

MMMICs

Selection Guide

united
monolithic
semiconductors



MIXER PRODUCTS

Function	P/N	Operational RF frequency	Operational LO frequency	IF bandwidth	Conversion Gain	LO input power	P-1dB	Case	Market
Mixer subH	CHM1290-99F	20-30GHz	10-15GHz	DC-6GHz	-10dB	-4dBm	0dBm	die	Telecom
I/Q Mixer subH	CHM1291-99F	25-32GHz	12-15.5GHz	0.1-3GHz	-11dB	5dBm	1dBm	die	Telecom
Mixer	MFC-PO10897	25-35GHz	5.5-9.5GHz	DC-3GHz	-11dB	10dBm	3dBm	die	Telecom
Mixer	CHR2294-99F*	25-35GHz	11-19GHz	DC-3GHz	-11dB	9dBm	2.5dBm	die	Telecom
I/Q Mixer subH	MFC-PO10892	35-45GHz	16-24GHz	0.1-3GHz	-11dB	10dBm	1dBm	die	Telecom
I/Q Mixer	MFC-PO9828	55-65GHz	27.5-32.5GHz	DC-5GHz	-12dB	10dBm	0dBm	die	Telecom
Mixer	CHM2179a99F*	76-77GHz	76-77GHz	DC-100MHz	-7.5dB	5dBm	0dBm	die	Automotive
Mixer	CHM2179b99F	76-77GHz	76-77GHz	DC-100MHz	-8dB	5.5dBm	0dBm	die	Automotive
Mixer	CHM2378a99F	76-77GHz	76-77GHz	DC-100MHz	-7.5dB	7dBm	-	die	Automotive

MULTIFUNCTION PRODUCTS

Function	P/N	Operational RF frequency	Operational LO frequency	IF bandwidth	Conversion Gain	LO input power	P-1dB	Case	Market
I/Q Down conv.	CHR2291-99F	12-17GHz	5.25-7.75GHz	0.25-1.5GHz	10dB	10dBm	-8dBm	die	Telecom
Down conv.	CHR2391-99F	12-17GHz	5.25-7.75GHz	0.25-1.5GHz	12dB	10dBm	-8dBm	die	Telecom
I/Q Down conv.	CHR2292-99F	17-20GHz	7.5-10GHz	0.25-1.5GHz	13dB	10dBm	-10dBm	die	Telecom
I/Q Down conv.	CHR2293-99F	20-24GHz	9.25-12.75GHz	0.25-1.5GHz	11dB	10dBm	-8dBm	die	Telecom
Down conv.	CHR2411-QDG	20-24GHz	20-24GHz	DC-1MHz	23dB	5dBm	-21dBm	QFN	Automotive
I/Q Down conv.	CHR2295-99F	24-30GHz	12-15GHz	0.25-1.5GHz	11dB	10dBm	-10dBm	die	Telecom
I/Q Down conv.	CHR2296-99F	36-40GHz	17-20GHz	0.25-1.5GHz	11dB	10dBm	-10dBm	die	Telecom
Down conv.	CHR2297-99F	36-44GHz	30-39GHz	2-6GHz	2.5dB	0dBm	+8dBm	die	Telecom

Function	P/N	Operational RF frequency	Downlink Sensitivity	Downlink Frequency	Uplink Conversion Gain	Uplink Modulation input power	Standby Consumption	Case	Market
Transponder	CHR2244-QDG	5.7-5.8GHz	-43dBm	250-500KHz	-4dB	0.1-10MHz	8µA	QFN	Automotive

60GHz RADIO PRODUCTS

Function	P/N	Operational Frequency		Noise figure	Gain	Gain Flatness	P-1dB	Case	Market
		Low	High						
LNA	CHA2157-99F	55GHz	60GHz	3.5dB	10dB	±1dB	15dBm	die	Telecom
LNA/MPA	CHA2159-99F	55GHz	65GHz	4dB	20dB	±1dB	15dBm	die	Telecom

Function	P/N	Input frequency		Output frequency		Input power	Conversion gain	Case	Market
		Low	High	Low	High				
X4 multiplier	MUX-P09824*	6.25GHz	8.25GHz	25GHz	33GHz	12dBm	0dB	die	Telecom
X3 multiplier	CHX2093a99F	9GHz	10GHz	27GHz	30GHz	7dBm	-2.5dB	die	Telecom
X2 multiplier	MUX-P09773*	12.5GHz	16.5GHz	25GHz	33GHz	10dBm	+2dB	die	Telecom
X2 multiplier	CHX2192-99F*	27GHz	33GHz	54GHz	66GHz	12dBm	-1dB	die	Telecom
X2 multiplier	CHX2190a99F	28GHz	30GHz	56GHz	60GHz	3dBm	-4dB	die	Telecom

Function	P/N	Operational RF frequency	Operational LO frequency	IF bandwidth	Conversion Gain	LO input power	P-1dB	Case	Market
I/Q Mixer	MFC-PO9828*	55-65GHz	27.5-32.5GHz	DC-5GHz	-12dB	10dBm	0dBm	die	Telecom

AUTOMOTIVE RADAR & ISM PRODUCTS

Function	P/N	Operational Frequency		Case	Market
		Low	High		
Transponder	CHR2244-QDG	5.7GHz	5.8GHz	QFN	ISM
VCO	VCO-PO13341-97F	12.6GHz	12.8GHz	die	Automotive
LNA	CHA2093-99F	20GHz	30GHz	die	Automotive
LNA	CHA2193-99F	20GHz	30GHz	die	Automotive
Down conv.	CHR2411-QDG	20GHz	24GHz	QFN	Automotive
VCO	CHV2411-QDG	24GHz	24.25GHz	QFN	Automotive
LNA	CHA2411-QDG	20GHz	25GHz	QFN	Automotive
SP4T SWITCH	CHS2411-QDG	20GHz	25GHz	QFN	Automotive
VCO	CHV2240-99F	37.5GHz	39GHz	die	Automotive
DR0/Mixer	CHV2241-99F	37.5GHz	39GHz	die	Automotive
VCO	CHV2242c98F	38GHz	38.5GHz	die	Automotive
VCO	CHV2243a99F	38GHz	38.5GHz	die	Automotive
Mixer	CHM2378a99F	76GHz	77GHz	die	Automotive
Mixer	CHM2179a99F	76GHz	77GHz	die	Automotive
Mixer	CHM2179b99F	76GHz	77GHz	die	Automotive
Frequency multiplier	CHU2277-99F	76GHz	77GHz	die	Automotive
Frequency multiplier	CHU2277a98F	76GHz	77GHz	die	Automotive
Frequency multiplier	CHU3277-98F	76GHz	77GHz	die	Automotive
Frequency multiplier	CHU3377-98F	76GHz	77GHz	die	Automotive
LNA	CHA1077a98F	76GHz	77GHz	die	Automotive
APS	CHA2177-99F*	76GHz	77GHz	die	Automotive

DISCRETE PRODUCTS

Transistor

Function	P/N	Operational Frequency		Noise Figure	Gain	Case	Market
		Low	High				
Transistor	EC2612-99F	DC	40GHz	1.5dB	9.5dB	die	Defence

Diode

Function	P/N	Cutt-off		Ideality factor	Anode Cathode Break down voltage	Case	Market
		Gate Width	Frequency				
Diode	DBES 105a99F	5µm	3THz	1.2	<-5V	die	Defence

All UMS products listed in this selection guide are ROHS compliant except the CND2047-DAF.

* Please contact our Marketing & Sales department for detailed information on these products (mktsales@ums-gaas.com)
All datasheets for these products are available on our website : www.ums-gaas.com

New products

THE European source for Products, Solutions and Foundry Services

www.ums-gaas.com

UMS Europe & Asia : +33(1) 69 33 02 26

UMS USA : +1 973-812-2139

united
monolithic
semiconductors



TRANSMIT PRODUCTS

Function	P/N	Operational		Gain	Gain control range	Gain flatness	Sat. Output power	P-1dB	Bias	Case	Market
		Low	High								
DRV	CHA3023-99F	1GHz	18GHz	14dB	-	±0.7dB	-	17dBm	95mA@5V	die	Defence
PA	CHA6518a99F	5GHz	18GHz	24dB	-	-	33.5dBm	-	1A@8V	die	Defence
DRV	CHA3664-QAG	5GHz	21GHz	15dB	-	±1.5dB	20.5dBm	19.5dBm	175mA@6V	QFN	Telecom
DRV	CHA3063-99F	5.5GHz	23GHz	19dB	-	±1dB	21dBm	18dBm	160mA@4V	die	Telecom
DRV-S	CHA2295-99F	6GHz	11GHz	18dB	-	±1.5dB	14dBm	-	160mA@3.5V	die	Telecom
PA	CHA7010-99F*	8.4GHz	10.4GHz	18dB	-	-	40dBm	39dBm	3.0A@9V	die	Defence
PA	CHA5010b99F*	9GHz	10.5GHz	15dB	-	±1.5dB	-	27dBm	400mA@8V	die	Defence
DRV-S	CHA2296-99F	9GHz	19GHz	16dB	-	±1.5dB	14dBm	-	190mA@3.5V	die	Telecom
PA	CHA7012-99F	9.2GHz	10.4GHz	20dB	-	-	39dBm	-	1.9A@7.5V	die	Defence
DRV	CHA5012-99F	9.2GHz	10.75GHz	23dB	-	±0.5dB	29dBm	27dBm	200mA@5V	die	Defence
PA	CHA6666-QDG	14GHz	17GHz	32dB	-	±2dB	30.5dBm	29.5dBm	600mA@8V	QFN	Telecom
PA	CHA5293a99F	17GHz	24GHz	18dB	-	±1dB	31.5dBm	31dBm	800mA@6V	die	Telecom
PA	CHA5290-99F	17.7GHz	24GHz	26dB	-	±1dB	27dBm	26dBm	400mA@6V	die	Telecom
DRV	CHA3693-QDG	20GHz	30GHz	21dB	-	±1.5dB	20dBm	18dBm	330mA@3.5V	QFN	Telecom
DRV	CHA3092-99F	20GHz	33GHz	22dB	-	±1dB	-	20dBm	300mA@3.5V	die	Telecom
DRV	CHA3093c99F	20GHz	40GHz	20dB	-	±0.5dB	-	20dBm	330mA@3.5V	die	Telecom
VGA	CHA2097a99F	20GHz	40GHz	18dB	12dB	±1.5dB	16dBm	14dBm	140mA@3.5V	die	Telecom
DRV	CHA2098b99F	20GHz	40GHz	19dB	-	±1.5dB	-	16dBm	150mA@3.5V	die	Telecom
PA	CHA5197a98F	21GHz	27GHz	25dB	-	±1dB	26dBm	-	550mA@6V	die	Telecom
PA	CHA5093-99F	22GHz	26GHz	20dB	-	±1.5dB	29.5dBm	29dBm	600mA@6V	die	Telecom
PA	CHA5295-99F	24.5GHz	26.5GHz	18dB	-	±1dB	-	31dBm	800mA@6V	die	Telecom
PA	CHA5296-99F	27GHz	30GHz	15dB	-	±1dB	30dBm	29dBm	850mA@6V	die	Telecom
PA	CHA5294-99F	31GHz	40GHz	24dB	-	±1.5dB	26dBm	24dBm	500mA@4V	die	Telecom
DRV-S	CHA2177-99F*	76GHz	77GHz	11dB	-	±0.5dB	12dBm	10dBm	80mA@4.5V	die	Automotive

CONTROL PRODUCTS

Function	P/N	Operational		Phase control	Phase error	Insertion loss	P-1dB	Case	Market
		Low	High						
Phase shifter	CHP6013-99F	1.2GHz	1.4GHz	6-bit	10° p-p	8.5dB	-	die	Defence
Phase shifter	CHP6013-SRF*	1.2GHz	1.4GHz	6-bit	10° p-p	8.5dB	-	ceramic	Defence

Function	P/N	Operational		Type	Insertion loss	Isolation	P-1dB	Case	Market
		Low	High						
SPDT Switch	CHS5100-99F	DC	20GHz	reflective	2.1dB	30dB	20dBm	die	Defence
SP4T Switch	CHS2411-QDG	20GHz	25GHz	reflective	2.9dB	35dB	23.5dBm	QFN	Automotive

Function	P/N	Operational		Amplitude control	Minimum attenuation	Maximum attenuation	IP-1dB	Case	Market
		Low	High						
Attenuator	CHT3091aGAG	DC	12GHz	20dB	3dB	23dB	15dBm	QFN	Telecom
Attenuator	CHT3091a99F	DC	40GHz	17dB	3dB	20dB	15dBm	die	Telecom
Attenuator	CHT3091aRCF	DC	40GHz	16dB	4dB	20dB	14dBm	SMD	Telecom
Attenuator	CHT4690-99F	5GHz	30GHz	27dB	-3dB	-30dB	25dBm	die	Telecom
Attenuator	CHT4690-GAG*	5GHz	30GHz	31dB	-4dB	-35dB	25dBm	QFN	Telecom

Function	P/N	Operational		Amplitude control	Gain	NF	P-1dB	Case	Market
		Low	High						
VGA	CHA2290-99F	10GHz	18GHz	22dB	25dB	2.2dB	12dBm	die	Telecom
LNA / VGA	CHA2291-99F	10GHz	18GHz	20dB	23dB	2.2dB	10dBm	die	Telecom
LNA / VGA	CHA2292-99F	17GHz	24GHz	15dB	25dB	2.8dB	11dBm	die	Telecom
VGA	CHA2097a99F	20GHz	40GHz	12dB	18dB	-	14dBm	die	Telecom
LNA / VGA	CHA2293-99F	24.5GHz	29.5GHz	15dB	24dB	3dB	12dBm	die	Telecom
LNA / VGA	CHA2294-99F	35GHz	40GHz	15dB	22dB	4dB	11dBm	die	Telecom

RECEIVE PRODUCTS

Function	P/N	Operational		Noise figure	Gain	Gain flatness	Gain control range	P-1dB	Case	Market
		Low	High							
LNA	CHA3666-99F	6GHz	17GHz	1.8dB	21dB	±0.5dB	-	17dBm	die	Telecom
LNA	CHA3666-QAG	6GHz	17GHz	1.8dB	21dB	±0.5dB	-	17dBm	QFN	Telecom
LNA	CHA2063a99F	7GHz	13GHz	2dB (8-13GHz)	16dB	±2dB	-	8dBm	die	Defence
LNA	CHA2066-99F	10GHz	16GHz	2dB	16dB	±0.5dB	-	10dBm	die	Telecom
LNA	CHA2066-QAG	10GHz	16GHz	2.5dB	15dB	±1dB	-	10dBm	QFN	Telecom
VGA	CHA2290-99F	10GHz	18GHz	2.2dB	25dB	±1dB	22dB	12dBm	die	Telecom
LNA / VGA	CHA2291-99F	10GHz	18GHz	2.2dB	23dB	±1dB	20dB	10dBm	die	Telecom
LNA / MPA	CHA2266-99F	12.5GHz	17GHz	2.5dB	34dB	±0.5dB	-	15dBm	die	Telecom
LNA	CHA3688-99F	13GHz	30GHz	2.0dB	24dB	±1.5dB	-	15dBm	die	Telecom
LNA	CHA3688-QDG	13GHz	30GHz	2.0dB	24dB	±2dB	-	14dBm	QFN	Telecom
LNA	CHA2090-99F	17GHz	24GHz	2dB	23dB	±1dB	-	10dBm	die	Telecom
LNA / VGA	CHA2292-99F	17GHz	24GHz	2.8dB	25dB	±1dB	15dB	11dBm	die	Telecom
LNA	CHA2069-99F	18GHz	31GHz	2.5dB	22dB	±1dB	-	10dBm	die	Telecom
LNA	CHA2069-QDG	18GHz	30GHz	3dB	20dB	±2dB	15dB	11dBm	QFN	Telecom
LNA	CHA2093-99F	20GHz	30GHz	2.2dB	15dB	±0.5dB	-	13dBm	die	Telecom
LNA	CHA2693-QAG	18GHz	30GHz	3dB	13dB	±2dB	-	12dBm	QFN	Telecom
LNA	CHA2092b99F	18GHz	32GHz	2.5dB	22dB	±1.5dB	-	10dBm	die	Telecom
LNA	CHA2411-QDG	20GHz	25GHz	2.5dB	26dB	±0.5dB	-	11dBm	QFN	Automotive
LNA	CHA2190-99F	20GHz	30GHz	2.2dB	15dB	±0.5dB	-	11dBm	die	Telecom
LNA	CHA2193-99F	20GHz	30GHz	2dB	18dB	±0.5dB	-	8dBm	die	Telecom
LNA / VGA	CHA2293-99F	24.5GHz	29.5GHz	3dB	24dB	±1.5dB	15dB	12dBm	die	Telecom
LNA / VGA	CHA2294-99F	35GHz	40GHz	4dB	22dB	±1dB	15dB	11dBm	die	Telecom
LNA	CHA2091-99F	36GHz	40GHz	3dB	14dB	±0.5dB	-	12dBm	die	Telecom
LNA	CHA2094b99F	36GHz	40GHz	3dB	21dB	±1.5dB	-	8dBm	die	Telecom
LNA	CHA2095a99F	36GHz	40GHz	3.5dB	26dB	±1.0dB	-	10dBm	die	Telecom
LNA	CHA2391-99F	36GHz	40GHz	2.5dB	15dB	±0.5dB	-	12dBm	die	Telecom
LNA	CHA2394-99F	36GHz	40GHz	2.5dB	21dB	±1.5dB	-	8dBm	die	Telecom
LNA	CHA2395-99F	36GHz	40GHz	3dB	30dB	±1.5dB	-	10dBm	die	Telecom
LNA	CHA2194-99F	36GHz	44GHz	3dB	19dB	±0.5dB	-	10dBm	die	Telecom
LNA	CHA2157-99F	55GHz	60GHz	3.5dB	10dB	±1.0dB	-	15dBm	die	Telecom
LNA / MPA	CHA2159-99F	55GHz	65GHz	4dB	20dB	±1.0dB	-	15dBm	die	Telecom
LNA	CHA1077a98F	76GHz	77GHz	4.5dB	15dB	±0.5dB	-	9dBm	die	Automotive

FREQUENCY GENERATION PRODUCTS

Function	P/N	Fo Output frequency	Resonator frequency	Tuning bandwidth	Output power	Case	Market
VCO	VCO-P013341-97F	12.6-12.8GHz	Fo/2	16MHz	5/15dBm	die	Automotive
VCO	CHV2411-QDG	24-24.25GHz	Fo/2	250MHz	16dBm	QFN	Automotive
VCO	CHV2240-99F	37.5-39GHz	Fo/2	5MHz	9dBm	die	Automotive
DRO/Mixer	CHV2241-99F	37.5-39GHz	(Fo-Fi)/2	-	-8dBm	die	Automotive
VCO	CHV2242c98F	38-38.5GHz	Fo/3	200MHz	7dBm	die	Automotive
VCO	CHV2243a99F	38-38.5GHz	Fo/3	3GHz	7dBm	die	Automotive

Function	P/N	Fi Input frequency	Fo Output frequency	Input sensitivity	Output power	Case	Market
Prescalers	CND2047-DAF*	1-9GHz	Fi/4	0dBm	-1.5dBm	SOIC8	Telecom
Prescalers	CND2047-DAG	1-9GHz	Fi/4	0dBm	-1.5dBm	SOIC8	Telecom

Function	P/N	Fi Input frequency	Fo Output frequency	Input power	Output power	Case	Market
Frequency multiplier	MUX-P09777	5-8GHz	10-16GHz	10dBm	13dBm	die	Telecom
Frequency multiplier	CHX2193-99F	6.25-8.25GHz	12.5-16.5GHz	12dBm	12dBm	die	Telecom
Frequency multiplier	MUX-P09824	6.25-8.25GHz	25-33GHz	12dBm	12dBm	die	Telecom
Frequency multiplier	CHX2089-99F	8-11.5GHz	16-23GHz	12dBm	15dBm	die	Telecom
Frequency multiplier	CHX2089-98F	8-11.5GHz	16-23GHz	12dBm	15dBm	die	Telecom
Frequency multiplier	CHX2092a99F	9-10GHz	36-40GHz	12dBm	11dBm	die	Telecom
Frequency multiplier	CHX2093a99F	9-10GHz	27-30GHz	7dBm	3dBm	die	Telecom
Frequency multiplier	CHX2090-99F	11-13GHz	22-26GHz	12dBm	15dBm	die	Telecom
Frequency multiplier	CHX2090-QDG	11-13GHz	22-26GHz	12dBm	13dBm	QFN	Telecom
Frequency multiplier	CHX1094-99F	12-13.5GHz	36-40.5GHz	14dBm	5dBm	die	Telecom
Frequency multiplier	MUX-P09773	12.5-16.5GHz	25-33GHz	10dBm	12dBm	die	Telecom
Frequency multiplier	CHX3068-QDG*	14-15GHz	28-30GHz	2dBm	20dBm	QFN	Telecom
Frequency multiplier	CHX2091-99F	17-20GHz	34-40GHz	12dBm	12dBm	die	Telecom
Frequency multiplier	CHX2191-98F	17-20GHz	34-40GHz	0dBm	11dBm	die	Telecom
Frequency multiplier	CHX2192-99F	27-33GHz	54-66GHz	12dBm	11dBm	die	Telecom
Frequency multiplier	CHX2190a99F	28-30GHz	56-60GHz	3dBm	-1dBm	die	Telecom
Frequency multiplier	CHU3377-98F	12.6-12.8GHz	76-77GHz	4dBm	14dBm	die	Automotive
Frequency multiplier	CHU2277-99F	38-38.5GHz	76-77GHz	5dBm	13dBm	die	Automotive
Frequency multiplier	CHU2277a98F	38-38.5GHz	76-77GHz	5dBm	13dBm	die	Automotive
Frequency multiplier	CHU3277-98F	38-38.5GHz	76-77GHz	5dBm	18dBm	die	Automotive

All UMS products listed in this selection guide are ROHS compliant except the CND2047-DAF.

Please contact our Marketing & Sales department for detailed information on these products (mktsales@ums-gaas.com) All datasheets for these products are available on our website : www.ums-gaas.com

New products