Surface Mount

Monolithic Amplifier

ERA-4XSM+
ERA-4XSM

50Ω, Broadband, DC to 4 GHz

Features

- wide bandwidth, DC-4 GHz
- gain, 14.7 dB typ. at 100 MHz
- high dynamic range, 4.2 dB NF, 35 dBm IP3
- low thermal resistance for high reliability
- supply voltage transient protection
- patent pending

CASE STYLE : WW107

+ RoHS compliant in accordance with EU Directive (2002/95/EC)

The +suffix identifies RoHS Compliance. See our web site for RoHS Compliance methodologies and qualifications.

Applications

- cellular
- PCS
- communication receivers & transmitters

Electrical Specifications @ 25°C

MODEL NO.	FREQ.* (GHz)	GAIN, dB Typical over frequency, GHz 0.1	1	2	3	4	Min. @ 2 GHz	MAXIMUM POWER (dBm) @1GHz Output (1dB Comp.) Typ.	Min.	Input (no dmg.)	DYNAMIC RANGE @1GHz NF (dB) Typ.	IP3 (dBm) Typ.	VSWR (:1) Typ. In DC-3 GHz	3-4 GHz	Out DC-2 GHz	2-4 GHz	MAXIMUM RATING** I mA	P mW	DC OPERATING POWER @ Pin 3*** Current (mA)	Volt Typ	Min	Max	THERMAL RESISTANCE θjc, typ. °C/W	PRICE $ Qty. (25)
ERA-4XSM(+)	DC-4	14.7	14.2	13.5	12.0	11.8	12	17.0	15	20	4.2	35	1.2	1.2	1.2	1.4	100	650	65	4.5	4.2	5.5	196	1.69

* Low frequency cutoff determined by external coupling capacitors.

** Permanent damage may occur if any of these limits are exceeded. These ratings are not intended for continuous normal operation.

***Reliability predictions and normal operating conditions are applicable at current specified.

Maximum Ratings

Operating Temperature	-45°C to 85°C
Storage Temperature	-65°C to 150°C

Model Identification

Model	Marking‡
ERA-4XSM(+)	4X

‡ Prefix letter (optional) designates assembly location. Suffix letters (optional) are for wafer identification.

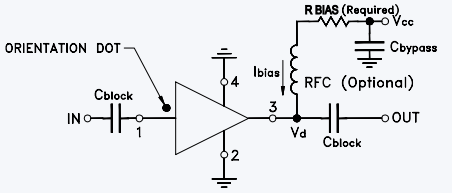
Pin Configuration

RF IN	1
RF OUT	3
DC	3
GROUND	2,4

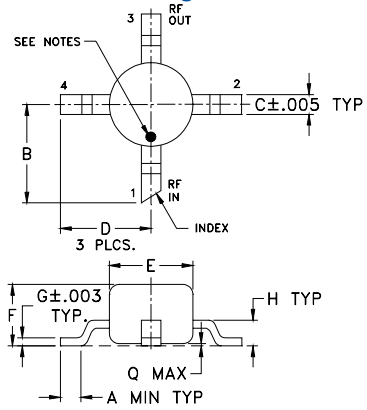
R BIAS
"1%" Resistor Values

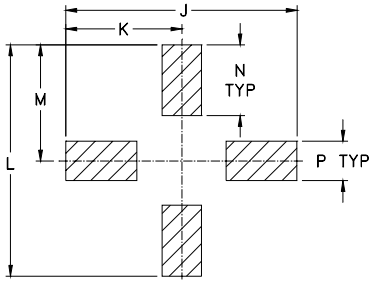
Vcc	ERA-4XSM(+)
7	38.3
8	52.3
9	66.5
10	80.6
11	95.3
12	110
13	127
14	143
15	158
16	174
17	187
18	205
19	221
20	237

Typical Biasing Configuration



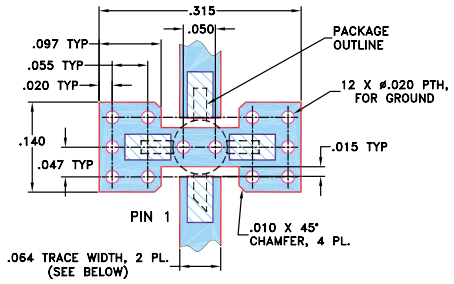
Outline Drawing





SUGGESTED LAYOUT FOR PC PATTERN

Suggested PCB Layout (PL-075)

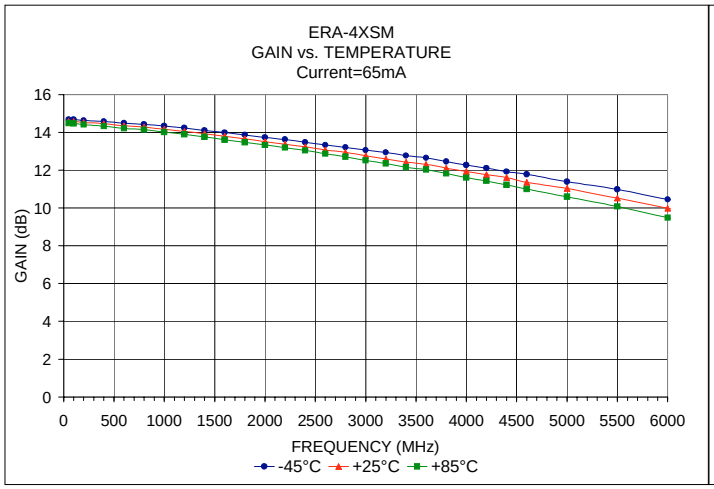


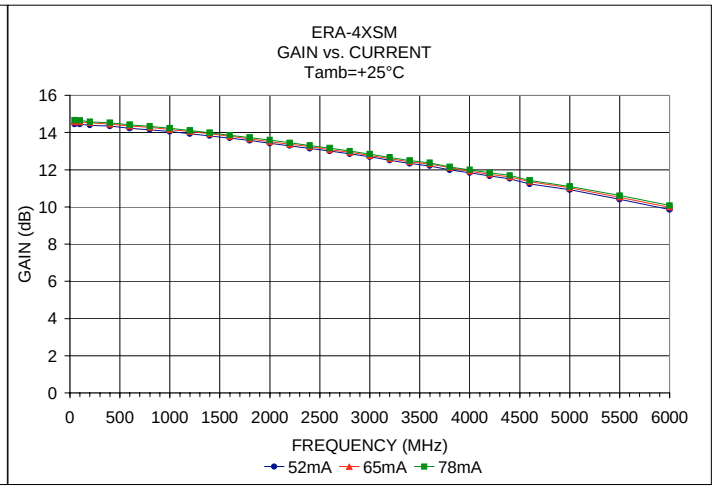
NOTES:
1. TRACE WIDTH IS SHOWN FOR ROGERS RO4350B WITH DIELECTRIC THICKNESS .030" ± .002"; COPPER: 1/2 OZ. EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH MAY NEED TO BE MODIFIED.
2. BOTTOM SIDE OF THE PCB IS CONTINUOUS GROUND PLANE.
3. IF PCB DESIGN RULES ALLOW, PLACE GROUND VIAS UNDER THE LAND PATTERN FOR BETTER RF PERFORMANCE. OTHERWISE PLACE GROUND VIAS AS CLOSE TO LAND PATTERN AS POSSIBLE.

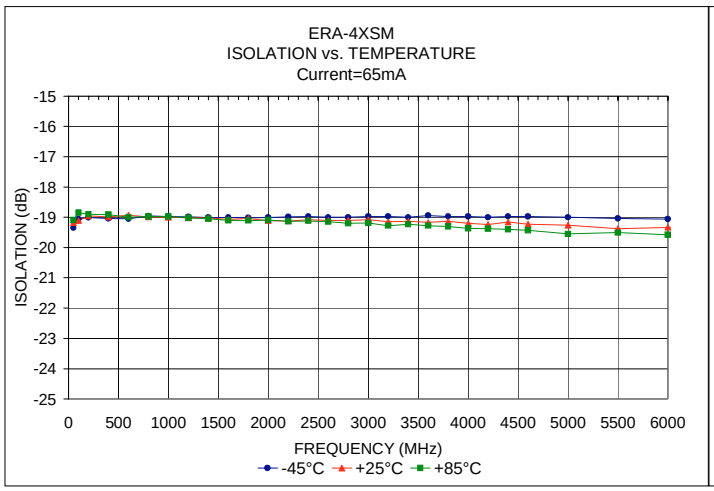
DENOTES PCB COPPER LAYOUT WITH SMOBC (SOLDER MASK OVER BARE COPPER)
DENOTES COPPER LAND PATTERN FREE OF SOLDER MASK

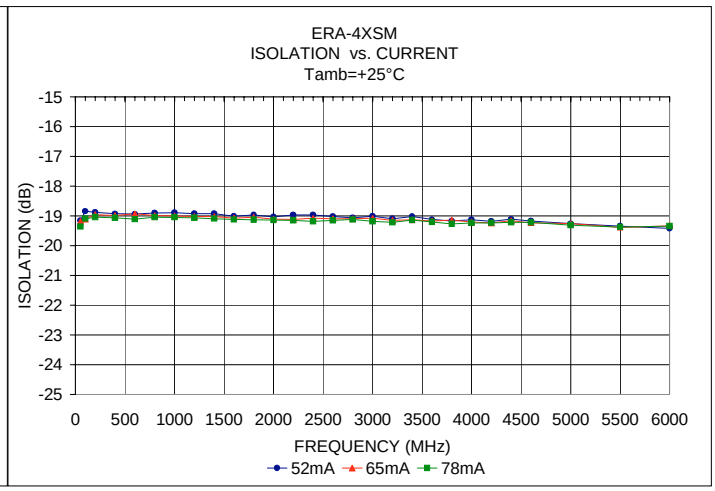
Outline Dimensions (inch / mm)

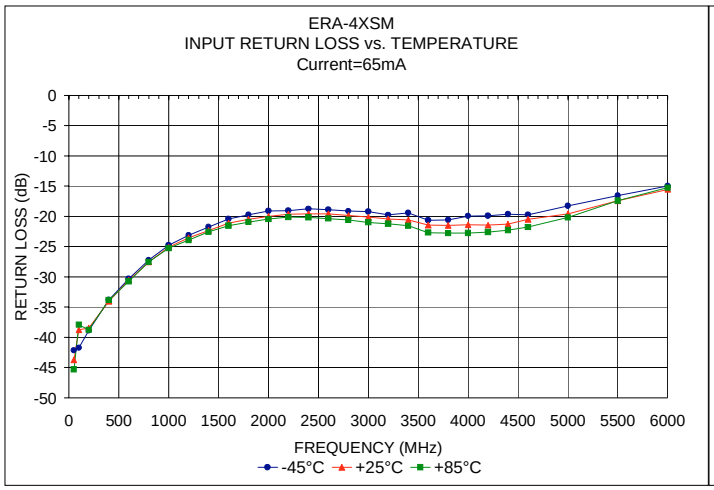
A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	wt.
.012	.10	.020	.092	.085	.060	.007	.026	.235	.118	.235	.118	.072	.040	.020	grams
.30	2.54	.51	2.34	2.16	1.52	.18	.66	5.97	3.00	5.97	3.00	1.83	1.02	0.51	.015

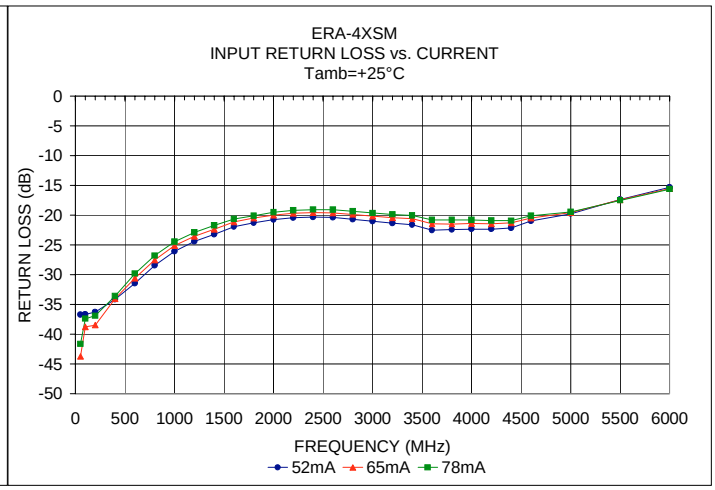

ERA-4XSM
GAIN vs. TEMPERATURE
Current=65mA
GAIN (dB)
FREQUENCY (MHz)
-45°C
+25°C
+85°C

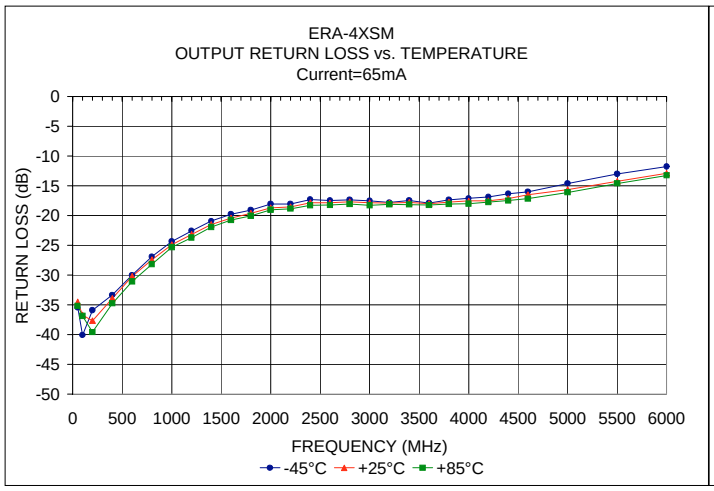

ERA-4XSM
GAIN vs. CURRENT
Tamb=+25°C
GAIN (dB)
FREQUENCY (MHz)
52mA
65mA
78mA

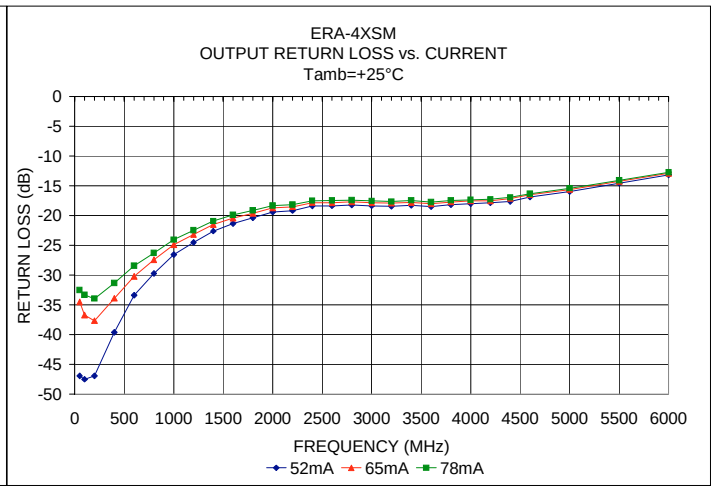

ERA-4XSM
ISOLATION vs. TEMPERATURE
Current=65mA
ISOLATION (dB)
FREQUENCY (MHz)
-45°C
+25°C
+85°C

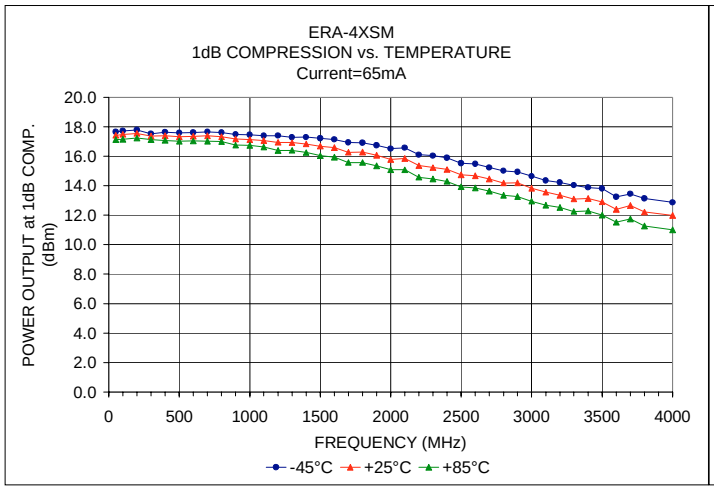

ERA-4XSM
ISOLATION vs. CURRENT
Tamb=+25°C
ISOLATION (dB)
FREQUENCY (MHz)
52mA
65mA
78mA

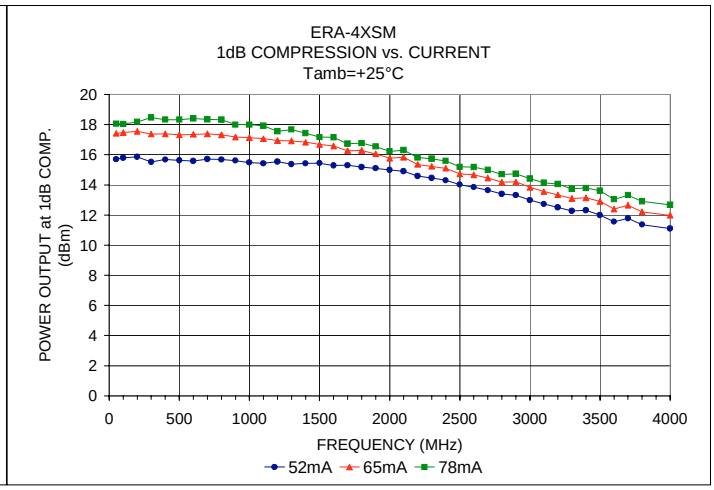

ERA-4XSM
INPUT RETURN LOSS vs. TEMPERATURE
Current=65mA
RETURN LOSS (dB)
FREQUENCY (MHz)
-45°C
+25°C
+85°C

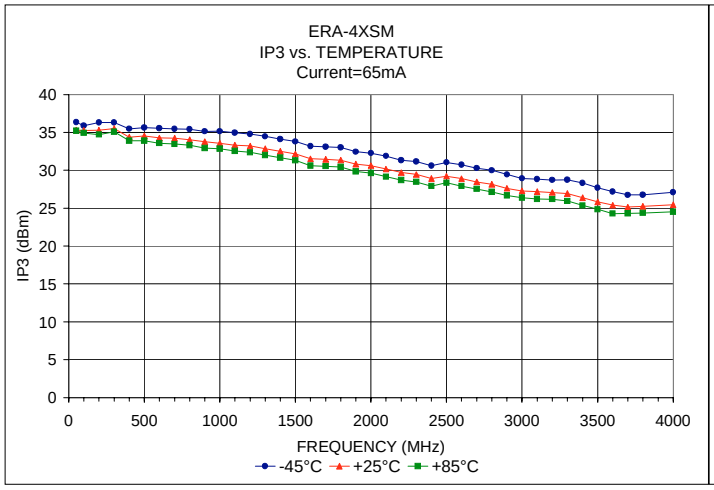

ERA-4XSM
INPUT RETURN LOSS vs. CURRENT
Tamb=+25°C
RETURN LOSS (dB)
FREQUENCY (MHz)
52mA
65mA
78mA

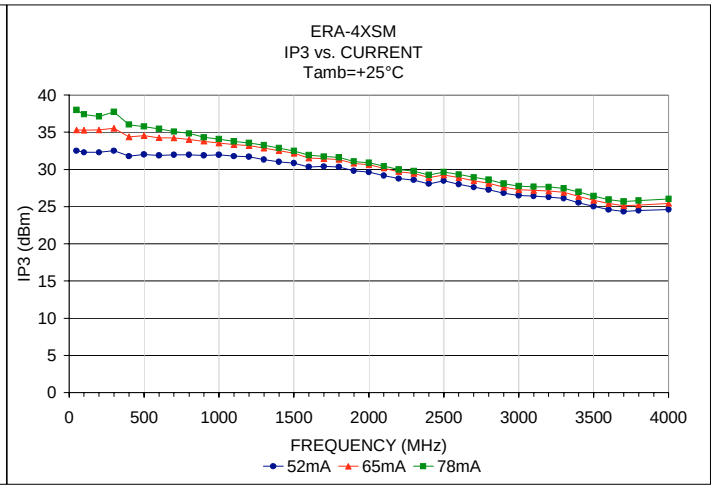

ERA-4XSM
OUTPUT RETURN LOSS vs. TEMPERATURE
Current=65mA
RETURN LOSS (dB)
0
-5
-10
-15
-20
-25
-30
-35
-40
-45
-50
0 500 1000 1500 2000 2500 3000 3500 4000 4500 5000 5500 6000
FREQUENCY (MHz)
-45°C +25°C +85°C

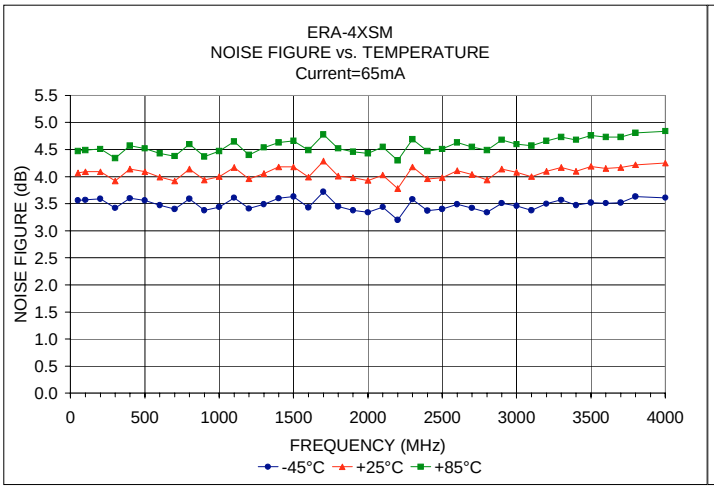

ERA-4XSM
OUTPUT RETURN LOSS vs. CURRENT
Tamb=+25°C
RETURN LOSS (dB)
0
-5
-10
-15
-20
-25
-30
-35
-40
-45
-50
0 500 1000 1500 2000 2500 3000 3500 4000 4500 5000 5500 6000
FREQUENCY (MHz)
52mA 65mA 78mA

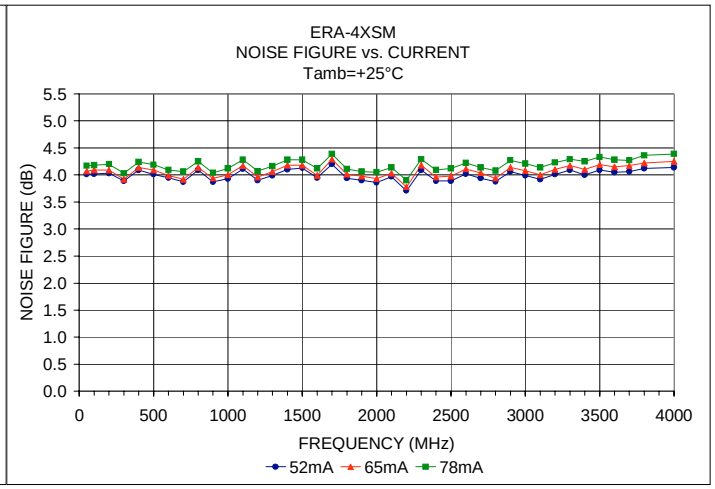

ERA-4XSM
1dB COMPRESSION vs. TEMPERATURE
Current=65mA
POWER OUTPUT at 1dB COMP. (dBm)
20.0
18.0
16.0
14.0
12.0
10.0
8.0
6.0
4.0
2.0
0.0
0 500 1000 1500 2000 2500 3000 3500 4000
FREQUENCY (MHz)
-45°C +25°C +85°C


ERA-4XSM
1dB COMPRESSION vs. CURRENT
Tamb=+25°C
POWER OUTPUT at 1dB COMP. (dBm)
20
18
16
14
12
10
8
6
4
2
0
0 500 1000 1500 2000 2500 3000 3500 4000
FREQUENCY (MHz)
52mA 65mA 78mA


ERA-4XSM
IP3 vs. TEMPERATURE
Current=65mA
IP3 (dBm)
40
35
30
25
20
15
10
5
0
0 500 1000 1500 2000 2500 3000 3500 4000
FREQUENCY (MHz)
-45°C +25°C +85°C


ERA-4XSM
IP3 vs. CURRENT
Tamb=+25°C
IP3 (dBm)
40
35
30
25
20
15
10
5
0
0 500 1000 1500 2000 2500 3000 3500 4000
FREQUENCY (MHz)
52mA 65mA 78mA


ERA-4XSM
NOISE FIGURE vs. TEMPERATURE
Current=65mA
NOISE FIGURE (dB)
5.5
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
0
500
1000
1500
2000
2500
3000
3500
4000
FREQUENCY (MHz)
-45°C
+25°C
+85°C


ERA-4XSM
NOISE FIGURE vs. CURRENT
Tamb=+25°C
NOISE FIGURE (dB)
5.5
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
0
500
1000
1500
2000
2500
3000
3500
4000
FREQUENCY (MHz)
52mA
65mA
78mA