Purpose: This Product Change Notification (PCN) is to provide notification to PHYTEC customers of component, process, or other relevant engineering changes on a PHYTEC hardware subassembly. Impact, qualification, validation, and approval of this change shall be documented on the corresponding Customer-Specific Modification (KSM/KSP) form for the PHYTEC hardware subassembly.

Per JEDEC Standard JESD46-D Section 3.2.3; lack of acknowledgment of this PCN within 30 days constitutes acceptance of change.

Type of Change	
Notice Date: **2018. 10.25** <yyyy.mm.dd>	LPN #: **LPN-204e_5** **Update**
☒ Major Change ☐ Minor Change	

Description of Change:
The additional UART2 receiver/transmitter, NXP SCC2691, has been discontinued by NXP without a functionally compatible replacement. Other manufactures (Intersil, Exar) do not have a functionally compatible replacement, either.

For all replacements, a redesign of the PCB and software adaptation is neccessary. The miniMODUL will be replaced either with a version without an external UART receiver/transmitter or with a new product, the MM-312 with an NXP SC28L91 UART receiver/transmitter.

The standard UART on the controller is not affected by this notification.

Referenced Documents: NXP Discontinuation Notification 201512008DN

Type of Change:	**Component Change**	**Software Update necessary**
☐ Lifecycle change to	☐ Controller	☐ Linux
☒ Component change	☐ PCB	☐ Android
☒ Software update	☐ RAM ☐ FLASH	☐ Windows
☐ Other	☒ Other UART receiver/transmitter	☒ Other

Product Affected	
Affected PHYTEC Productgroup:	miniMODUL-167
Affected PHYTEC Productgroup Part:	MM-311

Anticipated Impact on Form, Fit, Function, EMI, Quality or Reliability (positive/negative):

(1) No impact in fit or form of the miniMODUL itself
(2) Impact in fit, form and function of the component
(3) Impact in function of the second UART interface from the miniMODUL

Possible Measures

☒ Change to different option of product
☒ Change to different PHYTEC product MM-312
☒ Interims stock / final stock

Schedule	
Last Time Buy (current product version): (Last date to set an order for the current product version)	**2016.06.10** <yyyy.mm.dd> **ORDERS ARE NON-CANCELABLE AND NON-RETURNABLE.**
Samples of different option of product available:	April 2016
Mass production of different option of product:	Q2/2016
Samples of other PHYTEC product available:	January 2017
Mass production of other PHYTEC product:	Q1/2017

Product Affected	
Affected Product Number	Replacement Product Number
MM-311-630	MM-311-630U.A0 without UART2
MM-311.A1	MM-311-U.A0 without UART2
MM-311	MM-311-U.A0 without UART2
MM-311-520.A1	MM-311-520U.A0 without UART2
MM-311-A.A1	MM-311-AU.A0 without UART2
MM-311-020A.A1	MM-311-020AU.A0 without UART2
MM-311-I.A1	MM-311-UI.A0 without UART2
MM-311-CSI.A1	MM-311-CSUI.A0without UART2
MM-311-KSMxy.Az	MM-311-KSMxy.Az+1 without UART2 or MM-312-KSMab.A0
MM-311-KSPxy.Az	MM-311-KSPxy.Az+1 without UART2 or MM-312-KSPab.A0

Engineering Change (Component, Firmware, Process, other)		
Current Part		**New Part**
IP034	**PHYTEC Internal Part #**	IP200
NXP	**Manufacturer**	NXP
SCC2691AC1A28	**Manufacturer Part #**	SC28L91A1B
UART receiver/transmitter	**Description**	UART receiver/transmitter

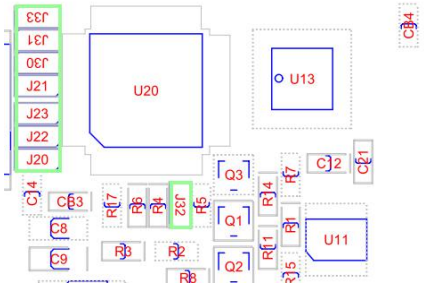
Engineering Change (Component, Firmware, Process, other)		
Current Part		**New Part**
IP036	**PHYTEC Internal Part #**	IP200
NXP	**Manufacturer**	NXP
SCC2691AE1A28	**Manufacturer Part #**	SC28L91A1B
UART receiver/transmitter	**Description**	UART receiver/transmitter

Technical Parameter			
Parameter	Original **SCC2691AE1A28**	Replacement **SC28L91A1B**	**Assess-ment**[1]
Package	PLCC-28 with 1.27 mm Pitch	PQFP44 with 0.8 mm Pitch	1
Supply Voltage	5 V	3.3V or 5 V	2
Temperature	IP034: 0 °C to +70 °C IP036: -40 °C to +85 °C	-40 °C to + 85 °C	2
Prozess Technology	CMOS	CMOS	2
Features	Full-duplex asynchronous receiver/transmitter Programmable data format 16-bit programmable Counter/Timer Single interrupt output with seven maskable interrupting conditions Quadruple buffered receiver data register	Full-duplex asynchronous receiver/transmitter Programmable data format 16-bit programmable Counter/Timer Multi-function 8-bit output port 16 character FIFO for each Rx/Tx	
Register Adressing 000 000 001 010 011 100 101 110 111 1101 1110 1111	 MR 1, MR2 SR, CSR CR RHR, THR 1x/16x Test, ACR ISR, IMR CTU,CTUR CTL, CTLR	 MR0 MR1, MR2 (identical to SCC2691) SR, CSR (identical to SCC2691) CR (identical to SCC2691, but differences in command codes) RxFIFO, TxFIFO IPCR, ACR (different to SCC2691) ISR, IMR (different to SCC2691) CTU, CTPU (identical to SCC2691) CTL, CTPL (identical to SCC2691 IPR, OPCR Str C/T, SOPR Stp C/T, ROPR	1
Affected Signals on MiniMODUL Connector	X1B-3A TO2 X1B-3B RI2 X1B-5A MPI X1B-5B RX2 X1B-6A MPO X1B-6B TX2 X1B-7B /IUART	MM-311 without UART: no function on this PINs MM-312: identical PIN description MPO and MPI is jumperable on the SOM to IP0/OP0, IP2/OP2, IP3/OP3 or IP4/OP4 of NXP SC28L91	1

The MPI/MPO functionality is not switchable in software with the new SC28L91A1B. The MPI/MPO function is possible to switch, but this is only selectable with jumpers on the module. Due to this, it is not possible to change this function during runtime. The MPI configuration is selectable with J20 to J23 and the MPO function with J30 to J33.

[1] Assessments:
1: Effects are to be expected
2: No negative effects are to be expected

Mounting cutout:



PHYTEC Qualification	
The new product(s) were qualified according to our company qualification procedure and best practices.	
☒ PCB redesign for MM-312 was necessary, because NXP SC28L91A1B has a different footprint and pinning.	☒ Software adaption was necessary, because MM-311: without UART2: external UART is deleted MM-312: NXP SC28L91A1B has differences in the register addresses
☒ Software tests were conducted with: BSP for testing: Test program: Serial, RAM, and flash tests in climatic chamber	

Recommended Measures for Customer

☒ Software update or patch
Example code for NXP SC28L91 is available
Example function to test type of UART receiver/transmitter after reset

```
byte is_UART_SC28L91(void)
{
        byte mr0;
        MVAR(char, CR) = 0xBA;          /* set MR-Pointer on MR0 for SC28L91, */
                                        /* Causes the RTSN output (MP0) to be negated (high) for SCC2691 */
        mr0 = MVAR(char, 0x00);
        MVAR(char, CR) = 0x45;          /* reset RxD Buf., Enable TxD und RxD */

        if (mr0 == 0) {
                //SC28L91
                return(0);
        }
        else {
                //SCC2691 without MR0
                return(-1);
        }
```

☐ Update Programming Tool

☒ Fit integration test with your system and case.
PHYTEC recommends that customers take this opportunity to review these changes against current application notes, system design considerations, and customer environment conditions to assess impact (if any) to their application.

Note:
Technical differences and similarities in the tables above may not be complete. Please refer to the manufacture datasheets for a complete comparison.

Please contact our order team to ask for an interims or final stock for components or PHYTEC products.
Please contact our support if you need any further information.

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Revision History of the Document
_1: Initial document _2: New description of the change _3: Additional information in table "Technical Parameters" _4: New product MM-312 _5: Additional information for MM-311 to MM-312 switch