1.5 Gbps 4x4 LVDS Crosspoint Switch

DS10CP154 Evaluation Kit

USER MANUAL

Part Number: DS10CP154EVK NOPB

For the latest documents concerning these products and evaluation kit, visit lvds.national.com.
Schematics and gerber files are also available at lvds.national.com.

September 2007
Rev. 0.1

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Overview

The DS10CP154EVK is an evaluation kit designed for demonstrating performance of DS10CP154, a 1.5 Gbps 4x4 LVDS Crosspoint Switch. The evaluation kit is comprised of the DS10CP154 with its associated input and output SMA connectors and jumpers to manually configure the switch.

The purpose of this document is to familiarize the user with the DS10CP154EVK, to suggest test setup procedures and instrumentation to test the device optimally, and to guide the user through some typical measurements that demonstrate the performance of the DS10CP154 in typical applications.

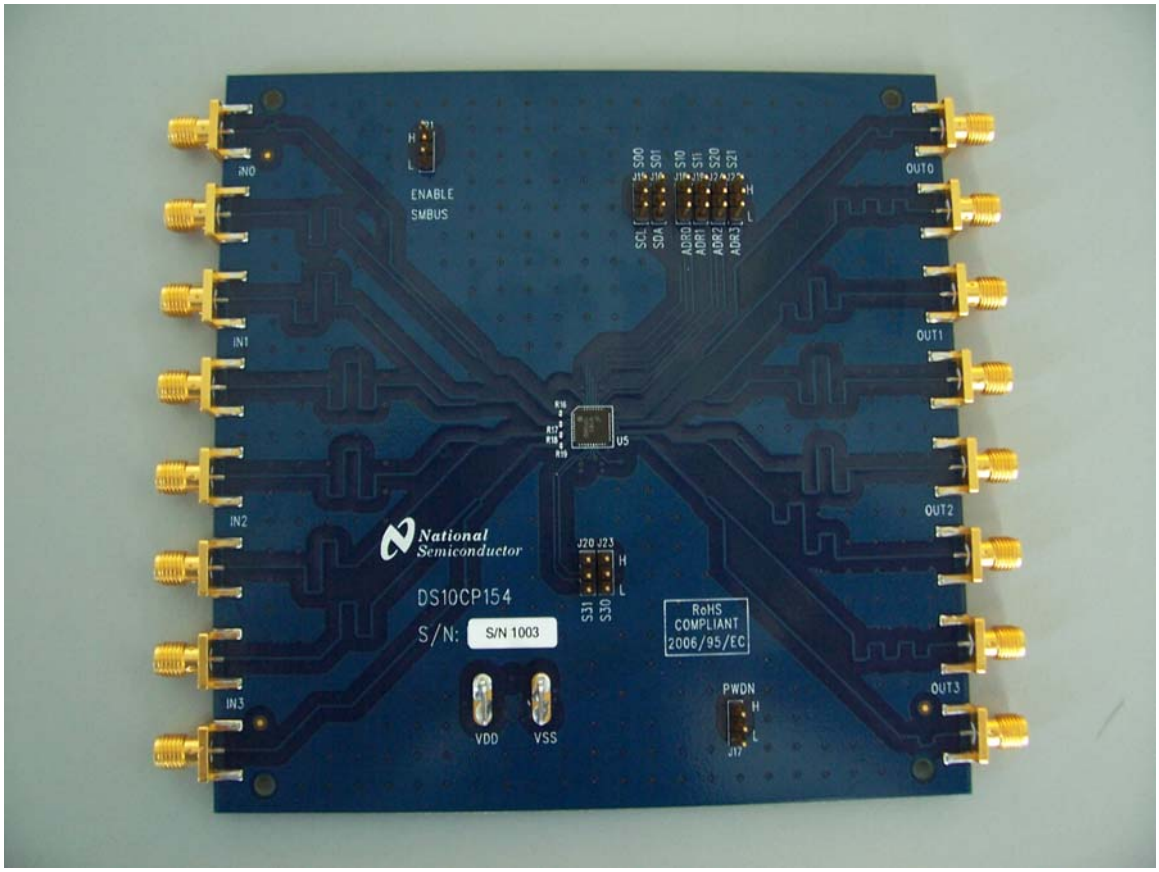


Figure 1. Photo of the DS10CP154EVK

Description

Figure 2 shows the top layer drawing of the PCB with the silkscreen annotations. The 5.25 by 5.25 inch, four-layer PCB is designed to evaluate the functions of the DS10CP154.

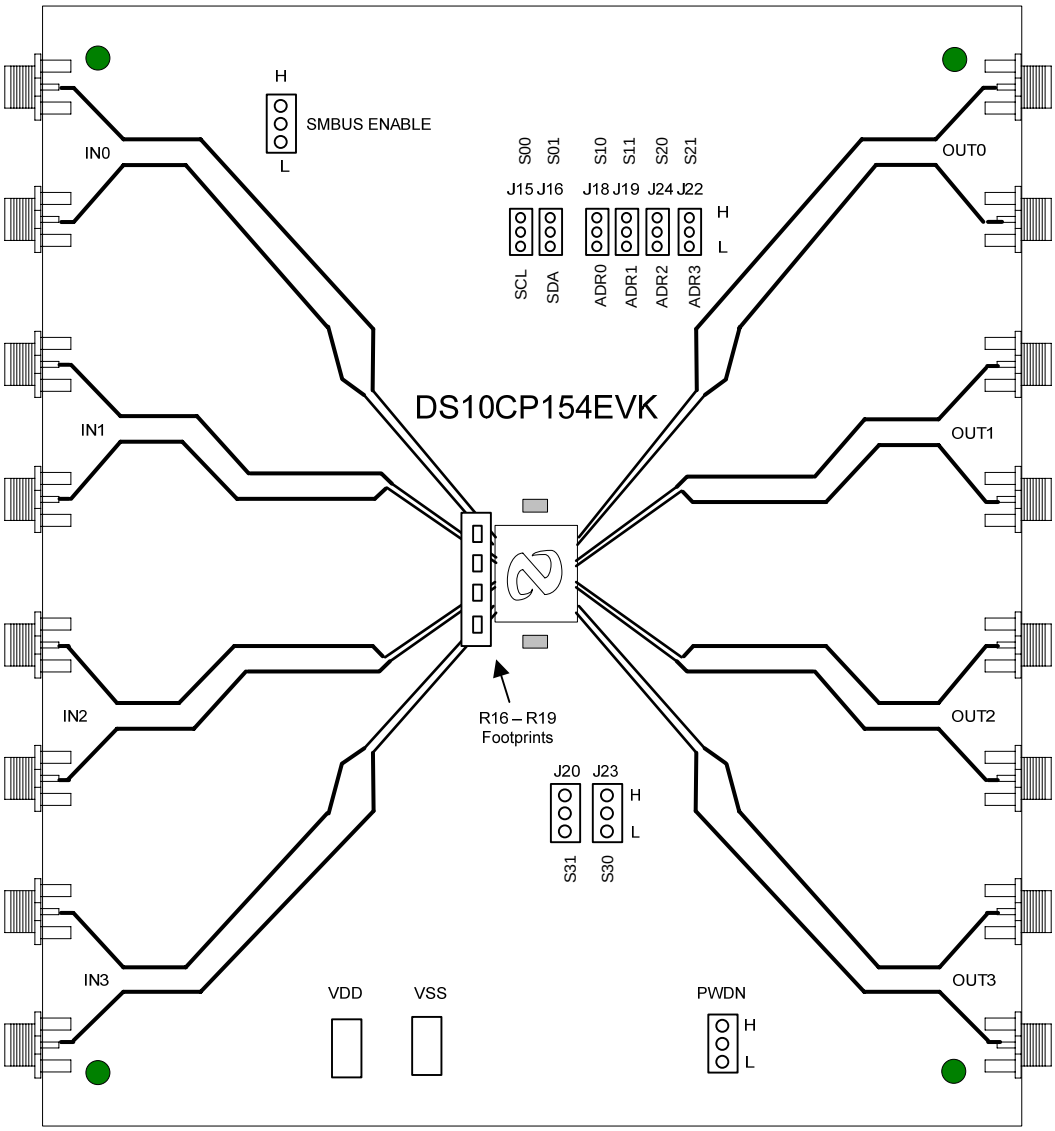


Figure 2. Top Layer DS10CP154EVK

Evaluation

This section provides recommended test setup procedure for the device evaluation. Figure 3 depicts a typical setup and instrumentation you may use for the device evaluation.

1. Configure the test setup as shown in Figure 3.
2. Set the desired INn to OUTn drivers by selecting S00, S01, S10, S11, S20, S21, S30 and S31 according to Tables 1 – 4.
3. Apply + supply (3.3V typical) to the VDD and – supply (ground) to the VSS connectors.
4. Set the PWDN* pin (J17) to a high state.
5. Connect a signal source (signal generator, data source, or an LVDS driver) to the desired INn inputs on the board and adjust the signal parameters (VOH, VOL, VCM) so that they comply with the device input recommendations.
6. Connect an oscilloscope to the selected OUTn outputs and view the output signals with an oscilloscope with the analog bandwidth of at least 5 GHz.

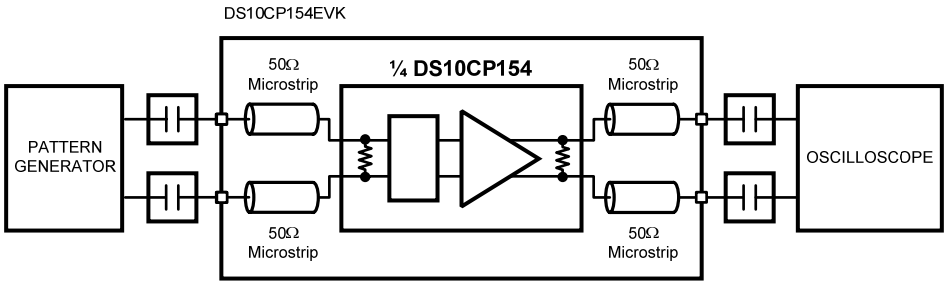


Figure 3. DS10CP154 Test Setup Example

Switch Configuration Truth Tables

S01	S00	Input Selected
0	0	IN0
0	1	IN1
1	0	IN2
1	1	IN3

Table 1. Input Select Pins Configuration for the Output OUT0

S11	S10	Input Selected
0	0	IN0
0	1	IN1
1	0	IN2
1	1	IN3

Table 2. Input Select Pins Configuration for the Output OUT1

S21	S20	Input Selected
0	0	IN0
0	1	IN1
1	0	IN2
1	1	IN3

Table 3. Input Select Pins Configuration for the Output OUT2

S31	S30	Input Selected
0	0	IN0
0	1	IN1
1	0	IN2
1	1	IN3

Table 4. Input Select Pins Configuration for the Output OUT3

Typical Performance

This section of the User Manual shows a typical eye diagram you can expect to see when evaluating the DS10BR150EVK.

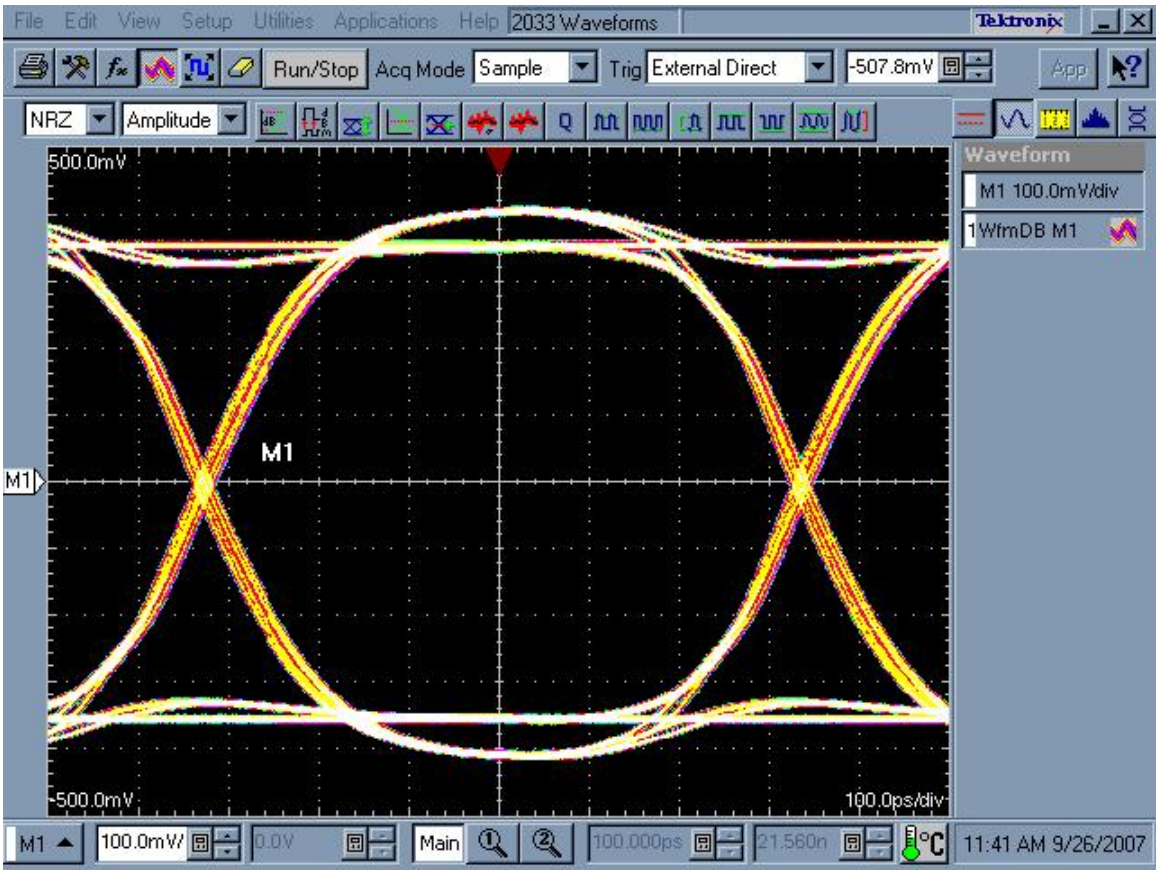
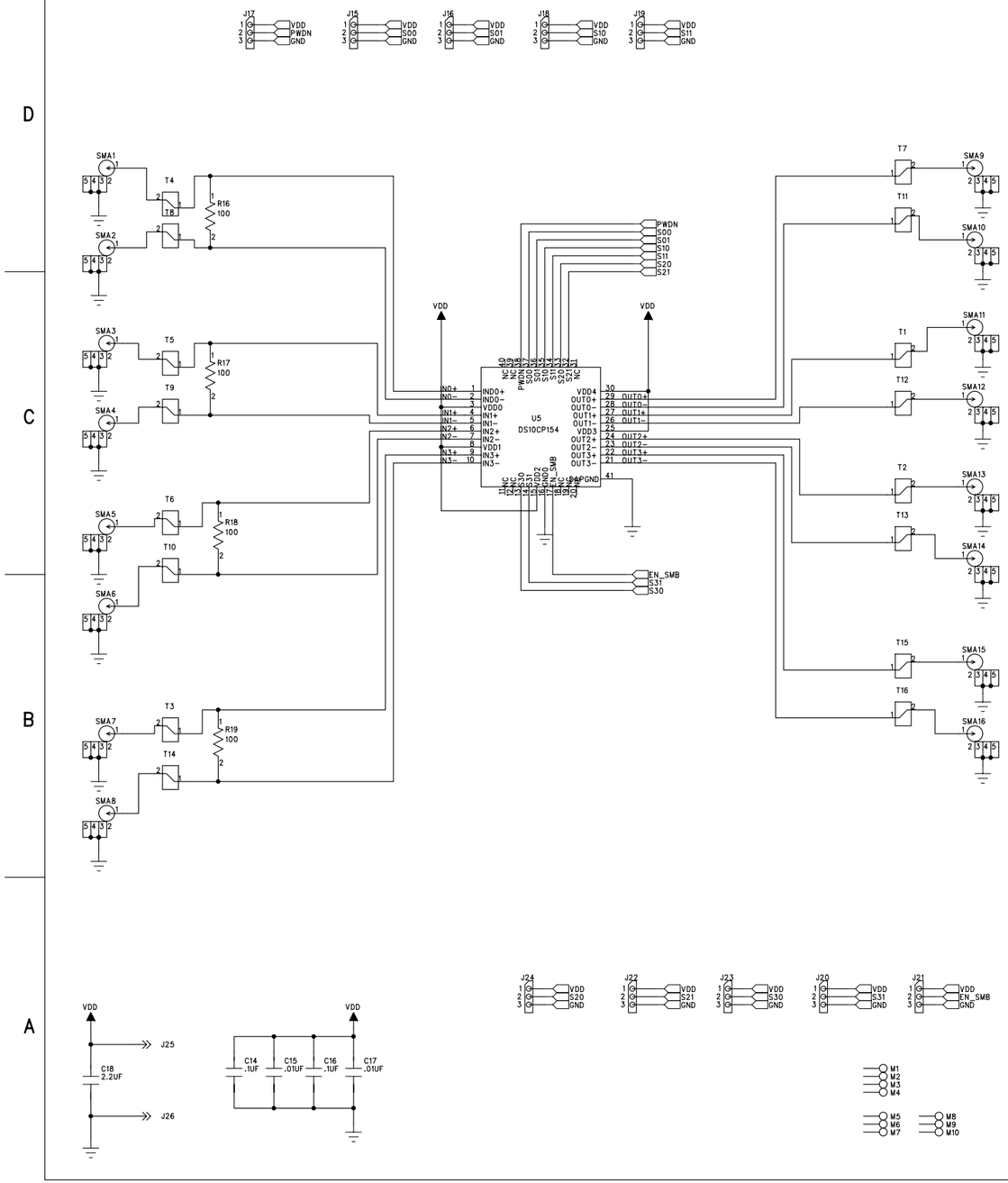


Figure 4. DS10CP154 1.5 Gbps NRZ PRBS-7 Output Eye Diagram

REVISION RECORD			
LTR:	ECO NO:	APPROVED:	DATE:
0	INITIAL RELEASE		



COMPANY:	NATIONAL SEMICONDUCTOR		
TITLE:	SCHEMATIC DS10CP154EVK		
CODE:	SIZE: C	DRAWING NO: S-06227	REV: 0
DRAWN: ACF	DATED: 9/7/07	SCALE:	SHEET: 1 OF 1

Enercon Technologies
25 NorthBrook Drive
Gray, Maine 04039
U.S.A.

ENERCON - BILL OF MATERIALS	TITLE:	NATIONAL SEMICONDUCTOR PCBA, DS10CP154EVK, ROHS DS10CP154	PL Number: Rev: Rev By:	Rev Date:	PL Status:
Main Product: PCBA, DS10CP154 EVK, ROHS			Z3181-01 0	9/12/2007	Released
			Responsible Eng/Mgr:	Creator: Arlene Fox	Creation Date: 9/12/2007

Item	Part Type	Part Number/Value	Mfg	NoSub	Description	Qty	SMT	Ref Des	Notes	Rev
1	PCB	P-06244R0	ENERCON		DS10CP154EVK: 5.25x5.25x.060in, 4 layer	1			Bd: (133.35x 133.35mm) Panel: (10.60x5.25in) (269.24x 133.35mm) 2 bds/panel	0
2										
3	IC	DS10CP154TSQ/NOPB	NAT		LVDS Crosspoint Switch,, LLP40, Pb-Free	1	X	U5	Customer Supplied	0
4										
5	CAP	0402YC103KAT	AVX		.01µF, 16V, ±10%, 0402, Ceramic, X7R, Pb-Free	2	X	C15,17		0
	<ALT>	C0402C103K4RAC	KEMET		.01µF, 16V, ±10%, 0402, Ceramic, X7R, Pb-Free					
	<ALT>	ECJ-0EB1C103K	PANA		.01µF, 16V, ±10%, 0402, Ceramic, X7R, Pb-Free					
6	CAP	C0402C104K8RAC	KEMET		.1µF, 10V, ±10%, 0402, Ceramic, X7R, Pb-Free	2	X	C14,16		0
7	CAP	C1206C225K4RAC	KEMET		2.2µF, 16V, ±10%, 1206, Ceramic, X7R, Pb-Free	1	X	C18		0
	<ALT>	ECJ-3YB1C225K	PANA		2.2µF, 16V, ±10%, 1206, Ceramic, X7R, Pb-Free					
8										
9	CONN	1287-ST	KEYSTONE		Faston, Male, .250x.032, Pb-Free	2		J25-26		0
10	CONN	142-0701-851	EMERSON		SMA, Jack Receptacle, 50 OHM, Pb-Free	16		SMA1-16		0
11	CONN	TSW-103-07-G-S	SAMTEC		Header, 3p, Male, .100"sp, Gold, Pb-Free	10		J15-24		0
12										
13	STENCL	T-06246R0	ENERCON		STENCIL FABRICATION, TOP, DS10CP154EVK	1				0
14	STENCL	T-06247R0	ENERCON		STENCIL FABRICATION, BOTTOM, DS10CP154EVK	1				0
15										
16	REF	C-06243R0	ENERCON		PALLET DWG, DS10CP154EVK					0
17	REF	C-06245R0	ENERCON		FABRICATION DWG, DS10CP154EVK					0

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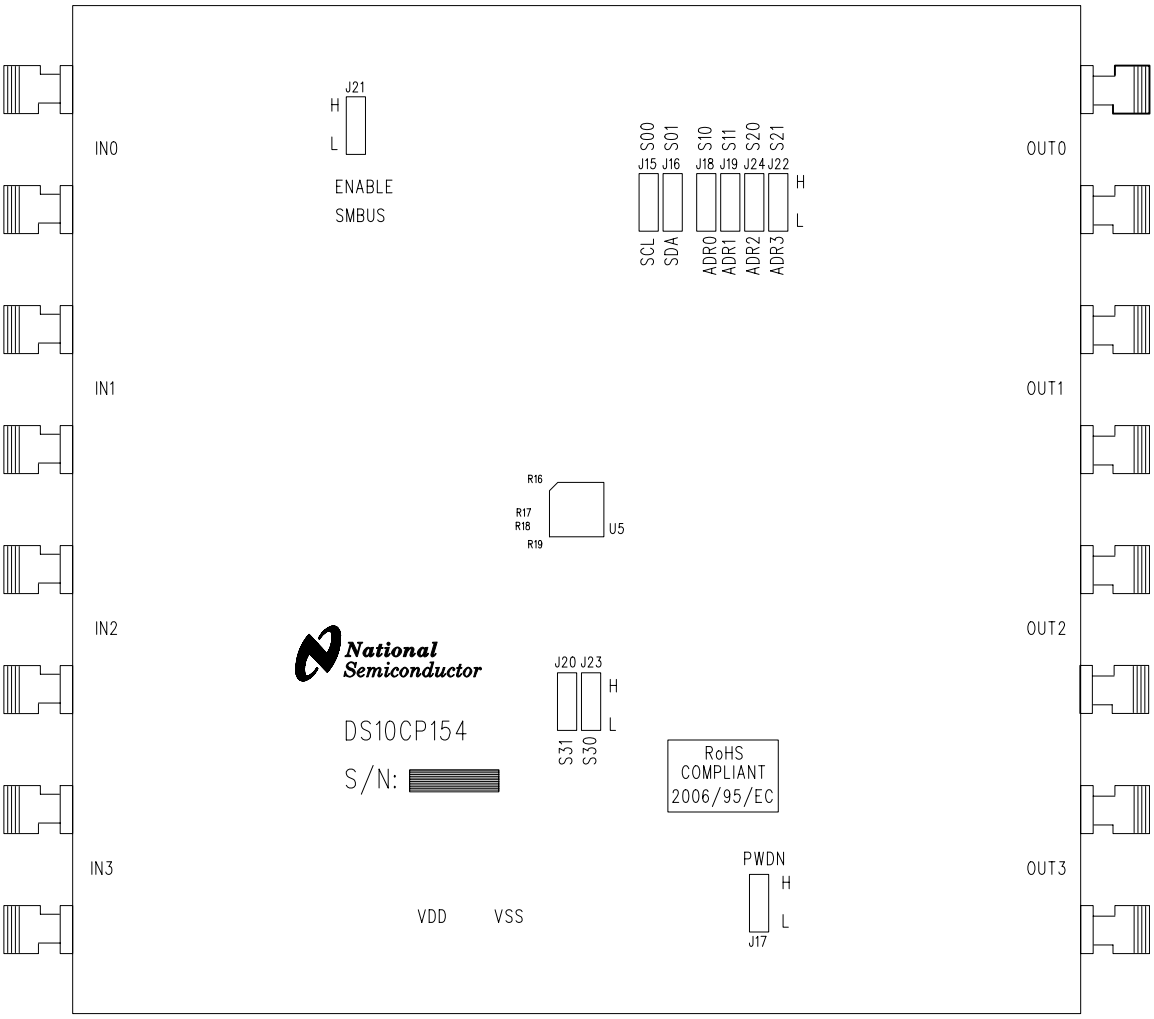
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Main Product: PCBA, DS10CP154 EVK, ROHS	NATIONAL SEMICONDUCTOR PCBA, DS10CP154EVK, ROHS DS10CP154	Z3181-01	0		9/12/2007	Released
		Responsible Eng/Mgr:		Creator: Arlene Fox		Creation Date: 9/12/2007

Item	Part Type	Part Number/Value	Mfg	NoSub	Description	Qty	SMT	Ref Des	Notes	Rev
18	REF	S-06227R0	ENERCON		SCHEMATIC, DS10CP154EVK					0
19										

Notes:
DO NOT STUFF:

R16-19

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IN0
IN1
IN2
IN3
OUT0
OUT1
OUT2
OUT3
J21
H
L
ENABLE
SMBUS
J15 J16 J18 J19 J24 J22
S00 S01 S10 S11 S20 S21
H
L
SCL
SDA
ADR0
ADR1
ADR2
ADR3
R16
R17
R18
R19
U5
National Semiconductor
DS10CP154
S/N:
J20 J23
H
L
S31
S30
RoHS
COMPLIANT
2006/95/EC
PWDN
H
L
J17
VDD
VSS

REVISION RECORD			
REV	ECO NO:	APPROVED:	DATE:

SPECIFICATIONS: P/N P-06244R0

1. PERFORMANCE: IN ACCORDANCE WITH (IAW) IPC-6012 CLASS 2.
2. DIMENSIONS: INTERPRET DRAWING, DIMENSIONS AND TOLERANCES PER ANSI Y14.5M. DIMENSIONS ARE IN INCHES.
3. MATERIAL: ROHS COMPLIANT/LEAD FREE ASSEMBLY CAPABLE WOVEN E-GLASS LAMINATE, POLYCLAD PCL-FR-370HR, PCL-FRP-370HR PREPREG.

CI 4. FLAMMABILITY RATING: FINISHED BOARD SHALL MEET THE REQUIREMENTS OF UL796 WITH A FLAME RATING OF 94V-0 OR BETTER. PER UL796, BOARD FABRICATOR SHALL APPLY THEIR TRADEMARK, TYPE DESIGNATION AND THE FLAME RATING IN ETCH OR SILKSCREEN ON THE BOARD. LOCATION AT FABRICATORS DISCRETION UNLESS OTHERWISE SPECIFIED.

5. FINISHED COPPER WEIGHT: 1 oz.
6. MIN CONDUCTOR WIDTH/SPACING: WIDTH 0.010 in. SPACING 0.008 in.. FINISHED CONDUCTOR WIDTHS AND SPACINGS SHALL BE WITHIN 10% OF SUPPLIED ORIGINAL CAD DATA.
7. MODIFICATIONS: NON-FUNCTIONAL ETCH MAY BE ADDED TO BALANCE CURRENT DENSITY FOR COPPER PLATING. IF NON-FUNCTIONAL ETCH IS ADDED TO ARTWORK, THE VENDOR MUST SUPPLY ENERCON TECHNOLOGIES A COMPLETE SET OF FABRICATION FILES (I.E. GERBER AND DRILL FILES ETC.) FOR CONFIGURATION CONTROL.

   REPAIR OF OPEN OR HIGH RESISTANCE TRACES PER IPC-7721.

CI 8. HOLES: DRILL BOARDS USING DRILL DATA, DRILL PATTERN AND HOLE SCHEDULE. HOLE LOCATIONS MAY VARY WITHIN 0.004 in. (RADIAL ERROR) MAXIMUM ABOUT TRUE POSITION.

   PLATE HOLES PER HOLE SCHEDULE. MINIMUM COPPER PLATING IN PLATED HOLES TO BE 0.001 in.

   UNLESS OTHERWISE NOTED ALL HOLE DIMENSIONS APPLY AFTER PLATING.

   ALL HOLES SURROUNDED BY A LAND SHALL HAVE A MINIMUM ANNULAR RING OF 0.002 in.

CI 9. SOLDER MASK: APPLY LPI GLOSS BLUE OVER BARE COPPER IAW IPC-SM-840.

   SOLDERMASK MISREGISTRATION SHALL NOT EXCEED +0.004 in. NO OVERLAP PERMITTED ON PADS.

CI 10. FINAL FINISH: ELECTROLESS NICKLE IMMERSION GOLD.

CI 11. SILKSCREEN: THE FOLLOWING LAYERS SHALL BE SCREEN PRINTED USING WHITE NON-CONDUCTIVE EPOXY INK IAW MIL-I-43553 PER APPROPRIATE ARTWORK FILE: LAYER 1-TOP

   INK NOT PERMITTED ON PADS.

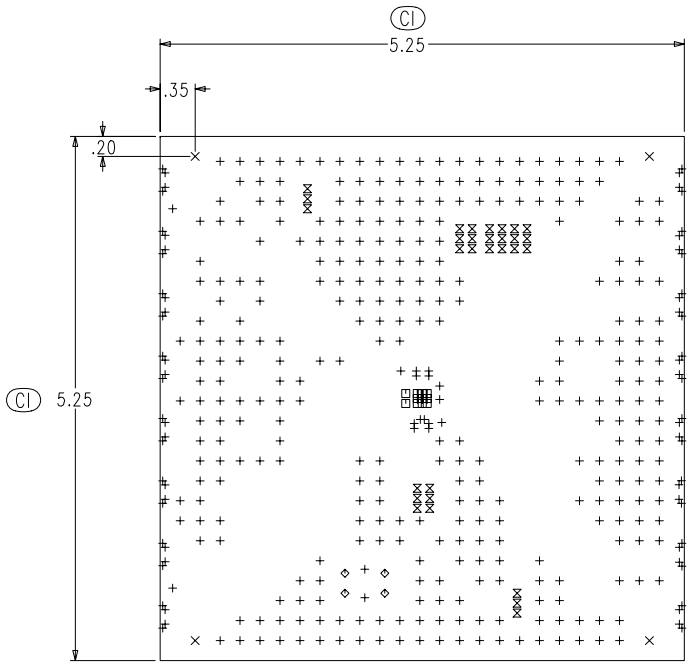
CI 12. FLATNESS: BOW AND TWIST SHALL NOT EXCEED 0.75% (0.00075 in. PER in.) IN ACCORDANCE WITH IPC-A-600F WHEN MEASURED WITH IPC-TM-650, METHOD 2.4.22.

13. INSPECTION: IAW IPC-A-600 CLASS 2.

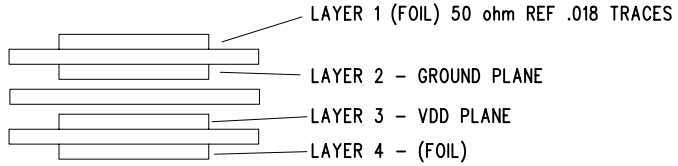
CI 14. BARE BOARD ELECTRICAL TEST: BARE BOARDS SHALL BE ELECTRICALLY TESTED USING CAD GENERATED NET LIST DATA. VENDOR SHALL SUPPLY CERTIFICATION OF BOARD CONTINUITY BASED ON CAD DATA SUPPLIED AND SHALL MARK ALL BOARDS THAT HAVE PASSED TEST. CERTIFICATION SHALL STATE HOW ACCEPTED BOARDS HAVE BEEN MARKED.

15. MISC: ALL LAYERS VIEWED FROM LAYER 1. REFERENCES TO IPC STANDARDS ASSUME CURRENT REVISION.

SIZE	QTY	SYM	PLTD	TOL
12	11	□	YES	+0.003/-0.012
18	398	+	YES	+0.003/-0.018
38	30	⊠	YES	+/-0.003
58	4	◇	YES	+/-0.003
125	4	×	NO	+/-0.003







CI

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25 NorthBrook Drive
Gray, Maine 04039
U.S.A.

COMPANY:	NATIONAL SEMICONDUCTOR
TITLE:	FABRICATION DWG DS10CP154EVK, ROHS
DRAWN: ACF	DATED: 9/10/07
TOLERANCES UNLESS OTHERWISE NOTED:	
.XXX +/- .005	
.XX +/- .010	

CODE:	SIZE:	DRAWING NO:	REV:
	C	C-06245	0

SCALE: SHEET: 1 OF 1

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RFID	www.ti-rfid.com		
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Wireless Connectivity	www.ti.com/wirelessconnectivity		
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