

PRODUCT CHANGE NOTICE

**Data Sheet Specification
Change for Intersil Product
ISL78600ANZ***

**Refer to:
PCN15003**

Date: January 19, 2015

January 19, 2015

To: Our Valued Intersil Customers

Subject: **Data Sheet Specification Change for Intersil Product ISL78600ANZ***

This notice is to inform you that Intersil has changed the data sheet specification for the ISL78600ANZ* products. The change involves multiple changes to the electrical table along with additional clarification of product operation on this complex device. The change aligns the data sheet with the product characteristics and is necessary to maintain product manufacturability in support of customer delivery requirements. Details regarding the change are contained on the following pages. The updated data sheet is available upon request, please send your request by email to: Automotive@intersil.com.

Products affected: ISL78600ANZ ISL78600ANZ-T

There have been no changes to the die/silicon or product itself. There will be no change in the external marking of the packaged parts.

Intersil will take all necessary actions to conform to agreed upon customer requirements and to ensure the continued high quality and reliability of Intersil products being supplied. Customers may expect to receive product electrically screened to the revised data sheet beginning *ninety* days from the date of this notification or earlier with approval.

If you have concerns with this advisory, Intersil must hear from you promptly. Please contact the nearest Intersil Sales Office or call the Intersil Corporate line at 1-888-468-3774, in the United States, or 1-321-724-7143 outside of the United States.

Regards,



Jeffrey Touvell

Intersil Corporation

PCN15003

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PCN15003 Data Sheet Change

Original:

ESD Rating	
Human Body Model (Tested per JESD22-A114F)	2kV
Machine Model (Tested per JESD22A115-A)	200V
Capacitive Discharge Model (Tested per JESD22-C101D)	750V
Latch Up (Tested per JESD-78B; Class 2, Level A)	100mA

Recommended Operating Conditions

T _A , Ambient Temperature Range	-40°C to +105°C
V _{BAT}	6V to 60V
V _{BAT} (Daisy Chain Operation)	10V to 60V
V _{Cn} (for n = 1 to 12)	V(VCn-1) to V(VCn-1) + 5V
V _{CO}	-0.1V to 0.1V
CBn (for n = 1 to 9)	V(VCn-1) to V(VCn-1) + 9V
CBn (for n = 10 to 12)	V(VCn) -9V to V(VCn)
DIN, SCLK, CS, DOUT, Data Ready, Comms Select 1, Comms Select 2, ExT1, ExT2, ExT3, ExT4, TEMPREG, REF, V3P3, VCC, Fault, Comms Rate 0, Comms Rate 1, EN, VDDEXT	0V to 3.6V

New:

ESD Rating	
Human Body Model (Tested per JESD22-A114F)	2kV
Capacitive Discharge Model (Tested per JESD22-C101D)	500V
Latch-up (Tested per JESD-78B; Class 2, Level A)	100mA

Recommended Operating Conditions

T _A , Ambient Temperature Range	-40°C to +105°C
V _{BAT}	6V to 60V
V _{BAT} (Daisy Chain Operation)	10V to 60V
V _{Cn} (for n = 1 to 12)	V(VCn-1) to V(VCn-1) + 5V
V _{CO}	-0.1V to 0.1V
CBn (for n = 1 to 9)	V(VCn-1) to V(VCn-1) + 9V
CBn (for n = 10 to 12)	V(VCn) -9V to V(VCn)
DIN, SCLK, CS, COMMS SELECT 1, COMMS SELECT 2, V3P3, VCC, COMMS RATE 0, COMMS RATE 1, EN,	0V to 3.6V
ExT1, ExT2, ExT3, ExT4	0V to 2.5V

Electrical Specifications $V_{BAT} = 6$ to $60V$, $T_A = -20^{\circ}C$ to $+60^{\circ}C$, unless otherwise specified. Biasing setup as in [Figure 56 on page 84](#) or equivalent.

				New				Original			
PARAMETER	SYMBOL	TEST CONDITIONS		MIN (Note 7)	TYP	MAX (Note 7)	UNIT	MIN (Note 7)	TYP	MAX (Note 7)	UNIT
VBAT Supply Current	IVBAT	Non Daisy Chain configuration. Device enabled. No communications, ADC, measurement, balancing or open wire detection activity.	6V	7	35	80	μA	15	35	60	μA
			39.6V	0	64	241	μA	15	64	150	μA
			60V	0	90	250	μA	15	90	160	μA
		-40 °C to +105 °C (Note 9)		0		280	μA			200	μA
	IVBATMID	Daisy Chain configuration – mid stack device. Enabled. No communications, ADC, measurement, balancing or open wire detection activity.	6V	700	1020	1210	μA	700	1020	1200	μA
			39.6V	900	1250	1560	μA	900	1250	1500	μA
			60V	1000	1400	1700	μA	1000	1400	1700	μA
		-40 °C to +105 °C (Note 9)				1850	μA			1850	μA
		Peak current when Daisy Chain transmitting			18		mA		18		mA
	IVBATSLEEP2 (Note 9)	Sleep mode (EN = 1, Stand-alone, non-Daisy Chain)		3.5	8	16	μA	5	8	14	μA
		40 °C to +105 °C		3		70	μA	5		23	μA
	IVBATSHDN (Note 9)	Shutdown. device “off” (EN = 0) (Daisy Chain and Non-Daisy Chain configurations)		1.5	7	15.5	μA	5	7	14	μA
			39.6V	3	7	18	μA	N/A	N/A	N/A	μA
			60V	5	7	23	μA	N/A	N/A	N/A	μA
		-40 °C to +105 °C		1		77	μA	5		23	μA
VCC Supply Current	IVCC	Device enabled (EN = 1). Stand-Alone or Daisy Configuration. No ADC or Daisy Chain communications active.		2.0	3.25	4.5	mA	2.0	3.25	4.5	mA
		-40 °C to +105 °C (Note 9)		2.0		5.0	mA	2.0		5.0	mA
	IVCCSHDN	Device disabled (EN = 0). Shutdown mode.		0	1.2	4.1	μA	0	1.2	3.5	μA
		-40 °C to +105 °C (Note 9)				9.0	μA			9.0	μA

			New				Original			
PARAMETER	SYMBOL	TEST CONDITIONS	MIN (Note 7)	TYP	MAX (Note 7)	UNIT	MIN (Note 7)	TYP	MAX (Note 7)	UNIT
MEASUREMENT SPECIFICATIONS										
Cell Input Current. Note: Cell accuracy figures assume a fixed 1k Ω resistor is placed in series with each VCn pin (n = 0 to 12)	I _{VCCELL}	VC0 input VC0 $\geq$ 0.5 and VC0 $\leq$ 4.0V	-1.5	-1	-0.5	μ A	-1.5	-1	-0.5	μ A
		VC0 > 4.0V	-1.75		-0.5	μ A	-1.75		-0.5	μ A
		-40°C to +105°C (Note 9)	-2.0	-1	-0.5	μ A	-2.0	-1	-0.5	μ A
		VC1, VC2, VC3 inputs VCn - VC(n-1) $\geq$ 0.5 and VCn-VC(n-1) $\leq$ 4.0V	-2.7	-2	-1.3	μ A	-2.7	-2	-1.3	μ A
		VCn - VC(n-1) > 4.0V	-2.85		-1.0	μ A	-2.85		-1.0	μ A
		-40°C to +105°C (Note 9)	-3.0	-2	-0.84	μ A	-3.0	-2	-1.0	μ A
		VC4 input VCn - VC(n-1) $\geq$ 0.5 and VCn-VC(n-1) $\leq$ 4.0V	-0.6	0	0.71	μ A	-0.6	0	0.6	μ A
		VCn - VC(n-1) > 4.0V	-0.8		1.15	μ A	-0.7		0.85	μ A
		-40°C to +105°C (Note 9)	-0.84	0	1.31	μ A	-0.8	0	0.95	μ A
		VC5, VC6, VC7, VC8, VC9, VC10, VC11 inputs VCn - VC(n-1) < 2.6V	0.5	2	2.7	μ A	0.5	2	2.7	μ A
		VCn - VC(n-1) $\geq$ 2.6V and VCn-VC(n-1) $\leq$ 4.0V	1.32	2	2.89	μ A	1.5	2	2.7	μ A
		VCn - VC(n-1) > 4.0V	1.16	2	3.33	μ A	1.5	2	3.1	μ A
		-40°C to +105°C (Note 9)	0.5	2	3.43	μ A	0.5	2	3.25	μ A
		VC12 input VC12 - VC11 $\geq$ 0.5 and VC12-VC11 $\leq$ 4.0V	0.37	1	1.85	μ A	0.6	1	1.7	μ A
		VC12 - VC11 > 4.0V	0.19		2.3	μ A	0.6		2.05	μ A
		-40°C to +105°C (Note 9)	0.15	1	2.47	μ A	0.6	1	2.3	μ A
Initial V _{BAT} monitor Voltage Error (Note 10)	Δ V _{BAT}	Measured at V _{BAT} = 36V to 43.2V	-100		100	mV	-100		100	mV
		Measured at V _{BAT} = 31.2V to 48V	-125		125	mV	-125		125	mV
		Measured at V _{BAT} = 31.2V to 59.4V	-250		250	mV	-250		250	mV
		Measured at V _{BAT} = 6V to 59.4V	-320		332	mV	-300		300	mV
		Measured at V _{BAT} = 6V to 59.4V -40°C to +105°C (Note 9)	-490		490	mV	-490		490	mV

			New				Original			
PARAMETER	SYMBOL	TEST CONDITIONS	MIN (Note 7)	TYP	MAX (Note 7)	UNIT	MIN (Note 7)	TYP	MAX (Note 7)	UNIT
External Temperature Input Gain Error	V _{EXTG}	Error at 2.5V input	-7.5		11	mV	-7.5		11.0	mV
		-40 °C to +105 °C (Note 9)	-13.4		19.3	mV	-8		18.5	mV
FAULT DETECTION SYSTEM SPECIFICATIONS										
V2P5 Power-good Window	V _{2PH}	2.5V power-good window high threshold. V _{BAT} = 39.6V	2.62	2.7	2.766	V	2.55	2.7	2.9	V
		-40 °C to +105 °C (These MIN and/or MAX values are based on characterization data and are not 100% tested.)	2.616		2.77	V	2.55		2.9	V
V _{REF} Power-Good Window	V _{RPH}	V _{REF} Power-good window high threshold. V _{BAT} = 39.6V	2.525	2.7	2.9	V	2.525	2.7	2.9	V
		V _{BAT} = 39.6V; -40 °C to +105 °C (Note 9)	2.525		2.9	V	2.525		2.9	V
	V _{RPL}	V _{REF} Power-good window low threshold. V _{BAT} = 39.6V	2.15	2.30	2.465	V	2.15	2.30	2.46	V
		V _{BAT} = 39.6V; -40 °C to +105 °C (Note 9)	2.0		2.5	V	2.0		2.5	V
V _{REF} Reference Accuracy Test	V _{RACC}	V _{REF} value calculated using stored coefficients. V _{BAT} = 39.6V (See “Voltage Reference Check Calculation” on page 88.)		2.500		V	2.488	2.500	2.512	V
		V _{BAT} = 39.6V; -40 °C (Note 9)					2.488		2.512	V
		V _{BAT} = 39.6V; +85 °C (Note 9)					2.4849		2.5172	V
		V _{BAT} = 39.6V; +105 °C (Note 9)					2.4692		2.5273	V
CELL BALANCE OUTPUT SPECIFICATIONS										
Internal Cell Balance Output Clamp	VCBCL	I _{CB} = 100µA.	8.94			V	9.0			V

Notes:

- Compliance to datasheet limits is assured by one or more methods: production test, characterization and/or design.
- Scan and Measurement start times are synchronised by the receiver to the falling edge of the 24th clock pulse (Daisy Chain systems) or to the falling edge of the 16th clock pulse (non-Daisy Chain, single device systems) of the Scan or Measure command. Clock pulses are at the SCLK pin for Master and Stand-alone devices, and at the DH_i/DLo₁ pins for middle and Top Daisy Chain devices. Max values are based on characterization of the internal clock and are not 100% tested.
- These MIN and/or MAX values are based on characterization data and are not 100% tested.
- ~~Biasing setup as in Figure 55 on page 84 or equivalent.~~
- Stresses may be induced in the ISL78600 during soldering or other high temperature events that affect measurement accuracy. Initial accuracy does not include effects due to this. See Figure 4B for cell reading accuracy obtained after soldering to Intersil evaluation boards. When soldering the ISL78600 to a customized circuit board with a layout or construction significantly differing from the Intersil evaluation board, design verification tests should be applied to determine drift due to soldering and over lifetime.

