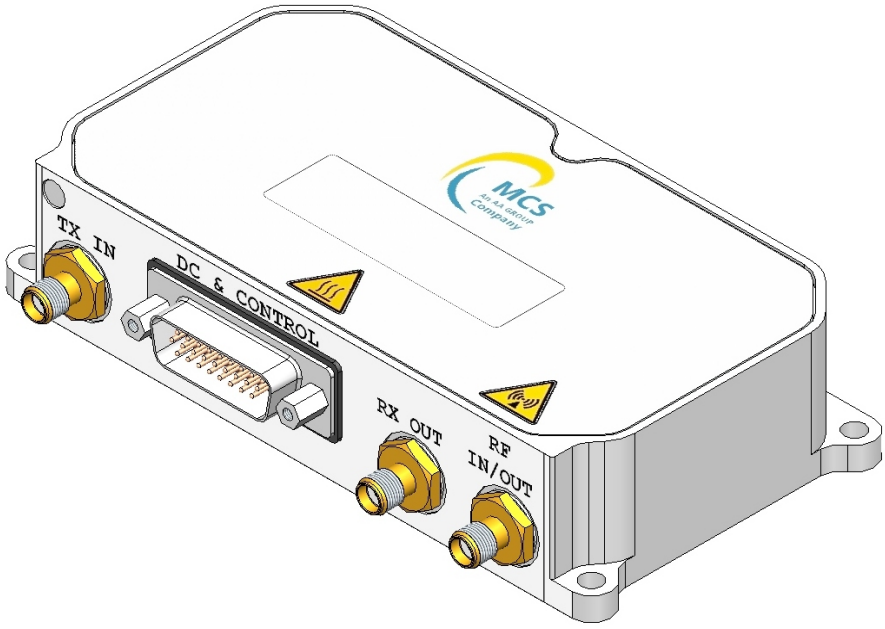
DATASHEET
FEUILLE DE SPECIFICATIONS

P/N: MCS-TRX-6700M-7900M-45dB-43dBm-0
Designation: 20W, 45dB, 6700-7900MHz Transceiver Module



6700-7900MHz 20W Transceiver Module

Ed.	*Written by*	*Date*	*Observation*	*Approved by*
0	A. Billy	07/04/2022	Creation	R. VERGNAULT

Electrical features *Caractéristiques électriques*		All parameters specified @ baseplate temperature of +25°C and Vsupply=+28Vdc, unless otherwise specified	
Electrical parameters *Paramètres électriques*	**Measuring conditions** *Conditions de mesure*	**MCS specifications** *Spécifications MCS*	**Units** *Unités*
Bandwidth *Bande de fréquence*		6700 - 7900	MHz
TX Output power *Puissance de sortie TX*	In CW Mode: **High power mode** @ Psat @ 0dBm Input power	Suitable for OQPSK modulation 43 min. 44 typ. 45 max. 43 typ.	dBm
	Low power mode @ 0dBm Input Power	15 typ.	dBm
Input power *Puissance d'entrée*	For saturated power Absolute maximum level	0 min. to +5 max. **+20 max.**	dBm
Gain *Gain*	**High power mode** @ small signal	50 min. 56 typ. 62 max. (includes gain compensation vs temperature)	dB
	Low power mode @ 0dBm Input Power	15 typ.	dB
In band Gain ripple *Ondulation de gain*	@ Psat	+/- 2 max.	dB
Insertion loss in RX mode *Perte d'insertion en mode RX*	RF_IN/OUT to RX_OUT	1.0 typ. 1.3 max.	dB
Impedance *Impedance*		50	Ohms
Input / Output VSWR *TOS d'entrée / sortie*	TX_IN RF_IN/OUT RX_OUT	1.5:1 typ. 2:1 max. 1.5:1 typ. 2:1 max. 1.5:1 typ. 2:1 max.	
Load mismatch *Résistance au TOS de charge*		Infinite (protected by the circulator, if RX_OUT is loaded)	
Noise figure *Facteur de bruit*	**High power mode**	12 typ. 15 max.	dB

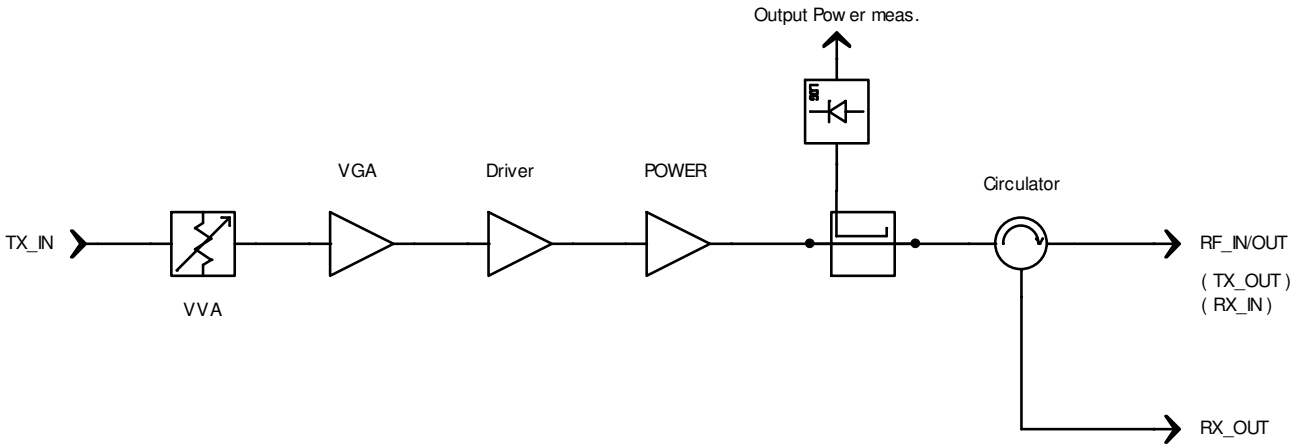
Ed.	*Written by*	*Date*	*Observation*	*Approved by*
0	A. Billy	07/04/2022	Creation	R. VERGNAULT

Electrical features *Caractéristiques électriques*		All parameters specified @ baseplate temperature of +25°C and Vsupply=+28Vdc, unless otherwise specified	
Electrical parameters *Paramètres électriques*	**Measuring conditions** *Conditions de mesure*	**MCS specifications** *Spécifications MCS*	**Units** *Unités*
Time for TX on/off (blanking) *Vitesse d'exctinction RF*	10-90% RF rise / fall time "RF_On/Off"	0.5 typ. 1 max.	µs
Power density in blanking mode *Densité spectrale de puissance*	In 2MHz BW	-120 max. (gate bias and drain cutoff of power MMICs)	dBm
Harmonics *Harmoniques*	**High power mode** @ 0dBm Input H2 H3	 -30 typ. -25 max. -40 typ. -35 max.	dBc
Spurious *Parasites*	**High power mode** @ 0dBm Input **Low power mode** @ 0dBm Input	 -65 max. -50 max.	dBc dBc
AM/PM conversion *Conversion AM/PM*	@ Pout=43dBm	3 max.	°/dB
Intermodulation OIP3 *Intermodulation OIP3*	@ Pout=40dBm	47 typ.	dBm
Operating class *Classe de fonctionnement*		A or AB on GaN power devices	
Supply voltage *Tension d'alimentation*	"Vdc"	+27 min. +28 typ. +29 max.	Vdc
Current consumption *Consommation de courant*	**High power mode :** @Psat @Pout=43dBm @ small signal **Low power mode** **Blanking mode**	 4.8 typ. 5.5 max 4 typ. 4.5 max. 2.1 typ. 0.7 typ. 0.5 max.	A

Ed.	*Written by*	*Date*	*Observation*	*Approved by*
0	A. Billy	07/04/2022	Creation	R. VERGNAULT

Electrical features *Caractéristiques électriques*		All parameters specified @ baseplate temperature of +25°C and Vsupply=+28Vdc, unless otherwise specified	
Electrical parameters *Paramètres électriques*	**Measuring conditions** *Conditions de mesure*	**MCS specifications** *Spécifications MCS*	**Units** *Unités*
Temperature voltage monitoring *Tension de contrôle de température*	"Temperature" Analog signal: positive slope & value	15 typ. **1.5V typ. @ +25°C**	mV/°C
Output Power voltage monitoring *Tension de contrôle de puissance*	"Output power level" Analog signal: positive slope & value	50 typ. **2.5V typ. @ 43dBm**	mV/dB

Bloc diagram



Ed.	*Written by*	*Date*	*Observation*	*Approved by*
0	A. Billy	07/04/2022	Creation	R. VERGNAULT

Control, Alarms and Monitoring (Sub-D connector) *Contrôles, Alarmes et Informations*		
Parameters *Paramètres*	**Description** *Description*	**Spécifications** *Specifications*
Shutdown ON/OFF command *Commande Marche/Arrêt*	RS422 - "DC ON/OFF" (Shutdown of internal supplies)	(-P) Low = **DC OFF (Shutdown)** (-P) High or Not connected = **DC ON**
Noise quieting / RF blanking control *Commande d'extinction RF*	RS422 - "RF ON/OFF"	(-P) Low = **RF Output OFF** (-P) High or Not Connected = **RF Output ON**
Power mode control *Sélection mode de puissance*	RS422 - "High/Low Power"	(-P) Low = **Low Power Mode** (-P) High or Not Connected = **High Power Mode**
Temperature analog signal *Lecture temperature*	Signal "Temperature"	Analog output Refer to Electrical features
Output Power analog signal *Lecture puissance de sortie*	Signal "Output power level"	Analog output Refer to Electrical features

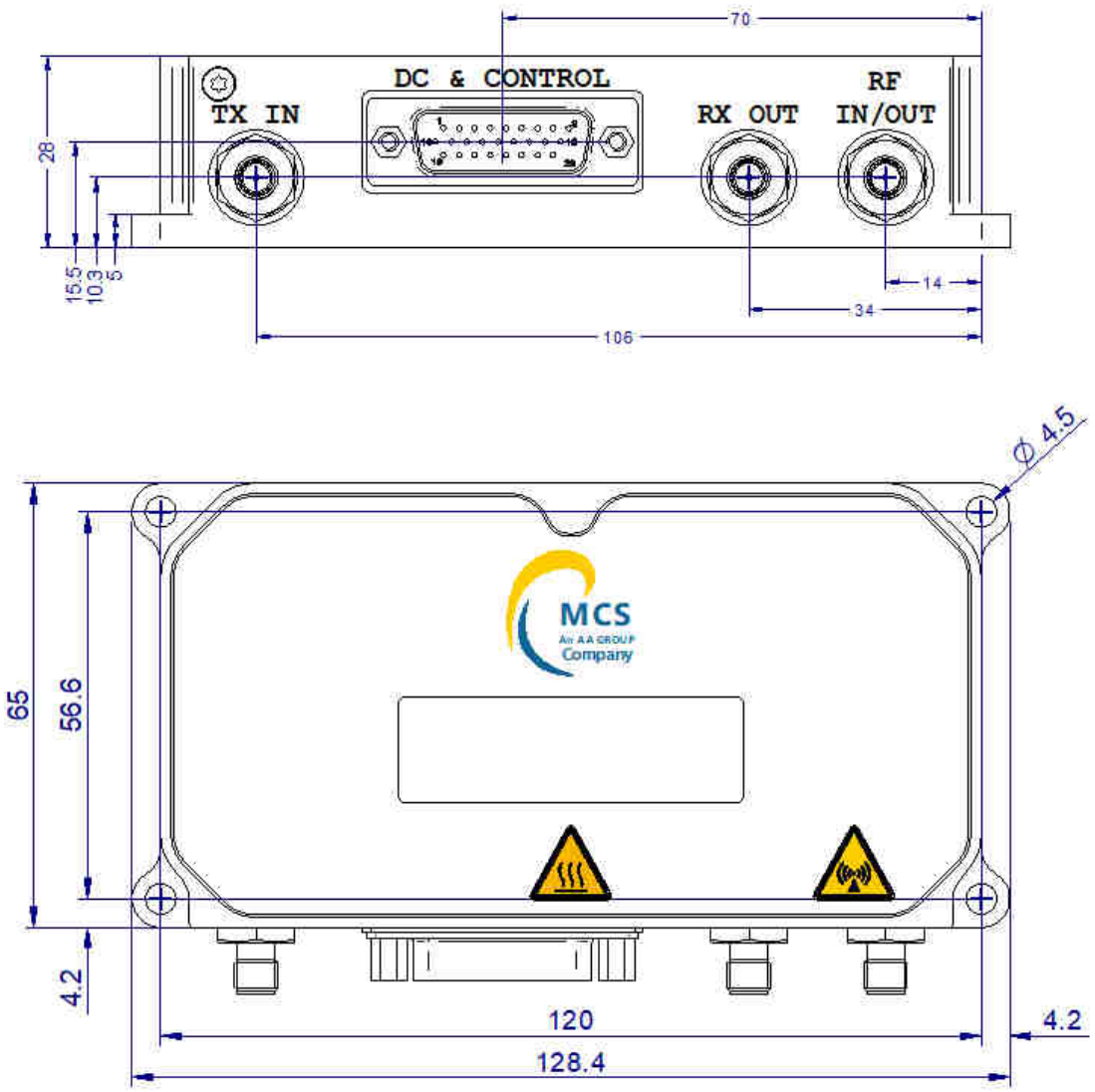
Mechanical features *Caractéristiques mécaniques*			
Parameters *Paramètres*	**Measuring conditions** *Conditions de mesure*	**MCS specifications** *Spécifications MCS*	**Units** *Unités*
Length x width x height *Longueur x largeur x Hauteur*	L x W x H ISO 2768-mH	129 x 65 x 28 max. (without connectors) (see drawings below)	mm
Cooling *Dissipation*	Apply thermal interface	Conduction cooled: user must maintain base plate temperature below +85°C (Self-protection turns ON at +90°C)	-
RF Connectors *Connectique RF*	Input / Output	SMA female	-
Supply & Control connector *Connecteur de contrôle et alim.*	"DC & CONTROL"	Sub-D High density male 26pts	
Weight *Masse*		400 typ.	g
Housing *Châssis*		Aluminium coated with Surtec 650	

"DC & Control" pinning:

Pin No.	Signal Name	Comment
1	RF_On/Off -P	RS422 Input
2	RF_On/Off -N	
3	High/Low Power -P	RS422 Input
4	High/Low Power -N	
5	DC_On/Off -P	RS422 Input
6	DC_On/Off -N	
7 to 10	GND	Common ground
11	Output power level	Analog output
12	Temperature	Analog output
13 to 16	Vdc	Supply voltage
17 to 26	N.C	

Ed.	*Written by*	*Date*	*Observation*	*Approved by*
0	A. Billy	07/04/2022	Creation	R. VERGNAULT

Mechanical drawing:



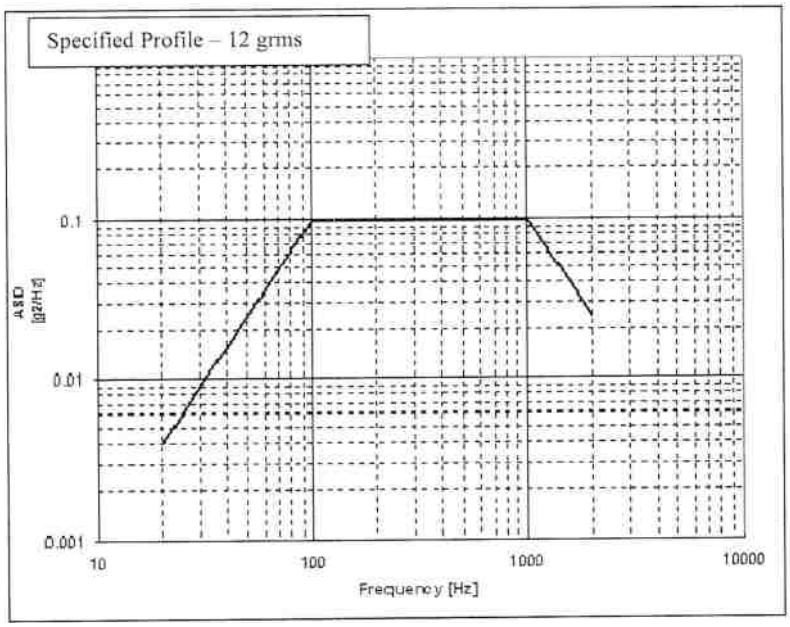
Ed.	*Written by*	*Date*	*Observation*	*Approved by*
0	A. Billy	07/04/2022	Creation	R. VERGNAULT

Standard environnemental conditions *Conditions environnementales standard*			
Parameters *Paramètres*	**Conditions** *Conditions*	**MCS specifications** *Spécifications MCS*	**Units** *Unités*
Cold temperature operation *Température de service à froid*	Baseplate temperature	-40 min.	°C
Cold temperature storage *Température de stockage à froid*	Baseplate temperature	-55 min.	°C
Dry heat temperature operation *Température de service à chaud*	Baseplate temperature	+85 max. (includes automatic shutdown for thermal protection when baseplate temp exceeds +90°C)	°C
Dry heat temperature storage *Température de stockage à chaud*	Baseplate temperature	+105 max.	°C

Specific environnemental conditions *Conditions environnementales spécifiques* (guaranteed by design, not qualified by test)			
Parameters *Paramètres*	**Conditions** *Conditions*	**MCS specifications** *Spécifications MCS*	**Units** *Unités*
Altitude *Altitude*		30 000 max.	ft
Sand and dust *Sable et poussières*		As per MIL-STD-810G, method 510.5 procedure I & II	
Humidity *Humidité*	97% @ +26°C	As per MIL-STD-810G, method 507.5 procedure II	
Salt fog *Brouillard salin*		As per MIL-STD-810G, method 509.6 for solution 6.5-7.2pH at 35°C	-
Fungus *Moisissures*		Coating compliant	-
Explosive atmosphere *Atmosphère explosive*		Sealing compliant No ignition caused by the amplifier.	

Ed.	*Written by*	*Date*	*Observation*	*Approved by*
0	A. Billy	07/04/2022	Creation	R. VERGNAULT

Specific environnemental conditions *Conditions environnementales spécifiques* (guaranteed by design, not qualified by test)			
Parameters *Paramètres*	**Conditions** *Conditions*	**MCS specifications** *Spécifications MCS*	**Units** *Unités*
Functional random vibrations *Vibrations aléatoires operation*	As per MIL-STD-810G method 514.6 procedure IV	shape: see graph below	
Functional shocks *Chocs fonctionnels*	As per MIL-STD-810G method 516.6 procedure I	30g half sine shock pulse during 11ms	
Functional acceleration *Accélération fonctionnelle*		Forward 12g Back 4g Up 4g Down 2g Lateral 3g	

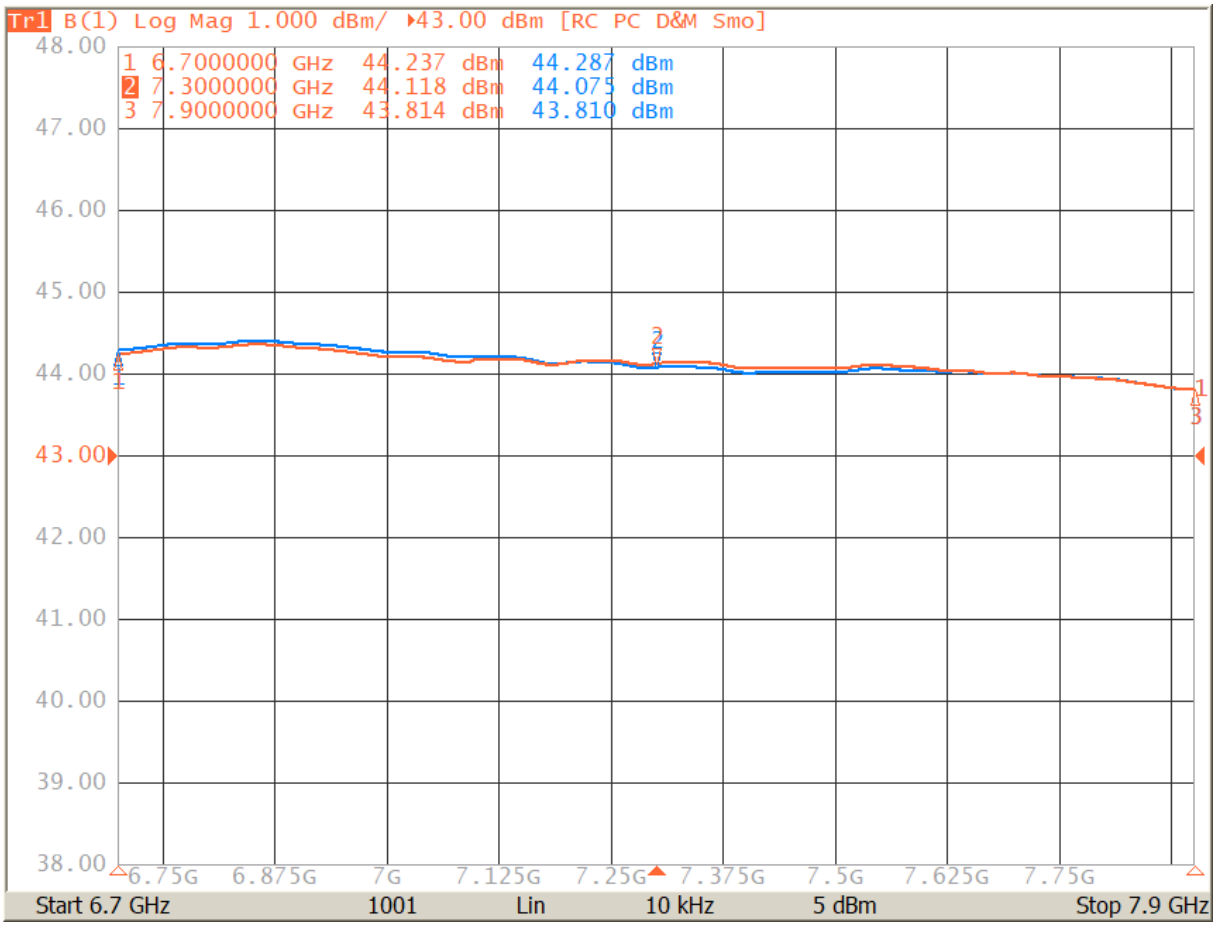


Vibration envelope

Ed.	*Written by*	*Date*	*Observation*	*Approved by*
0	A. Billy	07/04/2022	Creation	R. VERGNAULT

High Power mode

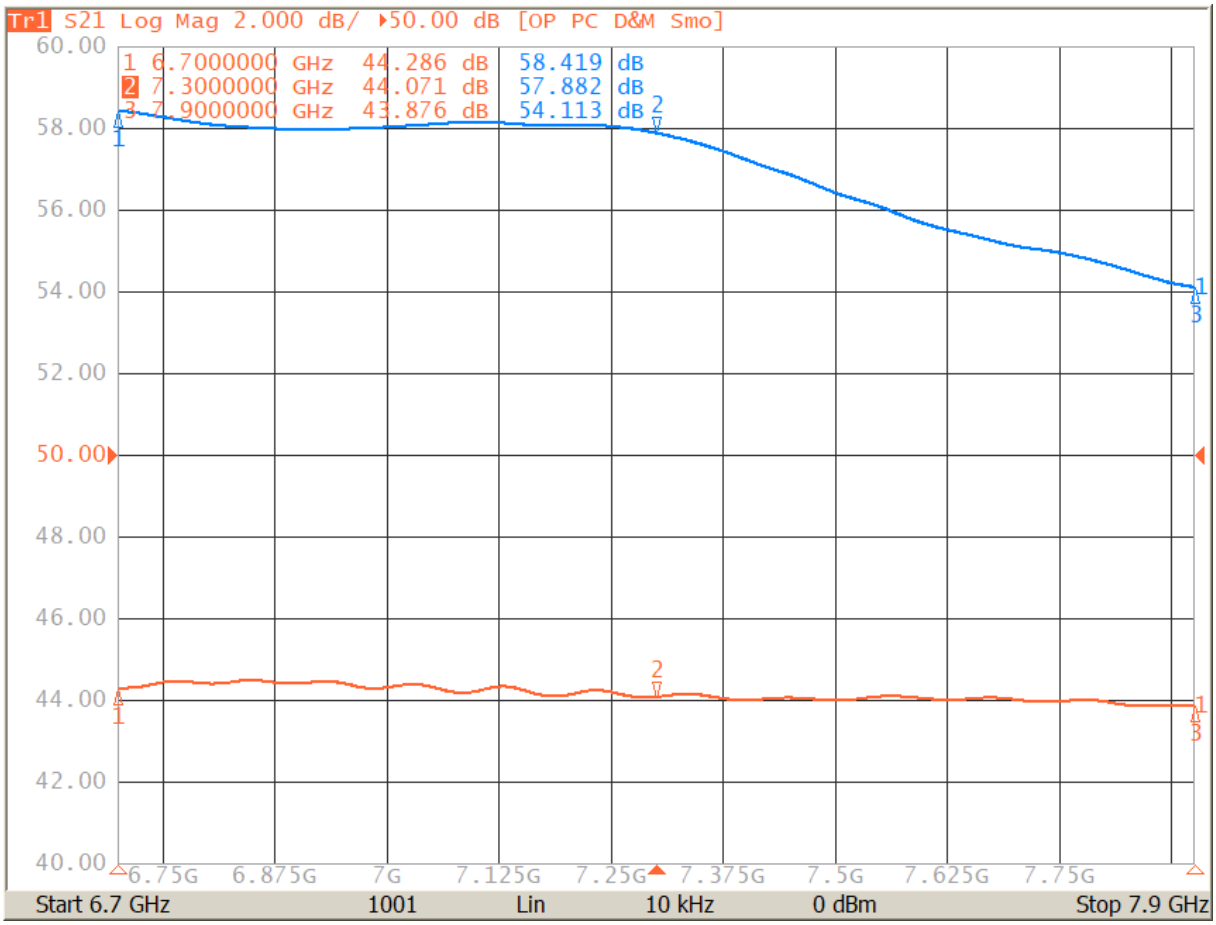
Output power at 0dBm input power in dBm (blue)
Saturated output power at +5dBm input power in dBm (orange)



Ed.	*Written by*	*Date*	*Observation*	*Approved by*
0	A. Billy	07/04/2022	Creation	R. VERGNAULT

High Power mode

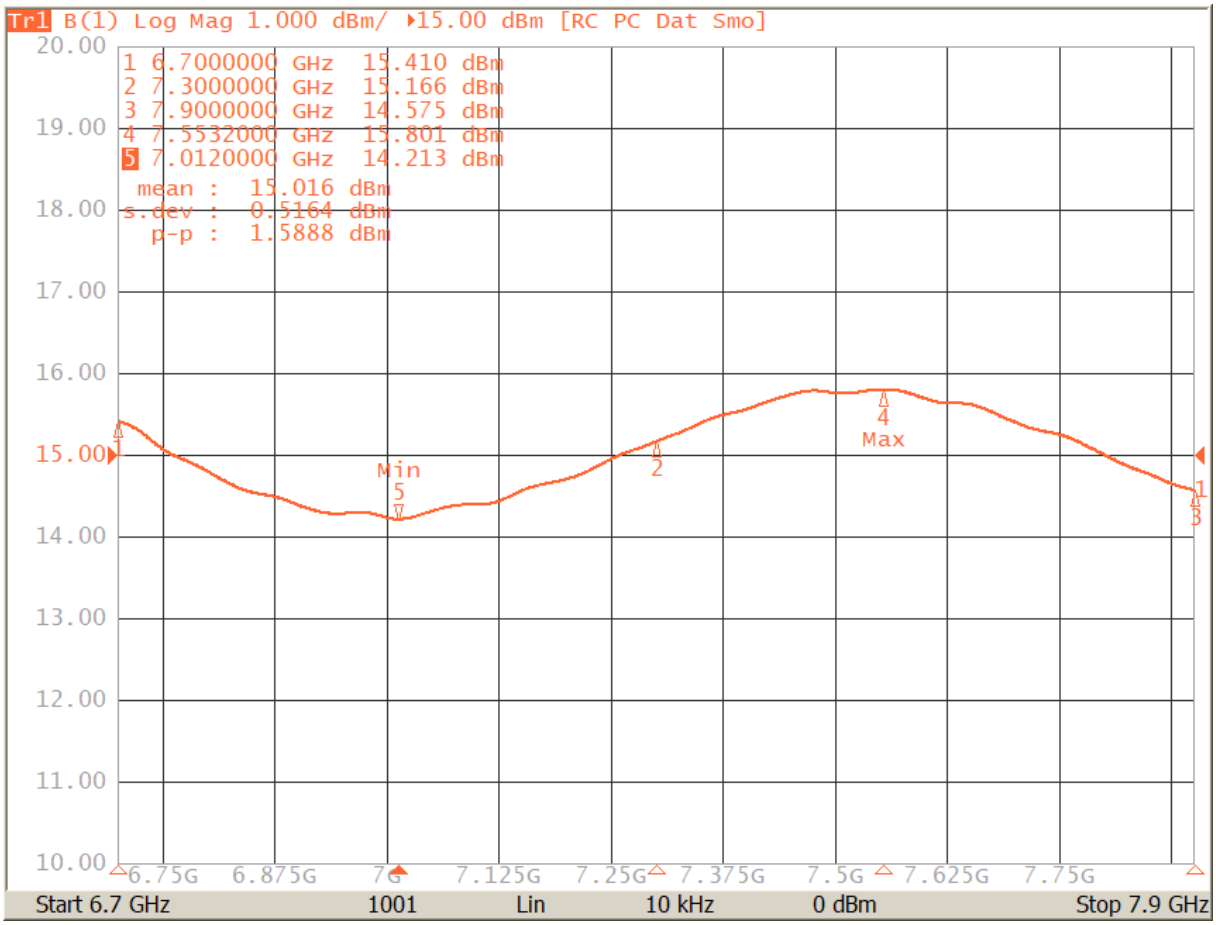
Small signal gain in dB (blue)
Gain at 0dBm input power in dB (orange)



Ed.	*Written by*	*Date*	*Observation*	*Approved by*
0	A. Billy	07/04/2022	Creation	R. VERGNAULT

Low Power mode

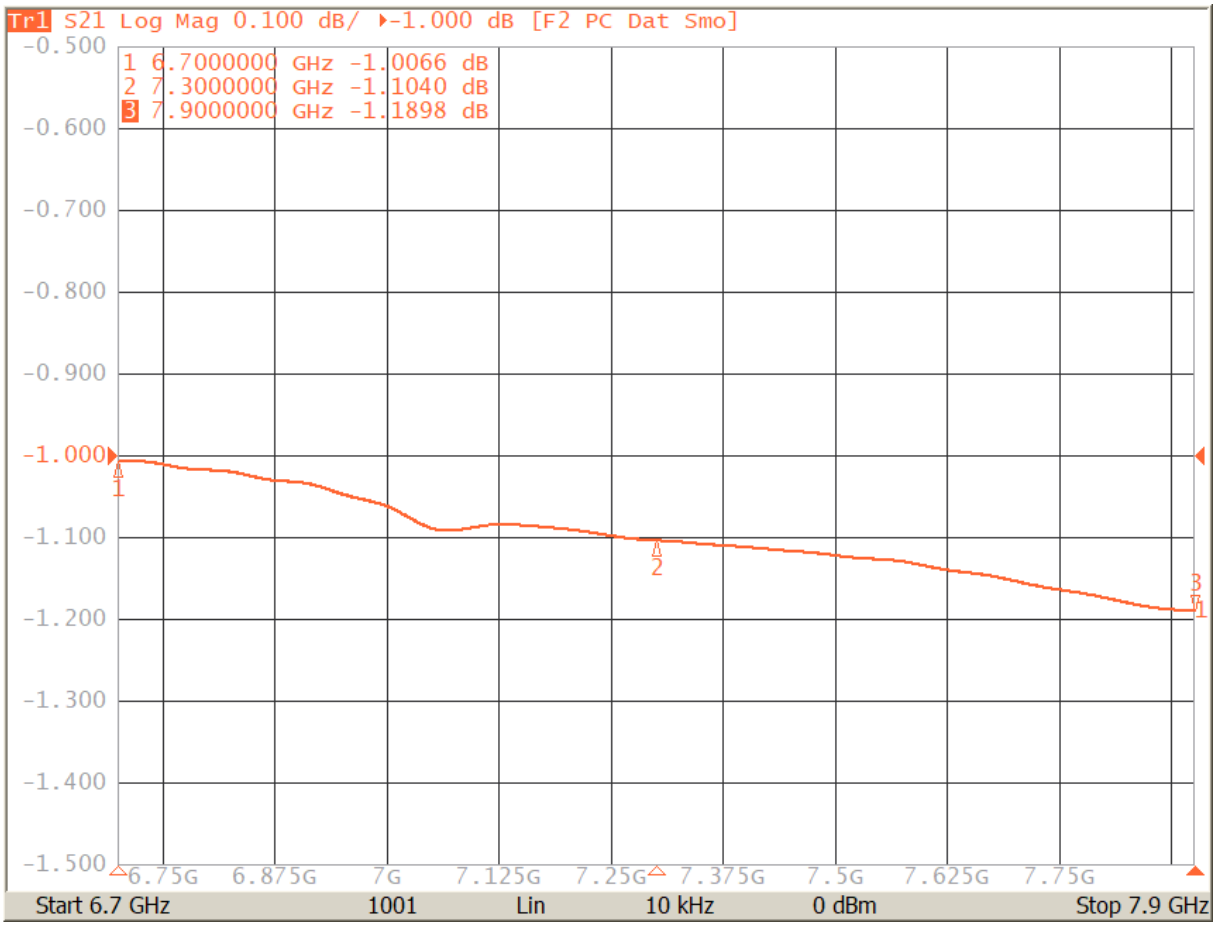
Output power at 0dBm input power in dBm



Ed.	*Written by*	*Date*	*Observation*	*Approved by*
0	A. Billy	07/04/2022	Creation	R. VERGNAULT

RX mode

RX loss in dB



Ed.	*Written by*	*Date*	*Observation*	*Approved by*
0	A. Billy	07/04/2022	Creation	R. VERGNAULT