

Preliminary
4-Channel Amp Module
RFM0458-4TRM-020



Product Features

- Frequency from 433~928MHz, 1160~1606MHz, 2400~2500MHz, 5725~5875MHz
- High Gain
- High Efficiency
- 50 Ohm Input/Output impedance
- Small size and Light weight



Description

The RRM0458-4TRM-020 is designed for general purpose. Operating frequency range is from 433~928MHz, 1160~1606MHz, 2400~2500MHz, 5725~5875MHz.

Gallium Nitride on SiC Technology is used and attached on a copper sub carrier.

Improved thermal handling by patented technology.

Electrical Specifications @ $V_{DC}=43V$, $T_C=40^{\circ}C$, 50 Ω System

PARAMETER	UNIT	MIN	TYP	MAX	SYMBOL
Operating Frequency	MHz	433	-	928	F _O
Operating Bandwidth	MHz	-	495	-	BW
Peak Output Power @CW Signal	W	20	25	-	P _{SAT}
Tx Input Power	dBm	-	0	-	P _{IN}
Tx Maximum Input Power @Without Damage	dBm		-	20	P _{IN, MAX}
Tx Small Signal Gain @Input Power -20dBm	dB	49	52		G _S
Tx Power Gain @Input Power 0dBm	dB	43	44	-	G _P
Gain Flatness @Input Power 0dBm	dB	-	0.5	1.0	ΔG_P
Power Added Efficiency	%	50	55	-	E _{EFF}
Harmonics 1 to N @Output Power 20W	dBc	10	15	-	H _N
Spurious Level	dBc	60	70	-	Spur
Tx Input VSWR		-	1.5:1	2.0:1	VSWR
Tx Output VSWR			2.0:1	2.5:1	VSWR
Rx Gain @Input Power -10Bm	dB	20.5	21.5		G _S
Rx Gain Flatness @Input Power -10Bm	dB	-	0.5	1.0	V _{DC}
Rx Output 1dB Compression	dBm	18	19		P _{1dB}
Rx Input VSWR			1.5:1	2.0:1	VSWR
Rx Output VSWR			1.5:1	2.0:1	VSWR
Rx Noise Figure	dB		2.5	3.0	NF

Preliminary
4-Channel Amp Module
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Electrical Specifications @ $V_{DC}=43V$, $T_C=40^{\circ}C$, 50Ω System

PARAMETER	UNIT	MIN	TYP	MAX	SYMBOL
Operating Frequency	MHz	1160	-	1606	F_O
Operating Bandwidth	MHz	-	446	-	BW
Peak Output Power @CW Signal	W	20	25	-	P_{SAT}
Tx Input Power	dBm	-	0	-	P_{IN}
Tx Maximum Input Power @Without Damage	dBm		-	20	$P_{IN, MAX}$
Tx Small Signal Gain @Input Power -20dBm	dB	49	52		G_S
Tx Power Gain @Input Power 0dBm	dB	43	44	-	G_P
Gain Flatness @Input Power 0dBm	dB	-	0.5	1.0	ΔG_P
Power Added Efficiency	%	47	52	-	E_{FF}
Harmonics 1 to N @Output Power 20W	dBc	10	15	-	H_N
Spurious Level	dBc	60	70	-	Spur
Tx Input VSWR		-	1.5:1	2.0:1	VSWR
Tx Output VSWR			2.0:1	2.5:1	VSWR
Rx Gain @Input Power -10Bm	dB	19.5	20.5		G_S
Rx Gain Flatness @Input Power -10Bm	dB	-	0.5	1.0	V_{DC}
Rx Output 1dB Compression	dBm	18	19		P_{1dB}
Rx Input VSWR			1.5:1	2.0:1	VSWR
Rx Output VSWR			1.5:1	2.0:1	VSWR
Rx Noise Figure	dB		2.5	3.0	NF

Preliminary
4-Channel Amp Module
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Electrical Specifications @ $V_{DC}=43V$, $T_C=40^{\circ}C$, 50Ω System

PARAMETER	UNIT	MIN	TYP	MAX	SYMBOL
Operating Frequency	MHz	2400	-	2500	F_O
Operating Bandwidth	MHz	-	100	-	BW
Peak Output Power @CW Signal	W	10	12	-	P_{SAT}
Tx Input Power	dBm	-	0	-	P_{IN}
Tx Maximum Input Power @Without Damage	dBm		-	20	$P_{IN, MAX}$
Tx Small Signal Gain @Input Power -20dBm	dB	47	50		G_S
Tx Power Gain @Input Power 0dBm	dB	40	41	-	G_P
Gain Flatness @Input Power 0dBm	dB	-	0.5	1.0	ΔG_P
Power Added Efficiency	%	43	48	-	E_{FF}
Harmonics 1 to N @Output Power 10W	dBc	15	20	-	H_N
Spurious Level	dBc	60	70	-	Spur
Tx Input VSWR		-	1.5:1	2.0:1	VSWR
Tx Output VSWR			2.0:1	2.5:1	VSWR
Rx Gain @Input Power -10Bm	dB	18.0	19.0		G_S
Rx Gain Flatness @Input Power -10Bm	dB	-	0.5	1.0	V_{DC}
Rx Output 1dB Compression	dBm	18	19		P_{1dB}
Rx Input VSWR			1.5:1	2.0:1	VSWR
Rx Output VSWR			1.5:1	2.0:1	VSWR
Rx Noise Figure	dB		2.5	3.0	NF

Preliminary
4-Channel Amp Module
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Electrical Specifications @ $V_{DC}=43V$, $T_C=40^{\circ}C$, 50Ω System

PARAMETER	UNIT	MIN	TYP	MAX	SYMBOL
Operating Frequency	MHz	5725	-	5875	F_O
Operating Bandwidth	MHz	-	150	-	BW
Peak Output Power @CW Signal	W	10	12	-	P_{SAT}
Tx Input Power	dBm	-	0	-	P_{IN}
Tx Maximum Input Power @Without Damage	dBm		-	20	$P_{IN, MAX}$
Tx Small Signal Gain @Input Power -20dBm	dB	47	50		G_S
Tx Power Gain @Input Power 0dBm	dB	40	41	-	G_P
Gain Flatness @Input Power 0dBm	dB	-	0.5	1.0	ΔG_P
Power Added Efficiency	%	40	45	-	E_{FF}
Harmonics 1 to N @Output Power 10W	dBc	15	20	-	H_N
Spurious Level	dBc	60	70	-	Spur
Tx Input VSWR		-	1.5:1	2.0:1	VSWR
Tx Output VSWR			2.0:1	2.5:1	VSWR
Rx Gain @Input Power -10Bm	dB	16.0	17.0		G_S
Rx Gain Flatness @Input Power -10Bm	dB	-	0.5	1.0	V_{DC}
Rx Output 1dB Compression	dBm	16	17		P_{1dB}
Rx Input VSWR			1.5:1	2.0:1	VSWR
Rx Output VSWR			1.5:1	2.0:1	VSWR
Rx Noise Figure	dB		3.0	3.5	NF

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4-Channel Amp Module
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Operating Voltages

PARAMETER	UNIT	NOMINAL VOLTAGE	VOLTAGE ACCURACY	SYMBOL
Operating Voltage	V	43	± 2%	V _{DC}
HPA Enable Voltage	V	TTL Low(0V) : HPA OFF, TTL High(5V) : HPA ON		
Tx Switch Enable Voltage	V	24	± 2%	
LNA Enable Voltage	V	TTL Low(0V) : LNA OFF, TTL High(5V) : LNA ON		
Rx Switch Enable Voltage	V	24	± 2%	
Current Monitor Voltage	V	Output Voltage 2V@1A(0.2V/0.1A)		
Temp Monitor Voltage	V	Output Voltage 0.75V@25°C (1°C/0.01V)		

Mechanical Specifications

PARAMETER	UNIT	TYP
Mass	kg	0.55
Dimension	mm	105 x 133 x 20 (Without Connectors)
RF Connector	-	SMA Female : RF Input
		SMA Female : RF Output
DC Connector	-	T2M-105-01-L-D-RA-WT(SAMTEC)
Cooling		External Heat-sink Required

Bias Sequence

433-928MHz, 1160-1606MHz, 2400-2500MHz				
	Tx Turn On	Tx Turn Off	Rx Turn On	Rx Turn Off
1	Pin7, Pin8 : +43V On	RF Off	Pin7, Pin8 : +43V On	RF Off
2	Pin1 : +24V On	Pin2 : TTL Low	Pin3 : +24V On	Pin4 : TTL Low
3	Pin3 : 0V(Ground)	Pin3 : 0V(Ground) or Open	Pin1 : 0V(Ground)	Pin1 : 0V(Ground) or Open
4	Pin2 : TTL High	Pin1 : +24V Off	Pin4 : TTL High	Pin3 : +24V Off
5	RF On	Pin7, Pin8 : +43V Off	RF On	Pin7, Pin8 : +43V Off
5725-5875MHz				
	Tx Turn On	Tx Turn Off	Rx Turn On	Rx Turn Off
1	Pin7, Pin8 : +43V On	RF Off	Pin7, Pin8 : +43V On	RF Off
2	Pin2 : TTL High	Pin2 : TTL Low	Pin4 : TTL High	Pin4 : TTL Low
3	RF On	Pin7, Pin8 : +43V Off	RF On	Pin7, Pin8 : +43V Off

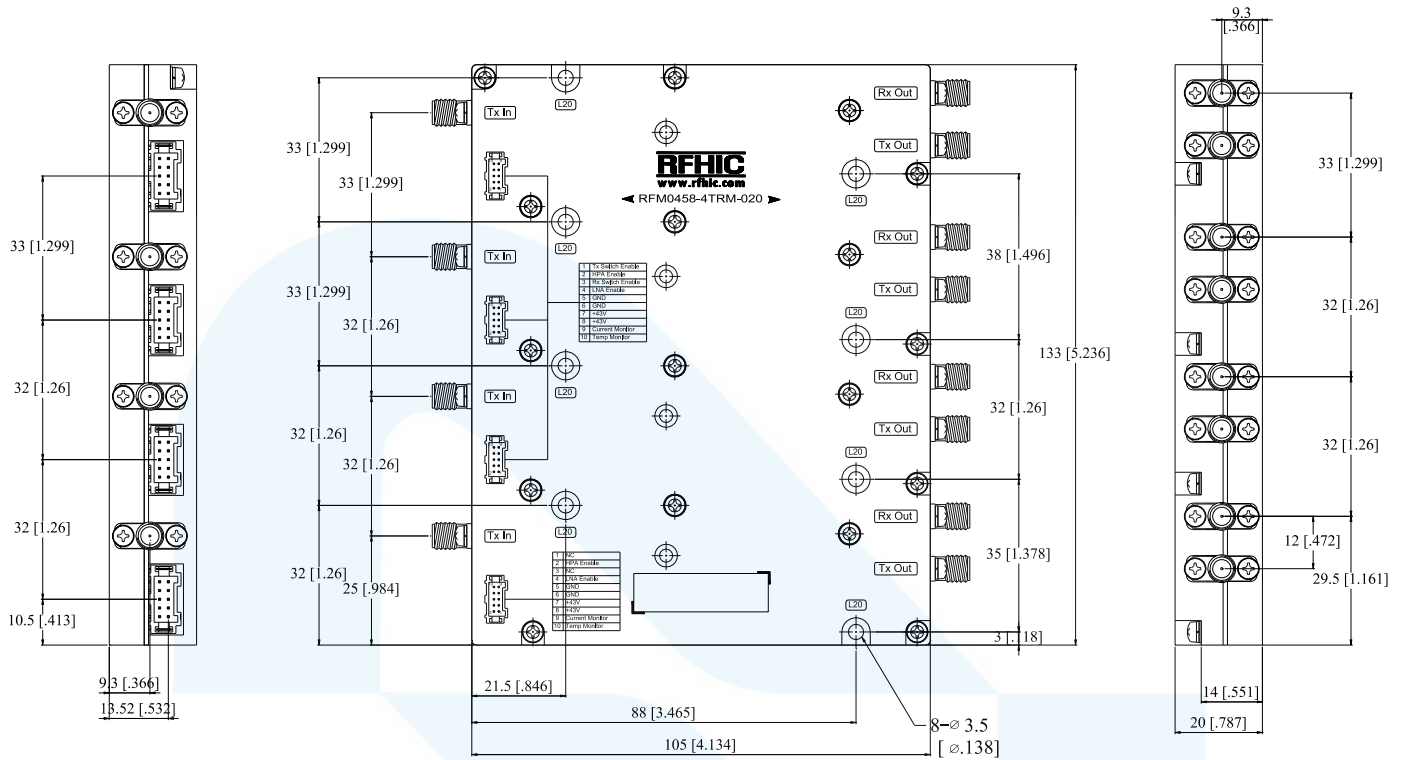
* It is recommended to follow the sequence of bias application as in the above table. However, there is an internal protection circuit that prevents the possible damages that may be occurred from a different sequence of bias applications.

Preliminary
4-Channel Amp Module
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Outline Drawing

* Unit: mm[inch] | Tolerance $\pm 0.3[.012]$



Pin Description

433-928MHz 1160-1606MHz 2400-2500MHz		5725~5875MHz	
Pin No	Description	Pin No	Description
1	Tx Switch Enable	1	NC
2	HPA Enable	2	HPA Enable
3	Rx Switch Enable	3	NC
4	LNA Enable	4	LNA Enable
5	GND	5	GND
6	GND	6	GND
7	+43V	7	+43V
8	+43V	8	+43V
9	Current Monitor	9	Current Monitor
10	Temp Monitor	10	Temp Monitor

Preliminary
4-Channel Amp Module
RFM0458-4TRM-020



Revision History

Part Number	Release Date	Version	Modification	Data Sheet Status
RFM0458-4TRM-020	2022.09.14	0.1	Initial release of datasheet	Preliminary



Certification

This product is manufactured by a company that is certified for the AS9100D quality management system.

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