

CONQUER SPACE WITH UMS

UMS RF Space
solutions for New
Space, LEO, GEO,
deep space missions,
Earth observation
and communications



A long heritage with more than 100 000 flying MMICs.

- GaAs and GaN state of the art proprietary technologies,
- Catalog products in bare die or package,
- Foundry service,
- ASIC design service.

Space evaluated technologies

GaN and GaAs processes from
DC to 100GHz

- Low noise and power pHEMT
- HBT
- Schottky diode
- MESFET
- GaN HEMT

Hermetic solutions

Our hermetic metal ceramic SMD packaged
products exhibit state of the art reliability
and electrical performance.

- Operation up to Ka-Band
- Hermetic sealing
- Space qualified assembly process and
space documentation
- Traceability

A complete offer:

- Large range of standard COTS products
in bare die or in QFN for New Space.
- Class S / Hi-Rel products
 - Catalog GaAs and GaN bare die
MMICs with WAT/LAT qualification.*
 - Specific range of off-the-shelf products
in hermetic packages.
- Development of MMICs according to
specifications
- Open Foundry service with Space
evaluated processes to design your
products

For New Space projects, benefit from UMS' experience with the support of a dedicated full or optimised qualification flow.

* Based on standards ESA/ESCC 9010 specifications and MIL-PRF-38354.



Build your own solution with UMS

www.ums-gaas.com





UMS catalog space offer

Already flying in GEO and beyond
fully qualified according to ESA/ESCC

AMPLIFIER LNA	Freq (GHz)	Gain (dB)	NF (dB)	OP1dB (dBm)
CHA3801-FAB	1-2	28	1.5	16
CHA3801-99F	1-2	28	1.5	15
CHA3024-FDB	2-22	14.5	3.25	17.5
CHA3656-FAB	5.8-16	20	1.75	14.5
CHA3666-FAB	6-16	21	1.8	17
CHA3666-99F	6-17	21	1.8	17
CHA2110-98F	7-12	19	1.2	11
CHA2063a99F	7-13	19	2	8
CHA2066-99F	10-16	16	2	10
CHA3689-99F	12.5-30	26	2	15
CHA2069-FAB	16-32	22	2.5	10
CHA2092b99F	18-32	22	2.5	10
CHA2095a99F	36-40	26	3.5	10
CHA2394-99F	36-40	21	2.5	8
CHA2194-99F	36-44	19	3	10
CHA2157-99F	55-60	10	3.5	15

AMPLIFIER – MPA	Freq (GHz)	Gain (dB)	OP1dB (dBm)	IP3 (dBm)
CHA3023-99F	1-18	14	17	-
CHA4314-98F	4.5-11.5	19	26	34
CHA5115-99F	8-12	25	28	-
CHA6710-FAB	8-12.75	22.5	-	39
CHA5266-FAB	10-16	23.5	26	35.5
CHA4253-FAB	17-21	26	23.5	33
CHA5350-99F*	17-24	26	26.5	35.5
CHA2098b99F	20-40	19	16	-

AMPLIFIER – HPA	Freq (GHz)	Gain (dB)	IP3 (dBm)	Psat (dBm)
CHA8054-99F	7.7-8.6	27	-	43.6
CHA7115-99F	8.5-11.5	27.5	-	39
CHA8352-99F	10.7-12.7	23	-	43.5
CHA6550-98F	17.23.6	22	39	34
CHA6551-99F	17-24	22	39	32
CHA6652-98F	21-27.5	22.5	39	33
CHA6653-98F	27-33.5	20	38	33

ATTENUATOR – ANALOG	Freq (GHz)	Ins. Loss (dB)	Att. Range (dB)	IP-1dB (dBm)
CHT3091-FAB	DC-14	2.5	20.5	15
CHT3091a99F	DC-40	3	17	15
CHT4690-FAB	5-30	3.5	37	25
CHT4690-99F	5-30	4	28	25
CHT4694-99F	25-45	4	24	22

ATTENUATOR – DIGITAL	Freq (GHz)	Ins. Loss (dB)	Att. Error (dB)	IP-1dB (dBm)
CHT4012a98F	DC-6	2.5	+/-0.5	20
CHT4016-99F	4-16	6.5	-1.5/1	18

DOWN CONVERTER	Freq (GHz)	NF (dB)	Conv Gain (dB)	IP1dB (dBm)
CHR3693-FAB	21-26.5	2.5	13	-12

POWER DETECTOR	Freq (GHz)	Dynamic Range (dB)	Type
CHE1270a99F	5-44	30	Wide-Band

MULTIPLIER	Xn	IF Freq (GHz)	Input Power (dBm)	Output Power (dBm)
CHX2193-99F	X2	6.25-8.25	12	14
CHX2193-FAB	X2	6.25-8.25	10	14
CHX2089-99F	X2	8-11.5	12	15
CHX2090-99F	X2	11-13	12	15

OSCILLATOR – VCO	Central Output Freq (GHz)	Tuning Bandwidth (GHz)	Noise @ 100KHz (dBc/Hz)
CHV1203a98F*	2.6	0.4	-108
CHV1203-FAB	2.6	0.4	-108
CHV1206a98F*	5.725	0.75	-100

PHASE SHIFTER	Freq (GHz)	Bits Nb	Phase range (°)	Ins. Loss (dB)
CHP6013-SRF	1.2-1.4	6	360	8.5
CHP4010-99F	7-9	6	360	9
CHP3015-99F	8.5-11.5	6	360	7.5

SWITCH	Freq (GHz)	Loss (dB)	IP-1dB IN (dBm)	Isol. (dB)
CHS5104-99F	DC-4	0.5	30	35
CHS5104-FAB	DC-6	0.6	30	30
CHS5100-99F	DC-20	2.1	20	30

TRANSISTOR	Freq (GHz)	Gain (dB)	NF (dB)
EC2612-99F	DC-40	9.5 @ 40GHz	1.5 @ 40GHz

Already flying in Low Earth Orbit (LEO)

AMPLIFIER LNA	Freq (GHz)	Gain (dB)	NF (dB)	OP1dB (dBm)
CHA3666-QAG	5.8-17	21	1.8	16
CHA3666-99F	6-17	21	1.8	17
CHA2110-QDG	7-12	19	1.2	10
CHA2090-99F	17-24	23	2	10

POWER DETECTOR	Freq (GHz)	Dynamic Range (dB)	Type
CHE1270a99F	5-44	30	Wide-Band
CHE1270-QAG	10-44	30	Wide-Band

ATTENUATOR – ANALOG	Freq (GHz)	Ins. Loss (dB)	Att. Range (dB)	IP-1dB (dBm)
CHT3091a99F	DC-40	3	20	15

AMPLIFIER – MPA	Freq (GHz)	Gain (dB)	OP1dB (dBm)	IP3 (dBm)
CHA5266-99F	10-16	23	26.5	36
CHA5350-99F*	17-24	26	26.5	35.5

AMPLIFIER – HPA	Freq (GHz)	Gain (dB)	IP3 (dBm)	Psat (dBm)
CHA8710a99F	8.5-10.5	28.5	-	44
CHA6550-98F	17-23.6	22	41	34

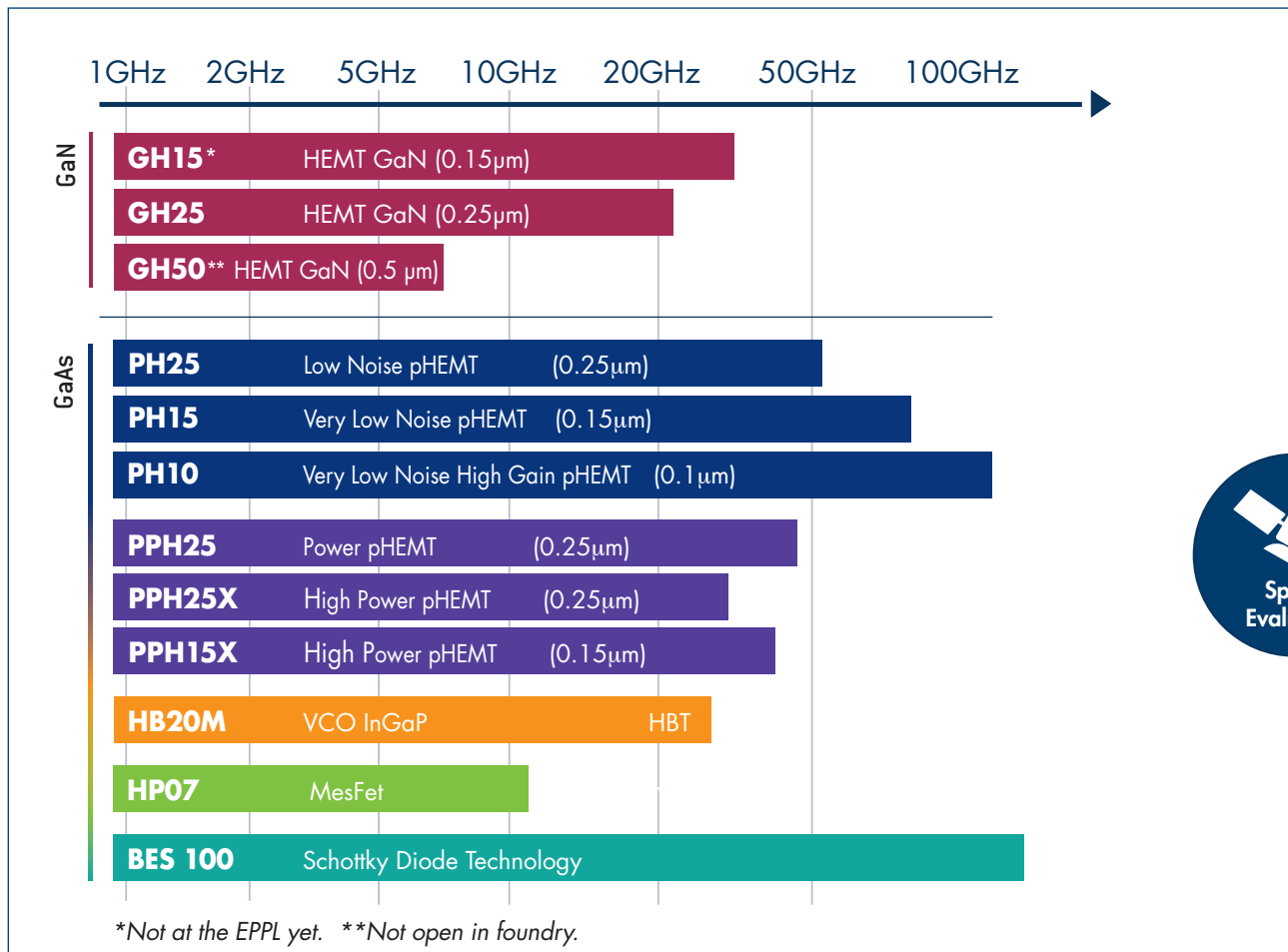
GAN POWER TRANSISTORS	Freq (GHz)	Glin(dB) @ Freq (GHz)	Power (W)	PAE (%) @ Freq (GHz)
CHK9014-99F	Up to 13	13 @ 12	60	50 @ 12

* Products referenced in the QPL list of ESA (ESCC 9010)



UMS Space evaluated technologies from DC to 100GHz

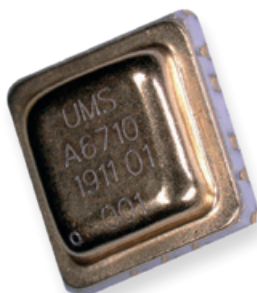
Our products are manufactured on UMS proprietary space evaluated technologies. These technologies are available to design your own MMIC via our foundry service & ASIC.



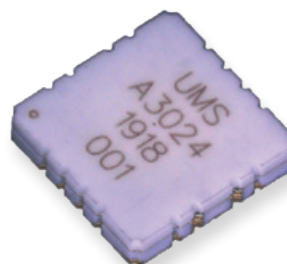
- Space evaluated processes according to ESA/ESCC 9010 standard
- Process Design Kit (PDK) on request for MMIC designer together with Full Foundry Service offer from wafer up to fully qualified Flight Model delivery

UMS hermetic packages:

UMS propose hermetic metal ceramic packaging solutions for space:



- **FAB**
Unleaded hermetic metal ceramic 6x6mm²



- **FDB**
Unleaded hermetic metal ceramic 7x7mm²



Hi-Rel Space Qualification Flow



UMS offers catalogue products, ASIC and Foundry service for space use. The S Class space products are qualified for Flight Model and processed on ESA evaluated technologies.

Discrete Die Lot Qualification based on ESA/ESCC 9010 and MIL-PRF-38534, Table C-II

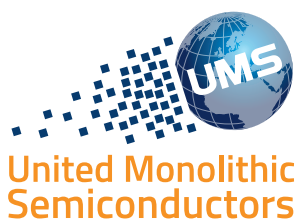
WAFER ACCEPTANCE TEST

TEST	TEST CONDITIONS	TESTED SAMPLES
100% DC & RF testing	As per data sheet or detail specification	100%
Visual inspection	MIL-STD-883 Method 2010, Cond.A	100%
Wire bond evaluation	MIL-STD-883 Method 2011	20 (1 failure allowed)
Die shear test	MIL-STD-883 Method 2019	5 (0 failure allowed)
SEM	MIL-STD-883 Method 2018	4

LOT ACCEPTANCE TEST

TEST	TEST CONDITIONS	TESTED SAMPLES
Device mounting	Sampling for element evaluation	12
Internal visual inspection	MIL-STD-883 Method 2010, Cond.A	12
Temperature cycling (note 1)	MIL-STD-883 Method 1010, Cond.C	10 + 2 reference part
Initial electrical test	As per data sheet or detail specification	10 + 2 reference part
Burn in	240H @T _j =175°C for GaAs (or Ta max= 125°C), DC biased 240H @T _j =200°C for GaN (or Ta max= 125°C), DC biased	10
Post burn in electrical test	As per data sheet or detail specification	10 + 2 reference part
Steady-state life	1000H @T _j =175°C for GaAs (or Ta max= 125°C), DC biased 1000H @T _j =200°C for GaN (or Ta max= 125°C), DC biased	10
Final electrical test	As per data sheet or detail specification	10 (0 failure allowed)

Note 1: performed when the element evaluation can be packaged.



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