Table 1. SKY73120-11 Signal Descriptions

Pin	Name	Description	Pin	Name	Description
1	GND	Ground	15	BS0	Band select 0
2	GND	Ground	16	BS1	Band select 1
3	GND	Ground	17	NC	No connection
4	GND	Ground	18	NC	No connection
5	GND	Ground	19	NC	No connection
6	GND	Ground	20	VDD	Power supply
7	GND	Ground	21	GND	Ground
8	GND	Ground	22	GND	Ground
9	GND	Ground	23	GND	Ground
10	VTUNE	Tune voltage	24	GND	Ground
11	GND	Ground	25	GND	Ground
12	GND	Ground	26	GND	Ground
13	GND	Ground	27	GND	Ground
14	GND	Ground	28	RF_OUT	RF output

Technical Description

The SKY73120-11 is a fully integrated VCO that includes varactors, a band select module, oscillator, output buffer, and RF balun. The output power from the RF balun is 0 dBm and the output impedance is designed to be 50 Ω.

The band select module can be used to change the center operation frequency of the VCO by controlling the BS1 and BS0 pin signals. This allows the total frequency range to be extended by keeping the same Kv and phase noise performance. The control logic for the BS1 and BS0 pins is shown in Table 2 and illustrated in Figure 3.

The band select pins BS0 and BS1 contain 10 kΩ pull-up resistors.

Table 2. Band Select Logic Table

BS1 (Pin 16)	BS0 (Pin 15)	Minimum Output Frequency Range (MHz) (VTUNE = 0.2 to 2.8 V)
0	0	940 to 960
0	1	928 to 940
1	0	902 to 928
1	1	890 to 902

Electrical and Mechanical Specifications

The absolute maximum ratings of the SKY73120-11 are provided in Table 3. The recommended operating conditions are specified in Table 4, and electrical specifications are provided in Table 5. Phase noise characteristics are shown in Figure 4.

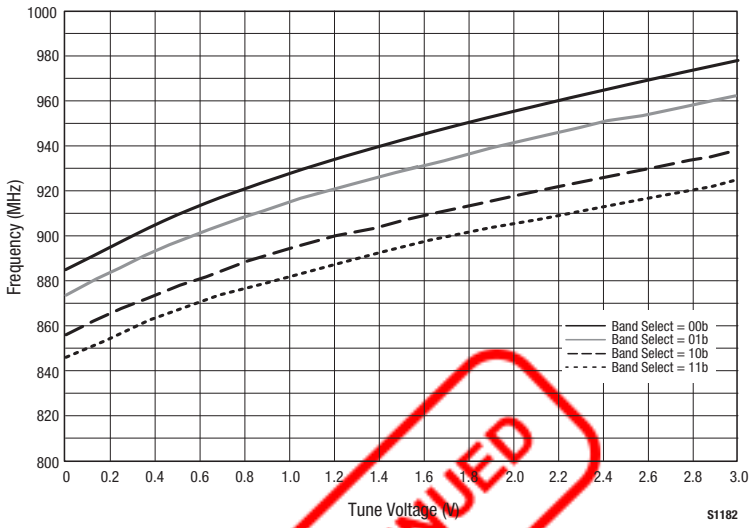


Figure 3. SKY73120-11 Operation Frequency vs Tuning Voltage and Band Select

Table 3. SKY73120-11 Absolute Maximum Ratings[1]

Parameter	Symbol	Min	Max	Units
Supply voltage	VCC		5.5	V
Storage temperature	T_{ST}	-40	+150	°C
Operating case temperature	T_C	-40	+85	°C
Electrostatic discharge: Human Body Model (HBM) (RF signal lines >100 MHz, analog and RF lines <100 MHz, digital lines, power supply lines, and ground pins	ESD		2500	V

Table 4. SKY73120-11 Recommended Operating Conditions

Parameter	Symbol	Min	Typical	Max	Units
Supply voltage	VCC	3.1	3.3	3.6	V
Tuning voltage	VTUNE	0.2		2.8	V
Load connected to RF output		50 Ω, maximum VSWR (load input) 2.0:1, all phases			
Band-select voltage level	BS_{HIGH} BS_{LOW}	2.3		 0.1	V V

Table 5. SKY73120-11 Electrical Characteristics
(VDD = 3.3 V, Tc = 25 °C Unless Otherwise Noted)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Units
Oscillation frequency			890		960	MHz
Tuning voltage: @ 890 MHz @ 960 MHz		 Band select = 11b Band select = 00b		 1 2		 V V
Tuning sensitivity			20	28	40	MHz/V
Output level				0		dBm
Output impedance				50		Ω
Harmonic suppression: 2nd harmonic 3rd harmonic				 -30 -35	 -20 -20	 dBc dBc
Single sideband phase noise: @ 12.5 kHz offset @ 25 kHz offset @ 100 kHz offset @ 1 MHz offset				 -100 -110 -124 -144	 -88 -95 -108 -128	 dBc/Hz dBc/Hz dBc/Hz dBc/Hz
Pushing		VCC = 3.1-3.6 V		2.3		MHzp-p
Pulling		12 dB RL		80		kHzp-p
Current consumption				22	30	mA

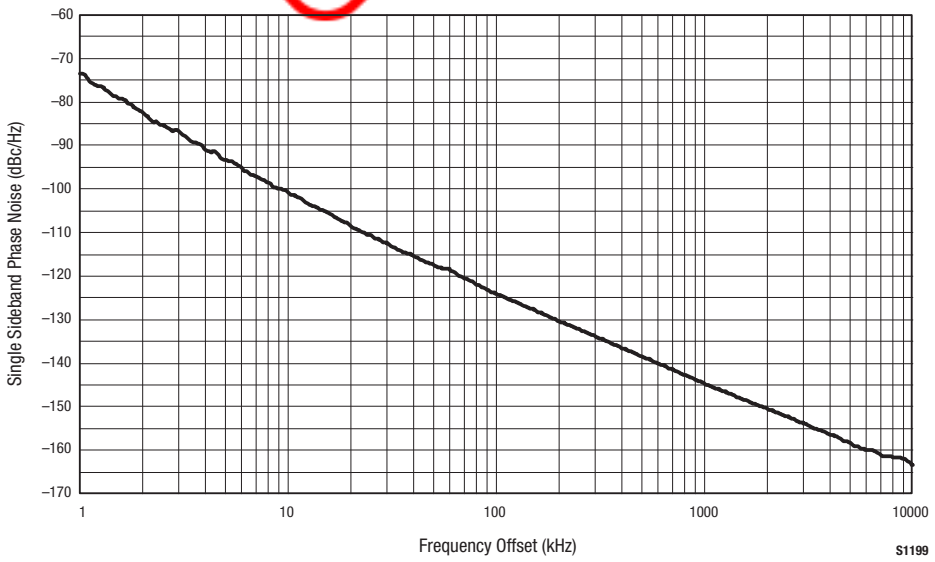


Figure 4. Single Sideband Phase Noise Measurements @ 951 MHz, VTUNE = 1.5 V, and Band Select = 00b

Package Dimensions

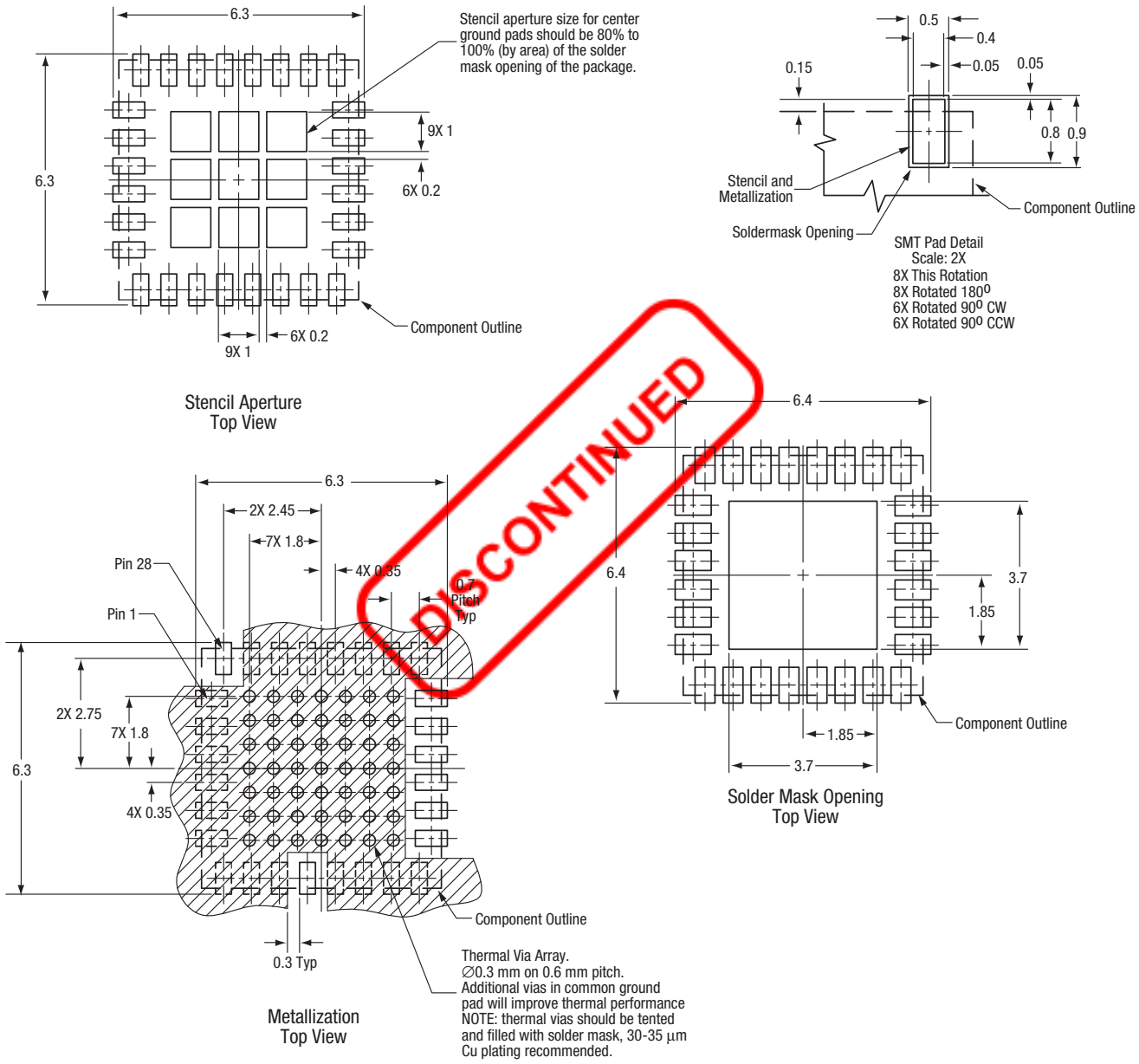
The PCB layout footprint for the SKY73120-11 is provided in Figure 5. Figure 6 shows the package dimensions, and Figure 7 provides the tape and reel dimensions.

Package and Handling Information

Since the device package is sensitive to moisture absorption, it is baked and vacuum packed before shipping. Instructions on the shipping container label regarding exposure to moisture after the container seal is broken must be followed. Otherwise, problems related to moisture absorption may occur when the part is subjected to high temperature during solder assembly.

The SKY73120-11 is rated to Moisture Sensitivity Level 3 (MSL3) at 260 °C. It can be used for lead or lead-free soldering. For additional information, refer to Skyworks Application Note, *PCB Design and SMT Assembly/Rework Guidelines for MCM-L Packages*, document number 101752.

Care must be taken when attaching this product, whether it is done manually or in a production solder reflow environment. Production quantities of this product are shipped in a standard tape and reel format.

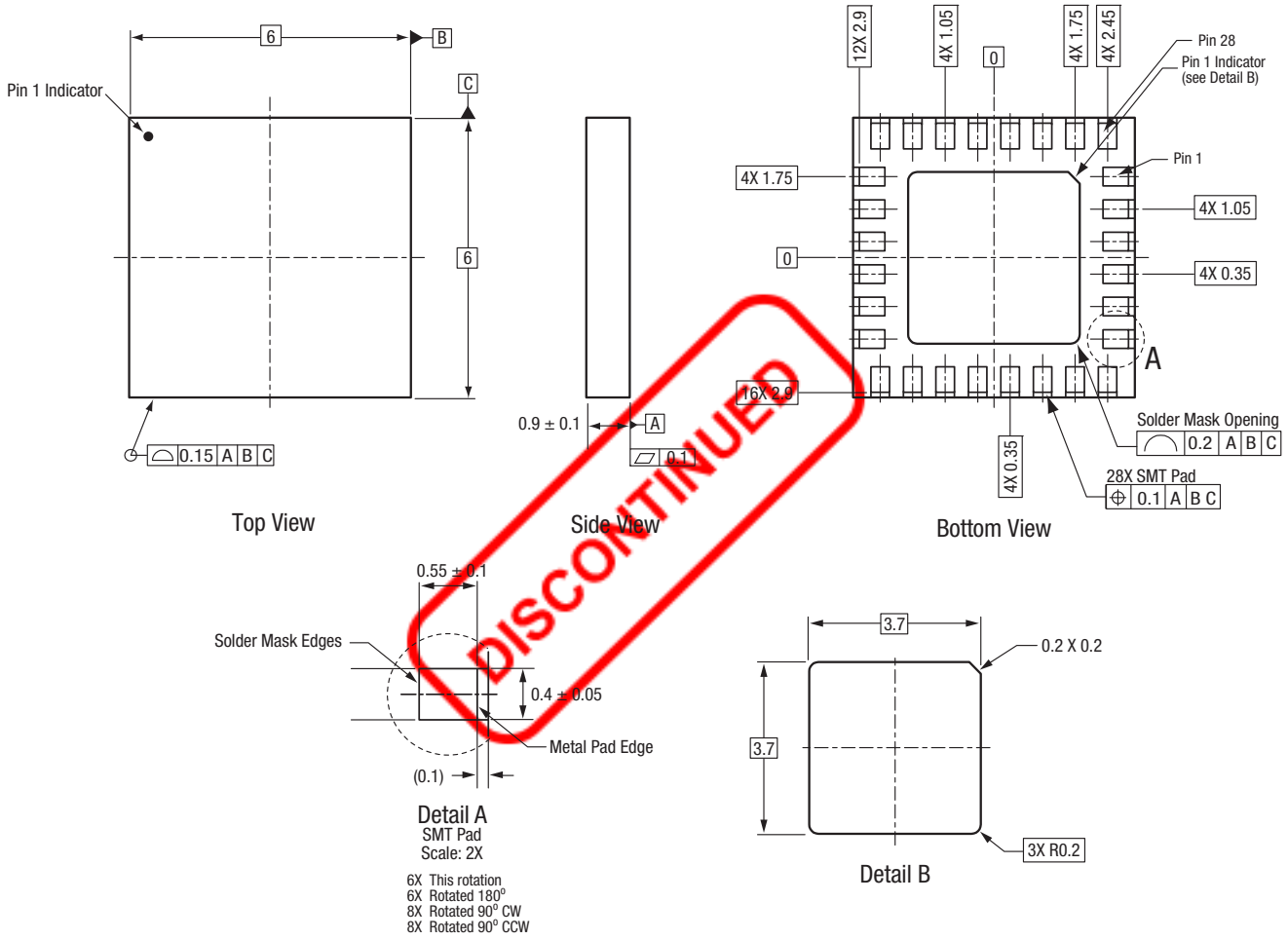


Note: The cross-hatched area represents the merger of the center ground pad +20 individual I/O ground pads. All I/O ground pads should have at least one via connected to internal ground planes for optimum electrical performance.

All measurements are in millimeters

S1197

Figure 5. PCB Layout Footprint for the SKY73120-11



All measurements are in millimeters

Dimensioning and tolerancing according to ASME Y14.5M-1994

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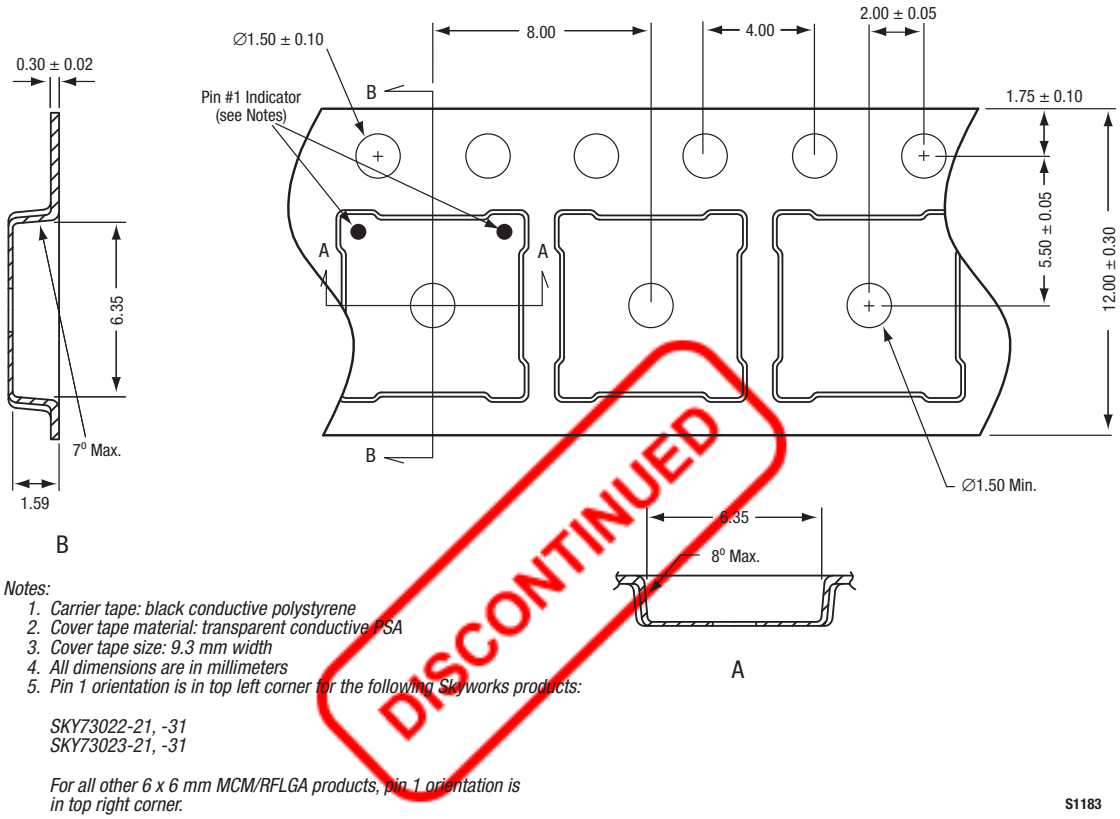
Figure 6. SKY73120-11 Package Dimensions



Notes:

1. *Carrier tape: black conductive polystyrene*
2. *Cover tape material: transparent conductive PSA*
3. *Cover tape size: 9.3 mm width*
4. *All dimensions are in millimeters*
5. *Pin 1 orientation is in top left corner for the following Skyworks products:*

   SKY73022-21, -31
   SKY73023-21, -31

   For all other 6 x 6 mm MCM/RFLGA products, pin 1 orientation is in top right corner.

Figure 7. SKY73120-11 Tape and Reel Dimensions

Ordering Information

Product Description	Product Part Number	Evaluation Kit Part Number
SKY73120-11: 890 to 960 MHz VCO	SKY73120-11 (Pb-free package)	SKY73120-11-EVB

Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

Skyworks:
SKY73120-11