# **SIGMA CONNECTION SYSTEM FAMILY OVERVIEW**



### Content

### Why SICMA?

Market environment and value proposition

Portfolio Overview Portfolio scope Technical Overview Design features

### **Part Numbers**



### Content

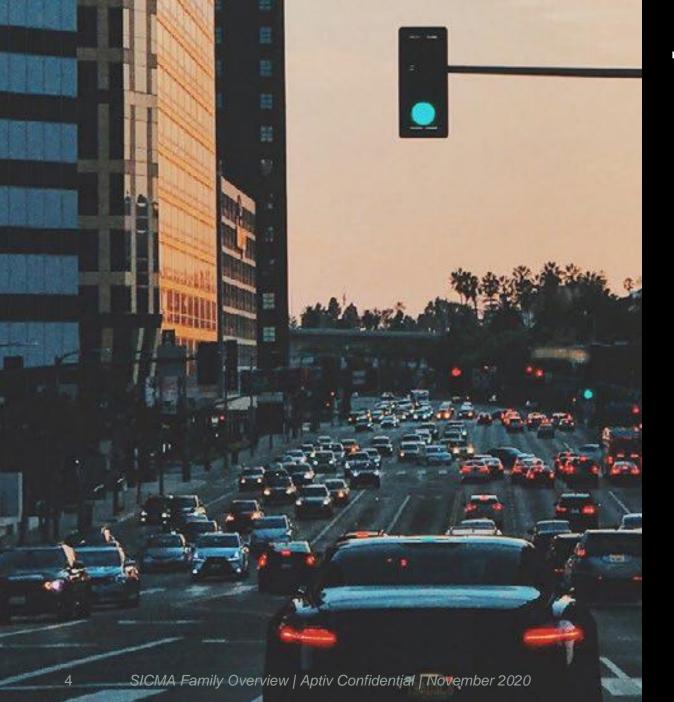
### Why SICMA?

Market environment and value proposition

Portfolio Overview **Technical Overview** Design features

### Part Numbers





## **The Challenge**

Higher current carrying capacity requirements

Higher operating temperature and vibration

Higher compatibility for transportation industry

• A P T I V •

## **The Solution**

### Presenting the SICMA (Automotive Modular Interconnect System) family. A comprehensive product portfolio for full interconnect system.





## **Robust features, meaningful benefits**

### Harsh Environment

- Water tightness of high level including jet spray IPx9K
- Submersion proof IP68
- Compact design to improve space efficiency
- Terminals are clean body design preventing any damages to wires and seals
- High temperature T4 endurance
- High vibration V3 endurance for Sensomate

### **Easy Assembly**

- Mat seal design with ergonomic terminal insertion
- TPA (Terminal Position Assurance) detects not fully inserted terminals
- CPA (Connector Position Assurance) ensures perfect mating between male and female connectors
- Low mating force between male and female under 60N
- Optional wire dress / back shell
- Convenient assembly and disassembly tools are available
- Mechanical coding well distinguished by color

### High Compatibility

- Foot print interface from 2 up to 6 way fully standardized at several OEMs
- Terminal cavity compatible with industry standard
- Terminal sizes: 0.64, 1.5, 2.8 mm
- Crimping ranges from 0.13 up to 5 mm<sup>2</sup>

### • A P T I V •

### Content

### Why SICMA?

Market environment and value proposition

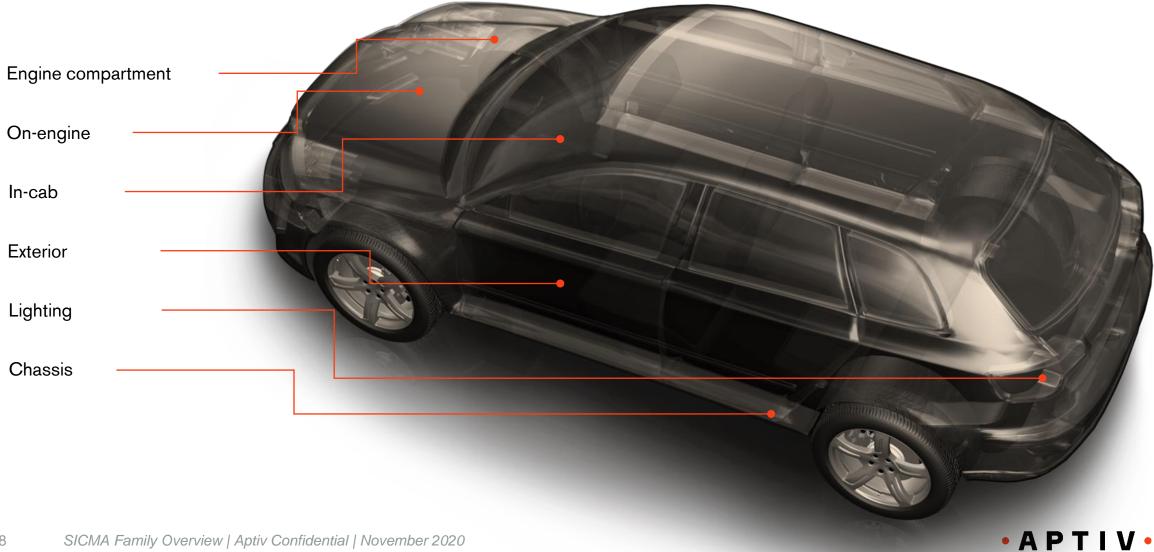
Portfolio Overview Portfolio scope

**Technical Overview** Design features

### Part Numbers



## **Versatility of application**



## A wide family range

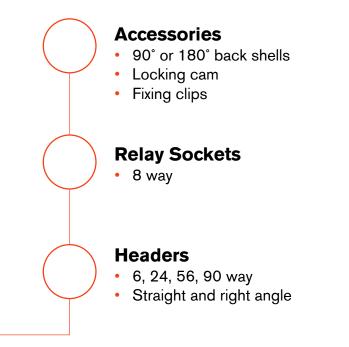


#### **Connectors**

- · Inline and device applications
- 2 through 90 way configurations
- SICMA Mini-Sealed, SICMA Sensomate Series, SICMA Inline Unsealed Series, SICMA Inline Sealed Series SICMA Panel Through Unsealed Series, SICMA Panel Through Sealed Series, SICMA Header Sealed Interconnect Series, SICMA Relay Sockets and SICMA On Board Diagnostic (OBD)

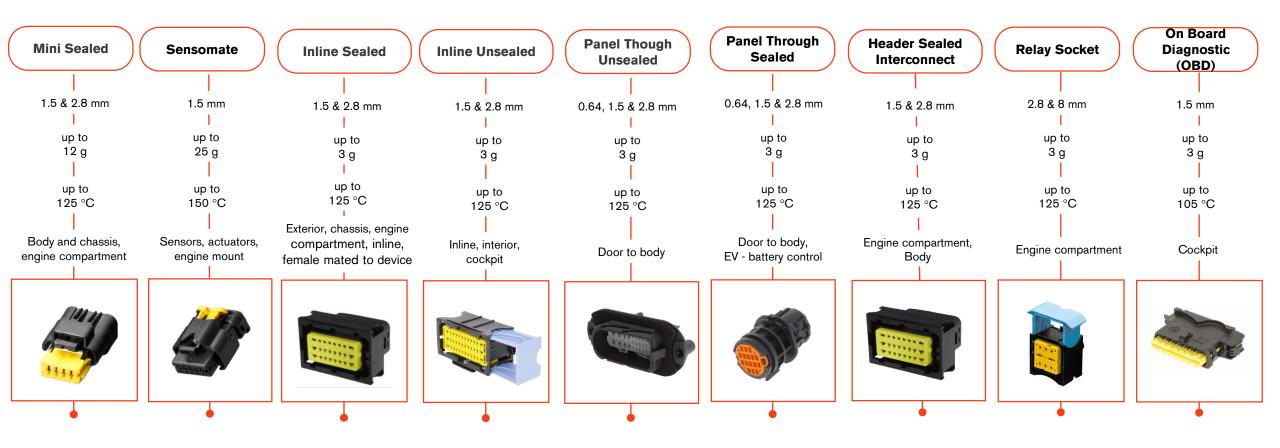
#### **Terminals**

- One-piece terminal system
- 0.64mm, 1.5mm, 2.8mm
- Tin, silver, or gold plating





### **SICMA housing range**



• A P T I V •

## **SICMA Mini-sealed Connector**

### Housing family



### **Key features & benefits**

- Standard commodity connection system
- Reliable inline harness sectioning connectors featuring a mechanical coding
- Compatible with standard interface footprint of several devices used in automotive and commercial vehicles
- Water tightness of high level including jet spray
- Compact design around 1.5 mm terminal
- 2, 3, 4, 5, 6 way connectors use 1.5 terminals
- Additional hybrid 6 way use 1.5 & 2.8 mm terminals

Performance characteristics	
Sealing protection (up to)	IP 67 & IPx9K
Temperature range (up to)	-40°C to +125°C
Vibration performance (up to)	12 g
Terminal retention force (up to)	> 100 N
Terminal insertion force (up to)	< 15 N
Connector mating force	< 80 N
Available cavity configurations	2, 3, 4, 5, 6, 6 (Mixed) way



## **SICMA Sensomate High Performance Connector**

### Housing family



**Application:** sensor and actuators on engine mount Air filter and pressure device

### Key features & benefits

- High performance connector featuring T4 and V3
- Back shell covers available
- As connector endures high temperature it will last for all the life of the vehicle without having any stoppage
- · CPA is premounted
- · Compatible with existing Mini Sealed family

Performance characteristics	
Sealing protection (up to)	IP 68 & IPx9K
Temperature range (up to)	-40°C to +150°C
Vibration performance (up to)	25 g
Terminal retention force (up to)	> 100 N
Terminal insertion force (up to)	< 15 N
Connector mating force	< 80 N
Available cavity configurations	4, 5 & 6 way

## **SICMA Panel Through Unsealed Connector**

### Housing family



**Application:** door to body connection, firewall between cockpit and engine interconnection, bulkhead for battery control in HV/EHV

#### Key features & benefits

- · Compact size for a panel mount solution and electrical link passing through a wall
- · Pass through, bulk head type, mounted on a metal panel sheet
- · Providing a convenient door-to-body or a reliable cockpit-to-engine
- 24 & 29 way connectors use 0.64, 1.5 & 2.8 mm terminals
- 42 way connectors use 1.5 & 2.8 mm terminals

Performance characteristics	
Sealing protection (up to)	IP 40
Temperature range (up to)	-40°C to +125°C
Vibration performance (up to)	3 g
Terminal retention force (up to)	> 60 N ~ 120 N *
Terminal insertion force (up to)	8 N ~ 10 N *
Connector mating force	< 60 N
Available cavity configurations	24, 29 & 42 way

\* Specifications vary for different cavity and used terminals.

## **SICMA Panel Through Sealed Connector**

### Housing family



**Application:** door to body connection, firewall between cockpit and engine interconnection, bulkhead for battery control in HV/EHV

#### **Key features & benefits**

- · Compact size for a panel mount solution and electrical link passing through a wall
- Circular through hole convenient for implementation
- · Pass through, bulk head type, mounted on a metal panel sheet
- Providing a convenient door-to-body or a reliable cockpit-to-engine
- 26 way connectors use 0.64, 1.5 & 2.8 mm terminals
- 14, 24, 33, 34 way connectors use 1.5 & 2.8 mm terminals
- 16 & 50 way connectors use 1.5 mm terminals

Performance characteristics	
Sealing protection (up to)	IP 64 ~ 67 *
Temperature range (up to)	-40°C to +125°C
Vibration performance (up to)	3 g
Terminal retention force (up to)	> 60 ~ 120 N *
Terminal insertion force (up to)	5 ~ 17 N *
Connector mating force	60 ~ 90 N *
Available cavity configurations	14, 16, 24, 26, 33, 34 & 50 way

\* Specifications vary for different cavity and used terminals.



## **SICMA Inline Sealed Connector**

### Housing family



**Application:** Exterior, chassis, engine compartment, inline, female mated

#### **Key features & benefits**

- · Clean body SICMA/BTS terminals are easily inserted in housing cavity
- Tin, silver, gold plated terminals available
- · Perfect solution for engine compartment at body mount, highly exposed to dirt and water
- Reliable IP68 watertight 6 and 8 Way connector and IP67 for the 24 Way connector
- 6 Way connector is equipped with a casing or holder for corrugated pipe by hinge principle

Performance characteristics	
Sealing protection (up to)	IP 68 (6, 8 way) IP 67 (24 way)
Temperature range (up to)	-40°C to +125°C
Vibration performance (up to)	3 g
Terminal retention force (up to)	> 80 N *
Terminal insertion force (up to)	5 ~ 15 N *
Connector mating force	60 N *
Available cavity configurations	6, 8, 24 way
	* Specifications your for different south and used terminals

\* Specifications vary for different cavity and used terminals.

## **SICMA Inline Unsealed Connector**

### Housing family



### **Key features & benefits**

- · Reliable inline harness sectioning connector
- Using standard fixing clip
- Compact male and female housings which provide a convenient inline wire to wire solution
- Mixed sizes of 1.5 & 2.8 mm terminals populating 24 & 36 way connectors
- 1.5 mm terminals are used for 2 & 6 way connectors

Performance characteristics	
Sealing protection (up to)	IP 40
Temperature range (up to)	-40°C to +125°C (up to 85°C for 24 & 36 way)
Vibration performance (up to)	3 g
Terminal retention force (up to)	>60 ~ 120 N *
Terminal insertion force (up to)	5 ~ 15 N *
Connector mating force	30 ~ 60 N *
Available cavity configurations	2, 6, 10, 24 & 36 way

\* Specifications vary for different cavity and used terminals.



## **SICMA Header Sealed Interconnect**

### Housing family



**Application:** engine management with gas converter, automatic gear box management

#### **Key features & benefits**

٠

- · Market standard, foot print interface to device headers
- Wire to Electronic Printed Circuit Board (PCB) solution in order to built electronic control units
- · Sealed Interconnection from harness wiring to an electronic equipment
- 6 & 24 way connectors use 1.5 & 2.8 mm terminals
- 56 & 90 way connectors use 1.5 mm terminals

Performance characteristics	
Sealing protection (up to)	IP 67
Temperature range (up to)	-40°C to +125°C
Vibration performance (up to)	3 g
Terminal retention force (up to)	< 75 N
Terminal insertion force (up to)	12 ~ 17 N
Connector mating force	< 75 N
Available cavity configurations	6, 24, 56 & 90 way

\* Specifications vary for different cavity and used terminals.



## **SICMA Sealed Relay Socket**

### Housing family

with SICMA 2.8 & NG1 8 mm terminals	

**Application:** pre-heating of diesel engines, comfort heating of cockpit, antipollution systems by EOBD

### Key features & benefits

- Reliable connection to relay which will last all the life of the vehicle.
- Easily disconnected and reconnected back again In case of relay change.
- Sliding lever mate assist for easy mating to the relay switch.
- Standard to different EOBD (Electronic on Board Diagnostics) devices.
- Cable seal (SWS) to ensure the water tightness

Performance characteristics	
Sealing protection (up to)	IP 68/IPx9K
Temperature range (up to)	-40°C to +125°C
Vibration performance (up to)	3 g
Terminal retention force (up to)	> 120 N
Terminal insertion force (up to)	< 20 N
Connector mating force	< 60 N
Available cavity configurations	8 way

## **SICMA On Board Diagnostic (OBD)**

### Housing family

OBD 16W Female
with SICMA 1.5 mm terminals



**Application:** Cockpit

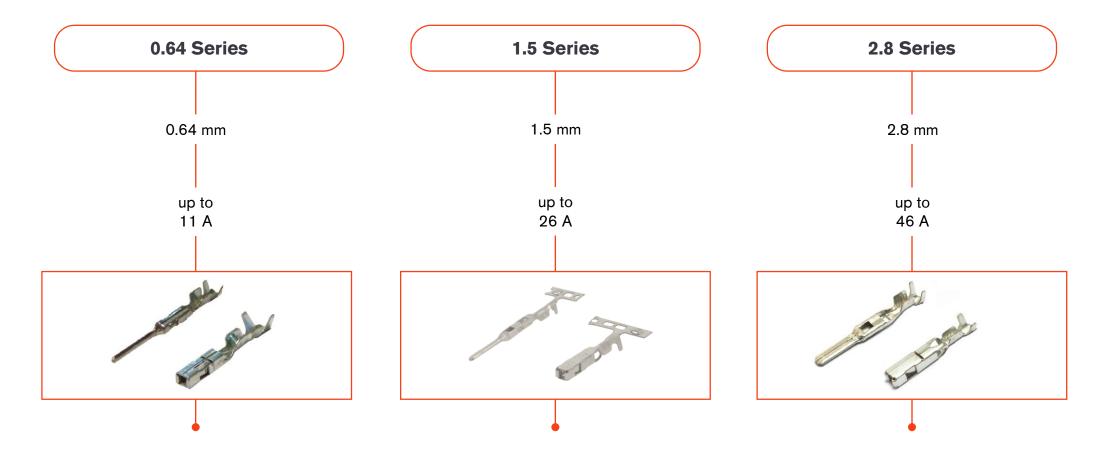
### **Key features & benefits**

- Optional protection cap cover with hinge against liquid splashes
- Pass-through panel mount inside cockpit
- Easiness of wiring and small shape housing ٠
- Unsealed housing for SICMA clean body terminal with lock reinforcement (TPA) ٠
- Standard "On-Board Diagnostic (OBD) receptacle with 16 Ways

Performance characteristics	
Temperature range (up to)	-40°C to +105°C
Vibration performance (up to)	3 g
Terminal retention force (up to)	> 90 N
Terminal insertion force (up to)	< 20 N
Connector mating force	< 60 N
Available cavity configurations	16 way



### **SICMA terminal** range





## Micro SICMA - 0.64 Series

### **Terminal family**



#### **Key features & benefits**

- Reliable contact pressure through life time of the vehicle
- Standard well known terminal cavity compatibility.
- Clean body which prevents of tearing the mat seal
- One piece terminal with high pressure contact
- Two crimping gauges for good slow motion performance and vibrations

Performance characteristics	
Contact resistance	< 3 mΩ
Contact mating force	< 4 N
Contact unmating force	< 2.5 N
Range of wire gauge	0.35-0.75 mm <sup>2</sup> / 22-18 AWG
Current carrying capacity for 0.6 mm <sup>2</sup>	
at 23°C up to approx. :	11 A
at 85°C up to approx. :	7 A
at 100°C up to approx. :	5 A



## SICMA 3 Plus & SICMA 4 - 1.5 Series

### **Terminal family**



\* SICMA 3 Plus are female terminals and SICMA 4 are male terminals

#### **Key features & benefits**

- Reliable contact pressure through life time of the vehicle
- Standard well known terminal cavity compatibility.
- Clean body which prevents of tearing the mat seal
- One piece terminal with high pressure contact
- Several crimping gauges for good slow motion performance and vibrations

Performance characteristics								
< 2 mΩ								
< 4 N								
< 3 N								
0.13-2 mm² / 24-14 AWG								
26 A								
15 A								
12 A								



## SICMA 2 & SICMA 3 - 2.8 Series

### **Terminal family**



#### **Key features & benefits**

- Reliable contact pressure through life time of the vehicle
- Standard well known terminal cavity compatibility.
- Clean body which prevents of tearing the mat seal
- One piece terminal with high pressure contact
- Several crimping gauges for good slow motion performance and vibrations.

Performance characteristics								
Contact resistance	< 1.5 mΩ							
Contact mating force	< 6 N							
Contact unmating force	< 1.5 N							
Range of wire gauge	0.35-5.0 mm² / 22-10 AWG							
Current carrying capacity for 5 mm <sup>2</sup>								
at 23°C up to approx. :	46 A							
at 85°C up to approx. :	27 A							
at 100°C up to approx. :	21 A							



### Content

### Why SICMA?

Market environment and value proposition Portfolio Overview Technical Overview Design features

### Part Numbers



## **Connector design overview**

#### **Benefits**

- Easy assembly
- High industry compatibility
- Compact package for space efficiency
- Robust performance to ensure long time duration

### **Design features**

- 1 CPA (Connector Position Assurance) ensures perfect mating between male and female connectors
- 2 TPA (Terminal Position Assurance) detects not fully inserted terminals
- 3 Mat seal design with ergonomic terminal insertion
- 4 Housing designed for high temperature T4 endurance
- 5 Interfacial seal to ensure high vibration V3 and sealing S3 endurance for Sensomate
- 6 Rear grid provides excellent guidance for terminals





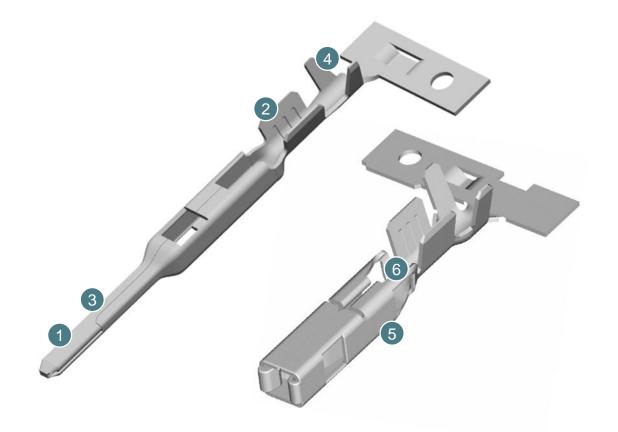
## **Terminal design overview**

#### **Benefits**

- Standard well know cavity compatibility
- Several crimping gauges for good slow motion performance and vibration
- · Clean body design for terminals to prevent any damages to wires and seals

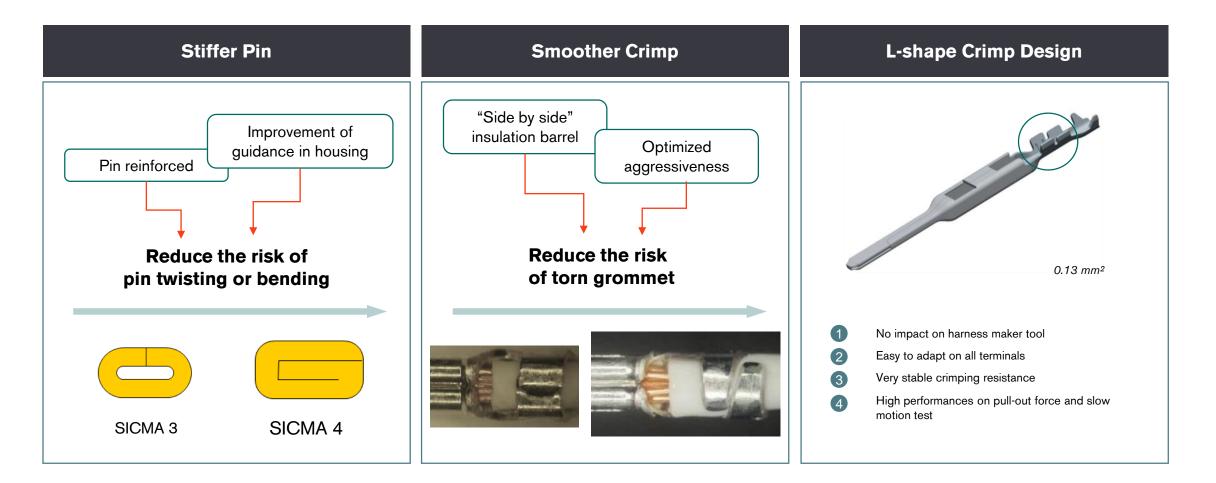
### **Design features**

- 1 No seam in contact area, enabling smooth contact area on both sides and enhancing electrical connection
- 2 SICMA terminals have very stable crimping resistance and high performances on pull-out force and slow motion test, and thanks to L-shape technology, 0.13 mm<sup>2</sup> cable is able to be crimped
- 3 Reinforced pin improves the guidance in housing and reduces the risk of pin twisting or bending
- 4 "Side by side" insulation crimping barrel optimizes aggressiveness and reduces the risk of torn grommet
- 5 Smooth edges to enable easy assembly without damage mat seal
- 6 Optimization of brace for better insertion and extraction





## SICMA terminal technology



Part numbers, specifications, dimensions and performance data in this document are for general references only and are subject to change without notice. To verify product information, please contact an Aptiv representative.

• A P T I V •

### Content

### Why SICMA?

Market environment and value proposition Portfolio Overview Technical Overview

### Part Numbers



### SICMA Mini-sealed Connector

Mini-sealed Connector	Cavity Count	Blade Size (mm)	Gender	Color	Part Number	Codings Offered
	2	1.5	F	Black	10820158	9
	2	1.5	М	Black	10787262	7
	3	1.5	F	Black	10820167	8
	3	1.5	М	Black	10788983	6
	4	1.5	F	Black	10763691	3
	4	1.5	М	Black	10768812	3
211	5	1.5	F	Black	10820113	3
SICMA Mini-Sealed Connectors	5	1.5	М	Black	33500323	3
	6	1.5	F	Black	10866615	3
	6	1.5	М	Black	13716617	3
	6*	1.5(4), 2.8(2)	F	Black	10866611	3
	6*	1.5(4), 2.8(2)	М	Black	15396354	3

• A P T I V •

SICMA Sensomate High Performance Connector

Sensomate High Temperature Connector	Cavity Count	Blade Size (mm)	Gender	Index	Part Number	Other Available Indexes
	4	1.5	F	Black	13876521	5
	4	1.5	Μ	Black	33502133	5
	5	1.5	F	Black	13893671	5
Real	5	1.5	Μ	Black	13855072	5
	6	1.5	F	Purple	33511993	5
	6	1.5	Μ	Purple	33511739	5

SICMA Sensomate High Perfomance Connectors



### SICMA Inline Unsealed Connector

Unsealed Inline Connector	Cavity Count	Blade Size (mm)	Gender	Color	Part Number	Codings Offered
	2	1.5	F	Black	33500298	1
Hun an	2	1.5	М	Black	33500318	1
ATT A CO	6	1.5	F	Black	10788770	5
	6	1.5	М	Black	10846895	5
	24	1.5(18), 2.8(6)	F	Black	13751295	3
	24	1.5(18), 2.8(6)	М	Black	33500326	3
SICMA Inline Unsealed	36	1.5(30), 2.8(6)	F	Black	33500789	2
Connectors 6 way	36	1.5(30), 2.8(6)	М	Black	13651194	2



### SICMA Inline Sealed Connector

Sealed Inline Connector	Cavity Count	Blade Size (mm)	Gender	Color	Part Number	Codings Offered
	6	1.5	F	Black	10723553	2
	6	1.5	М	Black	10752307	2
	8	1.5	F	Black	13800077	1
	8	1.5	М	Black	13799643	1
	24	1.5(18), 2.8(6)	F	Black	33504115	3
	24 *	1.5(18), 2.8(6)	М	Black	15470023	3
1 2 2 2	24**	1.5(18), 2.8(6)	М	Black	33500427	3
SICMA Inline Sealed 6W Female & Male	24	N/A	Pin header	Black	33501039	N/A

\* Clip fixing type \*\* Panel mount fixing type



SICMA Panel Through Unsealed Connector

Panel Through Unsealed Connector	Cavity Count	Blade Size (mm)	Gender	Color	Part Number	Codings Offered
	24	0.64(12), 1.5(8), 2.8(4)	F	Black	33500458	1
	24	0.64(12), 1.5(8), 2.8(4)	М	Black	33500459	1
	29	0.64(21), 1.5(4), 2.8(4)	F	Black	10819390	1
	29	0.64(21), 1.5(4), 2.8(4)	М	Black	10811880	1
PROMETING A	42	1.5(34), 2.8(8)	F	Black	10811874	1
CHANNEL ()	42	1.5(34), 2.8(8)	Μ	Black	10811875	1



### SICMA Panel Through Sealed Connector

Panel Through Sealed Connector	Cavity Count	Blade Size (mm)	Gender	Color	Part Number	Other Available Indexes
	14	1.5(10), 2.8(4)	F	Black	33517516	1
	14	1.5(10), 2.8(4)	Μ	Black	13798672	1
	16	1.5	F	Black	10779313	1
	16	1.5	Μ	Black	33500530	1
	24	1.5(18), 2.8(6)	F	Black	10820454	4
	24	1.5(18), 2.8(6)	Μ	Black	33500427	4
SICMA Panel Through Sealed	26	0.64(18), 1.5(4), 2.8(4)	F	Black	10811873	1
Connectors 14 way	26	0.64(18), 1.5(4), 2.8(4)	Μ	Black	10811880	1
	33	1.5(28), 2.8(5)	F	Black	33503444	2
	33	1.5(28), 2.8(5)	Μ	Black	33503443	2
	34	1.5(30), 2.8(4)	F	Black	10763095	2
	34	1.5(30), 2.8(4)	Μ	Black	10889065	2
	50	1.5	F	Black	10867079	1
	50	1.5	Μ	Black	10866552	1



### SICMA Sealed Header Interconnect

Sealed Header Interconnect	Cavity Count	Blade Size (mm)	Gender	Color	Part Number	Codings Offered
	6	1.5(4), 2.8(2)	F	Black	10768569	1
	24	1.5(18), 2.8(6)	F	Black	10820454	4
	24*	1.5(18), 2.8(6)	F	Black	33504115	4
C. C	56	1.5	F	Black	13669859	1
	90	1.5	F	Black	10776517	1
	90*	1.5	F	Black	33525675	1
-						* Cavity with locking cam

Compatible Pin Header	Cavity count	Angle	Color	Part number	Codings Offered
	6	Right	Black	10866611	1
	24	Straight	Black	33503978	3
111112 3	24	Right	Black	33501039	3
Martin J	56	Right	Black	33511394	1
	90	Straight	Black	33508365	1

35 SICMA Family Overview | Aptiv Confidential | November 2020



SICMA Sealed Relay Socket

Relay Socket	8	Blade Size (mm)	Gender	Color	Part Number
	8	2.8(6), 8*(2)	F	Black	10812007
	8	2.8(6), 8*(2)	F	Grey	13949302
		* Please consult Aptiv			



On Board Diagnostic

OBD	Cavity Count	Blade Size (mm)	Gender	Color	Part Number	Version
	16	1.5	F	Gray	13800155	With cap
	16	1.5	F	Black	13800154	Without cap
OBD 16W Female						



## **Terminal part numbers**

Micro SICMA - 0.64 Series





## **Terminal part numbers**

SICMA 3 Plus & SICMA 4 - 1.5 Series

SICMA 3 Plus & SICMA 4 1.5 Series	Blade Size (mm)	Gender	Plating	Wire Size Range	Part Number	Other Available Platings	
and a start and a second and a se	1.5	F	Tin	0.13-0.22mm <sup>2</sup> (26-24AWG)	33308333	Gold	
	1.5	F	Tin	0.35-0.70mm² (22-18AWG)	10863984	Gold	
and all all and	1.5	F	Tin	0.75-1.30mm² (18-16AWG)	10865152	Gold	
a go go go go	1.5	F	Tin	1.35-2mm² (*2.5mm²) (16-14AWG)	10863985	Gold	
you the part of the	1.5	Μ	Tin	0.13-0.22mm <sup>2</sup> (26-24AWG)	33400435	Silver	
and the party	1.5	Μ	Tin	0.35-0.70mm² (22-18AWG)	33501792	Gold, Silver	
and the set	1.5	Μ	Tin	0.75-1.30mm² (18-16AWG)	33512109	Silver	
and the second s	1.5	Μ	Tin	1.35-2.00mm² (16-14AWG)	33512190	Silver	
					* 2.5 mm <sup>2</sup> is only applicable to unsealed connectors		

iny app



## **Terminal part numbers**

SICMA 2 & SICMA 3 - 2.8 Series

SICMA 2 & SICMA 3 2.8 Series	Blade Size (mm)	Gender	Plating	Wire Size Range	Part Number	Other Available Platings
a to a state of a stat	2.8	F	Tin	0.35-0.70mm <sup>2</sup> (22-18AWG)	10781041	Gold
	2.8	F	Tin	0.75-1.30mm² (18-16AWG)	15522621	Gold
	2.8	F	Tin	1.35-2.00mm <sup>2</sup> (16-14AWG)	10726549	Gold
	2.8	F	Tin	3.00-5.00mm <sup>2</sup> (12-10AWG)	10725665	Gold
	2.8	F	Tin	0.35-0.70mm <sup>2</sup> (22-18AWG)*	10740375	Gold
	2.8	F	Tin	0.75-1.30mm² (18-16AWG)*	13873373	Gold
	2.8	F	Tin	1.35-2.00mm <sup>2</sup> (16-14AWG)*	10740376	Gold
	2.8	F	Tin	3.00-5.00mm <sup>2</sup> (12-10AWG)*	10725665	Gold
	2.8	М	Tin	0.35-0.70mm <sup>2</sup> (22-18AWG)	10779316	Gold
	2.8	М	Tin	0.75-1.30mm <sup>2</sup> (18-16AWG)	10779316	Gold
	2.8	М	Tin	1.35-2.00mm <sup>2</sup> (16-14AWG)	10756743	Gold
	2.8	М	Tin	3.00-5.00mm <sup>2</sup> (12-10AWG)	10738202	Gold

\* Single wire sealed terminal

Part numbers, specifications, dimensions and performance data in this document are for general references only and are subject to change without notice. To verify product information, please contact an Aptiv representative.



• A P T I V •

### Why SICMA?



Our high performance solution with superior compatibility in the industry



# Thank you.

42

