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-4 OCT 1982

FOR LANS

/JB

**COSSOR**  
electronics

Cossor Electronics Limited, The Pinnacles, Harlow, Essex, UK. Telephone: Harlow (0279) 26862. Telex: 81228. Cables: Cossor Harlow

GEC Ltd  
Hirst Research Centre  
East Lane  
Wembley  
Middx HA9 7PP

30th September 1982

833/1338/5/A/3512

For the attention of Mr G Swallow

Dear Sirs

With reference to our discussions concerning 29uS and 26.4uS Delay Lines please note the following requirements:

(a) 29uS Delay Line B914842/001

- (i) All new lines will be 6mm wide, with new case allowing provision of gasket and new SMA connector (subject to satisfactory completion of vibration tests). These lines will be identified by the same Cossor part number and NATO number as existing but the GEC Hirst number should be S29/6. It has already been agreed with MOD that the MOD strike number increases with the introduction of the 6mm line.
- (ii) The Cossor drawing will show a greater maximum height for the line to allow a thicker base plate and will call for GEC Hirst type number S29/1 and S29/6.

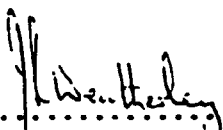
(b) 26.4uS Delay Line B917034/000 (New number TBA)

- (i) The insertion loss figure will be  $53 \pm 2$  dB.
- (ii) Input power testing will be at 5W CW.
- (iii) Following the policy of 29uS lines outlined above, all 26.4uS delay lines will have one Cossor and NATO identification but the line thickness should be identified within the GEC Hirst number, e.g. S26.4/6 and S26.4/8 or similar.

Further to our investigation into burn out failures of 29uS lines, we find that the dc transient on equipment switch on or mode change does not exceed +1.5V at the Delay Line input port. We believe that this is insufficient to cause the damage seen.

The line undergoing power testing has withstood up to 9W CW with no ill effect and has not failed when subjected to the transients measured above.

Yours faithfully  
for and on behalf of  
COSSOR ELECTRONICS LIMITED

  
.....  
J R Weatherley

c.c. Mr R A Swann, PDS  
Mr M McCreary, Purchasing  
Mr C Newson, Prog Management

<u>Number</u> SAN70 - 2 -	<u>COMPONENT SPECIFICATION</u>	<b>COSSOR</b> electronics
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<u>PART:-</u> 1	<u>Description</u> DELAY LINE. (R.F).
<u>PAGE:-</u> 2	
<u>ISSUE:-</u> A	

Marking

1. Each device will be marked as follows:-
  - (a) Terminal identification.
  - (b) Manufacturer's type number.
  - (c) Serial number.
  - (d) Factory identification.
2. Each primary package containing one or more devices shall bear the above markings except (a), and in addition:  
The British Standard detail specification number.

Ordering information

Orders for devices shall contain the following information:-

- (a) Quantity.
- (b) Type number.
- (c) Centre frequency.
- (d) The British Standard specification number.

Related documents

This specification shall be read in conjunction with:-

- |        |   |
|--------|---|
| BS2011 | Methods for environmental testing of electronic components and electronic equipment.    |
| BS6001 | Sampling procedures and tables for inspection by attributes.                            |
| BS9000 | General requirements for electronic components of assessed quality.                     |
| BS9300 | Semiconductor devices of assessed quality.  |
| BS9400 | Integrated electronic circuits of assessed quality. Generic data and methods of test.   |
| BS9450 | Custom built integrated circuits of assessed quality. Generic data and methods of test. |



# CHANGE NOTE PART 2

DRAWING OFFICE ACTION

SHEET NO. 2.

DRAWING B 914842 SHEET 1 ISSUE 2A  
DRAWING B 914842 SHEET 2 ISSUE 1D  
DRAWING B. 914842 SHEET 3 ISSUE 1B  
AMENDED TO SUIT PART 1.

CHANGING

CHANGE NOTE NO.

125/6933.

192

**ROSSOR**  
electronics

COMPONENT SPECIFICATION

Number EXHIBIT NO. 9 (CTD.)

**SPECIAL**

SAN 70 - 2 -

Description

DELAY LINE. (R.F).

PART:- 2

PAGE:- 1

ISSUE:- A

Recommended conditions of use and associated characteristics (not for inspection purposes).

Operating temperature.....25°C.

Input frequency.....3.00 to 3.41 GHz.

VSWR.....18 : 1 max.

Nominal impedance.....50 ohms.

Spurious signals.....At least 25 dB down on required output.

Ripple.....3 dB max.

**COSSOR**  
electronics

COMPONENT SPECIFICATION

NUMBER

SAN70 - 2 -

DESCRIPTION

DELAY LINE (R.F).

PART	3
PAGE	1
ISSUE	A

INSPECTION REQUIREMENTS

Inspection or test	BS9450 reference and conditions of test	Sample size	Limits		Units
			min.	max.	
<u>Group A</u>					
Subgroup A1 Visual	1.2.2 Correctness of marking. Correctness of terminal identification. Correct encapsulation. Unbroken body.	100%			
Subgroup A2 Electrical Insertion loss	1.2.4 Major static/dynamic characteristics at 25°C. Measured with pulse duration of 10 us and duty cycle 10% at: 3.1 GHz. 3.2 GHz. 3.3 GHz. 3.4 GHz.	100%	50	56	dB
Insertion loss variation (slope)	3.1 to 3.4 GHz.			3	dB
Power test	Pulse duration 10 us. Duty cycle 10%. Test duration 30s min.		5		Watts (pk)
<u>Group B</u>					
Subgroup B1 (b) Dimensions	1.2.3 Length Width Height Fixing hole positions and size Coaxial connector positions	10%			
Subgroup B2 Rapid change of temperature Damp heat, cyclic	1.2.6.13 -40°C to +80°C, 5 cycles 1.2.6.5 6 cycles	10%			
Subgroup B4 Acceleration	Not applicable	10%			
Low pressure	Equivalent to an altitude of 12,000 feet above sea level Test as B2.				
Subgroup B5 Endurance	160 hours at +80°C, non-operating	10%			
Subgroup B6 Post test end points for B2, B5.	Tests as in Subgroup A2				
		As Subgroup A2. Reject on 1 failure			

<u>NUMBER</u>  SAN70-2-	<u>COMPONENT SPECIFICATION</u>	<b>COSSOR</b> electronics
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PART	3	<u>DESCRIPTION</u> DELAY LINE (R.F).
PAGE	2	
ISSUE	A	

Inspection or test	BS9450 reference and conditions of test	Sample size	Limits		Units
			min.	max.	
<u>Group C</u>					
Subgroup C1 (a)(D) Vibration	1.2.6.8.1 55 to 500 Hz. 98 m/s <sup>2</sup> .	10%			
Shock	1.2.6.6 981 m/s <sup>2</sup> . 6 ms. Mounting to be agreed.				
Bump	1.2.6.7 Severity (a). 4000 ± 10 bumps at 390 m/s <sup>2</sup> .				
Damp heat, cyclic	1.2.6.5 28 cycles				
Subgroup C1 (b) Dimensions and mass	1.2.3 Mass			227	gms
Subgroup C2 (a) Electrical	Subgroup A2 tests at -35°C at +75°C	10%		-3 +3	dB dB
Subgroup C2 (b) Spurious reflection	Any spurious returns shall be down on the wanted return by		25		dB
Delay			25.9	26.9	us
VSWR				18:1	Ratio
Subgroup C4 Post test end points for C1.	Tests as in Subgroup A2				As Subgroup A2. Reject on 1 failure.

(D) = Destructive test.

Samples for destructive tests must be added to quantity ordered.

PURCHASING

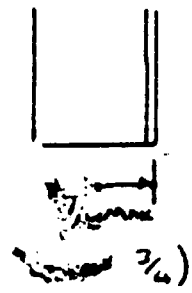
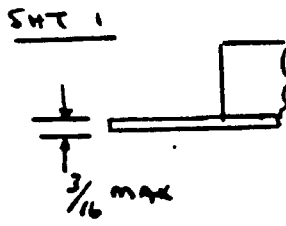
CHANGE NOTE PART I

CHANGE REQUEST AND AUTHORIZATION

ACTION		ORIGINATOR'S NAME J.R. WEATHERS	DATE 19-10-82	DEPARTMENT AND SERIAL NO. 833/005(N)/21
DRAWING LIST	DRAWINGS	UNIT AFFECTED DELAY WIRE		EQUIPMENT AFFECTED RAPID OLF
	DRAWING LIST	DRAWING NO. 914842/001		ISSUE
	ITEMS LIST	REASON FOR REQUEST MANUFACTURER DESIGN IMPROVEMENTS.		CROSSING POINTS AFFECTED: 64215735 Y04 Y05 Y06
	WORKING DRAWING			

CHANGE AFFECTS MOD STATE?	CHANGE AFFECTS PRICE?
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DETAILS OF REQUEST (ATTACH MARKED-UP PRINTS)



(was 1/16)

NOTE 6 TYPE NO. 529/1 OR 527/6

SHT 3

4. Interchangeability

Change to read '----- any other 'F' Band' delay line to 914842'

SHT 2

~~The device shall be designed such that it will meet the above electrical specifications - - - - - etc.~~

3. The device shall be designed such that it will meet the above electrical specifications - - - - - etc.

8273 2569  
(Continue on part 2 if Required)

APPROVAL	RELEASED FOR PRELIMINARY ACTION	DATE: 10-10-82	ADDITIONAL CIRCULATION:
	(SEN) [Signature]		
	(DES) [Signature]	DATE: 20/10/82	

PART 1 sheets	PART 2 sheets	PART 3 sheets	PART 4 sheets
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DELETE AS REQUIRED

AMENDMENT MODIFICATION 196

D. O. ASSISTANT JAS	DATE: 28/10/82	DATE: 20/10/82	CHANGING: M	CHANGE NOTE NUMBER: 125/6933
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Test Report No. MDIS 178  
 Rod No. 243/66/8  
 Serial No. B030M/83  
 Delay Time \_\_\_\_\_

'P' Band Delay Line Type S22

POST-MODIFICATION REPORT

Insertion Loss Measurements

Device State	Frequency (GHz)										Units	Comments	
	3.0	3.05	3.10	3.15	3.20	3.25	3.30	3.35	3.40	3.45			3.50
On re-assembly and tuning			59.4		59.1		58.4		57.7			dB	
After heating cycle completed			60.2		59.8		59.0		57.5			dB	
												dB	
Final test			59.6		58.9		58.1		57.0			dB	
Q.A. Check												dB	

Passed for Despatch: Date 18/4/83  
 Inspector's Signature [Signature]  
 Inspector's Signature

Test Report No. MDLS 179

'F' Band Delay Line Type S29

Rod No. 36/56

Serial No. B0747/83

Delay Time \_\_\_\_\_

POST-MODIFICATION REPORT

Insertion Loss Measurements

Device State	Frequency (GHz)										Units	Comments	
	3.0	3.06	3.10	3.15	3.20	3.25	3.30	3.35	3.40	3.45			3.50
On re-assembly and tuning			57.3		57.3		57.2		56.7			dB	
After heating cycle completed			57.2		57.0		56.6		56.3			dB	
												dB	
												dB	
Final test			58.8		58.3		57.2		56.2			dB	
Q.A. Check												dB	

Passed for Despatch: Date 18/4/83



K.I. Lewis

Inspectors Signature

Test Report No. MDIS 180

'P' Band Delay Line Type S29

Rod No. 85/21

Serial No. B2067/83

Delay Time \_\_\_\_\_

POST-MODIFICATION REPORT

Insertion Loss Measurements

EXHIBIT No. 9

(CTD.)

Device State	Frequency (GHz)										Units	Comments	
	3.0	3.05	3.10	3.15	3.20	3.25	3.30	3.35	3.40	3.45			3.50
On re-assembly and tuning			60.3		60.5		60.1		59.5			dB	
After heating cycle completed			60.2		60.3		60.3		60.0			dB	
												dB	
												dB	
Final test			60.1		60.1		60.1		59.5			dB	
Q.A. Check												dB	

Passed for Despatch: Date 18/4/83

*[Signature]*

Inspectors Signature

Test Report No. MDLS 181

'F' Band Delay Line Type S29

Rod No. B089

Serial No. B290M/83

Delay Time \_\_\_\_\_

POST-MODIFICATION REPORT

Insertion Loss Measurements

EXHIBIT No. 9

(CTD.)

Device State	Frequency (GHz)										Units	Comments	
	3.0	3.05	3.10	3.15	3.20	3.25	3.30	3.35	3.40	3.45			3.50
On re-assembly and tuning			58.2		58.5		58.4		57.9			dB	
After heating cycle completed			58.3		58.4		58.3		57.9			dB	
												dB	
												dB	
Final test			58.8		58.8		58.5		57.9			dB	
Q.A. Check												dB	

Passed for Despatch: Date 18/4/83

*[Signature]*

Inspector's Signature

Test Report No. MDIS 182

'F' Band Delay Line Type S22

Rod No. 002R.

Serial No. B4467/83

Delay Time \_\_\_\_\_

POST-MODIFICATION REPORT

Insertion Loss Measurements

Device State	Frequency (GHz)										Units	Comments	
	3.0	3.05	3.10	3.15	3.20	3.25	3.30	3.35	3.40	3.45			3.50
On re-assembly and tuning			58.4		58.2		57.6		56.7			dB	
After heating cycle completed			59.8		59.7		59.1		58.5			dB	
												dB	
												dB	
Final test			59.3		58.8		57.7		56.7			dB	
Q.A. Check												dB	

Passed for Despatch: Date 18/4/83



P. I. Lewis  
Inspectors Signature

Test Report No. MDIS 185.

'F' Band Delay Line Type S22

Rod No. 300/69/7

Serial No. B4667/83

Delay Time \_\_\_\_\_

POST-MODIFICATION REPORT

Insertion Loss Measurements

EXHIBIT No. 9

(CTD.)

Device State	Frequency (GHz)											Units	Comments	
	3.0	3.05	3.10	3.15	3.20	3.25	3.30	3.35	3.40	3.45	3.50			
On re-assembly and tuning			57.0		57.6		57.6		57.9				dB	
After heating cycle completed			58.3		58.7		59.0		59.2				dB	
													dB	
													dB	
Final test			57.1		57.3		57.1		56.9				dB	
Q.A. Check			57.0		57.0		56.0		56.7				dB	

Passed for Despatch: Date 20/4/83

S.T. Lewis 

Inspectors Signature

Test Report No. MDIS 184

'P' Band Delay Line Type S29

Rod No. 78/20.

Serial No. B356M/83

POST-MODIFICATION REPORT

Delay Time \_\_\_\_\_

Insertion Loss Measurements

Device State	Frequency (GHz)										Units	Comments	
	3.0	3.05	3.10	3.15	3.20	3.25	3.30	3.35	3.40	3.45			3.50
On re-assembly and tuning			57.5		57.8		57.9		57.6			dB	
After heating cycle completed			57.0		57.5		57.3		56.7			dB	
												dB	
												dB	
Final test			57.2		57.6		57.4		57.0			dB	
Q.A. Check			57.0		57.6		57.3		56.7			dB	

Passed for Despatch: Date 20/4/83



B.T. Kumar

Inspectors Signature

Test Report No. MDLS 183

'F' Band Delay Line Type S22

Rod No. 490/92/3

Serial No. B2344/83

Delay Time \_\_\_\_\_

POST-MODIFICATION REPORT

Insertion Loss Measurements

Device State	Frequency (GHz)											Units	Comments	
	3.0	3.05	3.10	3.15	3.20	3.25	3.30	3.35	3.40	3.45	3.50			
On re-assembly and tuning			57.2		58.6		59.5		60.0				dB	
After heating cycle completed			56.8		57.9		58.7		59.0				dB	
													dB	
													dB	
Final test			56.6		57.5		58.1		58.5				dB	
Q.A. Check			56.5		57.4		58.0		58.5				dB	

Passed for Despatch: Date 20/4/83



S. T. Lewis  
Inspectors Signature

