Product Guide

製品案内

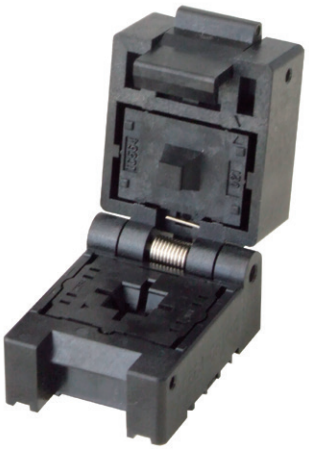
山一電機株式会社
YAMAICHI ELECTRONICS Co., Ltd.

バーンインソケット Burn-in Sockets

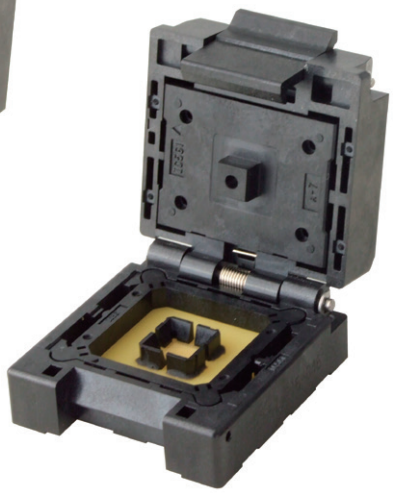
デバイスの進歩とともに進化する山一電機のテストソリューション
Yamaichi Electronics' Test Solutions evolve alongside the progress of semiconductor devices.

ユニバーサル対応ソケット　Universal Pitch Sockets

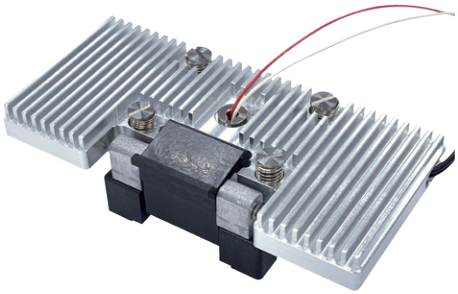
BGA, LGA, QFN, Others（0.3mm~ 変則ピッチ対応可 Irregular pitch available from 0.3mm pitch）



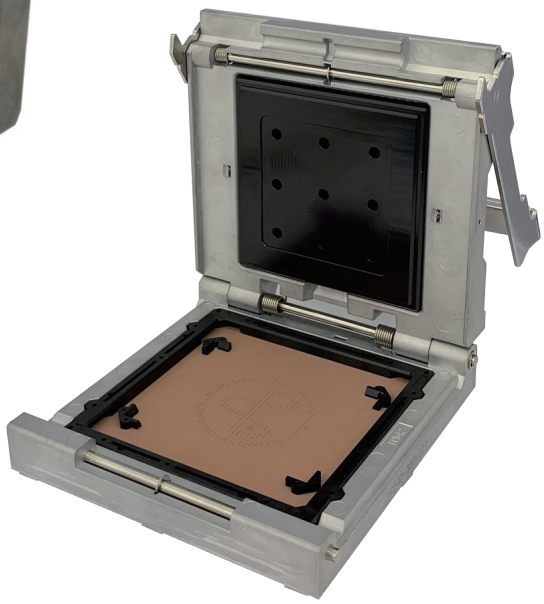
IC564 Series



IC561 Series



サーマル仕様
Thermal Solution



IC542 Series

大電流多ピンソケット　High Power Socket

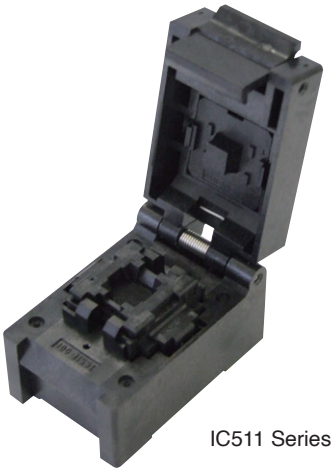
BGA, LGA（0.8mm, 1.0mm Pitch）

IC603 Series

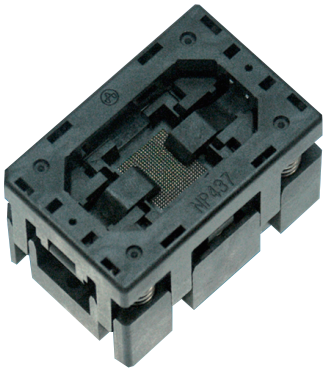
バーンインソケット Burn-in Sockets

グリッドアレイパッケージ用ソケット　Sockets for Grid-Array Package

BGA（0.35, 0.4mm Pitch）



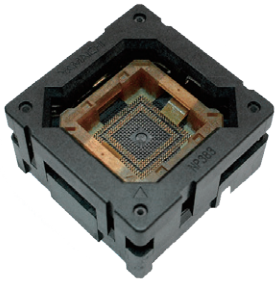
IC511 Series



NP437 Series

NP597 Series

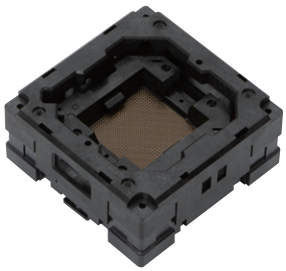
BGA（0.5mm Pitch）



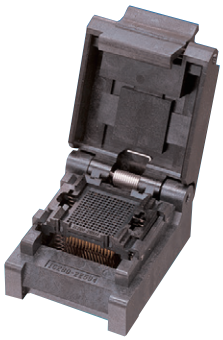
NP383 Series

IC409 Series

BGA（0.65mm Pitch）

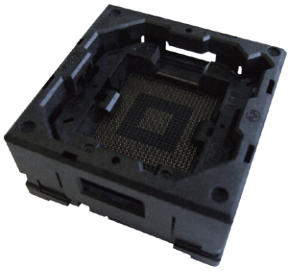


NP631 Series

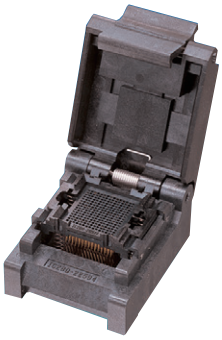


IC280 Series

BGA（0.8mm Pitch）

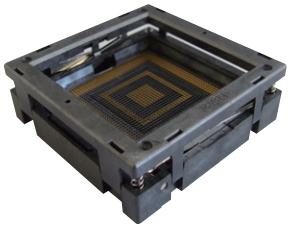


NP566 Series



IC280 Series

BGA（1.0mm Pitch）



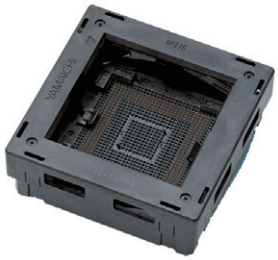
NP483 Series

IC280 Series

バーンインソケット Burn-in Sockets

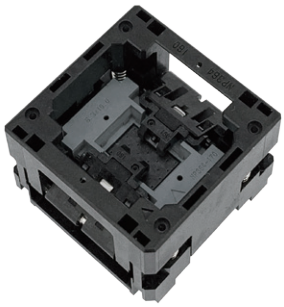
グリッドアレイパッケージ用ソケット　Sockets for Grid-Array Package

BGA（1.27mm Pitch）

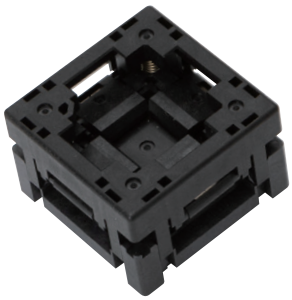


NP276 Series

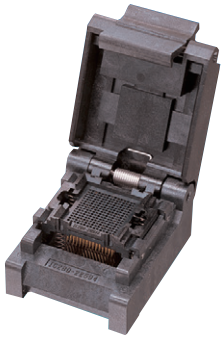
LGA（0.65, 0.75, 0.80, 1.00mm Pitch）



NP364 Series



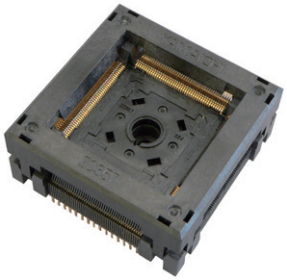
NP404 Series



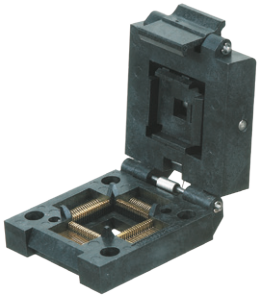
IC280 Series

リードフレームパッケージ用ソケット　Sockets for Lead Frame Package

QFP



IC357 Series



IC51 Series

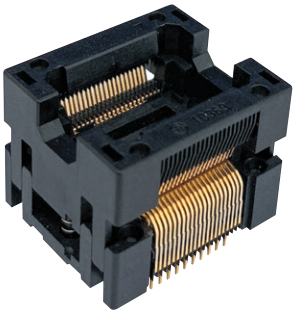
QFN

NP506 Series

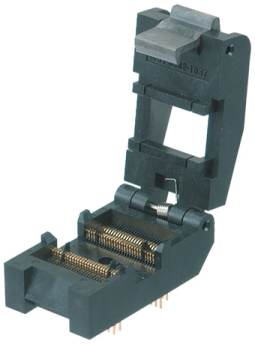
IC609 / IC610 Series

SOP / TSOP

IC354 Series



IC369 Series

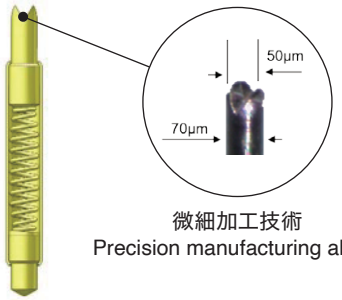


IC51 Series

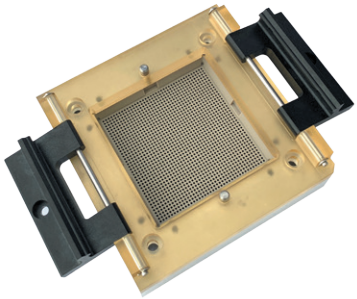
テストソケット Test Sockets

プローブピンテストソケット Probe Pin Test Sockets

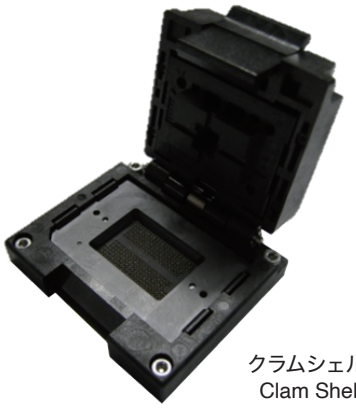
スプリングプローブピン
Spring Probe Pin



微細加工技術
Precision manufacturing ability

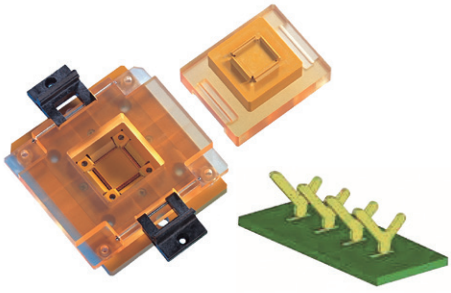


多ピンPKG用ICソケット
IC Socket for high pin count package

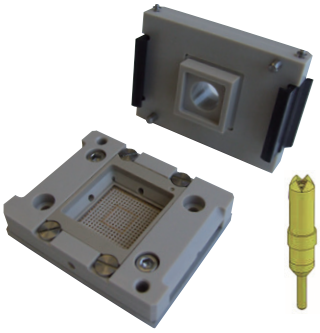


クラムシェルタイプ
Clam Shell Type

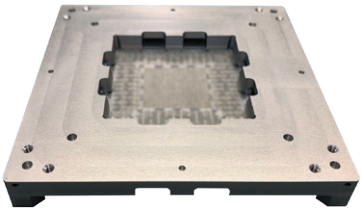
高周波テストソケット High Frequency Test Sockets



Yコンタクト
Y - Contact

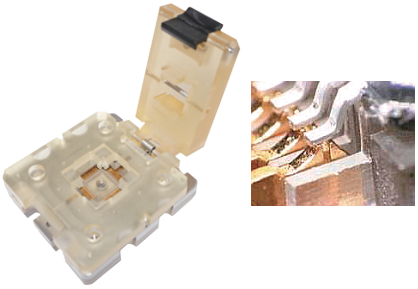


ショートプローブピン
Short Probe Pin



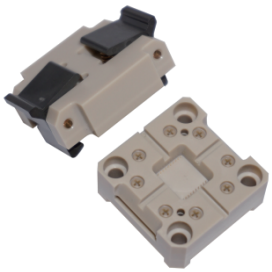
同軸ソケット
Coaxial Socket

ケルビンソケット Kelvin Socket



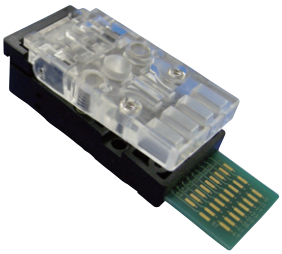
ケルビンソケット
Kelvin Socket

センサーソケット Sensor Socket



磁気センサーソケット
Magnetic Sensor Socket

FPC テストソケット FPC Test Socket



FPC テストソケット
FPC Test Socket

FPCフレキシブルプリント配線板　YFLEX®

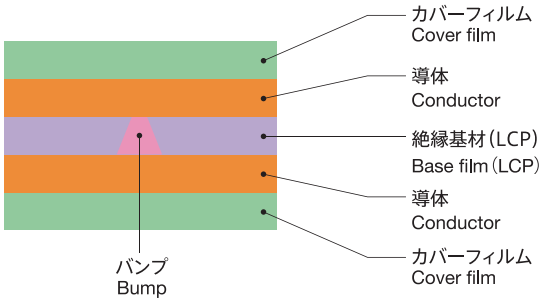
Flexible Printed Circuit Board YFLEX®

YFLEX®とは低損失の液晶ポリマー(LCP)を絶縁基材に採用した、フレキシブル配線板です。
5G、通信、ミリ波レーダー市場で求められる28Gbps、56Gbpsクラスの高速伝送用途やアンテナ基板用途にも対応可能です。
耐ノイズ、ヒーター、高耐熱、耐油、極薄、高屈曲など各種要求に特化したFPC製品もご提供致します。

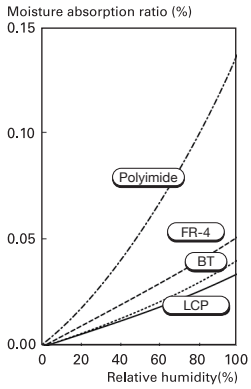
YFLEX® is a flexible wiring board with an insulating base material of low-loss liquid crystal polymer (LCP).
YFLEX® can be used for 28- and 56-Gbps-class high-speed transmission applications required in the 5G, telecommunications, and millimeter-wave radar markets.
We also offer YFLEX® products specialized for various requirements, such as noise resistance, heater, high heat resistance, oil resistance, ultra-thin, and high-flexibility performance requirements.

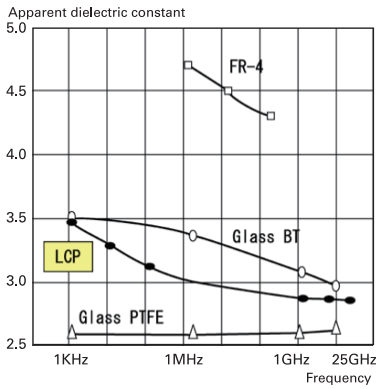
基本構造(両面構造) Basic Structure (Double-layer)

構成図
Structure of double-sided YFLEX



LCP材の吸湿特性および誘電率データ
Moisture absorption & dielectric constant





材質
Material

絶縁材料 Basefilm	液晶ポリマー（厚み：50μm,100μm） Liquid crustal polymer (Thickness: 50μm,100μm)
導体 Conductor	銅（厚み：12μm、18μm） Copper (Thickness:12μm、18μm)
層間接続材（導電性バンプ） Inter-layer connection (Conductive bump)	Ag系導電性樹脂 Ag conductive paste
カバーコート Cover film	ポリイミドフィルム、フォトレジスト Polyimide film、Photo resist

設計ルール(両面板)
Design Specs(Bouble-layer)

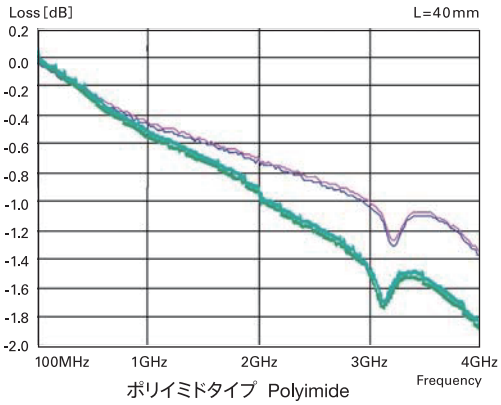
項目 Item	標準 Standard
線幅/スペース幅 Wire width/space	60/60μm
バンプ径 Bump diameter	250μm
ランド径 Land diameter	400μm
1バンプ当りの最大電流容量 Maximum current per bump	100mA (bump:φ250μm)

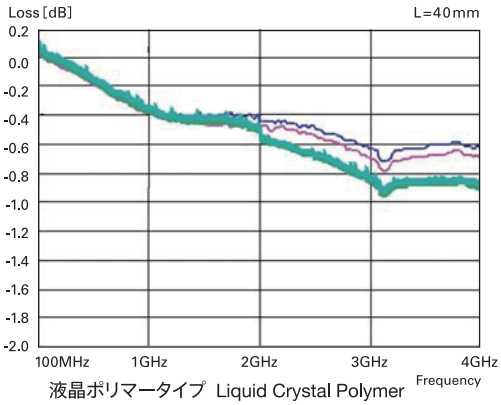
試験データ
Test data

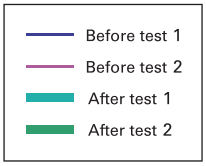
項目 Item	条件 Condition	試験結果 Result
1バンプ当たりの抵抗値試験 Resistance value per bump	常温、常湿 Room tempereture, normal humidity	6mΩ以下 Within 6mΩ
温度サイクル試験 Temperature cycle test	+55°C~+125°C、1,000cyc	抵抗変化率10%以内 Resistance change:Within 10%
高温保持試験 High temperature test	+85°C、1,000h	抵抗変化率10%以内 Resistance change:Within 10%
低温保持試験 Low temperature test	-40°C、1,000h	抵抗変化率10%以内 Resistance change:Within 10%
高温高湿試験 High temperature conant humidity test	+85°C、85%RH、1,000h	抵抗変化率10%以内 Resistance change:Within 10%
導体引き剝がし強度試験 Peeling test	90°peels	5N/cm以上 5N/cm or above
はんだ耐熱性試験 Solder resitance test	+260°C、10sec	異常なし No change
吸水率 Moisture adsorption	+23°C、24h	0.04%以下 0.04% or below
誘電率(1GHz) Dielectric constant(1GHz)	Bridge method ※2	2.8
誘電正接(1GHz) Dissipation factor(1GHz)	Bridge method ※2	0.0025

注)※2=測定方法 JIS C6481-1996　　上記データは参考値です。Values are for reference only.

挿入損失比較(ネットワークアナライザーによる温湿度サイクルテスト前後の測定値)
Comparison of insertion loss (Before/After temperature-humidity cycling test using a network analyzer)

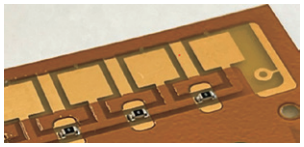


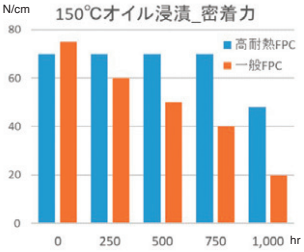


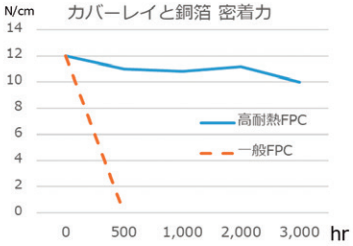


高耐熱FPC　High heat resistant FPC

150℃ 3,000時間対応

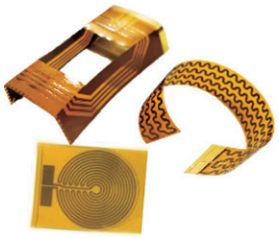




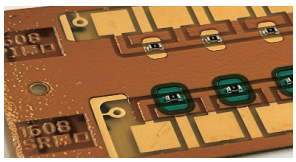


項目	条件	要求条件	YFB	YFH
耐電圧	AC500V1分間	放電現象及び痕跡が生じない事	OK	OK
温湿度cyc	−10℃/+65℃ 80〜98%RH 10cyc	導通抵抗変化率±10%以内	OK	OK
		絶縁抵抗500MΩ以上	OK	OK
熱衝撃	−55℃〜+125℃ (各30分)1,000cyc	導通抵抗変化率±10%以内	OK	OK
		絶縁抵抗500MΩ以上	OK	OK
高温放置	+150℃/3,000h	導通抵抗変化率±10%以内	OK	OK
		絶縁抵抗500MΩ以上	OK	OK
低温放置	−65℃/1,000h	導通抵抗変化率±10%以内	OK	OK
		絶縁抵抗500MΩ以上	OK	OK
高温高湿	85℃/85%RH 1,000h	導通抵抗変化率±10%以内	OK	OK
		絶縁抵抗500MΩ以上	OK	OK

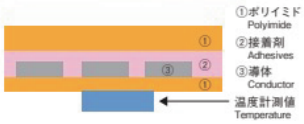
ヒーターFPC　Heater FPC

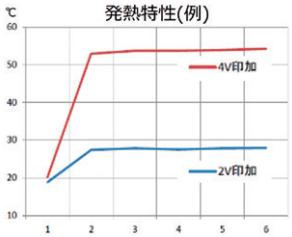


部品実装対応

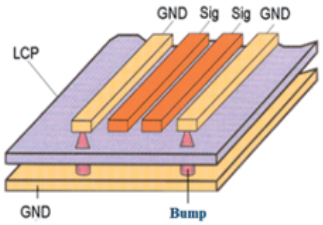


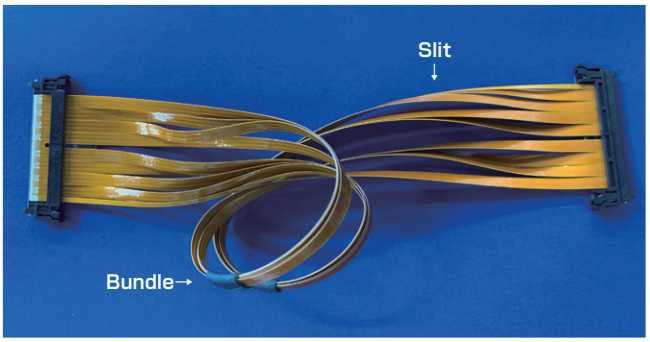
カメラレンズの曇り止めや結露防止、インクなどの液体凝固防止、センサーの温度調整用途に最適



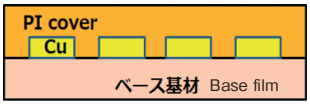


スリットFPC　Slit FPC





耐油FPC　Oil resistant FPC



一般FPC
流化断線現象
銅が表面に析出し配線欠損が起きている。

General FPC
Sulfurization disconnection phenomenon occurs and there is a wiring defect.

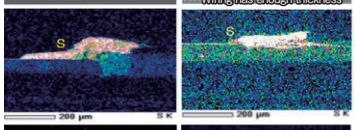
耐油タイプ
硫化銅が僅かに表面析出し銅箔表面も削れているが十分な厚さを保っている。

Oil resistant FPC
Copper sulfide is slightly deposited on the surface, and the copper surface is also scraped, but the copper heat is maintained sufficiently.

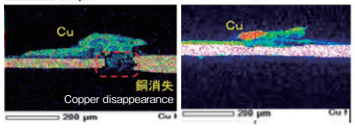
切断部表面
Cutting surface

試験後 断面
SEM写真
Cross-sectional photograph after the test
SEM photo

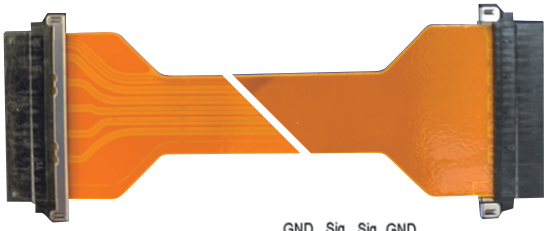
元素マッピング写真
硫黄成分
Element mapping photo
Sulfur component

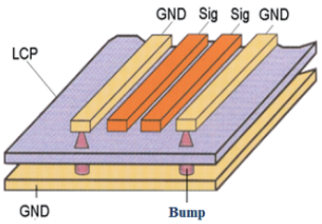


元素マッピング写真
銅成分
Element mapping photo
Copper component

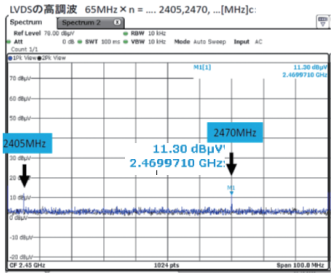


耐ノイズFPC　Noise resistant FPC

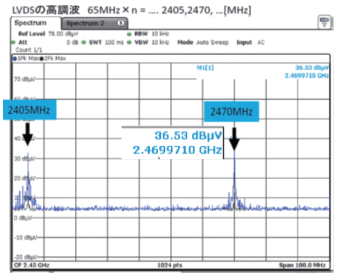




●耐ノイズFPCケーブル（YFBシリーズ）
Noise-resistant FPC(YFB Series)



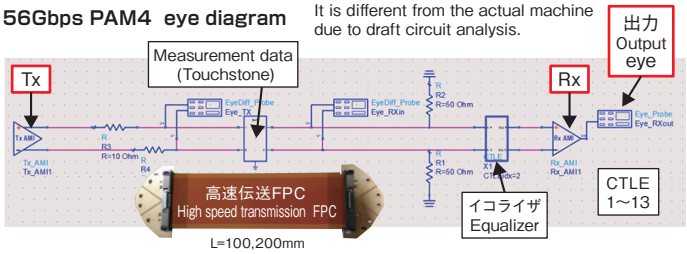
●ディスクリートケーブル
Discrete cable



高速伝送FPC　High speed transmission FPC

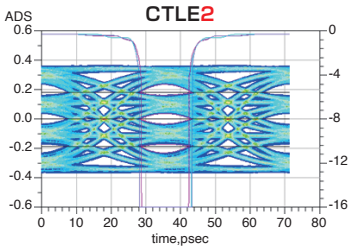
◆ドラフト回路解析のため実機と異なります
It is different from the actual machine due to draft circuit analysis.

56Gbps PAM4 eye diagram

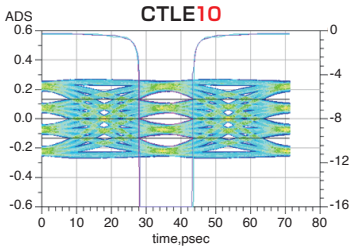


L=100,200mm
HF513

HF513&高速伝送FPC L=100mm
HF513＆High speed transmission FPC



HF513&高速伝送FPC L=200mm
HF513＆High speed transmission FPC



高速伝送コネクタ High Speed Connectors

NRZ		
28G	56G	64G

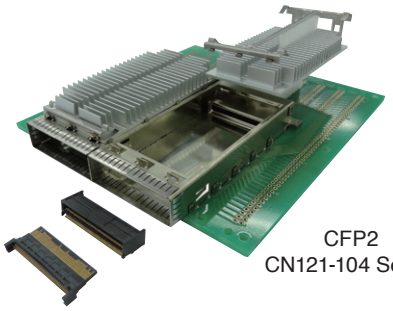
PAM4		
56G	112G	224G

テレコムコネクタ＆メカニカルユニット
Telecom connector & Mechanical unit

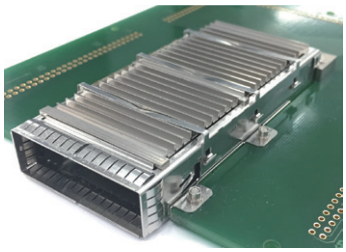
CFP Multi-Source Agreement（MSA）規格準拠
CFP Multi-Source Agreement（MSA）Compliant

40Gbps、100Gbps、200Gbps、400Gbps、800Gbpsイーサネット対応CFPファミリーコネクタ＆メカニカルユニット
CFP Family Connector and mechanical unit for 40Gbps, 100Gbps, 200Gbps, 400Gbps, & 800Gbps Ethernet

CFP2 Connector & Mecanical-Unit

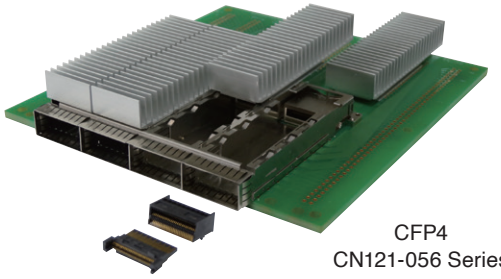


CFP2
CN121-104 Series



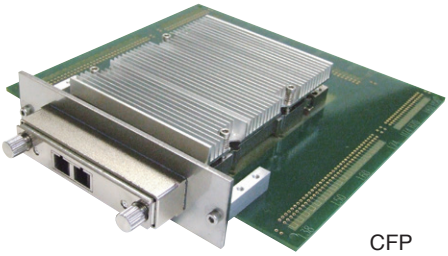
CFP2 Mid Mount Type
CN121-104 Series

CFP4 Host & Mechanial-Unit



CFP4
CN121-056 Series

CFP Host & Mechanical-Unit



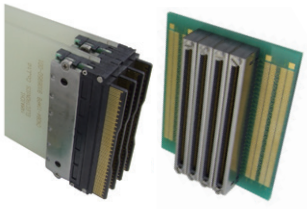
CFP
CA009 Series

Advanced MC Connector CN080＆CN084 Series
PICMG AMC,0準拠Advanced MC コネクタ
PICMG AMC, 0-Compliant Advanced MC Connector

AdvancedMC Connector for Micro TCA

CN080 Series

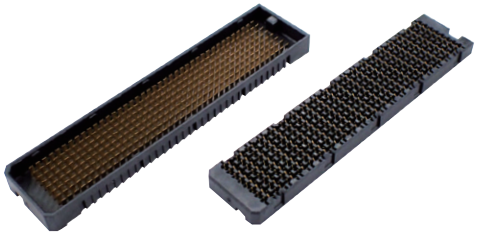
AdvancedMC Connector



CN084 Series

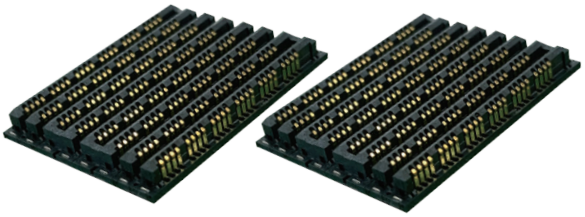
メザニンコネクタ　Mezzanine Connector

YGM-320 PAM4-56G



CN201

YTM Series PAM4-112G/224G



RC Series

データコムコネクタ＆メカニカルユニット
SFF規格準拠品 MSA準拠

Datacom Connector & Mechanical unit
SFF Committee Compliant MSA Compliant

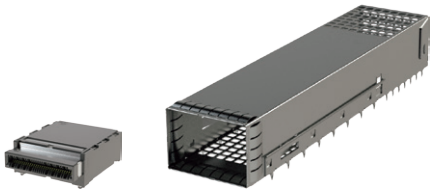
NRZ	
28G	56G

PAM4		
56G	112G	224G

OSFP Host & Mechanical Unit

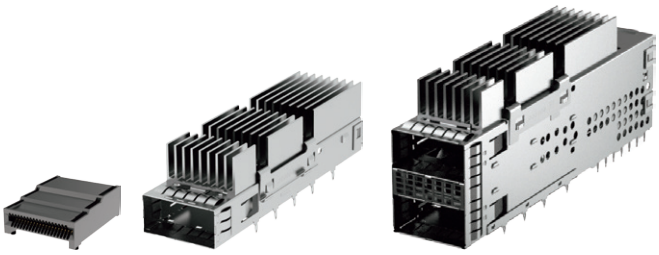
CN176 Series

OSFP-XD Host & Mechanical Unit



CN214 Series

QSFP-DD Host & Mechanical Unit



CN174 Series

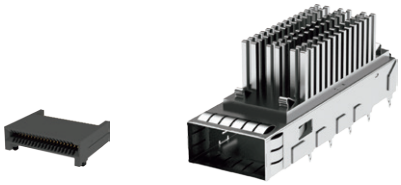
SFP Connector & Mechanical-Unit

CN109-020 Series

DSFP Connector & Mechanical-Unit

CN109-022 Series

QSFP Connector & Mechanical-Unit

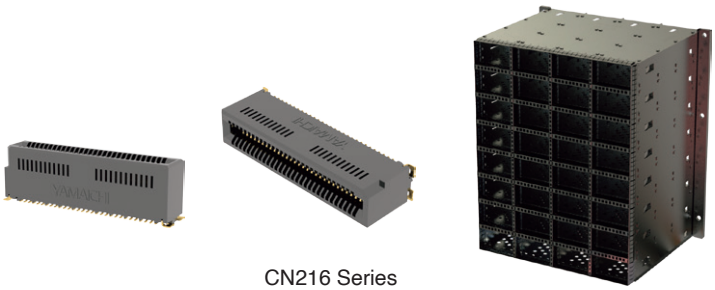


CN120 Series

NGSFP-DD Connector

CN109-044 Series

VLC-OSFP Host & Mechanical-Unit



CN216 Series

車載用コネクタ Connectors for In-vehicle Equipments

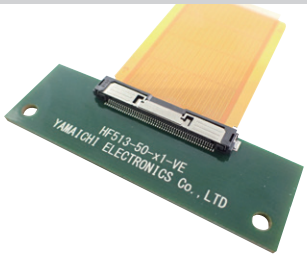
230/314極カードエッジコネクタ
230/314 Pin Card Edge Connector

CN113 Series

FPC/FFC フリップロックタイプコネクタ 125℃耐熱タイプ
FPC/FFC Connector Flip Lock Type 125°C Heat-resistant Type

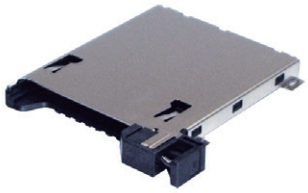
HF601 Series

FPC/FFC Non-ZIF コネクタ 125℃耐熱タイプ
FPC/FFC Connector Non-ZIF Type 125°C Heat-resistant Type



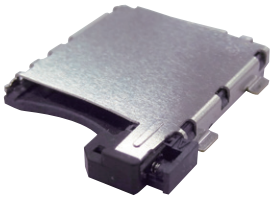
HF513 Series

車載用SDカードコネクタ ワンアクションロックタイプ
SD Card Connector for In-Vehicle One Action Lock Type



FPS009-4200 Series

車載用マイクロSDカードコネクタ ワンアクションロックタイプ
micro SD Card Connector for In-Vehicle One Action Lock Type



PJS008-4100 Series

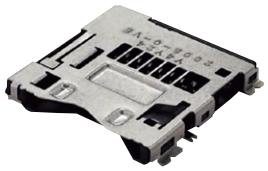
車載用SIMカードコネクタ ワンアクションロックタイプ
SIM SD Card Connector for In-Vehicle One Action Lock Type

FM006-2340 Series

車載用SDカードコネクタ
プッシュイン/プッシュアウトタイプ 半挿カード検知スイッチ付
SD Card Connector for In-Vehicle
Push-in/Push-out Type with Card Stay Detection Switch

FPS009-2920 Series

車載用マイクロSDカードコネクタ
プッシュイン/プッシュアウトタイプ 全端子2点接点採用
micro SD Card Connector for In-Vehicle
Push-in/Push-out Type 2-Beam Contact Installation

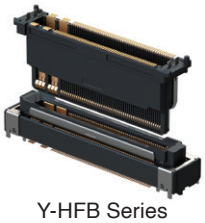


PJS008-2005

車載用カメラモジュールコネクタ
同軸タイプ/差動タイプ
Automotive Camera Module Connector
Coaxial / Differential

HC Series

基板対基板コネクタ フローティングタイプ
Board to Board Connector Floating Type



Y-HFB Series

次世代同軸コネクタ mini-FAKRA
Coaxial Connector of Next Generation

Y-MFC Series

高速イーサネット用差動コネクタ
Differential Transmission Connector for High Speed Ethernet

Y-HDE Series

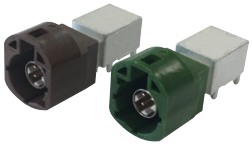
Y-Quad コネクションボックス
Y-Quad Connection Boxes

Y-Quad Series

FAKRA 同軸コネクタ シリーズ
FAKRA Coaxial Connector Series

HF106 Series

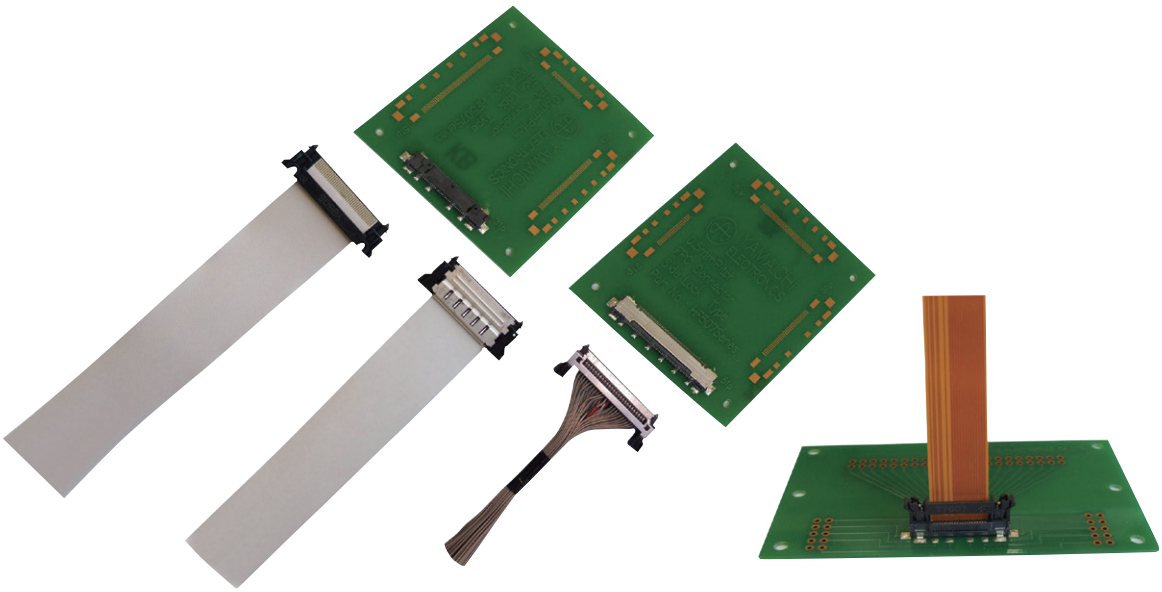
HSD コネクタ 標準タイプ
HSD Connector STD. Type



HF109 Series

高速コネクションシステム - YFLEX®ケーブル＆コネクタ -

High-Speed Connection System - YFLEX® cable & connector -



高速伝送対応コネクタ Connectors for High-Speed Transmission

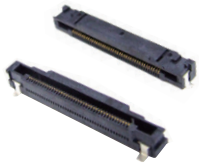
プラグ（サイドロックタイプ） Plug（Side-Lock Type）

YFLEX®+HF507 Series

Discreat Adapter+HF507 Series

High-Speed FFC+HF507 Series

レセプタクル Receptacle HF507 Series

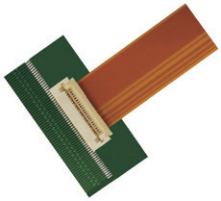


HF507S-**-01～04 Series

HF507-**-06 Series

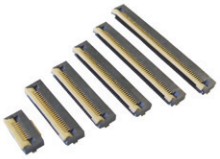
HF507S-**-72 Series

レセプタクル（フリップロックタイプ） Receptacle（Flip-Lock Type） HF601 Series



HF601-22-03 Series

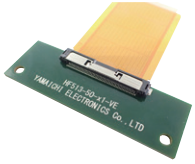
HF601-**-12 Series



HF601-**-02 Series

ロック付きFPC/FFC コネクタ FPC/FFC Connector with Lock Type

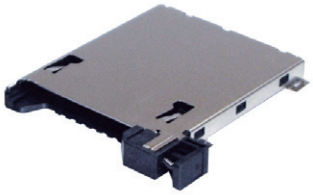
センターロックタイプ Center-Lock Type
HF512 Series



FPC/FFC Non-ZIF コネクタ125℃耐熱タイプ
FPC/FFC Connector Non-ZIF Type125°C Heat-resistant Type
HF513 Series

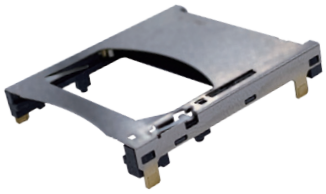
メモリーカードコネクタ Memory Card Connectors

SDカードコネクタ SD Card Connectors FPS009 Series



FPS009-4200 Series

FPS009-2920 Series



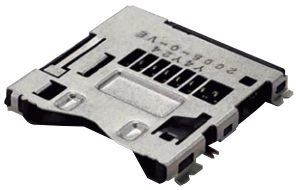
FPS009-2913 Series

FPS009-230* Series

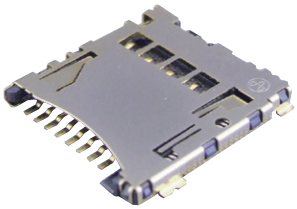
FPS009-2960 Series

FPS009-2940-0 Series

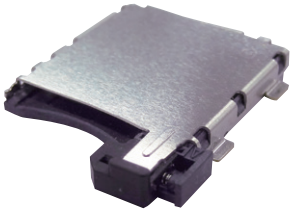
マイクロSDカードコネクタ micro SD Card Connectors PJS008 Series



PJS008-2004 & 2005

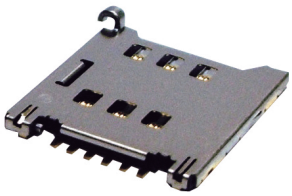


PJS008-21*0 Series

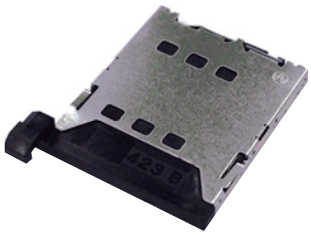


PJS008-4100 Series

マイクロSIMカードコネクタ Micro SIM Card Connectors FUS006 Series

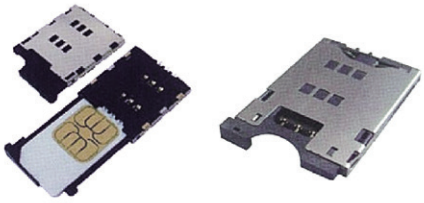


FUS006-8500 Series

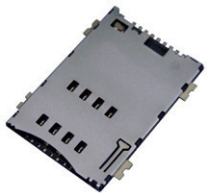


FUS006-3210 Series

SIMカードコネクタ SIM Card Connectors FMS Series



FMS006-3*** Series



FMS008-600* Series

FMS006-234* Series

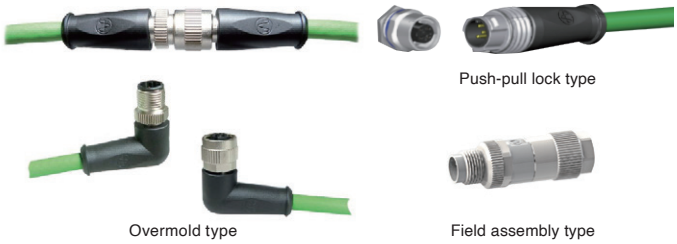
FMS006-5*** Series

FA・制御機器用コネクタ Industrial & Communication System Connectors

プッシュ・プル丸形コネクタ
Push-Pull Circular connector

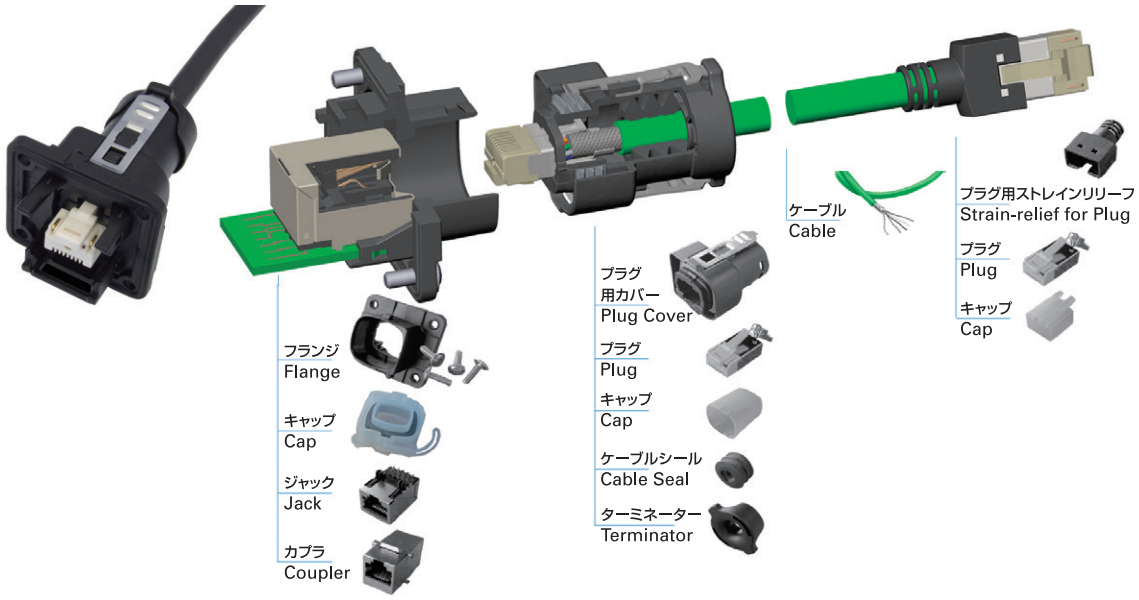
Y CIRC Series
Y-CIRC P

M12丸形コネクタ
M12 Circular connector



Y CIRC Series
Y-CIRC M

防塵・防水型モジュラーコネクタシステム CN078シリーズ
Dust & Water-Proof Modular Connection System CN078 Series



超低背 RJ45 縦型
Ultra-low profile RJ45 Vertical Type
CN078 Series

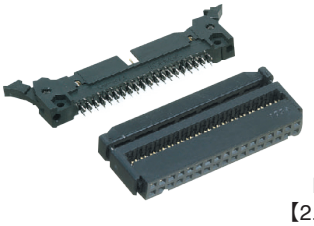
産業機器向けカメラモジュールコネクタ 同軸タイプ/差動タイプ
Camera module connector for industrial equipment
Coaxial / Differential

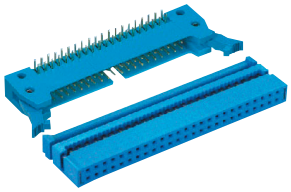
HC Series

MXM 3.1/SMARC2.0対応230/314pinカードエッジコネクタ
230 / 314 pins Card edge connector for MXM 3.1 / SMARC 2.0

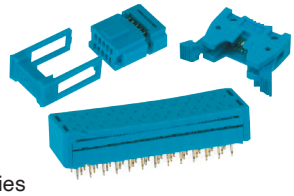
CN113 Series

フラットケーブルコネクタ Flat Cable Connector
MIL規格コネクタ MIL Standard Connector



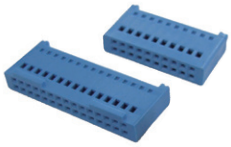


FA Series
【2.54㎜ Pitch】



NF Series
【1.27㎜ Pitch】

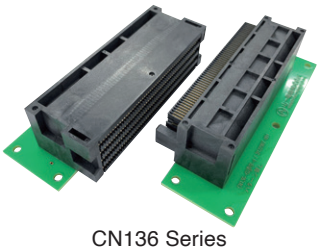
バラ線圧着コネクタ
Crimp Connecter for Loose Wires



UF Series
【2.54㎜ Pitch】

Contact 66

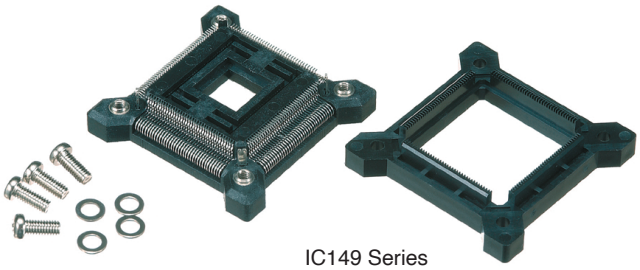
バーンイン装置向けバックプレーンコネクタ 180℃対応
Backplane Connector for Buran-In Equipment 180°C Heat-resistant Type



CN136 Series

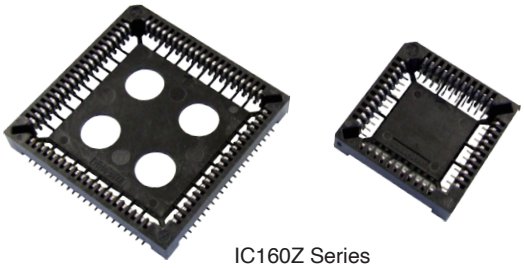
実装用ICソケット IC Production Sockets

QFP



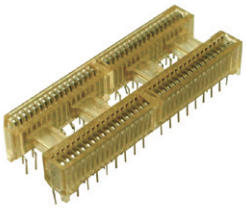
IC149 Series

PLCC



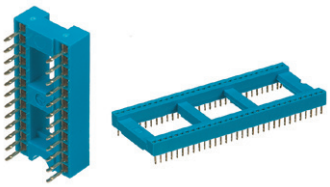
IC160Z Series

SSDIP

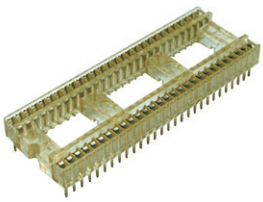


IC326 Series

SDIP

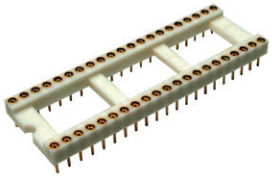


IC38 Series

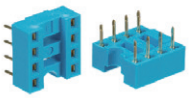


IC310 Series

DIP

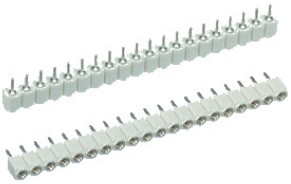


IC26V Series

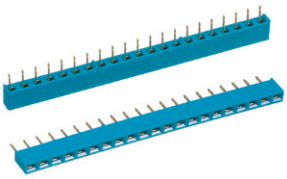


IC30 Series

SIP



IC26V Series



IC30 Series

光関連製品　Optical Products

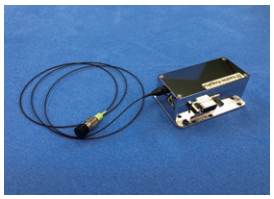
半導体レーザ光源製品　Tunable Laser Light Source Products

波長可変半導体レーザ　Tunable Semiconductor Laser
KLS-201A Series

1um帯／1200um帯／O／S／C／L／Uのバンドに対応
単色性に優れた挟スペクトラム線幅
低RINの低ノイズ光源

Supports 1um / 1200nm / O/ S/ C/ L/ U band
Narrow spectrum line width with excellent monochromaticity
Low noise light source with low RIN

固定波長半導体レーザ　Fixed-Wavelength Semiconductor Laser
FLS & FLM



FLM

FLS

1180-1370nm/1400-1680nmから任意の波長を選択可能
ドライバ内臓タイプ(FLS)とLDモジュール単体（FLM）をラインナップ

Any wavelength can be selected from 1180-1370nm / 1400-1680nm
Lineup of driver built-in type (FLS) and LD module unit (FLM)

光通信モジュール製品　Optical Module Products

2ポート透過フィルタモジュール　2port optical filter module

TFM / FC

WTFM / FC

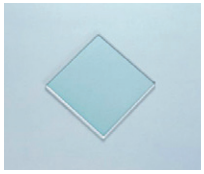
FBPF

3ポート透過/反射フィルタモジュール
3port tunable filter module

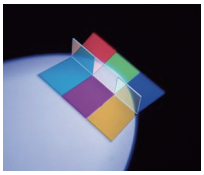
TMUX

光薄膜フィルタ製品　Optical Thin Film Filter Products

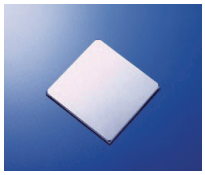
映像機器用途光薄膜フィルタ　For Visual Equipment Products



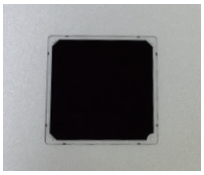
UV/IR Cut Filter



ダイクロイックミラー
Dichroic Mirror



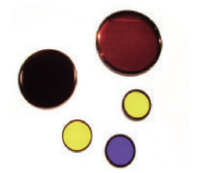
コールドミラー
Cold Mirror



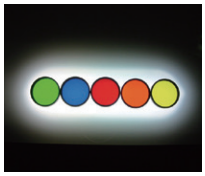
樹脂低反射NDフィルタ
Low-reflection Film ND Filter

分析機器用途光薄膜フィルタ　For Analysis Products

干渉フィルタ
Band-pass Filter

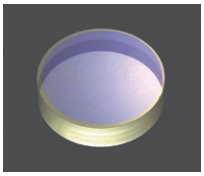


蛍光分析用励起フィルタ
Excitation Filter

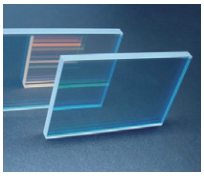


蛍光分析用蛍光フィルタ
Fluorescence Filter

産業機器用途光薄膜フィルタ　For Industrial Products

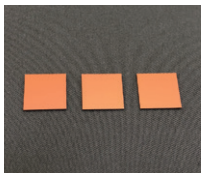


３５５nmレーザミラー
Laser Mirror Coating



高耐力レーザミラー
High-power Laser Mirror

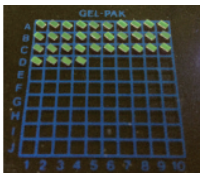
光通信用途光薄膜フィルタ　For Optical Communication Products



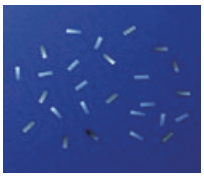
LIDAR,空間センシング用フィルタ
LIDAR, Spatial Sensing Filter

反射防止膜
Anti-Reflection Coating

バンドパスフィルタ
Band Pass Filter



ショートパスフィルタ
Short Pass Filter



ポリイミド フィルタ
Polyimide Filter

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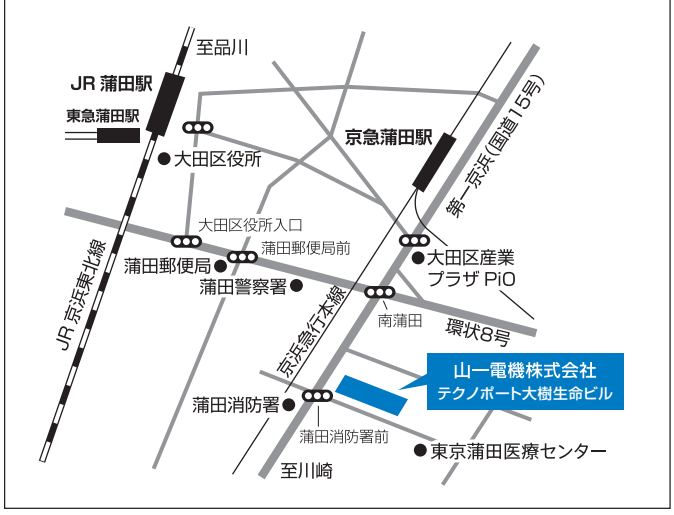
http://www.koshin-kogaku.co.jp

山一電機本社地図



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