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Accelerate state-of-the-art camera module developments with feature-packed camera socket solutions for serial and parallel data applications

The absence of a camera socket industry standard led to compatibility issues that made component sourcing and matching difficult. The release of the SMIA specification addressed standardization issues, made multiple sourcing easier and shortened design cycles.

Molex unveiled a class of SMT, SMIA-compliant sockets for serial data applications. These space-saving and high reliability sockets support ultra-slim mobile phone, tablet PC and vision system applications. Available in through-board and on-board mounting styles, they meet a variety of design requirements including low-profile (space-constrained), single-side PCB, compact footprint and more.

Complementing these are parallel data sockets available in side or bottom-contact, on-board or through-board mounting. These sockets feature a characteristically higher pin count than serial versions and can also come in a variety of X-Y (camera module) dimensions; housing and shell features; and mounting styles. An example is the 34-circuit, 8.50 by 9.50mm series 105199 socket which comes with side-contacts and on-board mounting configuration.

Molex offers sockets in both on-board (105028-1001) and through-board (105028-2001) versions for series 105028.

Molex is also ready to assist customers with customized socket solutions if needed.

For more information visit our website at:
www.molex.com/product/camerasocket.html

Camera Sockets for Serial and Parallel Data Applications

Serial data (SMIA*-compliant) sockets, SMT Bottom Contact:

78725	SMIA85, Through-board
105163	SMIA65, Through-board
105167	SMIA65, On-board
105168	SMIA75, Through-board
105190	SMIA75, On-board
105200	SMIA55, Through-board

Parallel data (non-SMIA-compliant) sockets, SMT Bottom Contact:

78499	6.50 by 6.50mm, On-board

Side Contact:

47337	8.50 by 8.50mm, Through-board
105199	8.50 by 9.50mm, On-board
105028	8.50 by 8.50mm, On-board and Through-board



Camera Sockets for Serial and Parallel Data Applications

Features and Benefits

Serial Data (SMIA-compliant) Sockets

SMIA-compliant sockets	Eliminate compatibility issues when used with non-standard camera modules For faster and easier camera module selection by mobile phone makers using PCB-to-socket footprint matching
Anti-short housing wall design	Prevents electrical shorting between socket terminals and the base metal shell
Dimpled terminal design	For added contact reliability between camera socket and module
Dual locking latches on socket	Position and secure the camera module to socket
Bottom-contact styles	Meet common module requirements based on latest trends

Parallel Data (non-SMIA-compliant) Sockets

Side-contact options (series 47337, 105028 and 105199)	Requires zero height between housing base and camera base Better contact force of (typically) 0.35N when mated
Higher pin-count	Supports additional features and functionality built into camera modules
Wide range of socket designs	Expand configuration possibilities for customized camera applications

* SMIA stands for Standard Mobile Imaging Architecture (SMIA) and is a royalty-free, open standard specification developed jointly by Nokia Corporation, ST Microelectronics NV and their licensors. Its purpose is to standardize functional and optical aspects of camera modules and allow mobile handset vendors to work with multiple suppliers in cost-efficient module sourcing.

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Camera Sockets for Serial and Parallel Data Applications

Specifications - Serial Data Versions

Reference Information
Packaging: Tape-and-reel
Mates with: Camera modules
Designed In: mm
RoHS: Yes
Halogen Free: Yes
Glow Wire Compliant: No

Electrical
Voltage (max.):
10V DC (Series 78725, 105168);
50V DC (others)
Current (max.): 0.5A per contact
Contact Resistance:
60milliohms (78725, 105167, 105168, 105190, 105200)
80milliohms (105163)
Dielectric Withstanding Voltage (1 min.):
500VAC (RMS) (78725, 105190)
150VAC (RMS) (105163, 105167, 105200)
Insulation Resistance (min.):
400 Megohm (105163, 105167);
100 Megohm (others)

Mechanical
Contact Force at max. deflection of contact spring (max.):
0.70N (105167, 105168, 105190)
Contact Force at min. deflection of contact spring (min.):
0.2N (78725, 105167, 105168, 105200)
Module Insertion Force (min.):
15N (78725, 105190); 10N (105167, 105168, 105200)
Module Locking Force (min.):
15N (78725, 105168, 105190, 105200); 12N (105167)
Durability (cycles min.):
30 (78725, 105168, 105190);
20 (105163, 105167, 105200)

Physical
Housing:
High temperature thermoplastic, black, UL94-V0
Contact:
Phosphor Bronze Alloy (105190);
Copper Alloy (others)
Plating:
Contact Area — 0.30µm (12µ”) Gold (Au)
Solder Tail Area — Gold (Au) Flash Underplating — 2.0µm (80µ”) Nickel (Ni) overall
Operating Temperature:
-30 to +85°C
(78725, 105168, 105200)
-55 to +85°C
(105163, 105167, 105190)



SMIA55,
5.50 by 5.50mm,
14 circuits
Through-board,
3.78mm height
(Series 105200)



SMIA65,
6.50 by 6.50mm,
12 circuits
Through-board,
3.10mm height
(Series 105163)



SMIA65,
6.50 by 6.50mm,
12 circuits
On-board,
4.50mm height
(Series 105167)



SMIA75,
7.50 by 7.50mm,
16 circuits
On-board,
4.00mm height
(Series 105190)



SMIA75,
7.50 by 7.50mm,
16 circuits
Through-board,
4.20mm height
(Series 105168)



SMIA85,
7.50 by 7.50mm,
18 circuits
Through-board,
5.25mm height
(Series 78725)

Ordering Information - Serial Data Versions

Order No.	SMIA Classification	Circuits	Socket Height (mm)	Module Dimensions (mm)	Mounting Style
105200-0008	SMIA55	14	3.78	5.50 by 5.50	Through-board
105167-0001	SMIA65	12	4.50	6.50 by 6.50	On-board
105163-1001			3.10		Through-board
105190-0001	SMIA75	16	4.00	7.50 by 7.50	On-board
105168-0601			4.20		Through-board
78725-1002	SMIA85	18	5.25	8.50 by 8.50	

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Camera Sockets for Serial and Parallel Data Applications

Specifications - Parallel Data Versions

Reference Information
Packaging: Tape-and-reel
Mates with: Camera modules
Designed In: mm
RoHS: Yes
Halogen Free: Yes
Glow Wire Compliant: No

Electrical
Voltage (max.): 50V DC
Current (max.): 0.5A DC per contact
Contact Resistance:
60milliohms (47337, 105028)
80milliohms (78499, 105199)
Dielectric Withstanding Voltage (1 min.):
500VAC (RMS) (105199)
150VAC (RMS) (47337, 78499, 105028)
Insulation Resistance (min.):
100 (78499); 400 (47337, 105028); 1000 Megaohm (105199)

Mechanical
Terminal / Housing Retention Force (min.):
0.49N (105199); 1.0N (47337, 78499, 105028)
Durability (cycles min.):
5 (78499); 20 (105199, 105028); 30 (47337)

Physical
Housing:
High temperature thermoplastic, white (105199), black (others), UL94-V0
Contact: Copper Alloy
Plating:
Contact Area — 0.30µm (12µ") Gold (Au)
Solder Tail Area — Gold (Au) Flash Underplating — 2.0µm (80µ") Nickel (Ni) overall
Operating Temperature:
-30 to +85°C (105199)
-55 to +85°C (47337, 78499, 105028)



6.50 by 6.50mm, SMT, On-board, 24 circuits Bottom Contact, 3.50mm height (Series 78499)



8.50 by 8.50mm, SMT, Through-board, 24 circuits Side Contact, 4.20mm height (Series 47337)



8.50 by 8.50mm, SMT, Through-board, 32 circuits Side Contact, 5.25mm height (Series 105028)



8.50 by 8.50mm, SMT, On-board, 32 circuits Side Contact, 4.20mm height (Series 105028)



8.50 by 9.50mm, SMT, On-board, 34 circuits Side Contact, 4.28mm height (Series 105199)

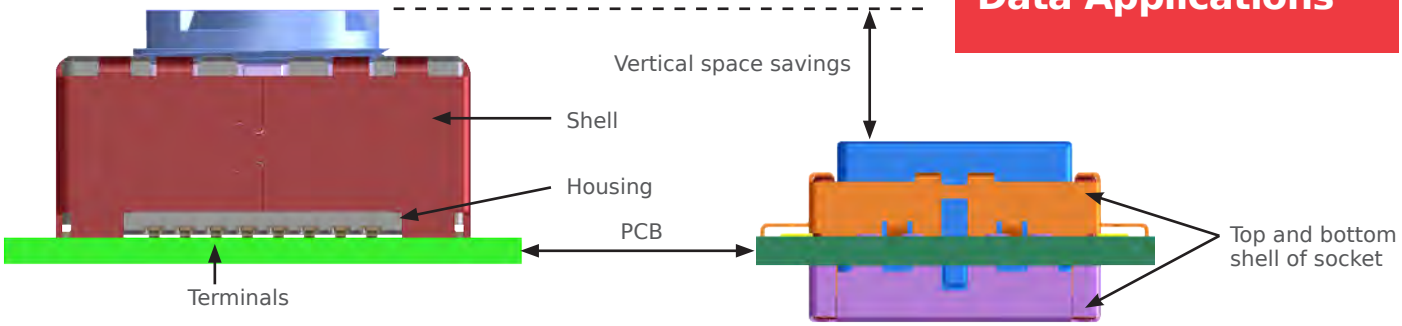
Ordering Information - Parallel Data Versions

Order No.	Module Dimensions (mm)	Circuits	Socket Height (mm)	Contact Style	Mounting Style
78499-0002	6.50 by 6.50	24	3.50	Bottom contact	On-board
105028-1001	8.50 by 8.50	32	4.20	Side contact	
105028-2001			5.25		Through-board
47337-0001		24	4.20		
105199-0001	8.50 by 9.50	34	4.28		On-board

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Camera Sockets for Serial and Parallel Data Applications

Product Features - Mounting Configurations



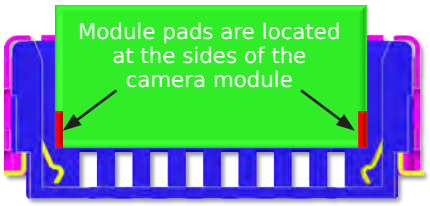
Typical on-board (top-mount) style socket

Typical through-board (mid-mount) style socket

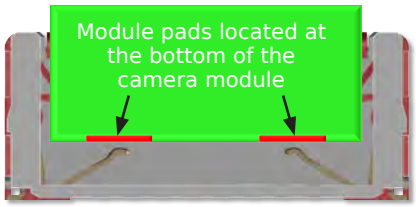
On-board (top-mount) and Through-board (mid-mount) style features and advantages

On-board style mounting (Serial data: Series 105167, 105190; Parallel data: Series 78499, 105028 and 105199)	Through-board style mounting (Serial data: Series 78725, 105163, 105168, 105200; Parallel data: Series 47337, 105028)
Occupies only single side of the PCB, frees up the entire opposite side for other uses	Occupies both sides of the PCB but frees up vertical space above PCB for other uses
Comprises fewer components (housing, terminals and metal shell)	Includes more components (housing, terminals, top and bottom shells)
Increases overall mobile phone height	Greater vertical space-saving with its lower profile height; excellent for ultra-slim applications

Product Features - Contact Styles



Side-contact camera socket

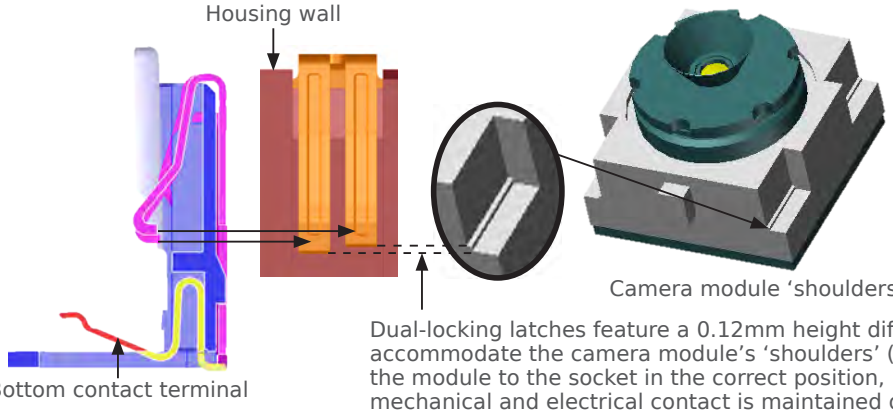


Bottom-contact camera socket

Advantages of side- and bottom-contact style camera sockets

Side-contact style (Parallel data: Series 47337, 105028, 105199)	Bottom-contact style (Serial data: Series 78725, 78499, 105163, 105167, 105168, 105190, 105200)
Zero height	Height between housing and camera base (~ 0.25mm)
Better contact force (~ 0.35N)	Contact force (~ 0.25N)
Specially designed camera module	Common camera module design
Non market trend	Market trend

Product Features - Dual Locking Latches



Dual-locking latches feature a 0.12mm height difference to accommodate the camera module's 'shoulders' (zoom-in). By locking the module to the socket in the correct position, it ensures proper mechanical and electrical contact is maintained during operation

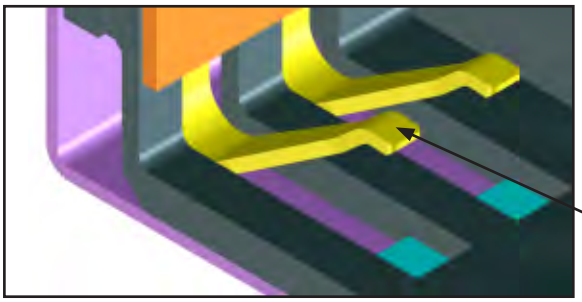
Dual locking latches on the socket wall for precise positioning and securing of mated module

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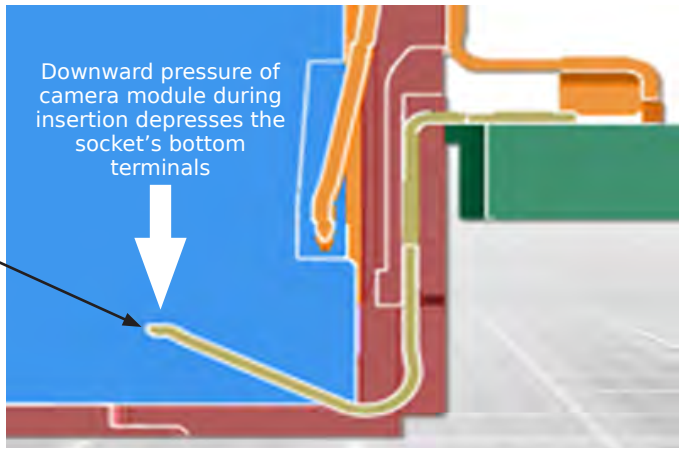
Camera Sockets for Serial and Parallel Data Applications

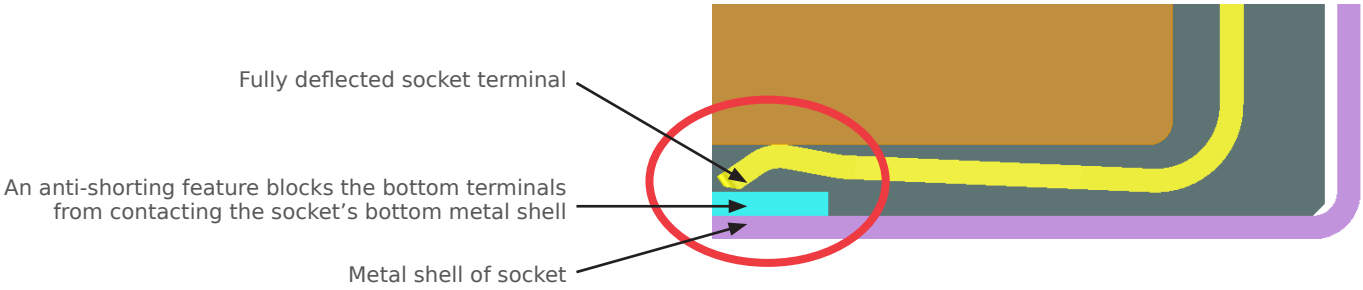
Product Features - Anti-Short Housing Wall Feature (SMIA-Compliant Versions Only)

Molex's anti-short housing wall feature prevents shorting of the socket's bottom contacts with the metal shell particularly during mating with the camera module. This feature is vital as it protects the costly investments of mobile phone, camera module and other user-applications



Bottom terminals of the camera socket

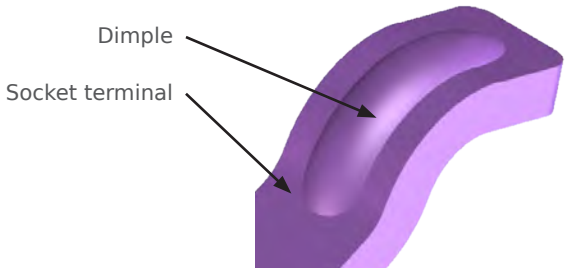




Cross-section illustration of an anti-shorting feature in Molex's SMIA-compliant camera sockets

Product Features - Dimpled Contact Design

- Molex's dimpled terminal design has been tested to demonstrate the ability in accepting maximum stress levels (measured in Mega Pascal) compared with variant designs. This feature is important as the terminal's reduced contact radius, width and area provides higher contact pressure between camera module and socket terminals for improved contact reliability
- Gold-plated contacts with their excellent electrical and mechanical qualities offer even higher contact integrity. All Molex's dimpled contacts are gold-plated



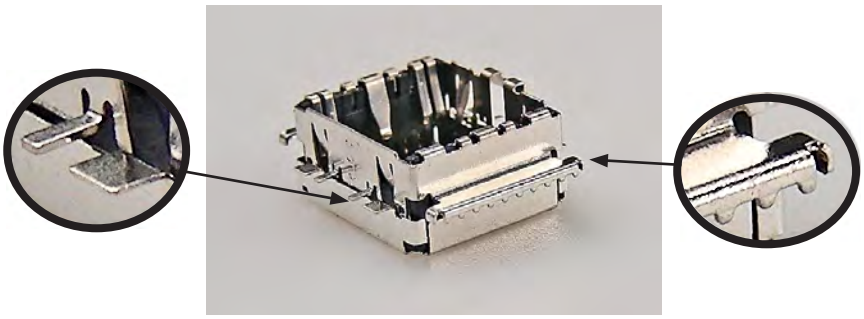
Dimpled design of Molex's SMIA-compliant camera socket terminals

Terminal designs		Contact height (Nominal)	Contact force (Nominal)	Stress (Pa = Pascals)
Non-dimpled		0.70+/-0.10mm	30gf	~80MPa
Dimpled				~350MPa
Crowned				~180MPa

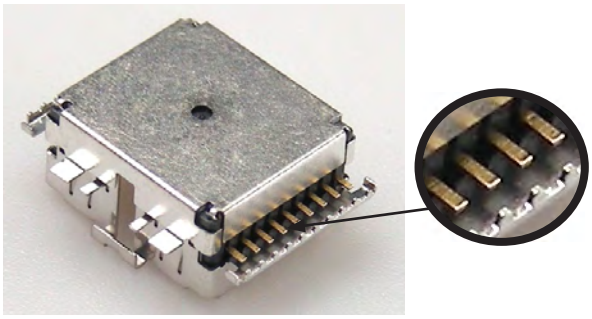
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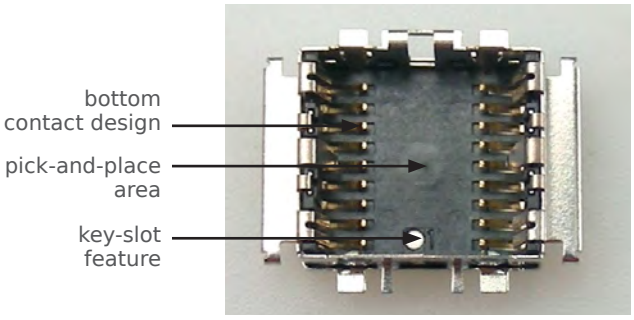
Unique Design Features - SMIA85 Camera Socket



Side view socket showing mounting tab features for low-profile applications



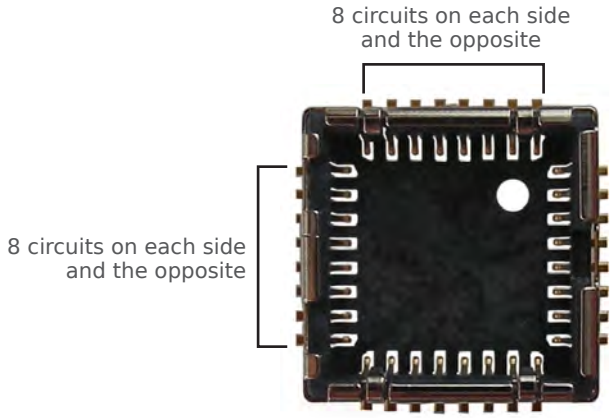
Bottom view of socket showing contacts hidden beneath protective shell extension for excellent EMI shielding



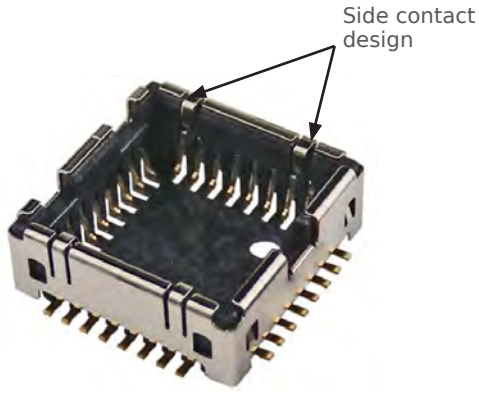
Top view of socket showing key-slot feature and pick-and-place zone

Unique mounting and low-profile features of the through-board style (series 78725) SMIA85 camera socket

Typical Parallel Data Camera Socket Features



Top view of series 105028 camera socket showing high (32) circuit count



Isometric view of series 105028 camera socket

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Camera Sockets for Serial and Parallel Data Applications

Applications

Consumer
- Camera phones
- Tablet PCs
- Phablets (a larger category of smart phones that combines the functionality of smart phones with those of tablets)
- Game cameras
- Pinhole cameras
- Webcams (notebook and PC monitors)

Industrial
- Surveillance (Internet protocol) and security cameras
- Traffic cameras
- Industrial cameras
- Remote or trail cameras

Automotive
- GPS navigator with digital camera



Surveillance camera



GPS navigator with digital camera





Smartphone and tablet PC devices



Webcam on notebook

Selection Matrix

Termination Styles	Socket Height (mm)	Serial Data (SMIA-compliant) Sockets	Parallel Data (non-SMIA-compliant) Sockets	
		Bottom Contact (Module dimensions in mm)	Side Contact (Module dimensions in mm)	Bottom Contact (Module dimensions in mm)
SMT (on-board)	3.50			78499-0002 (6.50 by 6.50)
	4.00	105190-0001 (7.50 by 7.50)		
	4.20		105028-1001 (8.50 by 8.50)	
	4.28		105199-0001 (8.50 by 9.50)	
	4.50	105167-0001 (6.50 by 6.50)		
SMT (through-board) (known also as midmount or sink-type	3.10	105163-1001 (6.50 by 6.50)		
	3.78	105200-0008 (5.50 by 5.50)		
	4.20	105168-0601 (7.50 by 7.50)	47337-0001 (8.50 by 8.50)	
	5.25	78725-1002 (8.50 by 8.50)	105028-2001 (8.50 by 8.50)	

www.molex.com/product/camerasocket.html

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