

6 ELECTRICAL CHARACTERISTICS

6.1 ABSOLUTE MAXIMUM RATINGS

This product contains devices designed to protect the inputs against damage due to high static voltages; however, it is advisable to take normal precautions to avoid applying voltages higher than the specified maximum ratings.

For proper operation, it is recommended that V_I and V_O be higher than V_{SS} and lower than V_{DD} . Reliability is enhanced if unused inputs are connected to an appropriate logic voltage level (V_{DD} or V_{SS}).

Power Considerations. The average chip-junction temperature, T_j , in degrees Celsius can be obtained from:

$$T_j = T_A + P_D \times R_{thJA}$$

Where:

T_A = Ambient Temperature.

R_{thJA} = Package thermal resistance (junction-to ambient).

$P_D = P_{int} + P_{port}$

$P_{int} = I_{DD} \times V_{DD}$ (chip internal power).

P_{port} = Port power dissipation (to be determined by the user)

Symbol	Parameter	Value	Unit
V_{DD}	Supply Voltage	-0.3 to 7.0	V
V_I	Input Voltage	$V_{SS} - 0.3$ to $V_{DD} + 0.3^{(1)}$	V
V_O	Output Voltage	$V_{SS} - 0.3$ to $V_{DD} + 0.3^{(1)}$	V
V_{PP}	OTP/EPROM Programming Voltage	13	V
I_O	Current Drain per Pin Excluding VDD, VSS	10	mA
I_{INJ+}	Pin Injection current (positive), All I/O, VDD = 4.5V	+5	mA
I_{INJ-}	Pin Injection current (negative), All I/O, VDD = 4.5V	-5	mA
I_{VDD}	Total Current into V_{DD} (source)	50 ⁽²⁾	mA
I_{VSS}	Total Current out of V_{SS} (sink)	50 ⁽²⁾	mA
T_j	Junction Temperature	150	°C
T_{STG}	Storage Temperature	-60 to 150	°C

Notes:

Stresses above those listed as "Absolute Maximum Ratings" may cause permanent damage to the device. This is a stress rating only and functional operation of the device under these conditions is not implied. Exposure to maximum rating conditions for extended periods may affect device reliability.

(1) Within these limits, clamping diodes are non-conducting. Voltages outside these limits are authorised provided injection current is kept within the specification.

(2) The total current through ports A and B combined may not exceed 50mA. If the application is designed with care and observing the limits stated above, total current may reach 50mA.

6.2 THERMAL CHARACTERISTICS

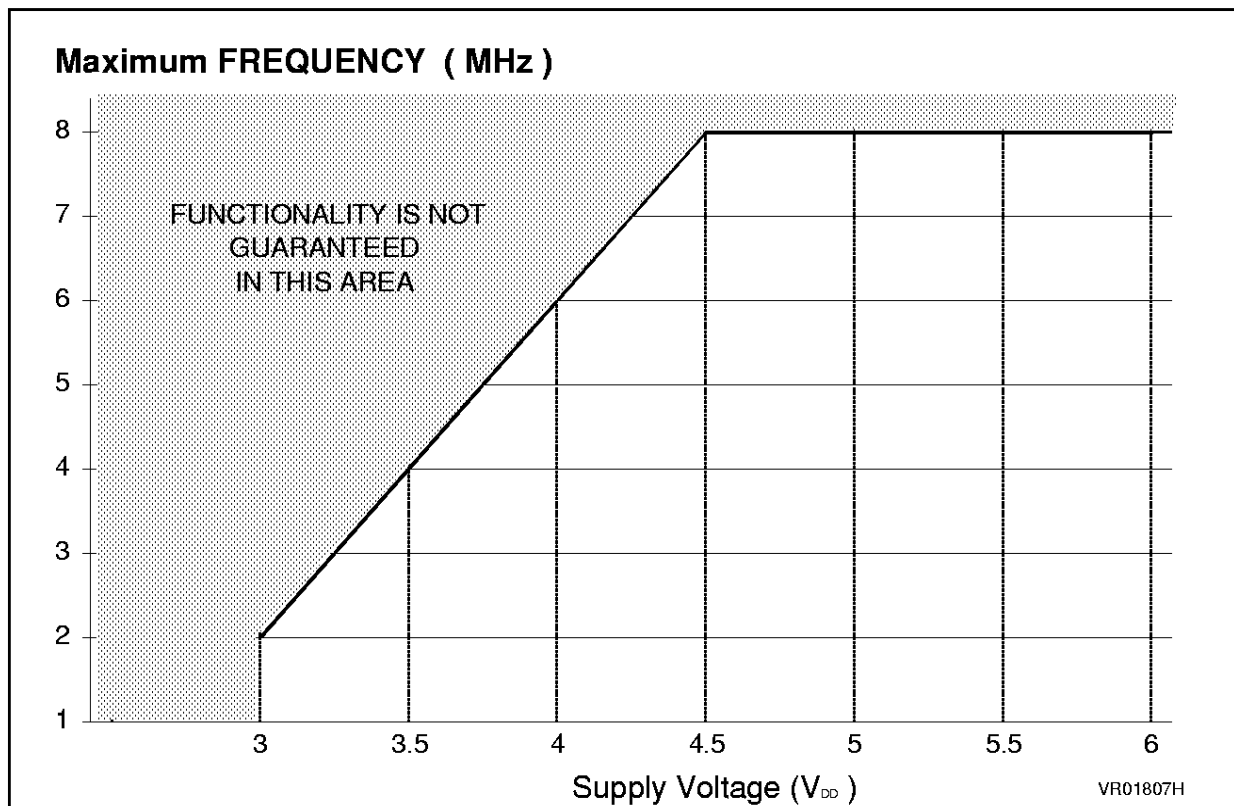
Symbol	Parameter	Test Conditions	Value			Unit
			Min.	Typ.	Max.	
R_{thJA}	Thermal Resistance (junction to ambient)	PDIP16			60	
		PSO16			80	
		CDIP16W			n/a	

6.3 RECOMMENDED OPERATING CONDITIONS

Symbol	Parameter	Test Conditions	Value			Unit
			Min.	Typ.	Max.	
T_A	Operating Temperature	6 Suffix Version 1 Suffix Version	-40 0		85 70	$^{\circ}\text{C}$
V_{DD}	Operating Supply Voltage		3.0V		6.0V	V
V_{PP}	Programming Voltage		12	12.5	13	V
I_{INJ+}	Pin Injection Current (positive) Digital Input Analog Inputs	$V_{DD} = 4.5$ to 5.5V			+5	mA
I_{INJ-}	Pin Injection Current (negative) Digital Input Analog Inputs	$V_{DD} = 4.5$ to 5.5V			-5	mA

Notes:

If a total current of +1mA is flowing into a single analog channel, or if the total current flowing into all the analog inputs is 1 mA, all resulting A/D conversions will be shifted by + 1 LSB. If a total positive current is flowing into a single analog channel, or if the total current flowing into all analog inputs is 5mA, all the resulting conversions are shifted by + 2 LSB.

Figure 5. Maximum Operating FREQUENCY (F_{MAX}) Versus SUPPLY VOLTAGE (V_{DD})

The shaded area is outside the recommended operating range; device functionality is not guaranteed under these conditions.