



# SELECTION GUIDE | 2022

Products, Foundry Processes  
& Chipsets for RF & microwave Solutions

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## AMPLIFIER – DIGITAL VGA

Part Number	RF Bandwidth (GHz)	Gain (dB)	Noise Figure (dB)	Dynamic Range (dB)	P-1dB OUT (dBm)	Sat. Output Power (dBm)	Bias (mA)	Bias (V)	Case
CHA4102-QEG	2-4	20	-	31.5	23.5	24.5	200	5	QFN
CHA3511-99F	6-18	16	7	39	20	22	190	4.5	Die
CHA3512-99F	6-18	16	7	20	20	23	210	4.5	Die
CHA3513-99F	6-18	19	12	25	18	20	300	4.5	Die
CHA3514-99F	6-18	13	7	39.5	18	19	190	4.5	Die

## AMPLIFIER – HPA

Part Number	RF Bandwidth (GHz)	Gain (dB)	IP3 (dBm)	P-1dB OUT (dBm)	Sat. Output Power (dBm)	PAE %	Bias (mA)	Bias (V)	Case
CHA6015-99F	2-8	18.5	-	36.5	37.5	29 @ 3dB comp	2000	7	Die
CHA8012-99F	5.2-6	22	-	-	41.5	43 @ 3dB comp	2100	8	Die
CHA7618-99F	5.5-18	30	-	-	40	20 @ 20dBm	530	18	Die
CHA7060-QAB	5.6-8.5	30	-	-	41	40 @ 41dBm Pout	420	20	QFN
CHA8054-99F	7.7-8.6	27	-	-	43.6	50 @ 7dB comp	900	28	Die
CHA6105-99F	8-12	30	-	30.5	31.5	-	700	8	Die
CHA6005-99F	8-12	22	-	31.5	32.5	38 @ 3dB comp	350	8	Die
CHA6005-QEG	8-12	19.5	-	31.5	32	35 @ 3dB comp	420	8	QFN
CHA8312-99F	8-12	26	-	-	43	50 @ 23dBm	320	20	Die
CHA6710-99F	8-12.75	23.5	-	-	37.4	36 @ Psat	200	25	Die
CHA6710-FAB	8-12.75	22.5	-	-	37	35 @ Psat	200	25	Hermetic SMD
CHA8612-QDB	8.5-10.5	24	-	-	42	30 @ Psat	680	30	QFN
CHA8710a99F	8.5-10.5	28.5	-	-	44	44 @ Psat	750	25	Die
CHA8610-99F	8.5-11	24	-	-	42	40 @ Psat	680	30	Die
CHA8611-99F	8.5-11	24	-	-	42.5	43 @ Psat	800	25	Die
CHA7114-99F	8.5-11.5	20	-	-	39.8	40 @ 4dB comp	2000	8	Die
CHA7115-99F	8.5-11.5	27.5	-	-	39	37 @ 4dB comp	2200	8	Die
CHA7215-99F	8.5-11.5	28	-	-	39.5	34 @ 4dB comp	2300	8	Die
CHA8212-99F	8.5-11.5	34	-	35	44	36 @ 7dB comp	840	28	Die
CHA8100-99F	9-10.5	18	-	-	41	40 @ 3dB comp	2100	9	Die
CHA7250-QAB	10-12.75	20	-	-	40	37 @ 40dBm	130	20	QFN
CHA8352-99F	10.7-12.75	25	-	-	43	45 @ 43dBm	500	20	Die
CHA7062-QCB	12.7-19.7	20	-	-	37	20 @ 37dBm	300	20	QFN

## AMPLIFIER – HPA... continued

Part Number	RF Bandwidth (GHz)	Gain (dB)	IP3 (dBm)	P-1dB OUT (dBm)	Sat. Output Power (dBm)	PAE %	Bias (mA)	Bias (V)	Case
CHA6550-98F	17- 23.6	22	39	33.5	34	20 @ Psat	1300	6	Die
CHA6550-QXG	17- 24	22	41	33.5	34	20 @ Psat	1300	6	QFN
CHA6551-99F	17-24	22	39	30	32	25 @ Psat	880	4	Die
CHA8252-99F	17.3-20.3	31	-	-	41	35 @ Pin 16dBm	300	18	Die
CHA8254-99F	17.3-20.3	29	-	-	40	31 @ Pin 20dBm 27 @ Pin 14dBm	225	15	Die
CHA6362-QXG	17.7-19.7	22	42	33	34.5	24 @ Psat	1340	6	QFN
CHA6262-99F	17.3-21.3	29	-	33	36	25 @ Psat	260	18	Die
CHA6652-98F	21-27.5	22.5	39	32.5	33	25 @ Psat	1300	6	Die
CHA6652-QXG	21-27.5	20	41	32.5	33	25 @ Psat	1300	6	QFN
CHA6356-QXG	21.2-23.6	20	42	33	33.5	22 @ Psat	1300	6	QFN
CHA6653-98F	27-34	23	38	31	32	17 @ Psat	900	6	Die
CHA6653-QXG	27-33.5	20	38	32	33	23 @ Psat	900	6	QFN
CHA5659-98F	36-43.5	22	38	30	31	15 @ Psat	800	6	Die
CHA5659-QXG	36-43.5	20	38.5	29.5	30	15 @ Psat	800	6	QFN
CHA6194-QXG	37- 40	20	38	30	31	-	800	6	QFN

## AMPLIFIER – LNA

Part Number	RF Bandwidth (GHz)	Gain (dB)	Gain Flatness (+/-dB)	Noise Figure (dB)	P-1dB OUT (dBm)	Bias (mA)	Bias (V)	Case
CHA3801-99F	1-2	28	0.5	1.5	15	70	5	Die
CHA3801-FAB	1-2	28	0.5	1.5	16	70	5	Hermetic SMD
CHA3801-QDG	1-2	28	0.5	1.5	15	70	5	QFN
CHA3218-99F	2-18	24	1	2	15	120	4	Die
CHA3024-99F	2-22	15	-	3	18	100	5	Die
CHA3024-QGG	2-22	15	-	3	18	100	5	QFN
CHA3024-FDB	2-22	15	-	3	18	100	5	Hermetic SMD
CHA3656-FAB	5.8-16	20	-	1.75	14.5	70	3.3	Hermetic SMD
CHA3666-QAG	5.8-17	21	0.5	1.8	16	80	4	QFN
CHA3666-FAB	6-16	21	1	1.8	17	80	4	Hermetic SMD

## AMPLIFIER – LNA ... continued

Part Number	RF Bandwidth (GHz)	Gain (dB)	Gain Flatness (+/-dB)	Noise Figure (dB)	P-1dB OUT (dBm)	Bias (mA)	Bias (V)	Case
CHA3666-99F	6-17	21	0.5	1.8	17	80	4	Die
CHA3656-QAG	6-17	20	0.5	1.7	14	68	3	QFN
CHA1010-99F	7-11	32	1.1	1	5.5	30	5	Die
CHA2110-98F	7-12	19	-	1.2	11	45	4	Die
CHA2110-QDG	7-12	19	-	1.2	10	45	4	QFN
CHA2063a99F	7-13	19	2	2	8	40	4	Die
CHA2066-99F	10-16	16	0.5	2	10	50	4	Die
CHA2066-QAG	10-16	16	1	2.5	10	50	4	QFN
CHA2266-99F	12.5-17	34	0.5	2.5	14.5	130	4	Die
CHA3688aQDG	12.5-30	26	2	2	14	85	4	QFN
CHA3689-99F	12.5-30	26	2	2	15	90	4	Die
CHA2069-FAB	16-32	22	1	2.5	10	55	4.5	Hermetic SMD
CHA2090-99F	17-24	23	1	2	10	55	4.5	Die
CHA2069-QDG	18-31	20	2	3	10.5	65	4.5	QFN
CHA2069-99F	18-31	22	1	2.5	10	55	4.5	Die
CHA2411-QDG	20-25	26	0.5	2.5	-	43	5	QFN
CHA2190-99F	20-30	15	0.5	2.2	11	50	4	Die
CHA2193-99F	20-30	18	0.5	2	8	60	3.5	Die
CHA2441-QAG	22-26	25.5	+/- 0.25	2.5	12	50	3.3	QFN
CHA2362-98F	26-40	22	-	2	9	65	4	Die
CHA2595-98F	27.5-43.5	19.5	-	2	11	61	3.3	Die
CHA2595-QDG	27.5-43.5	19.5	-	2.3	11	61	3.3	QFN
CHA2494-98F	34-44	20	-	3	12	80	4	Die
CHA2494-QEG	34-44	22	1.5	3	12	80	4	QFN
CHA2394-99F	36-40	21	1.5	2.5	8	60	3.5	Die
CHA2352-98F	46-52	21	-	3.5	12	55	3.3	Die
CHA2157-99F	55-60	10	1	3.5	15	60	3.3	Die
CHA2159-99F	55-65	20	1	4	14	115	3.5	Die
CHA2080-98F	71-86	22	0.8	3.5	10	75	3.5	Die
CHA1077a98F	76-77	15	0.5	4.5	9	80	5	Die
CHA1008-99F	80-105	17	1	6.5	5	115	2.5	Die

## AMPLIFIER – MPA

Part Number	RF Bandwidth (GHz)	Gain (dB)	IP3 (dBm)	P-1dB OUT (dBm)	Sat. Output Power (dBm)	Bias (mA)	Bias (V)	Case
CHA4220-98F	0.5-20	17	28	20	23	120	6.5	Die
CHA4220-QGG	0.5-20	17	28	20	23	120	6.5	QFN
CHA5005-QDG	0.8-1.5	18	-	26	27.5	120	7.5	QFN
CHA3023-99F	1-18	14	-	17	-	95	5	Die
CHA4105-99F	2-4	23	-	24	25.5	180	5	Die
CHA4105-QDG	2-4	23	-	24	25.5	180	5	QFN
CHA3024-99F	2-22	15	30	18	20	100	5	Die
CHA3024-QGG	2-22	15	28	18	20	100	5	QFN
CHA3024-FDB	2-22	15	-	18	22	100	5	Hermetic SMD
CHA4107-99F	4.5-6.5	24.5	-	25	26	115	8	Die
CHA4107-QDG	4.5-6.5	22.5	-	25.5	26	115	8	QFN
CHA4314-98F	4.7-11.3	19	34	26	27	180	8	Die
CHA3664-QAG	5-21	15	25	19.5	20.5	120	5	QFN
CHA3665-QAG	5-21	15	25	19.5	20.5	120	5	QFN
CHA3565-QAG	5-21	15	25	19.5	20.5	120	5	QFN
CHA4350-QDG	5.5-11.7	26	32	24	25	125	5.5	QFN
CHA3063-99F	5.5-23	19	28	18	21	160	4	Die
CHA5115-99F	8-12	25	-	28	29	190	8	Die
CHA5115-QDG	8-12	24	-	27.5	29	190	8	QFN
CHA5014-99F	8.5-11	20	-	29	30	230	8.5	Die
CHA5266-99F	10-16	23	36	26.5	27.5	360	5	Die
CHA5266-QDG	10-16	23	35	25.5	27	320	5	QFN
CHA5266-FAB	10-16	23.5	35.5	26	27.5	320	5	Hermetic SMD
CHA4253-FAB	17-21	26	33	23.5	24.5	230	4	Hermetic SMD
CHA4253a98F	17-24	26	32	24.5	25	230	4	Die
CHA4253aQQG	17-24	23	33	24	24.5	230	4	QFN
CHA5350-99F	17-24	26	35.5	26.5	27	300	6	Die
CHA3092-99F	20-33	22	29	20	-	300	3.5	Die
CHA2098b99F	20-40	19	-	16	16	150	3.5	Die
CHA3395-98F	21-30	24	32	20	22.5	180	4	Die

## AMPLIFIER – MPA ... continued

Part Number	RF Bandwidth (GHz)	Gain (dB)	IP3 (dBm)	P-1dB OUT (dBm)	Sat. Output Power (dBm)	Bias (mA)	Bias (V)	Case
CHA3395-QDG	21-30	24	32	20	22	180	4	QFN
CHA3409-98F	25-45	23	-	19	20	100	4	Die
CHA3396-QDG	27-33.5	22	30	19	21	155	4	QFN
CHA3397-QDG	36-40.5	21	29	18	20	200	4	QFN
CHA3398-98F	36-43.5	24	29	18	19	200	4	Die
CHA3398-QDG	36-43.5	22	29	18	19	200	4	QFN
CHA3080-98F	71-76	16	25	19	21	280	3.5	Die
CHA3090-98F	81-86	13	23	17	19	280	3.5	Die

## AMPLIFIER – ANALOG VGA

Part Number	RF Bandwidth (GHz)	Gain (dB)	Gain Flatness (+/-dB)	Noise Figure (dB)	Gain Control Range (dB)	P-1dB OUT (dBm)	Bias (mA)	Bias (V)	Case
CHA3024-99F	2-22	15	0.5	3	30	18	100	5	Die
CHA3024-QGG	2-22	15	-	3	30	18	100	5	QFN
CHA3024-FDB	2-22	15	-	3	30	18	100	5	Hermetic SMD
CHA4350-QDG	5.7-11.7	26	<0.4 (400MHz)	5.5	15	24	125	5.5	QFN
CHA2292-99F	16-24	26	1	2.8	20	11	160	5	Die
CHA4253-FAB	17-21	26	-	-	-	23.5	230	4	Hermetic SMD
CHA4253aQQG	17-24	23	1	7.5	15	24	230	4	QFN
CHA3395-QDG	21-30	24	0.5	4.5	15	20	180	4	QFN
CHA2293-99F	24-30	24	1.5	3	15	12	160	5	Die
CHA3396-QDG	27-33.5	22	1.5	4.5	15	19	155	4	QFN
CHA2595-98F	27.5-43.5	19.5	-	2	-	11	61	3.3	Die
CHA2595-QDG	27.5-43.5	19.5	-	2.3	-	11	61	3.3	QFN
CHA3397-QDG	36-40.5	21	1	7	15	18	200	4	QFN
CHA3398-QDG	36-43.5	22	1	7	15	18	200	4	QFN
CHA2352-98F	46-52	21	-	3.5	-	12	55	3.3	Die
CHA2080-98F	71-86	22	0.8	3.5	12	10	75	3.5	Die

## ATTENUATOR – ANALOG

Part Number	RF Bandwidth (GHz)	Insertion Loss (dB)	Amplitude Control (dB)	P-1dB IN (dBm)	Case
CHT3091aQAG	DC-12	3	20	15	QFN
CHT3091-FAB	DC-14	2.5	20.5	15	Hermetic SMD
CHT4660-QAG	DC-16	2	30	24	QFN
CHT3091a99F	DC-40	3	17	15	Die
CHT4660-FAB	0.5-16	2	35	27	Hermetic SMD
CHT4690-99F	5-30	4	28	25	Die
CHT4690-QAG	5-30	4	31	25	QFN
CHT4690-FAB	5-30	3.5	37	25	Hermetic SMD
CHT4694-QAG	25-40	4	22	22	QFN
CHT4694-99F	25-45	4	24	22	Die
CHT4699-QDG	36-44	4	30	20	QFN

## ATTENUATOR – DIGITAL

Part Number	RF Bandwidth (GHz)	Number of Bits	Amplitude Control (dB)	Insertion loss (dB)	Attenuation error (dB)	P-1dB IN (dBm)	Control voltage (V)	Case
CHT4012a98F	DC-6	6	31.5	2.5	+/-0.5	20	0/3.3 or 5	Die
CHT4012-QDG	DC-6	6	31.5	2.5	-0.7/+0.4	20	0/3.3 or 5	QFN
CHT3029-QEG	DC-30	4	15	5	+/-0.5	20	0/3.3 or 5	QFN
CHT3029-99F	DC-35	4	15	4.5	+/-0.5	20	0/3.3 or 5	Die
CHT4016-QEG	4-14	6	31.5	7	+/-0.8	23	-5/0	QFN
CHT4016-99F	4-16	6	31.5	6.5	-1.5/1	18	-5/0	Die



## CORE CHIP RX - TX

Part Number	RF Bandwidth (GHz)	Gain RX (dB)	Gain TX (dB)	Pout RX (dBm)	Pout TX (dBm)	NF RX (dB)	Number of Bit Atten.	Number of Bit Phase	Bias (mA)	Bias (V)	Case
CHA4102-QEG	2-4	-	20	-	23.5	-	6	-	200	5	QFN
CHP1102-98F	2.7-3.4	10	-	13	-	5.8	-	6	100	5	Die
CHP1102-QGG	2.7-3.4	10	-	13	-	5.8	-	6	100	5	QFN
CHC3014-99F	8-12	13.5	25	16.5	20	5.8	6	6	350	5	Die
CHC2442-QPG	24-24.5	37	VCO incl.	-	13.5	11.5	5	-	225	3.3	QFN
CHC1443-QRA	24-24.25	37	VCO incl.	-	5	11.5	4	-	200	3.3	QFN
CHC2444-QBB	24-24.5	37	VCO incl.	-	13	11.5	5	-	315	3.3	QFN

Part Number	RF Bandwidth (GHz)	Downlink Sensitivity (dBm)	Downlink Freq (KHz)	Uplink Conversion Gain (dB)	Uplink Freq (MHz)	Standby Current (μA)	Case
CHR2270-QRG	5.72-5.88	-44	250-500	-3	DC-30	6.5	QFN

## RF FRONT-END

Part Number	RF Bandwidth (GHz)	Gain RX (dB)	Gain TX (dB)	Psat TX (dBm)	NF RX (dBm)	ACPR (dBc) @ (dBm)	Case
CHC6054-QQA	24.25-30.5	18	28	31	3.25	36 @ 23	QFN

## POWER DIVIDER

Part Number	RF Bandwidth (GHz)	Ins. Loss (dB)	Isolation (dB)	Return Loss (dB)
CHW4212-QKA	12-22	0.5	20	>20
CHW4213-QAG	15-25	0.5	20	>18
CHW4312-QKA	22-34	0.75	20	>15
CHW4313-QAG	24-35	0.6	20	>16

## DETECTOR

Part Number	RF Bandwidth (GHz)	Loss (dB)	Dynamic Range (dB)	Type	Case
CHE1270a98F	5-44	-	30	Wide-Band	Die
CHE1270a99F	5-44	-	30	Wide-Band	Die
CHE1260-98F	10-27	0.8	30	Bidirectionnal	Die
CHE1260-QAG	10-27	1	30	Bidirectionnal	QFN
CHE1270-QAG	5-44	-	30	Wide-Band	QFN

## DOWN - CONVERTER

Part Number	RF Bandwidth (GHz)	LO Bandwidth (GHz)	IF Bandwidth (GHz)	Conv. Gain (dB)	Noise Figure (dB)	P-1dB IN (dBm)	LO Input Power (dBm)	Bias (mA)	Bias (V)	Case
CHR3762-QDG	5.5-9	4-12	DC-3.5	14	1.7	-5	5	100	3	QFN
CHR3861-QEG	5.9-9	3-12.5	DC-3.5	12	2.5	-7	0	380	4	QFN
CHR3662-QDG	7-16	4.5-19.5	DC-3.5	13	3	-8	0	280	4.5	QFN
CHR3362-QEG	10-16	6.5-19.5	DC-3.5	13	3.2	-6	0	310	4	QFN
CHR3352-QEG	12-16	8.5-19.5	DC-3.5	13	2.7	-6	0	250	4	QFN
CHR3763-QDG	12-16	8.5-19.5	DC-3.5	12	2.3	-8	5	80	3	QFN
CHR2291-99F	12-17	5.25-7.75	DC-1.5	10	3.5	-8	10	130	3.5	Die
CHR3663-QEG	17-24	7-14	DC-3.5	11	3.5	-5	0	380	4.5	QFN
CHR3364-QEG	17-24	6.5-14	DC-3.5	11	2.7	-7	0	320	4	QFN
CHR3664-QEG	17-27	7-15	DC-3.5	12	3.3	-8	0	320	4	QFN
CHR3693-99F	21-26.5	9-14	DC-3.5	15	3.2	-10	2	160	4	Die
CHR3693-QDG	21-26.5	9-14	DC-3.5	14	3	-12	2	160	4	QFN
CHR3693-FAB	21-26.5	9-14	DC-3.5	13	2.5	-12	2	160	4	Hermetic SMD
CHR3764-QEG	21-27	8.5-15	DC-3.5	14	3.1	-7	0	320	4	QFN
CHR2411-QDG	22-24.5	22-24.5	DC-0.001	23	7	-21	5	60	5	QFN
CHR2421-QEG	23.75-24.5	23.75-24.5	DC-0.001	22	7	-20	2	165	5	QFN
CHR2295-99F	24-30	12-15	DC-1.5	11	3.5	-10	10	120	3.5	Die
CHR2296-99F	36-40	17-20	DC-1.5	11	5	-10	10	110	3.5	Die
CHR3394-QEG	37-40	17.5-21	DC-3.5	13	3.5	-7	0	250	4	QFN
CHR3894-98F	37-40	17.5-21	DC-3.5	13	4.5	-6	0	250	4	Die
CHR3894-QEG	37-40	17.5-21	DC-3.5	13	4	-6	0	250	4	QFN
CHR1080a98F	71-86	34.5-44	DC-12	8	5	-10	1	175	3.5	Die

## GaN POWER TRANSISTOR

NEW

Part Number	Operating Frequency (GHz)	Glin (dB)@Freq (GHz)	Saturated Power (W)	PAE (%) @ Freq (GHz)	Bias (A)	Bias (V)	Case
CHKA011aSXA	Up to 1.5	23.5 @ 0.44	130	75 @ 0.5	0.64	50	Ceramic Metal Flange
CHKA012a99F	Up to 4	19 @ 3	140	65 @ 3	0.65	50	Die
CHK8101-SYC	Up to 6	12 @ 6	20	64 @ 1.3	0.1	50	Ceramic Metal Flange
CHK015AaQIA	Up to 6	13 @ 6	15	55 @ 6	0.1	50	QFN Plastic Package
CHK8101a99F	Up to 6	14 @ 6	20	60 @ 6	0.1	50	Die
CHK9013-99F	Up to 8	18 @ 6	88	65 @ 6	1.1	30	Die
CHK8013-99F	Up to 10	17 @ 6	14	70 @ 6	0.18	30	Die
CHK9014-99F	Up to 13	13 @ 12	60	50 @ 12	0.7	30	Die
CHK8015-99F	Up to 18	12 @ 15	20	50 @ 15	0.2	30	Die

## INTERNALLY MATCHED GaN POWER TRANSISTOR

Part Number	Frequency range (GHz)	Small signal Gain (dB)	Power (W)	Associated Gain (dB)	PAE (%)	DC Bias	Case
CHZ180AaSEB	1.2-1.4	20	200	> 14	52	VDS 45V@ID_Q 1.3A	Ceramic Metal Flange
CHZ015AaQEG	1.2-1.4	17.2	15	> 14	> 55	VDS 45V@ID_Q 100mA	QFN Plastic Package
CHZ8012-QJA	2.6-3.4	16.5	12	11	54	VDS 30V@ID_Q 180mA	QFN Plastic Package
CHZ9012-QFA	2.7-3.4	16	65	12	55	VDS 30V@ID_Q 800mA	QFN Plastic Package

## MIXER

Part Number	RF Bandwidth (GHz)	LO Bandwidth (GHz)	IF Bandwidth (GHz)	Conv. Gain (dB)	P-1dB IN (dBm)	LO Input Power (dBm)	Bias (mA)	Bias (V)	Case
CHM1290-99F	20-30	10-15	DC-6	-10	0	-4	33	4	Die
CHM1291-99F	25-32	12-15.5	0.1-3	-11	0	5	55	3.5	Die
CHR2294-99F	25-35	11-19	DC-3	-11	2.5	9	55	4	Die
CHM1294-99F	35-45	16-24	DC-3	-11	0	10	60	4	Die
CHM1298-99F	55-65	27.5-32.5	DC-5	-12	0	10	90	3.5	Die
CHM1080-98F	71-86	34.5-44	DC-12	-11	10	2	90	3.5	Die
CHM2179b98F	76-77	76-77	DC-0.1	-8	0	5.5	1	4.5	Die
CHM2378a99F	76-77	76-77	DC-0.1	-7.5	0	7	1.5	4.5	Die
CHM1270a98F	76-77	76-77	DC-0.1	-7.5	0	15	-	-	Die

## MULTIPLIER

NEW

Part Number	Xn	Input Bandwidth (GHz)	Output Bandwidth (GHz)	Input Power (dBm)	Output Power (dBm)	Bias (mA)	Bias (V)	Case
CHX2193-99F	X2	6.25-8.25	12.5-16.5	12	14	60	3.5	Die
CHX2193-FAB	X2	6.25-8.25	12.5-16.5	10	14	60	3.5	Hermetic SMD
CHX2095a99F	X4	6.25-8.25	25-33	12	11	75	3.5	Die
CHX2089-99F	X2	8-11.5	16-23	12	15	60	3.5	Die
CHX2092a99F	X4	9-10	36-40	12	11	80	3.5	Die
CHX2090-99F	X2	11-13	22-26	12	15	50	3.5	Die
CHX2090-QDG	X2	11-13	22-26	14	12	65	3.5	QFN
CHX1191-QDG	X3	11-14.5	33-43.5	1	6	80	5	QFN
CHX1191-98F	X3	11.25-14.5	33.75-43.5	-1	6	80	5	Die
CHU3377-98F	X6	12.67-12.83	76-77	4	15	210	4.5	Die
CHX3068-QDG	X2	14-15	28-30	0	20	270	4	QFN
CHX2091-99F	X2	17-20	34-40	12	12	50	3.5	Die
CHX1162-QDG	X2	17.5-21.5	35-43	1	8	50	5	QFN
CHX2192-99F	X2	27-33	54-66	12	11	130	3.5	Die
CHU2277a98F	X2	38-38.5	76-77	5	13	180	4.5	Die
CHU2277-99F	X2	38-38.5	76-77	5	13	180	4.5	Die

## OSCILLATOR – VCO

Part Number	Central Output Freq (GHz)	Tuning Bandwidth (GHz)	Noise @ 100KHz (dBc/Hz)	Output Power (dBm)	Bias (mA)	Bias (V)	Case
CHV1203a98F	2.6	0.4	-108	8	50	3	Die
CHV1203-FAB	2.8	0.4	-108	8	50	3	Hermetic SMD
CHV1206a98F	5.725	0.75	-100	8.5	75	3	Die
CHV2270-98F	12.7	1.2	-100	14	150	4.5	Die
CHV2411aQDG	24.125	2	-90	16	220	5	QFN
CHV3241-QDG	24.125	2	-94	16	225	5	QFN
CHV2421-QDG	24.25	2	-90	15	233	5	QFN
CHV2243a99F	38.2	3	-65	8	110	4.5	Die
CHV2240-99F	38.2	-	-100	9	120	4.5	Die

## PHASE SHIFTER

Part Number	RF Bandwidth (GHz)	Number of Bits	Phase range (°)	Insertion Loss (dB)	Phase Error (°p-p)	P-1dB IN (dBm)	Control Voltage (V)	Case
CHP6013-SRF	1.2-1.4	6	360	8.5	5	-	-6/0	Ceramic
CHP3010a98F	1.2-1.4	6	360	7	-1/+3	24	0/3.3 or 5	Die

## PHASE SHIFTER ... continued

NEW

Part Number	RF Bandwidth (GHz)	Number of Bits	Phase range (°)	Insertion Loss (dB)	Phase Error (° p-p)	P-1dB IN (dBm)	Control Voltage (V)	Case
CHP3010-QFG	1.2-1.4	6	360	7	-1/+3	24	0/3.3 or 5	QFN
CHP1102-98F	2.7-3.4	6	360	-10	5	3	0/3.3 or 5	Die
CHP1102-QGG	2.7-3.4	6	360	-10	5	3	0/3.3 or 5	QFN
CHP4012a98F	2.7-3.5	6	360	6	-2/+4	24.5	0/3.3 or 5	Die
CHP4012-QEG	2.7-3.5	6	360	6	-2/+4	24.5	0/3.3 or 5	QFN
CHP4014-98F	5-6	6	360	6	4	26	0/3.3 or 5	Die
CHP4014-QEG	5-6	6	360	6	4	26	0/3.3 or 5	QFN
CHP4511-99F	6-18	4	360	13	10	23	-5/0	Die
CHP4010-99F	7-9	6	360	9	-4/4.5	26	-3.5/0	Die
CHP3015-QDG	8.5-10.5	6	360	8	-2/+8	23.5	3.3 or 5	QFN
CHP3015-99F	8.5-11.5	6	360	7.5	-3/+5	24	0/3.3 or 5	Die

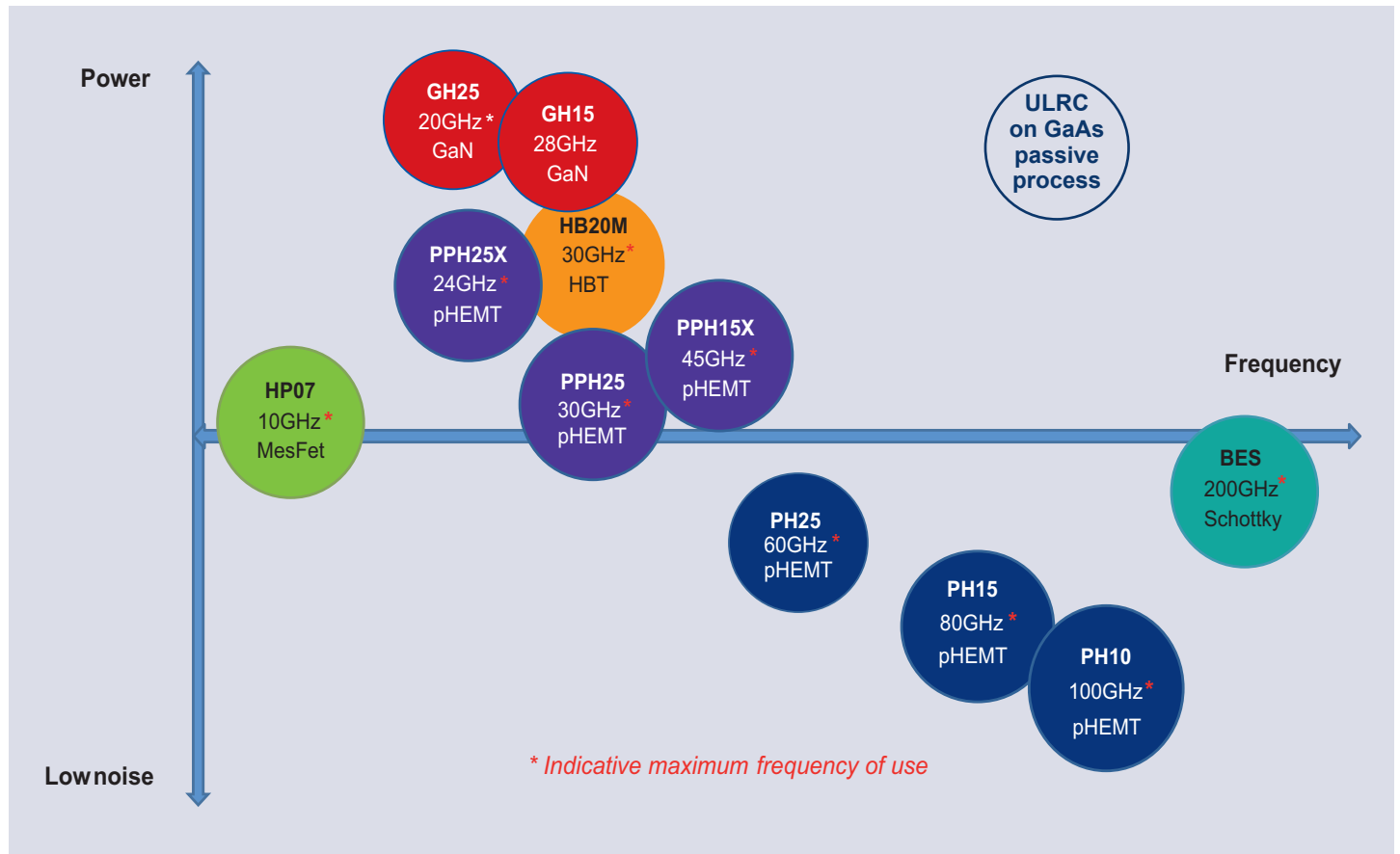
## SWITCH

Part Number	RF Bandwidth (GHz)	Loss (dB)	P-1dB IN (dBm)	Isolation (dB)	Type	Case
CHS5104-99F	DC-4	0.5	30	35	reflective	Die
CHS5104-QAG	DC-4	0.5	30	35	reflective	QFN
CHS5105-QAG	DC-4	0.5	30	35	reflective	QFN
CHS5104-FAB	DC-6	0.6	30	30	reflective	Hermetic SMD
CHS7012-99F	DC-12	1.4	40.5	35	reflective	Die
CHS5100-99F	DC-20	2.1	20	30	reflective	Die
CHS8618-99F	6-18	1.3	42	34	reflective	Die
CHS2411-QDG	23-26	2.9	23.5	35	reflective	QFN

## GaAs TRANSISTOR

Part Number	RF Bandwidth (GHz)	Gain (dB)	Noise Figure (dB)	Case
EC2612-99F	DC-40	9.5	1.5	Die

# Foundry open processes



## GaAs PHEMT PROCESS

	Power Density (mW/mm)	Gate Length ( $\mu\text{m}$ )	Ids@gm Max (mA/mm)	Ids Sat (mA/mm)	V <sub>BDS</sub> (>V)	Cut off Freq (GHz)	V Pinch (V)	Gm Max (mS/mm)	Noise/Gain <sub>ass</sub> @Freq (dB-dB-GHz)	Noise/Gain <sub>ass</sub> @Freq (dB-dB-GHz)
PH25 - Low noise	250	0.25	200	500	6	90	-0.8	560	0.6-13-10	2-8-40
PH15 - Low noise	300	0.15	220	550	4.5	110	-0.7	640	0.5-14-10	1.9-6-60
PH10 - Low noise	250	0.10	280	-	5	130	-0.45	750	1.3-7-40	2.3-4.5-70
PPH25 - Power	700	0.25	200	500	12	50	-0.9	450	0.6-12-10	-
PPH25X - Power	900	0.25	170	450	18	45	-0.9	400	-	-
PPH15X - Power	800	0.15	350	575	12	70	-0.95	480	1.8-6-40	-

## GaAs HBT PROCESS

	Power Density (W/mm)	Emitter Width ( $\mu\text{m}$ )	Ic Max (mA/ $\mu\text{m}^2$ )	V <sub>BCE</sub> (>V)	Cut off Freq (GHz)	Beta
HB20M - VCO	2	2	0.3	14	30	50

## GaAs MESFET PROCESS

	Power Density (mW/mm)	Gate Length ( $\mu\text{m}$ )	Ids@gm Max (mA/mm)	Ids Sat (mA/mm)	Cut off Freq (GHz)	V Pinch (V)	Gm Max (mS/mm)
HP07	400	0.7	300	450	15	-4	110

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## GaAs SCHOTTKY PROCESS

	Gate Length ( $\mu\text{m}$ )	V <sub>AK</sub> (<V)	Cut off Freq (THz)
BES	1	-5	3

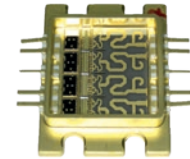
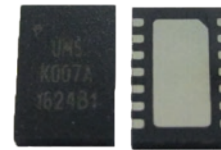
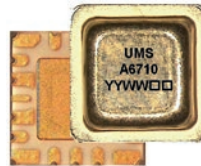
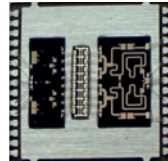
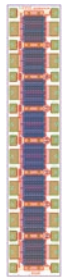
## GaN on SiC HEMT PROCESS

	Power Density (W/mm)	Gate Length ( $\mu\text{m}$ )	Idss mA/mm	Ids Sat (mA/mm)	V <sub>BDS</sub> (V)	Cut off Freq (GHz)	V Pinch (V)	Gm Max (mS/mm)	Noise/Gain@freq (dB-dB-GHz)
GH25	4	0.25	750	900	>100	30	-3	300	1.8-11-15
GH15	3.5	0.15	1200	1400	>70	>35	-3.2	390	1.5-11-15

# GaN RF PRODUCTS

## From transistors to packaged MMICs

Unmatched or fully matched solutions in bare die, SMD or flange ceramic packages



### AMPLIFIER – HPA

Part Number	RF Bandwidth (GHz)	Gain (dB)	Sat. Output Power (dBm)	PAE (%)	Bias (mA)	Bias (V)	Case
CHA7618-99F	5.5-18	30	40	20 @ 20dBm	530	18	Die
CHA7060-QAB	5.6-8.5	30	41	40 @ 41dBm	420	20	QFN
CHA8054-99F	7.7-8.6	27	43.6	50 @ 7dB comp	900	28	Die
CHA8312-99F	8-12	26	43	50 @ 23dBm	320	20	Die
CHA6710-99F	8-12.75	23.5	37.4	36 @ Psat	200	25	Die
CHA6710-FAB	8-12.75	22.5	37	35 @ Psat	200	25	Hermetic SMD
CHA8710a99F	8.5-10.5	28.5	44	44 @ Psat	750	25	Die
CHA8612-QDB	8.5-10.5	24	42	30 @ Psat	680	30	QFN
CHA8610-99F	8.5-11	24	42	40 @ Psat	680	30	Die
CHA8611-99F	8.5-11	24	42.5	43 @ Psat	800	25	Die
CHA8212-99F	8.5-11.5	34	44	36 @ 7dB comp	840	28	Die
CHA7250-QAB	10-12.75	20	40	37 @ 40dBm	130	20	QFN
CHA8352-99F	10.7-12.75	25	43	45 @ 43dBm	500	20	Die
CHA7062-QCB	12.7-19.7	20	37	20 @ 37dBm	300	20	QFN



## AMPLIFIER – HPA ... continued

Part Number	RF Bandwidth (GHz)	Gain (dB)	Sat. Output Power (dBm)	PAE (%)	Bias (mA)	Bias (V)	Case
CHA8254-99F	17.3-20.3	29	40	31 @ Pin 20dBm 27 @ Pin 14dBm	225	15	Die
CHA8252-99F	17.3-20.3	31	41	35 @ 16 dBm	300	18	Die
CHA6262-99F	17.3-21.3	29	36	25 @ Psat	260	18	Die

## GaN HEMT TRANSISTOR DIE

Part Number	Operating Frequency (GHz)	Glin (dB) @ Freq (GHz)	Saturated Power (W)	PAE (%) @ Freq (GHz)	Bias (A)	Bias (V)	Case
CHKA012a99F	Up to 4	19 @ 3	140	65 @ 3	0.65	50	Die
CHK8101a99F	Up to 6	14 @ 6	20	60 @ 6	0.1	50	Die
CHK9013-99F	Up to 8	18 @ 6	88	65 @ 6	1.1	30	Die
CHK8013-99F	Up to 10	17 @ 6	14	70 @ 6	0.18	30	Die
CHK9014-99F	Up to 13	13 @ 12	60	50 @ 12	0.7	30	Die
CHK8015-99F	Up to 18	12 @ 15	20	50 @ 15	0.2	30	Die

## GaN HEMT PACKAGED TRANSISTOR

Part Number	Operating Frequency (GHz)	Glin (dB) @ Freq (GHz)	Saturated Power (W)	PAE (%) @ Freq (GHz)	Bias (A)	Bias (V)	Case
CHKA011aSXA	Up to 1.5	23.5 @ 0.44	130	75 @ 0.5	0.64	50	Ceramic Metal Flange
CHK015AaQIA	Up to 6	13 @ 6	15	55 @ 6	0.1	50	QFN Plastic Package
CHK8101-SYC	Up to 6	12 @ 6	20	64 @ 1.3	0.1	50	Ceramic Metal Flange

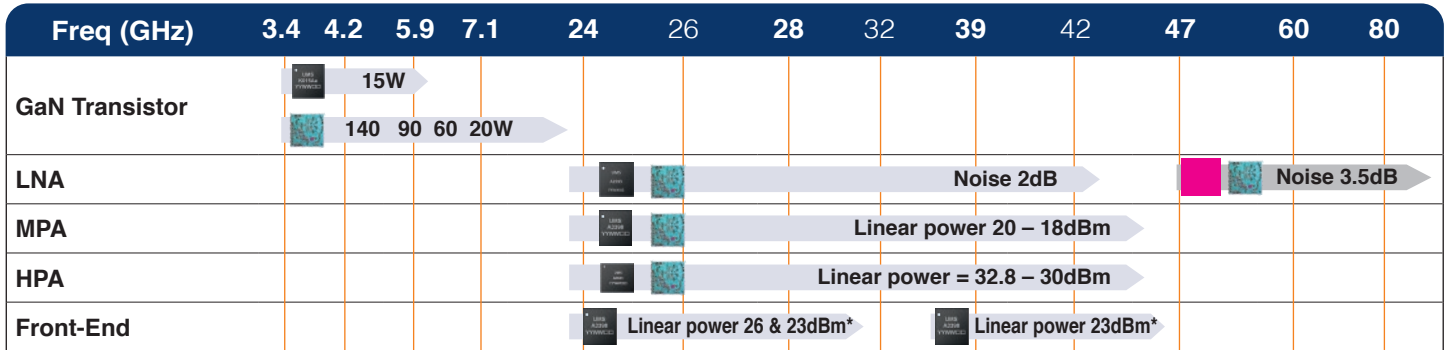
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## INTERNALLY MATCHED GaN POWER TRANSISTORS

Part Number	Frequency range (GHz)	Small signal Gain (dB)	Power (W)	Associated Gain (dB)	PAE %	DC Bias	Case
CHZ180AaSEB	1.2-1.4	20	200	> 14	52	VDS 45V@ID_Q 1.3A	Ceramic Metal Flange
CHZ015AaQEG	1.2-1.4	17.2	15	> 14	> 55	VDS 45V@ID_Q 100mA	QFN Plastic Package
CHZ8012-QJA	2.6-3.4	16.5	12	11	54	VDS 30V@ID_Q 180mA	QFN Plastic Package
CHZ9012-QFA	2.7-3.4	16	65	12	55	VDS 30V@ID_Q 800mA	QFN Plastic Package

## SWITCH

Part Number	RF Bandwidth (GHz)	Loss (dB)	P-1dB IN (dBm)	Isolation (dB)	Type	Case
CHS7012-99F	DC-12	1.4	40.5	35	reflective	Die
CHS8618-99F	6-18	1.3	42	34	reflective	Die



\* Linear power at 1024QAM

### RF FRONT-END

Part Number	RF Bandwidth (GHz)	Gain RX (dB)	Gain TX (dB)	Psat TX (dBm)	NF RX (dBm)	ACPR (dBc) @ (dBm)	Case
CHC6054-QQA	24.25-30.5	18	28	31	3.25	36 @ 23	QFN

### GaN POWER TRANSISTOR

Part Number	Operating Frequency (GHz)	Glin (dB)@Freq (GHz)	Saturated Power (W)	PAE (%) @ Freq (GHz)	Bias (A)	Bias (V)	Case
CHK015AaQIA	Up to 6	13 @ 6	15	55 @ 6	0.1	50	QFN Plastic Package
CHK8101a99F	Up to 6	14 @ 6	20	60 @ 6	0.1	50	Die
CHK8101-SYC	Up to 6	12 @ 6	20	64 @ 1.3	0.1	50	Ceramic Metal Flange
CHK9013-99F	Up to 8	18 @ 6	88	65 @ 6	1.1	30	Die

## AMPLIFIER – LNA

Part Number	RF Bandwidth (GHz)	Gain (dB)	Gain Flatness (+/-dB)	Noise Figure (dB)	P-1dB OUT (dBm)	Bias (mA)	Bias (V)	Case
CHA3688aQDG	12.5-30	26	2	2	14	85	4	QFN
CHA2069-QDG	18-31	20	2	3	10.5	65	4.5	QFN
CHA2362-98F	26-40	22	-	2	9	65	4	Die
CHA2595-98F	27.5-43.5	19.5	-	2	11	61	3.3	Die
CHA2595-QDG	27.5-43.5	19.5	-	2.3	11	61	3.3	QFN
CHA2494-QEG	34-44	22	1.5	3	12	80	4	QFN
CHA2352-98F	46-52	21	-	3.5	12	55	3.3	Die
CHA2157-99F	55-60	10	1	3.5	15	60	3.3	Die
CHA2159-99F	55-65	20	1	4	14	115	3.5	Die

## AMPLIFIER – MPA

Part Number	RF Bandwidth (GHz)	Gain (dB)	IP3 (dBm)	P-1dB OUT (dBm)	Sat. Output Power (dBm)	Bias (mA)	Bias (V)	Case
CHA3395-QDG	21-30	24	32	20	22	180	4	QFN
CHA3409-98F	25-45	23	26	19	20	100	4	Die
CHA3396-QDG	27-33.5	22	30	19	21	155	4	QFN
CHA3397-QDG	36-40.5	21	29	18	20	200	4	QFN
CHA3398-98F	36-43.5	24	29	18	19	200	4	Die
CHA3398-QDG	36-43.5	22	29	18	19	200	4	QFN

## AMPLIFIER – HPA

Part Number	RF Bandwidth (GHz)	Gain (dB)	IP3 (dBm)	P-1dB OUT (dBm)	Sat. Output Power (dBm)	PAE %	Bias (mA)	Bias (V)	Case
CHA7060-QAB	5.6-8.5	30	-	-	41	40 @ 41dBm Pout	420	20	QFN
CHA7250-QAB	10-12.75	20	-	-	40	37 @ 40dBm	130	20	QFN
CHA7062-QCB	12.7-19.7	20	-	-	37	20 @ 37dBm	300	20	QFN
CHA6652-QXG	21-27.5	20	41	32.5	33	25 @ Psat	1300	6	QFN
CHA6653-QXG	27-33.5	20	38	32	33	23 @ Psat	900	6	QFN
CHA5659-QXG	36-43.5	20	38.5	29.5	30	15 @ Psat	800	6	QFN
CHA5659-98F	36-43.5	22	38	30	31	15 @ Psat	800	6	Die
CHA6194-QXG	37-40	20	38	30	31	-	800	6	QFN

# L-Band Chipset

## Switch

CHS7012-99F  
CHS5104-FAB  
CHS5104-99F  
CHS5104-QAG  
CHS5105-QAG  
CHS5105-QAG  
CHS5100-99F

## Digital Attenuator

CHT3029-99F  
CHT3029-QEG  
CHT4012a98F  
CHT4012-QDG

## Analog Attenuator

CHT3091-FAB

## MPA

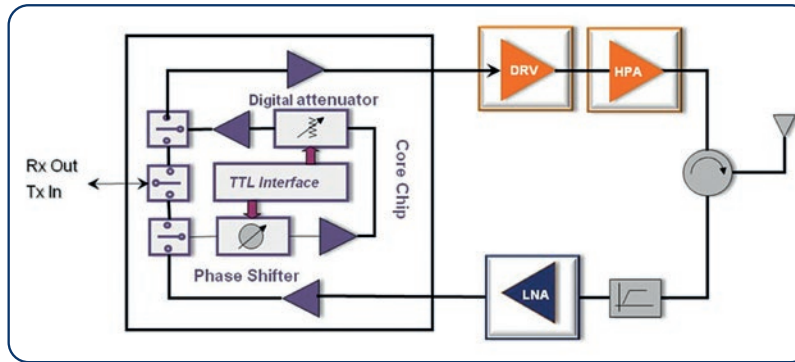
CHA3801-FAB  
CHA3801-99F  
CHA3801-QDG  
CHA3023-99F  
CHA4220-QGG  
CHA5005-QDG

## LNA

CHA3801-FAB  
CHA3801-99F  
CHA3801-QDG  
CHA3023-99F

## Phase Shifter

CHP3010a98F  
CHP3010-QFG  
CHP6013-SRF



## HPA

CHK015aQIA  
CHKA011aSXA  
CHKA012a99F  
CHZ015aQEG  
CHZ180A-SEB

## AMPLIFIER – LNA

Part Number	RF Bandwidth (GHz)	Gain (dB)	Gain Flatness (+/-dB)	Noise Figure (dB)	P-1dB OUT (dBm)	Bias (mA)	Bias (V)	Case
CHA3801-99F	1-2	28	0.5	1.5	15	70	5	Die
CHA3801-QDG	1-2	28	0.5	1.5	15	70	5	QFN
CHA3801-FAB	1-2	28	0.5	1.5	16	70	5	Hermetic SMD

## AMPLIFIER – MPA

Part Number	RF Bandwidth (GHz)	Gain (dB)	IP3 (dBm)	P-1dB OUT (dBm)	Sat. Output Power (dBm)	Bias (mA)	Bias (V)	Case
CHA4220-QGG	0.5-20	17	28	20	23	120	6.5	QFN
CHA5005-QDG	0.8-1.5	18	-	26	27.5	120	7.5	QFN
CHA3023-99F	1-18	14	-	17	-	95	5	Die

## ATTENUATOR – ANALOG

Part Number	RF Bandwidth (GHz)	Insertion Loss (dB)	Amplitude Control (dB)	P-1dB IN (dBm)	Case
CHT3091-FAB	DC-14	2.5	20.5	15	Hermetic SMD

## ATTENUATOR – DIGITAL

Part Number	RF Bandwidth (GHz)	Number of Bits	Amplitude Control (dB)	Insertion loss (dB)	Attenuation error (dB)	P-1dB IN (dBm)	Control voltage (V)	Case
CHT4012a98F	DC-6	6	31.5	2.5	+/-0.5	20	0/3.3 or 5	Die
CHT4012-QDG	DC-6	6	31.5	2.5	-0.7/+0.4	20	0/3.3 or 5	QFN
CHT3029-QEG	DC-30	4	15	5	+/-0.5	20	0/3.3 or 5	QFN
CHT3029-99F	DC-35	4	15	4.5	+/-0.5	20	0/3.3 or 5	Die

## GaN POWER TRANSISTOR

Part Number	Operating Frequency (GHz)	Glin (dB)@Freq (GHz)	Saturated Power (W)	PAE (%) @ Freq (GHz)	Bias (A)	Bias (V)	Case
CHKA011aSXA	Up to 1.5	23.5 @ 0.44	130	75 @ 0.5	0.64	50	Ceramic Metal Flange
CHKA012a99F	Up to 4	19 @ 3	140	65 @ 3	0.65	50	Die
CHK015AaQIA	Up to 6	13 @ 6	15	55 @ 6	0.1	50	QFN Plastic Package

## INTERNALLY MATCHED GaN POWER TRANSISTOR

Part Number	Frequency range (GHz)	Small signal Gain (dB)	Power (W)	Associated Gain (dB)	PAE (%)	DC Bias	Case
CHZ180AaSEB	1.2-1.4	20	200	> 14	52	VDS 45V@ID_Q 1.3A	Ceramic Metal Flange
CHZ015AaQEG	1.2-1.4	17.2	15	> 14	> 55	VDS 45V@ID_Q 100mA	QFN Plastic Package

## PHASE SHIFTER

Part Number	RF Bandwidth (GHz)	Number of Bits	Phase range (°)	Insertion Loss (dB)	Phase Error (°p-p)	P-1dB IN (dBm)	Control voltage (V)	Case
CHP6013-SRF	1.2-1.4	6	360	8.5	5	-	-6/0	Ceramic
CHP3010a98F	1.2-1.4	6	360	7	-1/+3	24	0/3.3 or 5	Die
CHP3010-QFG	1.2-1.4	6	360	7	-1/+3	24	0/3.3 or 5	QFN

## SWITCH

Part Number	RF Bandwidth (GHz)	Loss (dB)	P-1dB IN (dBm)	Isolation (dB)	Type	Case
CHS5104-99F	DC-4	0.5	30	35	reflective	Die
CHS5104-QAG	DC-4	0.5	30	35	reflective	QFN
CHS5105-QAG	DC-4	0.5	30	35	reflective	QFN
CHS5104-FAB	DC-6	0.6	30	30	reflective	Hermetic SMD
CHS7012-99F	DC-12	1.4	40.5	35	reflective	Die
CHS5100-99F	DC-20	2.1	20	30	reflective	Die

# S-Band Chipset

## Switch

CHS5100-99F  
CHS5104-99F  
CHS5104-QAG  
CHS5104-FAB  
CHS5105-QAG  
CHS7012-99F

## Digital Attenuator

CHT3029-99F  
CHT3029-QEG  
CHT4012a98F  
CHT4012-QDG

## Phase Shifter

CHP4012a98F  
CHP4012-QEG

## MPA

CHA3023-99F  
CHA4105-99F  
CHA4105-QDG

## Analog Attenuator

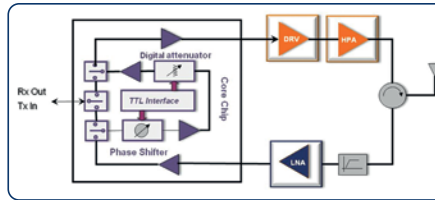
CHT3091-FAB

## VCO

CHV1203-FAB  
CHV1203a98F

## Core chip

CHA4102-QEG  
CHP1102-98F  
CHP1102-QGG



## HPA

CHK015AaQIA  
CHZ8012-QJA  
CHZ9012-QFA

## LNA

CHA3024-FDB  
CHA3024-99F  
CHA3054-QGG  
CHA3218-99F

## AMPLIFIER – DIGITAL VGA

Part Number	RF Bandwidth (GHz)	Gain (dB)	Noise Figure (dB)	Dynamic Range (dB)	P-1dB OUT (dBm)	Sat. Output Power (dBm)	Bias (mA)	Bias (V)	Case
CHA4102-QEG	2-4	20	-	31.5	23.5	24.5	200	5	QFN

## AMPLIFIER – LNA

Part Number	RF Bandwidth (GHz)	Gain (dB)	Gain Flatness (+/-dB)	Noise Figure (dB)	P-1dB OUT (dBm)	Bias (mA)	Bias (V)	Case
CHA3218-99F	2-18	24	1	2	15	120	4	Die
CHA3024-99F	2-22	15	-	3	18	100	5	Die
CHA3024-QGG	2-22	15	-	3	18	100	5	QFN
CHA3024-FDB	2-22	15	-	3	18	100	5	Hermetic SMD

## AMPLIFIER – MPA

Part Number	RF Bandwidth (GHz)	Gain (dB)	IP3 (dBm)	P-1dB OUT (dBm)	Sat. Output Power (dBm)	Bias (mA)	Bias (V)	Case
CHA3023-99F	1-18	14	-	17	-	95	5	Die
CHA4105-99F	2-4	23	-	24	25.5	180	5	Die
CHA4105-QDG	2-4	23	-	24	25.5	180	5	QFN

## ATTENUATOR – ANALOG

Part Number	RF Bandwidth (GHz)	Insertion Loss (dB)	Amplitude Control (dB)	P-1dB IN (dBm)	Case
CHT3091-FAB	DC-14	2.5	20.5	15	Hermetic SMD

## ATTENUATOR – DIGITAL

Part Number	RF Bandwidth (GHz)	Number of Bits	Amplitude Control (dB)	Insertion loss (dB)	Attenuation error (dB)	P-1dB IN (dBm)	Control voltage (V)	Case
CHT4012a98F	DC-6	6	31.5	2.5	+/-0.5	20	0/3.3 or 5	Die
CHT4012-QDG	DC-6	6	31.5	2.5	-0.7/+0.4	20	0/3.3 or 5	QFN
CHT3029-QEG	DC-30	4	15	5	+/-0.5	20	0/3.3 or 5	QFN
CHT3029-99F	DC-35	4	15	4.5	+/-0.5	20	0/3.3 or 5	Die

## GaN POWER TRANSISTOR

Part Number	Operating Frequency (GHz)	Glin (dB)@Freq (GHz)	Saturated Power (W)	PAE (%) @ Freq (GHz)	Bias (A)	Bias (V)	Case
CHK015AaQIA	Up to 6	13 @ 6	15	55 @ 6	0.1	50	QFN Plastic Package

## INTERNALLY MATCHED GaN POWER TRANSISTOR

Part Number	Frequency range (GHz)	Small signal Gain (dB)	Power (W)	Associated Gain (dB)	PAE (%)	DC Bias	Case
CHZ8012-QJA	2.6-3.4	16.5	12	11	54	VDS 30V@ID_Q 180mA	QFN Plastic Package
CHZ9012-QFA	2.7-3.4	16	65	12	55	VDS 30V@ID_Q 800mA	QFN Plastic Package

## OSCILLATOR – VCO

Part Number	Central Output Freq (GHz)	Tuning Bandwidth (GHz)	Noise @ 100KHz (dBc/Hz)	Output Power (dBm)	Bias (mA)	Bias (V)	Case
CHV1203a98F	2.6	0.4	-108	8	50	3	Die
CHV1203-FAB	2.8	0.4	-108	8	50	3	Hermetic SMD

## PHASE SHIFTER

Part Number	RF Bandwidth (GHz)	Number of Bits	Phase range (°)	Insertion Loss (dB)	Phase Error (°p-p)	P-1dB IN (dBm)	Control voltage (V)	Case
CHP1102-98F	2.7-3.4	6	360	-10	5	3	0/3.3 or 5	die
CHP1102-QGG	2.7-3.4	6	360	-10	5	3	0/3.3 or 5	QFN
CHP4012a98F	2.7-3.5	6	360	6	-2/+4	24.5	0/3.3 or 5	die
CHP4012-QEG	2.7-3.5	6	360	6	-2/+4	24.5	0/3.3 or 5	QFN

## SWITCH

Part Number	RF Bandwidth (GHz)	Loss (dB)	P-1dB IN (dBm)	Isolation (dB)	Type	Case
CHS5104-99F	DC-4	0.5	30	35	reflective	Die
CHS5104-QAG	DC-4	0.5	30	35	reflective	QFN
CHS5105-QAG	DC-4	0.5	30	35	reflective	QFN
CHS5104-FAB	DC-6	0.6	30	30	reflective	Hermetic SMD
CHS7012-99F	DC-12	1.4	40.5	35	reflective	Die
CHS5100-99F	DC-20	2.1	20	30	reflective	Die

# C-Band Chipset

## Digital Attenuator

CHT3029-99F  
CHT3029-QEG  
CHT4012a98F  
CHT4012-QDG  
CHT4016-99F  
CHT4016-QEG

## Switch

CHS5100-99F  
CHS5104-FAB  
CHS7012-99F  
CHS8618-99F

## Analog Attenuator

CHT3091-FAB  
CHT4690-FAB  
CHT4690-99F  
CHT4690-QAG

## Phase Shifter

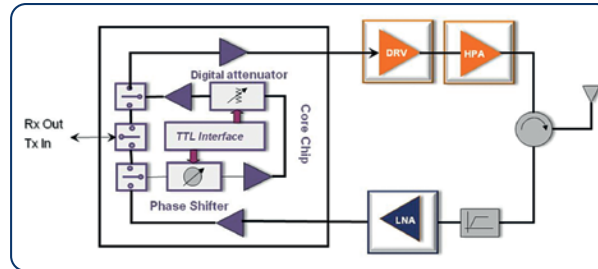
CHP4014-98F  
CHP4014-QEG

## MPA

CHA4314-98F  
CHA3024-FDB  
CHA4107-99F  
CHA4107-QDG  
CHA3024-QGG  
CHA3024-99F

## HPA

CHK8013-99F  
CHK015AaQIA  
CHK8101a99F  
CHA8012-99F  
CHK9013-99F  
CHK9014-99F  
CHA7618-99F  
CHK8101-SYC



## AMPLIFIER – HPA

Part Number	RF Bandwidth (GHz)	Gain (dB)	IP3 (dBm)	P-1dB OUT (dBm)	Sat. Output Power (dBm)	PAE %	Bias (mA)	Bias (V)	Case
CHA8012-99F	5.2-6	22	-	-	41.5	43 @ 3dB comp	2100	8	Die
CHA7618-99F	5.5-18	30	-	-	40	20 @ 20dBm	530	18	Die

## AMPLIFIER – MPA

Part Number	RF Bandwidth (GHz)	Gain (dB)	IP3 (dBm)	P-1dB OUT (dBm)	Sat. Output Power (dBm)	Bias (mA)	Bias (V)	Case
CHA3024-QGG	2-22	15	28	18	20	100	5	QFN
CHA3024-FDB	2-22	15	-	18	22	100	5	Hermetic SMD
CHA3024-99F	2-22	15	30	18	20	100	5	Die
CHA4107-99F	4.5-6.5	24.5	-	25	26	115	8	Die
CHA4107-QDG	4.5-6.5	22.5	-	25.5	26	115	8	QFN
CHA4314-98F	4.7-11.3	19	34	26	27	180	8	Die



## ATTENUATOR – ANALOG

Part Number	RF Bandwidth (GHz)	Insertion Loss (dB)	Amplitude Control (dB)	P-1dB IN (dBm)	Case
CHT3091-FAB	DC-14	2.5	20.5	15	Hermetic SMD
CHT4690-99F	5-30	4	28	25	Die
CHT4690-QAG	5-30	4	31	25	QFN
CHT4690-FAB	5-30	3.5	37	25	Hermetic SMD

## ATTENUATOR – DIGITAL

Part Number	RF Bandwidth (GHz)	Number of Bits	Amplitude Control (dB)	Insertion loss (dB)	Attenuation error (dB)	P-1dB IN (dBm)	Control voltage (V)	Case
CHT4012a98F	DC-6	6	31.5	2.5	+/-0.5	20	0/3.3 or 5	Die
CHT4012-QDG	DC-6	6	31.5	2.5	-0.7/+0.4	20	0/3.3 or 5	QFN
CHT3029-QEG	DC-30	4	15	5	+/-0.5	20	0/3.3 or 5	QFN
CHT3029-99F	DC-35	4	15	4.5	+/-0.5	20	0/3.3 or 5	Die
CHT4016-QEG	4-14	6	31.5	7	+/-0.8	23	-5/0	QFN
CHT4016-99F	4-16	6	31.5	6.5	-1.5/1	18	-5/0	Die

## GaN POWER TRANSISTOR

Part Number	Operating Frequency (GHz)	Glin (dB)@Freq (GHz)	Saturated Power (W)	PAE (%) @ Freq (GHz)	Bias (A)	Bias (V)	Case
CHK8101-SYC	Up to 6	12 @ 6	20	64 @ 1.3	0.1	50	Ceramic Metal Flange
CHK015AaQIA	Up to 6	13 @ 6	15	55 @ 6	0.1	50	QFN Plastic Package
CHK8101a99F	Up to 6	14 @ 6	20	60 @ 6	0.1	50	Die
CHK9013-99F	Up to 8	18 @ 6	88	65 @ 6	1.1	30	Die
CHK8013-99F	Up to 10	17 @ 6	14	70 @ 6	0.18	30	Die
CHK9014-99F	Up to 13	13 @ 12	60	50 @ 12	0.7	30	Die

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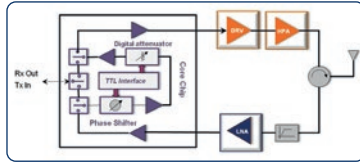
## PHASE SHIFTER

Part Number	RF Bandwidth (GHz)	Number of Bits	Phase range (°)	Insertion Loss (dB)	Phase Error (°p-p)	P-1dB IN (dBm)	Control voltage (V)	Case
CHP4014-98F	5-6	6	360	6	4	26	0/3.3 or 5	Die
CHP4014-QEG	5-6	6	360	6	4	26	0/3.3 or 5	QFN

## SWITCH

Part Number	RF Bandwidth (GHz)	Loss (dB)	P-1dB IN (dBm)	Isolation (dB)	Type	Case
CHS5104-FAB	DC-6	0.6	30	30	reflective	Hermetic SMD
CHS7012-99F	DC-12	1.4	40.5	35	reflective	Die
CHS5100-99F	DC-20	2.1	20	30	reflective	Die
CHS8618-99F	6-18	1.3	42	34	reflective	Die

# X-Band Chipset



CHA8611-99F  
CHA8710a99F  
CHA8312-99F  
CHA7250-QAB

## HPA

CHA6710-FAB  
CHA8054-99F  
CHA8212-99F  
CHA6005-QEG  
CHA6105-99F  
CHA6710-99F  
CHA7114-99F  
CHA7215-99F  
CHA8100-99F  
CHA8610-99F

## LNA

CHA3656-FAB  
CHA2110-98F  
CHA2110-QDG  
CHA1010-99F  
CHA3666-99F  
CHA3666-QAG  
CHA3666-FAB  
CHA3656-QAG

## MPA

CHA4350-QDG  
CHA4314-98F  
CHA5014-99F  
CHA5115-99F  
CHA5115-QDG  
CHA5266-FAB  
CHA5266-99F  
CHA5266-QDG

## Digital Attenuator

CHT3029-99F  
CHT3029-QEG  
CHT4016-99F  
CHT4016-QEG

## Analog Attenuator

CHT3091-FAB  
CHT4690-99F  
CHT4690-FAB  
CHT4690-QAG

## Switch

CHS5100-99F  
CHS7012-99F  
CHS8618-99F

## Phase Shifter

CHP4010-99F  
CHP3015-99F  
CHP3015-QDG

## Core chip

CHC3014-99F

## AMPLIFIER – HPA

Part Number	RF Bandwidth (GHz)	Gain (dB)	IP3 (dBm)	P-1dB OUT (dBm)	Sat. Output Power (dBm)	PAE %	Bias (mA)	Bias (V)	Case
CHA8054-99F	7.7-8.6	27	-	-	43.6	50 @ 7dB comp	900	28	Die
CHA6105-99F	8-12	30	-	30.5	31.5	-	700	8	Die
CHA6005-QEG	8-12	19.5	-	31.5	32	35 @ 3dB comp	420	8	QFN
CHA8312-99F	8-12	26	-	-	43	50 @ 23dBm	320	20	Die
CHA6710-99F	8-12.75	23.5	-	-	37.4	36 @ Psat	200	25	Die
CHA6710-FAB	8-12.75	22.5	-	-	37	35 @ Psat	200	25	Hermetic SMD
CHA8710a99F	8.5-10.5	28.5	-	-	44	44 @ Psat	750	25	Die
CHA8611-99F	8.5-11	24	-	-	42.5	43 @ Psat	800	25	Die
CHA8610-99F	8.5-11	24	-	-	42	40 @ Psat	680	30	Die
CHA8212-99F	8.5-11.5	34	-	35	44	36 @ 7dB comp	840	28	Die
CHA7114-99F	8.5-11.5	20	-	-	39.8	40 @ 4dB comp	2000	8	Die
CHA7215-99F	8.5-11.5	28	-	-	39.5	34 @ 4dB comp	2300	8	Die
CHA8100-99F	9-10.5	18	-	-	41	40 @ 3dB comp	2100	9	Die
CHA7250-QAB	10-12.75	20	-	-	40	37 @ 40dBm	130	20	QFN

## AMPLIFIER – LNA

Part Number	RF Bandwidth (GHz)	Gain (dB)	Gain Flatness (+/-dB)	Noise Figure (dB)	P-1dB OUT (dBm)	Bias (mA)	Bias (V)	Case
CHA3656-FAB	5.8-16	20	-	1.75	14.5	70	3.3	Hermetic SMD
CHA3666-QAG	5.8-17	21	0.5	1.8	16	80	4	QFN
CHA3666-FAB	6-16	21	1	1.8	17	80	4	Hermetic SMD
CHA3656-QAG	6-17	20	0.5	1.7	14	68	3	QFN
CHA3666-99F	6-17	21	0.5	1.8	17	80	4	Die
CHA1010-99F	7-11	32	1.1	1	5.5	30	5	Die
CHA2110-98F	7-12	19	-	1.2	11	45	4	Die
CHA2110-QDG	7-12	19	-	1.2	10	45	4	QFN

## AMPLIFIER – MPA

Part Number	RF Bandwidth (GHz)	Gain (dB)	IP3 (dBm)	P-1dB OUT (dBm)	Sat. Output Power (dBm)	Bias (mA)	Bias (V)	Case
CHA4314-98F	4.7-11.3	19	34	26	27	180	8	Die
CHA4350-QDG	5.5-11.7	26	32	24	25	125	5.5	QFN
CHA5115-99F	8-12	25	-	28	29	190	8	Die
CHA5115-QDG	8-12	24	-	27.5	29	190	8	QFN
CHA5014-99F	8.5-11	20	-	29	30	230	8.5	Die
CHA5266-FAB	10-16	23.5	35.5	26	27.5	320	5	Hermetic SMD
CHA5266-99F	10-16	23	36	26.5	27.5	360	5	Die
CHA5266-QDG	10-16	23	35	25.5	27	320	5	QFN

## ATTENUATOR – ANALOG

Part Number	RF Bandwidth (GHz)	Insertion Loss (dB)	Amplitude Control (dB)	P-1dB IN (dBm)	Case
CHT3091-FAB	DC-14	2.5	20.5	15	Hermetic SMD
CHT4690-99F	5-30	4	28	25	Die
CHT4690-QAG	5-30	4	31	25	QFN
CHT4690-FAB	5-30	3.5	37	25	Hermetic SMD

## ATTENUATOR – DIGITAL

Part Number	RF Bandwidth (GHz)	Number of Bits	Amplitude Control (dB)	Insertion loss (dB)	Attenuation error (dB)	P-1dB IN (dBm)	Control voltage (V)	Case
CHT3029-QEG	DC-30	4	15	5	+/-0.5	20	0/3.3 or 5	QFN
CHT3029-99F	DC-35	4	15	4.5	+/-0.5	20	0/3.3 or 5	Die
CHT4016-QEG	4-14	6	31.5	7	+/-0.8	23	-5/0	QFN
CHT4016-99F	4-16	6	31.5	6.5	-1.5/1	18	-5/0	Die

## CORE CHIP RX - TX

Part Number	RF Bandwidth (GHz)	Gain RX (dB)	Gain TX (dB)	Pout RX (dBm)	Pout TX (dBm)	NF RX (dB)	Number of Bit Atten.	Number of Bit Phase	Bias (mA)	Bias (V)	Case
CHC3014-99F	8-12	13.5	25	16.5	20	5.8	6	6	350	5	Die

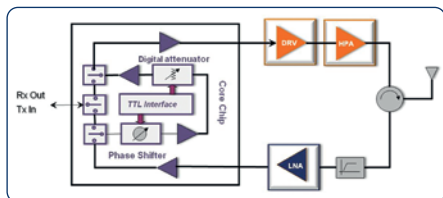
## PHASE SHIFTER

Part Number	RF Bandwidth (GHz)	Number of Bits	Phase range (°)	Insertion Loss (dB)	Phase Error (°p-p)	P-1dB IN (dBm)	Control Voltage (V)	Case
CHP4010-99F	7-9	6	360	9	-4/4.5	26	-3.5/0	Die
CHP3015-QDG	8.5-10.5	6	360	8	-2/+8	23.5	3.3 or 5	QFN
CHP3015-99F	8.5-11.5	6	360	7.5	-3/+5	24	0/3.3 or 5	die

## SWITCH

Part Number	RF Bandwidth (GHz)	Loss (dB)	P-1dB IN (dBm)	Isolation (dB)	Type	Case
CHS7012-99F	DC-12	1.4	40.5	35	reflective	Die
CHS5100-99F	DC-20	2.1	20	30	reflective	Die
CHS8618-99F	6-18	1.3	42	34	reflective	Die

# Ku-Band Chipset



Digital Attenuator	MPA	LNA	Analog Attenuator
CHT3029-99F CHT3029-QEG CHT4016-99F CHT4016-QEG	CHA3024-FDB CHA3024-99F CHA3024-QGG CHA3063-99F CHA4220-98F	CHA4220-QGG CHA5266-99F CHA5266-QDG CHA5266-FAB	CHA3656-FAB CHA3218-99F CHA3666-99F CHA3666-FAB CHA3666-QAG CHA3656-QAG
Switch	Multiplier	Phase Shifter	Rx
CHS5100-99F CHS8618-99FF	CHX2193-FAB CHX2193-99F	CHP4511-99F	CHR3662-QDG
HPA	CHA7062-QCB		

## AMPLIFIER – LNA

Part Number	RF Bandwidth (GHz)	Gain (dB)	Gain Flatness (+/-dB)	Noise Figure (dB)	P-1dB OUT (dBm)	Bias (mA)	Bias (V)	Case
CHA3218-99F	2-18	24	1	2	15	120	4	Die
CHA3656-FAB	5.8-16	20	-	1.75	14.5	70	3.3	Hermetic SMD
CHA3666-QAG	5.8-17	21	0.5	1.8	16	80	4	QFN
CHA3666-FAB	6-16	21	1	1.8	17	80	4	Hermetic SMD
CHA3666-99F	6-17	21	0.5	1.8	17	80	4	Die
CHA3656-QAG	6-17	20	0.5	1.7	14	68	3	QFN

## AMPLIFIER – MPA

Part Number	RF Bandwidth (GHz)	Gain (dB)	IP3 (dBm)	P-1dB OUT (dBm)	Sat. Output Power (dBm)	Bias (mA)	Bias (V)	Case
CHA4220-98F	0.5-20	17	28	20	23	120	6.5	Die
CHA4220-QGG	0.5-20	17	28	20	23	120	6.5	QFN
CHA3024-99F	2-22	15	30	18	20	100	5	Die
CHA3024-FDB	2-22	15	-	18	22	100	5	Hermetic SMD
CHA3024-QGG	2-22	15	28	18	20	100	5	QFN
CHA3063-99F	5.5-23	19	28	18	21	160	4	Die
CHA5266-QDG	10-16	23	35	25.5	27	320	5	QFN
CHA5266-FAB	10-16	23.5	35.5	26	27.5	320	5	Hermetic SMD
CHA5266-99F	10-16	23	36	26.5	27.5	360	5	Die

## AMPLIFIER – HPA

Part Number	RF Bandwidth (GHz)	Gain (dB)	IP3 (dBm)	P-1dB OUT (dBm)	Sat. Output Power (dBm)	PAE %	Bias (mA)	Bias (V)	Case
CHA7062-QCB	12.7-19.7	20	-	-	37	20 @ 37dBm	300	20	QFN

## ATTENUATOR – ANALOG

Part Number	RF Bandwidth (GHz)	Insertion Loss (dB)	Amplitude Control (dB)	P-1dB IN (dBm)	Case
CHT4690-99F	5-30	4	28	25	Die
CHT4690-QAG	5-30	4	31	25	QFN
CHT4690-FAB	5-30	3.5	37	25	Hermetic SMD

## ATTENUATOR – DIGITAL

Part Number	RF Bandwidth (GHz)	Number of Bits	Amplitude Control (dB)	Insertion loss (dB)	Attenuation error (dB)	P-1dB IN (dBm)	Control voltage (V)	Case
CHT3029-QEG	DC-30	4	15	5	+/-0.5	20	0/3.3 or 5	QFN
CHT3029-99F	DC-35	4	15	4.5	+/-0.5	20	0/3.3 or 5	Die
CHT4016-QEG	4-14	6	31.5	7	+/-0.8	23	-5/0	QFN
CHT4016-99F	4-16	6	31.5	6.5	-1.5/1	18	-5/0	Die

## DOWN - CONVERTER

Part Number	RF Bandwidth (GHz)	LO Bandwidth (GHz)	IF Bandwidth (GHz)	Conv. Gain (dB)	Noise Figure (dB)	P-1dB IN (dBm)	LO Input Power (dBm)	Bias (mA)	Bias (V)	Case
CHR3662-QDG	7-16	4.5-19.5	DC-3.5	13	3	-8	0	280	4.5	QFN

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## MULTIPLIER

Part Number	Xn	Input Bandwidth (GHz)	Output Bandwidth (GHz)	Input Power (dBm)	Output Power (dBm)	Bias (mA)	Bias (V)	Case
CHX2193-99F	X2	6.25-8.25	12.5-16.5	12	14	60	3.5	Die
CHX2193-FAB	X2	6.25-8.25	12.5-16.5	10	14	60	3.5	Hermetic SMD

## PHASE SHIFTER

Part Number	RF Bandwidth (GHz)	Number of Bits	Phase range (°)	Insertion Loss (dB)	Phase Error (° p-p)	P-1dB IN (dBm)	Control Voltage (V)	Case
CHP4511-99F	6-18	4	360	13	10	23	-5/0	Die

## SWITCH

Part Number	RF Bandwidth (GHz)	Loss (dB)	P-1dB IN (dBm)	Isolation (dB)	Type	Case
CHS5100-99F	DC-20	2.1	20	30	reflective	Die
CHS8618-99F	6-18	1.3	42	34	reflective	Die

# Ka-Band chipset

## Rx

CHM1290-99F  
CHM1291-99F  
CHR2294-99F  
CHR2295-99F  
CHR3693-FAB

## Tx

CHM1290-99F  
CHM1291-99F  
CHR2294-99F

## Analog Attenuator

CHT4690-FAB  
CHT4690-99F  
CHT4690-QAG  
CHT4694-99F  
CHT4694-QAG

## MPA

CHA3409-98F  
CHA2098b99F  
CHA3092-99F  
CHA4253aQQG  
CHA4253-FAB  
CHA5350-99F

## LNA

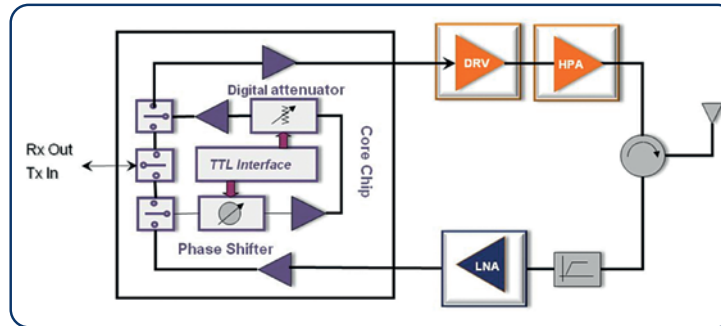
CHA2595-QDG  
CHA2362-98F  
CHA2069-99F  
CHA2069-QDG  
CHA2069-FAB  
CHA2190-99F  
CHA3688aQDG  
CHA2090-99F  
CHA2595-98F

## Digital Attenuator

CHT3029-99F  
CHT3029-QEG

## HPA

CHA6653-QXG



## RF Front-End

CHC6054-QQA

## AMPLIFIER – HPA

Part Number	RF Bandwidth (GHz)	Gain (dB)	IP3 (dBm)	P-1dB OUT (dBm)	Sat. Output Power (dBm)	PAE %	Bias (mA)	Bias (V)	Case
CHA6653-QXG	27-33.5	20	38	32	33	23 @ Psat	900	6	QFN

## RF FRONT-END

Part Number	RF Bandwidth (GHz)	Gain RX (dB)	Gain TX (dB)	Psat TX (dBm)	NF RX (dBm)	ACPR (dBc) @ (dBm)	Case
CHC6054-QQA	24.25-30.5	18	28	31	3.25	36 @ 23	QFN

## AMPLIFIER – LNA

Part Number	RF Bandwidth (GHz)	Gain (dB)	Gain Flatness (+/-dB)	Noise Figure (dB)	P-1dB OUT (dBm)	Bias (mA)	Bias (V)	Case
CHA3688aQDG	12.5-30	26	2	2	14	85	4	QFN
CHA2069-FAB	16-32	22	1	2.5	10	55	4.5	Hermetic SMD
CHA2090-99F	17-24	23	1	2	10	55	4.5	Die
CHA2069-QDG	18-31	20	2	3	10.5	65	4.5	QFN
CHA2069-99F	18-31	22	1	2.5	10	55	4.5	Die
CHA2190-99F	20-30	15	0.5	2.2	11	50	4	Die
CHA2362-98F	26-40	22	-	2	9	65	4	Die
CHA2595-98F	27.5-43.5	19.5	-	2	11	61	3.3	Die
CHA2595-QDG	27.5-43.5	19.5	-	2.3	11	61	3.3	QFN

## AMPLIFIER – MPA

Part Number	RF Bandwidth (GHz)	Gain (dB)	IP3 (dBm)	P-1dB OUT (dBm)	Sat. Output Power (dBm)	Bias (mA)	Bias (V)	Case
CHA4253-FAB	17-21	26	33	23.5	24.5	230	4	Hermetic SMD
CHA4253aQQG	17-24	23	33	24	24.5	230	4	QFN
CHA5350-99F	17-24	26	35.5	26.5	27	300	6	Die
CHA3092-99F	20-33	22	29	20	-	300	3.5	Die
CHA2098b99F	20-40	19	-	16	16	150	3.5	Die
CHA3409-98F	25-45	23	26	19	20	100	4	Die

## ATTENUATOR – ANALOG

Part Number	RF Bandwidth (GHz)	Insertion Loss (dB)	Amplitude Control (dB)	P-1dB IN (dBm)	Case
CHT4690-99F	5-30	4	28	25	Die
CHT4690-FAB	5-30	4	31	25	Hermetic SMD
CHT4690-QAG	5-30	4	37	25	QFN
CHT4694-QAG	25-40	4	22	22	QFN
CHT4694-99F	25-45	4	24	22	Die

## ATTENUATOR – DIGITAL

Part Number	RF Bandwidth (GHz)	Number of Bits	Amplitude Control (dB)	Insertion loss (dB)	Attenuation error (dB)	P-1dB IN (dBm)	Control voltage (V)	Case
CHT3029-QEG	DC-30	4	15	5	+/-0.5	20	0/3.3 or 5	QFN
CHT3029-99F	DC-35	4	15	4.5	+/-0.5	20	0/3.3 or 5	Die

## DOWN - CONVERTER

Part Number	RF Bandwidth (GHz)	LO Bandwidth (GHz)	IF Bandwidth (GHz)	Conv. Gain (dB)	Noise Figure (dB)	P-1dB IN (dBm)	LO Input Power (dBm)	Bias (mA)	Bias (V)	Case
CHR3693-FAB	21-26.5	9-14	DC-3.5	13	2.5	-12	2	160	4	Hermetic SMD
CHR2295-99F	24-30	12-15	DC-1.5	11	3.5	-10	10	120	3.5	Die

## MIXER

Part Number	RF Bandwidth (GHz)	LO Bandwidth (GHz)	IF Bandwidth (GHz)	Conv. Gain (dB)	P-1dB IN (dBm)	LO Input Power (dBm)	Bias (mA)	Bias (V)	Case
CHM1290-99F	20-30	10-15	DC-6	-10	0	-4	33	4	Die
CHM1291-99F	25-32	12-15.5	0.1-3	-11	0	5	55	3.5	Die
CHR2294-99F	25-35	11-19	DC-3	-11	2.5	9	55	4	Die

# 6-18GHz Chipset

## Analogue Attenuator

CHT4690-FAB  
CHT4690-99F  
CHT4690-QAG

## Switch

CHS5100-99F  
CHS8618-99F

## MPA

CHA3023-99F    CHA3664-QAG  
CHA3024-99F    CHA4220-98F  
CHA3024-QGG    CHA4220-QGG  
CHA3063-99F

## Digital Attenuator

CHT3029-99F  
CHT3029-QEG  
CHT4016-99F  
CHT4016-QEG

## Phase Shifter

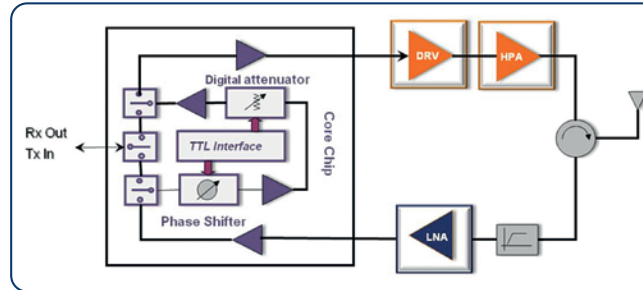
CHP4511-99F

## HPA

CHA7618-99F

## LNA

CHA3024-FDB  
CHA3656-FAB  
CHA3218-99F  
CHA3666-99F  
CHA3666-QAG  
CHA3666-FAB  
CHA3024-QGG



## AMPLIFIER – HPA

Part Number	RF Bandwidth (GHz)	Gain (dB)	IP3 (dBm)	P-1dB OUT (dBm)	Sat. Output Power (dBm)	PAE %	Bias (mA)	Bias (V)	Case
CHA7618-99F	5.5-18	30	-	-	40	20 @ 20dBm	530	18	Die

## AMPLIFIER – LNA

Part Number	RF Bandwidth (GHz)	Gain (dB)	Gain Flatness (+/-dB)	Noise Figure (dB)	P-1dB OUT (dBm)	Bias (mA)	Bias (V)	Case
CHA3218-99F	2-18	24	1	2	15	120	4	Die
CHA3024-FDB	2-22	15	-	3	18	100	5	Hermetic SMD
CHA3656-FAB	5.8-16	20	-	1.75	14.5	70	3.3	Hermetic SMD
CHA3666-QAG	5.8-17	21	0.5	1.8	16	80	4	QFN
CHA3666-FAB	6-16	21	1	1.8	17	80	4	Hermetic SMD
CHA3666-99F	6-17	21	0.5	1.8	17	80	4	Die



## AMPLIFIER – MPA

Part Number	RF Bandwidth (GHz)	Gain (dB)	IP3 (dBm)	P-1dB OUT (dBm)	Sat. Output Power (dBm)	Bias (mA)	Bias (V)	Case
CHA4220-98F	0.5-20	17	28	20	23	120	6.5	Die
CHA4220-QGG	0.5-20	17	28	20	23	120	6.5	QFN
CHA3023-99F	1-18	14	-	17	-	95	5	Die
CHA3024-99F	2-22	15	30	18	20	100	5	Die
CHA3024-QGG	2-22	15	28	18	20	100	5	QFN
CHA3664-QAG	5-21	15	25	19.5	20.5	120	5	QFN
CHA3063-99F	5.5-23	19	28	18	21	160	4	Die

## ATTENUATOR – ANALOG

Part Number	RF Bandwidth (GHz)	Insertion Loss (dB)	Amplitude Control (dB)	P-1 dB IN (dBm)	Case
CHT4690-99F	5-30	4	28	25	Die
CHT4690-QAG	5-30	4	31	25	QFN
CHT4690-FAB	5-30	3.5	37	25	Hermetic SMD

## ATTENUATOR – DIGITAL

Part Number	RF Bandwidth (GHz)	Number of Bits	Amplitude Control (dB)	Insertion loss (dB)	Attenuation error (dB)	P-1dB IN (dBm)	Control voltage (V)	Case
CHT3029-QEG	DC-30	4	15	5	+/-0.5	20	0/3.3 or 5	QFN
CHT3029-99F	DC-35	4	15	4.5	+/-0.5	20	0/3.3 or 5	Die
CHT4016-QEG	4-14	6	31.5	7	+/-0.8	23	-5/0	QFN
CHT4016-99F	4-16	6	31.5	6.5	-1.5/1	18	-5/0	Die

## PHASE SHIFTER

Part Number	RF Bandwidth (GHz)	Number of Bits	Phase range (°)	Insertion Loss (dB)	Phase Error (°p-p)	P-1dB IN (dBm)	Control voltage (V)	Case
CHP4511-99F	6-18	4	360	13	10	23	-5/0	Die

## SWITCH

Part Number	RF Bandwidth (GHz)	Loss (dB)	P-1dB IN (dBm)	Isolation (dB)	Type	Case
CHS5100-99F	DC-20	2.1	20	30	reflective	Die
CHS8618-99F	6-18	1.3	42	34	reflective	Die

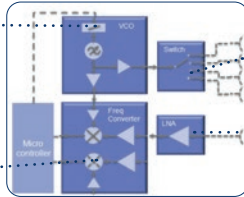
# Automotive & ISM 24GHz

**TX**

CHV2411aQDG  
CHV2421-QDG  
CHV3241-QDG

**RECEIVER**

CHR2411-QDG  
CHR2421-QEG



**SWITCH**

CHS2411-QDG

**LNA**

CHA2441-QAG  
CHA2411-QDG

**TRX**

CHC2444-QBB  
CHC2442-QPG  
CHC1443-QRA

**HPA**

CHC6652-QXG

**MPA**

CHA3395-QDG

## AMPLIFIER – LNA

Part Number	RF Bandwidth (GHz)	Gain (dB)	Gain Flatness (+/-dB)	Noise Figure (dB)	P-1dB OUT (dBm)	Bias (mA)	Bias (V)	Case
CHA2411-QDG	20-25	26	0.5	2.5	-	43	5	QFN
CHA2441-QAG	22-26	25.5	+/- 0.25	2.5	12	50	3.3	QFN

## TRX – 1TR2, 1TR4, 4TR2

Part Number	RF Bandwidth (GHz)	Gain RX (dB)	Gain TX (dB)	Pout TX (dBm)	NF RX (dB)	Number of Bit Atten.	Bias (mA)	Bias (V)	Case
CHC2442-QPG	24-24.5	37	VCO incl.	13.5	11.5	5	225	3.3	QFN
CHC2444-QBB	24-24.5	37	VCO incl.	13	11.5	5	315	3.3	QFN
CHC1443-QRA	24-24.25	37	VCO incl.	5	11.5	4	200	3.3	QFN

## RECEIVER R1, R2

Part Number	RF Bandwidth (GHz)	LO Bandwidth (GHz)	IF Bandwidth (GHz)	Conv. Gain (dB)	Noise Figure (dB)	P-1dB IN (dBm)	LO Input Power (dBm)	Bias (mA)	Bias (V)	Case
CHR2411-QDG	22-24.5	22-24.5	DC-0.001	23	7	-21	5	60	5	QFN
CHR2421-QEG	23.75-24.5	23.75-24.5	DC-0.001	22	7	-20	2	165	5	QFN

## TX - 1T, 2T

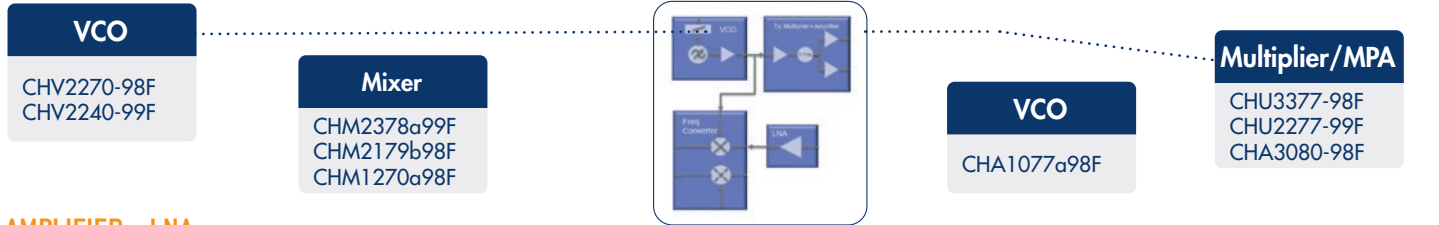
Part Number	Central Output Freq (GHz)	Tuning Bandwidth (GHz)	Noise @ 100KHz (dBc/Hz)	Output Power (dBm)	Bias (mA)	Bias (V)	Case
CHV2411aQDG	24.125	2	-90	16	220	5	QFN
CHV3241-QDG	24.125	2	-94	16	225	5	QFN
CHV2421-QDG	24.25	2	-90	15	233	5	QFN

## SWITCH - SP4T

Part Number	RF Bandwidth (GHz)	Loss (dB)	P-1dB IN (dBm)	Isolation (dB)	Type	Case
CHS2411-QDG	23-26	2.9	23.5	35	reflective	QFN

Automotive qualified product

# Automotive & ISM 77GHz



## AMPLIFIER – LNA

Part Number	RF Bandwidth (GHz)	Gain (dB)	Gain Flatness (+/-dB)	Noise Figure (dB)	P-1dB OUT (dBm)	Bias (mA)	Bias (V)	Case
CHA1077a98F	76-77	15	0.5	4.5	9	80	5	Die

## AMPLIFIER – MPA

Part Number	RF Bandwidth (GHz)	Gain (dB)	IP3 (dBm)	P-1dB OUT (dBm)	Sat. Output Power (dBm)	Bias (mA)	Bias (V)	Case
CHA3080-98F	71-76	16	25	19	21	280	3.5	Die

## MIXER

Part Number	RF Bandwidth (GHz)	LO Bandwidth (GHz)	IF Bandwidth (GHz)	Conv. Gain (dB)	P-1dB IN (dBm)	LO Input Power (dBm)	Bias (mA)	Bias (V)	Case
CHM2179b98F	76-77	76-77	DC-0.1	-8	0	5.5	1	4.5	Die
CHM2378a99F	76-77	76-77	DC-0.1	-7.5	0	7	1.5	4.5	Die
CHM1270a98F	76-77	76-77	DC-0.1	-7.5	0	15	-	-	Die

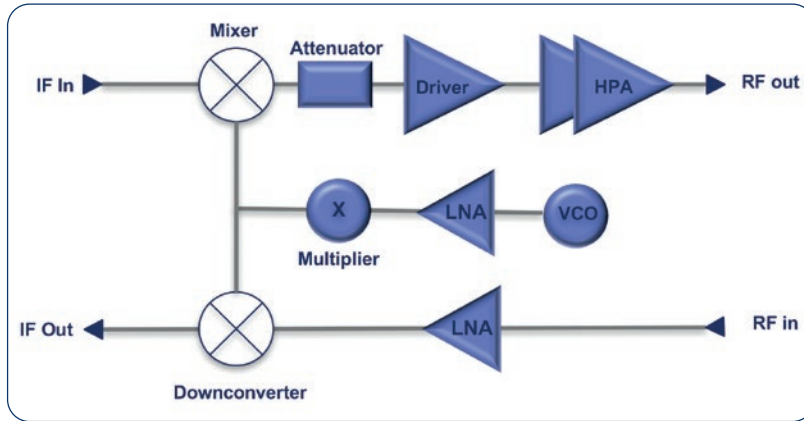
## MULTIPLIER

Part Number	Xn	Input Bandwidth (GHz)	Output Bandwidth (GHz)	Input Power (dBm)	Output Power (dBm)	Bias (mA)	Bias (V)	Case
CHU3377-98F	X6	12.67-12.83	76-77	4	15	210	4.5	Die
CHU2277-99F	X2	38-38.5	76-77	5	13	180	4.5	Die

## VCO

Part Number	Central Output Freq (GHz)	Tuning Bandwidth (GHz)	Noise @ 100KHz (dBc/Hz)	Output Power (dBm)	Bias (mA)	Bias (V)	Case
CHV2270-98F	12.7	1.2	-100	14	150	4.5	Die
CHV2240-99F	38.2	-	-100	9	120	4.5	Die

# Telecoms 6-8.5GHz



Buffer, VGA	LNA	Attenuator
CHA3565-QAG CHA3665-QAG CHA3666-QAG CHA3664-QAG	CHA3656-QAG CHA3666-99F CHA3666-QAG CHA2063a99F CHA3024-QGG	CHT4690-99F CHT4690-QAG CHT4660-QAG
		MPA
		CHA4350-QDG CHA3063-99F
IQ down converter	Detector	HPA
CHR3762-QDG CHR3662-QDG CHR3861-QEG	CHE1270a98F CHE1270-QAG CHE1270a99F	CHA7060-QAB

## AMPLIFIER – HPA

Part Number	RF Bandwidth (GHz)	Gain (dB)	IP3 (dBm)	P-1dB OUT (dBm)	Sat. Output Power (dBm)	PAE %	Bias (mA)	Bias (V)	Case
CHA7060-QAB	5.6-8.5	30	45	33	41	40 @ 41dBm	420	20	QFN

## AMPLIFIER – LNA

Part Number	RF Bandwidth (GHz)	Gain (dB)	Gain Flatness (+/-dB)	Noise Figure (dB)	P-1dB OUT (dBm)	Bias (mA)	Bias (V)	Case
CHA3024-QGG	2-22	15	-	3	18	100	5	QFN
CHA3666-QAG	5.8-17	21	0.5	1.8	16	80	4	QFN
CHA3666-99F	6-17	21	0.5	1.8	17	80	4	Die
CHA3656-QAG	6-17	20	0.5	1.7	14	68	3	QFN
CHA2063a99F	7-13	19	2	2	8	40	4	Die

## AMPLIFIER – MPA

Part Number	RF Bandwidth (GHz)	Gain (dB)	IP3 (dBm)	P-1dB OUT (dBm)	Sat. Output Power (dBm)	Bias (mA)	Bias (V)	Case
CHA3664-QAG	5-21	15	25	19.5	20.5	120	5	QFN
CHA3665-QAG	5-21	15	25	19.5	20.5	120	5	QFN
CHA3565-QAG	5-21	15	25	19.5	20.5	120	5	QFN
CHA4350-QDG	5.5-11.7	26	32	24	25	125	5.5	QFN
CHA3063-99F	5.5-23	19	28	18	21	160	4	Die

## ATTENUATOR – ANALOG

Part Number	RF Bandwidth (GHz)	Insertion Loss (dB)	Amplitude Control (dB)	P-1dB IN (dBm)	Case
CHT4660-QAG	DC-16	2	30	24	QFN
CHT4690-99F	5-30	4	28	25	Die
CHT4690-QAG	5-30	4	31	25	QFN

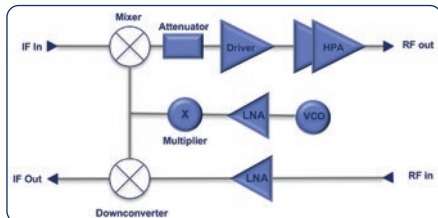
## DETECTOR

Part Number	RF Bandwidth (GHz)	Loss (dB)	Dynamic Range (dB)	Type	Case
CHE1270a98F	5-44	-	30	Wide-Band	Die
CHE1270a99F	5-44	-	30	Wide-Band	Die
CHE1270-QAG	5-44	-	30	Wide-Band	QFN

## DOWN - CONVERTER

Part Number	RF Bandwidth (GHz)	LO Bandwidth (GHz)	IF Bandwidth (GHz)	Conv. Gain (dB)	Noise Figure (dB)	P-1dB IN (dBm)	LO Input Power (dBm)	Bias (mA)	Bias (V)	Case
CHR3762-QDG	5.5-9	4-12	DC-3.5	14	1.7	-5	5	100	3	QFN
CHR3861-QEG	5.9-9	3-12.5	DC-3.5	12	2.5	-7	0	380	4	QFN
CHR3662-QDG	7-16	4.5-19.5	DC-3.5	13	3	-8	0	280	4.5	QFN

# 13-18GHz & VSAT Ku Chipset



IQ down converter	Buffer, VGA	Detector	LNA	MPA	PA
CHR3763-QDG CHR3352-QEG CHR3364-QEG CHR3662-QDG CHR3362-QEG CHR3664-QEG	CHA3565-QAG CHA3665-QAG CHA3664-QAG CHA3024-99F CHA3024-QGG	CHE1 260-98F CHE1 260-QAG CHE1 270a98F CHE1 270-QAG CHE1 270a99F	CHA3666-QAG CHA2066-QAG CHA3688aQDG CHA3656-QAG	CHA4253aQQG CHA5266-QDG CHA4253a98F	CHA6362-QXG CHA6550-QXG CHA6550-98F CHA7062-QCB CHA6262-99F CHA8252-99F CHA8254-99F
			Attenuator	Multiplier	
			CHT4690-QAG	CHX2193-99F CHX2089-99F	

## AMPLIFIER – HPA

Part Number	RF Bandwidth (GHz)	Gain (dB)	IP3 (dBm)	P-1dB OUT (dBm)	Sat. Output Power (dBm)	PAE %	Bias (mA)	Bias (V)	Case
CHA7062-QCB	12.7-19.7	20	-	-	37	20 @ 37dBm	300	20	QFN
CHA6550-98F	17-23.6	22	39	33.5	34	20 @ Psat	1300	6	Die
CHA6550-QXG	17- 24	22	41	33.5	34	20 @ Psat	1300	6	QFN
CHA8252-99F	17.3-20.3	31	-	-	41	35 @ Pin 16dBm	300	18	Die
CHA8254-99F	17.3-20.3	29	-	-	40	31 @ Pin 20dBm 27 @ Pin 14dBm	225	15	Die
CHA6362-QXG	17.7-19.7	22	42	33	34.5	24 @ Psat	1340	6	QFN
CHA6262-99F	17.3-21.3	29	-	33	36	25 @ Psat	260	18	Die

## AMPLIFIER – LNA

Part Number	RF Bandwidth (GHz)	Gain (dB)	Gain Flatness (+/-dB)	Noise Figure (dB)	P-1dB OUT (dBm)	Bias (mA)	Bias (V)	Case
CHA3024-QGG	2-22	15	-	3	18	100	5	QFN
CHA3666-QAG	5.8-17	21	0.5	1.8	16	80	4	QFN
CHA3656-QAG	6-17	20	0.5	1.7	14	68	3	QFN
CHA2066-QAG	10-16	16	1	2.5	10	50	4	QFN
CHA3688aQDG	12.5-30	26	2	2	14	85	4	QFN

## AMPLIFIER – MPA

Part Number	RF Bandwidth (GHz)	Gain (dB)	IP3 (dBm)	P-1dB OUT (dBm)	Sat. Output Power (dBm)	Bias (mA)	Bias (V)	Case
CHA3664-QAG	5-21	15	25	19.5	20.5	120	5	QFN
CHA3665-QAG	5-21	15	25	19.5	20.5	120	5	QFN
CHA3565-QAG	5-21	15	25	19.5	20.5	120	5	QFN
CHA5266-QDG	10-16	23	35	25.5	27	320	5	QFN
CHA4253aQQG	17-24	23	33	24	24.5	230	4	QFN
CHA4253a98F	17-24	26	32	24.5	25	230	4	Die

## AMPLIFIER – ANALOG VGA

Part Number	RF Bandwidth (GHz)	Gain (dB)	Gain Flatness (+/-dB)	Noise Figure (dB)	Gain Control Range (dB)	P-1dB OUT (dBm)	Bias (mA)	Bias (V)	Case
CHA3024-99F	2-22	15	0.5	3	30	18	100	5	Die
CHA3024-QGG	2-22	15	-	3	30	18	100	5	QFN
CHA4253aQQG	17-24	23	1	7.5	15	24	230	4	QFN

## ATTENUATOR – ANALOG

Part Number	RF Bandwidth (GHz)	Insertion Loss (dB)	Amplitude Control (dB)	P-1dB IN (dBm)	Case
CHT4690-QAG	5-30	4	31	25	QFN

## DETECTOR

Part Number	RF Bandwidth (GHz)	Loss (dB)	Dynamic Range (dB)	Type	Case
CHE1270a99F	5-44	-	30	Wide-Band	Die
CHE1270-QAG	5-44	-	30	Wide-Band	QFN
CHE1260-QAG	10-27	1	30	Bidirectional	QFN

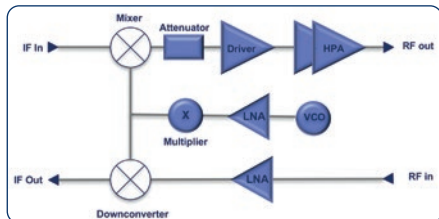
## DOWN - CONVERTER

Part Number	RF Bandwidth (GHz)	LO Bandwidth (GHz)	IF Bandwidth (GHz)	Conv. Gain (dB)	Noise Figure (dB)	P-1dB IN (dBm)	LO Input Power (dBm)	Bias (mA)	Bias (V)	Case
CHR3662-QDG	7-16	4.5-19.5	DC-3.5	13	3	-8	0	280	4.5	QFN
CHR3362-QEG	10-16	6.5-19.5	DC-3.5	13	3.2	-6	0	310	4	QFN
CHR3352-QEG	12-16	8.5-19.5	DC-3.5	13	2.7	-6	0	250	4	QFN
CHR3763-QDG	12-16	8.5-19.5	DC-3.5	12	2.3	-8	5	80	3	QFN
CHR3364-QEG	17-24	6.5-14	DC-3.5	11	2.7	-7	0	320	4	QFN
CHR3664-QEG	17-27	7-15	DC-3.5	12	3.3	-8	0	320	4	QFN

## MULTIPLIER

Part Number	Xn	Input Bandwidth (GHz)	Output Bandwidth (GHz)	Input Power (dBm)	Output Power (dBm)	Bias (mA)	Bias (V)	Case
CHX2193-99F	X2	6.25-8.25	12.5-16.5	12	14	60	3.5	Die
CHX2089-99F	X2	8-11.5	16-23	12	15	60	3.5	Die

# 23-26GHz Chipset



MPA
CHA3395-QDG
CHA5350-99F
CHA4253aQQG
CHA3395-98F
CHA4253a98F

PA
CHA6356-QXG
CHA6550-QXG
CHA6550-98F
CHA6652-QXG
CHA6652-98F

IQ down converter
CHR3364-QEG
CHR3764-QEG
CHR3693-QDG
CHM1290-99F
CHR3664-QEG

Buffer, VGA
CHA3395-QDG
CHA3688aQDG
CHA2293-99F
CHA4253aQQG

RF Front-End
CHC6054-QQA

Detector
CHE1260-98F
CHE1260-QAG
CHE1270a99F
CHE1270-QAG
CHE1270a98F

Attenuator
CHT4690-99F
CHT4690-QAG

Multiplier
CHX2095a99F
CHX2090-99F
CHX2090-QDG

LNA
CHA3688aQDG
CHA2069-QDG
CHA2090-99F
CHA2441-QAG

## AMPLIFIER – HPA

Part Number	RF Bandwidth (GHz)	Gain (dB)	IP3 (dBm)	P-1dB OUT (dBm)	Sat. Output Power (dBm)	PAE %	Bias (mA)	Bias (V)	Case
CHA6550-98F	17-23.6	22	39	33.5	34	20 @ Psat	1300	6	Die
CHA6550-QXG	17- 24	22	41	33.5	34	20 @ Psat	1300	6	QFN
CHA6652-98F	21-27.5	22.5	39	32.5	33	25 @ Psat	1300	6	Die
CHA6652-QXG	21-27.5	20	41	32.5	33	25 @ Psat	1300	6	QFN
CHA6356-QXG	21.2-23.6	20	42	33	33.5	22 @ Psat	1300	6	QFN

## AMPLIFIER – LNA

Part Number	RF Bandwidth (GHz)	Gain (dB)	Gain Flatness (+/-dB)	Noise Figure (dB)	P-1dB OUT (dBm)	Bias (mA)	Bias (V)	Case
CHA3688aQDG	12.5-30	26	2	2	14	85	4	QFN
CHA2090-99F	17-24	23	1	2	10	55	4.5	Die
CHA2069-QDG	18-31	20	2	3	10.5	65	4.5	QFN
CHA2069-99F	18-31	22	1	2.5	10	55	4.5	Die
CHA2441-QAG	22-26	25.5	+/- 0.25	2.5	12	50	3.3	QFN

## AMPLIFIER – MPA

Part Number	RF Bandwidth (GHz)	Gain (dB)	IP3 (dBm)	P-1dB OUT (dBm)	Sat. Output Power (dBm)	Bias (mA)	Bias (V)	Case
CHA4253aQQG	17-24	23	33	24	24.5	230	4	QFN
CHA5350-99F	17-24	26	35.5	26.5	27	300	6	Die
CHA3395-98F	21-30	24	32	20	22.5	180	4	Die
CHA3395-QDG	21-30	24	32	20	22	180	4	QFN
CHA4253a98F	17-24	26	32	24.5	25	230	4	Die



## AMPLIFIER – ANALOG VGA

Part Number	RF Bandwidth (GHz)	Gain (dB)	Gain Flatness (+/-dB)	Noise Figure (dB)	Gain Control Range (dB)	P-1dB OUT (dBm)	Bias (mA)	Bias (V)	Case
CHA4253aQQG	17-24	23	1	7.5	15	24	230	4	QFN
CHA3660-QQG	21-27.5	25	1	4	15	19	180	4	QFN
CHA3395-QDG	21-30	24	0.5	4.5	15	20	180	4	QFN
CHA2293-99F	24-30	24	1.5	3	15	12	160	5	Die

## ATTENUATOR – ANALOG

Part Number	RF Bandwidth (GHz)	Insertion Loss (dB)	Amplitude Control (dB)	P-1dB IN (dBm)	Case
CHT4690-99F	5-30	4	28	25	Die

## DETECTOR

Part Number	RF Bandwidth (GHz)	Loss (dB)	Dynamic Range (dB)	Type	Case
CHE1270a98F	5-44	-	30	Wide-Band	Die
CHE1270a99F	5-44	-	30	Wide-Band	Die
CHE1270-QAG	5-44	-	30	Wide-Band	QFN
CHE1260-98F	10-27	0.8	30	Bidirectional	Die
CHE1260-QAG	10-27	1	30	Bidirectional	QFN

## DOWN - CONVERTER

Part Number	RF Bandwidth (GHz)	LO Bandwidth (GHz)	IF Bandwidth (GHz)	Conv. Gain (dB)	Noise Figure (dB)	P-1dB IN (dBm)	LO Input Power (dBm)	Bias (mA)	Bias (V)	Case
CHR3364-QEG	17-24	6.5-14	DC-3.5	11	2.7	-7	0	320	4	QFN
CHR3664-QEG	17-27	7-15	DC-3.5	12	3.3	-8	0	320	4	QFN
CHR3693-QDG	21-26.5	9-14	DC-3.5	14	3	-12	2	160	4	QFN
CHR3764-QEG	21-27	8.5-15	DC-3.5	14	3.1	-7	0	320	4	QFN

## RF FRONT-END

Part Number	RF Bandwidth (GHz)	Gain RX (dB)	Gain TX (dB)	Psat TX (dBm)	NF RX (dBm)	ACPR (dBc) @ (dBm)	Case
CHC6054-QQA	24.25-30.5	18	28	31	3.25	36 @ 23	QFN

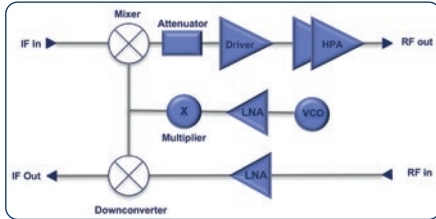
## MIXER

Part Number	RF Bandwidth (GHz)	LO Bandwidth (GHz)	IF Bandwidth (GHz)	Conv. Gain (dB)	P-1dB IN (dBm)	LO Input Power (dBm)	Bias (mA)	Bias (V)	Case
CHM1290-99F	20-30	10-15	DC-6	-10	0	-4	33	4	Die

## MULTIPLIER

Part Number	Xn	Input Bandwidth (GHz)	Output Bandwidth (GHz)	Input Power (dBm)	Output Power (dBm)	Bias (mA)	Bias (V)	Case
CHX2095a99F	X4	6.25-8.25	25-33	12	11	75	3.5	Die
CHX2090-99F	X2	11-13	22-26	12	15	50	3.5	Die
CHX2090-QDG	X2	11-13	22-26	14	12	65	3.5	QFN

# 28-32GHz & VSAT Ka Chipset



LNA	IQ down converter	Detector	Buffer, VGA	MPA	PA
CHA2595-QDG CHA3689-99F CHA3688aQDG CHA2069-99F CHA2190-99F <b>CHA2595-98F</b>	CHR2294-99F CHR2295-99F CHM1290-99F CHM1291-99F	CHE1270a98F CHE1270-QAG CHE1260-98F CHE1260-QAG CHE1270a99F	CHA3689-99F CHA3688aQDG CHA2293-99F CHA3395-98F CHA3396-99F	CHA3409-98F CHA3395-QDG CHA3092-99F CHA2098b99F CHA3396-99F	CHA6653-98F CHA6653-QXG
		IQ up converter	Multiplier	Attenuator	RF Front-End
		CHR2294-99F	CHX3068-QDG CHX2095a99F	CHT4694-99F CHT4694-QAG	<b>CHC6054-QQA</b>

## AMPLIFIER – HPA

Part Number	RF Bandwidth (GHz)	Gain (dB)	IP3 (dBm)	P-1dB OUT (dBm)	Sat. Output Power (dBm)	PAE %	Bias (mA)	Bias (V)	Case
CHA6653-98F	27-34	23	38	31	32	17 @ Psat	900	6	Die
CHA6653-QXG	27-33.5	20	38	32	33	23 @ Psat	900	6	QFN

## AMPLIFIER – LNA

Part Number	RF Bandwidth (GHz)	Gain (dB)	Gain Flatness (+/-dB)	Noise Figure (dB)	P-1dB OUT (dBm)	Bias (mA)	Bias (V)	Case
CHA3688aQDG	12.5-30	26	2	2	14	85	4	QFN
CHA3689-99F	12.5-30	26	2	2	15	90	4	Die
CHA2069-99F	18-31	22	1	2.5	10	55	4.5	Die
CHA2190-99F	20-30	15	0.5	2.2	11	50	4	Die
<b>CHA2595-98F</b>	<b>27.5-43.5</b>	<b>19.5</b>	<b>-</b>	<b>2</b>	<b>11</b>	<b>61</b>	<b>3.3</b>	<b>Die</b>
CHA2595-QDG	27.5-43.5	19.5	-	2.3	11	61	3.3	QFN

## AMPLIFIER – MPA

Part Number	RF Bandwidth (GHz)	Gain (dB)	IP3 (dBm)	P-1dB OUT (dBm)	Sat. Output Power (dBm)	Bias (mA)	Bias (V)	Case
CHA3092-99F	20-33	22	29	20	-	300	3.5	Die
CHA2098b99F	20-40	19	-	16	16	150	3.5	Die
CHA3395-QDG	21-30	24	32	20	22	180	4	QFN
<b>CHA3395-98F</b>	<b>21-30</b>	<b>24</b>	<b>32</b>	<b>20</b>	<b>22.5</b>	<b>180</b>	<b>4</b>	<b>QFN</b>
CHA3409-98F	25-45	23	26	19	20	100	4	Die
CHA3396-QDG	27-33.5	22	30	19	21	155	4	QFN

## AMPLIFIER – ANALOG VGA

Part Number	RF Bandwidth (GHz)	Gain (dB)	Gain Flatness (+/-dB)	Noise Figure (dB)	Gain Control Range (dB)	P-1dB OUT (dBm)	Bias (mA)	Bias (V)	Case
CHA3395-QDG	21-30	24	0.5	4.5	15	20	180	4	QFN
CHA2293-99F	24-30	24	1.5	3	15	12	160	5	Die
CHA3396-QDG	27-33.5	22	1.5	4.5	15	19	155	4	QFN

## ATTENUATOR – ANALOG

Part Number	RF Bandwidth (GHz)	Insertion Loss (dB)	Amplitude Control (dB)	P-1dB IN (dBm)	Case
CHT4694-QAG	25-40	4	22	22	QFN
CHT4694-99F	25-45	4	24	22	Die

## DETECTOR

Part Number	RF Bandwidth (GHz)	Loss (dB)	Dynamic Range (dB)	Type	Case
CHE1270a98F	5-44	-	30	Wide-Band	Die
CHE1270a99F	5-44	-	30	Wide-Band	Die
CHE1270-QAG	5-44	-	30	Wide-Band	QFN
CHE1260-98F	10-27	0.8	30	Bidirectionnal	Die
CHE1260-QAG	10-27	1	30	Bidirectionnal	QFN

## RF FRONT-END

Part Number	RF Bandwidth (GHz)	Gain RX (dB)	Gain TX (dB)	Psat TX (dBm)	NF RX (dBm)	ACPR (dBc) @ (dBm)	Case
CHC6054-QQA	24.25-30.5	18	28	31	3.25	36 @ 23	QFN

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## DOWN - CONVERTER

Part Number	RF Bandwidth (GHz)	LO Bandwidth (GHz)	IF Bandwidth (GHz)	Conv. Gain (dB)	Noise Figure (dB)	P-1dB IN (dBm)	LO Input Power (dBm)	Bias (mA)	Bias (V)	Case
CHR2295-99F	24-30	12-15	DC-1.5	11	3.5	-10	10	120	3.5	Die

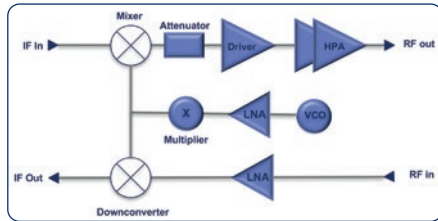
## MIXER

Part Number	RF Bandwidth (GHz)	LO Bandwidth (GHz)	IF Bandwidth (GHz)	Conv. Gain (dB)	P-1dB IN (dBm)	LO Input Power (dBm)	Bias (mA)	Bias (V)	Case
CHM1290-99F	20-30	10-15	DC-6	-10	0	-4	33	4	Die
CHM1291-99F	25-32	12-15.5	0.1-3	-11	0	5	55	3.5	Die
CHR2294-99F	25-35	11-19	DC-3	-11	2.5	9	55	4	Die

## MULTIPLIER

Part Number	Xn	Input Bandwidth (GHz)	Output Bandwidth (GHz)	Input Power (dBm)	Output Power (dBm)	Bias (mA)	Bias (V)	Case
CHX2095a99F	X4	6.25-8.25	25-33	12	11	75	3.5	Die
CHX3068-QDG	X2	14-15	28-30	0	20	270	4	QFN

# 36-44GHz Chipset



## Multiplier

CHX1191-98F  
CHX1191-QDG  
CHX1162-QDG  
CHX2091-99F

## IQ down converter

CHR3894-QEG  
CHR3394-QEG  
CHM1294-99F

## LNA

CHA2595-QDG  
CHA2362-98F  
CHA2494-98F  
CHA2494-QEG  
CHA2394-99F  
CHA2595-98F

## Buffer, VGA

CHA2098b99F  
CHA3397-QDG  
CHA3398-QDG

## Attenuator

CHT4694-99F  
CHT4694-QAG  
CHT4699-QDG

## MPA

CHA3409-98F  
CHA2098b99F  
CHA3397-QDG  
CHA3398-QDG

## PA

CHA5659-98F  
CHA6194-QXG  
CHA5659-QXG

## Detector

CHE1270a98F  
CHE1270-QAG  
CHE1270a99F

## IQ up converter

CHM1294-99F

## AMPLIFIER – HPA

Part Number	RF Bandwidth (GHz)	Gain (dB)	IP3 (dBm)	P-1dB OUT (dBm)	Sat. Output Power (dBm)	PAE %	Bias (mA)	Bias (V)	Case
CHA5659-98F	36-43.5	22	38	30	31	15 @ Psat	800	6	Die
CHA5659-QXG	36-43.5	20	38.5	29.5	30	15 @ Psat	800	6	QFN
CHA6194-QXG	37- 40	20	38	30	31	-	800	6	QFN

## AMPLIFIER – LNA

Part Number	RF Bandwidth (GHz)	Gain (dB)	Gain Flatness (+/-dB)	Noise Figure (dB)	P-1dB OUT (dBm)	Bias (mA)	Bias (V)	Case
CHA2362-98F	26-40	22	-	2	9	65	4	Die
CHA2595-98F	27.5-43.5	19.5	-	2	11	61	3.3	Die
CHA2595-QDG	27.5-43.5	19.5	-	2.3	11	61	3.3	QFN
CHA2494-98F	34-44	20	-	3	12	80	4	Die
CHA2494-QEG	34-44	22	1.5	3	12	80	4	QFN
CHA2394-99F	36-40	21	1.5	2.5	8	60	3.5	Die

## AMPLIFIER – MPA

Part Number	RF Bandwidth (GHz)	Gain (dB)	IP3 (dBm)	P-1dB OUT (dBm)	Sat. Output Power (dBm)	Bias (mA)	Bias (V)	Case
CHA2098b99F	20-40	19	-	16	16	150	3.5	Die
CHA3409-98F	25-45	23	26	19	20	100	4	Die
CHA3397-QDG	36-40.5	21	29	18	20	200	4	QFN
CHA3398-QDG	36-43.5	22	29	18	19	200	4	QFN

## AMPLIFIER – ANALOG VGA

Part Number	RF Bandwidth (GHz)	Gain (dB)	Gain Flatness (+/-dB)	Noise Figure (dB)	Gain Control Range (dB)	P-1dB OUT (dBm)	Bias (mA)	Bias (V)	Case
CHA3397-QDG	36-40.5	21	1	7	15	18	200	4	QFN
CHA3398-QDG	36-43.5	22	1	7	15	18	200	4	QFN

## ATTENUATOR – ANALOG

Part Number	RF Bandwidth (GHz)	Insertion Loss (dB)	Amplitude Control (dB)	P-1dB IN (dBm)	Case
CHT4694-QAG	25-40	4	22	22	QFN
CHT4694-99F	25-45	4	24	22	Die
CHT4699-QDG	36-44	4	30	20	QFN

## DETECTOR

Part Number	RF Bandwidth (GHz)	Loss (dB)	Dynamic Range (dB)	Type	Case
CHE1270a98F	5-44	-	30	Wide-Band	Die
CHE1270a99F	5-44	-	30	Wide-Band	Die
CHE1270-QAG	5-44	-	30	Wide-Band	QFN

## DOWN - CONVERTER

Part Number	RF Bandwidth (GHz)	LO Bandwidth (GHz)	IF Bandwidth (GHz)	Conv. Gain (dB)	Noise Figure (dB)	P-1dB IN (dBm)	LO Input Power (dBm)	Bias (mA)	Bias (V)	Case
CHR3394-QEG	37-40	17.5-21	DC-3.5	13	3.5	-7	0	250	4	QFN
CHR3894-QEG	37-40	17.5-21	DC-3.5	13	4	-6	0	250	4	QFN

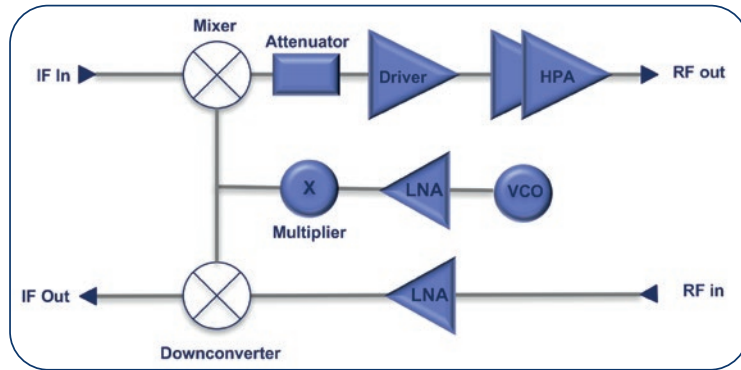
## MIXER

Part Number	RF Bandwidth (GHz)	LO Bandwidth (GHz)	IF Bandwidth (GHz)	Conv. Gain (dB)	P-1dB IN (dBm)	LO Input Power (dBm)	Bias (mA)	Bias (V)	Case
CHM1294-99F	35-45	16-24	DC-3	-11	0	10	60	4	Die

## MULTIPLIER

Part Number	Xn	Input Bandwidth (GHz)	Output Bandwidth (GHz)	Input Power (dBm)	Output Power (dBm)	Bias (mA)	Bias (V)	Case
CHX2092a99F	X4	9-10	36-40	12	11	80	3.5	Die
CHX1191-QDG	X3	11-14.5	33-43.5	1	6	80	5	QFN
CHX1191-98F	X3	11.25-14.5	33.75-43.5	-1	6	80	5	Die
CHX2091-99F	X2	17-20	34-40	12	12	50	3.5	Die
CHX1162-QDG	X2	17.5-21.5	35-43	1	8	50	5	QFN

# 52-85GHz & E-Band Chipset



## Multiplier

CHX2192-99F  
CHX1191-98F  
CHX1191-QDG  
CHX1162-QDG

## Buffer, VGA

CHA2080-98F  
CHA2159-99F  
CHA2157-99F

## LNA

CHA2080-98F  
CHA2159-99F  
CHA2157-99F  
CHA1077a98F  
CHA1008-99F

## PA

CHA3080-98F  
CHA3090-98F

## IQ down converter

CHM1080-98F  
CHM1298-99F

## IQ up converter

CHR1080a98F  
CHM1298-99F

## MPA

CHA2159-99F  
CHA2157-99F

## AMPLIFIER – LNA

Part Number	RF Bandwidth (GHz)	Gain (dB)	Gain Flatness (+/-dB)	Noise Figure (dB)	P-1dB OUT (dBm)	Bias (mA)	Bias (V)	Case
CHA2157-99F	55-60	10	1	3.5	15	60	3.3	Die
CHA2159-99F	55-65	20	1	4	14	115	3.5	Die
CHA2080-98F	71-86	22	0.8	3.5	10	75	3.5	Die
CHA1077a98F	76-77	15	0.5	4.5	9	80	5	Die
CHA1008-99F	80-105	17	1	6.5	5	115	2.5	Die

## AMPLIFIER – MPA

Part Number	RF Bandwidth (GHz)	Gain (dB)	IP3 (dBm)	P-1dB OUT (dBm)	Sat. Output Power (dBm)	Bias (mA)	Bias (V)	Case
CHA3080-98F	71-76	16	25	19	21	280	3.5	Die
CHA3090-98F	81-86	13	23	17	19	280	3.5	Die

## DOWN - CONVERTER

Part Number	RF Bandwidth (GHz)	LO Bandwidth (GHz)	IF Bandwidth (GHz)	Conv. Gain (dB)	Noise Figure (dB)	P-1dB IN (dBm)	LO Input Power (dBm)	Bias (mA)	Bias (V)	Case
CHR1080a98F	71-86	34.5-44	DC-12	8	5	-10	1	175	3.5	Die

## MIXER

Part Number	RF Bandwidth (GHz)	LO Bandwidth (GHz)	IF Bandwidth (GHz)	Conv. Gain (dB)	P-1dB IN (dBm)	LO Input Power (dBm)	Bias (mA)	Bias (V)	Case
CHM1298-99F	55-65	27.5-32.5	DC-5	-12	0	10	90	3.5	Die
CHM1080-98F	71-86	34.5-44	DC-12	-11	10	2	90	3.5	Die

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## MULTIPLIER

Part Number	Xn	Input Bandwidth (GHz)	Output Bandwidth (GHz)	Input Power (dBm)	Output Power (dBm)	Bias (mA)	Bias (V)	Case
CHX1191-QDG	X3	11-14.5	33-43.5	1	6	80	5	QFN
CHX1191-98F	X3	11.25-14.5	33.75-43.5	-1	6	80	5	Die
CHX1162-QDG	X2	17.5-21.5	35-43	1	8	50	5	QFN
CHX2192-99F	X2	27-33	54-66	12	11	130	3.5	Die

# Catalogue products commercial designation

Prefix		Radical <i>(The 1<sup>st</sup> digit after the prefix indicate the power range)</i>			Suffix	
<b>CHA</b>	Amplifiers		<b>W</b>	<b>dBm</b>	<b>Bare die products</b>	<b>Packages</b> <i>(The first letter defines the package family)</i>
<b>CHC</b>	Core chips / RF Front End	<b>1</b>	P < 10mW	P < 10dBm		
<b>CHE</b>	Detectors	<b>2</b>	10mW < P < 30mW	10dBm < P < 150dBm	<b>99F</b> Standard	<b>F</b> Ceramic metal SMD unleaded
<b>CHK</b>	GaN power bars	<b>3</b>	30mW < P < 100mW	15dBm < P < 20dBm		<b>Q</b> Over molded plastic SMD
<b>CHM</b>	Mixers	<b>4</b>	100mW < P < 300mW	20dBm < P < 25dBm		
<b>CHP</b>	Phase shifters	<b>5</b>	300mW < P < 1W	25dBm < P < 30dBm	<b>98F</b> With BCB protection	<b>S</b> Ceramic metal non SMD leaded
<b>CHR</b>	Down-converters	<b>6</b>	1W < P < 5W	30dBm < P < 37dBm		
<b>CHS</b>	Switch	<b>7</b>	5W < P < 10W	37dBm < P < 40dBm	<b>Dies can be delivered in Gel Pack, Waffle Pack or wafer on films</b>  <b>QFN can be delivered in Stick, Tape &amp; Reel or Waffle Pack</b>  <b>Other Package in Waffle Pack</b>	
<b>CHT</b>	Attenuators	<b>8</b>	10W < P < 50W	40dBm < P < 47dBm		
<b>CHU</b>	Up-converters	<b>9</b>	50W < P < 100W	47dBm < P < 50dBm		
<b>CHV</b>	Oscillators	<b>A</b>	100W < P < 500W	50dBm < P < 57dBm		
<b>CHW</b>	Power Divider	<b>B</b>	500W < P < 1000W	57dBm < P < 60dBm		
<b>CHX</b>	Multipliers	<b>C</b>	1000W < P < 5000W	60dBm < P < 67dBm		
<b>CHZ</b>	GaN power bars internally matched					
<b>EC</b>	GaAs transistors					

Exemple line

<b>CHA</b>	<b>6710</b>	<b>- 99F</b>
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# Notes

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