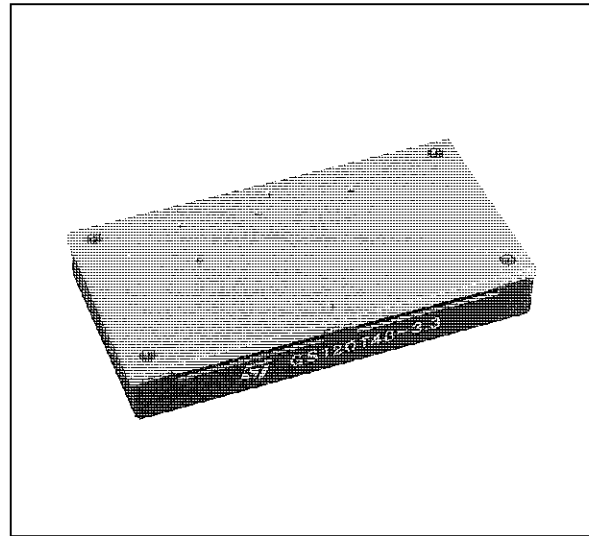


## 120W/175W DC-DC CONVERTERS FAMILY

| Type                          | V <sub>i</sub> | V <sub>o</sub> | I <sub>o</sub> |
|-------------------------------|----------------|----------------|----------------|
| GS120T48-3.3<br>GS120T48-3.3E | 38 to 60 V     | 3,35 V         | 35 A           |
| GS175T48-5<br>GS175T48-5E     | 38 to 60 V     | 5,075 V        | 35 A           |
| GS175T48-12<br>GS175T48-12E   | 38 to 60 V     | 12,0 V         | 15 A           |
| GS175T48-15<br>GS175T48-15E   | 38 to 60 V     | 15,0 V         | 12 A           |

### FEATURES

- UL, CSA, TUV approved
- High output power (up to 175W)
- High efficiency (82% typ. on GS175T48-5 module)
- Parallel operation with equal current sharing
- Synchronization pin
- Remote ON/OFF
- Remote load voltage sense compensation
- Output short-circuit protection
- Undervoltage lock-out
- Minimal overshoot during load transients
- Output overvoltage protection
- 500V<sub>DC</sub> input to output isolation voltage
- Internal input and output filtering
- Softstart
- PCB or chassis mountable
- Optional additional finned heatsink
- Mechanical dimensions 125 • 66,5 • 19 (4,92 • 2,62 • 0,75)



### DESCRIPTION

The GS120/175T48 family includes 120/175W DC-DC converters used to generate fixed isolated output voltages with an output current up to 35A from a wide range input voltage (38 to 60V). The suffix E identifies the metric threading on the planar heatsink (see fig. 1).

### OPTION

| Type<br>Ordering Number | Description                                | Thermal Resistance | Dimensions<br>L • W • H mm (inches)      |
|-------------------------|--------------------------------------------|--------------------|------------------------------------------|
| HS01                    | Additional finned heatsink<br>(See fig. 7) | 2.8°C/W            | 125 • 66.5 • 15<br>( 4.92 • 2.62 • 0.59) |

## GS120/175T48 FAMILY

### GS120T48-3.3 ELECTRICAL CHARACTERISTICS ( $T_{amb} = 25^{\circ}\text{C}$ unless otherwise specified)

| Symbol       | Parameter                            | Test Conditions                                                                  | Min  | Typ  | Max  | Unit                        |
|--------------|--------------------------------------|----------------------------------------------------------------------------------|------|------|------|-----------------------------|
| $V_i$        | Input Voltage                        | $V_o = 3.35\text{V}$ $I_o = 0$ to 35A<br>(Operating Conditions)                  | 38   | 48   | 60   | VDC                         |
| $V_{iuv}$    | Input Undervoltage Lockout           | $V_o = 3.35\text{V}$<br>$I_o = 0$ to 35A                                         | 32   | 34   | 36   | VDC                         |
| $I_i$        | Average Input Current                | $V_i = 0$ to 60V<br>$I_o = 35\text{A}$                                           |      |      | 4.2  | A                           |
| $I_{ipk}$    | Inrush Transient Peak Current        | $V_i = 60\text{V}$<br>$I_o = 35\text{A}$                                         |      |      | 0.2  | $\text{A}^2\text{s}$        |
| $I_{ir}$     | Reflected Input Current              | $V_i = 38$ to 60V<br>BW = 5Hz to 20MHz<br>$I_o = 35\text{A}$ (See fig. 2)        |      |      | 20   | mApp                        |
| $V_{ien}$    | Enable Input Voltage                 | $V_i = 38$ to 60V $I_o = 0$ to 35A                                               | 0    |      | 1.2  | V                           |
| $I_{ien}$    | Enable Input Current                 | $V_i = 38$ to 60V $I_o = 0$ to 35A<br>$V_{ien} = 0\text{V}$                      |      |      | -1   | mA                          |
| $V_{iinh}$   | Inhibit Voltage                      | $V_i = 38$ to 60V $I_o = 0$ to 35A<br>$V_{ien} = \text{open}$                    | 8    |      | 18   | V                           |
| $P_i$        | Input Power                          | $V_i = 38$ to 60V $I_o = 0\text{A}$ (No Load)                                    |      | 1.5  | 2    | W                           |
| $V_o$        | Total Output Voltage Regulation      | $V_i = 38$ to 60V $I_o = 0$ to 35A                                               | 3.25 | 3.35 | 3.45 | V                           |
| $V_{ost}$    | Short-term Output Voltage Regulation | $V_i = 38$ to 60V $I_o = 0$ to 35A                                               | 3.30 | 3.35 | 3.40 | V                           |
| $V_{ots}$    | Total Static Tolerance               | $V_i = 38$ to 60V $I_o = 0$ to 35A                                               | 3.28 | 3.35 | 3.42 | V                           |
| $V_{ol}$     | Output Overvoltage Limit Initiation  | $V_i = 38$ to 60V $I_o = 0$ to 35A                                               | 4    | 4.5  | 5.2  | VDC                         |
| $V_{or}$     | Output Ripple Voltage                | $V_i = 38$ to 60V $I_o = 35\text{A}$                                             |      | 20   | 30   | mVpp                        |
| $V_{on}$     | Output Noise Voltage                 | $V_i = 38$ to 60V $I_o = 35\text{A}$                                             |      | 50   | 80   | mVpp                        |
| $\Delta V_o$ | Total Remote Sense Compensation      | $V_i = 38$ to 60V                                                                |      |      | 0.6  | V                           |
| $\delta V_o$ | Peak Load Transient Response         | $V_i = 48\text{V}$ $\delta I_o = 5\text{A}$<br>slope = $0.1\text{A}/\mu\text{s}$ |      |      | 60   | mVp                         |
| $I_o$        | Output Current                       | $V_i = 38$ to 60V $V_o = 3.35\text{V}$                                           | 0    |      | 35   | A                           |
| $I_{ol}$     | Overcurrent Limit Initiation         | $V_i = 48\text{V}$                                                               | 36   |      | 39   | A                           |
| $I_{osc}$    | Shortcircuit Output Current          | $V_i = 48\text{V}$<br>$V_o = 0.2$ to 0.5V                                        |      |      | 51   | A                           |
| $t_s$        | Load Transient Settling Time         | $V_i = 48\text{V}$ $\delta I_o = 5\text{A}$<br>slope = $0.1\text{A}/\mu\text{s}$ |      |      | 200  | $\mu\text{s}$               |
| $t_{on}$     | Turn-on Time                         | $V_i = 48\text{V}$ $I_o = 35\text{A}$<br>$V_{ien} = \text{from high to low}$     |      |      | 5    | ms                          |
|              |                                      | $V_i = 0$ to 60V $I_o = 35\text{A}$<br>$V_{ien} = \text{low}$                    | 3    |      | 10   |                             |
| $V_{is}$     | Isolation Voltage                    |                                                                                  | 500  |      |      | V                           |
| $f_s$        | Switching Frequency                  | $V_i = 38$ to 60V $I_o = 0$ to 35A                                               | 160  | 175  | 200  | kHz                         |
| $\eta$       | Efficiency                           | $V_i = 38$ to 60V $I_o = 35\text{A}$                                             | 76   | 77   |      | %                           |
| $R_{th}$     | Thermal Resistance                   | Case to Ambient                                                                  |      | 5.2  |      | $^{\circ}\text{C}/\text{W}$ |
| $T_{cop}$    | Operating Case Temperature Range     |                                                                                  | -10  |      | +85  | $^{\circ}\text{C}$          |
| $T_{stg}$    | Storage Temperature Range            |                                                                                  | -40  |      | +105 | $^{\circ}\text{C}$          |

GS175T48-5 ELECTRICAL CHARACTERISTICS ( $T_{amb} = 25^{\circ}\text{C}$  unless otherwise specified)

| Symbol       | Parameter                            | Test Conditions                                                                  | Min   | Typ   | Max   | Unit                        |
|--------------|--------------------------------------|----------------------------------------------------------------------------------|-------|-------|-------|-----------------------------|
| $V_i$        | Input Voltage                        | $V_o = 5.075\text{V}$ $I_o = 0$ to 35A<br>(Operating Conditions)                 | 38    | 48    | 60    | VDC                         |
| $V_{iuv}$    | Input Undervoltage Lockout           | $V_o = 5.075\text{V}$<br>$I_o = 0$ to 35A                                        | 32    | 34    | 36    | VDC                         |
| $I_i$        | Average Input Current                | $V_i = 0$ to 60V $I_o = 35\text{A}$                                              |       |       | 6.1   | A                           |
| $I_{ipk}$    | Inrush Transient Peak Current        | $V_i = 60\text{V}$<br>$I_o = 35\text{A}$                                         |       |       | 0.2   | $\text{A}^2\text{s}$        |
| $I_{ir}$     | Reflected Input Current              | $V_i = 38$ to 60V<br>BW = 5Hz to 20MHz<br>$I_o = 35\text{A}$ (See fig. 2)        |       |       | 30    | mApp                        |
| $V_{ien}$    | Enable Input Voltage                 | $V_i = 38$ to 60V $I_o = 0$ to 35A                                               | 0     |       | 1.2   | V                           |
| $I_{ien}$    | Enable Input Current                 | $V_i = 38$ to 60V $I_o = 0$ to 35A<br>$V_{ien} = 0\text{V}$                      |       |       | -1    | mA                          |
| $V_{iinh}$   | Inhibit Voltage                      | $V_i = 38$ to 60V $I_o = 0$ to 35A<br>$V_{ien} = \text{open}$                    | 8     |       | 18    | V                           |
| $P_i$        | Input Power                          | $V_i = 38$ to 60V $I_o = 0\text{A}$ (No Load)                                    |       | 1.5   | 2     | W                           |
| $V_o$        | Total Output Voltage Regulation      | $V_i = 38$ to 60V $I_o = 0$ to 35A                                               | 4.94  | 5.075 | 5.21  | V                           |
| $V_{ost}$    | Short-term Output Voltage Regulation | $V_i = 38$ to 60V $I_o = 0$ to 35A                                               | 5.002 | 5.075 | 5.148 | V                           |
| $V_{ots}$    | Total Static Tolerance               | $V_i = 38$ to 60V $I_o = 0$ to 35A                                               | 4.97  | 5.075 | 5.18  | V                           |
| $V_{ol}$     | Output Overvoltage Limit Initiation  | $V_i = 38$ to 60V $I_o = 0$ to 35A                                               | 6     | 6.3   | 7     | VDC                         |
| $V_{or}$     | Output Ripple Voltage                | $V_i = 38$ to 60V $I_o = 35\text{A}$                                             |       | 20    | 30    | mVpp                        |
| $V_{on}$     | Output Noise Voltage                 | $V_i = 38$ to 60V $I_o = 35\text{A}$                                             |       | 50    | 80    | mVpp                        |
| $\Delta V_o$ | Total Remote Sense Compensation      | $V_i = 38$ to 60V                                                                |       |       | 0.6   | V                           |
| $\delta V_o$ | Peak Load Transient Response         | $V_i = 48\text{V}$ $\delta I_o = 5\text{A}$<br>slope = $0.1\text{A}/\mu\text{s}$ |       |       | 100   | mVp                         |
| $I_o$        | Output Current                       | $V_i = 38$ to 60V $V_o = 5.075\text{V}$                                          | 0     |       | 35    | A                           |
| $I_{ol}$     | Overcurrent Limit Initiation         | $V_i = 48\text{V}$                                                               | 36    |       | 39    | A                           |
| $I_{osc}$    | Shortcircuit Output Current          | $V_i = 48\text{V}$<br>$V_o = 0.2$ to $0.5\text{V}$                               |       |       | 51    | A                           |
| $t_s$        | Load Transient Settling Time         | $V_i = 48\text{V}$ $\delta I_o = 5\text{A}$<br>slope = $0.1\text{A}/\mu\text{s}$ |       |       | 250   | $\mu\text{s}$               |
| $t_{on}$     | Turn-on Time                         | $V_i = 48\text{V}$ $I_o = 35\text{A}$<br>$V_{ien} = \text{from high to low}$     |       |       | 5     | ms                          |
|              |                                      | $V_i = 0$ to 60V $I_o = 35\text{A}$<br>$V_{ien} = \text{low}$                    | 3     |       | 10    |                             |
| $V_{is}$     | Isolation Voltage                    |                                                                                  | 500   |       |       | V                           |
| $f_s$        | Switching Frequency                  | $V_i = 38$ to 60V $I_o = 0$ to 35A                                               | 160   | 175   | 200   | kHz                         |
| $\eta$       | Efficiency                           | $V_i = 38$ to 60V $I_o = 35\text{A}$                                             | 81    | 82    |       | %                           |
| $R_{th}$     | Thermal Resistance                   | Case to Ambient                                                                  |       | 5.2   |       | $^{\circ}\text{C}/\text{W}$ |
| $T_{cop}$    | Operating Case Temperature Range     |                                                                                  | -10   |       | +85   | $^{\circ}\text{C}$          |
| $T_{stg}$    | Storage Temperature Range            |                                                                                  | -40   |       | +105  | $^{\circ}\text{C}$          |

## GS120/175T48 FAMILY

### GS175T48-12 ELECTRICAL CHARACTERISTICS (T<sub>amb</sub> = 25°C unless otherwise specified)

| Symbol            | Parameter                            | Test Conditions                                                                      | Min   | Typ  | Max   | Unit             |
|-------------------|--------------------------------------|--------------------------------------------------------------------------------------|-------|------|-------|------------------|
| V <sub>i</sub>    | Input Voltage                        | V <sub>O</sub> = 12V I <sub>O</sub> = 0 to 15A<br>(Operating Conditions)             | 38    | 48   | 60    | VDC              |
| V <sub>iuv</sub>  | Input Undervoltage Lockout           | V <sub>O</sub> = 12V<br>I <sub>O</sub> = 0 to 15A                                    | 32    | 34   | 36    | VDC              |
| I <sub>i</sub>    | Average Input Current                | V <sub>i</sub> = 0 to 60V I <sub>O</sub> = 15A                                       |       |      | 5.5   | A                |
| I <sub>ipk</sub>  | Inrush Transient Peak Current        | V <sub>i</sub> = 60V<br>I <sub>O</sub> = 15A                                         |       |      | 0.2   | A <sup>2</sup> s |
| I <sub>ir</sub>   | Reflected Input Current              | V <sub>i</sub> = 38 to 60V<br>BW = 5Hz to 20MHz<br>I <sub>O</sub> = 15A (See fig. 2) |       |      | 20    | mApp             |
| V <sub>ien</sub>  | Enable Input Voltage                 | V <sub>i</sub> = 38 to 60V I <sub>O</sub> = 0 to 15A                                 | 0     |      | 1.2   | V                |
| I <sub>ien</sub>  | Enable Input Current                 | V <sub>i</sub> = 38 to 60V I <sub>O</sub> = 0 to 15A<br>V <sub>ien</sub> = 0V        |       |      | -1    | mA               |
| V <sub>iinh</sub> | Inhibit Voltage                      | V <sub>i</sub> = 38 to 60V I <sub>O</sub> = 0 to 15A<br>V <sub>ien</sub> = open      | 8     |      | 18    | V                |
| P <sub>i</sub>    | Input Power                          | V <sub>i</sub> = 38 to 60V I <sub>O</sub> = 0A (No Load)                             |       | 1.5  | 2     | W                |
| V <sub>O</sub>    | Total Output Voltage Regulation      | V <sub>i</sub> = 38 to 60V I <sub>O</sub> = 0 to 15A                                 | 11.4  | 12.0 | 12.6  | V                |
| V <sub>ost</sub>  | Short-term Output Voltage Regulation | V <sub>i</sub> = 38 to 60V I <sub>O</sub> = 0 to 15A                                 | 11.76 | 12.0 | 12.24 | V                |
| V <sub>ots</sub>  | Total Static Tolerance               | V <sub>i</sub> = 38 to 60V I <sub>O</sub> = 0 to 15A                                 | 11.64 | 12.0 | 12.36 | V                |
| V <sub>ol</sub>   | Output Overvoltage Limit Initiation  | V <sub>i</sub> = 38 to 60V I <sub>O</sub> = 0 to 15A                                 | 13.2  | 14   | 15    | VDC              |
| V <sub>or</sub>   | Output Ripple Voltage                | V <sub>i</sub> = 38 to 60V I <sub>O</sub> = 15A                                      |       | 35   | 70    | mVpp             |
| V <sub>on</sub>   | Output Noise Voltage                 | V <sub>i</sub> = 38 to 60V I <sub>O</sub> = 15A                                      |       | 60   | 120   | mVpp             |
| ΔV <sub>O</sub>   | Total Remote Sense Compensation      | V <sub>i</sub> = 38 to 60V                                                           |       |      | 0.6   | V                |
| δV <sub>O</sub>   | Peak Load Transient Response         | V <sub>i</sub> = 48V δI <sub>O</sub> = 3A<br>slope = 0.2A/μs                         |       |      | 200   | mVp              |
| I <sub>O</sub>    | Output Current                       | V <sub>i</sub> = 38 to 60V V <sub>O</sub> = 12V                                      | 0     |      | 15    | A                |
| I <sub>ol</sub>   | Overcurrent Limit Initiation         | V <sub>i</sub> = 48V                                                                 | 16    |      | 19    | A                |
| I <sub>osc</sub>  | Shortcircuit Output Current          | V <sub>i</sub> = 48V                                                                 |       |      | 25    | A                |
| t <sub>s</sub>    | Load Transient Setting Time          | V <sub>i</sub> = 48V δI <sub>O</sub> = 3A<br>slope = 0.2A/μs                         |       |      | 300   | μs               |
| t <sub>on</sub>   | Turn-on Time                         | V <sub>i</sub> = 48V I <sub>O</sub> = 15A<br>V <sub>ien</sub> = from high to low     |       |      | 5     | ms               |
|                   |                                      | V <sub>i</sub> = 0 to 60V I <sub>O</sub> = 15A<br>V <sub>ien</sub> = low             | 3     |      | 10    |                  |
| V <sub>is</sub>   | Isolation Voltage                    |                                                                                      | 500   |      |       | V                |
| f <sub>s</sub>    | Switching Frequency                  | V <sub>i</sub> = 38 to 60V I <sub>O</sub> = 0 to 15A                                 | 160   | 175  | 200   | kHz              |
| η                 | Efficiency                           | V <sub>i</sub> = 38 to 60V I <sub>O</sub> = 15A                                      | 84    | 86   |       | %                |
| R <sub>th</sub>   | Thermal Resistance                   | Case to Ambient                                                                      |       | 5.2  |       | °C/W             |
| T <sub>cop</sub>  | Operating Case Temperature Range     |                                                                                      | -10   |      | +85   | °C               |
| T <sub>stg</sub>  | Storage Temperature Range            |                                                                                      | -40   |      | +105  | °C               |

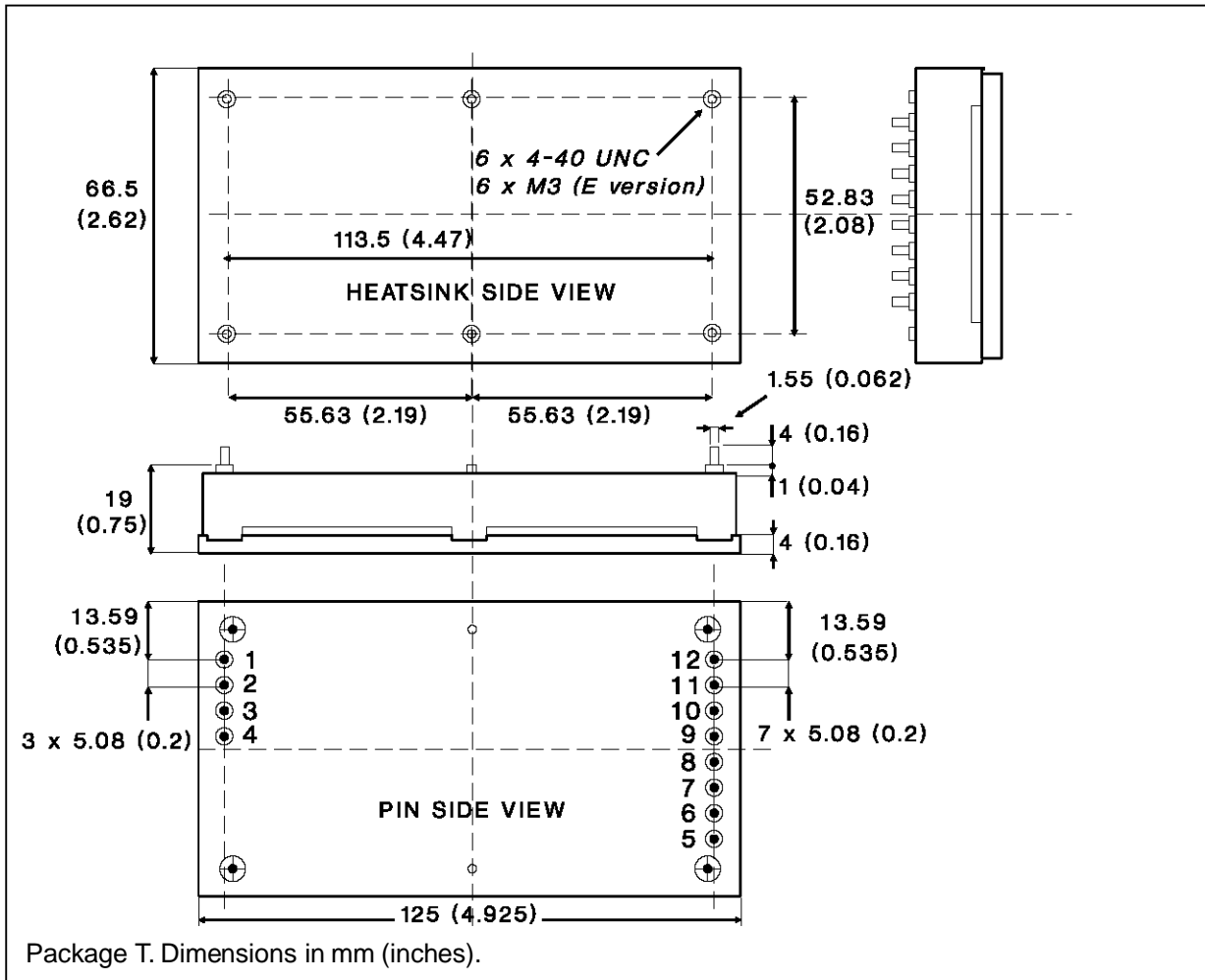
**GS175T48-15 ELECTRICAL CHARACTERISTICS** ( $T_{amb} = 25^{\circ}\text{C}$  unless otherwise specified)

| Symbol       | Parameter                            | Test Conditions                                                                  | Min   | Typ  | Max   | Unit                        |
|--------------|--------------------------------------|----------------------------------------------------------------------------------|-------|------|-------|-----------------------------|
| $V_i$        | Input Voltage                        | $V_o = 15\text{V}$ $I_o = 0$ to $12\text{A}$<br>(Operating Conditions)           | 38    | 48   | 60    | VDC                         |
| $V_{iuv}$    | Input Undervoltage Lockout           | $V_o = 15\text{V}$<br>$I_o = 0$ to $12\text{A}$                                  | 32    | 34   | 36    | VDC                         |
| $I_i$        | Average Input Current                | $V_i = 0$ to $60\text{V}$ $I_o = 12\text{A}$                                     |       |      | 5.5   | A                           |
| $I_{ipk}$    | Inrush Transient Peak Current        | $V_i = 60\text{V}$<br>$I_o = 12\text{A}$                                         |       |      | 0.2   | $\text{A}^2\text{s}$        |
| $I_{ir}$     | Reflected Input Current              | $V_i = 38$ to $60\text{V}$ $I_o = 12\text{A}$                                    |       |      | 20    | mApp                        |
| $V_{ien}$    | Enable Input Voltage                 | $V_i = 38$ to $60\text{V}$ $I_o = 0$ to $12\text{A}$                             | 0     |      | 1.2   | V                           |
| $I_{ien}$    | Enable Input Current                 | $V_i = 38$ to $60\text{V}$ $I_o = 0$ to $12\text{A}$<br>$V_{ien} = 0\text{V}$    |       |      | -1    | mA                          |
| $V_{iinh}$   | Inhibit Voltage                      | $V_i = 38$ to $60\text{V}$ $I_o = 0$ to $12\text{A}$<br>$V_{ien} = \text{open}$  | 8     |      | 18    | V                           |
| $P_i$        | Input Power                          | $V_i = 38$ to $60\text{V}$ $I_o = 0\text{A}$ (No Load)                           |       | 1.5  | 2     | W                           |
| $V_o$        | Total Output Voltage Regulation      | $V_i = 38$ to $60\text{V}$ $I_o = 0$ to $12\text{A}$                             | 14.25 | 15.0 | 15.75 | V                           |
| $V_{ost}$    | Short-term Output Voltage Regulation | $V_i = 38$ to $60\text{V}$ $I_o = 0$ to $12\text{A}$                             | 14.7  | 15.0 | 15.3  | V                           |
| $V_{ots}$    | Total Static Tolerance               | $V_i = 38$ to $60\text{V}$ $I_o = 0$ to $12\text{A}$                             | 14.55 | 15.0 | 15.45 | V                           |
| $V_{ol}$     | Output Overvoltage Limit Initiation  | $V_i = 38$ to $60\text{V}$ $I_o = 0$ to $12\text{A}$                             | 16.5  | 17   | 18    | VDC                         |
| $V_{or}$     | Output Ripple Voltage                | $V_i = 38$ to $60\text{V}$ $I_o = 12\text{A}$                                    |       | 45   | 90    | mVpp                        |
| $V_{on}$     | Output Noise Voltage                 | $V_i = 38$ to $60\text{V}$ $I_o = 12\text{A}$                                    |       | 75   | 150   | mVpp                        |
| $\Delta V_o$ | Total Remote Sense Compensation      | $V_i = 38$ to $60\text{V}$                                                       |       |      | 0.6   | V                           |
| $\delta V_o$ | Peak Load Transient Response         | $V_i = 48\text{V}$ $\delta I_o = 3\text{A}$<br>slope = $0.2\text{A}/\mu\text{s}$ |       |      | 200   | mVp                         |
| $I_o$        | Output Current                       | $V_i = 38$ to $60\text{V}$ $V_o = 15\text{V}$                                    | 0     |      | 12    | A                           |
| $I_{ol}$     | Overcurrent Limit Initiation         | $V_i = 48\text{V}$                                                               | 13    |      | 16    | A                           |
| $I_{osc}$    | Shortcircuit Output Current          | $V_i = 48\text{V}$<br>$V_o = 0.2$ to $0.5\text{V}$                               |       |      | 21    | A                           |
| $t_s$        | Load Transient Settling Time         | $V_i = 48\text{V}$ $\delta I_o = 3\text{A}$<br>slope = $0.2\text{A}/\mu\text{s}$ |       |      | 300   | $\mu\text{s}$               |
| $t_{on}$     | Turn-on Time                         | $V_i = 48\text{V}$ $I_o = 12\text{A}$<br>$V_{ien} = \text{from high to low}$     |       |      | 5     | ms                          |
|              |                                      | $V_i = 0$ to $60\text{V}$ $I_o = 12\text{A}$<br>$V_{ien} = \text{low}$           | 3     |      | 10    |                             |
| $V_{is}$     | Isolation Voltage                    |                                                                                  | 500   |      |       | V                           |
| $f_s$        | Switching Frequency                  | $V_i = 38$ to $60\text{V}$ $I_o = 0$ to $12\text{A}$                             | 160   | 175  | 200   | kHz                         |
| $\eta$       | Efficiency                           | $V_i = 38$ to $60\text{V}$ $I_o = 12\text{A}$                                    | 86    | 88   |       | %                           |
| $R_{th}$     | Thermal Resistance                   | Case to Ambient                                                                  |       | 5.2  |       | $^{\circ}\text{C}/\text{W}$ |
| $T_{cop}$    | Operating Case Temperature Range     |                                                                                  | -10   |      | +85   | $^{\circ}\text{C}$          |
| $T_{stg}$    | Storage Temperature Range            |                                                                                  | -40   |      | +105  | $^{\circ}\text{C}$          |

# GS120/175T48 FAMILY

## CONNECTION DIAGRAM AND MECHANICAL DATA

Figure 1.

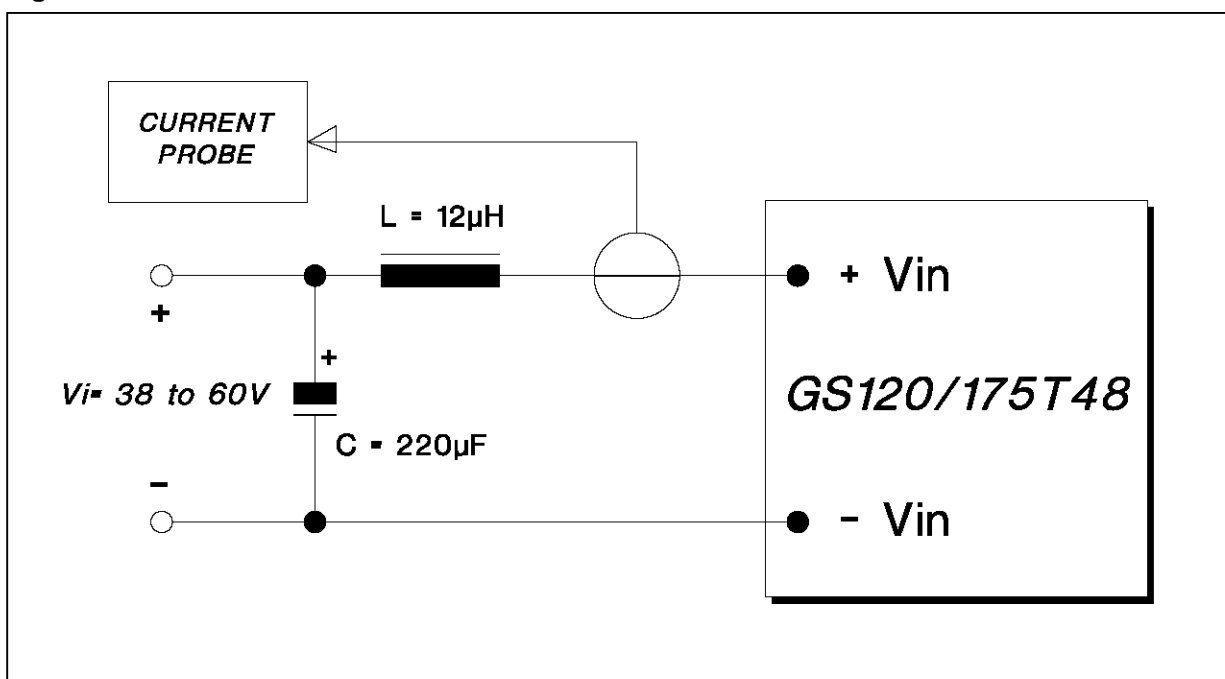


## PIN DESCRIPTION

| Pin   | Function | Description                                                                                                                                                                                                                                                                      |
|-------|----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1     | - IN     | Negative input voltage.                                                                                                                                                                                                                                                          |
| 2     | + IN     | Positive input voltage. Unregulated input voltage (typically 48V) must be applied between pin 1-2.                                                                                                                                                                               |
| 3     | ON/OFF   | The converter is ON (Enable) when the voltage applied to this pin with reference to pin 1 is lower than 1.2V (see V <sub>ien</sub> ). The converter is OFF (Inhibit) for a control voltage in the range of 8 to 18V. When the pin is unconnected the converter is OFF (Inhibit). |
| 4     | CASE     | Case connection pin.                                                                                                                                                                                                                                                             |
| 5     | SYNC     | Synchronization pin. See figures 3, 4, 5, 6. Open when not used.                                                                                                                                                                                                                 |
| 6     | PARALLEL | Parallel output. See figures 3, 4, 5, 6. Open when not used.                                                                                                                                                                                                                     |
| 7     | + SENSE  | Senses the remote load high side. To be connected to pin 11,12 when remote sense is not used.                                                                                                                                                                                    |
| 8     | - SENSE  | Senses the remote load return. To be connected to pin 9,10 when remote sense is not used. In parallel configuration, take care to connect all -S pins together (see figures 3,4,5,6).                                                                                            |
| 9,10  | - OUT    | Fixed output voltage return.                                                                                                                                                                                                                                                     |
| 11,12 | + OUT    | Fixed output voltage.                                                                                                                                                                                                                                                            |

**USER NOTES****Reflected Input Current**

The reflected input current measurement ( $I_{ir}$ , see Electrical Characteristics) is performed according to the test set-up of fig. 2.

**Figure 2.****Softstart**

To avoid heavy inrush current the output voltage rise time is 10ms maximum in any condition of load.

**Remote Sensing**

The remote voltage sense compensation range is for a total drop of 0.6V equally shared between the load connecting wires.

It is a good practice to shield the sensing wires to avoid oscillations.

See the connection diagram on figures 3, 4, 5, 6.

**Remote ON/OFF**

The module is controlled by the voltage applied between the ON/OFF pin and -IN pin.

The converter is ON (Enable) when the voltage applied is lower than 1.2 V (see  $V_{ien}$  on Electrical Characteristics).

The converter is OFF (Inhibit) for a control voltage in the range of 8 to 18V (see  $V_{iinh}$ ).

When the pin is unconnected the converter is OFF. Maximum sinking current is 1mA.

**Module Protection**

The module is protected against occasional and permanent shortcircuits of the output pins to ground, as well as against output current overload. It uses a current limiting protection circuitry, avoiding latch-up problems with certain type of loads.

A crowbar output overvoltage protection is activated when the output voltage exceeds the specified values (see Electrical Characteristics).

**Parallel Operation**

To increase available output regulated power, the module features the parallel connection possibility with equal current sharing and maximum deviation of 10% (two modules in parallel).

See the connection diagram on figures 3, 4, 5, 6.

Figure 3.

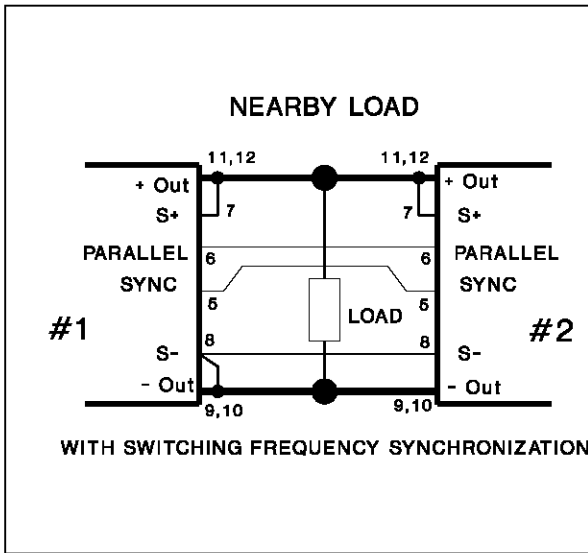


Figure 4.

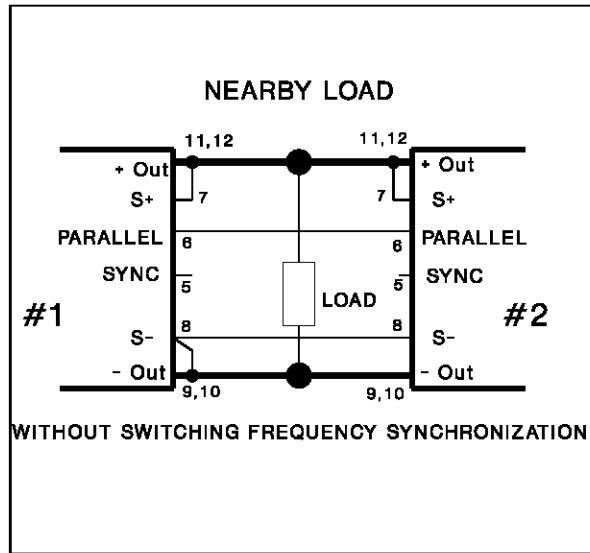


Figure 5.

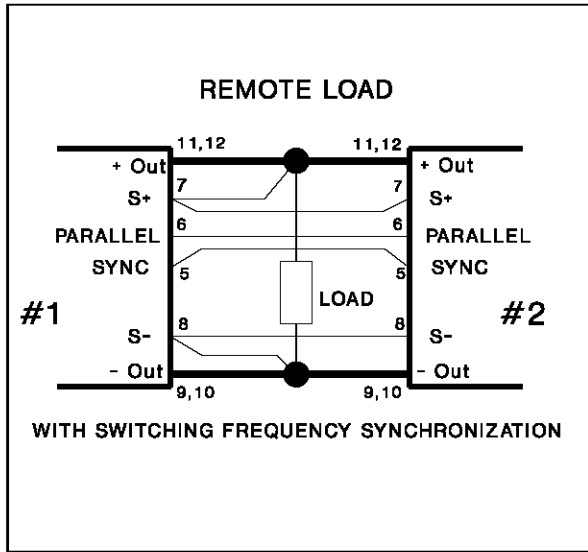
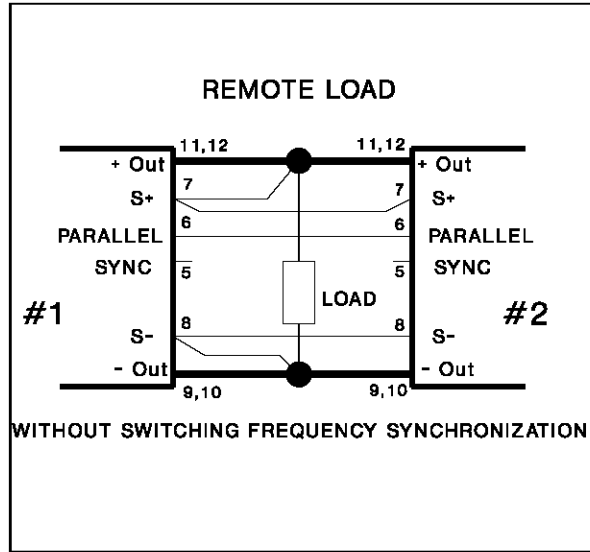


Figure 6.



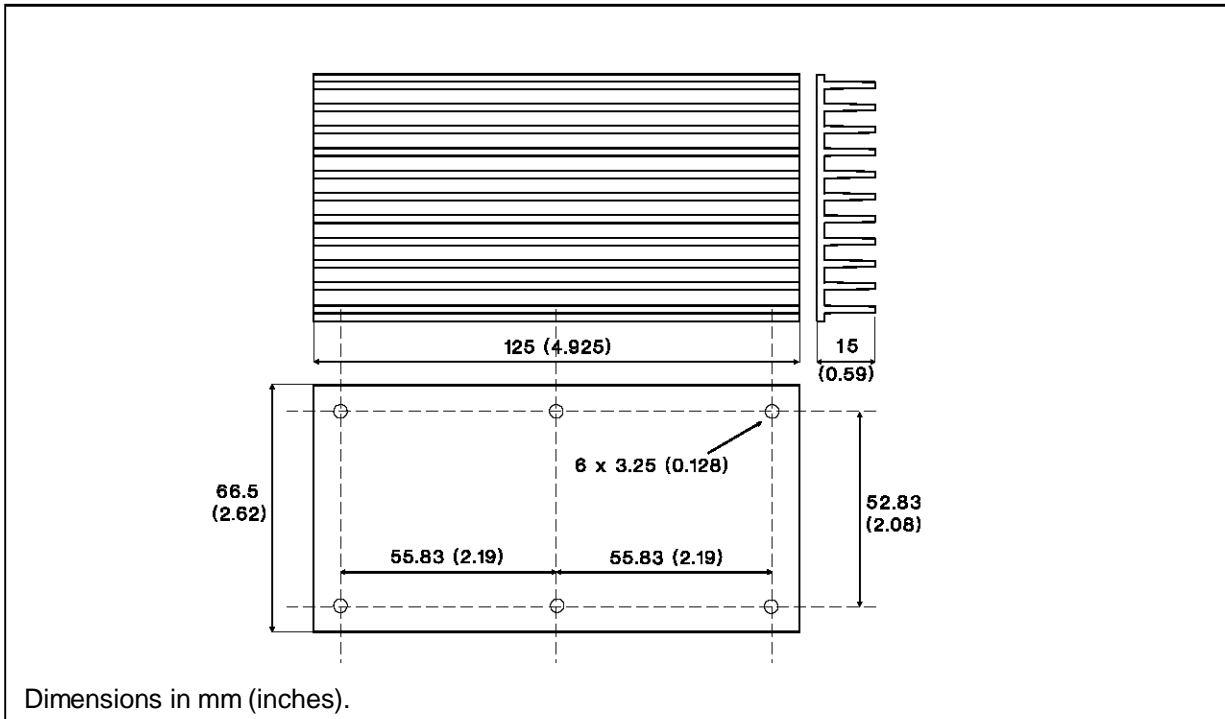
**Finned heatsink option**

An additional finned heatsink is available (type ordering number HS01) to allow the user to decrease the total thermal resistance of the module to a

typical value of 2.8 °C/W. The heatsink is suitable both for standard (4-40 UNC threading) and E version (M3 threading); screw length in the range of 6 to 8 mm (0.24 to 0.32"). See fig. 7.



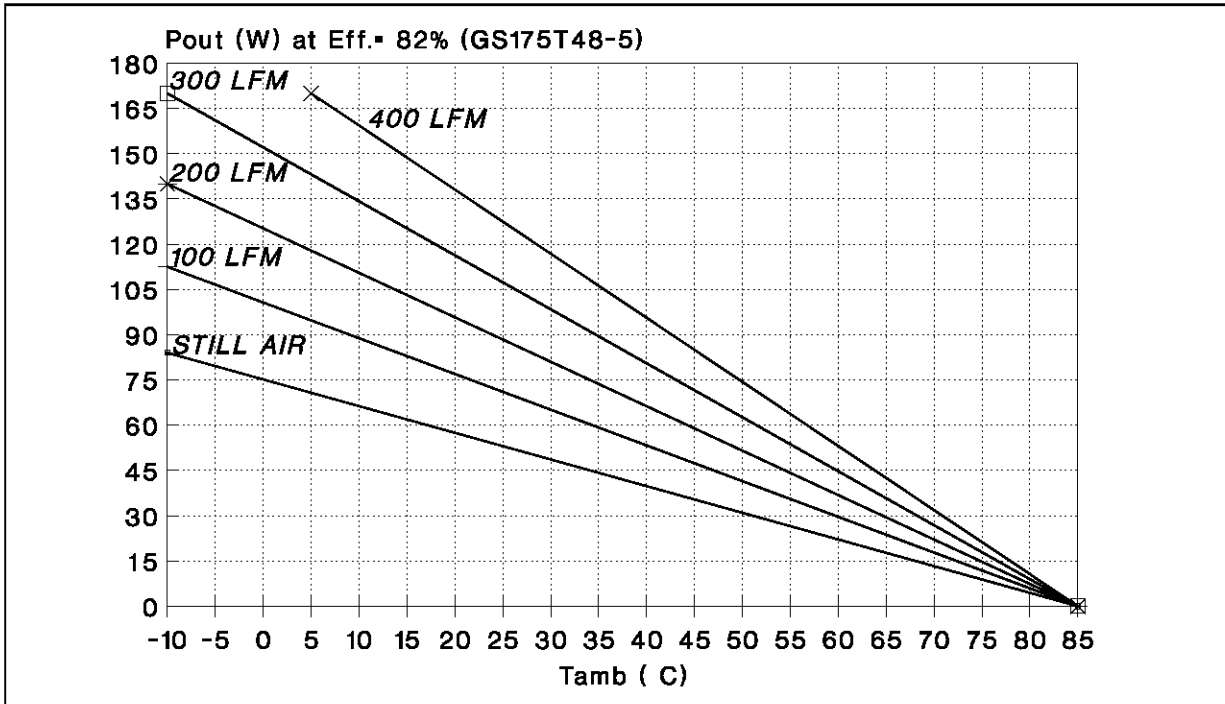
Figure 7. - HS01 Heatsink.



**Thermal Characteristics**

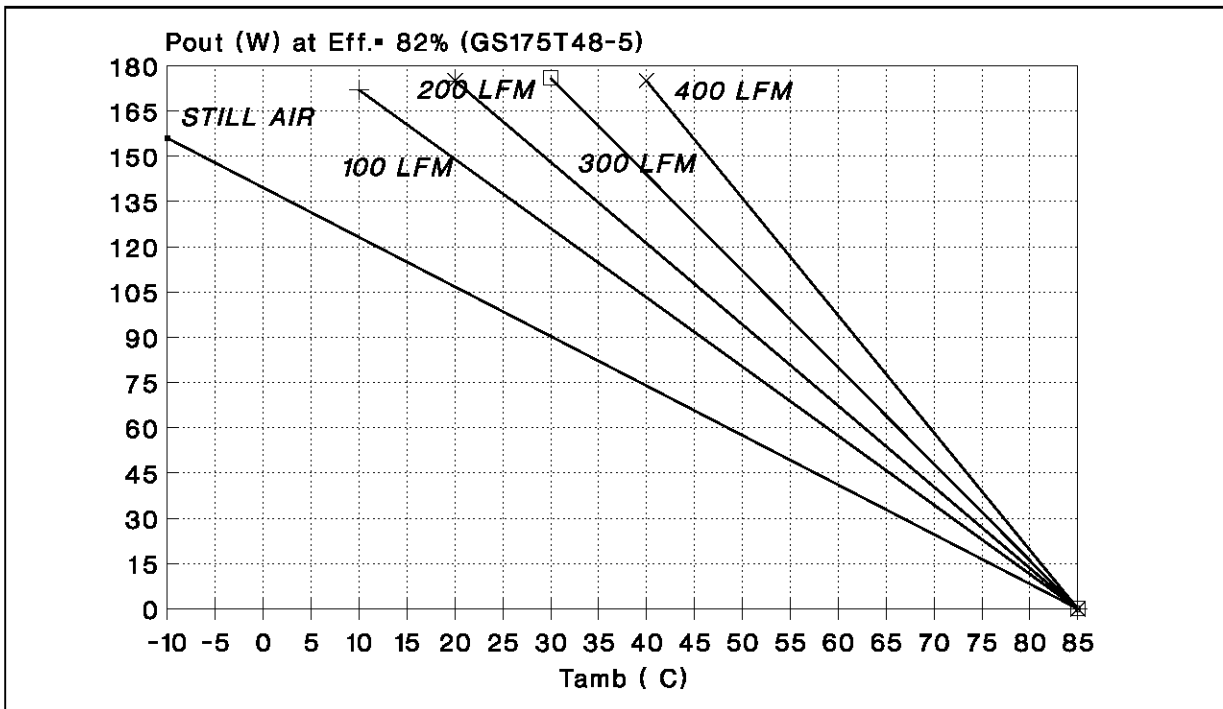
Following figures show the behaviour at still air and forced ventilation operation of the GS175T48-5 module (typical efficiency 82%) without (fig. 8) and with the additional finned HS01 heatsink (fig. 9)

Figure 8. - GS175T48-5 with standard flat heatsink.



## GS120/175T48 FAMILY

Figure 9. - GS175T48-5 with additional HS01 finned heatsink



### Safety approvals

The converter is agency certified to the following safety requirements.

| Agency | Requirements                      | License Number |
|--------|-----------------------------------|----------------|
| UL     | UL-STD-1950                       | E141284        |
| CSA    | CSA-STD-C22.2 No.234<br>(level 3) | LR 99794-2     |
| TUV    | EN 60950<br>DIN VDE 0805          | R 9272137      |

® UL is a registered trademark of UNDERWRITERS LABORATORIES inc.  
 ® CSA is a registered trademark of CANADIAN STANDARDS ASSOCIATION.  
 ® TUV is a registered trademark of TUV Rheinland.

Information furnished is believed to be accurate and reliable. However, SGS-THOMSON Microelectronics assumes no responsibility for the consequences of use of such information nor for any infringement of patents or other rights of third parties which may result from its use. No license is granted by implication or otherwise under any patent or patent rights of SGS-THOMSON Microelectronics. Specification mentioned in this publication are subject to change without notice. This publication supersedes and replaces all information previously supplied. SGS-THOMSON Microelectronics products are not authorized for use as critical components in life support devices or systems without express written approval of SGS-THOMSON Microelectronics.

© 1994 SGS-THOMSON Microelectronics – All Rights Reserved

® UL is a registered trademark of UNDERWRITERS LABORATORIES inc.  
 ® CSA is a registered trademark of CANADIAN STANDARDS ASSOCIATION.  
 ® TUV is a registered trademark of TUV Rheinland.

SGS-THOMSON Microelectronics GROUP OF COMPANIES  
 Australia - Brazil - China - France - Germany - Hong Kong - Italy - Japan - Korea - Malaysia - Malta - Morocco - The Netherlands -  
 Singapore - Spain - Sweden - Switzerland - Taiwan - Thailand - United Kingdom - U.S.A.