OPAMP3EVB

Op Amp Evaluation Board Manual TSSOP-16 Package

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Description

This document describes the TSSOP−16 package Op Amp evaluation board. It should be used in conjunction with the appropriate data sheet which contains full technical details on the device specification and operation. This evaluation board is offered as a convenience for the customers interested in performing their own engineering characterization and performance assessment. The evaluation board provides a 50 Ω controlled impedance environment. The evaluation board is designed to facilitate a quick evaluation of the device. The populated evaluation board will have a gain of two in a non−inverting op amp configuration.

This evaluation board manual contains:

- Information on NCS2530DTBEVB Evaluation Board for NCS2530 Op Amp
- Information on NCS2535DTBEVB Evaluation Board for NCS2535 Op Amp
- Information on NCS2540DTBEVB Evaluation Board for NCS2540 Op Amp
- Bill of Materials

Board Lay−up

The TSSOP−16 evaluation boards are implemented in two layers (Figure 1, Evaluation Board Lay−up). The first layer is the 1.0 oz copper ground plane, where a portion of the ground plane is cut out to mount the device. The FR4 dielectric material is placed between the first and second layer. The second layer contains the rest of the components and primary signal traces.

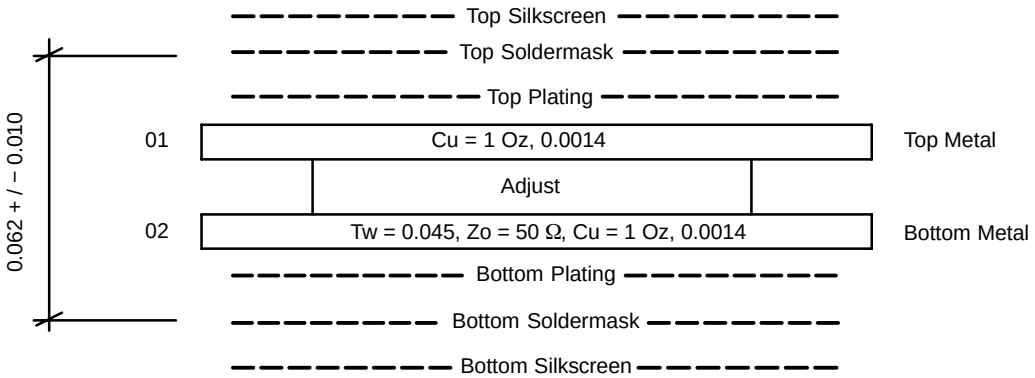

Figure 1. Evaluation Board Lay−up

Board Design (NCS2530DTBEVB/NCS2535DTBEVB)

The evaluation board was designed for non−inverting op amp configuration (See Figure 2). The input contains termination resistor (usually 50 Ω). The input can also be monitored through J1, J4, and J7. The evaluation board has versatile loading options for the op amp, depending on the user's preference, it can be configured as capacitive load, series resistance load, parallel resistance load, etc.

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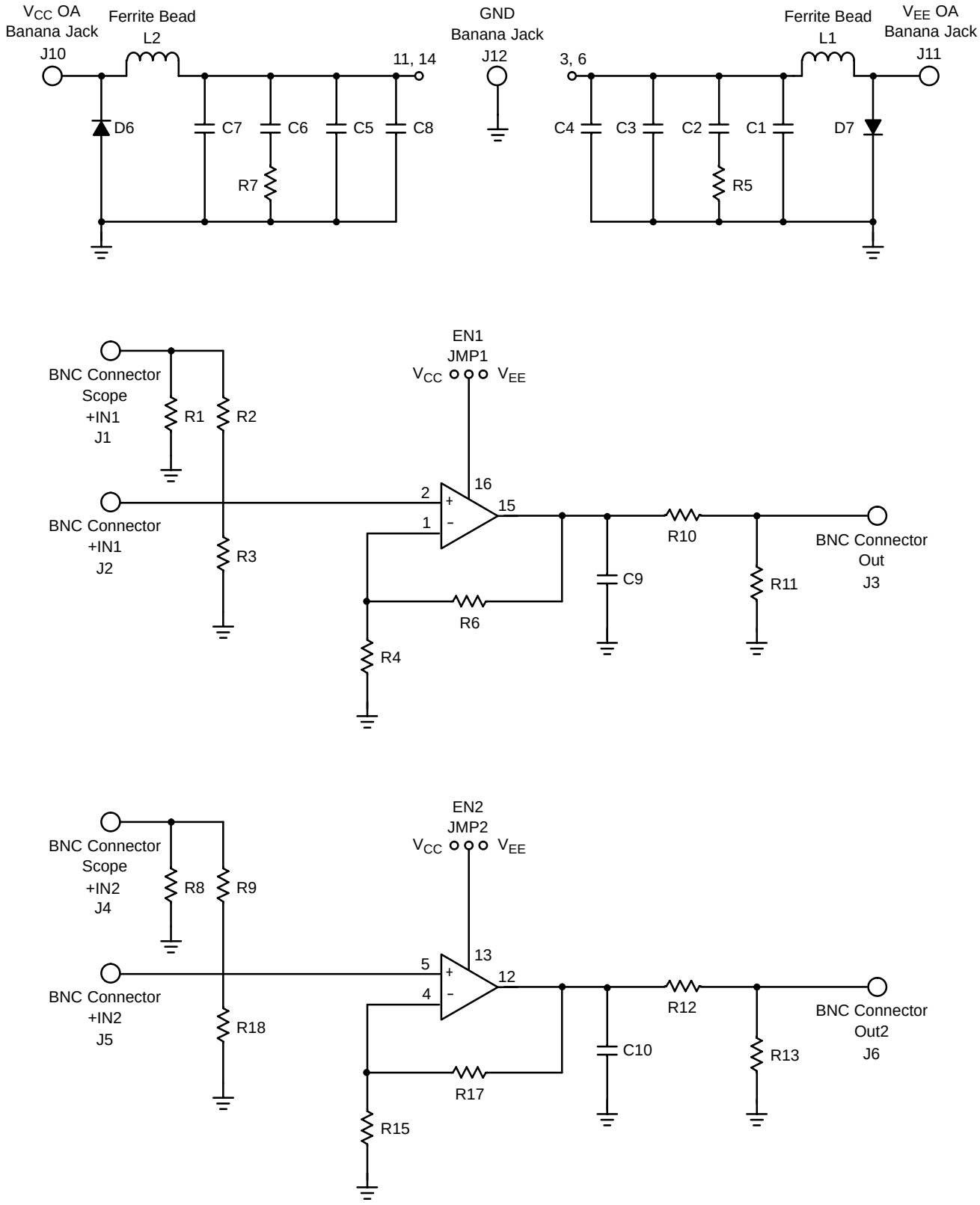


Figure 2. NCS2530/NCS2535 Evaluation Board Schematic

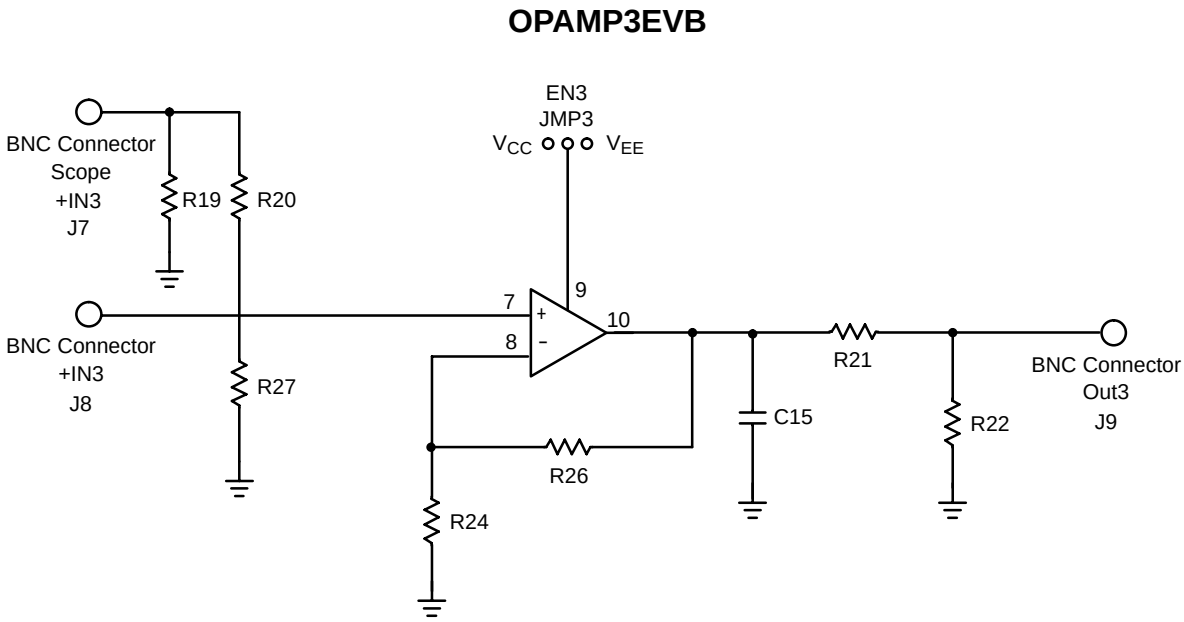


Figure 2. NCS2530/NCS2535 Evaluation Board Schematic (continued)

- L1, L2, C1, C2, C3, C4, C5, C6, C7, C8, D6, D7, R5, and R7 are for power supply noise suppression.
- R3, R18, R27 are for input matching of 50 Ω trace.
- R1, R2, R8, R9, R19, R20 are for monitoring the input signal.
- R4, R6 R15, R7, R24, R26 are for feedback resistor configuration.
- C9, R10, R11, C10, R12, R13, C15, R21, R22 are for different loading configurations of the op amp.
- Jumper 1, Jumper 2, and Jumper 3 are for the enable pins of each op amp. They can be used to enable or disable individual op amps.

Board Layout (NCS2530DTBEVB/NCS2535DTBEVB)

Figure 3 and 4 shows the board layout of NCS2530DTBEVB and NCS2535DTBEVB devices.

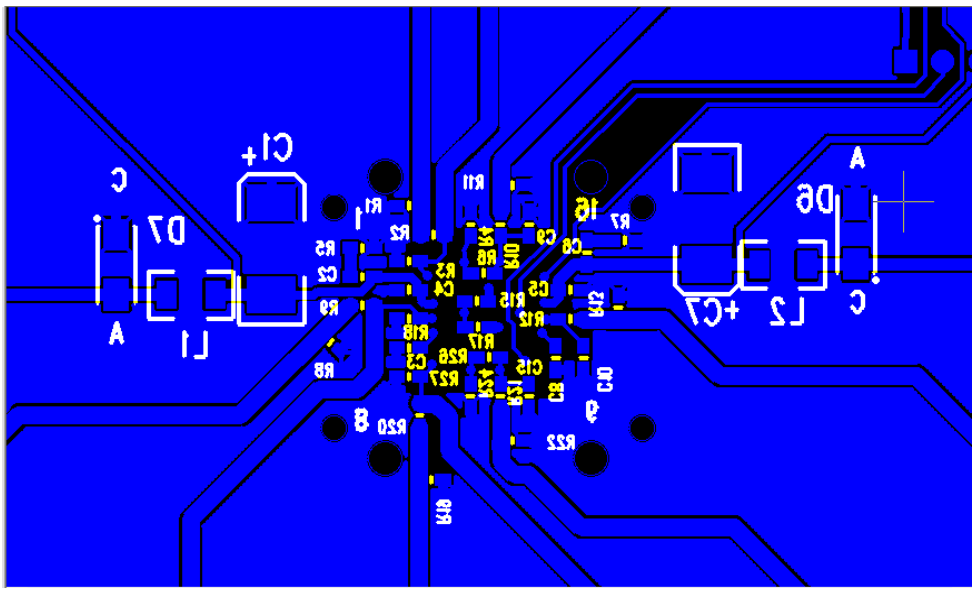
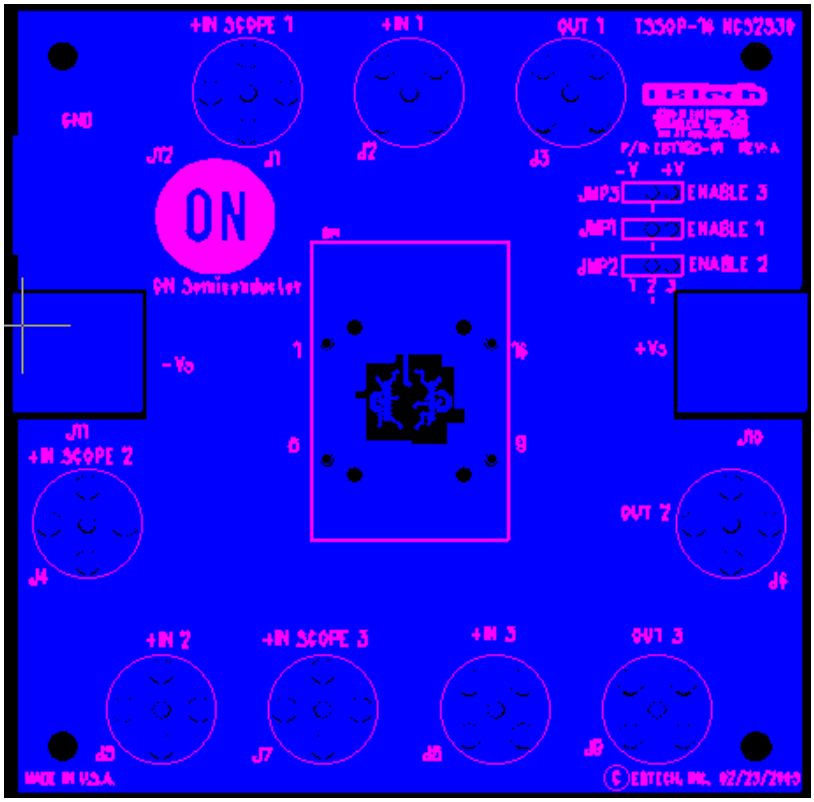
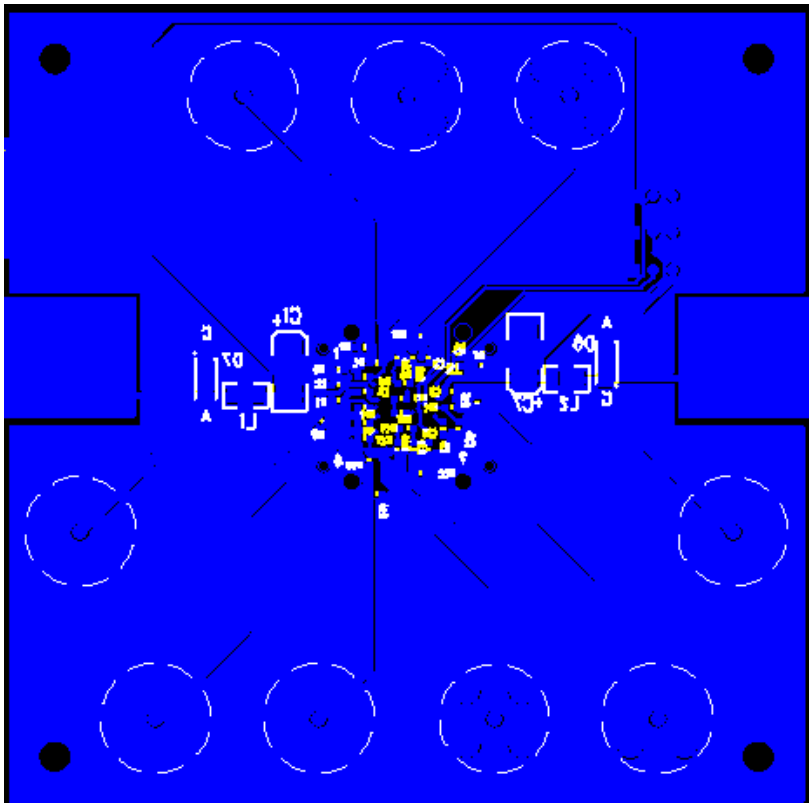


Figure 3. Close Up of NCS2530DTBEVB and NCS2535DTBEVB Evaluation Board Layout

OPAMP3EVB



Top View



Bottom View

Figure 4. NCS2530DTBEVB and NCS2535DTBEVB Evaluation Board Layout

Board Design (NCS2540DTBEVB)

The evaluation board was designed for non−inverting op amp configuration (See Figure 5). The input contains termination resistor (usually 50 Ω). The input can also be monitored through J1, J4, and J7. The evaluation board has versatile loading options for the op amp, depending on the user's preference, it can be configured as capacitive load, series resistance load, parallel resistance load, etc.

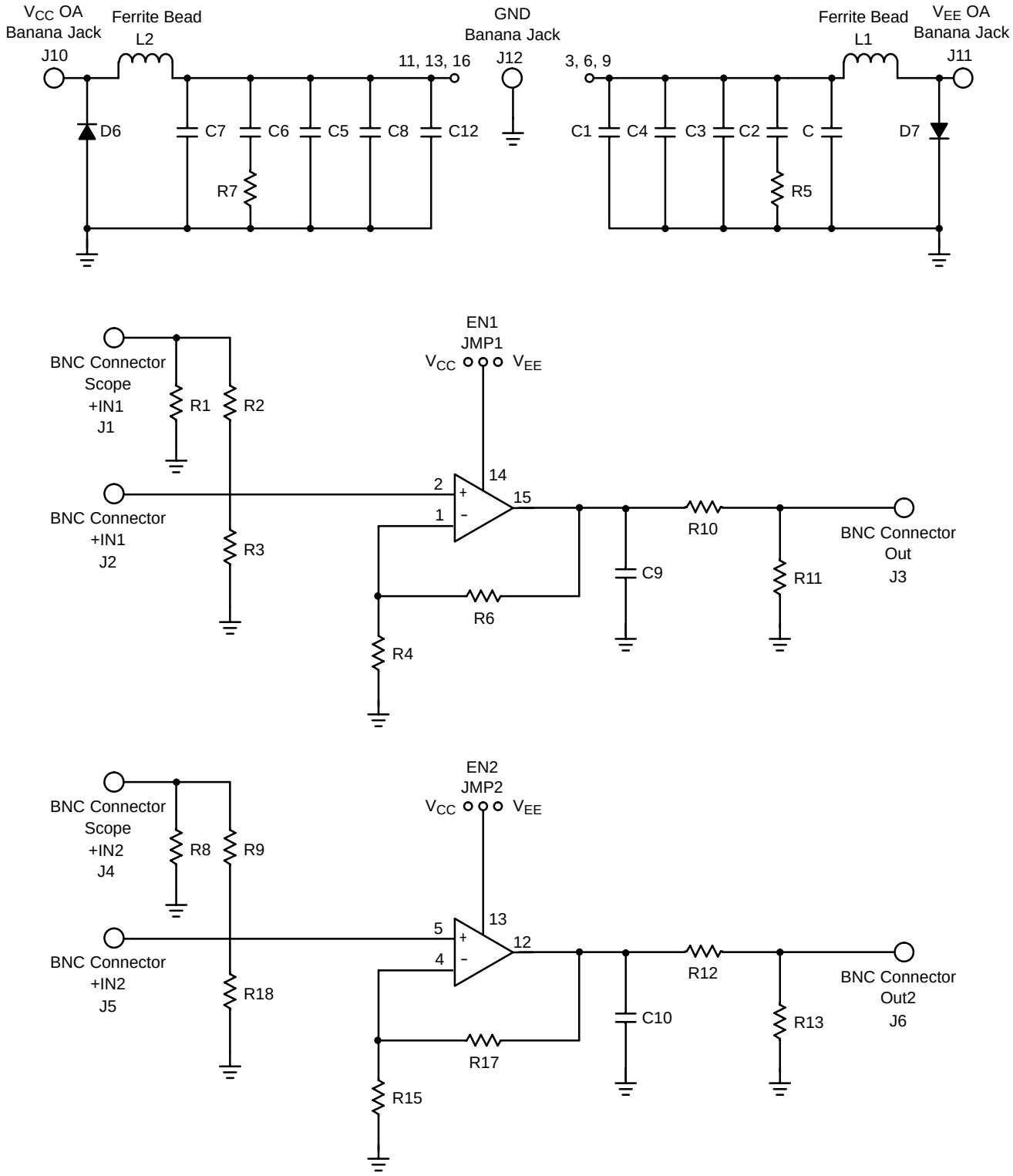


Figure 5. NCS2540 Evaluation Board Schematic

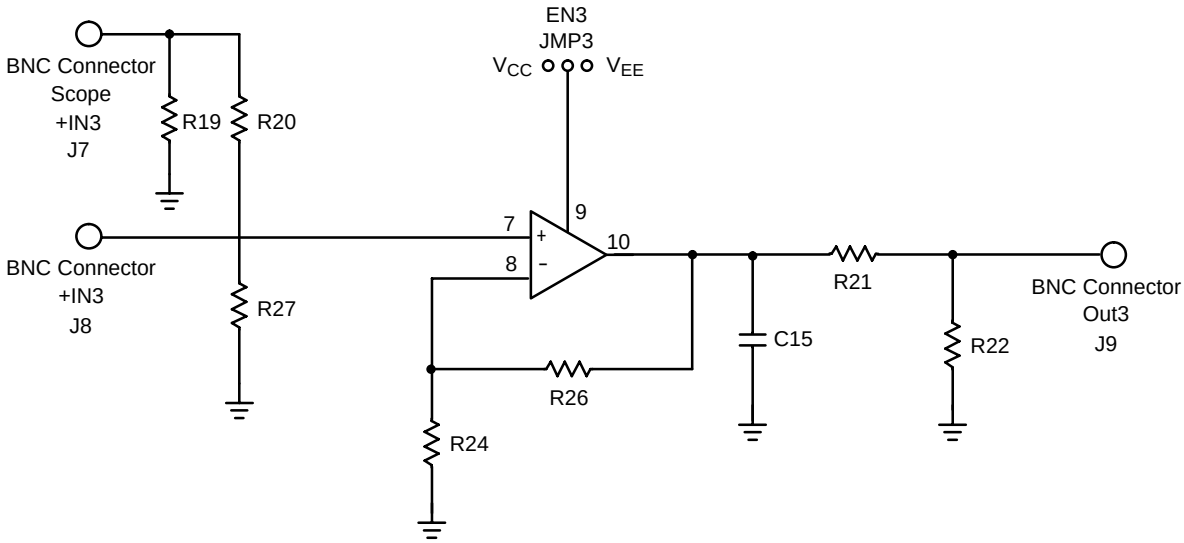


Figure 5. NCS2540 Evaluation Board Schematic (continued)

- L1, L2, C1, C2, C3, C4, C5, C6, C7, C8, C11, C12, D6, D7, R5, and R7 are for power supply noise suppression.
- R3, R18, R27 are for input matching of 50 Ω trace.
- R1, R2, R8, R9, R19, R20 are for monitoring the input signal.
- R4, R6 R15, R7, R24, R26 are for feedback resistor configuration.
- C9, R10, R11, C10, R12, R13, C15, R21, R22 are for different loading configurations of the op amp.
- Jumper 1 is for the enable pin of the device. They can be used to enable or disable the op amps.

Board Layout (NCS2540DTBEVB)

Figure 6 and 7 shows the board layout of the NCS2540DTBEVB device.

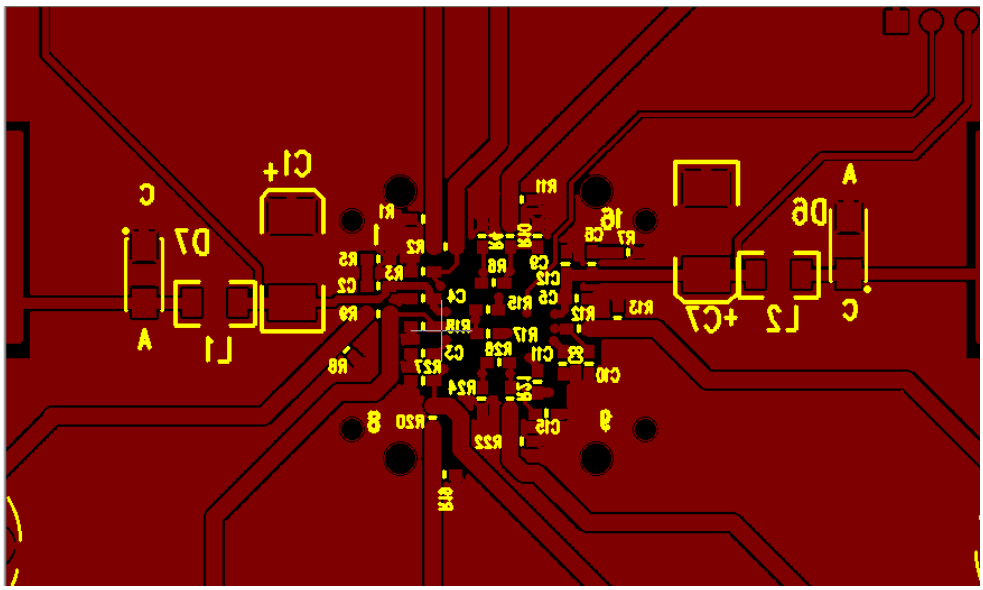


Figure 6. Close Up of NCS2540DTBEVB Evaluation Board Layout

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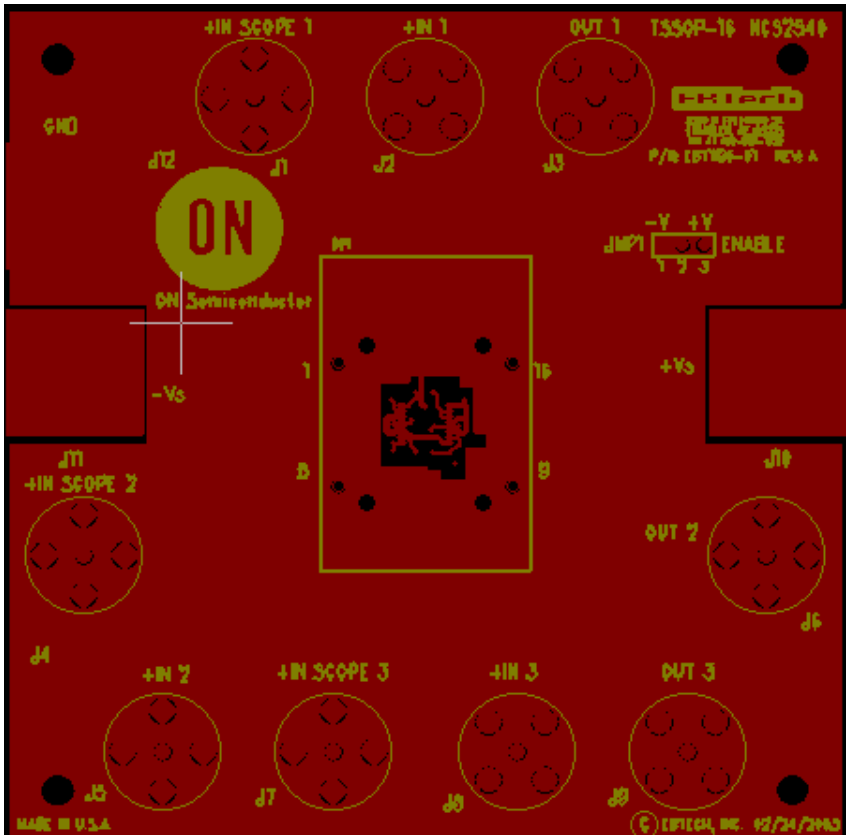
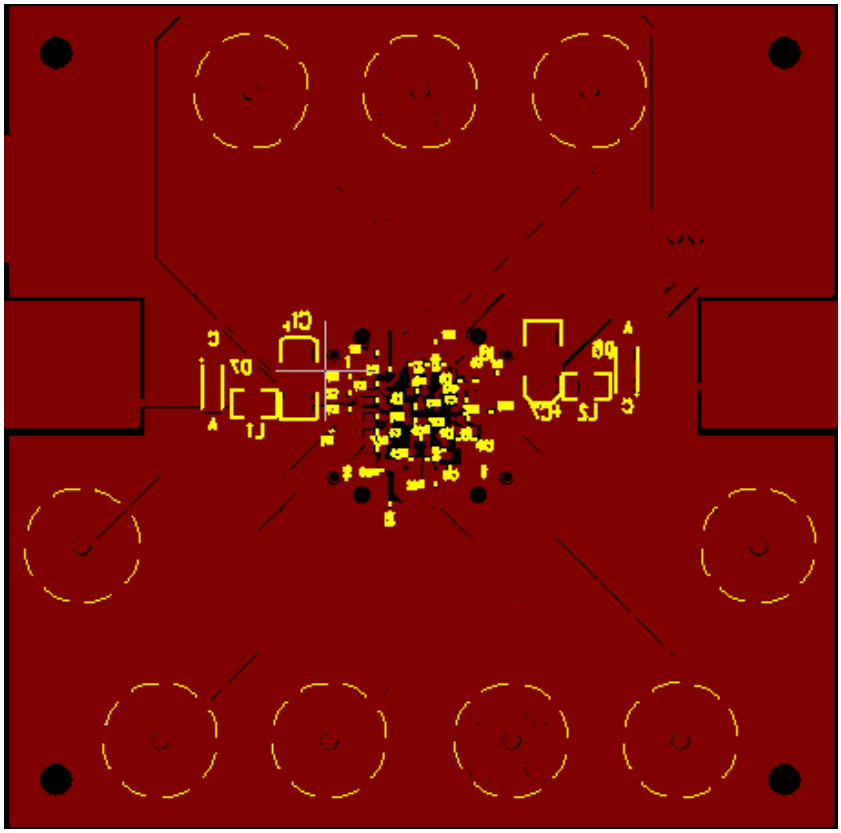


Top View



Bottom View

Figure 7. NCS2540DTBEVB Evaluation Board Layout

OPAMP3EVB

Package	ON P/N	ON Device P/N	Manufacturer	Manufacturer P/N
TSSOP16	NCS2530DTBEVB	NCS2530	EB Tech	EBT1195−01
TSSOP16	NCS2535DTBEVB	NCS2535	EB Tech	EBT1195−01
TSSOP16	NCS2540DTBEVB	NCS2540	EB Tech	EBT1196−01

BOM for NCS2530

Item	Qty	Ref Des	Value	Package	Description	MFG	Part Number
1	2	C1,C7	4.7 ufd		CAPACITOR TANT 4.7 μF 25 V 10% SMD	Kemet	T491C475K025AS
2	2	C2,C6	47 nfd	0603	CAP CER 47000 PF 50 V X7R 10% 0603	TDK Corporation	C1608X7R1H473K
3	4	C3,C4, C5,C8	330 pfd	0603	CAP CER 330 PF 50 V C0G 5% 0603	TDK Corporation	C1608C0G1H331J
4	2	D6,D7			DIODE STD REC 1.0 A 300 V SMA	ON Semiconductor	MRA4003T3
5	3	J10−J12			CONN JACK BANANA UNINS PANEL MOU	Johnson Components Inc	108−0740−001
6	9	J1−J9		BNC	CONN JACK BNC VERT 50 Ω PCB	AMP/TYCO	414305−1
7	2	L1,L2			BEAD CORE 68 Ω 3.0 A 1206 SMD	Panasonic − ECG	EXC−ML32A680U
8	3	R2,R9, R20	450	0603	RES 453 Ω 1/10W 1% 0603 SMD	Yageo America	9C06031A4530FKHFT
9	3	R3,R18, R27	50	0603	RES 49.9 Ω 1/10W 1% 0603 SMD	Yageo America	9C06031A49R9FKHFT
10	2	R5,R7	2R2	0603	RES 2.2 Ω 1/10W 5% 0603 SMD	Yageo America	9C06031A2R20JGHFT
11	3	JMP1−J MP3			HEADER 3 PIN MALE 0.1″	Sullins Electronics Corp.	PTC36SABN
12	3	JMP1−J MP3			CONNECTOR SHORTING	Sullins Electronics Corp.	STC02SYAN
13	4				Nylon Standoff 0.625″ 6−32		
14	4				Nylon Nuts 6−32 HEX		
15	3	R4,R15, R24	1.2k	0603	RES 1.2 kΩ 1/10W 1% 0603 SMD	Yageo America	9C06031A1201JGHFT
16	3	R6,R17, R26	1.2k	0603	RES 1.2 kΩ 1/10W 1% 0603 SMD	Yageo America	9C06031A1201JGHFT
17	3	R10,R12, R21	50	0603	RES 49.9 Ω 1/10W 1% 0603 SMD	Yageo America	9C06031A49R9FKHFT
18	1				OP3TSSOP16EVB Evaluation Board	EB Tech	NCS2530DTBEVB
19	1	DUT			High Speed Op Amp	ON Semiconductor	NCS2530DTB
Do Not Install These Parts							
20	3	C9,C10, C15		0603	NO VALUE DEFINED, TBD		
21	9	R1,R8, R11,R13, R19,R22		0603	RES 49.9 Ω 1/10W 1% 0603 SMD	Yageo America	9C06031A49R9FKHFT

NOTE: Assembled board has a default gain of +2.0. There is an attenuation factor of two when used in conjunction with a 50 Ω termination resistance of the measuring instrument.

OPAMP3EVB

BOM for NCS2535

Item	Qty	Ref Des	Value	Package	Description	MFG	Part Number
1	2	C1,C7	4.7 ufd		CAPACITOR TANT 4.7 μF 25 V 10% SMD	Kemet	T491C475K025AS
2	2	C2,C6	47 nfd	0603	CAP CER 47000 PF 50 V X7R 10% 0603	TDK Corporation	C1608X7R1H473K
3	4	C3,C4, C5,C8	330 pfd	0603	CAP CER 330 PF 50 V C0G 5% 0603	TDK Corporation	C1608C0G1H331J
4	2	D6,D7			DIODE STD REC 1.0 A 300 V SMA	ON Semiconductor3	MRA4003T
5	3	J10−J12			CONN JACK BANANA UNINS PANEL MOU	Johnson Components Inc	108−0740−001
6	9	J1−J9		BNC	CONN JACK BNC VERT 50 Ω PCB	AMP/TYCO	414305−1
7	2	L1,L2			BEAD CORE 68 Ω 3.0 A 1206 SMD	Panasonic − ECG	EXC−ML32A680U
8	3	R2,R9, R20	450	0603	RES 453 Ω 1/10W 1% 0603 SMD	Yageo America	9C06031A4530FKHFT
9	3	R3,R18, R27	50	0603	RES 49.9 Ω 1/10W 1% 0603 SMD	Yageo America	9C06031A49R9FKHFT
10	2	R5,R7	2R2	0603	RES 2.2 Ω 1/10W 5% 0603 SMD	Yageo America	9C06031A2R20JGHFT
11	3	JMP1−J MP3			HEADER 3 PIN MALE 0.1″	Sullins Electronics Corp.	PTC36SABN
12	3	JMP1−J MP3			CONNECTOR SHORTING	Sullins Electronics Corp.	STC02SYAN
13	4				Nylon Standoff 0.625″ 6−32		
14	4				Nylon Nuts 6−32 HEX		
15	3	R4,R15, R24	390	0603	RES 400 Ω 1/10W 1% 0603 SMD	Yageo America	9C06031A3900JGHFT
16	3	R6,R17, R26	390	0603	RES 400 Ω 1/10W 1% 0603 SMD	Yageo America	9C06031A3900JGHFT
17	3	R10,R12, R21	100	0603	RES 100 Ω 1/10W 1% 0603 SMD	Yageo America	9C06031A100FKHFT
18	1				OP3TSSOP16EVB Evaluation Board	EB Tech	NCS2535DTBEVB
19	1	DUT			High Speed Op Amp	ON Semiconductor	NCS2535DTB
Do Not Install These Parts							
19	3	C9,C10, C15		0603	NO VALUE DEFINED, TBD		
20	9	R1,R8, R11,R13, R19,R22		0603	RES 49.9 Ω 1/10W 1% 0603 SMD	Yageo America	9C06031A49R9FKHFT

NOTE: Assembled board has a default gain of +2.0. There is an attenuation factor of three when used in conjunction with a 50 Ω termination resistance of the measuring instrument.

BOM for NCS2540

Item	Qty	Ref Des	Value	Package	Description	MFG	Part Number
1	2	C1,C7	4.7 ufd		CAPACITOR TANT 4.7 μF 25 V 10% SMD	Kemet	T491C475K025AS
2	2	C2,C6	47 nfd	0603	CAP CER 47000 PF 50 V X7R 10% 0603	TDK Corporation	C1608X7R1H473K
3	4	C3,C4, C5,C8, C11,C12	330 pfd	0603	CAP CER 330 PF 50 V C0G 5% 0603	TDK Corporation	C1608C0G1H331J
4	2	D6,D7			DIODE STD REC 1.0 A 300 V SMA	ON Semiconductor	MRA4003T3
5	3	J10−J12			CONN JACK BANANA UNINS PANEL MOU	Johnson Components Inc	108−0740−001
6	9	J1−J9		BNC	CONN JACK BNC VERT 50 Ω PCB	AMP/TYCO	414305−1
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10	2	R5,R7	2R2	0603	RES 2.2 Ω 1/10W 5% 0603 SMD	Yageo America	9C06031A2R20JGHFT
11	1	JMP1			HEADER 3 PIN MALE 0.1″	Sullins Electronics Corp.	PTC36SABN
12	1	JMP1			CONNECTOR SHORTING	Sullins Electronics Corp.	STC02SYAN
13	4				Nylon Standoff 0.625″ 6−32		
14	4				Nylon Nuts 6−32 HEX		
15	3	R4,R15, R24	150	0603	RES 150 Ω 1/10W 1% 0603 SMD	Yageo America500JGHFT	9C06031A1
16	3	R6,R17, R26	150	0603	RES 150 Ω 1/10W 1% 0603 SMD	Yageo America500JGHFT	9C06031A1
17	3	R10,R12, R21	100	0603	RES 100 Ω 1/10W 1% 0603 SMD	Yageo America	9C06031A1000FKHFT
18	1				NCS2540DTBEVB Evaluation Board	EB Tech	NCS2540DTBEVB
19	1	DUT			High Speed Op Amp	ON Semiconductor	NCS2540DTB
Do Not Install These Parts							
19	3	C9,C10, C15		0603	NO VALUE DEFINED, TBD		
20	9	R1,R8, R11,R13, R19,R22		0603	RES 49.9 Ω 1/10W 1% 0603 SMD	Yageo America	9C06031A49R9FKHFT

NOTE: Assembled board has a default gain of +2.0. There is an attenuation factor of three when used in conjunction with a 50 Ω termination resistance of the measuring instrument.

Notes

OPAMP3EVB

PUBLICATION ORDERING INFORMATION

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