

4 Signals and DC Characteristics

4.1 DC Characteristics and Pin Assignment

Table 4.1 : DC Electrical Characteristics - Trooper I ($T_A = 0^\circ \text{C}$ to 70°C , $V_{DD} = 5V \pm 5\%$)

| SYMBOL | Parameter | Test Conditions | Min | Max |
|-----------|--------------------------------|---|------------------|--------------------|
| V_{IH} | Minimum input, high level | - | 2.0 V | - |
| V_{IL} | Maximum input, low level | - | - | 0.8 V |
| V_I | Input clamp voltage | $V_{DD} = 4.75 \text{ V}$, $I_{IN} = -18 \text{ mA}$ | - | -1.5 V |
| V_{OH} | Minimum output, high voltage | $V_{DD} = 4.75 \text{ V}$, $I_{OH} = -400 \mu\text{A}$ | 2.7 V | - |
| V_{OL} | Maximum output, low voltage | $V_{DD} = 4.75 \text{ V}$, $I_{OL} = 8 \text{ mA}$ | - | 0.5 V |
| I_I | Maximum input leakage current | $V_{DD} = 5.25 \text{ V}$, $V_I = 5.5 \text{ V}$ | - | 1 mA |
| I_{IH} | | $V_{DD} = 5.25 \text{ V}$, $V_I = 2.7 \text{ V}$ | - | 20 μA |
| I_{IL} | | $V_{DD} = 5.25 \text{ V}$, $V_I = 0.4 \text{ V}$ | - | -400 μA |
| I_{OH} | Output current | $V_{DD} = 5.25 \text{ V}$, $V_{OH} = 5.5 \text{ V}$ | - | 100 μA |
| I_{OS} | Short circuit output current | $V_{DD} = 5.25 \text{ V}$ | -40 mA | -120 mA |
| I_{OZH} | Maximum output leakage current | $V_{DD} = 5.25 \text{ V}$, $V_O = 2.7 \text{ V}$ | - | 20 μA |
| I_{OZL} | | $V_{DD} = 5.25 \text{ V}$, $V_O = 0.4 \text{ V}$ | - | 20 μA |
| I_{DD} | V_{DD} supply current | $V_{DD} = 5.25 \text{ V}$ | 100 mA (typical) | |

Table 4.2 : DC Electrical Characteristics - Trooper II ($T_A = 0^\circ\text{C}$ to 70°C , $V_{DD} = 5V \pm 5\%$)

| SYMBOL | Parameter | Test Conditions | Min | Max |
|------------|-------------------------------------|---|-------|--------------------|
| V_{IH} | Minimum input, high level | - | 2.0 V | - |
| V_{IL} | Maximum input, low level | - | - | 0.8 V |
| V_{OH} | Minimum output, high voltage | $V_{DD} = 4.75\text{ V}, I_{OH} = -4.0\text{ mA}$ | 2.4 V | - |
| V_{OL} | Maximum output, low voltage | $V_{DD} = 4.75\text{ V}, I_{OL} = 4.0\text{ mA}$ | - | 0.4 V |
| I_{IL} | Maximum input, low leakage current | $V_{DD} = 5.25\text{ V}, V_{IN} = 0\text{ V}$ | - | -1.0 μA |
| I_{IH} | Maximum input, high leakage current | $V_{DD} = 5.25\text{ V}, V_{IN} = V_{DD}$ | - | 1.0 μA |
| I_{OZH} | Maximum output leakage current | $V_{DD} = 5.25\text{ V}$ | - | 10 μA |
| I_{OZL} | | $V_{DD} = 5.25\text{ V}$ | - | -10 μA |
| I_{DD} | V_{DD} supply current | - | - | 40 mA |
| I_{DDSB} | Static V_{DD} supply current | $V_{DD} = 5.25\text{ V}, V_{IN} = V_{DD}$ or V_{SS} outputs open | - | 100 μA |



Caution: The pin lists in Table 4.3, Table 4.4, Table 4.5, Table 4.6, Table 4.7, Table 4.8, and Table 4.9 are for **Trooper 1** only.

Table 4.3 : Pin List and DC Characteristics for Trooper Signals - Trooper 1
($V_{DD} = 5V \pm 5\%$)

| Pin Name | Pin Number 84-pin PLCC | Type | Input Type | Output Type | Signal Description |
|----------------------------------|---------------------------|------|------------|-------------|---|
| A[31:09] | see Table 4.4 | I | TTL | – | VMEbus address lines A31 through A09 |
| A[05:01] | see Table 4.4 | I | TTL | – | VMEbus address lines A05 through A01 |
| AM[5:0] | see Table 4.5 | I | – | – | VMEbus address modifiers |
| AS* | 46 | I | TTL | – | VMEbus address strobe |
| $\overline{\text{AUXADD/LIRQ3}}$ | 16 | O | – | TP | Auxiliary address compare/local interrupt request |
| $\overline{\text{BWR/BRD}}$ | 67 | O | – | TP | Data buffer direction control |
| CLOCK | 44 | I | TTL | – | Device clock |
| D[7:0] | see Table 4.6 | I/O | TTL | TS | VMEbus/local data bus |
| DS0* | 41 | I | TTL | – | VMEbus data strobe 0 |
| DS1* | 42 | I | TTL | – | VMEbus data strobe 1 |
| $\overline{\text{VDTACK}}$ | 61 | O | – | TP | VMEbus data transfer acknowledge |
| IACK* | 79 | I | TTL | – | VMEbus interrupt acknowledge |
| IACKIN* | 82 | I | TTL | – | VMEbus interrupt acknowledge in |
| IACKOUT* | 62 | O | – | TP | VMEbus interrupt acknowledge out |
| $\overline{\text{VIRQ[7:1]}}$ | see Table 4.7 | O | – | TP | VMEbus interrupt request |
| LA[5:1] | see Table 4.8 | I | TTL | – | Local address A5 through A1 |
| $\overline{\text{LBENB}}$ | 65 | O | – | TP | Local data buffer enable control |
| $\overline{\text{LCE}}$ | 1 | I | TTL | – | Local chip enable |
| $\overline{\text{LDS}}$ | 2 | I | TTL | – | Local data strobe |
| $\overline{\text{LDTACK}}$ | 60 | O | – | TP | Local data transfer acknowledge |
| $\overline{\text{LIRQ0}}$ | 30 | O | – | TP | Local interrupt request 0 |
| $\overline{\text{LIRQ1}}$ | 28 | O | – | TP | Local interrupt request 1 |
| $\overline{\text{LRESET}}$ | 14 | O | – | OD | Local reset |

I = Input, O = Output, I/O = Bidirectional, TS = Tri-state output, TP = Totem Pole, OD = Open Drain, and TTL for Inputs.

Table 4.3 : Pin List and DC Characteristics for Trooper Signals - Trooper I
 ($V_{DD} = 5V \pm 5\%$) (Continued)

| Pin Name | Pin Number 84-pin PLCC | Type | Input Type | Output Type | Signal Description |
|----------------------------|---------------------------|------|------------|-------------|--|
| LWORD* | 71 | I | TTL | - | VMEbus longword |
| LR/ \overline{W} | 80 | I | TTL | - | Local read/write |
| $\overline{RMC/LAS}$ | 81 | I | TTL | - | Read modify cycle/local address strobe |
| SLOCLK/ $\overline{LIRQ2}$ | 27 | O | - | TP | Slow clock/local interrupt request |
| SYSRESET* | 83 | I | TTL | - | VMEbus system reset |
| \overline{VBENE} | 66 | O | - | TP | VMEbus data buffer enable control |
| V_{DD} | See Table 4.9 | - | - | - | Power: $5V \pm 5\%$ DC supply |
| V_{SS} | See Table 4.9 | - | - | - | Ground: 0 V |
| WRITE* | 47 | I | TTL | - | VMEbus write |

I = Input, O = Output, I/O = Bidirectional, TS = Tri-state output, TP = Totem Pole, OD = Open Drain, and TTL for Inputs.

Table 4.4 : VMEbus Address lines A01-05 and A09-31 - Trooper I

| Signal | 84-pin PLCC | | Signal | 84-pin PLCC |
|--------|-------------|--|--------|-------------|
| A01 | 5 | | A18 | 34 |
| A02 | 6 | | A19 | 35 |
| A03 | 7 | | A20 | 36 |
| A04 | 8 | | A21 | 37 |
| A05 | 9 | | A22 | 38 |
| A09 | 10 | | A23 | 48 |
| A10 | 11 | | A24 | 49 |
| A11 | 12 | | A25 | 50 |
| A12 | 13 | | A26 | 51 |
| A13 | 15 | | A27 | 52 |
| A14 | 29 | | A28 | 53 |
| A15 | 31 | | A29 | 54 |
| A16 | 32 | | A30 | 55 |
| A17 | 33 | | A31 | 57 |

Table 4.5 : VMEbus Address Modifiers - Trooper I

| Signal | 84-pin PLCC | | Signal | 84-pin PLCC |
|--------|-------------|--|--------|-------------|
| AM0 | 73 | | AM3 | 76 |
| AM1 | 74 | | AM4 | 77 |
| AM2 | 75 | | AM5 | 78 |

Table 4.6 : VMEbus/Local Data Bus - Trooper I

| Signal | 84-pin PLCC | | Signal | 84-pin PLCC |
|--------|-------------|--|--------|-------------|
| D0 | 17 | | D4 | 23 |
| D1 | 18 | | D5 | 24 |
| D2 | 19 | | D6 | 25 |
| D3 | 20 | | D7 | 26 |

Table 4.7 : VMEbus Interrupt Request - Trooper I

| Signal | 84-pin PLCC | | Signal | 84-pin PLCC |
|---------------------------|-------------|--|---------------------------|-------------|
| $\overline{\text{VIRQ1}}$ | 56 | | $\overline{\text{VIRQ5}}$ | 69 |
| $\overline{\text{VIRQ2}}$ | 58 | | $\overline{\text{VIRQ6}}$ | 70 |
| $\overline{\text{VIRQ3}}$ | 59 | | $\overline{\text{VIRQ7}}$ | 72 |
| $\overline{\text{VIRQ4}}$ | 68 | | | |

Table 4.8 : Local Address - Trooper I

| Signal | PLCC | | Signal | PLCC |
|--------|------|--|--------|------|
| LA1 | 3 | | LA4 | 40 |
| LA2 | 4 | | LA5 | 45 |
| LA3 | 39 | | | |

Table 4.9 : Pin Assignments for Power and Ground - Trooper I

| Ground = V_{SS} | | | Power = V_{DD} | |
|-------------------|----|--|------------------|----|
| 21 | 22 | | 43 | 84 |
| 63 | 64 | | | |

Appendix E Mechanical and Ordering Information

E.1 Mechanical Information - Trooper I

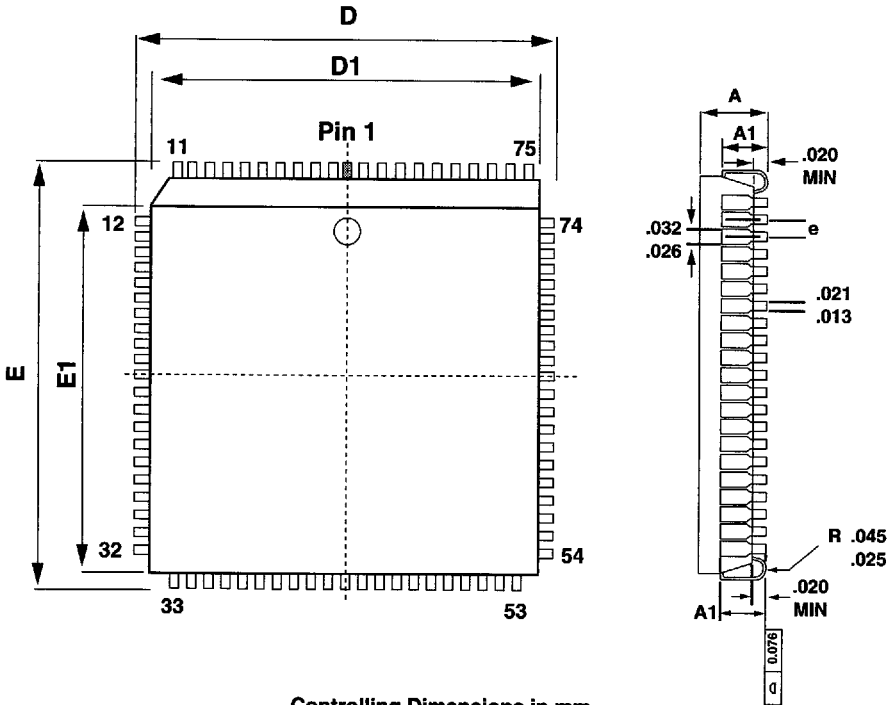
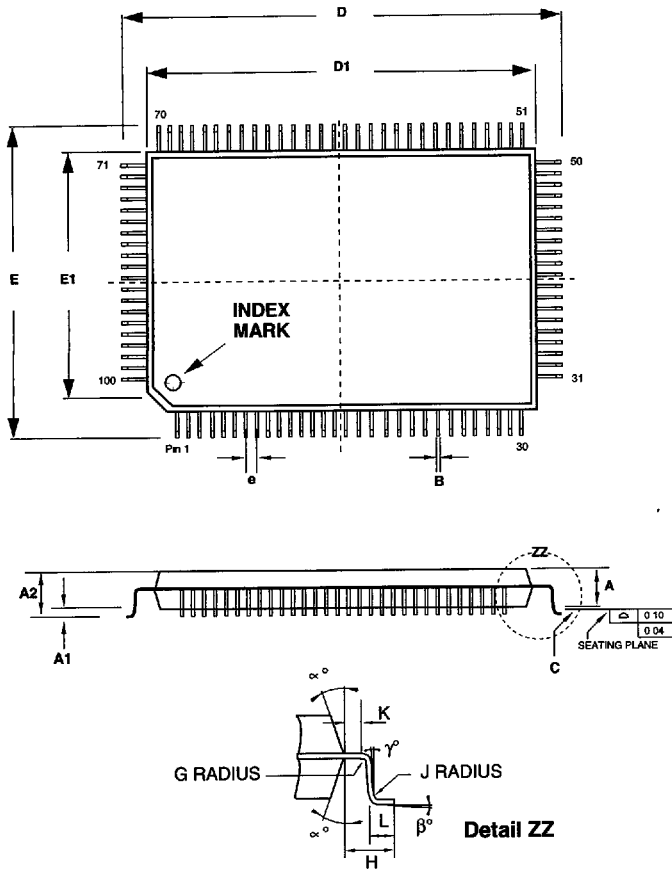


Figure E.1 : Mechanical Dimensions for 84-Pin PLCC - Trooper I

E.2 Mechanical Information - Trooper II



Controlling Dimensions in mm

| Dimension | Min | Max |
|----------------|----------|-------|
| A | - | 3.40 |
| A1 | 0.25 | - |
| A2 | 2.57 | 2.87 |
| D | 23.65 | 24.15 |
| D1 | 19.90 | 20.10 |
| E | 17.65 | 18.15 |
| E1 | 13.90 | 14.10 |
| L | 0.65 | 0.95 |
| e | 0.65 BSC | |
| B | 0.22 | 0.38 |
| c | 0.13 | 0.23 |
| ∞° | 12 | 16 |
| β° | 0 | 7 |
| γ° | 0 | - |
| G | 0.13 | - |
| H | 1.95 REF | |
| J | 0.13 | 0.30 |
| K | 0.40 | - |

Figure E.2 : Mechanical Dimensions for 100-Pin PQFP - Trooper II

E.3 Ordering Information

Newbridge Microsystems products are designated by a Product Code. When ordering, refer to products by their full code. For detailed mechanical drawings or alternative packaging requirements, please contact our factory directly.

