SLG7RN45753

GreenPAK ™

Enya Button Controller

General Description

Dialog SLG7RN45753 is a low power and small form device. The SoC is housed in a 1.6mm x 1.6mm STQFN package which is optimal for using with small devices.

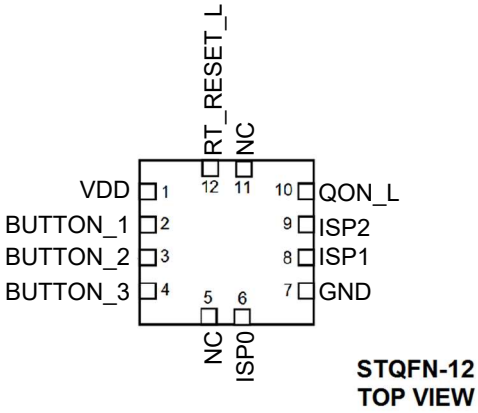
Features

- Low Power Consumption
- Pb - Free / RoHS Compliant
- Halogen - Free
- STQFN - 12 Package

Output Summary

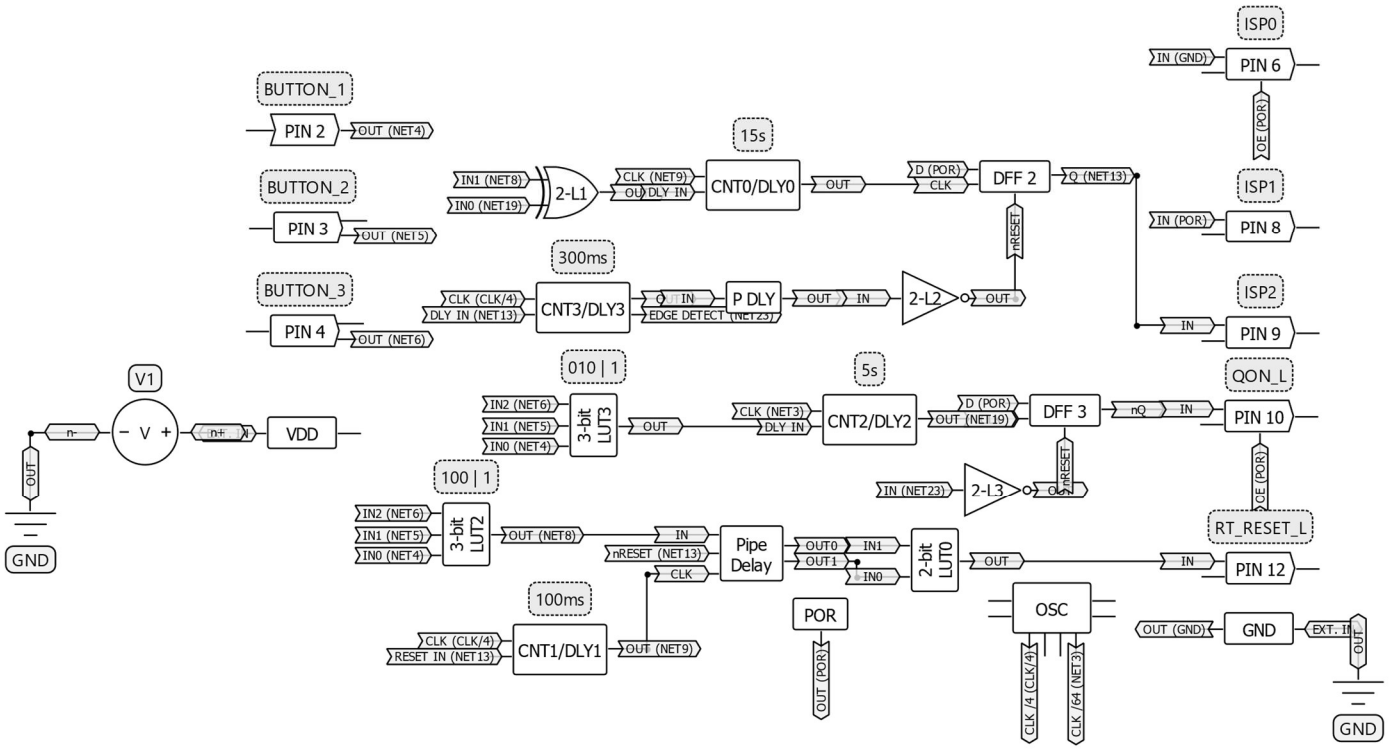
3 Outputs - Open Drain NMOS 1X
2 Outputs - Push Pull 1X

Pin Configuration



STQFN-12
TOP VIEW

Block Diagram



Pin Configuration

Pin #	Pin Name	Type	Pin Description	Internal Resistor
1	VDD	PWR	Supply Voltage	--
2	BUTTON_1	Digital Input	Digital Input without Schmitt trigger	floating
3	BUTTON_2	Digital Input	Digital Input without Schmitt trigger	floating
4	BUTTON_3	Digital Input	Digital Input without Schmitt trigger	floating
5	NC	--	Keep Floating or Connect to GND	--
6	ISP0	Digital Output	Push Pull 1X	floating
7	GND	GND	Ground	--
8	ISP1	Digital Output	Open Drain NMOS 1X	floating
9	ISP2	Digital Output	Push Pull 1X	floating
10	QON_L	Digital Output	Open Drain NMOS 1X	floating
11	NC	--	Keep Floating or Connect to GND	--
12	RT_RESET_L	Digital Output	Open Drain NMOS 1X	floating

Ordering Information

Part Number	Package Type
SLG7RN45753V	V=STQFN-12
SLG7RN45753VTR	STQFN-12 – Tape and Reel (3k units)

Absolute Maximum Conditions

Parameter		Min.	Max.	Unit
Supply Voltage on VDD relative to GND		-0.5	7	V
DC Input Voltage		GND - 0.5V	VDD + 0.5V	V
Maximum Average or DC Current (Through pin)	Push-Pull 1x	--	12	mA
	OD 1x	--	18	
Current at Input Pin		-1.0	1.0	mA
Input leakage (Absolute Value)		--	1000	nA
Storage Temperature Range		-65	150	°C
Junction Temperature		--	150	°C
ESD Protection (Human Body Model)		2000	--	V
ESD Protection (Charged Device Model)		1000	--	V
Moisture Sensitivity Level		1		

Electrical Characteristics

Symbol	Parameter	Condition/Note	Min.	Typ.	Max.	Unit
V_{DD}	Supply Voltage		2.3	3.3	5.5	V
T_A	Operating Temperature		-40	25	125	°C
C_{VDD}	Capacitor Value at VDD		--	0.1	--	µF
C_{IN}	Input Capacitance		--	4	--	pF
I_Q	Quiescent Current	Static inputs and floating outputs PIN2, PIN3 and PIN4 are low	--	7	--	µA
V_O	Maximal Voltage Applied to any PIN in High-Impedance State		--	--	VDD	V
I_{VDD}	Maximum Average or DC Current Through VDD Pin (Per chip side, see Note 2)	T_J = 85°C	--	--	73	mA
		T_J = 110°C	--	--	35	mA
I_{GND}	Maximum Average or DC Current Through GND Pin (Per chip side, see Note 2)	T_J = 85°C	--	--	92	mA
		T_J = 110°C	--	--	44	mA
V_{IH}	HIGH-Level Input Voltage	Logic Input at VDD=1.8V	1.1	--	VDD	V
		Logic Input at VDD=3.3V	1.78	--	VDD	V
		Logic Input at VDD=5.0V	2.64	--	VDD	V
V_{IL}	LOW-Level Input Voltage	Logic Input at VDD=1.8V	0	--	0.69	V
		Logic Input at VDD=3.3V	0	--	1.21	V
		Logic Input at VDD=5.0V	0	--	1.84	V
V_{OH}	HIGH-Level Output Voltage	Push-Pull 1X, I_{OH}=100µA, at VDD=1.8V	1.68	1.79	--	V
		Push-Pull 1X, I_{OH}=3mA, at VDD=3.3V	2.71	3.09	--	V
		Push-Pull 1X, I_{OH}=5mA, at VDD=5.0V	4.15	4.73	--	V
V_{OL}	LOW-Level Output Voltage	Push-Pull 1X, I_{OL}=100µA, at VDD=1.8V	--	0.02	0.03	V
		Push-Pull 1X, I_{OL}=3mA, at VDD=3.3V	--	0.18	0.28	V
		Push-Pull 1X, I_{OL}=5mA, at VDD=5.0V	--	0.23	0.33	V

		Open Drain NMOS 1X, I_{OL}=100µA, at VDD=1.8V	--	0.01	0.02	V
		Open Drain NMOS 1X, I_{OL}=3mA, at VDD=3.3V	--	0.09	0.13	V
		Open Drain NMOS 1X, I_{OL}=5mA, at VDD=5.0V	--	0.12	0.16	V
I_{OH}	HIGH-Level Output Current (Note 1)	Push-Pull 1X, V_{OH}=VDD-0.2V, at VDD=1.8V	1.04	1.4	--	mA
		Push-Pull 1X, V_{OH}=2.4V, at VDD=3.3V	5.83	10.18	--	mA
		Push-Pull 1X, V_{OH}=2.4V, at VDD=5.0V	21.808	29.1	--	mA
I_{OL}	LOW-Level Output Current (Note 1)	Push-Pull 1X, V_{OL}=0.15V, at VDD=1.8V	0.76	1.34	--	mA
		Push-Pull 1X, V_{OL}=0.4V, at VDD=3.3V	4.06	6.44	--	mA
		Push-Pull 1X, V_{OL}=0.4V, at VDD=5.0V	6.01	9.73	--	mA
		Open Drain NMOS 1X, V_{OL}=0.15V, at VDD=1.8V	1.53	2.67	--	mA
		Open Drain NMOS 1X, V_{OL}=0.4V, at VDD=3.3V	8.13	12.41	--	mA
		Open Drain NMOS 1X, V_{OL}=0.4V, at VDD=5.0V	11.76	19.46	--	mA
T_{DLY0}	Delay0 Time	At temperature 25°C	14.34	15.02	16.36	s
		At temperature -40 +125°C (Note 3)	13.45	15.02	19.14	s
T_{DLY2}	Delay2 Time	At temperature 25°C	4.78	5.01	5.31	s
		At temperature -40 +125°C (Note 3)	4.49	5.01	6.21	s
T_{DLY3}	Delay3 Time	At temperature 25°C	286.8	300.1	317.9	ms
		At temperature -40 +125°C (Note 3)	269.1	300.1	372.0	ms
T_{CNT1}	Counter1 Period	At temperature 25°C	95.6	99.8	108.3	ms
		At temperature -40 +125°C (Note 3)	89.7	99.8	126.7	ms
T_{SU}	Startup Time	From VDD rising past 1.35 V	--	0.27	--	ms
PON_{THR}	Power On Threshold	V_{DD} Level Required to Start Up the Chip	1.182	1.346	1.505	V
$POFF_{THR}$	Power Off Threshold	V_{DD} Level Required to Switch Off the Chip	0.752	0.918	1.11	V

Note:
1. DC or average current through any pin should not exceed value given in Absolute Maximum Conditions.
2. The GreenPAK's power rails are divided in two sides. Pins 2, 3, 4 and 6 are connected to one side, pins 8, 9, 10 and 12 to another.
3. Guaranteed by Design.

Functionality Waveforms

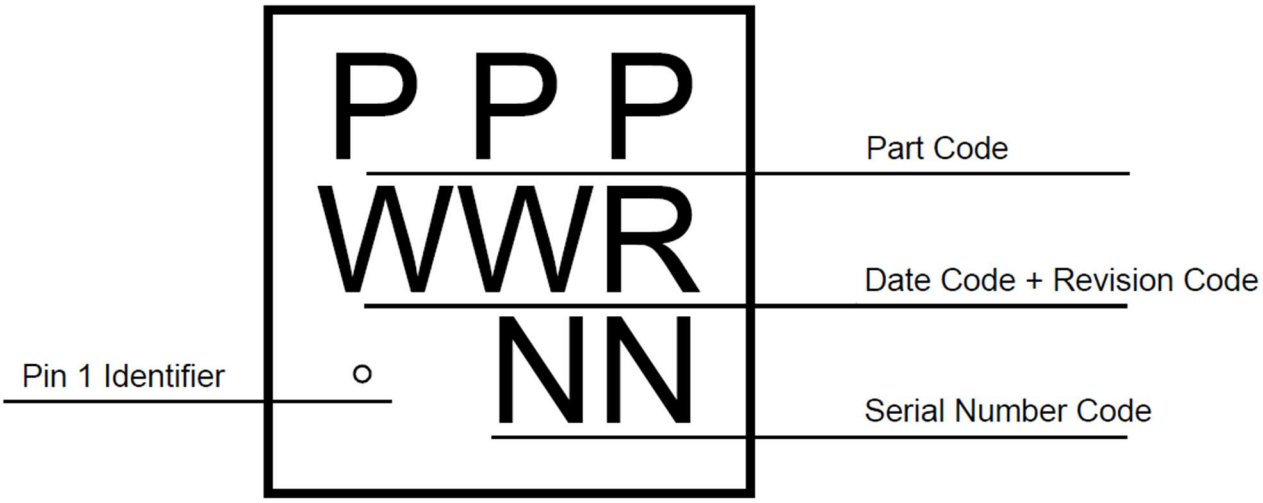
D0 – PIN#2 (BUTTON_1)
D1 – PIN#3 (BUTTON_2)
D2 – PIN#4 (BUTTON_3)
D3 – PIN#6 (ISP0)
D4 – PIN#8 (ISP1) with external 5kΩ pull up resistor
D5 – PIN#9 (ISP2)
D6 – PIN#10 (QON_L) with external 5kΩ pull up resistor
D7 – PIN#12 (RT_RESET_L) with external 5kΩ pull up resistor

1. The main design functionality for the Power Cycle

2. The main design functionality for the Serial DFU

3. Zoomed WF#2

Package Top Marking

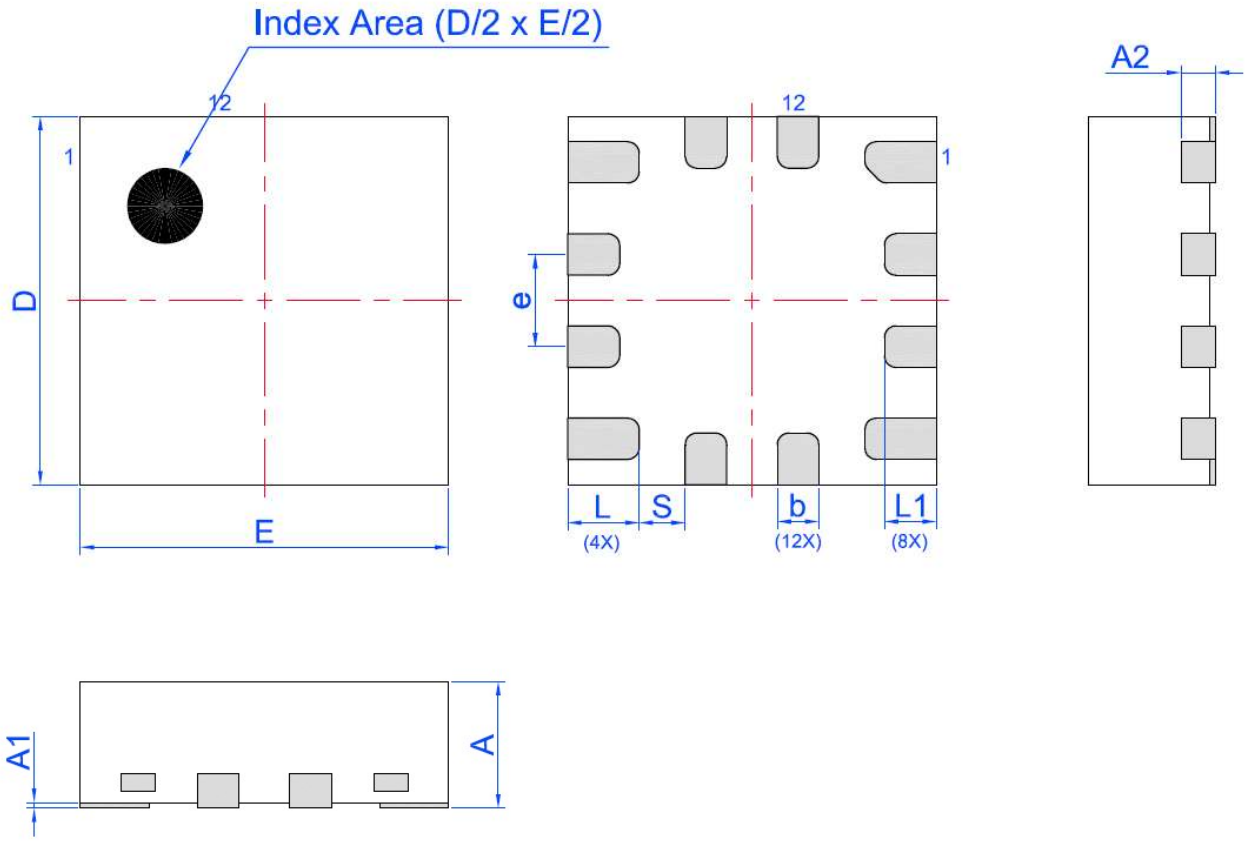


Datasheet Revision	Programming Code Number	Lock Status	Checksum	Part Code	Revision	Date
0.10	001	U	0xC60CCE74			05/06/2022

The IC security bit is locked/set for code security for production unless otherwise specified. The Programming Code Number is not changed based on the choice of locked vs. unlocked status.

Package Drawing and Dimensions

12 Lead STQFN FC Package 1.6 x 1.6 mm
IC net weight: 0.0028 g



Unit: mm

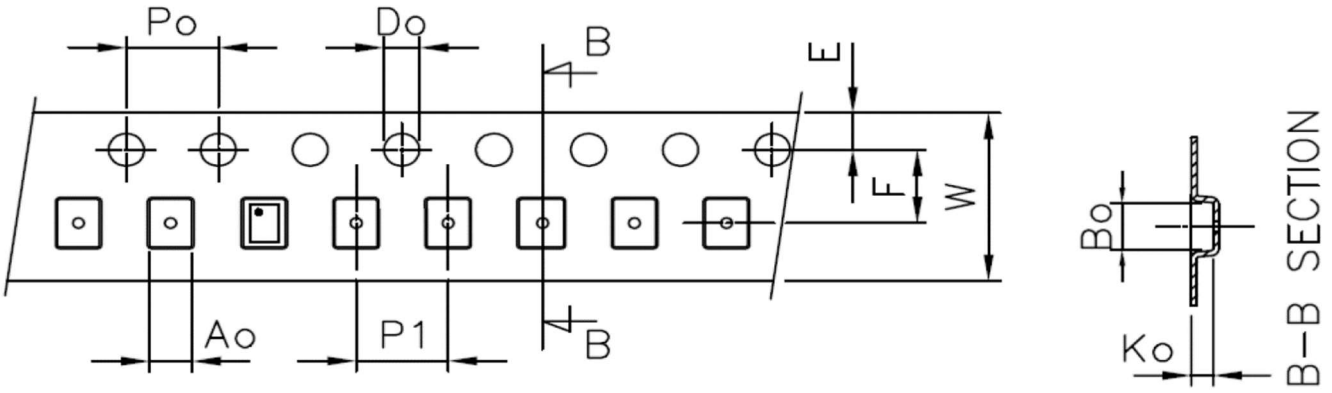
Symbol	Min	Nom.	Max	Symbol	Min	Nom.	Max
A	0.50	0.55	0.60	D	1.55	1.60	1.65
A1	0.005	-	0.060	E	1.55	1.60	1.65
A2	0.10	0.15	0.20	L	0.26	0.31	0.36
b	0.13	0.18	0.23	L1	0.175	0.225	0.275
e	0.40 BSC			S	0.2 REF		

Tape and Reel Specification

Package Type	# of Pins	Nominal Package Size [mm]	Max Units		Reel & Hub Size [mm]	Leader (min)		Trailer (min)		Tape Width [mm]	Part Pitch [mm]
			per Reel	per Box		Pockets	Length [mm]	Pockets	Length [mm]		
STQFN 12L FC 0.4P Green	12	1.6x1.6x0.55	3000	3000	178/60	100	400	100	400	8	4

Carrier Tape Drawing and Dimensions

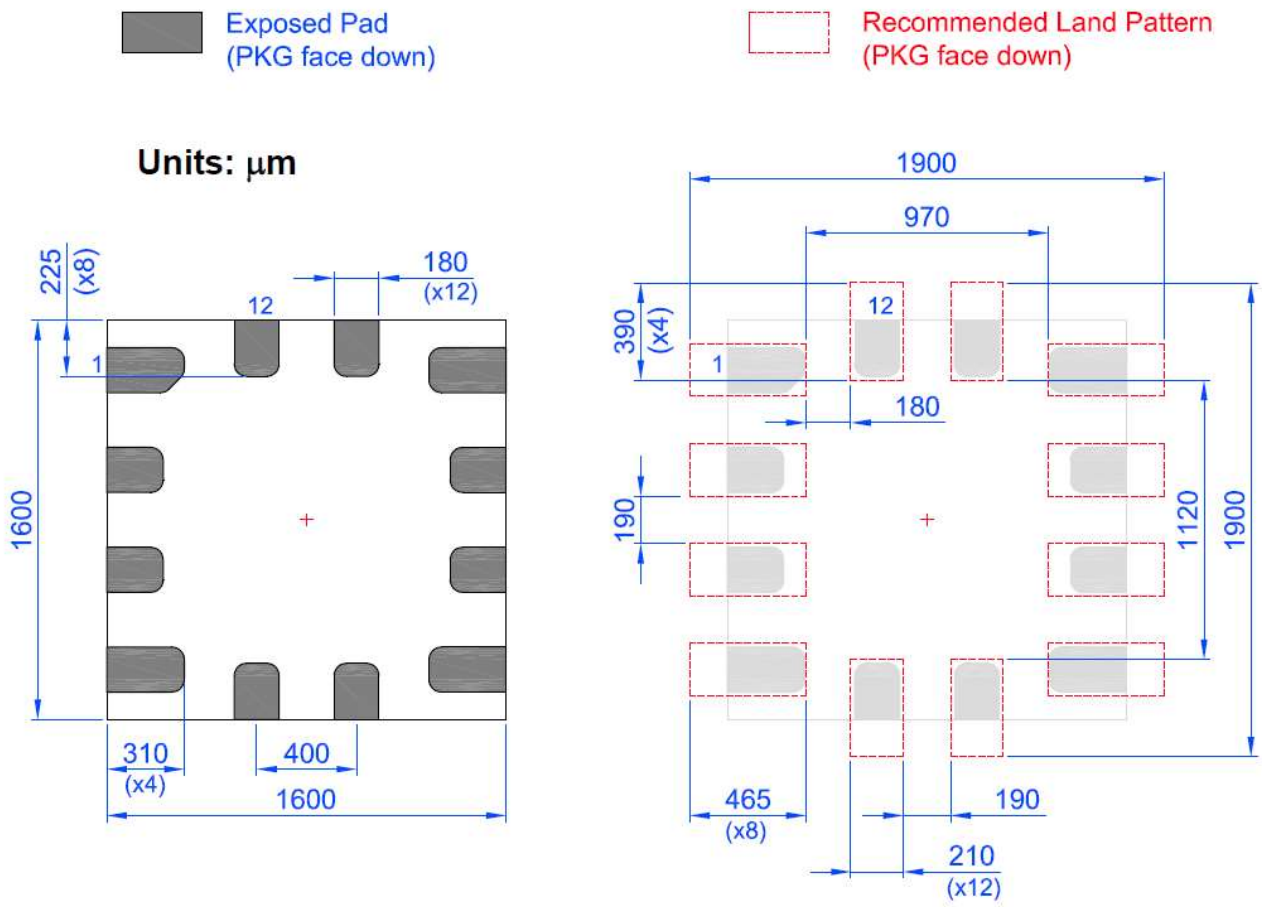
Package Type	Pocket BTM Length	Pocket BTM Width	Pocket Depth	Index Hole Pitch	Pocket Pitch	Index Hole Diameter	Index Hole to Tape Edge	Index Hole to Pocket Center	Tape Width
	A0	B0	K0	P0	P1	D0	E	F	W
STQFN 12L FC 0.4P Green	1.8±0.05	1.8±0.05	±0.7	4	4	1.5	1.75	3.5	8



Recommended Reflow Soldering Profile

Please see IPC/JEDEC J-STD-020: latest revision for reflow profile based on package volume of 1.408 mm^3 (nominal). More information can be found at www.jedec.org.

Recommended Land Pattern



Datasheet Revision History

Date	Version	Change
05/06/2022	0.10	New design for SLG46110 chip

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