

Frequency Synthesizer

KSN-1825A+

50Ω 1765 to 1825 MHz

The Big Deal

- Low phase noise and spurious
- Robust design and construction
- Small size 0.800" x 0.584" x 0.154"



Generic photo used for illustration purposes only

CASE STYLE: DK801

Product Overview

The KSN-1825A+ is a Frequency Synthesizer, designed to operate from 1765 to 1825 MHz for LTE base station application. The KSN-1825A+ is packaged in a metal case (size of 0.800" x 0.584" x 0.154") to shield against unwanted signals and noise.

Key Features

Feature	Advantages
Low phase noise and spurious: • Phase Noise: -108 dBc/Hz typ. @ 10 kHz offset • Comparison Spurious: -84 dBc typ. • Reference Spurious: -110 dBc typ.	Low phase noise and spurious improve system EVM (Error Vector Magnitude).
Robust design and construction	To enhance the robustness of KSN-1825A+, each internal component is secured to the substrate with chip bonder, thereby eliminating the risk of tombstoning during subsequent solder reflow operations by the customer.
Small size, 0.800" x 0.584" x 0.154"	The small size enables the KSN-1825A+ to be used in compact designs.

Notes

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Frequency Synthesizer

KSN-1825A+

50Ω 1765 to 1825 MHz

Features

- Integrated VCO + PLL
- Low phase noise and spurious
- Robust design and construction
- Low operating voltage ($V_{CC\ VCO}=+5V$, $V_{CC\ PLL}=+5V$)
- Small size 0.800" x 0.584" x 0.154"



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CASE STYLE: DK801

+RoHS Compliant

The +Suffix identifies RoHS Compliance. See our web site for RoHS Compliance methodologies and qualifications

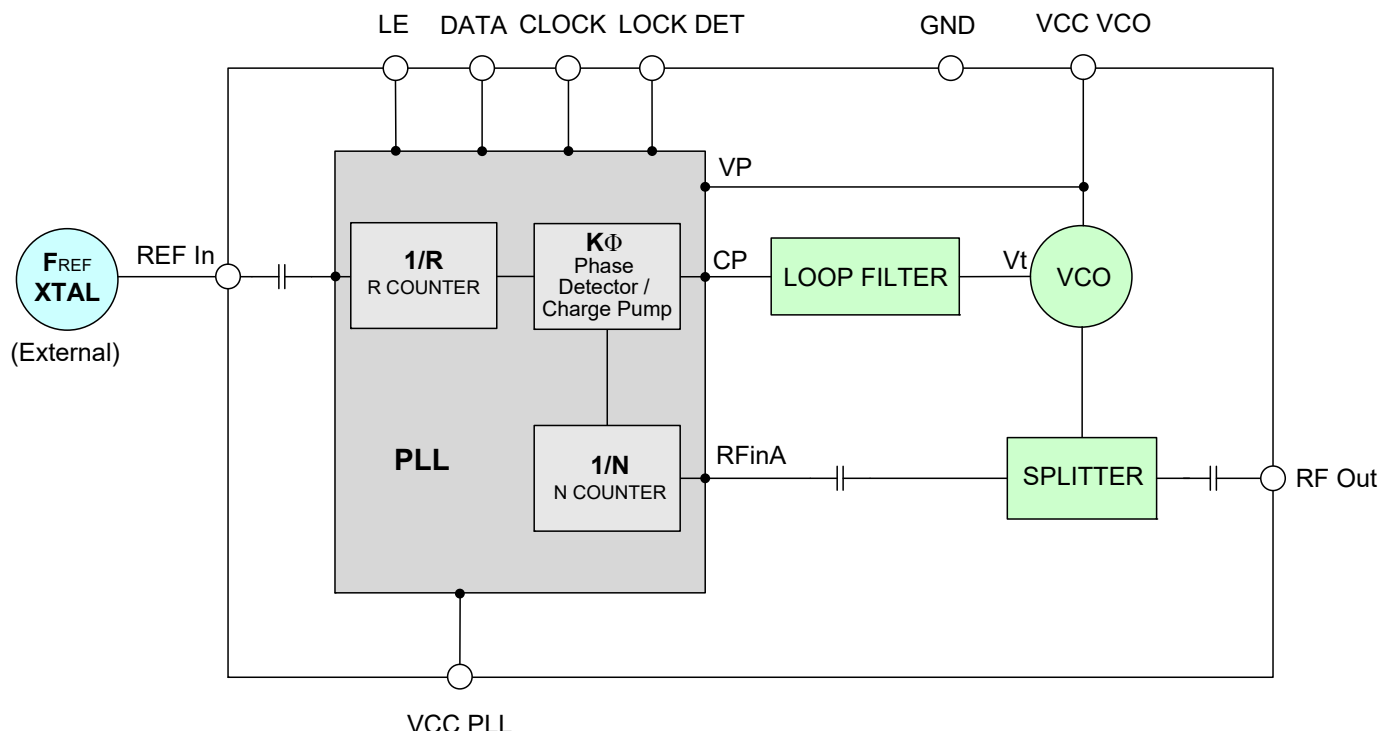
Applications

- LTE base station

General Description

The KSN-1825A+ is a Frequency Synthesizer, designed to operate from 1765 to 1825 MHz for LTE base station application. The KSN-1825A+ is packaged in a metal case (size of 0.800" x 0.584" x 0.154") to shield against unwanted signals and noise. To enhance the robustness of KSN-1825A+, each internal component is secured to the substrate with chip bonder, thereby eliminating the risk of tombstoning during subsequent solder reflow operations by the customer.

Simplified Schematic



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REV. C
 M176828
 EDR-9641/2F1
 KSN-1825A+
 Category-A1
 RAV
 191224
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Electrical Specifications (over operating temperature -40°C to +85°C)

Parameters				Test Conditions				Min.	Typ.	Max.	Units				
Frequency Range				-				1765	-	1825	MHz				
Step Size				-				-	50	-	kHz				
Settling Time				Within ± 1 kHz				-	28	-	mSec				
Output Power				-				-2.0	+0.5	+2.5	dBm				
SSB Phase Noise				@ 100 Hz offset				-	-72	-	dBc/Hz				
				@ 1 kHz offset				-	-73	-68					
				@ 10 kHz offset				-	-108	-103					
				@ 100 kHz offset				-	-129	-123					
				@ 1 MHz offset				-	-150	-144					
Integrated SSB Phase Noise				@ 100 Hz to 1MHz				-	-40	-	dBc				
Reference Spurious Suppression				Ref. Freq. 15 MHz				-	-110	-80	dBc				
Comparison Spurious Suppression				Step Size 50 kHz				-	-84	-70					
Non - Harmonic Spurious Suppression				-				-	-90	-					
Harmonic Suppression				-				-	-25	-20					
VCO Supply Voltage				+5.00				+4.75	+5.00	+5.25	V				
PLL Supply Voltage				+5.00				+4.75	+5.00	+5.25					
VCO Supply Current				-				-	22	30	mA				
PLL Supply Current				-				-	12	20					
Reference Input (External)		Frequency		15 (square wave)				-	15	-	MHz				
		Amplitude		1.0				0.8	1.0	1.2	V _{P-P}				
		Input impedance		-				-	100	-	KΩ				
		Phase Noise @ 1 kHz offset		-				-	-145	-	dBc/Hz				
RF Output port Impedance				-				-	50	-	Ω				
Input Logic Level		Input high voltage		-				4.20	-	-	V				
		Input low voltage		-				-	-	0.95	V				
Digital Lock Detect		Locked		-				4.35	-	5.25	V				
		Unlocked		-				-	-	0.40	V				
Frequency Synthesizer PLL				-				ADF4113							
PLL Programming				-				3-wire serial 5V CMOS							
Register Map ^{NOTE 1}	F_Register ^{NOTE 2}	Prescaler Value	Power-Down 2	Current Setting 2		Current Setting 1	Timer Counter Control	Fastlock Mode	Fastlock Enable	CP Three-State	PD Polarity	Muxout Control	Power-Down 1	Counter Reset	Control Bits
		10	0	111		111	0000	0	0	0	1	001	0	0	10
	N_Register @ 1825MHz	Reserved		CP Gain		13-Bit B Counter						6-Bit A Counter			Control Bits
		00		1		0010001110100						010100			01
		R_Register	Reserved	DLY	SYNC	Lock Detect Precision	Test Mode Bits	Anti-Backlash Width	14-BIT Reference Counter, R						
		0	0	0	1	00	00	00000100101100							00

Note 1: Registers Load Sequence: Initialization Register, F Register, R Register, N Register.**Note 2:** For the Initialization Register use Register F with Control Bits 11.**Absolute Maximum Ratings**

Parameters	Ratings
VCO Supply Voltage ^{NOTE 3}	6V
PLL Supply Voltage ^{NOTE 3}	6V
VCO Supply Voltage to PLL Supply Voltage ^{NOTE 3}	-0.3V to +5.5V
Reference Frequency Voltage	-0.3Vmin, VCC PLL +0.3Vmax
Data, Clock, LE Levels	-0.3Vmin, VCC PLL +0.3Vmax
Operating Temperature	-40°C to +85°C
Storage Temperature	-55°C to +100°C

Note 3: Power on/off Sequence: Power on: VCO Supply Voltage, followed by PLL Supply Voltage. Power off: PLL Supply Voltage, followed by VCO Supply Voltage.

Permanent damage may occur if any of these limits are exceeded

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Typical Performance Data

FREQUENCY (MHz)	POWER OUTPUT (dBm)			VCO CURRENT (mA)			PLL CURRENT (mA)		
	-45°C	+25°C	+85°C	-45°C	+25°C	+85°C	-45°C	+25°C	+85°C
1765	0.54	0.42	0.22	21.46	22.26	22.69	9.61	11.65	13.59
1771	0.59	0.45	0.27	21.48	22.27	22.65	9.62	11.68	13.62
1779	0.65	0.48	0.26	21.49	22.27	22.70	9.63	11.69	13.63
1787	0.68	0.48	0.28	21.49	22.27	22.65	9.63	11.70	13.63
1795	0.72	0.50	0.28	21.50	22.27	22.64	9.64	11.71	13.64
1803	0.76	0.49	0.23	21.50	22.25	22.67	9.64	11.71	13.66
1811	0.78	0.46	0.18	21.48	22.23	22.64	9.64	11.72	13.66
1819	0.61	0.57	0.22	21.58	22.14	22.43	9.65	11.72	13.66
1825	0.77	0.45	0.19	21.29	22.19	22.55	9.65	11.72	13.67

FREQUENCY (MHz)	HARMONICS (dBc)					
	F2			F3		
	-45°C	+25°C	+85°C	-45°C	+25°C	+85°C
1765	-23.77	-24.81	-26.25	-37.10	-40.09	-40.09
1771	-24.01	-25.06	-26.57	-37.42	-39.62	-39.87
1779	-24.24	-25.16	-26.73	-37.81	-39.97	-40.39
1787	-24.12	-24.98	-26.56	-39.04	-41.26	-41.26
1795	-24.14	-24.97	-26.90	-39.92	-41.87	-41.26
1803	-24.43	-25.67	-27.51	-40.92	-41.74	-41.42
1811	-25.04	-26.23	-28.07	-41.29	-41.56	-40.91
1819	-25.30	-26.22	-27.92	-41.90	-42.26	-41.14
1825	-25.17	-26.23	-28.15	-43.06	-42.67	-41.19

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FREQUENCY (MHz)	PHASE NOISE (dBc/Hz) @ OFFSETS				
	+25°C				
	100Hz	1kHz	10kHz	100kHz	1MHz
1765	-74.23	-74.82	-108.86	-129.88	-150.79
1771	-73.82	-73.42	-108.38	-129.52	-150.18
1779	-70.64	-73.50	-107.66	-128.71	-150.87
1787	-72.56	-75.05	-108.61	-130.38	-150.66
1795	-71.39	-75.19	-108.13	-130.43	-150.41
1803	-70.41	-73.03	-107.86	-128.74	-150.10
1811	-72.10	-73.89	-107.80	-129.25	-149.66
1819	-72.12	-73.54	-106.75	-129.50	-149.25
1825	-68.94	-74.99	-107.67	-126.20	-149.91

FREQUENCY (MHz)	PHASE NOISE (dBc/Hz) @ OFFSETS				
	-45°C				
	100Hz	1kHz	10kHz	100kHz	1MHz
1765	-75.74	-73.08	-108.91	-131.53	-151.45
1771	-74.16	-72.29	-108.56	-131.41	-151.11
1779	-72.50	-73.85	-108.55	-130.98	-151.36
1787	-74.37	-72.26	-107.98	-131.30	-151.56
1795	-73.57	-72.39	-108.24	-131.24	-150.66
1803	-70.78	-72.63	-107.92	-131.04	-151.10
1811	-73.68	-73.29	-108.11	-129.73	-148.86
1819	-69.28	-75.02	-107.10	-129.79	-148.97
1825	-70.44	-73.82	-107.52	-129.84	-150.02

FREQUENCY (MHz)	PHASE NOISE (dBc/Hz) @ OFFSETS				
	+85°C				
	100Hz	1kHz	10kHz	100kHz	1MHz
1765	-73.09	-72.04	-107.73	-128.84	-149.63
1771	-72.07	-72.12	-106.82	-129.28	-149.22
1779	-72.44	-72.76	-107.16	-128.68	-149.65
1787	-72.46	-74.54	-106.92	-129.24	-149.17
1795	-71.12	-73.37	-106.70	-128.19	-149.54
1803	-71.39	-73.21	-107.09	-127.13	-148.75
1811	-70.91	-72.18	-106.89	-127.67	-148.55
1819	-69.11	-74.93	-106.46	-128.32	-148.21
1825	-66.63	-73.09	-106.25	-127.11	-149.19

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COMPARISON SPURIOUS ORDER	COMPARISON SPURIOUS @ F _{carrier} 1765MHz+(n*F _{reference}) (dBc) note 1			COMPARISON SPURIOUS @ F _{carrier} 1795MHz+(n*F _{reference}) (dBc) note 1			COMPARISON SPURIOUS @ F _{carrier} 1825MHz+(n*F _{reference}) (dBc) note 1		
	-45°C	+25°C	+85°C	-45°C	+25°C	+85°C	-45°C	+25°C	+85°C
-5	-99.14	-94.87	-99.06	-98.58	-97.99	-98.58	-96.79	-98.67	-99.08
-4	-97.07	-97.69	-95.59	-95.49	-91.88	-95.49	-94.24	-93.75	-93.09
-3	-88.97	-88.52	-90.68	-89.77	-90.16	-89.77	-84.72	-88.31	-88.23
-2	-82.24	-86.89	-86.50	-85.20	-87.19	-85.20	-85.16	-88.34	-82.12
-1	-83.19	-82.89	-88.37	-83.81	-84.70	-83.81	-82.32	-84.07	-83.34
0 ^{note 2}	-	-	-	-	-	-	-	-	-
+1	-83.44	-88.51	-86.90	-84.04	-87.15	-84.04	-82.81	-84.06	-83.17
+2	-84.38	-87.14	-83.08	-85.09	-87.74	-85.09	-86.47	-84.44	-86.48
+3	-90.79	-89.38	-91.31	-91.54	-89.69	-91.54	-85.41	-89.42	-88.54
+4	-94.47	-94.60	-92.70	-97.07	-95.97	-97.07	-92.82	-92.35	-96.70
+5	-97.42	-101.43	-99.34	-94.88	-100.02	-94.88	-96.69	-101.98	-100.13

Note 1: Comparison frequency 50 kHz

Note 2: All spurs are referenced to carrier signal (n=0).

REFERENCE SPURIOUS ORDER	REFERENCE SPURIOUS @ F _{carrier} 1765MHz+(n*F _{reference}) (dBc) note 3			REFERENCE SPURIOUS @ F _{carrier} 1795MHz+(n*F _{reference}) (dBc) note 3			REFERENCE SPURIOUS @ F _{carrier} 1825MHz+(n*F _{reference}) (dBc) note 3		
	-45°C	+25°C	+85°C	-45°C	+25°C	+85°C	-45°C	+25°C	+85°C
-5	-128.29	-127.59	-127.63	-125.22	-129.84	-128.68	-127.59	-126.07	-128.18
-4	-122.50	-127.64	-123.72	-122.20	-126.68	-124.81	-124.12	-124.23	-126.96
-3	-122.94	-125.26	-126.04	-128.24	-128.61	-128.43	-128.27	-128.74	-128.36
-2	-118.65	-121.13	-117.89	-117.81	-120.37	-118.62	-120.76	-122.92	-125.82
-1	-117.70	-117.66	-109.50	-117.56	-111.57	-106.75	-106.12	-104.61	-107.11
0 ^{note 4}	-	-	-	-	-	-	-	-	-
+1	-112.93	-113.41	-117.61	-118.42	-119.98	-111.68	-113.43	-110.25	-112.83
+2	-118.30	-122.26	-118.76	-117.99	-119.51	-118.09	-118.29	-119.56	-118.49
+3	-129.03	-126.22	-125.66	-128.89	-128.10	-126.77	-124.91	-125.01	-128.72
+4	-120.55	-125.46	-124.45	-120.29	-125.29	-125.96	-123.75	-125.58	-128.52
+5	-129.93	-128.15	-128.54	-129.93	-128.87	-127.32	-125.92	-126.89	-129.54

Note 3: Reference frequency 15 MHz

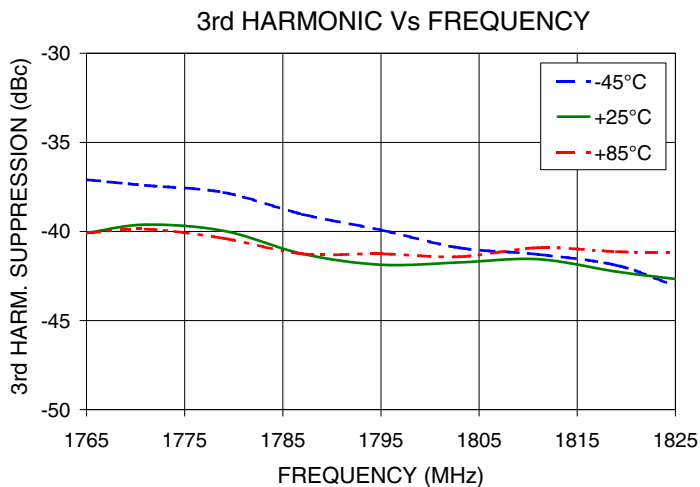
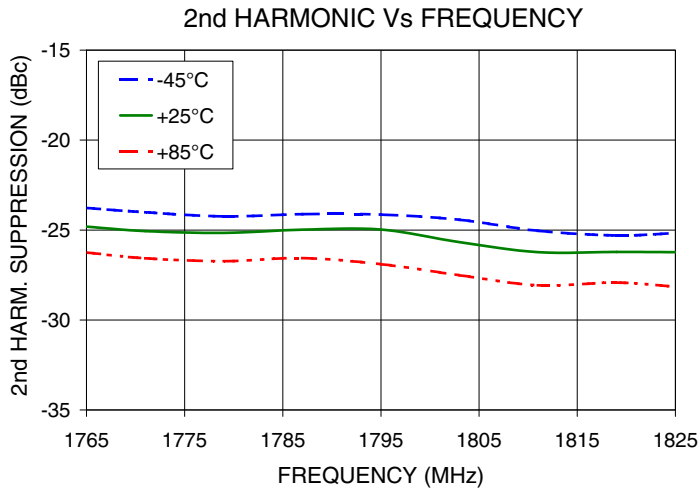
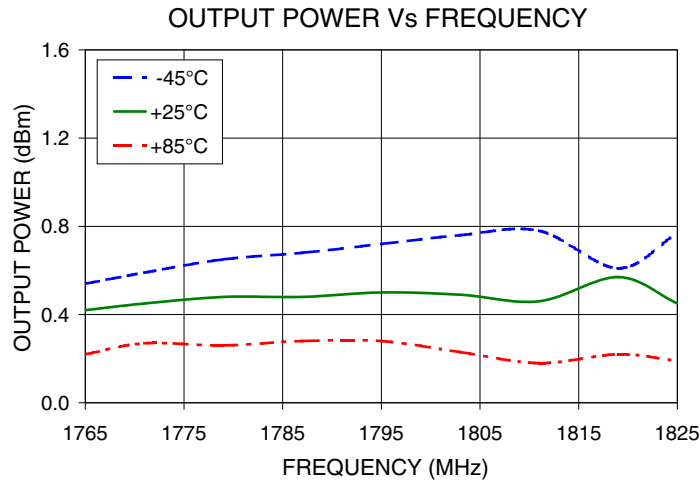
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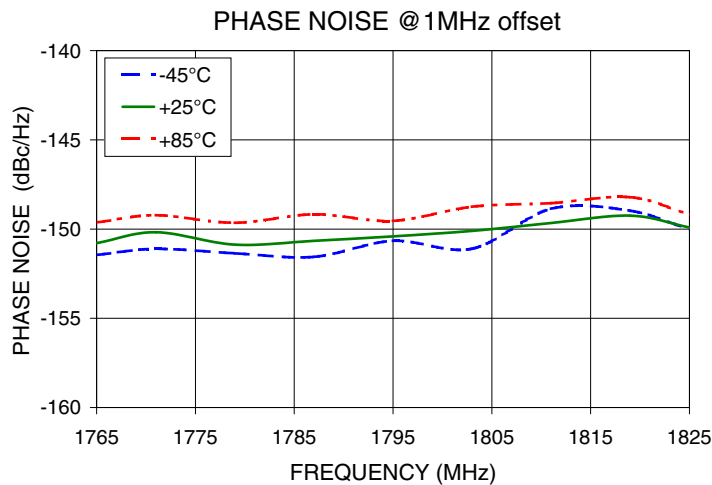
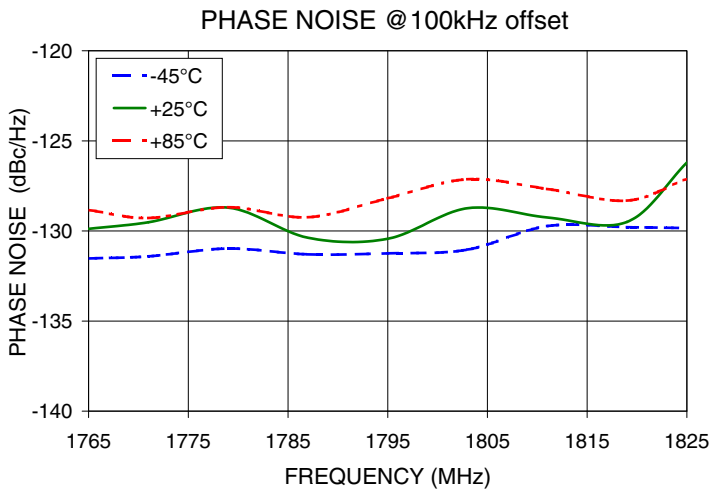
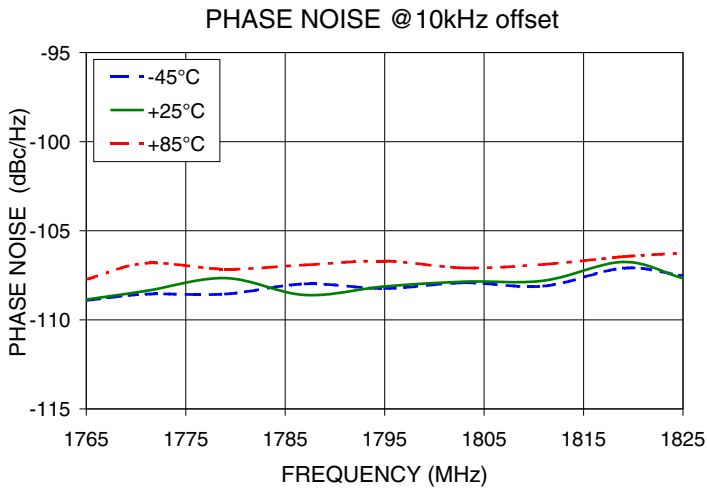
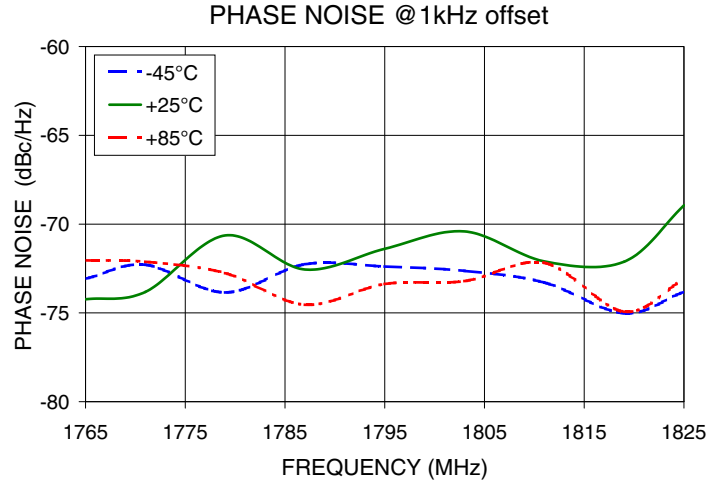
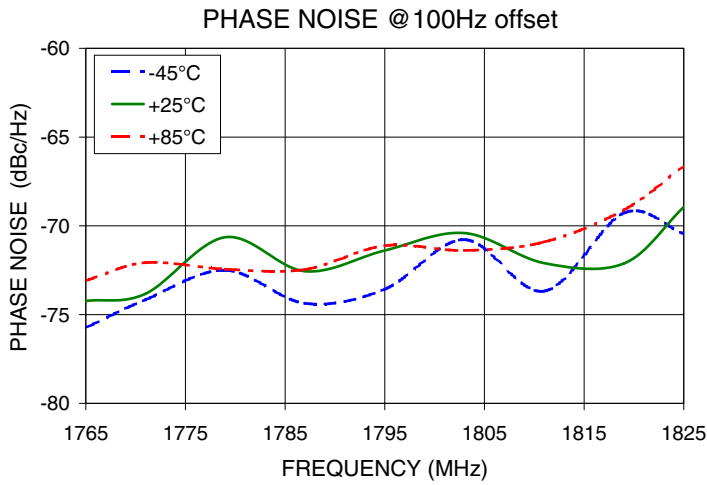
Typical Performance Curves



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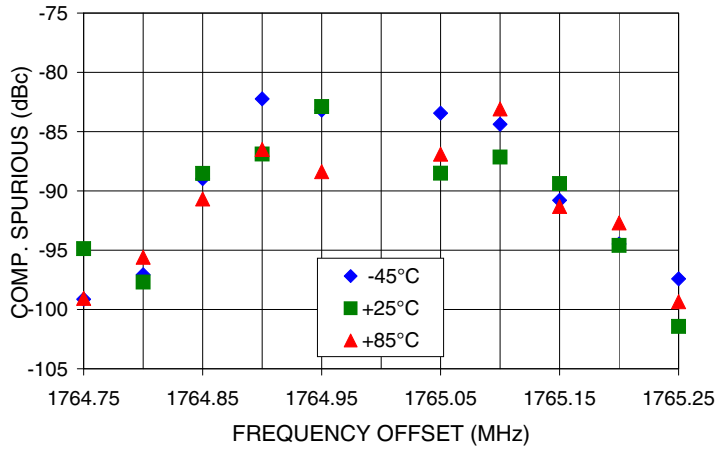


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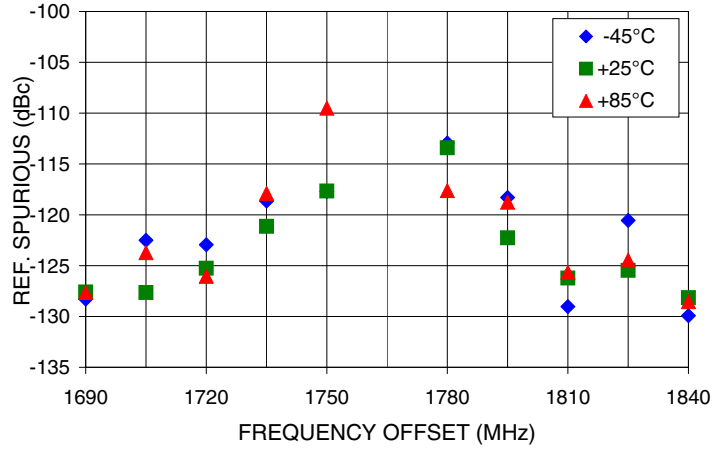
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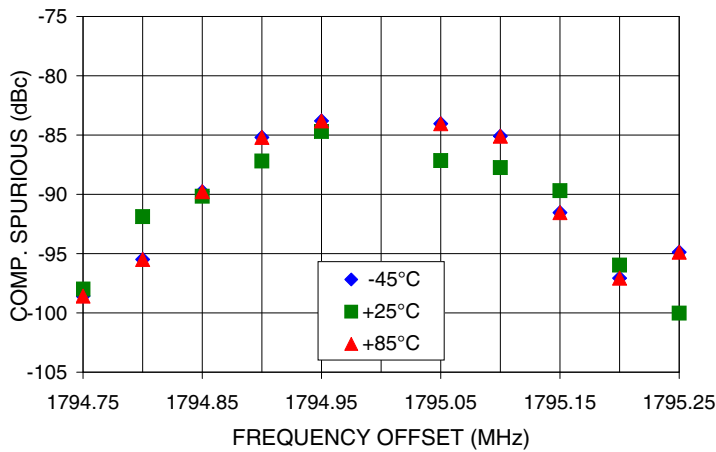
COMPARISON SPURIOUS
Vs FREQ. OFFSET @ Fcar = 1765MHz



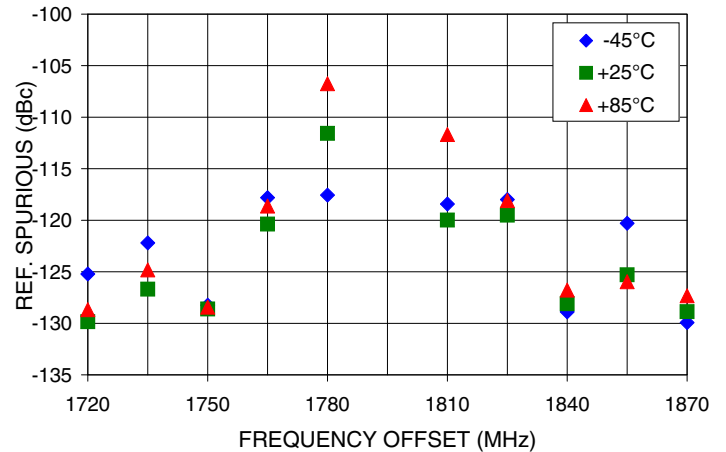
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Vs FREQ. OFFSET @ Fcar = 1765MHz



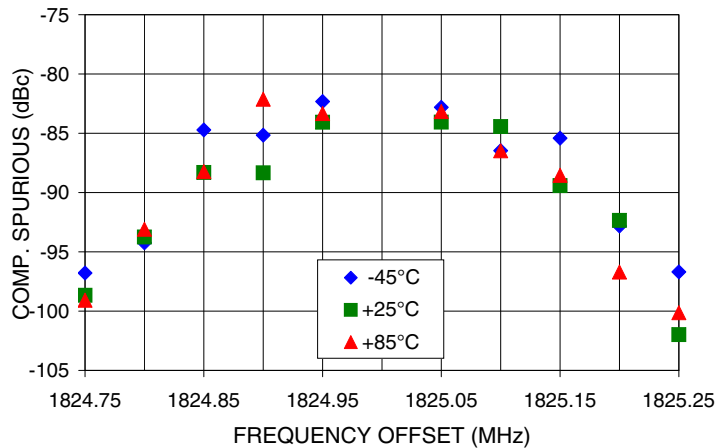
COMPARISON SPURIOUS
Vs FREQ. OFFSET @ Fcar = 1795MHz



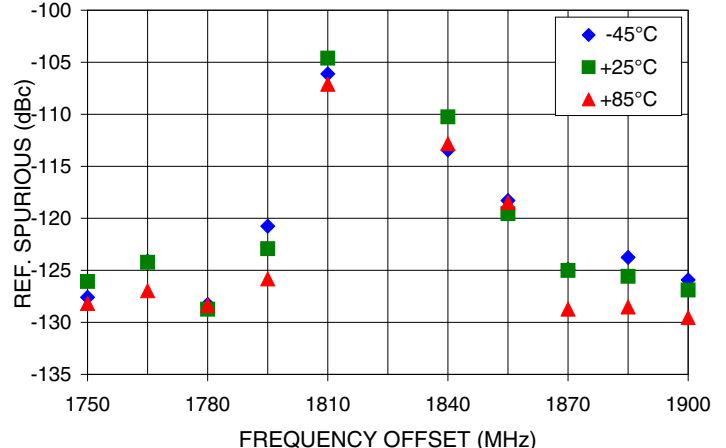
REFERENCE SPURIOUS
Vs FREQ. OFFSET @ Fcar = 1795MHz



COMPARISON SPURIOUS
Vs FREQ. OFFSET @ Fcar = 1825MHz



REFERENCE SPURIOUS
Vs FREQ. OFFSET @ Fcar = 1825MHz

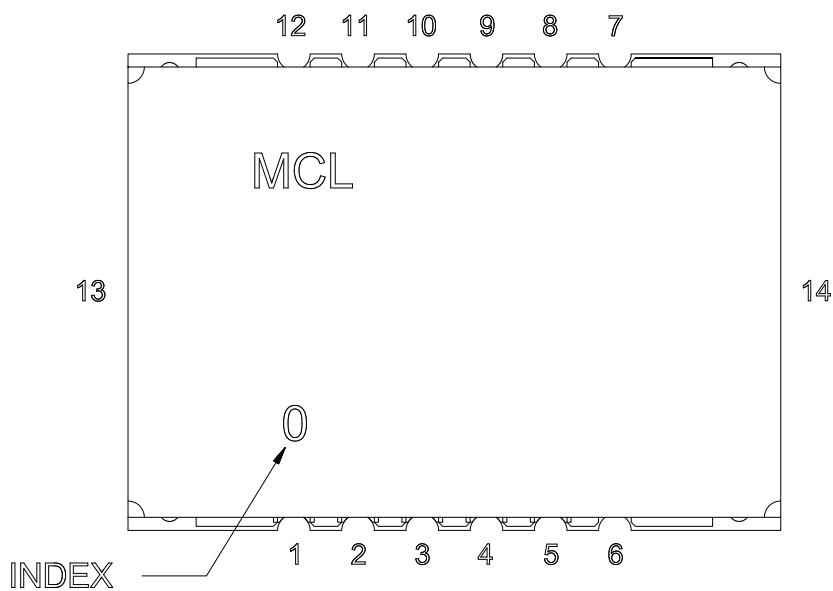


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Pin Configuration

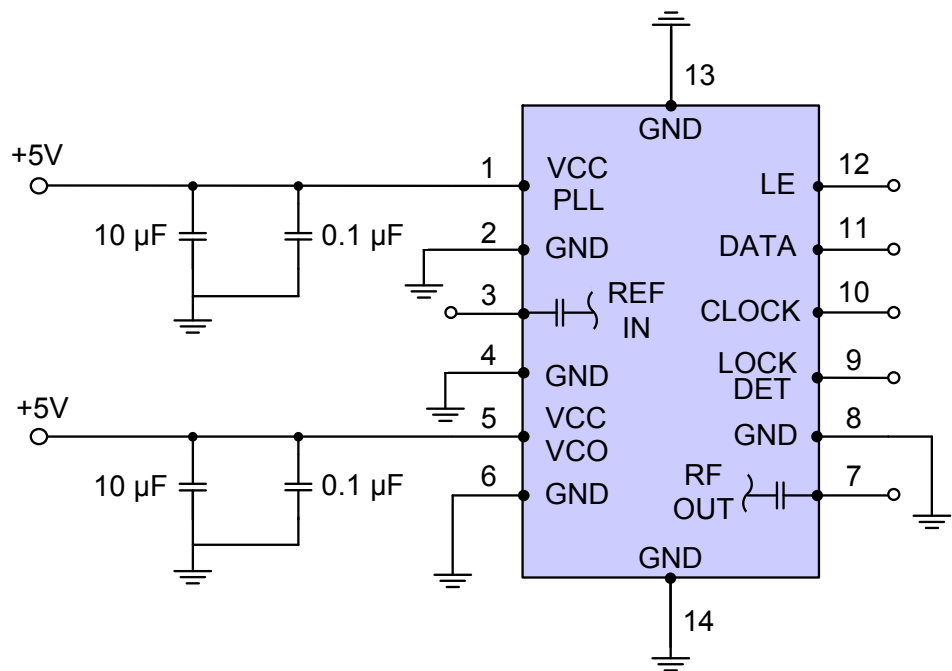


Pin Connection

Pin Number	Function
1	VCC PLL
2	GND
3	REF IN
4	GND
5	VCC VCO
6	GND
7	RF OUT
8	GND
9	LOCK DET
10	CLOCK
11	DATA
12	LE
13	GND
14	GND

Recommended Application Circuit

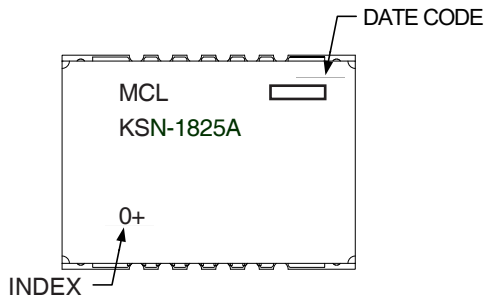
Note: REF IN and RF OUT ports are internally AC coupled.



Notes
A. Performance and quality attributes and conditions not expressly stated in this specification document are intended to be excluded and do not form a part of this specification document.
B. Electrical specifications and performance data contained in this specification document are based on Mini-Circuit's applicable established test performance criteria and measurement instructions.
C. The parts covered by this specification document are subject to Mini-Circuits standard limited warranty and terms and conditions (collectively, "Standard Terms"); Purchasers of this part are entitled to the rights and benefits contained therein. For a full statement of the Standard Terms and the exclusive rights and remedies thereunder, please visit Mini-Circuits' website at www.minicircuits.com/MCLStore/terms.jsp



Device Marking



Additional Detailed Technical Information

Additional information is available on our web site. To access this information enter the model number on our web site home page.

Case Style: DK801

Tape & Reel: TR-F28

Suggested Layout for PCB Design: PL-249

Evaluation Board: TB-567+

Environment Ratings: ENV03T2

Notes

- A. Performance and quality attributes and conditions not expressly stated in this specification document are intended to be excluded and do not form a part of this specification document.
- B. Electrical specifications and performance data contained in this specification document are based on Mini-Circuit's applicable established test performance criteria and measurement instructions.
- C. The parts covered by this specification document are subject to Mini-Circuits standard limited warranty and terms and conditions (collectively, "Standard Terms"); Purchasers of this part are entitled to the rights and benefits contained therein. For a full statement of the Standard Terms and the exclusive rights and remedies thereunder, please visit Mini-Circuits' website at www.minicircuits.com/MCLStore/terms.jsp



Frequency Synthesizer

KSN-1825A+

Typical Performance Data

FREQ. (MHz)	POWER OUTPUT (dBm)			HARMONICS (dBc)						VCO CURRENT (mA)			PLL CURENT (mA)		
				F2			F3								
	-45°C	+25°C	+85°C	-45°C	+25°C	+85°C	-45°C	+25°C	+85°C	-45°C	+25°C	+85°C	-45°C	+25°C	+85°C
1765	0.54	0.42	0.22	-23.77	-24.81	-26.25	-37.10	-40.09	-40.09	21.46	22.26	22.69	9.61	11.65	13.59
1771	0.59	0.45	0.27	-24.01	-25.06	-26.57	-37.42	-39.62	-39.87	21.48	22.27	22.65	9.62	11.68	13.62
1779	0.65	0.48	0.26	-24.24	-25.16	-26.73	-37.81	-39.97	-40.39	21.49	22.27	22.70	9.63	11.69	13.63
1787	0.68	0.48	0.28	-24.12	-24.98	-26.56	-39.04	-41.26	-41.26	21.49	22.27	22.65	9.63	11.70	13.63
1795	0.72	0.50	0.28	-24.14	-24.97	-26.90	-39.92	-41.87	-41.26	21.50	22.27	22.64	9.64	11.71	13.64
1803	0.76	0.49	0.23	-24.43	-25.67	-27.51	-40.92	-41.74	-41.42	21.50	22.25	22.67	9.64	11.71	13.66
1811	0.78	0.46	0.18	-25.04	-26.23	-28.07	-41.29	-41.56	-40.91	21.48	22.23	22.64	9.64	11.72	13.66
1819	0.61	0.57	0.22	-25.30	-26.22	-27.92	-41.90	-42.26	-41.14	21.58	22.14	22.43	9.65	11.72	13.66
1825	0.77	0.45	0.19	-25.17	-26.23	-28.15	-43.06	-42.67	-41.19	21.29	22.19	22.55	9.65	11.72	13.67

FREQ. (MHz)	PHASE NOISE (dBc/Hz)														
	@ OFFSETS														
	-45°C					+25°C					+85°C				
	100Hz	1kHz	10kHz	100kHz	1MHz	100Hz	1kHz	10kHz	100kHz	1MHz	100Hz	1kHz	10kHz	100kHz	1MHz
1765	-75.74	-73.08	-108.91	-131.53	-151.45	-74.23	-74.82	-108.86	-129.88	-150.79	-73.09	-72.04	-107.73	-128.84	-149.63
1771	-74.16	-72.29	-108.56	-131.41	-151.11	-73.82	-73.42	-108.38	-129.52	-150.18	-72.07	-72.12	-106.82	-129.28	-149.22
1779	-72.50	-73.85	-108.55	-130.98	-151.36	-70.64	-73.50	-107.66	-128.71	-150.87	-72.44	-72.76	-107.16	-128.68	-149.65
1787	-74.37	-72.26	-107.98	-131.30	-151.56	-72.56	-75.05	-108.61	-130.38	-150.66	-72.46	-74.54	-106.92	-129.24	-149.17
1795	-73.57	-72.39	-108.24	-131.24	-150.66	-71.39	-75.19	-108.13	-130.43	-150.41	-71.12	-73.37	-106.70	-128.19	-149.54
1803	-70.78	-72.63	-107.92	-131.04	-151.10	-70.41	-73.03	-107.86	-128.74	-150.10	-71.39	-73.21	-107.09	-127.13	-148.75
1811	-73.68	-73.29	-108.11	-129.73	-148.86	-72.10	-73.89	-107.80	-129.25	-149.66	-70.91	-72.18	-106.89	-127.67	-148.55
1819	-69.28	-75.02	-107.10	-129.79	-148.97	-72.12	-73.54	-106.75	-129.50	-149.25	-69.11	-74.93	-106.46	-128.32	-148.21
1825	-70.44	-73.82	-107.52	-129.84	-150.02	-68.94	-74.99	-107.67	-126.20	-149.91	-66.63	-73.09	-106.25	-127.11	-149.19

Frequency Synthesizer

KSN-1825A+

Typical Performance Data

COMPARISON SPURIOUS ORDER n	COMPARISON SPURIOUS @Fcarrier 1765MHz± (n*Fcomparison) (dBc) NOTE 1			COMPARISON SPURIOUS @Fcarrier 1795MHz± (n*Fcomparison) (dBc) NOTE 1			COMPARISON SPURIOUS @Fcarrier 1825MHz± (n*Fcomparison) (dBc) NOTE 1		
	-45°C	+25°C	+85°C	-45°C	+25°C	+85°C	-45°C	+25°C	+85°C
-5	-99.14	-94.87	-99.06	-98.58	-97.99	-99.77	-96.79	-98.67	-99.08
-4	-97.07	-97.69	-95.59	-95.49	-91.88	-93.36	-94.24	-93.75	-93.09
-3	-88.97	-88.52	-90.68	-89.77	-90.16	-87.03	-84.72	-88.31	-88.23
-2	-82.24	-86.89	-86.50	-85.20	-87.19	-86.29	-85.16	-88.34	-82.12
-1	-83.19	-82.89	-88.37	-83.81	-84.70	-83.91	-82.32	-84.07	-83.34
0 ^{note 2}	-	-	-	-	-	-	-	-	-
+1	-83.44	-88.51	-86.90	-84.04	-87.15	-83.32	-82.81	-84.06	-83.17
+2	-84.38	-87.14	-83.08	-85.09	-87.74	-82.12	-86.47	-84.44	-86.48
+3	-90.79	-89.38	-91.31	-91.54	-89.69	-87.27	-85.41	-89.42	-88.54
+4	-94.47	-94.60	-92.70	-97.07	-95.97	-95.55	-92.82	-92.35	-96.70
+5	-97.42	-101.43	-99.34	-94.88	-100.02	-96.51	-96.69	-101.98	-100.13

Note 1: Comparison frequency 50 kHz

Note 2: All spurs are referenced to carrier signal (n=0).

REFERENCE SPURIOUS ORDER n	REFERENCE SPURIOUS @Fcarrier 1765MHz± (n*Freference) (dBc) NOTE 3			REFERENCE SPURIOUS @Fcarrier 1795MHz± (n*Freference) (dBc) NOTE 3			REFERENCE SPURIOUS @Fcarrier 1825MHz± (n*Freference) (dBc) NOTE 3		
	-45°C	+25°C	+85°C	-45°C	+25°C	+85°C	-45°C	+25°C	+85°C
-5	-128.29	-127.59	-127.63	-125.22	-129.84	-128.68	-127.59	-126.07	-128.18
-4	-122.50	-127.64	-123.72	-122.20	-126.68	-124.81	-124.12	-124.23	-126.96
-3	-122.94	-125.26	-126.04	-128.24	-128.61	-128.43	-128.27	-128.74	-128.36
-2	-118.65	-121.13	-117.89	-117.81	-120.37	-118.62	-120.76	-122.92	-125.82
-1	-117.70	-117.66	-109.50	-117.56	-111.57	-106.75	-106.12	-104.61	-107.11
0 ^{note 4}	-	-	-	-	-	-	-	-	-
+1	-112.93	-113.41	-117.61	-118.42	-119.98	-111.68	-113.43	-110.25	-112.83
+2	-118.30	-122.26	-118.76	-117.99	-119.51	-118.09	-118.29	-119.56	-118.49
+3	-129.03	-126.22	-125.66	-128.89	-128.10	-126.77	-124.91	-125.01	-128.72
+4	-120.55	-125.46	-124.45	-120.29	-125.29	-125.96	-123.75	-125.58	-128.52
+5	-129.93	-128.15	-128.54	-129.93	-128.87	-127.32	-125.92	-126.89	-129.54

Note 3: Reference frequency 15 MHz

Note 4: All spurs are referenced to carrier signal (n=0).

REV. X1
KSN-1825A+
100707
Page 2 of 2



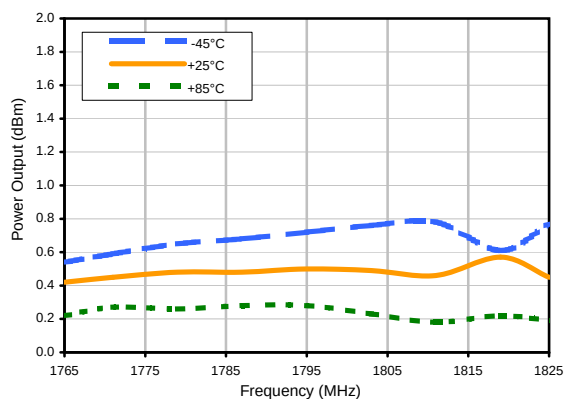
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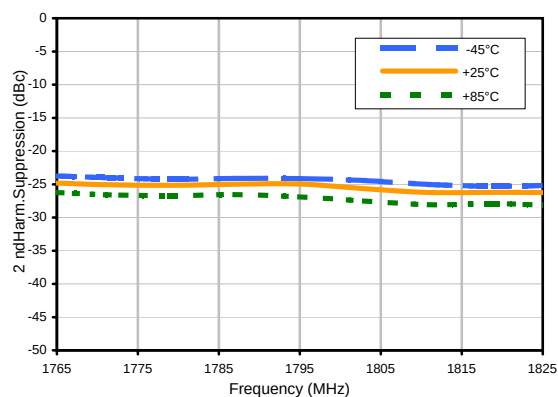


Typical Performance Data

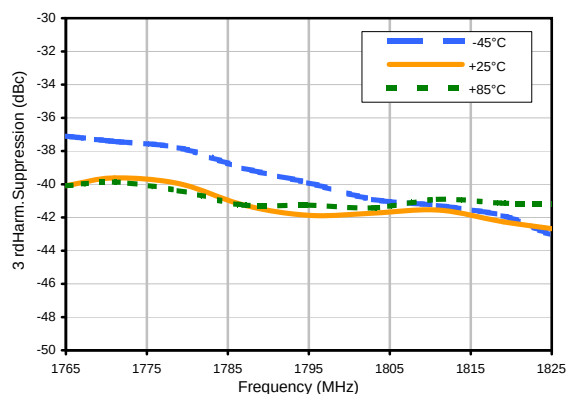
Power Output Vs Frequency



2nd Harmonics Vs Frequency



3rd Harmonics Vs Frequency

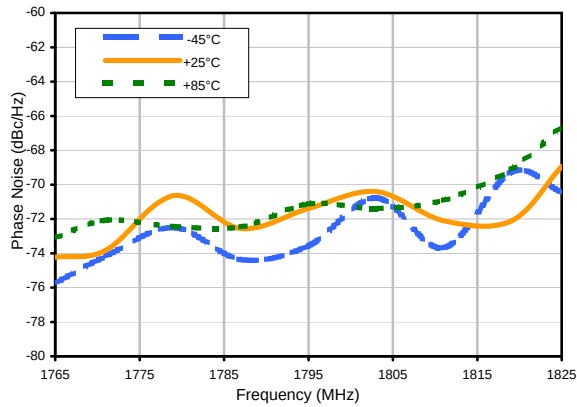


Frequency Synthesizer

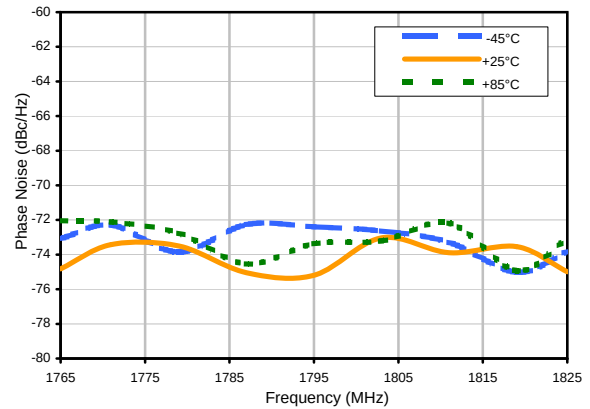
KSN-1825A+

Typical Performance Data

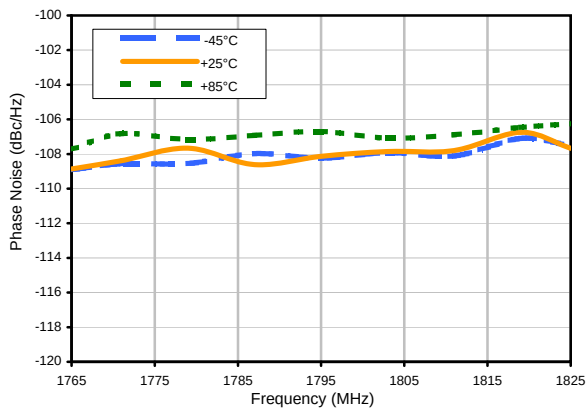
Phase Noise @ 100 Hz offset



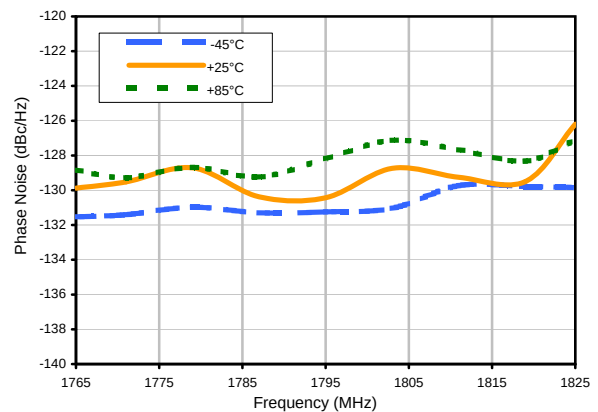
Phase Noise @ 1 kHz offset



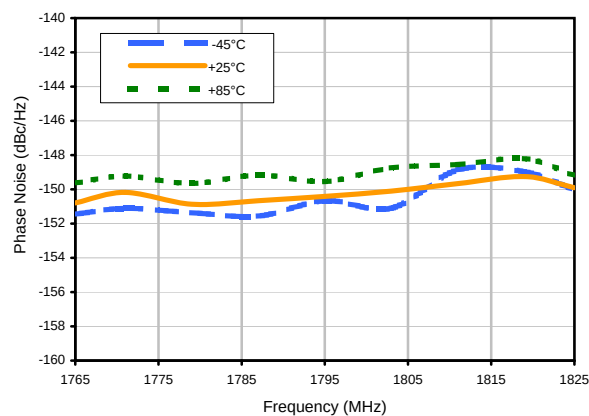
Phase Noise @ 10 kHz offset



Phase Noise @ 100 kHz offset



Phase Noise @ 1 MHz offset



REV. X1
KSN-1825A+
100707
Page 2 of 3



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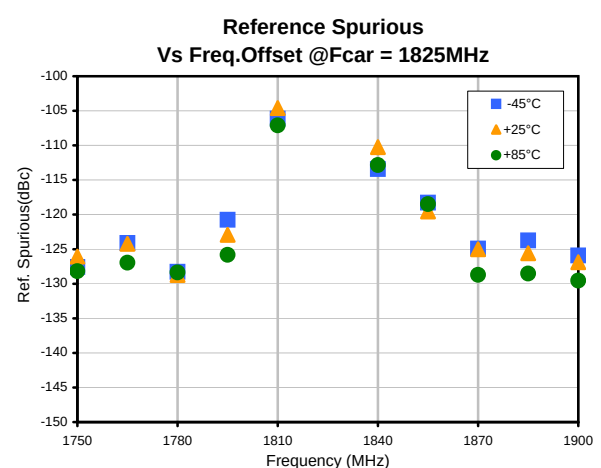
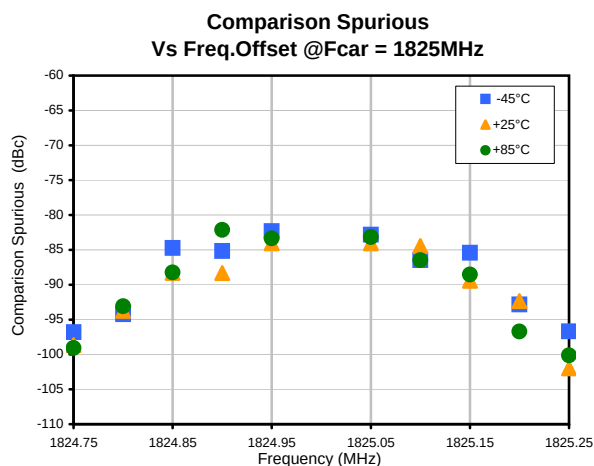
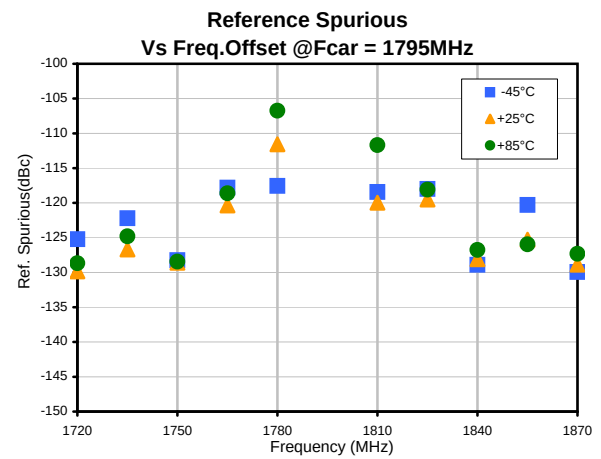
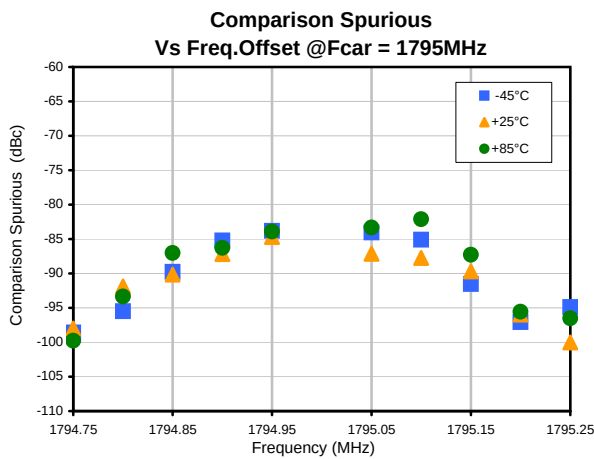
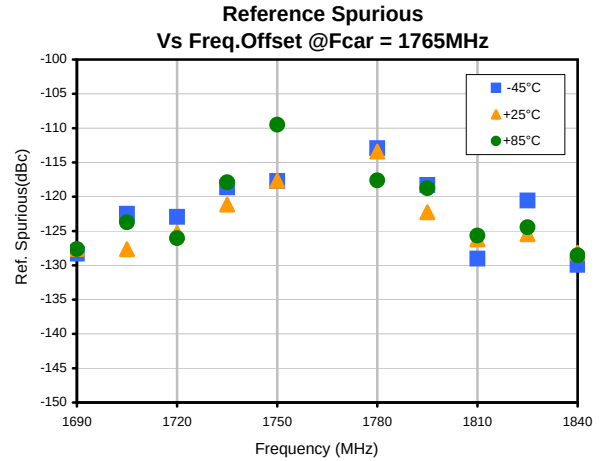
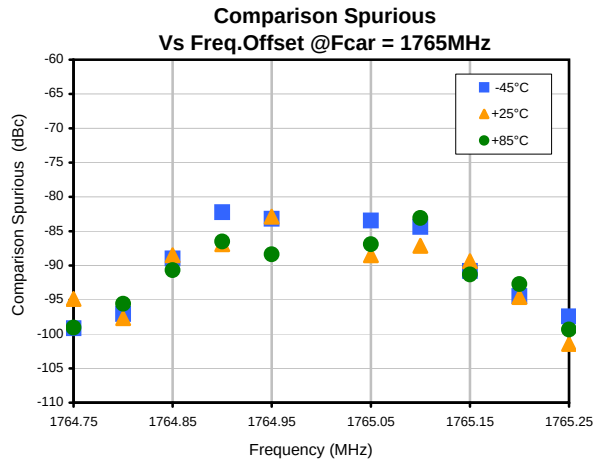
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Frequency Synthesizer

KSN-1825A+

Typical Performance Data



REV. X1

KSN-1825A+

100707

Page 3 of 3



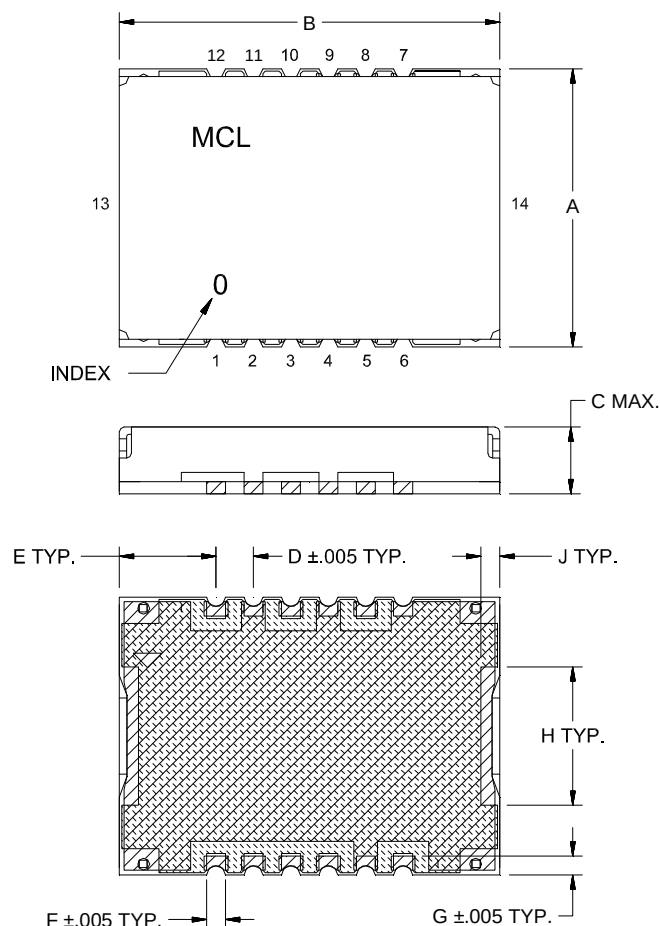
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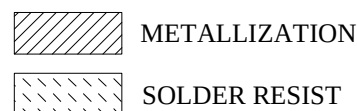
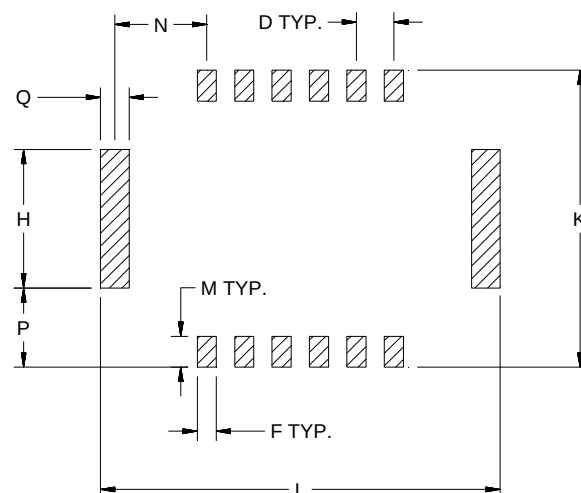
The Design Engineers Search Engine finds the model you need, Instantly • For detailed performance specs & shopping online see



Outline Dimensions



Suggested PCB Land Pattern



CASE#	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	WT. GRAM
DK801	.584 (14.83)	.800 (20.32)	.154 (3.91)	.079 (2.01)	.203 (5.16)	.040 (1.02)	.040 (1.02)	.291 (7.39)	.039 (1.0)	.624 (15.85)	.840 (21.34)	.060 (1.52)	.193 (4.90)	.170 (4.32)	.060 (1.52)	1.6

Dimensions are in inches (mm). Tolerances: 2PL. +/- .03; 3PL. +/- .015

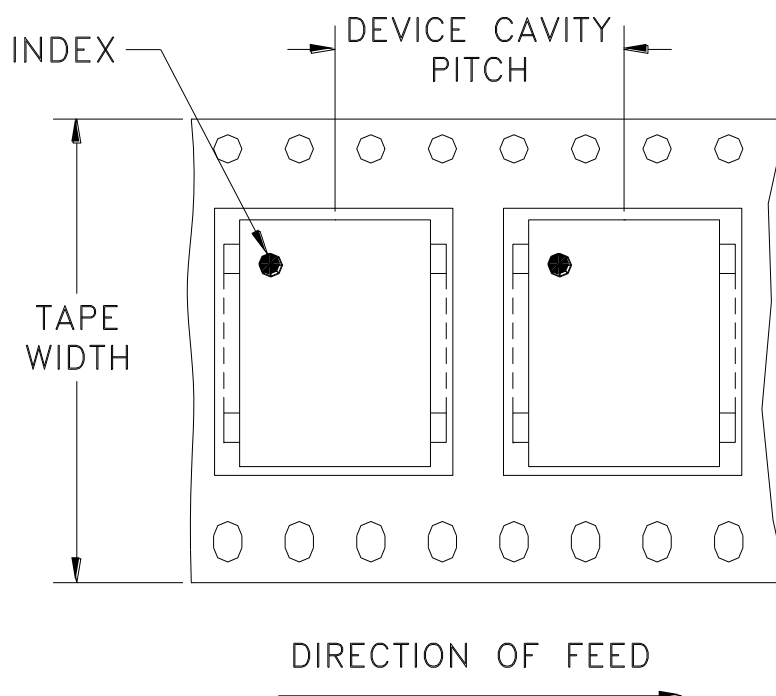
Notes:

1. Case material: Nickel-Silver alloy.
2. Base: Printed wiring laminate.
3. Termination finish:

For RoHS Case Styles: 2-5 μ inch (.05-.13 microns) Gold over 120-240 μ inch (3.05-6.10 microns) Nickel plate.
All models, (+) suffix.

Tape & Reel Packaging TR-F28

DEVICE ORIENTATION IN T&R



Tape Width, mm	Device Cavity Pitch, mm	Reel Size, inches	Devices per Reel	
32	20	13	Small quantity standards (see note)	20
				50
				100
				200
			Standard	500

Note: Please consult individual model data sheet to determine device per reel availability.

Mini-Circuits carrier tape materials provide protection from ESD (Electro-Static Discharge) during handling and transportation. Tapes are static dissipative and comply with industry standards EIA-481/EIA-541.

Go to: www.minicircuits.com/pages/pdfs/tape.pdf



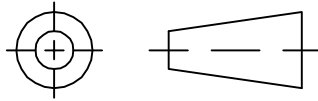
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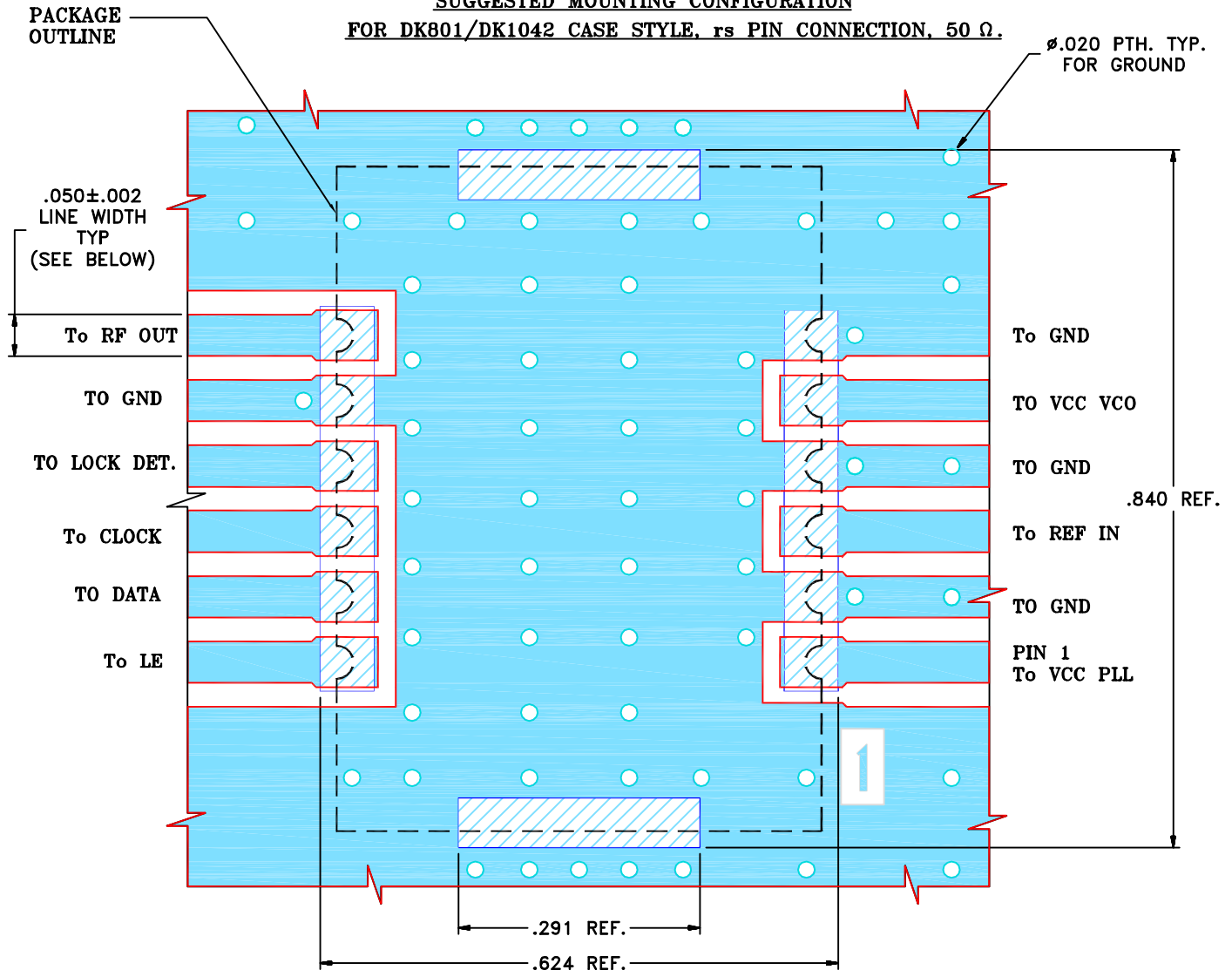
THIRD ANGLE PROJECTION



REVISIONS

REV	ECN No.	DESCRIPTION	DATE	DR	AUTH
OR	M108069	NEW RELEASE	11/06	DK	HH
A	M110535	MODIFY GROUND PADS	03/07	DK	HH
B	M126537	DELETE CHIP COMP. & TABLE OF VALUES	03/10	DK	HH
B	R78979	DELETE CHIP COMP. & TABLE OF VALUES	03/10	DK	HH

SUGGESTED MOUNTING CONFIGURATION

FOR DK801/DK1042 CASE STYLE, rs PIN CONNECTION, 50 Ω . ϕ .020 PTH. TYP.
FOR GROUND

NOTES:

- TRACE WIDTH IS SHOWN FOR FR4 WITH DIELECTRIC THICKNESS. .025"±.002". COPPER: 1/2 OZ. EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH MAY NEED TO BE MODIFIED.
- BOTTOM SIDE OF THE PCB IS CONTINUOUS GROUND PLANE.

DENOTES PCB COPPER LAYOUT WITH SMOBC (SOLDER MASK OVER BARE COPPER)

DENOTES COPPER LAND PATTERN FREE OF SOLDERMASK

UNLESS OTHERWISE SPECIFIED

INITIALS

DATE

DIMENSIONS ARE IN INCHES

TOLERANCES ON:

2 PL DECIMALS ±

3 PL DECIMALS ± .005

ANGLES ±

FRACTIONS ±

DRAWN

DK (RAVON)

27 MAR 07

CHECKED

RZ (RAVON)

27 MAR 07

APPROVED

HH (RAVON)

27 MAR 07

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ASHEETA1.DWG REV:A DATE:01/12/95



Mini-Circuits®

13 Neptune Avenue
Brooklyn NY 11235

PL, rs ,DK801/DK1042, KSN
TB-567+ (50 Ω)

SIZE
A

CODE IDENT
15542

DRAWING NO:
98-PL-249

REV:
B

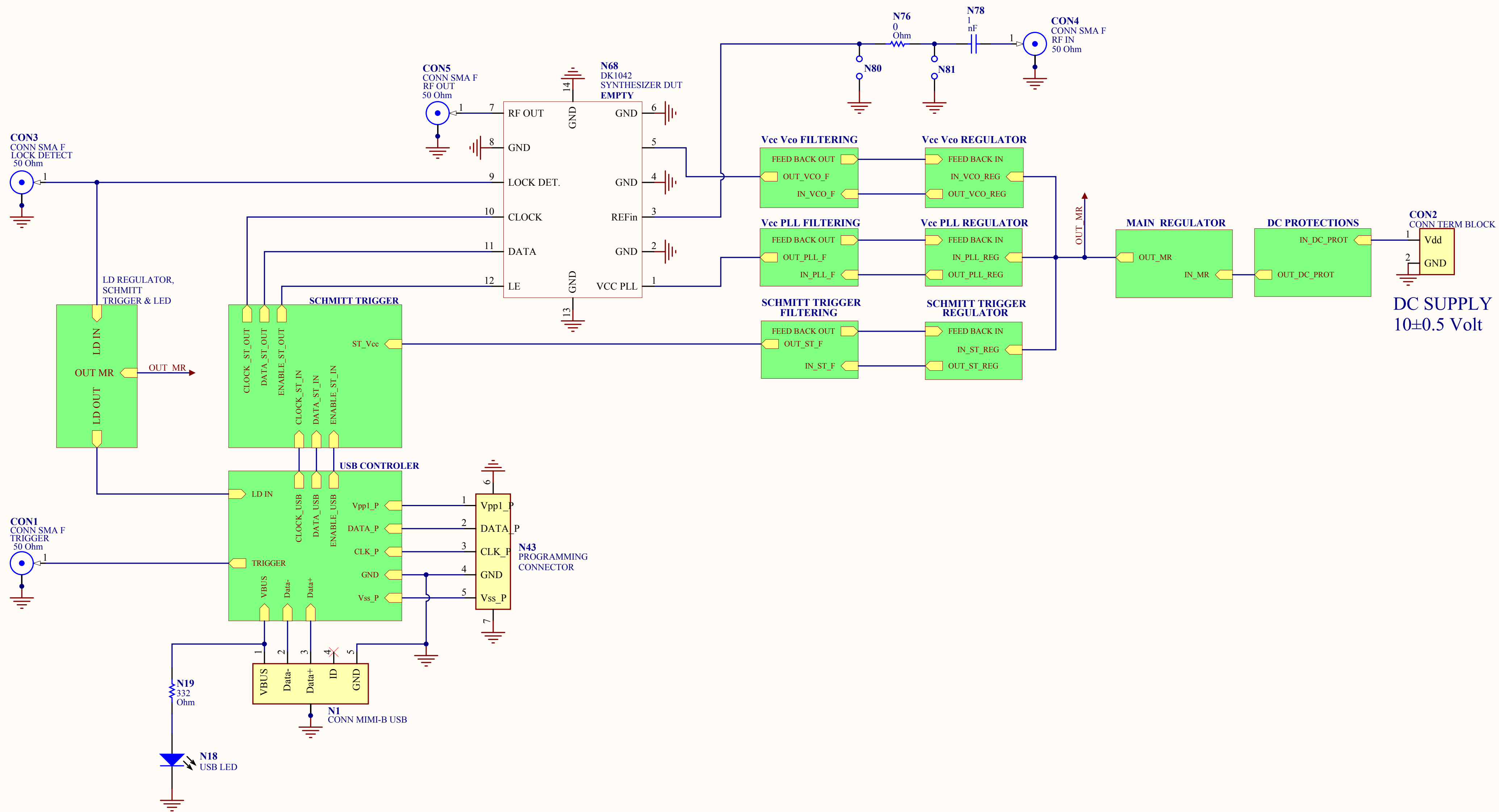
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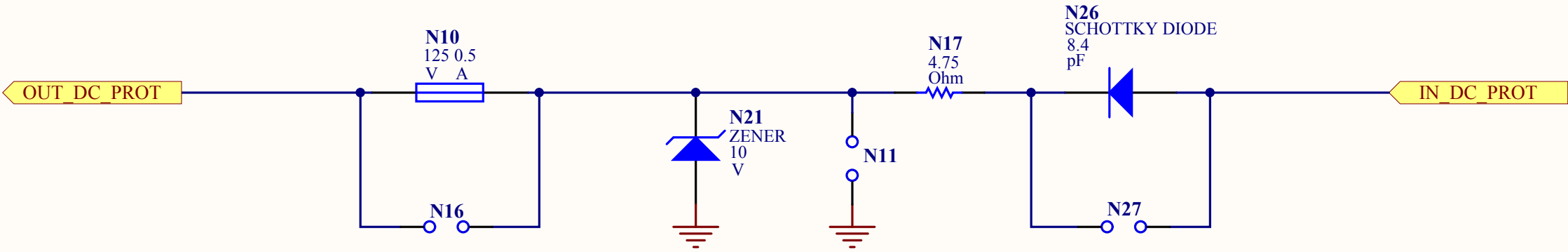
SHEET: 1 OF 1

ELECTRICAL SCHEME-GENERAL

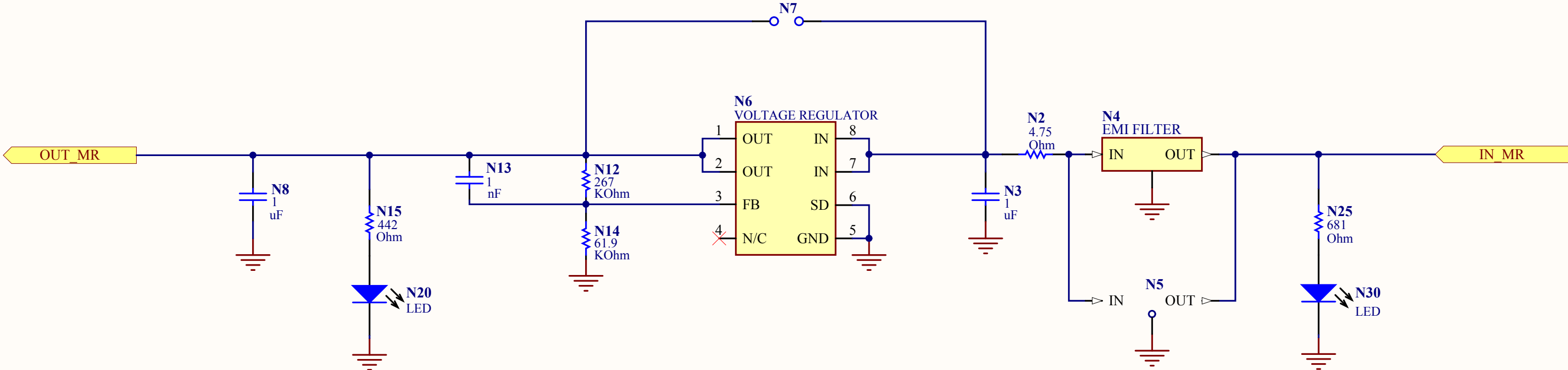
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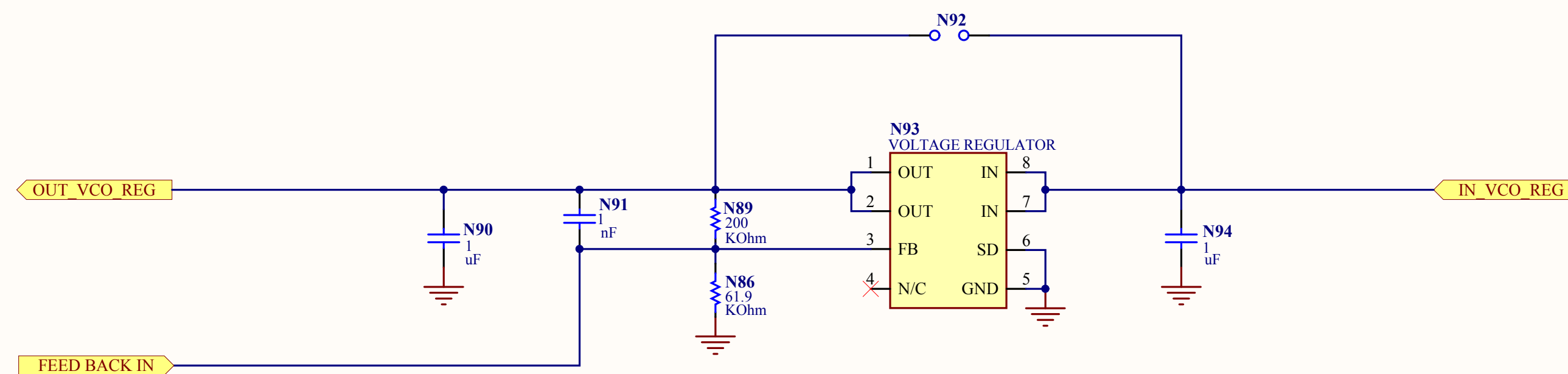
DC PROTECTIONS



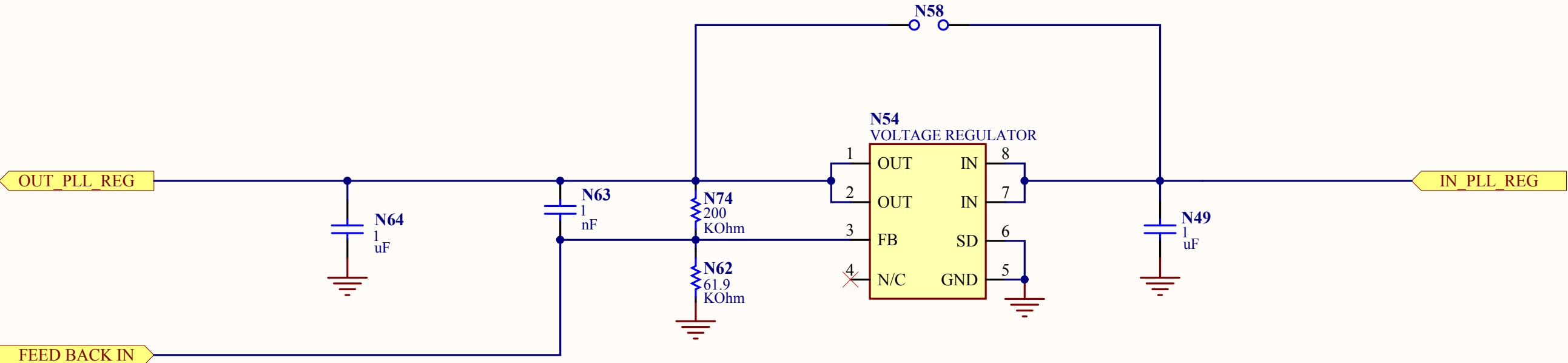
MAIN REGULATOR



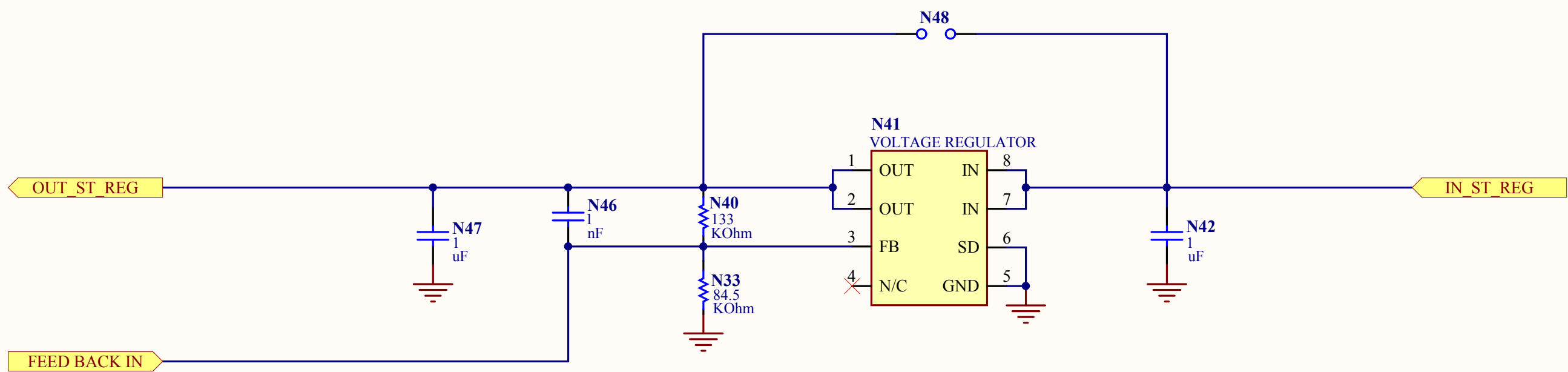
VCC VCO REGULATOR



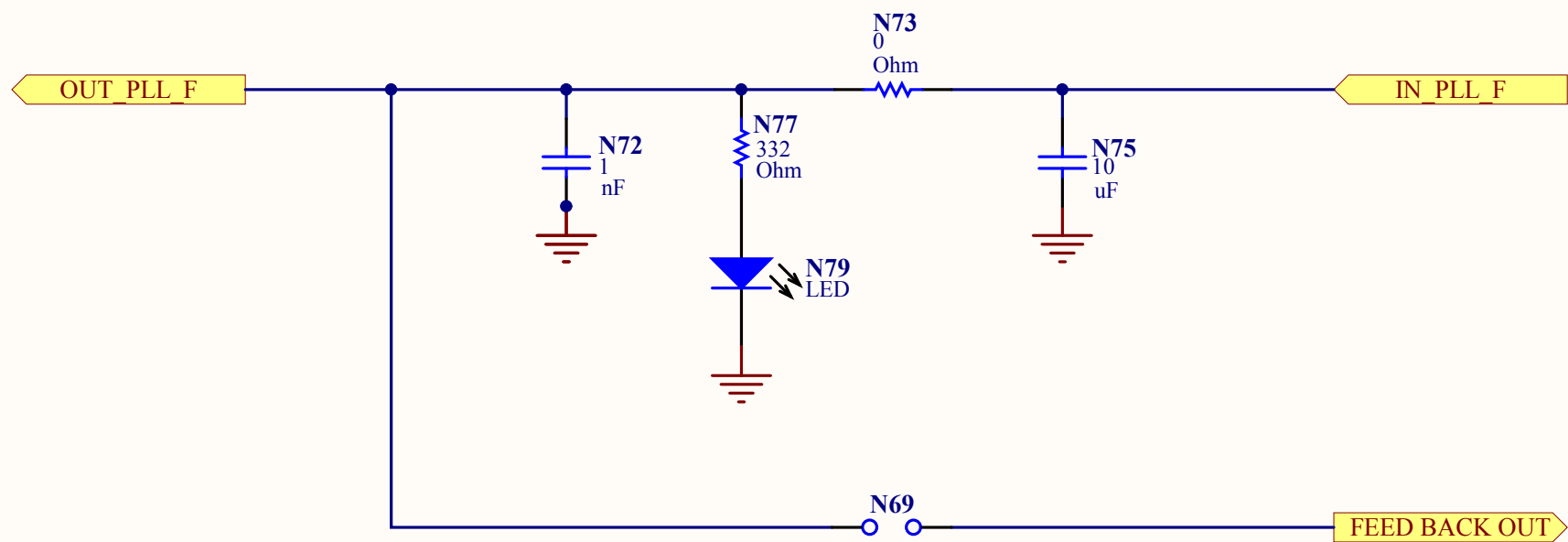
VCC PLL REGULATOR



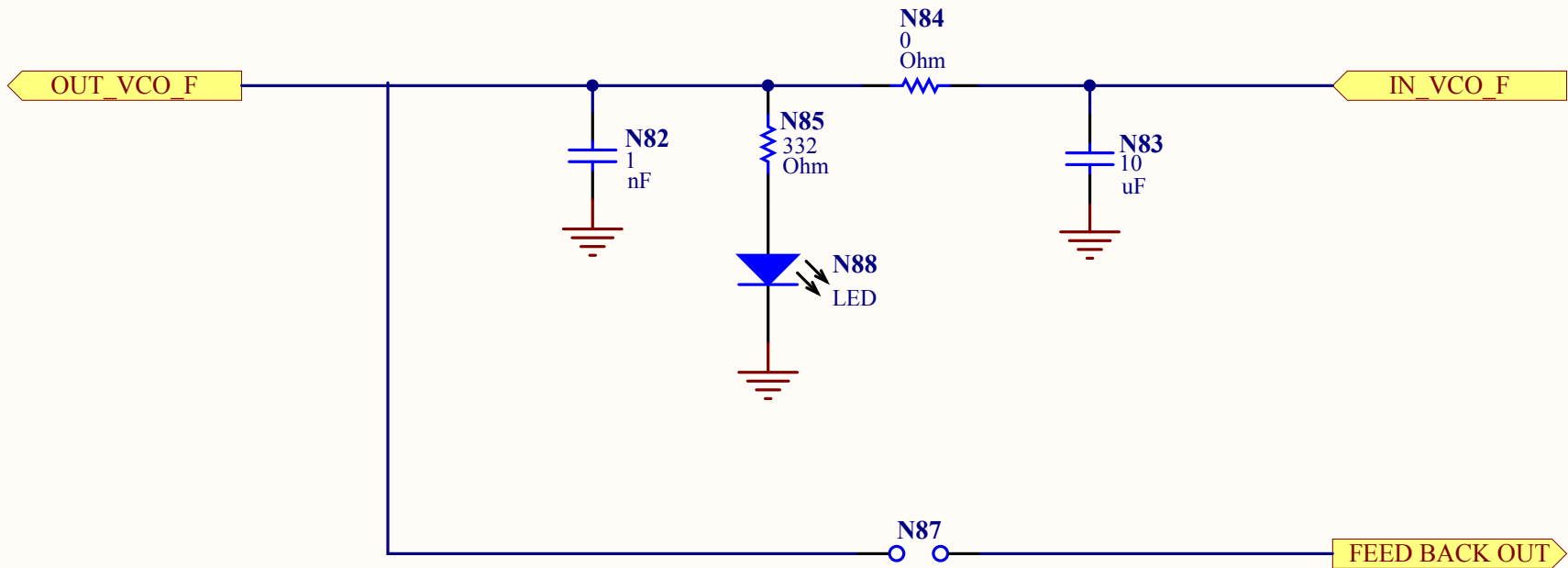
SCHMITT TRIGGER REGULATOR



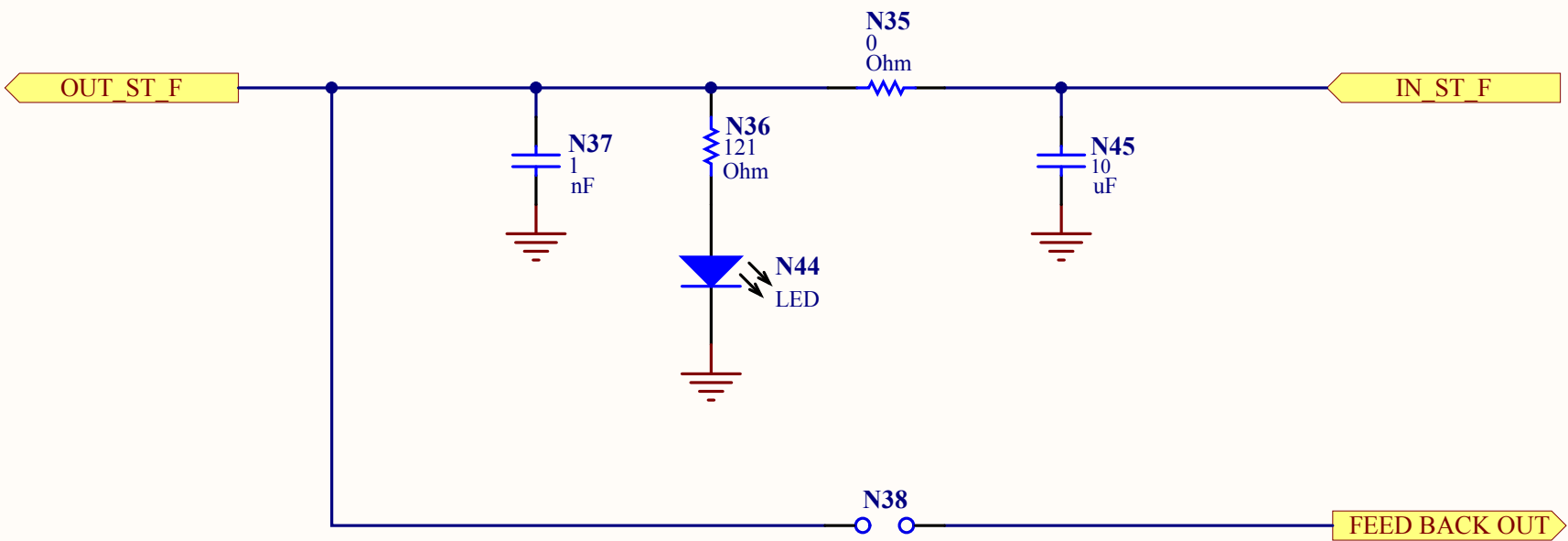
VCC PLL FILTERING



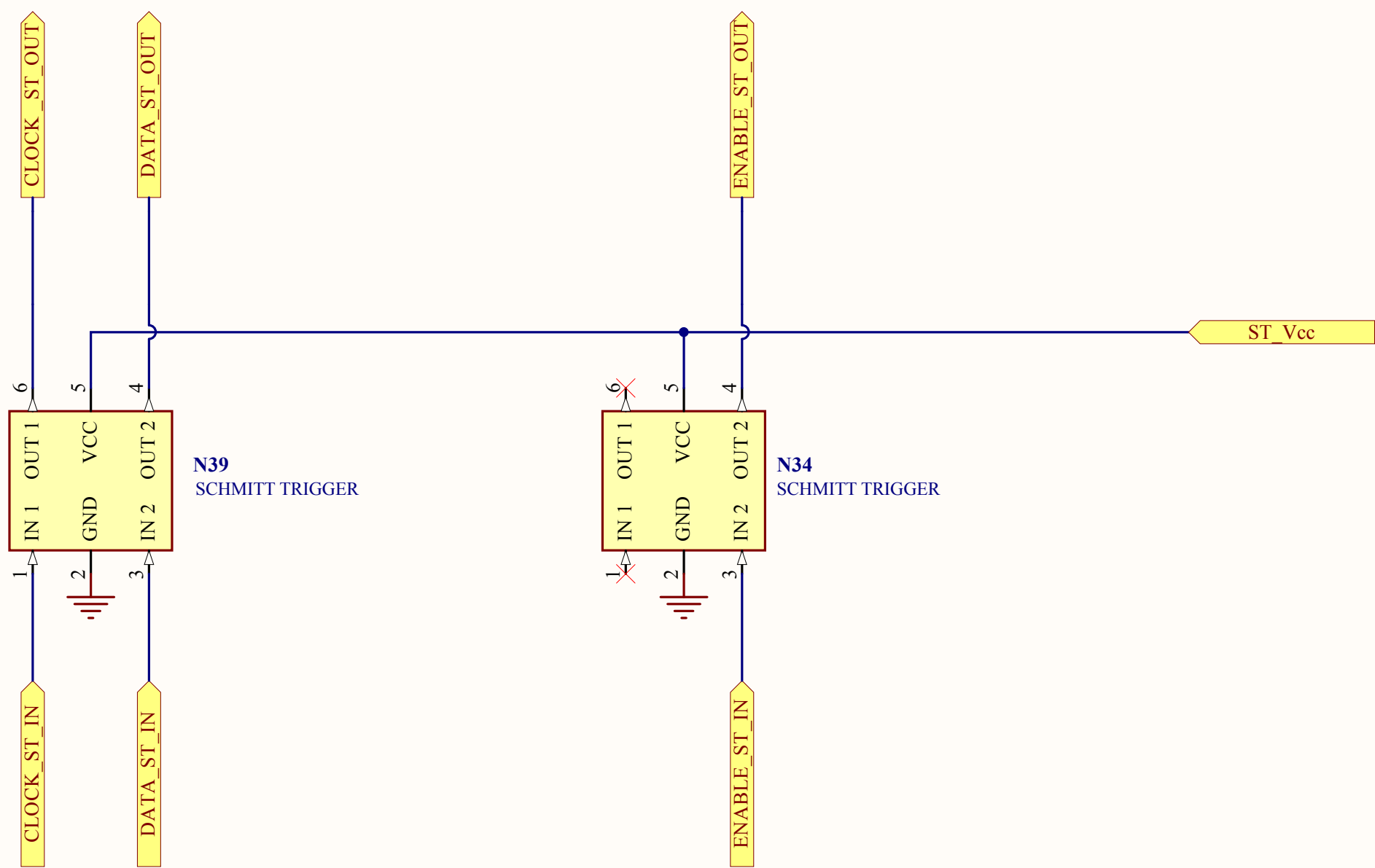
VCC VCO FILTERING



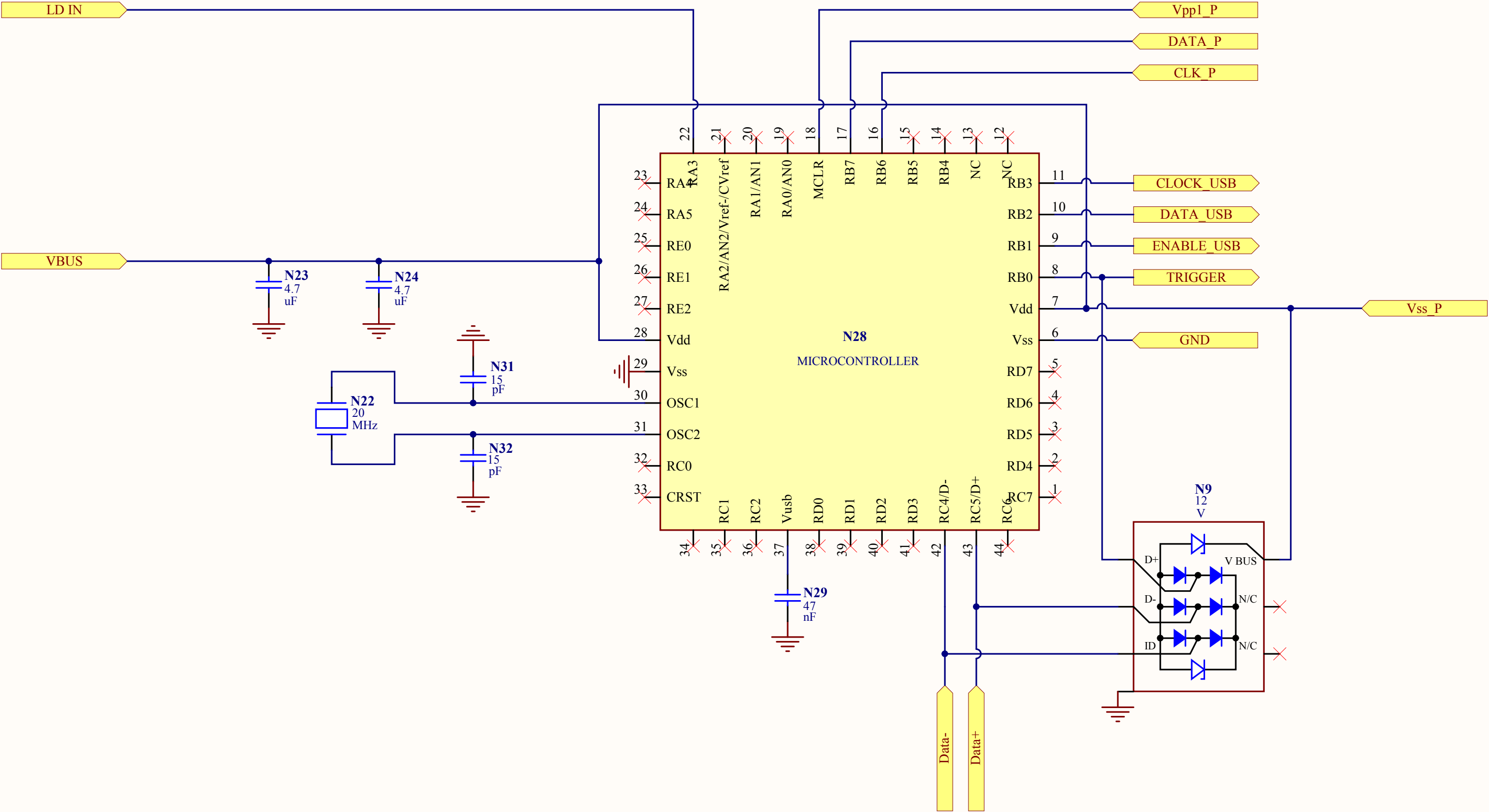
SCHMITT TRIGGER FILTERING



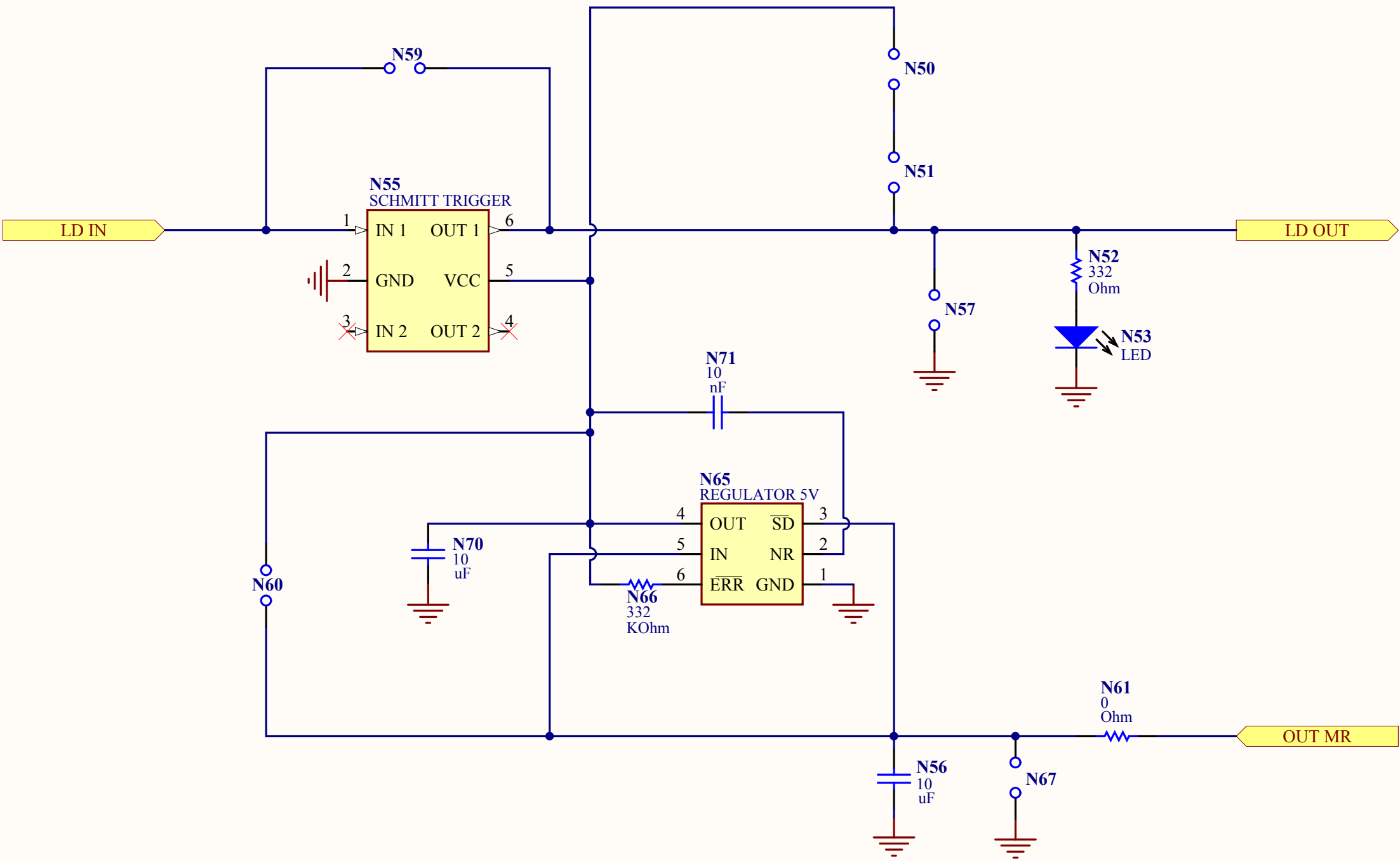
SCHMITT TRIGGER



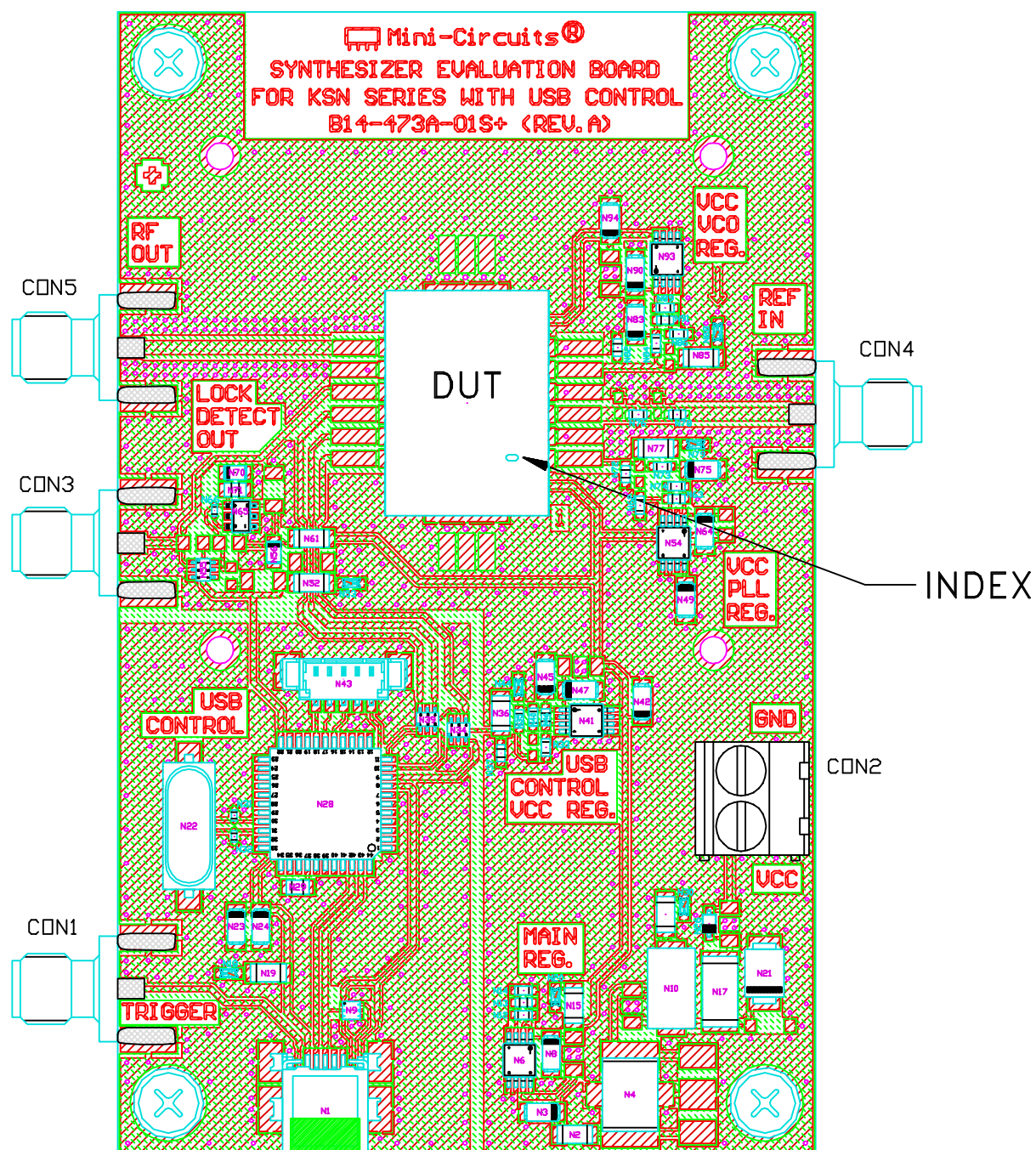
USB CONTROLER



LD REGULATOR SCHMITT TRIGGER AND LED



Evaluation Board and Circuit



TB-567+

NOTES:

1. SMA F JACK CONNECTORS.
2. PCB MATERIAL: FR4 OR EQUIVALENT, DIALECTRIC CONSTANT=4.7, DIALECTRIC THICKNESS=.059 INCH.



All Mini-Circuits products are manufactured under exacting quality assurance and control standards, and are capable of meeting published specifications after being subjected to any or all of the following physical and environmental test.

Specification	Test/Inspection Condition	Reference/Spec
Operating Temperature	-40° to 85°C Ambient Environment	Individual Model Data Sheet
Storage Temperature	-55° to 100° C Ambient Environment	Individual Model Data Sheet
Humidity	90 to 95% RH, 240 hours, 50°C	MIL-STD-202, Method 103, Condition A, Except 50°C and end-point electrical test done within 12 hours
Thermal Shock	-55° to 100°C, 100 cycles	MIL-STD-202, Method 107, Condition A-3, except +100°C
Solder Reflow Heat	Sn-Pb Eutectic Process: 225°C peak Pb-Free Process, 245°C peak	J-STD-020, Table 4-1, 4-2 and 5-2, Figure 5-1
Solderability	10X Magnification	J-STD-002, Para 4.2.5, Test S, 95% Coverage
Vibration (High Frequency)	20g peak, 20-2000 Hz, 4 times in each of three axes (total 12)	MIL-STD-883, Method 2007.3, Condition A
Mechanical Shock	50g, 11 ms, 1/2-sine, 18 shocks: 3 each direction, each of 3 axes	MIL-STD-202, Method 213, Condition A
Marking Resistance to Solvents	Isopropyl alcohol + mineral spirits at 25°C; terpene defluxer at 25°C; distilled water + proylene glycol monomethyl ether + monoethanolamine at 63°C to 70°C	MIL-STD-202, Method 215