4 Signals and DC Characteristics

4.1 DC Characteristics and Pin Assignment

Table 4.1 : DC Electrical Characteristics - *Trooper I* (T_A = 0° C to 70° C, V_{DD} = 5V±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 V, I_{IN} = -18 mA	–	-1.5 V
V_{OH}	Minimum output, high voltage	V_{DD} = 4.75 V, I_{OH} = -400 µA	2.7 V	–
V_{OL}	Maximum output, low voltage	V_{DD} = 4.75 V, I_{OL} = 8 mA	–	0.5 V
I_I	Maximum input leakage current	V_{DD} = 5.25 V, V_I = 5.5 V	–	1 mA
I_{IH}		V_{DD} = 5.25 V, V_I = 2.7 V	–	20 µA
I_{IL}		V_{DD} = 5.25 V, V_I = 0.4 V	–	-400 µA
I_{OH}	Output current	V_{DD} = 5.25 V, V_{OH} = 5.5 V	–	100 µA
I_{OS}	Short circuit output current	V_{DD} = 5.25 V	-40 mA	-120 mA
I_{OZH}	Maximum output leakage current	V_{DD} = 5 25 V, V_O = 2.7 V	–	20 µA
I_{OZL}		V_{DD} = 5.25 V, V_O = 0.4 V	–	20 µA
I_{DD}	V_{DD} supply current	V_{DD} = 5.25 V	100 mA (typical)	

Table 4.2 : DC Electrical Characteristics - *Trooper II* (T_A = 0° C to 70° C, V_{DD} = 5V±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 V, I_{OH} = -4 0 mA	2.4 V	–
V_{OL}	Maximum output, low voltage	V_{DD} = 4.75 V, I_{OL} = 4.0 mA	–	0.4 V
I_{IL}	Maximum input, low leakage current	V_{DD} = 5 25 V, V_{IN} = 0 V	–	-1.0 µA
I_{IH}	Maximum input, high leakage current	V_{DD} = 5.25 V, V_{IN} = V_{DD}	–	1.0 µA
I_{OZH}	Maximum output leakage current	V_{DD} = 5.25 V	–	10 µA
I_{OZL}		V_{DD} = 5.25 V	–	-10 µA
I_{DD}	V_{DD} supply current	–	–	40 mA
I_{DDSB}	Static V_{DD} supply current	V_{DD} = 5.25 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 I* (V_{DD} = 5V±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
$\overline{\text{LLDS}}$	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±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
$\overline{RMC}$/$\overline{LAS}$	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
$\overline{VBENB}$	66	O	–	TP	VMEbus data buffer enable control
V_{DD}	See Table 4.9	–	–	–	Power: 5V ± 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*

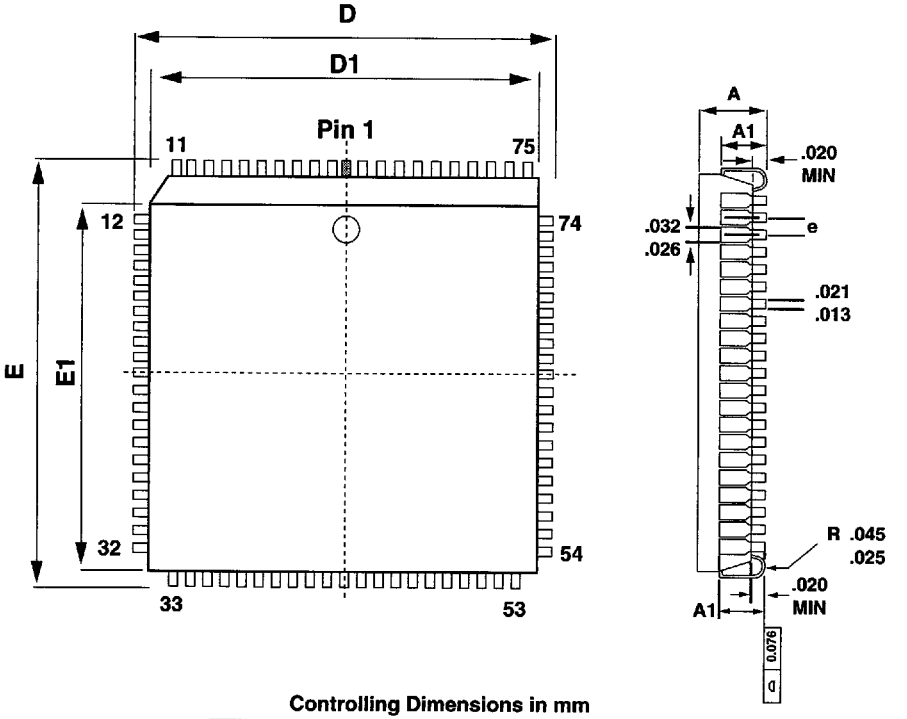
Signal	PLCC	Signal	PLCC
LA1	3	LA4	40
LA2	4	LA5	45
LA3	39		

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*

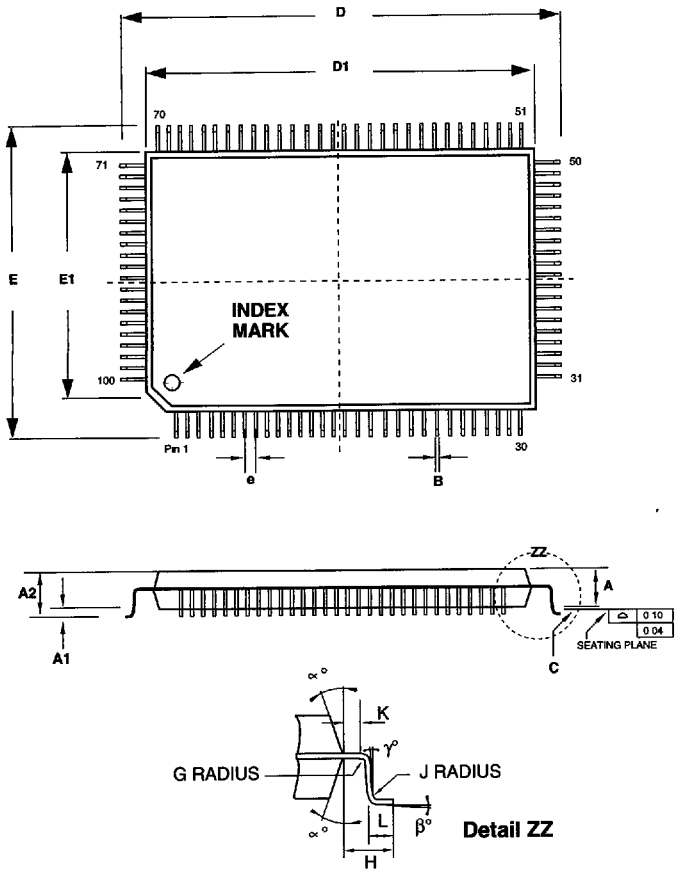


Controlling Dimensions in mm

Symbol	Min.	Nom.	Max.
A	.165	.170	.180
A1	.095	.099	.118
D	1.185	1.190	1.195
D1	1.150	1.152	1.156
E	1.185	1.190	1.195
E1	1.150	1.152	1.156
e	.050 BSC.		

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.