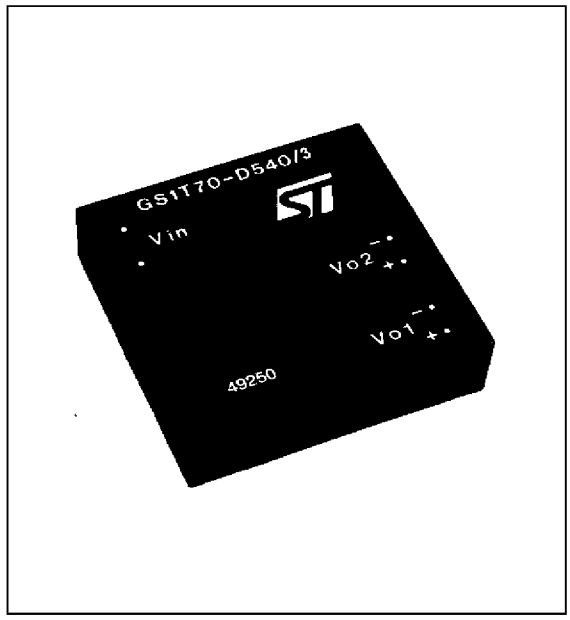
SGS-THOMSON MICROELECTRONICS

# GS1T70-D540/3

## ISDN DC-DC CONVERTER

**PRELIMINARY DATA**

| Type | $V_i$ | $V_o$ | $I_o$ |
|---|---|---|---|
| GS1T70-D540/3 | 28 to 115 V | 5 V | 90 mA |
| | | 40 V | 12 mA |




### FEATURES

- Wide operating line termination voltage
- Positive or negative input voltage polarity
- Input and output filtering
- Short-circuit protection on both outputs
- Input power during shortcircuit within specification
- Minimum current drain during stand-by condition: 10µA for Vi<18V
- Input-output isolation voltage: 10000$V_{RMS}$ pulse
- Mechanical dimensions (L x W x H): 50.8 mm x 50.8 mm x 18 mm (2" x 2" x 0.71")

### DESCRIPTION

The GS1T70-D540/3 converter has been designed for the "U" interface of an ISDN-NTBA (Network Termination Basic Access) system with either 4B3T or 2B1Q standard trasmission.

The module has been designed following the requirements of the standards:

EN 60950

VDE 0110

IEC664

ETR 080

ETS 300 012

ETS 300 019 (operating conditions)

ETS 300 047 (ISDN BASIC ACCESS, Safety and Protection)

Two isolated outputs, 5V/90 mA and 40V/12 mA are supplied. The converter offers short-circuit protection (short-circuit on 40V output doesn't affect 5V output while a short circuit on 5 V removes also the 40 V output) with input power never exceeding the limit of the specification; input can accept either voltage polarity, and the is provided with input and output filtering to meet very stringent noise requirements.

When the input voltage is below 18V, the converter offers a very high input impedance and a maximum quiescent current of 10µA according to the standard ETR080.

In addition, the wide operating input voltage range allows it to operate within the whole range of LT (Line Termination) battery voltage and its relevant line resistance.

The module is able to whitstand a pulse of 10000V (1,2/50 microseconds pulse) from primary to secondary side. Basic insulation (500 V) is provided between the outputs.

**ELECTRICAL CHARACTERISTICS** ($T_{amb}$ = 25°C unless otherwise specified)

Std. Conditions:

Line Termination voltage: 47 to 71V
87 to 99V

Line Resistance (Rs): 0 to 600 Ω
550 to 1400 Ω

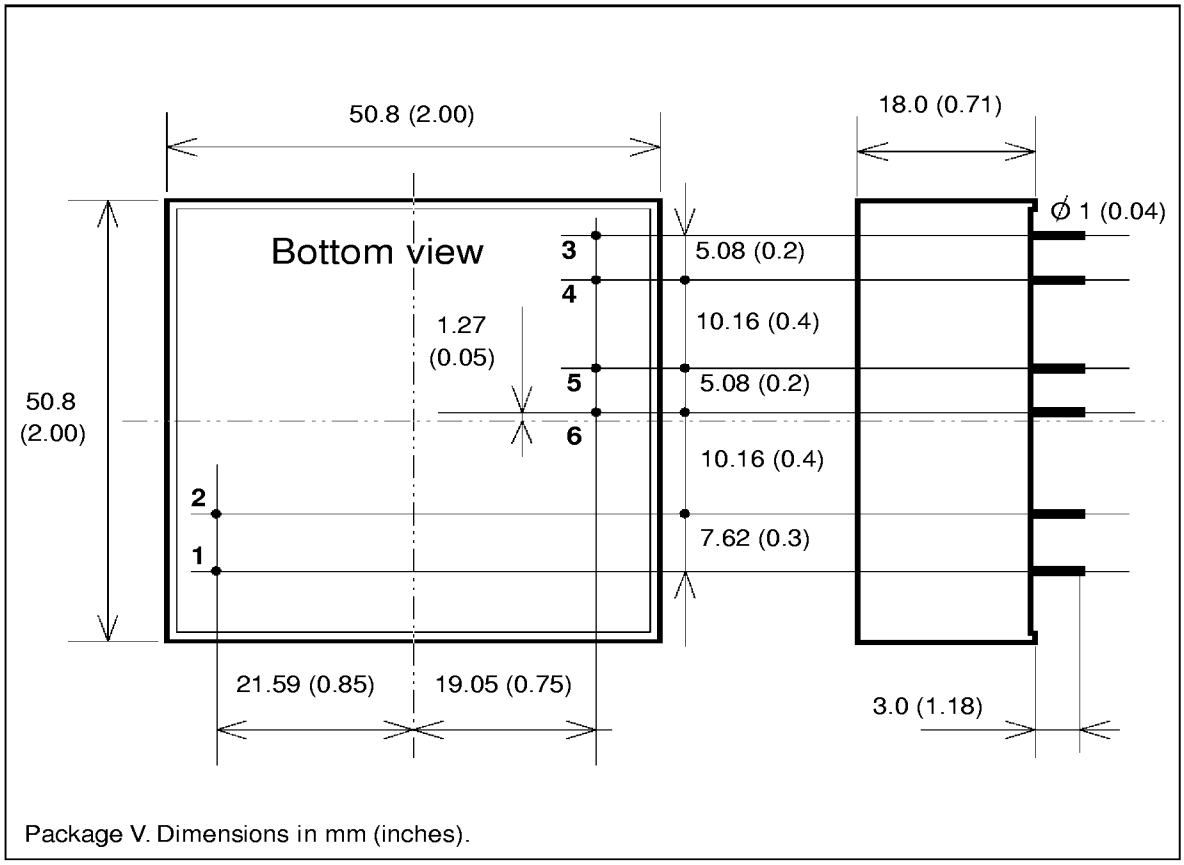
| Symbol | Parameter | Test Conditions | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|
| $V_i$ | Input Voltage | Std. Conditions | 28 | | 115 | V |
| Vist | Start Up Input Voltage | See fig. 2 | 28 | | 44 | V |
| $V_{o1}$ | Output Voltage 1 | Std. Conditions | 4.75 | 5 | 5.25 | V |
| $V_{o2}$ | Output Voltage 2 | Std. Conditions | 34 | 40 | 42 | V |
| $V_{or1}$ | Output Ripple Voltage 1 | Std. Conditions BW = 0 to 20MHz | | 20 | 50 | $mV_{RMS}$ |
| $V_{or2}$ | Output Ripple Voltage 2 | Std. Conditions BW = 0 to 20MHz | | 50 | 100 | $mV_{RMS}$ |
| $I_{o1}$ | Output Current 1 | Std. Conditions $P_{o2}$ = 410 mW $V_{o1}$ = 5V | 5 | | 90 | mA |
| $P_{o2}$ | Output Power 2 | Std. Conditions $V_{o1}$ = 4.75 to 5.25 V $V_{o2}$ = 34 to 42 V | 0 | | 420 | mW |
| $I_{o2}$ max | Max Output Current 2 | Std. Conditions $I_{o1}$ = 5 to 90 mA $V_{o2}$ = 34 to 42V | 11 | 12 | | mA |
| Iosc2 | Output 2 Short Circuit Current | Std. Conditions Output Shorted (Indefinite time) | 9.8 | | | mA |
| Vis | Isolation Voltage | Input to Outputs, 1.2/50 micros | 10000 | | | Vpeak |
| Top | Operating Ambient Temperature Range | | --20 | | +70 | °C |
| Tstg | Storage Temperature Range | | – 40 | | +85 | °C |

**OUTPUT POWER CHARACTERISTICS**

| **LT** (Line Termination Voltage) = **47V to 71V** **Rs** (Line Resistance) = 0 to 600 Ω | | | | **LT** (Line Termination Voltage) = **87V to 99V** **Rs** (Line Resistance) = 550 to 1400 Ω | | | |
|---|---|---|---|---|---|---|---|
| **Max Input Power (mW)** | **NT Status** | **Min Output Power 1 (5V)[mW]** | **Min Output Power 2 (40V)[mW]** | **Max Input Power (mW)** | **NT Status** | **Min Output Power 1 (5V)[mW]** | **Min Output Power 2 (40V)[mW]** |
| 450 | Activated | 320 | 0 | 450 | Activated | 320 | 0 |
| 950 (*) | Activated Emergency | 320 | 410 | 950 | Activated Emergency | 320 | 410 |
| 90 | Deactivated | 40 | 0 | 90 | Deactivated | 40 | 0 |
| 180 | Deactivated Emergency | 40 | 45 | 180 | Deactivated Emergency | 40 | 45 |
| 1050 (*) | Activated with 40 V Short circuit | 320 | Short circuit | 1050 | Activated with 40V Short circuit | 320 | Short circuit |

(*) The values indicated are subordinated to the available input power.

**Figure 1.** CONNECTION DIAGRAM AND MECHANICAL DATA

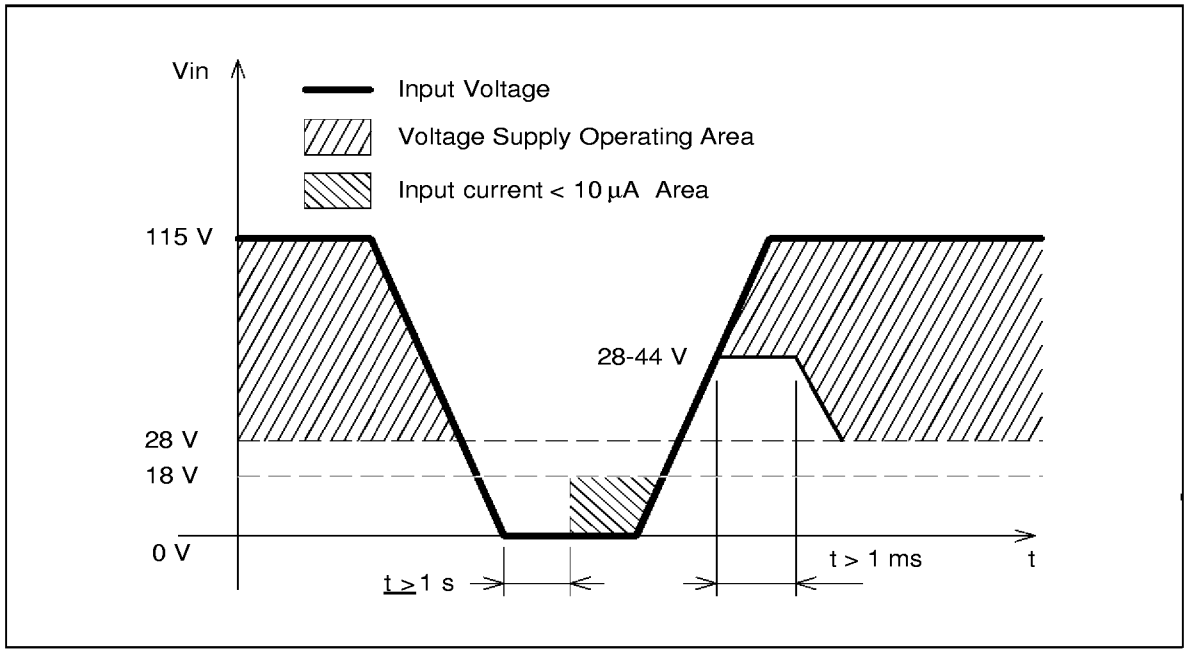



Package V. Dimensions in mm (inches).

**PIN DESCRIPTION**

| Pin | Description |
|---|---|
| 1 | Input (either polarity). |
| 2 | Input (either polarity). |
| 3 | +5V Output. |
| 4 | Return for +5V Output. |
| 5 | +40V Output. |
| 6 | Return for +40V Output. |

**Figure 2.** VOLTAGE SUPPLY OPERATING AREA




**VOLTAGE SUPPLY OPERATING AREA**

Figure 3 shows the Voltage Supply Operating area during a switching OFF-ON sequence.The start-up voltage is 44V maximum.

One second after U-interface disconnection, and if the input voltage remains below 18V, the maximum quiescent input current value remains below than 10µA.