2105181043 Si828x Version 2 Silicon Revision

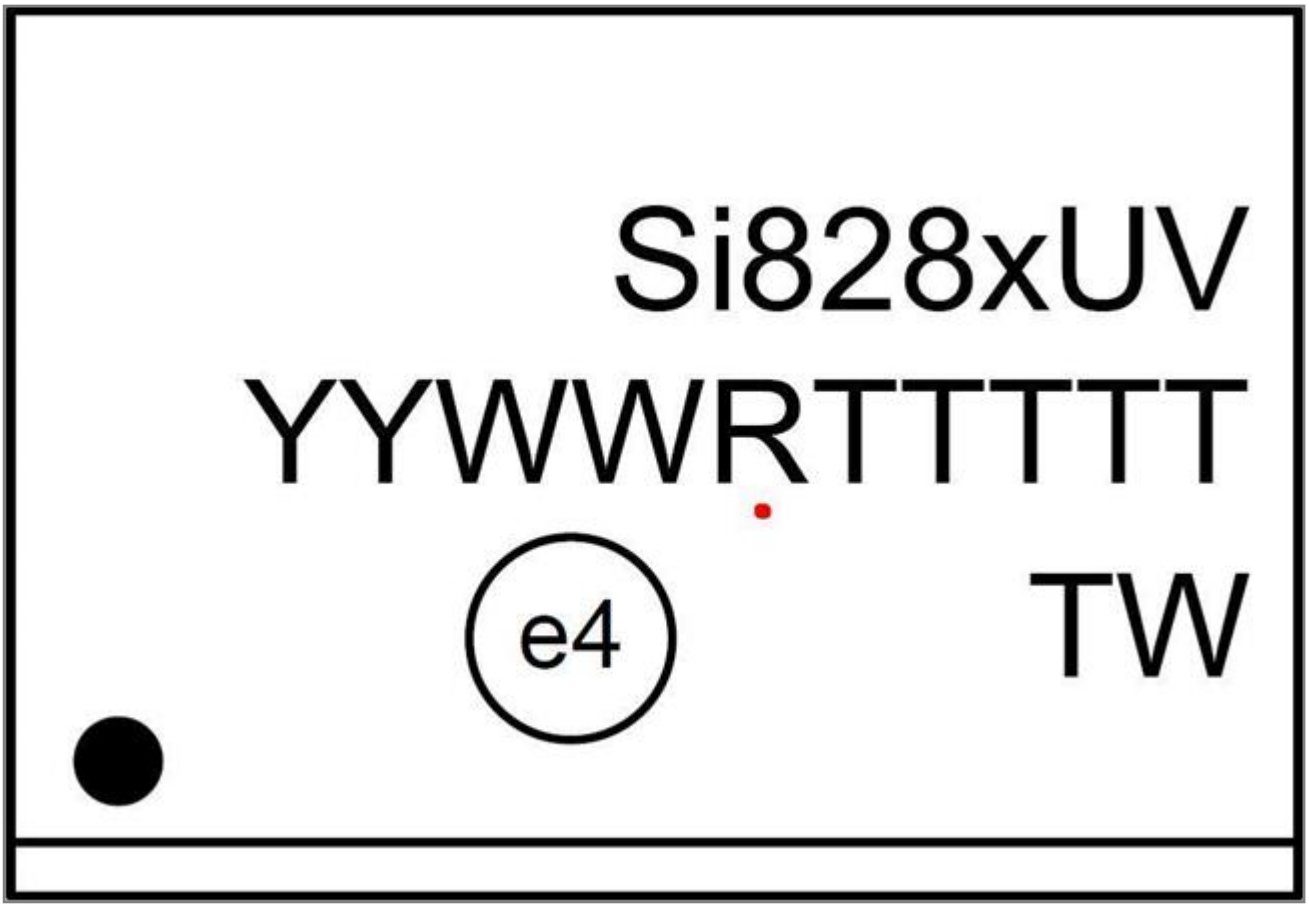
PRCN Issue Date: May 18, 2021 **Effective Date:** Aug 24, 2021

PCN Type: Product Revision

Description of Change

Silicon Labs is pleased to announce hardware version 2 of the Si828x SiC FET-Ready ISODrivers and revision 2.0 of the corresponding datasheet for these products.

Please note the identification of the revised devices. In the device topside marking, the first character ("R") in the "RTTTTT" field is "D" for Industrial Grade and "Q" for Automotive Grade of the new revision.



Note: After the effective date of the PRCN, Silicon Labs reserves the right not to accept orders for the old revision.

Reason for Change

The Si828x version 2 provides improvements that make it more relevant for SiC FET gate drive applications, including improved common mode transient immunity (CMTI) and additional undervoltage lockout (UVLO) voltages, in addition to being fully backwards compatible for IGBTs.

Several datasheet parameters have been updated and are documented in the new v2.0 datasheet. Please review the datasheet thoroughly when assessing the impact of this Product Revision on your design.

Refer to the Revision History section of the v2.0 datasheet for additional summaries of document changes. Among the parameters adjusted are the following:

Parameter Name	Symbol	Previous		New		Change Type	Reason
		Minimum	Maximum	Minimum	Maximum		
Common Mode Transient Immunity	CMTI	35kV/µs		125kV/µs		Improvement	Better noise immunity for fast-switching SiC FETs
High Drive Peak Output Current	IOH	2.5A		2.0A		Recharacterization	Improved peak current test methodology demonstrated lower IOH
Low Drive Peak Output Current	IOL	3.0A		4.1A		Recharacterization	Improved peak current test methodology demonstrated higher IOL
DESAT Threshold	VDESAT	6.5V	7.3V	6.25V	7.4V	Recharacterization	More correctly specify VDESAT
DESAT Sense to 90% VH Delay	tDESAT(90%)	--	300ns	--	350ns	Recharacterization	Test conditions clarified and spec revised
DESAT Sense to 10% VH Delay	tDESAT(10%)	0.7µs	2.7µs	--	2.3µs	Recharacterization	Test conditions clarified and spec revised
Reset to FLT High Delay	tRST to FLT	--	45ns	--	350ns	Improvement	Deglitch filter added to RST pin to improve noise immunity; impacts FLT indication time
Safety Temperature	TS	--	150°C		140°C	Respecification	Process parameters clarified
IC Junction-to-Air Thermal Resistance	θJA		60 °C/W		74 °C/W	Recharacterization	Packaging model updated

Impact on Form, Fit, Function, Quality, Reliability

The version 2 is a pin compatible, drop-in replacement for the version 1 devices with improved CMTI with no adverse impact on form, fit, function, or reliability of the devices.

The Si828x Industrial Grade does not fully comply to AEC-Q100 qualification requirements. However, Automotive grade components are available which support AEC-Q100 qualification requirements--please contact Silicon Labs for details.

Product Identification

Existing Part #	Replacement Part #	DropInCompInd.
Si8281BC-IS	Si8281BC-IS	YES
Si8281BD-IS	Si8281BD-IS	YES
Si8281CC-IS	Si8281CC-IS	YES
Si8281CD-IS	Si8281CD-IS	YES
Si8282BC-IS	Si8282BC-IS	YES
Si8282BD-IS	Si8282BD-IS	YES
Si8282CC-IS	Si8282CC-IS	YES
Si8282CD-IS	Si8282CD-IS	YES
Si8283BC-IS	Si8283BC-IS	YES
Si8283BD-IS	Si8283BD-IS	YES
Si8283CC-IS	Si8283CC-IS	YES
Si8283CD-IS	Si8283CD-IS	YES
Si8284BC-IS	Si8284BC-IS	YES
Si8284BD-IS	Si8284BD-IS	YES
Si8284CC-IS	Si8284CC-IS	YES
Si8284CD-IS	Si8284CD-IS	YES
Si8285BC-IS	Si8285BC-IS	YES
Si8285BD-IS	Si8285BD-IS	YES
Si8285CC-IS	Si8285CC-IS	YES
Si8285CD-IS	Si8285CD-IS	YES
Si8286BC-IS	Si8286BC-IS	YES
Si8286BD-IS	Si8286BD-IS	YES
Si8286CC-IS	Si8286CC-IS	YES
Si8286CD-IS	Si8286CD-IS	YES

Kit Identification

Kits impacted by the above product are listed below.
Orders for the following obsolete kits will no longer be accepted.

Existing Kit #	Replacement Kit #
SI8284-KIT	SI8284V2-KIT

Last Date of Unchanged Product: Aug 24, 2021

Qualification Samples

All OPNs available

Customer Response

Lack of acknowledgment of the PCN within 30 days constitutes acceptance of the change, Ref. JEDEC-J-STD-046.

To request further data or inquire about this notification, please contact your Silicon Labs sales representative. A list of Silicon Labs sales representatives is available at http://www.silabs.com.

Customers may approve early PCN acceptance by emailing approval, along with PCN # to PCNEarlyAcceptance@silabs.com

User Registration

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Qualification Data

See attached Qualification Report.

Si828x AEC-Q100 Qualification Report

Part Rev D, Vanguard Fabrication, ASECL Assembly except as noted							
Test Name	Test Condition	Qualification	Lot ID or Start	Fail/Pass or End	Notes	Summary	Status
Test Group A – Accelerated Environment Stress Tests - 24-Pin WB SOIC							
HAST	JA110		Q040569	0/80	1		
	130°C, 85%RH	3 lots, N=>77	Q040871	0/80	1	3 lots	Pass
	Vcc=5.5V, 96 hours		Q040872	0/80	1	0/240	
UHAST	JA110		Q040629	0/80	1		
	130°C, 85%RH	3 lots, N=>77	Q040873	0/80	1	3 lots	Pass
	96 hours		Q040874	0/80	1	0/240	
Temp Cycle	JA104		Q040875	0/80	1		
	Cond C: -65°C to 150°C	3 lots, N=>77	Q040630	0/80	1	3 lots	Pass
	500 cycles		Q040876	0/80	1	0/240	
HTSL	JA103		Q038795	0/46	1		
	150°C, 1000hr	1 lot, N=>45	Q040877	0/46	1	3 lots	Pass
			Q040878	0/46	1	0/138	
Test Group A – Accelerated Environment Stress Tests - 20-Pin WB SOIC							
HAST	JA110		Q037147	0/78	1, 2		
	130°C, 85%RH	3 lots, N=>77	Q040787	0/80	1, 2	3 lots	Pass
	Vcc=5.5V, 96 hours		Q040785	0/80	1, 2	0/238	
UHAST	JA110		Q037148	0/78	1, 2		
	130°C, 85%RH	3 lots, N=>77	Q040786	0/80	1, 2	3 lots	Pass
	96 hours		Q040784	0/80	1, 2	0/238	
Temp Cycle	JA104		Q046039	0/80	1		
	Cond C: -65°C to 150°C	3 lots, N=>77	Q040730	0/80	1, 2	3 lots	Pass
	500 cycles		Q040731	0/80	1, 2	0/240	
HTSL	JA103		Q036594	0/80	1, 2		
	150°C, 1000hr	1 lot, N=>45	Q040877	0/46	1, 2	3 lots	Pass
			Q040878	0/46	1, 2	0/172	

Prepared on: 17-May-2021 by N. Arguello

Si828x AEC-Q100 Qualification Report

Part Rev D, Vanguard Fabrication, ASECL Assembly except as noted							
Test Name	Test Condition	Qualification	Lot ID or Start	Fail/Pass or End	Notes	Summary	Status
Test Group A – Accelerated Environment Stress Tests - 16-Pin WB SOIC							
HAST	JA110		Q037147	0/78	1, 2		
	130°C, 85%RH	3 lots, N=>77	Q040787	0/80	1, 2	3 lots	Pass
	Vcc=5.5V, 96 hours		Q040785	0/80	1, 2	0/238	
UHAST	JA110		Q037148	0/78	1, 2		
	130°C, 85%RH	3 lots, N=>77	Q040786	0/80	1, 2	3 lots	Pass
	96 hours		Q040784	0/80	1, 2	0/238	
Temp Cycle	JA104		Q040730	0/80	1, 2		
	Cond C: -65°C to 150°C	3 lots, N=>77	Q040730	0/80	1, 2	3 lots	Pass
	500 cycles		Q040731	0/80	1, 2	0/240	
HTSL	JA103		Q036594	0/80	1, 2		
	150°C, 1000hr	1 lot, N=>45	Q040877	0/46	1, 2	3 lots	Pass
			Q040878	0/46	1, 2	0/172	
Test Group B – Accelerated Lifetime Simulation Tests							
HTOL	JA108		Q038379	0/80			
	T_J ≥ 125°C, Dynamic	3 lots, N=>77	Q041697	0/90		3 lots	Pass
	Vcc=5.5V, 1000 hours		Q042614	0/80		0/250	
LTOL	JA108						
	-10°C, Dynamic	1 lot, N=>77	Q027145	0/80	3	1 lots	Pass
	Vcc=5.5V, 1000 hours					0/80	
ELFR	AEC-Q100-008		Q047260	0/810			
	T_J ≥ 125°C, Dynamic	3 lots, N=>800	Q042775	0/808		4 lots	Pass
			Q042836	0/810		0/3237	
	Vcc=5.5V, 48 hours		Q029753	0/809			

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Si828x AEC-Q100 Qualification Report

Part Rev D, Vanguard Fabrication, ASECL Assembly except as noted

Test Name	Test Condition	Qualification	Lot ID or Start	Fail/Pass or End	Notes	Summary	Status
Test Group C – Package Assembly Integrity Tests - 16-Pin NB SOIC							
Wire Bond Shear	AEC-Q100-001	5 units, N=>30	723163 721178 388268	0/5 0/5 0/5		3 lots 0/15	Pass
Wire Bond Pull	M-STD-883 Performed post-TC	5 units, N=>30	798488 798489 798490	0/5 0/5 0/5		3 lots 0/15	Pass
Physical Dimensions	JB100 24-Pin WB (300mil)	3 lots, N=>10	798488 798489 798490	0/30 0/30 0/30		3 lots 0/90	Pass
Physical Dimensions	JB100 20-Pin WB (300mil)	3 lots, N=>10	725151 725150 709393	0/30 0/30 0/30		3 lots 0/90	Pass
Physical Dimensions	JB100 16-Pin WB (300mil)	3 lots, N=>10	723163 721178 388268	0/30 0/30 0/30		3 lots 0/90	Pass
Solderability	JB102	1 lot, N=>15	798488 798489 798490	0/10 0/10 0/10		3 lots 0/30	Pass
Test Group E – Electrical Verification							
ESD-HBM	AEC-Q100-002	1 lot, N=>3	Q047220			0.5 kV	Class H1B
ESD-CDM	AEC-Q100-011 16-Pin NB SOIC	1 lot, N=>3	Q047221			750 V	Class C5
Latch Up	AEC-Q100-004 ±100mA Overvoltage = 36V	1 lot, N=>6	Q047170	85 °C			Pass
Electromagnetic Compatibility	SAE J1752	1 lot, N=>1	Q045675				Pass

Notes:
1. Parts are Pre-conditioned at MSL3/260°C
2. Leveraged package family qualification data
3. Leveraged die family qualification data

This report applies to the following part numbers:				
Si8281BC-IS/R	Si8281BD-IS/R	Si8281CC-IS/R	Si8281CD-IS/R	Si8281DC-IS/R

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Si828x AEC-Q100 Qualification Report

Part Rev D, Vanguard Fabrication, ASECL Assembly except as noted

Test Name	Test Condition	Qualification	Lot ID or Start	Fail/Pass or End	Notes	Summary	Status
Si8281DD-IS/R	Si8281EC-IS/R	Si8281ED-IS/R		Si8282BC-IS/R		Si8282BD-IS/R	
Si8282CC-IS/R	Si8282CD-IS/R	Si8282DC-IS/R		Si8282DD-IS/R		Si8282EC-IS/R	
Si8282ED-IS/R	Si8283BC-IS/R	Si8283BD-IS/R		Si8283CC-IS/R		Si8283CD-IS/R	
Si8283DC-IS/R	Si8283DD-IS/R	Si8283EC-IS/R		Si8283ED-IS/R		Si8284BC-IS/R	
Si8284BD-IS/R	Si8284CC-IS/R	Si8284CD-IS/R		Si8284DC-IS/R		Si8284DD-IS/R	
Si8284EC-IS/R	Si8284ED-IS/R	Si8285BC-IS/R		Si8285BD-IS/R		Si8285CC-IS/R	
Si8285CD-IS/R	Si8285DC-IS/R	Si8285DD-IS/R		Si8285EC-IS/R		Si8285ED-IS/R	
Si8286BC-IS/R	Si8286BD-IS/R	Si8286CC-IS/R		Si8286CD-IS/R		Si8286DC-IS/R	
Si8286DD-IS/R	Si8286EC-IS/R	Si8286ED-IS/R					
Si8281BC-AS/R	Si8281BD-AS/R	Si8281CC-AS/R		Si8281CD-AS/R		Si8281DC-AS/R	
Si8281DD-AS/R	Si8281EC-AS/R	Si8281ED-AS/R		Si8282BC-AS/R		Si8282BD-AS/R	
Si8282CC-AS/R	Si8282CD-AS/R	Si8282DC-AS/R		Si8282DD-AS/R		Si8282EC-AS/R	
Si8282ED-AS/R	Si8283BC-AS/R	Si8283BD-AS/R		Si8283CC-AS/R		Si8283CD-AS/R	
Si8283DC-AS/R	Si8283DD-AS/R	Si8283EC-AS/R		Si8283ED-AS/R		Si8284BC-AS/R	
Si8284BD-AS/R	Si8284CC-AS/R	Si8284CD-AS/R		Si8284DC-AS/R		Si8284DD-AS/R	
Si8284EC-AS/R	Si8284ED-AS/R	Si8285BC-AS/R		Si8285BD-AS/R		Si8285CC-AS/R	
Si8285CD-AS/R	Si8285DC-AS/R	Si8285DD-AS/R		Si8285EC-AS/R		Si8285ED-AS/R	
Si8286BC-AS/R	Si8286BD-AS/R	Si8286CC-AS/R		Si8286CD-AS/R		Si8286DC-AS/R	
Si8286DD-AS/R	Si8286EC-AS/R	Si8286ED-AS/R					

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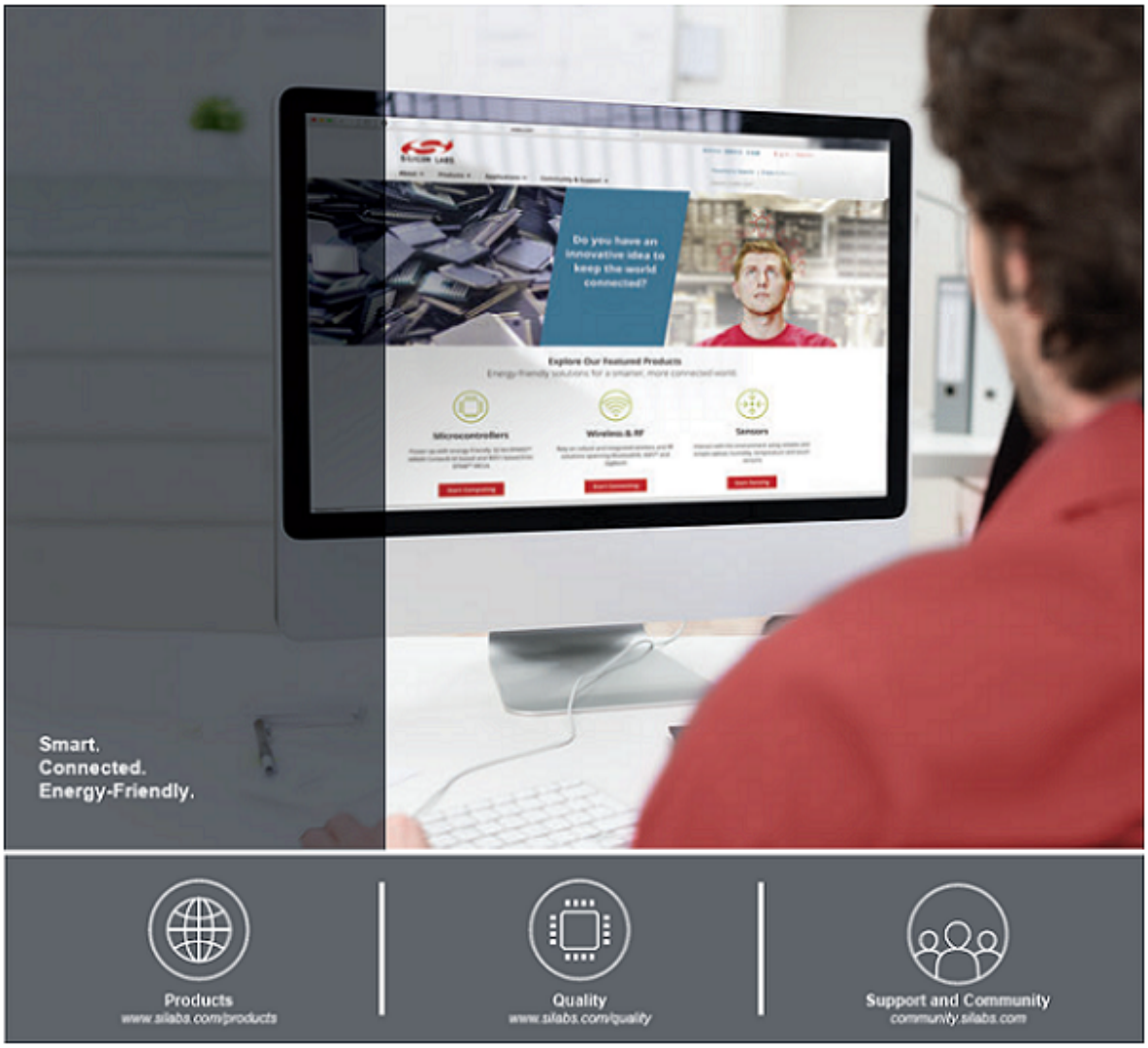

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