

Applications Interactive Block Diagrams

User Guide

Interactive Block Diagrams

- ▶ **Interact with block diagrams for a wide variety of applications.**
- ▶ **View and select ON Semiconductor devices which are functionally specific for each block.**
- ▶ **Create a Word summary document containing a listing of devices you have selected for each block in the block diagram. Links to each datasheet are provided.**
- ▶ **Print the document, if desired.**



ON Semiconductor Home Page

ON Semiconductor® Enabling Energy Efficient Solutions

Home Products Design Support Applications Quality MyON

Solutions

- Networking & Telecommunications Applications
- Automotive Applications
- Consumer & Portable Applications
- Industrial Applications

From onsemi.com home page, click on the APPLICATIONS tab or scroll on the SOLUTIONS slider.

Discrete

- Bipolar Transistors (1228)**
 - Audio Transistors (68)
 - Digital Transistors (BRTs) (235)
 - Darlington Transistors (147)
 - General Purpose Transistors (719)
 - Low $V_{CE(Sat)}$ Transistors (59)
- Diodes & Rectifiers (2118)**
 - ESD Protection Diodes & Arrays (233)
 - Rectifiers (229)
 - Schottky Diodes & Rectifiers (361)
 - Small Signal Switching Diodes (104)
 - Transient Voltage Suppressors (TVS) (531)
 - Tuning Diodes (5)
 - Zener Diodes (655)
- IGBTs & FETs (502)**
 - IGBTs (12)
 - JFETs (16)
 - MOSFETs (448)
 - Protected MOSFETs (26)
- Thyristors (345)**
 - Programmable Unijunction Transistors (PUTs) (7)
 - SIDACs (11)
 - Silicon Controlled Rectifiers (SCRs) (106)
 - Thyristor Surge Protection Devices (TSPDs) (81)
 - Triacs (140)

Power Management

- AC-DC Converters & Regulators (1890)**
 - Off-Line (1)
 - Off-Line (1)
 - Power Factor Correction (1)
 - Secondaries (1)
- DC-DC Controllers, Converters, & Regulators (1890)**
 - Battery Charge Controllers (1)
 - Charge Pumps (11)
 - Controllers (119)
 - Converters (266)
 - Linear Voltage Regulators (1493)
- Fan Controllers (41)**
- Temperature Sensors (63)**
- Voltage & Current Management (620)**
 - Current Protection (6)
 - Voltage Protection (30)
 - Voltage References (110)
 - Voltage Supervisors (474)

Logic

- Clock Generation (292)**
 - Crystal Oscillators (78)
 - Phase / Frequency Detectors (18)
 - PLL Clock Generators (75)
 - Spread Spectrum EMI Reduction Clocks (45)
 - VCOs (26)
 - Zero Delay Buffers (50)
- Memory (710)**
 - EEPROM Memory (682)
 - Flash Memory (16)
 - NVRAM Memory (4)
 - SRAM Memory (8)
- Standard Logic (2289)**
 - Arithmetic Functions (200)
 - Buffers (481)
 - Flip-Flops (212)
 - Latches & Registers (224)
 - Logic Gates (756)
 - Multiplexers (230)
 - Multivibrators (29)
 - Transceivers (89)
 - Translators (68)
- Clock & Data Distribution (1461)**
 - Arithmetic Functions (186)
 - Drivers & Fanout Buffers (450)
 - Flip-Flops, Latches, & Registers (218)
 - Logic Gates (160)

Signal Management

- Amplifiers & Comparators (427)**
 - Audio Amplifiers (27)
 - Compondors (15)
 - Comparators (74)
 - Operational Amplifiers (297)
 - Video Amplifiers (14)
- Analog Switches (249)**
 - Audio Switches (31)
 - Data Switches (22)
 - Signal Switches (194)
 - Video Switches (2)
- Digital Potentiometers (315)**
 - Digitally Programmable Potentiometers (315)
- DSP Systems (7)**
 - Audio DSP Systems (7)
- EMI / RFI Filters (150)**
 - Audio Filters (15)
 - Data Filters (135)
- Interfaces (155)**
 - Data Transmitters & Transceivers (99)
 - I / O Expanders (30)

GreenPoint®
From ON Semiconductor

Single Stage High Power Factor Flyback

Product Services

- Check Availability: Enter Part#/Keyword Search
- Competitor Cross Reference: Enter Part#/Keyword Search
- Order Samples: Enter Part#/Keyword Search

More Product Services ...

Design Support

- Technical Documentation: Select Product Group, Select Document Type, Go
- Technical & Sales Support

More Design Support ...

Events

- SANYO Semiconductor to be Acquired
- CMD Integration
- Intel Developer Forum 2010 - September 13-15
- Webcast: Power Management Architecture Solutions for Set-Top



Applications Home Page

ON Semiconductor® **ON** Enabling Energy Efficient Solutions

Home | Products | Design Support | **Applications** | Quality | MyON

Home > Applications

Applications

ON Semiconductor provides a variety of application specific information, including:

- » Interactive block diagrams
- » Fixed block diagrams and subsystem displays, which show design examples
- » Technical information
- » Links to industry standards via other web sites
- » Design and processing services information
- » Interactive product recommendation tools

Automotive Applications

- » Interactive block diagrams
- » Automotive subsystem display

Computing & Peripherals Applications

- » Interactive block diagrams
- » Solution sets
- » Industry standards

Industrial Applications

- » Interactive block diagrams

Medical Applications

- » Interactive block diagrams

Networking & Telecommunications Applications

- » Interactive block diagrams
- » Solution sets
- » Industry standards

Circuit Protection Applications

- » Types of protection devices
- » Selection of protection devices
- » Explanations of electrical threats
- » End applications information

Consumer & Portable Applications

- » Interactive block diagrams
- » Portable subsystem display

LED Lighting Applications

- » Interactive block diagrams
- » Product recommendation tools
- » Solution sets
- » Industry standards

Military & Aerospace Applications

- » Application-specific offerings
- » Solutions unique to Military & Aerospace

Power Supply Applications

- » Interactive block diagrams
- » Product recommendation tools
- » High-efficiency GreenPoint® reference designs
- » Environmental initiatives

Copyright © 1999-2010 ON Semiconductor. Privacy Policy Terms of Use Local intranet

Choose your Applications category of interest.
For this example, we will **CLICK Consumer & Portable**.



Consumer & Portable Home Page

The screenshot shows the ON Semiconductor website's 'Consumer & Portable Applications' page. The page is viewed in Internet Explorer. The top navigation bar includes 'Home', 'Products', 'Design Support', 'Applications', 'Quality', and 'MyON'. The 'Applications' section is active, showing a list of categories on the left and a main content area. The main content area is titled 'Consumer & Portable Applications' and includes a description of the company's products. Below this is a section for 'Consumer & Portable Interactive Block Diagrams' with a 'User Guide' link. A list of products is displayed, including 'Audio Amp-Performance', 'Cell Phone Handset', 'Digital Still Camera', 'Digital Video Recorder', 'Game Console', 'LCD TV Receiver', 'Multi-Channel Analog Receiver/Amplifier', and 'PDA'. A red arrow points to the 'Set Top Box' link. Below this is a 'Technical Information' section with links to 'Reference Designs (8)', 'Tutorials (2)', 'Reference Manuals (1)', 'Selector Guides (2)', and 'Collateral Brochures (4)'. The 'Portable Subsystem Display' section features an image of a flip phone and a list of components: 'LED Driver, Charge Pump', 'LED Driver, Inductive', 'Protection, Audio Line', 'Protection, Keypad', 'Data Switching', and 'Battery Charging Control'. A yellow callout box at the bottom of the screenshot contains the text: 'Consumer & Portable Interactive Block Diagrams are listed in the top pane. For this example, we will CLICK >> Set Top Box.'



Block Diagram

GREEN blocks list ON Semiconductor devices that are functionally specific to that block.

NEW means there are devices in this block which were introduced within the last 90 days.

For this example, **MOUSE OVER** the 'Clock Generation' functional block.

Copyright © 1999-2010 ON Semiconductor Privacy Policy | Terms of Use | Site Map | Careers | Contact Us | Terms and Conditions



Part Type Selection

The screenshot shows the ON Semiconductor website interface in a Windows Internet Explorer browser. The main content area displays a block diagram for a 'Set Top Box'. The diagram includes various functional blocks such as I/O Protection, Smart Card Interface, Line Protection, Codec/Modem, NCU, Audio DSP/Codec, Memory, I/O Interface, Input Amp, Audio Amp, Audio Switch, Audio Filter, Tuner, Video Switch, ADC, and SMPS (Input Bridge Rectification, Power Factor Correction, Voltage Regulation, Transformer, Output Rectification, Voltage Regulation, Supervisory, Reference/Error Amplifier, and Optoisolation). A red box highlights a menu titled 'Recommended parts for Clock Generation' which lists several part types: 'Clock Generation > Crystal Oscillators', 'Clock & Data Distribution > Drivers & Fanout Buffers', 'Clock Generation > Zero Delay Buffers', and 'Clock Generation > PLL Clock Generators'. A red arrow points from a yellow callout box to this menu. Another yellow callout box points to the 'PLL Clock Generators' option in the menu.

Set Top Box

Recommended parts for Clock Generation

The following types of parts may be used (click to view recommended part list):

- Clock Generation > Crystal Oscillators
- Clock & Data Distribution > Drivers & Fanout Buffers
- Clock Generation > Zero Delay Buffers
- Clock Generation > [PLL Clock Generators](#)

For this example, we will CLICK Clock Generation > PLL Clock Generators



Device Selection

PLL Clock Generators which are appropriate for this application are listed.

ON Semiconductor® Enabling Energy Efficient Solutions

Home > Applications > Consumer & Portable > Set Top Box > Clock Generation > PLL Clock Generators

Clock Generation

PLL Clock Generators

Phase Locked Loop Clock Synthesizers

ON Semiconductor supplies PLL clock generators and synthesizers that create precision clock signals.

[Add to Worksheet](#)
[Worksheet](#)
[See all devices in this product family](#)
[Return to Set Top Box Application Diagram](#)

14 Products Shown (0 Products Filtered Out)

[Reset All](#)
[Clear Filters](#)
[Quick Filter](#)
[Customize Table](#)
[Transpose Table](#)
[Spreadsheet](#)
[Print](#)

1 - 14 of 14 [1]

Select	Product	Data Sheet	Pb-free	Status	Description	Input Level	Output Level	V _{CC} Typ (V)	f _{Max} Min (MHz)	f _{Max} Max (MHz)	t _{LOCK} Max (ms)	t _{Jitter} Typ (ps)	t _{su} Min (ns)	t _h Min (ns)	t _R & t _F Min (ps)	t _R & t _F Max (ps)	Package	Price
<input type="checkbox"/>	NB3N3001DTG			Active	106.25 MHz / 212.5 MHz PureEdge™ Clock Generator	CMOS-TTL	ECL	3.3	not used	106.25 or 212.5 Typ	1	0.3	not used	not used	275	600	TSSOP-8 LEAD 3.0x4.4x1.1 mm	Contact Sales Office
<input checked="" type="checkbox"/>	NB3N3001DTR2G			Active	106.25 MHz / 212.5 MHz PureEdge™ Clock Generator	CMOS-TTL	ECL	3.3	not used	106.25 or 212.5 Typ	1	0.3	not used	not used	275	600	TSSOP-8 LEAD 3.0x4.4x1.1 mm	Contact Sales Office
<input type="checkbox"/>	NB3N3002DTG			Active	3.3 V PureEdge™ Crystal (25MHz) to HCSL Clock Generator	CMOS-TTL	HCSL	3.3	25	200	1	2	-	-	175	700	TSSOP-16	Contact Sales Office
<input checked="" type="checkbox"/>	NB3N3002DTR2G			Active	3.3 V PureEdge™ Crystal (25MHz) to HCSL Clock Generator	CMOS-TTL	HCSL	3.3	25	200	1	2	-	-	175	700	TSSOP-16	Contact Sales Office
<input type="checkbox"/>	NB3N3011DTG			Active	100 MHz / 106.25 MHz PureEdge™ Clock Generator	ECL	ECL	3.3	96	120	1	0.29	not speced	not speced	275	600	TSSOP-8 LEAD 3.0x4.4x1.1 mm	Contact Sales Office
<input checked="" type="checkbox"/>	NB3N3011DTR2G			Active	100 MHz / 106.25 MHz PureEdge™ Clock Generator	ECL	ECL	3.3	96	120	1	0.29	not speced	not speced	275	600	TSSOP-8 LEAD 3.0x4.4x1.1 mm	Contact Sales Office

Page size: 100

CLICK the Select box for each choice.

SORT and FILTER each column to narrow your selections.

Note each selection is highlighted.



Device Selection

ON Semiconductor Enabling Energy Efficient Solutions

Home > Applications > Consumer & Portable > Set Top Box > Clock Generation > PLL Clock Generators

Clock Generation
PLL Clock Generators
 Phase Locked Loop Clock Synthesizers

ON Semiconductor supplies PLL clock generators and synthesizers that create precision clock signals.

[Add to Worksheet](#) [Worksheet](#) [See all devices in this product family](#) [Return to Set Top Box Application Diagram](#)

Shown (0 Products Filtered Out)

Clear Filters Quick Filter Customize Table Transpose Table Spreadsheet Print

Product	Data Sheet	Pb-free	Status	Description	Input Level	Output Level	V _{CC} Typ (V)	f _{Max} Min (MHz)	f _{Max} Max (MHz)	t _{LOCK} Max (ms)	t _{Jitter} Typ (ps)	t _{su} Min (ns)	t _h Min (ns)	t _R & t _F Min (ps)	t _R & t _F Max (ps)	Package	Price
3001DTG			Active	106.25 MHz / 212.5 MHz PureEdge™ Clock Generator	CMOS-TTL	ECL	3.3	not used	106.25 or 212.5 Typ	1	0.3	not used	not used	275	600	TSSOP 8 LEAD 3.0x4.4x1.1 mm	Contact Sales Office
3001DTR2G			Active	106.25 MHz / 212.5 MHz PureEdge™ Clock Generator	CMOS-TTL	ECL	3.3	not used	106.25 or 212.5 Typ	1	0.3	not used	not used	275	600	TSSOP 8 LEAD 3.0x4.4x1.1 mm	Contact Sales Office
3002DTG			Active	3.3 V PureEdge™ Crystal (25MHz) to HCSSL Clock Generator	CMOS-TTL	HCSSL	3.3	25	200	1	2	-	-	175	700	TSSOP-16	Contact Sales Office
3002DTR2G			Active	3.3 V PureEdge™ Crystal (25MHz) to HCSSL Clock Generator	CMOS-TTL	HCSSL	3.3	25	200	1	2	-	-	175	700	TSSOP-16	Contact Sales Office
NB3N3011DTG			Active	100 MHz / 106.25 MHz PureEdge™ Clock Generator	ECL	ECL	3.3	96	120	1	0.29	not speced	not speced	275	600	TSSOP 8 LEAD 3.0x4.4x1.1 mm	Contact Sales Office
NB3N3011DTR2G			Active	100 MHz / 106.25 MHz PureEdge™ Clock Generator	ECL	ECL	3.3	96	120	1	0.29	not speced	not speced	275	600	TSSOP 8 LEAD 3.0x4.4x1.1 mm	Contact Sales Office

CLICK the 'Add to Worksheet' button.

Your selections will be saved for the creation of the final Worksheet and you will be returned to the block diagram to complete the process for the other blocks.

Or CLICK here to return to the block diagram at any time.



Finish Device Selections

The screenshot shows the ON Semiconductor website interface in a Windows Internet Explorer browser. The page is titled "Set Top Box" and features a detailed block diagram of the device's internal components. The diagram is organized into several functional blocks:

- I/O Protection:** Includes Keypad, IEEE1394, ATA PI, USB, Ethernet, PCI, Flash Memory, and Infrared.
- Smart Card Interface:** A block for smart card connectivity.
- Line Protection:** Includes VOIP, DSL, and Analog Phone Line.
- MCU (Microcontroller Unit):** The central processing unit, connected to an I/O Interface and Memory.
- Audio DSP/Codec:** Processes audio signals from Input Amps (L and R) and drives Audio Amps for Audio Out (L and R) and an Audio Filter.
- Video Path:** Includes a Tuner, Video Switch, Video Filter, Video Processor, and DACs, leading to Video Amps for S-Video Out and Composite Video Out.
- SMPS (Switching Mode Power Supply):** A dashed box containing Input Bridge Rectification, Power Factor Correction, Voltage Regulation (switching), Transformer, Output Rectification/Sync Rect., Reference/ Error Amplifier, and Optoisolation.
- Other Components:** Clock Generation, ADC, Video Processor, DAC, Video Filter, Video Amp, LCD Backlighting, Display, and Supervisory.

A yellow callout box on the right side of the diagram contains the text: "CLICK on other GREEN blocks and follow the same procedure." The website footer includes copyright information: "Copyright © 1999-2010 ON Semiconductor" and various links like Privacy Policy, Terms of Use, Site Map, Careers, Contact Us, and Terms and Conditions.






Creating the Output Worksheet

ON Semiconductor® **ON** Enabling Energy Efficient Solutions

Home > Applications > Consumer & Portable > Set Top Box

Application: **Consumer - Set Top Box**

Customer (Company) 
Program 
Customer Contact 

Enter information here. This will appear in the header of the Worksheet. You may leave blank, if you wish.

Keep All	Application Block	Product Taxonomy	Part
<input checked="" type="checkbox"/>	Audio Amp	Amplifiers & Comparators > Audio Amplifiers	NCP2890DMR2G
<input checked="" type="checkbox"/>	Clock Generation	Clock Generation > PLL Clock Generators	NB3N3001DTR2G
<input checked="" type="checkbox"/>	Clock Generation	Clock Generation > PLL Clock Generators	NB3N3002DTR2G
<input checked="" type="checkbox"/>	Clock Generation	Clock Generation > PLL Clock Generators	NB3N3011DTR2G
<input checked="" type="checkbox"/>	Smart Card Interface	Interfaces > Smart & SIM Card Interfaces	NCN6024DTBR2G
<input checked="" type="checkbox"/>	Audio Filter	EMI / RFI Filters > Audio Filters	NUF4220MNT1G
<input checked="" type="checkbox"/>	Audio Switch	Analog Switches > Audio Switches	NS5S1153MUTAG
<input checked="" type="checkbox"/>	Video Switch	Analog Switches > Video Switches	NCS6433DTBR2G
<input checked="" type="checkbox"/>	Video Amp	Amplifiers & Comparators > Video Amplifiers	NCS2564DTBR2G
<input checked="" type="checkbox"/>	Video Filter	Amplifiers & Comparators > Video Amplifiers	NCS2564DTBR2G

Your selections are listed here. You may uncheck boxes or return to the block diagrams to add others.

Copyright © 1999-2010 ON Semiconductor Privacy Policy | Terms of Use | Site Map | Careers | Contact Us | Terms and Conditions



Creating the Output Worksheet

ON Semiconductor - Windows Internet Explorer

ON Semiconductor® Enabling Energy Efficient Solutions

Home > Applications > Consumer & Portable > Set Top Box > Worksheet

Application: **Consumer - Set Top Box**

Customer (Company)

Program

Customer Contact

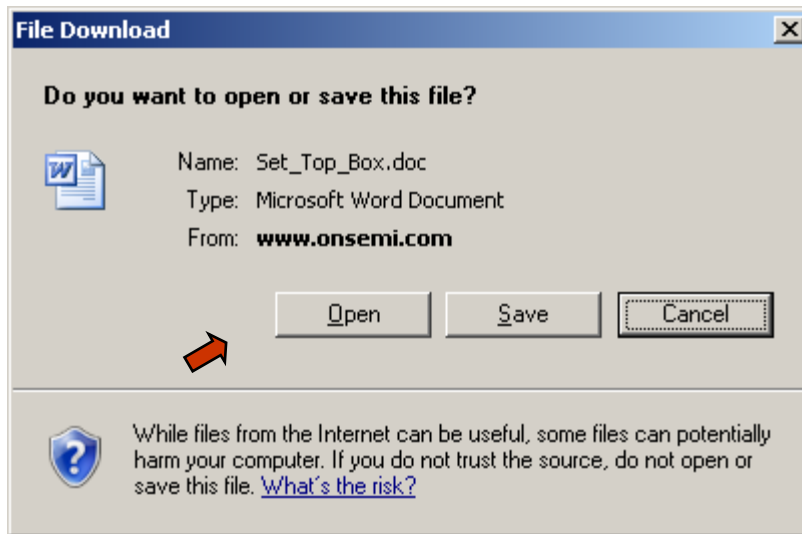
Keep All	Application Block	Product Taxonomy	Part
<input checked="" type="checkbox"/>	Audio Amp	Amplifiers & Comparators > Audio Amplifiers	NCP2890DMR2G
<input checked="" type="checkbox"/>	Clock Generation	Clock Generation > PLL Clock Generators	NB3N3001DTR2G
<input checked="" type="checkbox"/>	Clock Generation	Clock Generation > PLL Clock Generators	NB3N3002DTR2G
<input checked="" type="checkbox"/>	Clock Generation	Clock Generation > PLL Clock Generators	NB3N3011DTR2G
<input checked="" type="checkbox"/>	Smart Card Interface	Interfaces > Smart & SIM Card Interfaces	NCN6024DTBR2G
<input checked="" type="checkbox"/>	Audio Filter	EMI / RFI Filters > Audio Filters	NUF4220MNT1G
<input checked="" type="checkbox"/>	Audio Switch	Analog Switches > Audio Switches	NS5S1153MUTAG
<input checked="" type="checkbox"/>	Video Switch	Analog Switches > Video Switches	NCS6433DTBR2G
<input checked="" type="checkbox"/>	Video Amp	Amplifiers & Comparators > Video Amplifiers	NCS2564DTBR2G
<input checked="" type="checkbox"/>	Video Filter	Amplifiers & Comparators > Video Amplifiers	NCS2564DTBR2G

Copyright © 1999-2010 ON Semiconductor Privacy Policy | Terms of Use | Site Map | Careers | Contact Us | Terms and Conditions

When complete, CLICK
'Create Worksheet' at
bottom



Creating the Output Worksheet




'Worksheet' may be opened immediately or saved to your hard drive.

CLICK 'Open' and Word will be launched and your Worksheet will appear.

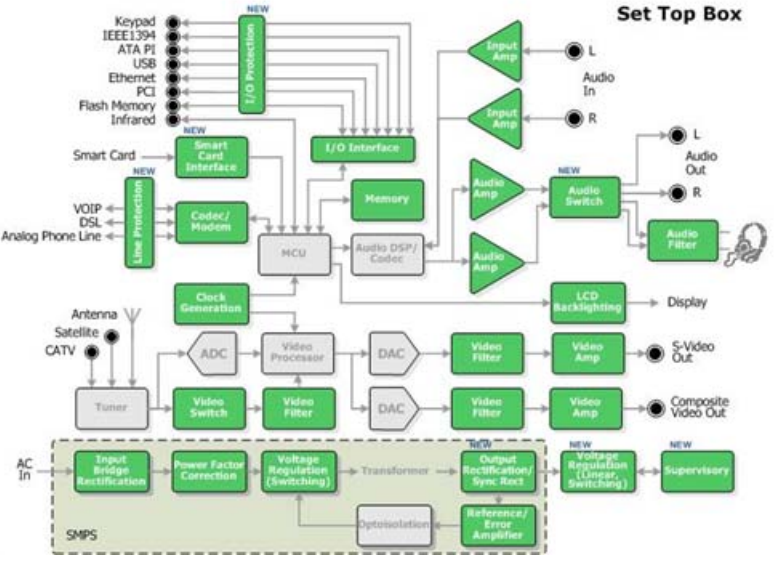
Worksheet

'Worksheet' is automatically created. This is a fully editable Microsoft Word document. Page 1 is shown.


| ON Semiconductor®
Application Worksheet

Customer	ABC Electronics	Customer Contact	James Watt
Program	2012 Suburbanite	Prepared by	
Application	Consumer - Set Top Box	Date Prepared	8/17/2010

Set Top Box



The block diagram illustrates the internal architecture of a Set Top Box. It features several input and output sections. On the left, inputs include a Keypad, IEEE1394, ATA PI, USB, Ethernet, PCI, Flash Memory, Infrared, Smart Card, VOIP, DSL, and Analog Phone Line. These connect to various interface and processing blocks such as I/O Protection, Smart Card Interface, I/O Interface, Memory, HCU, Audio DSP/Codec, Video Processor, and Video Switch. The central processing core includes a Clock Generation block, ADC, Video Processor, DAC, and Video Filter. On the right, outputs include Audio In (L, R), Audio Out (L, R), LCD Backlighting (Display), S-Video Out, and Composite Video Out. The bottom section, labeled SMPS (Switching Mode Power Supply), shows the power regulation path from AC In through Input Bridge Rectification, Power Factor Correction, Voltage Regulation (Switching), Transformer, Output Rectification/Sync Rect, and Voltage Regulation (Linear Switching) to a Supervisory block. A Reference/Error Amplifier is also shown connected to the SMPS.

Header information and logos appear at the top of page 1.

Block diagram shows next.



Worksheet

Block	Part Types Used	Selected Parts
Audio Amp	Amplifiers & Comparators > Audio Amplifiers	NCP2890DMR2G
Audio Filter	EMI / RFI Filters > Audio Filters	NLF420MNTJG
Audio Switch	Analog Switches > Audio Switches	NS5S1153MUTAG
	Analog Switches > Data Switches	
Clock Generation	Clock Generation > Crystal Oscillators	
	Clock & Data Distribution > Drivers & Fanout Buffers	
	Clock Generation > Zero Delay Buffers	
	Clock Generation > PLL Clock Generators	NB3NB001DTR2G NB3NB002DTR2G NB3NB011DTR2G
Codec/ Modem	Clock Generation > PLL Clock Generators	
Voltage Regulation (Linear, Switching)	Voltage & Current Management > Voltage References	
	DC-DC Controllers, Converters, & Regulators > Controllers	
	DC-DC Controllers, Converters, & Regulators > Linear Voltage Regulators	
	Bipolar Transistors > Low $V_{CE(sat)}$ Transistors	
	DC-DC Controllers, Converters, & Regulators > Converters	
	IGBTs & FETs > MOSFETs	
	Voltage & Current Management > Voltage Protection	
I/O Interface	Voltage & Current Management > Voltage Supervisors	
I/O Protection	EMI / RFI Filters > Data Filters	
	Diodes & Rectifiers > ESD Protection Diodes & Arrays	
	Voltage & Current Management > Current Protection	
Input Amp	Amplifiers & Comparators > Operational Amplifiers	
Input Bridge Rectification	Diodes & Rectifiers > Rectifiers	
LCD Backlighting	Bipolar Transistors > General Purpose Transistors	
	IGBTs & FETs > Protected MOSFETs	
	Drivers > Display / LED Drivers	
	DC-DC Controllers, Converters, & Regulators > Linear Voltage Regulators	
	Image Sensors > Ambient Light Sensors	
	Diodes & Rectifiers > Schottky Diodes & Rectifiers	
	Bipolar Transistors > Low $V_{CE(sat)}$ Transistors	
	DC-DC Controllers, Converters, & Regulators > Converters	
	IGBTs & FETs > MOSFETs	

Notes

Block list with Selected Parts list appears on the next 1 or 2 pages.

Note each Selected Part has a hyperlink to its Web product page, providing easy access to datasheet and other information.

Notes section appears last. You may use this area as desired.



Applications Interactive Block Diagrams

This Interactive Block Diagram tool is provided by ON Semiconductor.

© ON Semiconductor
All rights reserved.