Evaluation board for L9678 airbag and battery cut-off IC

Introduction

The L9678-S-EVB evaluation board is an evaluation board designed to provide to the user a platform for the evaluation of the L9678P or L9678P-S devices. The board provides all the main input/output capabilities needed to properly drive all IC inputs and outputs and to provide diagnostic functionalities.

1 Hardware description

The L9678-S-EVB evaluation board has been developed to evaluate the L9678P or L9678P-S devices and test all their functionalities.

Its main features are:

- L9678P/L9678P-S placed into a socket allowing an easy change of the samples
- Possibility to solder L9678P/L9678P-S directly on the PCB
- Total accessibility to all pins through test points
- Presence of jumpers to fix the desired set up configuration
- Possibility to interface the board with SPC56P-Discovery board

Figure 1. L9678-S-EVB evaluation board

2 Board layout

Figure 2. **Assembly Top**

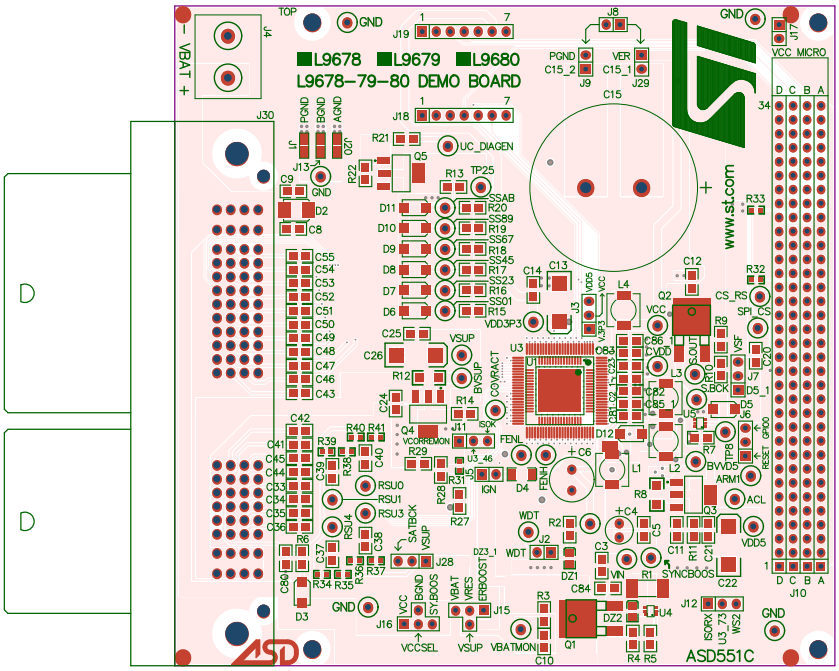
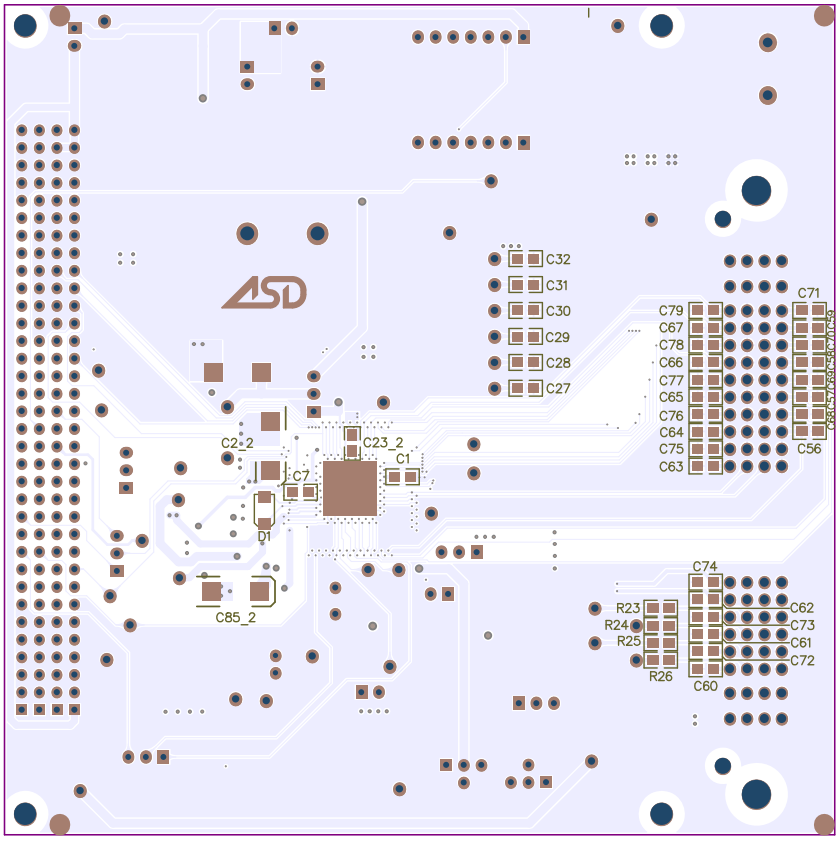


Figure 3. **Assembly Bottom**



3 Jumpers and connectors description

On Table 1 the name of each jumper on the board is listed while their default setting (closed or open) is reported in green; the name of the connectors and test points present on the board is also remarked.

Table 1. Jumpers and connectors description

#	Name	J = Jumper C = Connector	Function	Closed	Open
J1	PGND	J	Connection of PGND to GND	Power ground connected to common ground(1)	-
J2	WDT	J	To disable the watchdog timer	Watchdog disabled	Watchdog enabled(1)
J3		J	To set VCC to 5 V or to 3.3 V	1-2 closed: VCC connected to VDD3V3 2-3 closed: VCC connected to VDD5(1)	-
J4	VBAT	C	Battery voltage	-	-
J5	IGN	J	To wake-up the device	Device waked-up(1)	Device not waked-up
J6		J	Connection of L9678 RESET pin to GPIO or RESET pin of µC	1-2 closed: RESET_L96xx connected to uC RESET pin 2-3 closed: RESET_L96xx connected to µC GPIO0 pin	-
J7	SAFING INPUT	J	Connection of safing FET gate to VSF directly or through MUN5332DW	1-2 closed: safing FET enabled via uC 2-3 closed: safing FET always enabled	Safing FET disabled
J8		J	To discharge the ER capacitor	ER capacitor shorted to ground	ER capacitor charged(1)
J9		J	To connect the ER cap negative to ground	Cap negative connected to ground(1)	Cap negative not connected to ground
J10	HEADER34X4	C	To connect the L9678 demo board to discovery board	-	-
J11		J	To connect ISOK bus	2-3 closed: ISO bus enabled(1)	-
J12		J	Not used for L9678		-
J13	BGND	J	Connection of BGND to GND	Boost ground connected to common ground(1)	-
J15		J	Reserve voltage diagnostic (VRES)	VRES can be connected to ERBOOST, VBAT or VSUP	Reserve voltage is not diagnosed
J16		J	Not used for L9678		
J17		J	Connection of VCC to VCC_Micro	VCC connected to VCC_Micro	VCC and VCC_Micro disconnected(1)
J18		C	SPI interface connector	-	-
J19		C	SPI interface connector	-	-
J20	AGND	J	Connection of AGND to GND	Analog ground connected to common ground(1)	-
J28		J	RSU power supply	1-2 closed: RSU power supply connected to VSUP(1) 2-3 closed: not used for L9678	No RSU power supply

#	Name	J = Jumper C = Connector	Function	Closed	Open
J29		J	To connect the ER cap positive to VER	Cap positive connected to VER(1)	Cap positive not connected to VER
J30		C	Airbag standard connector	-	-

1. *Default condition.*

4 Test point list

Designator	Name	Function
TP1	FENH	FENH monitoring
TP2	FENL	FENL monitoring
TP3	COVRACT	COVRACT monitoring
TP4	ACL	ACL monitoring
TP5	ARM1	ARM/ARM1 monitoring
TP6	WDT	WDT monitoring
TP7	ERBOOST	ERBOOST monitoring
TP8	uc_SAFING	Monitoring of µC safing FET enable
TP9		VIN monitoring
TP10	VDD3P3	VDD3P3 monitoring
TP11	BVSUP	BVSUP monitoring
TP12	SAFING OUTPUT	SAFING OUTPUT monitoring
TP13	VSUP	VSUP monitoring
TP14	SS01	SS01 monitoring
TP15	SS23	SS23 monitoring
TP16	SS45	SS45 monitoring
TP17	SS67	SS67 monitoring
TP18	SS89	SS89 monitoring
TP19	SSAB	SSAB monitoring
TP20		CVDD monitoring
TP21		VBATMON monitoring
TP22	BVVD5	BVVD5
TP23	VDD5	VDD5 monitoring
TP24		SYNCBOOST monitoring (only L9679/80)
TP25		Monitoring of Q5 collector voltage
TP26		Monitoring of µC diagnostic enable
TP27		SATBCK monitoring
TP28		VCC monitoring
TP29		RSU4 monitoring
TP30		RSU3 monitoring
TP31		RSU1 monitoring
TP32		RSU0 monitoring
TP33	GND	GND monitoring
TP34	CS_RS	CS_RS monitoring (only L9680)
TP35	SPI_CS	SPI CS monitoring (only L9679/80)
TP36	GND	GND monitoring
TP37	GND	GND monitoring
TP38	GND	GND monitoring

Designator	Name	Function
TP39	GND	GND monitoring

Revision history

Table 2. **Document revision history**

Date	Version	Changes
02-Mar-2023	1	Initial release.

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