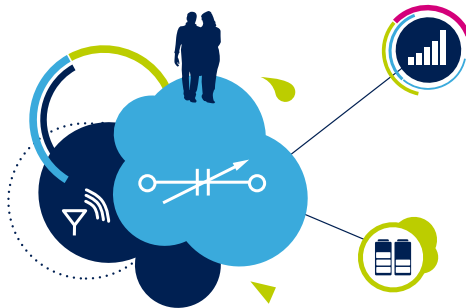


# IPAD™, RF IPD and smart antenna tuning



EMI filtering, interface conditioning, and RF devices





# Content

IPD for RF front-end.....	1
Baluns.....	1
Couplers.....	2
Diplexers.....	2
Filters.....	2
Antenna tuners.....	3
RF tunable capacitors.....	3
RFFE and SPI control ICS.....	3
Integrated EMI filtering and ESD protection.....	4
Audio and video IPAD™; EMI filter and ESD protection.....	4
Display, camera and keypad IPAD™; Common mode filter.....	5
Display, camera and keypad IPAD™; EMI filter and ESD protection..	6
Memory and SIM card IPAD™.....	7
Standard multiline bus IPAD™ EMI filter and ESD protection.....	8
USB IPAD™; single ended EMI filter or common mode filter.....	9
ECMF™ and CMF series: common mode filter and ESD protection	10
HDMI series.....	11
ASIP (Application Specific Integrated Passives).....	12

# IPD for RF front-end

## BALUNS

Part number	General description	Package	Insertion loss (I <sub>l</sub> )	At frequency range
			max (dB)	(GHz)
BAL-2690D3U	STMicroelectronics STLC2690	WLCSP 400μ	0.8	2.4 - 2.5
BALF-NRG-01D3	STMicroelectronics BLUENRG	WLCSP 400μ	1.1	2.4 - 2.5
BALF-SPI-01D3	STMicroelectronics SPIRIT1	WLCSP 400μ	1.4	0.868 - 0.915
BALF-SPI-02D3	STMicroelectronics SPIRIT1	WLCSP 400μ	2.3	0.433
BAL-CC25-01D3	Texas Instrument CC253x, CC254x, CC257x, CC852x, CC853x	WLCSP 400μ	0.73	2.4 - 2.5
BALF-CC25-02D3	Texas Instrument CC2541	WLCSP 400μ	1.6	2.4 - 2.5
BALF-CC26-05D3	Texas Instrument CC2630/2650 (5x5 package)	WLCSP 400μ	1.35	2.4 - 2.5
BALF-CC26-07D3	Texas Instrument CC2630/2650 (7x7 package)	WLCSP 400μ	1.35	2.4 - 2.5
BAL-CC1101-01D3	Texas Instrument CC1101	WLCSP 400μ	1.7	0.868 - 0.915
BALF-112X-01D3	Texas Instrument CC1120, CC1125, CC1175, CC1200	WLCSP 400μ	2.1	0.868 - 0.915
BALF-112X-02D3	Texas Instrument CC1120, CC1125, CC1175, CC1200	WLCSP 400μ	1.3	0.433
BAL-WINC1500A-D3	Atmel ATWINC1500A	WLCSP 400μ	0.7	2.4 - 2.5
BAL-NRF01D3	Nordic Semi nRF24LE1, nRF51822-QFAACx, nRF51822-QFABAx, nRF51422-QFAACx	WLCSP 400μ	1.3	2.4 - 2.5
BALF-NRF01D3	Nordic Semi nRF51822-QFAAGx, nRF51822-QFABBx, nRF51422-QFAAEx, nRF51422-QFABAx	WLCSP 400μ	1.35	2.4 - 2.5
BALF-NRF01E3	Nordic Semi nRF51822-QFAAHx, nRF51822-QFACAx, nRF51422-QFAAF0, nRF51422-QFACA0	LGA package	2.2	2.4 - 2.5
BAL-NRF02D3	Nordic Semi nRF51822-CxAx, nRF51422-CxAx	WLCSP 400μ	1.9	2.4 - 2.5

## COUPLERS

Part number	General description	Package	Insertion loss (I <sub>1</sub> )	At frequency range
			max (dB)	(GHz)
CPL-WB-00D3	Wide band directional coupler with ISO port	WLCSP 400μ	0.2	0.8 - 2.2
CPL-WB-01D3	Wide-band directional coupler with ISO port	WLCSP 400μ	0.2	0.8 - 2.2
CPL-WB-02D3	Wide-band, directional coupler with integrated 50 ohm loaded isolated port	WLCSP 400μ	0.2	2.4 - 5.9
CPL-WBF-00D3	Wide-band directional coupler with ISO port	WLCSP 400u	0.15 - 0.30	0.7 - 2.7
DCPL-WB-00D3	Wide band dual path directional coupler with ISO port	WLCSP 400μ	0.2	0.8 - 2.0
DCPL-WB-02D3	Wide-band, dual-path directional coupler with integrated 50 ohm loaded isolated port	WLCSP 400μ	0.2	2.4 - 2.5; 4.9 - 5.9

## DIPLEXERS

Part number	General description	Package	Insertion loss (I <sub>1</sub> )	At frequency range
			max (dB)	(GHz)
DIP1524-01D3	GPS/GLONASS and 2.4 GHz diplexer	WLCSP 400μ	0.65	1.5 - 1.6; 2.4 - 2.7
DIP2450-01D3	2 G / 5 G WLAN diplexer	WLCSP 400μ	0.70	2.4 - 2.5; 4.9 - 5.9

## FILTERS

Part number	General description	Package	Insertion loss (I <sub>1</sub> )	At frequency range
			max (dB)	(GHz)
DLPF-GP-01D3	GreenPeak GP540/560 - Dual differential Low pass filter	WLCSP 400μ	1.45	2.4 - 2.5
BBPF-SXM-01M8Y	Sirius XM radio - Band pass filter	WLCSP 400μ	2.70	2.4 - 2.5

# Antenna tuners

## RF TUNABLE CAPACITORS

Part number	General description	Package	Pitch	Number of tunable capacitors	Capacitor control	Capacitance (@ 2 V)	Capacitance (@ Vmax)	Tuning ratio (Delta C) (2 V-20 V)	Input leakage current ( $I_{in}$ ) (@ 20 V)	Quality factor (Q) (@ 1 GHz)	IP3 linearity (IP3) (@ 2 V)
			typ (mm)			typ (pF)	typ (pF)	typ	max (nA)	typ	typ (dBm)
STPTIC	BST tunable high-Q RF capacitor	Flip-chip; $\mu$ QFN-6L	0.5	1	Analog	2.7 to 8.2	0.8 to 2.3	3.5	100	65	60
STPTIC-27L1M6	BST tunable high-Q RF capacitor	$\mu$ QFN-6L	0.5	1	Analog	2.7	0.77	4	100	65	70
STPTIC-15G2	BST tunable high-Q RF capacitor 1.5 pF	Flip-chip	0.4	1	Analog	1.5	0.32	5	100	65	60
STPTIC-27G2	BST tunable high-Q RF capacitor 2.7 pF	Flip-chip	0.4	1	Analog	2.7	0.57	5	100	65	60
STPTIC-33G2	BST tunable high-Q RF capacitor 3.3 pF	Flip-chip	0.4	1	Analog	3.3	0.69	5	100	65	60
STPTIC-39G2	BST tunable high-Q RF capacitor 3.9 pF	Flip-chip	0.4	1	Analog	3.9	0.78	5	100	65	60
STPTIC-47G2	BST tunable high-Q RF capacitor 4.7 pF	Flip-chip	0.4	1	Analog	4.7	0.94	5	100	65	60
STPTIC-56G2	BST tunable high-Q RF capacitor 5.6 pF	Flip-chip	0.4	1	Analog	5.6	1.12	5	100	65	60
STPTIC-68G2	BST tunable high-Q RF capacitor 6.8 pF	Flip-chip	0.4	1	Analog	6.8	1.35	5	100	65	60
STPTIC-82G2	BST tunable high-Q RF capacitor 8.2 pF	Flip-chip	0.4	1	Analog	8.2	1.66	5	100	65	60

## RFFE AND SPI CONTROL ICs

Part number	General description	Package	Number of outputs	Regulated output voltage	Digital input type	Input voltage ( $V_{in}$ )	Supply voltage ( $V_{DD}$ )	Current consumption (active)	Current consumption (shutdown)	DAC voltage resolution	Dynamic control (Turbo, Glide)
				max (V)		min (V)	min (V)	typ ( $\mu$ A)	typ ( $\mu$ A)	min (mV)	
STHVDAC-303	High-voltage BST capacitance controller	Flip-chip 500 $\mu$	3	30	SPI	2.3	1.7	700	5	117	no
STHVDAC-304M	High-voltage BST capacitance controller	Flip-chip 400 $\mu$	4	30	MIPI	2.3	1.7	700	5	117	no
STHVDAC-253M	Antenna Tuning Circuit	Flip-chip 400 $\mu$	3	25	MIPI	2.3	1.7	700	5	117	no
STHVDAC-253MTG	Antenna Tuning Circuit	Flip-chip 400 $\mu$	3	25	MIPI	2.3	1.7	700	5	117	yes
STHVDAC-256MTG	Antenna Tuning Circuit	Flip-chip 400 $\mu$	6	25	MIPI	2.3	1.7	700	5	117	yes

# Integrated EMI filtering and ESD protection

## AUDIO AND VIDEO IPAD™: EMI FILTER AND ESD PROTECTION

Part number	Application	Number of lines	Package	Pin count	Attenuation @ 900 MHz	Bandwidth (@ -3 dB)	Filter resistance (FR)
					(dB)	(MHz)	typ ( $\Omega$ )
EMIF02-010ABRY	Video BroadR Reach™ AEC-Q101 compliant	2	Wettable flanks QFN 3.0 x 3.0	5	-20 dB from 60 MHz	250	-
EMIF08-VID1F3	Video	8	WLCSP 400 $\mu$	20	-43 dB	98	100
EMIF07-KB01F7	Video	7	WLCSP 350 $\mu$	20	-23 dB	320	330
EMIF02-AV01F3	Audio and Video	2	WLCSP 400 $\mu$	5	-35 dB	0.4	15
EMIF04-EAR02M8	Audio and Microphones	4	$\mu$ QFN-8L	8	-30 dB	70	0.3
EMIF05-AUD02F3	Audio and Microphones	2	WLCSP 400 $\mu$	12	-28 dB	1.2	2200
EMIF02-MIC03M6	Microphones	2	$\mu$ QFN-6L	6	-33 dB	100	68
EMIF02-MIC06F3	Microphones	2	WLCSP 400 $\mu$	8	-46 dB	2.0	2200
EMIF02-MIC02F2	Microphones	2	WLCSP 500 $\mu$	5	-30 dB	180	470
EMIF02-MIC02F3	Microphones	2	WLCSP 400 $\mu$	5	-30 dB	300	470
EMIF02-MIC03F2	Microphones	2	WLCSP 500 $\mu$	5	-40 dB	50	68
EMIF02-SPK02F2	Speaker	2	WLCSP 500 $\mu$	5	-40 dB	20	0.35
EMIF02-SPK03F2	Speaker	2	WLCSP 500 $\mu$	5	-40 dB	20	0.07

## DISPLAY, CAMERA AND KEYPAD IPAD™: COMMON MODE FILTER

### Serial interface camera and display IPAD

Part number	Application	ESD protection		Number of lines	Package	Pin count	Common mode attenuation (S <sub>21CP</sub> )			
		Datalines	Vbus				700 MHz	900 MHz	2.4 GHz	5.0 GHz
ECMF02-3HSM6	MIPI D-PHY	Yes	-	3	μQFN-6L	6	-22 dB	-33 dB		
ECMF04-4AMX12	MIPI D-PHY	Yes	-	4	μQFN-12L	12	-16 dB	-35 dB	-15 dB	-22 dB
ECMF04-4HSM10	MIPI D-PHY	Yes	-	4	μQFN-10L	10	-20 dB	-33 dB		
ECMF06-6AM16	MIPI D-PHY	Yes	-	6	μQFN-16L	16	-17 dB	-24 dB		
ECMF06-6HSM16	MIPI D-PHY	Yes	-	6	μQFN-16L	16	-20 dB	-33 dB		
CMF2-0650A09H3	MIPI D-PHY	-	-	2	CSP - 5 microbumps	5	-27 dB	-35 dB	-23 dB	-25 dB
CMF2-24A60H3	MIPI D-PHY	-	-	2	CSP - 4 microbumps	4		-15 dB	-40 dB	-16 dB
ECMF4-20A42N10	USB 3.1 Gen 1 and HDMI 2.0	Yes	-	4	μQFN-10L	10	-13 dB	-16 dB	-25 dB	
ECMF04-4HSWM10	USB 3.1 Gen 1 and HDMI 2.0	Yes	-	4	μQFN-10L	10		-15 dB	-28 dB	-16 dB
ECMF02-2HSMX6	USB 3.1 Gen 1 and HDMI 2.0	Yes	-	2	μQFN-6L	6	-20 dB	-25 dB	-20 dB	-20 dB
ECMF02-2BF3	USB 2.0	Yes	-	2	WLCSP 400μ	5	-13 dB	-24 dB	-16 dB	
ECMF02-3BF3	USB 2.0	Yes	-	3	WLCSP 400μ	6		-29 dB		
ECMF02-4CMX8	USB 2.0	Yes	Yes	2	μQFN-8L	8	-13 dB	-27 dB	-13 dB	
ECMF2-0730V12M12	USB 2.0	Yes	Yes	2	μQFN -12L	12	-18 dB	-30 dB	-20 dB	-13 dB
ECMF02-2AMX6	USB 2.0 and MIPI D-PHY/MDDI	Yes	-	2	μQFN-6L	6	-16 dB	-34 dB	-15 dB	

## DISPLAY, CAMERA AND KEYPAD IPAD™: EMI FILTER AND ESD PROTECTION

### Parallel interface display and camera IPAD, keypad IPAD

Part number	General description	Number of lines	Package	Pin count	Bandwidth	Attenuation		Capacitance
					(MHz)	900 MHz	2.4 GHz	max (pF)
EMIF08-VID1F3	Video	8	WLCSP 400μ	20	98	-42 dB	-35 dB	7
EMIF06-VID01F2	Video	6	WLCSP 500μ	12	160	-40 dB	-25 dB	19
EMIF08-VID01F2	Video	8	WLCSP 500μ	19	160	-33 dB	-34 dB	19
EMIF07-KB01F7	Video	7	WLCSP 350μ	20	320	-23 dB	-27 dB	30
EMIF10-COM01F2	Display	10	WLCSP 500μ	23	120	-37 dB	-42 dB	50
EMIF10-LCD02F3	Display	10	WLCSP 400μ	25	200	-23 dB	-45 dB	30
EMIF07-LCD02F3	Display	7	WLCSP 400μ	19	200	-25 dB	-42 dB	30
EMIF08-LCD04M16	Display	8	μQFN-16L	16	400	-35 dB	-38 dB	19
EMIF10-1K010F2	Keypads	10	WLCSP 500μ	23	35	-25 dB	-18 dB	120
EMIF06-1005MX12Y	General purpose < 200 MHz AEC-Q101 compliant	12	μQFN-12L	12	150	-35 dB	-33 dB	52
EMIF04-1005M8	General purpose < 200 MHz	4	μQFN-8L	8	110	-35 dB	-32 dB	52
EMIF06-1005M12	General purpose < 200 MHz	6	μQFN-12L	12	110	-35 dB	-32 dB	52
EMIF06-1005N12	General purpose < 200 MHz	6	μQFN-12L	12	110	-35 dB	-32 dB	52
EMIF08-1005M16	General purpose < 200 MHz	8	μQFN-16L	16	110	-35 dB	-33 dB	52
EMIF08-1005T16	General purpose < 200 MHz	8	μQFN-16L	16	110	-35 dB	-33 dB	50
EMIF06-1502M12	General purpose < 300 MHz	6	μQFN-12L	12	210	-25 dB	-32 dB	16.5
EMIF04-1502M8	General purpose < 300 MHz	4	μQFN-8L	8	210	-25 dB	-32 dB	16.5
EMIF08-1502M16	General purpose < 300 MHz	8	μQFN-16L	16	210	-30 dB	-27 dB	16.5
EMIF05-SK01F3	General purpose < 400 MHz	5	WLCSP 400μ	11	300	-35 dB	-25 dB	1200
EMIF08-0402T16	General purpose < 400 MHz	8	μQFN-16L	16	350		-24 dB	20



## MEMORY AND SIM CARD IPAD™

Part number	Application	Number of lines	Package	Pin count	Specific application	Bandwidth (@ -3 dB)	Attenuation		Line capacitance (C)
						(MHz)	900 MHz	2.4 GHz	max (pF)
EMIF03-SIM02F2	SIM card	3	WLCSP 500μ	8	3 lines + Vcc	200	-22 dB	-20 dB	20
EMIF03-SIM02M8	SIM card	3	μQFN-8L	8	3 lines + Vcc	280	-18 dB	-24 dB	20
EMIF03-SIM03F3	SIM card	3	WLCSP 400μ	8	3 lines + Vcc	350	-15 dB	-32 dB	12
EMIF03-SIM04F3	SIM card	3	WLCSP 400μ	12	3 lines + ESD	400	-12 dB	-22 dB	12
EMIF03-SIM05F3	SIM card	4	WLCSP 400μ	8	3 lines + ESD + NFC	300	-14 dB	-23 dB	12
EMIF03-SIM06F3	SIM card	3	WLCSP 400μ	11	3 lines + ESD + pull-up	400	-14 dB	-22 dB	12
EMIF06-MSD02N16	mini- and micro-SD card	6	μQFN-16L	16	With pull-up resistor	350	-18 dB	-24 dB	20
EMIF06-MSD04F3	mini- and micro-SD card	6	WLCSP 400μ	12	With pull-up resistor	550	-9 dB	-17 dB	10
EMIF06-mSD01F2	mini- and micro-SD card	6	WLCSP 500μ	12	With pull-up resistor	300	-14 dB	-25 dB	20
EMIF09-SD01F3	mini- and micro-SD card	9	WLCSP 400μ	25	With pull-up resistor	300	-16 dB	-22 dB	20
EMIF06-HSD03F3	mini- and micro-SD card	6	WLCSP 400μ	17	Without pull-up resistor	3000	-0.3 dB	-2.7 dB	3
EMIF06-HSD04F3	mini- and micro-SD card	6	WLCSP 400μ	15	With pull-up resistor	2000	-0.3 dB	-3 dB	4.5
EMIF06-USD05F3	mini- and micro-SD card	6	WLCSP 400μ	15	Without pull-up resistor	300	-30 dB	-26 dB	14
EMIF06-USD04F3	mini- and micro-SD card	6	WLCSP 400μ	15	Without pull-up resistor	600	-5 dB	-22 dB	12
EMIF06-USD14F3	mini- and micro-SD card	6	WLCSP 400μ	15	With pull-up resistor	600	-8 dB	-17 dB	12
EMIF06-HMC02F2	high speed multimedia card	6	WLCSP 500μ	16	With pull-up resistor	400	-14 dB	-27 dB	20

## STANDARD MULTILINE BUS IPAD™ EMI FILTER AND ESD PROTECTION

Part number	Number of lines	Package	Pin count	Bandwidth (@ -3 dB)	Attenuation		Line capacitance (C <sub>line</sub> )
				(MHz)	900 MHz	2.4 GHz	max (pF)
EMIF01-10005W5	2	SOT323-5L	5	150	-24 dB	-12 dB	50
EMIF01-1003M3	1	SOT-883	3	180	-27 dB	-20 dB	39
EMIF02-1003M6	2	μQFN-6L	6	180	-27 dB	-17 dB	39
EMIF04-1005M8	4	μQFN-8L	8	110	-35 dB	-33 dB	52
EMIF04-1502M8	4	μQFN-8L	8	210	-27 dB	-31 dB	16.5
EMIF06-1002F2	6	WLCSP 500μ	12	280	-19 dB	-20 dB	13.8
EMIF06-1005M12	6	μQFN-12L	12	110	-35 dB	-32 dB	52
EMIF06-1502M12	6	μQFN-12L	12	210	-25 dB	-32 dB	16.5
EMIF08-1005M16	8	μQFN-16L	16	110	-35 dB	-33 dB	52
EMIF08-1502M16	8	μQFN-16L	16	210	-35 dB	-32 dB	16.5
EMIF08-1005T16	8	μQFN-16L	16	110	-35 dB	-34 dB	50

## USB IPAD™: SINGLE ENDED EMI FILTER OR COMMON MODE FILTER

Part number	Application	ESD protection		Number of lines	Packages	Pin count	S <sub>21cc</sub> or S <sub>21dd</sub>	Attenuation (S <sub>21cc</sub> or S <sub>21dd</sub> )			
		Datalines	Vbus					700 MHz	900 MHz	2.4 GHz	5.0 GHz
ECMF4-20A42N10	USB 3.1 Gen 1	Yes	-	4	μQFN-10L	10	S21cc	-13 dB	-16 dB	-25 dB	
ECMF04-4HSWM10	USB 3.1 Gen 1	Yes	-	4	μQFN-10L	10	S21cc		-15 dB	-28 dB	-16 dB
ECMF02-2HSMX6	USB 3.1 Gen 1	Yes	-	2	μQFN-6L	6	S21cc	-20 dB	-25 dB	-20 dB	-20 dB
ECMF02-2BF3	USB 2.0	Yes	-	2	WLCSP 400μ	5	S21cc	-13 dB	-24 dB	-16 dB	
ECMF02-3BF3	USB 2.0	Yes	-	3	WLCSP 400μ	6	S21cc		-29 dB		
ECMF02-4CMX8	USB 2.0	Yes	Yes	2	μQFN-8L	8	S21cc	-13 dB	-27 dB	-13 dB	
ECMF2-0730V12M12	USB 2.0	Yes	Yes	2	μQFN -12L	12	S21cc	-18 dB	-30 dB	-20 dB	-13 dB
ECMF02-2AMX6	USB 2.0	Yes	-	2	μQFN-6L	6	S21cc	-16 dB	-34 dB	-15 dB	
EMIF02-USB01F2	USB 2.0 Low Speed	Yes	Yes	2	WLCSP 500μ	6	S21dd	-20 dB	-24 dB	-30 dB	
EMIF02-USB01F2	USB 2.0 Low Speed	Yes	Yes	2	WLCSP 500μ	6	S21dd	-20 dB	-24 dB	-30 dB	
EMIF02-USB03F2	USB 2.0 Low Speed	Yes	Yes	2	WLCSP 500μ	5	S21dd	-14 dB	-16 dB	-30 dB	-22 dB
USBDF01W5	USB 2.0 Low Speed	Yes	-	2	SOT323-5L	5	S21dd	-27 dB	-23 dB	-17 dB	
USBDF02W5	USB 2.0 Low Speed	Yes	-	2	SOT323-5L	5	S21dd	-27 dB	-23 dB	-17 dB	
USBUF01W6	USB 2.0 Low Speed	Yes	-	2	SOT323-6L	6	S21dd	-20 dB	-28 dB	-13 dB	
USBUF02W6	USB 2.0 Low Speed	Yes	-	2	SOT323-6L	6	S21dd	-20 dB	-28 dB	-13 dB	
USBUF01P6	USB 2.0 Low Speed	Yes	-	2	SOT-666	6	S21dd	-19 dB	-16 dB		

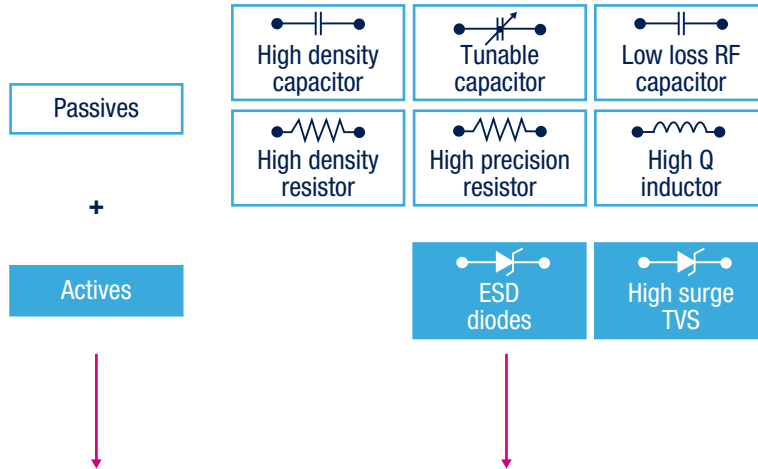
## ECMF™ AND CMF SERIES: COMMON MODE FILTER AND ESD PROTECTION

Part number	Application	ESD protection		Number of lines	Packages	Pin count	Common mode attenuation $S_{21CC}$			
		Datalines	Vbus				700 MHz	900 MHz	2.4 GHz	5.0 GHz
ECMF02-3HSM6	MIPI D-PHY	Yes	-	3	μQFN-6L	6	-22 dB	-33 dB		
ECMF04-4AMX12	MIPI D-PHY	Yes	-	4	μQFN-12L	12	-16 dB	-35 dB	-15 dB	-22dB
ECMF04-4HSM10	MIPI D-PHY	Yes	-	4	μQFN-10L	10	-20 dB	-33 dB		
ECMF06-6AM16	MIPI D-PHY	Yes	-	6	μQFN-16L	16	-17 dB	-24 dB		
ECMF06-6HSM16	MIPI D-PHY	Yes	-	6	μQFN-16L	16	-20 dB	-33 dB		
CMF2-0650A09H3	MIPI D-PHY	-	-	2	CSP - 5 microbumps	5	-27 dB	-35 dB	-23 dB	-25 dB
CMF2-24A60H3	MIPI D-PHY	-	-	2	CSP - 4 microbumps	4		-15 dB	-40 dB	-16 dB
ECMF4-20A42N10	USB 3.1 Gen 1 and HDMI 2.0	Yes	-	4	μQFN-10L	10	-13 dB	-16 dB	-25 dB	
ECMF04-4HSWM10	USB 3.1 Gen 1 and HDMI 2.0	Yes	-	4	μQFN-10L	10		-15 dB	-28 dB	-16 dB
ECMF02-2HSMX6	USB 3.1 Gen 1 and HDMI 2.0	Yes	-	2	μQFN-6L	6	-20 dB	-25 dB	-20 dB	-20 dB
ECMF02-2BF3	USB 2.0	Yes	-	2	WLCSP 400μ	5	-13 dB	-24 dB	-16 dB	
ECMF02-3BF3	USB 2.0	Yes	-	3	WLCSP 400μ	6		-29 dB		
ECMF02-4CMX8	USB 2.0	Yes	Yes	2	μQFN-8L	8	-13 dB	-27 dB	-13 dB	
ECMF2-0730V12M12	USB 2.0	Yes	Yes	2	μQFN -12L	12	-18 dB	-30 dB	-20 dB	-13 dB
ECMF02-2AMX6	USB 2.0 and MIPI D-PHY/MDDI	Yes	-	2	μQFN-6L	6	-16 dB	-34 dB	-15 dB	

## HDMI SERIES

Part number	General description	HDMI standard	Interface type	Package size mm	Package	Pitch	TMDS line protection	Bandwidth	HDMI long cable drive	5 V backdrive	Enable
<b>HDMI2C1-5DIJ</b>	Signal conditioning and ESD protection for HDMI control line interfaces	HDMI 1.4 and 2.0	Source	5.0 x 4.0	DFN-16L	500µm	-	-	Yes	No	No
<b>HDMI2C1-6C1</b>	Signal conditioning and ESD protection for HDMI control line interfaces	HDMI 1.4 and 2.0	Source	3.5 x 3.5	QFN-18L	500µm	-	-	Yes	No	No
<b>HDMI2C1-14HD</b>	Signal conditioning and ESD protection for HDMI control and TMDS line interfaces	HDMI 1.4 and 2.0	Source	6.5 x 3.5	µQFN-36L	500µm	Yes	6.5 GHz	Yes	Yes	No
<b>HDMI2C2-14HD</b>	Signal conditioning and ESD protection for HDMI control and TMDS line interfaces	HDMI 1.4 and 2.0	Sink	6.5 x 3.5	µQFN-36L	500µm	Yes	6.5 GHz	Yes	No	No
<b>HDMI2C1-14HDS</b>	Signal conditioning and ESD protection for HDMI control and TMDS line interfaces	HDMI 1.4 and 2.0	Source	4.0 x 4.0	µQFN-36L	500µm	Yes	6.0 GHz	Yes	No	No
<b>HDMI2C2-5F2</b>	Signal conditioning and ESD protection for HDMI control line interfaces	HDMI 1.4 and 2.0	Source	2.0 x 1.35	WLCSP-12b	500µm	-	-	Yes	Yes	Yes
<b>HDMI2C3-5F2</b>	Signal conditioning and ESD protection for HDMI control line interfaces	HDMI 1.4 and 2.0	Source	2.1 x 1.5	WLCSP-12b	500µm	-	-	Yes	Yes	Yes
<b>HDMI2C4-5F2</b>	Signal conditioning and ESD protection for HDMI control line interfaces	HDMI 1.4 and 2.0	Sink	2.1 x 1.5	WLCSP-10b	500µm	-	-	Yes	Yes	Yes
<b>HDMI05-CL01F3</b>	ESD protection for HDMI control line with pull-up resistor on DDC bus and pull-down on HPD	HDMI 1.4 and 2.0	Source and Sink	1.1 x 1.1	WLCSP-8b	400µm	-	-	No	No	No
<b>HDMI05-CL02F3</b>	ESD protection for HDMI control line with pull-up resistor on DDC bus/CEC and pull-down on HPD	HDMI 1.4 and 2.0	Source and Sink	1.1 x 1.1	WLCSP-9b	400µm	-	-	No	No	No

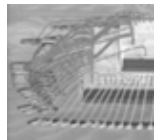
# ASIP (Application Specific Integrated Passives)



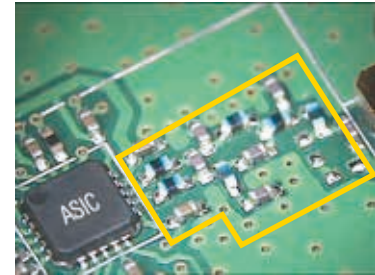
## ASIP (Application Specific Integrated Passives)



Chip scale package  
Plastic package



System in package





ST is a global leader in the semiconductor market serving customers across the spectrum of sense and power technologies and multimedia convergence applications.

From energy management and savings to trust and data security, from healthcare and wellness to smart consumer devices, in the home, car and office, at work and at play, ST is found everywhere microelectronics make a positive and innovative contribution to people's life.

By getting more from technology  
to get more from life, ST stands for

life.augmented

# life.augmented



Order code: SGIPAD0216



© STMicroelectronics - February 2016 - Printed in United Kingdom - All rights reserved  
The STMicroelectronics corporate logo is a registered trademark of the STMicroelectronics group of companies. IPAD™ and ECMF™ are trademarks of STMicroelectronics.  
All other names are the property of their respective owners

For more information on ST products and solutions, visit [www.st.com](http://www.st.com)