MMS4X00-NS400-ENC

400GBASE-DR4 OSFP112 InfiniBand and Ethernet 1310nm 500m SMF MPO-12/APC RHS Flat Top NVIDIA Mellanox Compatible

Introduction

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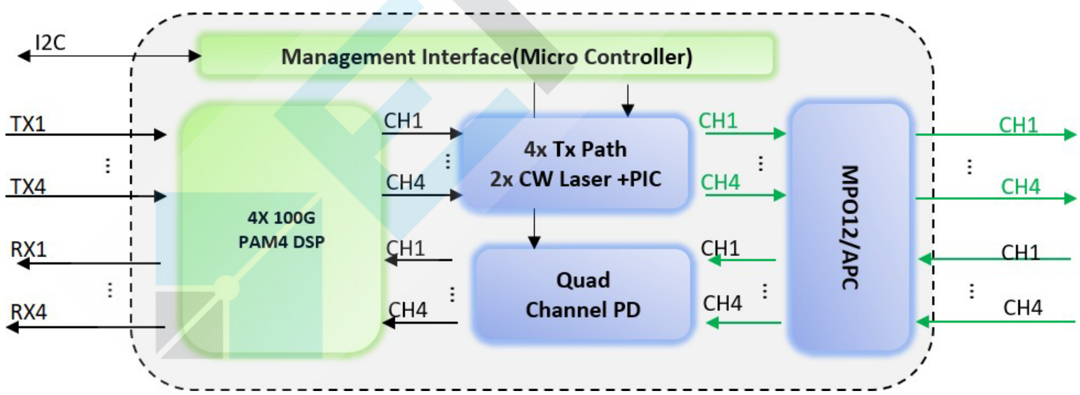

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Key Features

The transceiver complies with common management interface specification (CMIS). The supported key features listed below allow host software to read and control the transceiver status through I2C.

- Adaptive Tx input equalization
- Programmable Rx output amplitude
- Programmable Rx output pre-cursor
- Programmable Rx output post-cursor
- Supply voltage monitoring (DDM_Voltage)
- Transceiver case temperature monitoring (DDM_Temperature)
- Tx transmit optical power monitoring for each lane (DDM_TxPower)
- Tx bias current monitoring for each lane (DDM_TxBias)
- Rx receive optical power monitoring for each lane (DDM_RxPower)
- Warning and alarm indication for each DDM function
- Tx & Rx LOL and LOS indication
- Tx fault indication
- Host and line side loopback capabilities
- Host and line side PRBS generator and checker capabilities
- CDB firmware upgrade capability
- Versatile diagnostics monitoring (VDM) capability (optional, additional power consumption increase)
- Other functions defined in CMIS

Applications

The transceiver is designed for Ethernet, Telecom and Infiniband use cases. The application advertisements listed below allow host software to select proper application following CMIS definition Table 1 shows CMIS application advertisements list:

¢I·ōfŜ м¢ / a Ŀ{ ! ǈǈfΛŎI·űΛƻƴI·ŘØŜƜűΛăŜŸŜƴűă

DsSel Code	Krw Electrical Interface	Prgxoh Media Interface	Krw dqg Media 0dqh Count	Krw Lane Dssignment
!ǈ{Ŝf м	п/ όмллD! ¦Lπмπ[/нaύ	мп όмллD. ! {9π5wύ	мм όмΫмύ	лC όfI·yŜă мΣнΣoΣпύ
!ǈ{Ŝf н	рл όпллD! ¦Lππ[/нaύ	м/ όпллD. ! {9π5wпύ	пп όпΫпύ	лм όfI·yŜă мύ
!ǈ{Ŝf о	п. όмллD! ¦Lπмπ{ /нaύ	мп όмллD. ! {9π5wύ	мм όмΫмύ	лC όfI·yŜă мΣнΣoΣпύ
!ǈ{Ŝf п	пC όпллD! ¦Lππ{ /нaύ	м/ όпллD. ! {9π5wпύ	пп όпΫпύ	лм όfI·yŜă мύ

TECHNICAL SPECIFICATIONS

MMS4X00-NS400-ENC

Pin Map and Description

¢KŜ ŜfŜÕúŴŎĿf ʎyúŜŴŦĿÕŜ ƏŦ h{Ct ҮƏŘdzfŜ ÕƏyãʎǻú ƏŦ Ŀ· cл ÕƏyúĿÕúă ŜŘƎŜ ÕƏyỹŜÕúƏŴ ĿÄ ʎfdzăúŴĿúŜŘ ōè úKŜ ŘʎĿƎŴĿY ʎyʃ
CʎƎdzŴŜ нΣ ǿKʎÕK ŘŜŦʎyŜŘ ʎy /fĿdzăŜ yфм ƏŦ h{Ct a{! {ǈŜÕʎŦʎÕĿúʎƏyф

CʎƎdzŴŜ нф a{! /ƏYǈŦʎyú /ƏyỹŜÕúƏŴ

¢ĿōfŜ н ăKƏǿă úKŜ ŘŜúĿʎfŜŘ ǈʎyʃʎăú

¢ĿōfŜ нф h{Ct aƏŘdzfŜ ÕƏyúĿÕú ŘŜŦʎyʎúʎƏy

Pin#	Symbol	Description	Logic	Sox j Sequence
м	Db5		DŴƏdzyŘ	м
н	¢·нy	¢ŴĿyãYʎúúŜŴ 5ĿúĿ ǈyǿŜŴúŜŘ ǈyǈdzú	/ a [ΠL	о
о	¢·нǈ	¢ŴĿyãYʎúúŜŴ 5ĿúĿ bƏyΠǈyǿŜŴúŜŘ ǈyǈdzú	/ a [ΠL	о
п	Db5		DŴƏdzyŘ	м
р	¢·пy	¢ŴĿyãYʎúúŜŴ 5ĿúĿ ǈyǿŜŴúŜŘ ǈyǈdzú	/ a [ΠL	о
с	¢·пǈ	¢ŴĿyãYʎúúŜŴ 5ĿúĿ bƏyΠǈyǿŜŴúŜŘ ǈyǈdzú	/ a [ΠL	о
т	Db5		DŴƏdzyŘ	м
у	aƏŘ{Ŝf[	aƏŘdzfŜ {ŜfŜÕú	[±¢¢[ΠL	о
ф	wŜăŜú[	aƏŘdzfŜ wŜăŜú	[±¢¢[ΠL	о
мл	±ÕÕwĔ	ƀофо± tƏǿŜŴ ădzǈǈfè ŴŜÕŜʎǿŜŴ		н
мм	{/[	нπǿʎŴŜ {ŜŴĿf ʎyúŜŴŦĿÕŜ ÕfƏÕǩ	[±/ a h{ΠLκh	о
мн	{5!	нπǿʎŴŜ {ŜŴĿf ʎyúŜŴŦĿÕŜ ŘĿúĿ	[±/ a h{ΠLκh	о
мо	Db5		DŴƏdzyŘ	м
мп	w·оǈ	wŜÕŜʎǿŜŴ 5ĿúĿ bƏyΠǈyǿŜŴúŜŘ hdzúǈdzú	/ a [Πh	о
мр	w·оy	wŜÕŜʎǿŜŴ 5ĿúĿ ǈyǿŜŴúŜŘ hdzúǈdzú	/ a [Πh	о
мс	Db5		DŴƏdzyŘ	м
мт	w·мǈ	wŜÕŜʎǿŜŴ 5ĿúĿ bƏyΠǈyǿŜŴúŜŘ hdzúǈdzú	/ a [Πh	о
му	w·мy	wŜÕŜʎǿŜŴ 5ĿúĿ ǈyǿŜŴúŜŘ hdzúǈdzú	/ a [Πh	о
мф	Db5		DŴƏdzyŘ	м
нл	Db5		DŴƏdzyŘ	м
нм	w·нy	wŜÕŜʎǿŜŴ 5ĿúĿ ǈyǿŜŴúŜŘ hdzúǈdzú	/ a [Πh	о

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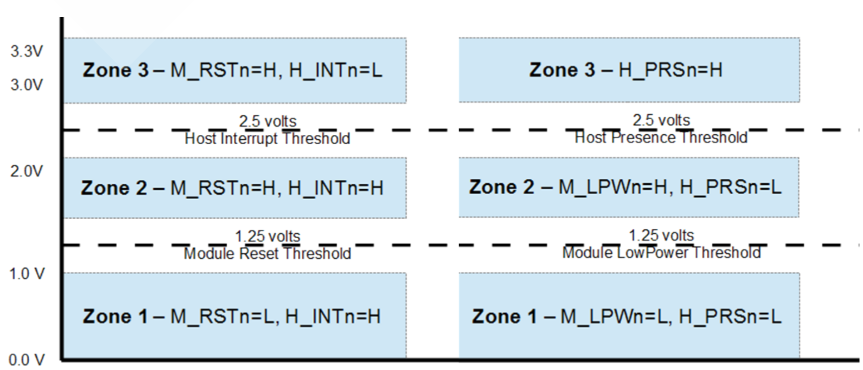
нн	w·HLJ	wŜÕŜʎØŜǋ 5l·ǘl· b2yπLyØŜǋǘŜŘ hdzǘLJdzǘ	/ a [πh	O
но	Db5		DǋƧdzyŘ	M
нп	w·пy	wŜÕŜʎØŜǋ 5l·ǘl· LyØŜǋǘŜŘ hdzǘLJdzǘ	/ a [πh	O
нр	w·пLJ	wŜÕŜʎØŜǋ 5l·ǘl· b2yπLyØŜǋǘŜŘ hdzǘLJdzǘ	/ a [πh	O
нс	Db5		DǋƧdzyŘ	M
нт	a2ŘtǋǎŤ	a2ŘdzŤŜ tǋŜǎŜyǘ	[±¢¢[πh	O
ну	Lyǘ[κwĚ[h{	LyǘŜǋǋdzLJǘκƧLJǘʎƧyl·Ť wĚ[h{	[±¢¢[πh	O
нф	±ÕÕ¢Ě	ƀoφo± tƧØŜǋ ǎdzLJLJŤĕ ǘǋl·yǎYʎǘǘŜǋ		H
ол	±ÕÕм	ƀoφo± tƧØŜǋ {dzLJLJŤĕ		H
ом	[taƧŘŜκ¢Ě5ʎǎ	[ƧØŜǋ tƧØŜǋ aƧŘŜκƧLJǘʎƧyl·Ť ¢· 5ʎǎl·ōŤŜ	[±¢¢[πL	O
он	Db5		DǋƧdzyŘ	M
оо	¢·oLJ	¢ǋl·yǎYʎǘǘŜǋ 5l·ǘl· b2yπLyØŜǋǘŜŘ LyLJdzǘ	/ a [πL	O
оп	¢·oy	¢ǋl·yǎYʎǘǘŜǋ 5l·ǘl· LyØŜǋǘŜŘ LyLJdzǘ	/ a [πL	O
ор	Db5		DǋƧdzyŘ	M
ос	¢·мLJ	¢ǋl·yǎYʎǘǘŜǋ 5l·ǘl· b2yπLyØŜǋǘŜŘ LyLJdzǘ	/ a [πL	O
от	¢·мy	¢ǋl·yǎYʎǘǘŜǋ 5l·ǘl· LyØŜǋǘŜŘ LyLJdzǘ	/ a [πL	O
оу	Db5		DǋƧdzyŘ	M

¢l·ōŤŜ o ǎKƧØǎ ǘKŜ ŘŜǘl·ʎŤŜŘ ÕƧyǘǋƧŤ LJʎyǎ

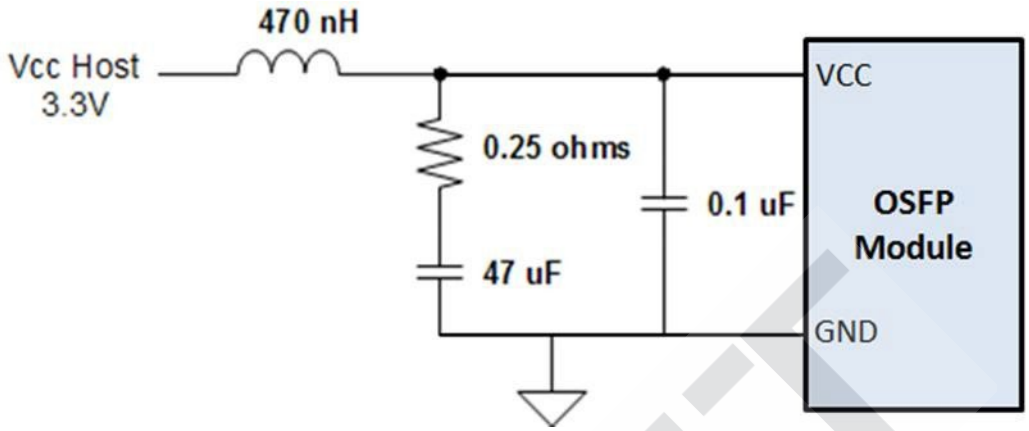
¢l·ōŤŜ oφ h{Ct /ƧyǘǋƧŤ LJʎyǎ

Name	Direction	Description
{/[	.ʎ5ʎǋ	HπØʎǋŜ ǎŜǋʎl·Ť ÕŤƧÕ] ǎʎƎyl·Ťφ wŜIjdzʎǋŜǎ LJdzŤŤπdzLJ ǋŜǎʎǎǘƧǋ ǘƧ oφo± ƧyK2ǎǘ
{5!	.ʎ5ʎǋ	HπØʎǋŜ ǎŜǋʎl·Ť Řl·ǘl· ǎʎƎyl·Ťφ wŜIjdzʎǋŜǎ LJdzŤŤπdzLJ ǋŜǎʎǎǘƧǋ ǘƧ oφo± ƧyK2ǎǘφ
[t²yκtw{y	LyLJdzǘκhdzǘLJdzǘ	5dzl·Ť Cdzyǘʎƽy {ʎƎyl·Ť φ [ƧØ tƧØŜǋ YƧŘŜ ʎǎ l·y l·ÕǘʎØŜπŤƧØ ʎyLJdzǘ ǎʎƎyl·Ť φ aƧŘdzŤŜ tǋŜǎŜyǘ ʎǎ ÕƧyǘǋƧŤŤŜŘ ōĕ l· LJdzŤŤπŘƧØy ǋŜǎʎǎǘƧǋ ƧyǘKŜ YƧŘdzŤŜ ØKʎÕK ʒŜǘǎ ÕƧyØŜǋǘŜŘ ǘƧ l·y l·ÕǘʎØŜπŤƧØ ƧdzǘLJdzǘ ŤƧƎʎÕ ǎʎƎyl·Ť ±Ƨǘl·ƎŜ îƧyŜǎ ʎǎ ǎKƧØy l·ǎ ŦʎƎdzǋŜoφ
Lb¢κw{¢y	LyLJdzǘκhdzǘLJdzǘ	5dzl·Ť Cdzyǘʎƽy {ʎƎyl·Ť φ wŜǎŜǘ ʎǎ l·y l·ÕǘʎØŜπŤƧØ ʎyLJdzǘ ǎʎƎyl·Ť φ LyǘŜǋǋdzLJǘ ʎǎ l·y l·ÕǘʎØŜπKʒK ƧdzǘLJdzǘ ǎʎƎyl·Ť ±Ƨǘl·ƎŜ îƧyŜǎ ʎǎ ǎKƧØy l·ǎ ŦʎƎdzǋŜ oφ



CʎƎdzǋŜ oφ Voltage Zones

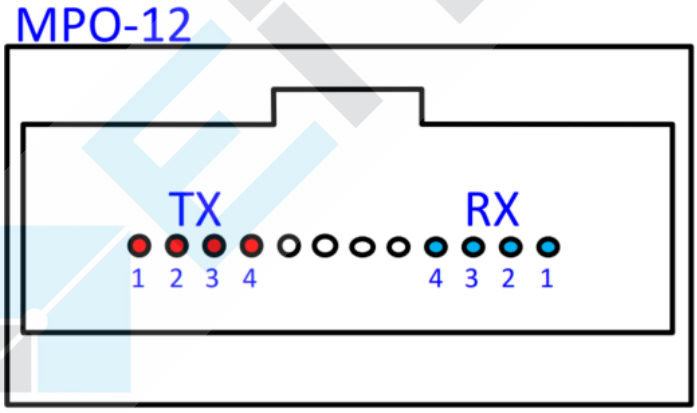
CλƎdzNŜ n ăK2ǿă ŭKŜ NŜŎ2YΥŜyŘŜŘ LJ2ǿŜN ădzLJLJfè ŦλfűŜN ŘŜăλƎy



CλƎdzNŜ nφ wŜŎ2YΥŜyŘŜŘ t2ǿŜN {dzLJLJfè CλfűŜN

Optical Port Description

¢KŜ 2LJűλŎl·f λyűŜNŦl·ŎŜ LJ2Nú λă l·y a thπмн NŜŎŜLJűl·ŎfŜφ ¢KŜ úNl·yãYλú l·yŘ NŜŎŜλØŜ 2LJűλŎl·f fl·ySă ăKl·ft 2ŎŎdzLJè ŭKŜ LJ2ăλűλ2yã ŘŜLJλŎűŜŘ λy CλƎdzNŜ n ǿKŜyf22ʅλyƎ λyű2 ŭKŜ a 5L NŜŎŜLJűl·ŎfŜ ǿλűK ŭKŜ Ŏ2yyŜŎú2N ʅŜèǿl·è ŦŜl·údzNŜ 2y ű2LJφ



CλƎdzNŜ pφ hLJűλŎl·f a ŜŘλl· 5ŜLJŜyŘŜyű LyűŜNŦl·ŎŜ LJ2Nú l·ăăλƎyΥŜyűă

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Specification

Absolute Maximum Ratings

Ľů Kŀă ů2 ōŜ y2ůŜŘ ůKŀů ůKŜ 2ǈŜŀůʎ2ƴʎƴ ŜĚŎŜăă 2Ŧ ŀyè ʎyŘʎØʎŘdzŀſ ŀōă2ſdzůŜ Yŀ ÈʎYdzY ŀůʎy∃ YʎƎKů Ŏŀdză ǈŜY ŀ ySyů ŘŀYŀƎŜ ů2 ůKʎă Y2ŘdzſŜ◦

tŀŀ·YŜůŜ	{èYō2ſ	aʎy	aŀÈ	¦yʎůă	b2ůŜă
{ů2ŀƎŜ ¢ŜYǈŜŀ·ůdzŜ	¢{	πпл	ур	ŘŜƎ/	
hǈŜŀůʎyƎ /ŀăŜ ¢ŜYǈŜŀ·ůdzŜ	¢ht	л	тл	ŘŜƎ/	
t2øŜ {dzǈǈſè ±2ſůŀƎŜ	±//	πл◦р	о◦с	±	
wŜſŀůʎØŜ ŀdzYʎŘʎůè óy2yπŎ2yŘŜyăŀůʎ2yύ	wl	л	ур	҈	

Recommended Operating Conditions

tŀŀ·YŜůŜ	{èYō2ſ	aʎy	¢èǈʎŎŀſ	aŀÈ	¦yʎůă	b2ůŜă
hǈŜŀůʎyƎ /ŀăŜ ¢ŜYǈŜŀ·ůdzŜ	¢ht	л		тл	ŘŜƎ/	
t2øŜ {dzǈǈſè ±2ſůŀƎŜ	±//	о◦мор	о◦о	о◦пср	±	
5ŀůŀ wŀůŜΣ ŜŀŎK [ŀyŜ			ро◦мнр		D.Ř	t!ап
5ŀůŀ wŀůŜ !ŎŎdzŀŎè		πмлл		млл	ǈǈY	
tŜπC9/ .ʎů 9ŀŀ2ŀ wŀůʎ2				н◦пЀмл[πп]		
t2ăůπC9/ .ʎů 9ŀŀ2ŀ wŀůʎ2				мЀмл[πмн]		м
[ʎy ǂ 5ʎăůŀyŎŜ	5	л◦ллн		н	ʅY	н

b2ůŜăΥ

1. C9/ ǈŀ2ØʎŘŜŘ ōè K2ăů ăèăůŜY◦
2. C9/ ŀŜǉdzʎŀŜŘ 2y K2ăů ăèăůŜY ů2 ădzǈǈ2ŀů YŀÈʎYdzY Řʎăůŀ yŎŜ◦

Electrical Characteristics

¢KŜ Ŧ2ſſ2øʎyƎ ŜſŜŎůŀʎŎŀſ ŎKŀŀŀŎůŜŀʎăůʎŎă ŀŀŜ ŘŜŦʎyŜŘ 2øŜŀ ůKŜ wŜŎ2YYŜyŘŜŘ hǈŜŀŀůʎyƎ 9yØʎŀ2yYŜyů dzyſŜăă 2ůKŜŀøʎăŜ ăǈŜŎʎŦʎŜŘ◦

tŀŀ·YŜůŜ	¢Ŝăů t2ʎyů	aʎy	¢èǈʎŎŀſ	aŀÈ	¦yʎůă	b2ůŜă
t2øŜ /2yădzYǈůʎ2y				ф	2	
{dzǈǈſè /dzŀŀŜyů	ǈŎŎ			н◦тн	!	
a 2ŘdzſŜ ǈyǈdzů óŜŀŎK [ŀyŜύ						
{ʎƎyŀſʎyƎ wŀůŜΣ ŜŀŎK [ŀyŜ	¢tм	ро◦мнр ҕ млл ǈǈY			D.Ř	
5/ /2YY2yπY2ŘŜ ʎyǈdzů ±2ſůŀƎŜ	¢tм	πл◦ор		н◦ур	±	
{ʎyƎſŜπŜyŘŜŘ ʎyǈdzů ±2ſůŀƎŜ	¢tмŀ	πл◦п		о◦о	±	

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!/ /2YY2yͲY2ŘŜ wa{ ʎyLJdzű ±2ʄűl·ЭŜ [2ǿͲCNjŜljdzŜyŎèΣ±/ a[c Cdzʄʄͳ .l·yŘΣ±/ a[c	¢tмl·	он ул			Y±	
a2ŘdzʄŜ ăűNjŜăăŜŘ ʎyLJdzű űŜăű		Ŀ999 улн◊оŎ˥ мнлDо◊п◊о				
5ʎŦŦŜNjŜyűʎl·ʄ tŜl·˥ͳű2ͲtŜl·˥ ʎyLJdzű ±2ʄűl·ЭŜ ű2ʄŜNjl·yŎŜ	¢tмl·	трл			Y±	
/2YY2yű2 5ʎŦŦŜNjŜyű a2ŘŜ ʎyLJdzű wŜűdzNjyʃ [2ăă	¢tм	Ŀ999улн◊оŎ˥ 9ljdzl·űʎ2yʃ мнлDпн				
9ŦŦŜŎűʎØŜ ʎyLJdzű wŜűdzNjyʃ [2ăă	¢tм	у◊р			Ř.	
5ʎŦŦŜNjŜyűʎl·ʄ ʎyLJdzű ¢ŜNjYʎyl·űʎ2yʃ aʎăYl·űŎK	¢tм			мл	̂	
wŜŎŜʎØŜNj óŜl·ŎK [l·yŜú						
{ʎЭyl·ʄʎyЭ wl·űŜΣ Ŝl·ŎK ʄl·yŜ	¢tп	ро◊мнр Ꮾ млл ĿĿY			D.Ř	
5ʎŦŦŜNjŜyűʎl·ʄ tŜl·˥ͳű2ͲtŜl·˥ hdzűLJdzű ±2ʄűl·ЭŜ {K2Njű a2ŘŜ [2yЭ a2ŘŜ	¢tп			слл упр	Y±	
!/ /2YY2yʃ a2ŘŜ hdzűLJdzű ±2ʄűl·ЭŜΣ wa{ [2ǿͲŦNjŜljdzŜyŎèΣ±/ a[c Cdzʄʄͳ .l·yŘΣ±/ a[c	¢tп			он ул	Y±	
5ʎŦŦŜNjŜyűʎl·ʄ ¢ŜNjYʎyl·űʎ2yʃ aʎăYl·űŎK	¢tп			мл	̂	
±ŜNjűʎŎl·ʄ ŜèŜ ŎʄŜădzNjŜΣ ±9/	¢tп			мн	Ř.	
9èŜ l ŜʎЭKű	¢tп	мр			Y±	
/2YY2yͲY2ŘŜ ű2 5ʎŦŦŜNjŜyűʎl·ʄ Y2ŘŜ 2dzűLJdzű wŜűdzNjyʃ [2ăă	¢tп	Ŀ999улн◊оŎ˥ 9ljdzl·űʎ2yʃ мнлDпм			Ř.	
9ŦŦŜŎűʎØŜ 2dzűLJdzű wŜűdzNjyʃ [2ăă	¢tп	у◊р			Ř.	
hdzűLJdzű ¢Njl·yăʎűʎ2yʃűʎYŜ óнʄ˥ ű2 yʄ˥ ú	¢tп	у◊р			LJă	
5/ /2YY2yͲY2ŘŜ 2dzűLJdzű ±2ʄűl·ЭŜ	¢tп	ͲорЛ		нурл	Y±	

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Optical Characteristics

tl·Ŵl·YŜůŜŴ	{èYō2ƭ	aʎy	¢èLJʎŐl·ƭ	al·È	¦yʎůă	b2ůŜă
¢Ŵl·yãYʎůůŜŴ						
5l·ůl· wl·ůŜΣ Ŝl·ŎK [l·yŜ		poφмнр ҕ млл ǈǈY			D.Ř	
a2ŘdzƒI·ůʎ2yƳC2ŴYl·ů		t!aп				
² l·ØŜƒŜyƎůK	λ	1304.5	1310	1317.5	nm	
Side-mode suppression ratio	SMSR			30	dB	
Average Launch Power, each Lane	P_{AVG}	-2.9		4	dBm	1
Outer Optical Modulation Amplitude (OMA_{outer}), each Lane	P_{OMA}	-0.8		4.2	dBm	2
Launch power in OMA_{outer} minus TDECQ, each Lane	OMA-TDECQ	-2.2			dBm	
Transmitter and Dispersion Eye Closure for PAM4 (TDECQ), each Lane	TDECQ			3.4	dB	
TDECQ – $10\log_{10}(Ceq)$				3.4	dB	
Extinction Ratio	ER	3.5			dB	
Transition Time	T_t			17	ps	
Average Launch Power of OFF Transmitter, each Lane	P_{off}			-15	dBm	
$RIN_{21.4}OMA$	RIN			-136	dB/Hz	
Optical Return Loss Tolerance	TOL			21.4	dB	
Transmitter reflectance	T_r			-26	dBm	

MMS4X00-NS400-ENC

Receiver						
Data Rate, each Lane		53.125 ± 100 ppm			GBd	
Modulation Format		PAM4				
Center wavelength	λ	1304.5		1317.5	Nm	
Damage Threshold, each Lane	TH_d	5			dBm	3
Average Receive Power, each Lane		-5.9		4	dBm	4
Receive Power (OMA_{outer}), each Lane				4.2	dBm	
Receiver Reflectance	R_R			-26	dB	
Receiver Sensitivity (OMA_{outer}), each Lane	SEN			Equation (1)	dBm	5
Stressed Receiver Sensitivity (OMA_{outer}), each Lane	SRS			-1.9	dBm	6
LOS Assert	LOSA	-15			dBm	
LOS De-assert	LOSD			-9.2	dBm	
LOS Hysteresis	LOSH	0.5			dB	
Conditions of Stress Receiver Sensitivity Test (Note 7)						
Stressed Eye Closure for PAM4 (SECQ), Lane under Test			3.4		dB	
SECQ – $10\log_{10}$(Ceq), lane under test			3.4		dB	
OMA_{outer} of each aggressor lane			4.2		dBm	

Notes:

1. Average launch power, each lane (min) is informative and not the principal indicator of signal strength. A transmitter with launch power below this value cannot be compliant; however, a value above this does not ensure compliance.
2. Even if the TDECQ < 1.4 dB, the OMA_{outer}(min) has to exceed this value.
3. The receiver shall be able to tolerate, without damage, continuous exposure to a modulated optical input signal having this power level on one lane. The receiver does not have to operate correctly at this input power.
4. Average receive power, each lane (min) is informative and not the principal indicator of signal strength. A received power below this value cannot be compliant; however, a value above this does not ensure compliance.
5. Receiver sensitivity (OMA_{outer}) is informative and is defined for a transmitter with a value of SECQ up to 3.4 dB. Receiver sensitivity should meet Equation (1), which is illustrated in Figure 6.

$$RS = \max(-3.9, SECQ - 5.9)\ dBm \quad (1)$$

Where:

RS is the receiver sensitivity, and

SECQ is the SECQ of the transmitter used to measure the receiver sensitivity.

6. Measured with conformance test signal at TP3 for the BER equal to 2.4×10^{-4}.
7. These test conditions are for measuring stressed receiver sensitivity. They are not characteristics of the receiver.

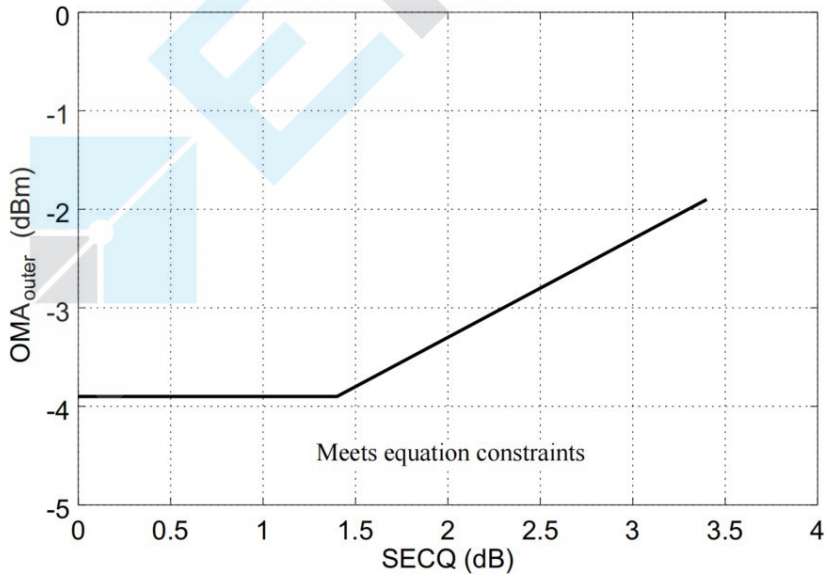

Figure 6. Illustration of Receiver Sensitivity Mask for 100GBASE-FR1

Digital Diagnostic Specifications

The following digital diagnostic characteristics are defined over the normal operating conditions unless otherwise specified.

Parameter	Symbol	Min	Max	Units	Notes
Temperature monitor absolute error	DMI_Temp	-3	3	degC	Over operating temperature range
Supply voltage monitor absolute error	DMI _VCC	-0.1	0.1	V	Over full operating range
Channel RX power monitor absolute error	DMI_RX_Ch	-2	2	dB	1
Channel Bias current monitor	DMI_Ibias_Ch	-10%	10%	mA	
Channel TX power monitor absolute error	DMI_TX_Ch	-2	2	dB	1

Notes:

1. Due to measurement accuracy of different single mode fibers, there could be an additional +/-1 dB fluctuation, or a +/- 3 dB total accuracy.

Mechanical Drawing

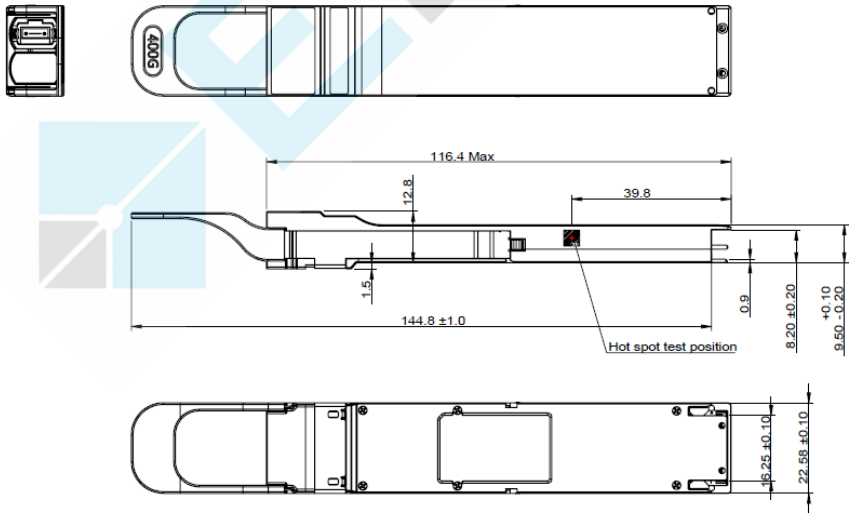

Figure 6. Mechanical Outline

Notes:

1) The mechanical design is flat top (RHS).
2) The pull tab color is green, engraved with “400G” letter.

ESD

This transceiver is specified as ESD threshold 1kV for high-speed data pins and 2kV for all other electrical input pins, tested per MIL-STD-883, Method 3015.4 /JESD22-A114-A (HBM). However, normal ESD precautions are still required during the handling of this module. This transceiver is shipped in ESD protective packaging. It should be removed from the packaging and handled only in an ESD protected environment.

Laser safety

This is a Class I Laser Product, or Class 1 Laser Product according to IEC/EN 60825-1:2014. This product complies with 21 CFR 1040.10 and 1040.11 except for conformance with IEC 60825-1 Ed. 3., as described in Laser Notice No. 56, dated May 8, 2019.

Caution: Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.