SPECIFICATION AND INSPECTION PROCEDURE FOR ANALOG RECEIVER MODULE

Receiver Part No: POR00L12SKX

Customer: CERN

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NGK INSULATORS, LTD.:

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Signature:

CUSTOMER CONFIRMATION:

Name: ___________________________ Signature: ___________________________

Name: ___________________________ Signature: ___________________________

Name: ___________________________ Signature: ___________________________

Product applicable to this document

This is a preliminary document for the analog receiver module for CERN, which is supplied by NGK Insulators, Ltd. This document is applicable to preproduction R2.

Electrostatic Discharge

CAUTION: This device is susceptible to damage as a result of electrostatic discharge(ESD).Take proper precaution during both handling and testing.

Caution

This product contains Gallium Arsenide (GaAs) which can be hazardous to the human body and the environment. For safety, observe the following procedures.

- Do not put this product into the mouth.
- Do not alter the form of this product into a gas, powder, or liquid through burning, crushing, or chemical processing as these by-products are dangerous to the human body if inhaled, ingested or swallowed.

Observe governmental laws and company regulations when discarding this product. This product must be discarded in accordance with methods specified by applicable hazardous waste procedures

Contents

Revision	Date of Revision	Description of Change
A	Mar 30 '02	Module specification *Fix the max numebr of Module output skew *Add Max reflow temperature Drawing *Add the tolerance of guide hole diameter *Change the pin assignment *Add smaller de-coupling capacitor Inspection * Test of the power dissipation with changing control input

Module Specification

General description

	Parameter		
5.1	Number of channels	12	
5.2	Number of electrical pins	43	
	Type of Optical Fiber	Single mode 12 Fiber Ribbon	
5.45	Optical Connector	MTP ® (MPO)	Angle polished

Electrical Characteristic

	Parameter	Min.	Typ.	Max	Unit	
5.5	Module responsivity	TBD		TBD	A/W	
5.21	Module bandwidth	100			MHz	Including ASIC
5.22	Output track capacitance			5	pF	
5.23	Pin diode rise/fall time			2	ns	5V reverse bias Tc 25C at start of life
5.24	Pin diode capacitance	0.6		1.2	pF	2V reverse bias Tc 25C f=1MHz at start of life
5.25	Module output skew			1.5	ns	
5.26	Module output jitter			0.5	ns	rms
5.28	Pin diode dark current		0.1	1	nA	5V reverse bias Tc 25C at start of life
5.29	Pin diode absolute maximum photo current	3			mA	
5.30	Pin diode absolute maximum forward current	5			mA	
5.31	Pin diode absolute maximum reverse voltage	20			V	
5.37	Control inputs	X_0, X_1 , X_2,X_3 ,X_4 ,X_5,				
5.38	Power supply	4.5	5	5.5	V	
5.39	Power dissipation			3	W	Module can dissipate up to 3W at 70C with air flow of 3m/s

Optical Characteristic

	Parameter	Min.	Typ.	Max	Unit	
5.41	Wavelength		1310		nm	
5.42	Optical input range		300		μW	
5.43	Absolute maximum optical input power	3			mW	
5.44	Pin diode responsivity	0.7	0.85	1	A/W	Tc 25C at start of life
5.46	Module optical return loss	40			dB	

Operating Environment

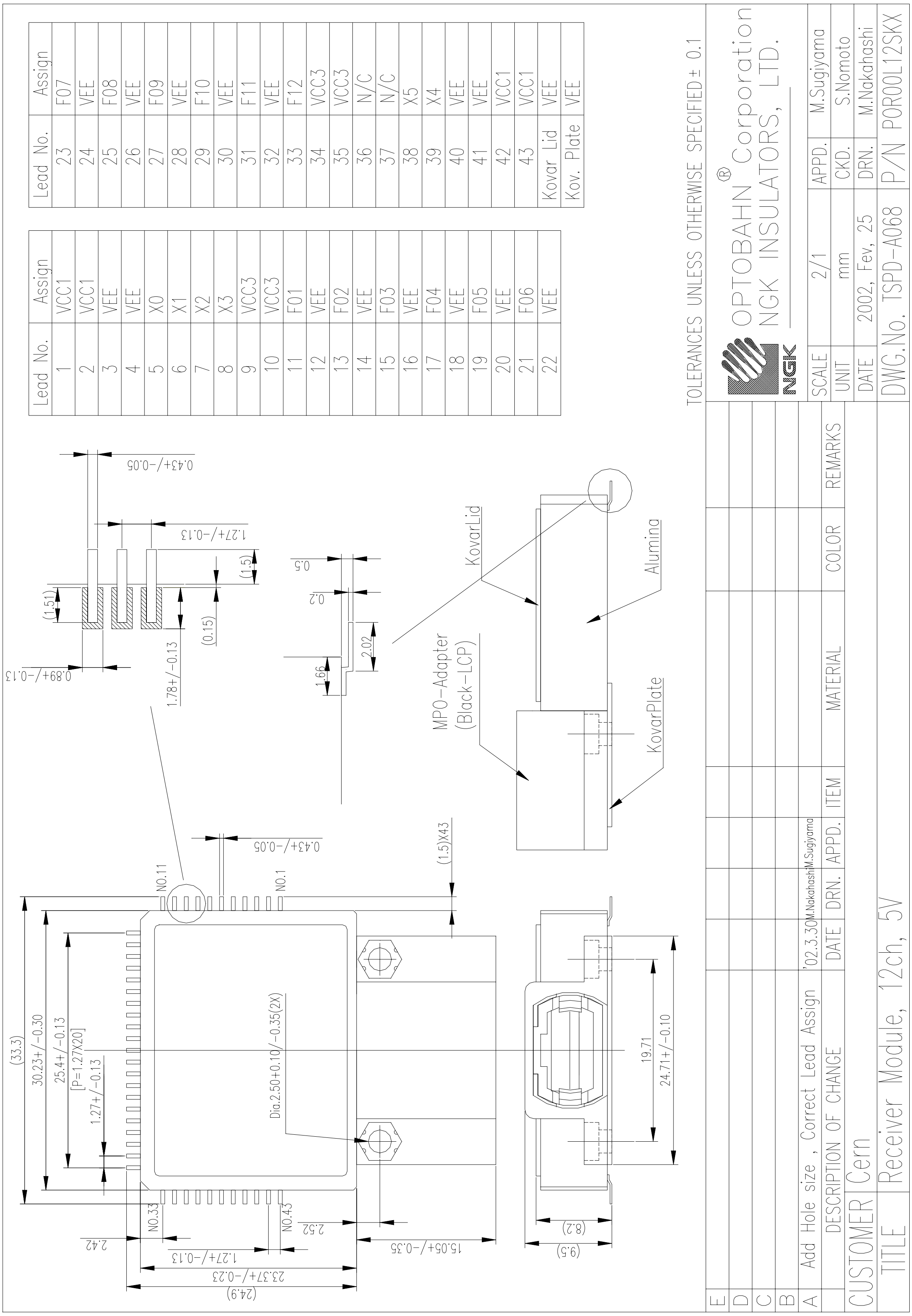
	Parameter	Min.	Typ.	Max	Unit	
5.61	Storage temperature	-20		70	°C	
5.62	Operating temperature	0		70	°C	
5.63	Operating humidity			60%	RH	
5.81	Material composition	Halogen-free material				
	Maximum Reflow Temperature			260	°C	Temperature for 30 second with 3 cycles.

Labeling

Product Number and Serial number is marked on the lid of every module by the laser.

OPTOBAHN/NGK
POR00L12SKX
S/N XXXXXX

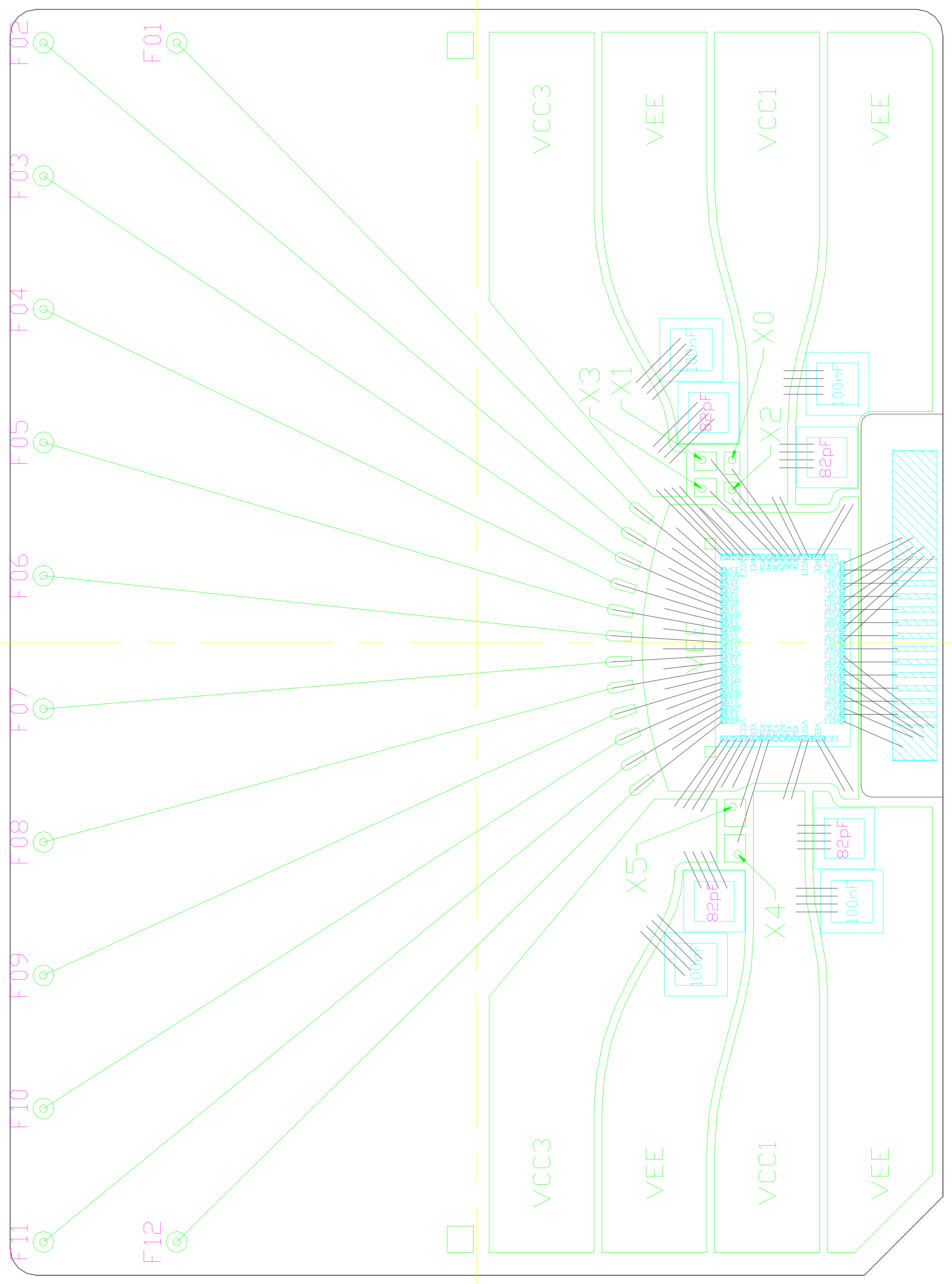
PACKAGE DRAWING



Lead No.	Assign
1	VCC1
2	VCC1
3	VEE
4	VEE
5	X0
6	X1
7	X2
8	X3
9	VCC3
10	VCC3
11	F01
12	VEE
13	F02
14	VEE
15	F03
16	VEE
17	F04
18	VEE
19	F05
20	VEE
21	F06
22	VEE

Lead No.	Assign
23	F07
24	VEE
25	F08
26	VEE
27	F09
28	VEE
29	F10
30	VEE
31	F11
32	VEE
33	F12
34	VCC3
35	VCC3
36	N/C
37	N/C
38	X5
39	X4
40	VEE
41	VEE
42	VCC1
43	VCC1
Kovar Lid	VEE
Kov. Plate	VEE

Assembly Drawing



Inspection Procedures and Conditions

A. Inspection items

- Module Responsivity
- Module Power dissipation
- Module Band width
- Module Output jitter
- Module Optical return loss

* **Except inspection of module power dissipation , each channel of one module is inspected one by one,based on following condition.**

B. Module Responsivity and Power dissipation

- Every module is checked with below digital optical input sequence,which is individually put into one channel.
  - Popt = 100 μW
  - Wave form: F =20MHz square (equivalent with 40Mb/s)
  - λ=1310nm laser sourse
  - Test at RT and 70 degree

- The definition of Responsivity : Amplitude(100uW)/100uW
- Power dissipation is measured at RT and 70 degree.
- Power dissipation is measured at RT,when each control input is turned on/off

C. Module Band width

- Every module is checked with below digital optical input sequence,which is individually put into one channel.
  - Popt = 100 μW
  - Wave form: F =20MHz square (equivalent with 40Mb/s)
  - λ=1310nm laser source
  - Test at RT
- The definition of Band width : 0.35/ rising time (10%-90%)

D. Module Output jitter

- Every module is checked with below digital optical input sequence,which is individually put into one channel.
  - Popt = 100 μW
  - Wave form: F =20MHz square (equivalent with 40Mb/s)
  - λ=1310nm laser source
  - Test at RT
- The definition of Output jitter : rms

E. Module Optical return loss

- Every module is checked with below conditions.
  - OCDR
  - λ=1550nm laser source
  - Test at RT