

Newport Media

Fixed TV Business Unit

2010-12-15



- **Founded in January 2005**
- **Company is focused exclusively on System Semiconductor Solutions (ICs and Software) for Digital Mobile Television terminals**
 - NMI is a total Mobile TV system solution provider with complete protocol stack and middleware products for all standards
- **First commercial product is a DVB-H/T tri-band SOC solution *shipping***
- **Second commercial product is an ISDB-T one/three segment SOC solution for Japan and Brazil *shipping***
- **Third product is a FLO SOC solution for U.S. , Japan and other markets *shipping***
- **Fourth product is Analog TV (NTSC, PAL and SECAM) for global “free to air” *shipping***
- **Commercializing CMMB SOC for China**
- **Roadmap specifies key multimode configurations and integrated A/V decoder functionality**

Customer Products – Examples



Motorola EX245 2.5G Cell phone
Latin America ISDB-T



Hitachi "Besky" 3G Cell phone
Japan ISDB-T



Samsung Galaxy Android Tablet
Latin America Dual Mode
ISDB-T/Analog TV



K-Touch 2G Cell phone
Taiwan DVB-T



Garmin nuvi 1480
Japan / Latin America ISDB-T PND



Mophie TV accessory for iPhone
United States MediaFLO



Sanyo "7.4" and "5.5" "Gorilla" PND
Japan ISDB-T



Countless "Grey Market" 2G handsets
Analog TV (Worldwide)
and
ISDB-T (Latin America)



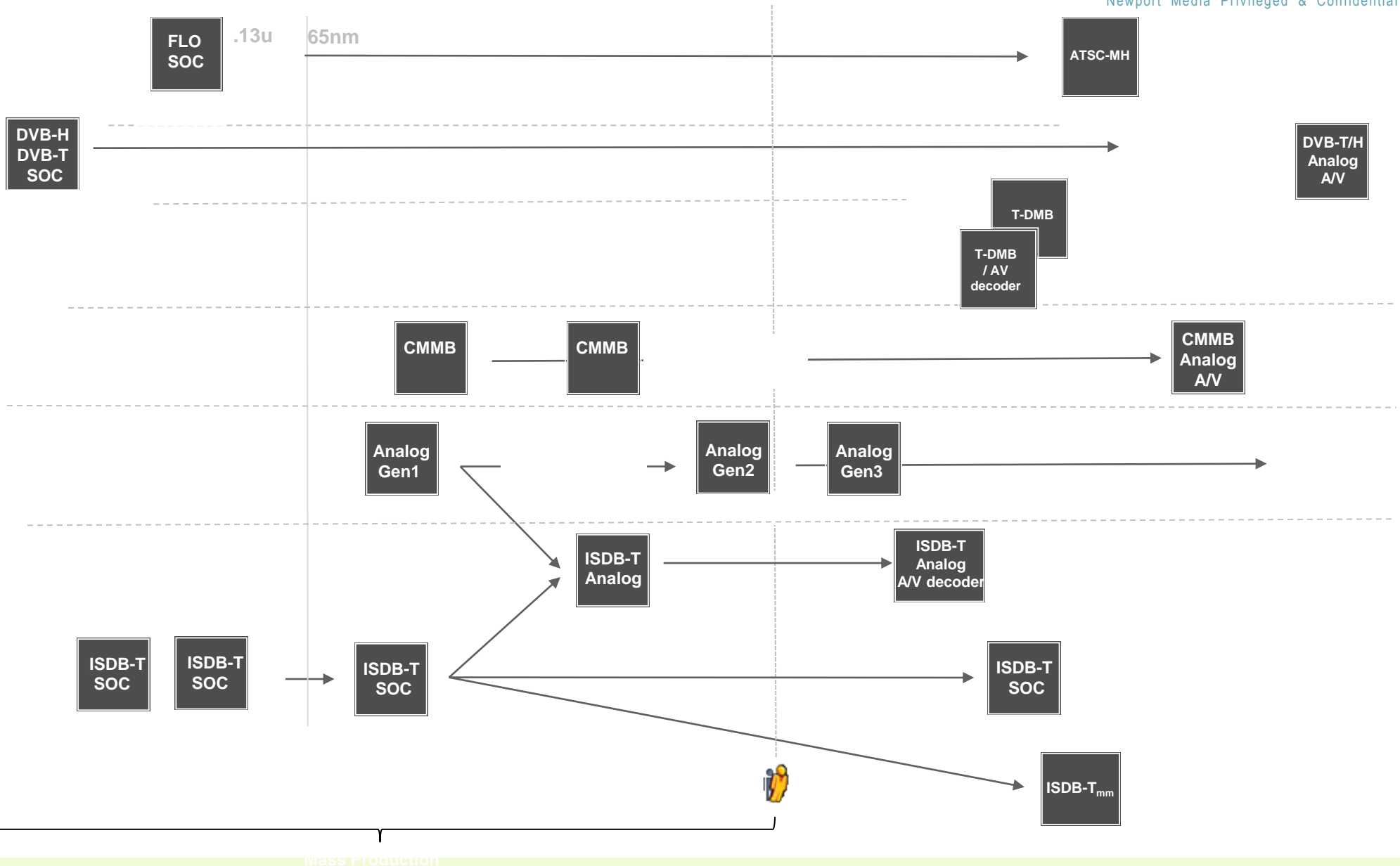
Casio CA005 "Exilim" 3G Cell phone
Japan ISDB-T

- **160+ Engineers and business professionals on three continents**
 - Headquarters (Lake Forest, CA)
 - Corporate, Operations and Sales/Marketing Management
 - 40+ engineers from top tier U.S. graduate universities with many decades of cellular and set-top box system IC experience at leading companies
 - NMI Egypt Design Center (Cairo, Egypt)
 - 30+ engineers from top tier Egyptian universities
 - Extensive experience at leading European telecommunications and semiconductor firms
 - NMI Korea (Seoul, Korea)
 - 80+ engineers from top tier Korean universities
 - Extensive mobile TV middleware and handset application software experience
 - Long history of customer support services in Korea across multiple handset platforms
 - Newport Media China. (Shanghai & Shenzhen, China)
 - Sales Manager plus Application Engineering, Technical Support and R&D group
 - Newport Media K.K. (Tokyo, Japan)
 - 1 Sales/Marketing Manager



New Product Offering and Roadmap

NMI Product Roadmap



Set top line card

- Since inception, Newport Media has **developed extensive expertise and IP in RF, Analog, Mixed Signal, and DSP for Mobile TV applications**
- Leveraging this IP, NMI is developing a **comprehensive portfolio of silicon tuners for global cable, terrestrial, Set Top Box and Television**

Fixed TV Product Portfolio



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DTV Tuner

Ideal for
Terrestrial STB



Hybrid Tuner

Ideal for
Cable/Terrestrial STB
and LCD TV



Hybrid Tuner with ATV Demod

Ideal for LCD TV

- Newport Media has **more global Analog TV field experience than any other silicon tuner supplier**
 - Millions of units shipping in all major ATV markets, including South America, Africa, Asia, and the Middle East
- Newport Media was built **from the ground up as a RF + Digital company**
 - Optimum tuner designs resulting from intelligent allocation of Analog and Digital signal processing
- Newport Media **has a unique IP portfolio** which gives it significant performance advantages over our competitors

Technical Details



DTV Tuner



Hybrid Tuner



Hybrid Tuner with ATV Demod

- **Common packaging allows one PCB design to be quickly re-deployed across multiple platforms**
 - All three products available in 3x3 QFN with nearly identical footprints
- Common driver facilitates SW integration across multiple platforms



Optimized for DTT STB applications

- Tailored for small signals; noise priority over linearity
- Absolute lowest cost



Optimized for cable STB and TV tuner applications

- Larger signal power levels, higher linearity & HR
- Absolute highest performance



Optimized for best overall TV tuner cost

- Identical tuner performance to nm130
- Integrated **demodulator and VSB VIF/SIF SAW filter**

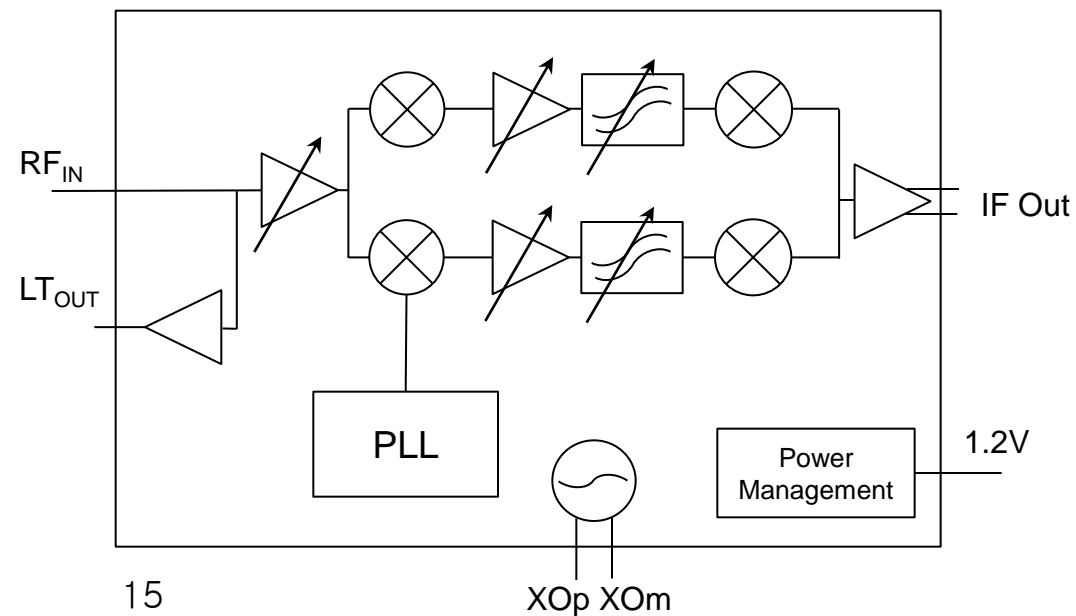
NM120

NM120: Global DTT Tuner



DTV Tuner

Ideal for Terrestrial STB



- Global Digital Terrestrial Tuner for STB
- DVB-T, ATSC, ISDB-T 13 segment, and DTMB compliant
- Significant margin to NorDig, A/74, ARIB, and GB20600 standards
- Under 150mA power consumption: less than half of competing solutions
- Cost effective 3x3 QFN package
- Lowest BOM: no SAW filters, tracking filters, or baluns required
 - No off chip inductors for “integrated” tracking filter
- Differential standard or low-IF outputs, up to 60MHz
- Flexible 1.8-3.3V supply with integrated Power Management

At a glance: NM120 Performance



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Parameter	Min	Typical	Max	Comment
Noise Figure		3dB		75Ω
IIP ₃ at max gain		-6dBm		N+8, N+16
IIP ₂ at max gain		+20dBm		
IIP ₃ at minimum gain	+12dBm			N+8, N+16
IIP ₂ at minimum gain	+40dBm			
Video SNR	40dB			Pin > -55dBm
Harmonic rejection	55dB			HR2-HR9
Integrated Phase noise			1°	Across Band
Current consumption		150mA		1.8V supply, LT disabled

NM120: Details



DTV Tuner

- Power consumption breakdown:
 - 140mA from 1.2V
 - 10mA from VDD_IO (1.8-3.3V)
- Frequency plan does not interfere with satellite band (950-2150MHz)
- Loop through and crystal buffers allow efficient multi-tuner design
- Fully Digital, self-contained RF and IF AGC
 - Reduces BOM and I/O
 - Utilizes NMI unique AGC algorithms to optimize blocker and intermodulation performance.

Parameter	Min	Typical	Max.	Comment
Blocker Rejection	75dB			N+1 and beyond
Group Delay			275ns	
LO Leakage on RF _{IN} & LT _{OUT}			-90dBm	
IF output swing accuracy	-2.5%		2.5%	
RF _{in} -LT _{out} Gain	-1	0	+3	Gain programmable

NM120 13-seg ARIB B-21 Performance



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Parameter	ISDB-T Spec	Design Target	Margin
Freq Support (MHz)	93 - 767 MHz	44 – 862 MHz	+/- 5%
Min Signal 64QAM 7/8 ¹	-75 dBm	< -81 dBm	6 dB
Max Signal 64QAM 7/8 ¹	-20 dBm	0 dBm	20 dB
D/U ATV blocker N-1 ²	-33 dB	-42 dB	9 dB
D/U ATV blocker N+1 ²	-35 dB	-44 dB	9 dB
D/U DTV blocker N-1 ²	-26 dB	-40 dB	14 dB
D/U DTV blocker N+1 ²	-29 dB	-40 dB	11 dB
D/U DTV blocker, N+m, m>1 ²	-	-47 dB	-
D/U DTV blocker, N+m, m>1 ²	-	-47 dB	-

¹: Assumes C-N of 22 dB as per ARIB B-21

²: Measured at -65 dBm desired signal level.

NM120 Nordig Terrestrial Compliance



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Parameter	NORDIG Spec	Design Target	Margin
Freq Support (MHz)	47 - 862 MHz	44 – 862MHz	-
S11 – worst (dB)	-8 dB	-8.5 dB	0.5 dB
NF (dB)	7 – 10	2.5 – 3.5	5 dB
Max Desired (dBm)	-35	+5	40 dB
ACI N+1 ATV (dB) ¹	+33	+42	9 dB
ACI N+X ATV (dB) ¹	+44	+48	4 dB
ACI N+1 DTV (dB) ²	+28	+39	11 dB
ACI N+X DTV (dB) ²	+38	+43	5 dB
Loop Thru Gain (dB)	-1 to 3 dB	-1 to 3 dB	-
RSSI Accuracy (dB)	+/- 5dB absolute	+/- 3.5 dB absolute	+/- 1.5 dB

¹: ATV Blocker kept at -20 dBm and Desired Signal dropped until BER > 1e-7.

²: DTV Blocker kept at -35 dBm and Desired Signal dropped until BER > 1e-7.

Nm120 ATSC Terrestrial Performance

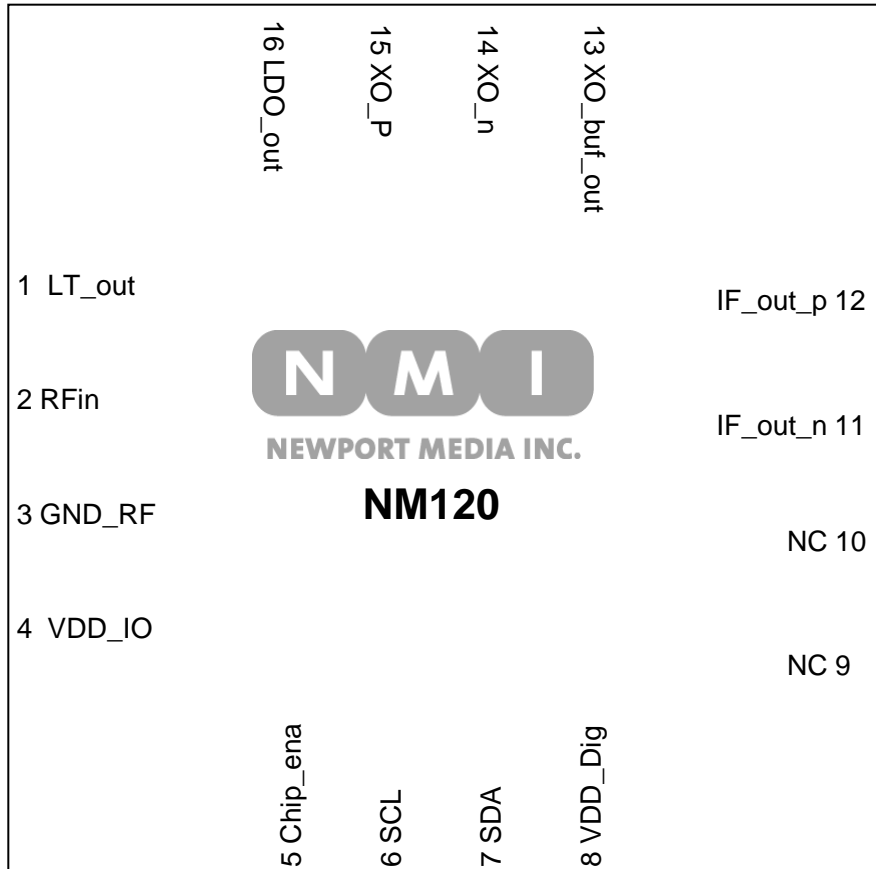


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Parameter	ATSC Spec	Design Target	Margin
Freq Support (MHz)	47 - 862 MHz	44 – 862 MHz	SPEC
NF (dB)	7	3	4 dB
Max Signal (dBm)	-8	+5	13 dBm
Intermodulation D/U, -68 dBm desired ¹	-	-47	-
Intermodulation D/U, -53 dBm desired ¹	-	-38	-

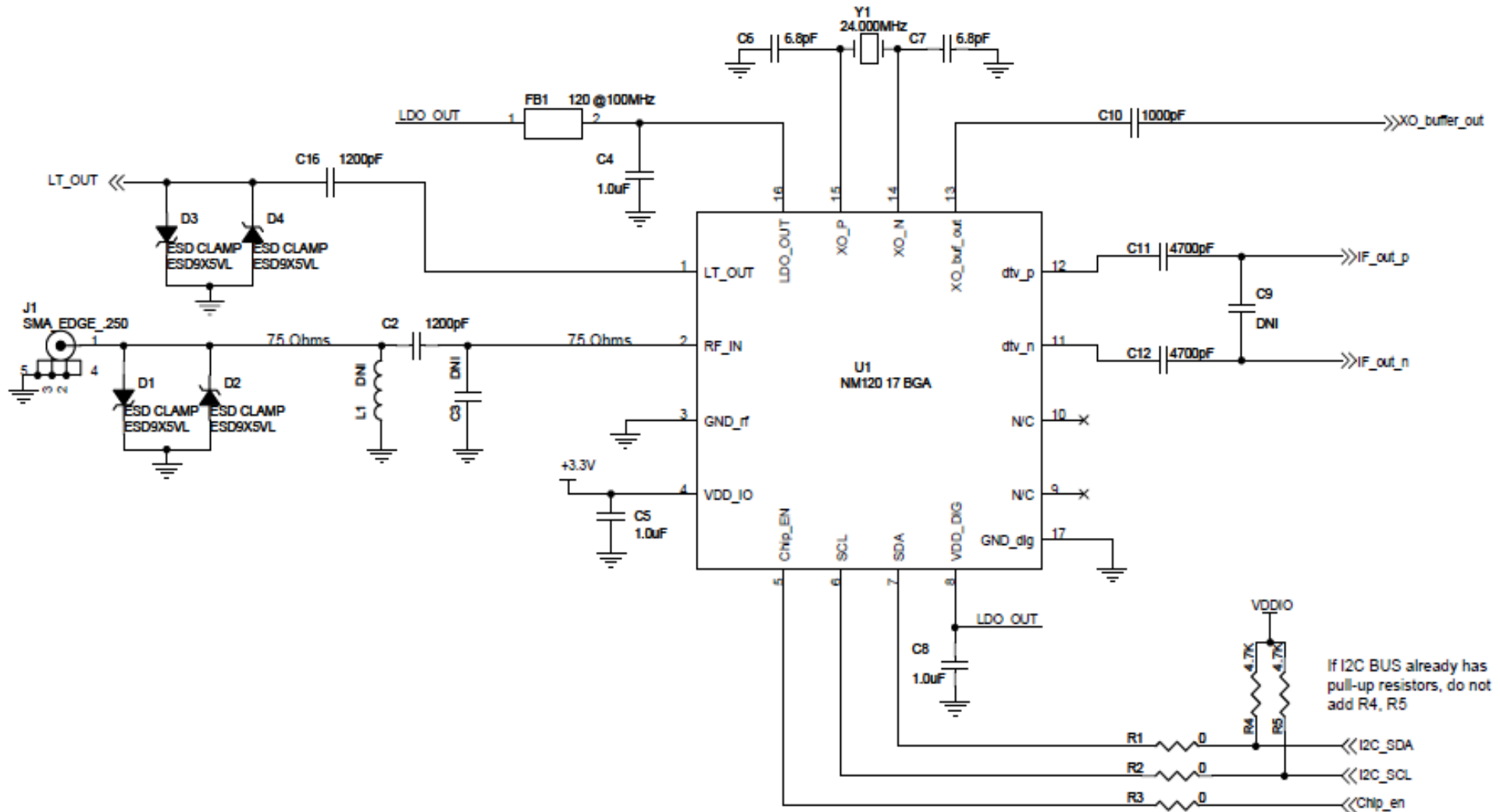
¹: 2 Digital blockers at N+4,N+8 are placed with desired signal at specified value.

NM120 0.5mm pitch Pinout



	Pin	Description
1	LT out	Loop Through
2	RF IN	42-862MHz RF input
3	GND RF	RF Ground
4	VDD_IO	IO VDD (1.8-3.3V)
5	Chip Ena	Chip Enable (VDD_IO)
6	SCL	I ² C Clock
7	SDA	I ² C Data
8	VDD Dig	1.2V Digital Supply
9	NC	No Connect
10	NC	No Connect
11	IF_out_n	Differential IF output, minus
12	IF_out_p	Differential IF output, plus
13	XO_buf_out	Crystal Oscillator Buffer out
14	XO_n	Negative Crystal Terminal
15	XO_p	Positive Crystal Terminal
16	LDO_out	LDO output

NM120: Typical Application Schematic



STB Tuner Integration Comparison

- The NM120 has the highest level of integration of any STB tuner

	RDA	MXL	NMI
Fully integrated Tracking filter	no	no	yes
Integrated AGC	no	no	yes
Integrated POR	no	no	yes
Integrated LT	no	yes	yes
Low-IF support	no	yes	yes

NMI's BOM Advantage

- This high level of integration translates directly to cost saving for our customers via significantly reduced BOM

	RDA	MXL	NMI
SMT resistor	16	4	0
SMT Capacitor	31	21	9
SMT inductor	11	3	0
SMT ferrite Bead	3	11	1
Discrete Transistor	1	0	0

Antenna bias, esd components, and I2C components ignored in all designs.

NM130 & NM131

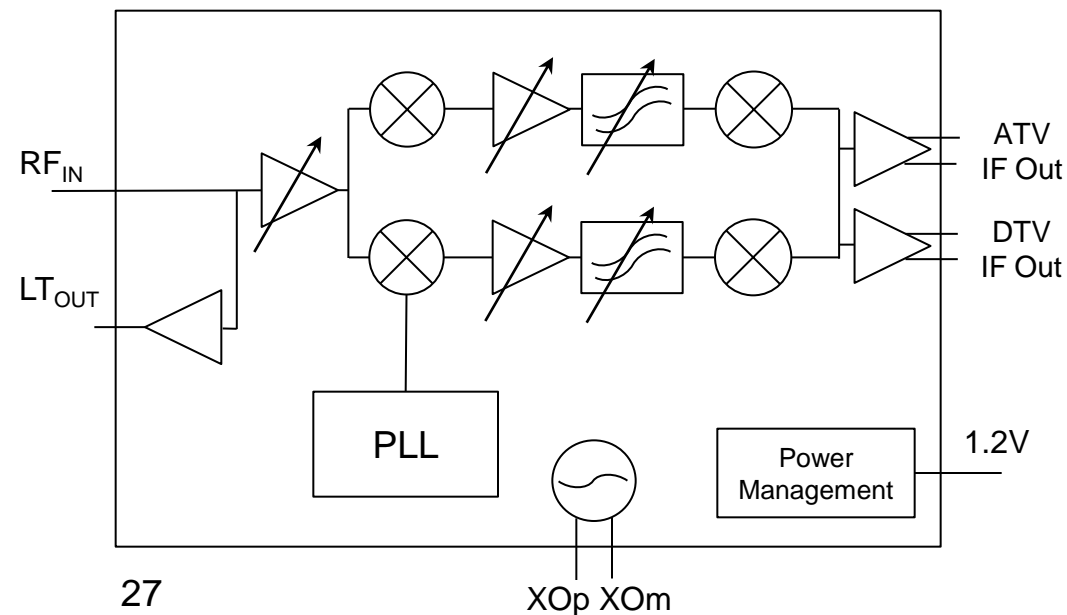
- NM130 and NM131 build on a common tuner architecture
 - Able to simultaneously meet **Digital Terrestrial, Cable, and Analog tuner requirements**
- NM131 integrates the **VSB/AV separation** typically performed by an IF SAW filter
 - This can also be added to nm130 at customer's request
- The NM131 also adds a field proven, production ATV demodulator
 - Lowest overall system cost

NM130: Global Hybrid Tuner



Hybrid Tuner

- Global Hybrid TV tuner
- Digital TV: DVB-T, ATSC, ISDB-T 13 segment, and DTMB compliant
- Analog TV: PAL, NTSC, SECAM compliant
- Cable TV: DOCSIS, DVB-C, OpenCable compliant
- Significant margin to NorDig, A/74, ARIB, GB20600, SCTE 40, and CENELEC standards
- Under 200mA current consumption: less than half of competing solutions
- Cost effective 3x3 QFN package
- Lowest BOM: no SAW filters, tracking filters, or balun required
- Dual (ATV/DTV) differential standard or low-IF outputs, up to 60MHz
- Flexible 1.8-3.3V supply with integrated Power Management

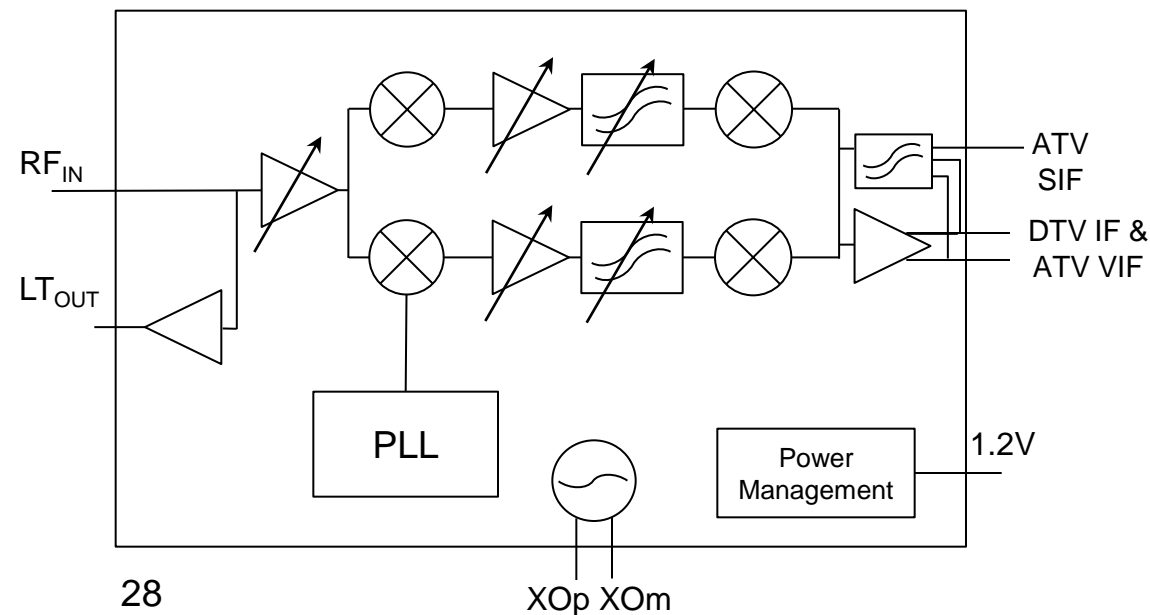


NM130V: Global Hybrid Tuner

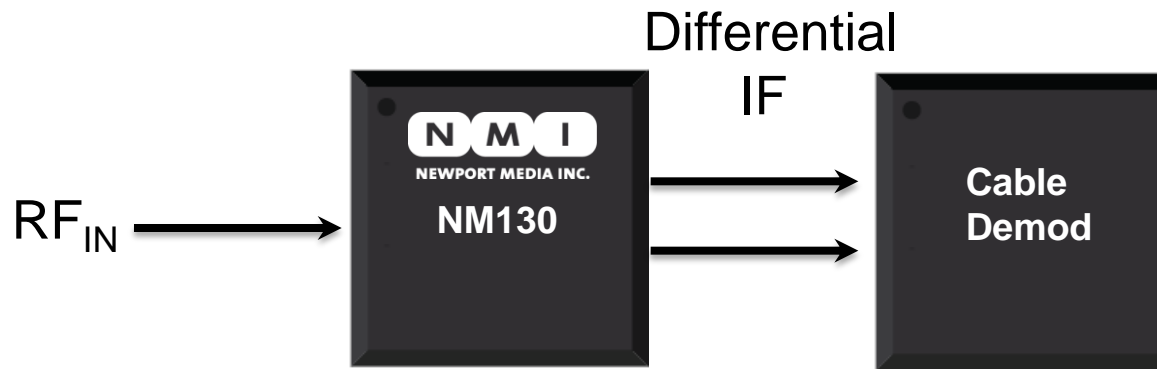


Hybrid Tuner

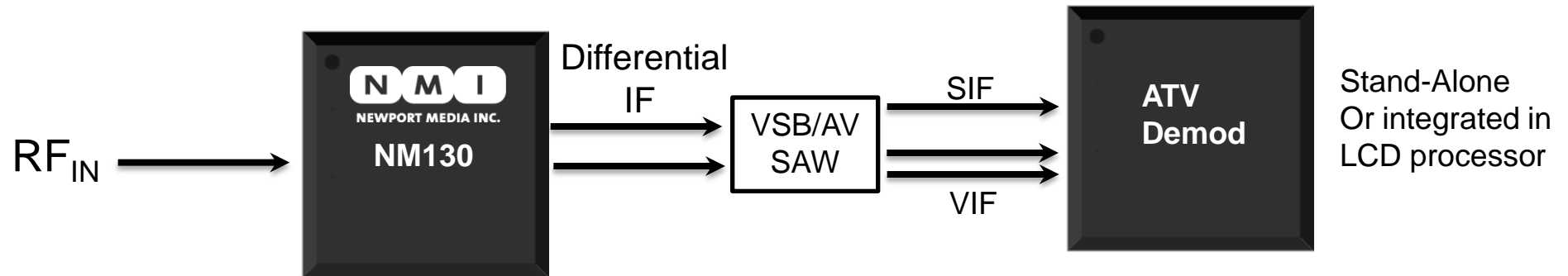
- Global Hybrid TV tuner
- Digital TV: DVB-T, ATSC, ISDB-T 13 segment, and DTMB compliant
- Analog TV: PAL, NTSC, SECAM compliant
- Cable TV: DOCSIS, DVB-C, OpenCable compliant
- Significant margin to NorDig, A/74, ARIB, GB20600, SCTE 40, and CENELEC standards
- Under 200mW power consumption: less than half of competing solutions
- Cost effective 3x3 QFN package
- Lowest BOM: no SAW filters, tracking filters, or balun required
- Dual (ATV/DTV) differential standard or low-IF outputs, up to 60MHz
- Flexible 1.8-3.3V supply with integrated Power Management



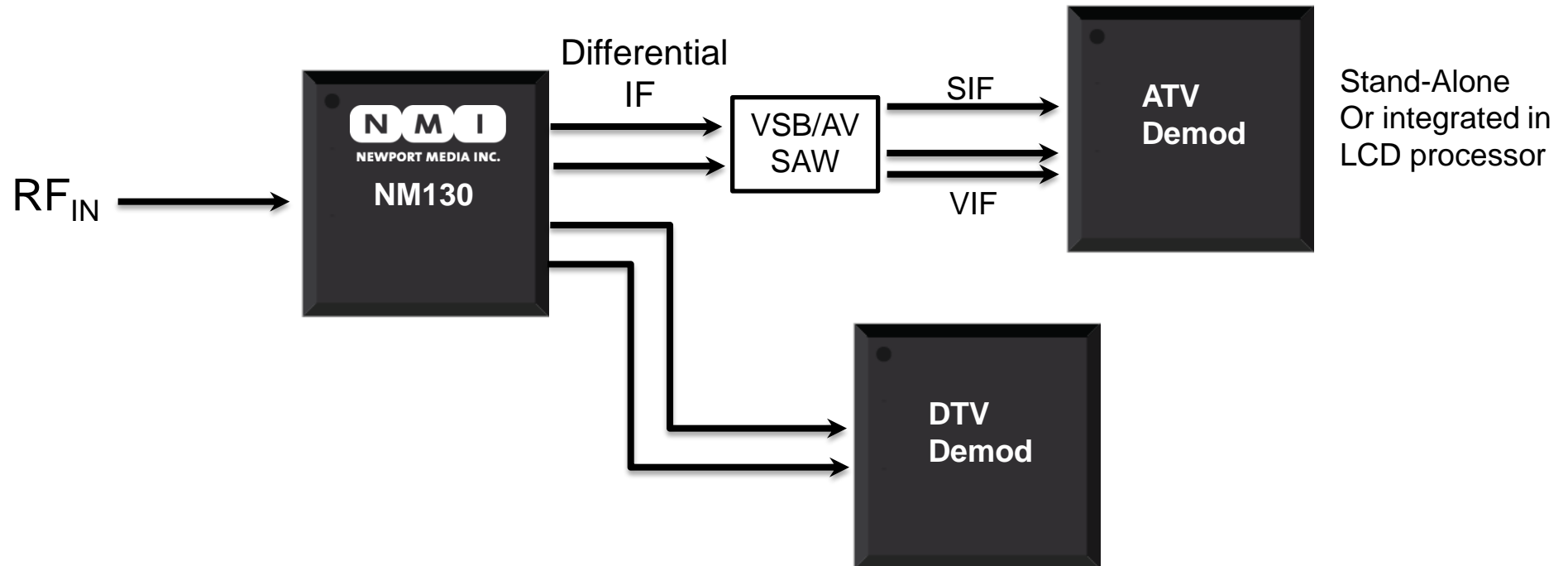
NM130 Use Case #1: Cable STB



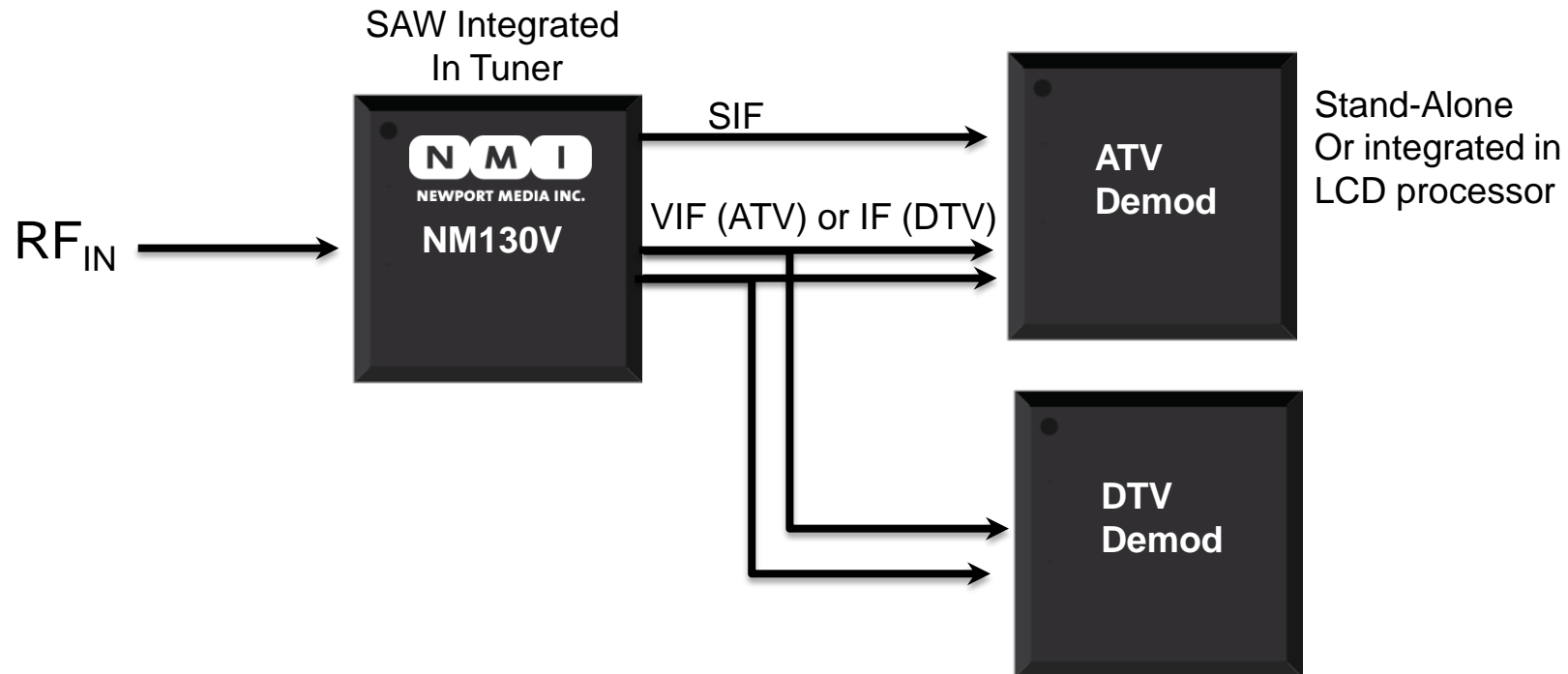
NM130 Use Case #2: Analog TV



NM130 Use Case #3: Hybrid TV



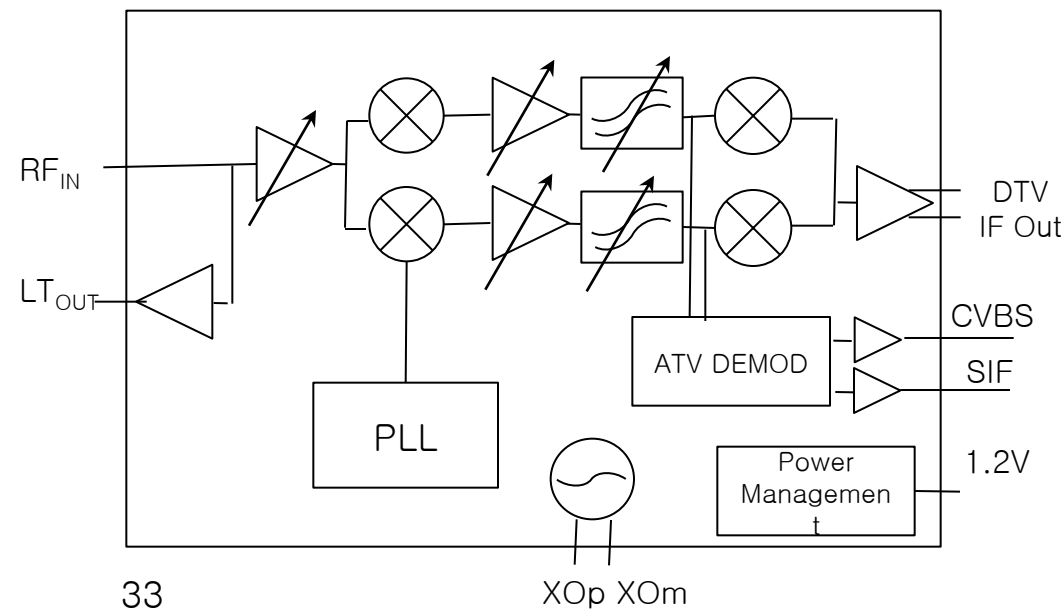
NM130V Use Case #4: Hybrid TV with Integrated SAW





Hybrid Tuner with ATV Demod

- Global Hybrid TV tuner with **ATV Demodulator**
- Digital TV: DVB-T, ATSC, ISDB-T 13 segment, and DTMB compliant
- Analog TV: PAL, NTSC, SECAM compliant
- Cable TV: DOCSIS, DVB-C, OpenCable compliant
- Significant margin to NorDig, A/74, ARIB, GB20600, SCTE 40, and CENELEC standards
- Under 200mA current consumption: less than half of competing solutions
- Cost effective 3x3 QFN package
- Lowest BOM: no SAW filters, tracking filters, or balun required
- Standard or low-IF interface, up to 60MHz
- CVBS and SIF outputs
- Flexible 1.8-3.3V supply with integrated Power Management



At-a-Glance: NM130/131 Performance



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Parameter	Min	Typical	Max	Comment
Noise Figure		4dB		75Ω
IIP ₃ at max gain		-6dBm		N+8, N+16
IIP ₂ at max gain		+20dBm		
IIP ₃ at minimum gain	+25dBm			N+8, N+16
IIP ₂ at minimum gain	+60dBm			
Video SNR	55dB			Pin > -55dBm
Harmonic rejection	60dB			HR2-HR9
Integrated Phase noise			1°	Across Band
Current consumption		185mA		1.8V supply, LT disabled

NM130/131: Hybrid/Cable Tuner



Hybrid/Cable Tuner

- NM130 Power consumption breakdown:
 - 170mA from 1.2V
 - 15mA from VBATT (1.8-3.3V)
- NM131 Power consumption breakdown:
 - 185mA from 1.2V
 - 15mA from VBATT (1.8-3.3V)
- Frequency plan does not interfere with satellite band (950-2150MHz)
- Loop through and crystal buffers allow efficient multi-tuner design
- Fully Digital, self-contained RF and IF AGC
 - Reduces BOM and I/O

Parameter	Min	Typical	Max.	Comment
Blocker Rejection	75dB			N+1 and beyond
Group Delay			125ns	
LO Leakage on RF _{IN} & LT _{OUT}			-90dBm	
IF output swing accuracy	-2.5%		2.5%	
RF _{in} -LT _{out} Gain	-2	0	+2	Gain programmable

NM131 VSB/ACI Filter vs. Low Cost SAW

- NM131 VSB and ACI filtering is far superior to conventional off-chip SAW filters

Parameter	Min	Typical	Max.
Relative Attenuation			
Picture Carrier	5.3dB	6.0dB	6.7dB
Color Carrier	-0.3dB	0dB	0.3dB
Adjacent Picture $N \pm 1$		75dB	
Adjacent Sound $N \pm 1$		75dB	
Upper/Lower Sidelobe		75dB	
AV separation			
Audio Rejection on Video Channel		50dB	
Video Rejection on Audio Channel		50dB	



SAW Components		M 3565 D			
IF Filter for Quasi/Split Sound Applications		45,75 MHz			
		min.	typ.	max.	
Insertion attenuation	α				
Reference level for the following data	44,06 (44,00) MHz	13,5	15,0	16,5	dB
Relative attenuation	α_{rel}				
Picture carrier	45,81 (45,75) MHz	6,0	7,0	8,0	dB
Color carrier	42,23 (42,17) MHz	-1,8	-0,8	0,2	dB
	42,06 (42,00) MHz	—	-0,5	—	dB
Sound carrier	41,31 (41,25) MHz	17,0	22,0	—	dB
Adjacent picture carrier	39,81 (39,75) MHz	45,0	52,0	—	dB
Adjacent sound carrier	47,31 (47,25) MHz	38,0	47,0	—	dB
Lower sidelobe					
	35,06 ... 39,81 (35,00 ... 39,75) MHz	40,0	45,0	—	dB
Upper sidelobe					
	47,31 ... 55,06 (47,25 ... 55,00) MHz	35,0	40,0	—	dB

NM131 VSB/ACI Filter vs. Expensive SAW

- NM131 VSB and ACI filtering is superior to even high cost SAW filters

Parameter	Min	Typical	Max.
Relative Attenuation			
Picture Carrier	5.3dB	6.0dB	6.7dB
Color Carrier	-0.3dB	0dB	0.3dB
Adjacent Picture N±1		75dB	
Adjacent Sound N±1		75dB	
Upper/Lower Sidelobe		75dB	
AV separation			
Audio Rejection on Video Channel		50dB	
Video Rejection on Audio Channel		50dB	



SAW Components		M 3565 M			
IF Filter for Quasi/Split Sound Applications		45,75 MHz			
		min.	typ.	max.	
Insertion attenuation	α				
Reference level for the following data	44,06 (44,00) MHz	13,8	15,3	16,8	dB
Relative attenuation	α_{rel}				
Picture carrier	45,81 (45,75) MHz	5,1	6,1	7,1	dB
Color carrier	42,23 (42,17) MHz	-1,3	-0,3	0,7	dB
	42,06 (42,00) MHz	—	-0,2	—	dB
Sound carrier	41,31 (41,25) MHz	24,0	38,0	—	dB
Adjacent picture carrier	39,81 (39,75) MHz	45,0	58,0	—	dB
Adjacent sound carrier	47,31 (47,25) MHz	42,0	53,0	—	dB
Lower sidelobe					
	35,06 ... 39,81 (35,00 ... 39,75) MHz	40,0	45,0	—	dB
Upper sidelobe					
	47,31 ... 55,06 (47,25 ... 55,00) MHz	35,0	39,0	—	dB

NM130/131 SCTE-40 Compliance



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Parameter		SCTE-40	Design Target	Margin
Freq Support (MHz)		54 - 864 MHz	44 – 864 MHz	-
NF		12dB	4.5dB	7.5 dB
CSO / CTB (Analog)		53dBc	>56dBc	>3 dB
SNR, Fully Loaded		43 dB	55 dB	12 dB
Chroma/Luma Group Delay		<170ns	<125ns	45ns
Amplitude Variation (incl. Tilt)		>4dB	>3dB	1dB
Phase noise		-88dB _c /Hz @ 10kHz	-92dB _c /Hz @ 10kHz	4 dB
Maximum carrier level	64QAM	15dBmV	30dBmV	15dB
	256QAM	15dBmV	30dBmV	15dB
	AM-VSB	15dBmV	30dBmV	15dB

SCTE Blocker Performance

Desired Signal	Fully Loaded Cable Blocker (15dBmV)	D/U Ratio (dB)	SCTE 40 Required C/N (dB)	nm130/nm131 SNR (dB)
NTSC (14dBmV)	256QAM	-6	43	48
64QAM (-6dBmV)	256QAM	-21	27	33
256QAM(-1dBmV)	NTSC	-16	33	38
QPSK FDC (-7dBmV)	NTSC	-22	20	37

NM130/131 DOCSIS 3.0 Performance



Newport Media Privileged & Confidential

Parameter	DOCSIS Spec	Design Target	Margin
Freq Support (MHz)	111- 867 MHz	44 – 867 MHz	SPEC
S11 – worst (dB)	-6 dB	-8.5 dB	2.5 dB
NF (dB)	8 – 10	3.5 – 4.5	5 dB
Max Total Power (dBmV)	33	50	17 dBmV
CSO / CTB (dBc) ¹	57	60	3 dBc
SNR Fully Loaded (dB) ¹	36	40	4 dB

¹: Desired Signal is 256QAM at 5 dBmV with loading channels at 15 dBmV each, for total power of 33 dBmV. C-N required for BER=1e-7 is 36 dB.

NM130/131 NorDig Cable Performance



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Parameter	NORDIG Spec	Design Target	Margin
Freq Support (MHz)	47 - 862 MHz	44 – 862 MHz	-
S11 – worst (dB)	-8 dB	-8.5 dB	0.5 dB
NF (dB)	8 – 10	3.5 – 4.5	5 dB
Max Total Power (dBmV)	33	50	17 dBmV
CSO / CTB (dBc) ¹	57	60	3 dBc
SNR Fully Loaded (dB) ¹	36	40	4 dB
Loop Through Gain (dB)	-2 to 3 dB	-1 to 2 dB	1 dB
Loop Through NF (dB)	9 - 11	6.5	2.5 dB
LO Leakage (dBmV)	-14	-22	8 dBmV
Spur Emission (dBmV)	-26 (5-65 MHz) & -30 (65-862 MHz)	-35 (across band)	5 dBmV

¹: Desired Signal is 256QAM at 7 dBmV with loading channels at 17 dBmV each, for total power of 33 dBmV. C-N required for BER=1e-7 is 36 dB

NM130/131 Nordig Terrestrial Compliance



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Parameter	NORDIG Spec	Design Target	Margin
Freq Support (MHz)	47 - 862 MHz	44 – 862MHz	-
S11 – worst (dB)	-8 dB	-8.5 dB	0.5 dB
NF (dB)	7 – 10	4	3 dB
Max Desired (dBm)	-35	+10	45 dB
ACI N+1 ATV (dB) ¹	+33	+42	9 dB
ACI N+X ATV (dB) ¹	+44	+48	4 dB
ACI N+1 DTV (dB) ²	+28	+39	11 dB
ACI N+X DTV (dB) ²	+38	+44	5 dB
Loop Thru Gain (dB)	-1 to 3 dB	-1 to 3 dB	-
RSSI Accuracy (dB)	+/- 5dB absolute	+/- 3.5 dB absolute	+/- 1.5 dB

¹: ATV Blocker kept at -20 dBm and Desired Signal dropped until BER > 1e-7.

²: DTV Blocker kept at -35 dBm and Desired Signal dropped until BER > 1e-7.

NM130/131 13-seg ARIB B-21 Performance



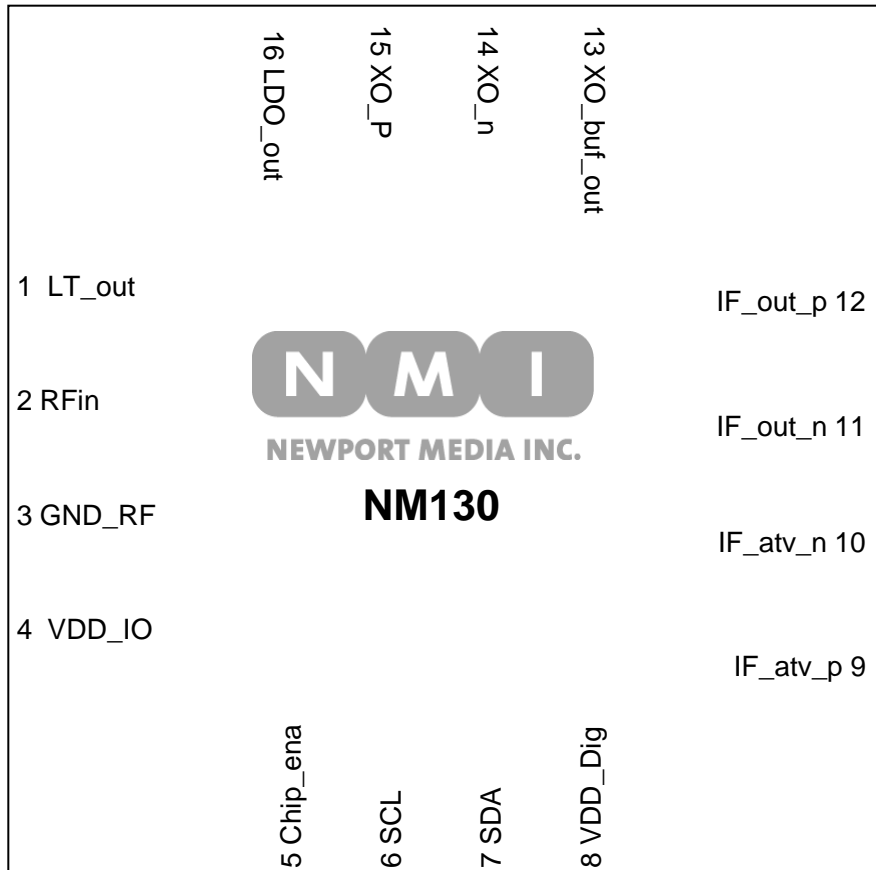
Newport Media Privileged & Confidential

Parameter	ISDB-T Spec	Design Target	Margin
Freq Support (MHz)	93 - 767 MHz	44 – 862 MHz	+/- 5%
Min Signal 64QAM 7/8 ¹	-75 dBm	< -80 dBm	6 dB
Max Signal 64QAM 7/8 ¹	-20 dBm	8 dBm	28 dB
D/U ATV blocker N-1 ²	-33 dB	-42 dB	9 dB
D/U ATV blocker N+1 ²	-35 dB	-44 dB	9 dB
D/U DTV blocker N-1 ²	-26 dB	-40 dB	14 dB
D/U DTV blocker N+1 ²	-29 dB	-40 dB	11 dB
D/U DTV blocker, N+m, m>1 ²	-	-47 dB	-
D/U DTV blocker, N+m, m>1 ²	-	-47 dB	-

¹: Assumes C-N of 22 dB as per ARIB B-21

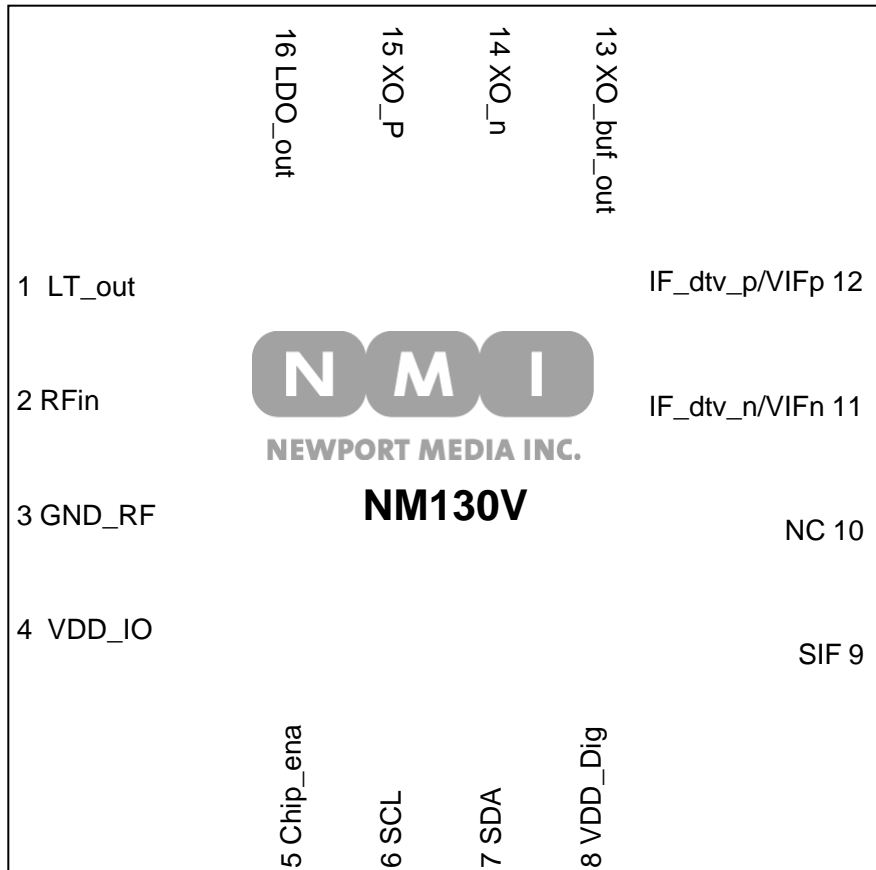
²: Measured at -65 dBm desired signal level.

NM130 0.5mm pitch Pinout



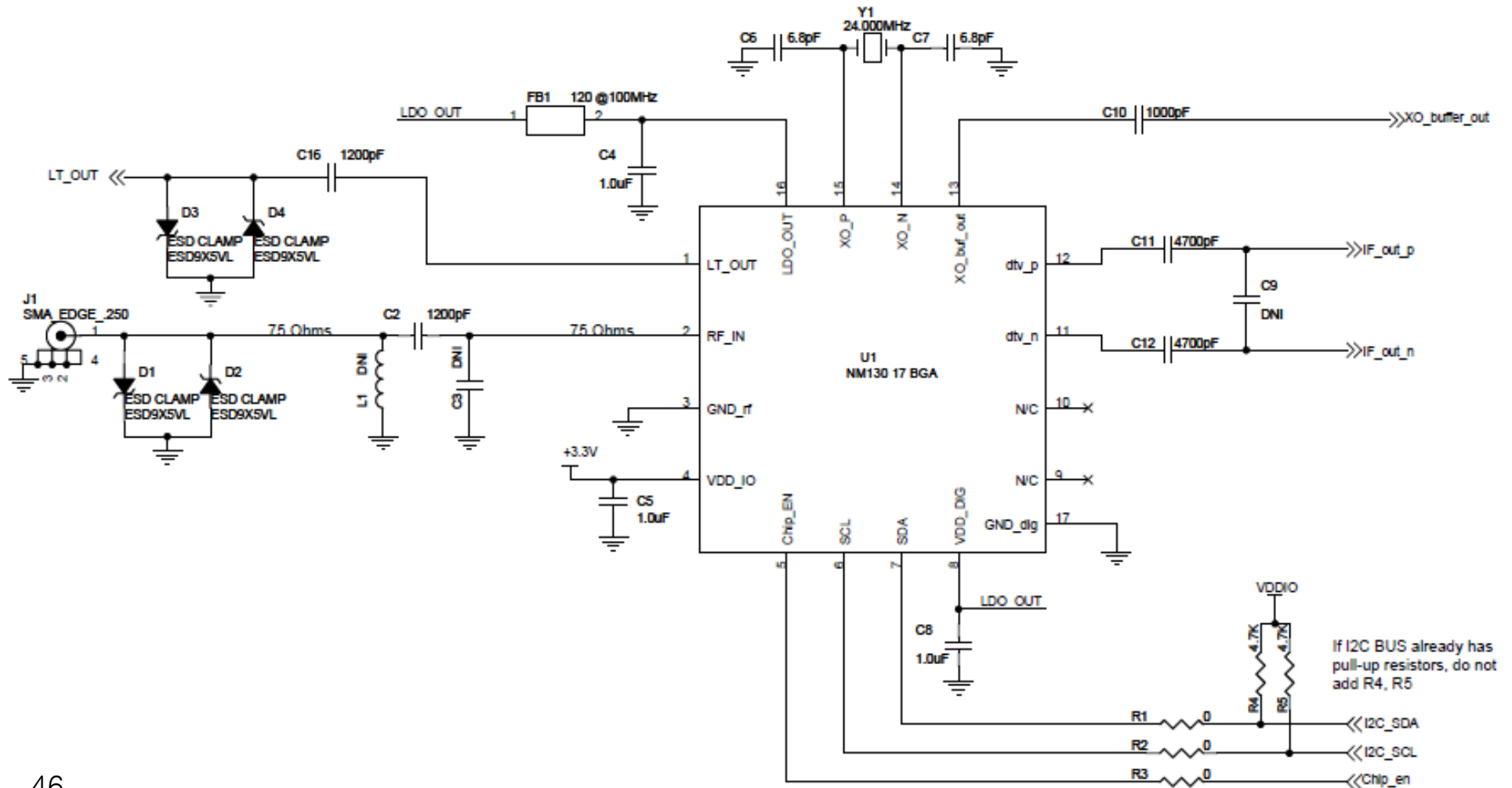
	Pin	Description
1	LT out	Loop Through
2	RF IN	42-862MHz RF input
3	GND RF	RF Ground
4	VDD_IO	IO VDD (1.8-3.3V)
5	Chip Ena	Chip Enable (VDD_IO)
6	SCL	I ² C Clock
7	SDA	I ² C Data
8	VDD Dig	1.2V Digital Supply
9	IF_atv_p	ATV Differential IF output, plus
10	IF_atv_n	ATV Differential IF output, minus
11	IF_dtv_n	DTV Differential IF output, minus
12	IF_dtv_p	DTV Differential IF output, plus
13	XO_buf_out	Crystal Oscillator Buffer out
14	XO_n	Negative Crystal Terminal
15	XO_p	Positive Crystal Terminal
16	LDO_out	LDO output

NM130V 0.5mm pitch Pinout

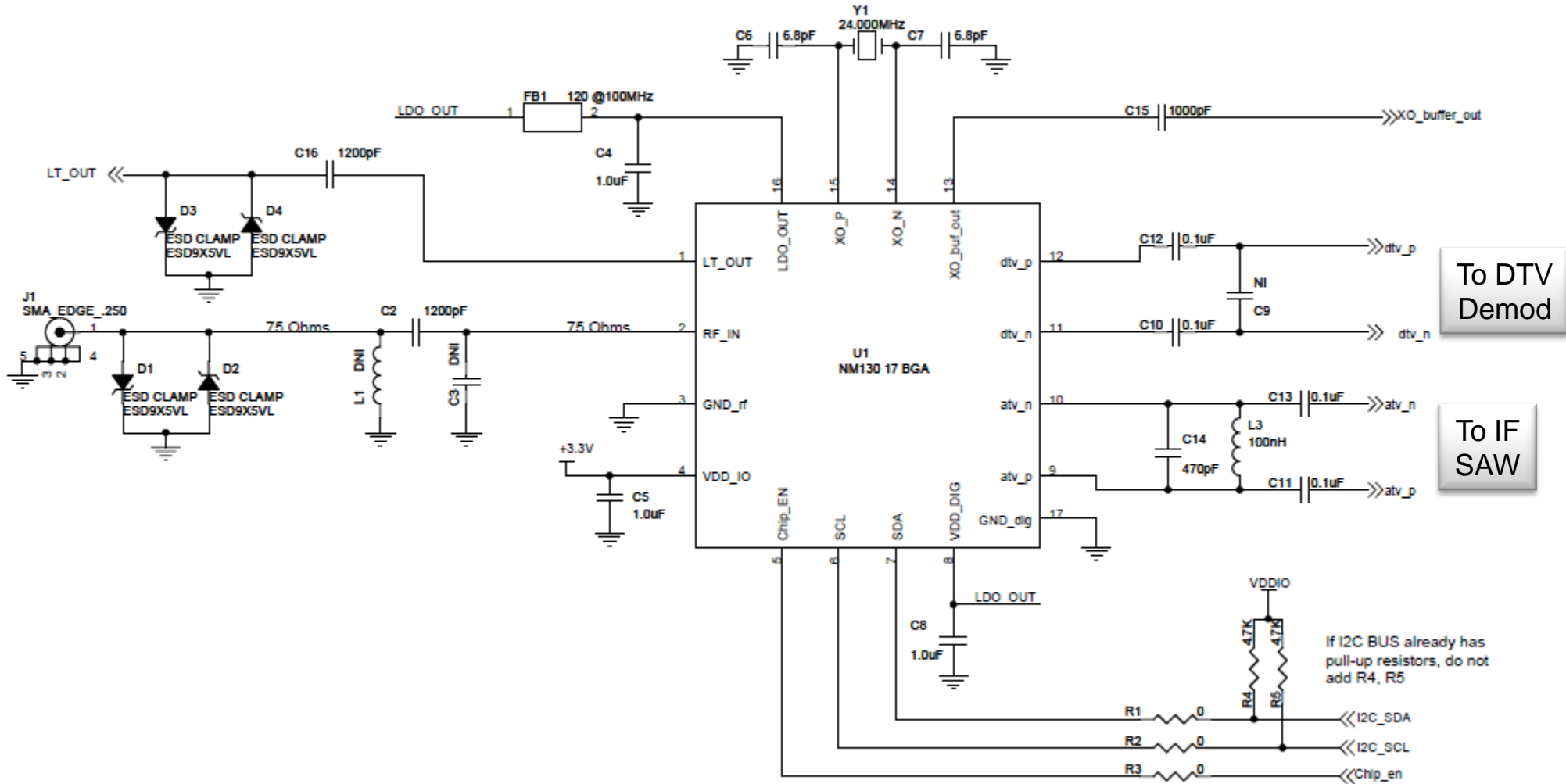


	Pin	Description
1	LT out	Loop Through
2	RF IN	42-862MHz RF input
3	GND RF	RF Ground
4	VDD_IO	IO VDD (1.8-3.3V)
5	Chip Ena	Chip Enable (VDD_IO)
6	SCL	I ² C Clock
7	SDA	I ² C Data
8	VDD Dig	1.2V Digital Supply
9	SIF	VSB SAW Sound IF output
10	NC	No Connect
11	IF_dtv_n/VIFn	DTV IF and ATV VIF output, minus
12	IF_dtv_p/VIFp	DTV IF and ATV VIF output, plus
13	XO_buf_out	Crystal Oscillator Buffer out
14	XO_n	Negative Crystal Terminal
15	XO_p	Positive Crystal Terminal
16	LDO_out	LDO output

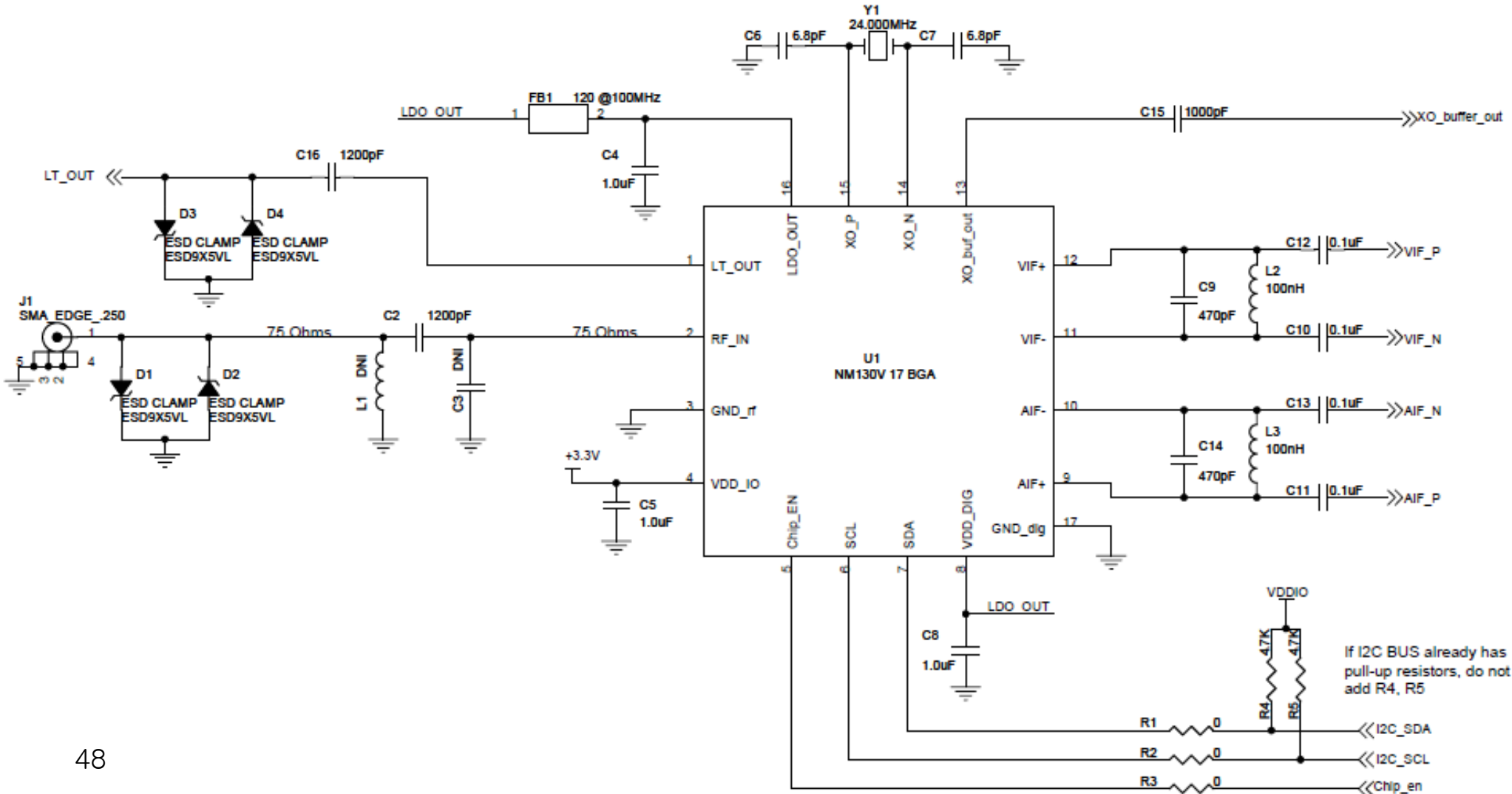
NM130: Cable STB Application Schematic



NM130: LCD TV Application Schematic

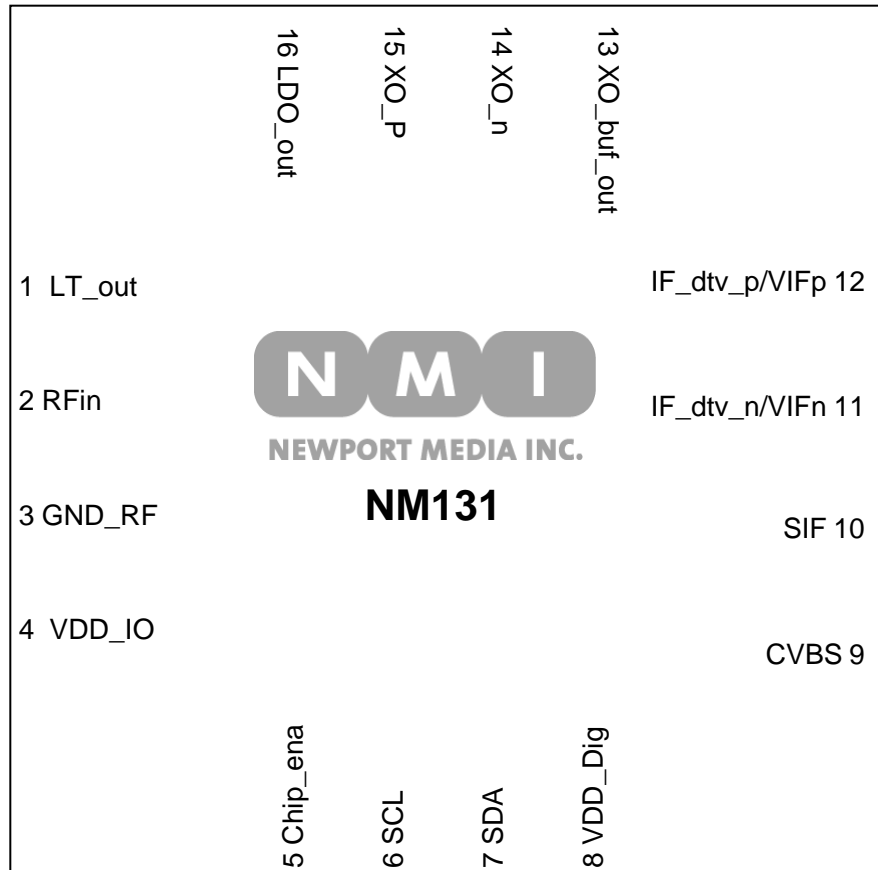


NM130V: LCD TV Application Schematic



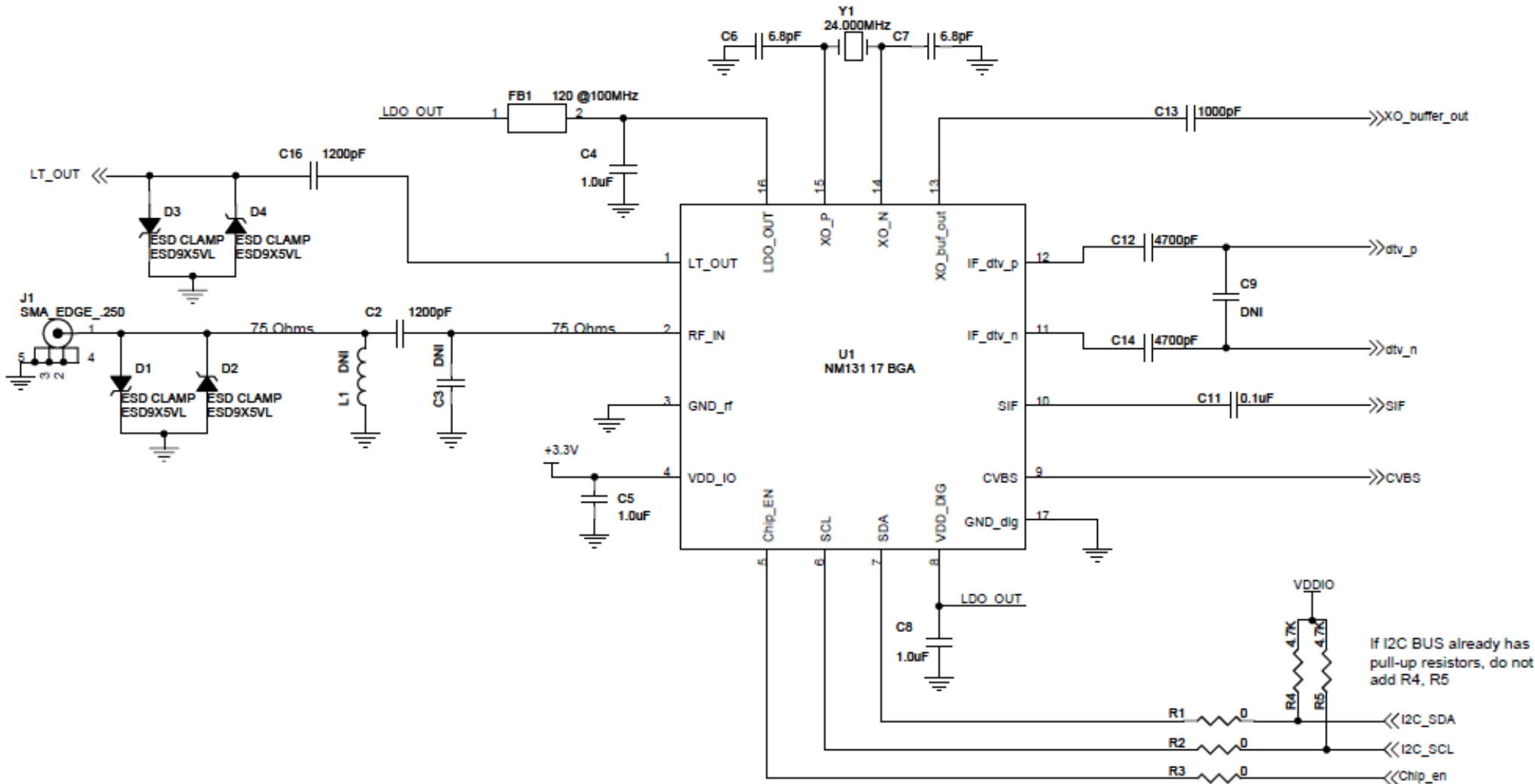
If I2C BUS already has pull-up resistors, do not add R4, R5

NM131 0.5mm pitch Pinout



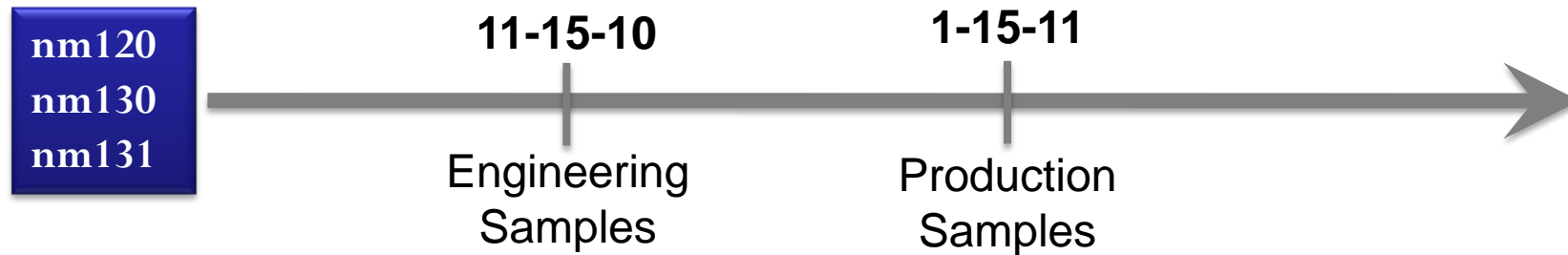
	Pin	Description
1	LT out	Loop Through
2	RF IN	42-862MHz RF input
3	GND RF	RF Ground
4	VDD_IO	IO VDD (1.8-3.3V)
5	Chip Ena	Chip Enable (VDD_IO)
6	SCL	I ² C Clock
7	SDA	I ² C Data
8	VDD Dig	1.2V Digital Supply
9	CVBS	CVBS output
10	SIF	SIF output
11	IF_dtv_n	DTV Differential IF output, minus
12	IF_dtv_p	DTV Differential IF output, plus
13	XO_buf_out	Crystal Oscillator Buffer out
14	XO_n	Negative Crystal Terminal
15	XO_p	Positive Crystal Terminal
16	LDO_out	LDO output

NM131: Typical Application Schematic

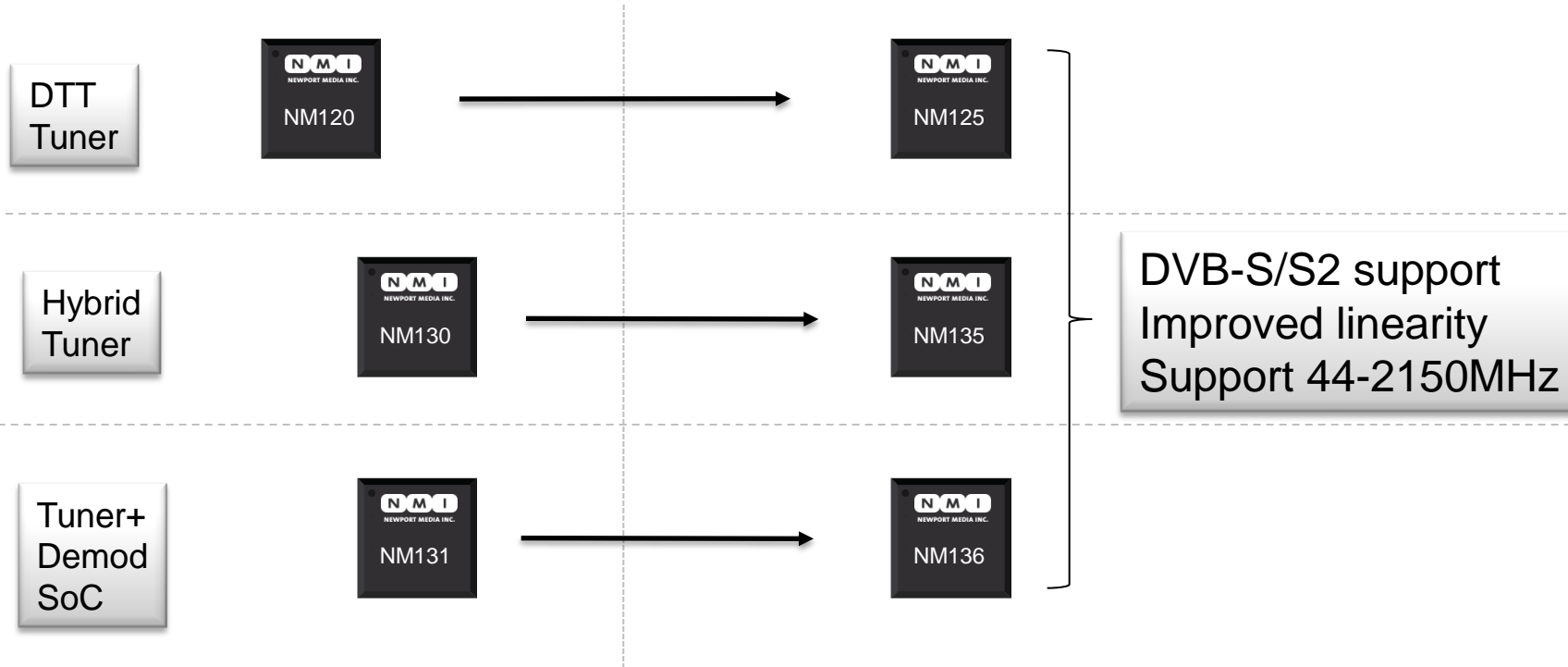


Future Directions

Device Availability



Fixed TV Business Roadmap





Thank You!