Peripheral semiconductors for set-top box applications

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Power management

Power MOSFETs - low voltage (STripFET™)
- Reduced switching losses
- Optimized intrinsic body diode
- Schottky diode
- Product range (24 V to 60 V)

Power MOSFETs - high voltage (SuperMESH™)
- Extremely high dv/dt capability
- Avalanche rated
- Gate charge minimized
- Very low intrinsic capacitances
- High efficiency

Microprocessor supervisors
STM6779
- Dual voltage reset
- Primary supply monitor: 4.625 to 1.575 V
- 1 additional adjustable supply monitor input
- Manual reset with delay manual reset

STM6905
- Quintuple voltage reset
- Primary supply monitor: 3.078 to 2.866 V
- Secondary supply monitor: 2.333 to 1.05 V
- 3 additional adjustable supply monitor inputs

Linear regulators - very low dropout
KFxxx, LFxxx, L4931, LD1117, LD29080/150/300, LD39080/150/300, LD49150/300 LD108x, ST1L04, ST1L02, ST1L05
- Very low dropout voltage from 0.2 V
- Output current: up to 5 A
- Logic-controlled electronic shutdown
- Output voltages: 1.25 to 12 V and adjustable from 0.8 V

DC-DC conversion - step-down
ST1S03, ST1S06, ST1S09, ST1S10, ST1S12, ST2S06, ST1S30I, ST1S40
- Step-down current mode PWM (up to 1.7 MHz)
- Reference voltage 0.8 V
- Internal soft-start and power-on delay
- Maximum output current up to 3 A

L598x, L798x
- Up to 3 A DC output current (up to 28 V for L798x)
- 2.9 V to 18 V input voltage range
- Output voltage adjustable from 0.6 V
- 250 kHz switching frequency, programmable up to 1 MHz
- Overcurrent, overvoltage and thermal protection

AC-DC conversion - high voltage converter
VIPer28
- Standby PSU consumption less than 50 mW
- 800 V avalanche rugged power section
- PWM operation with fixed frequency jittering for low EMI
- Thermal shutdown with hysteresis

Schottky diodes for secondary rectification
STPSxxx
- 20 V to 100 V reverse voltage
- SMD packages below 5 A
- Power packages above 5 A
- Low Vf
- Flat packages available in halogen free models

Separable security

Power switches
ST890
- Input range: 2.7 to 5.5 V
- Programmable current limit: up to 1.2 A
- Low quiescent current
- Thermal shutdown, fault indicator output

STMPS2141, STMPS2151, STMPS2161, STMPS2171
- Enhanced single channel power switches
- Input range: 2.7 to 5.5 V
- 500 mA/1 A continuous current with fixed current limit
- Low quiescent current
- Thermal shutdown, fault indicator output, reverse-current protection and
- fault-blanking features

STMPS2242, STMPS2252, STMPS2262, STMPS2272
- Input range: 2.7 to 5.5 V
- 500 mA/1 A continuous current per channel with fixed current limit
- Low quiescent current
- Thermal shutdown, fault indicator output, reverse-current protection and fault-blanking features

Front panel display

EMI filter and ESD protection
EMIFxx-1005yzz
- Available in 4/6/8-line configuration
- Micro qFN package
- IEC 61000-4-2 level 4, 15 kV

VFD controllers
- Compact single chip solution
- Easy software implementation through SPI/I²C serial interface
- Drives VFD panel with 8 digits / 20 segments up to 16 digits / 12 segments
- Energy Star and Blue Angel standard compliant
- Integrated key-scan, infrared RC decoder and real-time clock (RTC)

LED controllers
- Drive up to 7 digits, 8 segments
- Drive capability of 40 mA (max)
- Integrated key-scan up to 16 keys
- 3-wire serial SPI interface
- Low power consumption during standby

S-Touch™ 3- to 24-channel capacitive touch key controllers
STMPE821, STMPE1208S, STMPE321, STMPE16M31, STMPE24M31
- PWM and GPIOs
- Noise filtering
- 400 kHz I²C communication interface
- Ultra-low-power consumption: 1 µA in hibernate mode, 25 µA in touch detection mode
- Highly sensitive impedance change detection engine
- Innovative calibration method enables high tolerance to environmental changes
- Ultra small packages

Serial real-time clocks
M41T62
- Serial RTC with alarm
- 32 kHz output
- Power supply from 1.3 to 4.4 V
- Timekeeping down to 1.0 V
- Current consumption: 350 nA at 3 V

Temperature sensors
STTS75
- Digital I²C temperature sensor
- +/-2 °C accuracy from -25 to +100 °C
- Power saving one-shot temperature measurement
- Power supply range: 2.7 to 5.5 V

STLM20
- Precision analog voltage output temperature sensor
- Operating voltage: 2.4 to 5.5 V
- Ultra-low quiescent supply current: 8.0 µA max

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LNB power supply

Multi-function switching regulators
LNBP8/9/10/11L, LNBK/P20, LNBP1x, LNBP21, LNBS21, LNBH23, LNBH23L, LNBH24
- Built-in DC-DC converter for single 12 V supply with integrated NMOS
- Built-in 22 kHz tone detector supports bidirectional DiSEqC™ 2.0, DiSEqC 1.0 (L version) receivers/Sat-TV, sat-PC cards
- LNB short circuit dynamic protection and diagnostic
- Dual tuner application (LNBH221 and LNBH24)

Lightning protection
LNBTVSx-xxx
- Up to 500 A peak protection (1.2/50 µs; 8/20 µs combination waveform)
- Unidirectional protection
- 2 voltages according to LNB choice

Data communication

RS-232 interface ICs
ST2XXE, ST32XXE
- ±15 kV human body model (E series)
- ±8 kV contact discharge and ±15 kV air-gap discharge IEC 1000-4-2, (E series)
- Data rate: 120 to 480 Kbit/s
- Slew rate range: 3 to 30 V/µs

Protection devices
USBLC6-xxx
- IEC 61000-4-2
- C = 0.42 pF

LCPxxxxxx
- ITU-T K20/21 and GR-1089
- Up to 175 V - 500 A 2/10 µs

HSP061
- 4 and 8 lines
- IEC 61000-4-2
- Low-time domain reflexion
- 6 GHz cut-off frequency

Video block

Standard definition video
TSH122
- Single 2.5 to 5 V supply
- Integrated 6 dB gain
- Integrated 6th order video reconstruction filter for SD (-3 dB bandwidth: 9 MHz)
- 0.1 dB gain flatness: 5.4 MHz minimum

TSH103/173
- Single 5 V supply
- Integrated 6 dB gain
- Integrated video reconstruction filters for SD (-3 dB bandwidth: 8.2 MHz)
- 0.1 dB gain flatness: 6 MHz

High definition video
TSH345/TSH346
- Single 5 V supply
- Integrated 6 dB gain
- Integrated 6th order video reconstruction filters for SD/PV/HD (TSH345) or HD only (TSH346)
- Multiplexed inputs (TSH345)

TSH343/TSH344
- Single 5 V supply
- >250 MHz bandwidth
- Slew rate > 750 V/µs
- 0.1 dB gain flatness: 65 MHz
- Internal 6 dB gain
- Integrated DC shift (TSH343)

HDMIULC6-xxx
- 15 kV (IEC 61000-4-2) ESD protection
- Ultra-large bandwidth (5.3 GHz)
- Low clamping voltage
- No impact on signal integrity

HDMI2C1-5DIJ
- HDMI 1.3 compliant
- ESD protection (8 kV contact IEC 1000-4-2)
- Signal booster and level shifter
- Long-cable drive (up to 750 pF)

HDMI high speed data protection
HSP06
- 4-line ESD protection for high speed lines
- Ultra-large bandwidth (6 GHz)
- Ultra-low capacitance (0.6 pF)
- High integration
- High ESD protection level

Audio block

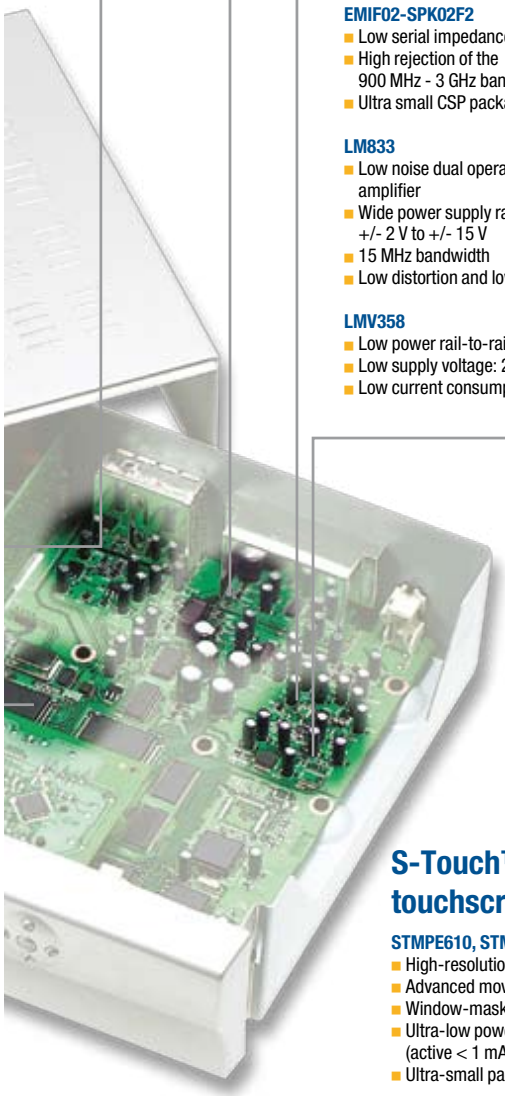
EMIF02-SPK02F2
- Low serial impedance
- High rejection of the 900 MHz - 3 GHz band
- Ultra small CSP package

LM833
- Low noise dual operational amplifier
- Wide power supply range: +/- 2 V to +/- 15 V
- 15 MHz bandwidth
- Low distortion and low noise

LMV358
- Low power rail-to-rail amplifier
- Low supply voltage: 2.7 to 6 V
- Low current consumption: 150 µA

TSH62
- Low cost rail-to-rail wide band amplifier
- Wide power supply range: 5 to 12 V
- 60 MHz bandwidth
- Excellent PSRR leading to better audio performances

TS4657
- Stereo digital audio line driver with capaless outputs
- Single supply voltage: 3.0 to 5.5 V
- Output voltage: 2.2 Vrms max
- Digital audio inputs: I²S, left-justified, right-justified
- 16-bit to 24-bit data format, 32 kHz to 48 kHz



Remote control

- STM32F for high-end remote with LCD and MEMS
- STM8L for basic remote control

S-Touch™ resistive touchscreen controller

STMPE610, STMPE811
- High-resolution resistive touchscreens
- Advanced movement tracking to reduce CPU/bus usage
- Window-masking function to allow intelligent use of screen
- Ultra-low power consumption for touchscreen applications (active < 1 mA, standby < 100 µA)
- Ultra-small package: QFN16 (3 x 3 mm)

Smartcard reader

Smartcard interface (ASI)
ST8004, ST8024, ST8024L
- ISO 7816-3 compatible with the NDS conditional access system (ST8024 in progress)
- 3 specific, protected half duplex bidirectional buffered I/O lines
- Thermal and short-circuit protection on all card contacts
- 26 MHz integrated crystal oscillator
- Step-up converter for V_{cc} generation

Microcontrollers
ST7SCR/GEM
- 8-bit microcontroller core
- 16 Kbyte Flash or ROM memory
- ISO 7816 UART interface
- Power supply management unit (5, 3, and 1.8 V)
- Possibility of embedded application firmware (ST7GEM version)

Motion sensors (MEMS)

LIS302DL / LIS331DLx / LIS3DH
- Voltage operating range from 2.16 to 3.6 V
- 2g/4g/8g acceleration ranges
- Ultra-low power operational modes
- I²C/SPI Digital output interface
- High data resolution: 12 bits

Single or multi-axis gyroscopes
- Voltage operating range from 2.7 to 3.6 V
- Selectable full scale: up to ±2000°/sec
- Digital SPI/I²C output
- Power down and sleep modes

Inertial module
- 3-axis digital accelerometer (±2g/±4g/±8g full scale) + 2-axis analog pitch and yaw gyroscope (300 & 1200°/s full scale)

Magnetic sensor module
- 3-axis digital accelerometer (±2g/±4g/±8g full scale) + 3-axis digital magnetic sensor (from ±1.3 up to ±8 gauss full scale)

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Power management

DC-DC conversion - step-down converters

Part number	Description	Package	V_{in} (V)	V_{out} (V)	I_{out} max (A)	Switching frequency (kHz)
PM8903	3 A step-down switching regulator with PGood and synchronization	QFN16L (3x3)	2.8 to 6	0.6 to Vin	3	adjustable up to 1.2 MHz
L5970AD	1.5 A switch step-down switching regulator	SO-8	4.4 to 36	0.5 to 35	1.5	500
L5972D	2 A switch step-down switching regulator	SO-8	4.4 to 36	1.23 to 35	2	250
L5973AD	2 A switch step-down switching regulator	HSOP8	4 to 36	0.5 to 35	2	500
L5973D	2.5 A switch step-down switching regulator	HSOP8	4 to 36	0.5 to 35	2.5	250
L5980	700 mA step-down switching regulator	QFN8L (3x3)	2.9 to 18	0.6 to Vin	0.7	250 - adjustable up to 1 MHz
L5981	1 A step-down switching regulator	QFN8L (3x3)	2.9 to 18	0.6 to Vin	1	250 - adjustable up to 1 MHz
L5983	1.5 A step-down switching regulator	QFN8L (3x3)	2.9 to 18	0.6 to Vin	1.5	250 - adjustable up to 1 MHz
L5985	2 A step-down switching regulator	QFN8L (3x3)	2.9 to 18	0.6 to Vin	2	250 - adjustable up to 1 MHz
L5986/A	2.5 A step-down switching regulator	QFN8L (3x3)/HSOP8	2.9 to 18	0.6 to Vin	2.5	250 - adjustable up to 1 MHz
L5987/A	3 A step-down switching regulator	QFN8L (3x3)/HSOP8	2.9 to 18	0.6 to Vin	3	250 - adjustable up to 1 MHz
L7980A	2 A step-down switching regulator	QFN8L (3x3)/HSOP8	4.5 to 28	0.6 to Vin	2	250 - adjustable up to 1 MHz
L7981A	3 A step-down switching regulator	QFN8L (3x3)/HSOP8	4.5 to 28	0.6 to Vin	3	250 - adjustable up to 1 MHz
L6925D	High-efficiency monolithic synchronous step-down regulator	MSOP8	2.7 to 5.5	0.6 to 5.5	1.2	600
L6926	High-efficiency monolithic synchronous step-down regulator	MSOP8	2 to 5.5	0.6 to 5.5	1.2	600
L6926Q1	High-efficiency monolithic synchronous step-down regulator	QFN8L (3x3)	2 to 5.5	0.6 to 5.5	1.2	600
L6928D	High-efficiency monolithic synchronous step-down regulator	MSOP8	2 to 5.5	0.6 to 5.5	1.2	1400
L6928Q1	High-efficiency monolithic synchronous step-down regulator	QFN8L (3x3)	2 to 5.5	0.6 to 5.5	1.2	1400
ST1S03	1.5 A, 1.5 MHz adjustable, step-down switching regulator	DFN6L	3 to 16	0.8 typ	1.5	1500
ST1S06	Synchronous rectification with inhibit, 1.5 A, 1.5 MHz fixed or adjustable, step-down switching regulator	DFN6L	2.5 to 6	0.8 typ	1.5	1500
ST1S09I	2 A, 1.5 MHz PWM step-down switching regulator with synchronous rectification	DFN6L	2.7 to 6	0.8 typ	2	1500
ST1S30I	3 A, 1.5 MHz PWM step-down switching regulator with synchronous rectification	DFN8	2.7 to 6	0.8 typ	3	1500
ST1S10	3 A, 900 kHz, monolithic synchronous step-down regulator	MLP8L, SO-8 ex.p	2.5 to 18	0.8 typ	3	900
ST1S40	4 A, 900 kHz, monolithic synchronous step-down regulator	MLP8L, SO-8 ex.p, SO8	2.5 to 18	0.8 typ	4	900
ST1S12	Synchronous rectification with enable, 0.7 A, 1.7 MHz fixed or adjustable step-down switching regulator	TSOT23-5L	2.5 to 5.5	0.6 typ	0.7	1700
ST2S06B	Dual synchronous rectification with reset or inhibit, 0.5 A, 1.5 MHz adjustable step-down switching regulator	QFN12L	2.5 to 5.5	0.8 typ	0.5, 0.5	1500

DC-DC conversion - step-up converters

Part number	Description	Package	V_{in} (V)	V_{out} (V)	I_{out} (A)	Switching frequency (kHz)
ST8R00W	Synchronous DC-DC converter	DFN8L	4 to 6	6 to 12	1	1400

For the SMPS eDesign Studio simulator, please refer to www.st.com/edesignstudio

Power management

DC-DC conversion - multi-output regulators

Part number	Package	Description	V_{in} (V)	V_{out} PWM1 (V)	V_{out} PWM2 (V)	V_{out} PWM3 (V)	V_{out} LDO1 (V)	V_{out} LDO2 (V)	Fsw (kHz)	I_{out} PWM (A)	I_{out} LDO1 (mA)	I_{out} LDO2 (mA)
PM6680	QFN32L (5x5)	Dual adjustable output controller plus 5 V LDO	5.5 to 28	0.9 to 5	0.9 to 3.3	-	5	-	200 to 500	up to 10	up to 200	-
PM6675S	QFN24L (4x4)	High-efficiency step-down controller with embedded 2 A LDO regulator	4.5 to 28	0.6 to 3.3	-	-	0.6 to 2	-	200 to 500	up to 10	up to ±2000	-
PM6681A	QFN32L (5x5)	Dual synchronous step-down controller with two LDO regulators	5.5 to 36	0.9 to 5	0.9 to 3.3	-	5	0.9 to 3.3	200 to 500	up to 10	up to 200	up to 120
PM6641	QFN48L (7x7)	Monolithic voltage regulator: 3 x switching regulators and 1 LDO (DDR supply compatible)	2.7 to 5.5	0.8 to 4.7	0.8 to 4.7	0.8 to 4.7	0.5 * VinLDO	-	500 to 1000	up to 2.5	up to ±2000	-
PM6686	QFN32L (5x5)	Dual synchronous step-down controller with adjustable LDO regulator	5.5 to 28	0.7 to 5.5	0.7 to 2.5	-	5/3.3/0.7 to 4.5	-	200 to 500	up to 10	up to 200	-

Single-phase switching DC-DC controllers and smart regulators

Part number	Package	Input voltage (V)	Output voltage (V)	Supply voltage (V)	Output current (A) max
L6726A	SO-8	19 max	0.8 min	4.1 to 13.2	3 to 20 (according to external MOSFET)
L6727	SO-8	19 max	0.8 min	4.1 to 13.2	3 to 20 (according to external MOSFET)
L6728D/AH	DFN10	15 max	0.8 min	4.1 to 15	3 to 20 (according to external MOSFET)
L6738	QFN16L (3x3)	19 max	0.8 min	4.2 to 13.2	3 - 20 A according to external MOSFET
L6935	QFN20L (4x4)	0.5 to 5	0.5 to 3	1.2 to 5	3
L6933H	HSOP8	2 to 14	1.2 to 5	-	2
L6932D	SO-8	2 to 14	1.2 to 5	-	2
L6932H	HSOP8	2 to 14	1.2 to 5	-	2

AC-DC conversion - high-voltage converters

Part number	Package	Power capability (W) max	Drain source voltage (V) min	V_{DD} (V)		$R_{DS(on)}$ (Ω) max	I_{out} (A) min	Switching frequency (kHz) typ	Switching frequency mode	Max duty cycle (%) typ	Topology	Current limiting mode	Standby mode
				min	max								
VIPER53SP-E	PowerSO-10	40	620	9.3	40	1	1.6	up to 300	Fixed frequency (settable)	90	Buck-boost, buck, flyback	Pulse	Burst mode
VIPER53DIP-E	DIP-8	30	620	9.3	30	1	1.6	up to 300	Fixed frequency (settable)	90	Buck-boost, flyback	Pulse	Burst mode
VIPER53ESP-E	PowerSO-10	40	620	9.3	40	1	1.6	up to 300	Fixed frequency (settable)	90	Buck-boost, flyback	Pulse	Burst mode
VIPER53EDIP-E	DIP-8	30	620	9.3	30	1	1.6	up to 300	Fixed frequency (settable)	90	Buck-boost, flyback	Pulse	Burst mode
VIPER22AS-E	SO-8	7	730	9	7	17	0.56	60	Fixed frequency	90	Buck-boost, flyback	Pulse	Burst mode
VIPER22ADIP-E	DIP-8	12	730	9	12	17	0.56	60	Fixed frequency	90	Buck-boost. buck. flyback	Pulse	Burst mode
VIPER17LN	DIP-7	7	800 (avalanche rugged)	8.5	23.5	20	from 0.2 to 0.4 (settable)	60	Fixed frequency with jittering	70	Flyback, buck-boost, buck	Pulse	Burst mode
VIPER17HN	DIP-7	7	800 (avalanche rugged)	8.5	23.5	20	from 0.2 to 0.4 (settable)	115	Fixed frequency with jittering	70	Flyback, buck-boost, buck	Pulse	Burst mode

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Power management

AC-DC conversion - high-voltage converters (cont'd)

Part number	Package	Power capability (W) max	Drain source voltage (V) min	V_{DD} (V)		$R_{DS(on)}$ (Ω) max	I_{out} (A) min	Switching frequency (kHz) typ	Switching frequency mode	Max duty cycle (%) typ	Topology	Current limiting mode	Standby mode
				min	max								
VIPER17LD	SO-16N	7	800 (avalanche rugged)	8.5	23.5	20	from 0.2 to 0.4 (settable)	60	Fixed frequency with jittering	70	Flyback, buck-boost, buck	Pulse	Burst mode
VIPER17HD	SO-16N	7	800 (avalanche rugged)	8.5	23.5	20	from 0.2 to 0.4 (settable)	115	Fixed frequency with jittering	70	Flyback, buck-boost, buck	Pulse	Burst mode
VIPER15LN	DIP-7	8	800 (avalanche rugged)	8.5	23.5	20	from 0.2 to 0.4 (settable)	limited to 136	Quasi resonant	70	Flyback	Pulse	Burst mode
VIPER15HN	DIP-7	8	800 (avalanche rugged)	8.5	23.5	20	from 0.2 to 0.4 (settable)	limited to 225	Quasi resonant	70	Flyback	Pulse	Burst mode
VIPER27LN	DIP-7	13	800 (avalanche rugged)	8.5	23.5	8	from 0.2 to 0.7 (settable)	60	Fixed frequency with jittering	70	Flyback, buck-boost, buck	Pulse	Burst mode
VIPER27HN	DIP-7	13	800 (avalanche rugged)	8.5	23.5	8	from 0.2 to 0.7 (settable)	115	Fixed frequency with jittering	70	Flyback, buck-boost, buck	Pulse	Burst mode
VIPER25LN	DIP-7	15	800 (avalanche rugged)	8.5	23.5	8	from 0.2 to 0.7 (settable)	limited to 136	Quasi resonant	70	Flyback	Pulse	Burst mode
VIPER25HN	DIP-7	15	800 (avalanche rugged)	8.5	23.5	8	from 0.2 to 0.7 (settable)	limited to 225	Quasi resonant	70	Flyback	Pulse	Burst mode
VIPER28LN	DIP-7	13	800 (avalanche rugged)	8.5	23.5	8	from 0.2 to 0.8 (settable)	60	Fixed frequency with jittering	70	Flyback, buck-boost, buck	Pulse	Burst mode
VIPER28HN	DIP-7	13	800 (avalanche rugged)	8.5	23.5	8	from 0.2 to 0.8 (settable)	115	Fixed frequency with jittering	70	Flyback, buck-boost, buck	Pulse	Burst mode

AC-DC conversion - PWM controllers

Part number	Package	Description	Topology	V_{cc} range (V)	Quiescent current (mA)	Max duty cycle (%)	Oscillator frequency (kHz)
L6668	SO-16N	Smart primary controller	Buck, boost, buck-boost, flyback, forward (including 2-switch forward)	9.4 (min), 22 (max)	2	75	100
L6566B	SO-16N	Multimode primary controller	Buck, boost, buck-boost, flyback, forward (including 2-switch forward)	8 (min), 23 (max)	2.5	70	300 (max)

Linear regulators - very low dropout

Part number	Description	V_{in} max (V)	V_{out} (V)	I_{out} (A)	V_{drop} typ (V)	I_q (mA)	Enable pin	Package	Operating temperature (°C)	
									min	max
LD1117	Low drop adjustable positive voltage regulator	15	Adjustable, 1.2, 1.8, 2.5, 2.85, 3.0, 3.3, 5.0	0.8	1.1		No	DPAK, TO-220, SOT22-3	0	125
LD1117A	Low drop adjustable positive voltage regulator	15	Adjustable, 1.2, 1.8, 2.5, 3.3	1	1.1	5	No	DPAK, TO-220, SOT22-3	0	125
LD108x	Low drop positive voltage regulator	30	Adjustable, 1.5, 1.8, 2.5, 2.85, 3.3, 3.6, 5, 8, 12	1.5, 3, 5	1.3	5	No	DPAK, TO-220, SOT22-3	-40	125
LFxx	Very low drop voltage regulator with inhibit	40	2.5, 2.7, 3.3, 3.5, 5, 8, 12	0.5	0.4	5	Yes	PPAK, DPAK, TO-220, TO-220FP	-40	125
KFxx	Very low drop voltage regulator with inhibit	20	1.5, 2.5, 3.3, 4, 5, 8	0.5	0.4	5	Yes	SO-8, DPAK	-40	125
L4931	Very low drop voltage regulator with inhibit	20	1.5, 1.8, 2.5, 3.3, 4.7, 5, 6, , 8, 8.5, 9, 12	0.25	0.4	6	Yes	SO-8, TO-92, DPAK, PPAK, TO-220	-40	125
LD29080/150/300	Very low drop voltage regulators	14	Adjustable, 1.5, 1.8, 2.5, 3.3, 5, 8	0.8, 1.5, 3	0.4	30	Yes	PPAK, TO-220, DPAK, D^2PAK, P^2PAK	-40	125
LD39050/100	Very low dropout for low output voltage regulator	5.5	Adjustable from 0.8	0.5, 1	0.2	0.1	Yes	DFN6		
LD39080/150/300	Ultra low drop BiCMOS voltage regulator	6	Adjustable, 1.22, 1.8, 2.5, 3.3	0.8, 1.5, 3	0.2	1	Yes	DPAK, PPAK, DFN6L	-40	125

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Power management

Linear regulators - very low dropout (cont'd)

Part number	Description	V_{in} max (V)	V_{out} (V)	I_{out} (A)	V_{drop} typ (V)	I_q (mA)	Enable pin	Package	Operating temperature (°C)	
									min	max
LD49150/300	Very low drop for low output voltage regulator	5.5	Adjustable down to 0.8	1.5, 3	0.12	4	Yes	PPAK	-25	125
ST1L02	Very low quiescent BiCMOS voltage regulator	10	1.8, 2.5, 3.3	1	0.7	0.5	No	VFDFPN6	0	125
ST1L04	Low quiescent current voltage regulator	10	Adjustable from 0.8	1	1	3	No	PPAK-5L	-40	150
ST1L05	Very low quiescent BiCMOS voltage regulator	7	Adjustable, 1.8, 2.5, 3.3	1.3	0.3	0.65	Yes	VFDFPN6	-40	150

Voltage reference

Part number	Description	Operating temperature (°C)		Precision (%)	Cathode-to-anode voltage		Package
		min	max		min (V)	max (V)	
TS2431	Programmable shunt voltage reference	-40	105	2, 1, 0.5	2.5	24	SOT23-3
TS3431	Programmable shunt voltage reference	-40	125	2, 1, 0.5, 0.25	1.2	24	SOT23-3, TO-92

Reset ICs

Part number	Description	Manual reset	Programmable delay	Reset pulse width typ (ms)	1st voltage threshold (V)	2nd voltage threshold (V)	3rd voltage threshold	4th voltage threshold	5th voltage threshold
STM1061	Voltage detector, open-drain low				1.6, 1.7, 1.9, 2.1, 2.2, 2.3, 2.5, 2.6, 2.7, 2.8, 2.9, 3.0, 3.1, 3.4, 3.8				
STM809	Reset push-pull low			210	4.63, 4.38, 3.08, 2.93, 2.63				
STM810	Reset push-pull high			210	4.63, 4.38, 3.08, 2.93, 2.63				
STM811	Reset push-pull low	X		210	4.63, 4.38, 3.08, 2.93, 2.63				
STM812	Reset push-pull high	X		210	4.63, 4.38, 3.08, 2.93, 2.63				
STM1001	Reset open-drain low			210	4.63, 4.38, 3.08, 2.93, 2.63				
STM6315	Reset open-drain low	X		1.5, 20, 210, 1680	4.63, 2.93, 2.63				
STM1810	Reset push-pull low			150	4.63, 4.38				
STM1811	Reset open-drain low with pull-up			150	4.63, 4.38				
STM1812	Reset push-pull high			150	4.63, 4.38				
STM1813	Reset open-drain low bidirectional			150	4.63, 4.38				
STM1815	Reset push-pull low			150	3.08, 2.93, 2.63				
STM1816	Reset open-drain low with pull-up			150	3.08, 2.93, 2.63				
STM1817	Reset push-pull high			150	3.08, 2.93, 2.63				

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Power management

Reset ICs (cont'd)

Part number	Description	Manual reset	Programmable delay	Reset pulse width typ (ms)	1st voltage threshold (V)	2nd voltage threshold (V)	3rd voltage threshold	4th voltage threshold	5th voltage threshold
STM1818	Reset open-drain low bidirectional			150	3.08, 2.93, 2.63				
STM6717	Dual reset open-drain low	X		210	3.08, 2.93	2.31, 2.18, 1.66, 1.57, 1.31, 1.11, 1.05, 0.875, 0.788			
STM6718	Dual reset push-pull low	X		210	3.08, 2.93	2.31, 2.18, 1.66, 1.57, 1.31, 1.11, 1.05			
STM6719	Triple reset open-drain low	X		210	3.08, 2.93	2.31, 2.18, 1.66, 1.57, 1.31, 1.11, 1.05	Adjustable		
STM6720	Triple reset push-pull low	X		210	3.08, 2.93	2.31, 2.18, 1.66, 1.57, 1.31, 1.11, 1.05	Adjustable		
STM6777	Dual reset open-drain low	X	X	210	4.63, 4.38, 3.08, 2.93, 2.63	2.31, 2.18, 1.66, 1.57, 1.31, 1.11, 1.05			
STM6778	Dual reset push-pull low	X	X	210	4.63, 4.38	2.31, 2.18, 1.66, 1.57, 1.31, 1.11, 1.05			
STM6779	Dual reset open-drain low	X	X	210	4.63, 3.08, 2.93, 2.18, 1.57		Adjustable		
STM6780	Dual reset push-pull low	X	X	210	4.63, 3.08, 2.93, 2.18, 1.57		Adjustable		
STM6904	Quad open-drain low with pull-up	X		210 / 420	3.08, 2.96, 2.86	2.33, 1.68, 1.11, 1.05	Adjustable	Adjustable	
STM6905	Quint open-drain low with pull-up	X		210	3.08, 2.96, 2.86	2.33, 1.68, 1.11, 1.05	Adjustable	Adjustable	Adjustable

Microprocessor supervisors

Part number	Description	Watchdog	Manual reset	Reset pulse width typ (ms)	Operating voltage (V)	Voltage threshold (V)	Temperature range (°C)		Package
							min	max	
STWD100	Watchdog with chip enable	X		210	2.7 to 5.5		-40	85	SOT23-5
STM6321	Watchdog with reset open-drain low and push-pull high	X		210	1.2 to 5.5	4.63, 4.38, 3.08, 2.93, 2.63	-40	85	SOT23-5
STM6322	Reset push-pull high and open-drain low		X	210	1.2 to 5.5	4.63, 4.38, 3.08, 2.93, 2.63	-40	855	SOT23-5
STM6821	Watchdog with reset push-pull high	X	X	210	1.2 to 5.5	4.63, 4.38, 3.08, 2.93, 2.63	-40	85	SOT23-5
STM6822	Watchdog with reset open-drain low	X	X	210	1.2 to 5.5	4.63, 4.38, 3.08, 2.93, 2.63	-40	85	SOT23-5
STM6823	Watchdog with reset push-pull low	X	X	210	1.2 to 5.5	4.63, 4.38, 3.08, 2.93, 2.63	-40	85	SOT23-5
STM6824	Watchdog with reset push-pull low and high	X		210	1.2 to 5.5	4.63, 4.38, 3.08, 2.93, 2.63	-40	85	SOT23-5
STM6825	Reset push-pull low and high		X	210	1.2 to 5.5	4.63, 4.38, 3.08, 2.93, 2.63	-40	85	SOT23-5

Schottky diodes

Part number	Package	Halogen-free	$I_{F(AV)}$ (A)	V_{RRM} (V)	V_F max (25 °C, $I_{F(AV)}$) (V)	I_R max (25 °C) (µA)	Operating T_J (°C)
STPS2L30A/AF	SMA/SMA flat	Yes	2	30	0.375	200	150
STPS2L40A/AF	SMA/SMA flat	Yes	2	40	0.43	220	150

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Power management

Schottky diodes (cont'd)

Part number	Package	Halogen-Free	If(av) (A)	Vrrm (V)	Vf max (25 °C, If(av)) (V)	Ir max (25 °C) (µA)	Operating Tj (°C)
STPS2L40U/UF	SMB/SMB flat	Yes	2	40	0.43	220	150
STPS3L40U/UF	SMB/SMB flat	Yes	3	40	0.5	100	150
STPS0520Z	SOD-123	Yes	0.5	20	0.385	150	125
STPS0540Z	SOD-123	Yes	0.5	40	0.5	40	150
STPS1L40A/AF	SMA/SMA flat	No	1	40	0.5	35	150
STPS3L60S	SMC	No	3	60	0.7	55	150
1N5822RL	DO-201AD	Yes	3	40	0.525	2000	150
STPS30L30CT	TO-220AB	No	30	30	0.57	1500	150
STPS5H100B-TR	DPAK	No	5	100	0.73	3.5	175

Power MOSFETs

Part number	Description	T_j max (°C)	V_{DSS} (V)	$R_{DS(on)}$ @ 10 V (Ω)	I_D (A)	Package
STD10PF06T4	P-channel power MOSFET	150	-60	0.2	-10	DPAK
STS5DNF20V	Dual N-channel power MOSFET	150	20	0.045 @ 2.7 V	5	SO-8
STS30N3LLH6	N-channel power MOSFET	150	30	0.0024	30	SO-8
STS25NH3LL	N-channel power MOSFET	150	30	0.0035	25	SO-8
STS20N3LLH6	N-channel power MOSFET	150	30	0.0047	20	SO-8
STD85N3LH5	N-channel power MOSFET	150	30	0.005	85	DPAK
STL17N3LLH6	N-channel power MOSFET	150	30	0.0054	15	PowerFLAT (3x3)
STS4DNFS30L	N-channel power MOSFET	150	30	0.0055	5	SO-8
STS12N3LLH6	N-channel power MOSFET	150	30	0.0057	17	SO-8
STS14N3LLH5	N-channel power MOSFET	150	30	0.006	14	SO-8
STS12N3LLH5	N-channel power MOSFET	150	30	0.0073	12	SO-8
STD60N3LH5	N-channel power MOSFET	150	30	0.008	60	DPAK
STL60N3LLH5	N-channel power MOSFET	150	30	0.008	45	PowerFLAT (6x5)
STD50N03L	N-channel power MOSFET	150	30	0.01	50	DPAK
STL9N3LLH5	N-channel power MOSFET	150	30	0.014	9	PowerFLAT (3.3x3.3)
STS11N3LLH5	N-channel power MOSFET	150	30	0.014	11	SO-8
STS9D8NH3LL	N-channel power MOSFET	150	30	0.015	9	SO-8
STL150N3LLH5	N-channel power MOSFET	150	30	0.0175	-	PowerFLAT

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Power management

Power MOSFETs

Part number	Description	T_j max (°C)	V_{DSS} (V)	$R_{DS(on)}$ @ 10 V (Ω)	I_D (A)	Package
STS10DN3LH5	Dual N-channel power MOSFET	150	30	0.018	9	SO-8
STS10N3LH5	N-channel power MOSFET	150	30	0.018	10	SO-8
STS8DN3LLH5	Dual N-channel power MOSFET	150	30	0.019	10	SO-8
STS10DN3LH5	N-channel power MOSFET	150	30	0.022	8	SO-8
STL65N3LLH5	N-channel power MOSFET	150	30	0.058	65	DPAK
STS15N4LLF5	N-channel power MOSFET	150	40	0.006	15	SO-8
STF60N55F3	N-channel power MOSFET	150	55	0.0085	65	TO-220FP
STP70N6F6	N-channel power MOSFET	150	60	0.0084	70	TO-220
STP45NF06	N-channel power MOSFET	150	60	0.028	38	TO-220
STS4DNF60L	N-channel power MOSFET	150	60	0.055	4	SO-8
STD12NF06LT4	N-channel power MOSFET	150	60	0.1	12	DPAK
STP9NK50ZFP	N-channel power MOSFET	150	500	0.85	7.2	TO-220FP
STD4N52K3	N-channel power MOSFET	150	500	2.7	3	DPAK
STD3NK50ZT4	N-channel power MOSFET	150	500	3.3	2.3	DPAK
STF5N52K3	N-channel power MOSFET	150	525	1.5	5	TO-220FP
STF10N62K3	N-channel power MOSFET	150	620	0.75	8.4	TO-220FP
STF6N62K3	N-channel power MOSFET	150	620	1.28	5.5	TO-220FP
STF5N62K3	N-channel power MOSFET	150	620	1.6	5	TO-220FP
STF4N62K3	N-channel power MOSFET	150	620	1.95	4	TO-220FP
STF3N62K3	N-channel power MOSFET	150	620	2.5	2.7	TO-220FP
STP5NK80ZFP	N-channel power MOSFET	150	800	2.4	4.3	TO-220FP
STP4NK80ZFP	N-channel power MOSFET	150	800	3.5	3	TO-220FP
STD3NK80Z	N-channel power MOSFET	150	800	4.5	2.5	DPAK

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Audio / Video

High-speed amplifiers - video drivers

Part number	Description	V_{supply} (V)	Number of operators	Gain (dB)	Filter bandwidth (MHz)	I_{supply} (mA)	Temperature range (°C)		Package
							min	max	
TSH122ICT	Low-power 6th-order single video buffer with filter and sag correction	2.2 to 5.5	1	6	9	2	-40	85	SC70
TSH173IDT	Triple video buffer with filter for SD video	4.5 to 5.5	3	6	6	7	-40	85	SO-8
TSH103IDT	Low-cost triple video buffer with filter for SD video	4.5 to 5.5	3	6	6	5.8	-40	85	SO-8
TSH343IDT	280 MHz triple video buffer with DC shift	4.5 to 5.5	3	6	No filter	13	-40	85	SO-8
TSH344IDT	340 MHz triple video buffer	4.5 to 5.5	3	6	No filter	13	-40	85	SO-8
TSH345IDT	Triple video buffer with selectable filter for SD/PV/HD video	3.3 to 5.5	3	6	6/12/30	16	-40	85	SO-14/TSSOP14
TSH346IDT	Triple video buffer with filter for HD video	3.3 to 5.5	3	6	30	16	-40	85	SO-8
TSH6x	Low-cost wide-band rail-to-rail amplifier	4.5 to 12	1, 2, 3, 4	NA	No filter	8	0	70	SO-8/SO-14
TSH7x	Wide-band rail-to-rail amplifiers	3 to 12	1, 2, 3, 4	NA	No filter	8	0	70	SOT23/SO-8/SO-14/TSSOP14

Audio driver

Part number	Description	V_{supply} (V)	Icc	Icc standby	Dynamic range	PSRR	Audio line output amplitude	Temperature range (°C)		Package
								min	max	
TS4657IQT	Stereo digital audio line driver with capless outputs	3.3 to 5.5	7.4 mA	1 µA	93 dB	80 dB (@217 Hz)	2.2 Vrms	-40	85	QFN20 (4x4)

Analog video switches

Part number	Description	V_{cc} (V)	$R_{(on)}$ (Ω)	-3 dB bandwidth (MHz)	X_{talk} (dB)	C_{in} (pF)	I_{cc} (µA)	ESD (kV)	Package
STMAV340TTR	Quad SPDT high bandwidth switch	4 to 5.5	4	300 (min)	-58 (typ)	3 (typ)	3	2 (HBM)	TSSOP16
STMAV335TTR	Triple SP3T high bandwidth switch	4 to 5.5	4	300 (min)	-58 (typ)	3 (typ)	3	2 (HBM)	TSSOP16

Protection devices - ESD suppressors

Part number	Package	Leakage current (I_{RM}) max (µA)	General description	Mounting	Breakdown voltage (V_{BR}) min (V)	Reverse current (I_R) (mA)	Forward voltage (V_F) max (V)	Terminal capacitance (C_t) typ (pF)	Number of protected lines (typ)	Peak pulse power dissipation (P_{PP}) typ (W)	Stand-off voltage (V_{RM}) typ (V)	Packing type
ESDA14V2L	SOT23	5	Dual Transil array for ESD protection	Surface mount	14.2	1	1.25	90	2	300	12	Tape and reel
ESDA6V1-4BC6	SOT23-6L	1	Quad bidirectional Transil suppressor for ESD protection	Surface mount	6.1	1	-	45	4	80	3	Tape and reel

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Data communication

Operational amplifiers

Part number	Description	Temperature range (°C)		I_{supply} (mA)	V_{cc} min (V)	V_{cc} max (V)	Input offset max (mV)	Bandwidth (MHz)	Package
		min	max						
LM833	Low-noise dual operational amplifier	-40	105	2	5	30	5	15	SO-8
LMV358	Low-cost, low-power I/O rail-to-rail op-amp	-40	125	0.15	2.7	6	3	1	SO-8/TSSOP8
TSV358	General-purpose, I/O rail-to-rail, low-power op-amp	-40	125	0.45	2.7	6	3	1.4	SO-8/TSSOP8/MiniSO-8
TSH62	Low-cost wide-band rail-to-rail amplifier	0	70	8	4.5	12	10	60	SO-8
TSH72	Wide-band rail-to-rail amplifier	0	70	8	3	12	10	90	SO-8/TSSOP8

Digital switches

Part number	Description	V_{cc} (V)	C_{in} (pF) typ	Data rate (Gbit/s)	ESD (kV)	DDC	HPD	CEC	50 Ω input termination	Other features	Package
STHDMI002ABTR	1.65 Gbit/s 2-to-1 HDMI (HDMI v1.2) switch (passive)	3.3	2	1.65	2 (HBM)	Switch	Switch	No	No	No	TQFP48
STDVE003ABTR	3.4 Gbit/s 3-to-1 HDMI (HDMI v1.3) switch with equalizer	3.3	3.5	3.4	6 (HBM)	Buffer/switch	Switch	No	Yes (selectable)	Adaptive EQ boost pin for long cable	TQFP80
STDVE103ABTR	3.4 Gbit/s 3-to-1 HDMI (HDMI v1.3) switch with equalizer	3.3	3.5	3.4	6 (HBM)	Buffer/switch	Switch	No	Yes (selectable)	Adaptive EQ boost pin for long cable	TQFP64
STDVE001AQTR	3.4 Gbit/s single HDMI repeater	3.3	3.5	3.4	6 (HBM)	Buffer	N.A.	Yes (buffer)	Yes	EQ boost for long cable and pre-emphasis pins	QFN-8
STDVE001ABTR	3.4 Gbit/s single HDMI repeater	3.3	3.5	3.4	6 (HBM)	Buffer	N.A.	Yes (buffer)	Yes	No	TQFP48

Interface ICs - USB

Part number	Description	V_{bus} (V) V_{if} (V)	Data rate	Number of Dx/Rx	I_{cc} (mA)	ESD (kV)	t_{PLH} t_{PHL} (ns)	Operating temperature (°C)		Package
								min	max	
STUSB02E	USB transceiver	4 to 5.5 1.6 to 3.6	1.5 Kbit/s to 12 Mbit/s	1/1	5	14	20	-40	85	QFN16
STUSB03	USB transceiver	4 to 5.5 1.6 to 3.6	1.5 Kbit/s to 12 Mbit/s	1/1	5	14	18	-40	85	QFN16
STOTG04E	USB-OTG full-speed transceiver	2.7 to 5.5 1.6 to 3.6	1.5 Kbit/s to 12 Mbit/s	1/1	7	8	38	-40	85	QFN24

Interface ICs - RS-232

Part number	Supply voltage V_{cc} (V)	Number of Dx/Rx	I_{cc} typ (mA)	External capacitors (µF)	Number of external capacitors	High ESD protection (kV)	Packages	Data rate typ (Kbit/s)
ST2xxE	5	2/2, 5/3	2 to 5	0.1 to 1	4	15	DIP, SO, TSSOP, SSOP	230 to 480
ST32xxE	3	2/2, 5/3, 3/5	0.3	0.1	4	15	DIP, SO, TSSOP, SSOP, Flip-chip	250

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Data communication

Protection devices - ESD suppressors

Part number	Package	Leakage current (I_{RM}) max (µA)	General description	Mounting	Breakdown voltage (V_{BR}) min (V)	Reverse current (I_R) nom (mA)	Terminal capacitance (C_L) typ (pF)	Number of protected lines typ	Packing type
HDMIULC6-2M6	µQFN	0.5	Ultra low capacitance 2-line ESD protection	Surface mount	6	1	0.6	2	Tape and reel
HSP061-4NY8	µQFN 2x1-8L	0.1	High-speed Line protection	Surface mount	6	1	0.6	4	Tape and reel
USBLC6-2P6	SOT-666	0.15	Very low capacitance ESD protection	Surface mount	6	1	2.5	2	Tape and reel
USBLC6-4SC6	SOT23-6L	0.15	Very low capacitance ESD protection	Surface mount	6	1	3	4	Tape and reel
HSP061-8M16*	µQFN 3.3x1.5	0.1	High-speed Line protection	Surface mount	6	1	0.6	8	Tape and reel

Note:
*in development

Protection devices - 100 A Trisils

Part number	Package	General description	Mounting	Continuous reverse current I_R @ V_R max (µA)	Continuous reverse voltage V_R min (V)	Junction capacitance C typ (pF)	Holding current I_H min (mA)	Peak pulse current I_{PP} 10/1000 µs max (A)	Stand-off voltage V_{RM} max (V)	Dynamic breakover voltage V_{BO} max (V)	Static breakover current I_{BO} nom (mA)	Stand-off current IRM max (µA)	Packing type
SMP100LC-25	SMB CLIP (SOD 6)	Trisil standard 100 A low capacitance	Surface mount	5	25	65	150	100	22	40	800	2	Tape and reel
SMP100LC-200	SMB CLIP (SOD 6)	Trisil standard 100 A low capacitance	Surface mount	5	200	60	150	100	180	255	800	2	Tape and reel
SMP100LC-270	SMB CLIP (SOD 6)	Trisil standard 100 A low capacitance	Surface mount	5	270	60	150	100	243	345	800	2	Tape and reel

EMI filtering and conditioning

Part number	Package	General description	Mounting	ESD protection level	Operating temperature range (°C)	
					min	max
HDMI2C1-5DIJ	QFN16L (5x4)	Fully integrated ESD protection, bidirectional level-shifting buffer and signal booster for control links of HDMI 1.3 transmitters	Surface mount	IEC 61000-4-2 level 4, 8 kV contact	-40	85
EMIFxx-1005yzz	µQFN	EMI filter array (4, 6 and 8 lines) with integrated ESD protection for parallel interface	Surface mount	15 kV	-40	85
EMIF02-SPK02F2	CSP 0.5 mm	EMI filter with serial inductor for speakers	Surface mount	15 kV	-40	85

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LNB power supply

Multifunction linear regulators

Part number	Description	Input voltage typ V_{in} (V)	I_o (max) (A)	Built-in 22 kHz oscillator	DiSEqC		Eutelsat compliant	Operating temperature (°C)		Efficiency (%)	Overload flag	Over-temperature flag	Dynamic overload protection	Package
					1.x compliant	2.x compliant		min	max					
LNBP8/9/10/11L	LNBP supply and control voltage regulator	16/23	0.5	X	X		X	-25	125	-	X	X	X	IPPAK/DFN10
LNBP1x/20	LNBP supply and control voltage regulator	16/23	0.5	X	X		X	-25	125	-	X	X	X	PSO10/PSO20

Multifunction switching regulators

Part number	Description	Input voltage typ V_{in} (V)	I_{out} (max) (A)	Built-in 22 kHz oscillator	DiSEqC		Eutelsat compliant	Operating temperature (°C)		Efficiency (%)	Overload flag	Over-temperature flag	Dynamic overload protection	Package
					1.x compliant	2.x compliant		min	max					
LNBH23	LNB power supply and control IC with step-up, I²C and embedded NMOS	12	1	X	X	X	X	-25	125	93	through I²C	through I²C	X	PSSO24-ep/ QFN32
LNBH23L	LNB power supply and control IC with step-up, I²C and embedded NMOS	12	0.5 A	X	X		X	-25	125	93	through I²C	through I²C	X	QFN32
LNBH24	Dual LNB power supply and control IC with step-up, I²C and embedded NMOS	12	1	X	X	X	X	-25	125	93	through I²C	through I²C	X	PSSO36-ep
LNBH24L	Dual LNBS supply and control IC with step-up and I²C interface	12	1	X	X		X	-25	125	93	through I²C	through I²C	X	QFN32

Microcontrollers

Part number	Package	Program memory type	Internal ROM size (Kbyte)	Internal RAM size (byte)	A/D converter	12 or 16-bit timer (IC/OC/PWM)	8-bit timer (IC/OC/PWM)	Other timer functions	Serial interface	LVD Levels	I/Os (high current)	Supply voltage (V_{cc})		Other functions
												min (V)	max (V)	
ST7LNB0V2Y0	SO-16	ROM	1.5	128	-	-	-	-	-	-	13(6)	4.5	5.5	DiSEqC™ 2.1 interface, 22 kHz tone detector

Protection devices - 3000 W Transils

Part number	Package	Peak pulse power dissipation (P_{PP}) typ (W)	Stand-off voltage V_{RM} typ (V)	Directionality	Breakdown voltage V_{BR} min (V)	Clamping voltage max (V)	General description	Stand-off current (I_{RM}) max (µA)	Reverse current (I_R) (mA)	Peak pulse current (I_{PP}) typ (A)	Non-repeat peak forward surge current (I_{FSM}) max (A)	Mounting	Packing type
LNBTVS6-221S	SMC	3000	20	Unidirectional	22	32	Lightning protection for LNB power supply	1	1	500	200	Surface mount	Tape and reel
LNBTVS6-304S	SMC	3000	28	Unidirectional	30	45	Lightning protection for LNB power supply	1	1	500	300	Surface mount	Tape and reel

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Front panel

VFD/LED front-panel controllers

Part number	Description	V_{cc} (V)	Number of digits/segments	Interface	Key scan	IR decoder	Dimming	Programmable hot-keys (wake-up)	Special feature	Package
STLED316SMTR	Serial-interfaced, 6-digit LED display panel controller with key scan	5	Configurable: up to 7-digits/8-segments	Serial (CLK, STB, DIN, DOUT)	8 x 2	No	8-steps	No	-	SO-24
STFPC311BTR	VFD controller with standby power management	3.3	Configurable: 8-digits/20-segments to 16-digits/12-segments	Serial (CLK, STB, DIN, DOUT)	12 x 2	Yes	8-steps	Yes	Standby power management	PQFP52
STFPC320BTR	VFD controller with standby power management + RTC	3.3	Configurable: 8-digits/20-segments to 16-digits/12-segments	I^2C (SCL, SDA)	12 x 2	Yes	8-steps	Yes	Standby power management, AV_Pin8, integrated RTC	PQFP52
STM86312	VFD controller	5	Configurable: 6-digits/16-segments to 11-digits/11-segments	Serial (CLK, STB, DIN, DOUT)	6 x 4	No	8-steps	No	-	PQFP44

Touchscreen ICs

Part number	Description	Supply voltage (V_{cc})		Number of I/O ports nom	Communication interface	Sensor revolution (B)	Buffer size	Package
		min (V)	max (V)					
STMPE610QTR	Advanced resistive touchscreen controller with 6-bit GPIO expander	1.8	3.3	6	SPI, I^2C	12	128 x 4 bytes	QFN16
STMPE811QTR	Advanced resistive touchscreen controller with 8-bit GPIO expander	1.8	3.3	8	SPI, I^2C	12	128 x 4 bytes	QFN16

Touch key ICs

Part number	Description	V_{cc} (V)	Number of GPIOs	Number of touch key channels	Communication	I_{ACTIVE} (µA)	I_{SLEEP} (µA)	ESD (kV)	Features	Package
STMPE321	3-channel capacitive touch key controller	1.65 to 1.95		3	I^2C	280	27	8 kV HBM	Advanced immunity against noise and environmental variance	QFN12
STMPE16M31	S-Touch 16-channel touchkey controller with PWM and ratio engines	1.65 to 1.95	16	16	I^2C	400/600	50	8 kV HBM	Advanced immunity against noise and environmental variance	QFN32 and QFN40
STMPE24M31	S-Touch 24-channel touchkey controller with PWM and ratio engines	1.65 to 1.95	24	16	I^2C	400/600	50	8 kV HBM	Advanced immunity against noise and environmental variance	QFN32 and QFN40
STMPE1208SQTR	12-channel capacitive touch key controller	2.5 to 5.5	12	12	I^2C	98 (typ)	1.0 (typ)	7 (HBM)	Advanced immunity against noise and environmental variance	QFN40
STMPE821QTR	8-channel capacitive touch key controller with 4-channel PWM controller	2.7 to 3.6	8 (multiplexed with touch key)	8 (multiplexed with GPIO)	I^2C	60 (typ)	4.0 (typ)	8 (HBM)	Advanced immunity against noise and environmental variance	QFN16

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Front panel

Temperature sensors

Part number	Description	Operating voltage (V)	Accuracy (°C)	Temperature range (°C)	Communication bus	Package
STLM20	Analog temperature sensor	2.4 to 5.5	+/-1.5 at 25 °C	-55 to 130		SC70-5, uDFN4
STTS75	Digital temperature sensor	2.7 to 5.5	+/-2 across -25 to 100 °C	-55 to 125	I²C	SO-8, TSSOP8

Serial real-time clocks

Part number	Description	Operating voltage (V)	Internal switchover	Alarm	Watchdog	Square-wave output	Reset	Package
M41T60	I²C, RTC	1.0 to 4.4						QFN16
M41T62	I²C, RTC with alarm and 32 kHz output	1.0 to 4.4		X	X (muxed with alarm)	X		QFN16
M41T64	I²C, RTC with 32 kHz output and square wave	1.0 to 4.4				X		QFN16
M41T65	I²C, RTC with alarm and watchdog	1.0 to 4.4		X	X			QFN16
M41T66	I²C, RTC with alarm and 32 kHz output	1.0 to 4.4		X	X	X		QFN16
M41T0	I²C, RTC	2.0 to 5.5						SO-8
M41T00S	I²C, RTC with switchover	2.0 to 5.5	X					SO-8
M41T81S	I²C, RTC with switchover and alarm	2.0 to 5.5	X	X	X (muxed with alarm)			SO-8, SOX-18
M41T82	I²C, RTC with switchover and reset	2.0 to 5.5	X				X	SO-8
M41T83	I²C, RTC with switchover, alarm and reset, watchdog and 32 kHz output	2.0 to 5.5	X	2	X (muxed with one alarm)	X	X	QFN16

Microcontrollers

Part number	Package	Program memory type	Internal ROM size (Kbyte)	Internal RAM size (byte)	A/D converter	12 or 16-bit timer (IC/OC/PWM)	8-bit timer (IC/OC/PWM)	I/Os (high current)	Supply voltage (V_{cc})		Other Functions
									min (V)	max (V)	
ST7LITEU0	SO-8	Flash	2	128	5 x 10-bit	1 x 12-bit (0/1/1)	1 x 8-bit (1/0/0)	6(5)	2.7	5.5	Precise RC, AWU, ROP, ICD, IAP
STM8S103	TSSOP20, VQFN20	Flash	4 to 8	Up to 1K	5 x 10-bit	2 x 16-bit (7/7/7)	1 x 8-bit (1/0/0)	16(9)	3.0	5.5	16 MHz and 128 MHz internal RC, WWDG, WDG, CSS
STM8S105	LQFP32, VQFN32	Flash	16 to 32	Up to 2K	10 x 10-bit	3 x 16-bit (9/9/12)	1 x 8-bit	25(8)	3.0	5.5	16 MHz oscillator, 16 MHz RC, WWDG, WDG, CSS

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Smartcard reader

Smartcard ICs

Part number	ROM (Kbyte)	NVM (Kbyte) (EEPROM or Flash)	RAM (Kbyte)	Cryptography	Interface	Common criteria Security certification
ST19NA18	128	EE: 18	4	EDES, AES, RSA	ISO 7816-3, IART	CC EAL5+
ST19NL66	128	EE: 66	4	EDES, AES, RSA	ISO 7816-3, IART	CC EAL5+
ST19NP18	128	EE: 18	4+2	EDES, AES, RSA	ISO 7816-3, IART, LPC, GPIOs, I^2C	CC EAL4+
ST23YL18	200	EE: 18	4+2	EDES, AES, RSA, ECC	ISO 7816-3, IART	CC EAL5+
ST23YL48	300	EE: 48	6+2	EDES, AES, RSA, ECC	ISO 7816-3, IART	CC EAL5+
ST23ZL48	300	EE: 48	6+2	EDES, AES, RSA, ECC	ISO 7816-3, IART	CC EAL5+ (planned Q1/10)
ST23YL80	400	EE: 80	6+2	EDES, AES, RSA, ECC	ISO 7816-3, IART	CC EAL5+
ST23YT34	200	EE: 34	4+2	EDES, AES, RSA, ECC	ISO 7816-3, IART, USB FS	CC EAL5+ (planned Q3/09)
ST23YT66	300	EE: 66	6+2	EDES, AES, RSA, ECC	ISO 7816-3, IART, USB FS, GPIO	CC EAL5+ (planned Q3/09)
ST33F1M		Flash: 1200	30	EDES, AES, RSA, ECC	ISO 7816-3, IART, SWP, SPI	CC EAL5+ (Q1/10)

Smartcard interface (ASI)

Part number	Supply voltage (V)	Step-up converter	I_{out} max (mA)	Ripple on Vout max (mV)	Thermal and smartcard protection	ESD protection	Package	Operating temperature (°C)	
								min	max
ST8004	Vdd = 2.7 to 6.5; Vddp = 4.5 to 6	Yes	65	350	All card contacts	±4 kV (card contacts) standard	SO-28, TSSOP28	0	70
ST8024	Vdd = 2.7 to 6.5; Vddp = 4 to 6.5	Yes	65 at V_{cc} = 3 V 80 at V_{cc} = 5 V	350	All card contacts	±6 kV (card contacts) standard	SO-28, TSSOP28	0	70
ST8024L	Vdd = 2.7 to 6.5, Vddp = 4 to 6.5	Yes	55 at V_{cc} = 1.8 V 65 at V_{cc} = 3 V 80 at V_{cc} = 5 V	350	All card contacts	>6 kV (card contacts) standard	SO-28, TSSOP-28, TSSOP20	-25	85

Microcontrollers

Part number	Package	Program memory type	Internal ROM size (Kbyte)	Internal RAM size (byte)	A/D converter	12 or 16-bit timer (IC/OC/PWM)	8-bit timer (IC/OC/PWM)	Other timer functions	Serial interface	LVD levels	I/Os (high current)	Supply voltage (V_{cc})		Other functions
												min (V)	max (V)	
ST7FOXA0	SO-8	Flash	2	128	5 x 10-bit	1 x 12-bit (0/1/1)	1 x 8-bit (1/0/0)	-	-	1	6(5)	4.5	5.5	Precise RC, AWU, ROP, ICD, IAP
ST7SCR1E4	SO-24	Flash	16	768	-	-	1 x 8-bit (0/0/0)	Watchdog	USB/ISO 7816	1	4(1)	4	5.5	Smartcard power supply unit, ISO 7816, 7 full-speed USB endpoints, ICP, IAP, 4 LED outputs
ST7GEME4	SO-24	ROM	16	768	-	-	1 x 8-bit (0/0/0)	Watchdog	USB/ISO 7816	1	4(1)	4	5.5	Turnkey firmware from Gemalto

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Smartcard reader

Security supervisors

Part number	Description	Tamper detect inputs	RST threshold (VPFD) typ (V)	Manual reset input (/MR)	Power fail comparator (PFI/PFO)	Over/under-temperature alarm	Over/undervoltage alarm	Package
STM1403	3 V FIPS-140 security supervisor with battery switchover	4	2.925 to 3.075	Yes	Yes	No	Yes	QFN16
STM1404	3 V FIPS-140 security supervisor with battery switchover	4	2.625 to 3.075	Yes	Yes	Yes	Yes	QFN16

Smartcard protection

Part number	Number of lines	IEC 61000-4-2 contact / air (kV)	V_{RM} (V)	I_{RM} max @ V_{RM} (µA)	V_{BR} min @ IR		C typ @ 0 V bias (pF)	$T_j$max (°C)	Package
					(V)	(mA)			
ESDALC6V1M6	4	> 8 / 15	3	0.07	6.1	1	12		µQFN6L

Memories

Serial EEPROM, I²C bus

Part number	Package	Size (Kb)	Supply voltage (V_{CC})		Write cycle time (tWC) (ms)	Number of erase/write cycles (NW) (Kcycles)	Data retention min (years)
			min (V)	max (V)			
M24C02	SO-8, TSSOP8, MLP (2x3)	2	1.8	5.5	5	1000	40
M24C04	SO-8, TSSOP8, MLP (2x3)	4	1.8	5.5	5	1000	40
M24C08	SO-8, TSSOP8, MLP (2x3)	8	1.8	5.5	5	1000	40
M24C16	SO-8, TSSOP8, MLP (2x3)	16	1.8	5.5	5	1000	40
M24C32	SO-8, TSSOP8, MLP (2x3)	32	1.8	5.5	5	1000	40
M24C64	SO-8, TSSOP8, MLP (2x3)	64	1.8	5.5	5	1000	40
M24128	SO-8, TSSOP8, MLP (2x3)	128	1.8	5.5	5	1000	40
M24256	SO-8, TSSOP8	256	1.8	5.5	5	1000	40
M24512	SO-8, TSSOP8	512	1.8	5.5	5	1000	40
M24M01	SO-8	1024	1.8	5.5	5	1000	40

Memories

Serial EEPROM, Microwire® bus

Part number	Package	Size (Kb)	Supply voltage (V_{cc})		Write cycle time (tWC) (ms)	Number of erase/write cycles (NW) (Kcycles)	Data retention min (years)
			min (V)	max (V)			
M93C46	SO-8, TSSOP8	1	2.5	5.5	5	1000	40
M93C56	SO-8, TSSOP8	2	2.5	5.5	5	1000	40
M93C66	SO-8, TSSOP8	4	2.5	5.5	5	1000	40

Separable security

Power switches

Part number	Description	V_i (V)	$R_{DS(on)}$ (mΩ)	$I_{out\ (continuous)}$ (A)	$I_{OS\ (short\ circuit)}$ (A)	$I_{supply\ (on)}$ (µA)	Features	Package
STMPS2141MTR	Single channel, 0.5 A, active low enable	2.7 to 5.5	110	0.5 (max)	0.9 (max)	70 (max)	Fault blanking, reverse-current protection	SO-8
STMPS2141TTR	Single channel, 0.5 A, active low enable	2.7 to 5.5	110	0.5 (max)	0.9 (max)	70 (max)	Fault blanking, reverse-current protection	MSO-8
STMPS2141STR	Single channel, 0.5 A, active low enable	2.7 to 5.5	90	0.5 (max)	0.9 (max)	70 (max)	Fault blanking, reverse-current protection	SOT23-5
STMPS2151MTR	Single channel, 0.5 A, active high enable	2.7 to 5.5	110	0.5 (max)	0.9 (max)	70 (max)	Fault blanking, reverse-current protection	SO-8
STMPS2151TTR	Single channel, 0.5 A, active high enable	2.7 to 5.5	110	0.5 (max)	0.9 (max)	70 (max)	Fault blanking, reverse-current protection	MSO-8
STMPS2151STR	Single channel, 0.5 A, active high enable	2.7 to 5.5	90	0.5 (max)	0.9 (max)	70 (max)	Fault blanking, reverse-current protection	SOT23-5
STMPS2161MTR	Single channel, 1 A, active low enable	2.7 to 5.5	110	1.0 (max)	1.8 (max)	70 (max)	Fault blanking, reverse-current protection	SO-8
STMPS2161TTR	Single channel, 1 A, active low enable	2.7 to 5.5	110	1.0 (max)	1.8 (max)	70 (max)	Fault blanking, reverse-current protection	MSO-8
STMPS2161STR	Single channel, 1 A, active low enable	2.7 to 5.5	90	1.0 (max)	1.8 (max)	70 (max)	Fault blanking, reverse-current protection	SOT23-5
STMPS2171MTR	Single channel, 1 A, active high enable	2.7 to 5.5	110	1.0 (max)	1.8 (max)	70 (max)	Fault blanking, reverse-current protection	SO-8
STMPS2171TTR	Single channel, 1 A, active high enable	2.7 to 5.5	110	1.0 (max)	1.8 (max)	70 (max)	Fault blanking, reverse-current protection	MSO-8
STMPS2171STR	Single channel, 1 A, active high enable	2.7 to 5.5	90	1.0 (max)	1.8 (max)	70 (max)	Fault blanking, reverse-current protection	SOT23-5
STMPS2242	Dual channel, 0.5 A, active low enable	2.7 to 5.5	105	0.5 (max)	1.0 (max)	85 (max)	Fault blanking, reverse-current protection	SO-8, MSO-8
STMPS2252	Dual channel, 0.5 A, active high enable	2.7 to 5.5	105	0.5 (max)	1.0 (max)	85 (max)	Fault blanking, reverse-current protection	SO-8, MSO-8
STMPS2262	Dual channel, 1 A, active low enable	2.7 to 5.5	105	1.0 (max)	2.0 (max)	85 (max)	Fault blanking, reverse-current protection	SO-8, MSO-8
STMPS2272	Dual channel, 1 A, active high enable	2.7 to 5.5	105	1.0 (max)	2.0 (max)	85 (max)	Fault blanking, reverse-current protection	SO-8, MSO-8
ST890CDR/BDR	Single channel, programmable output (up to 1.2 A), active low enable	2.7 to 5.5	75	Up to 1.2 (ADJ)	1.2 x I_{OUT}	25 (max)	-	SO-8
ST890DTR	Single channel, programmable output (up to 1.2 A), active low enable	2.7 to 5.5	75	Up to 1.2 (ADJ)	1.2 x I_{OUT}	25 (max)	-	DFN8
STMEC001ATTR	ExpressCard™ power switch (3 I/O: 3.3 V, 1.5 V, 3.3 V AUX)	1.35 to 1.65, 3.0 to 3.6	53, 70, 140	1.3, 0.65, 0.275	2.5, 1.3, 0.66	120, 40, 10	-	TSSOP20

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Motion sensors (MEMS)

Accelerometers

Part number	LGA package (mm-leads)	Sensing axes (x,y,z)	Full scale (typ) (±g)	Supply voltage (min) (V)	Supply voltage (typ) (V)	Supply voltage (max) (V)	Resolution (bits)	Current consumption (typ) mA	Power down (µA)	Low power (µA)
LIS302DL	3x5x0.9 14L	x,y,z	2/8	2.16	2.5	3.6	8	0.3	1	-
LIS331DLM	3x3x0.9 16L	x,y,z	2/4/8	2.16	2.5	3.6	8	0.25	1	10
LIS331DLH	3x3x0.9 16L	x,y,z	2/4/8	2.16	2.5	3.6	12	0.25	1	10
LIS331DLF	3x3x1 16L	x,y,z	2/4/8	2.16	2.5	3.6	6	0.25	1	10
LIS33DE	3x3x1 16L	x,y,z	2/8	2.16	2.5	3.6		0.3	1	
LIS35DE	3x3x1 16L	x,y,z	2/8	2.16	2.5	3.6		0.3	1	

Gyroscopes

Part number	LGA package	Sensing axes	Full scale (°/s)	Supply voltage (min) (V)	Supply voltage (typ) (V)	Supply voltage (max) (V)	Rate noise density (°/s/√Hz)	Current consumption (typ) mA	Power down (µA)
LY3xx	LGA10 - 3x5x1 mm	yaw	±1000	2.7	3	3.6	0.016	4.2	5
LPR4xx	LGA28 - 4x5x1 mm	Pitch - roll	±30/±1500	2.7	3	3.6	0.01 to 0.07	6.8	5
LPY4xx	LGA28 - 4x5x1 mm	Pitch - yaw	±30/±1500	2.7	3	3.6	0.01 to 0.07	6.8	5
LPR530AL	5x5x1.5 16L	Pitch - roll	±300/1200	2.7	3	3.6	0.035	6.8	5
LPR550AL	5x5x1.5 16L	Pitch - roll	±500/±2000	2.7	3	3.6	0.059	6.8	5
LPY530AL	5x5x1.5 16L	Pitch - yaw	±300/1200	2.7	3	3.6	0.035	6.8	5
LPY550AL	5x5x1.5 16L	Pitch - yaw	±500/±2000	2.7	3	3.6	0.059	6.8	5
LY530ALH	5x5x1.5 16L	yaw	±300/1200	2.7	3	3.6	0.035	4.8	5
LY550ALH	5x5x1.5 16L	yaw	±500/±2000	2.7	3	3.6	0.059	4.8	5
LSM320HAY30	LGA28 - 4x5x1 mm	x,y,z - pitch - yaw	±300	2.7	3	3.6	0.2	6.8	5
LSM303DLH	LGA28L - 5x5x1 mm	x,y,z	±2/±4/±8	2.7	3	3.3		0.83	3

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Demonstration boards

Audio

Sales code	Board	Description	Core products
STEVAL-CCA001V1		Mono class D audio amplifier	Audio power amplifier: TS4962MEIJT
STEVAL-CCA002V1		Low-voltage differential audio power amplifier	Audio power amplifier: TS4994IQT
STEVAL-CCA003V1		Low-voltage stereo audio power amplifier	Standard linear: TS4994IQT

Front panel

Sales code	Board	Description	Core products
STEVAL-CBP002V1		VFD display controller with power management, real-time clock and other front-panel control/display functions	Front-panel controller: STFPC320, 8-bit microcontroller: ST72F325K4T6
STEVAL-CBP003V1		Set-top box front-panel board	LED driver: STLED316SMTR, 8-bit microcontroller: ST7FLITE39F2M6
STEVAL-CBP004V1		STB/DVD front-panel display	LED driver: STFPC311, 8-bit microcontrollers: ST72264

HDMI

Sales code	Board	Description	Core products
STEVAL-CCH002V1		HDMI and video switch evaluation board	Analog video switches: STMAV335 and STMAV340 Digital video switches: STHDMI002A and STDVE003A

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Demonstration boards

LNB

Sales code	Board	Description	Core products
STEVAL-CBL001V1		Power supply and control for LNB	8-bit microcontroller: ST72521, voltage regulator: LNBP15SP
STEVAL-CBL003V1		Power supply for LNB	Switching regulator: LNBH23
STEVAL-CBL004V1		Power supply for LNB based on LNBH24	Switching regulator: LNBH24
STEVAL-CBL005V1		Power supply for LNB	Switching regulator: LNBH23
STEVAL-CBL006V1		Power supply for LNB	Switching regulator: LNBH24

Power management

Sales code	Board	Description	Core products
EVAL5970D		L5970D up to 1 A step-down swtching regulator evaluation board	Step-down regulator: L5970D
EVAL5972D		L5972D up to 2 A step-down switching regulator evaluation board	Step-down regulator: L5972D
EVAL5973D		L5973D up to 2.5 A step-down switching regulator evaluation board	Step-down regulator: L5973D
EVAL5985		Evaluation board for L5985: 2 A step-down switching regulator	Step-down regulator: L5985

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Demonstration boards

Power management (cont'd)

Sales code	Board	Description	Core products
EVAL6928D		L6928D high-efficiency monolithic synchronous step-down regulator evaluation board	Step-down regulator: L6928D
STEVAL-ISA016V1		Power supply for STB based on L6565 (EU: 220 V)	Power supply: L6565
STEVAL-ISA017V1		Power supply for STB based on L6565 (US: 110 V)	Power supply: L6565
STEVAL-ISA024V1		Step-down DC-DC converter at 3.3 Vout/20 A, switching frequency 250 kHz	Voltage mode PWM controller: L6725
STEVAL-ISA025V1		Step-down DC-DC converter at 3.3 Vout/30 A, switching frequency 400 kHz	Step-down controller: L6730
STEVAL-ISA026V1		Step-down DC-DC converter at 3.3 Vout/20 A, switching frequency 250 kHz	Step-down controller: L6732
STEVAL-ISA027V1		Single-phase step-down converter	PWM controller: L6726A
STEVAL-ISA028V1		Single-phase step-down converter	PWM controller: L6727
STEVAL-ISA037V1		Single-phase, 20 A evaluation board for L6728 step-down PWM controller with power good	PWM controller: L6728
STEVAL-ISA038V1		Single-phase 5 A step-down converter	PWM controller: L6728

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Demonstration boards

Power management (cont'd)

Sales code	Board	Description	Core products
STEVAL-ISA039V1		Single-phase 5 A step-down converter	PWM controller: L6727
STEVAL-ISA042V1		1.5 A/1.2 V step-down DC-DC converter	Step-down regulator: ST1S03
STEVAL-ISA042V2		1.5 A/3.3 V step-down DC-DC converter	Step-down regulator: ST1S03
STEVAL-ISA044V1		3 A synchronous 900 kHz step-down DC-DC converter with inhibit function	Step-down regulator: ST1S10PHR
STEVAL-ISA044V2		3 A synchronous 900 kHz step-down DC-DC converter with inhibit function	Step-down regulator: ST1S10
STEVAL-ISA045V1		2 A/1.2 V high-efficiency synchronous buck converter	Step-down regulator: ST1S09
STEVAL-ISA045V2		2 A/3.3 V high-efficiency synchronous buck converter	Step-down regulator: ST1S09

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Demonstration boards

Smartcard interface

Sales code	Board	Description	Core products
STEVAL-IPA001V1		Anti tamper and security kit	Security supervisor: STM1403, 8-bit microcontroller: UPSD3422EV

Video

Sales code	Board	Description	Core products
STEVAL-CCA004V1		Video buffer and filter with sag correction	High-speed op amp: TSH120
STEVAL-CCA005V1		Triple video buffer with filter	High-speed op amp: TSH173
STEVAL-CCA006V1		Low-cost triple video buffer with filter	High-speed op amp: TSH103
STEVAL-MKI062V2		iNEMO™: inertial module demonstration board based on MEMS and STM32	MEMS and STM32
STEVAL-MKI022V1		MEMS 3-axis ±2g /±4g /±8g smart digital output evaluation board based on nano accelerometer LIS331DLH	Low-power 3-axis linear accelerometer with digital output: LIS331DLH
STEVAL-ISA058V1		High-performance VIPER17LN demo board (low consumption in standby and low load)	Off-line high-voltage converters: VIPER17LN

For a complete list of demonstration boards, please refer to www.st.com/evalboards

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