

ICP2-GANG(G3) Production Quality In-Circuit Programmer

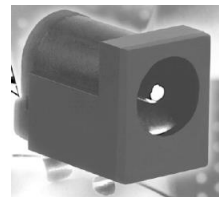
Specification (Preliminary)

1 Mechanical

ICP2-GANG(G3) programmer size: 195 x 110 x 68 mm

2 Connectors

2.1 "Power" Connector (Power Jack, Center Pin 2.1mm)



Pin No.	Pin Name	Voltage Range	Pin Type	Description
1/center	POWER (+)	12V to 15V	Power input with in-series diode	Main ICP2-GANG(G3) power supply
2	POWER (-)			

2.2 "USB" Connector (Type-B Female)



2.3 "RS-232 IN" Connector (D-type 9 Female)

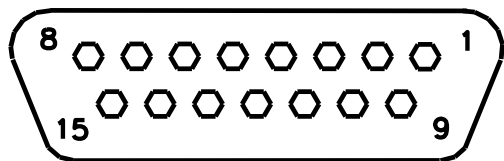
Pin No.	Pin Name	Voltage Range	Pin Type	Description
1	-	-	-	Not connected
2	PC_RXD	RS-232 level	RS-232 output	TxD output to PC
3	PC_TXD	RS-232 level	RS-232 input	RxD input from PC
4	-	-	-	Not connected
5	GND	-	GND	Ground connection
6	12V_OUT	11-14VDC	Power	Optional power output
7,8,9	-	-	-	Not connected

2.4 "RS-232 OUT" Connector (D-type 9 Male)

Pin No.	Pin Name	Voltage Range	Pin Type	Description
1	-	-	-	Not connected
2	CHAIN_232_RXD	RS-232 level	RS-232 input	RxD input from next ICP2-GANG(G3)
3	CHAIN_232_TXD	RS-232 level	RS-232 output	RxD output to next ICP2-GANG(G3)
4	-	-	-	Not connected
5	GND	-	GND	Ground connection
6,7,8,9	-	-	-	Not connected

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2.5 “TARGET” Connector (D-type 15 Female), 4 Identical Channels



Pin No.	Pin Name	Voltage Range	Pin Type	Description
1	T_VDD	1.8V to 5.5V	Output or input with weak pull-down and programmable strong pull-down	Target VDD supply voltage
2	GND	-	-	Ground connection
3	T_SCK	1.8V to 5.5V	CMOS output or input with weak pull-down and programmable pull-up and pull-down	Target clock
4	T_MOSI	1.8V to 5.5V	CMOS output or input with weak pull-down and programmable pull-up and pull-down	Target data
5	T_MISO	1.8V to 5.5V	CMOS output or input with weak pull-down and programmable pull-up and pull-down	Target data, internally connected to T_MOSI
6	T_VPP	1.8V to 13.5V	Output or input with weak pull-down	Target VPP supply voltage
7	T_TARG	5.0V	CMOS output	General purpose output
8	T_DIO_2	1.8V to 5.5V	CMOS output or input with weak pull-down	Target I/O number 2
9	T_DIO_0	1.8V to 5.5V	CMOS output or input with weak pull-down	Target I/O number 0
10	T_DIO_1	1.8V to 5.5V	CMOS output or input with weak pull-down	Target I/O number 1
11	GND	-	-	Optional ground connection
12	GND	-	-	Optional ground connection
13	GO	0-1.0V or N/C	CMOS input with pull-up 10K	Input for programming activation in standalone mode
14	PASS_OUT	5.0V	CMOS output	Output for pass/fail/busy indication
15	FAIL_OUT	5.0V	CMOS output	Output for pass/fail/busy indication

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3 Electrical Characteristics

3.1 Absolute Maximum Ratings

Symbol	Parameter	Min.	Max.	Unit
T _{ST}	Storage temperature	-30	+80	°C
T _A	Operating temperature	0	+60	°C
V _{IN}	Input supply voltage	-18	18	V
V _{RS}	RS-232 voltage	-15	15	V
V _{DD}	T_VDD voltage	-10	10	V
V _{PP}	T_VPP voltage	-10	20	V
V _{PRG}	T_SCK, T_MOSI, T_MISO, T_DIO_0, T_DIO_1 and T_DIO_2 voltage	-7.5	7.5	V
V _{TARG}	T_TARG voltage	-7.5	7.5	V
V _{GO}	GO voltage	-7.5	7.5	V
V _{PF}	PASS_OUT and FAIL_OUT voltage	-7.5	7.5	V

3.2 Recommended Operating Conditions

Symbol	Parameter	Min.	Max.	Unit
T _A	Operating temperature	0	+50	°C
V _{IN}	Input supply voltage	11	15	V
-	T_VDD current (per channel)	-	200	mA
-	T_VPP resistive load to GND or T_VDD	1	-	KΩ
-	T_VPP capacitive load to GND	-	22	nF
-	T_SCK, T_MOSI, T_MISO, T_DIO_0, T_DIO_1 and T_DIO_2 resistive load to GND or T_VDD	3	-	KΩ
-	T_SCK, T_MOSI, T_MISO, T_DIO_0, T_DIO_1 and T_DIO_2 capacitive load to GND or T_VDD	-	33	pF

3.3 On-Board Flash Memory (Per Channel)

(T_A = 0 to 50°C, unless otherwise specified. Typical values are referred to T_A = 25°C)

Param No.	Parameter	Test Condition	Min.	Typ.	Max.	Unit
M001	Capacity	All conditions	-	32	-	MByte
M002	Endurance	All conditions	10K	100K	-	-
M003	Data retention	All conditions	20	-	-	Years
M004	Logical number of environments	All conditions	-	6 (software after Oct-21)	-	-

3.4 On-Board EEPROM (Per Channel)

(T_A = 0 to 50°C, unless otherwise specified. Typical values are referred to T_A = 25°C)

Param No.	Parameter	Test Condition	Min.	Typ.	Max.	Unit
E001	Secure non-volatile counter endurance	All conditions	8M	-	-	-
E002	Data retention	All conditions	40	-	-	Years

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3.5 DC Characteristics

(TA = 0 to 50°C, unless otherwise specified. Typical values are referred to TA = 25°C)

Param No.	Parameter	Test Condition	Min.	Typ.	Max.	Unit
	Input Voltage					
D001	Input supply voltage	All conditions	11	-	15	V
D002	Input supply current	V _{IN} =12V, no operation	-	200	-	mA
	T_VDD Input/Output (Per Channel)					
D010	Output high level	ICP powered mode	1.8	-	5.5	V
	Input high level	Target powered mode	1.8	-	6.0	V
D011	Current limit (short to GND)	V _{IN} =12V to 15V	250	300	-	mA
D013	Weak pull-down resistor	All conditions	-	30	-	KΩ
D014	Programmable strong pull-down resistor	All conditions	-	500	-	Ω
	T_VPP Output (Per Channel)					
D020	Output high level	All conditions	1.8	-	13.5	V
D021	Current limit (short to GND). Note: higher current is available – contact Softlog	All conditions	30	-	-	mA
D022	Weak pull-down resistor	All conditions	-	160	-	KΩ
	Programming I/Os (Per Channel): T_SCK, T_MOSI, T_MISO, T_DIO_0, T_DIO_1, T_DIO_2					
D040	Output/input high level	All conditions	1.8	-	5.5	V
D041	Output impedance	All conditions	-	100	-	Ω
D042	Weak pull-down resistor	All conditions	-	300	-	KΩ
	GO Input (Per Channel)					
D050	Input low level	All conditions	0	-	0.8	V
D051	Pull-up resistor	All conditions	-	10	-	KΩ
D052	Input high level	All conditions	4.0	-	5.0	V
	PASS_OUT and FAIL_OUT Outputs (Per Channel)					
D060	Output impedance	All conditions	-	1.3	-	KΩ
D061	Output low level	No load	-	-	0.2	V
D062	Output high level	No load	4.8	-	-	V
	V_TARG Output (Per Channel)					
D070	Output impedance	All conditions	-	1	-	KΩ
D071	Output low level	No load	-	-	0.2	V
D072	Output high level	No load	4.8	-	-	V

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3.6 AC Characteristics

(TA = 0 to 50°C, unless otherwise specified. Typical values are referred to TA = 25°C)

Param No.	Parameter	Test Condition	Min.	Typ.	Max.	Unit
	T_VDD Output					
A001	Rise time	V _{IN} =12V, V _{dd} =5.0V, no load	-	0.07	-	ms
A002	Fall time	V _{IN} =12V, V _{dd} =5.0V, no load	-	2	-	ms
A003	Rise time	V _{IN} =12V, V _{dd} =5.0V, C _{load} =100uF	-	1.5	-	ms
A004	Fall time	V _{IN} =12V, V _{dd} =5.0V, C _{load} =100uF	-	200	-	ms
A005	Rise time	V _{IN} =12V, V _{dd} =5.0V, C _{load} =1000uF, R _{load} =22Ω	-	20	-	ms
A006	Fall time	V _{IN} =12V, V _{dd} =5.0V, C _{load} =1000uF, R _{load} =22Ω	-	50	-	ms
	T_VPP Output					
A010	Rise time	V _{IN} =12V, V _{pp} =13V, no load	-	0.1	-	us
A011	Fall time	V _{IN} =12V, V _{pp} =13V, no load	-	0.4	-	us
A012	Rise time to 0V to 10V	V _{IN} =12V, V _{pp} =13V, C _{load} =33nF	-	0.7	-	us
A013	Fall time from 13V to 1V	V _{IN} =12V, V _{pp} =13V, C _{load} =33nF	-	3	-	us
	Programming I/Os: T_SCK, T_MOSI, T_MISO, T_DIO_0, T_DIO_1, T_DIO_2					
A030	Rise time	V _{dd} =5V, no load	-	10	-	ns
A031	Fall time	V _{dd} =5V, no load	-	10	-	ns
A032	T_SCK frequency	All conditions	-	-	10	MHz
A032	T_SCK programmable frequencies	All conditions	-	0.5, 0.625, 0.714, 0.833, 1.00, 1.25, 1.67, 2.5, 5.0, 10.0	-	MHz

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