

## 650mA LNB-Power Supply & Control Voltage Regulator

### FEATURES

- Low noise output to avoid sensitivity of Can Tuner and DISH's LNA dropping down
- Noise < +/-80mV@350MHz BWL,
- Noise < +/-50mV@20MHz BWL
- Single chip solution on 700mVpp 22KHz EXT<sub>M</sub> with 10μs Trise/Tfall for less Transferring noise
- LNB Voltages (2 levels: 14V and 19V) compatible with common standards, Push-pull output stage minimizes 14→ 19V and 19V→ 14V output transition times;
- External 22KHz EXT<sub>M</sub> input;
- Integrated DC/DC BOOST converter and high efficiency (typ. 90%) with integrated Power Mos-FET
- 1.0MHz Switch Frequency BOOST
- Integrated low Noise Linear Regulator
- 5.0V, 3.3V, 2.5V, 1.8V, 1.2 and 1.05V logic compatible
- Internal Short, OCP, OTP, protection
- eSOP8L package, eTSSOP14L package

### APPLICATIONS

- LNB Power supply For DVB-S/S2/ABS
- Digital STB
- Satellite TV cards

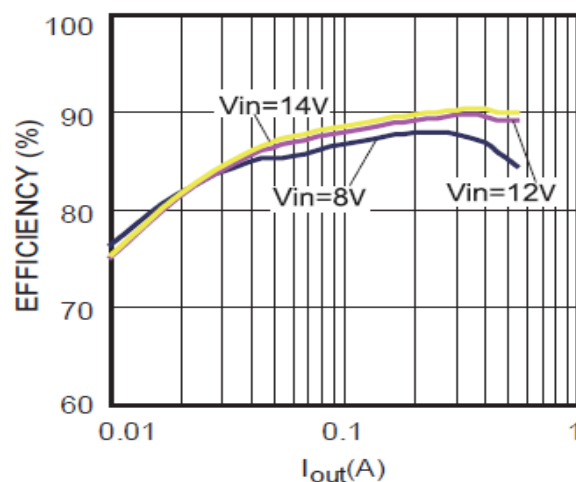
### GENERAL DESCRIPTION

Intended for analog and digital satellite receivers/sat-TV, sat-OC cards, the STI8035 is a monolithic voltage regulator and interface IC, packaged in eSOP8EL, specifically designed to provide the 14/19V power supply with high efficiency and the 22kHz EXT<sub>M</sub> signaling to the LNB down-converter in the antenna dish or to the multi-switch box.

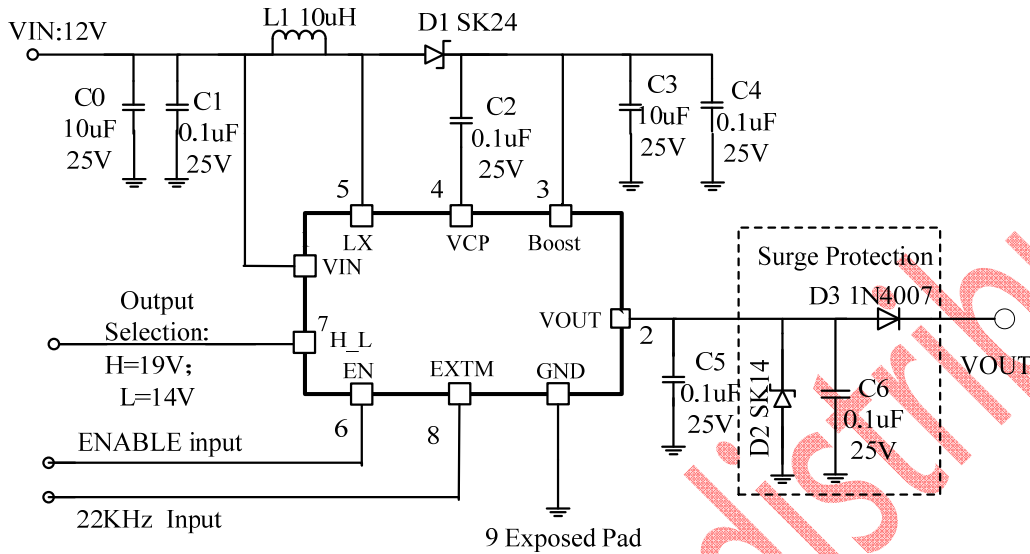
STI8035 consists of a BOOST converter and a low-noise linear regulator along with the circuitry required for EXT<sub>M</sub> injection and pin controllable interface. The device makes the total LNB supply design simple, efficient and compact with low external component count

The external modulation input (EXT<sub>M</sub> pin) can accept a tone modulated DiSEqC command and transfer it symmetrically to the output to meet DiSEqC 1.x protocol

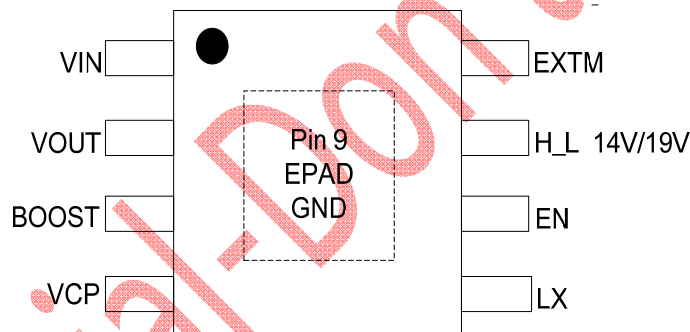
### EFFICIENCY



**TYPICAL APPLICATION**



**PIN DESCRIPTION (ESOP8)**



NAME	PIN	DESCRIPTION
VIN	1	Power Supply input
VOUT	2	Output voltage for the LNB
BOOST	3	BOOST converter output voltage sense, and internal LDO' s input terminal
VCP	4	Charge Pump for LDO supply
LX	5	DC-DC converter switch node connection, connects to inductor
EN	6	When this pin is low, the output is disabled. Setting EN = 1 enables the output voltage
H_L	7	Output Voltage set input pin, high:19V, Low:14V
EXTM	8	22KHz EXTM signal input pin
GND	9	Power Ground (Exposed pad)

## ELECTRICAL SPECIFICATION

### 1、ABSOLUTE MAXIMUM RATINGS (Note 1)

ITEMS	NAME	VALUE	UNIT
Voltage Range	VIN, EN	-0.3~40	V
	BOOST	-0.3~27	V
	VOUT(10ns)	-2~27	V
	LX(10ns)	-2~40	V
	VCP	-0.3~30	V
	H L,TON IN	-0.3~5.5	V
Tj	Junction Temperature	-40~150	°C
Tstg	Storage Temperature	-50~150	°C

### 2、DISSIPATION RATINGS

(2oz. trace and copper pad)

PACKAGE	$\theta_{JA}$	$\theta_{JC}$	UNIT
eSOP8L	60	40	°C/W

### 3、RECOMMENDED OPERATING CONDITIONS

Over operating free-air temperature range (unless otherwise noted)

ITEMS	NAME	MIN	MAX	UNIT
Voltage Range	VIN, EN	9	14	V
	BOOST, VOUT	-0.1	23	V
	LX	-0.1	30	V
	H_L,EXTM_IN	-0.1	5	V
	Ground(Exposed Pad)	-0.1	0.1	V
TA	Operating free-air temperature	-40	+85	°C
TJ	Operating junction temperature	-40	+125	°C

### 4、ELECTRICAL CHARACTERISTICS

Over operating free-air temperature range(unless otherwise noted)

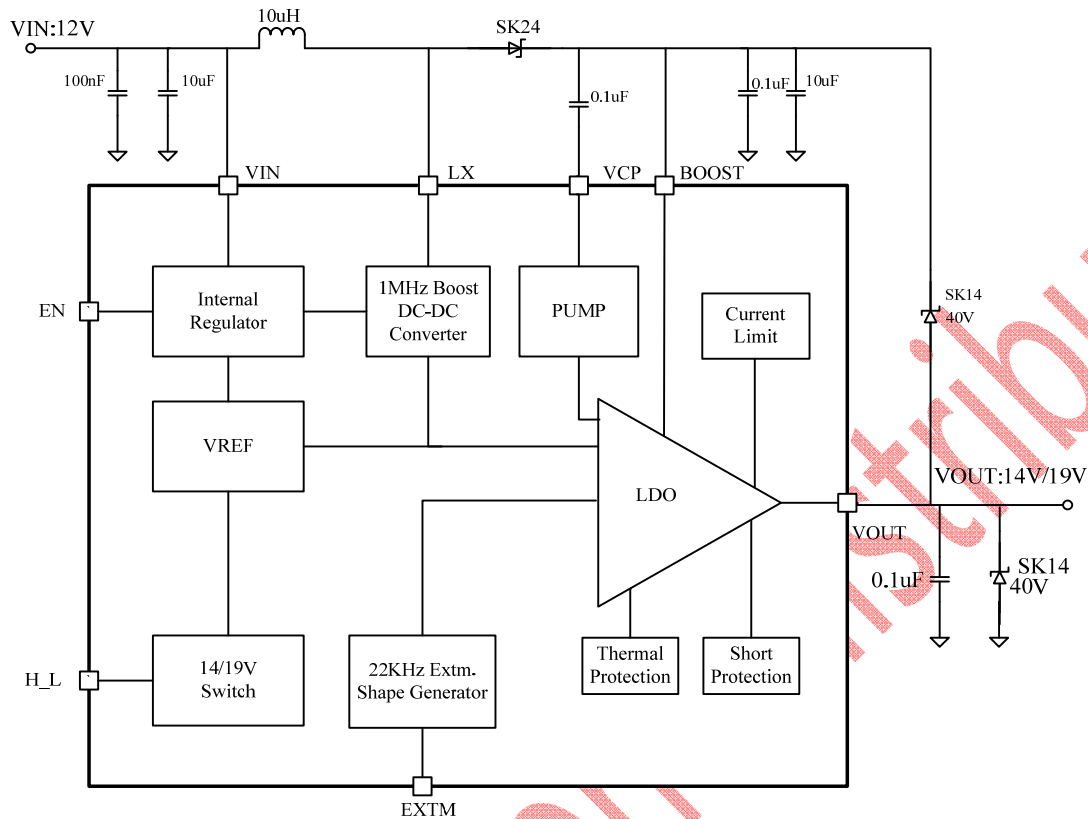
VIN=12V, TA=25°C

PARAMETER	Symbol	CONDITIONS	MIN	TYP	MAX	UNIT
<b>Supply Voltage</b>						
Operating supply voltage range	VIN		9	12	14	V
Input Under Voltage Lockout Threshold	VUVLO	Vin rising		8		V
Input Under Voltage Lockout Threshold Hysteresis	VUVLO_HY			0.3		V
Operating supply current	IIN	EN="1",VOUT=19V, EXTM_IN=0V		8		mA

		EN="1", VOUT=19V, 22KHz EXTM Input		24		mA
Disable Supply Current	ISDN	EN="0"		1.6		mA
<b>Output Voltage</b>						
Output Voltage	VOUT	EN="1", H_L="1"	18.5	19	19.9	V
		EN="1", H_L="0"	13.6	14	14.4	V
Linear Regulator Drop Voltage	VDROP	EN="1", ILOAD=450mA		0.9		V
VIN Line Regulation	RLINE	VIN=9~14V, VOUT=19V		4	40	mV
VOUT output load regulation	RLOAD	Iload=0~450mA, VOUT=19V Slow Rate=255mA/us, CLOAD=0.2uF		30		mV
Ripple and noise on VOUT output	VNOISE	20MHz BWL			50	mV
		350MHz BWL			80	mV
Output Current limit	ILIMIT	VOUT=19V or VOUT=14V			900	mA
		VOUT output short		180		mA
<b>BOOST DC/DC</b>						
Boost DC/DC Switching Frequency	FBOOST	EN="1"	0.8	1	1.2	MHz
Switch On Resistance	Rson	ILOAD=450mA		120		mΩ
BOOST Maximum Duty	DBST_MAX			80		%
BOOST Minimum On time	DBST_MIN			0		%
BOOST Current Limit	IBST_LIMIT			2.2		A
<b>Short and Overload Protection</b>						
Dynamic Overload ON time	Ton	Output shorted to GND		65		mS
Dynamic Overload OFF time	Toff	Output shorted to GND		1800		mS
Thermal Shutdown Threshold	TSDN			160		°C
Thermal Shutdown Hysteresis	TSDN_HY			25		°C
<b>EXTM</b>						
Input EXTM Frequency Range	FEXTM		20	22		KHz
VOUT Output EXTM Amplitude, peak to peak	VPP_EXTM	ILOAD=0~450mA, CLOAD=100nF	600	660	720	mV

VOUT output EXTM Duty	DEXTM	ILOAD=0~450mA, CLOAD=570nF		50		%
VOUT output EXTM Rising Time	TRISE_T ON	ILOAD=0~450mA, CLOAD=570nF	7.5	10	12.5	uS
VOUT output EXTM Falling Time	TFALL_T ON	ILOAD=0~450mA, CLOAD=570nF	7.5	10	12.5	uS
EXTM High Logic Input	VTON_I NH		0.95			V
EXTM Low Logic Input	VTON_I NL				0.55	V
EXTM Pin Input Leakage Current	ITON_LE AK	Pull down 2M RES	-3		3	uA
<b>H_L</b>						
H_L High Logic Input	VHL_INH		0.95			V
H_L Low Logic Input	VHL_INL				0.55	V
H_L Pin Input Leakage Current	IHL_LEA K	Input=1.2V Pull down 2M RES	-3		3	uA
<b>EN</b>						
EN High Logic Input	VEN_IN H		0.95			V
EN Low Logic Input	VEN_INL				0.55	V
EN PIN Maximum Input Current	IEN_MA X				10	uA

## 5. INTERNAL BLOCK DIAGRAM



## 6. FUNCTION DESCRIPTION

The STI8035 single output LNB supply utilizes built-in DC/DC step-up converters, which operate from 9V to 14V and outputs the low noise voltage set by H-L pin, and accepts a tone modulated DiSEqC command and transfers it symmetrically to the output to meet DiSEqC 1.x protocol.

### DiSEqC Encoding

The EXTM accepts an externally modulated EXTM command and in turn modulates the VOUT symmetrically to meet the DiSEqC 1.x and with few more external components to meet DiSEqC 2.0 transmit protocol. Burst coding of the EXTM can be accomplished due to the fast response of the EXTM pin.

### Linear Regulator

The output linear regulator is designed to source 500mA continuous current and 650mA peak. In order to minimize the power dissipation, the output voltage of the internal step-up converter is adjusted to allow the linear regulator to work at a minimum dropout of 1 V typical (Load current = 500mA) between the BOOST and VOUT pin. The BOOST pin is capable of withstanding a back voltage of 27V.

### **Short and Over Load Protection**

When the LDO current exceeds the preset overcurrent threshold for a period of 65ms, the device enters a TON = 65ms/TOFF = 500ms routine. The device returns to normal operation after a successful soft-start cycle

This IC is protected against overheating. When the junction temperature exceeds +160°C (typical), the step-up converter and the linear regulator are shut-off. When the junction is cooled down to +135°C (typical), normal operation is resumed.

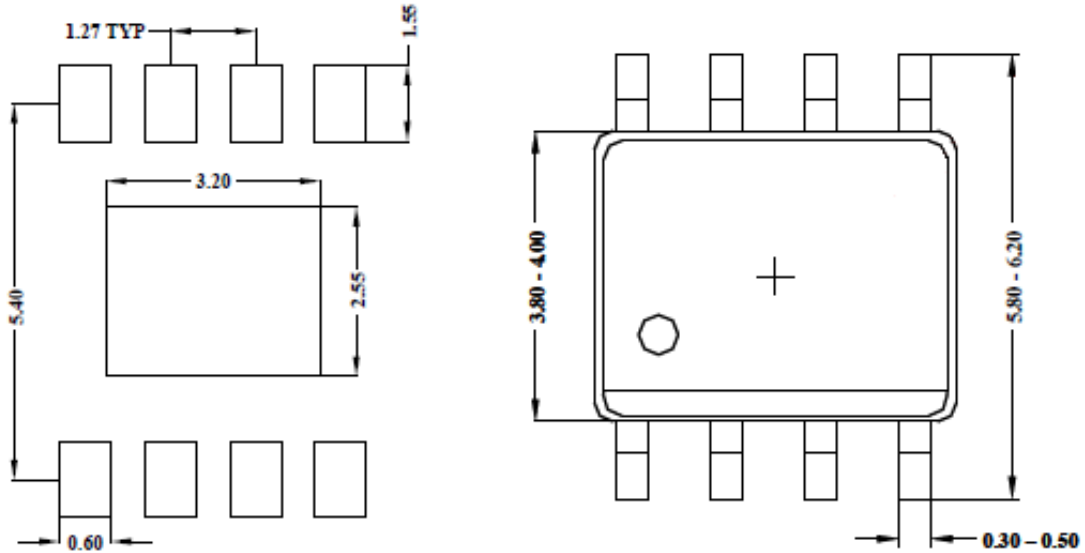
### **EXTM input**

Once EN is pulled high, after a 50ms delay before applying 22kHz, 50% square pulse on EXTM in generates the DISEQ EXTM (+/-350mV) on the output VOUT.

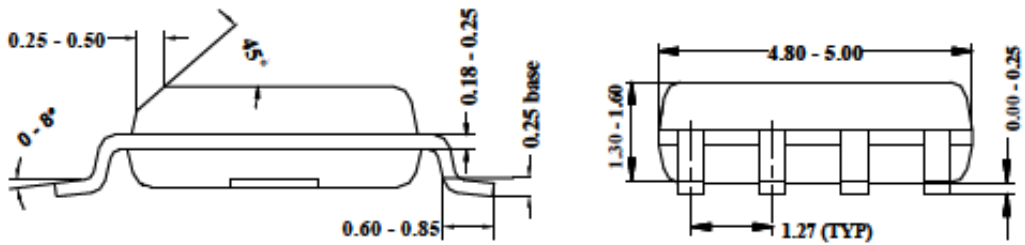
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**PACKAGE INFORMATION**

**ESOP8**



**Recommended Pad Layout**



**Notes:** All dimensions are in millimeters.  
All dimensions don't include mold flash & metal burr.