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REVISIONS				
LTR	ECO	DESCRIPTION	DATE	APPROVED
S2	1533	ADDED NOTE 7., UPDATED TABLE 1. "RESERVED" PADS.		
S3	1542	UPDATED TABLE 1. PAD FUNCTIONS.		
A	1577	RELEASE TO PRODUCTION	4/5/06	MF
B	1637	ADD DIM FROM DATUM C TO OPTICAL CENTER.	7/17/06	SB
C	1754	ADDED "CE300" TO DESCRIPTION.	12/21/06	SB
D	1877	UPDATE DWG TO MATCH THE ACTUAL CERAMIC	7/05/07	SB
E	2276	UPDATED TABLE 1. PINS 5 & 10 WHERE "RESERVED". SEE ECO	10/4/10	VB

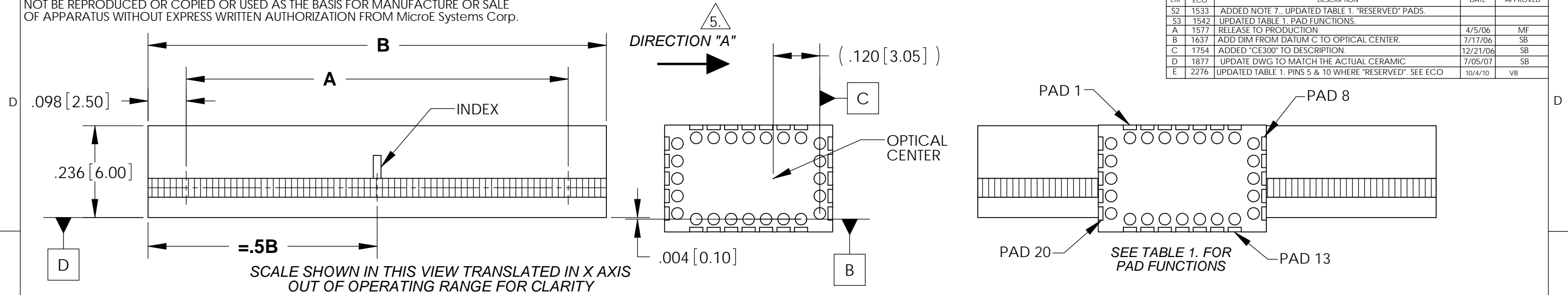
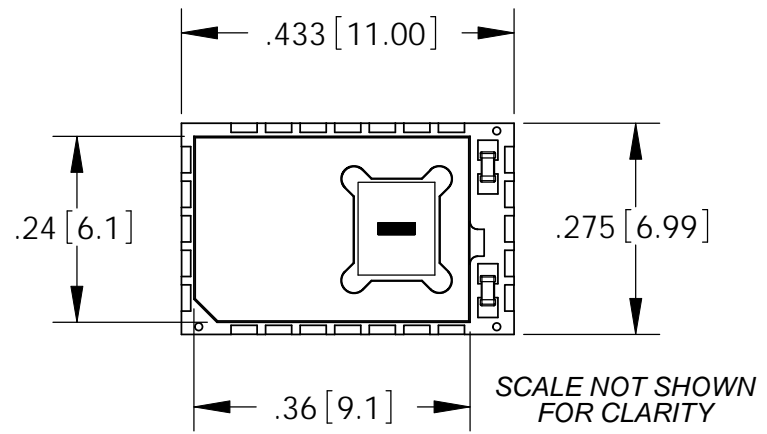
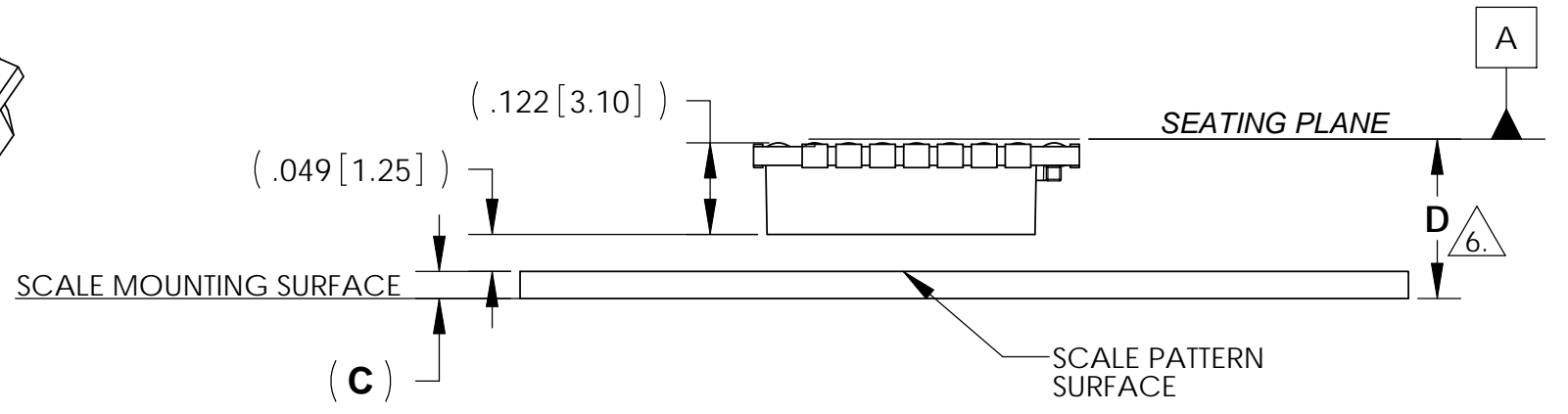
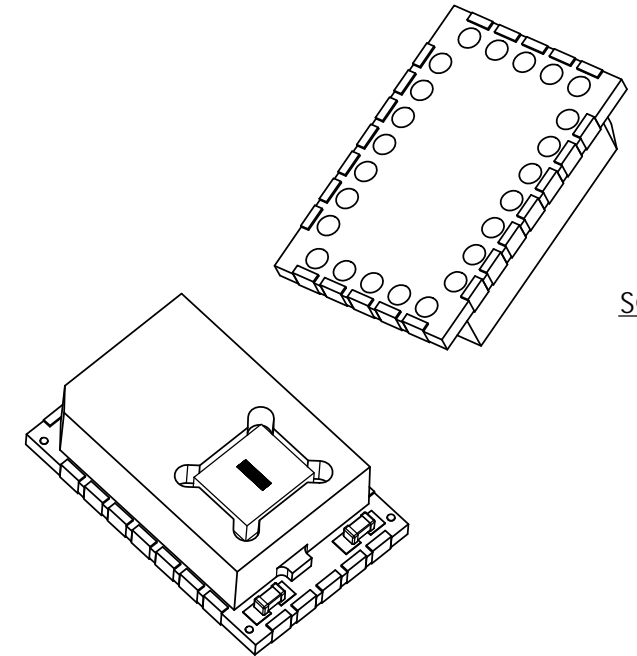


TABLE 1

Pad	Function	Pad	Function
1	Index Window -	13	AN
2	GND	14	SIN+
3	RESERVED	15	RESERVED
4	RESERVED	16	RESERVED
5	CP+	17	RESERVED
6	+5VA	18	GND
7	RESERVED	19	+5VD
8	GND	20	B+
9	DC2	21	B-
10	CA	22	A+
11	DC1	23	A-
12	RESERVED	24	Index Window +



- NOTES:
- IF BENCHING PINS ARE TO BE USED, PINS MUST BE PLACED ALONG DATUM EDGES OF THE SCALE FOR PROPER ALIGNMENT.
 - HEIGHT OF SCALE BENCHING PINS NOT TO EXCEED THE THICKNESS OF THE SCALE.
 - DATUM EDGES [B] AND [C] OF CHIPENCODER ARE THE CENTERLINES OF THE BGA PADS.
 - REFER TO ID-00321 FOR CHIPENCODER MOUNTING REQUIREMENTS.
 - WHEN SCALE MOVES IN DIRECTION "A" WITH RESPECT TO A STATIONARY READHEAD, OUTPUT SIGNAL A+(PAD 22) LEADS OUTPUT SIGNAL B+ (PAD 20).

FOR SCALES WITH TAPE (LXXCE-T), THE SCALE MOUNTING SURFACE MUST BE .006" [.152] FURTHER AWAY FROM THE SEATING PLANE OF CHIPENCODER FOR NOMINAL Z HEIGHT.
 DIM = .218 [5.54] SCALES UP TO L130CE
 DIM = .281 [7.14] SCALES FROM L135CE TO L325CE

SCALE IDENTIFICATION AND SIZE

Scale Identification	Dim. A Measured Length	Dim. B Scale Length	Dim. C Scale Thickness	Dim. D Mounting Dim
LXXCE	XXmm-5mm	XXmm	up to L130CE .036±.004 [.91±.10]	.212[5.39]
L30CE	30mm-5mm = 25mm	30mm	L135CE to L325CE	
(max) L325CE	325mm-5mm = 320mm	325mm	.098±.004 [2.50±.10]	.275[6.98]

UNLESS OTHERWISE SPECIFIED ALL DIMENSIONS ARE IN INCHES [MILLIMETERS] DIM. APPLY AFTER PROCESSING INTERPRET ALL GEOMETRIC TOLS. PER ANSI Y14.5M-1994

TOLERANCES ARE:
 DECIMALS: XX [X]±.01 [.25]
 ANGULAR: ±30 MIN.
 XXX [XX]±.005 [.13]

APPROVALS: S. BUTURLIA, VINCEN CLARK, THOMAS GARCIA, S. OPPENHEIM
 DATE: 12/8/05, 4/4/06, 4/6/06, 4/4/06

MicroE Systems Division of GSI Group
 125 Middlesex Tpk. Bedford, MA 01730

DESCRIPTION: INTERFACE, ENCODER, 40um SHORT LINEAR, CHIPENCODER CE300

SIZE: B DWG. NO: ID-00327 REV. E
 SCALE: 1:1 CAD FILE: SHEET 1 OF 1

UNITS: INCHES [MM]

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REVISIONS				
LTR	ECO	DESCRIPTION	DATE	APPROVED
S2	1533	ADDED NOTE 7., UPDATED TABLE 1 "RESERVED" PADS.		
S3	1542	UPDATED TABLE 1. PAD FUNCTIONS.		
A	1577	RELEASE TO PRODUCTION	4/5/06	MF
B	1637	ADDED DIM FROM DATUM C TO OPTICAL CENTER.	7/17/06	SB
C	1754	ADDED "CE300" TO DESCRIPTION.	12/21/06	SB
D	1877	UPDATE DWG TO REFLECT ACTUAL CERAMIC	07/05/07	SB
E	2276	UPDATED TABLE 1. PIN 5 & 10 WHERE "RESERVED". SEE ECO	10/4/10	VB

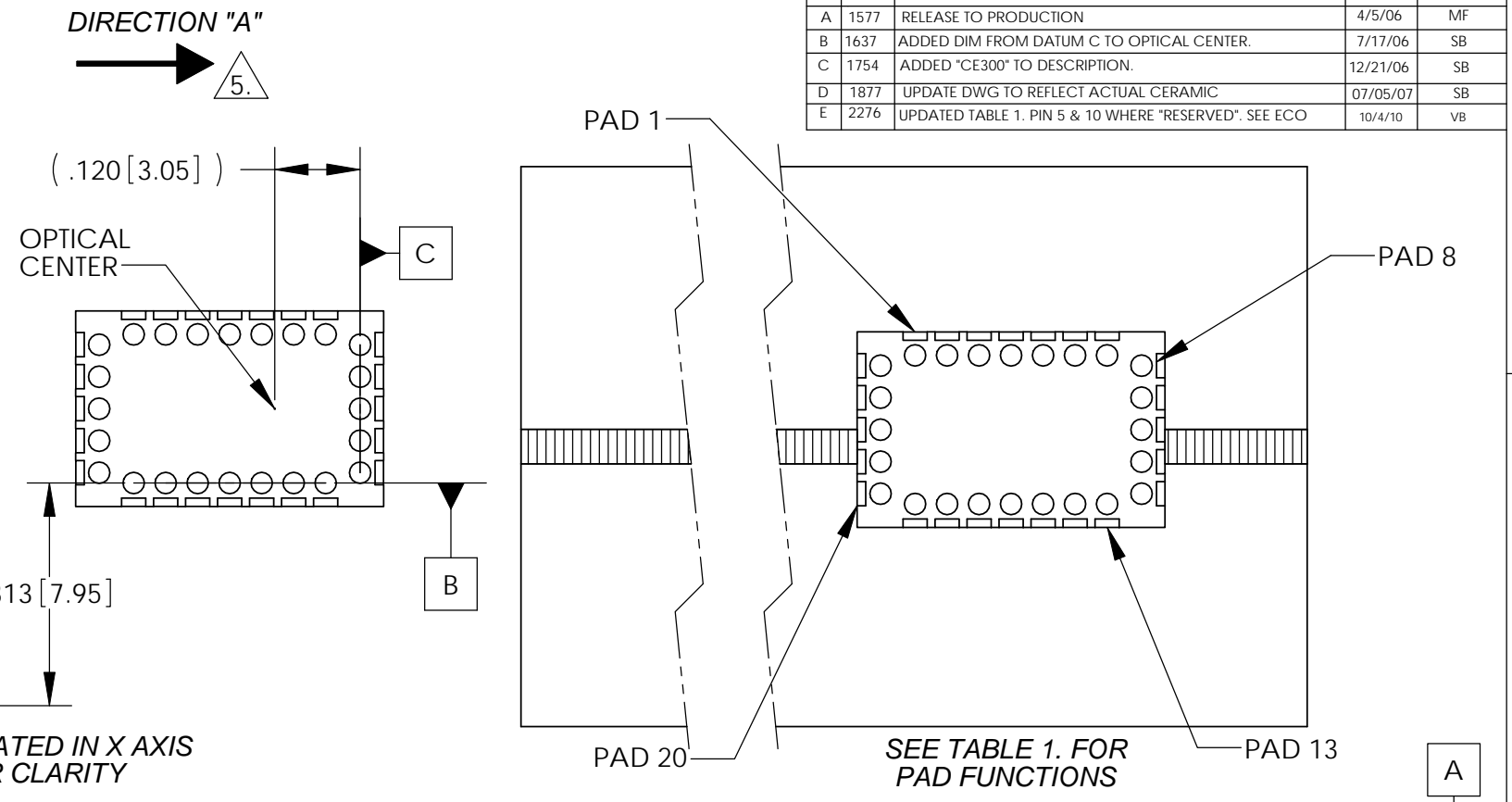
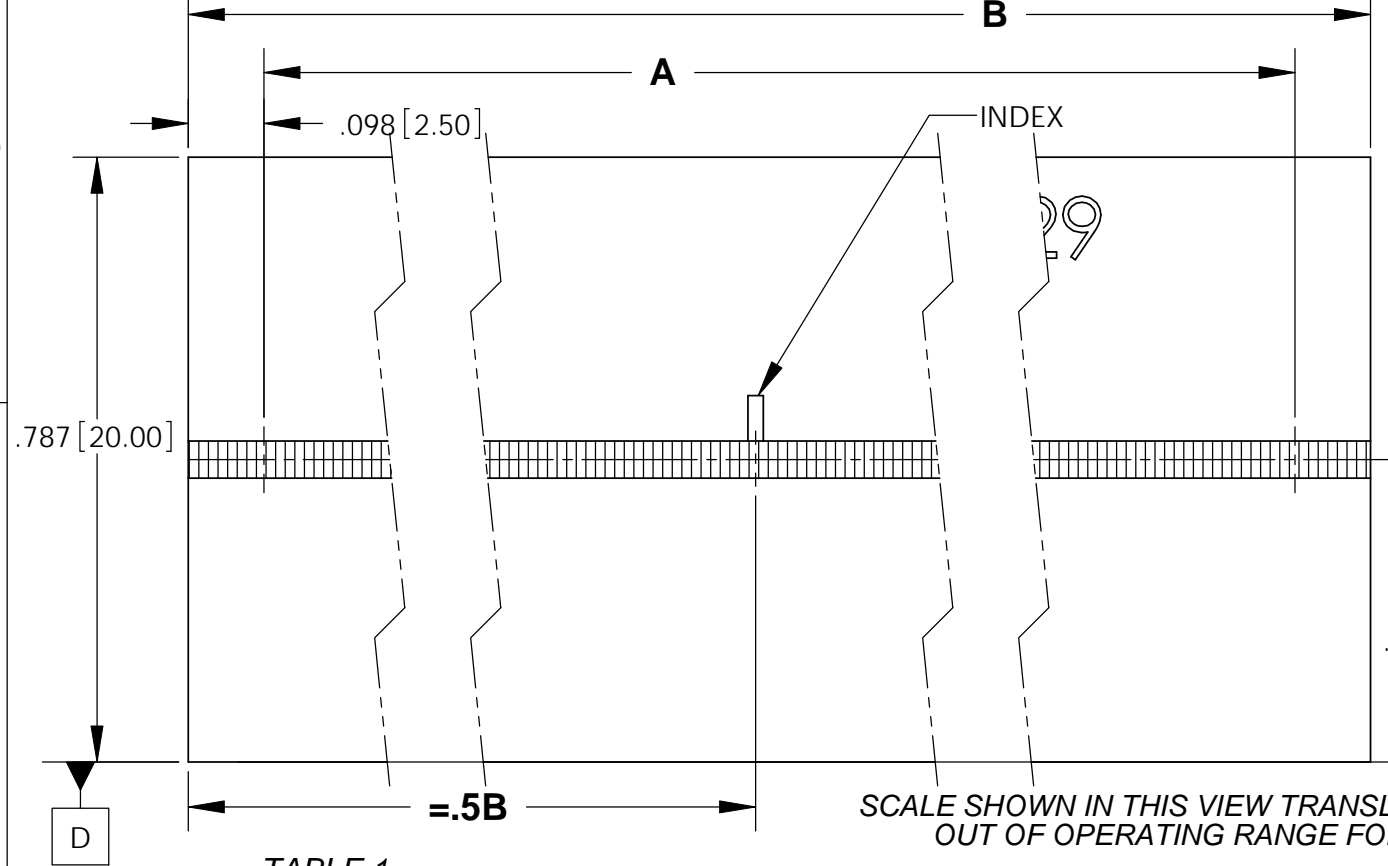
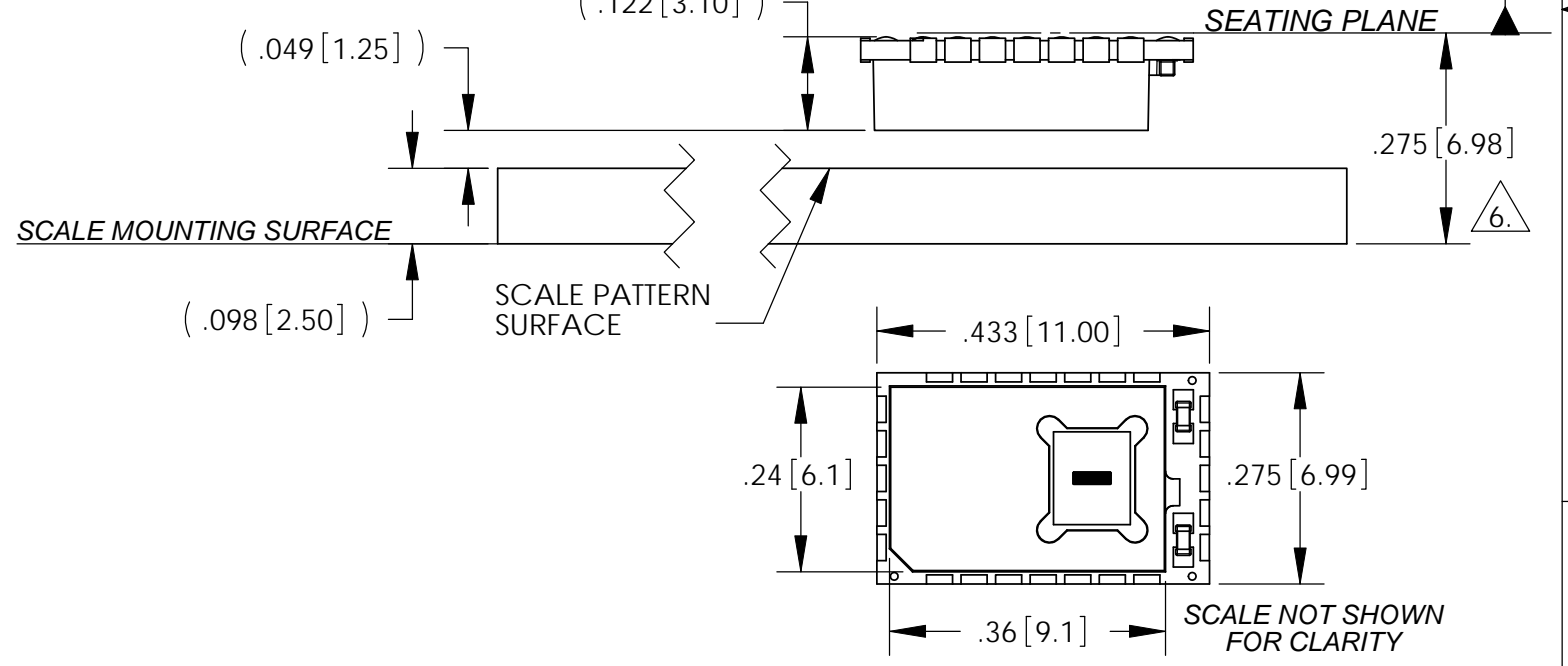
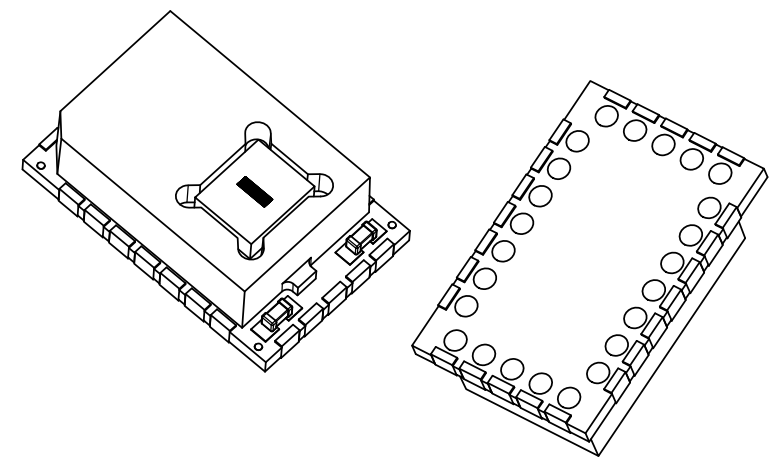


TABLE 1.

Pad	Function	Pad	Function
1	Index Window -	13	AN
2	GND	14	SIN+
3	RESERVED	15	RESERVED
4	RESERVED	16	RESERVED
5	CP+	17	RESERVED
6	+5VA	18	GND
7	RESERVED	19	+5VD
8	GND	20	B+
9	DC2	21	B-
10	CA	22	A+
11	DC1	23	A-
12	RESERVED	24	Index Window +



- NOTES:
- IF BENCHING PINS ARE TO BE USED, PINS MUST BE PLACED ALONG DATUM EDGES OF THE SCALE FOR PROPER ALIGNMENT.
 - HEIGHT OF SCALE BENCHING PINS NOT TO EXCEED THE THICKNESS OF THE SCALE.
 - DATUM EDGES [B] AND [C] OF CHIPENCODER ARE THE CENTERLINES OF THE BGA PADS.
 - REFER TO ID-00321 FOR CHIPENCODER MOUNTING REQUIREMENTS.

- WHEN SCALE MOVES IN DIRECTION "A" WITH RESPECT TO A STATIONARY READHEAD, OUTPUT SIGNAL A+ (PAD 22) LEADS OUTPUT SIGNAL B+ (PAD 20).
- FOR SCALES WITH TAPE (LXXXCE-T), THE SCALE MOUNTING SURFACE MUST BE .006" [.152] FURTHER AWAY FROM THE SEATING PLANE OF CHIPENCODER FOR NOMINAL Z HEIGHT. DIM = .281 [7.14]
- DO NOT CONNECT TO "RESERVED" PADS. SEE TABLE 1. FOR RESERVED PADS.

SCALE IDENTIFICATION AND SIZE

Scale Identification	Dim. A Measured Length	Dim. B Scale Length
LXXCE	XXmm-5mm	XXmm
L335CE	335mm-5mm = 330mm	335mm
(max) L625CE	625mm-5mm = 620mm	625mm

UNLESS OTHERWISE SPECIFIED ALL DIMENSIONS ARE IN INCHES (MILLIMETERS) DIM. APPLY AFTER PROCESSING INTERPRET ALL GEOMETRIC TOLS. PER ANSI Y14.5M-1994

TOLERANCES ARE:
 DECIMALS: .XX [X] ± .01 [.25]
 .XXX [XX] ± .005 [.13]
 ANGULAR: ± 30 MIN.

APPROVALS	DATE
DRAWN: S. BUTURLIA	12/8/05
CHECKED:	
ENGRG: VINCE CLARK	4/4/06
MFG ENG: THOMAS GARCIA	4/6/06
QA: S. OPPENHEIM	4/4/06

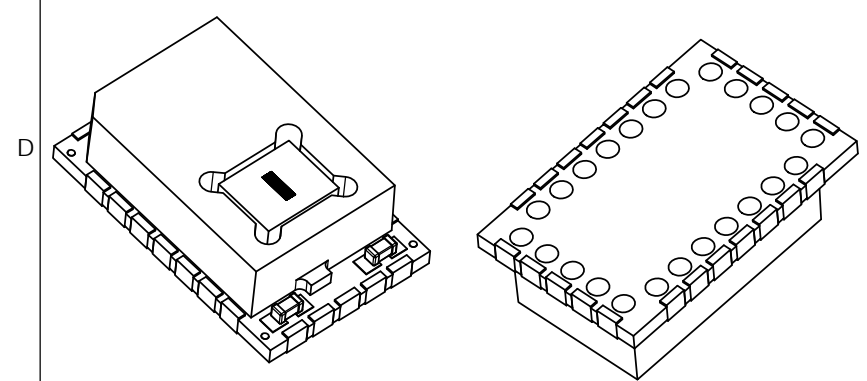
GSI MicroE Systems
 Division of GSI Group
 125 Middlesex Tpk.
 Bedford, MA 01730

DESCRIPTION:
INTERFACE, ENCODER, 40um LONG LINEAR, CHIPENCODER CE300

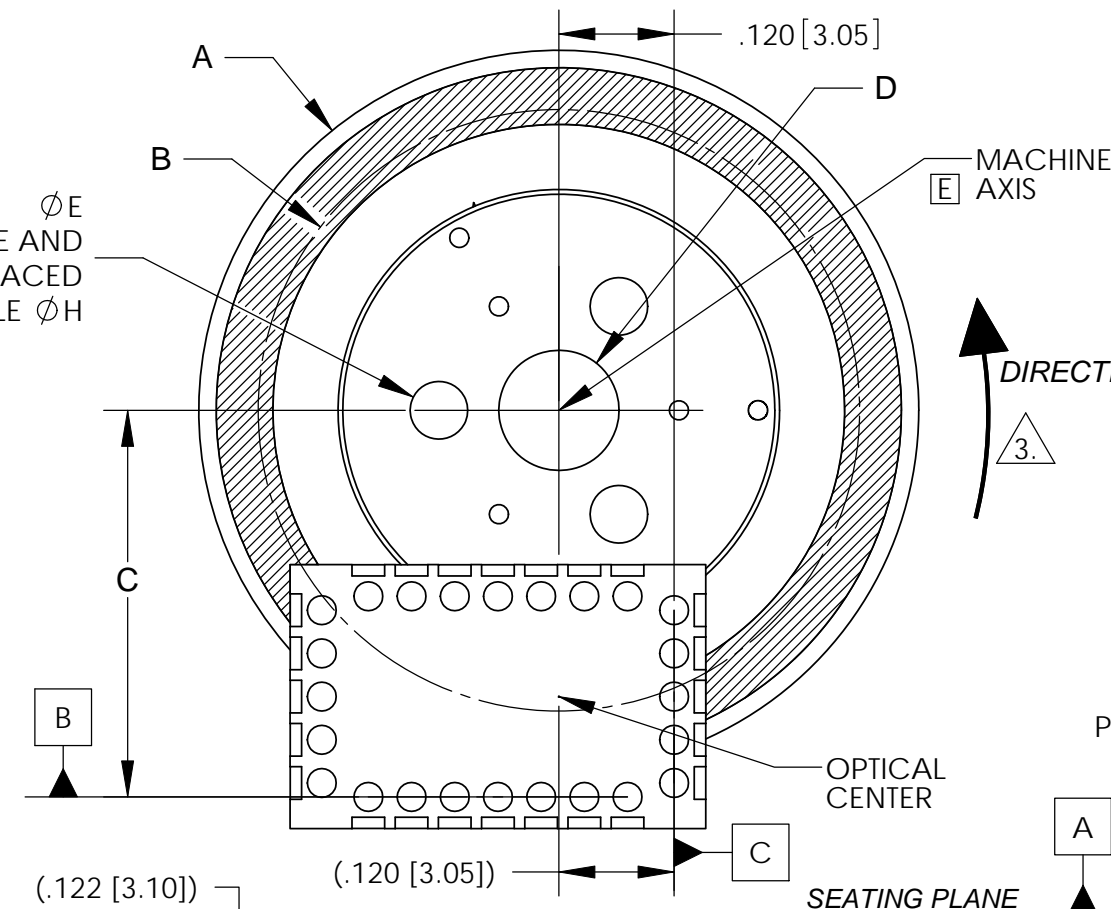
SIZE: B DWG. NO: ID-00328 REV. E
 SCALE: 1:1 CAD FILE: SHEET 1 OF 1

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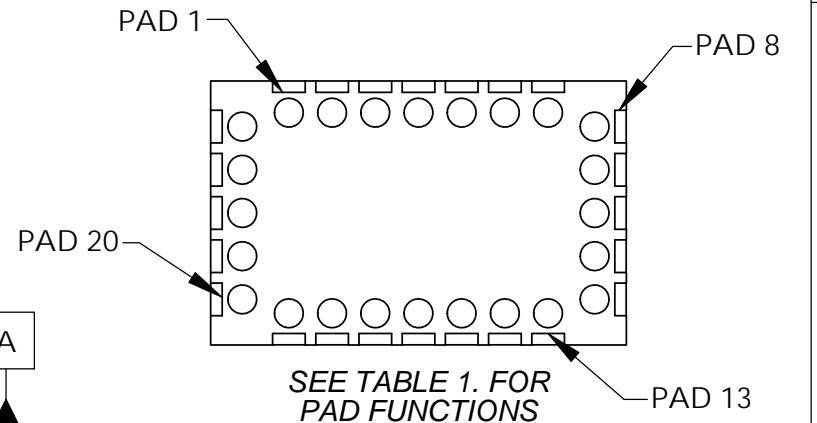
REVISIONS				
LTR	ECO	DESCRIPTION	DATE	APPRD
S2	1533	ADDED NOTE 7. UPDATED TABLE 1. "RESERVED" PADS.		
S3	1542	UPDATED TABLE 1. PAD FUNCTIONS.		
A	1604	RELEASE TO PRODUCTION	5/18/06	MF
B	1637	ADDED DIM FROM DATUM C TO OPTICAL CENTER.	7/17/06	SB
C	1754	ADDED "CE300" TO DESCRIPTION.	12/21/06	SB
D	1877	UPDATE DWG TO REFLECT ACTUAL CERAMIC	07/05/07	SB
E	1972	HUB HEIGHT FOR R1206, R1506, R1910 & R3213 UPDATED.	2/21/08	SB
F	2276	UPDATED TABLE 1. PAD 5 & 10 WHERE "RESERVED". SEE ECO	10/4/10	VB



ØE
MOUNTING HOLE AND
THREAD F. EQ. SPACED
ON A BOLT CIRCLE ØH



DIRECTION "A"
3.



- NOTES:
- DATUM EDGES **B** AND **C** OF CHIPENCODER ARE THE CENTERLINES OF THE BGA PADS.
 - REFER TO ID-00321 FOR CHIPENCODER MOUNTING REQUIREMENTS.
 - WHEN SCALE MOVES IN DIRECTION "A" WITH RESPECT TO A STATIONARY READHEAD, OUTPUT SIGNAL A+ (PAD 22) LEADS OUTPUT SIGNAL B+ (PAD 20).
 - DO NOT CONNECT TO "RESERVED" PADS. SEE TABLE 1. FOR RESERVED PADS.
- * SOME HUBS INCLUDE RELIEF TO PROVIDE SUFFICIENT CLEARANCE NOT SHOWN IN THESE VIEWS. SCALE SHOWN R1910CE

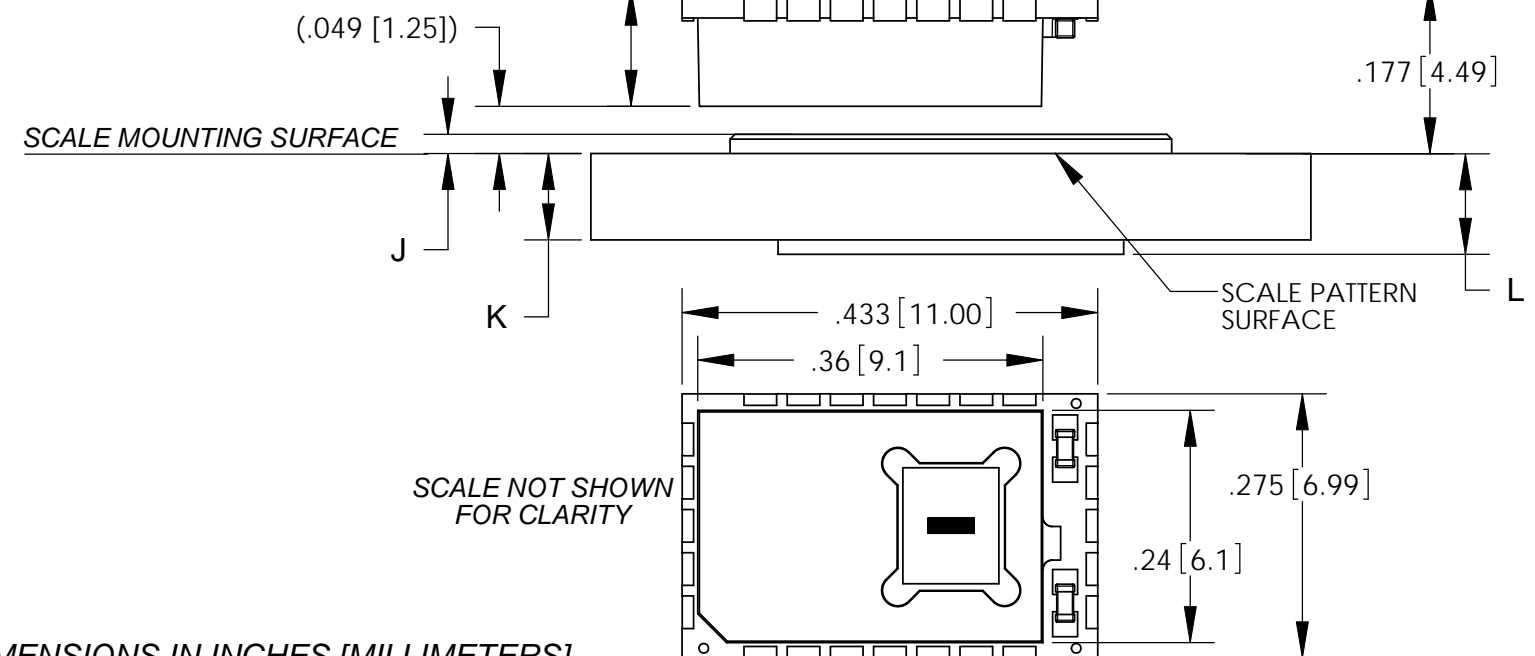


TABLE 1.

Pad	Function	Pad	Function
1	Index Window -	13	AN
2	GND	14	SIN+
3	RESERVED	15	RESERVED
4	RESERVED	16	RESERVED
5	CP+	17	RESERVED
6	+5VA	18	GND
7	RESERVED	19	+5VD
8	GND	20	B+
9	DC2	21	B-
10	CA	22	A+
11	DC1	23	A-
12	RESERVED	24	Index Window +

SCALE IDENTIFICATION AND SIZE. DIMENSIONS IN INCHES [MILLIMETERS]

Scale	Counts/ Rev	Dim. A Scale O.D.	Dim. B Scale I.D.	Dim. C Optical Dia.	Dim. D Mounting Dim.	Dim. E Hub I.D.	Dim. F Mounting Hole Dia.	Thread F.	Dim. H Bolt Circle	Dim. J * Hub Height	Dim. K Scale Thickness	Dim. L Hub Relief
R1206CE	825	0.472 [12.00]	.250+/- .005 [6.35+/- .13]	0.414 [10.50]	0.296+/- .002 [7.52+/- .05]	0.1253+ .0005/- .0000 [3.182+ .013/- .000]	N/A	N/A	N/A	0.020 [0.51]	0.036+/- .004 [0.91]+/- .10	0.045 [1.14]
R1506CE	1,024	0.572 [14.53]	.250+/- .005 [6.35+/- .13]	0.513 [13.04]	0.346+/- .002 [8.79]+/- .05]	0.1253+ .0005/- .0000 [3.182+ .013/- .000]	N/A	N/A	N/A	0.020 [0.51]	0.036+/- .004 [0.91]+/- .05]	0.045 [1.14]
R1910CE	1,250	0.750 [19.05]	.375+/- .005 [9.53+/- .013]	0.627 [15.92]	0.403+/- .002 [10.23]+/- .05]	0.1253+ .0005/- .0000 [3.182+ .013/- .000]	0.047 [1.19]	0-80	0.250 [6.35]	0.020 [0.51]	0.090+/- .004 [2.29]+/- .10]	0.105 [2.67]
R3213CE	2,048	1.250 [31.75]	.500+/- .005 [12.70+/- .013]	1.027 [26.08]	0.603+/- .002 [15.31]+/- .05]	0.2503+ .0005/- .0000 [6.357+ .013/- .000]	0.070 [1.78]	2-56	0.370 [9.40]	0.035 [0.89]	0.090+/- .004 [2.29]+/- .10]	0.105 [2.67]
R5725CE	4,096	2.250 [57.15]	1.000+/- .005 [25.40+/- .013]	2.053 [52.15]	1.116+/- .002 [28.35]+/- .05]	0.5003+ .0005/- .0000 [12.707+ .013/- .000]	0.136 [3.45]	8-32	0.750 [19.05]	0.060 [1.52]	0.090+/- .004 [2.29]+/- .10]	0.105 [2.67]
R10851CE	8,192	4.250 [107.95]	2.000+/- .005 [50.80+/- .013]	4.106 [104.30]	2.143+/- .002 [54.42]+/- .05]	1.0003+ .0005/- .0000 [25.408+ .013/- .000]	0.136 [3.45]	8-32	1.375 [34.93]	0.080 [2.03]	0.090+/- .004 [2.29]+/- .10]	0.105 [2.67]

UNLESS OTHERWISE SPECIFIED ALL DIMENSIONS ARE IN INCHES DIM. APPLY AFTER PROCESSING INTERPRET ALL GEOMETRIC TOLS. PER ANSI Y14.5M-1994

TOLERANCES ARE:
DECIMALS: .XX [X]±.01 [25]
XXX [XX]±.005 [13]

ANGULAR: ±30 MIN.

APPROVALS	DATE
DRAWN: S.BUTURLIA	12/8/05
CHECKED:	
ENGRG: VINCE CLARK	5/18/06
MFG ENG: L. SALATE	5/18/06
QA: A. VILLARROEL	5/18/06

UNITS: INCHES [mm]

GSI MicroE Systems
Division of GSI Group
125 Middlesex Tpk.
Bedford, MA 01730

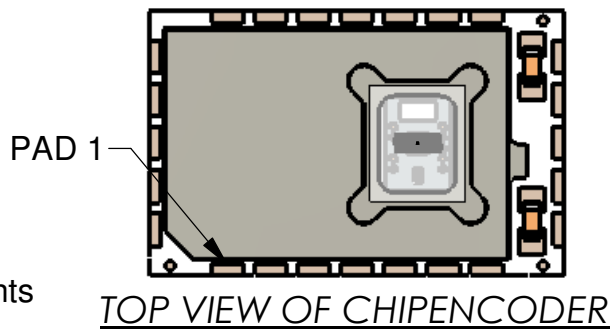
DESCRIPTION:
**INTERFACE, ENCODER,
40um ROTARY w/HUB,
CHIPENCODER CE300**

SIZE: B DWG. NO: ID-00329 REV. F
SCALE: 1:1 CAD FILE: SHEET 1 OF 1

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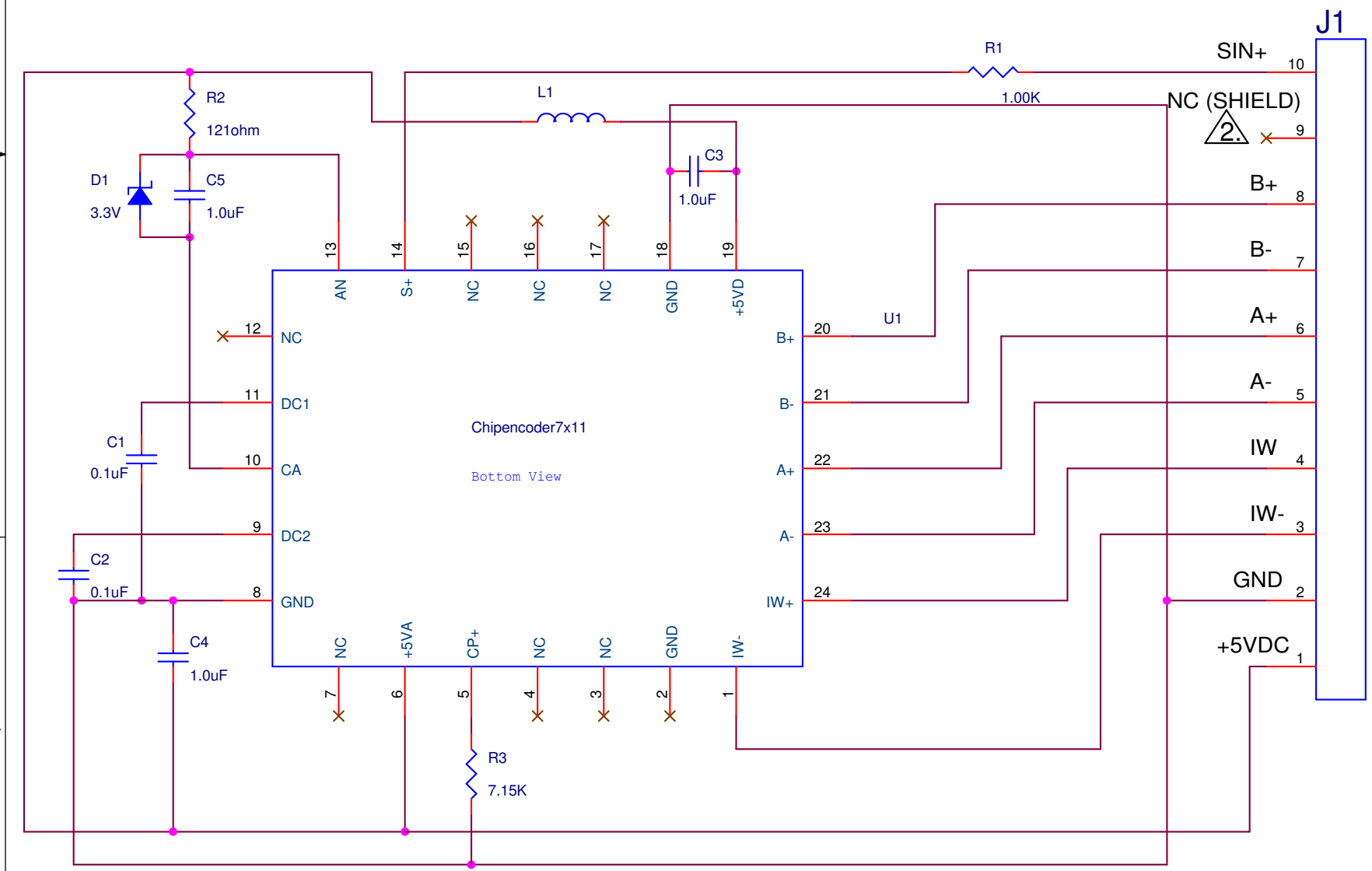
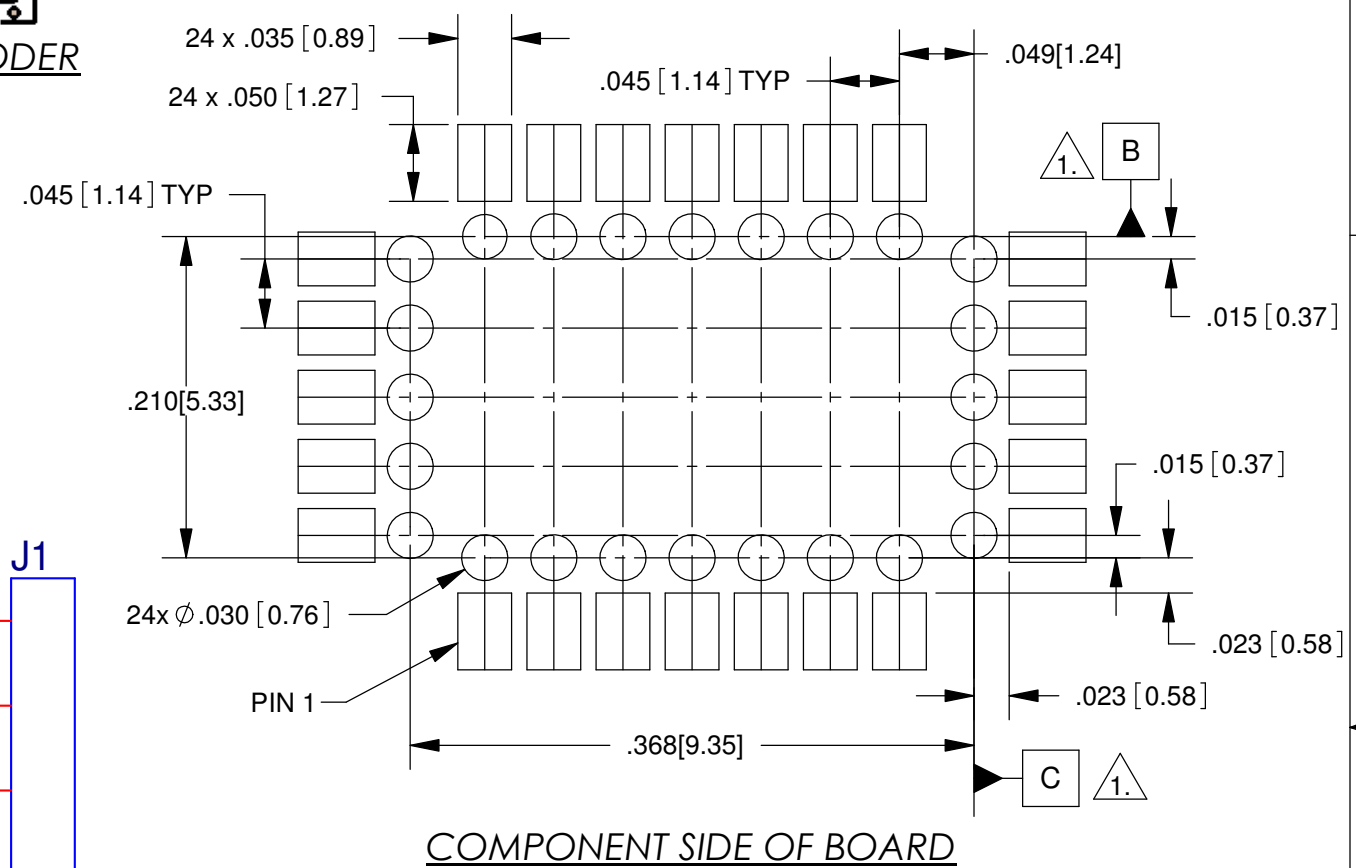
Electrical Interface:

The ChipEncoder CE300 must be interfaced to subsequent electronics in the following manner to ensure proper system performance. All passive components must be located directly adjacent to the pads to which they are connected.



REVISIONS				
LTR	ECO	DESCRIPTION	DATE	APPD
S2	1513	ADDED NOTES 3 AND 4.	11/30/05	SB
S3	1542	PINS 4, 5, 7, 10, 12, 15, 16, & 17 CHANGED TO NC.	1/25/06	SB
A	1582	PINS 3 CHANGED TO NC. RELEASE TO PRODUCTION	4/17/06	SB
B	1643	ADDED C5 CAPACITOR. SEE ECO.	8/2/06	SB
C	1688	NOTE 4, "HAND SOLDERING" WAS "REWORK".	9/28/06	SB
D	1754	ADDED "CE300" TO DESCRIPTION.	12/21/06	SB
E	1766	CORRECTED DIMENSIONS. SEE ECO.	1/23/07	SB
F	1885	ADDED D1, R2 AND NOTE 5. SEE ECO.	7/11/07	DS
G	2276	ADDED R3 TO SCHEMATIC TABLE. REMOVED NOTE 5. UPDATED NOTE 4. SEE ECO	10/4/10	VB
H	2653	ADDED NOTE 5. REVISED LOGO/ADDRESS. SEE ECO	12/18/13	VB

Designation	Description	Manufacturer P/N or Equivalent
C1, C2	Capacitor, Ceramic, 0.1uF, 10V, ±10%, 0402	Panasonic - ECJ-0EB1A104K
C3, C4, C5	Capacitor, Ceramic, 1.0uF, 10V, ±10%, 0603	Panasonic - ECJ-1VB1A105K
D1	Diode, ESD Protection TVS, ASD, 102W 3.3V SOD-923	ON Semiconductor - ESD9x3.3ST5G
L1	EMI Filter, 600 Ohms @ 100MHz, 200mA, 0603	Murata - BLM18AG601SN1D
R1	Resistor, Thick Film Chip, 1.00K, 1/16W, ±1%, 0402	Panasonic - ERJ-2RK1001X
R2	Resistor, Thick Film Chip, 121 OHM, 1/16W, ±1%, 0402	Panasonic - ERJ-2RK1210X
R3	Resistor, Thick Film Chip, 7.15K, 1/10W, ±1%, 0402	Panasonic - ERJ-2RK7151X



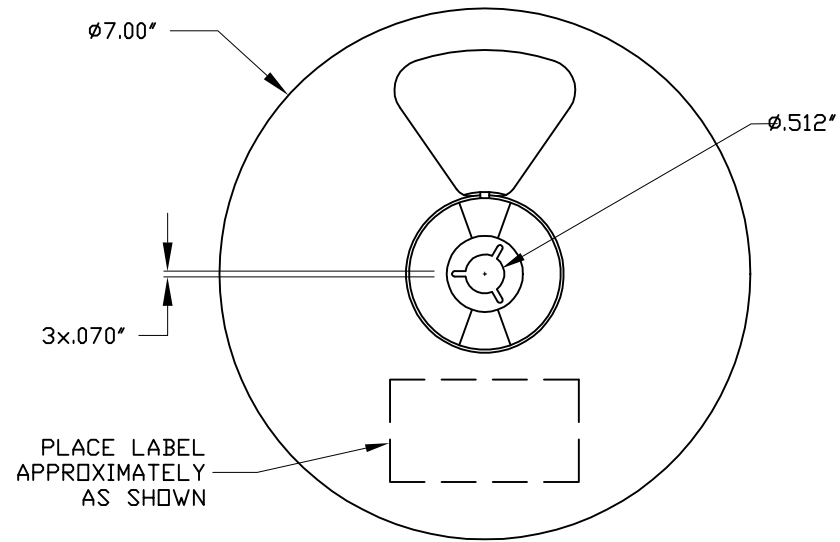
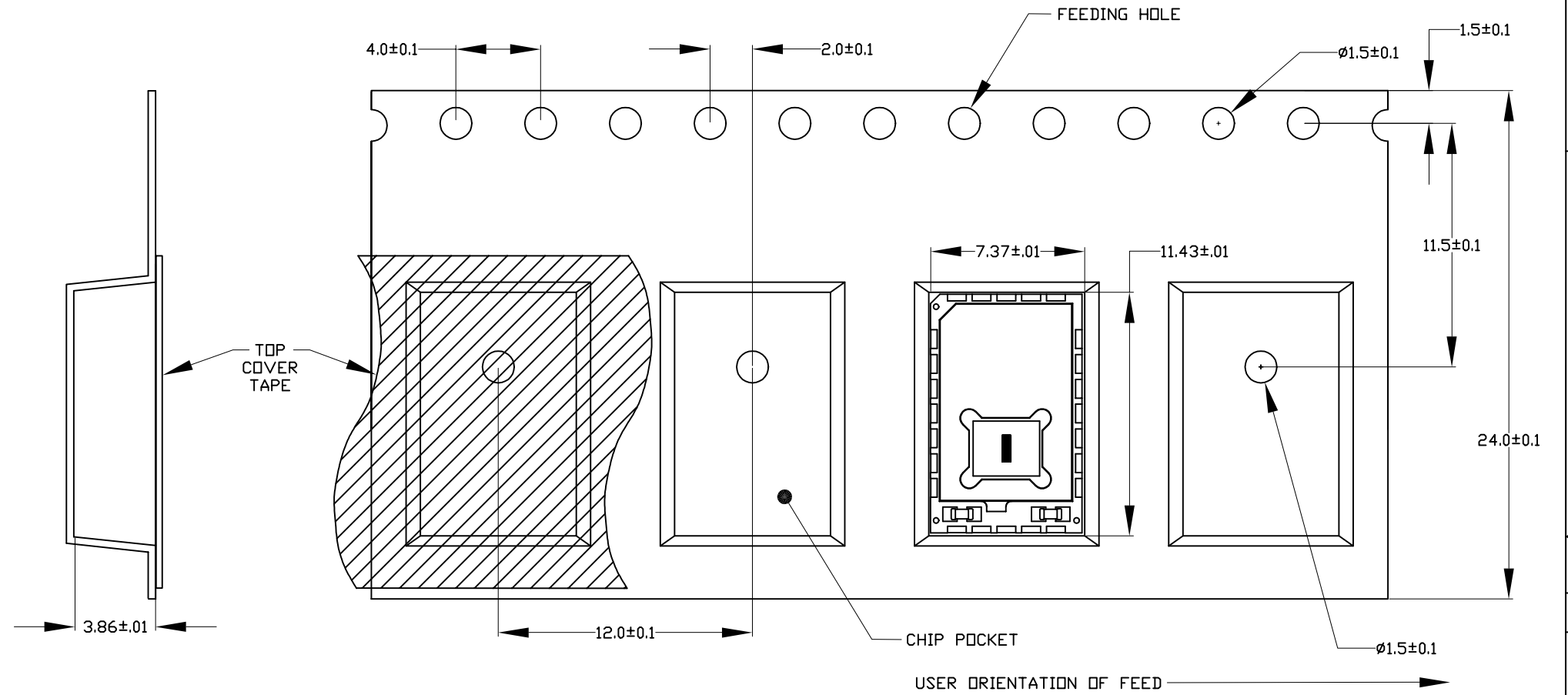
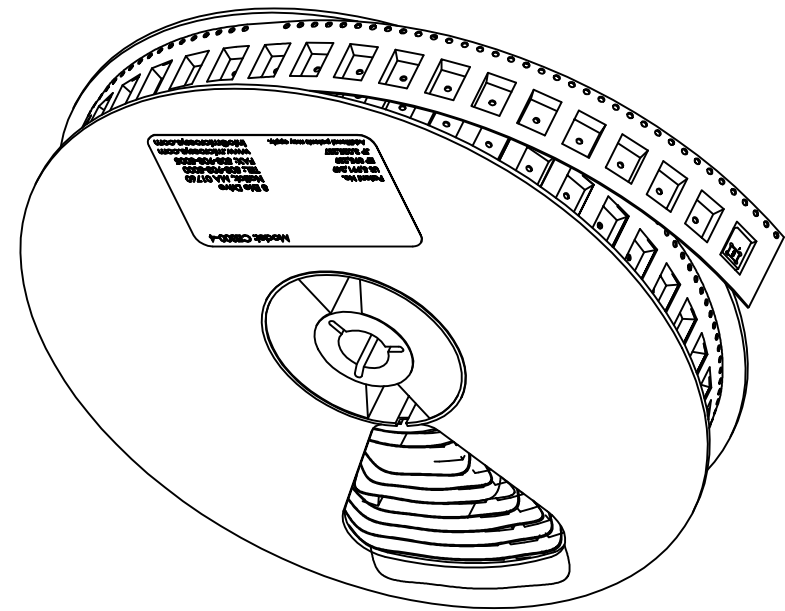
NOTES:

1. THE DATUMS SHOWN REPRESENT THE PAD CENTERS ON THE 7mm x 11mm CHIPENCODER.
2. GROUND AT RECEIVER.
3. BGA SOLDER BALL COMPOSITION IS Sn96.5 Ag3.0 Cu0.5 (SAC305)
4. OPTIONAL SQUARE PADS FOR TESTING. NO SOLDER PASTE.
5. DO NOT USE ANY PCB WASHING TECHNIQUES ON THE CHIPENCODER.

UNLESS OTHERWISE SPECIFIED ALL DIMENSIONS ARE IN INCHES[millimeters] DIM. APPLY AFTER PROCESSING INTERPRET ALL GEOMETRIC TOLS. PER ANSI Y14.5M-1994 TOLERANCES ARE: DECIMALS: .XX[X] ±.01[.25] .XXX[XX] ±.005[.13]	APPROVALS DRAWN M. FARLAND CHECKED VINCE CLARK ENGRG. NJ TOBEY MFG ENG THOMAS GARCIA QA JOHN DALCO	DATE 9/13/05 4/7/06 4/17/06 4/7/06 4/7/06	125 Middlesex Tpk. Bedford, MA 01730 DESCRIPTION: LAND PATTERN & ELECTRICAL INTERFACE REQUIREMENTS, CHIPENCODER, CE300, 40um
	SUBJECT TO CHANGE WITHOUT NOTIFICATION		

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REVISIONS				
LTR	ECO	DESCRIPTION	DATE	CHKR-APVD
S1		INITIAL	12/21/06	SB
A	1779	RELEASE TO PRODUCTION	03/07/07	SB
B	1877	UPDATAE DWG TO REFLECT ACTUAL CERAMIC	07/05/07	SB



<p>UNLESS OTHERWISE SPECIFIED: ALL DIMENSIONS ARE IN MILLIMETERS DIM. APPLY AFTER PROCESSING</p> <p>INTERPRET ALL GEOMETRIC TOLS. PER ANSI Y14.5M-1994</p> <p>TOLERANCES ARE: DECIMALS: .X ±.3 .X ±.13 SURFACE FINISH 32 BREAK SHARP EDGES, REMOVE BURRS</p>	<p>DRAWN M. FARLAND</p>	<p>DATE 12/12/06</p>	<p>DESCRIPTION: INTERFACE, PACKAGING, TAPE & REEL, CE300, ENCODER SIDE UP</p>					
	<p>CHECKED</p>	<p>ENGRG. VINCE CLARK</p>		<p>03/07/07</p>				
	<p>MFG. TOM GARCIA</p>	<p>03/07/07</p>		<p>QA. JOHN DALCO</p>	<p>03/07/07</p>			
	<p>ADDITIONAL</p>							
<p>MATERIAL:</p>	<p>FINISH:</p>	<p>MAKE FROM:</p>	<p>SIZE B</p>	<p>DWG No. ID-00341</p>	<p>REV. B</p>	<p>SCALE:</p>	<p>3rd ANGLE PROJECTION</p>	<p>SHEET: 1 OF 1</p>