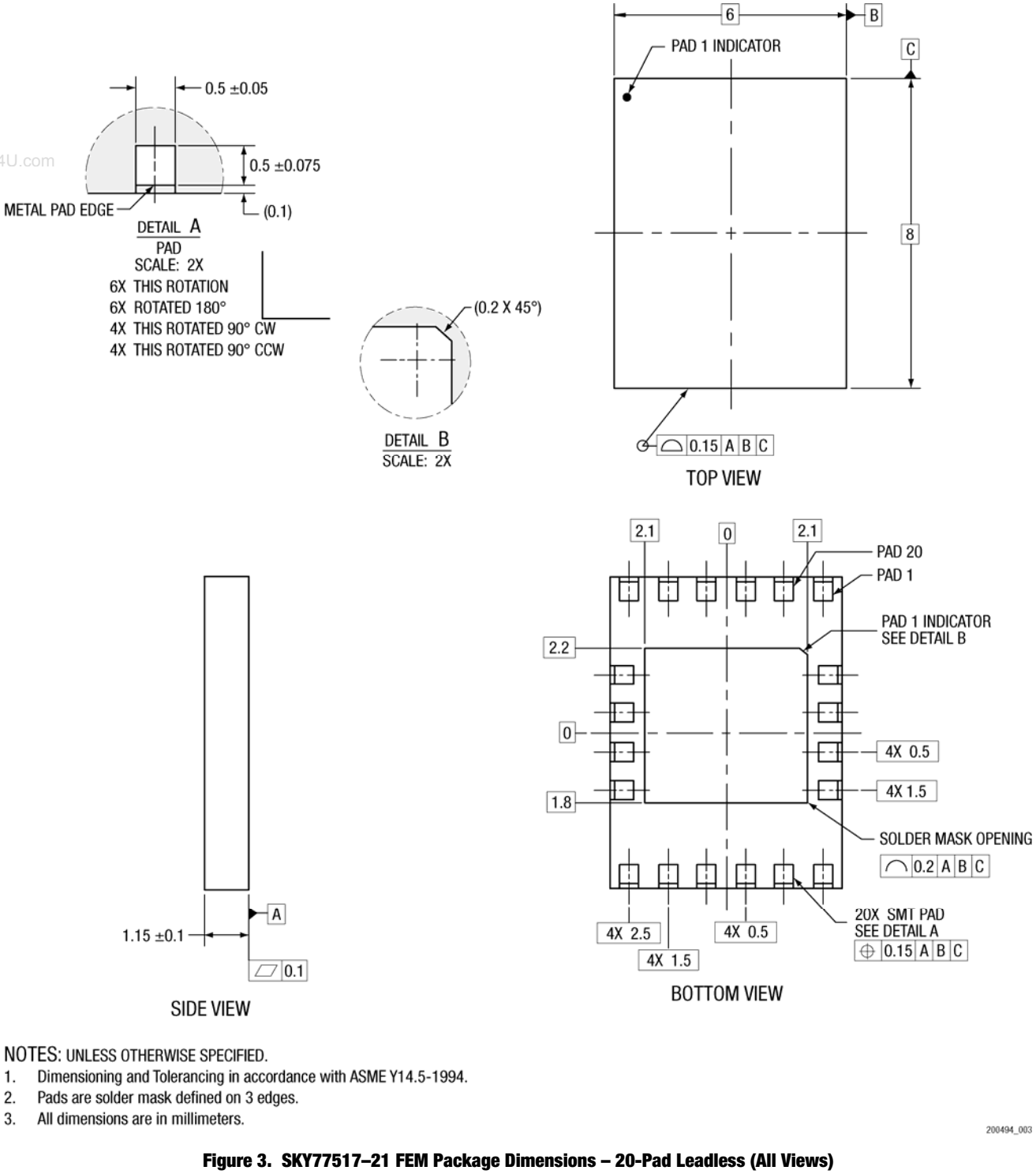
NOTES:
1. The value of 10 µF cap is dependent on the noise level on the phone board.
2. Ensure sufficient number of vias to supply battery current to Vbatt.
3. VBATT trace width should be ≥ 1 mm.
4. Ground terminal of bypass capacitor connected to ground plane with vias.
5. Layer 2 should be solid ground plane under SKY77517 and any RF trace interconnect.

200494_002

Figure 2. SKY77517–21 Application Schematic Diagram

Package Dimensions and Pad Descriptions

Figure 3 is a mechanical diagram of the pad layout for the SKY77517–21, a 20-pad leadless dual-band FEM. Figure 4 provides a recommended phone board layout footprint for the FEM to help the designer attain optimum thermal conductivity, good grounding, and minimum RF discontinuity for the 50-ohm terminals. Figure 5 illustrates the device pad configuration and the numbering convention which starts with pad 1 at the upper left as indicated, and increments counter-clockwise around the package. Table 5 lists the pad names and the associated signal descriptions. Figure 6 interprets typical case markings.



NOTES: UNLESS OTHERWISE SPECIFIED.
1. Dimensioning and Tolerancing in accordance with ASME Y14.5-1994.
2. Pads are solder mask defined on 3 edges.
3. All dimensions are in millimeters.

200494_003

Figure 3. SKY77517–21 FEM Package Dimensions – 20-Pad Leadless (All Views)

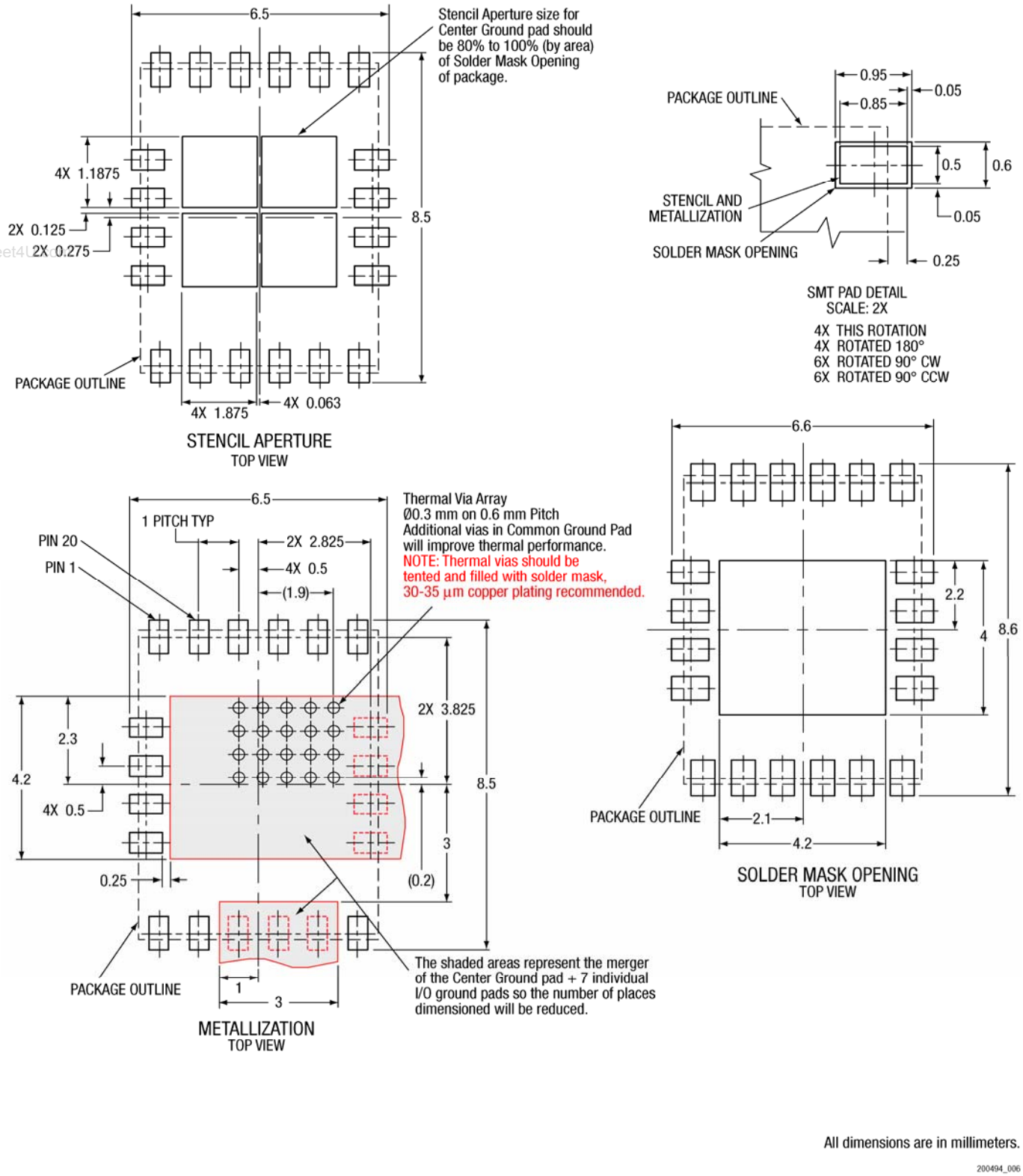
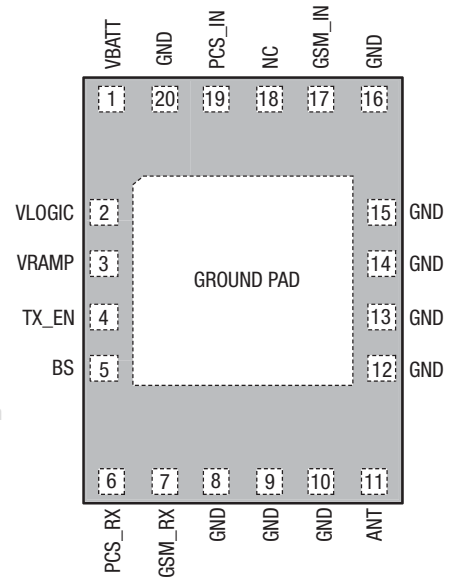


Figure 4. Phone PCB Layout Footprint for 6 x 8 mm, 20-Pad Package with Grid-Bottom Solder Mask – SKY77517–21 Specific



Pad layout as seen from top view looking through the package.

Figure 5. SKY77517–21 FEM Package Pad Configuration – 20-Pad Leadless (Top View)

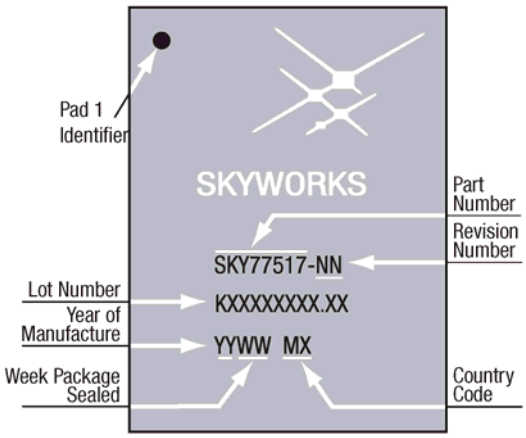


Figure 6. Typical Case Markings

Table 5. SKY77517–21 Pad Names and Signal Descriptions

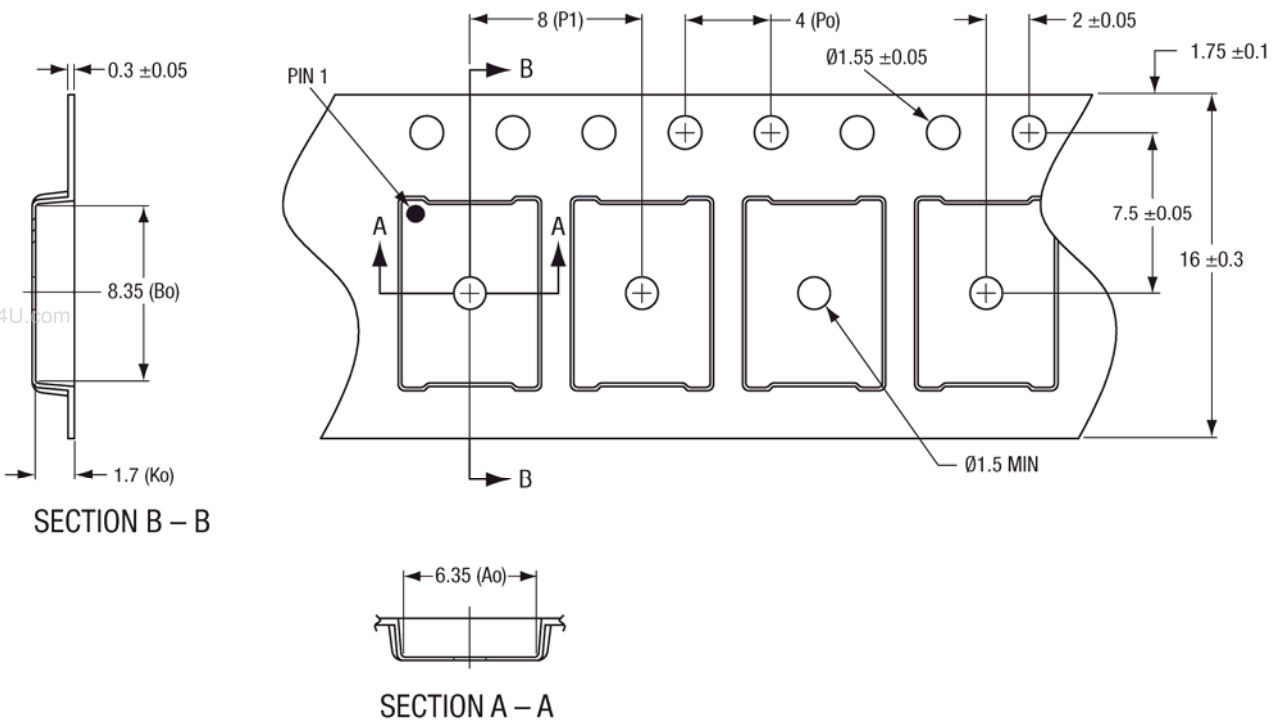
Pad	Name	Description
1	VBATT	Battery input voltage
2	VLOGIC	Control logic level selection/Standby control
3	VRAMP	Analog power control voltage input
4	TX_EN	TX / RX select (mode control)
5	BS	Band Select (mode control)
6	PCS_RX	PCS Receive RF Output (1930-1990 MHz)
7	GSM_RX	GSM Receive RF Output (869-894 MHz)
8	GND	RF and DC Ground
9	GND	RF and DC Ground
10	GND	RF and DC Ground
11	ANT	RF_IN / RF_OUT to Antenna
12	GND	RF and DC Ground
13	GND	RF and DC Ground
14	GND	RF and DC Ground
15	GND	RF and DC Ground
16	GND	RF and DC Ground
17	GSM_IN	RF input 824–849 MHz
18	NC	No Connect
19	PCS_IN	RF input 1850–1910 MHz
20	GND	RF and DC Ground
GND PADS	GROUND GRID	Ground Pads, module underside

Package and Handling Information

Because of its sensitivity to moisture absorption, this device package is baked and vacuum-packed prior to shipment. Instructions on the shipping container label must be followed regarding exposure to moisture after the container seal is broken, otherwise, problems related to moisture absorption may occur when the part is subjected to high temperature during solder assembly.

The SKY77517–21 is capable of withstanding an MSL3/250 °C solder reflow. Care must be taken when attaching this product, whether it is done manually or in a production solder reflow environment. If the part is attached in a reflow oven, the temperature ramp rate should not exceed 3 °C per second; maximum temperature should not exceed 250 °C. If the part is manually attached, precaution should be taken to insure that the part is not subjected to temperatures exceeding 250 °C for more than 10 seconds. For details on attachment techniques, precautions, and handling procedures recommended by Skyworks, please refer to Skyworks Application Note: *PCB Design and SMT Assembly/Rework*, Document Number 101752. Additional information on standard SMT reflow profiles can also be found in the JEDEC *Joint Industry Standard J-STD-020*.

Production quantities of this product are shipped in the standard tape-and-reel format (see Figure 7). For additional packaging details, refer to Skyworks Application Note: *Tape and Reel Information – RF Modules*, Document Number 101568.



NOTES:
1. CARRIER TAPES MUST MEET ALL REQUIREMENTS OF SKYWORKS GP01–D232 PROCUREMENT SPEC FOR TAPE AND REEL SHIPPING.
2. CARRIER TAPE SHALL BE BLACK CONDUCTIVE POLYSTYRENE.
3. COVER TAPE SHALL BE TRANSPARENT CONDUCTIVE PRESSURE SENSITIVE ADHESIVE (PSA) MATERIAL W/13.3 mm WIDTH.
4. ESD-SURFACE RESISTIVITY SHALL BE $\leq 1 \times 10^{10}$ OHMS/SQUARE PER EIA, JEDEC TNR SPECIFICATION.
5. Po / P1, 10 PITCHES CUMULATIVE TOLERANCE ON TAPE: ±0.2 mm.
6. Ao & Bo MEASUREMENT POINT TO BE 0.3 mm FROM BOTTOM POCKET.
7. ALL DIMENSIONS ARE IN MILLIMETERS.
8. PART NO.: eC3-MCM0608-16-8-F1-L REV. 0. PLEASE INDICATE ON PURCHASE ORDER.
9. NUMBER OF PARTS per 13 inch (DIAMETER) x 16 mm wide REEL: 2500.

ePAK CARRIER TAPE

CARRIER TAPE OVERMOLD MCM 6 x 8 x 1.4 mm BODY SIZE GP01-D232-081C
101568_019

–Figure 7. Tape and Reel Dimensional Diagram for 6 x 8 x 1.2 mm Package – SKY77517–21 Specific

Electrostatic Discharge Sensitivity

The SKY77517–21 is a Class 1 device. The ESD testing was performed in compliance with JEDEC JESD22-A114B Human Body Model (HBM) and JEDEC JESD22-A115B Machine Model (MM) requirements.

Various failure criteria can be utilized when performing ESD testing. Many vendors employ relaxed ESD failure standards that fail devices only after "the pad fails the electrical specification limits" or "the pad becomes completely non-functional".

Skyworks employs stringent criteria, rejecting devices as soon as the pad begins to show any degradation on a curve tracer.

To avoid ESD damage, both latent and visible, it is very important that the product assembly and test areas follow the Class 1 ESD handling precautions listed below.

- Personnel Grounding
  - Wrist Straps
  - Conductive Smocks, Gloves and Finger Cots
  - Antistatic ID Badges
- Protective Workstation
  - Dissipative Table Top
  - Protective Test Equipment (Properly Grounded)
  - Grounded Tip Soldering Irons
  - Solder Conductive Suckers
  - Static Sensors
- Facility
  - Relative Humidity Control and Air Ionizers
  - Dissipative Floors (less than 10^9 Ω to GND)
- Protective Packaging and Transportation
  - Bags and Pouches (Faraday Shield)
  - Protective Tote Boxes (Conductive Static Shielding)
  - Protective Trays
  - Grounded Carts
  - Protective Work Order Holders

Ordering Information

Model Number	Manufacturing Part Number	Product Revision	Package	Operating Temperature
SKY77517–21	SKY77517–21		6x8MCM–20	–20 °C to +85 °C

Revision History

Revision	Level	Date	Description
A		November 6, 2007	Initial Issue

References

Application Note: PCB Design and SMT Assembly/Rework, Document Number 101752

Application Note: Tape and Reel Information – RF Modules, Document Number 101568

Application Note: BiCMOS iPAC™ Front-End Module Implementation, Document Number 200576

Application Note: SKY77517 / SKY77518 Evaluation Board Information, Document Number 200574

Standard SMT Reflow Profiles: JEDEC Standard J-STD-020

JEDEC JESD22-A114B Human Body Model (HBM)

JEDEC JESD22-A115B Machine Model (MM)