
ICP2-Portable(G3)

Production Quality In-Circuit Service Programmer

Specification

1 Mechanical

Programmer size: 145 x 82 x 28 mm

2 Connectors

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

<i>Pin No.</i>	<i>Pin Name</i>	<i>Voltage Range</i>	<i>Pin Type</i>	<i>Description</i>
1/center	POWER_1	12V to 15V	Power input with diode bridge, any polarity	Optional power supply
2	POWER_2			

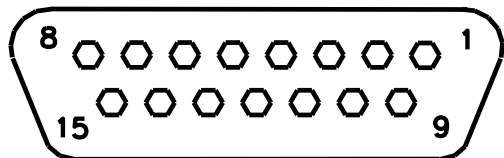
Note: recommended power supply - GST25A12-P1J (Mean-Well)

2.2 "USB" Connector (Mini B Female)

Use standard USB 2.0 A to Mini B cable (M/M), 28/24AWG

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2.3 "TARGET" Connector (D-type 15 Female)



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 or dedicated I/O
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	Optional input for programming activation in standalone mode
14	PASS_OUT	5.0V	CMOS output	Optional output for pass/fail/busy indication
15	FAIL_OUT	5.0V	CMOS output	Optional 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 _{BAT}	Battery supply voltage	-5.5	5.5	V
V _{IN}	Input supply voltage (adapter)	-18	18	V
V _{USB}	USB supply voltage (VBUS)	-0.3	5.5	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 voltage	-4.0	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 _{BAT}	Battery supply voltage	3.6	4.5	V
-	Battery type	3xAA: alkaline, 2600mA*h		-
V _{IN}	Input supply voltage (adapter)	11	15	V
-	T_VDD current (w/o power adapter)	-	80	mA
-	T_VDD current (with power adapter)	-	80	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	1	-	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

(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	-	-

3.4 On-Board EEPROM

(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	Non-volatile counter endurance	All conditions	1M	-	-	-
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	-	60	-	mA
D003	USB supply voltage	V _{IN} =0V	4.0	-	5.2	V
D004	USB supply current	V _{IN} =0V, V _{USB} =4.8V, no operation	-	170	-	mA
D005	Battery voltage	All conditions	3.3	-	4.5	V
D006	Battery current (preliminary)	V _{IN} =V _{USB} =0V, V _{BAT} =4.0V, no operation, 25 seconds or more after power up	-	85	-	mA
D007	Low battery level	No operation	-	3.3	-	V
		Start of programming	-	3.0	-	V
D008	Battery leakage	V _{IN} =V _{USB} =0V, V _{BAT} =4.0V, power off	-	2	-	uA
	T_VDD Input/Output					
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	100	-	-	mA
D012	Current limit (short to GND)	V _{IN} =0V, USB or/and battery powered	100 (firmware 33.15 or higher)	-	-	mA
D013	Weak pull-down resistor	All conditions	-	30	-	KΩ
D014	Programmable strong pull-down resistor	All conditions	-	500	-	Ω
	T_VPP Output					
D020	Output high level	All conditions	1.8	-	13.5	V
D021	Current limit (short to GND)	All conditions	12	-	-	mA
D022	Weak pull-down resistor	All conditions	-	160	-	KΩ
	Programming I/Os: 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					
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, FAIL_OUT and T_TARG Outputs					
D060	Output impedance	All conditions	-	1	-	KΩ
D061	Output low level	No load	-	-	0.2	V
D062	Output high level	No load	4.6	-	-	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 _{BAT} =4.0V, V _{dd} =5.0V, no load	-	0.07	-	ms
A002	Fall time	V _{BAT} =4.0V, V _{dd} =5.0V, no load	-	2	-	ms
A003	Rise time	V _{BAT} =4.0V, V _{dd} =5.0V, C _{load} =100uF	-	TBD	-	ms
A004	Fall time	V _{BAT} =4.0V, V _{dd} =5.0V, C _{load} =100uF	-	TBD	-	ms
T_VPP Output						
A010	Rise time	V _{BAT} =4.0V, V _{pp} =13V, no load	-	0.1	-	us
A011	Fall time	V _{BAT} =4.0V, V _{pp} =13V, no load	-	0.4	-	us
A012	Rise time to 0V to 10V	V _{BAT} =4.0V, V _{pp} =13V, C _{load} =33nF	-	TBD	-	us
A013	Fall time from 13V to 1V	V _{BAT} =4.0V, V _{pp} =13V, C _{load} =33nF	-	TBD	-	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

4 Revision History

- Feb-24: minimum supply voltage reduced to 11V (old: 12V)
- Nov-2021:
 - VDD current w/o power supply (D012) increased to 100mA (old: 40mA)
 - removed connection table
- Jan-2020: minor corrections in connection table
- Jul-2018: Initial revision of this document

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